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SYDENHAM TO BANKSTOWN

ENVIRONMENTAL IMPACT STATEMENT

> Volume 2 – Technical Papers

NSW GOVERNMENT

Volume 2 – Technical Papers

The following technical paper informed the preparation of the Environmental Impact Statement

Volume 2

Technical Paper 1 – Traffic, transport and access assessment

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NSW GOVERNMENT

Sydney Metro City & Southwest Sydenham to Bankstown upgrade
Transport for NSW
29-Aug-2017
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Technical Paper 1 - Traffic, Transport and Access

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Sydney Metro City & Southwest Sydenham to Bankstown upgrade

Technical Paper 1 - Traffic, Transport and Access

Client: Transport for NSW

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Abbreviations

Full description	Abbreviation
Australian Rail Track Corporation	ARTC
Central Business District	CBD
Construction Traffic Management Plan	CTMP
Degree of Saturation	DoS
Disability Discrimination Act 1992	DDA
Disability Standards for Accessible Public Transport 2002	DSAPT
Environmental Impact Statement	EIS
Level of Service	LoS
Metropolitan Freight Network	MFN
New South Wales	NSW
NSW Environmental Planning and Assessment Act 1979	EP&A Act
Passenger Car Unit	PCU
Public Transport Project Model	PTPM
Roads and Maritime Services	RMS
Secretary's Environmental Assessment Requirements	SEARs
Southern Sydney Freight Line	SSFL
Strategic Traffic Model	STM
Sydney Coordinated Adaptive Traffic System	SCATS
Technical Advisor	TA
Temporary Transport Plan	TTP
Temporary Transport Strategy	TTS
Transport for New South Wales	TfNSW

Glossary

Glossary of terms and acronyms Term	Meaning
Active Transport	Walking and cycling modes connecting to other transport modes.
Average Delay	Duration, in seconds, of the average vehicle waiting time at an intersection
Compound	The construction compound is an area within the project area that would include site offices, amenities, workshops, material and plant storage areas, laydown area, storage of rail track and ballast, concrete batching plant etc.
Construction Haulage Traffic	Traffic resulting from the construction of the new Sydney Metro network from Marrickville to Bankstown.
Interchange	A place where passengers move between vehicles or between transport modes including train stations, rapid transit stations, bus stops etc.
LinSig	Multi-intersection modelling software for corridor or small network analysis.

Glossary of terms and acronyms Term	Meaning
Local Road	Local roads provide for local access and circulation and are the responsibility of Councils with only limited funding assistance from the State Government.
Possession Periods	Periods of time during which the T3 Bankstown Line would be closed.
Project Area	The area where the project would be undertaken, including the existing rail corridor (from about one kilometre south-east of Marrickville Station to about one kilometre north-west of Bankstown Station), at the 10 existing stations within the corridor, and the area surrounding the rail corridor.
Rail corridor (or corridor)	This area includes all elements within the Sydney Rail land where it forms a linear corridor. The rail corridor includes the permanent way, cuttings and embankments, overhead lines, signalling equipment, vegetation etc.
Regional Roads	Roads which supplement the State Road network for significant intra-urban flows and provide access for significant flows to other commercial and industrial centres. Also known as sub-arterial roads.
Single Unit Truck	Construction haulage vehicle – 10 cubic metre capacity, maximum length 12.5 metres or 8.8 metres.
State Road	State Roads are the major arterial links throughout NSW and within major urban areas. They are the principle traffic carrying and linking routes for the movement of people and goods within the Sydney urban areas and which connect between urban centres, the major regional towns, the major regions of the State and the major connections interstate.
Station precinct	Includes the station and any development directly associated with the station such as adjacent retail and transport links and interchanges/roads.
Study Area	The area surrounding where the project would be undertaken, and potentially impacted from the works which is about one kilometre north-east of Sydenham Station to Sefton Station in the west, to Lidcombe Station in the north, and bounded to the south by a line approximately 3km south of the project area.
Sydney Metro	Sydney Metro is a new standalone automated rapid transit rail network under construction in Sydney. The Sydney Metro network consists of Sydney Metro Northwest (under construction) and Sydney Metro City & Southwest, which together would provide 66 kilometres of metro rail line and 31 metro railway stations.
Sydney Trains	The agency responsible for the provision of suburban passenger train services in/around Sydney.
T1 North Shore & Northern Line	Sydney Trains line - City to Berowra via Gordon, City to Hornsby via Macquarie University City to Epping via Strathfield.
T2 Airport line	Sydney Trains line - Macarthur to City via Airport or Sydenham
T2 Inner West & South Line	Sydney Trains line - Campbelltown or Leppington to City via Granville
T3 Bankstown Line	Sydney Trains line - Liverpool or Lidcombe to City via Bankstown
T3 Lane	Transit lane to provide improved travel for buses, taxis and other vehicles carrying multiple occupants. They can also be used by emergency vehicles, motorcycles and bikes.
Worksite	This area is the footprint of the construction works (also referred to as the project area). A range of construction activities would take place within this area including the construction of station buildings, public realm areas and ancillary works.

Executive Summary

Project Overview

Sydney Metro is part of the NSW Government's infrastructure investment program to respond to the growth in transport demand in Sydney. It will transform Sydney, delivering more trains and faster services for customers across the network.

Sydney Metro is a key component of Sydney's Rail Future (Transport for NSW, 2012a), a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future.

The Sydney Metro network consists of Sydney Metro Northwest (between Rouse Hill and Chatswood) and Sydney Metro City & Southwest (between Chatswood and Bankstown). Sydney Metro City & Southwest comprises two core components:

- the Chatswood to Sydenham project, which involves about 15.5 kilometres of new underground rail line and new stations between Chatswood and Sydenham
- the Sydenham to Bankstown upgrade component ('the project' and the subject of this document), which involves the upgrade for accessibility and conversion to metro standards of 10 stations along the existing Sydney Trains rail line between Marrickville and Bankstown.

The Sydney Metro Delivery Office, part of Transport for NSW, is managing the planning, procurement, and delivery of the Sydney Metro network.

The project would provide the following key benefits to traffic, transport and access in Sydney:

Increased capacity –the project would release train paths and facilitate extra services to operate on the T2 Airport Line and T2 Inner West and South Line, therefore improving capacity to meet demand and alleviate crowding on trains.

Supports growth -The Department of Planning and Environment has initiated urban renewal investigations along the Sydenham to Bankstown corridor. The project would support growth within this corridor by providing much needed additional capacity. Strong population growth from Sydney's south west is expected to see forecast demand exceed capacity on the Bankstown Line by around 2021. The project would provide critical congestion relief by 2025, and support long-term growth beyond.

Reduces station crowding - Potentially reduce the number of different service types/patterns operating through City Circle stations, improving service legibility and reducing the risk of platform congestion due to passengers having to dwell at these stations to wait for their desired service in the afternoon peak.

Enhances reliability- Eliminating several merges that currently occur with the T2 Airport Line and T2 Inner West and South Line services, thus reducing operational complexity and the risk of service unreliability.

Customer Benefits – The project would upgrade all stations to full access compliance and provide progressive improvements to individual stations and surrounding precincts along with travel time savings.

The project involves upgrading 10 stations along a 13 km long section of the Sydney Trains T3 Bankstown Line from west of Sydenham (Marrickville to Bankstown inclusive). This allows the existing catchment of train customers to be maintained along this alignment which would encourage mode shift from road based transport onto trains, delivering customers a more comfortable, reliable and efficient train service, and urban renewal around existing stations.

The existing T3 Bankstown Line and ARTC freight line need to remain operational whilst much of the project is being constructed. Many components can only be safely constructed during rail possession periods. Existing rail possession periods typically occur four times a year over a weekend to enable rail maintenance work to occur safely with no services operating. In order to deliver the project safely and efficiently, additional possession periods which extend into weekdays which are required to carry out the substantial construction works. This would include a final extended period of between three to six months before the Sydney Metro conversion of the line is complete. During this time customers using the Sydney Trains service on the T3 Bankstown Line would be directed to replacement transport options. A suite of plans would be developed and implemented in these periods to minimise impacts to customers.

This technical paper, Technical Paper 1 - Traffic, transport and access, is one of a number of technical documents that forms part of the Environmental Impact Statement (EIS). The purpose of this technical paper is to identify and assess the traffic, transport and access impacts of the project during both construction and operation. In doing so, it responds directly to the Secretary's environmental assessment requirements.

Approach to traffic and transport assessment

This technical paper considers the construction and operational traffic, transport and access impacts of the project on pedestrians, cyclists, public transport and other motorised vehicles.

The construction haulage traffic, transport and access impact assessment has included:

- assessment of the impacts of works on pedestrians, cyclists and scheduled bus service networks
- consideration of parking provision during the works for both construction related activities and existing businesses, residents and commuters
- swept path assessment of the largest construction haulage vehicle anticipated for each compound to ensure that construction activities can be conducted as programmed
- collection of current traffic volume data as a baseline for key intersections in the vicinity of the construction works, including replacement bus routes, during the peak periods
- utilising forecast annual growth trends in traffic on Sydney roads as a result of development and economic growth to consider the future construction impacts
- forecasting of construction period traffic flows and assessment of effects through intersection modelling
- modelling of key intersections with and without construction (both phases) haulage to and from the project worksite and construction compounds to ascertain the impact on the local area of the proposed construction tasks and program
- assessment of the impact of the replacement buses required during the possession periods of the construction program including the impact to parking spaces at stations from bus stops and layovers
- testing potential mitigation measures for selected critical intersections
- consideration of diversions resulting from the closure or restrictions on existing bridges which cross the rail line and are to be upgraded as part of the works
- consideration of how pedestrian and cycle routes in close proximity to construction activities may be impacted
- consideration of pedestrian, cycle and bus movements on routes proposed for construction haulage, or impacted by bridge closures
- potential impacts of construction works on pedestrian, cyclist and motorist safety, major special events, emergency vehicles and power supply routes
- a cumulative assessment that considers approved construction projects adjacent to the project.

As such the assessment has considered the effects of construction on all modes of transport within the vicinity of the project.

Construction of the project would commence once all necessary approvals are obtained (anticipated to be in 2018), and would take about five years to complete.

The Operational (end-state) Traffic Impact Assessment has included consideration of:

- a description of how many customers would access the station and how
- pedestrian routes to stations including the accessibility for mobility impaired
- cycle routes to the stations and the provision of bike parking
- consideration of interchange amenity for bus passengers
- improvements to intersections surrounding the stations
- assessment of availability of taxi stand, kiss and ride and parking adjacent to stations.

Overview of potential impacts

During Construction

In assessing the current traffic volumes and conditions surrounding the project alignment, it was noted that several intersections are operating at, or close to capacity in the morning and evening peaks, as could be expected in built up urban areas of Sydney. When the anticipated population and traffic growth has been added to reflect the conditions which are likely to be present for the latter years of the construction (i.e. background traffic growth), the assessment found that even without any disruption or additional construction related traffic resulting from the project, some of these intersections would have demands exceeding capacity resulting in long delays unless otherwise mitigated.

In the context of the volumes of vehicles that the road network is carrying in the peak periods, the construction haulage vehicles are forecast to add a negligible volume to the flows, and therefore from a capacity and delay perspective have very minor impacts. However, careful consideration of construction haulage traffic routes to maintain safety and avoid a loss of amenity for residents especially, has led to the development of specific routes between the primary road network and the project area. These routes have been developed with the principle of having direct access to major arterial roads with easy access to the wider road network.

A Temporary Transport Strategy has been developed, that describes the process for planning and delivering the integrated, multi-modal transport network that would operate during possession periods on the Bankstown Line. The Temporary Transport Strategy outlines that for each possession period, a number of Temporary Transport Plans[1] would be developed in line with the Temporary Transport Strategy as the guiding document and utilising the assessment outlined in this Technical Paper. The plans would define initiatives to be implemented to assist customers affected by closures of the line and its stations. These Temporary Transport Plans would be developed post-approval and would be informed through community feedback, and refined based on further understanding of construction planning, timetabling options on the rail network and customer needs and ongoing development of alternatives to deliver improved customer outcomes.

A Baseline Temporary Transport Plan is described in this document. This includes replacement buses during possession periods that provide a full rail capacity replacement by buses only, as currently occurs during typical weekend possession. This Baseline Temporary Transport Plan has been assessed in this Technical Paper. In this case there would be extensive impacts with both intersection capacities and the ability to provide safe and efficient boarding and alighting facilities at stations being affected. This scenario would have the potential to adversely affect not just the amenity for passengers using the rail replacement service, but those on existing bus routes in the area, private car users and cyclists.

A Refined Baseline TTP has been tested to assess an alternative rail replacement strategy to convey passengers west of Campsie to parallel rail lines and reduce the impact on intersections between Dulwich Hill and Marrickville.

The assessment of bridge works includes 27 bridges (17 overbridges, three footbridges and 7 underpass structures). Bridge works would require both partial closures and full closures, requiring general traffic to divert or use restricted lanes on the bridge. At no time would bridge works occur on

[1] Temporary Transport Plans, as referenced in this document, are now referred as Temporary Transport Management Plans in the EIS main report and other technical papers.

adjacent bridges simultaneously and scheduling of closures would consider the broader network in conjunction with other activities. The assessment of potential impacts demonstrates that the majority of the bridges can be upgraded with minimal delays to traffic. However, there are several key bridges where the proposed upgrade works would create significant restrictions on capacity, have the potential to cause long delays, and the effects could be expected to extend a significant distance across the network. Having highlighted these issues, detailed construction traffic management plans developed when specific scheduling of works is defined, would seek to minimise these impacts.

The addition of construction haulage vehicles on haulage routes and of vehicles accessing the worksites has been assessed to determine the potential impact on the existing transport network facilities. This concluded:

- a number of bus routes would need to be diverted as a result of temporary lane or road closures during the construction of the project, which includes bridge works. Potential diversion routes have been allocated in a manner which minimises the effect on bus passengers by designating direct routes where possible
- some bus stops in proximity to works would be relocated to ensure effective operations and safety of customers. The temporary relocation of bus stops would be selected taking into account the most practical location for bus passengers, while maintaining safe and efficient pedestrian, cycle and traffic movements
- pedestrians and cyclists movements at a number of bridge locations would be periodically effected during half lane bridge closures. During these partial closures temporary traffic management would divert pedestrians to the opposite side of the road. Cyclists would in most cases follow the diversion routes established for vehicles. During full bridge closures, pedestrians and cyclists would need to be diverted to an adjacent bridge. The diversion routes would aim to minimise the additional travel distance required and consider the suitability of those routes for the safety of cyclists
- bicycle parking would be affected during construction works at a number of stations. Replacement bicycle parking would be provided at alternative locations during these works where practicable.

The construction traffic assessment is based on forecast construction traffic generation along specified construction haulage routes, and their associated affects upon intersection operation. Specific activities requiring closures, work zones and other traffic management activities would be detailed in Construction Traffic Management Plans.

During Operation

The project would deliver a component of the Sydney Metro network within the existing T3 Bankstown Line rail corridor. However, the project may impact on the road network as a result of the project changing mode share for existing customers and attracting new customers. .

The upgraded Metro network would provide twice as many trains per hour in peak periods. This would reduce waiting time at stations for passengers and transfer from a timetabled service to a “turn up and go” service, removing the need for pre-planning to co-ordinate with a specific train.

The project would provide travel time savings from the new metro stations to the CBD and to stations along the Sydney Metro Northwest component. On board travel times would be up to 10 minutes faster for customers from Bankstown to Central compared to the current journey on Sydney Trains. These customer benefits would be further realised through an increased reliability which arises from the segregation of the Metro from the Sydney Trains network.

The project design has prioritised pedestrian and cyclist access to stations within the modal hierarchy. These modes are sustainable, cost-effective, equitable, accessible and require the least amount of space. The project would upgrade the pedestrian environment and facilities within the station precinct to improve cycle connections and bike parking at stations to support these modes.

The project design would safeguard for an active transport corridor between Sydenham and Bankstown. Components of the active transport corridor would be delivered as part of station precinct work. The active transport corridor would facilitate strategic walking and cycling connections to a number of important destinations, including linking public transport interchanges between Sydenham and Bankstown, residential areas, schools, retail and commercial precincts.

Appropriate footpath widths and gradients would be provided outside of station exits and throughout the public domain. Vision and mobility impaired customers would be considered in the pavement designs, for example by keeping one side of the travel path clear of fittings and fixtures and providing tactile ground surface indicators on travel paths to warn of hazards and assist wayfinding where required.

Benefits to bus patrons would also be achieved as a result of the project. Connections between bus and rail services would be provided to optimise routes from origin to destination. The project would provide bus stops within 100m from the platform gate line where practicable. This would increase the accessibility for passengers choosing to transfer from bus to rail.

Summary of Mitigation

Construction

To manage the construction impacts of the project, a range of mitigation measures have been incorporated during project planning and are discussed in the Paper. The key recommended mitigation measures are as follows:

- ongoing consultation with relevant councils, Sydney Co-ordination Office, Roads and Maritime Services, Sydney Trains, NSW TrainLink, RailCorp, emergency services and bus operators would be consulted throughout the construction period in relation to the programme of works and nature of planned activities
- the Temporary Transport Strategy would be developed into a suite of Temporary Transport Plans which would be implemented to maintain public transport mode choice during rail shutdown periods
- possession periods would be scheduled to occur at times of lower demand on road and rail demand, with a focus on the programming minimising the effect of the six most critical bridges
- directional signage and line marking around construction sites and the surrounding network would include Variable Message Signs to direct and guide drivers and pedestrians past construction sites and advise of potential delays, diversion routes for traffic, buses, cyclists and pedestrians, during partial or full road closures and speed restrictions
- ongoing monitoring and reporting of the road network would be carried out by the Traffic Management Centre and Sydney Co-ordination Office, including of other ongoing project construction such as WestConnex, to identify traffic congestion and make operational changes as required
- minor intersection upgrades would be assessed during the detailed planning of the construction phase and where appropriate and in consultation with local councils and Roads and Maritime Services alterations to lane markings, parking, kerblines and permitted turns would be implemented for the duration of local construction activities
- a Construction Traffic Management Plan would contain measures for managing hours of work and deliveries, staff transport and staff parking to limit impact to the public during peak hours, school hours and minimise construction staff traffic by the use of shuttles and public transport
- scheduled bus service timetables, routes and stops would be assessed and monitored during the works and changes made as required to minimise the effects on bus patrons during the construction works
- early engagement activities would be carried out to alert the community in advance of proposed road and pedestrian network changes via media channels and other appropriate forms of community liaison
- the construction program would be designed to where feasible, restrict works from being carried out simultaneously on adjacent bridges
- specific traffic management plans for special events would be developed in conjunction with the relevant stakeholders.

Operation

To manage the operational impacts of the project a suite of management measures have been outlined in this Technical Paper, primarily to further encourage integration of the project with other transport modes. The recommended mitigation measures include:

- the ongoing review and monitoring of pedestrian and cycle facility usage following the commencement of operations and implementation of safety and amenity upgrades as required
- review and update of the bus services to provide adequate capacity for integration of bus and metro services
- provision of wayfinding signage to support customer experience and accessibility with specific focus for directions to cycle facilities, bus stops, kiss and ride, taxi bays and dedicated commuter parking
- regular reviews of the cycle and bike parking and kiss and ride facilities with provision of additional facilities and management as required.

1.0 Introduction

1.1 Project background

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

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future, providing 66 kilometres of metro rail line and 31 metro stations. The NSW Government is currently delivering the first two stages of Sydney Metro, shown in **Figure 1.1**, which consist of Sydney Metro Northwest (between Rouse Hill and Chatswood) and Sydney Metro City & Southwest (between Chatswood and Bankstown).

Sydney Metro Northwest is currently under construction. Sydney Metro Northwest services will start in the first half of 2019, with a metro train running every four minutes in the peak period. Services will operate between a new station at Cudgegong Road (beyond Rouse Hill) and Chatswood Station.

Sydney Metro City & Southwest will extend the Sydney Metro system beyond Chatswood to Bankstown, delivering about 30 kilometres of additional metro rail, a new crossing beneath Sydney Harbour, new railway stations in the lower North Shore and Sydney central business district (CBD), and the upgrade of existing stations from Marrickville to Bankstown. City & Southwest trains would run between Sydenham and Bankstown stations in each direction, at least every four minutes in peak periods, averaging around 15 trains per hour.

Sydney Metro City & Southwest comprises two core components (shown in **Figure 1.1**):

- the Chatswood to Sydenham project
- the Sydenham to Bankstown upgrade ('the project' and the subject of this document).

1.1.1 The project for which approval is sought

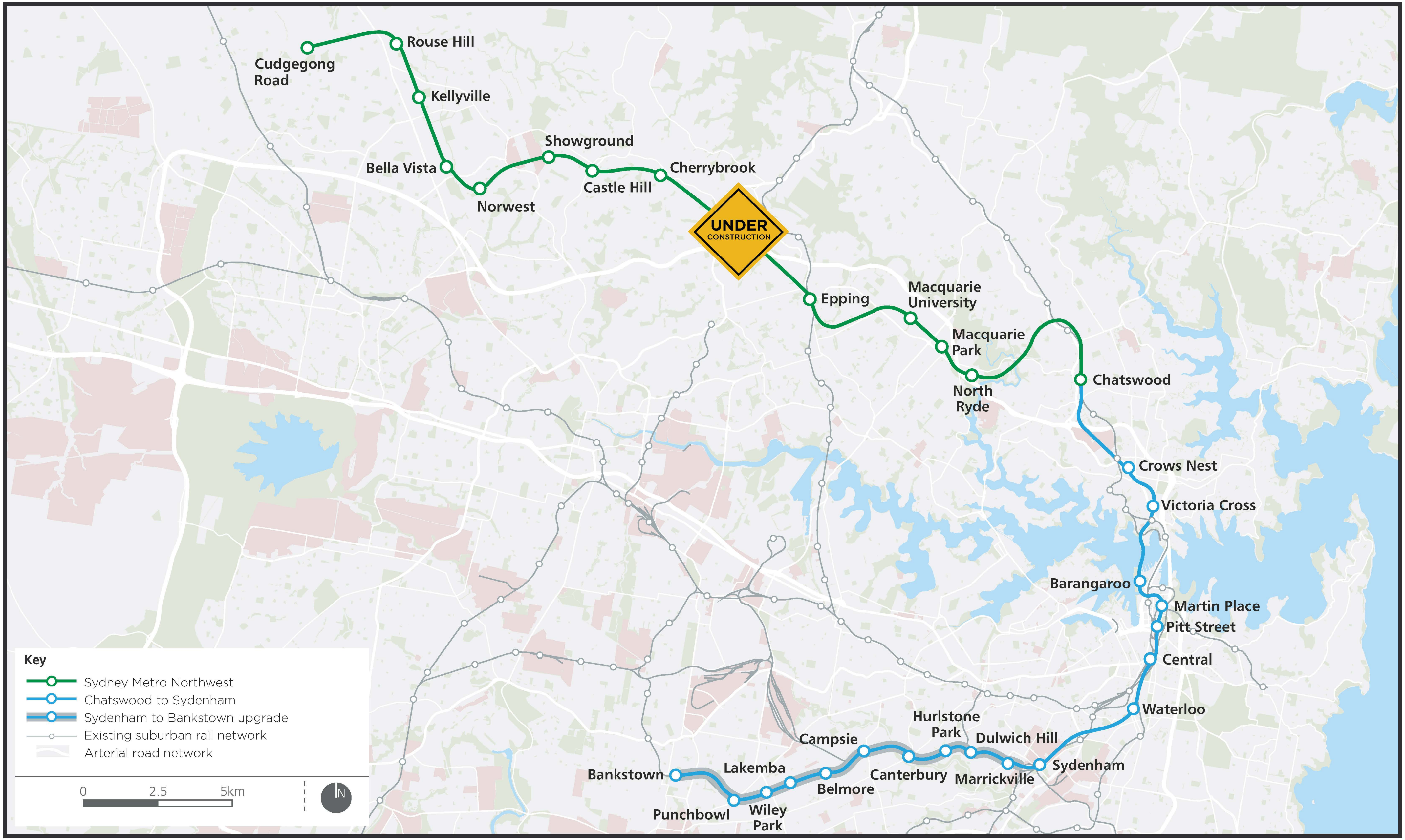
Transport for NSW is seeking approval to construct and operate the Sydenham to Bankstown upgrade component of Sydney Metro City & Southwest (the project).

The project involves upgrading 10 existing stations west of Sydenham (Marrickville to Bankstown inclusive), and a 13 kilometre long section of the Sydney Trains T3 Bankstown Line, from west of Sydenham Station to just west of Bankstown Station, to improve accessibility for customers and meet the standards required for metro operations. The project would enable Sydney Metro to operate beyond Sydenham, to Bankstown.

A key element of the project is upgrading stations along the corridor from Marrickville to Bankstown, to allow better access for more people by providing new concourses, level platforms, and lifts at stations. These upgrades aim to provide a better, more convenient and safer experience for public transport customers, by delivering:

- stations that are accessible to people with a disability or limited mobility, the elderly, people with prams, and people travelling with luggage
- upgraded station buildings and facilities for all transport modes that meet the needs of a growing population
- interchanges that support an integrated transport network and allow seamless transfers between different modes for all customers.

The project is subject to assessment and approval by the NSW Minister for Planning under Part 5.1 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act).



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The Sydney Metro network

FIGURE 1.1

1.2 The project

1.2.1 Location

The location of the project is shown in **Figure 1.2**.

The key elements of the project are located mainly within the existing rail corridor, from about 800 metres west of Sydenham Station in Marrickville, to about one kilometre west of Bankstown Station in Bankstown. The project is located in the Inner West and Canterbury-Bankstown local government areas.

The term ‘project area’ is used throughout this document to refer to the area where the physical works for the project would be undertaken. This area encompasses the existing rail corridor (as described above), the 10 existing stations within the corridor, and areas surrounding the rail corridor as shown in **Figure 1.2**.

1.2.2 Key features

The key features of the project are summarised below and are shown in Figure 1.2.

Works to upgrade access at stations

The project includes upgrading the 10 stations from Marrickville to Bankstown as required, to meet legislative requirements for accessible public transport, including the requirements of the *Disability Discrimination Act 1992* and the *Disability Standard for Accessible Public Transport 2002*. The proposed works include:

- works to platforms to address accessibility issues, including levelling and straightening platforms
- new station concourse and station entrance locations, including:
  - new stairs and ramps
  - new or relocated lifts
- provision of additional station facilities as required, including signage and canopies.

Works would also be undertaken in the areas around the stations to better integrate with other modes of transport, improve travel paths, and meet statutory accessibility requirements. This would include provision of pedestrian, cyclist, and other transport interchange facilities; as well as works to the public domain, including landscaping.

Works to convert stations and the rail line to Sydney Metro standards

Station works

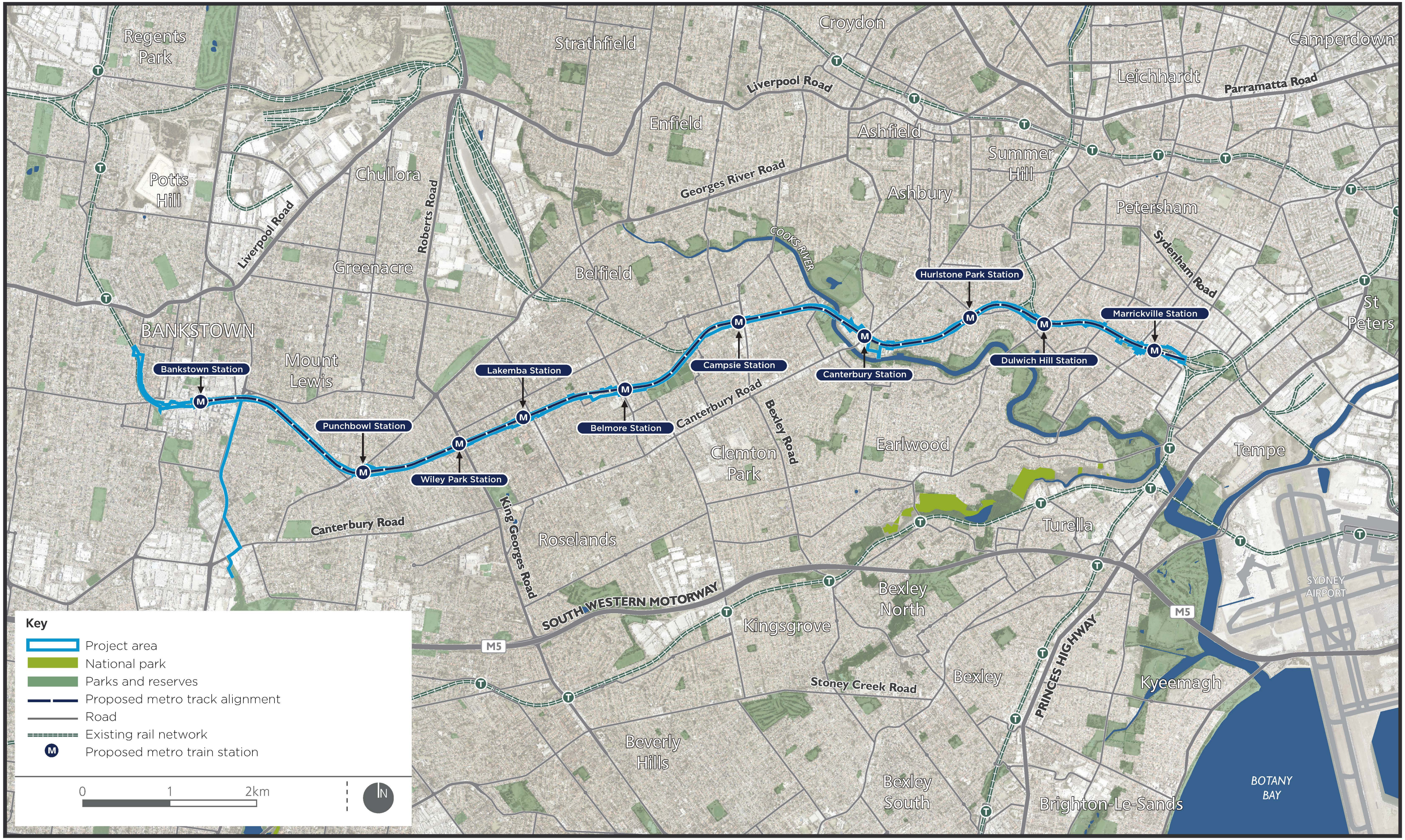
In addition to the station upgrades to improve accessibility, works to meet the standards required for metro services would be carried out, including:

- installation of platform screen doors
- provision of operational facilities, such as station services buildings.

Track and rail system facility works

Upgrading the track and rail systems to enable operation of metro services would include:

- track works where required along the rail corridor, including upgrading tracks and adjusting alignments, between Sydenham Station and west of Bankstown Station
- new turn back facilities and track crossovers
- installing Sydney Metro rail systems and adjusting existing Sydney Trains rail systems
- overhead wiring adjustments.



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Overview of the project

FIGURE 1.2

Other works

Other works proposed to support Sydney Metro operations include:

- upgrading existing bridges and underpasses across the rail corridor
- installation of security measures, including fencing
- installation of noise barriers where required
- modifications to corridor access gates and tracks
- augmenting the existing power supply, including new traction substations and provision of new feeder cables
- utility and rail system protection and relocation works
- drainage works to reduce flooding and manage stormwater.

Active transport corridor and surrounding development

The project would also provide for:

- parts of an active transport corridor where located within the station areas or surplus rail corridor land, to facilitate walking and cycling connections to each station and between Marrickville and Bankstown
- Enabling works to support future development at Campsie Station (future development would be subject to a separate approvals process).

Temporary works during construction

During construction, the project would involve:

- provision of temporary facilities to support construction, including construction compounds and work sites
- implementation of alternative transport arrangements for rail customers during possession period and/or station closures, guided by the Temporary Transport Strategy (included in **Appendix E**).

1.2.3 Timing

Construction

Construction of the project would commence once all necessary approvals are obtained (anticipated to be in 2018), and would take about five years to complete.

The T3 Bankstown Line would remain operational for the majority of the construction period. However, to ensure the station and infrastructure upgrade works are completed as efficiently and safely as possible and to accommodate works that cannot be undertaken when trains are operating, would be necessary to undertake some work during rail possession periods, when trains are not operating. It is anticipated that these rail possession periods would comprise the routine weekend maintenance possession periods during periods of reduced patronage such as school holidays.

A final, longer possession of about three to six months would also be required. This would involve full closure of the line to enable conversion to metro operations. This would include works such as the installation of new signalling, communication systems, and platform screen doors.

During each possession period, alternative transport arrangements would be implemented to ensure that customers can continue to reach their destinations.

Operation

Sydney Metro City & Southwest would be fully operational by 2024, with the opportunity of operation commencing in two phases. Initially, Sydney Metro Northwest services would be extended by the City & Southwest project, and would operate from Chatswood Station to Sydenham Station. Some months later, metro operations would extend from Sydenham Station to Bankstown Station, with both phases planned to be completed before the end of 2024. The opportunity for phased opening of the project would enable metro trains to operate from Cudgegong Road Station to Sydenham Station prior to the final conversion of the T3 Bankstown Line to metro operations.

Once the project is operational, Sydney Trains services would no longer operate along the T3 Bankstown line between Sydenham and Bankstown Stations. Customers would be able to interchange with Sydney Trains services at Sydenham and Bankstown stations. Sydney Trains services to and from Bankstown to Liverpool and Lidcombe stations would not be affected.

1.3 Purpose and scope of this report

This technical paper, Technical Paper 1 – Traffic, transport and access, is one of a number of technical documents that forms part of the EIS. The purpose of this technical paper is to identify and assess the traffic, transport and access impacts of the project during both construction and operation. In doing so it responds directly to the Secretary's environmental assessment requirements (Section 1.4).

This technical paper considers the construction haulage and operational traffic, transport and access impacts to customers, and to the walking, cycling, public transport and road networks surrounding the project. It also addresses the impacts to the existing parking at stations along the corridor during construction and permanent changes to dedicated commuter parking during operation.

The construction haulage traffic, transport and access assessment has included:

- assessment of the impacts of works on pedestrians, cyclists and scheduled bus service networks
- consideration of parking provision during the works for both construction related activities and existing businesses, residents and commuters
- swept path assessment of the largest construction haulage vehicle anticipated for each compound to ensure that construction activities can be conducted as programmed
- modelling of key intersections with and without construction (both phases) haulage to and from the project worksite and construction compounds to ascertain the impact on the local area of the proposed construction tasks and program
- assessment of the impact of the replacement buses required during the possession periods of the construction program
- testing potential mitigation measures for selected critical intersections
- consideration of diversions resulting from the closure or restrictions on existing bridges which cross the rail line and are to be upgraded as part of the works
- potential impacts of construction works on pedestrian, cyclist and motorist safety, major special events, emergency vehicles and power supply routes
- a cumulative assessment that considers approved construction projects adjacent to the project.

The methodology for the assessment of the potential construction impacts of the project included:

- consideration of how pedestrian and cycle routes in close proximity to construction activities may be impacted
- consideration of pedestrian, cycle and bus movements on routes proposed for construction haulage, or impacted by bridge closures
- collection of current traffic volume data as a baseline for key intersections in the vicinity of the construction works, including replacement bus routes, during the peak periods
- utilising forecast annual growth trends in traffic on Sydney roads as a result of development and economic growth to consider the future construction impacts
- forecasting of construction period traffic flows and assessment of effects through intersection modelling.

As such the assessment has considered the effects of construction on all modes of transport within the vicinity of the project.

The most significant consideration for this technical paper is the potential construction impacts resulting from the project. The existing Sydney Trains Sydenham to Bankstown Line and ARTC freight line need to remain operational whilst much of the project is being constructed. Given this, much of the project is required to be constructed during rail possession periods. Existing rail possession periods typically occur four times a year over a weekend period to enable rail maintenance work to occur safely with no services operating. In order to deliver the project by 2024, additional possession periods of a longer duration are required to carry out the substantial construction works safely. In addition, a longer period of testing and commissioning is required. For these periods the Sydney Trains services on the Sydenham to Bankstown Line would need to be replaced by alternative transport. This assessment has considered the addition of the buses required during these periods to the road network, as well as construction haulage required within and outside of these periods.

In parallel to this traffic and transport assessment, a Temporary Transport Strategy (TTS) has been developed to address the likely temporary modal shift during these periods and its implications on bus transport, other rail lines, parking availability, walking, cycling and the road network (refer to Section 4.5).

The Temporary Transport Strategy outlines that for each possession period, a number of Temporary Transport Plans[2] (TTPs) would be developed in line with the Temporary Transport Strategy as the guiding document and utilising the assessment outlined in this Technical Paper. The plans would define initiatives to be implemented to assist customers affected by closures of the line and its stations. These TTPs would be developed post-approval and would be informed through community feedback, and refined based on further understanding of construction planning, timetabling options on the rail network and customer needs and ongoing development of alternatives to deliver improved customer outcomes.

There are also a number of bridges that cross the current alignment that would require enhancements and upgrade to facilitate the operation of the metro. During these works, access may be restricted and road users may need to be diverted to other bridges.

As detailed in subsequent chapters, whilst the overall construction duration would span from 2018 - 2024, the track closures, individual station works and bridge activities occur for shorter periods within that overall program, and whilst some overlap, not all would occur at the same time. The construction assessment approach outlined in Chapter 4 and then presented in Chapter 5 and Chapter 6 provides the detail of the assumptions and constraints related to the timing of these activities.

Conversely the operational assessment is somewhat more straightforward. Whilst the project would deliver enhancements to the public transport system between Marrickville and Bankstown, there are already stations present. As such the facilities for modal interchanges with private car (parking and passenger drop off), bus, cycling and walking whilst modified, are present and would, where possible, be improved. Qualitative descriptions of these improvements and interactions are outlined in Chapter 8.

The Operational (end-state) Traffic Impact Assessment has included consideration of:

- pedestrian routes to stations including the accessibility for mobility impaired
- cycle routes to the stations and the provision of bike parking
- consideration of interchange amenity for bus passengers
- improvements to intersections surrounding the stations
- assessment of availability of taxi stand, kiss and ride and parking adjacent to stations
- consideration of changes to total station entry and egress
- consideration of changes to mode of access.

Mitigation measures during construction and operation have been identified.

[2] Temporary Transport Plans, as referenced in this document, are now referred as Temporary Transport Management Plans in the EIS main report and other technical papers.

The key mitigation requirements are during construction. Mitigation strategies have been developed for selected critical intersections to demonstrate that the construction haulage traffic, TTPs and bridge diversions can occur simultaneously whilst minimising disruption and maintaining an acceptable level of service for Sydney Road network users.

This assessment focusses on:

- the ten station precincts of Marrickville, Dulwich Hill, Hurlstone Park, Canterbury, Campsie, Belmore, Lakemba, Wiley Park, Punchbowl and Bankstown where construction works would be undertaken as part of this project, and the rail corridor between west of Sydenham and west of Bankstown (the project area)
- the intersections identified as being impacted by the construction and operation of the project. This is discussed in more detail in Chapter 4 and Chapter 8.

1.4 Secretary's environmental assessment requirements

The Secretary's environmental assessment requirements relating to traffic and transport, and where these requirements are addressed in this technical paper, are outlined in **Table 1.1**.

Table 1.1 Secretary's environmental assessment requirements – traffic, transport and access

Secretary's environmental assessment requirements	Where addressed/drafting comment for discussion
13. Transport and traffic	
1. The Proponent must assess construction transport and traffic (vehicle, pedestrian and cyclists) impacts, including, but not limited to: (a) a considered approach to route identification and scheduling of transport movements;	Chapter 4, Chapter 5, Chapter 6, and Chapter 7.
(b) the number, frequency and size of construction related vehicles (passenger, commercial and heavy vehicles, including spoil management movements);	Chapter 4, Section 4.3, Chapter 5,Chapter 6 and **Appendix C**
(d) the need to upgrade roads proposed as construction vehicle routes including impacts of road closures, construction worker parking and impacts on availability of public parking;	Chapter 4, Chapter 5, Chapter 6, Chapter 7 and Chapter 9.
(e) 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);	Chapter 3, Chapter 4, Chapter 5, Chapter 6 and **Appendix A**
(f) information on how construction and scheduling of works will be coordinated in regard to cumulative traffic impacts resulting from concurrent work on WestConnex and other approved key construction projects.	Chapter 10
(g) access constraints and impacts on public transport, pedestrians and cyclists including:	Chapter 5 and Chapter 6
• impacts on customers and reliability of suburban and intercity rail services (including increased demand for rail services on other lines, particularly the T2 Inner West, T1 North Shore, Northern and Western Lines) during possession periods and testing and commissioning of metro trains;	Section 4.5, Chapter 5 and Sections 3.1 to Section 3.3 of **Appendix E**

Secretary's environmental assessment requirements	Where addressed/drafting comment for discussion
• alternative transport arrangements for customers during rail possessions and closure of the rail line (including how the Temporary Transport Plan will be developed in consultation with relevant Councils and community); and	Section 4.5, Chapter 5, and **Appendix E**
• identification of key traffic performance issues in the surrounding areas during rail shutdowns and implementation of alternative transport arrangements.	Section 4.5, Chapters 5 and Chapter 6 and **Appendix E**
(h) the need to close, divert or otherwise reconfigure elements of the road and cycle network associated with construction of the project.	Chapters 5, Chapter 6 and Chapter 7
(i) assess the likely risks of the project to public safety, paying particular attention to pedestrian safety	Chapter 5, Chapter 6 and Chapter 7 for assessment, and Chapter 9 for mitigation
2. The Proponent must assess the operational transport impacts of the project, including the wider transport interactions (local and regional roads, change to commuter parking and loading zones, provision of kiss and ride facilities, cycling, public and freight transport). The EIS must define a transport hierarchy and a framework for an active transport strategy.	Section 2.3 and Chapter 8
14. Place Making and Urban Design	
1. The Proponent must describe the accessibility elements of the project including relevant accessibility legislation and guidelines and:	Chapter 5, Chapter 6, Chapter 7 and Chapter 8
(a) impacts on pedestrian access in and around stations and connecting streets (including consideration of land use change);	Chapter 5, Chapter 6 for construction and Chapter 8 for operation
(b) enhancing the accessibility of each station and the general vicinity of walking and cycling catchments;	Chapter 8
(c) the provision of infrastructure to support accessible paths of travel and interchange;	Chapter 8
(d) impacts on cyclists (including provision of and integration with active transport routes) and pedestrian access and safety; and	Chapter 8
(e) minimising barriers across the rail corridor and opportunities to integrate cycling and pedestrian elements with surrounding networks and in the project.	Chapters 5 and Chapter 6 for Construction Chapter 8 for operation Chapter 9 for mitigation

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2.0 Strategic Transport Context

2.1 Overview

This chapter provides an overview of the overall strategic transport context in which the project sits.

Sydney's rail network is the backbone of the city's public transport system. On a typical workday, customers take approximately 1.2 million journeys on the rail network, one-third of which occur between 6.00am and 9.30am.

The estimated rate of growth across Sydney over the next 10 or 20 years is expected to exceed the operating capacity of the existing rail network and as a result significant changes to support are required. This change is required in the near future to allow forecast increases in rail network demand of over 40 per cent by 2026, and over 60 per cent by 2036 (NSW Government, 2016).

The existing T3 Bankstown Line, along which the project sits, effectively slows down the Sydney Trains network because of the way it merges with other railway lines close to the city and impacts the ability to operate the surrounding network reliably. Further, by 2026, without an increase in network capacity, demand will exceed capacity on the T1 North Shore, T1 Northern, T2 Inner West and South, and T3 Bankstown lines, and demand will be approaching capacity on the T2 Airport and South Line.

The upgrade of the existing T3 Bankstown Line forms part of the rail network solution for accommodating growth in public transport patronage now and into the future. Further, over half of the stations along the project alignment have not had major upgrades and remain largely as built early last century. These stations do not comply with NSW and Australian Government accessibility standards for public transport. The project would help to contribute to urban renewal and improved operating conditions, including reliability, capacity enhancements and accessibility within the CBD and across the south and south-west region of the rail network.

This phase of the project consists of the T3 Bankstown Line section of the existing Sydney Train rail network and includes the rail corridor and 10 station precincts between Marrickville and Bankstown which are affected by construction works as part of this project. In addition, the impact of TTS buses on Sydenham Station and the stations west of Bankstown on the T3 Bankstown Line are considered. Station precincts are generally the area within 800m for walking and up to 2.5 km for cycling from the relevant station, which are typically a focus for station access, changes in urban form and for effectively managing growth within a region.

Rail trips (Metro and Sydney Trains) are almost always just one part of a multi modal journey that includes walking, and often other modes such as bus, car or travel by bicycle. All of these modes are currently used to access stations and in order to manage demand, access would be prioritised. The prioritisation of modes typically follows Sydney Metro's transport integration and traditional travel demand management principles with travel and access by private vehicle being the lowest priority. This is very relevant for planning in Sydney's south west where there is a high level of reliance on private car for trips starting or ending in areas surrounding the project. This is coupled with significant road network capacity constraints, a restricted urban environment and limited program for enhancing the road network in this area of Sydney beyond current commitments.

2.2 Regional public transport network

Sydney has an extensive and developing public transport network which consists of a wide variety of modes and options. Each of these modes is described below in the context of the project area.

2.2.1 Suburban Rail

The Sydney Trains rail network is experiencing significant patronage growth, with the reliability and capacity constrained by a number of factors. Most of the rail network was built more than 100 years ago, and involves complex operations. Part of the complexity is a result of up to 13 lines having to converge into eight inbound tracks (including freight) through the CBD. The funnelling of these lines into the limited CBD track capacity constrains the number of services that can be operated 'upstream'. Merging and crossing movements required as part of the funnelling also introduce risks to service reliability during times of service disruption. Other key constraints, such as narrow platforms and vertical egress at key CBD Stations such as Town Hall, the limitations of the existing double deck rolling stock in terms of passenger flow rate, as well as the numerous stopping patterns that each CBD station platform has to serve, results in long station dwell times, further limiting the capacity of the network.

In addition, future demand for rail services is expected to either exceed or be approaching capacity on much of the existing rail network by 2026 under projected population growth and subsequent increase in employment. This would result in overcrowding and reduced network reliability.

As shown in **Figure 2.1** there are three suburban train routes operating in the Sydney's south and south-west regions.

Figure 2.1 Sydney Trains Network (Transport for NSW website, accessed on 7 September 2016)[3]

The T3 Bankstown Line traverses the study area and connects suburbs as far west as Liverpool and Lidcombe to the Sydney CBD. These services currently utilises Platform 1 and 2 at Sydenham Station. T2 Airport Line between Campbelltown / Macarthur and the CBD also operate via Sydenham Station during peak periods, and these services operate via Platforms 3 and 4. T3 Bankstown Line and T2 Airport Line services share the Illawarra Local tracks north of Sydenham Station. Lastly, T4 Illawarra Line services between Waterfall / Cronulla and the CBD operate via Sydenham Station Platform 5 and 6, on the Illawarra Main tracks.

Key existing issues in Sydney's south and south-west regions include:

- the Sydney Trains rail network is experiencing significant growth, with the reliability and capacity constrained by a number of factors. The T3 Bankstown Line services have to merge with other railway lines approaching the city, including the T2 Airport Line at Sydenham (during the AM Peak) and the Inner West & South Line approaching Central (again during the AM Peak). The T3 Bankstown Line effectively slows down the Sydney Trains network because of the way it merges with other railway lines close to the city, including the T2 Airport, Inner West & South Line

[3] Note: The NSW government are implementing a More Trains, More Services program in 2018, which involves delivering extra services and upgraded rail infrastructure to the Sydney Trains rail network. This will replace the current Sydney Trains Network Map shown in Figure 2.1.

- merging and crossing movements also introduce risks to service reliability during times of service disruption. The existing timetable provides for windows to accommodate merging/crossing movements without affecting reliability. However, problems arise during times of disruption, when those windows for merging and crossing are affected, increasing the susceptibility of delays on one Line impacting another. The merging of services approaching the city (because of limited track capacity) also limits the operable service frequency on each individual line, given the upper limit of 20 trains per hour per track on the Sydney Trains network governed by the signalling system in use
- by 2026, without an increase in network capacity, demand will exceed capacity on the T1 North Shore, T1 Northern, T2 Inner West and South, and T3 Bankstown lines, and demand will be approaching capacity on the T2 Airport and South Line
- by 2036, demand for rail services will be at 108 per cent of capacity, leading to widespread crowding and decreases in reliability. For the T3 Bankstown Line, based on the annual growth rate of six per cent between 2014 and 2016, there will be around twice as many customers attempting to use the service
- of the 10 stations between Marrickville and Bankstown, five have not had major upgrades and remain largely as built early last century. Access is generally provided by stairs or ramps, with lifts available at five of the stations. These stations do not comply with Commonwealth accessibility standards for public transport.

The project would result in the following benefits for the existing local and regional rail network:

- **supporting growth on the rail network** - with the projected additional 100,000 customers per hour catered for through the delivery of the full City & Southwest metro rail system (including the Project)
- **increasing accessibility and trip diversity** – improving the frequency of services, interchange with other transport modes, and connections to key destinations would increase accessibility (for example, to major employment, commercial, industrial, and residential areas) and trip diversity (for example, journey to work, education, local service trips and work related trips)
- **reducing network complexity, improving reliability** – the project would remove the T3 Bankstown Line from its existing requirement to merge/diverge with the T2 Airport, Inner West and South Line at flat junctions, converging into the constrained City Circle. This in turn would allow the City Circle to be dedicated to the T2 Airport, Inner West and South Line , reducing operational complexity and the risk of service unreliability
- **increasing rail network capacity** - removing T3 Bankstown Line services from the City Circle would enable the T2 Airport, Inner West and South Line to use the released capacity. This would improve service frequencies on the Sydney Trains network, reducing likelihood of trains and stations from being overcrowded and station dwell times from being impacted. Note - this is subject to the design of future suburban rail timetables by TfNSW
- **improved service legibility** – Sydney Metro would provide passengers with the ability to 'turn up and go' as opposed to pre-planning and co-ordinating with a specific train. This service model has led to greater rail patronage in other cities around the world. Removal of T3 Bankstown Line services from the City Circle would also reduce the number of different service types/patterns operating through City Circle stations, improving service legibility and reducing the risk of platform congestion due to passengers having to dwell at these stations to wait for their desired service in the afternoon peak. Note - this is subject to the design of future suburban rail timetables by TfNSW
- **travel time savings** - T3 Bankstown Line customers would have access to more direct Sydney Metro services to key activity areas in the Global Economic Corridor. Travel time savings would be experienced by existing rail service passengers (who would directly benefit from shorter travel times), new metro passengers (who could transfer from road-based transport such as buses and cars to rail), and road users, who would potentially experience less congestion.

2.2.2 Bus network

Buses in Sydney either provide local connections to key transport interchanges and other services, or provide regional public transport.

The key bus routes operating south of Sydney CBD include Princes Highway and King Street. Cross-regional services also operate between Marrickville and Bondi Junction (Jacobs and Arcadis, 2016).

Public transport use in Sydney is rapidly increasing, putting more pressure on already crowded buses. Previous attempts to meet growing demand have resulted in additional services added to the network, however this may not necessarily result in faster or more reliable services, and also adds further congestion to the road network. Bus services can experience delays in peak periods despite the addition of bus priority lanes and traffic light prioritisation.

The majority of bus routes traverse the project area in a north-south direction, providing perpendicular linkage to the T3 Bankstown Line. Cross-regional and local services are concentrated at the key transport interchanges of Bankstown, Campsie and Sydenham stations.

Restwell Street at Bankstown is a key bus corridor, carrying numerous bus routes such as the M90, M91 and M92. The corridor connects suburbs such as Parramatta, Lidcombe and Burwood, to Liverpool, Hurstville, and Sutherland. Beamish Street at Campsie is the other key bus corridor in the project area, with routes such as the M41, 492 and 400 providing connections from Hurstville, Rockdale, and Burwood, to Macquarie Park, Drummoyne, and the Sydney International Airport. These routes have frequent services during peak hours, and experience low speeds and unreliability due to the congested traffic environment within the town centres.

Parallel to the rail corridor, a number of bus services connect suburbs within the project area to their local station. Additionally, some services operating along Canterbury Road and Marrickville Road connect the project area to inner city suburbs, the Sydney CBD, and Mosman.

A number of school bus services also operate in the project area; however, these represent only a small proportion of the total number of bus services in the project area. However it is recognised that school buses play an important capacity relief function to the road network.

The project and implementation of the wider Sydney Metro network may assist with minimising the need to add further bus services to meet future public transport demand, resulting in reduced congestion of the road network, and assisting to minimise overcrowding on existing bus services.

2.2.3 Light rail

Light rail is expected to play a central role in the future of transport in Sydney. With reliable and high capacity services, the light rail network will provide additional capacity to the public transport network that cannot be met by enhancements to current networks. The L1 Dulwich Hill Line was completed in March 2015 and together with the planned CBD and South East Light Rail will form the new Sydney Light Rail network. The light rail lines will be running north from Central to Circular Quay along George Street, west to Pyrmont and Dulwich Hill, and south east through Surry Hills to Moore Park, Randwick and Kingsford.

The light rail network present in the study area is located within the suburb of Dulwich Hill, defined by the L1 Dulwich Hill Line between Dulwich Hill and Central via Lilyfield and Pyrmont. It has frequent services over extended periods and plays an important role in connecting suburban areas with the Sydney CBD.

The interchange at Dulwich Hill between Sydney Trains and the Light Rail provides the opportunity to significantly increase the effective catchments of the individual rail systems. However, the current capacity constraints in the peaks on Sydney Trains and the differing service frequencies are creating a barrier to the attractiveness of this interchange.

2.2.4 Ferry

Ferry services within Sydney perform two core functions – serving commuters and serving tourists / leisure customers. Most services connect to the Sydney CBD at Circular Quay.

The Sydney's ferry network doesn't have any close access to the south-west rail line, but feeding into Sydney Metro and light rail in the CBD allows the facilitation of access to public transport over a wider area.

2.3 ARTC metropolitan freight network

The Sydney Freight Network, managed by the Australian Rail Track Corporation (ARTC), is a network of dedicated railway lines for freight in Sydney linking the state's rural and interstate rail network with the city's main yards at Enfield and Port Botany. Its primary components are the Southern Sydney Freight Line (SSFL) and a line from Sefton to Enfield and Port Botany.

The Southern Sydney Freight Line (SSFL) is a dedicated freight line for a distance of 36 kilometres between Sefton Park Junction and Macarthur in southern Sydney. The SSFL provides a track in the rail corridor specifically for freight services, allowing passenger and freight services to operate independently and provides an end-on-end connection to the Metropolitan Freight Network (MFN).

As shown in **Figure 2.2**, there are three freight rail lines linking or traversing the study area. These freight lines are:

- the MFN which is the core of the Sydney freight system and extends from Lidcombe / North Strathfield in the north to Sefton Park Junction in the west and Marrickville in the south / east. This network has two tracks dedicated to freight but shares a corridor with passenger trains on the Bankstown line. At Marrickville (Meeks Road Junction), there is an existing connection from the Down Bankstown Line track to this Goods Line
- the Botany line which links from the MFN at Marrickville (at Meeks Road Junction) to the container port at Botany
- the Illawarra Line which is a shared passenger and freight rail corridor that extends between South Coast and the interface with the MFN at Marrickville (at Meeks Road Junction).

The part of the MFN between Sefton Park Junction and Marrickville generally has ample capacity but the shared tracks with suburban passenger services on the Illawarra Line and the Western Line have already constrained flexibility for freight. Passenger growth will represent a major challenge for future capacity of these sections (2015 Sydney Metropolitan Freight Strategy).

The project would not utilise the freight tracks, and would allow for further segregation of the freight from the Metro. The investment which has been made on these freight tracks to allow greater efficiency in the rail freight network would therefore be further protected.

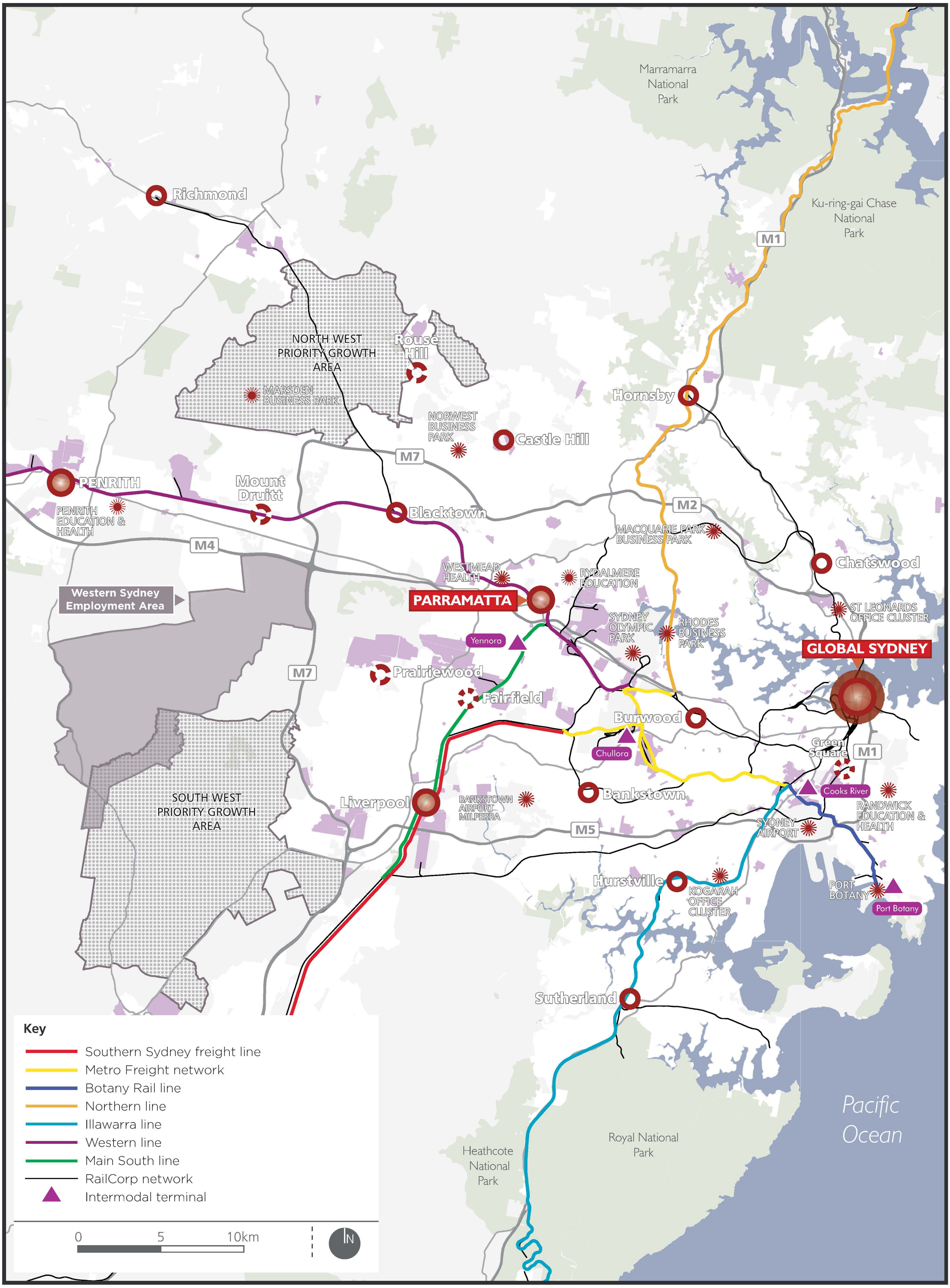
2.4 Road Network

North of Sydney Harbour, the road network is dominated by several motorways, including the Lane Cove Tunnel and the Hills M2 Motorway and Warringah Freeway / Gore Hill Freeway, connecting to the Sydney CBD. Traffic volumes generally increase on the approaches to the Sydney Harbour crossings.

Key roads south of the Sydney CBD include the Eastern Distributor (providing a connection to the M5 Motorway), King Street, the Princes Highway and Regent Street.

Sydney's road network is already heavily congested and cannot be effectively augmented into the CBD under the projected increase in transport demand (driven by population growth). While there is significant investment planned for the road network, cars and buses alone cannot provide for future travel demands.

The introduction of an efficient and reliable metro system (including the project) that delivers seamless travel between modes would encourage greater public transport use. This would likely result in a reduction of cars using the road network and contribute to lower levels of congestion. The project would also reduce the need for further bus services to be added to the road network to cater for future public transport demand.



sydney METRO | city & southwest

Sydney Rail freight corridors

FIGURE 2.2

Key State Roads in the vicinity of the project area which serve Sydney CBD, Port Botany and the wider Sydney metropolitan area include the M5 East Freeway and M5 South Western Motorway which run some 1.5-3km to the south of the project alignment, and the M1 Southern Cross Drive approximately 6km to the east of the project area. The M5 East Freeway is almost 10 kilometres in length and connects to the Sydney International Airport, Port Botany and the Cross City Tunnel. It includes twin four kilometre tunnels between Bexley Road, Earlwood and Marsh Street, Arncliffe. These routes and the key local road network are shown in **Figure 2.3** overleaf.

The WestConnex project which is currently partially under construction and partially in planning phase will result in the following changes to the road network (Sydney Motorway Corporation, 2017):-

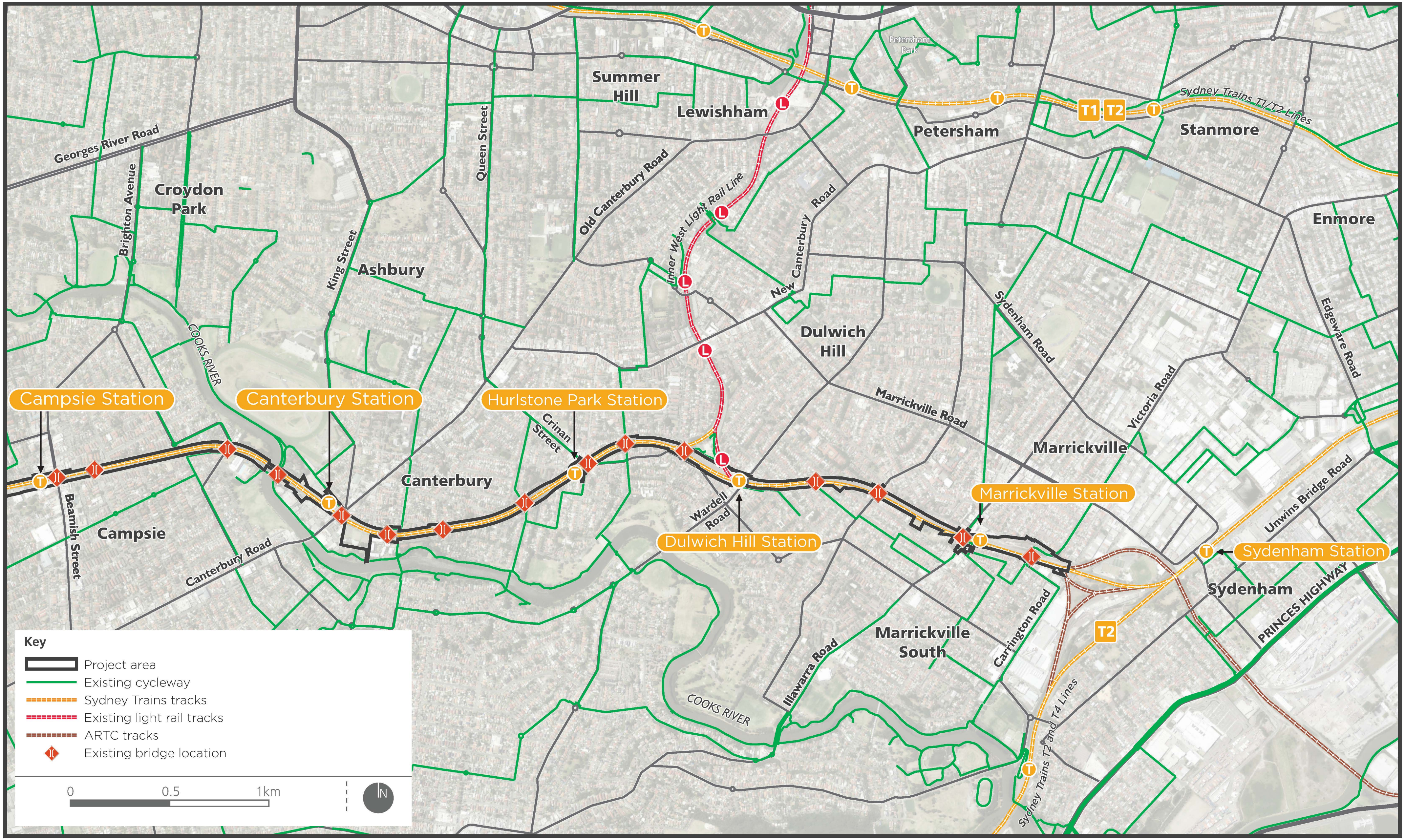
- widen the M4 between Parramatta and Homebush and extend it in underground tunnels between Homebush and Haberfield
- double road capacity along the M5 East corridor with the New M5 underground tunnels running between St Peters and Kingsgrove
- join these underground routes together via the M4–M5 Link tunnel to form a seamless motorway without traffic lights
- provide a western bypass of the Sydney central business district (CBD)
- provide for future connections to the Western Harbour Tunnel and Beaches Link
- provide a connection to Sydney Airport and Port Botany via Sydney Gateway.

These scheme components will provide additional road capacity, to help support the continued population and economic growth of Sydney, and New South Wales.

The project would work alongside these road network enhancements to provide an integrated transport network to deliver the capacity needed to cater for the projected population growth.

State Roads in the vicinity of the study area include:

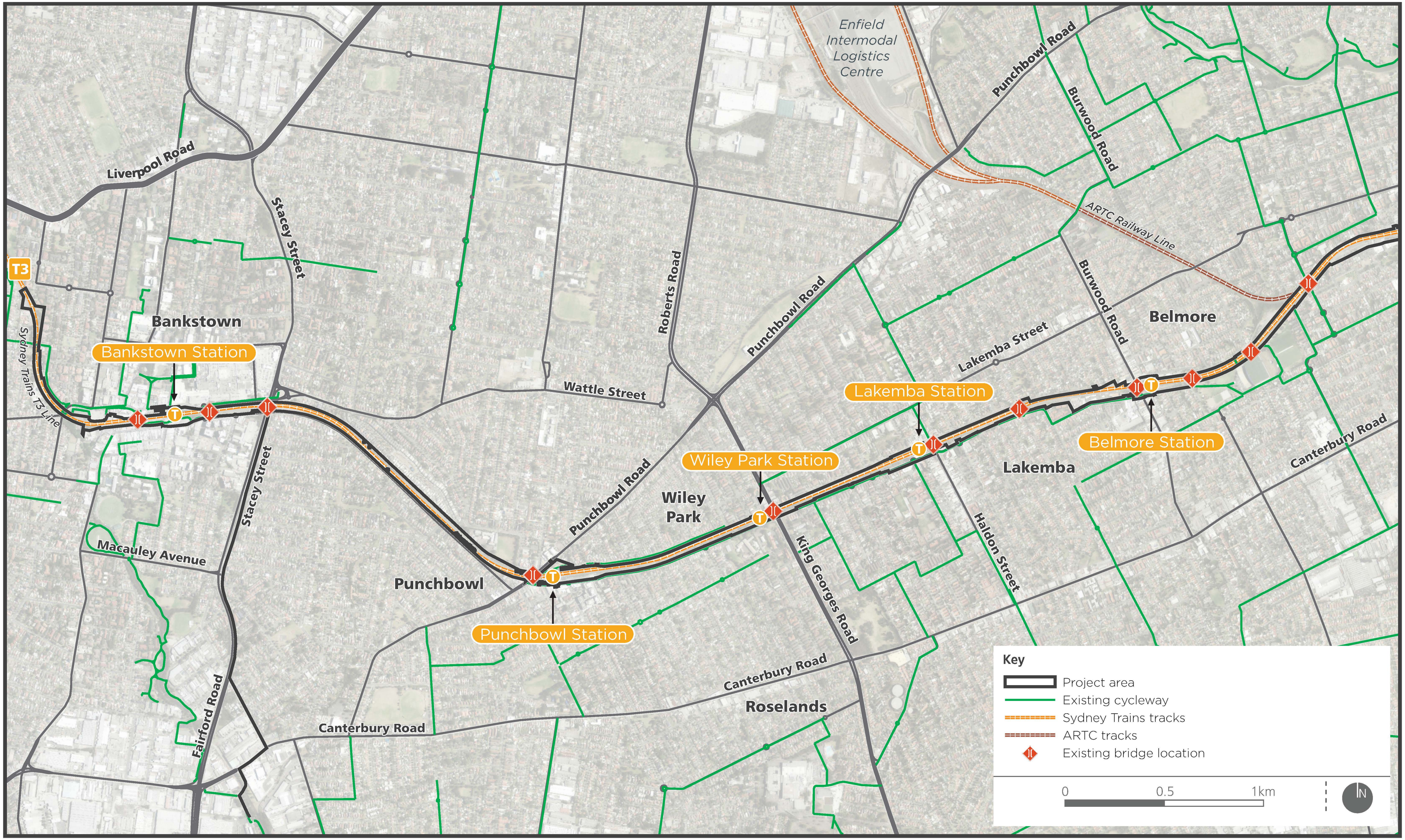
- Canterbury Road / New Canterbury Road, which passes through the Dulwich Hill precinct, and Canterbury Road that continues through from the Hurlstone Park precinct to the Bankstown precinct. Traffic volumes on Canterbury Road are concentrated around the suburbs of Canterbury and Bankstown
- King Georges Road, which runs north-south through Wiley Park, connecting the M5 South Western Motorway with the M4 Western Motorway. The State Road corridor also connects to the suburbs of Ryde and Macquarie Park via Concord Road
- Stacey Street, which provides an important north-south connection through Bankstown, connecting the M5 South Western Motorway with the M4 Western Motorway. The corridor also connects to the Hills District via Silverwater Road
- Princes Highway, which passes through Sydenham in a north-south direction and provides connections via Local roads to the Inner West
- Hume Highway, which traverses Bankstown in an east-west direction and connects Sydney's western suburbs to Parramatta Road and the Inner West
- Punchbowl Road, which runs northeast-southwest through the Punchbowl precinct connecting to Canterbury Road at the southern junction. It runs parallel and further south to Hume Highway between Stacey Street and Roberts Road.



sydney METRO | city & southwest

Existing road network and transport facilities - map 1

FIGURE 2.3



Existing road network and transport facilities - map 2

FIGURE 2.3

In addition to the above, east-west State Roads such as Unwins Bridge Road, Lakemba Street and Wattle Street are available as alternative routes for east-west movements. Numerous Regional roads provide connections from the surrounding areas to New Canterbury Road and Canterbury Road.

Regional roads that provide linkages through the town centres in the study area include:

- Railway Parade and Buckley Street, Sydenham
- Illawarra Road, Marrickville
- Wardell Road, Dulwich Hill
- Crinan Street, Hurlstone Park
- Broughton Street and Jeffery Street, Canterbury
- Beamish Street, Campsie
- Burwood Road, Belmore
- Haldon Street and The Boulevarde, Lakemba
- Lakemba Street, Wiley Park
- The Boulevarde, Punchbowl
- North Terrace and South Terrace, Bankstown.

The majority of the State and Regional road network experience significant traffic volumes and congestion, especially during the peak periods.

It should be noted that Canterbury Road/New Canterbury Road is congested throughout the project extent especially near to Canterbury, Campsie, Belmore, Wiley Park and Bankstown Stations. This can be attributed to the fact that Canterbury Road/New Canterbury Road is the only east-west State Road, in the locale, and runs broadly parallel to the project. For the north south movements; Illawarra Road at Marrickville Station, Beamish Street at Campsie Station, Burwood Road at Belmore Station, King Georges Road at Wiley Park Station and Stacey Street at Bankstown Station also exhibit congestion.

2.5 Walking Environment

Figure 2.4 shows that a majority of the south and south western Sydney sits within a greater than 17% walking mode share. The study area is located in the 17% to 19% walking mode share range. Travelling from west towards east, there is a gradual increase in the walking modal share as we approach areas of high density, employment areas and the CBD.

Pedestrians can generally move freely through the study area on local footpaths and dedicated road crossings, but experience reduced permeability within centres such as Bankstown due to large street blocks, major roads and the rail corridor. The areas surrounding these centres generally have a high volume of pedestrians access interchanges and commercial precincts.

With the exception of the medium density commercial/industrial land uses in Canterbury, Campsie and Bankstown, the rest of the area surrounding the project generally encompasses low density residential areas generating low pedestrian volumes adjacent to and between the stations.

Wide and inter-connected footpaths and a variety of pedestrian crossing facilities are provided all over the road network. Safer and more accessible pedestrian crossing facilities have also been provided close to the areas with higher pedestrian activity such as schools and pre-schools.

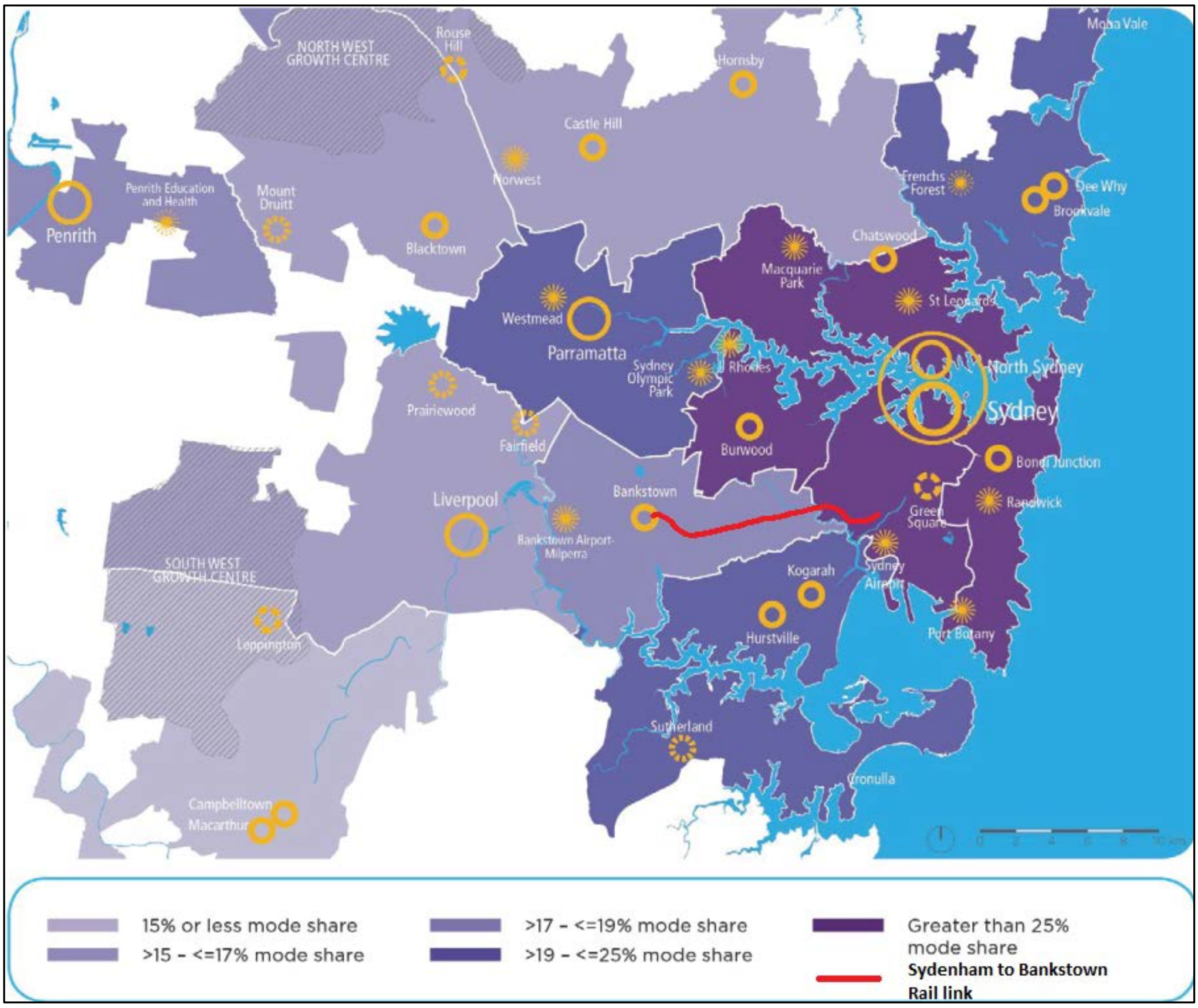


Figure 2.4 Walking Patterns across Sydney (Sydney's Walking Future, NSW Government, December, 2013)

2.6 Cycle Network

The cycle network in southern Sydney is developing from what has previously been a series of individual on and off road facilities towards a cohesive network which supports the varied needs of those cycling for leisure, personal business and commuting.

Figure 2.5 shows the activity centre catchments (*Sydney's Cycling Future* NSW Government, December, 2013). The overarching goal of Sydney's Cycling Future is to make cycling a safe, convenient and enjoyable transport option for short trips by improving access to towns and centres, reducing congestion and increasing capacity on the public transport system.

Sydney's Cycling Future notes that 70 percent of NSW residents would ride a bike more for everyday transport if it was safer and more convenient. Sydney's Cycling Future aims to fix the missing links in the cycle network so that people can bike to town centres, including railway stations, in a safer manner.

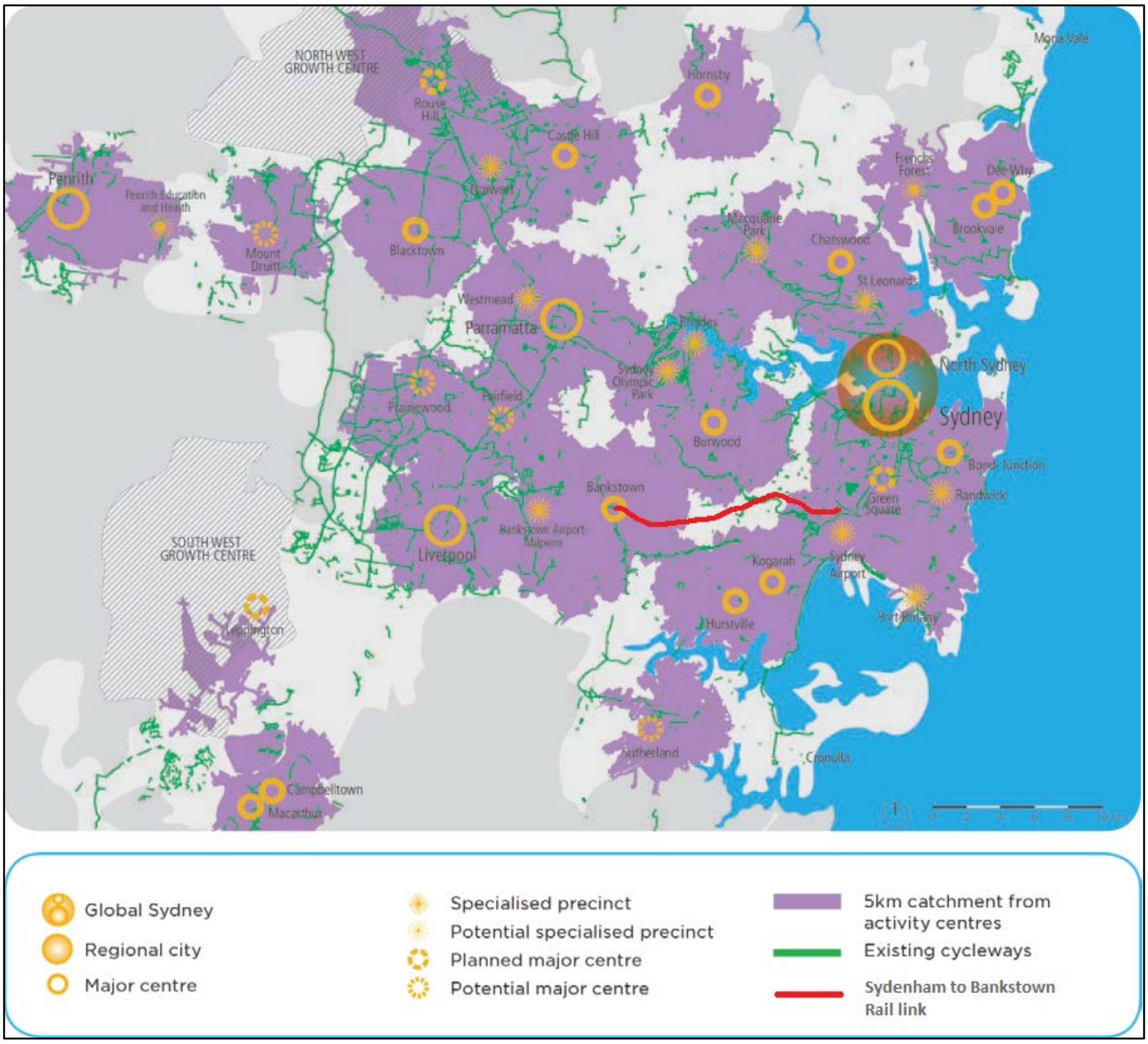


Figure 2.5 Existing Cycleways of Sydney and Activity Centre Catchments (Sydney's Cycling Future, NSW Government, December, 2013)

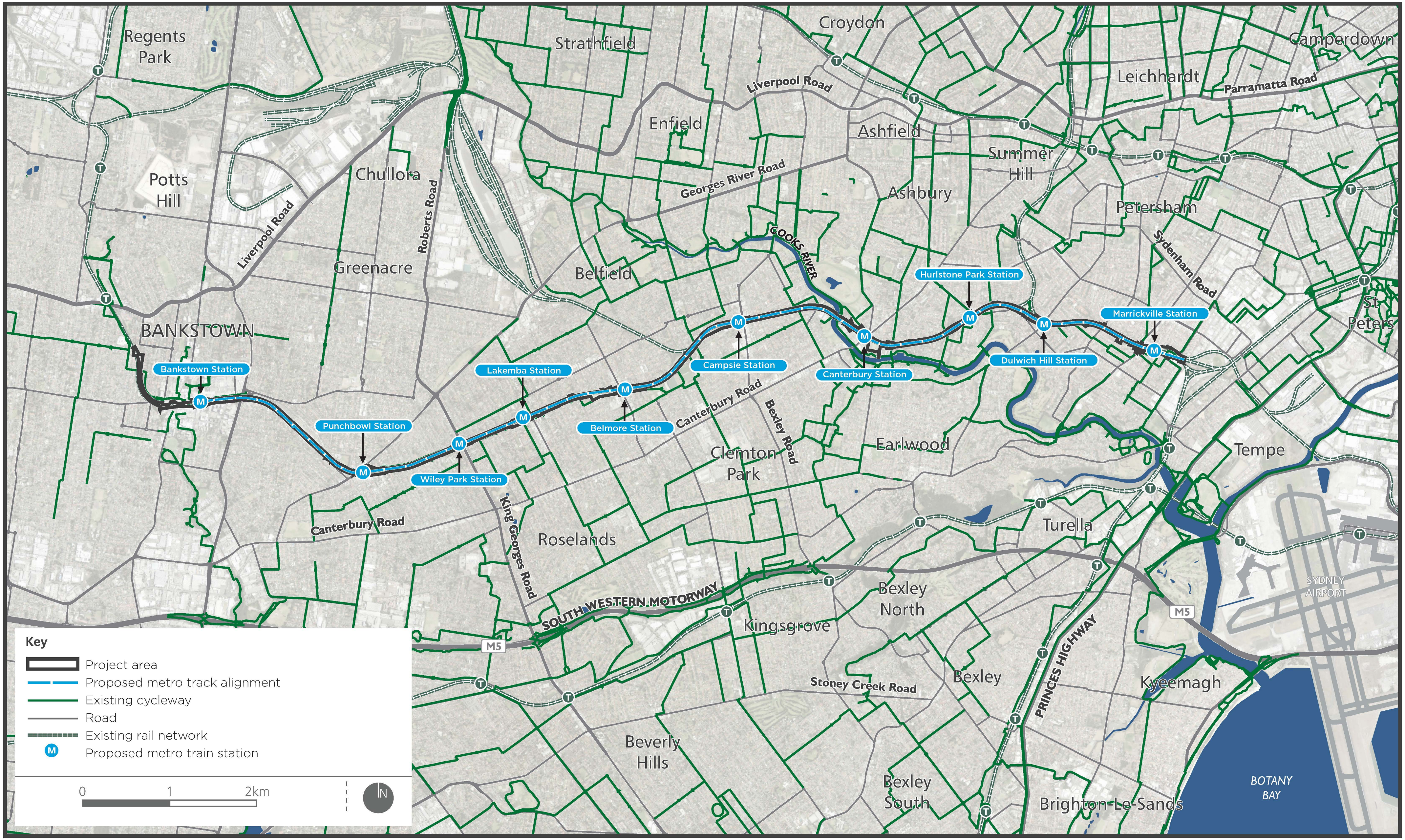
As shown in **Figure 2.5**, approximately half of the study area is providing the opportunity for residents who are more than 5km away from major activity centres to use the Metro as part of their journey. This demonstrates the need for both the project, and also for the linkages to the cycling network to provide multimodal journey opportunities for these longer journeys.

Figure 2.6 illustrates the project area and the existing cycleways in the vicinity of this alignment.

In the vicinity of the project area, the cycle network consists of:

- the Greenway Cycleway, which connects Dulwich Hill to Lewisham
- the Cooks River cycle route, which connects Campsie, Canterbury and Tempe
- Salt Pan Creek cycle route, which connects Bankstown to Georges Hall.

Whilst the existing facilities offer some amenity and connectivity to wider transport networks, there are several aspects of the system that are contributing to a relatively low uptake in cycling. These include restricted bike parking at some locations, poor facilities to enable mode transfer at stations, and the timetable constraints of the Sydney Trains services.



Sydney Metro | city & southwest

Existing cycleways of Sydney

FIGURE 2.6

The project would address many of these aspects to support the wider use of cycling as a mode of transport and enable a greater number of Sydney residents to use cycling as a key mode of transport, with the addition of a Metro based leg on their journey.

To support this:

- each interchange is being configured to link directly to any existing or planned cycle routes, an active transport corridor and ample parking is to be provided for bikes through a mixture of bike sheds, bike shelters and bike hoops
- the facilities and plan are intended to encourage cyclists within a reasonable cycling distance – approximately 2.5km or 10 minutes ride of the interchange, to safely store their bike before transferring onto a metro or other public transport service
- design provision is provided to support the introduction of an active transport corridor to the south of the rail corridor linking each station between Marrickville and Bankstown.

2.7 Parking

The study area contains a variety of car parking opportunities for customers of Sydney Trains services. These include dedicated commuter parking spaces on RailCorp land, on and off-street unrestricted parking spaces within the surrounding residential streets of the train station. However, unrestricted spaces may also be used by employees within the employment centres, as well as visitors or shoppers. The existing parking situation at each station is discussed further in Chapter 3.

Whilst the use of car to access the Metro is not the preferred modal chain, there is the recognition that supporting the use of Metro for at least part of the journey offers many benefits to both the individual and the overall environment and economy of Sydney. As such the project would provide the following features to support this:

- kiss and ride facilities, as well as taxi ranks at some stations would be provided to enable customers to drop and pick up passengers at each station using safe and efficient routes
- where dedicated commuter parking has been provided on RailCorp land, the existing number of spaces would be retained on the day of opening
- in most cases, car parking spaces would be retained in the original position or moved to other locations within the precinct.

3.0 Local Traffic and Transport context

This chapter presents information related to the local transport context for the study area, including the station precincts, defined as an area located within a 10 minute walk and up to a 2.5 km cycling distance from the relevant station. It provides a snapshot of the local transport context of all stations with a focus on the local characteristics, the station interchange and the area's role and function, the current modes of travel used to access the station, and the infrastructure and services that currently facilitate access to the station. The transport choices of the resident populations adjacent to each of the stations is described along with current parking provision and the walking, cycling and public transport connections to and from stations. Details of the current traffic flows on the network and intersection functionality are presented later in this Technical Paper (Chapter 5 and Chapter 6).

Parking surveys conducted in October 2016 followed by verification inspections in November 2016 were used for the analysis on the existing parking capacity and utilisation for the area surrounding each station. Parking at each station was inspected after the AM peak on two typical weekdays and within a 400m radius to reflect an appropriate walking distance to the station. Parking was analysed according to the following four categories:

- all day, unrestricted off-street car parking areas
- time restricted off-street car parking areas
- all day, unrestricted on-street car parking areas
- time restricted on-street car parking areas.

It is assumed that unrestricted parking would be used by people who intend to park and ride. A subset of unrestricted parking is "dedicated" commuter parking which refers to unrestricted parking on RailCorp land, or parking which is signed as commuter parking such as the commuter car park on Floss Street at Hurlstone Park Station.

Table 3.1 provides a summary of the existing overall parking capacity, average utilisation, the number of formal and informal bike parking, taxi, kiss and ride and dedicated commuter spaces at each station.

Table 3.1 Parking Analysis Summary

	Marrickville	Dulwich Hill	Hurlstone Park	Canterbury	Campsie	Belmore	Lakemba	Wiley Park	Punchbowl	Bankstown
Existing formal bike parking capacity (bikes)	8	10	12	4	10	5	8	4	12	32
Demand (cycles)[4]	4	10	2	5	28	4	8	6	3	13
Bike parking utilisation	50%	100%	17%	125%	280%	80%	100%	150%	25%	41%
Existing Dedicated Commuter spaces	0	55	23	32	138	56	138	0	137	147

[4] Cycle demand was assessed based on the observed usage of bike parking at stations provided by TfNSW.

	Marrickville	Dulwich Hill	Hurlstone Park	Canterbury	Campsie	Belmore	Lakemba	Wiley Park	Punchbowl	Bankstown
Existing Kiss & Ride spaces	3	3	0	0	4	0	1	0	0	4
Existing Taxi Bays	1	0	0	0	6	4	3	0	2	10
On and off-street parking capacity	1519	1332	1208	849	1539	1220	1498	746	1123	1696
Parking Utilisation (%)	81%	74%	55%	68%	90%	78%	85%	63%	84%	98%

3.1 Study area overview

3.1.1 Local rail network

The T2 Inner West and South Line and the T3 Bankstown Line facilitate travel from the inner and outer suburbs of southwest Sydney to and from the CBD. These rail lines call at Sydenham Station and share tracks through to the Sydney CBD. This increases the strategic importance of Sydenham Station as a local hub but downstream capacity places a constraint on the frequency and timing of train movements from the west and southwest.

The stations within the study area are located in high activity areas and are located in the middle of local centres. The areas away from the stations are comprised of low and medium density residential housing.

While network demand across Sydney is expected to increase by 41 per cent by 2026, the growth in demand for rail travel into the CBD alone is expected to increase by 31 per cent by 2026. The T2 and T3 lines are forecast to experience significant growth in passenger demand into the CBD by 2026:

- T2 Inner West and South Line – Increase of 5,200 passengers per hour (36 per cent)
- T3 Bankstown Line – Increase of 4,900 passengers per hour (58 per cent).

Added pressure is expected on Sydenham station as a result of the improved frequency and quality of service for connecting services after the opening of the Sydney Metro Northwest and the Chatswood to Sydenham portion of Sydney Metro City & Southwest. Additional capacity would be enabled through the Sydenham to Chatswood component of Metro, and this project would enable the utilisation of the capacity provided.

The existing service details for the T3 Bankstown Line for stations within the project area are provided in **Table 3.2**, with the temporal span for each station in

Table 3.3.

Table 3.2 Service Details for the T3 Bankstown Line (Sydney Trains 2016)

Direction	Service Frequency[5],[6]	
	Weekday	Weekend
T3 Bankstown Line towards the CBD	Peak≈8 mins Late PM= 30 mins Other= 15 mins	0800-22:30= 15 mins Other= 30 mins
T3 Bankstown Line towards Bankstown	Peak≈9 mins Late PM= 30 mins Other =15 mins	07:15-22:15= 15 mins Other= 30 mins

Table 3.3 Temporal span for stations on T3 Bankstown Line (Sydney Trains 2016)

Station	Temporal Span[7]	
	Weekday	Weekend
Marrickville (towards City)	5:03am to 23:36pm	5:28am to 00:28am
Marrickville (towards Bankstown)	4:49am to 00:38am	4:51am to 01:21am
Dulwich Hill (towards City)	5:00am to 23:33pm	5:26am to 00:26am
Dulwich Hill (towards Bankstown)	4:52am to 00:40am	4:53am to 01:23am
Hurlstone Park (towards City)	4:58am to 23:31pm	5:24am to 00:24am
Hurlstone Park (towards Bankstown)	4:54am to 00:42am	4:55am to 01:25am
Canterbury (towards City)	4:56am to 23:29pm	5:21am to 00:21am
Canterbury (towards Bankstown)	4:56am to 00:44am	4:57am to 01:27am
Campsie (towards City)	4:53am to 23:26pm	5:19am to 00:19am
Campsie (towards Bankstown)	4:59am to 00:47am	5:00am to 01:30am
Belmore (towards City)	4:51am to 23:24pm	5:16am to 00:16am
Belmore (towards Bankstown)	5:01am to 00:49am	5:02am to 01:32am
Lakemba (towards City)	4:49am to 23:22pm	5:14am to 00:14am
Lakemba (towards Bankstown)	5:04am to 00:52am	5:05am to 01:35am
Wiley Park (towards City)	4:47am to 23:20pm	5:12am to 00:12am
Wiley Park (towards Bankstown)	5:06am to 00:54am	5:07am to 01:37am
Punchbowl (towards City)	4:45am to 23:18pm	5:10am to 00:10am
Punchbowl (towards Bankstown)	5:08am to 00:56am	5:09am to 01:39am
Bankstown (towards City)	4:42am to 23:59pm	4:47am to 01:17am
Bankstown (towards Bankstown)	5:14am to 01:07am	4:59am to 01:44am

[5] Times at station (up line): AM=before 07:15, AM Peak= 07:16-09:45, IP=09:46-16:45, PM Peak= 16:46-19:00, PM=19:01-22:00, Late PM= 22:01 onwards
[6] Times at Station (down line): AM=before 06:30, AM Peak=06:31-09:45, IP=09:46-17:00, PM Peak=17:01-18:30, PM=18:31-21:30, Late PM=21:31 onwards
[7] Taken as the time of the first and last train leaving the Station.

Peak hour entry and exit barrier counts for T3 Bankstown Line stations within the project area are shown in **Table 3.4** below:

Table 3.4 Peak hour barrier counts (Parsons Brinckerhoff 2016)

Station	Peak Hour	AM Peak customers/hour	PM Peak customers/hour
Marrickville	Entry	953 (07:30-8:30)	313 (15:30-16:30)
	Exit	305 (07:45-08:45)	726 (17:30-18:30)
Dulwich Hill Station	Entry	688 (07:30-8:30)	251 (15:00-16:00)
	Exit	298 (08:45-09:45)	369 (17:30-18:30)
Hurlstone Park	Entry	458 (07:30-8:30)	39 (15:00-16:00)
	Exit	51 (07:45-08:45)	306 (17:30-18:30)
Canterbury	Entry	366 (07:30-8:30)	446 (15:15-16:15)
	Exit	407 (07:45-08:45)	260 (17:30-18:30)
Campsie	Entry	1499 (07:30-8:30)	432 (15:00-16:00)
	Exit	332 (08:15-09:15)	1251 (17:15-18:15)
Belmore	Entry	721 (07:30-8:30)	250 (15:00-16:00)
	Exit	175 (08:00-09:00)	518 (17:30-18:30)
Lakemba	Entry	949 (07:30-8:30)	547 (15:00-16:00)
	Exit	365 (07:30-08:30)	727 (17:30-18:30)
Wiley Park	Entry	471 (07:30-8:30)	206 (15:00-16:00)
	Exit	151 (08:00-09:00)	337 (17:30-18:30)
Punchbowl	Entry	799 (07:30-8:30)	192 (15:15-16:15)
	Exit	159 (08:00-09:00)	624 (15:00-16:00)
Bankstown	Entry	1503 (07:15-8:15)	994 (15:45-16:45)
	Exit	917 (8:00-09:00)	1099 (17:30-18:30)

3.1.2 Land use

The study area traverses well-established urban areas. The main land uses within the study area include a mix of residential and commercial land uses.

Residential land uses are the most common land use, with low to medium density residential areas located in the surrounding area, particularly between stations. Higher density residential areas are concentrated around Campsie, Lakemba and Bankstown stations.

Commercial development is generally focused within local and neighbourhood centres, located near Marrickville Dulwich Hill, Canterbury, Hurlstone Park, and Punchbowl stations. Bankstown Station is located within a larger regional centre.

Other land uses adjacent to the project area include education, recreation, and industrial uses.

The Department of Planning and Environment has prepared a Draft Urban Renewal Corridor Strategy, and supporting Land Use and Infrastructure Analysis for the Sydenham to Bankstown corridor to identify opportunities for development uplift and renewal around station precincts over the next 20 years. Consultation on this draft occurred in 2016 and an amended draft was released for comment, taking feedback received into account, in mid 2017.

Refer to the EIS Chapter 16 - Land Use and Property for further information about the land use characteristics of the study area as well as future land use planning considerations.

3.1.3 Bus network

The bus network in the study area plays an important role in the overall public transport network. As well as providing connections between the walking, cycling, light rail and Sydney Trains networks, the bus network also delivers east-west connections that would otherwise require trips through the CBD.

Consideration of bus network in this paper is limited to the day-time service bus network. Infrequent services such as private buses and night rider services have not been included in this paper, as these services as they tend to be very minor contributors in terms of overall passenger movements. In addition, school bus services have not been considered as the majority of works would be undertaken during school holiday periods. Consideration of impacts on all of these services and appropriate mitigation measures would be included in individual Construction Traffic Management Plans (CTMPs).

3.1.4 Public Transport Interchange

Opal data has been used to assess the number of people transferring from train to other modes of public transport at stations within the project area. This primarily relates to interchange between Sydney Train and bus services, but at Dulwich this interchange includes Light Rail Transport (LRT). As shown below in **Table 3.5**. Bankstown Station has the highest total transferring patronage of passengers, although Dulwich has a higher proportion of transfer as a result of the LRT.

Table 3.5 Annual interchanges at stations

Station	Board/Alight (Passengers)	Interchange (%)
Marrickville	2,250,000	3.60%
Dulwich Hill	1,430,000	15.28%
Hurlstone Park	740,000	1.55%
Canterbury	1,140,000	4.28%
Campsie	4,500,000	5.58%
Belmore	1,490,000	1.91%
Lakemba	2,110,000	1.95%
Wiley Park	1,020,000	0.21%
Punchbowl	1,420,000	2.21%
Bankstown	4,830,000	12.44%

Source: TfNSW, March 2017

The table above shows that there are significant differences in the proportion of interchange at stations, and this is a function of the amenity of that interchange, and also the connections to the bus network. Dulwich Hill and Bankstown stations stand out as having high proportions of interchanging passengers (greater than 10%), followed by Campsie station. Bankstown is also the busiest station in terms of total passengers, followed by Campsie. In contrast, Dulwich Hill is one of the less busy stations. These specific aspects are discussed in greater detail in the sections below for each station.

3.1.5 Existing Traffic Flows

Table 3.6 overleaf outlines the existing Average Daily Traffic (ADT) for roads within the area surrounding the station precincts. The two-way ADTs were calculated by combining data from the Public Transport Project Model (PTPM) with existing Roads and Maritime Services (RMS) traffic count data to determine an estimated ADT. The PTPM is a strategic model that has all major routes, but does not include all minor roads within the study area. The model used was only available for the AM peak period and therefore local factors were applied to convert the modelled peak hour flows to the ADT.

Table 3.6 Station Precinct - Existing ADT

Station Precinct	Road	Existing ADT (Vehicles per day)		
		Total	LV	HV
Marrickville	Myrtle Street	1,100	1,000	100
	Carrington Road (Between Schwebel Street and Myrtle Street)	8,800	8,000	800
	Richardson Crescent	18,600	17,400	1,200
	Illawarra Road (Between Marrickville Road and Calvert Street)	11,900	11,100	800
	Marrickville Road (Between Illawarra Road and Silver Street)	16,200	14,100	2,100
	Victoria Road (Between Marrickville Road and Fernbank Street)	7,900	7,400	500
	Warren Road (Between Illawarra Road and Moyes Street)	11,000	9,600	1,400
Dulwich Hill	Livingstone Road (Between Warren Road and Jersey Street)	12,200	11,800	400
	Marrickville Road (Between Darley Street and Wardell Road)	12,600	11,200	1,400
	Dudley Street (Between School Parade and Wardell Road)	4,300	4,100	200
	Bayley Street (Between Ewart Street and Dudley Street)	800	700	100
	Ewart Street (Between Bayley Street and Wicks Avenue)	7,500	7,100	400
	Beauchamp Street (Between School Parade and Ewart Street)	7,500	7,100	400
	Wardell Road (Between Marrickville Road and Pine Street)	14,400	14,000	400
	Terrace Road (Between New Canterbury Road and Consett Street)	1,300	1,300	0
	New Canterbury Road (Between Kintore Street and Terrace Road)	28,800	27,800	1,000

Station Precinct	Road	Existing ADT (Vehicles per day)		
		Total	LV	HV
Hurlstone Park	Garnet Street (Between Canterbury Road and Hampden Street)	2,200	2,200	0
	New Canterbury Road (Between Wattle Lane and Old Canterbury Road)	25,100	24,000	1,100
	Duntroon Street	2,000	1,900	100
	Crinan Street (Between Floss Street and Fernhil Street)	8,500	7,800	700
	Canterbury Road (Between Queen Street and Wattle Lane)	25,400	23,500	1,900
	Dunstaffenage Street (Between Crinan Street and Floss Street)	300	300	0
	Crinan Street (Between Melford Street and Dunstaffenage Street)	6,700	6,000	700
	Canterbury Road (Between Queen Street and Princess Street)	29,800	27,600	2,200
Canterbury	Crinan Street (Between Melford Street and Dunstaffenage Street)	6,700	6,000	700
	Canterbury Road (Between Close Street and Broughton Street)	51,300	47,800	3,500
	Broughton Street (Between Canterbury Road and Robert Street)	3,600	3,200	400
	Canterbury Road (Between Jeffrey Street and Minter Street)	35,800	33,000	2,800
	Charles Street	1,000	800	200
	Canterbury Road (Between Charles Street and Close Street)	51,300	47,800	3,500
	Wairoa Street (Between Wonga Street and Nowra Street)	10,100	10,000	100
	Close Street	800	630	170
	Wonga Street	13,000	12,800	200
	Canterbury Road (Between Wonga Street and Cooks Avenue)	38,600	35,400	3,200
	Canterbury Road (Between Fore Street and Charles Street)	51,600	48,100	3,500
	Canterbury Road (Between Wonga St and Fore Street)	44,500	41,200	3,300

Station Precinct	Road	Existing ADT (Vehicles per day)		
		Total	LV	HV
Campsie	South Parade (Between Beamish Street and Harold Street)	6,900	6,500	400
	Canterbury Road (Between Beamish Street and Scahill Street)	41,200	38,200	3,000
	Beamish Street (Between Ninth Avenue and Campsie Street)	14,500	14,100	400
	North Parade (Between Browning Street and Beamish Street)	2,400	2,400	0
	Beamish Street (Between South Parade and Amy Street)	18,900	18,500	400
	Brighton Avenue (Between Browning Street and Shakespeare Street)	12,700	12,600	100
	Ninth Avenue (Between Beamish Street and Fifth Avenue)	16,300	15,900	400
	Loch Street (Between Evaline Street and Lillian Street)	15,600	14,300	1,300
	Evaline Street (Between Loch Street and Beamish Street)	5,500	5,300	200
	Thorncraft Parade (Between Canterbury Road and Claremont Street)	8,200	7,600	600
	Palmer Street	10,300	9,600	700
Belmore	Redman Parade (Between Burwood Road and Sudbury Street)	6,200	6,100	100
	Burwood Road (Between Redman Parade and Bridge Road)	19,700	17,600	2,100
	Bridge Road (Between Marie Lane and Burwood Avenue)	10,500	10,000	500
	Burwood Road (Between Bridge Road and Collins Street)	21,500	19,300	2,200

Station Precinct	Road	Existing ADT (Vehicles per day)		
		Total	LV	HV
Lakemba	The Boulevarde (Between Haldon Street and Croydon Street)	8,100	7,900	200
	Moreton Street (Between Lakemba Street and The Boulevarde)	16,800	15,600	1,200
	Lakemba Street (Between King Georges Road and Shadforth Street)	3,600	3,500	100
	Burwood Road (Between Redman Parade and Bridge Road)	19,700	17,600	2,100
	Railway Parade (Between Haldon Street and Croydon Street)	4,500	4,400	100
	Haldon Street (Between Railway Parade and The Boulevarde)	15,000	14,100	900
	The Boulevarde (Between Haldon Street and Croyden Street)	8,100	7,900	200
	Haldon Street (Between The Boulevarde and Oneata Street)	9,800	8,900	900
	Canterbury Road (Between Haldon Street and Legge Street)	43,900	40,000	3,900
Wiley Park	The Boulevarde (Between Renown Avenue and King Georges Road)	13,900	13,500	400
	King Georges Road (Between The Boulevarde and Mary Street)	88,000	78,100	9,900
	Lakemba Street (Between King Georges Road and Shadforth Street)	3,600	3,500	100
	King Georges Road (Between Lakemba Street and The Boulevarde)	96,800	86,700	10,100
Punchbowl	Punchbowl Road (Between The Boulevarde and Acacia Avenue)	50,500	47,000	3,500
	The Boulevarde (Between Punchbowl Road and Arthur Street)	24,800	23,400	1,400
	South Terrace (Between Loder Lane and Punchbowl Road)	14,000	13,600	400
	Punchbowl Road (Between South Terrace and The Boulevarde)	60,700	56,600	4,100
	Wattle Street (Between Highclere Avenue and Acacia Avenue)	18,400	18,100	300
	South Terrace (Between West Terrace and East Terrace)	12,000	11,800	200

Station Precinct	Road	Existing ADT (Vehicles per day)		
		Total	LV	HV
Bankstown	Stacey Street (Between Verbena Avenue and Stanley Street)	66,000	56,300	9,700
	Restwell Street (Between Stewart Lane and Raymond Street)	8,800	8,500	300
	Raymond Street (Between Restwell Street and West Terrace)	3,200	3,000	200
	South Terrace (Between West Terrace and Restwell Street)	6,300	6,000	300
	North Terrace (Between The Appian Way and Fetherstone Street)	9,000	9,000	0
	Wattle Street (Between Stacey Street and North Terrace)	12,400	12,100	300
	Marion Street (Between Bungalow Cres and Meredith Street)	34,800	30,700	4,100
	Meredith Street (Between Marion Street and Gordan Street)	24,600	21,100	3,500
	Rickard Road (Between Jacobs Street and Chapel Road)	6,100	5,700	400

3.1.6 School Break Travel Patterns

Based on the potential customer impacts that closures of the T3 Bankstown Line would have, it was determined to focus construction and rail possessions during school holiday periods for the following reasons:

- lower demand on the Bankstown Line due to the number of people taking holidays during these periods and the lack of school student travel
- reduced traffic volumes on the road network due to the removal of school-based traffic, potentially delivering faster and more reliable journeys on replacement buses
- increased available capacity on parallel rail lines to accommodate T3 Bankstown Line customers who are diverted to these lines
- increased bus fleet and driver availability to operate replacement services as school bus operations cease during holidays.

Traffic data from the following four different traffic count sites in Southwest Sydney has been analysed to develop an understanding of the impact of school breaks on traffic flows:

- Princes Highway, 200m east of Brodie Spark Drive (28/01/2015 – 01/01/2016)
- King Georges Road, 40m north of The Boulevarde (19/10/2015 – 08/10/2016)
- Stacey Street, 70m south of Aster Avenue (29/01/2014 – 02/01/2015)
- Canterbury Road, 90m west of Charles Street (27/01/2012 – 04/01/2013).

School Break periods analysed included:

- Break 1 (09/04/2014 – 20/04/2014) (~1 Week)
- Break 2 (02/07/2012 – 13/07/2012) (~1 Week)
- Break 3 (24/09/2012 – 05/10/2012) (~ 2 Weeks)
- Break 4 (24/12/2012 04/01/2013) (~ 2 Weeks).

These school break periods were compared with “normal” periods to identify trends in traffic volumes.

The impacts of different school break periods vary across the sites. The count site on King Georges Road experienced an increase in average traffic volume during the term 1 and 2 PM peaks, however the average traffic volume reduced during the peaks at all other sites and breaks. The traffic variation between the terms and breaks across all four sites ranged from a 1.5% increase to a 32% reduction. In all breaks and sites, the AM peak had a greater reduction in traffic than the PM Peak.

The term four break experiences a much greater reduction in traffic than the other school breaks. **Table 3.7** shows the average reduction in traffic when comparing the term and break volumes.

Table 3.7 Impacts of School Breaks on Traffic Volumes

Breaks	AM Peak Reduction		PM Peak Reduction	
	Average	Range	Average	Range
Break 1 vs. Term 1	5.6% reduction	1.5 to 12.8%	2.0% reduction	-1.46% to 5.3%
Break 2 vs. Term 2	6.1% reduction	0.6% to 14.5%	0.9% reduction	-1.5% to 2.5%
Break 3 vs. Term 3	5.4% reduction	2.0% to 8.5%	1.3% reduction	0.6% to 1.8%
Break 4 vs. Term 4	34.1% reduction	25.8% to 49.5%	15.7% reduction	7.5% to 27.2%

It should be noted that this analysis only considers four sites across Southwest Sydney. This may not be representative of the average reductions when considering Sydney as a whole.

3.1.7 Existing Mode Share (Station entries and exits)

Table 3.8 provides an overview of the mode shares for travel to and from stations. It is evident that, with the exception of Bankstown, walking is the predominate mode for station access. Cycling mode shares are generally low. Bus mode share is generally between 3-7%, with the exception of Bankstown where bus accounts for 16% of travel to / from the station.

Table 3.8 Station Mode Share (entries and exits)

Station	Walking	Cycling	Vehicle (parked)	Vehicle (dropped off)	Bus	Total Entries
Marrickville	86%	0.3%	5%	4%	5%	8,950
Dulwich Hill	76%	0.4%	14%	6%	3%	5,170
Hurlstone Park	81%	0.1%	10%	6%	3%	2,844
Canterbury	84%	0.2%	9%	4%	3%	4,590
Campsie	73%	0.3%	9%	11%	7%	16,276
Belmore	65%	0.1%	21%	11%	3%	5,872
Lakemba	72%	0.2%	15%	10%	3%	8,432
Wiley Park	90%	0.3%	6%	4%	0%	3,812
Punchbowl	56%	0.1%	23%	17%	3%	5,741
Bankstown	49%	0.1%	15%	19%	16%	18,343

3.2 Marrickville

Marrickville is approximately 6.6km from Sydney's CBD within the Inner West Council local government area.

Marrickville had 13,700 residents in 2011 and provided 2891 jobs (according to the 2011 census). 39% of jobs are in the health, education and public services sector, while 29% are in retail and hospitality.

The rail line divides Marrickville precinct into two distinct sections by limiting north-south movement, as shown in **Figure 3.2** overleaf.

3.2.1 Modes of Travel

Of 525 surveyed passengers using Marrickville Railway Station, the majority of people walked to the station (TfNSW, 2014). The remaining passengers connect to the station by bike or bus, with just 9% travelling by car, either to be of dropped off (4%) or parking around the station (5%). The travel modes are shown in **Figure 3.1.**

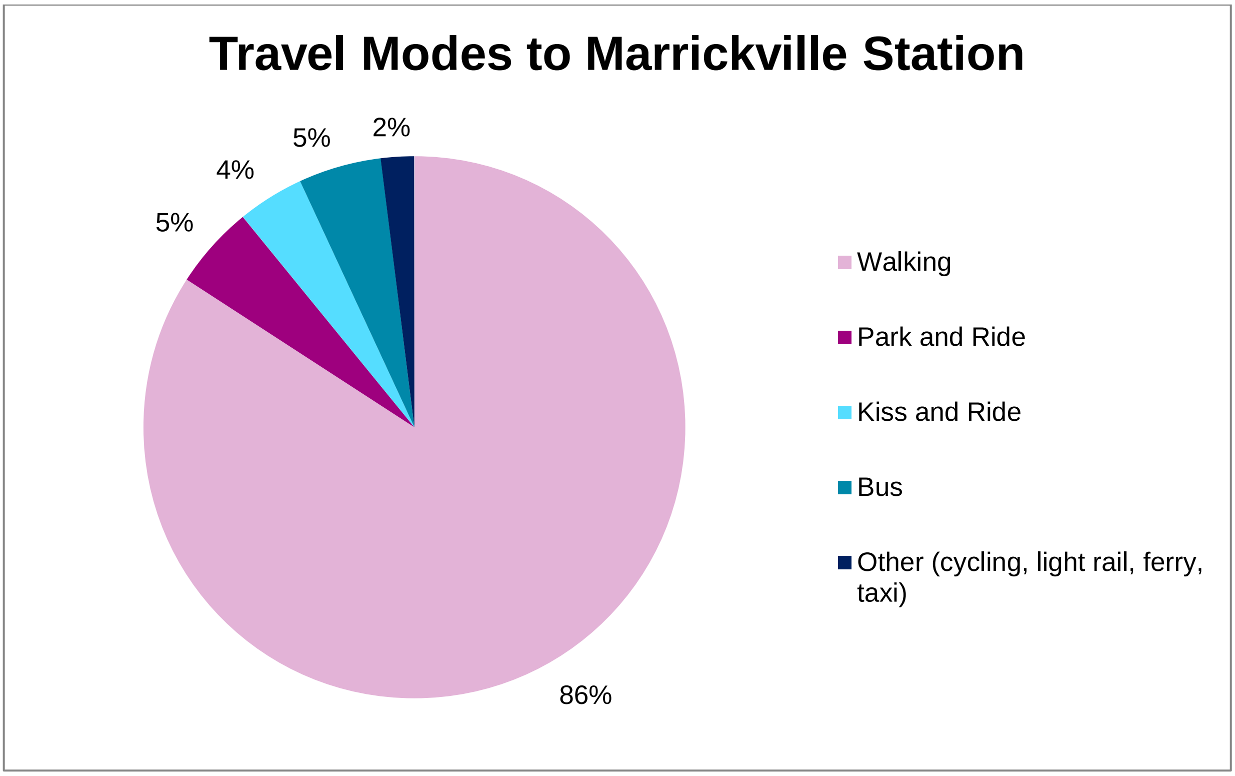


Figure 3.1 Travel modes to the station- Marrickville (TfNSW, 2014)

3.2.2 Walking

There is a relatively large walking catchment in the Marrickville precinct with linear, intersecting primary roads and a few perpendicular secondary streets within a predominantly residential area (NSW Govt. 2015), resulting in a high proportion of rail users walking to the station. The Local and Regional roads have footpaths on either side of the road to cater for pedestrians.

The 10-minute walking catchment extends to include Marrickville Road, the entry to Marrickville Library and St Brigid's School. Marrickville West Public School falls just outside the 10-minute catchment (TfNSW. 2017).

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Station location, railway lines, cycle routes and existing bus routes in the Marrickville area

FIGURE 3.2

3.2.3 Cycling

The Cooks River cycleway runs along the southern boundary of Marrickville precinct (NSW Govt. 2015). The demand for the cycleway is particularly high in the early morning, evening and on Sundays (NSW Govt. 2011). This cycleway is a key part of the regional cycle network.

There are a number of roads in the area which have on road cycle lanes/road shoulders/mixed traffic lanes which are suitable for both less experienced riders and confident bikers (RMS NSW Gov 2016). The cycle routes in the Marrickville areas are shown on **Figure 3.2**. This includes the key north-south route on Illawarra Road which is part of the Regional Cycle Network and which connects to Marrickville Station allowing interchange to Sydney Trains services for those cyclists wishing to travel longer distances.

Inverted u-rails are provided on the southern corner of Arthur Street and on the western side of Station Street providing eight bike parking spaces.

3.2.4 Bus

Marrickville is serviced by two bus routes, the 423 and L23, that travel along Illawarra Road and turn to/from Marrickville Road. These bus routes connect Kingsgrove to the city centre.

A bus stop on Illawarra Road immediately south of Marrickville Station services both the 423 and L23 southbound journeys and provides direct access to Marrickville station. Bus passengers interchanging with Marrickville station do not need to make any road crossings to access the station. The distance from the bus stop to the station is approximately 30m.

There is also another bus stop on Illawarra Road providing service to bus passengers travelling north on the 423 bus wanting to interchange with the train station. They use the two pedestrian crossings to the north of the bus stop which is approximately 120m to the station entry.

A 2016 survey by Parsons Brinkerhoff for TfNSW found that of 525 people only 6% of rail passengers used the bus to travel to the train station. This low percentage may be a consequence of the general walkability of the suburb, as well as the multiple public transport options available for direct travel from the suburb into Sydney CBD including several bus routes and walkability to Petersham and Stanmore train stations on the T2 Airport, Inner West and South railway line.

The bus frequency is shown in **Table 3.9**.

Table 3.9 Bus frequency - Marrickville Station (Sydney Buses 2016)

Route Number	Weekday		Weekend
	Frequency (Peak)	Frequency (Off peak)	Frequency
423	Approx. 10 mins	Approx. 15 - 20 mins	Approx. 20 - 30 mins
L23	Approx. 10 mins	None	None

3.2.5 Road Network

The existing road network in the Marrickville precinct contains the following State, Regional and Local roads, as described below.

State Roads:

- Sydenham Road.

Regional Roads

- Illawarra Road south of Marrickville Road
- Marrickville Road east of Illawarra Road
- Marrickville Road west of Illawarra Road.

Local roads include:

- Illawarra Road north of Marrickville Road.
- Petersham Road
- Victoria Road
- Leofrene Avenue
- Moncur Street
- Greenbank Street
- Church Street
- Warren Road
- Ivanhoe Street
- High Street.

3.2.6 Traffic data

Traffic turning counts and queue length surveys were undertaken during three separate surveys between April and December 2016 to provide data for this assessment.

The existing approach traffic volumes for the intersections assessed are provided in **Table 3.10**.

All intersections surrounding Marrickville Station currently operate at a level of service C or above. Refer to Chapter 5 for details of intersection performance and a map showing the location of the intersections modelled.

Table 3.10 Marrickville Existing Traffic Volumes

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
B.16 Illawarra Road/Warren Road	Illawarra Road	North	289	715
	Warren Road	East	310	287
	Illawarra Road	South	621	357
	Warren Road	West	187	279
B.17 Marrickville Road/Illawarra Road	Illawarra Road	North	108	286
	Marrickville Road	East	404	766
	Illawarra Road	South	460	281
	Marrickville Road	West	755	473
B.18 Marrickville Road/Victoria Road	Victoria Road	North	296	613
	Marrickville Road	East	700	453
	Victoria Road	South	661	390
	Marrickville Road	West	357	826
H.19 Petersham Road/Illawarra Road	Illawarra Road	North	659	417
	Illawarra Road	South	210	598
	Petersham Road	Northwest	254	210

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
Marrickville Bridge Pedestrian Crossing	Illawarra Road	North	370	704
	Illawarra Road	South	648	411

Further details of these counts are provided in **Appendix A**.

3.2.7 Commuter Parking

Marrickville Station has approximately 1500 spaces in the area surrounding the station with no commuter spaces falling within the rail corridor as shown in **Table 3.11** below. There are currently three kiss and ride parking spaces and one taxi parking bay at Marrickville Station.

Table 3.12 below outlines the total capacity and utilisation of the parking spaces available to commuters. Demand for the unrestricted on-street parking is generally high as a result of residents in the areas close to the station parking on-street in addition to commuters and visitors to the area.

Despite having no dedicated commuter parking spaces, 6% of the users of the station choose to park and ride (Arup 2015).

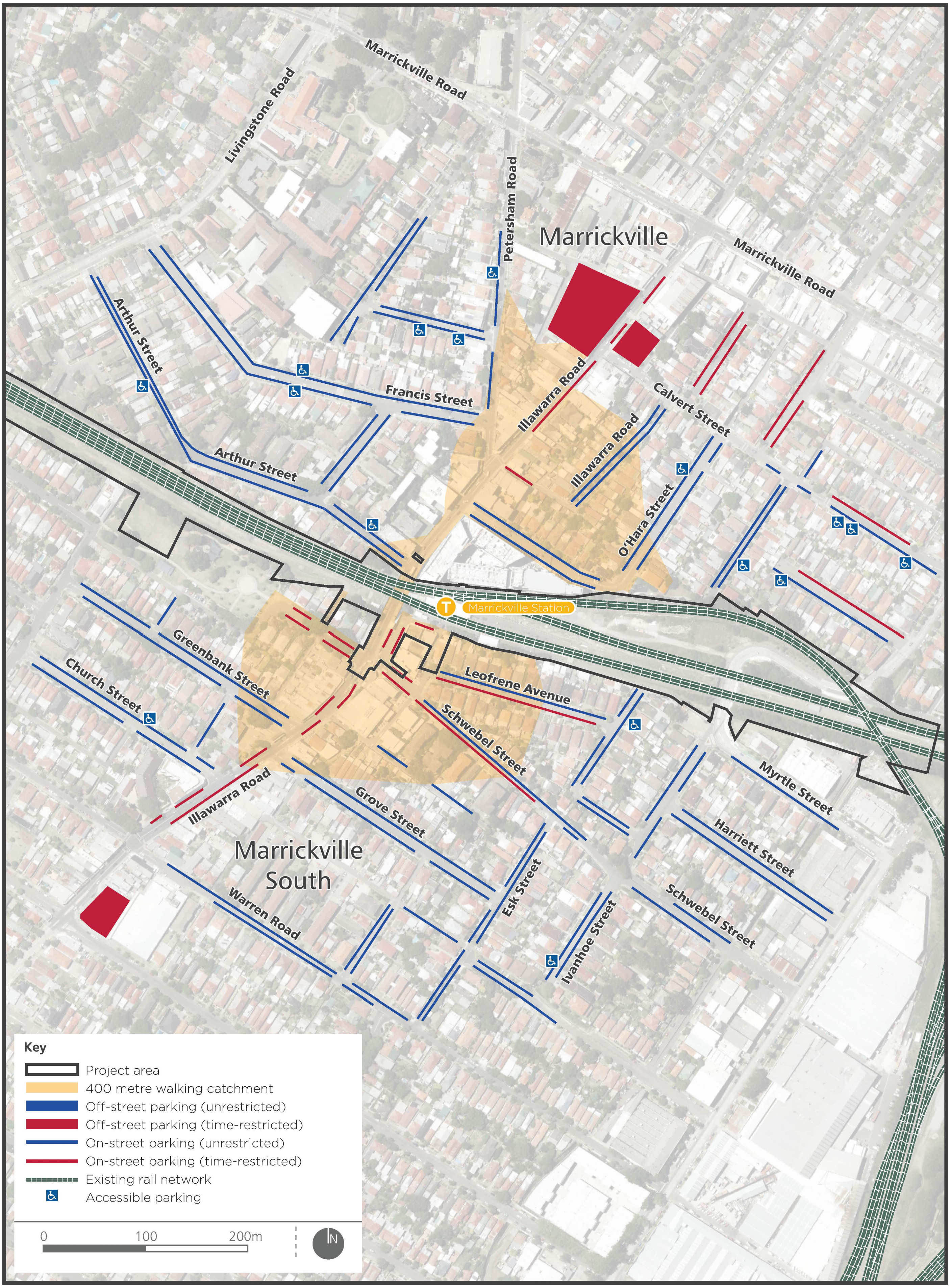
Table 3.11 Marrickville Station Parking Summary

Dedicated Commuter spaces	Kiss and Ride spaces	Total Parking Capacity
0	3	1519

Table 3.12 Marrickville Station Parking Capacity and Utilisation within 400m Radius

	On-street		Off-street	
Time Restriction	Capacity	Utilisation (%)	Capacity	Utilisation (%)
Unrestricted	1257	82%	-	-
Time restricted	262	76%	-	-
Overall	**1519**	**81%**	**-**	**-**

Figure 3.3 shows the type and location of parking spaces available in the vicinity of Marrickville Station.



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Parking restrictions around Marrickville Station

FIGURE 3.3

3.3 Dulwich Hill

Dulwich Hill is 7.9km from Sydney's CBD and within the Inner West local government area. The area has excellent public transport, with rail, light rail and frequent bus services. Dulwich Hill Station is at the centre of the precinct as shown in **Figure 3.5** overleaf.

Dulwich Hill had 9116 residents and 1266 jobs in 2011 (according to the 2011 census). Of the jobs in Dulwich Hill, 27% are in education, healthcare and public services and 23% in business.

3.3.1 Modes of Transport

Of 285 surveyed passengers using Dulwich Hill Railway Station, the majority of people walked to the station (TfNSW, 2014). The remaining passengers connect to the station by bike, bus or LRT, with 20% travelling by car, either to be being dropped off (6%) or parking around the station (14%). The travel modes are shown in **Figure 3.4**.

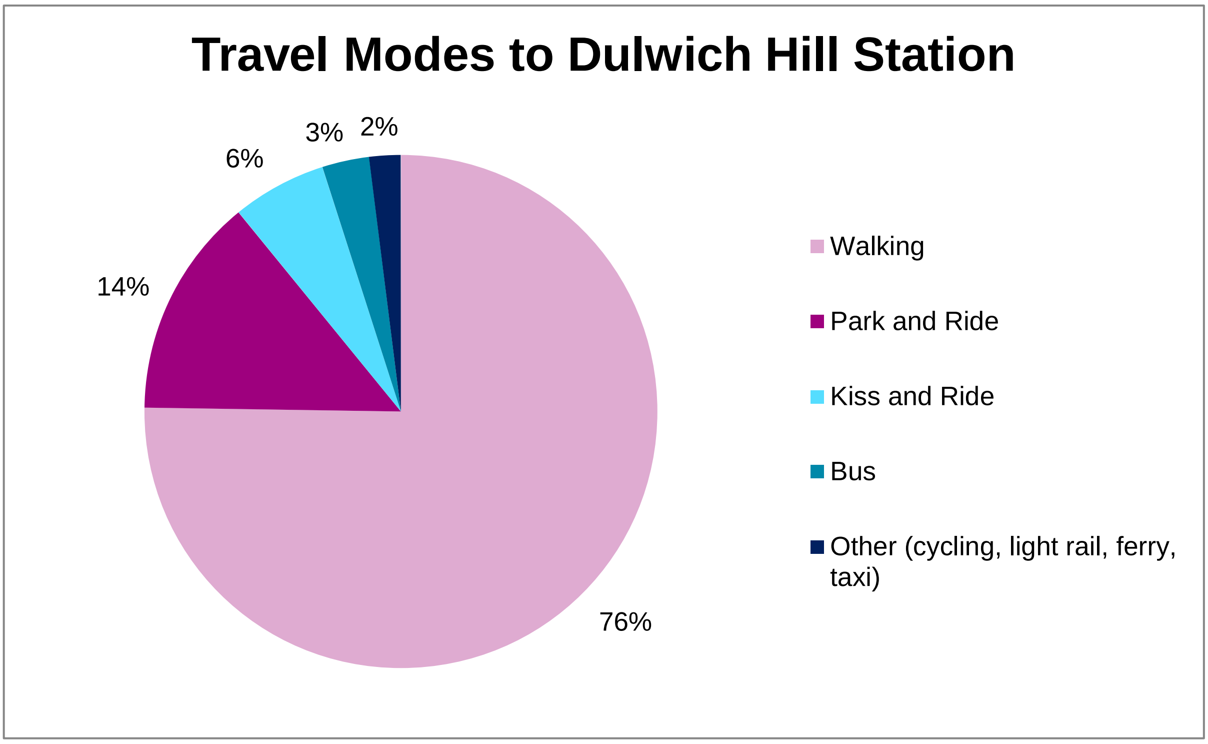
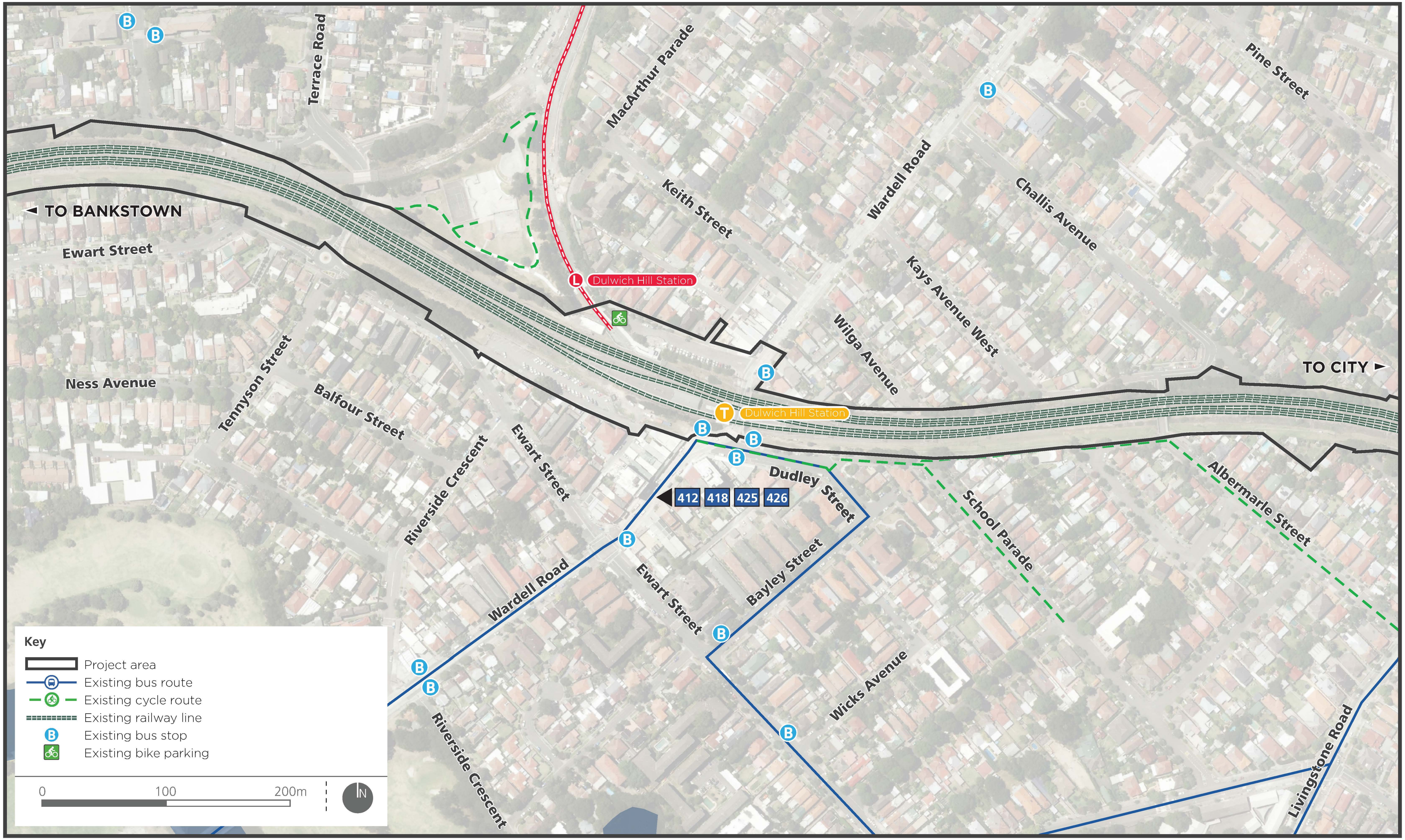


Figure 3.4 Travel modes to the station- Dulwich Hill (TfNSW, 2014)

The L1 Dulwich Hill Line terminates near the project area at the Dulwich Hill light rail stop, located about 130 metres to the north-west of Dulwich Hill Station. This extension of the line was opened in 2014 and is now referred to as the 'L1 Dulwich Hill Line'. As shown below in **,** the Opal data for 2016 shows there were a total of 194,319 trips where there was an interchange between LRT and trains out of a total 218,634. This shows that since the introduction of the LRT in 2014 there has been a significant change to the proportion of people using bus versus light rail to access the station.

Table 3.13 Dulwich Hill Station Transfers

From mode	To mode	Opal Trips
Train	LRT	100,719
LRT	Train	93,600
Bus	Train	14,439
Train	Bus	9,876
Total		**218,634**



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Station location, railway lines, cycle routes and existing bus routes in the Dulwich Hill area

FIGURE 3.5

LRT passengers travelling further out of the city on the Bankstown train line are likely to transfer to trains. Passengers travelling from the city bound adjacent suburbs (Marrickville and Sydenham) to the bay side suburbs are likely to transfer from train to LRT. The LRT line also stops more frequently compared to the train line making it a more attractive option for passengers wanting to reach specific destinations.

Overall, Trains and LRT are the preferred mode of transport over buses and passengers are more likely to transfer to LRT as it services more areas.

3.3.2 Walking

Pedestrian accessibility in Dulwich Hill is generally good with footpaths on either side of the road; however movements are constrained by the rail and light rail corridor (NSW Govt. 2015).

Wardell Road is a Regional road travelling from the north to the south of the Station. The road travels through Dulwich Hill Station, connecting both sides of Dulwich Hill village and residential areas further afield. Low vehicle speeds and relatively narrow carriageways along this road make it attractive for pedestrians.

3.3.3 Cycling

There are several cycle routes in close proximity to the station. Routes on both Albermarle Street and School Parade running parallel to the rail corridor have on road bike lanes/road shoulders/mixed traffic lanes which are suitable for riders of varying experience and confidence. Along with the other cycle routes, these are shown on **Figure 3.5**.

In addition, the Cooks River cycleway runs to the south of Dulwich Hill Station. The demand for the cycleway is particularly high in the early morning, evening and on Sundays (NSW Govt. 2011). This cycleway is a key part of the regional cycle network.

Currently there are provisions for bike parking spaces on the southern side of Bedford Crescent and the northern side of Wardell Road at the station. The types of bike parking are outlined in **Table 3.14**.

Table 3.14 Dulwich Hill Bike Facilities

Location	Type of Parking	Bike Parking Supply
Bedford Crescent	Inverted u-rails	10 spaces
Wardell Road	Inverted u-rails	4 spaces
Wardell Road	Multi bike rack	6 spaces

The demand is for 10 bike spaces in total across the three locations meaning there is sufficient supply to cater for the demand. Specifically the bike spaces on Bedford Crescent are operating at 60% capacity and are primarily used by light rail customers.

3.3.4 Bus

Dulwich Hill centre is only served by one bus route that travels from Campsie to the CBD (412). A number of other bus routes (418, 425 and 426) serve the northern section of the precinct, as shown in **Figure 3.5**.

A bus stop on Dudley Street immediately south of Dulwich Hill Station services the 412 bus route and provides direct access to Dulwich Hill station. Bus passengers interchanging with Dulwich Hill station need to cross a pedestrian crossing to the west of the bus stop on Wardell Road in order to get to the station. This is approximately 50m to the station entry.

There is another bus stop on Dudley Street servicing bus passengers travelling north on the 412 bus wanting to interchange with the train station. They use a pedestrian refuge island on Dudley Street and the pedestrian crossing on Wardell Road in order to get to the station. This is approximately 80m to the station entry.

The local bus route frequency is shown in **Table 3.15** below.

Table 3.15 Bus frequency - Dulwich Hill Station (Sydney Buses 2016)

Route Number	Weekday		Weekend
	Frequency (Peak)	Frequency (Off peak)	Frequency
412	Approx. 15 mins	Approx. 20 mins	Approx. 20 mins

3.3.5 Road network

The existing road network at the Dulwich Hill precinct contains a number of State, Regional and Local roads, as described below

State

- New Canterbury Road.

Regional

- Wardell Road
- Marrickville Road.

Local

- Ewart Street
- Beauchamp Road
- Livingstone Road
- Bayley Street
- School Parade
- Albermarle Street
- Wilga Avenue
- Challis Avenue
- Kays Avenue West
- Dudley Street.

3.3.6 Traffic data

Traffic turning counts and queue length surveys were undertaken during three separate surveys between April and December 2016 to provide data for this assessment.

The existing approach traffic volumes for the intersections assessed are provided in **Table 3.16**.

All intersections surrounding Dulwich Hill Station currently operate at a level of service C or above. Refer to Chapter 5 for details of intersection performance and a map showing the location of the intersections modelled.

Table 3.16 Dulwich Hill Existing Traffic Volumes

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
B.15 Wardell Road/Ewart Street	Ewart Street	North	447	379
	Wardell Road	East	385	860
	Ewart Street	South	208	414
	Wardell Road	West	591	355

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
H.16 Wardell Road/Dudley Street	Wardell Road	Northeast	403	775
	Dudley Street	East	72	94
	Wardell Road	Southwest	681	499
B.28 New Canterbury Road/Marrickville Road	New Canterbury Road	North	437	1050
	Marrickville Road	East	288	411
	New Canterbury Road	South	1496	786
	Marrickville Road	West	139	82
H.25 Ewart Street/Bayley Street	Ewart Street	Northeast	39	61
	Bayley Street	Southeast	539	432
	Ewart Street	Southwest	20	22
	Dibble Avenue	Northwest	303	265
H.36 New Canterbury Road/Terrace Road	New Canterbury Road	East	620	1344
	Terrace Road	Southwest	78	74
	New Canterbury Road	West	1528	747
H.37 Wardell Road/Marrickville Road	Marrickville Road	North	671	354
	Wardell Road	East	251	556
	Marrickville Road	South	426	773
	Wardell Road	West	566	396

Further details of these counts are provided in **Appendix A**.

3.3.7 Commuter Parking

Dulwich Hill Station has approximately 1300 parking spaces in the area surrounding the station with 55 dedicated commuter spaces as shown in **Table 3.17** below.

The 55 dedicated commuter spaces at or near Dulwich Hill Station cater for the (approximately) 14% of the users of the station who choose to park and ride (Arup 2015). In addition to these spaces there are three accessible parking bays available (two on-street, one off-street). There are currently three kiss and ride parking spaces but no taxi parking bays at Dulwich Hill Station.

Table 3.18 below outlines the total capacity and utilisation of the parking spaces available to commuters.

Table 3.17 Dulwich Hill Station Parking Summary

Dedicated Commuter spaces	Kiss and Ride spaces	Total Parking Capacity
55	3	1332

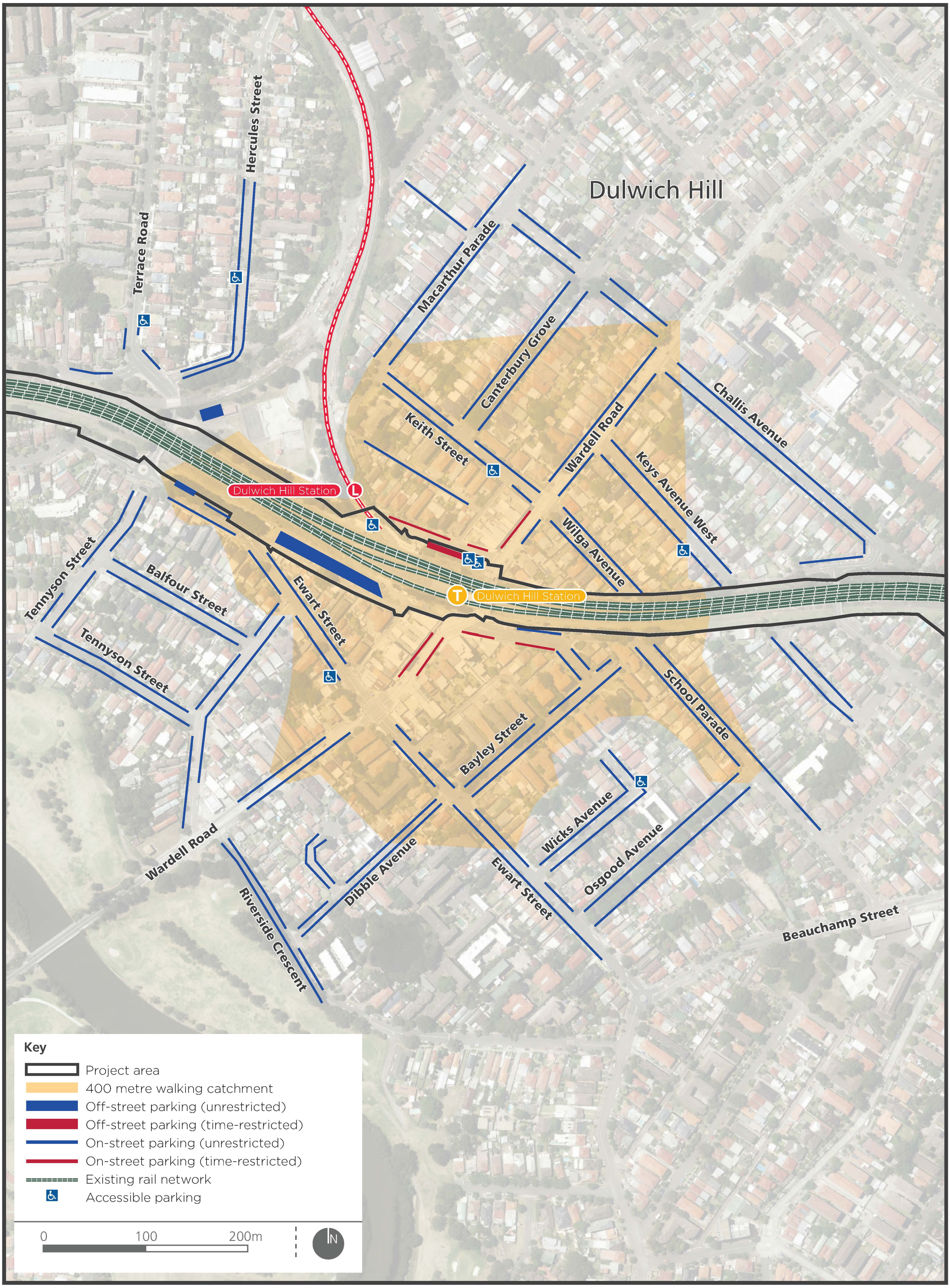
Table 3.18 Dulwich Hill Station Parking Capacity and Utilisation within 400m Radius

	On-street		Off-street	
Time Restriction	Capacity	Utilisation (%)	Capacity	Utilisation (%)
Unrestricted	1202	72%	57[8]	100%

[8] The car park has 56 marked spaces (including one accessible space) and has been observed to regularly hold 57 vehicles, with one vehicle parking over yellow lines.

	On-street		Off-street	
Time Restriction	**Capacity**	**Utilisation (%)**	**Capacity**	**Utilisation (%)**
Time restricted	73	86%	-	-
Overall	**1275**	**74%**	**57**	**100%**

Figure 3.6 shows the type and location of parking spaces available in the vicinity of Dulwich Hill Station.



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Parking restrictions around Dulwich Hill station

FIGURE 3.6

3.4 Hurlstone Park

Hurlstone Park is approximately 8.5km from Sydney's CBD, falling under the City of Canterbury-Bankstown local government area.

Hurlstone Park Station had 6045 residents in 2011 and 466 jobs (according to the 2011 census). Over a third (37%) of jobs are in retail and hospitality, 21% in education, healthcare and public services and 20% in business services. **Figure 3.8** overleaf, illustrates the proximity of the station to Hurlstone Park village.

3.4.1 Modes of Travel

Of 207 surveyed passengers using Hurlstone Park Station, the majority of people walked to the station (TfNSW, 2014). The remaining passengers connect to the station by bike or bus, with 16% travelling by car, either to be dropped off (6%) or parking around the station (10%). The travel modes are shown in **Figure 3.7**.

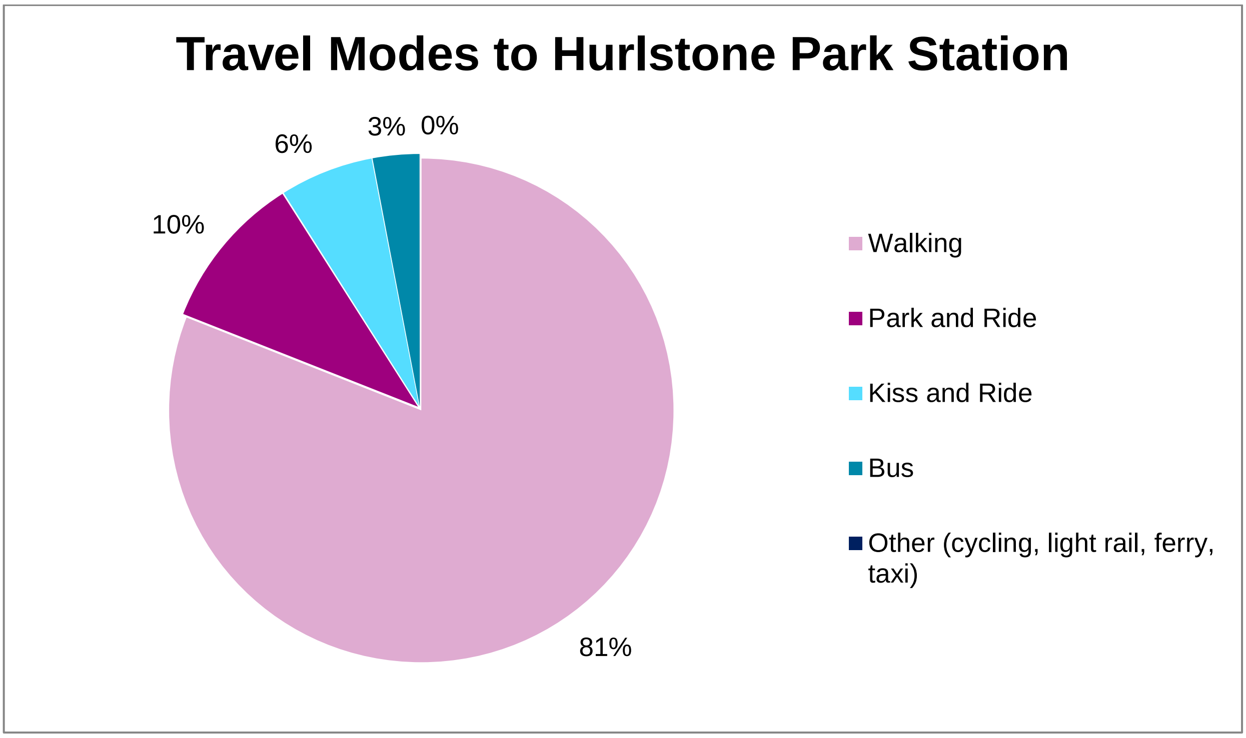


Figure 3.7 Travel modes to the station- Hurlstone Park (TfNSW, 2014)

3.4.2 Walking

Pedestrian access in the precinct is generally good due to radiating and intersecting roads (NSW Govt. 2015). Crinan Street in Hurlstone Park village is attractive to pedestrians due to a narrow carriageway and low vehicular speeds. The key roads have footpaths on either side of the road to cater for pedestrians.

3.4.3 Cycling

Hurlstone Park has good on-road cycle routes connecting cyclists from Canterbury Road in the north west, Floss Street in the east, and Foord Avenue in the south to the Railway Station (NSW Govt. 2015). A section of Floss Street (between Garnet Street and Duntroon Street) cycle route connects to Cooks River cycleway which runs along the southern boundary of Hurlstone Park precinct.

There are a number of roads in the area which have on road cycle lanes/road shoulders/mixed traffic lanes which are suitable for confident bikers and connect from Canterbury Road to Floss Street (RMS NSW Gov 2016).

Currently there are 12 bike racks which supply 12 spaces on Crinan Street outside the station entrance. There is a demand of two bike spaces meaning there is sufficient supply to cater for the current demand.

Station location, railway lines, cycle routes and existing bus routes in the Hurlstone Park area

FIGURE 3.8

3.4.4 Bus

Hurlstone Park is serviced by two bus routes, the 406 and 418, that provide access to surrounding suburbs including Five Dock, Burwood, Mascot and Bondi Junction. The local bus routes are shown on **Figure 3.8** and the frequency is shown in **Table 3.19** below.

A bus stop on the Crinan Street overpass bridge services both the 406 and 418 northbound journeys and provides direct access to Hurlstone Park Station. Bus passengers interchanging with Hurlstone Park station do not need to make any road crossings to access the station. The distance from the bus stop to the station is approximately 10m.

There is also another bus stop on Crinan Street providing service to bus passengers travelling south on the 406 and 418 buses wanting to interchange with the train station. They use the pedestrian crossing to the north of the bus stop. This is approximately 50m to the station entry.

The 2016 survey of 207 people found that only 3% of rail passengers used the bus to travel to the train station. The bus frequency is shown in **Table 3.19** overleaf.

Table 3.19 Bus frequency - Hurlstone Park Station (Sydney Buses 2016)

Route Number	Weekday	Weekday	Weekend
	Frequency (Peak)	Frequency (Off peak)	Frequency
406	30 mins	1 hour	1 hour
418	Approx. 20 mins	Approx. 30 mins	Approx. 30 mins

3.4.5 Road Network

The existing road network in the Hurlstone Park precinct contains a number of State and Local roads as described below.

State

- Canterbury Road
- New Canterbury Road.

Local

- Crinan Street
- Floss Street
- Dunstaffenage Street
- Keir Avenue
- Foord Avenue
- Burnett Street
- Hopetoun Street
- Duntroon Street
- Garnet Street
- Ewart Street
- Hampden Street
- Myra Road.

3.4.6 Traffic data

Traffic turning counts and queue length surveys were undertaken during three separate surveys between April and December 2016 to provide data for this assessment.

The existing approach traffic volumes for the intersections assessed are provided in **Table 3.20**.

All intersections surrounding Hurlstone Park Station currently operate at a level of service C or above. Refer to Chapter 5 for details of intersection performance and a map showing the location of the intersections modelled.

Table 3.20 Hurlstone Park Existing Traffic Volumes

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
B.14 Canterbury Road/ Crinan Street	Canterbury Road	North	800	1436
	Crinan Street	East	313	315
	Canterbury Road	South	1696	1197
	Queen Street	Northwest	216	272
B.27 Old Canterbury Road/New Canterbury Road	Old Canterbury Road	North	448	790
	New Canterbury Road	East	644	1111
	Canterbury Road	South	1606	1074
	Griffiths Street	West	323	336
H.17 Crinan Street/ Floss Street	Crinan Street	North	319	274
	Floss Street	East	243	277
	Floss Street	West	99	86
H.18. Crinan Street/ Duntroon Street	Crinan Street	North	396	316
	Duntroon Street	East	70	88
	Crinan Street	South	255	279
	Floss Street	West	3	27

Further details of these counts are provided in **Appendix A**.

3.4.7 Commuter Parking

Hurlstone Park Station has approximately 1200 spaces in the area surrounding the station with 23 dedicated commuter spaces as shown in **Table 3.21** below. **Table 3.22** below outlines the total capacity and utilisation of the parking spaces available to commuters.

The 23 dedicated commuter spaces at Hurlstone Park cater for the (approximately) 10% of the users of the station who choose to park and ride (Arup 2015).

There are currently no kiss and ride or taxi parking bays at Hurlstone Park Station.

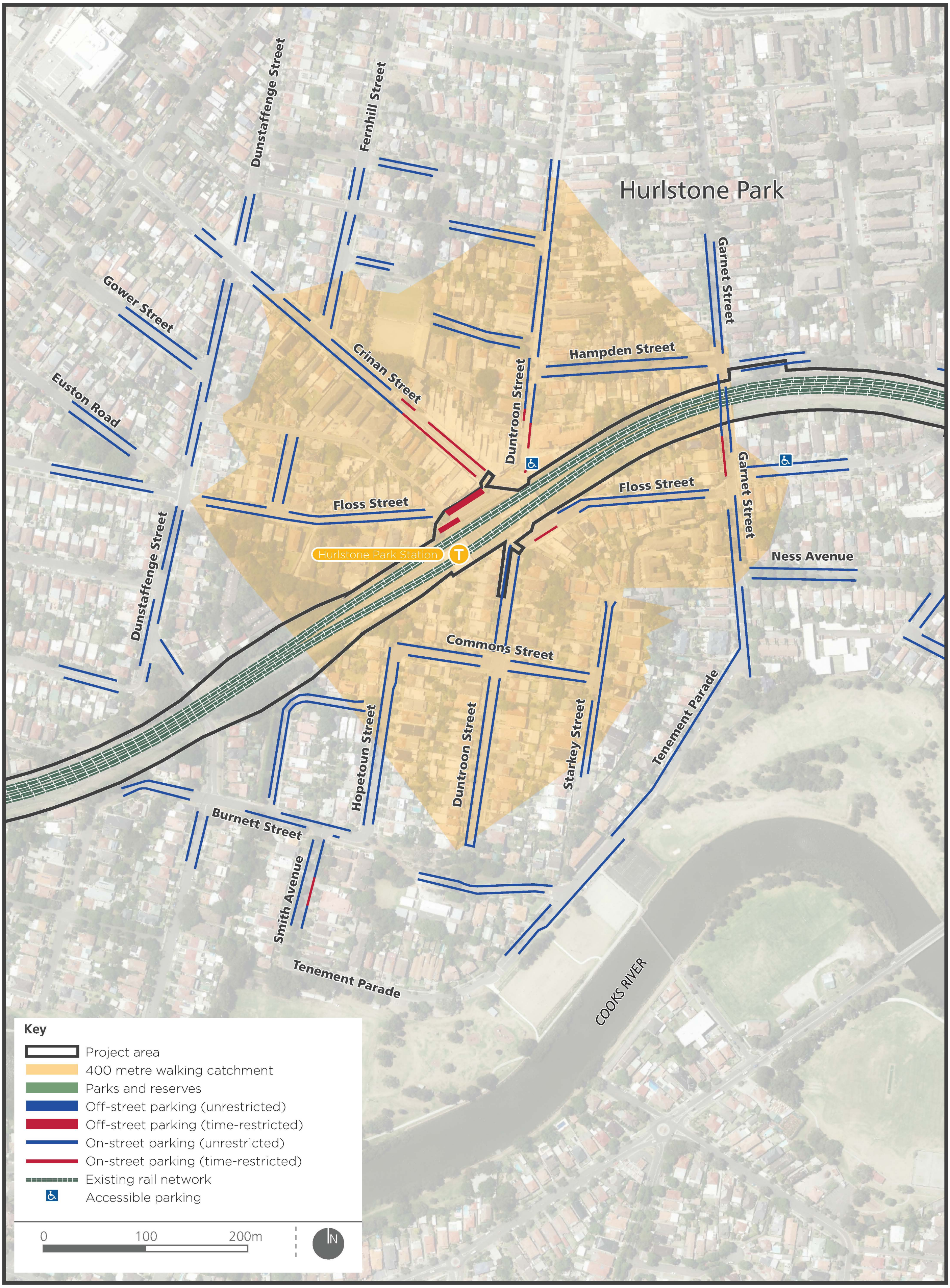
Table 3.21 Hurlstone Park Station Parking Summary

Dedicated Commuter spaces	Kiss and Ride spaces	Total Parking Capacity
23	0	1208

Table 3.22 Hurlstone Park Station Parking Capacity and Utilisation within 400m Radius

	On-street		Off-street	
Time Restriction	Capacity	Utilisation (%)	Capacity	Utilisation (%)
Unrestricted	1135	53%	-	-
Time restricted	50	74%	23	100%
Overall	**1185**	**54%**	**23**	**100%**

Figure 3.9 overleaf shows the type and location of parking spaces available in the vicinity of Hurlstone Park Station.



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Parking restrictions around Hurlstone Park station

FIGURE 3.9

3.5 Canterbury

Canterbury Station is approximately 10km from Sydney's CBD, falling under the City of Canterbury-Bankstown local government area.

Canterbury had 6320 residents in 2011 and provided 1434 jobs (according to the 2011 census). Almost half (45%) of jobs were in education, healthcare and public services, while 20% were in retail and hospitality.

The T3 Bankstown Line and Cooks River divide Canterbury precinct from the areas located in the south of the precinct as shown in **Figure 3.11** overleaf.

3.5.1 Modes of Travel

Of 182 surveyed passengers using Canterbury Station, the majority of people walked to the station (TfNSW, 2014). The remaining passengers connect to the station by bike or bus, with 13% travelling by car, either to be dropped off (4%) or parking around the station (9%). Travel modes are shown in **Figure 3.10**.

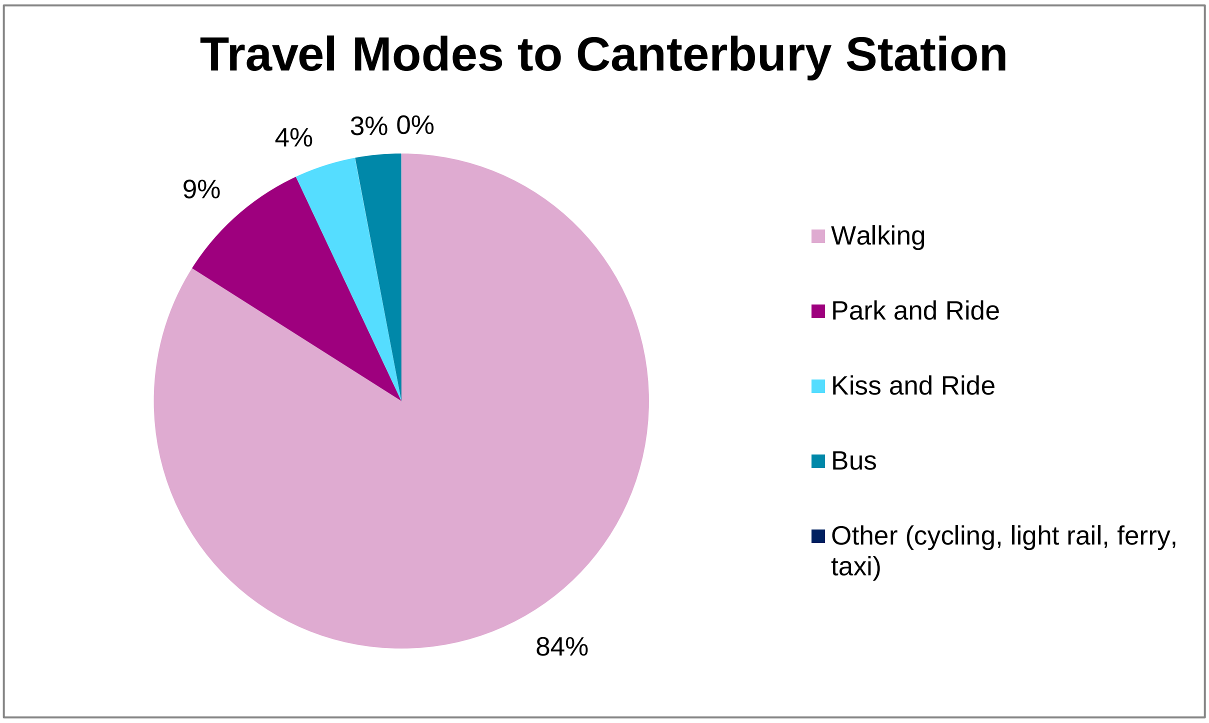
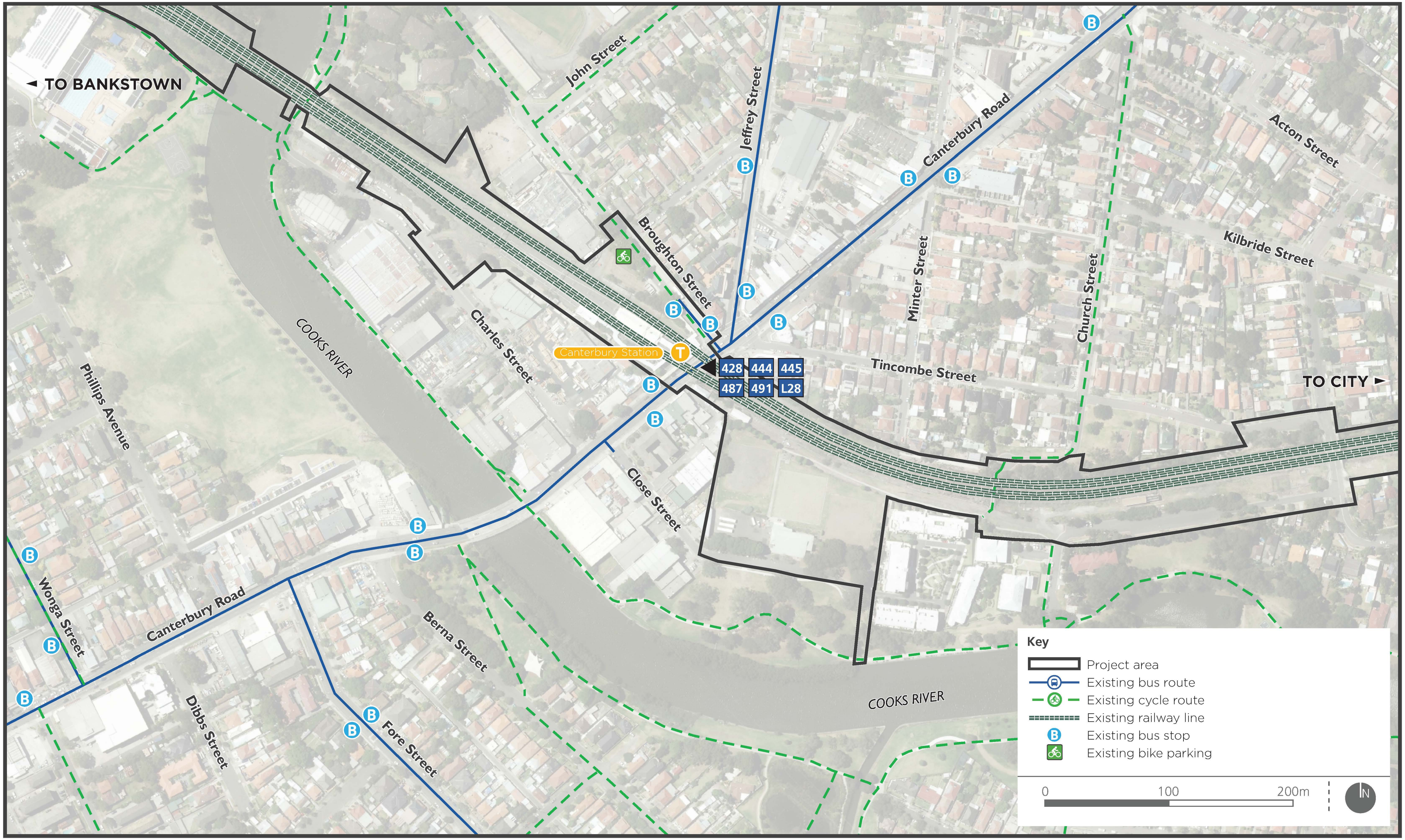


Figure 3.10 Travel modes to the station- Canterbury (TfNSW, 2014)

3.5.2 Walking

There is a relatively good pedestrian accessibility in the precinct for those living in the east and the north. The Cooks River, railway corridor and the busy Canterbury Road (regional) limits movement from the south (NSW Govt. 2015). The Regional roads have footpaths on either side to facilitate pedestrian movement.



Station location, railway lines, cycle routes and existing bus routes in the Canterbury area

FIGURE 3.11

3.5.3 Cycling

The Cooks River cycleway runs along the northern and southern side of the river, as shown in **Figure 3.11**.

There are a very limited number of roads in the area which have on road cycle lanes/road shoulders/mixed traffic lanes which are suitable for less experienced riders and on road cycle lanes/shoulders /mixed traffic lanes which are suitable for confident bikers (RMS NSW Gov 2016).

Canterbury Station has bike lockers providing four formal bike spaces. Despite the bike locker acting at 25% capacity, bikers are choosing to park along fences outside the station on Canterbury Road and northwest of the station on Broughton Street. The parking demand is for one bike space on Canterbury Road and three bike spaces on Broughton Street.

3.5.4 Bus

Canterbury Station is serviced by six bus routes, including high frequency routes from Sydney CBD, Campsie and Hurstville. All six routes serve bus stops on Canterbury Road at the entrance to the station as shown in **Figure 3.11**.

A bus stop on Canterbury Road immediately south of Canterbury Station services the 444, 445, 487 and 491 northbound bus routes and provides direct access to the Canterbury station. Bus passengers interchanging with Canterbury station do not need to make any road crossings to access the station. The distance from the bus stop to the station is approximately 50m. Bus passengers on the northbound 428 service wanting to interchange with Canterbury station are able to use the signalised crossing to cross Broughton Street and access the station. The distance from the bus stop to the station is approximately 40m.

There is also another bus stop on Canterbury Road providing service to the bus passengers travelling south on all six routes wanting to interchange with the train station. They use the signalised crossings at the intersection of Canterbury Road and Broughton Street which is approximately 60m to the station entry. A bus layover facility is provided on Broughton Street adjacent to the bus stops.

The survey in 2016 of 182 people found that only 3% of rail passengers used the bus to travel to the train station.

The bus frequency is shown in **Table 3.23**.

Table 3.23 Bus frequency - Canterbury Station (Sydney Buses 2016)

Route Number	Weekday	Weekday	Weekend
	Frequency (Peak)	Frequency (Off peak)	Frequency
428	Approx. 5 mins	Approx. 20 mins	Approx. 20 mins
444	Approx. 20 mins	None	Approx. 30 mins
445	None	Approx. 20 mins	Approx. 20 mins
487	Approx. 30 mins	30 mins	Approx. 35 mins
491	Approx. 30 mins	Approx. 30 mins	30 mins
L28	10 mins	None	None

3.5.5 Road Network

The existing road network in the Canterbury precinct contains a number of State, Regional roads and Local roads, as described below.

State

- Canterbury Road.

Regional

- Jeffrey Street.

Local

- Wairoa Street
- Fore Street
- Wonga Street
- Berna Street
- Close Street
- Charles Street
- Broughton Street
- John Street
- Tincombe Street
- Church Street.

3.5.6 Traffic data

Traffic turning counts and queue length surveys were undertaken during three separate surveys between April and December 2016 to provide data for this assessment.

The existing approach traffic volumes for the intersections assessed are provided in **Table 3.24**.

All intersections surrounding Canterbury Station currently operate at a level of service B or above. Refer to Chapter 5 for details of intersection performance and a map showing the location of the intersections modelled.

Table 3.24 Canterbury Existing Traffic Volumes

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
B.13 Canterbury Road/Wonga Street	Wonga Street	North	383	409
	Canterbury Road	East	1279	2013
	Canterbury Road	West	1697	1283
H.14 Canterbury Road/Charles Street	Charles Street	North	25	25
	Canterbury Road	East	1186	1302
	Canterbury Road	West	1924	1500
H.15 Canterbury Road /Jeffrey Street	Broughton Street	North	170	212
	Jeffrey Street	Northeast	252	338
	Canterbury Road	East	863	1548
	Tincombe Street	Southeast	0 – Tincombe Street is a one way street	0 – Tincombe Street is a one way street
	Canterbury Road	West	1932	1465
H.14 Canterbury Road/Close Street	Canterbury Road	East	1176	1975
	Close Street	South	20	18
	Canterbury Road	West	1905	1475

Further of these counts are provided in **Appendix A**.

3.5.7 Commuter Parking

Canterbury Station has approximately 850 parking spaces in the area surrounding the station with 32 dedicated commuter spaces on the southern side of the station on Charles Street[9], as shown in **Table 3.25** below. There is currently no formalised kiss and ride or taxi parking bays at Canterbury Station. However, there is a section of Broughton Street which has a no parking restriction which is recognised as facilitating kiss and ride trips. **Table 3.26** below outlines the total capacity and utilisation of the parking spaces available to commuters.

The 32 dedicated commuter spaces are used to cater for the (approximately) 9% of the users of the station who choose to park and ride (Arup 2015). It was observed that Broughton Street and Robert Street have high volumes of parked vehicles during standard work hours and therefore, it is assumed that commuters are using these streets for on-street informal park and ride parking.

Time restricted carparks are available on Pierson Lane and a time restricted carpark containing approximately 100 spaces operated by Aldi is available adjacent to this.

There is currently no kiss and ride or taxi parking bays at Canterbury Station.

Table 3.25 Canterbury Station Parking Summary

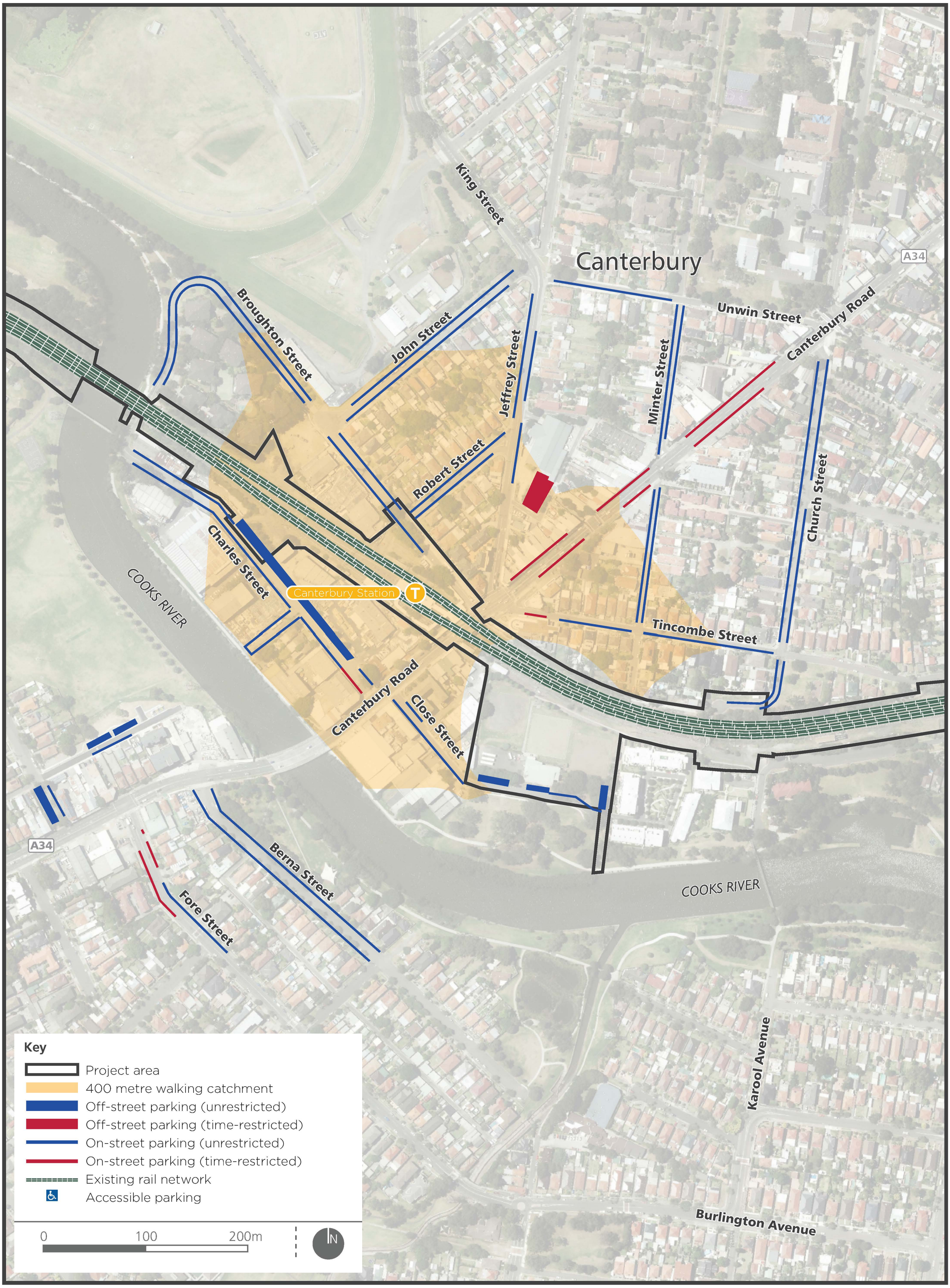
Dedicated Commuter Spaces	Kiss and Ride spaces	Total Parking Capacity
32	0	849

Table 3.26 Canterbury Station Parking Capacity and Utilisation within 400m Radius

	On-street		Off-street	
Time Restriction	Capacity	Utilisation (%)	Capacity	Utilisation (%)
Unrestricted	597	60%	107	84%
Time restricted	19	26%	126	100%
Overall	**616**	**59%**	**233**	**84%**

Figure 3.12 shows the type and location of parking spaces available in the vicinity of Canterbury Station.

[9] The number of available spaces is currently reduced due to construction works on adjacent properties.



Parking restrictions around Canterbury station

FIGURE 3.12

3.6 Campsie

Campsie is approximately 12km from Sydney's CBD, falling under the City of Canterbury-Bankstown local government area.

Campsie had 19582 residents in 2011 and provided 5092 jobs (according to the 2011 census). Almost half (47%) of jobs were in education, healthcare and public services, while 29% were in retail and hospitality.

The station location, railway lines, cycle routes and existing bus routes in the Campsie area are shown in overleaf.

3.6.1 Modes of Travel

Of 592 surveyed passengers using Campsie Station, the majority of people walked to the station (TfNSW, 2014). The remaining passengers connect to the station by bike or bus, with 20% travelling by car, either to be dropped off (11%) or parking around the station (9%). Travel modes are shown in **Figure 3.13**.

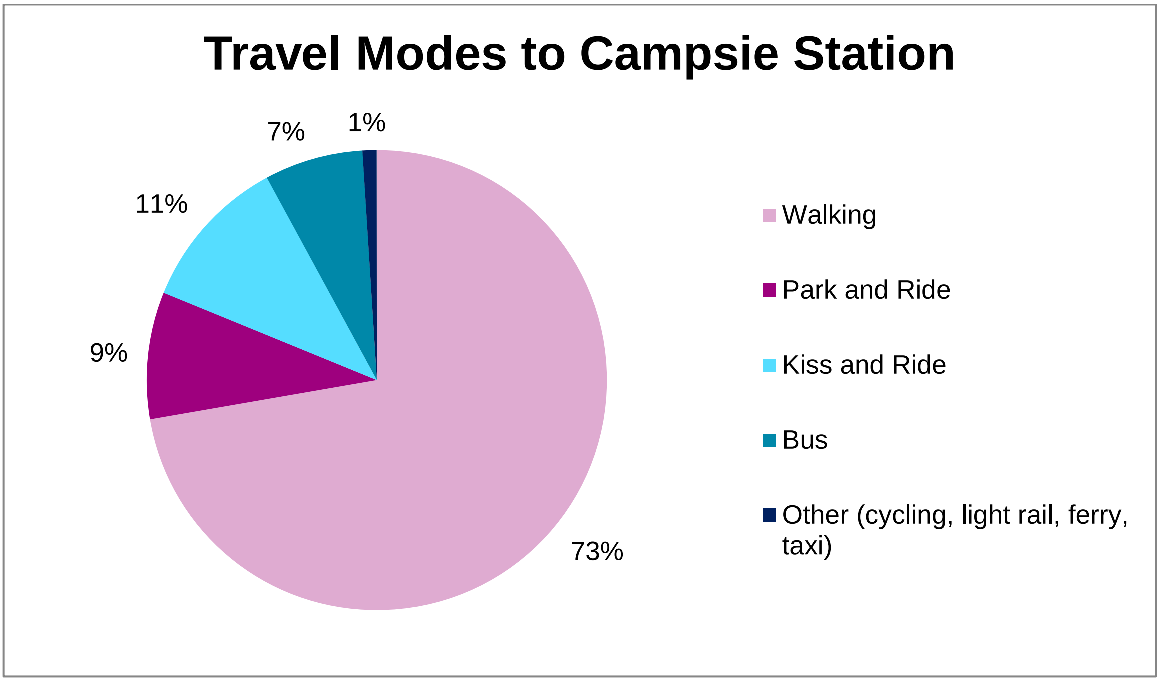


Figure 3.13 Travel modes to the station- Campsie (TfNSW, 2014)

3.6.2 Walking

There is a good walking catchment in the Campsie precinct, with linear intersecting Regional roads and perpendicular Local roads (NSW Govt. 2015), resulting in a high proportion of rail users walking to the station. The Regional and Local roads have footpaths on either side of the road to cater for pedestrians.

3.6.3 Cycling

The Cooks River cycleway runs along the northern boundary of Campsie precinct (NSW Govt. 2015) as shown in **Figure 3.14**. It should be noted that there is no direct cycle path on or off road which connects to Campsie Station.

However, as shown in the figure there are some roads in the area which have on road cycle lanes/road shoulders/mixed traffic lanes to provide some amenity to cyclists (RMS NSW Gov 2016).

Currently there are 10 multi bike racks which supply 10 bike spaces on Beamish Street outside the station. There is a demand of 28 bike spaces meaning there is a shortfall in supply, with additional bikes parked along the guard rail in front of the main station entrance.

Station location, railway lines, cycle routes and existing bus routes in the Campsie area

FIGURE 3.14

3.6.4 Bus

Campsie is a major hub for bus and rail interchange. The precinct is serviced by nine bus routes including a frequent service providing north-south connections to Macquarie Park shown in **Figure 3.14**.

Bus stops on Beamish Street and South Parade provide access to the station. A bus stop on Beamish Street south of the Campsie station provides service to bus passengers travelling north on the 412, 415, 487 and 473 services wanting to interchange with the train station. They use the signalised crossing at the intersection of Lilian Lane and Beamish Street. This is approximately 90m to the station entry. Bus passengers travelling north on the 400, 490 and 492 services use the bus stop on Beamish Street north of the train station. They cross one pedestrian crossing on North Parade in order to interchange with the station which is approximately 70m to the station entry.

There is also another bus stop on Beamish Street providing service to bus passengers travelling south on the 400, 490 and 492 services. Bus passengers travelling south on the 412, 415, 473 and 487 services use the bus stop on South Parade. Passengers disembarking at both of these stops use the signalised crossings at the intersection of South Parade and Beamish Street which is approximately 70m to the station entry.

The 2016 survey of 592 people found that 7% of rail passengers used the bus to travel to the train station.

The bus frequency is shown in **Table 3.27**

Table 3.27 Bus frequency - Campsie Station (Sydney Buses 2016)

Route Number	Weekday	Weekday	Weekend
	Frequency (Peak)	Frequency (Off peak)	Frequency
400	Approx. 20 mins	Approx. 20 mins	Approx. 20 mins
412	Approx. 15 mins	Approx. 20 mins	Approx. 20 mins
415	Approx. 30 mins	Approx. 30 mins	Approx. 30 mins
444	Approx. 20 mins	None	Approx. 30 mins
445	None	Approx. 20 mins	Approx. 20 mins
473	30 mins	30 mins	1 hour
487	Approx. 30 mins	30 mins	Approx. 35 mins
490	30 mins	30 mins	30 mins
492	30 mins	30 mins	30 mins

3.6.5 Road Network

The existing road network in the Campsie precinct contains a number of State, Regional roads and Local roads, as described below.

State

- Canterbury Road.

Regional

- Beamish Street
- Brighton Avenue
- Fifth Avenue
- Ninth Avenue.

Local

- Bellombi Street
- Evaline Street
- Loch Street
- Campsie Street
- Carrington Square
- Amy Street
- Wilfred Avenue
- Duke Street
- Browning Street
- Clissold Parade
- South Parade
- North Parade.

3.6.6 Traffic Data

Traffic turning counts and queue length surveys were undertaken during three separate surveys between April and December 2016 to provide data for this assessment.

The existing approach traffic volumes for the intersections assessed are provided in **Table 3.28**.

All intersections surrounding Campsie Station currently operate at a level of service C or above. Refer to Chapter 5 for details of intersection performance and a map showing the location of the intersections modelled.

Table 3.28 Campsie Existing Traffic Volumes

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
B.10 Beamish Street/Ninth Avenue	Beamish Street	North	404	612
	Beamish Street	South	741	706
	Ninth Avenue	West	608	550
B.11 Beamish Street/Clissold Parade	Beamish Street	North	648	708
	Clissold Parade	West	85	164
	Beamish Street	South	713	692
B.12 Beamish Street/South Parade	Beamish Street	North	649	735
	South Parade	East	168	142
	Beamish Street	South	571	518
	Lillian Street	West	83	74
H.11 Beamish Street/North Parade	Beamish Street	North	663	655
	North Parade	East	34	34
	Beamish Street	South	654	704
	North Parade	West	54	43

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
H.12 Beamish Street/Amy Street	Beamish Street	North	522	585
	Beamish Street	South	564	589
	Amy Street	West	36	40
H.13 Canterbury Road/Beamish Street	Beamish Street	North	467	544
	Canterbury Road	East	910	1197
	Bexley Road	South	971	846
	Canterbury Road	West	1585	1184
Ninth Avenue/Loch Street	Ninth Avenue	East	613	854
	Loch Street	South	754	805
	Ninth Avenue	West	638	574

Further details of these counts are provided in **Appendix A**.

3.6.7 Commuter Parking

Campsie has approximately 1550 parking spaces in the area surrounding the station with 138 dedicated commuter spaces falling within the rail corridor as shown in **Table 3.29** overleaf.

The 138 dedicated commuter spaces at or near Campsie Station cater for the (approximately) nine percent of the users of the station who choose to park and ride (Arup 2015).

There are currently four kiss and ride parking spaces and six taxi parking bays at Campsie Station.

Table 3.29 Campsie Station Parking Summary

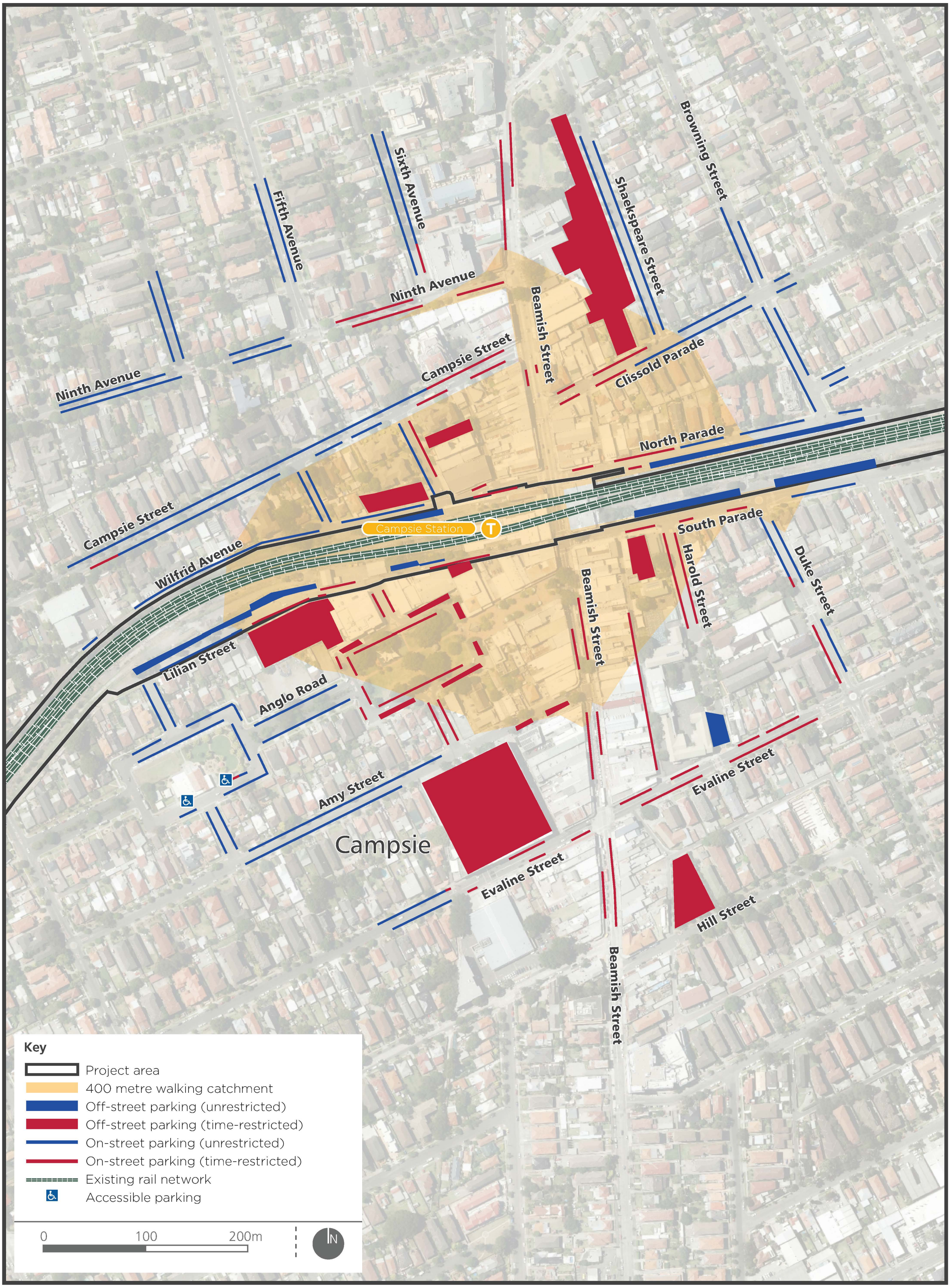
Dedicated Commuter spaces	Kiss and Ride spaces	Total Parking Capacity
138	4	1539

Table 3.30 below outlines the total capacity and utilisation of the parking spaces available to commuters, and highlights that both on and off-street parking spaces are highly utilised at present.

Table 3.30 Campsie Station Parking Capacity and Utilisation within 400m Radius

	On-street		Off-street	
Time Restriction	Capacity	Utilisation (%)	Capacity	Utilisation (%)
Unrestricted	759	87%	166	100%
Time restricted	286	81%	328	100%
Overall	**1045**	**85%**	**494**	**100%**

Figure 3.15 shows the type and location of parking spaces available in the vicinity of Campsie Station.



Parking restrictions around Campsie station

FIGURE 3.15

3.7 Belmore

Belmore is approximately 13.3km from Sydney's CBD, falling under the City of Canterbury-Bankstown local government area.

Belmore had 9720 residents in 2011 and provided 3018 jobs (according to the 2011 census). The majority of jobs are in retail and hospitality (37%).

North-south movement is limited by the presence of the T3 Bankstown Line, as shown in **Figure 3.17** overleaf**.**

3.7.1 Modes of Travel

Of 310 passengers using Belmore Railway Station, almost two thirds of people walk to the station (TfNSW, 2014). The remaining passengers connect to the station by bike or bus, with a third travelling by car, either to be dropped off (11%) or park around the station (21%). The percentages for different modes are shown in **Figure 3.16**.

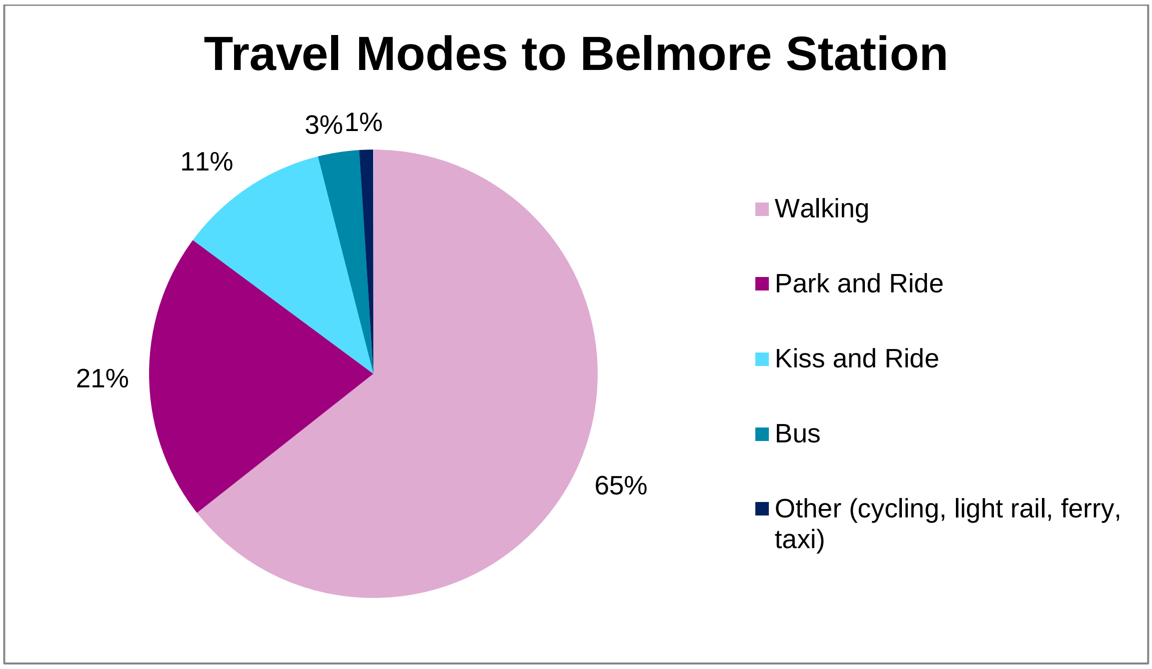


Figure 3.16 Travel modes to the station- Belmore (TfNSW, 2014)

3.7.2 Walking

There is a good walking catchment in the Belmore precinct, with linear intersecting primary roads and perpendicular secondary streets within a predominantly residential area (NSW Govt. 2015), resulting in a high proportion of rail users walking to the station. The primary and secondary roads have footpaths on either side of the road to cater for pedestrians.

However, the railway limits north south pedestrian movement between the two commercial sides of the Belmore precinct.

3.7.3 Cycling

An off street shared path links the station to the east of the precinct and to Belmore Sports Ground (NSW Govt. 2015) as shown **in Figure 3.17**.

The remainder of the local road network offers relatively low amenity for cyclists in the form of on or off road facilities.

Currently there are five multi bike racks which supply five bike spaces on Burwood Road 20m north of the station entrance. There is a demand of four bike spaces meaning that supply is sufficient to accommodate the demand. Despite the extra available bike parking spaces, one cyclist chose to park along the fence.

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Station location, railway lines, cycle routes and existing bus routes in the Belmore area

FIGURE 3.17

3.7.4 Bus

Belmore is serviced by two bus routes that travel along Burwood Road, as shown in **Figure 3.17**. These routes connect the precinct to Haberfield, Burwood, Strathfield, Campsie and Roselands.

A bus stop on Burwood Road immediately south of the Belmore Station services both the 415 and 942 southbound routes providing direct access to Belmore station. Bus passengers interchanging with Belmore station do not need to make any road crossings to access the station. This distance from the bus stop is approximately 40m to the station entry.

There is also another bus stop on Burwood Road providing service to bus passengers travelling north on the 415 and 942 buses wanting to interchange with the train station. They use pedestrian refuge island on Bridge Road and the signalised pedestrian crossing on Burwood Road in order to get to the station. This is approximately 90m to the station entry.

The 2016 survey of 310 people found that only 3% of rail passengers used the bus to travel to the station.

The frequency of service is shown in **Table 3.31**.

Table 3.31 Bus frequency - Belmore Station (Sydney Buses 2016)

Route Number	Weekday	Weekday	Weekend
	Frequency (Peak)	Frequency (Off peak)	Frequency
415	Approx. 30 mins	Approx. 30 mins	Approx. 30 mins
942	Approx. 30 mins	Approx. 30 mins	Approx. 30 mins

3.7.5 Road Network

The existing road network in the Belmore precinct contains a number of State, Regional roads and Local roads as described below.

State

- Canterbury Road.

Regional

- Burwood Road
- Lakemba Street.

Local

- Leylands Parade
- Bridge Road
- Peel Street
- Redman Parade
- Acacia Lane.

3.7.6 Traffic data

Traffic turning counts and queue length surveys were undertaken during three separate surveys between April and December 2016 to provide data for this assessment.

The existing approach traffic volumes for the intersections assessed are provided in **Table 3.32**.

All intersections surrounding Belmore Station currently operate at a level of service B or above. Refer to Chapter 5 for details of intersection performance and a map showing the location of the intersections modelled.

Table 3.32 Belmore Existing Traffic Volumes

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
B.08 Burwood Road / Bridge Road	Burwood Road	North	733	759
	Tobruk Avenue	East	14	24
	Burwood Road	South	742	653
	Bridge Road	West	212	180
B.09 Burwood Road / Redman Parade	Burwood Road	North	701	753
	Redman Parade	East	150	183
	Burwood Road	South	768	672
H.20 Burwood Road / Lakemba Street	Burwood Road	North	555	680
	Lakemba Street	East	382	499
	Burwood Road	South	572	633
	Lakemba Street	West	576	480
H.33 Canterbury Road / Burwood Road	Burwood Road	North	199	271
	Canterbury Road	East	812	1419
	Canterbury Road	West	1515	1008
Burwood Road at Belmore Station[10]	Burwood Road	North	780	864
	Burwood Road	South	812	674

Further details of these counts are provided in **Appendix A**.

3.7.7 Commuter Parking

Belmore has approximately 1200 parking spaces in the area surrounding the station with 56 dedicated commuter spaces as shown in **Table 3.33** below. **Table 3.34** below outlines the total capacity and utilisation of the parking spaces available to commuters.

The 56 dedicated commuter spaces at or near Belmore Station cater for the (approximately) 21% of the users of the station who choose to park and ride (Arup 2015).

There is currently no kiss and ride parking spaces but there are four taxi parking bays at Belmore Station.

Table 3.33 Belmore Station Parking Summary

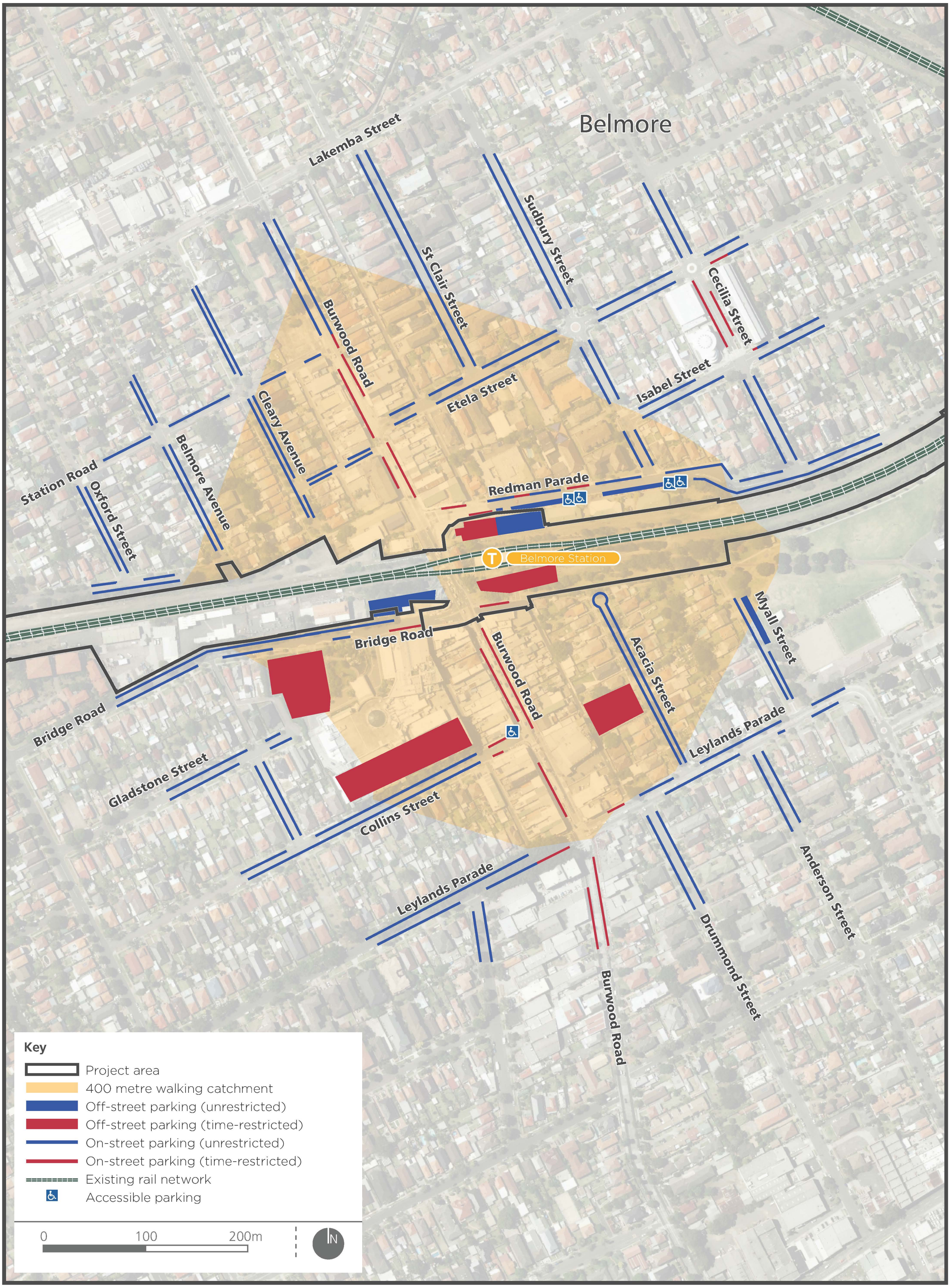
Dedicated Commuter spaces	Kiss and Ride spaces	Total Parking Capacity
56	0	1220

Table 3.34 Belmore Station Parking Capacity and Utilisation within 400m Radius

	On-street		Off-street	
Time Restriction	**Capacity**	**Utilisation (%)**	**Capacity**	**Utilisation (%)**
Unrestricted	914	75%	63	82%
Time restricted	164	84%	79	100%
Overall	**1078**	**76%**	**142**	**92%**

Figure 3.18 shows the type and location of parking spaces available in the vicinity of Belmore Station.

[10] Traffic flows on Burwood Road have been included in this table as there is a mid-block pedestrian crossing which may be impacted by TTS. This is assessed in Chapter 5.



Parking restrictions around Belmore station

FIGURE 3.18

3.8 Lakemba

Lakemba is approximately 16km from Sydney's CBD falling under the City of Canterbury-Bankstown local government area.

Lakemba had 14590 residents in 2011 and provided 2565 jobs (according to the 2011 census). A total of 41% of jobs are in education, health care and public services, while 27% are in retail and hospitality. Lakemba Station is at the centre of the precinct as shown in **Figure 3.20** overleaf.

3.8.1 Modes of Travel

Of 446 surveyed passengers using Lakemba Station, the majority of people (73%) walked to the station (TfNSW, 2014). The remaining passengers connect to the station by bike or bus, with one quarter travelling by car, either to be dropped off (10%) or parking around the station (15%). Travel modes are shown in **Figure 3.19**.

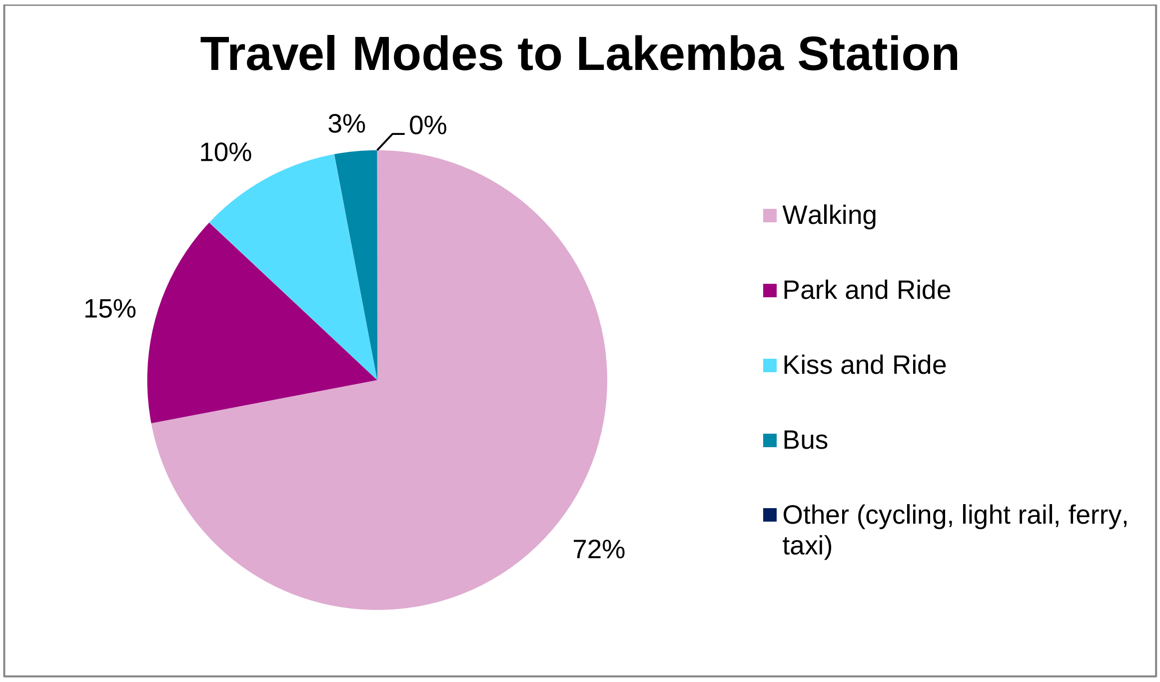


Figure 3.19 Travel modes to the station- Lakemba (TfNSW, 2014)

3.8.2 Walking

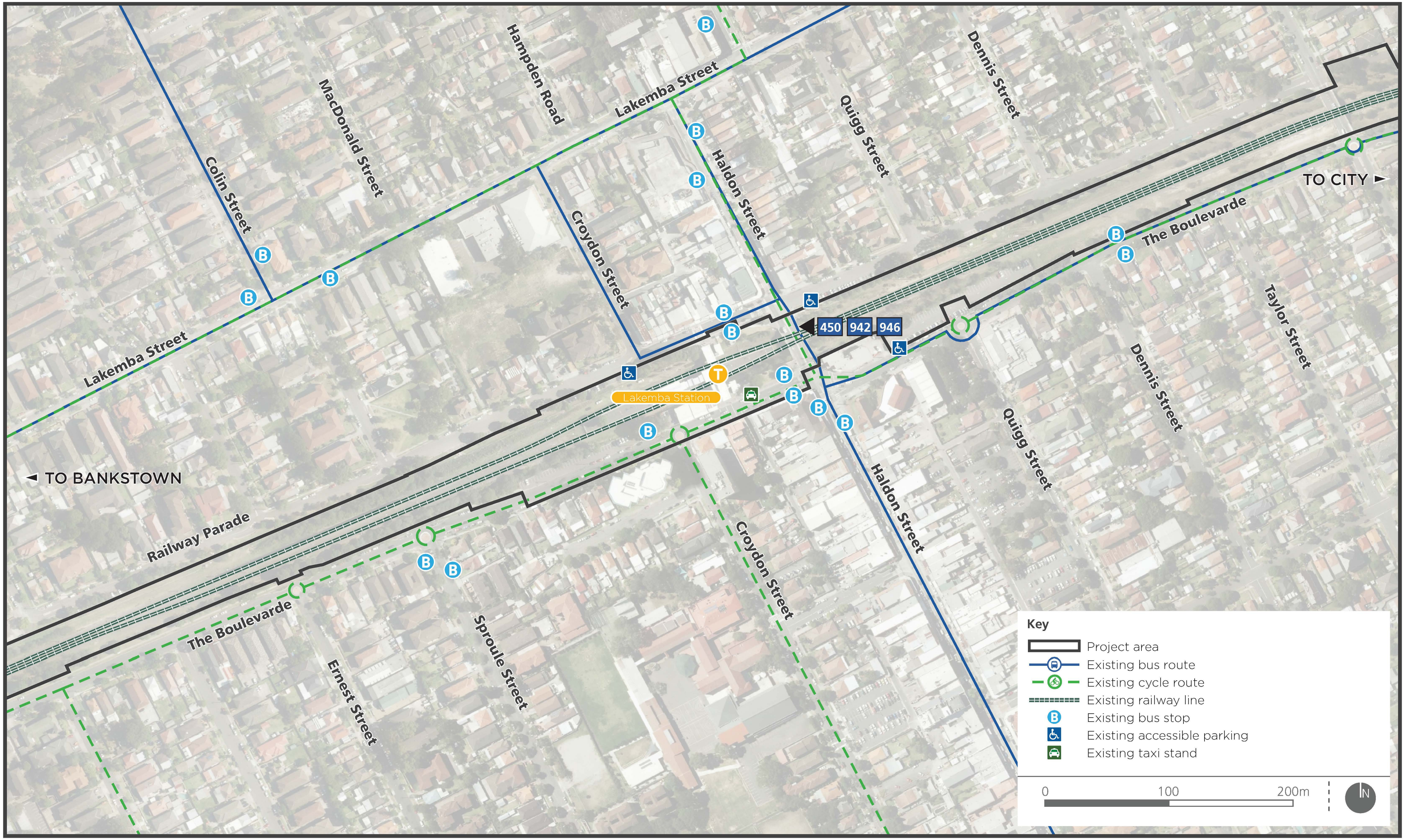
There is a good walking catchment in the Lakemba precinct, with linear intersecting primary roads and perpendicular secondary streets in a predominantly residential area (NSW Govt. 2015), resulting in a high proportion of rail users walking to the station. The primary and secondary roads have footpaths on either side of the road to cater for pedestrians.

The centre of Lakemba precinct (Haldon Street) has low vehicle speeds and narrow carriageways which make it an attractive area for pedestrians as reflected in the high modal share for walking in.

3.8.3 Cycling

Lakemba does not have any off-street cycleways in the precinct; however there are some roads which have on road facilities as illustrated in **Figure 3.20**. These roads include Lakemba Street, Haldon Street, and Wangee Street (RMS NSW Gov 2016).

Currently there are provisions for bike parking on the northern side of The Boulevarde and the southern side of Railway Parade. The types of bike parking are outlined in **Table 3.35**.



Station location, railway lines, cycle routes and existing bus routes in the Lakemba area

FIGURE 3.20

Table 3.35 Lakemba Bike Facilities

Location	Type of Parking	Bike Parking Supply
The Boulevarde	Multi bike rack	4 spaces
Railway Parade	Multi bike rack	4 spaces

The demand is for eight bike spaces in total across the two locations meaning the supply matches the current demand.

3.8.4 Bus

Lakemba has relatively good bus access with three services travelling through the precinct, as shown in **Figure 3.20.** Frequent services are provided to Roselands, Greenacre, Bankstown, Hurstville, Burwood and Strathfield.

A bus stop on Railway Parade immediately north of the Lakemba Station services the 942 northbound route providing direct access to Lakemba Station. Bus passengers interchanging with Lakemba Station do not need to make any road crossings to access the station. This distance from the bus stop is approximately 20m to the station entry. Bus passengers travelling south on the 942 service use the bus stop on the northern side of Railway Parade. They cross one pedestrian crossing in order to interchange with the station which is approximately 40m to the station entry.

There is also another bus stop on Haldon Street providing service to bus passengers travelling north on the 450 and 946 buses wanting to interchange with the train station. They use signalised pedestrian crossing on The Boulevarde in order to get to the station. This is approximately 110m to the station entry. Bus passengers travelling south on the 450 and 946 services use the bus stop on the eastern side of Haldon Street. They use the signalised crossing at the intersection of Haldon Street and The Boulevarde and the signalised pedestrian crossing on The Boulevarde in order to get to the station. This is approximately 130m to the station entry.

The 2016 survey of 446 people found that only 3% of rail passengers used the bus to travel to the station.

The bus frequency is shown in **Table 3.36**.

Table 3.36 Bus frequency- Lakemba Station (Sydney Buses 2016)

Route Number	Weekday	Weekday	Weekend
	Frequency (Peak)	Frequency (Off peak)	Frequency
450	Approx. 15 mins	Unknown	Unknown
942	Approx. 30 mins	Unknown	Unknown
946	Approx. 30 mins	Unknown	Unknown

3.8.5 Road Network

The existing road network in the Lakemba precinct contains a number of State, Regional and Local roads, as described below.

State

- Punchbowl Road
- Canterbury Road.

Regional

- Lakemba Street.

Local

- Moreton Street
- The Boulevarde
- Wangee Road
- Haldon Street
- Sproule Street
- Croydon Street
- Railway Parade
- Colin Street.

3.8.6 Traffic data

Traffic turning counts and queue length surveys were undertaken during three separate surveys between April and December 2016 to provide data for this assessment.

The existing approach traffic volumes for the intersections assessed are provided in **Table 3.37**.

All intersections surrounding Lakemba Station currently operate at a level of service C or above. Refer to Chapter 5 for details of intersection performance and a map showing the location of the intersections modelled.

Table 3.37 Lakemba Existing Traffic Volumes

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
B.07 The Boulevarde / Haldon Street	Haldon Street	North	658	675
	The Boulevarde	East	250	393
	Haldon Street	South	404	366
	The Boulevarde	West	554	454
H.07 Lakemba Street / Wangee Road	Wangee Road	North	397	490
	Lakemba Street	East	304	513
	Lakemba Street	West	801	648
H.08 Haldon Street / Railway Parade	Haldon Street	North	520	541
	Railway Parade	East	77	128
	Haldon Street	South	556	585
	Railway Parade	West	113	127
H.09 Lakemba Street / Haldon Street	Lakemba Street	East	592	840
	Haldon Street	South	428	406
	Lakemba Street	West	702	602
The Boulevarde Ped Crossing	The Boulevarde	East	407	548
	The Boulevarde	West	554	454
H.21 Canterbury Road / Haldon Street	Haldon Street	North	290	331
	Canterbury Road	East	806	1347
	Canterbury Road	West	1655	1220

Further details of these counts are provided in **Appendix A**.

3.8.7 Commuter Parking

Lakemba Station has approximately 1500 parking spaces in the area surrounding the station with 138 dedicated commuter spaces, as shown in **Table 3.38** below.

Table 3.39 below outlines the total capacity and level of utilisation of the parking spaces available to commuters.

The 138 dedicated commuter spaces at or near Lakemba Station cater for the approximately 15% of the users of the station who choose to park and ride (Arup 2015).

There is one kiss and ride parking space and three taxi parking bays at Lakemba Station.

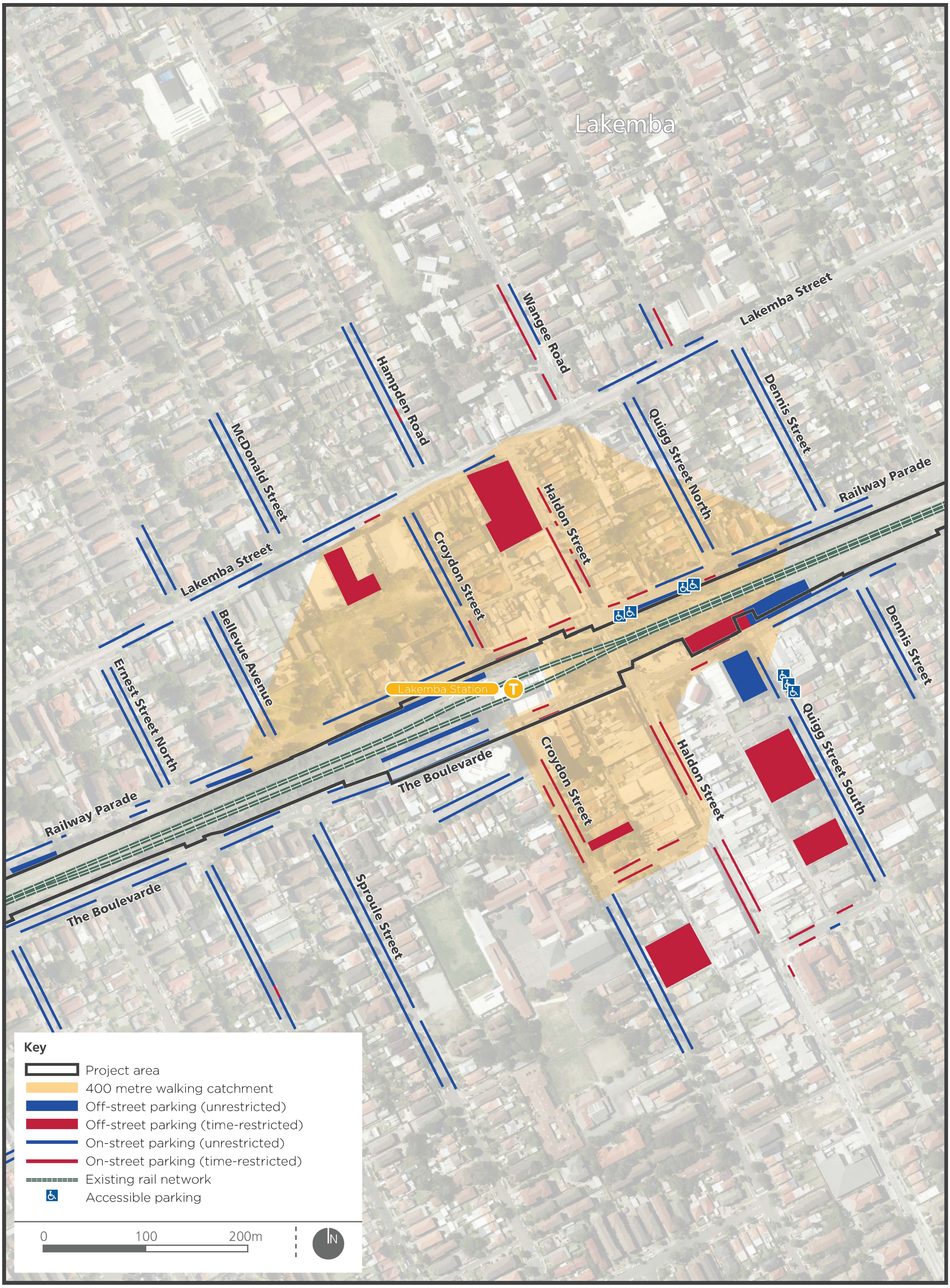
Table 3.38 Lakemba Station Parking Summary

Dedicated Commuter spaces	Kiss and Ride spaces	Total Parking Capacity
138	1	1498

Table 3.39 Lakemba Station Parking Capacity and Utilisation within 400m Radius

	On-street		Off-street	
Time Restriction	Capacity	Utilisation (%)	Capacity	Utilisation (%)
Unrestricted	775	86%	190	100%
Time restricted	186	83%	347	77%
Overall	**961**	**85%**	**537**	**86%**

Figure 3.21 shows the type and location of parking spaces available in the vicinity of Lakemba Station.



Parking restrictions around Lakemba station

FIGURE 3.21

3.9 Wiley Park

Wiley Park is approximately 15km from Sydney's CBD, falling within the City of Canterbury-Bankstown local government area.

Wiley Park had 9081 residents in 2011 and provided 786 jobs (according to the 2011 census). In all 40% of jobs were in retail and hospitality and 39% were in education, health care and public services.

King Georges Road in a north-south direction and the T3 Bankstown Line in an east-west direction limits connectivity in the area as shown on **Figure 3.23** overleaf.

3.9.1 Modes of Travel

Of the 245 surveyed passengers using Wiley Park Station, the majority of people (90%) walked to the station (TfNSW, 2014). No bus use was identified for passengers travelling to this station. The remaining passengers travelled to the station by car, either to be dropped off (4%) or parking around the station (6%). Travel modes are shown in **Figure 3.22**.

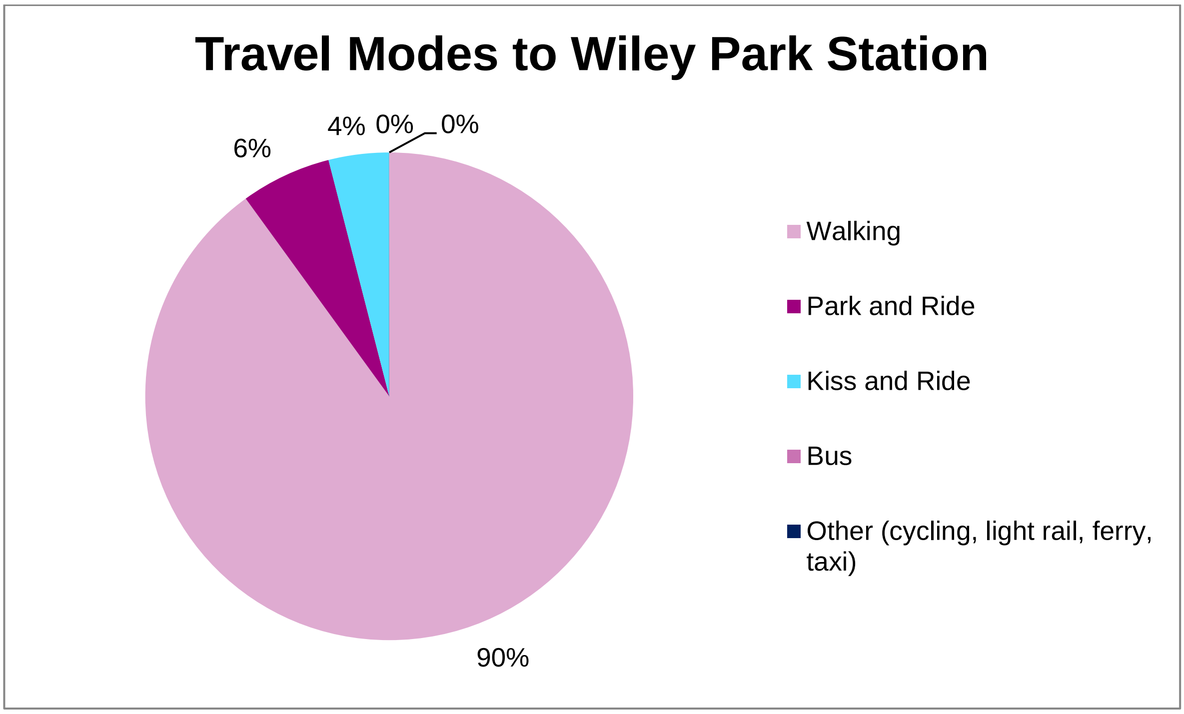


Figure 3.22 Travel modes to the station - Wiley Park (TfNSW, 2014)

3.9.2 Walking

There is a good walking catchment in the Wiley Park precinct, with linear, intersecting primary roads and perpendicular secondary streets in a predominantly residential area (NSW Govt. 2015), resulting in a high proportion of rail users walking to the station. The primary and secondary roads have footpaths on either side.

King Georges Road runs in a north-south direction and is a six lane Regional road with heavy traffic flows. This limits movements from one side of the precinct to the other. The railway line acts as a barrier in an east-west direction also limiting pedestrian connectivity in the area.

3.9.3 Cycling

As shown in **Figure 3.23**, only Urunga Parade and Lakemba Street provide specific infrastructure to support cyclists accessing Wiley Park Station (RMS NSW Gov 2016). Bike friendly roads are also depicted in **Figure 3.23**.

Currently there are four multi bike racks which supply four bike spaces on King Georges Road outside the station. There is a demand of six bike spaces meaning there is a shortfall in supply.

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Station location, railway lines, cycle routes and existing bus routes in the Wiley Park area

FIGURE 3.23

3.9.4 Bus

Wiley Park is serviced by two local bus routes (bus 942 and bus 487) which provide access to Campsie, Roselands and Riverwood. Although bus route 942 travels directly past Wiley Park Station and there is a bus stop near the station on King Georges Road, a 2015 survey found that no commuters used the bus to connect to the station.

Figure 3.23 shows the path of bus route 942 as it travels through the centre of the precinct. Bus 487 travels along the border of the precinct on Canterbury Road.

A bus stop on King George Road south of the Wiley Park station services the 942 northbound route providing access to Wiley Park station. Bus passengers interchanging with Wiley Park station use the signalised crossing at the intersection of The Boulevarde and King Georges Road in order to get to the station. This is approximately 80m to the station entry.

There is also another bus stop on King Georges Road providing service to bus passengers travelling south on the 942 route wanting to interchange with the train station. They use the signalised pedestrian crossing on King Georges Road in order to get to the station. This is approximately 150m to the station entry.

The bus frequency is shown in **Table 3.40**.

Table 3.40 Bus frequency - Wiley Park Station (Sydney Buses 2016)

Route Number	Weekday	Weekday	Weekend
	Frequency (Peak)	Frequency (Off peak)	Frequency
487	Approx. 30 mins	30 mins	Approx. 35 mins
942	Approx. 30 mins	Approx. 30 mins	Approx. 30 mins

3.9.5 Road Network

The existing road network in the Wiley Park precinct contains a number of State, Regional and Local roads, as described below.

State

- King Georges Road
- Canterbury Road
- Punchbowl Road.

Regional

- Lakemba Street.

Local

- The Boulevarde
- Hillcrest Street
- Alice Street
- Railway Parade
- Cornelia Street
- Urunga Parade.

3.9.6 Traffic data

Traffic turning counts and queue length surveys were undertaken during three separate surveys between April and December 2016 to provide data for this this assessment.

The existing approach traffic volumes for the intersections assessed are provided in **Table 3.41**.

All intersections surrounding Wiley Park Station currently operate at a level of service C. Refer to Chapter 5 for details of intersection performance and a map showing the location of the intersections modelled.

Table 3.41 Wiley Park Existing Traffic Volumes

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
H.06 King Georges Road / Lakemba Street	King Georges Road	North	2170	2335
	Lakemba Street	East	275	515
	King Georges Road	South	2675	2215
	Lakemba Street	West	326	191
B.06 King Georges Road / The Boulevarde	King Georges Road	North	2285	2961
	The Boulevarde	East	341	533
	King Georges Road	South	2573	2069
	The Boulevarde	West	411	377

Further details of these counts are provided in **Appendix A**.

3.9.7 Commuter Parking

Wiley Park Station has approximately 750 parking spaces in the area surrounding the station with no dedicated commuter spaces, as shown in **Table 3.42**. No kiss and ride or taxi parking bays are located at Wiley Park Station.

Table 3.43 below outlines the total capacity and utilisation of the parking spaces available to commuters.

Despite having no dedicated commuter parking spaces, approximately 6% of the users of the station choose to park and ride (Arup 2015). It was observed that The Boulevarde had high volumes of parked vehicles during standard work hours. It is therefore assumed that commuters are using these streets for on-street informal park and ride parking.

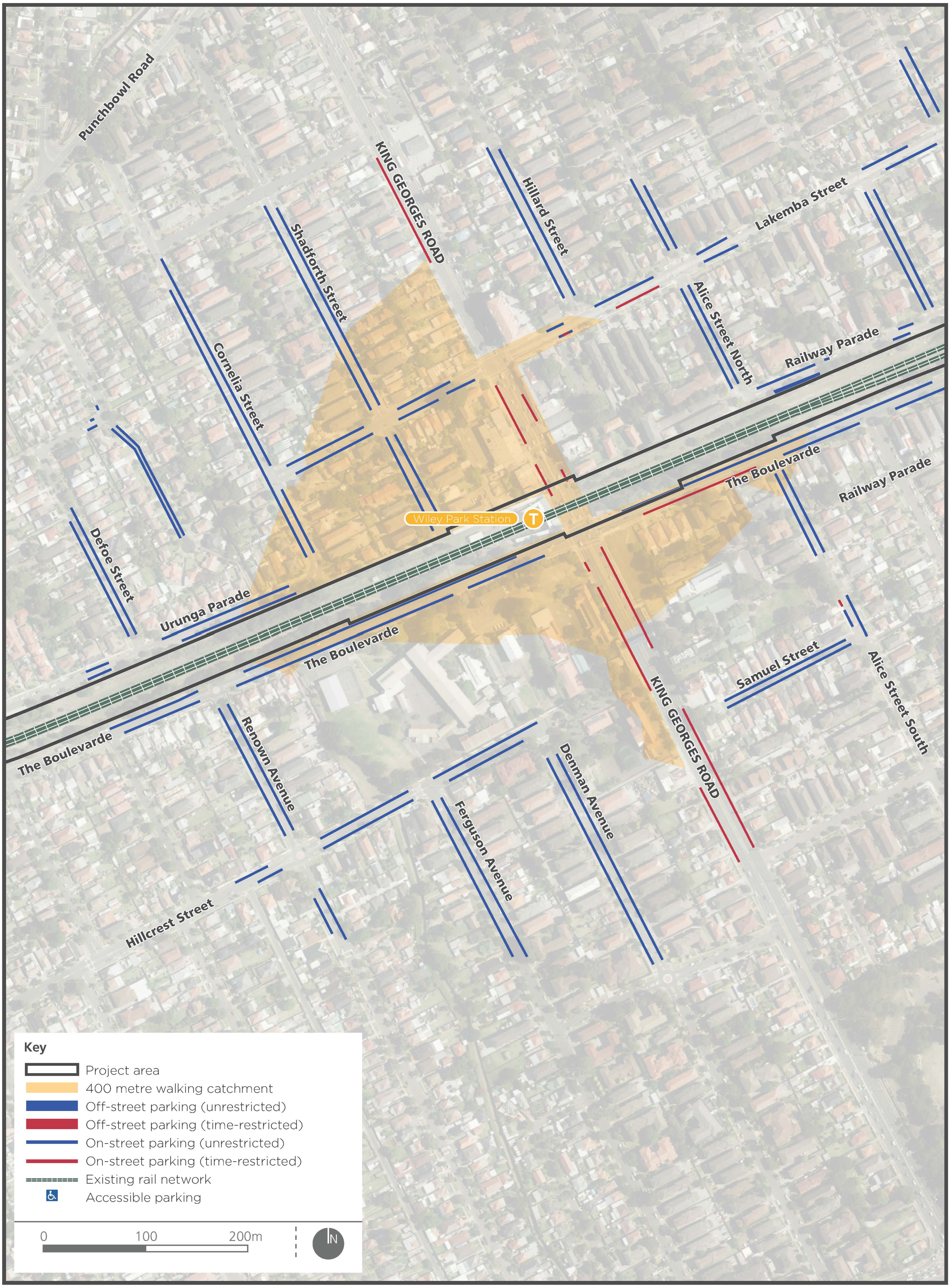
Table 3.42 Wiley Park Station Parking Summary

Dedicated Commuter spaces	Kiss and Ride spaces	Total Parking Capacity
0	0	746

Table 3.43 Wiley Park Station Parking Capacity and Utilisation within 400m Radius

	On-street		Off-street	
Time Restriction	Capacity	Utilisation (%)	Capacity	Utilisation (%)
Unrestricted	693	64%	25	60%
Time restricted	28	32%	-	-
Overall	**721**	**63%**	**25**	**60%**

Figure 3.24 shows the type and location of parking spaces available in the vicinity of Wiley Park Station.



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Parking Restrictions around Wiley Park station

FIGURE 3.24

3.10 Punchbowl

Punchbowl is approximately 16.5km from Sydney's CBD. The precinct is within the City of Canterbury-Bankstown Council local government area.

Punchbowl had 12,476 residents in 2011 and provided 1668 jobs (according to the 2011 census) with almost half the jobs in education, health care and public services (46%), while over a quarter (26%) are in retail and hospitality.

Punchbowl Road and the T3 Bankstown Line limit north-south connectivity as shown in **Figure 3.26** overleaf.

3.10.1 Modes of Travel

Of the 350 surveyed passengers using Punchbowl Station, only half of the people walked to the station (TfNSW, 2014) which is less than the majority of other stations. A small percentage used the bus to connect to the railway station. The remaining passengers connect to the station by bike, or are part of the much higher proportion being dropped off at kiss and ride facility or parking around the station. Travel modes are shown in **Figure 3.25**.

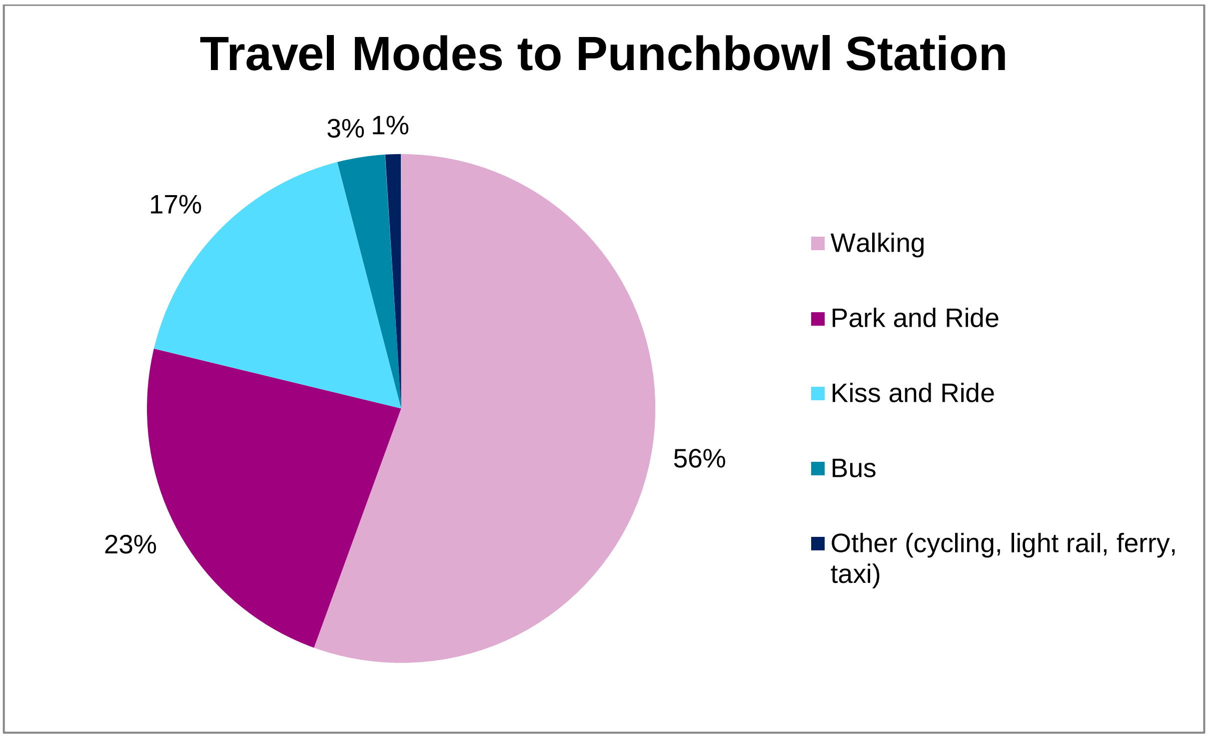

Figure 3.25 Travel modes to the station - Punchbowl (TfNSW, 2014)

3.10.2 Cycling

There are no off road cycle lanes in Punchbowl. This limits cyclist activity in the precinct (NSW Govt. 2015).

Urunga Parade is the only road in the area which has on road cycle lanes/road shoulders/mixed traffic lanes which are suitable for less experienced riders as shown in **Figure 3.26** (RMS NSW Gov 2016). The remaining roads in the area are not considered suitable for confident or experienced riders.

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Station location, railway lines, cycle routes and existing bus routes in the Punchbowl area

FIGURE 3.26

Currently there are provisions for bike spaces on the northern side of The Boulevarde and the southern side of Punchbowl Road. The types of bike parking are outlined in **Table 3.44**.

Table 3.44 Punchbowl Bike Facilities

Location	Type of Parking	Bike Parking Supply
The Boulevarde	Multi bike rack	6 spaces
Punchbowl Road	Multi bike rack	6 spaces

The demand is for three bike spaces in total across the two locations meaning that the supply is sufficient to accommodate the demand.

3.10.3 Bus

Punchbowl is serviced by five bus routes that travel through the precinct. These routes connect Punchbowl to Bankstown, Roselands, Riverwood and Hurstville.

Bus stops on Punchbowl Road and The Boulevarde provide access to the station. A bus stop on Punchbowl Road north of the Punchbowl station provides service to bus passengers travelling north on the 940 service wanting to interchange with the train station. They use the signalised crossing at the intersection of Punchbowl Road and The Boulevarde. This is approximately 180m to the station entry. Bus passengers travelling south on the 940 service use the bus stop on Punchbowl Road north of the train station. They do not need to make any road crossing to access the station and need to walk approximately 190m to the station entry.

There is also another bus stop on The Boulevarde providing service to bus passengers travelling north on the 941, 944 and S14 services. They would use the signalised crossing at the intersection of The Boulevarde and Arthur Street in order to get to the station. This is approximately 70m to the station entry. Bus passengers travelling south on the 941, 944 and S14 services use the bus stop on The Boulevarde immediately south of the Punchbowl Station, they have direct access to the station. Bus passengers interchanging with Punchbowl Station do not need to make any road crossings to access the station. This distance from the bus stop is approximately 40m to the station entry.

The 2016 survey of 350 people found that only 3% of rail passengers used the bus to travel to the train station.

Figure 3.26 shows the path of four bus routes that travel through the centre of the precinct. Bus 487 travels along the border of the precinct on Canterbury Road and bus S14 operates outside of peak hours.

The bus frequency is shown in **Table 3.45**.

Table 3.45 Bus frequency - Punchbowl Station (Sydney Buses 2016)

Route Number	Weekday	Weekday	Weekend
	Frequency (Peak)	Frequency (Off peak)	Frequency
487	Approx. 30 mins	30 mins	Approx. 35 mins
940	30 mins	30 mins	60 mins
941	30 mins	30 mins	30 mins – 60 mins
944	Approx. 20 mins	30 mins	60 mins
S14	Once per day	None	None

3.10.4 Road Network

The existing road network in the Punchbowl precinct contains a number of State, Regional and Local roads, as described below.

State

- Punchbowl Road
- Canterbury Road.

Regional

- Wattle Street.

Local

- South Terrace
- Rossmore Avenue
- The Boulevarde
- Kelly Street
- Arthur Street
- Urunga Parade
- Highclere Avenue.

3.10.5 Traffic data

Traffic turning counts and queue length surveys were undertaken during three separate surveys between April and December 2016 to provide data for this assessment.

The existing approach traffic volumes for the intersections assessed are provided in **Table 3.46**.

All intersections surrounding Punchbowl Station currently operate at a level of service C or above. Refer to Chapter 5 for details of intersection performance and a map showing the location of the intersections modelled.

Table 3.46 Punchbowl Existing Traffic Volumes

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
B.04 Punchbowl Road / South Terrace	Punchbowl Road	Northeast	769	1138
	Punchbowl Road	Southwest	797	502
	South Terrace	Northwest	621	684
B.05 Punchbowl Road / The Boulevarde	Punchbowl Road	Northeast	692	830
	The Boulevarde	Southeast	584	765
	Punchbowl Road	Southwest	1291	1001
H.05 Punchbowl Road / Rossmore Road	Punchbowl Road	Northeast	1012	1271
	Rossmore Road	Southeast	0 – Rossmore Road is a one way road	0 – Rossmore Road is a one way road
	Punchbowl Road	Southwest	1229	971
H.22 The Boulevarde / Arthur Street	The Boulevarde	East	551	676
	Arthur Street	South	277	225
	The Boulevarde	West	421	496

Further details of these counts are provided in **Appendix A**.

3.10.6 Commuter Parking

Punchbowl Station has approximately 1100 parking spaces in the area surrounding the station with dedicated 137 commuter spaces.

Table 3.48 below outlines the total capacity and utilisation of the parking spaces available to commuters.

As shown in **Table 3.47,** there are currently 137 dedicated commuter spaces at or near Punchbowl Station to cater for the approximately 23% of users of the station choosing to park and ride (Arup 2015).

There are no kiss and ride parking spaces. The precinct has two taxi parking bays located in proximity to Punchbowl Station.

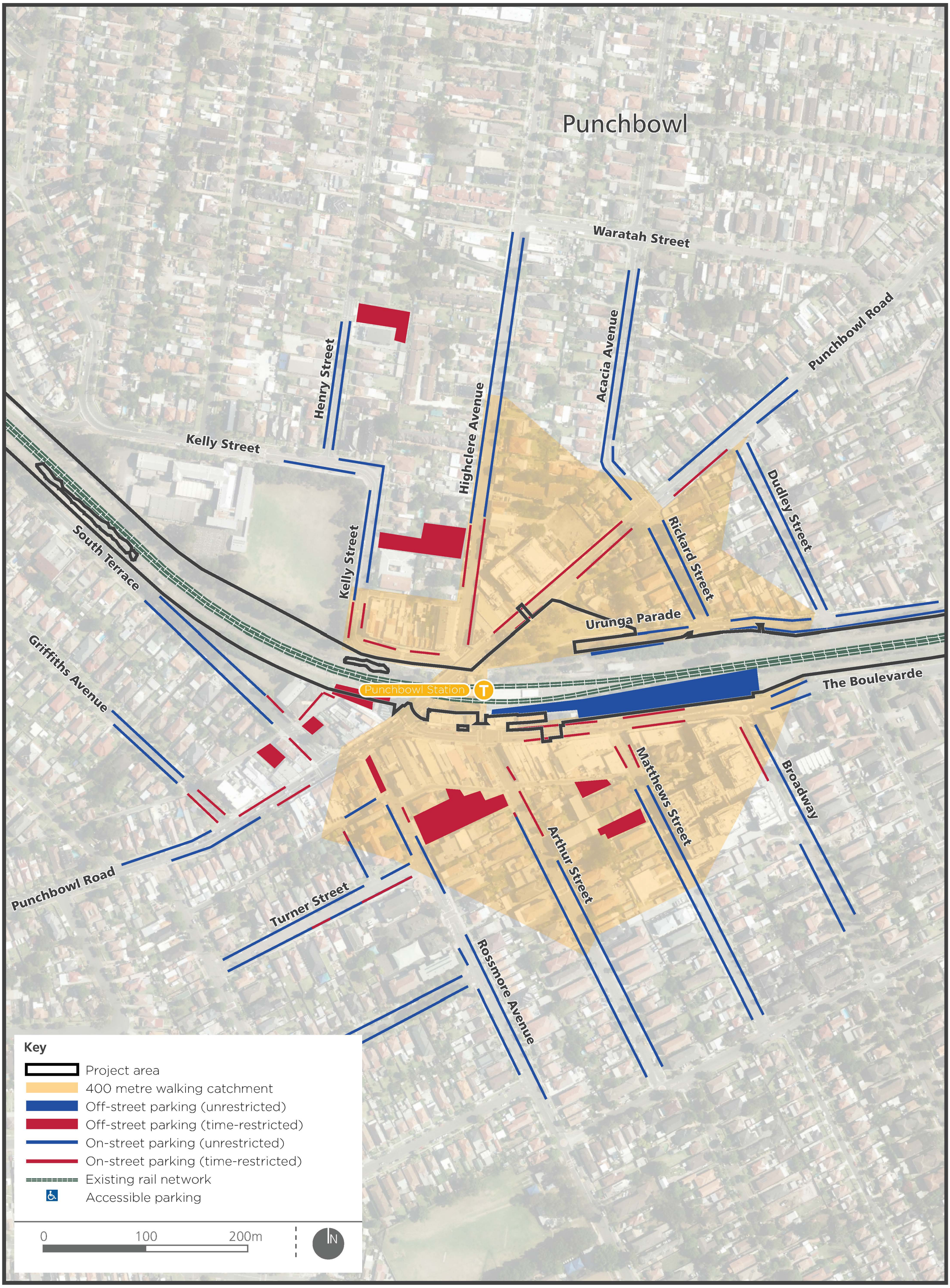
Table 3.47 Punchbowl Station Parking Summary

Dedicated Commuter spaces	Kiss and Ride spaces	Total Parking Capacity
137	0	1123

Table 3.48 Punchbowl Station Parking Capacity and Utilisation within 400m Radius

	On-street		Off-street	
Time Restriction	Capacity	Utilisation (%)	Capacity	Utilisation (%)
Unrestricted	626	79%	197	100%
Time restricted	212	78%	88	100%
Overall	**838**	**79%**	**285**	**100%**

Figure 3.27 shows the type and location of parking spaces available in the vicinity of Punchbowl Station.



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Parking Restrictions around Punchbowl station

FIGURE 3.27

3.11 Bankstown

Bankstown Station is approximately 17km from Sydney's CBD, falling under the City of Canterbury-Bankstown Council local government area.

Bankstown had approximately 17,957 residents in 2011 and provided 10,090 jobs (according to the 2011 census). The majority of jobs are in education, healthcare and public services (40%).

Bankstown Station is at the centre of the precinct as shown on **Figure 3.29** overleaf.

3.11.1 Modes of Travel

Bankstown has the lowest sustainable travel mode share of all stations between Bankstown and Sydenham. Of the 608 surveyed passengers using Bankstown Station, around half of the people chose to walk to the station (TfNSW, 2014). Around one third of passengers travel to the station by car, either to be dropped off (19%), or parking around the station (15%). The remaining passengers travel to the station by bike or bus. Travel modes are shown in **Figure 3.28**.

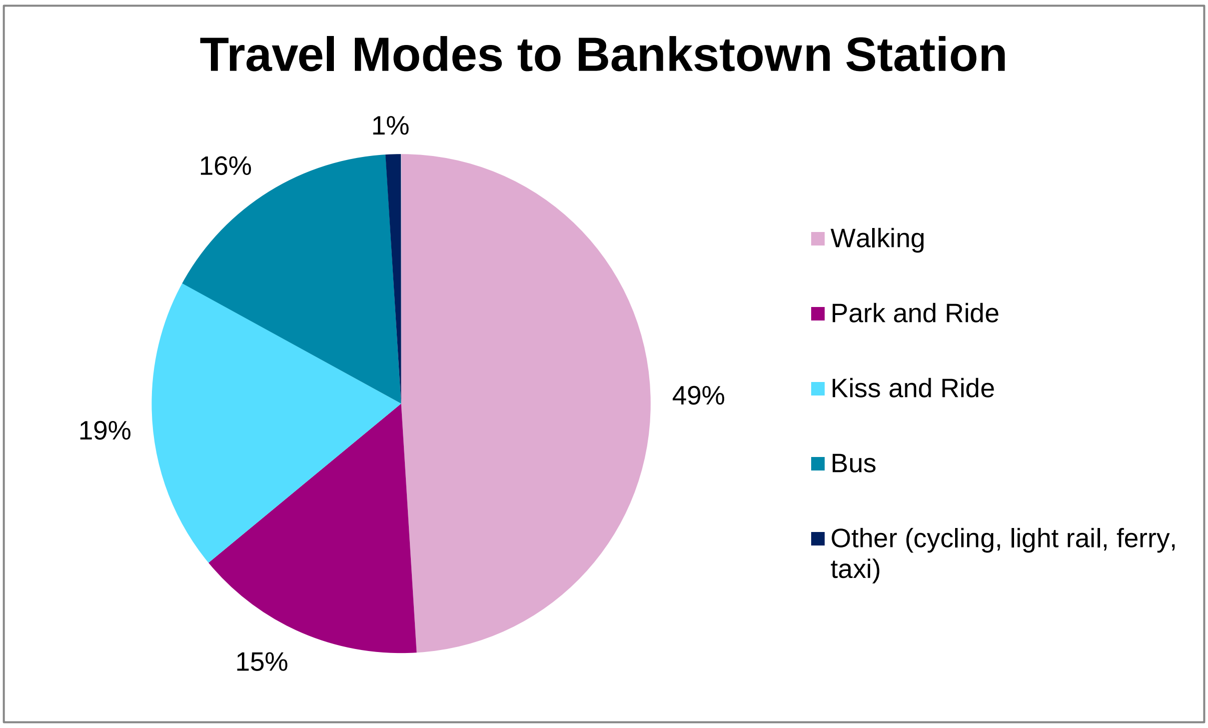


Figure 3.28 Travel modes to the station- Bankstown (TfNSW, 2014)

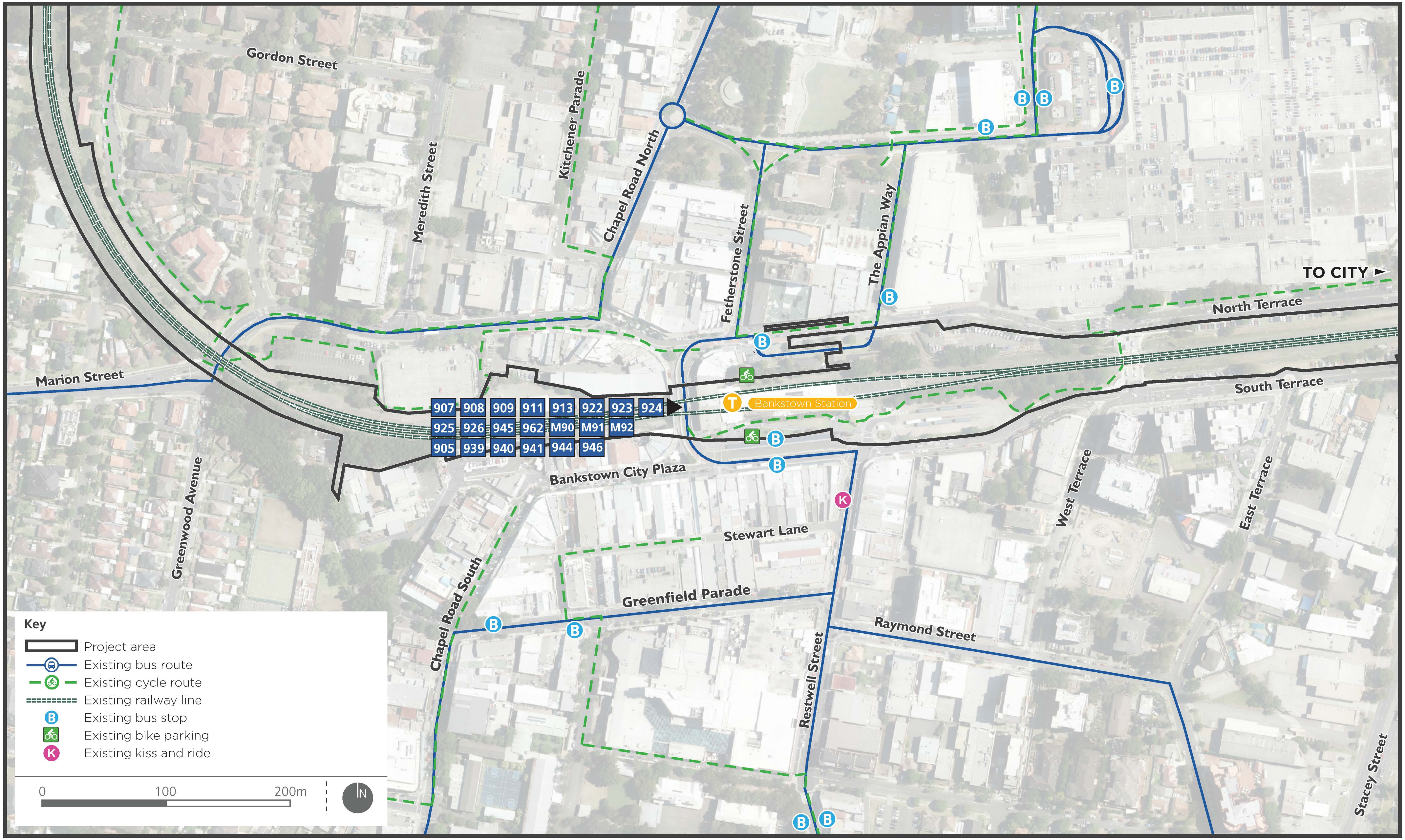
3.11.2 Walking

The walking catchment in Bankstown is mostly limited to the central area. This is a result of the railway line, major roads and large street blocks (NSW Govt. 2015). Most of the roads in the precinct have footpaths on either side.

3.11.3 Cycling

Bankstown has a number of cycleways in the precinct as shown on **Figure 3.29**. The Salt Pan Creek Cycleway connects from the south to Bankstown Memorial Park. There is also a cycleway from East Hills railway line towards Bankstown Station (NSW Govt. 2015).

There are a number of roads in the area which have on road cycle lanes/road shoulders/mixed traffic lanes which are suitable for less experienced riders (RMS NSW Gov 2016) and provide a direct connection to Bankstown Station.



Station location, railway lines, cycle routes and existing bus routes in the Bankstown area

FIGURE 3.29

Currently there is provision for bike spaces at the Southern Terrace bus interchange, Bankstown City Plaza and Northern Terrace. The types of bike parking are outlined in **Table 3.49**.

Table 3.49 Bankstown Bike Facilities

Location	Type of Parking	Bike Parking Supply
Southern Terrace Bus Interchange	Bike Lockers	2 spaces
Bankstown City Plaza (under bus shelter)	Bespoke bike rack	6 spaces
Bankstown City Plaza (40m from station entry)	Multi bike rack	12 spaces
North Terrace	Multi bike rack	12 spaces

The demand is for 13 bike spaces in total across the four locations meaning that the supply is sufficient to accommodate the demand. Despite having sufficient supply overall, the bike spaces at Bankstown City Plaza (under bus shelter) are operating at capacity, with two bikes parking on an adjacent pole.

3.11.4 Bus

Bankstown is serviced by a large number of buses as it is the main hub for buses serving the station on the Bankstown Line, as well as providing key regional connectivity. Bankstown is a key employment, administrative and retail centre due to its location on a well-connected public transport network. Bus routes connect Bankstown to Parramatta, Lidcombe, Burwood, Liverpool, Fairfield, Hurstville and Sutherland. The bus routes are shown in **Figure 3.29**.

The main bus hub is to the south of the train station on Bankstown City Plaza with seven bus stands within approximately 160m of each other, and to the north of the train station on North Terrace with one bus stand. The bus hub is serviced by five different bus routes.

Three bus stops in Bankstown City Plaza (Bankstown Station Stand A, B and C) to the south of the station service the 905, 907, 908, 909, 911, 913, 922, 923, 924, 925, 926, 939, 940, 941, 944, 945, 946, 962, M90, M91,M92 and M30 for southbound journeys providing direct access to Bankstown Station. Bus passengers interchanging with Bankstown Station do not need to make any road crossings to access the station. The distance from Stand C is approximately 20m, 40m from Stand B and 80m from Stand A.

Three bus stops in Bankstown City Plaza (Bankstown Station Stand D, E and F) to the south of the station service the 905, 907, 908, 909, 911, 913, 922, 923, 924, 925, 926, 945, 962, M90, M91, M92 and M30 for northbound journeys providing direct access to Sydenham Station. Bus passengers interchanging with Sydenham Station use the signalised pedestrian crossing to access the station. The distance from Stand D is approximately 50m, 80m from Stand E and 110m from Stand F.

There is also another bus stop to the north of the station on North Terrace providing service to bus passengers travelling north on the 939, 940, 941, 944 and 946 services. They have direct access to Bankstown Station. Bus passengers interchanging with Bankstown Station do not need to make any road crossings to access the station. The distance from the bus stop is approximately 50m to the station entry.

The bus frequency is shown in **Table 3.50**.

Table 3.50 Bus frequency - Bankstown Station (Sydney Buses 2016)

Route Number	Weekday	Weekday	Weekend
	Frequency (Peak)	Frequency (Off peak)	Frequency
905	15mins	30 mins	30mins
907	20 mins	30 mins	30 mins
908	Approx. 60 mins	Approx. 60 mins	Approx. 60 mins
909	Approx. 30 mins	Approx. 30 mins	30 mins – 60 mins
911	Approx. 30 mins	Approx. 30 mins	60 mins
913	Approx. 60 mins	Approx. 60 mins	None
922	60 mins	60 mins	60 mins
923	Approx. 30 mins	Approx. 30 mins	Approx. 60 mins
924	Approx. 30 mins	Approx. 30 mins	Approx. 60 mins
925	Approx. 30 mins	60 mins	60 mins
926	Approx. 35 mins	60 mins	60 mins
939	30 mins	30 mins	60 mins
940	30 mins	30 mins	60 mins
941	30 mins	30 mins	30 mins
944	30 mins	30 mins	60 mins
945	Approx. 15 mins	30 mins	30 mins – 60 mins
946	30 mins	30mins	60 mins
962	Approx. 30 mins	Approx. 30 mins	30 mins – 60 mins
M90	10 mins	Approx. 15 mins	20 mins
M91	10 mins	Approx. 20 mins	Approx. 20 mins
M92	10 mins	Approx. 15 mins	Approx. 20 mins

3.11.5 Road Network

The existing road network in the Bankstown precinct contains a number of State, Regional and Local roads as described below.

State

- Stacey Street

Regional

- Rickard Road
- Greenwood Avenue
- Wattle Street
- Marion Street (west end only)
- Meredith Street
- Chapel Road (north of Rickard Road).

Local

- North Terrace
- South Terrace
- Brandon Avenue
- Greenfield Parade
- Bankstown City Plaza
- Stewart Lane
- Restwell Street
- Raymond Street
- East Terrace
- Fetherstone Street
- The Appian Way.

3.11.6 Traffic data

Traffic turning counts and queue length surveys were undertaken during three separate surveys between April and December 2016 to provide data for this assessment.

The existing approach traffic volumes for the intersections assessed are provided in **Table 3.51**.

All modelled intersections surrounding Bankstown Station currently operate at a level of service C or above. Refer to Chapter 5 for details of intersection performance and a map showing the location of the intersections modelled.

Table 3.51 Bankstown Existing Traffic Volumes

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
B.01 South Terrace / Restwell Street	Local Access Road	North	20	24
	South Terrace	East	0 – South Terrace is one way	0 – South Terrace is one way
	Restwell Street	South	1082	909
	Bankstown City Plaza	West	57	58
B.02 Restwell Street / Raymond Street	Restwell Street	North	35	39
	Raymond Street	East	692	852
	Restwell Street	South	469	386
	Greenfield Parade	West	163	1
B.03 South Terrace / West Terrace	Underpass	North	651	873
	South Terrace	East	693	610
	West Terrace	South	0 – West Terrace is one way	0 – West Terrace is one way
	South Terrace	West	909	784

Intersection	Road	Approach Arm	AM Peak (Veh per hour)	PM Peak (Veh per hour)
H.01 Meredith Street / Marion Street	Meredith Street	North	497	968
	Marion Street	East	449	626
	Meredith Street	South	30	153
	Marion Street	West	1643	989
H.03 Stacey Street / Wattle Street	Stacey Street	North	1889	2820
	Wattle Street	East	422	761
	Stacey Street	South	2152	1892
	Car Park	West	43	291
H.04 Stanley Street / Stacey Street	Stacey Street	North	1943	3121
	Salvia Avenue	East	228	197
	Stacey Street	South	1922	1861
	Stanley Street	West	267	258
H.30 The Appian Way / North Terrace	The Appian Way	North	648	903
	North Terrace	East	527	437
	North Terrace	West	0 – North Terrace is one way	0 – North Terrace is one way
H.31 Marion Street / Oxford Avenue	Marion Street	East	762	1290
	Oxford Avenue	South	362	383
	Marion Street	West	1524	917
H.32 Marion Street / Greenwood Avenue	Marion Street	North	769	1419
	Olympic Parade	East	404	620
	Greenwood Avenue	South	525	465
	Marion Street	West	1641	975

Further details of these counts are provided in **Appendix A**.

3.11.7 Commuter Parking

Bankstown Station has approximately 1700 parking spaces in the area surrounding the station with 147 dedicated commuter spaces. **Table 3.53** below outlines the total capacity and utilisation of the parking spaces available to commuters.

As shown in **Table 3.52** there are currently 147 dedicated commuter spaces at or near Bankstown Station to cater for the (approximately) 15% of the users of the station choosing to park and ride (Arup 2015). Noting from **Table 3.4** that some 1500 passengers enter Bankstown Station in the hour from 7:15 to 8:15, this shows that the commuter parking spaces in the vicinity are only providing a small proportion of the total commuter demand. Whilst not explicitly recorded, it is likely that the park and ride commuters are walking more than 400m between parking and the station.

The precinct also has four kiss and ride parking spaces and ten taxi parking bays.

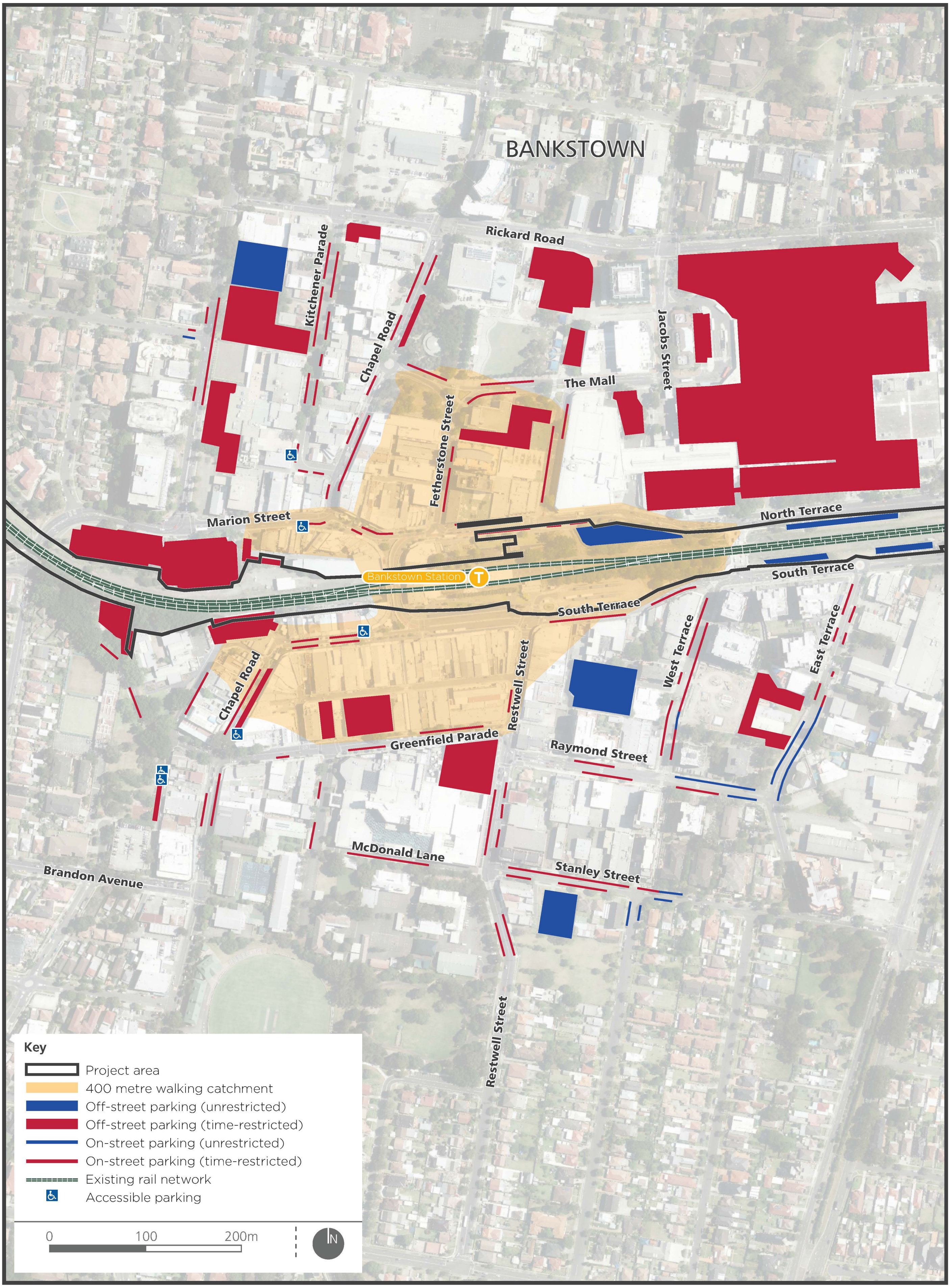
Table 3.52 Bankstown Station Parking Summary

Dedicated Commuter spaces	Kiss and Ride spaces	Total Parking Capacity
147	4	1696

Table 3.53 Bankstown Station Parking Capacity and Utilisation within 400m Radius

	On-street		Off-street	
Parking type	Capacity	Utilisation (%)	Capacity	Utilisation (%)
Unrestricted	58	98%	20	100%
Time restricted	530	93%	1088	100%
Overall	**588**	**93%**	**1108**	**100%**

Figure 3.30 overleaf shows the types and locations of parking spaces available near Bankstown Station.



Parking restrictions around Bankstown station

FIGURE 3.30

4.0 Construction Phase Assessment Methodology

4.1 Overview

The methodology for the assessment of the project construction impacts included:

- assessing the potential construction impacts on the road network
- consideration of pedestrian routes in close proximity to construction activities
- consideration of cycle and pedestrian movements on routes proposed for construction haulage
- consideration of route diversions for scheduled bus services
- reviewing existing peak period operating conditions for key intersections in the vicinity of the proposed worksite
- assessing the impacts on pedestrians, cyclists and road users resulting from diversions required during construction activities on bridges over the project area
- assessment of the impact of the replacement buses required during the possession periods of the construction program
- forecasting of construction period traffic flows and assessment of effects, including replacement buses and route diversions through intersection modelling and estimating future Degree of Saturation (DoS) and Level of Service (LoS)
- assessment of the effects to route and additional delays to road users
- potential impacts of construction works on pedestrian, cyclist and motorist safety, major special events, emergency vehicles and power supply routes
- cumulative assessment that considers approved construction projects adjacent to the project.

As such the assessment has considered the potential impacts of construction on all modes of transport within the vicinity of the project.

The assessment of traffic and transport impacts of the project once operational is presented in Chapter 8.

4.2 Construction Haulage Traffic

The construction haulage traffic impact assessed comprises of trucks, delivery vehicles and light vehicles for station compounds and the wider project worksite. This section sets out the anticipated construction haulage vehicle traffic generation arising from the planned construction activities along the project alignment and within the station compounds. The key assumptions regarding vehicle types, volumes operating hours, and routes are set out, with the assumed traffic generation feeding into the impact assessment section below.

4.2.1 Construction Vehicle Types

The anticipated construction haulage vehicle numbers are based on the following assumed truck types:

- single unit truck, 12.5 metres long for all project worksite entrances/gates and compounds
- light construction vehicles for all station compounds.

Whilst not within the current construction assumptions, the use of truck and dog combinations would reduce the total number of vehicles. Should these vehicles be proposed, additional swept path analysis would be required for the sites being served by these vehicle combinations.

Under the Heavy Vehicle National Law (NSW) a heavy vehicle is defined has having a gross vehicle mass of more than 4.5 tonnes. Within this Technical Paper, a light vehicle is classified as any vehicle equal to or less than 4.5 tonnes.

4.2.2 Construction Hours

Proposed construction hours are shown in **Table 4.1**. The majority of the construction activities would be carried out during the following hours (except during track possessions):

- Monday to Friday – 7am to 6pm
- Saturday – 8am to 1pm.

As the project is located within an active rail corridor, works outside of standard construction hours would be required where works cannot safely be undertaken without restrictions to train operations. These activities would take place during non-peak periods, and could include full closure of the rail operations known as 'possessions'. Construction activities to be carried out during the scheduled track possessions would occur over the entire 24 hour period.

The possession periods can be summarised as follows:

- **Standard possession -** possession on the line on weekends on four occasions over the year
- **Additional possession** – additional weekend possessions as required, over and above the standard periods
- **School holiday possessions** – planned during each **December and January** school holiday period, including public holidays between 2019 and 2024. Further **2 week school holiday possessions** in July each year
- **Final possession** – between 3 to 6 months possession at the end of the construction phase.

The indicative program of possessions (longer than the standard weekend possessions) is shown in **Figure 4.1**.

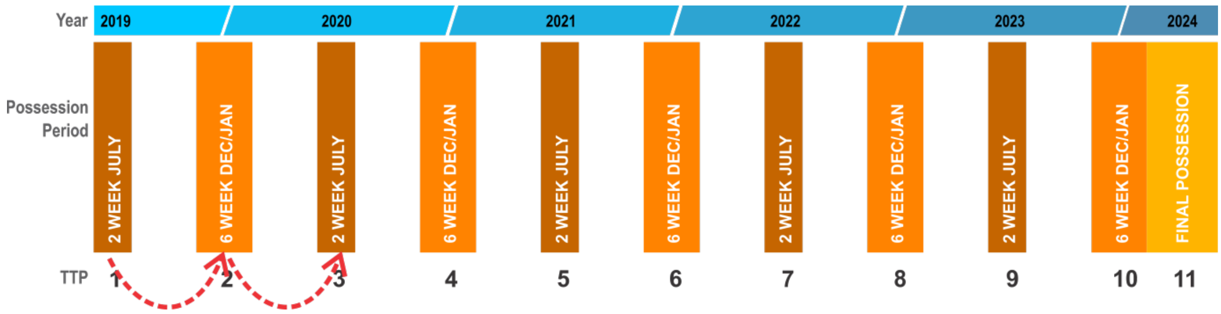


Figure 4.1 Indicative Program of Possessions

It is noted that there are other construction activities which are programmed or likely to occur in parallel with the project implementation. These schemes may result in cumulative impacts, adding additional construction haulage traffic onto existing routes or requiring additional closures. The impacts of these projects and locations are discussed in Chapter 10.

It should be noted that additional works on Sundays and Public Holidays would occur during possession periods as outlined above. These Sunday and Public Holiday works may require separate approval from various authorities, and would be communicated to relevant stakeholders well in advance of commencement.

It is therefore assumed for the purposes of the analysis that all the materials are delivered on the basis of a four year construction period, with five working days as a conservative assessment. Additional working on a weekend would reduce the daily movements below that assessed.

Table 4.1 Anticipated construction hours

	Non possession			Possession period works			Complete close-down and conversion		
Site	**Construction works**	**Spoil haulages, heavy plant and deliveries**	**Oversize/ wide load deliveries**	**Construction works**	**Spoil haulages, heavy plant and deliveries**	**Oversize/ wide load deliveries**	**Construction works**	**Spoil haulages, heavy plant and deliveries**	**Oversize/ wide load deliveries**
Marrickville Station Dulwich Hill Station Hurlstone Park Station Canterbury Station Campsie Station Belmore Station Lakemba Station Wiley Park Station Punchbowl Station Bankstown Station	**Standard hours**: Monday to Friday (7am to 6pm) Saturday (8am to 1pm)	**Standard hours**: Monday to Friday (7am to 6pm) Saturday (8am to 1pm)	Non-peak hours	24 hours/ day during possession	24 hours/ day during possession	24 hours/ day during possession	24 hours/ day during possession	**Standard hours**: Monday to Friday (7am to 6pm) Saturday (8am to 1pm)	Non-peak hours

4.2.3 Spoil Haulage Options

Spoil from the project construction would be removed using the road network. An assessment has been made of the construction access /egress gates and an initial review has shown that these are all considered feasible. All access gates facilitating access to the project construction zone are within close proximity to the motorway / main State Road network. Trucks hauling spoil would use the same routes as construction haulage vehicles. A more detailed assessment is included in Chapter 5 of this Technical Paper.

The use of freight rail to move materials has been considered and was discounted owing to the limited track capacity to cater for additional engineering trains that can carry spoil within the constrained schedule. Up to three trains would be required concurrently for spoil removal. The issues with speed of work required at the project worksite and compounds, limited availability of rolling stock, scheduling constraints and the large geographic spread of the worksite and compounds in the project area make this option unviable.

4.2.4 Construction Haulage Routes

Construction Haulage routes to and from the construction compounds and access gates to the project area have been developed with the following aims:

- use local or residential streets only for direct access to compound locations. Local streets would only be used where there is no other suitable alterative to deliver or remove materials for a particular section of the works
- minimise potential safety impacts for pedestrians, cyclists and other road users
- maximise the use of the State Road network.

Construction Haulage routes have been categorised as follows:

- primary routes forming the main access for construction haulage vehicles
- secondary routes providing links to the primary route and to State Roads
- tertiary (alternative) routes used as a back-up route to connect to the primary and secondary routes.

Routes were then mapped for each station and are presented in Chapter 5.

4.2.5 Construction Haulage Traffic Volumes

The volume of materials required to be moved to and from each construction compound has been analysed to estimate the duration of construction and the total number of haulage vehicle movements required. A flat profile of haulage vehicle movements per day has been assumed and a process of manual assignment of haulage vehicle movements to peak hours has been undertaken. Where daily haulage vehicle volumes to a compound are low (less than 10 per day), all haulage movements are assumed to take place during the peak hours. Where there are 10 or more haulage vehicles per day, 20% of the vehicle movements have been assigned to each of the peak hours. Forecast construction haulage traffic volumes are included in **Appendix C**.

As the compounds are all relatively constrained in size, there is a practical limitation on the concurrent activities that can occur within the sites, and the vehicle movements are anticipated to be correspondingly low compared with much larger sites. As such the indicative programme assumed for the purposes of this assessment has addressed this by assuming that for compounds with greater volumes of materials the duration of works would be longer. Therefore whilst the assessment has been built from the specific volumes of materials, at an hourly and daily level there is a similarity in the generated vehicles.

In some station locations construction activities would occur across multiple compounds. The peak generation of each individual compound has been assessed within the intersection analysis, although the differing nature of the works to be undertaken at each compound would mean that the peaks would not be co-incidental.

4.2.6 Construction Worker Parking

Given the nature of construction works and extended construction duration, limited on-site construction worker parking would be provided at each site compound (per station). Each construction site would typically provide 10 parking spaces for engineers, other management staff and trades.

All of the construction compounds are located in close proximity to public transport services and construction workers would be encouraged to use these services. A “Travel Demand Management” strategy would be implemented for construction worker parking demand which would seek to incentivise the use of public transport during non-possession periods.

Options considered may include:

- use of rail services
- shuttle bus transfers to worksites, particularly during possession periods
- use of existing under-utilised car parks in association with shuttle bus transfers.

Whilst the above measures may limit the number of construction workers who drive into the project area during the construction period, it is recognised that there would be a proportion of workers who drive and park in the vicinity of the compounds. Whilst the peak construction worker numbers coincide with the shutdown periods, and therefore an expected drop in commuter parking, consideration is given to the availability of nearby commuter parking within the assessment of effects in the subsequent Chapters.

4.2.7 Pedestrian, cyclist and motorist safety

The introduction of additional heavy vehicles to the network has the potential to result in safety impacts to pedestrians, cyclists and other motorists, especially where there is an increased likelihood for interaction with pedestrians and cyclists. Key locations where pedestrian, cyclist and motorist safety issues may arise include:

- construction compounds where access and egress points, or haulage routes would interface with pedestrians using surrounding footpaths and / or cyclists using marked cycle routes;
- areas where footpath widths are reduced around the construction compounds and worksites; and
- diversion routes for pedestrian and cyclists during bridge works and closures required.

Areas where there is likely to be increased interactions between cyclists, pedestrians, motorists and heavy vehicles as a result of the construction works are identified and assessed in Chapters 5 and 6.

Access and egress arrangements at construction compounds have been developed with consideration for pedestrian, cyclist and motorist safety. For example, the need for construction vehicles to turn right to or from State Roads to access construction sites has been avoided where practicable.

Appropriate controls would be established where vehicles are required to cross footpaths to access construction sites. This may include manual supervision, physical barriers or temporary traffic signals as required. Safety audits would be carried out at each of the construction compound traffic access and egress points. In addition, Sydney Metro City & Southwest is currently investigating options to further enhance pedestrian, cyclist and motorist safety in the vicinity of the construction worksite. This would include measures such as:

- use of speed awareness signs in conjunction with variable message signs near construction sites to provide alerts to drivers
- shared experience educational events that allow pedestrians, cyclists or motorists to sit in trucks and understand the visibility restrictions of truck drivers, and for truck drivers to understand the visibility from a bike
- specific construction driver training to understand route constraints, expectations, safety issues and to limit the use of compression braking
- safety devices on construction haulage vehicles that warn drivers of the presence of a vulnerable road user located in the vehicles’ blind spots and warn the vulnerable road user that a vehicle is about to turn.

4.3 Bridge Works

The assumed scope of the bridge works required is based on a review of the bridge assets along the project alignment and an assumption of work made for the purposes of the traffic and transport impact assessment.

The review assessed 27 bridges, which included 17 overbridges, three footbridges and 7 underbridge structures.

The majority of the bridges were designed before the release of current collision standards (Australian Standard 5100 Bridge Design).

Some bridges were constructed at the turn of the century; with the most recent bridge structures being typically over 40 years old, and even these require upgrades to conform to the current structural standards. The bridge works do not seek to achieve full compliance with the standard, as this is considered impractical, but instead seek to provide an acceptable level of compliance.

4.3.1 Approach

The scope of bridge works for this assessment was determined in consultation with Transport for NSW and their construction advisers. A Bridge Works Assumption Memo that formed the basis of the bridge works assessment is included in **Appendix D.** This includes commentary regarding the temporary traffic management, duration of traffic management, diversion routes and necessity for modelling..

The bridge works assessment includes intersection operations during partial and full road closures and the re-directed traffic resulting.

Key underlying assumptions to the bridge works impact assessment are:

- no bridges require closures longer than eight months
- multiple bridges within close proximity to each other would not be closed simultaneously
- bridge works undertaken at or adjacent to stations during possessions, would be undertaken to avoid interaction with the refined baseline TTP bus routes..

The bridges were considered in two distinct sections; between west of Sydenham in the project area to Belmore, and between Belmore to Bankstown within the project area. A different set of assumptions are relevant for each section, as outlined below:

Between Sydenham to Belmore

- works would occur during ARTC shut down periods, where a possession is required to complete the works and therefore would not occur during school holiday periods
- bridge works requiring continuous shut down periods of longer than two days are assumed to have a significant impact on traffic and would be modelled to assess the effects
- bridge works requiring continuous shut down periods not exceeding two days would only occur during weekend and night works. Diversion routes have been identified, but it is assumed that these weekend / evening closures would have detailed Temporary Traffic Management plans prepared prior to construction and do not require modelling
- all works to bridges that do not carry motorised traffic (such as pedestrian or rail overbridges) are not expected to impact the road network
- bridges directly adjacent to each other cannot be programmed for upgrade at the same time.

Between Belmore to Bankstown

- bridge works undertaken at or adjacent to stations during possessions, would be undertaken to avoid interaction with the refined baseline TTP bus routes.
- for works on all of the bridges between Belmore and Bankstown, with the exception of Punchbowl Road Overbridge and Chapel Road Overbridge, it has been assumed that these works would continue for six to eight months, with two weeks of half or full road closures and the remaining construction occurring during weekends/nights

- Punchbowl Road Overbridge and Chapel Road Overbridge are assumed to have no effect on traffic as no lane closures would be required
- bridges directly adjacent to each other cannot be programmed for upgrade at the same time.

The diversion routes and traffic impacts are explained in Chapter 6. Potential closures and diversion routes are indicative, based on the current stage of the design. Further detailed assessment would be undertaken in the future, if required, when a more detailed construction strategy and program has been developed and to inform the specific construction traffic management plans for the sites.

4.4 Temporary Transport Strategy

The Temporary Transport Strategy (TTS) is an overarching document that describes the process for planning and delivering the integrated, multi-modal temporary transport response that would operate during possession period shutdowns on the Bankstown Line. This strategy is included in **Appendix E**.

For each possession, a Temporary Transport Plan[11] (TTP) would be developed that would detail the initiatives that would be implemented to assist customers affected by closures of the line and its stations. The TTS provides the guiding document for the development of the TTPs. The TTPs would be developed prior to construction and would be informed by stakeholder and community feedback. Each successive TTP would improve on the previous plan, based on further understanding of customer needs and ongoing development of alternatives.

Each TTP would identify:

- Impacts on other modes

  The Temporary Transport Plan would provide a forecast of how those customers using the Bankstown Line before its closure would travel during the possession periods. In addition to the range of customer demand forecasts for each temporary bus route, the outputs from TfNSW's Public Transport Project Model (PTPM) would also include impacts on other modes including the regular bus network.

- Impacts on the regular bus network

  An assessment of the change in demand for regular bus services would be undertaken. Where increases in demand are identified, the analysis would determine whether sufficient capacity exists on each route, and whether additional services may be required to prevent overcrowding.

- Impacts on road network performance

  The closure of the Bankstown Line and the provision of temporary bus services would impact the performance of the road network through a combination of the number of buses required to provide temporary bus services, and the decisions some customers might make to drive to their destination or to drive to a different station to access the rail network by park and ride or kiss and ride. Each TTP would quantify the potential increase in traffic resulting from the closure of the Bankstown Line.

  Traffic modelling would be undertaken to assess these impacts on general traffic and on the operation of the temporary bus services. This would involve the modelling of key intersections and the development of options to improve their performance, such as modifying how the intersection operates, or by changing the routes that temporary bus services take between stations to avoid congested intersections.

- Impacts on parking demand

  The temporary closure of the Bankstown Line would affect the demand for parking at stations along the Bankstown Line, and at stations on the parallel rail lines where people may choose to drive to instead. The PTPM would provide an estimate of the changes in demand for park and ride at all stations, allowing an assessment of locations where intervention may be required to mitigate the impact of increased demand.

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[11] Temporary Transport Plans, as referenced in this document, are now referred as Temporary Transport Management Plans in the EIS main report and other technical papers.

- Impact on parking provision

  Parking areas along the corridor may be affected by construction activities and the need to provide temporary bus stops. This may affect both designated dedicated commuter parking spaces and general kerbside parking.

  Each TTP would identify what changes would be required to parking arrangements during each possession, potentially including:

  - the temporary conversion of dedicated commuter car parking spaces and/or kerbside parking spaces at some Bankstown Line stations to full-time bus zones to accommodate customer and operational needs of the TTP buses. This occurs at present during weekend possessions when rail replacement bus services are provided
  - reducing the available hours of kerbside parking spaces at or near selected train stations so that the spaces can operate as a bus zone at certain times of high demand to accommodate customer and operational needs of the TTP buses
  - the provision of temporary park and ride facilities at other locations within the Bankstown Line catchment, supported by temporary bus routes to connect to rail stations on the parallel rail lines
  - extended or new clearways (with some additional temporary parking losses) to allow buses and other traffic to operate safely
  - trimming of trees where buses are proposed to operate in the kerbside lanes, where trees currently overhang in the operating area
  - traffic signal phase changes at some interactions.

  In addition, the TTP includes the provision of additional bus services to stations on parallel lines. These would inevitably require bus stop / layover space which may displace parking spaces. This would be described, assessed and mitigated where possible, when the final suite of TTPs is prepared. It is not possible to assess these impacts now as the number of buses required has not been quantified, or the routes and destinations confirmed. Final changes required would be determined during detailed design and construction planning, and would be subject to additional impact assessment if required.

- Impacts on active transport

  Each TTP would consider the potential impacts of the Bankstown Line closure on cyclists and on pedestrians, including:

  - identifying the extent to which cyclists and pedestrians may divert to stations on the parallel rail lines
  - assessing the availability and capacity of end-of-trip facilities at stations which may attract increased numbers of cyclists; and
  - assessing the suitability of existing cycle and pedestrian infrastructure to support diverted demand to/from other stations, or for customers who may choose to cycle or walk to their destination rather than use temporary bus services.

  To assist the preparation of this aspect of the Temporary Transport Plans, Sydney Metro is developing a cycling strategy to assist existing cyclists affected by closures of the Bankstown Line, and to promote cycling as an alternative mode of transport during closures.

  Each TTP would consider the following initiatives:

  - temporary train service plans that provide additional capacity on other rail lines where affected customers may be diverted to, and altered services on sections of the Bankstown Line that are not being converted to Metro operations
  - integrated temporary bus services to allow customers to travel between stations on the Bankstown Line, and to stations on the other lines. This includes understanding the opportunities that the regular bus network can provide

- planning specialised services for customers who may not be able to use the temporary bus services, such as those with mobility impairments or other special needs
- initiatives to encourage and assist customers to walk or cycle to stations on other lines, or to their destinations
- infrastructure to support temporary bus services including bus stops and shelters, improvements to walkways and lighting, and wayfinding and information signage
- improvements to the road network, such as bus priority measures to support the temporary bus services, and adjustments to traffic signals to mitigate changes in road network demand
- understanding the changes in demand for parking near rail stations, the impacts this may cause and measures to manage those impacts
- customer and stakeholder engagement strategies, including communication, information provision and supporting travel demand management initiatives.

A number of different approaches are available for providing temporary bus services. Each approach would form a component of the overall temporary bus service plan. These components, shown schematically in **Figure 4.2**, are:

- buses that stop at all stations along the corridor (component 1)
- buses that only stop at a limited number of stations before continuing an express service another station (component 2)
- buses that move passengers to another rail line such as the T2 Airport Line and the T2 South and Inner West Line (component 3)
- increasing the frequency of regular bus services at specific locations, acknowledging that customers may prefer to use those instead of the temporary bus route service (component 4).

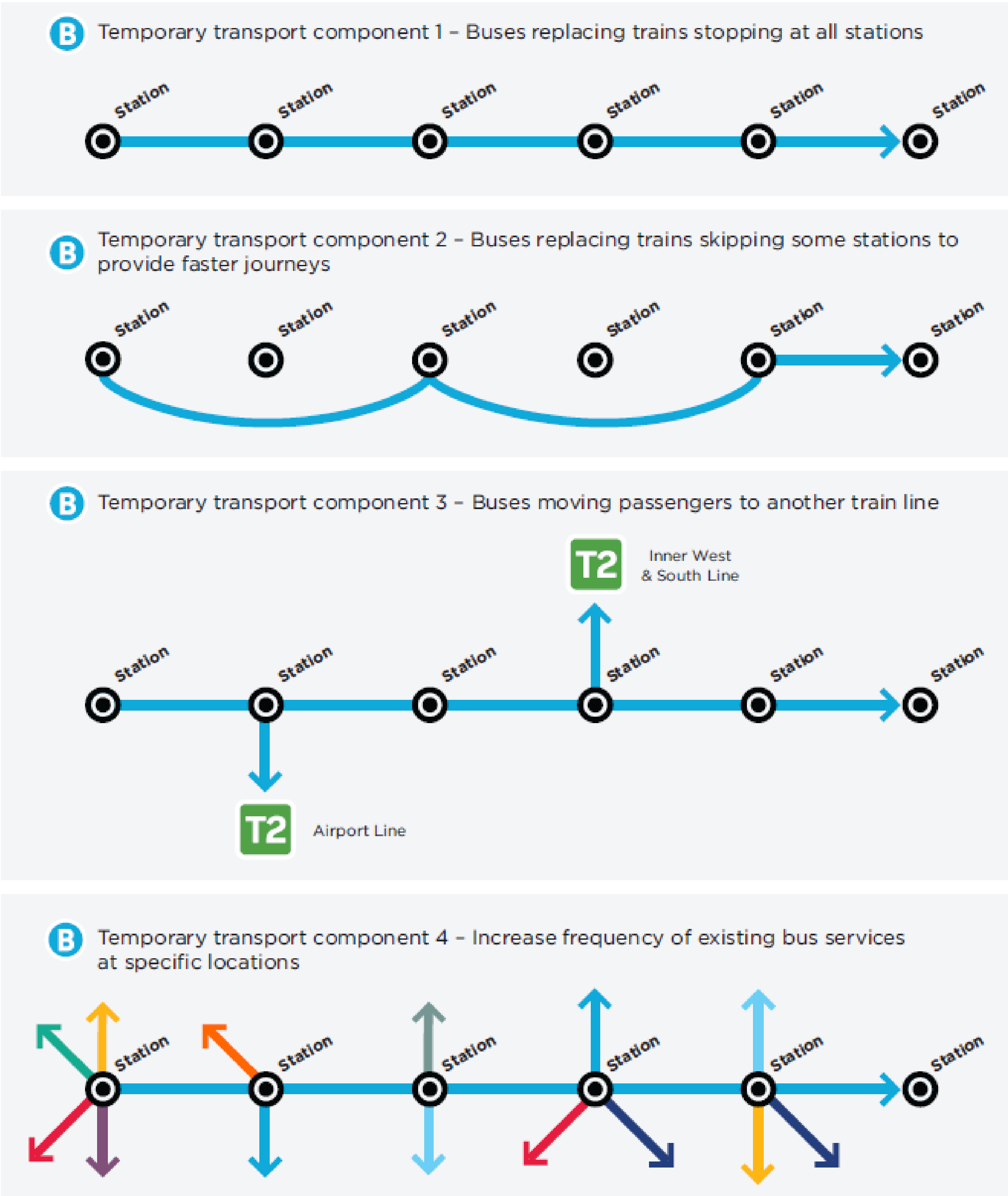


Figure 4.2 Temporary Transport Components

For the purposes of assessment, a Baseline TTP has been developed (refer also to **Appendix E**) which includes component 1 and component 2 as illustrated in **Figure 4.2**.

The Baseline TTP closely emulates the rail replacement bus services that are provided during scheduled weekend possessions that occur several times each year when maintenance activities occur.

By definition the Baseline TTP provides bus routes for customers that travel along the Bankstown Line corridor, with destinations in the CBD or beyond, to Sydenham Station to transfer to train services operating on the T2 Airport Line and T4 Illawarra Line. Minor adjustments have been made to the weekend service plan, to better serve the volume of customers travelling during weekday peak periods. It is assumed that the current regular scheduled bus routes would continue to operate as per normal unless required to divert as a result of other project construction works.

The Baseline TTP consists of four temporary bus routes as shown in **Figure 4.3**:

- Route 1: Lidcombe to Sydenham, all stations. This provides consistent, all-hours service during each possession between Sydenham and Lidcombe. During some possessions, the route may only need to travel to Sefton or Regents Park instead of Lidcombe
- Route 2: Bankstown to Sydenham, via Punchbowl, Wiley Park and Lakemba. This limited-stops route provides a reduced travel time for customers travelling from Bankstown, Punchbowl, Wiley Park and Lakemba
- Route 3: Belmore to Sydenham, via Campsie and Canterbury. This route only stops at Campsie and Canterbury when travelling from Belmore to Sydenham. It provides a reduced travel time and increased service reliability for customers travelling from Belmore, Campsie and Canterbury
- Route 4: Hurlstone Park to Sydenham, via Dulwich Hill and Marrickville. This route only stops at Dulwich Hill and Marrickville when travelling from Hurlstone Park to Sydenham. It provides increased service frequency, reliability and capacity for customers travelling from these stations.

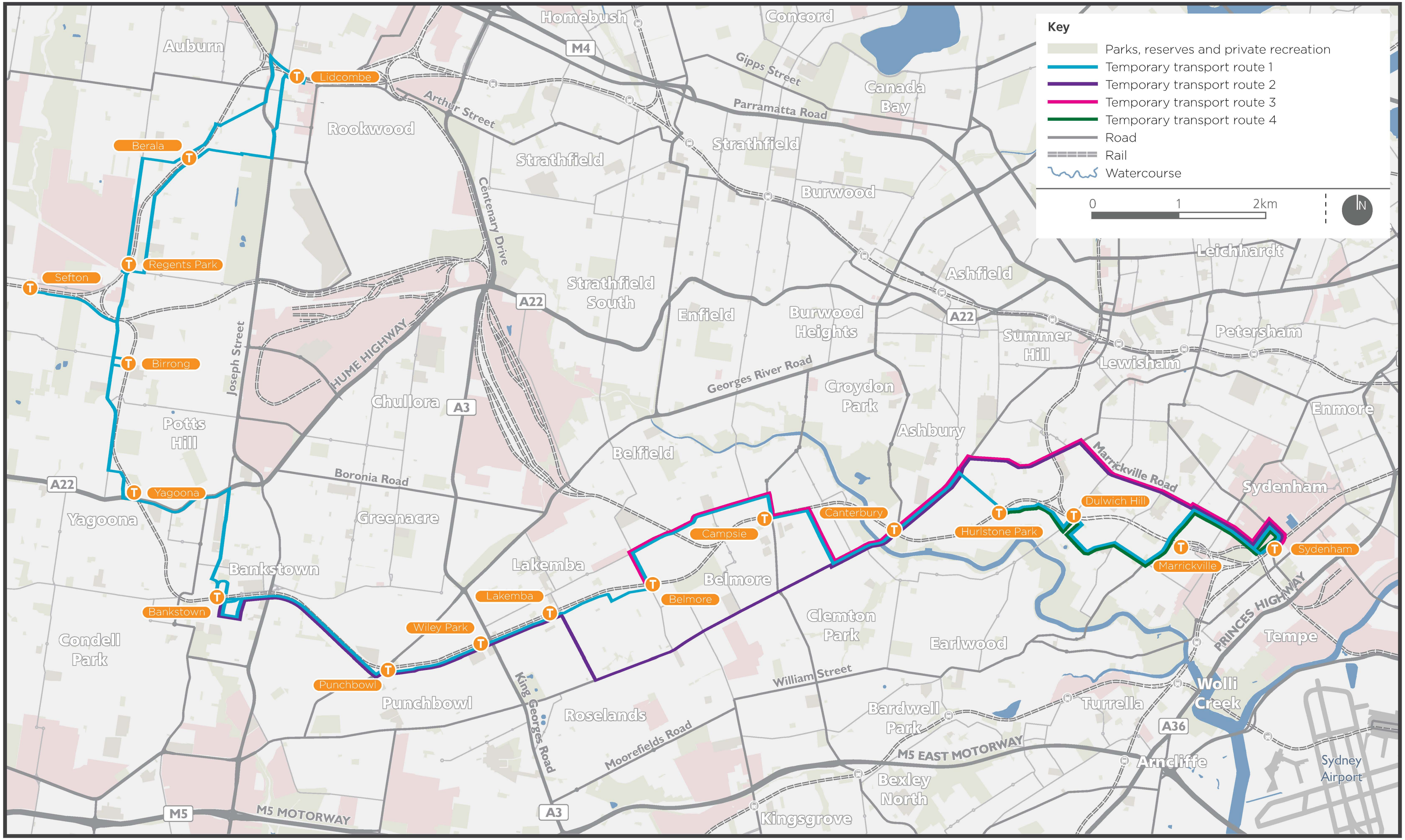
Analysis of the Baseline TTP showed that across the four routes, at least 101 bus services per hour would be required to travel in the inbound direction to Sydenham Station during the weekday AM peak period. **Table 4.2** below shows the required service frequencies for each temporary bus route.

Table 4.2 Required minimum temporary bus route frequencies for AM peak hour (TTS, Appendix E)

Route	Description	Minimum Inbound Frequency	Minimum Outbound Frequency
1	Lidcombe to Sydenham, all stations	11 buses per hour	10 buses per hour
2	Bankstown to Sydenham, via Punchbowl, Wiley Park and Lakemba	33 buses per hour	10 buses per hour
3	Belmore to Sydenham, via Campsie and Canterbury	35 buses per hour	10 buses per hour
4	Hurlstone Park to Sydenham, via Dulwich Hill and Marrickville	22 buses per hour	10 buses per hour

All planned possessions of the Bankstown Line require the closure of all stations from Marrickville to Punchbowl. Additionally, some possessions would also require the closure of Bankstown Station, Yagoona Station and Birrong Station, and changes to how stations between Liverpool and Lidcombe are serviced. During such possessions, temporary bus services would need to extend west from Bankstown Station, to Lidcombe Station and/or Sefton Station, depending on the nature of the line closure during a particular possession. The Baseline TTP responds to this more extensive closure scenario and the impact of the Baseline TTP buses travelling to Yagoona, Birrong, Regents Park and Lidcombe has been assessed (approximately 11 buses per hour per direction).

Erskineville and St Peters stations are currently serviced by the T3 Bankstown Line. During possession periods an alternative train working timetable may be implemented which could result in these stations being serviced by either the T4 Illawarra Line or the T2 Airport Line via Sydenham Station.



sydney METRO | city & southwest

Baseline TTP bus routes

FIGURE 4.3

Although there is a potential variant of Route 1 that would call at Sefton, the frequency of this service would be low and its impact has not been quantitatively assessed. At Berala, bus flows are uni-directional movements occurring on separate roads to either side of the station where local intersections are unsignalised, and consequently the low one-way flows of 11 buses per hour have not been quantitatively assessed.

Analysis of the baseline TTP is presented in Chapter 5 and Chapter 6 and shows that the large volume of buses would impact the performance of the road network.

Effectively, the Baseline TTP represents the worst case scenario. The assessment of this TTP determines the need to mitigate these impacts by adding bus services that allow some customers to travel to their destinations without travelling to Sydenham Station.

A Refined Baseline TTP has been tested to assess an alternative rail replacement strategy to convey passengers west of Campsie to parallel rail lines and reduce the impact on intersections between Dulwich Hill and Marrickville. The changes to the Baseline TTP are as follows:

- Route 1: Increased frequency to account for the reduction in service resulting from the changes to route 4
- Route 2: Removed due to the reduced eastbound demand following conveyance to parallel rail lines
- Route 3: Reduced frequency of buses and shortened route (to begin at Campsie instead of Belmore) due to the reduced eastbound demand following conveyance to parallel rail lines
- Route 4: Minor localised route alteration to bypass Marrickville Station and travel via Wardell Road. This is to reduce the impact on a number of intersections on the road network linking Dulwich Hill and Marrickville Station.

This would be achieved by adding routes that travel to other rail lines (component 3) and increasing the frequency of regular bus routes (component 4). Additionally, options would be developed for the routes that do need to travel to Sydenham Station, to travel along different roads in order to reduce the impact on any one road or intersection.

As each TTP is developed, its impact on the road network would be assessed in the same manner as the Baseline and Refined Baseline TTP. Learnings from previous assessment would be applied to develop continuous improvements in TTPs, reducing network impacts by:

- better estimating the service levels required and patronage expectations
- applying a greater understanding of mode shift and alternate routes and travel times
- improving the accuracy of TTS services to be more closely matched to demand avoiding over provision of TTS vehicles
- monitoring intersection performance and any route pinch points to allow alternate routes to avoid specific locations
- finessing of signalled intersection timings to match the additional TTS vehicles
- improving the communication and notification of the TTPs to pedestrians, cyclists, Sydney Train, other public transport customers and road users.

The feasibility of providing the required bus stop and passenger waiting areas would be addressed during the development of each TTP, when further detail of the service frequencies and routes of the replacement buses is available. This would include the assessment of the effects of parking at stations to facilitate the TTP, and also the effects on parking at impacted stations on the T3 line and other parallel routes. Operational requirements to cater for the specific TTP such as layover areas would also be assessed as the TTP is developed.

Blending the observations from earlier implementations of the TTS with updated modelling from the PTPM would provide greater certainty in the anticipated impacts, and thereby the development of more resilient and comprehensive mitigation strategies.

4.5 Intersection Assessment Methodology

4.5.1 Overview

The project includes the upgrade of 10 stations from Marrickville to Bankstown to improve accessibility before conversion to Metro Standards. Six additional railway stations have also been considered in the assessment of potential construction impacts, including Sydenham Station and those on the T3 Bankstown line west of Bankstown. Whilst these stations would not be upgraded as part of this project, the rail services would be suspended at times during construction and so there would be transport related effects in these locations.

Intersections likely to be impacted by the project were selected following consideration of:

- those that would be impacted by the replacement buses during possessions (Baseline TTP and refined baseline TTP) bus routes, refer to **Section 4.5**), construction haulage routes and construction compounds and other worksite access points in the project area
- precinct information (road hierarchy, bus volumes, proximity to the station and key intersections)
- intersection form (e.g. signalled, roundabout, priority)
- road classifications, i.e. avoiding use of local streets to the extent practicable
- bus routes and volumes
- bridge diversion routes.

A total of 75 intersections were selected for detailed assessment with modelling using SIDRA 6.1 or LinSig (two widely used software tools) to assist in the quantitative assessment of capacity and the potential delay at these intersections that may result from the construction of the project.

The assessment of traffic conditions during construction considered the impact of the TTS, construction haulage vehicles and bridge diversion routes.

The assessment considered the following scenarios:

- 2016 Existing conditions, based on collected traffic volume data (refer to **Section 4.5.2**)
- 2023 Future conditions, based on an applied traffic growth rate (refer to **Section 4.5.3**), as well as the following analysis of the 2023 future conditions:
  - A. 2023 Future Conditions Base Model as the reference case
  - B. 2023 Future Conditions + Construction haulage traffic
  - C. 2023 Future Conditions + Construction haulage traffic + Temporary Transport Strategy (TTS) Baseline TTP buses (Baseline TTP)
  - D. 2023 Future Conditions + Construction haulage traffic + Refined Baseline Temporary Transport Plan buses (Refined Baseline TTP)
  - E. 2023 Future Conditions + Construction haulage traffic + bridge works impact and traffic rerouting.

The Refined Baseline TTP is based on the premise that customers located west of Campsie would be conveyed to stations on parallel lines, reducing the volume of buses east of Campsie. The alternative scenario also reduces the number of buses on the road network connecting Dulwich Hill and Marrickville Station to reduce the effect on the intersections in that area.

Scenarios C and E above were considered to represent the worst case scenarios. It should be noted that bridge works which have a duration beyond a weekend / evening are assumed to occur outside of the possession periods (ie no TTP).

The project is being delivered in a constantly changing landscape, with multiple concurrent projects being planned, constructed and coming into use. This includes changes to land use, transport networks for both car and other modes, and commercial developments. The timescales of many of these are unknown at this time, and the overall duration of the project construction of around six years is such that there are many interdependencies and opportunities that would require management as the project evolves.

As with all construction activities, co-ordination with other temporary works, events and planned maintenance would be required as part of the mitigation of effects, and this would include known projects such as WestConnex and Chatswood to Sydenham component of the Sydney Metro. A cumulative assessment, considering the potential overlap of these projects, is provided in Chapter 10.

4.5.2 Precinct Information

The existing land use and transport patterns were reviewed, to provide additional context to the areas surrounding the stations. This assisted with the selection of the routes and intersections that required specific assessment for each station precinct. Existing land use and travel patterns contained in the "Precinct Land Use and Infrastructure Analysis" (NSW Govt. 2015) were used to identify the key intersections in the precinct and these were then modelled. Reference should be made to chapter 2 and 3 of this technical paper and Chapter 15 Land use and property of the EIS for further context on land use.

4.5.3 Traffic Volume Data

Existing traffic volumes and approach queues were surveyed for the project during April to November 2016 for key intersections. The traffic surveys contained lane by lane 15-minute counts with separate classification of light vehicles, heavy vehicles, buses, pedestrians and cyclists. Sydney Coordinated Adaptive Traffic System (SCATS) traffic signal data was also provided by Roads and Maritime Services (RMS) for all of the signalised intersections.

Sources for traffic volumes included:

- traffic surveys commissioned by AECOM
- traffic surveys provided by the Transport for NSW Technical Advisor (TA)
- base models of select intersections from the TA
- SCATS data from RMS.

This information was used to develop 2016 base models for all intersections (refer to **Section 4.5.1**) with the observed data summarised in **Appendix A**.

4.5.4 AM and PM Peak modelling

Table 4.3 displays RMS traffic count information at sites near stations to demonstrate the difference between peak hour and non-peak hour traffic flows. It should be noted that some of the count data is of varying age, collected over several years since 2009 and up 2014. While the traffic flows may have changed), this data provides an indication of the relative reduction in traffic flows experienced in the off peak periods.

Table 4.3 Peak and Off Peak Traffic Flows[12]

RMS Count Site	Average Hourly Flows (2-Way)		Difference between maximum of AM PM Peak flows and off-peak flows:		
	AM Peak	PM Peak	Day time Interpeak traffic flows	Night-time traffic flows	Weekend Traffic Flows
43236 - Fairford Road	3,990	4,898	-16%	-49%	-20%
24008 - King Georges Road	3,333	4,033	4%	-27%	10%
18032 - Railway Road	1,319	1,529	-5%	-54%	-9%
24212 - Wardell Road	1,620	1,557	-36%	-73%	-27%
24213 - Canterbury Road	2,777	3,088	-16%	-61%	-14%
24214 - Brighton Avenue	1,362	1,259	-25%	-69%	-20%
19041 - Illawarra Road	1,392	1,270	-40%	-77%	-32%

From **Figure 4.3** it can be seen that traffic flows in the interpeak period can be as much as 16% to 40% lower than traffic flows in the highest peak period. An exception to this rule is the count site at King Georges Road, which experiences marginally greater flows in the interpeak period. Consideration of traffic impacts in this report has focused on peak times when demands are generally greatest to provide worst-case modelling for the intersections. Off peak periods are generally characterised by lower traffic flows and reduced network demand. Possession periods are mostly timed to be during periods of reduced network demand. This would greatly assist in managing impacts on the network from construction work undertaken during these periods.

Weekend traffic flows are generally between 10% and 30% lower than weekday peak flows, with the count site at King Georges Road again being the exception with a 10% increase in traffic flows at the weekend. For the vast majority of locations, undertaking works at the weekend would reduce traffic impacts. The more specific impacts of out of hours and weekend works would be considered further during the development of traffic management plans, when scheduling and construction haulage traffic volumes would be known and details of traffic flows in the surrounding areas at any particular time would be more fully understood.

4.5.5 Traffic Growth

A growth factor was applied to the 2016 base models to reflect forecast land use and traffic behavioural changes that would occur over the course of the construction of the project.

A comparison between the Public Transport Project Model (PTPM), which is an incremental multi-modal model (including a strategic highway component), and RMS's Strategic Traffic Model (STM) was made by WSP | Parsons Brinckerhoff in September 2016. Both models use EMME software. The growth factors are similar for the PTPM and STM (1.4% p.a. AM Peak for PTPM and 1.2% p.a. AM Peak for STM, and both have 1.5% p.a. in the PM Peak). As the PTPM has the most up to date land use assumptions for this corridor, it was considered the most appropriate model to estimate the changes in transport behaviour for this assessment.

The growth factor used for the 2023 future model was the PTPM growth rate, which adopts the overall growth rate for car-driver trips from the PTPM strategic model. This was applied as a global increase (1.4% p.a. in the AM peak and 1.5% p.a. in the PM peak).

[12] AM and PM Peak flows are the highest recorded flows for any 60 minute period pre or post noon. The daytime Interpeak is the highest flows in 60 minutes between 10am and 3pm, and weekend flows are peak 60 minute flows on Saturday or Sunday..

Adopting a blanket traffic growth rate would not account for specific issues on the local road network which may arise as traffic growth occurs across the local network. For example, as the road becomes more congested drivers may choose to divert to other routes or transport modes or re-time their trip. To account for this:

1. The intersections were modelled using surveyed traffic volumes from 2016
2. The intersections were assessed by movement
3. Future traffic volumes were calculated based on the growth rates identified above
4. Any intersection with a current LOS of E or F had a capped growth rate so that the maximum future degree of saturation was 1.1, or the future volume was capped at the existing volume, if the existing degree of saturation was above 1.1.

4.5.6 Intersection Traffic Modelling

The approach to traffic modelling undertaken for this assessment aligns with the RMS Traffic Modelling Guidelines (version 1.0, February 2013) and includes the following broad steps:

- Development of calibrated and validated existing base models to align with existing operational conditions at each intersection. The following data sources were used in the calibration and validation process:
  - surveyed and SCATS traffic counts (including pedestrian and cyclist volumes)
  - SCATS traffic signal data
  - site observations of pedestrian delays, posted speed limits, intersection configurations, lane usage, location of parking, bus stop locations, bottlenecks and pinch points
  - pedestrian crossing volumes from traffic surveys.
- Application of anticipated construction haulage traffic demands to the calibrated and validated base models to develop construction phase models to allow the identification of potential impacts.

The traffic modelling results obtained should not be interpreted in absolute terms, rather the purposes of traffic modelling is to enable a comparison to be made between the 'with' and 'without' construction haulage traffic scenarios. Traffic signal operations have been modelled as fixed time operation whereas in reality the traffic signal control system used throughout Sydney is SCATS. Under adaptive SCATS control, the actual operational performance achieved is likely to be better than the modelled results. Furthermore, the adaptive nature of the traffic signal control available in Sydney means that intersections are able to modify phase times in response to variability in traffic demand. Therefore, it is important when reviewing the traffic modelling results that the scenarios be viewed relative to each other in order to determine any potential change in operational performance due to the project.

The traffic modelling undertaken was of the AM and PM peak periods only, consistent with the standard approach for this of type assessment. The peak traffic periods represent a 'worst case scenario' as during these periods the road network experiences the maximum background traffic demand and the available spare capacity of the road network is at its most limited. Construction haulage vehicle volumes are anticipated to be higher outside the AM and PM weekday peak periods; however, the number of movements would remain relatively low and be within the range of daily variations in traffic volumes on the road network when compared to background traffic.

It is acknowledged that in some locations the Saturday peaks remain high relative to weekday peaks, and for these sites the Construction Traffic Management Plan (CTMP) process would be utilised to manage the activities at specific locations or to a finer degree of detail, to minimise impacts to the road network.

4.5.7 Performance Indicators

In order to assess the impact of the 2023 scenarios as outlined in **Section 4.5.1** on the performance of the intersections, the main indicators were:

- Degree of Saturation (DoS): the ratio between traffic volumes and capacity (v/c) of the intersection, used to measure how close to capacity an intersection is operating. The DoS is a direct measure of the congestion level of the intersection and as DoS approaches 1.0, both queue length and delays increase rapidly. Satisfactory operations usually occur with a DoS range between 0.8 to 0.9 or lower

- average delay: duration, in seconds, of the average vehicle waiting time at an intersection
- Level of Service (LoS): a measure of the overall performance of the intersection. The levels of service (LoS) presented in **Table 4.4** are in accordance to the RMS Traffic Modelling Guidelines and LoS gives an indication of how well the intersection is performing in regards to delay in seconds faced by vehicles.

Table 4.4 Level of Service delay bands

Level of Service (LoS)	Average Delay (sec/vehicle)	Guide to Interpretation
A	Less than 14	Good operation
B	15 to 28	Good with acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity; at signals incidents would cause excessive delays
F	> 70	Exceeds capacity; roundabouts require other control mode

4.5.8 Construction phase – Assessment of traffic volumes

The construction traffic assessment is based on forecast construction haulage traffic generation along specified haulage routes, and their associated affects upon intersection operation. Construction specific activities requiring closures, work zones and other traffic management activities would be detailed in the CTMPs. Construction haulage traffic volumes generated from station construction compounds and/or construction activity within the project area were included in the future intersection models to assess construction impacts within the project area in the vicinity of the station.

Peak hour construction haulage traffic volumes determined for station compounds were used in the future models to assess construction impacts.

For other construction activities within the project area, the following assumptions were made to obtain peak hour truck movements:

- construction activity period assumed based on type of activity, size of site, etc. The peak hourly vehicle flows have been derived by averaging the overall expected volumes over the estimated construction duration
- peak hour flows worked out based on assumed construction activity duration
- movements for earthworks / fill and concrete pouring typically taking place outside of peak hours to assess a realistic scenario of construction haulage traffic impact
- site activities occur over five working days and exclude any allowance for the distribution of the deliveries during weekend works, including possessions.

The assumptions above were used to model the worst case impact to the road network. The peak hour volumes estimation and overall construction impact can be further refined with more detailed programming for individual activities and their respective access gates as the Construction Traffic Management Plans (CTMPs) are developed at a later stage.

The assumed movements for construction haulage routes are provided in **Appendix C**.

It should also be noted that traffic generation from construction workers has not been included in this assessment. Intensive station compound works are planned to occur during 24 hour possession periods and therefore worker arrivals can be expected to be dispersed throughout the day, as opposed to arriving during the morning peak hours.

4.5.9 Night-time construction haulage traffic

During the night, construction haulage traffic demands at each station are indicatively estimated to be around nine heavy vehicles and five light vehicles trips[13] per hour. **Table 4.3** demonstrates the reductions in background traffic that can be expected during the night (between 27% and 77%). As a result of the lower background traffic flows, the relatively small number of night-time construction haulage traffic trips would not result in any significant impacts in traffic terms. However it is recognised that night-time construction haulage traffic could have amenity impacts and this is considered in Technical Paper 2 – Noise and vibration assessment.

4.5.10 Construction phase – Assessment of impacted routes

The construction and TTS traffic affected intersections identified for further analysis were selected by consideration of:

- construction haulage routes - the predicted route that construction haulage vehicles would use to travel to/from compounds and access gates into the project area worksite. The predicted routes were determined by choosing the shortest travel time from a State Road to the compounds/worksite from the list of potential construction haulage routes that have been assumed for the purposes of assessment
- TTS bus routes – the plan to manage temporary transport needs during the construction period is being developed in parallel with the design and outlines the proposed strategy for managing impacts of closures of the Bankstown Line during construction. Intersections along TTS routes were identified and are included in the traffic impact assessment.

A construction haulage traffic swept path analysis was also undertaken for key construction inbound and outbound routes approaching station compounds. A 12.5m Heavy Rigid Truck was been used for the analysis. Vehicles greater than 12.5m that would access compounds and the access gates along the project area are expected to do so under active traffic management and outside of peak hours as these would be discreet movements. Discussion of the suitability of the turns is included in Chapter 5 on a station by station basis with the intersections assessed and individual turn diagrams provided in **Appendix B**.

4.5.11 Intersection Controls

A review of satellite imagery supplemented by site inspections was used to identify the type of existing intersection controls for each of the intersections along the construction haulage routes and/or TTS bus routes. The controls were categorised into signalised, roundabout or priority controlled.

The project team completed site visits to key intersections at Campsie, Bankstown and Sydenham Stations to observe existing traffic operations. The visits were undertaken during the morning peak to reflect the peak with the higher people movements based on survey data.

Additional site visits were also conducted where preliminary modelling results (LoS) differed from the existing situation. A number of intersections were visited in January and February 2017 for this reason. These visits allowed observations of recent changes to road layouts, actual lane usage to reflects parking or other factors that produced biased lane choice, and the interaction of pedestrians with traffic flows. Sites visited include:

- Gleeson Avenue / Unwins Bridge Road
- Marrickville Road / Victoria Street
- Marrickville Road Illawarra Road
- Marrickville Road / Warren Road
- Ewart Street / Wardell Street
- Ewart Street / Bayley Street
- Crinan Street / Floss Street / Duntroon Street

[13] A trip is a one-way vehicular movement from one point to another excluding the return journey. Therefore a vehicle entering and leaving a worksite is counted as two trips.

- Canterbury Road / Crinan Street / Queen Street
- Canterbury Road / Jeffrey Street / Broughton Street
- Canterbury Road / Charles Street / Close Street
- Beamish Street/Lilian Lane / South Parade.

All modelled intersections have been compared and calibrated against vehicle queue length surveys to ensure the base models reflect the existing observed intersection operation.

Signalised intersections were selected for inclusion in the assessment. Non-signalised intersections were included in the assessment if they:

- have turning TTS or construction haulage vehicle movements; or
- are shown to be key access routes within the adjacent road network.

5.0 Construction Haulage Traffic and Transport Assessment - Station and Track Alignment works

5.1 Summary

Potential construction traffic impacts would arise primarily from the addition of construction haulage vehicles (light and heavy trucks), rail replacement bus services and light vehicles (cars and utility vehicles) onto surrounding road network. These construction haulage vehicle movements may increase traffic congestion and impact on intersection performance, as well as impact on the existing bus services, pedestrians and cyclists.

Construction haulage vehicle routes to and from the construction compounds, worksites and access gates to the project area have been developed as described in Chapter 4:

There are periods during construction when the current rail services would be suspended and alternate public transport would be provided by a replacement bus service. As described in Chapter 4, an approach to the bus replacement service has been developed through the TTS, of which the ‘Baseline TTP’ and ‘Refined baseline TTP’ has been considered in this assessment.

As discussed throughout this chapter, pedestrians may be redirected to cross the road at upstream intersections. However the delay, distance and duration of these diversions have not been quantitatively assessed as they are subject to construction staging details that are yet to be developed. When staging details are available, the access routes for pedestrians and cyclists would also be assessed as part of the preparation of the Construction Traffic Management Plans (CTMPs).

Reference should be made to the summary of the existing bike parking space supply and demand at each station found in **Table 3.1** in Chapter 3. Any alternate parking provision temporarily required during the work would need to comply with the NSW Government Bike and Ride Program and the ASA Bicycle Facilities Standard (TfNSW 2016).

In total 75 intersections were assessed to determine the capacity to absorb the additional construction haulage and other traffic generated from construction work. In the intersection summary tables in the body of the report (chapter 5 and 6, the naming conventions (for example B.11 and H.11) are a standard file reference for the project and provide a cross reference point during the modelling and to the intersections diagrams provided in **Appendix A**.

The assessment included consideration of the parking, construction haulage vehicle movements and the impacts of providing temporary transport solutions such as bus replacement during temporary closures of the existing rail system on the surrounding roadways.

Section 5.17 provides a summary table which identifies the constraining intersections on the network in relation to the programmed construction activities. **Appendix A** shows station maps with modelled light and heavy vehicles, construction and Baseline TTP volumes.

Existing and anticipated vehicle flows by hour and daily, with night time flows separately identified, for all construction routes and the Baseline and Refined Baseline TTP routes can be seen in **Appendix C** and summarised as vehicles expected per day in **Section 5.17.1**. This data is also split into ‘light’ and ‘heavy’ vehicles.

Existing on and off street car parking may also be affected from construction works and / or construction worker vehicle parking. **Table 5.1** presents parking spaces and utilisation. Within the station specific discussions later in this chapter there is a discussion on indicative effects on parking from provision of stops and layovers for the TTP scenario buses, although as stated in **Section 4.4** above, the full assessment and mitigation for any parking effects would be undertaken as part of the development of each of the detailed TTPs.

Table 5.1 Existing Parking Summary

	Marrickville	Dulwich Hill	Hurlstone Park	Canterbury	Campsie	Belmore	Lakemba	Wiley Park	Punchbowl	Bankstown
On-street Parking Spaces	1519	1275	1185	616	1045	1078	961	721	838	588
Off-street Parking Spaces	0	57	23	233	494	142	537	25	285	1108
Total parking spaces	1519	1332	1208	849	1539	1220	1498	746	1123	1696
Total Parking Utilisation (%)	81%	74%	55%	68%	90%	78%	85%	63%	84%	98%

Table 5.2 below provides a summary of the total number of dedicated commuter parking spaces that would be removed due to the location of the worksite extent/ access gates.

Table 5.2 Dedicated Commuter Parking Summary Table for Spaces Affected by Worksite Extent / Access Gates

	Marrickville	Dulwich Hill	Hurlstone Park	Canterbury	Campsie	Belmore	Lakemba	Wiley Park	Punchbowl	Bankstown
Total parking spaces	1519	1332	1208	849	1539	1220	1498	746	1123	1696
Existing Dedicated Commuter Parking	0	55	0	32	138	56	138	-	137	147
Spaces removed – entire construction period (*dedicated commuter*)	3	9	23	-	*(14)*	75 *(29)*	*(47)*	25	*(30)*	*(90)*
Additional Spaces removed – short-term i.e. during possessions (*dedicated commuter*)	7	*(27)*	-	(32)	*(45)*	21	*(25)*	-	50[14]	-

Note: The 25 spaces temporarily removed at Wiley Park Station refer to the spaces which Roads and Maritime propose to install as part of the clearways project.

It should also be noted that three Kiss and Ride spaces, one taxi bay and five short term spaces are being removed from use at Marrickville Station during construction. In addition, 23 two-hour time restricted spaces on Floss Street at Hurlstone Park Station and 32 un-restricted parking spaces on

[14] Land is available for 40 replacement spaces.

Charles Street at Canterbury Station are being removed from use for the entirety of the construction period.

The following sections:

- consider the impact of heavy vehicle routes and accessibility
- the impact of the temporary transport route
- assess intersection performance with future growth traffic volumes, construction haulage traffic, Baseline TTP and Refined Baseline TTP volumes
- assess the effects on public transport
- assess the effects on the active transport network
- the impact of construction worker parking
- the impact of dedicated commuter and short-term parking.

Possessions of the Bankstown Line entail closure of all stations from Marrickville to Punchbowl. Additionally, some possessions would also require the closure of the line between Sydenham Station and Bankstown Station, Yagoona Station or Birrong Station, and changes to how stations between Liverpool and Lidcombe are serviced. During such possessions, temporary bus services would need to extend west from Bankstown Station, to Lidcombe Station and/or Sefton Station, depending on the nature of the line closure during a particular possession.

Whilst the stations below are not affected by construction activities, these stations and their surrounding network have been considered in this section as TTS bus services call at these stations:

- Sydenham Station
- Regents Park Station
- Lidcombe Station
- Birrong Station
- Yagoona Station.

Although it is recognised that works at Sydenham Station are not within the scope of works that are part of this project, the assessment has been structured in geographical sequence from east to west. As a result, in the subsequent sections of this chapter the assessment of the effects of the TTS at Sydenham are presented ahead of the stations with actual works occurring, and we conclude with the stations west of the physical works.

Using the methodology detailed in **Chapter 4**, the following section presents summary outputs of the intersections assessment for each station. Average delay per vehicle, overall level of service and the degree of saturation for the worst movement are presented for the following scenarios (refer to table headings in **Section 5.2.2 - 5.16.2** throughout Chapter 5):

- Existing: Existing traffic flows
- Future: Forecast traffic flows for the year 2023
- Construction: Future traffic flows + projected construction haulage vehicles
- Baseline TTP: Future traffic flows + projected construction haulage vehicles +Baseline TTP plan
- Refined Baseline TTP: Future traffic flows + projected construction haulage vehicles +Refined Baseline TTP plan.

5.2 Sydenham Station

Construction haulage traffic has not been modelled for Sydenham Station within this assessment because the construction of Sydenham Station would occur as part of the Sydney Metro Chatswood to Sydenham project. Therefore the Baseline TTP and Refined Baseline TTP results presented within this section do not include construction haulage traffic. However Chapter 10 of this report does consider the cumulative impact of construction haulage traffic for Sydenham Station.

Figure 5.2 overleaf, shows the intersections that were modelled around Sydenham Station for assessment of the baseline TTP.

5.2.1 Sydenham Temporary Transport Route

As noted in Section 4.5, the Baseline TTP outlines a temporary transport scenario that has all bus routes converging in Sydenham, resulting in 101 buses per hour arriving at Sydenham Station in peak periods. The temporary transport bus stops utilise existing bus set down zones in addition to some areas currently used for on-street parking.

The indicative rail replacement bus service operation at Sydenham Station is shown in **Figure 5.1**.

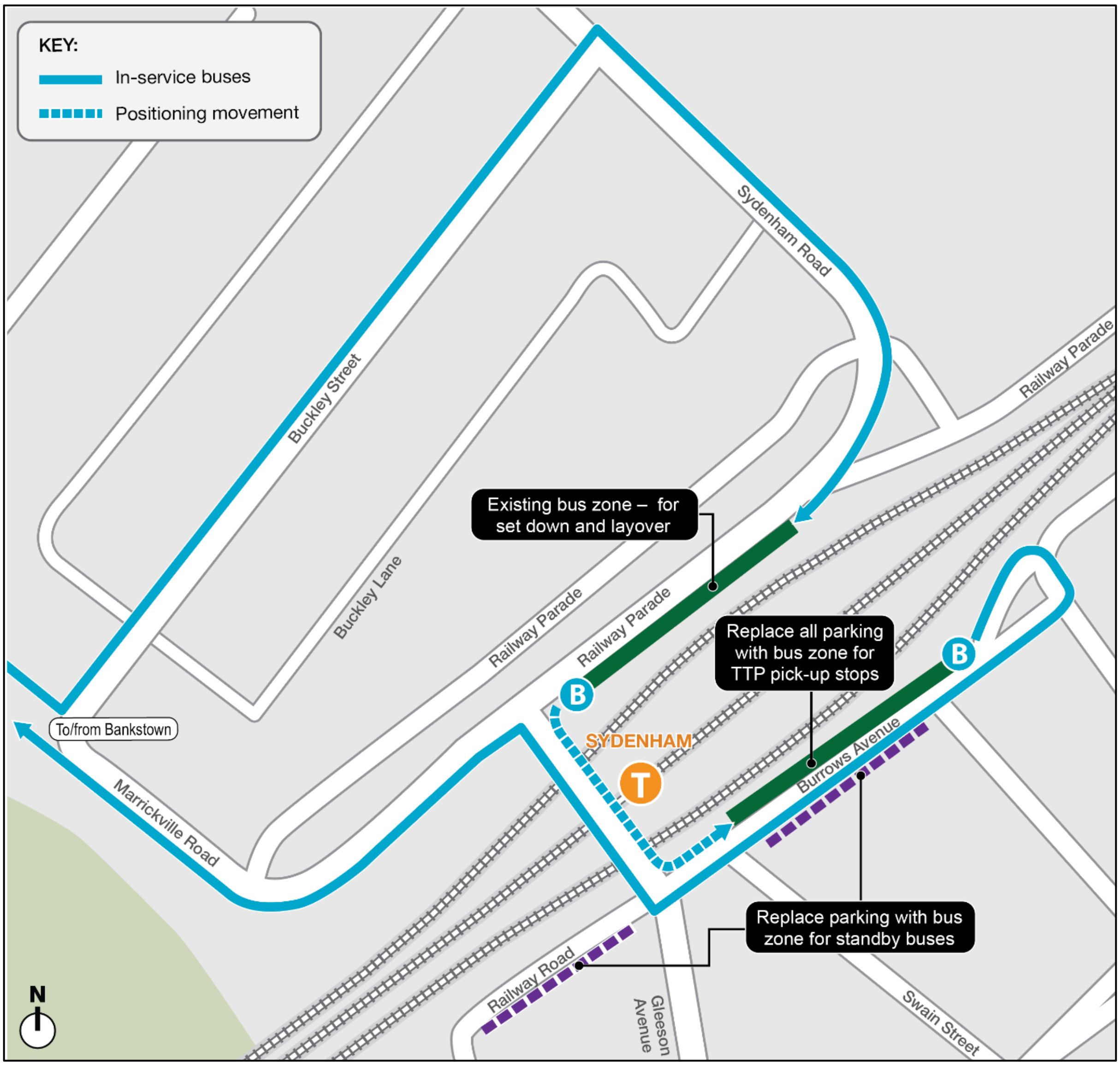


Figure 5.1 **Temporary Transport Strategy - Sydenham (Sydney Metro 2017)**

Sydenham station intersections

FIGURE 5.2

5.2.2 Road Network Operation and Intersection Performance

Three intersections have been modelled in the area surrounding Sydenham Station. These intersections are shown on **Figure 5.2**.

Road Network Performance - AM Peak

Table 5.3 below shows a summary of the intersection assessment undertaken for this station. Refer to **Appendix A** for the turning counts modelled and **Appendix F** for detailed intersection movement summary tables for this station and all further locations assessed in this Chapter.

Table 5.3 Sydenham Station Intersection Assessment – AM Peak

Sydenham Station – AM Peak					
Scenario	Existing	Future	Construction[15]	Baseline TTP	Refined Baseline TTP
B.19 Gleeson Avenue / Burrows Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1962	2155	No Vehicles	2363	2268
Average Delay per Vehicle (Average over all arms in seconds)	16	15		20	17
LoS (Overall)	B	B		B	B
DoS (Worst Movement)	0.67	0.67		0.89	0.76
H.23 Gleeson Avenue / Railway Parade (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2413	2650	No Vehicles	2856	2762
Average Delay per Vehicle (Average over all arms in seconds)	5	5		7	5
LoS (Overall)	A	A		A	A
DoS (Worst Movement)	0.49	0.54		0.80	0.58
H.24 Gleeson Avenue / Unwins Bridge Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2082	2286	No Vehicles	2286	2286
Average Delay per Vehicle (Average over all arms in seconds)	29	37		37	37
LoS (Overall)	B	C		C	C
DoS (Worst Movement)	0.78	0.92		0.92	0.92

The modelled analysis showed that all of the intersections around Sydenham Station have a residual LoS ‘C’ or better after allowing for future traffic growth and the addition of TTS bus traffic. A LoS ‘C’ would not cause delays above that which could be typically expected in the peak hour in Sydney.

The Refined Baseline TTP would reduce the number of buses per hour in the Sydenham precinct from 101 to 55. Due to the relatively low levels of congestion the modelled intersections, the impact of the Refined Baseline TTP is minimal, and all intersections still perform at LoS ‘C’ or better.

[15] 1. The intersections surrounding Sydenham Station are not affected by construction haulage traffic associated with this project. Consequently there are no construction scenarios that have been modelled for Sydenham Station. Construction haulage vehicles for station upgrade assessed within Sydenham Station and Sydney Metro Trains Facility South Modification Report, June 2017

Road Network Performance - PM Peak

Table 5.4 below shows a summary of the intersection assessment undertaken for this station.

Table 5.4 Sydenham Station Intersection Assessment – PM Peak

Sydenham Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
B.19 Gleeson Avenue / Burrows Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2357	2605	No Vehicles	2811	2717
Average Delay per Vehicle (Average over all arms in seconds)	28	29		35	32
LoS (Overall)	B	C		C	C
DoS (Worst Movement)	0.80	0.66		0.84	0.77
H.23 Gleeson Avenue / Railway Parade (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2661	2940	No Vehicles	3148	3054
Average Delay per Vehicle (Average over all arms in seconds)	4	4		4	5
LoS (Overall)	A	A		A	A
DoS (Worst Movement)	0.45	0.50		0.57	0.54
H.24 Gleeson Avenue / Unwins Bridge Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2433	2688	No Vehicles	2688	2688
Average Delay per Vehicle (Average over all arms in seconds)	28	33		33	33
LoS (Overall)	B	C		C	C
DoS (Worst Movement)	0.60	0.79		0.79	0.79

All of the intersections around Sydenham Station have a residual LoS ‘C’ or better after allowing for future and TTP traffic. This delay would not be atypical of peak hour conditions within Sydney.

The Refined Baseline TTP reduces the number of buses per hour in the Sydenham precinct from 101 to 55. Due to the relatively low levels of congestion at the modelled intersections, the impact of the Refined Baseline TTP is minimal.

5.2.3 Public Transport Services

The main bus routes in the Sydenham precinct are on Princes Highway, Railway Road and Marrickville Road (NSW Govt. 2016b). As there are no construction works occurring at Sydenham Station as part of the project, the bus routes would not be affected. However it is noted that as some TTP services are sharing the existing stops, there may be additional crowding of facilities which would need to be assessed and managed as part of the TTP. The cumulative impacts related to construction activities are considered in Chapter 10..

5.2.4 Active Transport Network

The project area has a number of footpaths and roads that are used by pedestrians and cyclists. These would not be affected by the construction work for the project.

5.2.5 Dedicated Commuter and Short-Term Parking

As there are currently no dedicated commuter parking spaces at or near Sydenham Station, no dedicated commuter spaces are affected by the TTP bus set down zone. Overall, there are approximately 760 on and off-street unrestricted parking spaces currently operating at 78% utilisation within a 400m catchment that can be used as informal park and ride spaces.

Approximately 19 on street spaces on Burrows Avenue / Railway Road south of the rail line would be affected by the TTP bus set down zone. These parking spaces would only be affected while the TTP is in operation, which is during possession periods when as a result of school holidays or at weekends, there would be a drop in demand.

5.3 Marrickville Station

5.3.1 Construction Haulage Routes

Figure 5.4 overleaf, shows the proposed construction haulage routes into the worksites within the project area surrounding Marrickville Station. At Marrickville Station it is anticipated that 10 heavy and 10 light vehicles would be generated in the AM and PM peak hours. Construction haulage trips at night would be no more than nine heavy and five light vehicle movements per hour.

The swept path analysis determined that construction haulage vehicles are able to access all of the proposed sites / gates safely with the exception of:

- 12.5m Trucks turning left from Illawarra Road into Station Street. This movement conflicts with the existing building frontage on Station Street due to lack of carriageway width. Trucks up to 8.8m can perform this movement safely. Larger trucks can access the site via active traffic management.

Drawings of the turns are included in **Appendix B**.

5.3.2 Marrickville Temporary Transport Route

The TTP shows two bus routes converging before Marrickville, resulting in 33 buses per hour in each direction calling at Marrickville Station in peak periods. The temporary transport bus stops for these routes utilise existing bus stops.

The indicative rail replacement bus operation at Marrickville Station is shown in **Figure 5.3**.

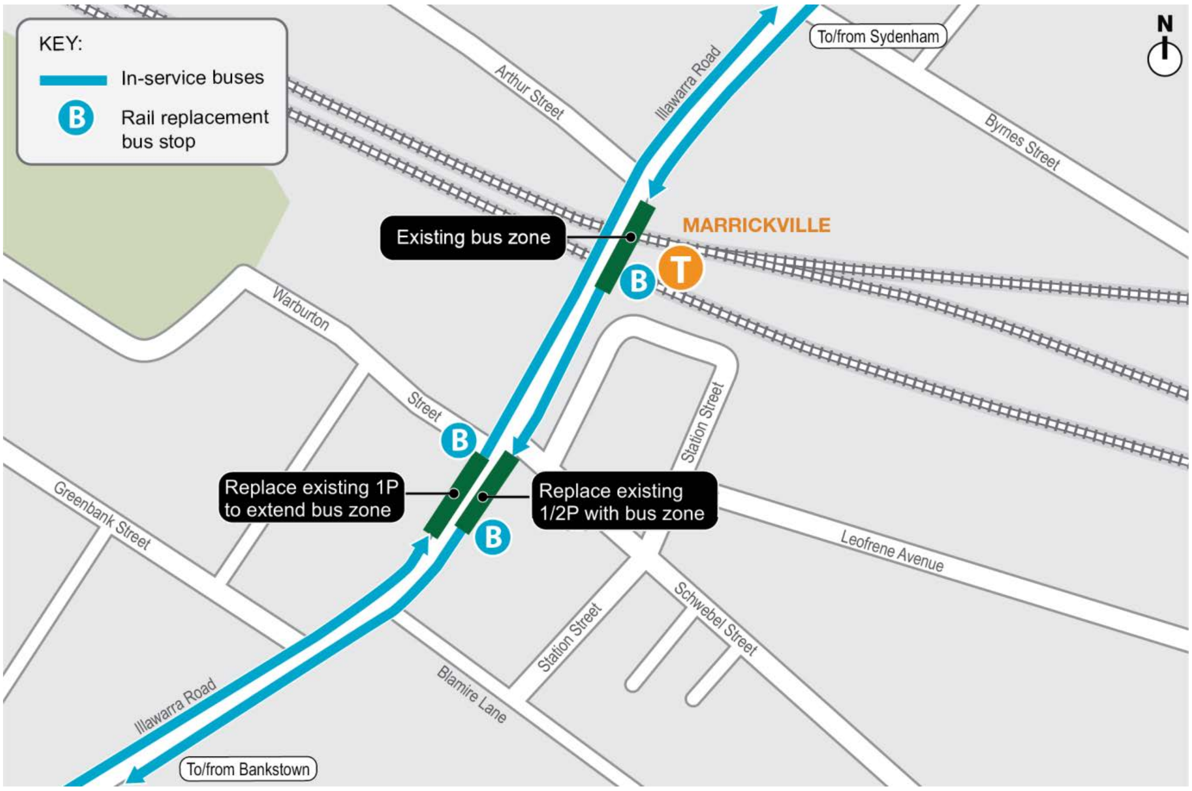


Figure 5.3 Temporary Transport Plan - Marrickville (Sydney Metro 2017)

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Marrickville heavy vehicle routes and station intersections

FIGURE 5.4

5.3.3 Road Network Operation and Intersection Performance

Five intersections were modelled in the area surrounding Marrickville Station as shown in **Figure 5.3**.

Road Network Performance - AM Peak

Table 5.5 provides a summary of the intersection assessment undertaken for this station.

Table 5.5 Marrickville Station Intersection Assessment – AM Peak

Marrickville Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
B.16 Illawarra Road / Warren Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1407	1545	1545	1611	1575
Average Delay per Vehicle (Average over all arms in seconds)	23	25	25	32	28
LoS (Overall)	B	B	B	C	B
DoS (Worst Movement)	0.76	0.81	0.81	0.89	0.89
B.17 Marrickville Road / Illawarra Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1762	1935	1960	2167	2073
Average Delay per Vehicle (Average over all arms in seconds)	19	22	24	76	37
LoS (Overall)	B	B	B	F	C
DoS (Worst Movement)	0.79	0.83	0.87	1.09	0.98
B.18 Marrickville Road / Victoria Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2034	2234	2234	2438	2345
Average Delay per Vehicle (Average over all arms in seconds)	30	49	49	205	192
LoS (Overall)	C	D	D	F	F
DoS (Worst Movement)	0.79	1.03	1.03	1.38	1.38
H.19 Petersham Road / Illawarra Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1158	1271	1297	1365	1328
Average Delay per Vehicle (Average over all arms in seconds)	16	17	16	16	16
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.47	0.50	0.52	0.55	0.54
H.38 Marrickville Station Overbridge (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1039	1141	1166	1233	1197
Average Delay per Vehicle (Average over all arms in seconds)	4	4	4	5	4
LoS (Overall)	A	A	A	A	A
DoS (Worst Movement)	0.45	0.49	0.50	0.55	0.53

For three of the five intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP scenarios result in a LoS ‘C’ or better. A LoS ‘C’ would generally be considered reasonable during peak periods.

The Marrickville Road / Illawarra Road intersection is forecast to experience a drop in the level of service to ‘F’ which denotes the TTP traffic would exceed the capacity of the intersection. The intersection has a LoS of ‘B’ for the Existing, Future and Construction scenarios which would be acceptable to commuters in the peak hour. The LoS worsens to a LoS ‘F’ for the Baseline TTP scenario, however the reduced number of bus movements in the Refined Baseline TTP scenario result in a LoS of C.

The four TTP bus routes converge at this intersection, with two bus routes approaching from the west and two bus routes approaching from the south. The convergence of the bus routes from different directions results in the worst movement (through movement from Marrickville Road west) experiencing a delay of approximately two minutes.

The Refined Baseline TTP reduces the number of buses approaching from the west by approximately 30 per hour and the number approaching from the south by approximately 20 per hour. This results in the level of service improving to LoS ‘C’.

The Marrickville Road / Victoria Road intersection has an existing LoS ‘C’ which is based on an average delay across all arms. The intersection is forecast to experience a decline in amenity to a LoS ‘D’ resulting from future traffic growth and construction haulage traffic. A LoS ‘D’ would be considered a reasonably acceptable delay during peak hours in Sydney.

The level of service further declines to ‘F’ with the addition of the Baseline TTP buses, and the average delay across all arms exceeds three minutes. The through and right turning movements from the Victoria Road north approach are the worst performing movements, with delays of up to four minutes. The additional 101 Baseline TTP buses from the Marrickville Road east and west approach dictates the green time for this intersection, resulting in the large increase in DoS and delay for the movements from Victoria Road north.

The Refined Baseline TTP reduces the average delay to approximately three minutes, but still has a LoS ‘F’. Even if works were undertaken during school holidays the demand would exceed capacity, albeit delays would be reduced. Potential mitigation measures for this intersection are discussed in **Section 5.3.4**.

Road Network Performance - PM Peak

Table 5.6 provides a summary of the intersection assessment undertaken for this station.

Table 5.6 Marrickville Station Intersection Assessment – PM

Marrickville Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
B.16 Illawarra Road / Warren Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1671	1847	1847	1914	1878
Average Delay per Vehicle (Average over all arms in seconds)	19	22	22	27	23
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.69	0.89	0.89	0.90	0.88
B.17 Marrickville Road / Illawarra Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1824	2016	2041	2245	2152
Average Delay per Vehicle (Average over all arms in seconds)	19	20	23	62	27
LoS (Overall)	B	B	B	E	B
DoS (Worst Movement)	0.60	0.73	0.81	1.08	0.90
B.18 Marrickville Road / Victoria Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2353	2600	2600	2808	2713
Average Delay per Vehicle (Average over all arms in seconds)	38	66	66	118	71
LoS (Overall)	C	E	E	F	F
DoS (Worst Movement)	0.95	1.07	1.07	1.18	1.05
H.19 Petersham Road / Illawarra Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1250	1381	1407	1474	1437
Average Delay per Vehicle (Average over all arms in seconds)	13	12	12	12	12
LoS (Overall)	A	A	A	A	A
DoS (Worst Movement)	0.50	0.53	0.55	0.60	0.58
H.38 Marrickville Station Overbridge (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1138	1257	1283	1350	1313
Average Delay per Vehicle (Average over all arms in seconds)	4	5	5	5	5
LoS (Overall)	A	A	A	A	A
DoS (Worst Movement)	0.49	0.54	0.56	0.60	0.58

For three of the five intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP results in a LoS ‘B’ or better. A level of service ‘B’ would not cause delays above that which could be reasonably expected in the peak hour.

The Marrickville Road / Illawarra Road intersection is forecast to experience a decline in amenity as a result of the addition of the TTP traffic. The intersection has a LoS of ‘B’ for the existing, future and construction scenarios, worsening to a LoS ‘E’ for the Baseline TTP scenario. The left and through movements from the Marrickville Road west approach are the worst performing movements with delays of nearly three minutes. The Refined Baseline TTP reduces the number of buses through the intersection, which improves the intersection to an acceptable LoS ‘B’.

The Marrickville Road / Victoria Road intersection has a current LoS 'C' which declines to a LoS 'E' with future traffic growth and the addition of construction haulage traffic. The intersection further declines to a LoS 'F' with the addition of TTP traffic.

The Refined Baseline TTP reduces the average delay from two minutes to approximately one minute, but the LoS is still 'F'. This may surpass what is considered to be acceptable by local residents. The worst movements are the through and left turning movements from the Marrickville Road east approach because the right turn is being opposed by the additional TTP buses from the west approach.

Performance of the through and the right turn movements from the Victoria Road South approach are also worsened in the Baseline TTP scenario as the green time is dictated by the additional 101 Baseline TTP buses from the Marrickville Road east and west approaches. Potential mitigation measures for this intersection are discussed in the following section.

5.3.4 Mitigation

As described in **Section 5.3.3**, the LoS at the intersection of Marrickville Road / Victoria Road is expected to deteriorate in the future due to traffic volume growth and the addition of TTP bus volumes during the construction period resulting in further increased congestion and delays.

The following phasing changes have been tested as mitigation measures to improve intersection performance during the Refined Baseline TTP scenario:

- **AM Peak**: Additional traffic signal phase for Marrickville Road west approach during the AM peak. As this approach has the highest traffic volume during the AM peak, allowing an additional signal phase results in reduced delays and congestion on Marrickville Road.

  In addition to the signal phasing change, the phase times have also been 'optimised' in SIDRA to ensure each approach gets the appropriate green time, whilst maintaining the cycle time.

  Whilst the proposed mitigation measures do not reduce the LoS from 'F', the level of congestion on Marrickville Road is reduced. Overall congestion at this intersection can be further improved by increasing the overall cycle time; this however requires consideration of adjacent intersections operation and co-ordination.

- **PM Peak**: Additional traffic signal phase for Marrickville Road east approach during the PM. This approach has the highest traffic volumes during the PM peak, and allowing an additional signal phase results in reduced delays and congestion on Marrickville Road. The overall intersection LoS reduces to 'D', indicating improved intersection performance in the Mitigated TTP scenario.

  In addition to the signal phasing change, the phase times have also been 'optimised' in SIDRA to ensure each approach gets the appropriate green time, whilst maintaining the cycle time.

Table 5.7 shows the mitigation modelling results with the mitigation described above.

Table 5.7 Marrickville Road / Victoria Road AM & PM Peak Mitigation Results

B.18 Marrickville Road / Victoria Road (Signals)					
Scenario	Existing	Future	Baseline TTP	Refined Baseline TTP	Mitigated TTP
AM Peak					**Year Capped: 2023**
Demand Flow (veh)	2034	2234	2438	2345	2345
Average Delay per Vehicle (Average over all arms in seconds)	30	49	205	192	84
LoS (Overall)	C	D	F	F	F
DoS (Worst Movement)	0.79	1.03	1.38	1.38	1.14
AM Peak (125 second cycle time)					**Year Capped: 2023**
Demand Flow (veh)	2034	2234	2438	2345	2345
Average Delay per Vehicle (Average over all arms in seconds)	30	49	205	192	58
LoS (Overall)	C	D	F	F	E
DoS (Worst Movement)	0.79	1.03	1.38	1.38	0.99
PM Peak					**Year Capped: 2023**
Demand Flow (veh)	2353	2600	2808	2713	2713
Average Delay per Vehicle (Average over all arms in seconds)	38	66	118	71	47
LoS (Overall)	C	E	F	F	D
DoS (Worst Movement)	0.95	1.07	1.18	1.05	0.95

To summarise, as shown by **Table 5.7**, the proposed mitigation measures are expected to reduce overall congestion and delays. Whilst the overall intersection LoS is still 'E' during the AM peak, the level of congestion is reduced from the unmitigated scenario. It should also be noted that the models use peak hour traffic flows during non-school holiday periods. However the TTP would be in place during possession periods which is mostly during school holiday periods. Consequently the modelling results reflect the worst case scenario and the delays incurred at the intersection are likely to be lower due to lower school holiday traffic volumes.

5.3.5 Public Transport Services

The main bus routes in the Marrickville precinct are on Marrickville Road, Victoria Road, Illawarra Road and Livingstone Road (NSW Govt. 2016b). An assessment of the worksite extent shows that there should not be a requirement to move bus stops to facilitate construction haulage vehicle movements and access to the worksite.

Bus stop 2204101 is located on Illawarra Road Bridge. This bus stop should not be affected either by the worksite extent, however the stop is in close proximity to the worksite adjacent to Station Street and therefore may require relocation if cranes are to be used from the worksite extent to access the bridge.

5.3.6 Active Transport Network

The project area and associated compound area on Station Street would require the establishment of pedestrian zones for rail passengers to ensure that they can safely manoeuvre from the train to the pedestrian footpaths in the surrounding road network. The project area on the northern side of the railway line is not within the road reserve and would therefore not affect pedestrians. The bike friendly routes would not be affected by either of the project areas.

Construction works to install a new signalised intersection and upgrade existing footpaths on the corner of Warburton Road, Schwebel Street and Illawarra Road may result in short-term pedestrian movement impacts, and may require the temporary and localised diversion of some pedestrian routes at intersections for short periods, generally less than a week.

Carrington Road as there is sufficient width and a painted on-street bike path. Illawarra Road identified as an on-road bike friendly road. Cyclists and construction haulage vehicles would be sharing the road but the relatively low volume of construction haulage vehicles should not have a major effect on the user experience or safety of the cyclists.

5.3.7 Commuter and Short-Term Parking

As there are currently no dedicated commuter parking spaces at or near Marrickville Station, no long term parking spaces are affected by the worksite. However, there are three kiss and ride spaces, one accessible bay, one taxi space and three on-street time restricted parking spaces in Station Street. These parking spaces would be required for the duration of the construction activities at Marrickville Station and area.

Overall, there are approximately 1260 on-street unrestricted parking spaces currently operating at 82% utilisation within a 400m catchment that can be used as informal park and ride spaces. There are no off-street parking spaces near Marrickville Station.

Three on street spaces on Illawarra Road south of the rail line would be required to provide the TTP bus stops, only during possession periods. During these periods there is likely to be a reduction in demand for parking at the stations. This decrease results from the influence of school holiday periods and the change of mode share as parking at the station to commute by train would not be possible and alternative means to reach destinations would be required (i.e. bus service, active transport or drive).

5.3.8 Construction Worker Parking

It is anticipated that four to ten parking spaces would be provided at any one time for project workers in the Marrickville Station compound area. **Table 5.8** provides the anticipated daily construction workforce volumes for Marrickville Station. It is assumed that public transport would be promoted as the primary mode of transport for construction workers. This would reduce the impacts on the local road network and parking requirements. As noted above, parking in the area is not fully utilised therefore there is capacity to accommodate any remaining worker parking. Off-site parking alternatives and associated shuttle arrangements would also be investigated to transport workers to and from the site.

Table 5.8 Anticipated Daily Workforce- Marrickville

	Non Possession		Possession Short Period Close-down	
	Peak	Typical / Average	Peak	Typical/Average
Marrickville Station	60	40	130	65

5.4 Dulwich Hill Station

5.4.1 Dulwich Hill Construction Haulage Routes

Figure 5.6 overleaf, shows the proposed construction haulage routes into the sites to be used during construction. At Dulwich Hill Station it is anticipated that 10 heavy and 10 light vehicles would be generated in the AM and PM peak hours. Construction haulage trips at night would be no more than nine heavy and five light vehicle movements per hour.

The swept path analysis determined that construction haulage vehicles are able to access all of the proposed sites / gates safely. Drawings of the turns are included in **Appendix B**.

5.4.2 Dulwich Hill Temporary Transport Route

The TTP has two of the four bus routes converging before Dulwich Hill, resulting in 33 buses per hour in each direction calling at Dulwich Hill Station in peak periods. The temporary transport bus stops for these routes utilise existing bus stops. The other two routes do not stop at, or pass through the vicinity of the Dulwich Hill Station.

The indicative rail replacement operation at Dulwich Hill Station is shown in **Figure 5.5**.

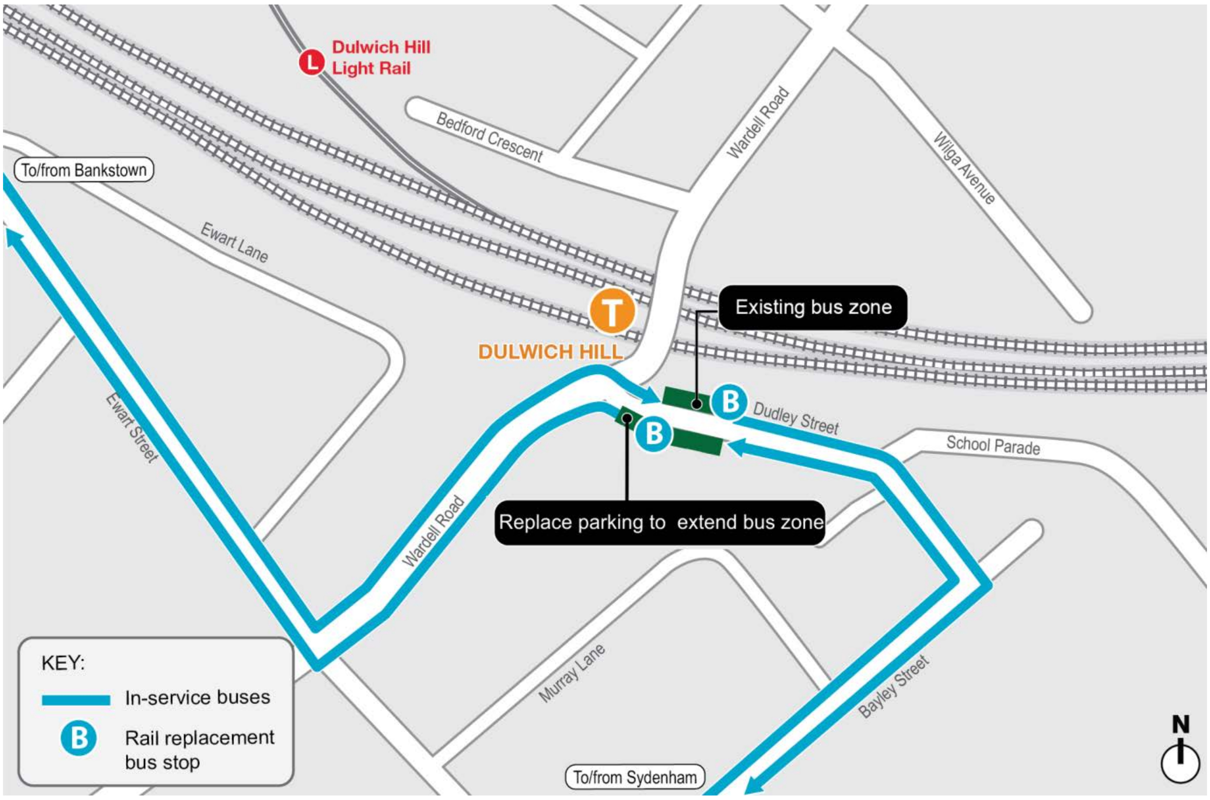

Figure 5.5 Temporary Transport Plan – Dulwich Hill (Sydney Metro 2017)

5.4.3 Road Network Operation and Intersection Performance

Six intersections were modelled in the area surrounding the Dulwich Hill Station as shown in **Figure 5.6**.

Road Network Performance – AM Peak

Table 5.9 provides a summary of the intersection assessment undertaken for this station.

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Dulwich Hill heavy vehicle routes and station intersections

FIGURE 5.6

Table 5.9 Dulwich Hill Station Intersection Assessment – AM Peak

Dulwich Hill Station – AM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
B.15 Wardell Road / Ewart Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1664	1827	1843	1910	1904
Average Delay per Vehicle (Average over all arms in seconds)	30	102	120	196	179
LoS (Overall)	C	F	F	F	F
DoS (Worst Movement)	0.94	1.10	1.13	1.32	1.28
H.16 Wardell Road / Dudley Street (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	1204	1322	1322	1391	1385
Average Delay per Vehicle (Average over all arms in seconds)	9	18	18	34	31
Average Delay per Vehicle (Worst Movement in seconds)	38	65	65	85	85
LoS (Worst Movement)	C	E	E	F	F
DoS (Worst Movement)	0.78	0.91	0.91	1.00	0.99
B.28 New Canterbury Road / Marrickville Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2408	2644	2644	2783	2685
Average Delay per Vehicle (Average over all arms in seconds)	16	22	22	22	22
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.72	0.95	0.95	0.95	0.95
H.25 Ewart Street / Bayley Street (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	642	705	709	779	741
Average Delay per Vehicle (Average over all arms in seconds)	1	1	2	3	2
Average Delay per Vehicle (Worst Movement in seconds)	13	15	15	17	16
LoS (Worst Movement)	A	B	B	B	B
DoS (Worst Movement)	0.27	0.30	0.30	0.31	0.30
H.36 New Canterbury Road / Terrace Road (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	2271	2494	2527	2665	2578
Average Delay per Vehicle (Average over all arms in seconds)	1	1	1	1	1
Average Delay per Vehicle (Worst Movement in seconds)	10	10	12	14	13
LoS (Worst Movement)	A	A	A	A	A
DoS (Worst Movement)	0.58	0.64	0.64	0.68	0.65

Dulwich Hill Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
H.37 Wardell Road / Marrickville Road (Signals)					**Year Capped: 223**
Demand Flow (veh)	1933	2123	2140	2277	2221
Average Delay per Vehicle (Average over all arms in seconds)	28	51	61	94	88
LoS (Overall)	B	D	E	F	F
DoS (Worst Movement)	0.90	1.10	1.14	1.17	1.20

For three of the six intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP result in a LoS 'B' or better. This delay would not be atypical of peak hour conditions within Sydney.

The Wardell Road / Ewart Street intersection is forecast to perform poorly due to future traffic volumes, regardless of this project. The addition of TTP traffic would worsen this performance. The overall intersection has a LoS of 'F' in the future, construction and TTS scenarios. Noting that the assessment has assumed the full background non holiday flows, this is a slight over estimation of the delays for the construction period, where the TTP only occurs in holidays. However, scheduling construction works during school term break periods would help to alleviate congestion at this intersection, albeit this would still require further mitigation as the intersection is some 30% over capacity.

The right turning movements from the Ewart Street north approach is the worst performing movement with an average delay of approximately six minutes in the Baseline TTP scenario. The 33 buses on the Wardell Road east approach resulted in less green time (32 seconds in the construction scenario to 27 seconds in the Baseline TTP scenario) for the opposed right turning movement from the Ewart Street north approach. The LoS remained at 'F' during the Refined Baseline TTP scenario and indicates that it would lead to a moderate increase in delays for drivers on Ewart Street.

The Wardell Road / Marrickville Road intersection is also forecast to experience a decline in performance as a result of the addition of the TTP traffic. The overall intersection has a LoS of 'E' in the construction scenario which worsens to 'F' in the TTP scenarios. Potential mitigation measures for these two intersections are discussed in **Section 5.4.4**.

The through and right turning movements from the Marrickville Road north approach are the worst performing movements. The deterioration in amenity for the through movement can be attributed to the additional TTP buses. For the opposed right turning movement, the additional TTP buses from the Marrickville Road south approach going through the intersection reduces the gaps available to make an opposed turn. The Refined Baseline TTP has a minimal reduction to the overall delay at the intersection because the number of buses along Marrickville Road is reduced, but additional buses are added to Wardell Road.

The right turning movements may choose to use a parallel road, such as Canonbury Grove, which potent would reduce delays to a level that may be considered acceptable to local residents.

The Wardell Road / Dudley Street intersection has an existing LoS 'C'. This worsens to an 'E' in the future and construction scenarios and to an 'F' in the TTP scenarios. As the intersection is a priority controlled intersection, the LoS 'F' can be attributed to the right turning movement from the Wardell Road west approach giving way to an un-opposed through movement from Wardell Road. The Refined Baseline TTP has minimal effect on the intersection performance because there are less replacement buses turning right from Wardell Road west. If works are scheduled to take place during the school term 4 break, the reduction in traffic flows during this period would help to alleviate congestion at this intersection, and therefore result in delays that are somewhat consistent with the usual non holiday period conditions.

It is noted that there are alternate routes available and whilst the TTS would retain this route, other drivers may divert onto parallel routes, further reducing the impact of the construction at this intersection.

Road Network Performance – PM Peak

Table 5.10 provides a summary of the intersection assessment undertaken for this station. Refer to **Appendix A** for the turning counts modelled and **Appendix F** for detailed intersection movement summary tables.

Table 5.10 Dulwich Hill Station Intersection Assessment – PM Peak

Dulwich Hill Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
B.15 Wardell Road / Ewart Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2028	2241	2256	2323	2317
Average Delay per Vehicle (Average over all arms in seconds)	32	55	60	94	88
LoS (Overall)	C	D	E	F	F
DoS (Worst Movement)	0.91	1.01	1.03	1.11	1.11
H.16 Wardell Road / Dudley Street (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	1382	1527	1527	1594	1588
Average Delay per Vehicle (Average over all arms in seconds)	6	10	10	14	13
Average Delay per Vehicle (Worst Movement in seconds)	35	58	58	73	73
LoS (Worst Movement)	C	E	E	F	F
DoS (Worst Movement)	0.72	0.82	0.82	0.82	0.85
B.28 New Canterbury Road / Marrickville Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2353	2600	2600	2737	2650
Average Delay per Vehicle (Average over all arms in seconds)	23	23	23	27	25
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.55	0.61	0.61	0.71	0.65
H.25 Ewart Street / Bayley Street (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	796	879	884	951	914
Average Delay per Vehicle (Average over all arms in seconds)	2	2	2	3	2
Average Delay per Vehicle (Worst Movement in seconds)	16	19	19	23	20
LoS (Worst Movement)	B	B	B	B	B
DoS (Worst Movement)	0.36	0.40	0.40	0.46	0.43

Dulwich Hill Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
H.36 New Canterbury Road / Terrace Road (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	2255	2492	2525	2667	2577
Average Delay per Vehicle (Average over all arms in seconds)	1	1	2	2	2
Average Delay per Vehicle (Worst Movement in seconds)	17	22	33	44	36
LoS (Worst Movement)	B	B	C	D	C
DoS (Worst Movement)	0.55	0.61	0.61	0.69	0.64
H.37 Wardell Road / Marrickville Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2166	2393	2411	2552	2494
Average Delay per Vehicle (Average over all arms in seconds)	29	36	36	105	70
LoS (Overall)	C	C	C	F	E
DoS (Worst Movement)	0.86	0.92	0.90	1.31	1.25

For three of the six intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP results in a LoS ‘D’ or better. A LoS ‘D’ would generally be considered reasonable during peak periods.

The Wardell Road / Ewart Street intersection is forecast to experience a decline in amenity as a result of the addition of the future, construction and TTP traffic. The overall intersection LoS worsens with each addition of traffic, resulting in a LoS ‘F’ in the Baseline and Refined Baseline TTP scenarios.

The through and right turning movements from the Wardell Street east approach are the worst performing movements with an average delay of approximately two minutes in the Baseline TTP scenario. This delay results from the right turning movement occurring at the same time as the opposing Wardell west approach through traffic. The additional 33 buses at the opposing west approach in the Baseline TTP scenario results in the decreased level of service. Whilst less than desirable, a delay of 90 seconds in the peak periods is unlikely to result in congestion beyond the immediate location.

The average delay reduces by a minor amount and the level of service remains as ‘F’ in the Refined Baseline TTP. The minor change occurs because the number of replacement buses has reduced from 33/hour to 30/hour in the AM peak.

The Wardell Road / Marrickville Road intersection is also forecast to experience a decline in amenity as a result of the addition of the TTP traffic. The intersection has a LoS of ‘C’ in the future and construction scenarios, which worsens to ‘F’ in the Baseline TTP scenario.

The through and right turning movements from the Marrickville Road north approach are the worst performing movements with an average delay of nearly six minutes in the Baseline TTP scenario. The deterioration in amenity of the through movement can be attributed to the additional 68 buses. For the opposed right turning movement, the additional 68 buses from the Marrickville Road south approach reduces the gaps available to make an opposed turn.

The LoS improves slightly to ‘E’ in the Refined Baseline TTP scenario. The improvement results from a reduction of 43 TTP buses at the Marrickville Road south approach which provides more frequent gaps for the right turning traffic. Potential mitigation measures for these two intersections are discussed in **Section 5.4.4**.

The Wardell Road / Dudley Street intersection has an existing LoS ‘C’ which worsens to ‘E’ in the future and construction Scenarios. This declines further to ‘F’ in the Baseline TTP scenario. The worst movement is the right turning movement from the Wardell Road west approach, which must give way to an un-opposed through movement from Wardell Road, resulting in average delays in excess of one minute.

The DoS increases for the worst movement with the Refined Baseline TTP and the LoS remains as ‘F’ because TTP Route 4 is modified to continue straight through the Wardell Road / Dudley Street intersection. This reduces the frequency of gaps for right turning vehicles, increasing the delay.

At the Wardell / Dudley Street intersection, drivers performing opposed turning movements may choose to divert to the Wardell Road / Ewart Street signalised intersection to avoid waiting for a gap in the traffic flow at the priority intersection. If works are scheduled to take place during the school term 4 break for this intersection, the reduction in traffic flows during this period would help to alleviate congestion at this intersection.

5.4.4 Mitigation

The intersections of Wardell Road / Ewart Street and Marrickville Road / Wardell Road are expected to have high congestion and delays. Mitigation measures have been tested to potentially improve high congestion and delays resulting from additional Refined Baseline TTP volumes.

Wardell Road / Ewart Street mitigation

As described in **Section 5.4.3,** under furture scenarios, this intersection is forecast to experience LoS F. The right turning movement from Ewart Street north would experience the highest congestion and delays during the AM peak, whereas Wardell Street east approach would have the worst performance during the PM peak.

The following mitigation measures have been tested to reduce expected congestion and delays:

- change Wardell Road east approach from shared through and right to right only
- change Ewart Street north approach from shared through and right to right only
- change traffic signal phasing to run Ewart Street north approach twice during the morning peak
- change traffic signal phasing to run Wardell Road east approach twice during the evening peak
- run optimised phase times (whilst maintaining cycle time).

As both through and right turning volumes are quite high on Wardell Road and Ewart Road, changing the lane arrangement would allow traffic to flow better through the intersection. The additional phasing changes during the AM and PM peak provides the dominant approach (i.e. with high traffic volumes) more green time, and therefore reduces overall intersection delays and congestion.

These mitigation measures result in improved intersection performance, as shown with LoS ‘D’ during both AM and PM peaks in the Mitigated TTP scenario in **Table 5.11**.

Table 5.11 Wardell Road / Ewart Street AM & PM Peak Mitigation Results

B.15 Wardell Road / Ewart Street (Signals)					
Scenario	Existing	Future	Baseline TTP	Refined Baseline TTP	Mitigated TTP
AM Peak					**Year Capped: 2023**
Demand Flow (veh)	1664	1827	1910	1904	1904
Average Delay per Vehicle (Average over all arms in seconds)	30	102	196	179	45
LoS (Overall)	C	F	F	F	D
DoS (Worst Movement)	0.94	1.10	1.32	1.28	0.94
PM Peak					**Year Capped: 2023**
Demand Flow (veh)	2028	2241	2323	2317	2317
Average Delay per Vehicle (Average over all arms in seconds)	32	55	94	88	53
LoS (Overall)	C	D	F	F	D
DoS (Worst Movement)	0.91	1.01	1.11	1.11	0.99

To summarise, as shown by **Table 5.11**, the proposed mitigation measures are expected to reduce congestion and delays to an acceptable LoS during AM and PM peaks, and improve intersection performance during the Refined Baseline TTP scenario.

Wardell Road / Marrickville Road mitigation

As with the Wardell Road/Ewart Street intersection above, the intersection performance at Wardell Road / Marrickville Road would be expected to deteriorate due to traffic volume growth, and the addition of TTP bus volumes further increases congestion and delays at this intersection. The through and right turning movements from Marrickville Road north approach are the worst performing movements during both AM and PM peaks.

The following mitigation measures have been tested to reduce expected increase in congestion and delays:

- change lane arrangement for Wardell Road west from shared through and right, to right only
- change traffic signal phasing to run Marrickville Street north approach twice during the morning peak
- change traffic signal phasing to run Marrickville Street south approach twice during the evening peak
- run optimised phase times (whilst maintaining cycle time).

The phasing changes during the AM and PM peak provides the dominant approach more green time, and therefore reduces overall intersection delays and congestion. The lane configuration change on Wardell Road west is recommended due to the high proportion of vehicles making a right turn from this approach.

These mitigation measures result in improved intersection performance, as shown with LoS ‘D’ during the AM peak, and LoS ‘C’ during the PM peak for the Mitigated TTP scenario in **Table 5.12**.

Table 5.12 Wardell Road / Marrickville Road AM & PM Peak Mitigation Results

H.37 Wardell Road / Marrickville Road (Signals)					
Scenario	Existing	Future	Baseline TTP	Refined Baseline TTP	Mitigated TTP
AM Peak		**Year Capped: 2023**			
Demand Flow (veh)	1933	2123	2277	2221	2221
Average Delay per Vehicle (Average over all arms in seconds)	28	51	94	88	45
LoS (Overall)	B	D	F	F	D
DoS (Worst Movement)	0.90	1.10	1.17	1.20	0.97
PM Peak		**Year Capped: 2023**			
Demand Flow (veh)	2166	2393	2552	2494	2494
Average Delay per Vehicle (Average over all arms in seconds)	29	36	105	70	33
LoS (Overall)	C	C	F	E	C
DoS (Worst Movement)	0.86	0.92	1.31	1.25	0.90

To summarise, as shown by **Table 5.12**, the proposed mitigation measures are expected to reduce congestion and delays to an acceptable LoS during AM and PM peaks, and improve intersection performance during the Refined Baseline TTP scenario.

5.4.5 Public Transport Services

The main bus routes in the Dulwich Hill precinct are on Wardell Road, Ewart Street and Beauchamp Street (NSW Govt. 2016b). An assessment of the worksite extent shows that there would be no need for relocation of bus stops as a consequence of construction access and movements in the area.

While the worksite boundary is in close proximity to bus stops, it does not encroach into public land and would not therefore impact the bus network.

5.4.6 Active Transport Network

There are existing footpaths for pedestrians adjacent to the project area and associated worksite and compound areas. Construction activities are generally outside of the road reserve and therefore are not expected to affect pedestrian connectivity and safety along footpaths. Works adjacent to Ewart Lane and Bedford Crescent may require half road closures during construction activities and would potentially require closure of the footpath along one side of each road adjacent to the worksite during construction. Pedestrian accessibility would still be maintained during works via active transport management and pedestrians would be directed to footpaths unaffected by works on the opposite side of the road.

The following roads are considered cycling friendly, and within close proximity to the worksite [16]:

- Challis Avenue (dedicated cycling lanes)
- School Parade to Kays Avenue East containing separate dedicated cycling lanes along the south side of the railway
- Dudley Street (dedicated cycling lanes).

These roads are not expected to be impacted by construction activities as the works are not within the road reserve.

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[16] Source - http://www.sydneycycleways.net/map/

There are five existing cycle racks, providing 10 bike parking spaces, in the open space on Bedford Crescent[17]. This area is proposed to be upgraded during station works[18]. Alternate bike parking locations would be assessed and provided during works, that would also be accessible for LRT customers, which would meet the requirements of the NSW Government Bike and Ride Program and TfNSW 'Bicycle Facilities' standard.

5.4.7 Commuter and Short-Term Parking

There are currently 55 dedicated commuter spaces in Ewart Lane near Dulwich Hill Station and due to the location of the worksite extent; approximately 27 spaces would be removed from use by short term construction possessions. During this time commuters can use on-street parking in local residential streets, transfer to buses or move to alternative modes of transport such as cycling.

Approximately nine out of the 17 time restricted spaces along Bedford Crescent would be removed from use for the entirety of the construction possession. During construction, there are short periods where construction activities may require additional footprint and the remaining spaces along Bedford Crescent would be suspended during these short term construction possessions.

Other on-street and off-street parking around the station would be unaffected by construction. Overall, there are approximately 1260 unrestricted parking spaces operating at 73% utilisation within a 400 m catchment that can be used by commuters.

Dedicated commuter spaces are not expected to be affected while the TTP is in operation, however approximately four on street spaces on Dudley Street south of the rail line would be affected by the TTP bus stops. These parking spaces would only be affected while the TTP is in operation, which is during possession periods. During these periods there is likely to be a reduction in demand for parking at the stations. This decrease results from the influence of school holiday periods and the change of mode share as some drivers choose to drive to another station or their destination.

5.4.8 Construction Worker Parking

It is anticipated that four to ten parking spaces would be provided at any one time for project workers in the Dulwich Hill area. The location of these parking spaces would be determined based on the specific location within the worksite which has active construction at the time.

Table 5.13 provides the anticipated daily construction workforce volume in the Dulwich Hill Area. It is assumed that public transport would be promoted as the primary mode of transport for construction workers. This would reduce the impacts on the local road network and parking requirements. As noted above, parking in the area is not fully utilised therefore there is capacity to accommodate any remaining demand for worker parking. Off-site parking alternatives and associated shuttle arrangements would also be investigated to transport workers to and from the site.

Table 5.13 Anticipated Daily Workforce- Dulwich Hill

	Non Possession		Possession Short Period Close-down	
	Peak	Typical / Average	Peak	Typical
Dulwich Hill Station	60	40	130	65

[17] Source - Southwest Metro – Extent of Precinct Works & Interchange Requirements, Sydney Metro
[18] Source – Sydney Metro Southwest Precinct Plan – Dulwich Hill Station, Sydney Metro

5.5 Hurlstone Park Station

5.5.1 Hurlstone Park Construction Haulage Routes

Figure 5.8 overleaf, shows the proposed construction haulage routes into the sites to be used during construction**.** At Hurlstone Park Station it is anticipated that 10 heavy and 10 light vehicles would be generated in the AM and PM peak hours. Construction haulage trips at night would be no more than nine heavy and five light vehicles per hour.

The swept path analysis determined that construction haulage vehicles are generally able to access all of the proposed sites / gates safely. However the left turn from Floss Street into Crinan Street is restricted by the existing kerb and a tree.

5.5.2 Hurlstone Park Temporary Transport Route

Two bus routes converge at Hurlstone Park, resulting in 33 buses per hour in each direction calling at Hurlstone Park Station in peak periods. The temporary transport bus stops for these routes would use existing bus stops. The remaining two TTS routes follow New Canterbury Road carrying a peak hour volume of 68 buses per hour in each direction and bypass Hurlstone Station. Please refer to **Appendix E** for the TTP.

The indicative rail replacement operation at Hurlstone Park Station is shown in **Figure 5.7**.

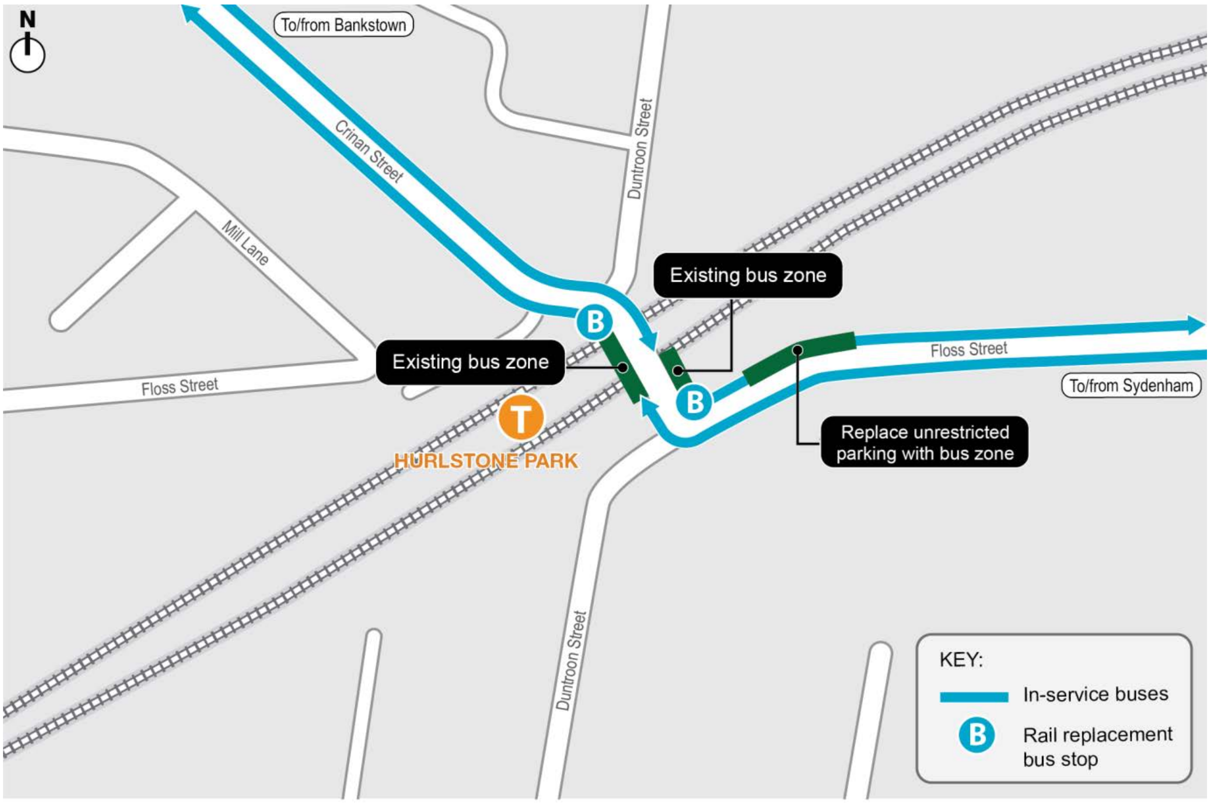

Figure 5.7 **Temporary Transport Plan – Hurlstone Park (Sydney Metro 2017)**

5.5.3 Road Network Operation and Intersection Performance

Four intersections were modelled in the area surrounding Hurlstone Park Station as shown in **Figure 5.8**.

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Hurlstone Park heavy vehicle routes and station intersections

FIGURE 5.8

Road Network Performance – AM Peak

Table 5.14 below shows a summary of the intersection assessment undertaken for this station.

Table 5.14 Hurlstone Park Station Intersection Assessment – AM Peak

Hurlstone Park Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
B.14 Canterbury Road / Crinan Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	3025	3322	3356	3503	3436
Average Delay per Vehicle (Average over all arms in seconds)	20	24	25	26	26
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.61	0.67	0.68	0.74	0.73
B.27 Old Canterbury Road / New Canterbury Road (Signals)					**Year Capped: 2021**
Demand Flow (veh)	3052	3266	3266	3403	3316
Average Delay per Vehicle (Average over all arms in seconds)	26	34	34	56	41
LoS (Overall)	B	C	C	D	C
DoS (Worst Movement)	0.91	0.96	0.96	1.05	0.99
H.17 Crinan Street / Floss Street - South of Railway (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	703	772	788	811	852
Average Delay per Vehicle (Average over all arms in seconds)	8	8	8	8	8
Average Delay per Vehicle (Worst Movement in seconds)	12	12	12	12	13
LoS (Worst Movement)	A	A	A	A	A
DoS (Worst Movement)	0.25	0.28	0.29	0.32	0.37
H.18 Floss Street / Crinan Street / Duntroon Street (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	762	837	868	892	932
Average Delay per Vehicle (Average over all arms in seconds)	2	2	2	2	3
Average Delay per Vehicle (Worst Movement in seconds)	12	13	14	15	17
LoS (Worst Movement)	A	A	B	B	B
DoS (Worst Movement)	0.23	0.25	0.27	0.28	0.30

All of the intersections modelled at Hurlstone Park Station have a LoS 'D' or better for the worst case scenario which could be reasonably expected in the peak hour in Sydney.

Road Network Performance – PM Peak

Table 5.15 below shows a summary of the intersection assessment undertaken for this station.

Table 5.15 Hurlstone Park Station Intersection Assessment – PM Peak

Hurlstone Park Station – PM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
B.14 Canterbury Road / Crinan Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	3253	3595	3629	3777	3710
Average Delay per Vehicle (Average over all arms in seconds)	20	20	22	25	27
LoS (Overall)	B	B	B	B	C
DoS (Worst Movement)	0.74	0.78	0.80	0.86	0.83
B.27 Old Canterbury Road / New Canterbury Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	3413	3772	3772	3912	3823
Average Delay per Vehicle (Average over all arms in seconds)	31	36	36	46	37
LoS (Overall)	C	C	C	D	C
DoS (Worst Movement)	0.85	0.91	0.91	1.01	0.9
H.17 Crinan Street / Floss Street - South of Railway (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	643	711	726	748	787
Average Delay per Vehicle (Average over all arms in seconds)	8	7	8	8	8
Average Delay per Vehicle (Worst Movement in seconds)	14	13	13	13	14
LoS (Worst Movement)	A	A	A	A	A
DoS (Worst Movement)	0.21	0.24	0.25	0.26	0.29
H.18 Floss Street / Crinan Street / Duntroon Street (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	717	792	823	845	883
Average Delay per Vehicle (Average over all arms in seconds)	2	3	3	3	3
Average Delay per Vehicle (Worst Movement in seconds)	12	14	15	16	17
LoS (Worst Movement)	A	B	B	B	B
DoS (Worst Movement)	0.18	0.19	0.21	0.22	0.24

As with the AM Peak, all of the intersections modelled at Hurlstone Park Station have a LoS 'D' or better for the worst case scenario.

5.5.4 Public Transport Services

The main bus routes in the Hurlstone Park precinct are on Crinan Street, Hampden Street, The Parade and Garnet Street (NSW Govt. 2016b). An assessment of the worksite boundary shows that one bus stop would need to be relocated as a result of construction activities.

Bus route 406 travels along Duntroon Street which requires a full closure during possession periods. It is proposed that the bus reroutes using Tennant Parade, Garnet Street and Floss Street before crossing the Duntroon Street Overbridge. Bus stops 219319 in the southbound direction and 219350 in the northbound direction would be missed during the reroute. Passengers wishing to use these stops would be required to walk an extra 150m to the bus stops on Burnett Street.

5.5.5 Active Transport Network

There are existing footpaths for pedestrians adjacent to the worksite adjacent to Hurlstone Park Station. Construction activities at this location are generally outside of the road reserve (except for Floss Street) and therefore are not expected to affect pedestrian connectivity and safety along footpaths.

Station works would potentially require the closure of Floss Street commuter car park and footpath closure on Duntroon Street (adjacent Hurlstone Park Station) during possession periods only. During such periods, the footpath would be maintained via active traffic management and re-directing pedestrians to footpaths unaffected by works. Pedestrians may be redirected to cross the road at upstream intersections, however further analysis of these intersections feasibility are subject to construction staging details. The staging details would also provide details for pedestrian diversions and the total distance and delay experienced by them during works.

There are no dedicated or cycle friendly roads in close proximity to the worksite and 12 dedicated bike parking spaces facilities at this station [19]. The roads identified as bike friendly on Crinan Street, Garnet Street and Dunstaffenage Street have also been identified for potential construction vehicle haulage routes. The roads are reasonably wide but allow parking on either side. The relatively low volume of construction haulage vehicles should not have a major effect on the user experience or safety of the cyclists.

5.5.6 Commuter and Short-Term Parking

The 23 time-restricted spaces on Floss Street adjacent to the station are expected to be removed from use for the entirety of the possession. Other on-street and off-street parking around the station would be unaffected by construction. Overall, there are approximately 1,150 on and off-street unrestricted parking spaces operating at 55% utilisation within a 400 m catchment available for use as informal park and ride spaces.

Approximately eight on street spaces on Floss Street south of the rail line would be affected by the TTP bus stops. These parking spaces would only be affected while the TTP is in operation, which is during possession periods. During these periods demand for parking is likely to reduce at the stations. This decrease arises during school holiday periods and the change of mode share as some drivers choose to drive to another station or their destination.

5.5.7 Construction Worker Parking

It is anticipated that four to ten parking spaces would be provided at any one time for project workers in the Hurlstone Park area. The location of these parking spaces would be based on the specific location within the worksite which has active construction at the time.

Table 5.16 provides the anticipated daily construction workforce volume in the Hurlstone Park Area. It is assumed that public transport would be promoted as the primary mode of transport for construction workers. This would reduce the impacts on the local road network and parking requirements. As noted above, parking in the area is not fully utilised therefore there is capacity to accommodate any remaining demand for worker parking. Off-site parking alternatives and associated shuttle arrangements would be also investigated to transport workers to and from the site.

Table 5.16 Anticipated Daily Workforce- Hurlstone Park

	Non Possession		Possession Short Period Close-down	
	Peak	Typical / Average	Peak	Typical
Hurlstone Park Station	60	40	140	65

[19] Source - http://www.sydneycycleways.net/map/

5.6 Canterbury Station

5.6.1 Canterbury Construction Haulage Routes

Figure 5.10 overleaf, shows the proposed construction haulage routes into the sites to be used during construction. Cumulatively the peak effects on the road network from the construction activities in the locale of Canterbury Station are forecast to be an addition of 24 heavy and 22 light vehicles in the AM and PM peak hours. Construction haulage trips at night would be no more than nine heavy and five light vehicle movements per hour.

The swept path analysis determined that construction haulage vehicles are able to access all of the proposed sites / gates safely with the exception of:

- Canterbury Road / Close Street – the 12.5m truck left in and out movements cannot take place simultaneously. Access out of Close Street onto Canterbury Road could be managed through active traffic management to ensure exiting trucks would not conflict with trucks entering Close Street
- truck movement along Close Street – Close Street is quite narrow and would not accommodate two way truck movements at the same time. Inbound and outbound truck movements could be carried out under active traffic management to remove conflicts
- site entry to Canterbury Bowls gate – access to Canterbury Bowls could be carried out under active traffic management so that truck movements in and out of the worksite would not conflict with each other
- Canterbury Road / Broughton Street – the left turn truck movement into Broughton Street conflicts with vehicles exiting this street. This conflict could be mitigated by temporarily relocating the Broughton Street approach limit line further back, such that vehicles are waiting at the traffic lights away from the conflict area.

5.6.2 Canterbury Temporary Transport Route

Three bus routes converge before Canterbury, resulting in 79 buses per hour in each direction calling at Canterbury Station in peak periods. Existing bus stops would be used as temporary transport bus stops for these routes.

The indicative rail replacement operation at Canterbury Station is shown in **Figure 5.9**.

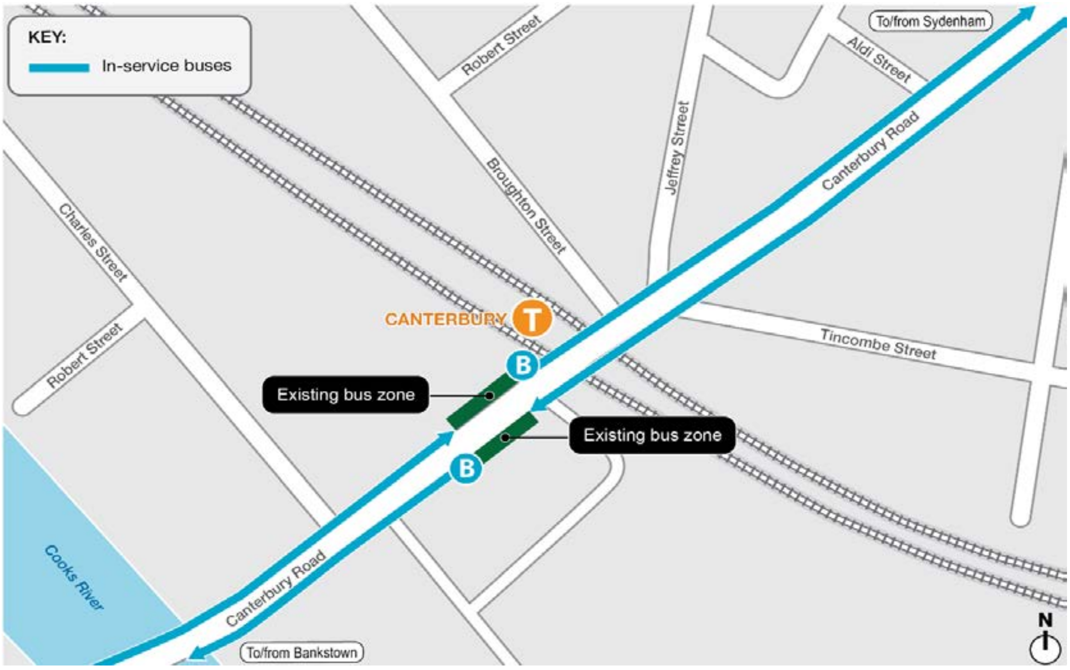
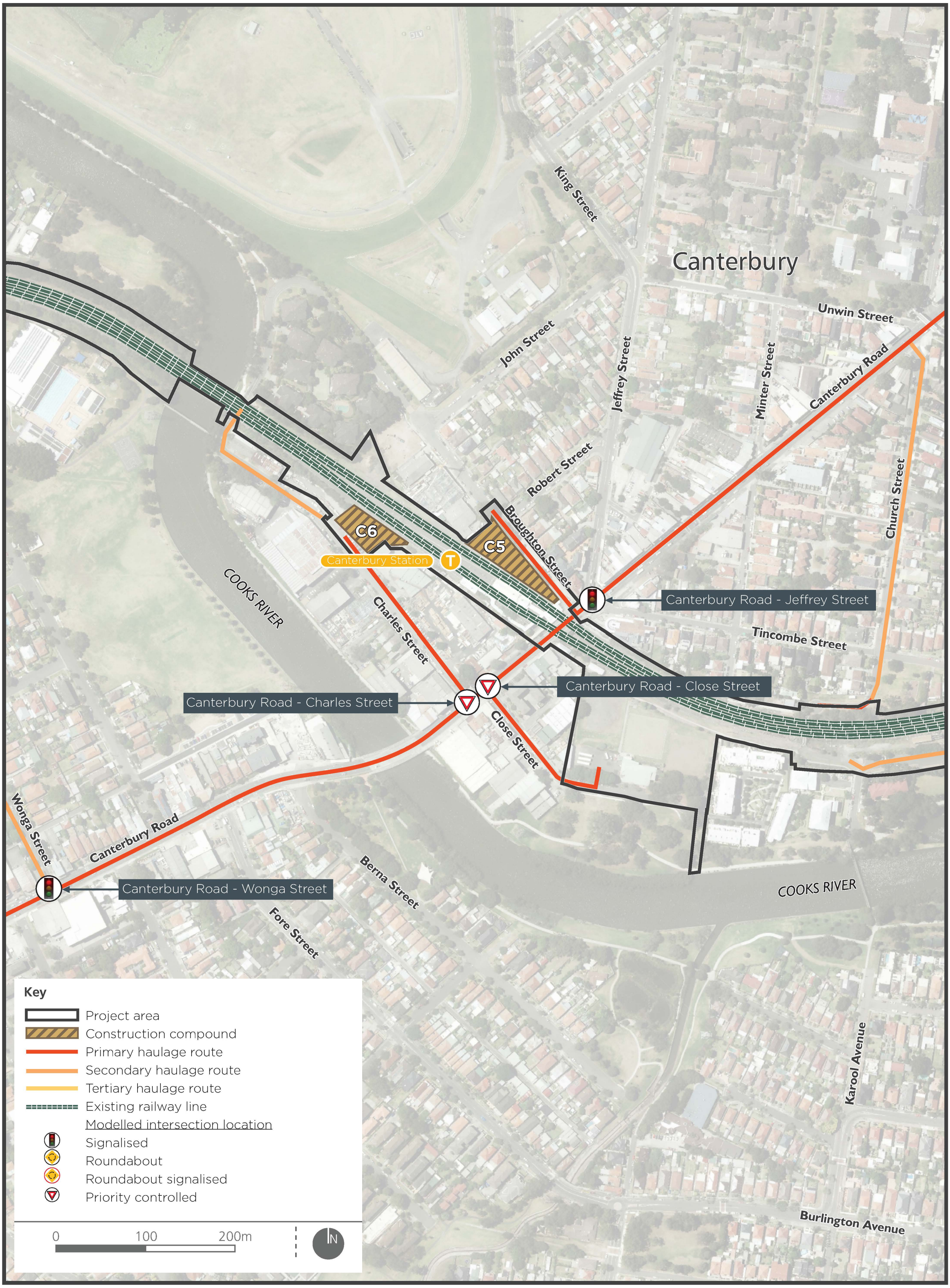


Figure 5.9 Temporary Transport Plan – Canterbury (Sydney Metro 2017)



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Canterbury Station heavy vehicle routes and station intersections

FIGURE 5.10

5.6.3 Road Network Operation and Intersection Performance

Four intersections were modelled in the area surrounding Canterbury Station as shown in **Figure 5.10**.

Road Network Performance - AM Peak

Table 5.17 below shows a summary of the intersection assessment undertaken for this station.

Table 5.17 Canterbury Station Intersection Assessment – AM Peak

Canterbury Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
B.13 Canterbury Road / Wonga Street (Signals)				**Year Capped: 2023**	
Demand Flow (veh)	3393	3726	3754	3913	3834
Average Delay per Vehicle (Average over all arms in seconds)	18	21	21	26	21
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.79	0.82	0.83	0.90	0.84
H.14 Canterbury Road / Charles Street (Priority Controlled)				**Year Capped: 2023**	
Demand Flow (veh)	3135	3442	3471	3629	3551
Average Delay per Vehicle (Average over all arms in seconds)	3	5	5	7	6
Average Delay per Vehicle (Worst Movement in seconds)	252	460	494	737	608
LoS (Worst Movement)	F	F	F	F	F
DoS (Worst Movement)	0.52	0.57	0.58	0.62	0.60
H.15 Canterbury Road / Jeffrey Street (Signals)				**Year Capped: 2023**	
Demand Flow (veh)	3249	3568	3606	3766	3687
Average Delay per Vehicle (Average over all arms in seconds)	17	17	18	18	18
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.80	0.88	0.88	0.88	0.88
H.14 Canterbury Road / Close Street (Priority Controlled)				**Year Capped: 2023**	
Demand Flow (veh)	3101	3405	3447	3605	3527
Average Delay per Vehicle (Average over all arms in seconds)	0	0	0	0	0
Average Delay per Vehicle (Worst Movement in seconds)	17	21	22	28	25
LoS (Worst Movement)	B	B	B	C	B
DoS (Worst Movement)	0.51	0.56	0.57	0.61	0.59

For three of the four intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP results in a LoS ‘C’ or better. This delay would not be atypical of peak hour conditions within Sydney and would generally be considered reasonable during peak periods

Canterbury Road / Charles Street has an existing and future LoS 'F' which is based on the worst movement (right turn movement out from Charles Street).

The model shows that the average intersection delay across all arms would be a maximum of five seconds for the worst scenario and the delay for the worst movement would be approximately 14 minutes. This implies that the main (through) movement is operating with negligible delay and the level of service is being heavily influenced by the small volumes of traffic turning left and right out of Charles Street.

In practice, drivers would not wait 10 minutes to turn right from Charles Street as modelled for the existing scenario. A short detour under the Cooks River / Charles Street Underbridge to the signalised crossing at Broughton Street / Canterbury Road could be used to turn left and right onto Canterbury Road.

There is a proposal to convert the Canterbury Road / Charles Street intersection to signal control, although full details of this proposal were not available at the time this assessment was undertaken. Temporary or permanent signals at the intersection would reduce the delay for right turning vehicles. Signals would also improve safety in the area as it would reduce the number of drivers pulling out into small gaps.

Road Network Performance – PM Peak

Table 5.18 overleaf shows a summary of the intersection assessment undertaken for this station.

Table 5.18 Canterbury Station Intersection Assessment – PM Peak

Canterbury Station – PM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
B.13 Canterbury Road / Wonga Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	3705	4094	4121	4279	4201
Average Delay per Vehicle (Average over all arms in seconds)	21	23	23	24	23
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.76	0.83	0.84	0.88	0.86
H.14 Canterbury Road / Charles Street (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	3502	3870	3898	4056	3978
Average Delay per Vehicle (Average over all arms in seconds)	1	2	2	2	2
Average Delay per Vehicle (Worst Movement in seconds)	321	574	573	570	570
LoS (Worst Movement)	F	F	F	F	F
DoS (Worst Movement)	0.54	0.60	0.61	0.66	0.64
H.15 Canterbury Road / Jeffrey Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	3636	4017	4056	4217	4138
Average Delay per Vehicle (Average over all arms in seconds)	20	27	27	28	27
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.91	0.93	0.93	0.93	0.93

Canterbury Station – PM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
H.14 Canterbury Road / Close Street (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	3468	3832	3875	4033	3955
Average Delay per Vehicle (Average over all arms in seconds)	1	1	1	2	2
Average Delay per Vehicle (Worst Movement in seconds)	32	45	47	60	53
LoS (Worst Movement)	C	D	D	E	D
DoS (Worst Movement)	0.52	0.57	0.59	0.63	0.61

For two of the four intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP results in a LoS ‘C’ or better

The Canterbury Road / Charles Street intersection has an existing and future LoS ‘F’ which is based off the worst movement (right turn movement out from Charles Street). The modelling shows the construction and TTP have minimal effect.

The Canterbury Road / Close Street intersection is forecast to experience a slight increase in delays for in the PM Peak for the future scenarios. The worst movement delay is the right turn movement from the Canterbury Road west approach onto Close Street, which is approximately one minute. The delay for this movement results from the increase in future traffic and TTP buses through Canterbury Road which provides fewer opportunities for gaps to allow drivers to perform safe right turn movements. This pushes the level of service to the LoS ‘E’ in the TTP scenario from LoS ‘D’ in the Construction scenario.

5.6.4 Public Transport Services

The main bus routes in the Canterbury precinct are on Canterbury Road, Fore Street, Wonga Street and Jeffrey Street (NSW Govt. 2016b). An assessment of the worksite extent shows that there should not be a requirement for bus stops to be relocated in the area as a result of construction activities.

While there are a number of construction access gates in close proximity to bus stops, the worksite extent is assumed to be in land owned by the RailCorp and should therefore not impact the bus network.

5.6.5 Active Transport Network

There are existing footpaths for pedestrians adjacent to the project area in this region. The majority of the construction activities at these sites are outside of the road reserve and therefore are not expected to affect pedestrian connectivity and safety. However, it is proposed to relocate the existing footbridge off Broughton Street/Canterbury Road. During this relocation, temporary pedestrian diversions would be in place. The operational impacts of these changes are discussed separately in Chapter 8.

Further, footpath diversions may be required temporarily along Broughton Street during the relocation of the station entrance. Additional compounds and accesses to facilitate bridge related construction are considered separately in Chapter 6.

There are no cycle friendly roads in close proximity to the worksites in this area, other than a dedicated separate cycleway along Cooks River south of Canterbury Station, which would not be impacted by construction activities[20].

There are no dedicated bike parking facilities at this station[21].

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[20] Source - http://www.sydneycycleways.net/map/

5.6.6 Commuter and Short-Term Parking

There are currently 32 dedicated commuter spaces at or near Canterbury Station. All of the 32 unrestricted spaces in the recently constructed off-street parking area along Charles Street to the southwest of the station are expected to be removed from use by short term construction possessions, returning to parking during possessions.

Other on-street and off-street parking around the station would be unaffected by construction. Overall, there are approximately 700 on and off-street unrestricted parking spaces operating at 64% utilisation within a 400 m catchment which can be used as informal park and ride spaces.

While the TTP is in operation, the replacement buses would stop on Canterbury Road Overbridge and would not interfere with on and off street carpark spaces.

5.6.7 Construction Worker Parking

It is anticipated that four to ten parking spaces would be provided at any one time for project workers in the Canterbury area. The location of these parking spaces would move dependent on the specific location within the worksite which has active construction at the time.

Table 5.19 provides the anticipated daily construction workforce volume in the Canterbury Area. It is assumed that public transport would be promoted as the primary mode of transport for construction workers. This would reduce the impacts on the local road network and parking requirements. As noted above, parking in the area is not fully utilised therefore there is capacity to accommodate any remaining demand for worker parking. Off-site parking alternatives and associated shuttle arrangements would also be investigated to transport workers to and from the site.

Table 5.19 Anticipated Daily Workforce- Canterbury

	Non Possession		Possession Short Period Close-down	
	Peak	Typical / Average	Peak	Typical
Canterbury Station	75	50	160	75

[21] Source - Southwest Metro – Extent of Precinct Works & Interchange Requirements, Sydney Metro

5.7 Campsie Station

5.7.1 Campsie Construction Haulage Routes

Figure 5.12 overleaf, shows the proposed construction haulage routes into the sites to be used during construction. At Campsie Station it is anticipated that 10 heavy and 10 light vehicles would be generated in the AM and PM peak hours. Construction haulage trips at night would be no more than nine heavy and five light vehicle movements per hour.

The swept path analysis determined that construction haulage vehicles are able to access all of the proposed sites / gates safely. Campsie Temporary Transport Route

Two bus routes converge before Campsie, resulting in 46 buses per hour in each direction calling at Campsie Station in peak periods. The temporary transport bus stops for these routes would be existing bus stops.

The indicative rail replacement operation at Campsie Station is shown in **Figure 5.11**.

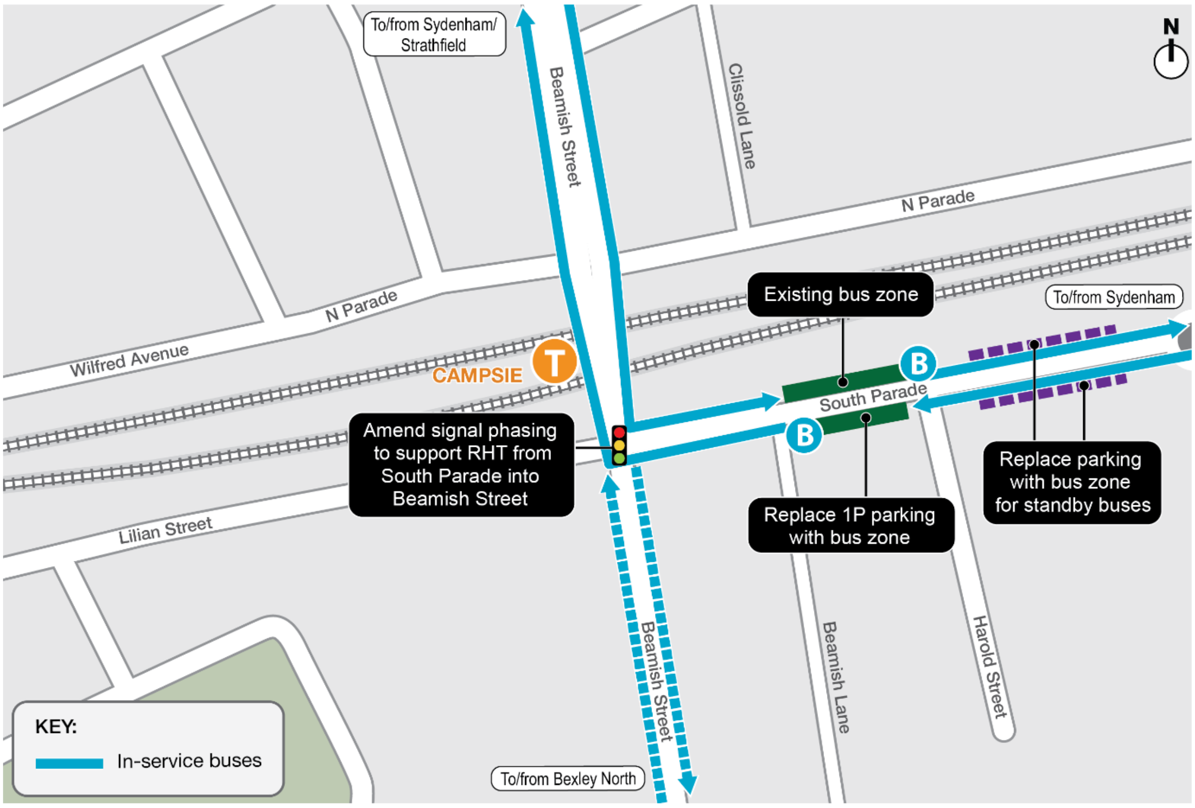
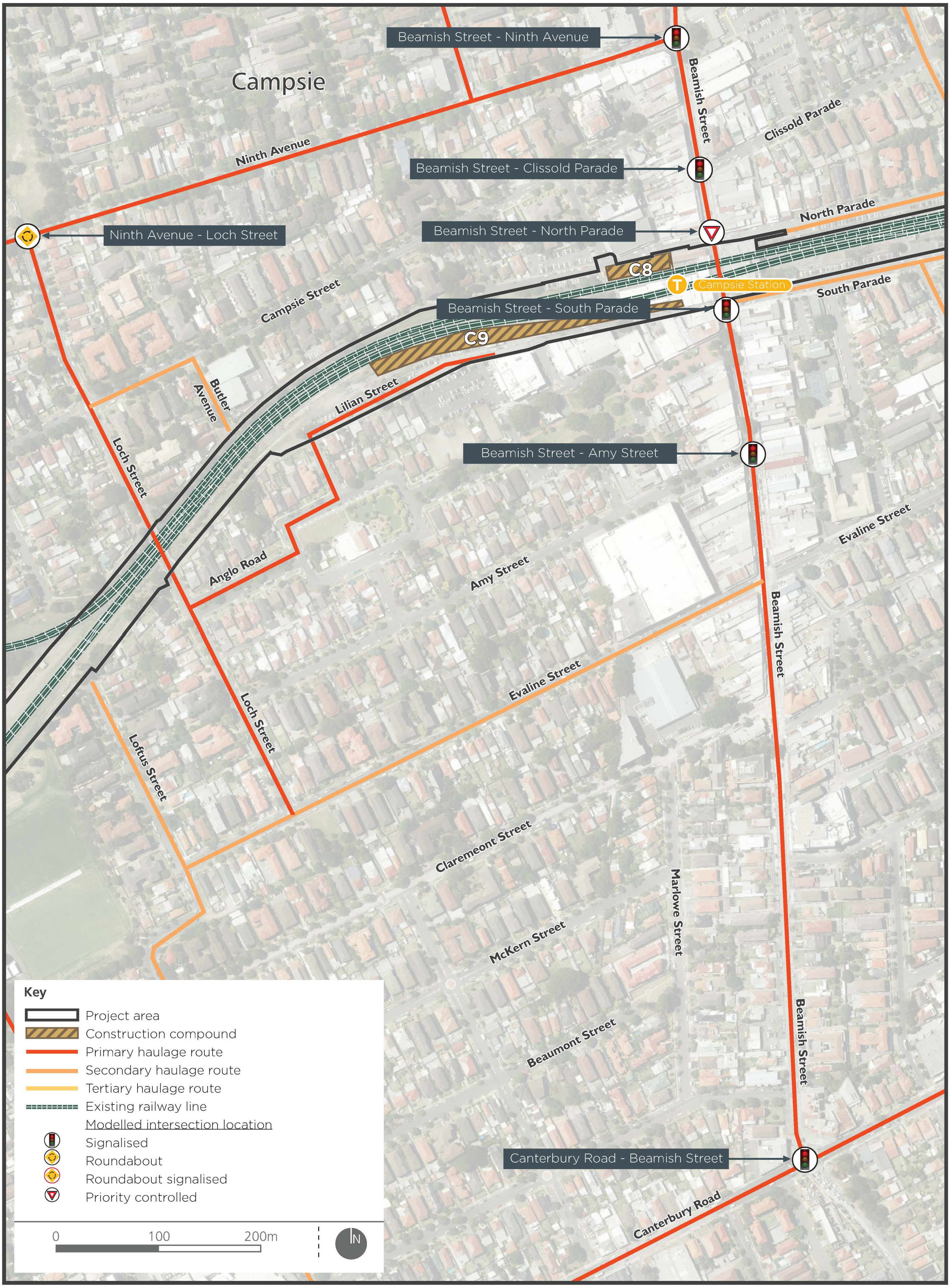


Figure 5.11 Temporary Transport Plan – Campsie (Sydney Metro 2017)

Bus route 2 travels down Canterbury Road, avoiding Campsie Station. The remaining bus route originates east of Campsie.

5.7.2 Road Network Operation and Intersection Performance

Seven intersections were modelled in the area surrounding Campsie Station as shown on **Figure 5.12**.



Campsie Station heavy vehicle routes and station intersections

FIGURE 5.12

Road Network Performance – AM Peak

Table 5.20 below shows a summary of the intersection assessment undertaken for this station.

Table 5.20 Campsie Station Intersection Assessment – AM Peak

Campsie Station – AM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
B.10 Beamish Street / Ninth Avenue (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1771	1944	1960	2053	1990
Average Delay per Vehicle (Average over all arms in seconds)	15	15	16	16	16
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.60	0.69	0.69	0.71	0.71
B.11 Beamish Street / Clissold Parade (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1494	1641	1657	1751	1739
Average Delay per Vehicle (Average over all arms in seconds)	14	28	24	39	38
LoS (Overall)	A	B	B	C	C
DoS (Worst Movement)	0.70	0.81	0.78	0.94	0.92
B.12 Beamish Street / South Parade (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1486	1632	1649	1742	1730
Average Delay per Vehicle (Average over all arms in seconds)	20	21	22	31	29
LoS (Overall)	B	B	B	C	C
DoS (Worst Movement)	0.73	0.90	0.92	0.91	0.91
H.11 Beamish Street / North Parade (Priority Controlled)[22]					**Year Capped: 2023**
Demand Flow (veh)	1446	1593	1616	1711	1699
Average Delay per Vehicle (Average over all arms in seconds)	2	2	3	3	3
Average Delay per Vehicle (Worst Movement in seconds)	27	31	36	43	35
LoS (Worst Movement)	B	C	C	D	C
DoS (Worst Movement)	0.64	0.71	0.72	0.72	0.72

[22] This intersection has been modelled within a local network of Beamish Street/Clissold Street and Beamish Street/South Parade Street intersections in order to take the northbound and southbound gaps in the traffic flows into account.

Campsie Station – AM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
H.12 Beamish Street / Amy Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1145	1257	1267	1267	1267
Average Delay per Vehicle (Average over all arms in seconds)	8	8	8	8	8
LoS (Overall)	A	A	A	A	A
DoS (Worst Movement)	0.45	0.51	0.52	0.52	0.52
H.13 Canterbury Road / Beamish Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	4227	4642	4642	4713	4642
Average Delay per Vehicle (Average over all arms in seconds)	38	38	38	38	38
LoS (Overall)	C	C	C	C	C
DoS (Worst Movement)	0.94	0.95	0.95	0.91	0.95
H.34 Ninth Avenue / Loch Street (Roundabout)					**Year Capped: 2023**
Demand Flow (veh)	2067	2270	2270	2364	2301
Average Delay per Vehicle (Average over all arms in seconds)	10	20	20	47	26
Average Delay per Vehicle (Worst Movement in seconds)	18	44	44	123	63
LoS (Worst Movement)	B	D	D	F	E
DoS (Worst Movement)	0.81	0.97	0.97	1.10	1.01

For six of the seven intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP results in a LoS 'D' or better.

'The Ninth Avenue / Loch Street roundabout is the only intersection forecast to experience a significant decline in amenity as a result of the addition of the TTP traffic. The overall intersection has a LoS of 'D' in the construction scenario, worsening to a LoS 'F' in the TTS scenario.

The through and right turning movements from the Ninth Avenue west approach are the worst performing movements with a delay of two minutes in the TTP scenario. The intersection is already near capacity in the construction scenario, and with the additional 46 TTP buses to the Ninth Avenue west approach, the intersection is pushed over capacity leading to the sharp increase in delay.

The Refined Baseline TTP scenario reduces the delay for the worst movement to just over one minute and reduces the LoS to 'E' which is a level of service most drivers would consider acceptable during peak periods.

There are a number of parallel roads, such as Eighth Avenue, which do not have TTS buses travelling along them. Some of the vehicles that currently use Ninth Avenue would divert to those parallel roads while the TTP is in operation. This would reduce the demand at the Ninth Avenue / Loch Street intersection. Scheduling construction works during any of the school term break periods would alleviate congestion to the point that the roundabout would be operating within capacity.

Due to the proximity and interaction between Beamish Street/ Clissold Street and Beamish Street/ South Parade Street, these have been modelled within a local network in order to take the northbound and southbound gaps in the traffic flows into account.

Road Network Performance – PM Peak

Table 5.21 below shows a summary of the intersection assessment undertaken for this station.

Table 5.21 Campsie Station Intersection Assessment – PM Peak

Campsie Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
B.10 Beamish Street / Ninth Avenue (Signals)				**Year Capped: 2023**	
Demand Flow (veh)	1869	2065	2081	2175	2111
Average Delay per Vehicle (Average over all arms in seconds)	17	17	17	19	18
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.61	0.71	0.73	0.85	0.79
B.11 Beamish Street / Clissold Parade (Signals)				**Year Capped: 2023**	
Demand Flow (veh)	1595	1762	1778	1872	1860
Average Delay per Vehicle (Average over all arms in seconds)	19	60	68	203	180
LoS (Overall)	B	E	E	F	F
DoS (Worst Movement)	0.82	1.05	1.07	1.41	1.35
B.12 Beamish Street / South Parade (Signals)				**Year Capped: 2023**	
Demand Flow (veh)	1531	1692	1710	1802	1790
Average Delay per Vehicle (Average over all arms in seconds)	20	25	26	103	93
LoS (Overall)	B	B	B	F	F
DoS (Worst Movement)	0.83	0.96	0.94	1.88	1.79
H.11 Beamish Street / North Parade (Priority Controlled)[23]				**Year Capped: 2023**	
Demand Flow (veh)	1447	1609	1566[24]	1558[20]	1720
Average Delay per Vehicle (Average over all arms in seconds)	2	2	2	3	36
Average Delay per Vehicle (Worst Movement in seconds)	26	29	35	60	877
LoS (Worst Movement)	B	C	C	E	F
DoS (Worst Movement)	0.65	0.72	0.72	0.78	1.78
H.12 Beamish Street / Amy Street (Signals)				**Year Capped: 2023**	
Demand Flow (veh)	1266	1399	1408	1408	1408
Average Delay per Vehicle (Average over all arms in seconds)	9	17	19	19	19
LoS (Overall)	A	B	B	B	B
DoS (Worst Movement)	0.84	0.94	0.95	0.95	0.96

[23] * This intersection has been modelled within a local network of Beamish Street/Clissold Street and Beamish Street/South Parade Street intersections in order to take the northbound and southbound gaps in the traffic flows into account.

[24] Arrival flow is reduced by the model due to capacity constraint at oversaturated upstream lanes.

Campsie Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
H.13 Canterbury Road / Beamish Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	3848	4252	4252	4319	4252
Average Delay per Vehicle (Average over all arms in seconds)	34	35	35	35	34
LoS (Overall)	C	C	C	C	C
DoS (Worst Movement)	0.94	0.94	0.94	0.94	0.92
H.34 Ninth Avenue / Loch Street (Roundabout)					**Year Capped: 2023**
Demand Flow (veh)	2279	2518	2518	2612	2548
Average Delay per Vehicle (Average over all arms in seconds)	11	21	21	40	26
Average Delay per Vehicle (Worst Movement in seconds)	13	29	29	63	37
LoS (Worst Movement)	A	B	B	E	C
DoS (Worst Movement)	0.84	0.97	0.97	1.04	0.99

For four of the seven intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP results in a LoS ‘C’ or better. This delay would not be atypical of peak hour conditions within Sydney.

The Beamish Street / Clissold Parade intersection is forecast to experience a decline in amenity as a result of the addition of the TTP traffic. The intersection has a LoS of ‘E’ in the construction scenario, worsening to a LoS ‘F’ in the Baseline TTP.

The right turning movement from the Beamish Street south approach is the worst performing movement with a modelled delay increasing to over seven minutes in the Baseline TTP . This is a modelled delay, and reflects the demands are exceeding capacity. Drivers would be unlikely to choose to queue for seven minutes to turn right from Beamish Street south, instead diverting or retiming their journey to avoid the peak periods. Drivers could potentially reroute using North Parade while the through traffic at the Beamish Street / Clissold Parade intersection is in the intergreen phase.

The Refined Baseline TTP scenario results in a minor reduction in delay and no change in the level of service as there are still 15 replacement buses running along Beamish Street.

The Beamish Street / South Parade intersection is also forecast to experience a decline in amenity as a result of the addition of the TTP buses. The intersection has a LoS of ‘B’ in the construction scenario, worsening to a LoS of ‘F’ in the TTP scenario.

The right turning movement from the South Parade east approach is the worst performing movement with the delay for the movement increasing to over 14 minutes. This results from the high volume of pedestrian movements across Beamish Street and the 46 TTP buses waiting to turn right from South Parade east. The Refined Baseline TTP has 40 buses and therefore the level of service remains as ‘F’.

Site observations in March 2017 observed additional delays at the beginning of the movements from the eastern and western approaches. The average delays recorded were approximately seven, 12 and 10 seconds for the left and right turn movements from the east approach (South Parade) and left turn out from the west approach (Lilian Street), respectively. The pedestrian count records at the Beamish Street / North Parade intersection shows a lower magnitude of pedestrian activity in the AM peak by nearly 35 percent. However, the same levels of lost times as the observed values in the PM peak are assumed for the AM peak, given the observed delays are close to the minimum crossing times for pedestrians over the approaches of the intersection.

It is likely that drivers would continue to use Beamish Street / South Parade while the TTP is in operation despite the increased levels of delay as it connects people from the northern and southern sides of the railway line with few local diversion routes available. As a result, whilst the modelled delay is a theoretical value that exceeds any likely delay that would occur, there are potential safety impacts that this highlights. With modelled delays at this level it suggest that driver frustration would potentially lead to drivers attempting manoeuvres during the late amber period of signal phase changes.

The Ninth Avenue / Loch Street intersection is also forecast to experience a decline in amenity as a result of the addition of the TTP buses. The intersection has a LoS of 'B' in the future and construction scenarios, worsening to a LoS of 'E' in the Baseline TTP. This roundabout provides local access to residential areas at Campsie.

The through and left turning movements from the Ninth Avenue east approach are the worst performing movements with the delay increasing to over one minute in the TTP scenario. The intersection is already near capacity in the construction scenario, and with the additional 46 TTP buses to the Ninth Avenue east approach, the intersection is pushed over capacity leading to the sharp increase in delay. Whilst the PM LoS would not justify it, the timing of the works for the term 4 break to mitigate the morning conditions would result in further reductions to the delay predicted in the PM.

5.7.3 Public Transport Services

The main bus routes at Campsie Station are on Beamish Street, Ninth Avenue, Fifth Avenue, Brighton Avenue, South Parade and Duke Street (NSW Govt. 2016b). An assessment of the worksite extent shows that a bus stop would need to be relocated to accommodate construction activities.

Works adjacent to South Parade, west of the bus stop, are next to bus stop 419216. This bus stop is along bus route 487 and the origin/destination of routes 412, 415, 444, 445 and 473. Half lane closures are required for this activity for day and night works. During this time, the bus stop for the origin/destination routes could be moved to the opposite side of the railway track on North Parade, still providing direct access to the station. As North Parade / Beamish Street is a priority intersection, it is recognised that this proposal may create additional delays for buses turning out of North Parade. Further consultation and assessment of alternatives would be undertaken prior to construction.

Route 487 could travel through Evaline Street, avoiding South Parade. If this diversion was to be put in place, temporary bus stops would need to be established on Evaline Street, requiring pedestrians to walk approximately 300m further to access the station.

A potential alternative diversion would involve redirecting the buses on a full loop of Campsie; using Evaline Street, Beamish Street, South Parade, Duke Street and back along Evaline Street, before continuing on its usual route. This enables all buses to travel in a one way direction along South Parade.

5.7.4 Active Transport Network

There are existing footpaths for pedestrians next to the works adjacent to South Parade (east of Campsie Station), Lilian Lane, Wilfred Ave and North Parade (west of Campsie Station). Construction activities for this worksite extent are generally outside of the road reserve and therefore are not expected to affect pedestrian connectivity and safety along footpaths. The extent of impacts to pedestrians in these locations would be expected to hoardings resulting in reduced footpath widths.

The exception is one of the construction haulage routes into Lilian Street and the construction compound adjacent to Lilian Street/Lilian Lane. Access to this compound and wider worksite area is expected to require some discreet road closure periods, but this is planned to occur during night works and therefore expected to have minor effects on pedestrians. Active traffic management would be in place during closure periods to direct pedestrians to a safe alternative route away from the access gate. Pedestrians may be redirected to cross the road at upstream locations, however further analysis of the feasibility of using theses intersections are subject to construction staging details. The staging details would also provide details for pedestrian diversions and the total distance and delay experienced by them during works.

Works to install a new kerbside facility on the east side of Beamish Street may also require pedestrian management on South Parade and North Parade during construction. Dedicated separate cycleways at Anzac Square connect to Beamish Street and on Harold Street between South Parade and Evaline Street[25]. There are no adjacent works or station compound sites nearby which could potentially impact these cycleways. However, as noted above, Lilian Lane is narrow and combined with the expected night time road closures and presence of some construction traffic that would be larger and wider than other vehicles, some minor effects on cyclists can be expected. Traffic management practices including detours would enable safe passage for cyclists.

There is existing bike parking on the station forecourt at Beamish Street[26]. This area is proposed to be upgraded to a mixed use / plaza type area and the bike parking relocated to North Parade[27]. It is recommended to stage construction such that the new bike parking is completed prior to affecting the existing bike parking.

A short section of Campsie Street, closest to Beamish Street, is common to both the on-street cycle friendly network and the construction haulage routes. Due to the relatively low volume of construction haulage vehicles and the short section of road, there should not be a major effect on the user experience or safety of the cyclists.

5.7.5 Commuter and Short-Term Parking

There are currently 138 dedicated commuter parking spaces at or near Campsie Station and 14 of these spaces would be removed from use for the entirety of the construction possession due to the location of the worksite extent. A further 45 spaces would be removed from use by short term construction possessions. During this time commuters can use on-street parking in local residential streets, transfer to buses or move to alternative modes of transport such as cycling.

Other on-street and off-street parking around the station would be unaffected by construction. Overall, there are approximately 925 unrestricted parking spaces operating at 89% utilisation within a 400 m catchment that can be used as informal park and ride spaces.

Extra bus stops required for TTP operation would impact 40 dedicated commuter spaces on the northern side of South Parade. Approximately three further on street short-term spaces on the southern side of South Parade would be affected by the TTP bus stops. These parking spaces would only be affected while the TTP is in operation, which is during possession periods. During these periods there is likely to be a reduction in demand for parking at the stations owing to school holiday periods and the change of mode share as some drivers choose to drive to another station or their destination.

5.7.6 Construction Worker Parking

It is anticipated that four to ten parking spaces would be provided at any one time for project workers in the Campsie area. The exact location of these parking spaces would vary based on the specific location within the worksite which has active construction at the time.

Table 5.22 provides the anticipated daily construction workforce volume in the Campsie Area. Public transport would be promoted as the primary mode of transport for construction workers, in order to reduce the traffic impacts on the local road network and parking requirements. As noted above, parking in the area is not fully utilised therefore there is some capacity to accommodate demand for worker parking. Taking into account the removal of dedicated commuter spaces during construction, there may be insufficient capacity to accommodate peak (non-possession[28]) worker parking. Off-site parking alternatives and associated shuttle arrangements would be investigated to transport workers to and from the site.

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[25] Source - http://www.sydneycycleways.net/map/
[26] Source - Southwest Metro – Extent of Precinct Works & Interchange Requirements, Sydney Metro
[27] Source – Sydney Metro Southwest Precinct Plan – Campsie, Sydney Metro
[28] Peak worker demand during possession periods is greater, however background park and ride demand is expected to be much less.

Table 5.22 Anticipated Daily Workforce- Campsie

	Non Possession		Possession Short Period Close-down	
	Peak	Typical / Average	Peak	Typical
Campsie Station	75	50	160	75

As noted above, parking in the area is not fully utilised therefore there is capacity to accommodate any remaining demand for worker parking.

5.8 Belmore Station

5.8.1 Belmore Construction Haulage Routes

Figure 5.14 overleaf, above shows the proposed construction haulage routes into the sites to be used during construction. At Belmore Station it is anticipated that 10 heavy and 10 light vehicles would be generated in the AM and PM peak hours. Construction haulage trips at night would be no more than nine heavy and five light vehicle movements per hour.

The swept path analysis determined that construction haulage vehicles are generally able to access all of the proposed sites / gates safely. Drawings of the turns are included in **Appendix B**. However, the following specific movements are noted:

- right turn from Burwood Road into Tobruk Avenue overlaps two existing kerb side car parks. This can be resolved by removing / restricting car parking during construction hours
- right turn from Dean Avenue onto Burwood Rood has trucks conflicting against existing kerbside parking. This can be resolved by removing / restricting car parking during construction hours.

All of the above would be considered in the detailed design of the project.

5.8.2 Belmore Temporary Transport Route

Two bus routes converge before Belmore, resulting in 46 buses per hour in each direction calling at Belmore Station in peak periods. The temporary transport bus stops for these routes utilise existing bus stops.

The indicative rail replacement operation at Belmore Station is shown in **Figure 5.13**.

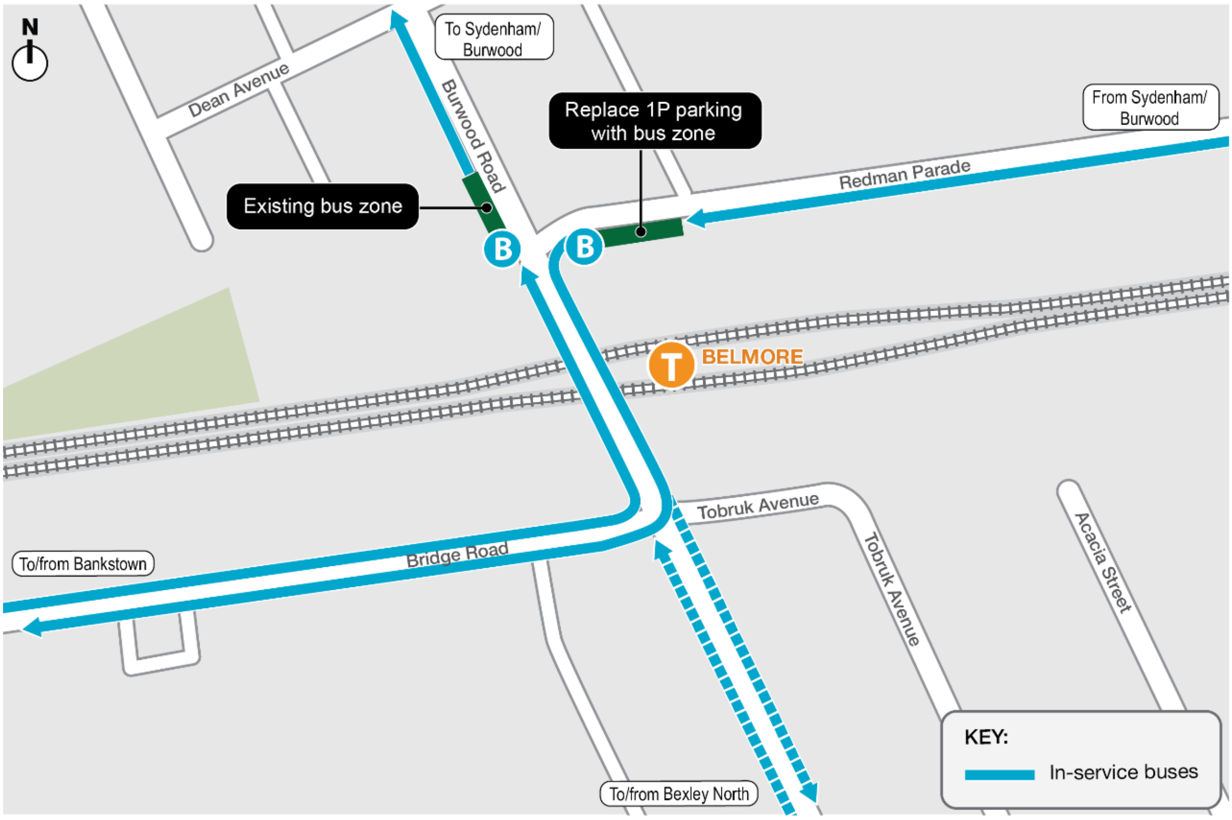


Figure 5.13 Temporary Transport Plan – Belmore (Sydney Metro 2017)

Bus route 2 travels down Canterbury Road, avoiding Belmore Station. The remaining bus route originates east of Belmore.

sydney METRO | city & southwest

Belmore Station modelled intersections and heavy vehicle routes

FIGURE 5.14

5.8.3 Road Network Operation and Intersection Performance

Four intersections were modelled in the area surrounding Belmore Station as shown in **Figure 5.14**.

Road Network performance - AM Peak

Table 5.23 below shows a summary of the intersection assessment undertaken for this station.

Table 5.23 Belmore Station Intersection Assessment –AM

Belmore Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
B.08 Burwood Road / Bridge Road (Priority Controlled)				**Year Capped: 2017**	
Demand Flow (veh)	1736	1760	1795	1818	1826
Average Delay per Vehicle (Average over all arms in seconds)	11	12	20	21	21
Average Delay per Vehicle (Worst Movement in seconds)	266	322	611	660	679
LoS (Worst Movement)	F	F	F	F	F
DoS (Worst Movement)	0.95	1.03	1.39	1.44	1.46
B.09 Burwood Road / Redman Parade (Priority Controlled)				**Year Capped: 2023**	
Demand Flow (veh)	1652	1813	1845	1938	1875
Average Delay per Vehicle (Average over all arms in seconds)	3	4	4	6	5
Average Delay per Vehicle (Worst Movement in seconds)	55	93	110	195	130
LoS (Worst Movement)	D	F	F	F	F
DoS (Worst Movement)	0.63	0.69	0.72	0.78	0.74
H.20 Burwood Road / Lakemba Street (Signals)				**Year Capped: 2021**	
Demand Flow (veh)	2149	2300	2309	2404	2340
Average Delay per Vehicle (Average over all arms in seconds)	24	36	34	84	111
LoS (Overall)	B	C	C	F	F
DoS (Worst Movement)	0.84	0.96	0.92	1.30	1.51
H.33 Canterbury Road / Burwood Road (Signals)				**Year Capped: 2023**	
Demand Flow (veh)	2526	2774	2774	2774	2774
Average Delay per Vehicle (Average over all arms in seconds)	10	13	13	13	13
LoS (Overall)	A	A	A	A	A
DoS (Worst Movement)	0.72	0.91	0.91	0.91	0.91

The Burwood Road / Bridge Road intersection has an existing LoS ‘F’. The level of service continues to be ‘F’ during the future, construction, TTP and Refined Baseline TTP scenarios. The average delay for the worst movement in the TTP scenario (through and right turn movements from the Bridge Road west approach) is 11 minutes. This results from the right turn movement from Bridge Road west being opposed by the through movements from the Burwood Road north and south approaches. There is 30 times more volume going through these approaches than the Bridge Road west approach, which results in few gaps to facilitate the through and right movements. The Refined Baseline TTP has a minor increase in delay for the worst movement because the number of replacement buses increases from 11 to 15 per hour at the Bridge Road west approach.

The overall intersection delay is approximately 21 seconds for the worst case scenario which indicates that the main (through) movement is operating with negligible delay.

A potential diversion route could turn left at the intersection and turn around using Redman Parade, or use a parallel road such as Leylands Parade which has a signalised intersection onto Burwood Road to aid right turning vehicles in order to avoid the significant delay forecast for the intersection. The DoS indicated that undertaking the works in holidays would not reduce flows significantly to avoid delays.

The Burwood Road / Redman Parade intersection has an existing LoS ‘D’. The level of service declines to be ‘F’ during the future, construction, baseline TTP and Refined Baseline TTP scenarios. The right turning movement from Redman Parade experiences a modelled delay of over three minutes. Potential mitigation measures for these two intersections are discussed in a later section following the discussion of the PM performance.

While the modelled delay indicates that the right turning movement would experience delays of over three minutes, short detours to parallel roads, such as Lakemba Street, would be used by some vehicles mitigating the effects of the construction over the expected future conditions.

The Burwood Road / Lakemba Street intersection is forecast to experience a decline in amenity as a result of the addition of the TTP traffic. The existing intersection has a LoS of ‘B’ which reduces in each scenario to a LoS ‘F’ in the TTP scenario.

The right turning movements from the Lakemba Street west approach are the worst performing movements with delays of five minutes. With the additional 46 TTP buses from the Lakemba Street east approach, the opposed right turn from the Lakemba Street west approach has less opportunity for gaps and to make a turn, resulting in increased movement delay in the TTP scenario. This reduces the number of replacement buses from 46 buses/hour to 15 buses/hour which reduces the delay for the worst movement to two minutes.

Unless the timing of the signals is amended to provide additional capacity for the right turn, there is the potential for an increased likelihood for drivers to turn on the amber which increases the crash risk.

For the mid-block pedestrian crossing at Burwood Road, considering the directional traffic volumes at this crossing, which are expected to be less than 950 in each direction in 2023 (taking into account the construction and TTP traffic), and considering the fact that mid-block crossings normally allow for 75% green split for the vehicular traffic, no capacity issue is foreseeable as a result of operation of this pedestrian crossing.

Road Network Performance – PM Peak

Table 5.24 below shows a summary of the intersection assessment undertaken for this station. .

Table 5.24 Belmore Station Intersection Assessment – PM Peak

Belmore Station – PM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
B.08 Burwood Road / Bridge Road (Priority Controlled)					**Year Capped: 2018**
Demand Flow (veh)	1735	1787	1822	1845	1853
Average Delay per Vehicle (Average over all arms in seconds)	10	14	22	24	24
Average Delay per Vehicle (Worst Movement in seconds)	198	297	581	627	644
LoS (Worst Movement)	F	F	F	F	F
DoS (Worst Movement)	0.89	1.05	1.39	1.44	1.46
B.09 Burwood Road / Redman Parade (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	1625	1795	1826	1919	1857
Average Delay per Vehicle (Average over all arms in seconds)	3	4	4	6	5
Average Delay per Vehicle (Worst Movement in seconds)	56	103	124	248	152
LoS (Worst Movement)	D	F	F	F	F
DoS (Worst Movement)	0.65	0.72	0.74	0.80	0.76
H.20 Burwood Road / Lakemba Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2315	2558	2567	2660	2598
Average Delay per Vehicle (Average over all arms in seconds)	21	27	28	101	98
LoS (Overall)	B	B	B	F	F
DoS (Worst Movement)	0.62	0.90	0.90	1.44	1.56
H.33 Canterbury Road / Burwood Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2810	3106	3106	3106	3106
Average Delay per Vehicle (Average over all arms in seconds)	12	24	24	24	24
LoS (Overall)	A	B	B	B	B
DoS (Worst Movement)	0.85	0.97	0.97	0.97	0.97

One of the four intersections modelled has a negligible increase in delay and a resultant LoS ‘B’.

The Burwood Road / Bridge Road priority controlled intersection has a LoS of ‘F’ in all scenarios, including existing. This is due to the imbalance between the flows. A small number of vehicles on the minor arms experience a high delay, but when combined with the large number of vehicles with no delay on the Burwood Road west and east approaches, it averages to a relatively low average delay. There is 30 times greater traffic volume going through these approaches than the Bridge Road west approach, which results in few gaps to facilitate the through and right movements leading to high modelled theoretical delays of over 10 minutes for both the Construction and TTP scenarios. The overall intersection delay is approximately 20 seconds.

As with the AM Peak, vehicles would be likely to reroute rather than queue on Bridge Road.

The Burwood Road / Redman Parade intersection has an existing LoS 'D'. The level of service declines to 'F' during the future, construction, TTP and Refined Baseline TTP scenarios. The right turning movement from Redman Parade experiences a modelled delay of over four minutes. In practice, short detours to parallel roads, such as Lakemba Street, would be used for vehicles not wishing to pull out into less than satisfactory gaps.

The average delay for the intersection is approximately six seconds which indicates that the major (through) movement operates with negligible delay. Even with the addition of TTP, delays only occurs on the minor approach.

The Burwood Road / Lakemba Street intersection is forecast to experience a decline in amenity as a result of the addition of the TTP traffic. The intersection has a LoS 'B' in the existing, future and construction scenario, worsening to LoS 'F' in the TTS scenario.

The right turning movement from the Lakemba Street west approach is the worst performing movement with delay increasing to nearly seven minutes. The additional 46 TTP buses from the Lakemba Street east approach provides less gaps for the opposed right turn from the Lakemba Street west. Potential mitigation measures for these two intersections are discussed in the next section of this Chapter.

Due to limited alternative routes, it is likely that right turning vehicles would continue to use this intersection. This has the potential unless mitigated to lead to driver frustration.

For the mid-block pedestrian crossing at Burwood Road, considering the directional traffic volumes at this crossing, which are expected to be less than 950 in each direction in 2023 (taking into account the construction and TTP traffic), and considering the fact that mid-block crossings normally allow for 75% green split for the vehicular traffic, no capacity issue is foreseeable as a result of operation of this pedestrian crossing.

5.8.4 Mitigation

The intersections of Burwood Road / Bridge Road and Burwood Road / Lakemba Street have high DoS and LoS F during the Refined Baseline TTP scenario, suggesting high congestion and delays. These intersections have been further tested in SIDRA with mitigation measures to improve intersection performance.

Burwood Road / Bridge Road mitigation testing

As stated in **Section 5.8.3**, Burwood Road / Bridge Road intersection operates at LoS 'F' in all scenarios due to it being a priority controlled intersection, and with very low traffic volumes from the minor arms.

A through and right turn movement ban from Bridge Road west has been tested, with the following results from SIDRA in **Table 5.25**. The Mitigation TTP scenario shows reduction in congestion during both AM and PM peaks, with the reduction of DoS to less than 1, showing that the intersection is within capacity, albeit with delays. The LoS is still F during the AM peak and PM for the worst movement. This is due to very low volumes of right turners off Tobruk Ave (three vehicles) against high traffic volumes on Burwood Road.

As a result of banning the through and right turn movements from Bridge Road west, there is a traffic diversion which impacts other movements. It is therefore assumed that all through and right turning traffic would divert through Marie Lane and Collins Street to reach Burwood Road. For the right turning traffic this would not be expected to add distance to the route. However, noting that Tobruk Avenue is one way, the natural diversion route where the 'ahead' movements divert via Burwood Avenue northbound and then turn right into Tobruk Avenue has been assessed. This is included within the modelling described below.

Table 5.25 Burwood Road / Bridge Road Mitigation Assessment – AM & PM Peak

B.08 Burwood Road / Bridge Road (Priority Controlled)					
Scenario	Existing	Future	Baseline TTP	Refined Baseline TTP	Mitigated TTP
AM Peak					**Year Capped: 2017**
Demand Flow (veh)	1736	1760	1818	1826	1826
Average Delay per Vehicle (Average over all arms in seconds)	11	12	21	21	7
Average Delay per Vehicle (Worst Movement in seconds)	266	322	660	679	293
LoS (Worst Movement)	F	F	F	F	F
DoS (Worst Movement)	0.95	1.03	1.44	1.46	0.756
PM Peak					**Year Capped: 2018**
Demand Flow (veh)	1735	1787	1845	1853	1853
Average Delay per Vehicle (Average over all arms in seconds)	10	14	24	24	9
Average Delay per Vehicle (Worst Movement in seconds)	198	297	627	644	248
LoS (Worst Movement)	F	F	F	F	F
DoS (Worst Movement)	0.89	1.05	1.44	1.46	0.77

To summarise, as shown by **Table 5.25**, the proposed mitigation measures are expected to reduce congestion and delays to an acceptable LoS during AM and PM peaks, and improve intersection performance during the TTP Scenario.

Notwithstanding the proposed mitigation outlined above, as shown in Chapter 8 this intersection is proposed to be signalled as part of the project. Whilst not a requirement to mitigate the construction effects, implementation of the signals ahead of construction would provide the opportunity to give priority to the minor arms, and an initial assessment has shown that the signalled intersection would operate with LoS B or C during the construction phase.

Burwood Road / Lakemba Street

As stated in **Section 5.8.3**, Burwood Road / Lakemba Street intersection performance deteriorates to LoS 'F' with the addition of TTP traffic. Congestion is particularly worse on Lakemba Street west approach. This is due to high right turning volumes from this approach.

The following mitigation measures have been tested to improve intersection performance:

- change lane arrangement from through and right, to right only on the Lakemba Street west approach
- change phase times to 'optimum' using SIDRA, for better allocation of green time against increased traffic volumes
- increase Lakemba Street west lane from 25m to 70m to allow more vehicles to queue without impacting right turning vehicles. This requires only two parking spaces to be removed.

As the right turning volumes from Lakemba Street west forms a sizable portion of the traffic at this approach, the lane re-arrangement improves overall intersection performance. The results of this are shown in **Table 5.26**.

Table 5.26 Burwood Road / Lakemba Street Mitigation Assessment – AM & PM Peak

H.20 Burwood Road / Lakemba Street (Signals)					
Scenario	Existing	Future	Baseline TTP	Refined Baseline TTP	Mitigated TTP
AM Peak					**Year Capped: 2021**
Demand Flow (veh)	2149	2300	2404	2340	2340
Average Delay per Vehicle (Average over all arms in seconds)	24	36	84	111	22
LoS (Overall)	B	C	F	F	B
DoS (Worst Movement)	0.84	0.96	1.30	1.51	0.67
PM Peak					**Year Capped: 2023**
Demand Flow (veh)	2315	2558	2660	2598	2598
Average Delay per Vehicle (Average over all arms in seconds)	21	27	101	98	22
LoS (Overall)	B	B	F	F	B
DoS (Worst Movement)	0.62	0.90	1.44	1.56	0.71

To summarise, as shown by **Table 5.26**, the proposed mitigation measures are expected to reduce congestion and delays to an acceptable LoS during AM and PM peaks, and improve intersection performance during the TTP Scenario.

5.8.5 Public Transport Services

The main bus routes in the Belmore precinct are on Burwood Road, Lakemba Street and Leylands Parade. An assessment of the worksite extent shows that there would be no need to relocate bus stops in the area as a result of construction activities.

While there are a number of construction access gates in close proximity to bus stops, the construction activities are assumed to be in land owned by the RailCorp and should therefore cause no major effects to the bus network.

5.8.6 Active Transport Network

There are existing footpaths for pedestrians adjacent to the worksite extent in this region. Construction activities at these sites are outside of the road reserve and therefore are not expected to affect pedestrian connectivity and safety along footpaths.

Tobruk Ave would form an access way into the worksite and a compound area, as well as be converted into a shared zone for the operation of the project. Active pedestrian management would be required on the footpaths on the north side of Tobruk Ave during the construction works at this location.

Construction works to install a new signalised intersection and upgrade existing footpaths on Burwood Road may result in short-term pedestrian movement impacts, requiring the localised diversion of pedestrians to adjacent footpaths for periods of a week or less.

Works by the Belmore Sports Ground are considered separately in Chapter 6.

There is an off road separate dedicated cycleway along the railway line, between Bridge Road and Edison lane[29]. Further separation can be maintained via the use of hoardings, which can be confirmed closer to works. Works adjacent to the carpark (south of Belmore Station) runs along the edge of the cycleway and is therefore not expected to affect cyclists. Bridge works by the Belmore Sports Ground could potentially require closure of this cycleway. Cyclists can be diverted through the existing carpark onto Edison Lane under active traffic management during closure periods.

There are six cycle racks at Burwood Road station entry[30]. Belmore Station frontage along Burwood Road would be upgraded as part of the project. New cycle parking facilities are proposed as part of the station upgrade in the new station plaza south of the station. The new facilities should be constructed prior to removal of the facilities on Burwood Road.

5.8.7 Commuter and Short Term Parking

There are currently 56 dedicated commuter spaces near Belmore Station. There are further two hour parking spaces on Tobruk Avenue and Redman Parade which also falls on RailCorp land. Due to the location of the worksite extent, an estimated 29 of the dedicated commuter spaces would be removed from use for the entirety of the construction possession. The 46 two hour spaces on Tobruk Avenue would also be removed from use for the entirety of the construction possessions as it would be subsumed into the new station forecourt and entry for Belmore Station.

Some 21 spaces would be removed from use by short term construction possessions. Outside of possessions these 21 two hour spaces could be converted to dedicated commuter car parking.

Other on and off-street parking around the station would be unaffected by construction. Overall, there are approximately 980 unrestricted parking spaces operating at 75% utilisation within a 400 m catchment that can be used as informal park and ride spaces.

Approximately seven on street spaces would be affected by the TTP bus stops. These parking spaces would only be affected while the TTP is in operation, which is during possession periods. During these periods there is likely to be a reduction in demand for parking at the stations. This decline results from the influence of school holiday periods and the change of mode share as some drivers choose to drive to another station or their destination.

5.8.8 Construction Worker Parking

It is anticipated that four to ten parking spaces would be provided at any one time for project workers in the Belmore area. The location of these parking spaces would be dependent on the specific location within the worksite which has active construction at the time.

Table 5.27 provides the anticipated daily construction workforce volume in the Belmore Area. It is assumed that public transport would be promoted as the primary mode of transport for construction workers. This would reduce the impacts on the local road network and parking requirements. As noted above, parking in the area is not fully utilised therefore there is capacity to accommodate any remaining demand for worker parking. Off-site parking alternatives and associated shuttle arrangements would also be investigated to transport workers to and from the site.

Table 5.27 Anticipated Daily Workforce- Belmore

	Non Possession		Possession Short Period Close-down	
	Peak	Typical / Average	Peak	Typical
Belmore Station	60	40	130	60

[29] Source - http://www.sydneycycleways.net/map/
[30] Source - Southwest Metro – Extent of Precinct Works & Interchange Requirements, Sydney Metro

5.9 Lakemba Station

5.9.1 Lakemba Construction Haulage Routes

Figure 5.16 overleaf, shows the proposed construction haulage routes into the sites to be used during construction. At Lakemba Station it is anticipated that 10 heavy and 10 light vehicles would be generated in the AM and PM peak hours. Construction haulage trips at night would be no more than nine heavy and five light vehicle movements per hour.

The swept path analysis determined that construction haulage vehicles are generally able to access all of the proposed sites / gates safely. However, the left turn from The Boulevarde into Haldon Street impacts an existing kerb. Minor kerb cutback at this corner would resolve this conflict. This would be considered in detailed design.

5.9.2 Lakemba Temporary Transport Route

Two bus routes converge before Lakemba, resulting in 44 buses per hour in each direction calling at Lakemba Station in peak periods. The temporary transport bus stops for these routes would use existing bus stops. Please refer to **Appendix E** for the TTS.

The indicative rail replacement operation at Lakemba Station is shown in **Figure 5.15**.

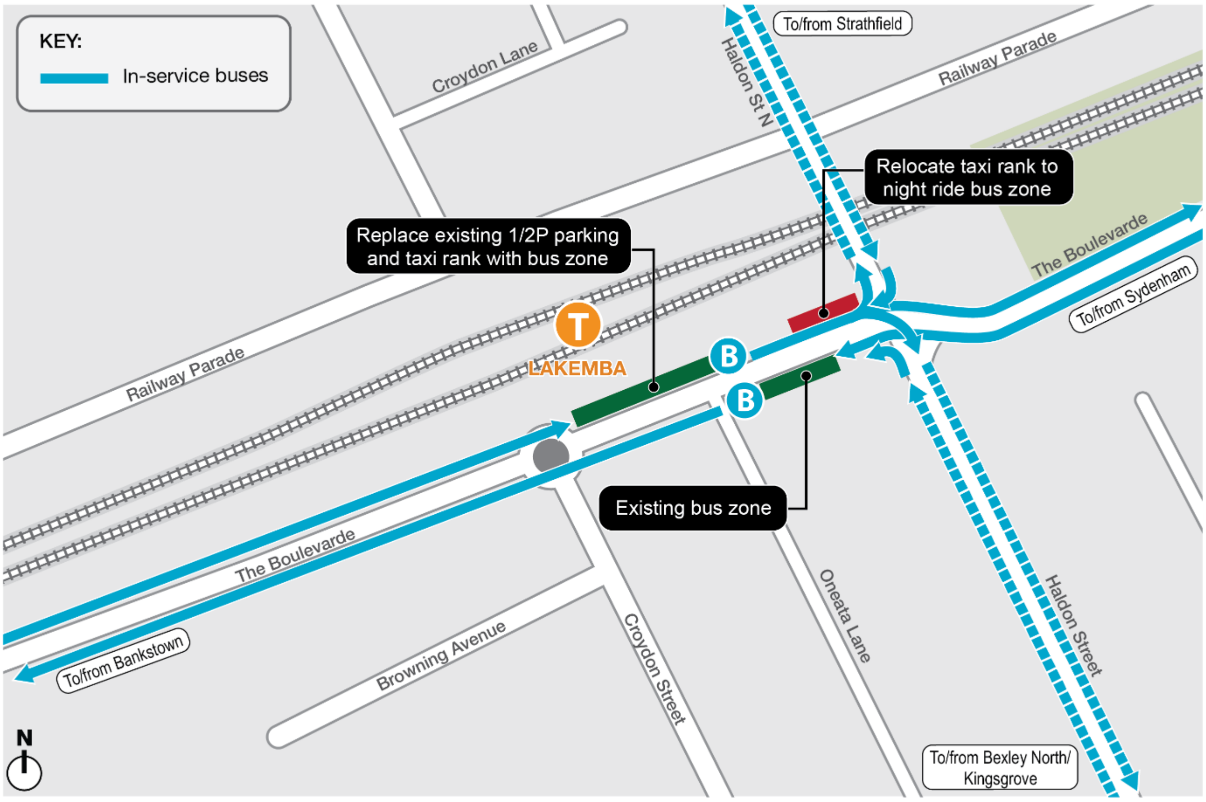


Figure 5.15 Temporary Transport Plan – Lakemba (Sydney Metro 2017)

The remaining bus routes originate east of Lakemba.

5.9.3 Road Network Operation and Intersection Performance

Six intersections were modelled in the area surrounding Lakemba Station as shown in **Figure 5.16**.

Lakemba Station heavy vehicle routes and station intersections

FIGURE 5.16

Road Network Performance – AM Peak

Table 5.28 below shows a summary of the intersection assessment undertaken for this station.

Table 5.28 Lakemba Station Intersection Assessment – AM Peak

Lakemba Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
B.07 The Boulevarde / Haldon Street (Signals)					**Year Capped: 2021**
Demand Flow (veh)	1964	2102	2139	2232	2171
Average Delay per Vehicle (Average over all arms in seconds)	29	65	91	208	108
LoS (Overall)	C	E	F	F	F
DoS (Worst Movement)	0.93	1.05	1.12	1.47	1.21
H.07 Lakemba Street / Wangee Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1565	1729	1729	1729	1729
Average Delay per Vehicle (Average over all arms in seconds)	13	18	18	18	18
LoS (Overall)	A	B	B	B	B
DoS (Worst Movement)	0.62	0.92	0.92	0.92	0.92
H.08 Haldon Street / Railway Parade (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	1376	1511	1527	1527	1527
Average Delay per Vehicle (Average over all arms in seconds)	8	20	32	32	32
Average Delay per Vehicle (Worst Movement in seconds)	65	186	326	326	326
LoS (Worst Movement)	E	F	F	F	F
DoS (Worst Movement)	0.72	1.03	1.22	1.22	1.22
H.09 Lakemba Street / Haldon Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1757	1929	1929	1929	1929
Average Delay per Vehicle (Average over all arms in seconds)	15	15	15	15	15
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.54	0.59	0.59	0.59	0.59
H.10 Ped Crossing on The Boulevarde (Signals)					**Year Capped: 2020**
Demand Flow (veh)	1012	1111	1111	1215	1154
Average Delay per Vehicle (Average over all arms in seconds)	3	4	4	4	4
LoS (Overall)	A	A	A	A	A
DoS (Worst Movement)	0.41	0.46	0.46	0.53	0.49

Lakemba Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
H.21 Canterbury Road / Haldon Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2779	3051	3051	3118	3051
Average Delay per Vehicle (Average over all arms in seconds)	12	12	12	15	12
LoS (Overall)	A	A	A	B	A
DoS (Worst Movement)	0.58	0.86	0.86	0.92	0.86

For four of the six intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and baseline TTP results in a LoS ‘B’ or better. A LoS ‘B’ would result in negligible delays.

The Boulevarde / Haldon Street has an existing LoS ‘C’. The intersection is forecast to experience a decline in amenity as a result of the addition of the future traffic, construction and baseline TTP. The intersection has a LoS of ‘F’ for both the construction and TTP scenarios.

The worst movements (through and right turning movements from The Boulevarde west approach) experience modelled delays of nearly seven minutes. The average delay for the whole intersection is over three minutes which indicates that, while a lot of the delay is being experienced at the west approach, the other approaches also experience some delay.

The through movement from the Haldon Street south approach is also worsened with an average modelled delay of five minutes. The delay results from the increased volume through the intersection with the additional 33 TTP buses, along with a reduction in green time to accommodate the additional 44 TTS buses at The Boulevarde west approach. The intersection remains as LoS ‘F’ in the Refined Baseline TTP scenario but the average delay is halved because route 2 of the TTS does not run.

Local traffic may divert to the main arterials via local roads, such as Croydon Street to avoid waiting at the Boulevarde / Haldon Street intersection.

The Haldon Street / Railway Parade intersection has an existing LoS ‘E’. The intersection is forecast to experience a decline in amenity with the introduction of the construction haulage traffic which stays constant in the TTP scenario. Despite overall intersection delays in the range of less than 35 seconds (LoS ‘C’), the intersection has a LoS of ‘F’ for the future, construction and TTP scenarios due to the movement delays from the Railway Parade west approach.

Being a left, through and right shared lane, all movements from the Railway Parade west approach are the worst performing movements with delays of over five minutes. Although a shared lane, the through and right turning movements are the critical movements as they both must cross northbound and southbound traffic to complete their movement. As it is a priority intersection, these two movements are opposed by over 12 times the traffic from the Haldon Street north and south approaches, leading to few gaps for the movement to be achieved.

Although only three construction haulage vehicles are added to the Railway Parade west approach, given that the intersection is already over capacity this small number of heavy vehicles increases the average movement delay. Mitigation measures for this intersection are discussed in **Section 5.9.4**.

In practice, drivers would not wait for five minutes at the Railway Parade west approach. Left turning vehicles would likely form a short queue to the left of the right turning vehicles. Through and right turning vehicles would become frustrated, reroute along parallel streets, such as Lakemba Street, or turn left at the intersection and reroute.

Road Network Performance – PM Peak

Table 5.29 below shows a summary of the intersection assessment undertaken for this station.

Table 5.29 Lakemba Station Intersection Assessment – PM Peak

Lakemba Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
B.07 The Boulevarde / Haldon Street (Signals)					**Year Capped: 2021**
Demand Flow (veh)	1988	2138	2175	2267	2206
Average Delay per Vehicle (Average over all arms in seconds)	31	61	79	164	99
LoS (Overall)	C	E	F	F	F
DoS (Worst Movement)	0.95	1.10	1.16	1.32	1.18
H.07 Lakemba Street / Wangee Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1720	1900	1900	1900	1900
Average Delay per Vehicle (Average over all arms in seconds)	16	20	20	20	20
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.75	0.90	0.90	0.90	0.90
H.08 Haldon Street / Railway Parade (Priority Controlled)					**Year Capped: 2023**
Demand Flow (veh)	1381	1526	1541	1541	1541
Average Delay per Vehicle (Average over all arms in seconds)	10	22	31	31	31
Average Delay per Vehicle (Worst Movement in seconds)	57	177	271	271	271
LoS (Worst Movement)	E	F	F	F	F
DoS (Worst Movement)	0.74	1.06	1.18	1.18	1.18
H.09 Lakemba Street / Haldon Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1905	2105	2105	2105	2105
Average Delay per Vehicle (Average over all arms in seconds)	14	13	13	13	13
LoS (Overall)	A	A	A	A	A
DoS (Worst Movement)	0.51	0.57	0.57	0.57	0.57
H.10 Ped Crossing on The Boulevarde (Signals)					**Year Capped: 2020**
Demand Flow (veh)	1056	1167	1167	1271	1210
Average Delay per Vehicle (Average over all arms in seconds)	3	3	3	4	4
LoS (Overall)	A	A	A	A	A
DoS (Worst Movement)	0.34	0.38	0.38	0.46	0.42

Lakemba Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
H.21 Canterbury Road / Haldon Street (Signals)					**Year Capped: 2023**
Demand Flow (veh)	3050	3370	3370	3440	3370
Average Delay per Vehicle (Average over all arms in seconds)	12	15	15	16	15
LoS (Overall)	A	B	B	B	B
DoS (Worst Movement)	0.60	0.90	0.90	0.90	0.90

For four of the six intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP results in a LoS 'B' or better. A LoS 'B' would result in negligible delays for the peak hour in Sydney.

The Boulevarde / Haldon Street has an existing LoS 'C'. The intersection is forecast to experience increased delays as a result of the addition of the future traffic, construction and TTP. The intersection has a LoS of 'F' for both the construction and TTP scenarios.

The worst movement (right turning movements from The Boulevarde east approach) experience modelled delays of five minutes. With the additional TTP buses from The Boulevarde west approach, the opposed right turn from The Boulevarde east approach has less opportunity for gaps and to make a turn, resulting in increased movement delay. The Railway Parade west approach has a modelled delay which is nearly as poor as the eastern approach (4.5 minutes).

The average delay for the whole intersection is nearly three minutes which indicates that, while a lot of the delay is being experienced at the west approach, the other approaches also experience some delay.

Local traffic may divert to the main arterials via local roads, such as Croydon Street to avoid waiting at the Boulevarde / Haldon Street intersection.

Haldon Street / Railway Parade has an existing LoS 'E'. The intersection is forecast to increase to LoS 'F' based on the worst movement. The average delay for the worst movement is modelled to be nearly five minutes. TTP does not travel through this intersection and so the delay for the construction scenario and TTP scenarios are the same. Mitigation measures for this intersection are discussed in **Section 5.9.4** .

Most of the increase in delay results from the future traffic. Future traffic is not a result of this project and should therefore not be considered as a negative impact of the Sydney Metro Sydenham to Bankstown upgrade project.

5.9.4 Mitigation

As described in **Section 5.9.3**, Haldon Street / Railway Parade intersection is expected to have high LoS 'F' during the Future and TTP scenarios. Expected traffic growth increases delays at this intersection, and with the addition of TTP buses, the delays are expected to further increase. LoS 'F' and long delays are predominantly at the Railway Parade approach, due to high opposing traffic volumes on Haldon Street.

To mitigate the deteriorating LoS at this intersection, and specifically for Railway Parade approach, signalisation has been tested using SIDRA. Mitigation results are shown in **Table 5.30**.

Signalisation of this intersection is potentially merited due to high traffic volumes approaching on the Railway Parade approach. Mitigation results suggest that the overall intersection LoS improves to 'B' during AM peak and 'A' during PM peak, mainly due to signals reducing delays and allowing traffic from Railway Parade to access Haldon Street.

Table 5.30 Haldon Street / Railway Parade AM & PM Peak Mitigation results

H.08 Haldon Street / Railway Parade (Priority Controlled)					
Scenario	Existing	Future	Baseline TTP	Refined Baseline TTP	Mitigated TTP
AM Peak					**Year Capped: 2023**
Demand Flow (veh)	1376	1511	1527	1527	1527
Average Delay per Vehicle (Average over all arms in seconds)	8	20	32	32	15
Average Delay per Vehicle (Worst Movement in seconds)	65	186	326	326	21
LoS (Worst Movement) (overall for signals)	E	F	F	F	B
DoS (Worst Movement)	0.72	1.03	1.22	1.22	0.78
PM Peak					**Year Capped: 2023**
Demand Flow (veh)	1381	1526	1541	1541	1541
Average Delay per Vehicle (Average over all arms in seconds)	10	22	31	31	13
Average Delay per Vehicle (Worst Movement in seconds)	57	177	271	271	26
LoS (Worst Movement) (overall for signals)	E	F	F	F	A
DoS (Worst Movement)	0.74	1.06	1.18	1.18	0.64

To summarise, as shown by **Table 5.30**, the proposed mitigation measures are expected to reduce congestion and delays to an acceptable LoS during AM and PM peaks, and improve intersection performance during the TTP Scenario.

5.9.5 Public Transport Services

The main bus routes in the Lakemba precinct are on Haldon Street, Railway Parade, Croydon Street, Lakemba Street, Colin Street and The Boulevarde (NSW Govt. 2016b). An assessment of the worksite extent shows that there should not be a requirement for the relocation of bus stops in the area as a result of construction worksites/compound activities.

While there are a number of construction access gates in the area and in close proximity to bus stops, the construction activities are assumed to be on land owned by the RailCorp and should not impact the bus network.

5.9.6 Active Transport Network

Footpaths are adjacent the worksite extent, as well as construction compounds at Lakemba Station. Construction activities at these sites are outside of the road reserve and therefore are not expected to affect pedestrian connectivity and safety along footpaths. Installation of hoarding and site fences in this area may reduce footpath widths. New footpaths and pavements along Railway Parade and the Boulevard may require active pedestrian management.

The construction compound and worksite area west of Haldon Street, adjacent to The Boulevarde is a bridge construction site and is assessed separately in Chapter 6.

The Boulevarde is considered as a cycling friendly road. There are no dedicated on road cycling facilities close to the worksite extent[31]. Although works on Haldon Street Bridge would require full closure of Haldon Street adjacent the station, it is not expected to affect westbound cyclists on The Boulevarde (along the cycle friendly route).

Four cycle racks are located on either side of the station[32] (Railway Parade and The Boulevarde). These areas are proposed to be upgraded as part of the station works[33], and would be phased to provide continuous availability of the parking throughout construction.

A section of Haldon Street and Lakemba Street is common to both the on-street cycle friendly network and the construction haulage routes. Due to the relatively low volume of construction haulage vehicles and the short section of road, there should not be an impact on the user experience or safety of the cyclists.

5.9.7 Commuter and Short Term Parking

There are currently 138 dedicated commuter spaces near Lakemba Station on Railway Parade and The Boulevarde which fall on RailCorp land. Due to the location of the worksite extent, an estimated 47 of these dedicated commuter spaces would be removed from use for the entirety of the construction possessions. An additional 25 of the dedicated commuter spaces would be removed from use by short term construction possessions.

Other on and off-street parking around the station would be unaffected by construction. Overall, there are approximately 960 unrestricted parking spaces operating at 89% utilisation within a 400 m catchment that can be used as informal park and ride spaces.

Approximately 12 on street spaces would be affected by the TTP bus stops in addition to the 25 spaces described above. These parking spaces would only be affected while the TTP is in operation, which is during possession periods. During these periods there is likely to be a reduction in demand for parking at the stations. This reduction results from the influence of school holiday periods and the change of mode share as some drivers choose to drive to another station or their destination.

5.9.8 Construction Worker Parking

It is anticipated that four to ten parking spaces would be provided at any one time for project workers in the Lakemba area. The location of these parking spaces would be dependent on the specific location within the worksite which has active construction at the time.

Table 5.31 provides the anticipated daily construction workforce volume in the Lakemba area. It is assumed that public transport would be promoted as the primary mode of transport for construction workers. This would reduce the impacts on the local road network and parking requirements. As noted above, parking in the area is not fully utilised therefore there is capacity to accommodate any remaining demand for worker parking. Off-site parking alternatives and associated shuttle arrangements would be investigated to transport workers to and from the project area.

Table 5.31 Anticipated Daily Workforce- Lakemba

	Non Possession		Possession Short Period Close-down	
	Peak	Typical / Average	Peak	Typical
Lakemba Station	60	40	130	60

[31] Source - http://www.sydneycycleways.net/map/
[32] Source - Southwest Metro – Extent of Precinct Works & Interchange Requirements, Sydney Metro
[33] Source – Sydney Metro Southwest Precinct Plan – Sydenham, Sydney Metro

5.10 Wiley Park Station

5.10.1 Wiley Park Construction Haulage Routes

Figure 5.18 overleaf, shows the proposed construction haulage routes into the sites to be used during construction. At Wiley Park Station it is anticipated that 10 heavy and 10 light vehicles would be generated in the AM and PM peak hours. Construction haulage trips at night would be no more than nine heavy and five light vehicle movements per hour.

The swept path analysis determined that construction haulage vehicles are generally able to access all of the proposed sites / gates safely.

However, the following movements are noted:

- trucks turning left from King Georges Road into The Boulevarde need to turn from lane 2 (currently a through lane) to avoid conflict with opposing traffic on The Boulevarde. This can be resolved via traffic management and temporary re-alignment of The Boulevarde centre line
- trucks turning left from King Georges Road into Lakemba Street need to turn from Lane 2 (currently a through movement only lane) to avoid conflict with opposing traffic on Lakemba Street. Traffic management and closure of the kerbside lane is recommended during construction delivery hours to remove this conflict.

These movements would be given further consideration in detailed design.

5.10.2 Wiley Park Temporary Transport Route

Two bus routes converge before Wiley Park, resulting in 44 buses per hour in each direction calling at Wiley Park Station in peak periods. Existing unrestricted parking on both the north and south sides of The Boulevarde would be replaced by temporary transport bus stops for these routes. Please refer to **Appendix E** for the TTS.

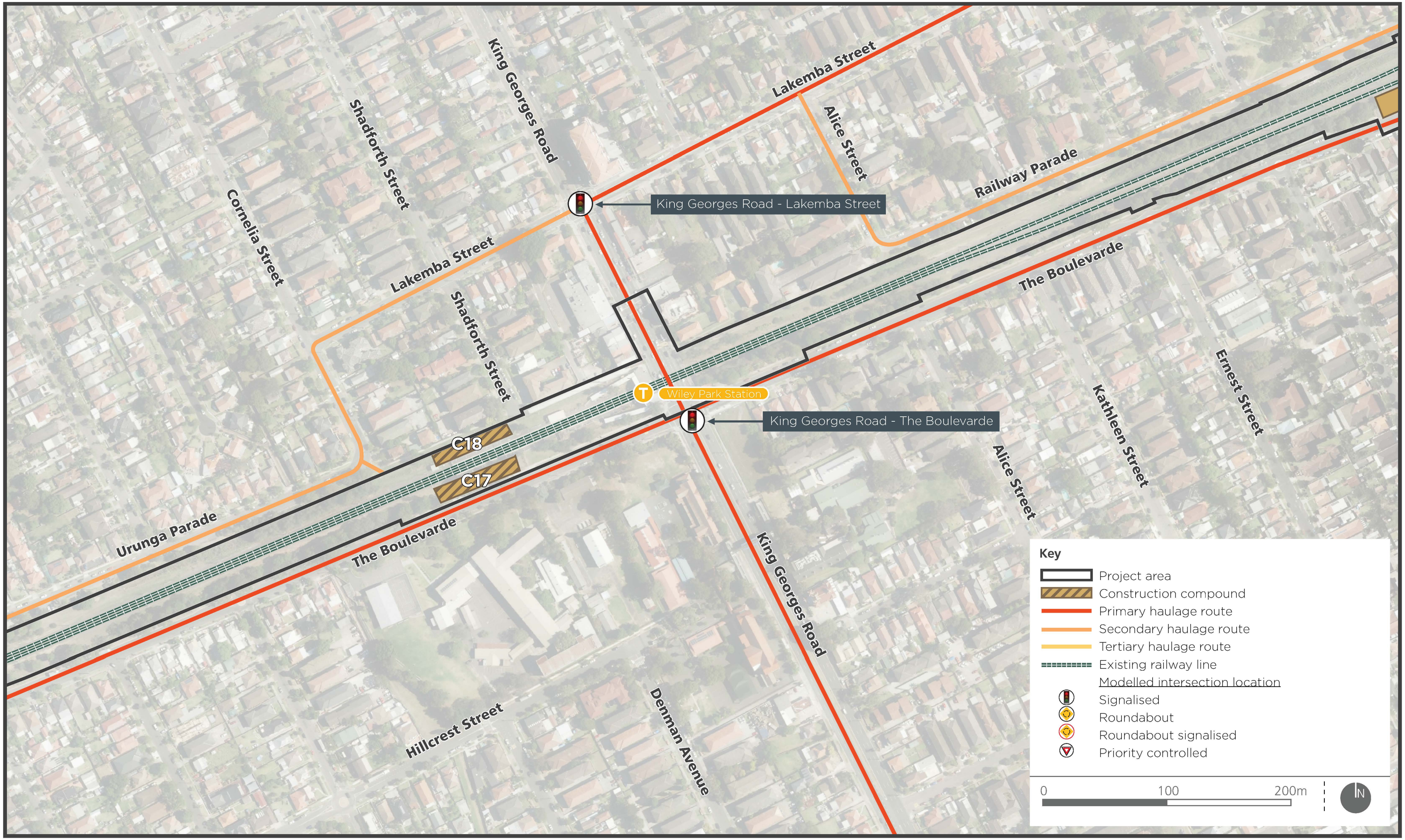
The indicative rail replacement operation at Wiley Park Station is shown in **Figure 5.17**.

Figure 5.17 Temporary Transport Plan – Wiley Park (Sydney Metro 2017)

The remaining bus routes originate east of Wiley Park.

5.10.3 Road Network Operation and Network Performance

Two intersections were modelled in the area surrounding Wiley park Station as shown in **Figure 5.18**.



Wiley Park Station heavy vehicle routes and station intersections

FIGURE 5.18

Road Network Performance – AM Peak

Table 5.32 below shows a summary of the intersection assessment undertaken for this station.

Table 5.32 Wiley Park Station Intersection Assessment – AM Peak

Wiley Park Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
H.06 King Georges Road / Lakemba Street (Signals)					**Year Capped: 2023**
Demand Flow (PCU)	5881	6483	6528	6528	6528
Average Delay per PCU (Overall)	23	30	31	31	30
LoS (Overall)	B	C	C	C	C
DoS (Worst Movement)	0.86	0.95	0.97	0.98	0.95
B.06 King Georges Road / The Boulevarde (Signals)					**Year Capped: 2023**
Demand Flow (PCU)	5868	6468	6517	6693	6577
Average Delay per PCU (Overall)	35	45	47	87	57
LoS (Overall)	C	D	D	F	E
DoS (Worst Movement)	0.95	0.98	1.01	1.01	0.96

For the King Georges Road / Lakemba Street intersection, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The King Georges Road / The Boulevarde intersection is forecast to experience a decline in amenity as a result of the addition of the TTP traffic. The intersection currently has a LoS of ‘C’ which worsens to a LoS ‘F’ in the TTP scenario.

The worst performing movement at this intersection is The Boulevarde west approach with a DoS of 1.01 for both the Construction and TTP scenarios. The additional TTP buses (44 per hour in the peak arriving at the intersection from the east and west approaches of The Boulevarde) also increases the delay for the through movement from the King George Road south approach which increases to nearly two minutes.

The Refined Baseline TTP continues along the same route as the baseline TTP, but the number of replacement buses reduces to 15 per hour. The reduction in replacement buses improves the level of service to ‘E’ which is negligibly above the future conditions.

Road Network Performance – PM Peak

Table 5.33 below shows a summary of the intersection assessment undertaken for this station.

Table 5.33 Wiley Park Station Intersection Assessment – PM Peak

Wiley Park Station – PM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
H.06 King Georges Road / Lakemba Street (Signals)					**Year Capped: 2023**
Demand Flow (PCU)	5656	6277	6322	6322	6322
Average Delay per PCU (Overall)	25	43	45	47	38
LoS (Overall)	B	D	D	D	D
DoS (Worst Movement)	0.83	0.96	0.98	0.99	0.98
B.06 King Georges Road / The Boulevarde (Signals)					**Year Capped: 2023**
Demand Flow (PCU)	5796	6432	6481	6657	6511
Average Delay per PCU (Overall)	35	50	51	89	53
LoS (Overall)	C	D	D	F	D
DoS (Worst Movement)	0.84	0.96	0.97	1.02	0.95

For the King Georges Road / Lakemba Street intersection, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP results in a LoS 'D'.

The King Georges Road / The Boulevarde intersection has an existing LoS 'C'. The TTP scenario is forecast to experience a decline in amenity to LoS 'F' as a result of the additional TTP traffic.

The Boulevarde east approach is the worst performing movement with a delay of over two minutes in the TTP scenario. An additional 44 buses/hour travel through the intersection from the east and west approaches in the TTP scenario. This causes queues for other traffic at the same approaches.

The additional TTP buses reduce the green time for the northbound/southbound phase. This reduces the northbound capacity at the King George Road north approach which leads to a delay of over one minute for the through movement from the King Georges Road north.

The Refined Baseline TTP continues along the same route as the baseline TTP, but the number of replacement buses reduces to 15 per hour. The reduction in replacement buses improves the level of service to 'D' which would not be of any note within the context of the typical journey at peak time.

It should be noted that due to the close proximity of the King Georges Road / Lakemba Street and King Georges Road / The Boulevarde there is a high level of interdependence between the intersections. A shift in green time at one intersection causes a misalignment of signal phases between the intersections. This could lead to additional queues for southbound traffic on the King Georges Road overbridge. This interdependence has been included in the models.

5.10.4 Public Transport Services

The main bus routes in the Wiley Park precinct are on King Georges Road and Lakemba Street. The night bus (N40) travels along The Boulevarde. An assessment of the worksite extent shows that there should not be a requirement for bus stops to be relocated as a consequence of construction activities.

While there are a number of construction access gates in the area and in close proximity to bus stops, the construction activities are assumed to be on land owned by the RailCorp and should therefore not impact the bus network.

5.10.5 Active Transport Network

Pedestrian footpaths are next to the works adjacent to the works west of Wiley Park Station. Construction activities at the worksite extent are outside of the road reserve and therefore are not expected to affect pedestrian connectivity and safety along footpaths. Installation of hoarding and site fences in this area may reduce footpath widths.

There may be some construction activities adjacent the footpath on The Boulevarde, including removal of the existing access. Works on the Boulevarde to the west of King Georges Road would be physically separated from footpaths to maintain pedestrian and construction activity separation and way-finding provided. Works on the Boulevarde to the east of King Georges Road may temporarily require pedestrian management while the kerbside facilities are constructed.

The Boulevarde is considered to be a cycling friendly road, without any dedicated on road cycling facilities close to worksite extents[34]. Works on King Georges Road Bridge in the vicinity of the station would require lane closures on King Georges Road adjacent the station, but is not expected to affect westbound / eastbound cyclists on The Boulevarde (along the cycle friendly route).

There are currently five cycle parks on the northern side of the station entry on King Georges Road[35]. This area is proposed to be upgraded as part of the station works[36], and the phasing of the works would be such to maintain at least five cycle parks throughout the construction period. The temporary cycle parks would meet the requirements of the NSW Government Bike and Ride Program and TfNSW 'Bicycle Facilities' standard.

Lakemba Street and Urunga Parade are common to both the on-street cycle friendly network and the construction haulage routes. Due to the relatively low volume of construction haulage vehicles there should not be a major effect on the user experience or safety of the cyclists.

5.10.6 Commuter and Short Term Parking

As there are currently no dedicated commuter spaces at or near Wiley Park Station, and so there are no dedicated spaces expected affected by the worksite extent. Overall, there are approximately 720 unrestricted parking spaces currently operating at 63% utilisation within a 400 m catchment that can be used as informal park and ride spaces.

Approximately 16 on street spaces would be affected by the TTP bus stops. These parking spaces would only be affected while the TTP is in operation, which is during possession periods. During these periods there is likely to be reduced demand for parking at the stations. This decline results from the influence of school holiday periods and the change of mode share as some drivers choose to drive to another station or their destination.

5.10.7 Construction Worker Parking

It is anticipated that four to ten parking spaces would be provided at any one time for project workers in the Wiley Park area. These parking spaces would be located dependent on the specific location within the worksite which has active construction at the time.

Table 5.34 provides the anticipated daily construction workforce volume in the Wiley Park area. It is assumed that public transport would be promoted as the primary mode of transport for construction workers. This would reduce the impacts on the local road network and parking requirements. As noted above, parking in the area is not fully utilised therefore there is capacity to accommodate any remaining demand for worker parking. Off-site parking alternatives and associated shuttle arrangements would also be investigated to transport workers to and from the site.

[34] Source - http://www.sydneycycleways.net/map/
[35] Source - Southwest Metro – Extent of Precinct Works & Interchange Requirements, Sydney Metro
[36] Source – Sydney Metro Southwest Precinct Plan – Wiley Park, Sydney Metro

Table 5.34 Anticipated Daily Workforce- Wiley Park

	Non Possession		Possession Short Period Close-down	
	Peak	Typical / Average	Peak	Typical
Wiley Park Station	60	40	130	60

5.11 Punchbowl Station

5.11.1 Punchbowl Construction Haulage Routes

Figure 5.20 overleaf, shows the proposed construction haulage routes into the sites to be used during construction. At Punchbowl Station it is anticipated that 10 heavy and 10 light vehicles would be generated in the AM and PM peak hours. Construction haulage trips at night would be no more than nine heavy and five light vehicle movements per hour.

The swept path analysis determined that construction haulage vehicles are generally able to access all of the proposed sites / gates safely. However, the following specific movements are noted:

- trucks turning left from Wattle Street into Highclere Avenue need to turn from the through (middle) lane in order to avoid opposing traffic on Highclere Avenue. This conflict can be resolved via traffic management and re-aligning the centreline along Highclere Avenue (would require removal of median traffic island which would be reinstated post construction) and temporary parking ban on both sides of Highclere Avenue at times of delivery
- Loder Lane / South Terrace –the left turn for a 12.5m truck from Loder Lane onto South Terrace tracks over the centre line. This can be managed via temporary parking removal on South Terrace to allow eastbound vehicles to drive along closer to the kerb. The turning truck can be further separated from on-coming vehicles by using cones or other physical barriers.

These options would be further considered in detailed design.

5.11.2 Punchbowl Temporary Transport Route

Two bus routes converge before Punchbowl, resulting in 44 buses per hour in each direction calling at Punchbowl Station in peak periods. The temporary transport bus stops for these routes would use existing bus stops.

The indicative rail replacement operation at Punchbowl Station is shown in **Figure 5.19**.

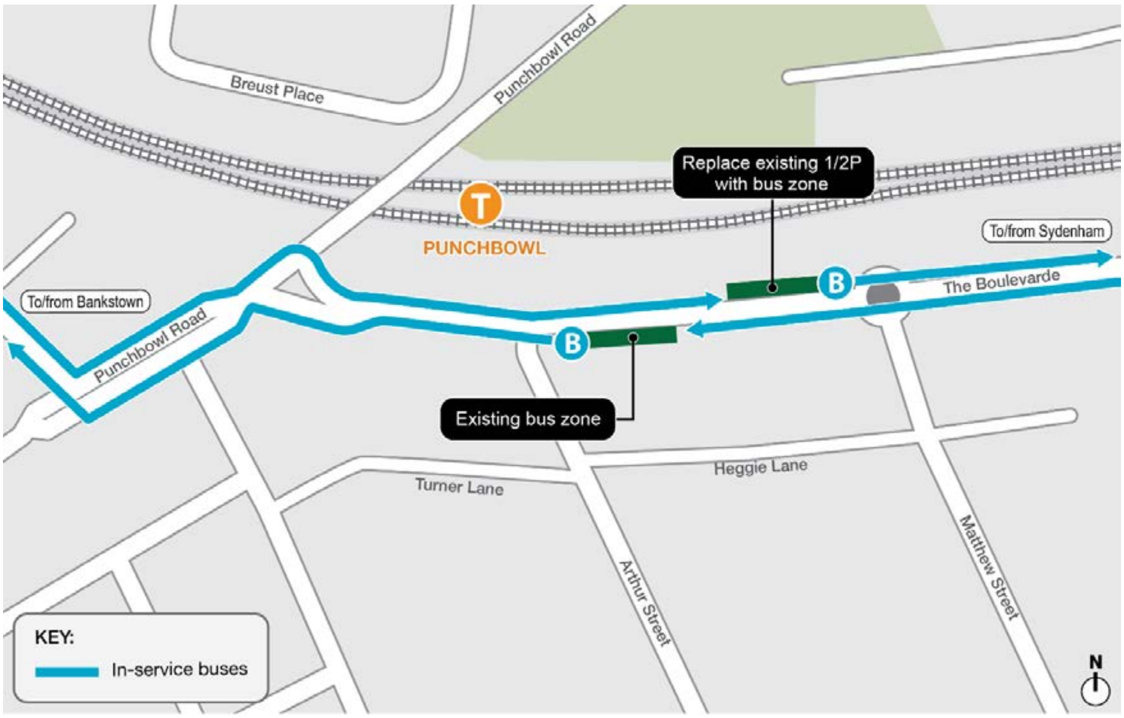


Figure 5.19 Temporary Transport Plan – Punchbowl (Sydney Metro 2017)

The remaining bus routes originate east of Punchbowl.

5.11.3 Road Network Operations and Intersection Performance

Four intersections were modelled in the area of Punchbowl Station as shown in **Figure 5.20**.

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Punchbowl Station heavy vehicle routes and station intersections

FIGURE 5.20

Road Network Performance – AM Peak

Table 5.35 below shows a summary of the intersection assessment undertaken for this station.

Table 5.35 Punchbowl Station Intersection Assessment – AM Peak

Punchbowl Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
B.04 Punchbowl Road / South Terrace (Signals)					**Year Capped: 2023**
Demand Flow (PCU)	2425	2637	2649	2825	2709
Average Delay per PCU (Overall)	41	75	78	118	85
LoS (Overall)	C	F	F	F	F
DoS (Worst Movement)	0.95	1.02	1.03	1.09	1.03
B.05 Punchbowl Road / The Boulevarde (Signals)					**Year Capped: 2023**
Demand Flow (PCU)	2901	3153	3177	3353	3237
Average Delay per PCU (Overall)	33	40	42	48	46
LoS (Overall)	C	C	C	D	D
DoS (Worst Movement)	0.95	0.99	1.00	1.05	1.05
H.05 Punchbowl Road / Rossmore Avenue (Priority Controlled)					**Year Capped: 2023**
Demand Flow (PCU)	1061	1153	1159	1247	1189
Average Delay per PCU (Overall)	1	2	2	2	2
Average Delay per PCU (Worst Movement)	1	2	2	2	2
LoS (Worst Movement)	A	A	A	A	A
DoS (Worst Movement)	0.39	0.42	0.42	0.42	0.42
H.22 The Boulevarde / Arthur Street (Signals)					**Year Capped: 2023**
Demand Flow (PCU)	1278	1388	1400	1576	1460
Average Delay per PCU (Overall)	15	17	17	17	17
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.60	0.63	0.65	0.72	0.72

For three of the four intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP results in a LoS ‘D’ or better. A LoS ‘D’ would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The Punchbowl Road / South Terrace intersection has a current LoS ‘C’. The intersection is forecast to experience a decline in amenity to LoS ‘F’ for the future, construction and TTP scenarios. The through and left turning movements from the Punchbowl Road west approach are the worst performing movements in the TTP scenario with a modelled delay of over three minutes.

The intersection delay is nearly two minutes for the TTP and nearly 1.5 minutes for the Refined Baseline TTP scenario. This implies that the South Terrace and Punchbowl Road east approaches both experience some delay.

The reduction in delay for the Refined Baseline TTP results from a reduction of 29 replacement buses in the Refined Baseline TTP scenario.

It is expected that most commuters would continue to use the intersection with these levels of delay. Those wishing to reduce their travel time may use the local roads, such as Rossmore Avenue. Due to a reduction in background traffic, scheduling works during the school term 4 break period would help to alleviate congestion at this intersection although further mitigation measures may be required.

Road Network Performance – PM Peak

Table 5.36 below shows a summary of the intersection assessment undertaken for this station.

Table 5.36 Punchbowl Station Intersection Assessment – PM Peak

Punchbowl Station – PM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
B.04 Punchbowl Road / South Terrace (Signals)					**Year Capped: 2023**
Demand Flow (PCU)	2397	2620	2632	2808	2662
Average Delay per PCU (Overall)	28	33	34	41	35
LoS (Overall)	B	C	C	C	C
DoS (Worst Movement)	0.79	0.87	0.87	0.94	0.91
B.05 Punchbowl Road / The Boulevarde (Signals)					**Year Capped: 2023**
Demand Flow (PCU)	2716	2969	2993	3169	3053
Average Delay per PCU (Overall)	30	35	36	41	38
LoS (Overall)	C	C	C	C	D
DoS (Worst Movement)	0.79	0.87	0.88	0.93	0.93
H.05 Punchbowl Road / Rossmore Avenue (Priority Controlled)					**Year Capped: 2023**
Demand Flow (PCU)	1302	1423	1429	1517	1459
Average Delay per PCU (Overall)	2	2	2	2	2
Average Delay per PCU (Worst Movement)	2	2	2	2	2
LoS (Worst Movement)	A	A	A	A	A
DoS (Worst Movement)	0.44	0.48	0.48	0.48	0.48
H.22 The Boulevarde / Arthur Street (Signals)					**Year Capped: 2023**
Demand Flow (PCU)	1440	1574	1586	1762	1646
Average Delay per PCU (Overall)	21	17	16	20	17
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.80	0.71	0.70	0.77	0.77

All of the intersections modelled in the PM around Punchbowl Station have a level of service of 'C' or better after accounting for the increase in delay resulting from future traffic growth, construction haulage traffic and TTP scenarios.

The Refined Baseline TTP reduces the number of buses per hour through the intersection from 44 to 15 per hour. Due to the relatively low levels of congestion, the impact of the reduced TTP is minimal.

5.11.4 Public Transport Services

The main bus routes in the Punchbowl precinct are on Punchbowl Road, Dudley Street and Acacia Avenue. The night bus (N40) travels along The Boulevarde. An assessment of the construction worksite extent shows that bus stops would not need to be relocated as a consequence of construction activities.

While there are a number of construction access gates in the area and in close proximity to bus stops, the construction activities are assumed to be in land owned by the RailCorp and should therefore have no impact on the bus network.

5.11.5 Active Transport Network

There are existing footpaths for pedestrians adjacent the worksite extent around Punchbowl Station. Construction activities at these sites are outside of the road reserve and therefore are not expected to affect pedestrian connectivity and safety along footpaths. Installation of hoarding and site fences in this area may reduce footpath widths.

Pedestrian management may be required during the following construction activities:

- for access to the station from the corner of Punchbowl Road and Warren Reserve, due to the extent of the worksite and construction compound in this location for the duration of the project
- during the removal of the station access from the corner of Punchbowl Road and Warren Reserve and construction of the new station entrance off Urunga Parade
- during the construction of the new pavement and kerbside facilities on the Boulevarde.

There are no dedicated cycleways or designated cycle friendly roads within the Punchbowl Station catchment[37].

There are six existing bike parking facilities on each side of the station (off The Boulevarde and Punchbowl Road)[38]. These areas are proposed to be upgraded with secure bike parking[39], and installation of the new facilities would be phased to occur prior to the removal of the existing facilities. These new facilities would meet the requirements of the NSW Government Bike and Ride Program and TfNSW 'Bicycle Facilities' standard.

5.11.6 Commuter and Short-Term Parking

There are currently 137 dedicated commuter spaces at or near Punchbowl Station which fall on RailCorp land. Approximately 30 of these spaces would be removed from use for the entirety of the construction possessions from long term construction possessions. They would be subsumed by the new station forecourt and entry on The Boulevarde. In addition, approximately 50 unrestricted spaces on The Boulevarde would be removed from use by short term construction possessions to accommodate construction activities on land managed by RailCorp. Land is available during this time for 40 replacement spaces to be built along The Boulevarde.

Other on-street and off-street parking around the station would be unaffected by construction. Overall, there are approximately 825 unrestricted parking spaces operating at 84% utilisation within a 400 m catchment that can be used as informal park and ride spaces.

Dedicated commuter spaces are not expected to be affected while the TTP is in operation, however six on street short-term spaces would be affected by the TTP bus stops. These parking spaces would only be affected while the TTP is in operation, which is during possession periods. During these periods there is likely to be a reduction in demand for parking at the stations. This decline results from the influence of school holiday periods and the change of mode share as some drivers choose to drive to another station or their destination.

[37] Source - http://www.sydneycycleways.net/map/
[38] Source - Southwest Metro – Extent of Precinct Works & Interchange Requirements, Sydney Metro
[39] Source – Sydney Metro Southwest Precinct Plan – Punchbowl, Sydney Metro

5.11.7 Construction Worker Parking

It is anticipated that four to ten parking spaces would be provided at any one time for project workers in the Punchbowl area. The location of these parking spaces would move dependent on the specific location within the worksite which has active construction at the time.

Table 5.37 provides the anticipated daily construction workforce in the Punchbowl Area. It is assumed that public transport would be promoted as the primary mode of transport for construction workers. This would reduce the impacts on the local road network and parking requirements. As noted above, parking in the area is not fully utilised therefore there is capacity to accommodate any remaining demand for worker parking. Off-site parking alternatives and associated shuttle arrangements would be investigated to transport workers to and from the site.

Table 5.37 Anticipated Daily Workforce- Punchbowl

	Non Possession		Possession Short Period Close-down	
	Peak	Typical / Average	Peak	Typical
Punchbowl Station	60	40	130	60

5.12 Bankstown Station

5.12.1 Bankstown Construction Haulage Routes

Figure 5.22 overleaf, shows the proposed construction haulage routes into the sites to be used during construction. At Bankstown Station it is anticipated that 10 heavy and 10 light vehicles would be generated in the AM and PM peak hours. Construction haulage trips at night would be no more than nine heavy and five light vehicle movements per hour.

The swept path analysis determined that construction vehicles are generally able to access all of the proposed sites / gates safely. However the following specific movements are noted:

- right turn from Raymond Street into Restwell Street overlaps on adjacent right turn lane. This is expected to be a minor issue and can be resolved by minor road marking changes to remove the conflict zone
- left turn from North Terrace onto Stacey Street overlaps slightly over the right turning lanes on Wattle Street. This issue can be resolved by minor adjustments to the existing traffic island / road marking to remove the conflict.

These matters would be considered further in detailed design.

5.12.2 Bankstown Temporary Transport Route

Two bus routes converge at Bankstown, resulting in 44 buses per hour in each direction calling at Bankstown Station in peak periods. The temporary transport bus stops would use areas that are currently allocated car parking, bus layovers, loading zones and special events bus zones.

The indicative rail replacement operation at Bankstown Station is shown in **Figure 5.21**.

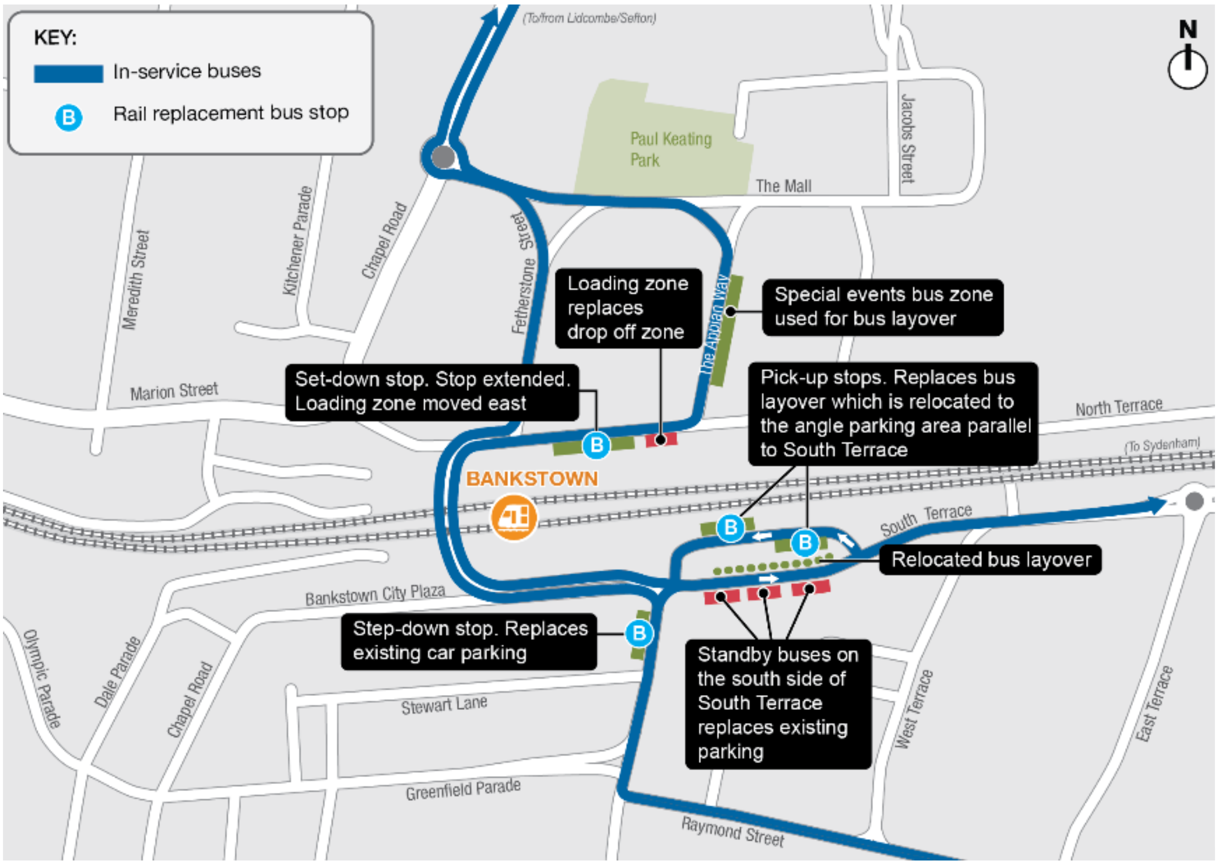
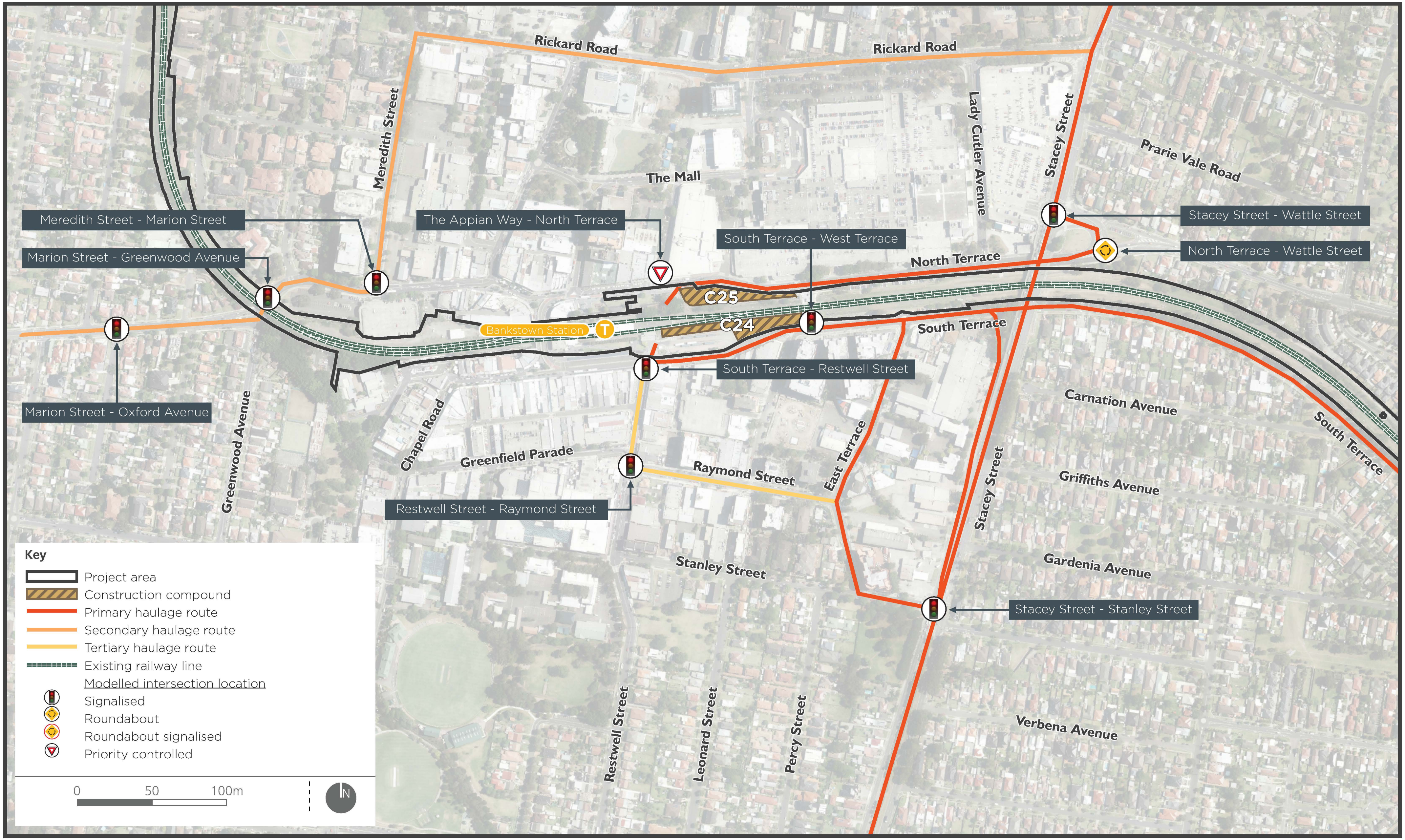


Figure 5.21 Temporary Transport Plan – Bankstown (Sydney Metro 2017)

The remaining bus routes originate east of Bankstown.



Bankstown Station heavy vehicle routes and station intersections

FIGURE 5.22

5.12.3 Road Network Operation and Intersection Performance

Ten intersections were modelled in the area surrounding Bankstown Station as shown in **Figure 5.22**.

Road Network performance - AM Peak

Table 5.38 below shows a summary of the intersection assessment undertaken for this station.

Table 5.38 Bankstown Station Intersection Assessment – AM Peak

Bankstown Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
B.01 South Terrace / Restwell Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	1183	1299	1314	1445	1385
Average Delay per Vehicle (Average over all arms in seconds)	24	25	26	48	35
LoS (Overall)	B	B	B	D	C
DoS (Worst Movement)	0.58	0.64	0.65	0.88	0.79
B.02 Restwell Street / Raymond Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	1446	1588	1596	1643	1612
Average Delay per Vehicle (Average over all arms in seconds)	23	26	26	34	28
LoS (Overall)	B	B	B	C	B
DoS (Worst Movement)	0.76	0.83	0.83	0.91	0.86
B.03 South Terrace / West Terrace (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	2322	2550	2558	2603	2589
Average Delay per Vehicle (Average over all arms in seconds)	29	30	30	31	31
LoS (Overall)	C	C	C	C	B
DoS (Worst Movement)	0.56	0.63	0.64	0.71	0.67
H.01 Meredith Street / Marion Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	2645	2905	2905	2905	2905
Average Delay per Vehicle (Average over all arms in seconds)	28	32	32	32	32
LoS (Overall)	B	C	C	C	C
DoS (Worst Movement)	0.85	0.90	0.90	0.90	0.91
H.02 Stacey Street / Wattle Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	4598	5049	5064	5064	5064
Average Delay per Vehicle (Average over all arms in seconds)	16	16	17	17	17
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.81	0.89	0.89	0.89	0.89

Bankstown Station – AM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
H.03 North Terrace / Wattle Street (Roundabout)					**Year Capped: 2023**
Demand Flow (Veh)	2719	2985	3001	3001	3001
Average Delay per Vehicle (Average over all arms in seconds)	8	10	11	11	11
Average Delay per Vehicle (Worst Movement in seconds)	17	22	22	22	22
LoS (Worst Movement)	B	B	B	B	B
DoS (Worst Movement)	0.66	0.77	0.77	0.77	0.95
H.04 Stanley Street / Stacey Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	4449	4885	4926	4926	4926
Average Delay per Vehicle (Average over all arms in seconds)	25	26	28	28	28
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.86	0.95	0.95	0.95	0.95
H.30 The Appian Way / North Terrace (Priority Controlled)					**Year Capped: 2023**
Demand Flow (Veh)	1263	1387	1387	1409	1409
Average Delay per Vehicle (Average over all arms in seconds)	7	9	9	10	10
Average Delay per Vehicle (Worst Movement in seconds)	18	26	26	34	34
LoS (Worst Movement)	B	B	B	C	C
DoS (Worst Movement)	0.60	0.68	0.68	0.76	0.76
H.31 Marion Street / Oxford Avenue (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	2675	2937	2937	2937	2937
Average Delay per Vehicle (Average over all arms in seconds)	14	23	23	23	23
LoS (Overall)	A	B	B	B	B
DoS (Worst Movement)	0.73	0.75	0.75	0.75	0.75
H.32 Marion Street / Greenwood Avenue (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	3407	3741	3741	3741	3741
Average Delay per Vehicle (Average over all arms in seconds)	29	33	33	33	33
LoS (Overall)	C	C	C	C	C
DoS (Worst Movement)	0.77	0.89	0.89	0.89	0.89

All of the intersections modelled in the AM around Bankstown Station have a level of service of ‘D’ or better after accounting for the increase in delay resulting from future traffic growth, construction haulage traffic and TTP scenarios. A LoS ‘D’ would generally be considered reasonable during peak periods.

The Refined Baseline TTP reduces the number of buses per hour in the Bankstown precinct from 44 to 15 per hour. Due to the relatively low levels of congestion and the low interaction of TTP buses with the modelled intersections, the impact of the reduced TTP is minimal.

It should be noted that the improvement in the DoS from the Existing to Future scenarios is due to SCATS optimising the signal times from what has been observed, resulting in improved performance of the intersection.

Road Network Performance – PM Peak

Table 5.39 below shows a summary of the intersection assessment undertaken for this station.

Table 5.39 Bankstown Station Intersection Assessment – PM Peak

Bankstown Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
B.01 South Terrace / Restwell Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	1032	1141	1157	1290	1229
Average Delay per Vehicle (Average over all arms in seconds)	26	27	27	49	38
LoS (Overall)	B	B	B	D	C
DoS (Worst Movement)	0.56	0.61	0.62	0.88	0.79
B.02 Restwell Street / Raymond Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	1318	1456	1464	1509	1479
Average Delay per Vehicle (Average over all arms in seconds)	23	26	27	34	29
LoS (Overall)	B	B	B	C	C
DoS (Worst Movement)	0.74	0.82	0.85	0.91	0.86
B.03 South Terrace / West Terrace (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	2290	2530	2538	2582	2568
Average Delay per Vehicle (Average over all arms in seconds)	29	30	30	32	31
LoS (Overall)	C	C	C	C	C
DoS (Worst Movement)	0.61	0.69	0.70	0.77	0.74
H.01 Meredith Street / Marion Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	2764	3054	3054	3054	3054
Average Delay per Vehicle (Average over all arms in seconds)	43	42	42	42	42
LoS (Overall)	C	C	C	C	C
DoS (Worst Movement)	0.94	0.92	0.92	0.92	0.92
H.02 Stacey Street / Wattle Street (Signals)					**Year Capped: 2018**
Demand Flow (Veh)	5882	6058	6074	6074	6074
Average Delay per Vehicle (Average over all arms in seconds)	38	39	40	40	40
LoS (Overall)	C	C	C	C	C
DoS (Worst Movement)	0.92	1.10	1.10	1.10	1.10

Bankstown Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
H.03 North Terrace / Wattle Street (Roundabout)					**Year Capped: 2023**
Demand Flow (Veh)	2411	2664	2680	2680	2680
Average Delay per Vehicle (Average over all arms in seconds)	11	20	20	20	20
Average Delay per Vehicle (Worst Movement in seconds)	28	81	81	81	81
LoS (Worst Movement)	B	F	F	F	F
DoS (Worst Movement)	0.77	0.99	0.99	0.99	0.99
H.04 Stanley Street / Stacey Street (Signals)					**Year Capped: 2017**
Demand Flow (Veh)	5548	5631	5672	5672	5672
Average Delay per Vehicle (Average over all arms in seconds)	14	18	27	27	27
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.94	1.10	1.24	1.24	1.24
H.30 The Appian Way / North Terrace (Priority Controlled)					**Year Capped: 2022**
Demand Flow (Veh)	1367	1490	1490	1511	1511
Average Delay per Vehicle (Average over all arms in seconds)	11	27	27	52	52
Average Delay per Vehicle (Worst Movement in seconds)	26	121	121	267	267
LoS (Worst Movement)	B	F	F	F	F
DoS (Worst Movement)	0.74	1.07	1.07	1.25	1.25
H.31 Marion Street / Oxford Avenue (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	2616	2891	2891	2891	2891
Average Delay per Vehicle (Average over all arms in seconds)	14	17	17	17	17
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.86	0.90	0.90	0.90	0.90
H.32 Marion Street / Greenwood Avenue (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	3550	3923	3923	3923	3923
Average Delay per Vehicle (Average over all arms in seconds)	30	29	29	29	30
LoS (Overall)	C	C	C	C	C
DoS (Worst Movement)	0.91	0.90	0.90	0.90	0.91

For eight of the ten intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and TTP results in a LoS ‘D’ or better. A LoS ‘D’ would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The North Terrace / Wattle Street roundabout has an existing LoS ‘B’. The intersection worsens to a LoS ‘F’ with the addition of future traffic. There are only eight construction haulage vehicles at the eastern approach, eight construction haulage vehicles at the western approach and no additional TTP buses passing through the North Terrace / Wattle Street intersection. Therefore the average delay remains the same as the future scenario. The decline in amenity that has been modelled for this intersection is therefore not attributed to the Sydney Metro Sydenham to Bankstown Project.

The Appian Way / North Terrace intersection has an existing LoS ‘B’. The intersection delays increase and the LoS changes to ‘F’ with the introduction of future traffic volumes. Construction haulage traffic does not affect the intersection but TTP traffic travels along The Appian Way and onto North Terrace. The average delay for the whole intersection increases to nearly one minute in the TTP scenario.

The right turning movement from The Appian Way north approach is the worst performing movement with a delay of over four minutes. This approach is nearly over capacity in the future traffic scenario and so the additional 20 TTP buses leads to a sharp increase in delay.

The Refined Baseline TTP reduces the number of buses per hour in the Bankstown precinct from 44 to 15 per hour. Due to the relatively low levels of congestion and the low interaction of TTP buses with the modelled intersections, the impact of the reduced TTP is minimal.

Due to a reduction in background traffic, scheduling works during the school term 4 break period would significantly reduce congestion at the North Street / Wattle Street roundabout and would help to alleviate congestion at the Appian Way / North Terrace intersection although further mitigation measures would be required, as identified in Chapter 9.

5.12.4 Public Transport Services

There are a number of different bus routes that travel through the Bankstown precinct. An assessment of the worksite extent shows that there should not be a requirement for bus stops to be relocated in the area as a consequence of construction activities.

The works adjacent to South Terrace, between Restwell Street and Lopez Lane, are next to bus stop 2200343. Construction haulage vehicles are expected to use the bus bay to approach the access gate, however truck movements should not affect the ability of the bay to function as a bus stop.

5.12.5 Active Transport Network

Footpaths adjacent to the worksite extent in Bankstown are outside of the road reserve and would not be impacted by construction activities.

Pedestrian management may be required during the construction of the new station entrance on South Terrace and North Terrace, as well as the kerbside facilities proposed for North Terrace.

Works at Stacey Street Overbridge are a bridge construction site and are considered separately in Chapter 6.

There are existing bike parking areas on both sides of the station (North Terrace and South Terrace)[40]. These areas are proposed to be upgraded with secure bike parking[41]. Bike parking is recommended to be managed through staged construction activities.

5.12.6 Commuter and Short Term Parking

There are currently 147 dedicated commuter spaces near Bankstown Station on North Terrace and South Terrace, which fall on RailCorp land. Due to the location of the worksite extent, an estimated 90 of these dedicated commuter spaces would be removed from use for the entirety of the construction possessions.

Other on-street and off-street parking around the station would be unaffected by construction. Overall, there are only approximately 80 unrestricted parking spaces within a 400 m catchment that can be used as informal park and ride spaces and these are already operating at 98% utilisation.

The analysis in Chapter 3 shows that passengers are already used to parking more than 400m from the station at Bankstown.

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[40] Source - Southwest Metro – Extent of Precinct Works & Interchange Requirements, Sydney Metro
[41] Source – Sydney Metro Southwest Precinct Plan – Bankstown, Sydney Metro

Dedicated commuter spaces are not expected to be affected while the TTP is in operation, however approximately 18 on street spaces would be affected by the TTP bus stops. These parking spaces would only be affected while the TTP is in operation, which is during possession periods. During these periods there is likely to be a reduction in demand for parking at the stations. This decline results from the influence of school holiday periods and the change of mode share as some drivers choose to drive to another station or their destination.

5.12.7 Construction Worker Parking

It is anticipated that four to ten parking spaces would be provided at any one time for project workers in the Bankstown area. The location of these parking spaces would move dependent on the specific location within the worksite which has active construction at the time.

Table 5.40 provides the anticipated daily workforce volume for construction workers in the Bankstown Area. It is assumed that public transport would be promoted as the primary mode of transport for construction workers. This would reduce the impacts on the local road network and parking requirements. As noted above, there is very little spare parking capacity in this location to accommodate worker parking. Off-site parking alternatives and associated shuttle arrangements would be investigated to transport workers to and from the site.

Table 5.40 Anticipated Daily Workforce - Bankstown

	Non Possession		Possession Short Period Close-down	
	Peak	Typical / Average	Peak	Typical
Bankstown Station	135	90	300	130

5.13 Regents Park Station

Regents Park Station, and the other stations west of Bankstown do not have any civil construction related activities occurring as part of the project. Some enabling activities related to the implementation of the TTP may be required as detailed in Chapter 9 of the main EIS report. However as a result of the track possessions which are required for the project, the current rail services would be suspended to these stations in addition to those above, with the TTP implemented. This requires consideration of the effects on the road network from these additional bus movements.

5.13.1 Active Transport Network

There are no proposed construction activities within those station catchments and therefore there are no expected effects on active transport modes.

5.13.2 Regents Park Temporary Transport Route

The Baseline TTP assumes the need for one bus service for Regents Park Station, resulting in 12 buses per hour in each direction. The temporary transport bus stops would use areas that are currently used for bus stops.

The remaining bus routes originate east of Regents Park.

The indicative rail replacement operation at Regents Park Station is shown in **Figure 5.23**.

Figure 5.23 Temporary Transport Plan – Regents Park (Sydney Metro 2017)

5.13.3 Road Network Performance – AM Peak and PM Peaks

Table 5.41 and **Table 5.42** below shows a summary of the intersection assessment undertaken for this station.

Table 5.41 Regents Park Station Intersection Assessment – AM Peak

Regents Park Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
H.35 Auburn Road / Amy Street (Roundabout)					**Year Capped: 2023**
Demand Flow (Veh)	2216	2433	No Vehicles	2446	2446
Average Delay per Vehicle (Average over all arms in seconds)	10	13		14	14
Average Delay per Vehicle (Worst Movement in seconds)	13	18		18	18
LoS (Worst Movement)	A	B		B	B
DoS (Worst Movement)	0.70	0.81		0.82	0.82

Table 5.42 Regents Park Station Intersection Assessment – PM Peak

Regents Park Station – PM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
H.35 Auburn Road / Amy Street (Roundabout)					**Year Capped: 2023**
Demand Flow (Veh)	1985	2193	No Vehicles	2205	2205
Average Delay per Vehicle (Average over all arms in seconds)	9	10		10	10
Average Delay per Vehicle (Worst Movement in seconds)	10	12		13	13
LoS (Worst Movement)	A	A		A	A
DoS (Worst Movement)	0.56	0.65		0.65	0.65

In the AM peak, the intersections around Regents Park Station have a level of service of 'B' or better after accounting for the increase in delay resulting from future traffic growth and TTP scenarios. A LoS 'B' would not cause noticeable delays for commuters in the peak hour in Sydney.

5.13.4 Commuter and Short Term Parking

Dedicated commuter and other unrestricted parking spaces are not expected to be affected while the TTP is in operation.

5.14 Lidcombe Station

5.14.1 Lidcombe Temporary Transport Route

One bus route travels past Lidcombe Station, resulting in six buses per hour in each direction. The temporary transport bus stops would utilise areas that are currently used for bus stops and car parking.

The indicative rail replacement operation at Lidcombe is shown in **Figure 5.24**.

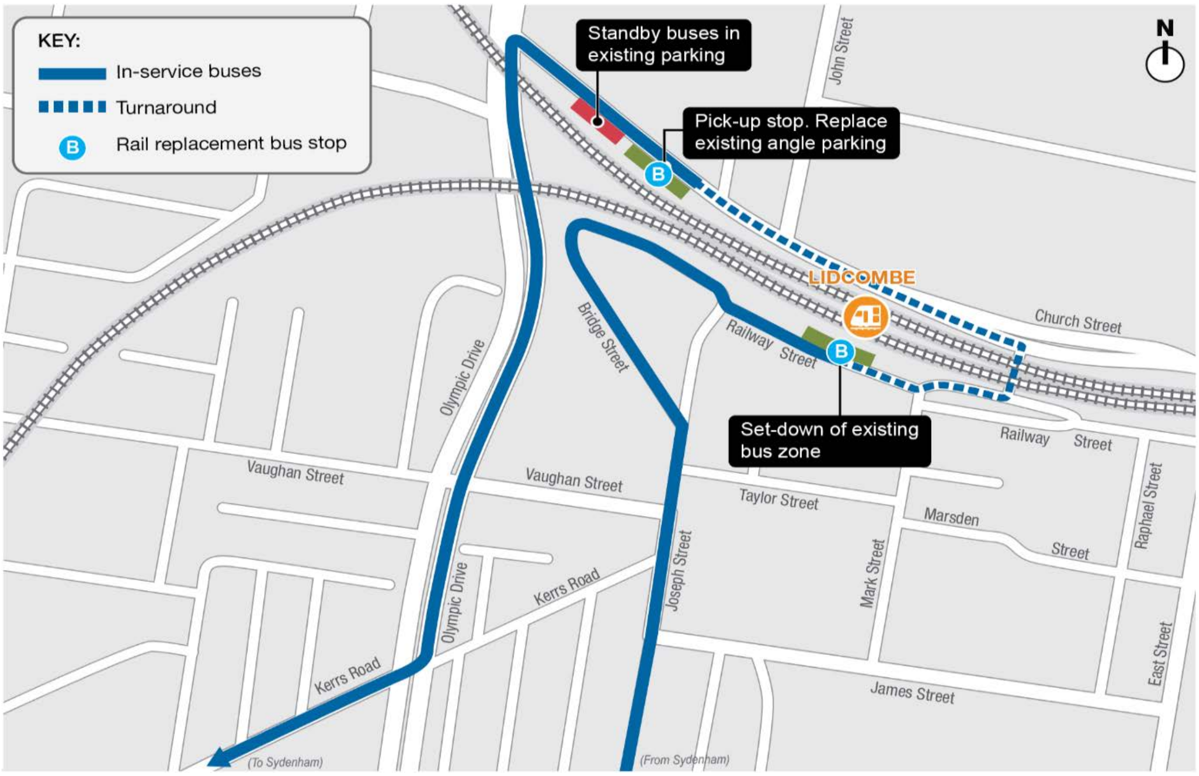


Figure 5.24 Temporary Transport Plan – Lidcombe (Sydney Metro 2017)

The remaining bus routes originate east of Lidcombe.

5.14.2 Road Network Performance – AM Peak

Table 5.43 below shows a summary of the intersection assessment undertaken for this station.

Table 5.43 Lidcombe Station Intersection Assessment – AM Peak

Lidcombe Station – AM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
H.26 Joseph Street / Georges Avenue (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	5386	5914	No Vehicles	5928	5928
Average Delay per Vehicle (Average over all arms in seconds)	21	20		20	20
LoS (Overall)	B	B		B	B
DoS (Worst Movement)	0.89	0.96		0.96	0.96
H.27 Olympic Drive / Joseph Street (Signals)					**Year Capped: 2019**
Demand Flow (Veh)	4661	5117	No Vehicles	5131	5131
Average Delay per Vehicle (Average over all arms in seconds)	5	5		5	5
LoS (Overall)	A	A		A	A
DoS (Worst Movement)	0.75	0.76		0.78	0.78
H.28 Vaughan Street / Joseph Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	1323	1453	No Vehicles	1468	1468
Average Delay per Vehicle (Average over all arms in seconds)	12	13		13	13
LoS (Overall)	A	A		A	A
DoS (Worst Movement)	0.75	0.80		0.80	0.80
H.29 Olympic Drive / Church Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	4888	5367	No Vehicles	5381	5381
Average Delay per Vehicle (Average over all arms in seconds)	20	41		49	49
LoS (Overall)	B	C		D	D
DoS (Worst Movement)	0.80	0.96		0.98	0.98

All four intersections near Lidcombe Station have a LoS ‘D’ or better after allowing for future traffic growth and TTP scenarios.

Olympic Drive / Church Street is the only intersection which is forecast to experience a decline in amenity. This decline is mostly attributed to future traffic growth. The TTP scenario increases the delay by eight seconds as a result of 14 buses travelling through the intersection. Eight seconds could be considered to be within the range of reasonable daily fluctuations and therefore should not be noticed by commuters.

5.14.3 Road Network Performance – PM Peak

Table 5.44 below shows a summary of the intersection assessment undertaken for this station.

Table 5.44 Lidcombe Station Intersection Assessment – PM Peak

Lidcombe Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
H.26 Joseph Street / Georges Avenue (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	5300	5856	No Vehicles	5871	5871
Average Delay per Vehicle (Average over all arms in seconds)	22	25		25	25
LoS (Overall)	B	B		B	B
DoS (Worst Movement)	0.71	0.91		0.94	0.94
H.27 Olympic Drive / Joseph Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	4495	4967	No Vehicles	4981	4981
Average Delay per Vehicle (Average over all arms in seconds)	6	6		6	6
LoS (Overall)	A	A		A	A
DoS (Worst Movement)	0.69	0.72		0.73	0.73
H.28 Vaughan Street / Joseph Street (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	1440	1591	No Vehicles	1606	1606
Average Delay per Vehicle (Average over all arms in seconds)	14	14		14	14
LoS (Overall)	A	B		B	B
DoS (Worst Movement)	0.52	0.56		0.58	0.58
H.29 Olympic Drive / Church Street (Signals)					**Year Capped: 2022**
Demand Flow (Veh)	4802	5306	No Vehicles	5320	5320
Average Delay per Vehicle (Average over all arms in seconds)	29	56		65	65
LoS (Overall)	B	D		E	E
DoS (Worst Movement)	0.90	0.94		0.97	0.97

The Olympic Drive / Church Street intersection is forecast to experience an increase in delay as a result of the addition of the TTP traffic in the PM Peak. The intersection has a LoS of ‘D’ in the Future scenario, worsening to a LoS ‘E’ in the TTP scenario. Scheduling works during the school term break periods would help to alleviate congestion at this intersection.

The through movement from the Olympic Drive north approach is the worst performing movement with an average delay of over 1 minute. There are 14 replacement buses travelling southeast in the TTP scenario, causing green time to be taken away from the dominant north-south movement and reallocated to the southeast movement.

5.14.4 Active Transport Network

There are no proposed construction activities within this station catchment and therefore there are no expected effects on active transport modes.

5.14.5 Commuter and Short Term Parking

Approximately 20 on street short-term spaces would be affected by the TTP bus stops. These parking spaces would only be affected while the TTP is in operation, which is during possession periods. During these periods there is likely to be a reduction in demand for parking at the stations. This reduction results from the influence of school holiday periods and the change of mode share as some drivers choose to drive to another station or their destination.

5.15 Birrong Station

5.15.1 Birrong Temporary Transport Route

One bus route travels past Birrong Station, resulting in twelve buses per hour. The temporary transport bus stops would use areas that are currently used for car parking.

The indicative rail replacement operation at Birrong is shown in **Figure 5.25**.

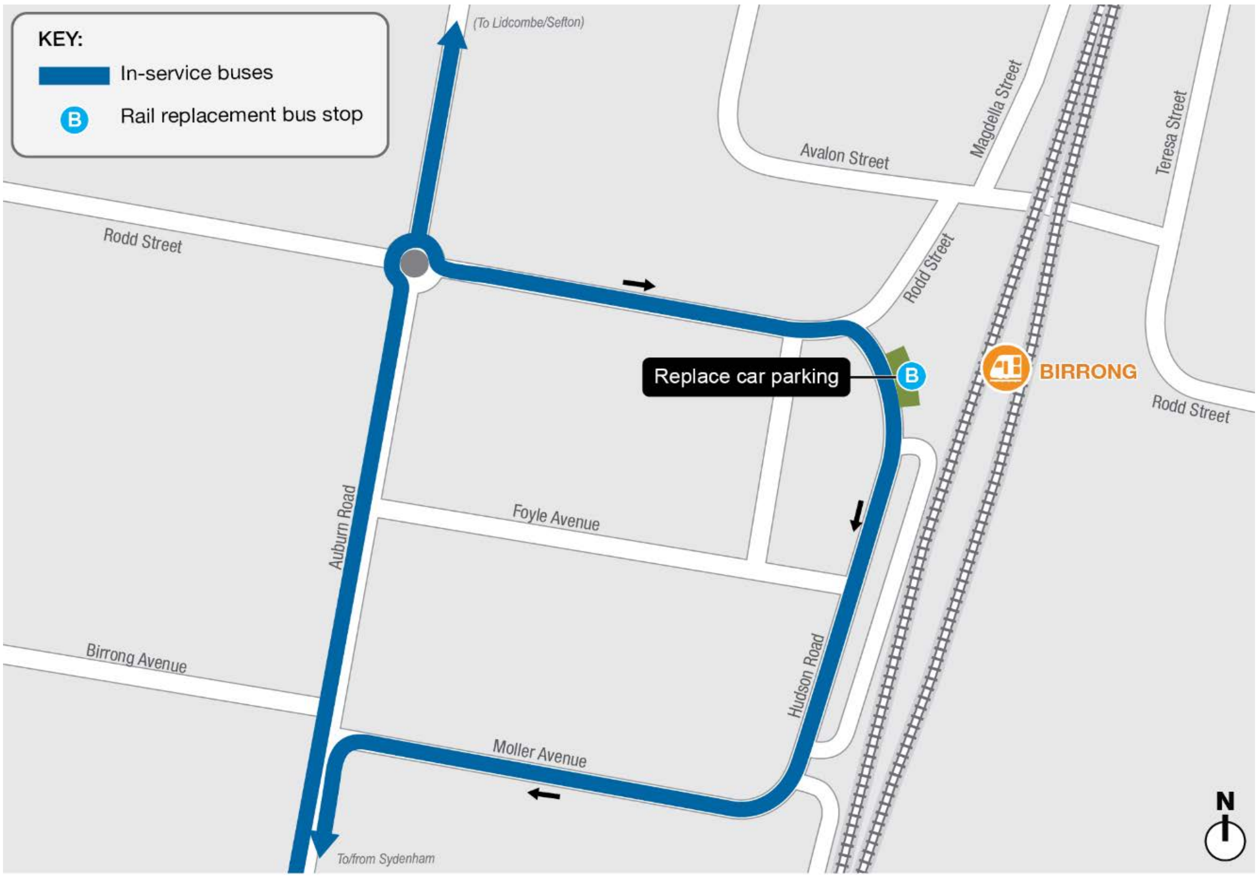


Figure 5.25 Temporary Transport Plan – Birrong (Sydney Metro 2017)

The remaining bus routes originate east of Birrong.

5.15.2 Road Network Performance – AM Peak and PM Peak

Table 5.45 and **Table 5.46** below show a summary of the intersection assessment undertaken for this station.

Table 5.45 Birrong Station Intersection Assessment – AM Peak

Birrong Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
H.44 Auburn Road / Moller Avenue (Priority Controlled)					**Year Capped: 2023**
Demand Flow (Veh)	1271	1396	No Vehicles	1437	1437
Average Delay per Vehicle (Average over all arms in seconds)	1	1		1	1
Average Delay per Vehicle (Worst Movement in seconds)	31	41		47	47
LoS (Worst Movement)	C	C		D	D
DoS (Worst Movement)	0.35	0.39		0.41	0.41

Table 5.46 Birrong Station Intersection Assessment – PM Peak

Birrong Station – PM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
H.44 Auburn Road / Moller Avenue (Priority Controlled)					**Year Capped: 2023**
Demand Flow (Veh)	1303	1440	No Vehicles	1481	1481
Average Delay per Vehicle (Average over all arms in seconds)	0	0		0	0
Average Delay per Vehicle (Worst Movement in seconds)	22	28		31	31
LoS (Worst Movement)	B	B		C	C
DoS (Worst Movement)	0.36	0.40		0.42	0.42

In the AM peak the level of service declines from 'C' in the existing and future scenario, and declines to 'D' with the addition of TTP which is based off the worst movement (right turning movement from the Birrong Road approach). A LoS 'D' would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

In the PM peak the level of service declines from 'B' in the existing and future scenario, and declines to 'C' with the addition of TTP which is based off the worst movement (right turning movement from the Birrong Road approach).

5.15.3 Active Transport Network

There are no proposed construction activities within this station catchment and therefore there are no expected effects on active transport modes.

5.15.4 Commuter and Short Term Parking

Approximately six on street short-term spaces would be affected by the TTP bus stops. These parking spaces would only be affected while the TTP is in operation, which is during possession periods. During these periods there is likely to be a decline in demand for parking at the stations. This decline results from the influence of school holiday periods and the change of mode share as some drivers choose to drive to another station or their destination.

5.16 Yagoona Station

5.16.1 Yagoona Temporary Transport Route

One bus route travels past Yagoona Station, resulting in 12 buses per hour in each direction. The temporary transport bus stops would use existing bus stops.

The indicative rail replacement operation at Yagoona is shown in **Figure 5.26**.

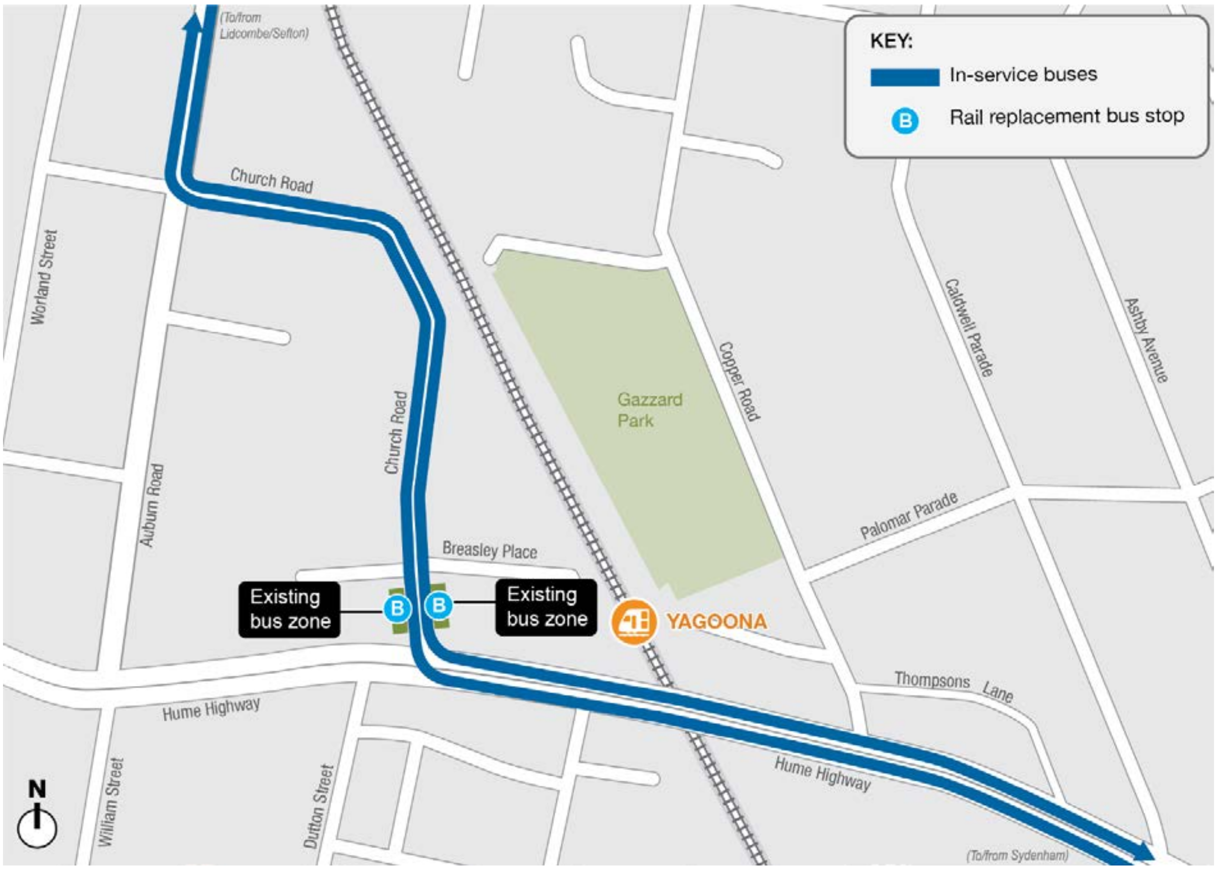


Figure 5.26 Temporary Transport Plan – Yagoona (Sydney Metro 2017)

The remaining bus routes originate east of Yagoona.

5.16.2 Road Network Performance – AM Peak

Table 5.47 below shows a summary of the intersection assessment undertaken for this station.

Table 5.47 Yagoona Station Intersection Assessment – AM Peak

Yagoona Station – AM Peak					
Scenario	Existing	Future	Construction	Baseline TTP	Refined Baseline TTP
H.42 Chapel Road / Hume Highway (Signals)		**Year Capped: 2021**			
Demand Flow (Veh)	4361	4666	No Vehicles	4706	4706
Average Delay per Vehicle (Average over all arms in seconds)	34	36		42	42
LoS (Overall)	C	C		C	C
DoS (Worst Movement)	0.82	0.83		0.90	0.90
H.43 Church Road / Hume Highway (Priority Controlled)				**Year Capped: 2023**	
Demand Flow (Veh)	4031	4426	No Vehicles	4467	4467
Average Delay per Vehicle (Average over all arms in seconds)	4	19		27	27
Average Delay per Vehicle (Worst Movement in seconds)	608	943		778	778
LoS (Worst Movement)	F	F		F	F
DoS (Worst Movement)	0.91	1.10		1.76	1.76

Of the two intersections, Chapel Road / Hume Highway retains a LoS ‘C’ throughout all scenarios. A LoS ‘C’ would generally be considered reasonable during peak periods.

The Church Road /Hume Highway priority intersection has a current level of service F during the morning and afternoon peaks. The modelled average delay is likely to increase as a result of the future traffic from a predicted 10 minutes at present to 16 minutes with future traffic growth in the AM. These modelled delays reflect the demand at Church Road exceeding the capacity of gaps in the main flow. Where the demand exceeds capacity, driver behaviour potentially changes, resulting in the choice to pull into smaller gaps between vehicles on the main movement. Under the baseline TTP the modelled delays would actually decrease slightly reflecting the additional gaps in through traffic arising from increase turning traffic creating gaps for egressing vehicles.

However, the modelling does not take account of the signalled intersection to the east, and the queues / platooning effects which arise as a result. The ‘keep clear’ road markings mean that when the signals stop the flow along Hume Highway, and the queue extends to the Church Street intersection, it is possible for the movement into Church Street to occur, and likely that some vehicles would be able to egress.

5.16.3 Road Network Performance – PM Peak

Table 5.48 below shows a summary of the intersection assessment undertaken for this station.

Table 5.48 Yagoona Station Intersection Assessment – PM Peak

Yagoona Station – PM Peak					
Scenario	**Existing**	**Future**	**Construction**	**Baseline TTP**	**Refined Baseline TTP**
H.42 Chapel Road / Hume Highway (Signals)					**Year Capped: 2023**
Demand Flow (Veh)	5059	5591	No Vehicles	5632	5632
Average Delay per Vehicle (Average over all arms in seconds)	35	38		41	41
LoS (Overall)	C	C		C	C
DoS (Worst Movement)	0.80	0.89		0.89	0.89
H.43 Church Road / Hume Highway (Priority Controlled)					**Year Capped: 2023**
Demand Flow (Veh)	4176	4614	No Vehicles	4655	4655
Average Delay per Vehicle (Average over all arms in seconds)	3	4		23	23
Average Delay per Vehicle (Worst Movement in seconds)	317	284		926	926
LoS (Worst Movement)	F	F		F	F
DoS (Worst Movement)	0.91	0.91		1.79	1.79

The Chapel Road / Hume Highway retains a LoS ‘C’ throughout all scenarios. As with the AM assessment above, the PM modelling shows that without the keep clear markings and queues from the Chapel Road signals Church Road would be significantly over capacity when TTS services are running. Monitoring of the conditions and efficiency of the TTS would be required, and potential mitigations should the delays lead to significant delays for existing traffic or the buses on TTS could include alternate routes for some or all TTS services.

5.16.4 Active Transport Network

There are no proposed construction activities within this station catchment and therefore there are no expected effects on active transport modes.

5.16.5 Commuter and Short Term Parking

Dedicated commuter and other unrestricted parking spaces are not expected to be affected while the TTP is in operation.

5.17 Summary of construction assessment - Station and Track Alignment works

5.17.1 Existing, Construction and TTP Scenario Average Daily Traffic

Table 5.49 below outlines the existing Average Daily Traffic (ADT) for construction haulage routes and TTP scenario routes, as well as the estimated construction haulage volumes and baseline TTP scenario bus volumes for the area surrounding each station. The method of calculating the ADTs from the peak hourly flow has been discussed in **Section 3.1.5** above.

Table 5.49 Existing, Construction and TTP ADT

Station	Road	Existing ADT (Vehicles per day)			Additional Construction Haulage ADT (Vehicles per day)			Additional Baseline TTP ADT (Vehicles per day)	Additional Refined Baseline TTP ADT (Vehicles per day)
		Total	LV	HV	Total	LV	HV	Buses	Buses
Marrickville	Myrtle Street	1,100	1,000	100	220	110	110	0	0
	Carrington Road (Between Schwebel Street and Myrtle Street)	8,800	8,000	800	220	110	110	0	0
	Richardson Crescent	18,600	17,400	1,200	220	110	110	0	0
	Illawarra Road (between Marrickville Road and Calvert Street)	11,900	11,100	800	330	110	220	500	230
	Marrickville Road (Between Illawarra Road and Silver Street)	16,200	14,100	2,100	0	0	0	1,590	860
	Victoria Road (Between Marrickville Road and Fernbank Street)	7,900	7,400	500	0	0	0	0	0
	Warren Road (Between Illawarra Road and Moyes Street)	11,000	9,600	1,400	220	110	110	570	260
Dulwich Hill	Livingstone Road (between Warren Road and Jersey Street)	12,200	11,800	400	40	0	40	0	0
	Marrickville Road (Between Darley Street and Wardell Road)	12,600	11,200	1,400	240	110	130	1,020	600
	Dudley Street (Between School Parade and Wardell Road)	4,300	4,100	200	40	0	40	570	40
	Bayley Street (Between Ewart Street and Dudley Street)	800	700	100	40	0	40	570	40
	Ewart Street (Between Bayley Street and Wicks Ave)	7,500	7,100	400	40	0	40	570	490

Station	Road	Existing ADT (Vehicles per day)			Additional Construction Haulage ADT (Vehicles per day)			Additional Baseline TTP ADT (Vehicles per day)	Additional Refined Baseline TTP ADT (Vehicles per day)
		Total	LV	HV	Total	LV	HV	Buses	Buses
	Beauchamp Street (Between School Parade and Ewart Street)	7,500	7,100	400	40	0	40	570	260
	Wardell Road (Between Marrickville Road and Pine Street)	14,400	14,000	400	240	110	130	0	230
	Terrace Road (Between New Canterbury Road and Consett Street)	1,300	1,300	0	460	220	240	0	0
	New Canterbury Road (Between Kintore Street and Terrace Road)	28,800	27,800	1,000	460	220	240	1,020	380
Hurlstone Park	Garnet Street (Between Canterbury Road and Hampden Street)	2,200	2,200	0	40	0	40	0	0
	New Canterbury Road (Between Wattle Lane and Old Canterbury Road)	25,100	24,000	1,100	460	220	240	1,020	380
	Duntroon Street	2,000	1,900	100	220	110	110	0	0
	Crinan Street (Between Floss Street and Fernhil Street)	8,500	7,800	700	360	220	140	240	260
	Canterbury Road (Between Queen Street and Wattle Ln)	25,400	23,500	1,900	480	220	260	1,020	600
	Dunstaffenage Street (Between Crinan Street and Floss Street)	300	300	0	70	0	70	0	0
	Crinan Street (Between Melford Street and Dunstaffenage Street)	6,700	6,000	700	480	220	260	240	260
	Canterbury Road (Between Queen Street and Princess Street)	29,800	27,600	2,200	480	220	260	1260	640

Station	Road	Existing ADT (Vehicles per day)			Additional Construction Haulage ADT (Vehicles per day)			Additional Baseline TTP ADT (Vehicles per day)	Additional Refined Baseline TTP ADT (Vehicles per day)
		Total	LV	HV	Total	LV	HV	Buses	Buses
Canterbury	Crinan Street (Between Melford Street and Dunstaffenage Street)	6,700	6,000	700	480	220	260	240	260
	Canterbury Road (Between Close Street and Broughton Street)	51,300	47,840	3,530	260	110	150	1,260	640
	Close Street	800	600	200	410	240	170	0	0
	Broughton Street (Between Canterbury Road and Robert Street)	3,600	3,200	400	260	110	150	0	0
	Canterbury Road (Between Jeffrey Street and Minter Street)	35,740	32,970	2,770	530	220	310	1,260	640
	Charles Street	930	760	170	44	22	22	0	0
	Charles Street (Between Canterbury Road and Broughton Street)	1,000	800	200	260	110	150	0	0
	Canterbury Road (Between Charles Street and Close Street)	51,300	47,800	3,500	260	110	150	1,260	640
	Wairoa Street (between Wonga Street and Nowra Street)	10,100	10,000	100	0	0	0	0	0
	Canterbury Road (Between Wonga Street and Cooks Avenue)	38,600	35,400	3,200	350	110	240	500	0
	Canterbury Road (Between Fore Street and Charles Street)	51,600	48,100	3,500	350	110	240	1,260	640
	Canterbury Road (Between Wonga Street and Fore Street)	44,500	41,200	3,300	350	110	240	500	0
	Wonga Street	13,000	12,800	200	0	0	0	0	0
	Canterbury Road	51,600	48,100	3,500	260	110	150	500	0

Station	Road	Existing ADT (Vehicles per day)			Additional Construction Haulage ADT (Vehicles per day)			Additional Baseline TTP ADT (Vehicles per day)	Additional Refined Baseline TTP ADT (Vehicles per day)
		Total	LV	HV	Total	LV	HV	Buses	Buses
Campsie	South Parade (Between Beamish Street and Harold Street)	6,900	6,500	400	20	0	20	760	740
	Canterbury Road (Between Beamish Street and Scahill Street)	41,200	38,200	3,000	120	60	60	500	0
	Beamish Street (Between Ninth Ave and Campsie Street)	14,500	14,100	400	120	60	60	760	640
	North Parade (Between Browning Street and Beamish Street)	2,400	2,400	0	0	0	0	0	0
	Beamish Street (Between South Parade and Amy Street)	18,900	18,500	400	120	60	60	0	0
	Brighton Ave (Between Browning Street and Shakespeare Street)	12,700	12,600	100	120	60	60	0	0
	Ninth Avenue (Between Beamish Street and Fifth Avenue)	16,300	15,900	400	20	0	20	760	260
	Loch Street (Between Evaline Street and Lillian Street)	15,600	14,300	1,300	20	0	20	0	0
	Evaline Street (Between Loch Street and Beamish Street)	5,500	5,300	200	20	0	20	0	0
	Thorncraft Parade (Between Canterbury Road and Claremont Street)	8,200	7,600	600	20	0	20	0	0
	Palmer Street	10,300	9,600	700	0	0	0	0	0
Belmore	Redman Parade (Between Burwood Road and Sudbury Street)	6,200	6,100	100	0	0	0	0	0
	Burwood Road (Between Redman Parade and Bridge Road)	19,700	17,600	2,100	440	220	220	760	260

Station	Road	Existing ADT (Vehicles per day)			Additional Construction Haulage ADT (Vehicles per day)			Additional Baseline TTP ADT (Vehicles per day)	Additional Refined Baseline TTP ADT (Vehicles per day)
		Total	LV	HV	Total	LV	HV	Buses	Buses
	Bridge Road (Between Marie Lane and Burwood Avenue)	10,500	10,000	500	0	0	0	760	260
	Burwood Road (Between Bridge Road and Collins Street)	21,500	19,300	2,200	480	220	260	0	0
Lakemba	The Boulevarde (Between Haldon Street and Croydon Street)	8,100	7,900	200	120	60	60	730	260
	Moreton Street (Between Lakemba Street and The Boulevarde)	16,800	15,600	1,200	90	0	90	0	0
	Lakemba Street (Between King Georges Road and Shadforth Street)	3,600	3,500	100	220	110	110	0	0
	Burwood Road (Between Redman Parade and Bridge Road)	19,700	17,600	2,100	440	220	220	760	260
	Railway Parade (Between Haldon Street and Croydon Street)	4,500	4,400	100	80	40	40	0	0
	Haldon Street (Between Railway Parade and The Boulevarde)	15,000	14,100	900	220	110	110	0	0
	The Boulevarde (Between Haldon Street and Croyden Street)	8,100	7,900	200	60	30	30	730	260
	Haldon Street (Between The Boulevarde and Oneata Street)	9,800	8,900	900	500	170	330	500	0
	Canterbury Road (Between Haldon Street and Legge Street)	43,900	40,000	3,900	40	0	40	500	0
Wiley Park	The Boulevarde (Between Renown Avenue and King Georges Road)	13,900	13,500	400	220	110	110	730	260

Station	Road	Existing ADT (Vehicles per day)			Additional Construction Haulage ADT (Vehicles per day)			Additional Baseline TTP ADT (Vehicles per day)	Additional Refined Baseline TTP ADT (Vehicles per day)
		Total	LV	HV	Total	LV	HV	Buses	Buses
	King Georges Road (Between The Boulevarde and Mary Street)	88,000	78,100	9,900	240	110	130	0	0
	Lakemba Street (Between King Georges Road and Shadforth Street)	3,600	3,500	100	220	110	110	0	0
	King Georges Road (Between Lakemba Street and The Boulevarde)	96,800	86,700	10,100	220	110	110	0	0
Punchbowl	Dudley Street (Between School Parade and Wardell Road)	4,300	4,100	200	40	0	40	570	40
	Punchbowl Road (Between The Boulevarde and Acacia Ave)	50,500	47,000	3,500	180	90	90	0	0
	The Boulevarde (Between Punchbowl Road and Arthur Street)	24,800	23,400	1,400	80	40	40	730	260
	South Terrace (Between Loder Lane and Punchbowl Road)	14,000	13,600	400	80	40	40	730	260
	Punchbowl Road (Between South Terrace and The Boulevarde)	60,700	56,600	4,100	80	40	40	0	0
	Wattle Street (Between Highclere Ave and Acacia Ave)	18,400	18,100	300	80	40	40	0	0
Bankstown	South Terrace (Between West Terrace and East Terrace)	12,000	11,800	200	120	60	60	730	260
	Stacey Street (Between Verbena Avenue and Stanley Street)	66,000	56,300	9,700	500	130	370	0	0
	Restwell Street (Between Stewart Lane and Raymond Street)	8,800	8,500	300	120	60	60	730	260

Station	Road	Existing ADT (Vehicles per day)			Additional Construction Haulage ADT (Vehicles per day)			Additional Baseline TTP ADT (Vehicles per day)	Additional Refined Baseline TTP ADT (Vehicles per day)
		Total	LV	HV	Total	LV	HV	Buses	Buses
	Raymond Street (Between Restwell Street and West Terrace)	3,200	3,000	200	120	60	60	730	260
	South Terrace (Between West Terrace and Restwell Street)	6,300	6,000	300	120	60	60	730	260
	North Terrace (Between The Appian Way and Fetherstone Street)	9,000	9,000	0	120	60	60	660	230
	Wattle Street (Between Stacey Street and North Terrace)	12,400	12,100	300	120	60	60	0	0
	Marion Street (Between Bungalow Cres and Meredith Street)	34,800	30,700	4,100	0	0	0	0	0
	Meredith Street (Between Marion Street and Gordon Street)	24,600	21,100	3,500	0	0	0	0	0
	Rickard Road (Between Jacobs Street and Chapel Road)	6,100	5,700	400	0	0	0	0	0

5.17.2 Summary of intersection performance assessments

The assessment above shows that there are several intersections that are forecast to develop deteriorating levels of service through the growth in traffic volumes that are expected regardless of the project. These are noted, but are considered to be part of the 'baseline'.

Consideration of the construction traffic, specifically the haulage of materials, shows that across all of the stations and intersections modelled, there is only one which is forecast to become oversaturated as a result of the construction haulage traffic, and in that case it is by a relatively small degree. It is expected that changes in commuter behaviour would lead to the delays being managed (travel earlier or later, avoid peak periods etc.) without the need for specific interventions over and above notifications to the travelling public informing people of the potential issues that may be experienced during each phase of the works.

However, the assessment of the TTS (Baseline TTP) has forecast levels of delay which would have the potential to lead to delays and diversions that extend well beyond the immediate vicinity of the project area. In addition these delays would be experienced by the existing buses on orbital and radial routes, leading to significant journey time delay and variability on public transport as a whole in the region. The Refined Baseline TTP reduces the delays at a number of the modelled intersections, but the reduction is mostly insufficient to improve the level of service.

Table 5.50 provides a summary of the intersections which are modelled to have a LoS of 'E' or 'F' in the Future, Construction, Baseline or Refined Baseline TTP scenarios as a consequence of the project. The degree of saturation of each critical intersection is also displayed below.

As noted in **Section 3.1.6**, variations in traffic volumes and flows may be significant during some school break periods, with the term 4 break resulting in the greatest reductions. In the morning peak, term 1-3 breaks lead to a reduction typical reduction of some 5-6% in the AM peak, and 1.4% in the PM peak. However, the Term 4 break has been shown to provide the opportunity to undertake works with some 34% reduction in the AM flows and 16% in the PM peak.

It is recommended that where practicable, the works that are forecast to result in lowest levels of service should be programmed to be undertaken during the term 4 break, with those with lesser impacts undertaken during breaks 1 to 3.

Table 5.50 Summary of intersections modelling where an LoS of 'E' or 'F' resulted from the Future, Construction, Baseline or Refined Baseline TTP scenarios

Station	Scenario							
	Future		Construction		Baseline TTP		Refined Baseline TTP	
	AM	PM	AM	PM	AM	PM	AM	PM
Sydenham	-	-	-	-	-	-	-	-
Marrickville	-	B.18 Marrickville Road / Victoria Road (DoS 1.07)	-	B.18 Marrickville Road / Victoria Road (DoS 1.07)	B.17 Marrickville Road / Illawarra Road (DoS 1.09) B.18 Marrickville Road / Victoria Road (DoS 1.38)	B.17 Marrickville Road / Illawarra Road (DoS 1.08) B.18 Marrickville Road / Victoria Road (DoS 1.18)	B.18 Marrickville Road / Victoria Road (DoS 1.38)	B.18 Marrickville Road / Victoria Road (DoS 1.05)
Dulwich Hill	B.15 Wardell Road / Ewart Street (DoS 1.10) H.16 Wardell Road / Dudley Street (DoS 0.91)	H.16 Wardell Road / Dudley Street (DoS 0.82)	B.15 Wardell Road / Ewart Street (DoS 1.13) H.37 Wardell Road / Marrickville Road (DoS 1.14) H.16 Wardell Road / Dudley Street (DoS 0.91)	B.15 Wardell Road / Ewart Street (DoS 1.03) H.16 Wardell Road / Dudley Street (DoS 0.82)	B.15 Wardell Road / Ewart Street (DoS 1.32) H.37 Wardell Road / Marrickville Road (DoS 1.17) H.16 Wardell Road / Dudley Street (DoS 1.00)	B.15 Wardell Road / Ewart Street (DoS 1.11) H.37 Wardell Road / Marrickville Road (DoS 1.31) H.16 Wardell Road / Dudley Street (DoS 0.82)	B.15 Wardell Road / Ewart Street (DoS 1.28) H.37 Wardell Road / Marrickville Road (DoS 1.20) H.16 Wardell Road / Dudley Street (DoS 0.99)	B.15 Wardell Road / Ewart Street (DoS 1.11) H.37 Wardell Road / Marrickville Road (DoS 1.25) H.16 Wardell Road / Dudley Street (DoS 0.85)
Hurlstone Park	-	-	-	-	-	-	-	-

Station	Scenario							
	Future		Construction		Baseline TTP		Refined Baseline TTP	
	AM	PM	AM	PM	AM	PM	AM	PM
Canterbury	H.14 Canterbury Road / Charles Street (DoS 0.57)	H.14 Canterbury Road / Charles Street (DoS 0.60)	H.14 Canterbury Road / Charles Street (DoS 0.58)	H.14 Canterbury Road / Charles Street (DoS 0.61)	H.14 Canterbury Road / Charles Street (DoS 0.62)	H.14 Canterbury Road / Charles Street (DoS 0.66) H.14 Canterbury Road / Close Street (Dos 0.63)	H.14 Canterbury Road / Charles Street (DoS 0.60)	H.14 Canterbury Road / Charles Street (DoS 0.64)
Campsie	-	B.11 Beamish Street / Clissold Parade (DoS 1.05)	-	B.11 Beamish Street / Clissold Parade (DoS 1.07)	H.34 Ninth Avenue / Loch Street (DoS 1.10)	B.11 Beamish Street / Clissold Parade (DoS 1.41) H.34 Ninth Avenue / Loch Street (DoS 1.04) B.12 Beamish Street / South Parade (DoS 1.88) H.11 Beamish Street / North Parade (DoS 0.78)	H.34 Ninth Avenue / Loch Street (DoS 1.01)	B.11 Beamish Street / Clissold Parade (DoS 1.35) B.12 Beamish Street / South Parade (DoS 1.79) H.11 Beamish Street / North Parade (DoS 1.78)

Station	Scenario							
	Future		Construction		Baseline TTP		Refined Baseline TTP	
	AM	PM	AM	PM	AM	PM	AM	PM
Belmore	B.08 Burwood Road / Bridge Road (DoS 1.03) B.09 Burwood Road / Redman Parade (DoS 0.69)	B.08 Burwood Road / Bridge Road (DoS 1.05) B.09 Burwood Road / Redman Parade (DoS 0.72)	B.08 Burwood Road / Bridge Road (DoS 1.39) B.09 Burwood Road / Redman Parade (DoS 0.72)	B.08 Burwood Road / Bridge Road (DoS 1.39) B.09 Burwood Road / Redman Parade (DoS 0.74)	H.20 Burwood Road / Lakemba Street (DoS 1.30) B.08 Burwood Road / Bridge Road (DoS 1.44) B.09 Burwood Road / Redman Parade (DoS 0.78)	H.20 Burwood Road / Lakemba Street (DoS 1.44) B.08 Burwood Road / Bridge Road (DoS 1.44) B.09 Burwood Road / Redman Parade (DoS 0.80)	H.20 Burwood Road / Lakemba Street (DoS 1.51) B.08 Burwood Road / Bridge Road (DoS 1.46) B.09 Burwood Road / Redman Parade (DoS 0.74)	H.20 Burwood Road / Lakemba Street (DoS 1.56) B.08 Burwood Road / Bridge Road (DoS 1.46) B.09 Burwood Road / Redman Parade (DoS 0.76)
Lakemba	B.07 The Boulevarde / Haldon Street (DoS 1.05) H.08 Haldon Street / Railway Parade (DoS 1.03)	B.07 The Boulevarde / Haldon Street (DoS 1.10) H.08 Haldon Street / Railway Parade (DoS 1.06)	B.07 The Boulevarde / Haldon Street (DoS 1.12) H.08 Haldon Street / Railway Parade (DoS 1.22)	B.07 The Boulevarde / Haldon Street (DoS 1.16) H.08 Haldon Street / Railway Parade (DoS 1.18)	B.07 The Boulevarde / Haldon Street (DoS 1.47) H.08 Haldon Street / Railway Parade (DoS 1.22)	B.07 The Boulevarde / Haldon Street (DoS 1.32) H.08 Haldon Street / Railway Parade (DoS 1.18)	B.07 The Boulevarde / Haldon Street (DoS 1.21) H.08 Haldon Street / Railway Parade (DoS 1.22)	B.07 The Boulevarde / Haldon Street (DoS 1.18) H.08 Haldon Street / Railway Parade (DoS 1.18)
Wiley Park	-	-	-	-	B.06 King Georges Road / The Boulevarde (DoS 1.01)	B.06 King Georges Road / The Boulevarde (DoS 1.02)	B.06 King Georges Road / The Boulevarde (DoS 0.96)	-

Station	Scenario							
	Future		Construction		Baseline TTP		Refined Baseline TTP	
	AM	PM	AM	PM	AM	PM	AM	PM
Punchbowl	B.04 Punchbowl Road / South Terrace (DoS 1.02)	-	B.04 Punchbowl Road / South Terrace (DoS 1.03)	-	B.04 Punchbowl Road / South Terrace (DoS 1.09)	-	B.04 Punchbowl Road / South Terrace (DoS 1.03)	
Bankstown	-	H.03 North Terrace / Wattle Street (DoS 0.99) H.30 The Appian Way / North Terrace (DoS 1.07)	-	H.03 North Terrace / Wattle Street (DoS 0.99) H.30 The Appian Way / North Terrace (DoS 1.07)	-	H.03 North Terrace / Wattle Street (DoS 0.99) H.30 The Appian Way / North Terrace (DoS 1.25)	-	H.03 North Terrace / Wattle Street (DoS 0.99) H.30 The Appian Way / North Terrace (DoS 1.25)
Regents Park	-	-	-	-	-	-	-	-
Lidcombe	-	-	-	-	-	H.29 Olympic Drive / Church Street (DoS 0.97)	-	H.29 Olympic Drive / Church Street (DoS 0.97)
Birrong	-	-	-	-	-	-	-	-
Yagoona	H.43 Church Road / Hume Highway (DoS 1.10)	H.43 Church Road / Hume Highway (DoS 0.91)	-	-	H.43 Church Road / Hume Highway (DoS 1.76)	H.43 Church Road / Hume Highway (DoS 1.79)	H.43 Church Road / Hume Highway (DoS 1.76)	H.43 Church Road / Hume Highway (DoS 1.79)

5.17.3 Summary of intersection mitigation measures

From the results summarised in **Table 5.51**, the following intersections have been identified as having particularly high congestion and delays due to the addition of the Refined Baseline TTP scenario assessed:

- Belmore: Burwood Road / Bridge Road
- Belmore: Burwood Road / Lakemba Street
- Lakemba: Haldon Street/ Railway Parade
- Marrickville: Marrickville Road / Victoria Road
- Dulwich Hill: Wardell Road / Ewart Street
- Dulwich Hill: Wardell Road / Marrickville Road.

Typical mitigation measures tested included:

- running optimised phase times
- re-phasing to run highest volume approach twice
- lane re-arrangement to better separate heavy traffic flow movements.

Overall, the mitigation measures result in improved intersection operation from the Refined Baseline TTP scenario, indicating that the additional traffic volumes can be managed during possession periods. This mitigated intersection modelling and the interaction with other mitigations is discussed further in Chapter 9 – Mitigation Measures.

6.0 Construction Haulage Traffic and Transport Assessment – Bridge works

6.1 Summary

This chapter presents the assessment of the potential impacts of the proposed upgrade work to bridges which cross the current rail corridor. This includes pedestrian, rail and road traffic bridges.

Many of the bridge works rely on the diversion of traffic from one bridge onto one or more parallel bridges crossing the corridor in the vicinity. For the purposes of this assessment, it is assumed the construction program would, where feasible, restrict works from being carried out simultaneously on adjacent bridges, including pedestrian / road traffic bridges. Where these interdependencies between works occur, they are identified within the individual descriptions and assessments that follow in this chapter.

It is assumed that bridge works would be scheduled to minimise disruption to the traffic network and would not interface with the Baseline TTP and Refined Baseline TTP scenario buses.

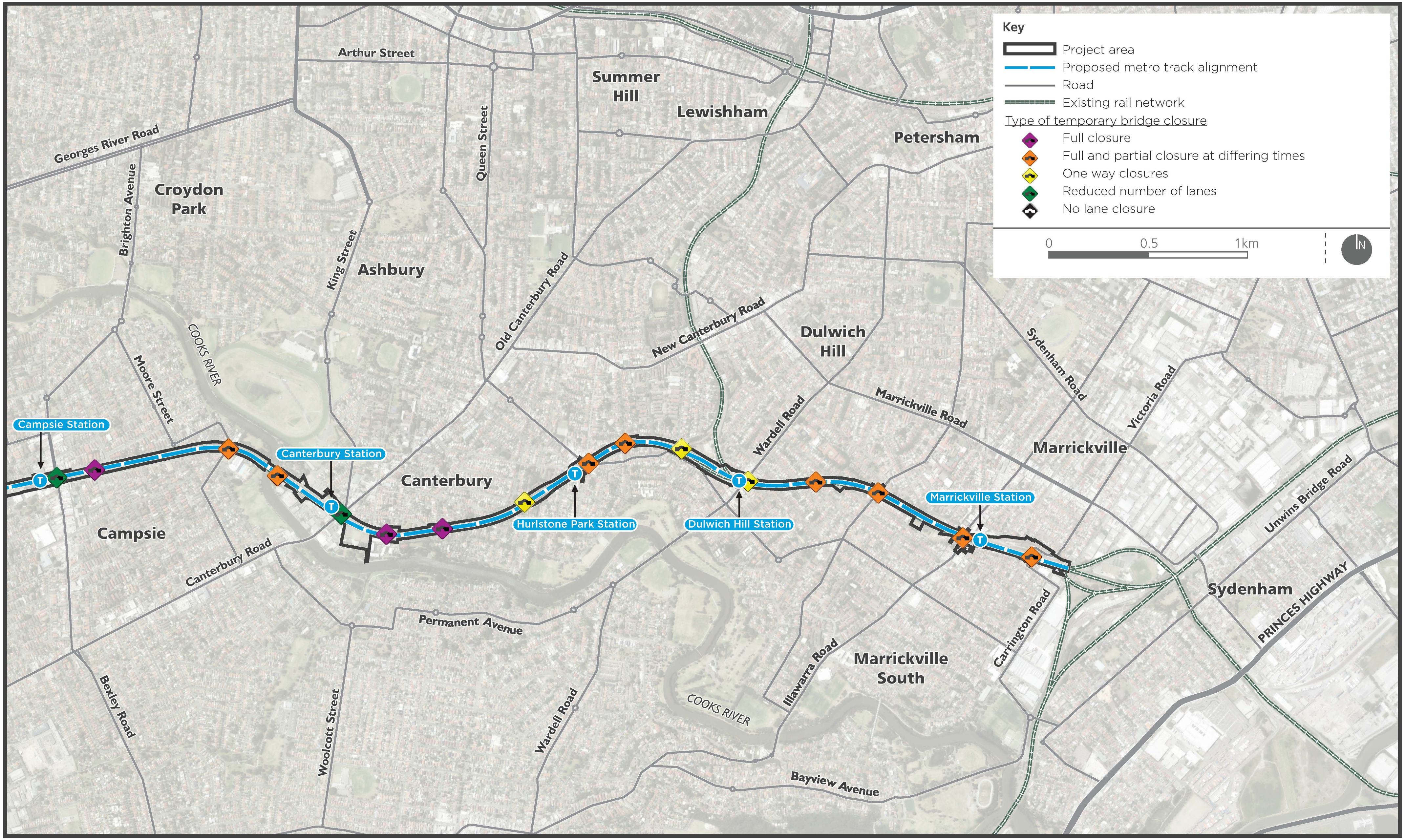
As outlined in Chapter 4, the assessment and methodology of the bridge work has been split into two distinct sections; within the project area between Sydenham to Belmore and Belmore to Bankstown. This is due to the different assumptions that apply to these two sections of the project alignment. A full description of the scope of the bridge work can be found in the main EIS Chapter 9 – Project description – construction.

The scope of work assumed for this assessment is included in **Appendix D**, and relates to the construction phase of the project only, with all bridge structures being reinstated to provide unchanged alignment and amenity for pedestrians, cyclists and motorised traffic on the completion of the bridge upgrade work. As such no assessment of the operational phase is required in relation to the bridge closures discussed within this chapter.

The assessment demonstrates that access is retained to all locations throughout construction, although for some areas and at some periods during construction, local access may be via a short diversion. This is a key issue, especially in relation to access for emergency vehicles where additional discussion and communications would be held to ensure that they are aware of the available routes as the construction progresses.

Figure 6.1 displays the location of the bridge works within the project area. There are a total of 26 bridges with differing types of bridge closures. An overview of the bridge closures is shown in the figure overleaf. More information regarding each bridge is discussed in the following sub-sections.

In many cases, bridge works would be undertaken at night and during weekends when traffic flows are generally lower and congestion related impacts would be reduced. **Sections 4.5.4** and **4.5.9** provide an example of the level of traffic reductions that can be expected during these periods.



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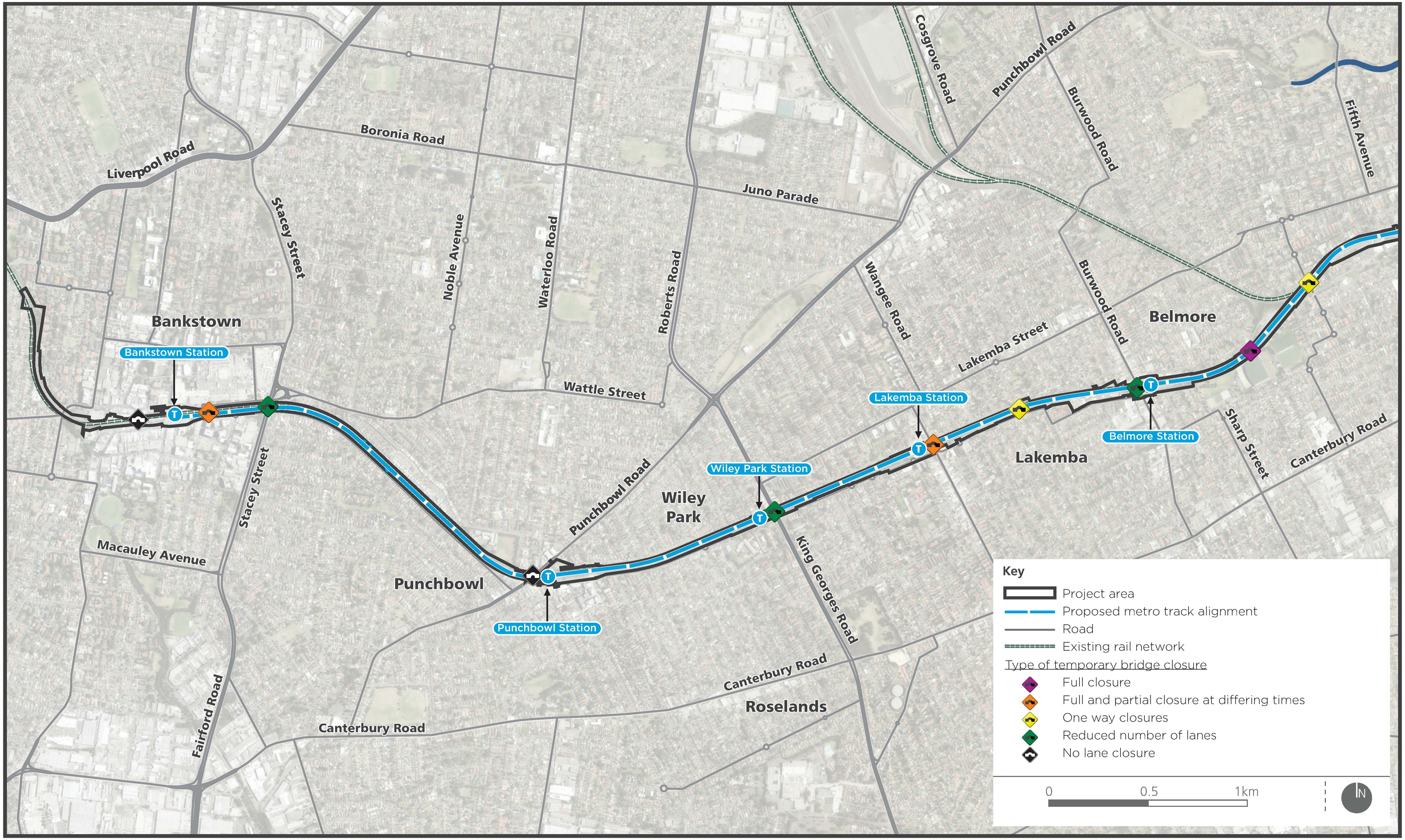
Bridge closures - map 1

FIGURE 6.1



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Overview of the project - map 2

FIGURE 6.1

6.2 Bridge Construction Sequencing

Appendix I provides a summary diagram showing a possible sequencing of bridge construction program for the project. The diagrams show at a conceptual level how the construction activities could occur in relation to the possessions which are proposed for the project.

Potential closures and diversion routes are indicative, based on the current stage of the design. Further detailed assessment would be undertaken in the future, if required, when a more detailed construction strategy and program has been developed and to inform the specific construction traffic management plans for the sites.

The diagrams in **Appendix I** also identifies the dependencies between bridges, as diversions are generally to adjacent bridges and cannot have closures or restrictions at the same time.

6.3 Bridge Traffic Data and Closures

Table 6.1 overleaf outlines the existing Average Daily Traffic (ADT) for bridges impacted by bridge works within the project area. The table also includes forecast construction haulage traffic and Baseline TTP volumes. The method of calculating the ADTs from the peak hourly flow has been discussed in **Section 3.1.5.**

The required closure time and type of closure to enable the necessary works has also been provided. The term “half lane closure” has been used to describe a situation which involves the need to reduce the road width by 1.5-2m to create a safe work area. This has been assessed as a closure of one lane of traffic, although it is possible that as part of the CTMP for longer term works a contractor could investigate the opportunities for narrowing lanes for the duration of the works on multi-lane bridges (instead of lane closures) which would lead to a reduced effect.

The volumes presented in **Table 6.1** are ADTs which reflect an average daily traffic flow. As such they would generally reflect flow levels biased towards the five weekdays as opposed to the two weekend days. The tables are provided to give context to the relative contributions that the bridges provide to the local road network.

The individual assessments carried out in sections 6.3 and below do not consider a reduction in traffic at weekends and during night periods. Where closure periods are noted as “during weekends and nights” or where the length of the closure period is three days or less, it is expected that these upgrade works would be conducted during weekends, public holiday periods or nights. The volumes during these periods are generally less than weekdays and the presentation of data is therefore conservative. In the intersection summary tables, the naming conventions (for example B.11 and H.11) are a standard file reference for the project and provided a cross reference point during the modelling and to the intersections diagrams provided in **Appendix A**.

As stated in **Section 6.2** above, the information contained in the table below is based on initial design and construction options, and is subject to further refinement as the design progresses.

Table 6.1 Bridge Works - ADT and Closure information

Station	Road	Closure Time	Closure Type	Existing ADT (Vehicles per day)			Additional Construction Haulage ADT (Vehicles per day)		
				Total	LV	HV	Total	LV	HV
Marrickville	Charlotte Avenue Underbridge	14 weeks	Half lane closure	7,900	7,400	500	220	110	110
		3 days	Full closure						
	Illawarra Road Overbridge	28 days	Half lane closure	11,900	11,100	800	330	110	220
		2 days	Full closure						
	Livingstone Road Overbridge	2 days	Full Closure	12,200	11,800	400	40	0	40
		8 months during weekends and nights	Narrow lanes						
	Albermarle Street Overbridge	1 month	Full closure	Albermarle Street is a minor road which did not contain any traffic count data or data in the strategic transport model, for this link at the time of reporting.					
		7 months during weekends and nights	Mix of half lane and full closure						
Dulwich Hill	Wardell Road Overbridge	6 months during weekends and nights	Half lane closure	14,400	14,000	400	240	110	130
	Ness Avenue / Terrace Road Underbridge	6 months during weekends and nights	Half lane closure	1,300	1,300	0	460	220	240
Hurlstone Park	Garnet Street Overbridge	8 months during weekends and nights	Half lane closures	2,200	2,200	0	40	0	40
		2 days	Full closure						
	Duntroon Street Overbridge	8 months during weekends and nights	Half lane closures	2,000	1,900	100	220	110	110
		2 days	Full closure						
	Foord Avenue Overbridge	6 months during weekends and nights	Half lane closures	Foord Avenue is a minor road which did not contain any traffic count data or data in the strategic transport model, for this link at the time of reporting.					

Station	Road	Closure Time	Closure Type	Existing ADT (Vehicles per day)			Additional Construction Haulage ADT (Vehicles per day)		
				Total	LV	HV	Total	LV	HV
	Melford Street Overbridge	8 months during weekends and nights	Full closure	Although Melford Street is not a minor road, there was no traffic count data or volume data in the strategic transport model, for this link at the time of reporting.					
Canterbury	Canterbury Road Overbridge	8 months during weekends and nights	One northbound and one southbound lane closure (reduction from 2 to 1 lane in each direction).	51,300	47,800	3,500	260	110	150
	Cooks River / Charles Street Underbridge	6 months during weekends and nights	Mix of half lane and full closure	1,000	800	200	260	110	150
	Wairoa M24 Street Underbridge	6 months during weekends and nights	Half lane closure	10,100	10,000	100	0	0	0
		1 day (overnight)	Full closure						
Campsie	Beamish Street Overbridge	6 months during weekends and nights	Half lane closure	18,900	18,500	400	120	60	60
	Loch Street Overbridge	6 months during weekends and nights	Half lane closure	15,600	14,300	1,300	20	0	20
Belmore	Burwood Road Overbridge	6 months during weekends and nights	Half lane closure	19,700	17,600	2,100	440	220	220
		4 weeks continuous	Half lane closure						
Lakemba	Moreton Street Overbridge	6 months during weekends and nights	Half lane closure	16,800	15,600	1,200	90	0	90
		4 weeks continuous	Half lane closure						

Station	Road	Closure Time	Closure Type	Existing ADT (Vehicles per day)			Additional Construction Haulage ADT (Vehicles per day)		
				Total	LV	HV	Total	LV	HV
	Haldon Street Overbridge	6 months during weekends and nights	Half lane closure	15,000	14,100	900	220	110	110
		4 weeks continuous	Half lane closure						
Wiley Park	King Georges Road Overbridge	3 weeks	One southbound lane closure (reduction from 4 to 3 lanes southbound).	96,800	86,700	10,100	220	110	110
Punchbowl	Punchbowl Road Overbridge	6 months during weekends and nights	No closure necessary	50,500	47,000	3,500	180	90	90
Bankstown	Stacey Street Overbridge	6 months during weekends and nights	One northbound and southbound closure (reduction for 3 to 2 lanes in each direction).	66,000	56,300	9,700	500	130	370
		4 weeks continuous	One northbound and southbound closure (reduction for 3 to 2 lanes in each direction).						
	North Terrace to South Terrace Underbridge	6 months during weekends and nights	Half lane closure	The North Terrace to South Terrace is a minor road which did not contain any traffic count data or data in the strategic transport model, for this link at the time of reporting.					
		4 weeks continuous	Full lane closure						
	Chapel Road Overbridge	6 months during weekends	No closures necessary	34,800	30,700	4,100	0	0	0

The following sections provide an overview of the proposed approach to undertake the works shown in the table above. As shown in the table the impact of the works varies by bridge, with some requiring works that can be achieved with some short term closures of footpaths, and others require several months of full closure to all modes on weekends and at night.

The approach that has been taken is to attempt to retain access for pedestrians and cyclists, and where possible two way flow for traffic. Where this is not possible, access for pedestrians and one way traffic flow was the next most preferable, with the direction of flow selected to produce the better diversion flow with respect to the available road network and the consideration of turning vehicles. Where routes on the cycle network would be impacted, an alternative route has been identified, although it is recognised that the added distance this would require may result in some cyclists choosing to dismount and walk through the pedestrian route where available.

In some cases, where the traffic flows are low, shuttle working is proposed, with alternating traffic flow, and pedestrian and cycle access retained.

The least preferable approach would be full closures, and this was selected only in cases where there was a full bridge deck replacement or the roadway is narrow and there is not sufficient space to create a safe work zone and also provide traffic flow. In this case diversion routes have been prepared, and an assessment carried out of the effect on pedestrians, cyclists, bus route diversion and intersection delays for all traffic (including buses) on the diversion routes.

6.4 Sydenham to Belmore Bridge Closures

Bridge closures between west of Sydenham and Belmore within the project area occur during the scheduled annual ARTC track possessions and therefore would not occur during school holiday periods. This applies to the following bridges:

- Charlotte Avenue Underbridge
- Illawarra Road Overbridge
- Livingstone Road Overbridge
- Albermarle Street Overbridge
- Wardell Road Overbridge
- Ness Avenue / Terrace Road Underbridge
- Garnet Street Overbridge
- Duntroon Street Overbridge
- Melford Street Overbridge
- Church Street / Hutton Street Footbridge
- Canterbury Road Overbridge
- Cooks River / Charles Street Underbridge
- Wairoa M24 Street Underbridge
- Duke Street Footbridge
- Beamish Street Overbridge
- Loch Street Overbridge
- Pedestrian Access Oval Underbridge.

The remainder of this chapter provides an assessment of the effects of these bridge closures. Refer to **Appendix G** for the traffic diversion diagrams and **Appendix H** for the detailed intersection movement summary tables.

6.5 Charlotte Avenue Underbridge

The Charlotte Avenue Underbridge is a 23m long twin deck bridge that carries the T3 Bankstown Line and the ARTC Goods Line between Sydenham and Marrickville. **Figure 6.2** shows the Underbridge location. The Underbridge carries approximately 7,900 vehicles per day.

In the order of 220 construction haulage vehicle trips[42] are expected to be made using Charlotte Avenue Underbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours it is are expected that 10 light vehicle and 10 heavy vehicles trips would be performed using this route.

6.5.1 Diversion Route

The upgrade works require a lane closure of Charlotte Avenue Underbridge for 14 weeks; 7 weeks per side of the bridge. This is followed by a three day full closure of Charlotte Avenue. The three day closure would occur over a long weekend with management of traffic addressed in detailed traffic management plans.

During the half lane closure, traffic is assumed to use the Illawarra Road Overbridge as the diversion route as it is the closest alternative bridge to cross the railway line. The diversion route is shown in **Figure 6.2**.

Northbound and southbound traffic would be diverted to the Illawarra Road Overbridge separately. The following intersections are impacted by the diversion:

- Illawarra Road / Warren Road intersection
- Marrickville Road / Illawarra Road intersection
- Marrickville Road / Victoria Road intersection
- Illawarra Road / Petersham Road intersection
- Marrickville Road mid-block pedestrian crossing
- Warren Road / Carrington Road intersection.

Northbound Lane Closure Intersection Performance

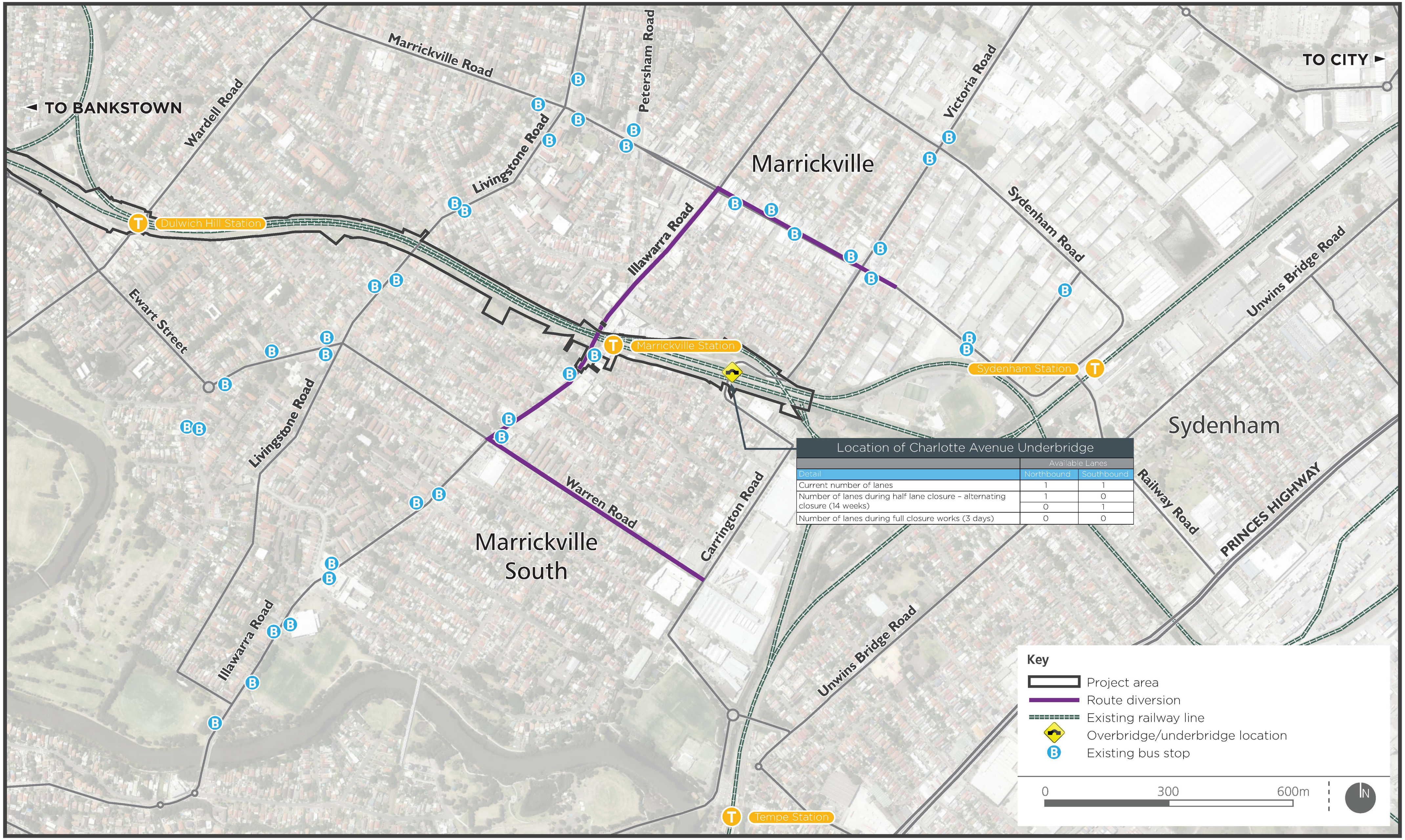
In order for the Marrickville Road / Victoria Road intersection to perform adequately during the traffic diversion scenario, the following assumptions have been built into the SIDRA model:

- the existing B-phase (green signal for all of the movements from the Victoria Road south approach) is deactivated during the AM peak hour
- inclusion of a new phase (green signal for all of the movements from the Illawarra Road south approach) during the AM peak
- removal of the on-street parking from the eastbound side of Marrickville Road within 50 metres north and south of the Marrickville Road / Illawarra Road intersection providing longer approach and exit lanes during the AM peak.

AM Peak Intersection Performance

Table 6.2 presents the Charlotte Bridge Northbound Closure Assessment – AM Peak.

[42] A trip is a one-way vehicular movement from one point to another excluding the return journey. Therefore a vehicle entering and leaving a land use is counted as two trips.



Location of Charlotte Avenue Underbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during half lane closure – alternating closure (14 weeks)	1	0
	0	1
Number of lanes during full closure works (3 days)	0	0

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Location and diversion routes - Charlotte Avenue underbridge

FIGURE 6.2

Table 6.2 Charlotte Avenue Underbridge Intersection Northbound closure Assessment – AM Peak

Charlotte Avenue Underbridge Northbound Closure – AM Peak				
Scenario	Existing	Future	Construction	Traffic Diversion
B.16 Illawarra Road / Warren Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1407	1545	1545	2322
Average Delay per Vehicle (Average over all arms in seconds)	23	25	25	197
LoS (Overall)	B	B	B	F
DoS (Worst Movement)	0.76	0.81	0.81	1.30
B.17 Marrickville Road / Illawarra Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1762	1935	1960	2636
Average Delay per Vehicle (Average over all arms in seconds)	19	22	24	208
LoS (Overall)	B	B	B	F
DoS (Worst Movement)	0.79	0.83	0.87	1.29
B.18 Marrickville Road / Victoria Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	2034	2234	2234	2184
Average Delay per Vehicle (Average over all arms in seconds)	30	49	49	31
LoS (Overall)	C	D	D	C
DoS (Worst Movement)	0.79	1.03	1.03	0.95
H.19 Illawarra Road / Petersham Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1158	1271	1297	2004
Average Delay per Vehicle (Average over all arms in seconds)	16	17	16	62
LoS (Worst Movement)	B	B	B	E
DoS (Worst Movement)	0.47	0.50	0.52	1.01
H.38 Marrickville Road mid-block pedestrian crossing (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1039	1141	1166	1866
Average Delay per Vehicle (Average over all arms in seconds)	4	4	4	38
LoS (Worst Movement)	A	A	A	C
DoS (Worst Movement)	0.45	0.49	0.50	0.98
Warren Road / Carrington Road (Priority Controlled)				**Year Capped: 2023**
Demand Flow (veh)	1216	1335	1335	1479
Average Delay per Vehicle (Average over all arms in seconds)	4	6	6	7
Average Delay per Vehicle (Worst Movement in seconds)	19	30	30	18
LoS (Worst Movement)	C	C	C	B
DoS (Worst Movement)	0.58	0.75	0.75	0.53

For three of the six intersections modelled, the increase in delay resulting from future traffic growth, construction traffic and traffic diversions results in a level of service 'C' or better. A level of service 'C' would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The following information describes the modelling results based on the assumption that all diverted traffic uses the route outlined in **Figure 6.2**. This is a scenario that presents a worst case for assessment. It could reasonably be expected that drivers would use a range of diversion routes which would spread the area of influence to a greater number of intersections, resulting in a reduced impact to the modelled intersections.

The Illawarra Road / Warren Road intersection has a current level of service 'B'. The LoS remains as 'B' for the future and construction scenarios, but increases to 'F' while the diversion is in place.

The right turning movement from the Warren Road south approach is the worst performing movement with congestion and delay increasing to over five minutes in the Traffic Diversion scenario. It is unlikely drivers would wait five minutes to turn right in practice. Instead, drivers would either reroute using parallel routes, or turn right in less than satisfactory gaps.

The Marrickville Road / Illawarra Road intersection has a level of service 'B' for existing, future and construction scenarios. The intersection experiences a decline in amenity as a result of the bridge diversion works. The intersection has a LoS of 'B' in the Construction scenario, worsening to a LoS 'F' in the Traffic Diversion scenario.

The movements from Marrickville west approach are the worst performing movements with delays of over five minutes. Drivers queuing to turn left at the intersection would likely use alternative local roads such as Despointes Street to avoid waiting at the intersection.

The Illawarra Road / Petersham Road intersection has an existing level of service 'B'. The LoS remains as 'B' for the future and construction scenarios, but increases to 'E' while the diversion is in place. Some drivers may choose to reroute to avoid queuing at the intersection, however it is expected that a one minute delay during peak hour traffic to the worst movement at the intersection would not be sufficiently long enough to encourage a large number of diversions.

PM Peak Intersection Performance

Table 6.3 presents the Charlotte Bridge Northbound Closure Assessment – PM Peak.

Table 6.3 Charlotte Avenue Underbridge Intersection Northbound closure Assessment – PM Peak

Charlotte Avenue Underbridge Northbound Closure – PM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
B.16 Illawarra Road / Warren Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1671	1847	1847	2158
Average Delay per Vehicle (Average over all arms in seconds)	19	22	22	59
LoS (Overall)	B	B	B	E
DoS (Worst Movement)	0.69	0.89	0.89	1.04
B.17 Marrickville Road / Illawarra Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1824	2016	2041	2205
Average Delay per Vehicle (Average over all arms in seconds)	19	20	23	55
LoS (Overall)	B	B	B	D
DoS (Worst Movement)	0.60	0.73	0.81	1.04

Charlotte Avenue Underbridge Northbound Closure – PM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
B.18 Marrickville Road / Victoria Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	2353	2600	2600	2568
Average Delay per Vehicle (Average over all arms in seconds)	38	66	66	40
LoS (Overall)	C	E	E	C
DoS (Worst Movement)	0.95	1.07	1.07	0.96
H.19 Petersham Road / Illawarra Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1250	1381	1407	1718
Average Delay per Vehicle (Average over all arms in seconds)	13	12	12	12
LoS (Worst Movement)	A	A	A	D
DoS (Worst Movement)	0.51	0.53	0.55	0.62
H.38 Marrickville Road mid-block pedestrian crossing (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1138	1257	1283	1594
Average Delay per Vehicle (Average over all arms in seconds)	4	5	5	45
LoS (Worst Movement)	A	A	A	A
DoS (Worst Movement)	0.49	0.54	0.56	0.56
Warren Road / Carrington Road (Priority Controlled)				**Year Capped: 2023**
Demand Flow (veh)	1216	1335	1335	1789
Average Delay per Vehicle (Average over all arms in seconds)	4	6	6	10
Average Delay per Vehicle (Worst Movement in seconds)	19	30	30	91
LoS (Worst Movement)	C	C	C	F
DoS (Worst Movement)	0.58	0.75	0.75	0.93

For four of the six intersections modelled, the increase in delay resulting from future traffic growth, construction traffic and traffic diversions results in a level of service ‘D’ or better. A level of service ‘D’ would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The Illawarra Road / Warren Road intersection is forecast to experience a decline in amenity as a result of the addition of the diverted traffic. The intersection has a LoS of ‘B’ in the existing, future and construction scenario, worsening to a LoS ‘E’ in the traffic diversion scenario.

The right turning movement from the Warren Road south approach is the worst performing movement with a delay of nearly 2 minutes. In practice, it is likely that the average delay would be reduced as drivers would turn right in less than satisfactory gaps.

The intersection of Warren Road / Carrington Road has a level of service ‘C’ during existing, future and construction scenarios. The intersection is expected to experience increased delays during the PM peak with a LoS ‘F’ and delay of 1.5 minutes. This is based on the worst movement. Additional traffic is being added to Warren Road which increases volumes on the minor road. Outside of the constraints of the modelled assumptions, in reality much of this traffic would divert to a number of parallel roads, relieving some of the demand on the Warren Road / Carrington Road intersection.

The seasonal traffic patterns discussed in Chapter 3 shows that during the mid-year school holidays traffic reduces by some 5%, and 15% following term 4. As a result, it can be seen that should some if the works be undertaken in the term 4 holiday this could be expected to allow the diversion route to operate within capacity. Noting the proposed works consist of two periods of 7 weeks, this would imply that the works would need to be undertaken over a period spanning 12 months.

Southbound Lane Closure Intersection Performance

AM Peak assessment

Table 6.4 presents the Charlotte Bridge Southbound Closure Assessment – AM Peak.

Table 6.4 Charlotte Avenue Underbridge Intersection Southbound Closure Assessment – AM Peak

Charlotte Avenue Underbridge Southbound Closure – AM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
B.16 Illawarra Road / Warren Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1407	1545	1545	1732
Average Delay per Vehicle (Average over all arms in seconds)	23	25	25	25
LoS (Overall)	B	B	B	B
DoS (Worst Movement)	0.76	0.81	0.81	0.81
B.17 Marrickville Road / Illawarra Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1762	1935	1960	2151
Average Delay per Vehicle (Average over all arms in seconds)	19	22	24	24
LoS (Overall)	B	B	B	B
DoS (Worst Movement)	0.79	0.83	0.87	0.88
B.18 Marrickville Road / Victoria Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	2034	2234	2234	2218
Average Delay per Vehicle (Average over all arms in seconds)	30	49	49	34
LoS (Overall)	C	D	D	C
DoS (Worst Movement)	0.79	1.03	1.03	0.91
H.19 Petersham Road / Illawarra Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1158	1271	1297	1489
Average Delay per Vehicle (Average over all arms in seconds)	16	17	16	15
LoS (Worst Movement)	B	B	B	B
DoS (Worst Movement)	0.47	0.50	0.52	0.52

Charlotte Avenue Underbridge Southbound Closure – AM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
H.38 Marrickville Station Overbridge (Signals)		**Year Capped: 2023**		
Demand Flow (veh)	1039	1141	1166	1357
Average Delay per Vehicle (Average over all arms in seconds)	4	4	4	4
LoS (Worst Movement)	A	A	A	A
DoS (Worst Movement)	0.45	0.49	0.50	0.50
Carrington Road / Warren Road (Priority Controlled)			**Year Capped: 2023**	
Demand Flow (veh)	1216	1335	1335	1331
Average Delay per Vehicle (Average over all arms in seconds)	4	6	6	40
Average Delay per Vehicle (Worst Movement in seconds)	19	30	30	129
LoS (Worst Movement)	C	C	C	F
DoS (Worst Movement)	0.58	0.75	0.75	1.10

For four of the five intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and traffic diversions results in a LoS ‘C’ or better. A LoS ‘C’ would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The Carrington Road / Warren Road intersection is forecast to experience a decline in amenity as a result of the addition of the diverted traffic. The intersection has a LoS of ‘C’ in the existing, future and construction scenarios, worsening to a LoS ‘F’ in the Traffic Diversion scenario.

The movements from the Warren Road west approach are the worst performing movements with delays increasing to over two minutes in the traffic diversion scenario. The modelled average delay over all arms is 40 seconds, implying that the majority of the delay is occurring at the Warren Road west approach, with minimal delay at the major (through) movement.

It is expected that much of the diverted traffic being added to the Warren Road West would divert to the parallel roads, relieving some of the demand on the Warren Road / Carrington Road intersection.

PM Peak Assessment

Table 6.5 presents the Charlotte Bridge Southbound Closure Assessment – PM Peak.

Table 6.5 Charlotte Avenue Underbridge Intersection Southbound Closure Assessment – PM Peak

Charlotte Avenue Underbridge Southbound Closure – PM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
B.16 Illawarra Road / Warren Road (Signals)		**Year Capped: 2023**		
Demand Flow (veh)	1671	1847	1847	2569
Average Delay per Vehicle (Average over all arms in seconds)	19	22	22	458
LoS (Overall)	B	B	B	F
DoS (Worst Movement)	0.69	0.89	0.89	3.24

Charlotte Avenue Underbridge Southbound Closure – PM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
B.17 Marrickville Road / Illawarra Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1824	2016	2041	2755
Average Delay per Vehicle (Average over all arms in seconds)	19	20	23	176
LoS (Overall)	B	B	B	F
DoS (Worst Movement)	0.60	0.73	0.81	1.43
B.18 Marrickville Road / Victoria Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	2353	2600	2600	2544
Average Delay per Vehicle (Average over all arms in seconds)	38	66	66	246
LoS (Overall)	C	E	E	F
DoS (Worst Movement)	0.95	1.07	1.07	1.74
H.19 Petersham Road / Illawarra Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1250	1381	1407	2128
Average Delay per Vehicle (Average over all arms in seconds)	13	12	12	44
LoS (Worst Movement)	A	A	A	D
DoS (Worst Movement)	0.51	0.53	0.55	0.99
H.38 Marrickville Station Overbridge (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1138	1257	1283	2004
Average Delay per Vehicle (Average over all arms in seconds)	4	5	5	76
LoS (Worst Movement)	A	A	A	F
DoS (Worst Movement)	0.49	0.54	0.56	1.05
Carrington Road / Warren Road (Priority Controlled)				**Year Capped: 2023**
Demand Flow (veh)	1216	1335	1335	1424
Average Delay per Vehicle (Average over all arms in seconds)	4	6	6	187
Average Delay per Vehicle (Worst Movement in seconds)	19	30	30	314
LoS (Worst Movement)	C	C	C	F
DoS (Worst Movement)	0.58	0.75	0.75	1.33

The Petersham Road / Illawarra Road intersection has a residual LoS ‘D’ after modelling the diverted traffic. A level of service ‘D’ would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The remaining five intersections in the area around Charlotte Avenue Underbridge have a level of service ‘F’ after allowing for the diverted traffic. This demonstrates that the southbound lane closures would have a much greater effect on the surrounding road network in the PM peak than the northbound lane closures.

It is therefore recommended that southbound traffic always uses the Charlotte Avenue Underbridge in the PM peak and the northbound traffic would always be the movement diverted, irrespective of which lane would be closed for bridge works. This would enable the diversion to occur with only localised impact.

6.5.2 Bus Network

As no bus route uses the Charlotte Avenue Underbridge, bus routes would not be affected by the works on this bridge.

6.5.3 Pedestrians and Cyclists

During the half lane closures, pedestrians would be diverted to the other side of the road which would remain open. Temporary traffic management would need to be in place at both ends of the bridge to aid pedestrians crossing the road. During the full bridge closures over three days, prior notification would be provided to cyclists and pedestrians that alternative crossing of the rail corridor would be required.

6.6 Illawarra Road Overbridge

Illawarra Road Overbridge in Marrickville is a two span bridge with a central pier. The bridge spans the ARTC Goods Line and the current rail alignment. The bridge is approximately 34m in length, carrying one lane of traffic in each direction. Refer to **Figure 6.3** for Illawarra Road Overbridge location. The Overbridge carries approximately 11,900 vehicles per day.

In the order of 330 construction vehicle trips are expected to be made using Illawarra Road Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours it is are expected that 10 light vehicle and 20 heavy vehicles trips would be performed using this route. However, preliminary construction scheduling information suggests that the bridge works at Illawarra Road would not coincide with the construction activities that utilise this bridge as a construction haulage route.

6.6.1 Diversion Route

When modelling Illawarra Road Overbridge it was assumed that the construction works would require 28 days of half lane closures (14 days per side) and two days of full closure. The two day full closure was assumed to occur over a weekend, during which time traffic would be diverted to Charlotte Avenue Underbridge and Livingstone Road Overbridge. These assumptions were based on the current stage of design at the time of modelling. Further analysis of the bridge structure has identified the duration of the bridge replacement may need to be greater and require a full closure for up to 4 weeks.

The 28 days of half lane closures would not occur during school holiday periods as the works need to occur during ARTC possession periods which are done outside of school holiday periods. The closures would therefore potentially impact peak weekday traffic volumes and could impact the surrounding local road network. However, the traffic analysis did examine the impacts of separate northbound and southbound bridge closures during the weekday am and pm peak hours as a worst case scenario.

The diversion routes assume that, for the half lane southbound closure, 50% of the traffic would divert to Charlotte Avenue Underbridge and 50% would divert to Livingstone Road Overbridge, as shown in **Figure 6.3**. During the northbound closure, it is assumed that all traffic would divert to Charlotte Avenue Underbridge due to the banned right turn movement at the Livingstone Road – Warren Road intersection.

Illawarra Road Overbridge is on a number of bus routes. Buses would be diverted to Livingstone Road Overbridge during the half lane closures where passengers can access bus stops on Livingstone Road. Passengers accessing/exiting Marrickville Station would be required to walk 650m to bus stop 220496 or 2204104 on Livingstone Road.

Through development of the design it has been noted that Warren Road and Schwebel Street may be unsuitable for bus operations due to the narrow carriageway widths. Temporary changes may be required to the route to enable these diversion routes to be used, such as implementing clearways which would result in the temporary loss of parking. Measures to manage identifying potential road modifications are provided in chapter 9.0 and would be further examined as part of the construction traffic management plan process.

Since modelling the intersections, the design has progressed. From consultation with key stakeholders it is thought that further full closures of Illawarra Road Overbridge may be required (of up to 4 weeks) to complete the works and these full closures could occur outside of night / weekend works, that is, they would impact daytime peak period traffic and multi modal access. This would be finalised during detailed design and construction planning. Further consultation and co-ordination would be undertaken once sufficient information is available and work would be subject to an additional impact assessment if required.

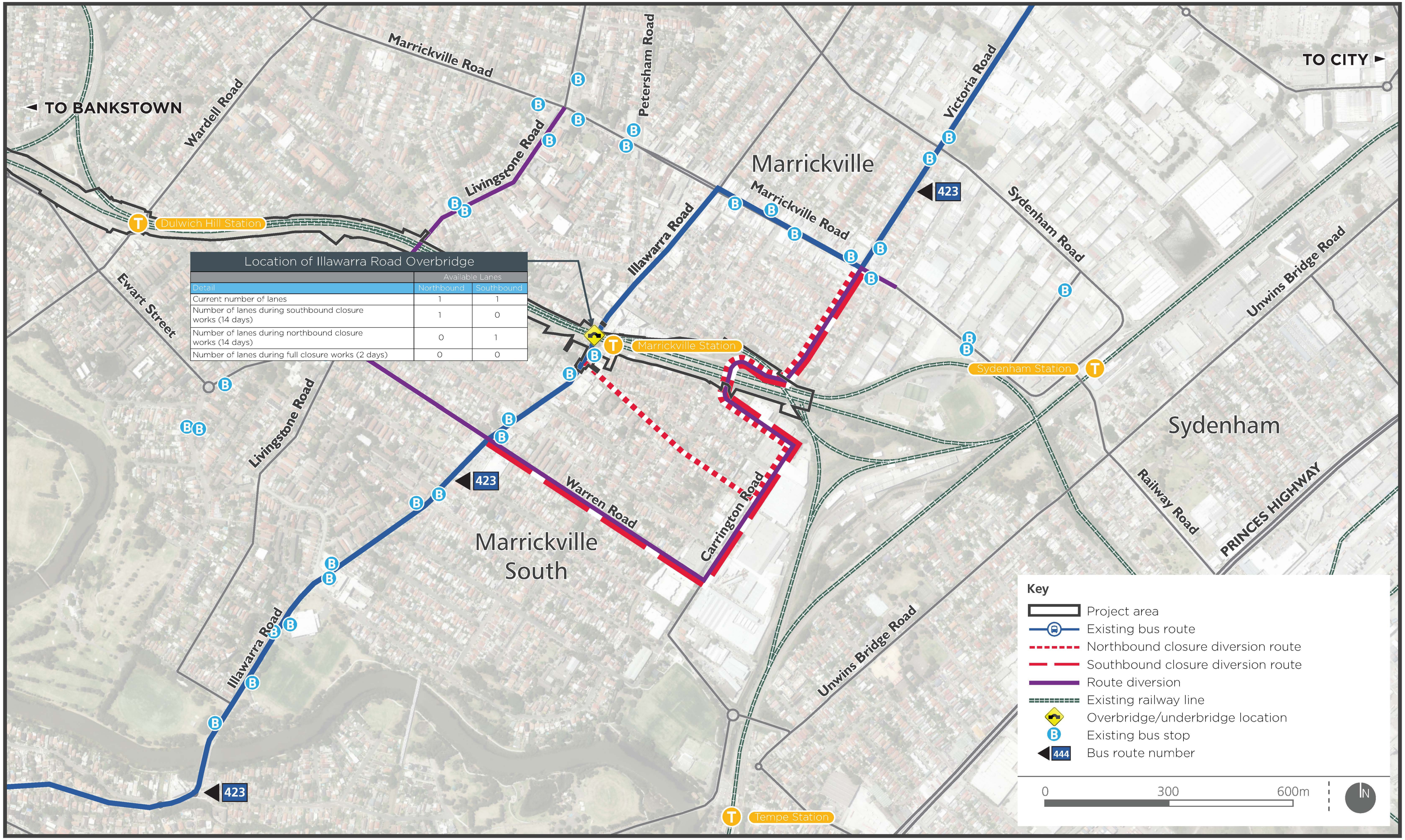
The information presented below is based on the outputs from the time of modelling; i.e. that the full closure would occur over night / weekend works and would not impact peak weekday traffic volumes and only the half lane closures may impact peak weekday traffic volumes. However, the traffic analysis did examine the impacts of separate northbound and southbound bridge closures during the weekday am and pm peak hours as a worst case scenario.

6.6.2 Intersection Performance

As mentioned above, due to the partial closure of Illawarra Road Overbridge during construction, the following intersections are directly impacted in both peak periods by traffic diversion:

- Carrington Road / Warren Road
- Marrickville Road / Illawarra Road
- Marrickville Road / Victoria Road
- Illawarra Road / Warren Road
- Marrickville Road / Livingstone Road[43]
- Livingstone Road / Warren Road[44].

[43] Due to insufficient data at the time of reporting, this intersection has not been modelled
[44] Due to insufficient data at the time of reporting, this intersection has not been modelled



Location of Illawarra Road Overbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during southbound closure works (14 days)	1	0
Number of lanes during northbound closure works (14 days)	0	1
Number of lanes during full closure works (2 days)	0	0

Location and diversion routes - Illawarra Road overbridge

FIGURE 6.3

Southbound Diversion

AM Peak Intersection Performance

Table 6.6 below shows a summary of the intersection assessment undertaken for this bridge.

Table 6.6 Illawarra Road Overbridge Southbound Closure Assessment – AM Peak

Illawarra Road Overbridge – Southbound Diversion AM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
Demand Flow (veh)	1407	1545	1545	1294
Average Delay per Vehicle (Average over all arms in seconds)	23	25	25	24
LoS (Overall)				
DoS (Worst Movement)	0.76	0.81	0.81	0.68
Demand Flow (veh)	1762	1935	1960	2031
Average Delay per Vehicle (Average over all arms in seconds)	19	22	24	26
LoS (Overall)				
DoS (Worst Movement)	0.79	0.83	0.87	0.86
Demand Flow (veh)	2034	2234	2234	2355
Average Delay per Vehicle (Average over all arms in seconds)	30	49	49	901
LoS (Overall)				
DoS (Worst Movement)	0.79	1.03	1.03	3.50
Demand Flow (veh)	1216	1335	1335	1457
Average Delay per Vehicle (Average over all arms in seconds)	4	6	6	9
Average Delay per Vehicle (Worst Movement in seconds)	19	30	30	53
LoS (Worst Movement)				
DoS (Worst Movement)	0.58	0.75	0.75	0.90

For three of the four intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and traffic diversion results in a LoS 'D' or better. A level of service 'D' would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The Marrickville Road / Victoria Road intersection is forecast to experience a decline in amenity as a result of the southbound traffic diversion. The intersection has an existing LoS of 'C' which worsens to a LoS 'F' for the Traffic Diversion scenario. The through and right turning movements from the Victoria Road south approach are the worst performing movements with modelled delays showing that demand would significantly exceed capacity and result in significant delays.

The additional 105 vehicles of diverted traffic turning right from the Marrickville Road west approach, dictates the green time for this intersection, resulting in less green time for the Victoria Road south approach.

The main source of delay would arise as a result of the opposed right turn movement, and suggests that if not otherwise mitigated, there is potential for the delays to result in drivers choosing to turn in less than satisfactory gaps through frustration. It is also expected that another portion of the diverted traffic would avoid the intersection by using Unwins Bridge Road continuing onto Richardson Crescent while the Illawarra Road Bridge Works are being undertaken.

Notwithstanding some level of increased delay would be experienced at the intersection as the high volumes of traffic using Illawarra Road Overbridge are diverted elsewhere. Given the degree of saturation which shows the demand is significantly over capacity, undertaking the works during holidays would not significantly reduce the delays.

PM Peak Intersection Performance

Table 6.7 below shows a summary of the intersection assessment undertaken for this bridge.

Table 6.7 Illawarra Road Overbridge Southbound Closure Assessment – PM Peak

Illawarra Road Overbridge – Southbound Diversion PM Peak				
Scenario	Existing	Future	Construction	Traffic Diversion
B.16 Illawarra Road / Warren Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1671	1847	1847	1185
Average Delay per Vehicle (Average over all arms in seconds)	19	22	22	21
LoS (Overall)	B	B	B	B
DoS (Worst Movement)	0.69	0.89	0.89	0.51
B.17 Marrickville Road / Illawarra Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1824	2016	2041	2169
Average Delay per Vehicle (Average over all arms in seconds)	19	20	23	25
LoS (Overall)	B	B	B	B
DoS (Worst Movement)	0.60	0.73	0.81	0.81
B.18 Marrickville Road / Victoria Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	2353	2600	2600	2903
Average Delay per Vehicle (Average over all arms in seconds)	38	66	66	216
LoS (Overall)	C	E	E	F
DoS (Worst Movement)	0.95	1.07	1.07	1.88
Carrington Road / Warren Road (Priority Controlled)				**Year Capped: 2023**
Demand Flow (veh)	1328	1468	1468	1853
Average Delay per Vehicle (Average over all arms in seconds)	3	5	5	52
Average Delay per Vehicle (Worst Movement in seconds)	20	34	34	466
LoS (Worst Movement)	B	C	C	F
DoS (Worst Movement)	0.47	0.65	0.65	1.44

For two of the four intersections modelled, the increase in delay resulting from future traffic growth, construction traffic and traffic diversion results in a Level of Service ‘B’ or better. A Level of Service ‘B’ would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

In the PM peak the Marrickville Road / Victoria Road intersection is again forecast to experience a decline in amenity as a result of the southbound traffic diversion. The intersection has a LoS of ‘E’ for the future and construction scenarios, worsening to a LoS ‘F’ for the Traffic Diversion scenario.

The right turning movement from the Marrickville Road west approach onto Victoria Road is the worst performing movement with modelled Degree of Saturation of 1.88 showing the intersection would have approaching double the demand compared to the capacity. The additional 266 diverted vehicles turning right from the Marrickville Road west approach, dictates the green time for this intersection, resulting in less green time for the other approaches.

The intersection of Carrington Road / Warren Road is also expected to experience increased delays as a result of the southbound traffic diversion, especially during the PM peak. The intersection has a LoS of ‘C’ for the future and construction scenarios, worsening to a LoS ‘F’ during the Traffic Diversion scenario. The level of service is dictated by the worst movement, which has a modelled theoretical delay of over seven minutes. The overall intersection delay is nearly one minute, which implies that the main (through) movement is experiencing minimal delay.

Northbound Diversion

AM Peak Intersection Performance

Table 6.8 below shows a summary of the intersection assessment undertaken for this station.

Table 6.8 Illawarra Road Overbridge Northbound Closure Assessment – AM Peak

Illawarra Road Overbridge – Northbound Diversion AM Peak				
Scenario	Existing	Future	Construction	Traffic Diversion
B.16 Illawarra Road / Warren Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1407	1545	1545	954
Average Delay per Vehicle (Average over all arms in seconds)	23	25	25	34
LoS (Overall)	B	B	B	C
DoS (Worst Movement)	0.76	0.81	0.81	0.83
B.17 Marrickville Road / Illawarra Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1762	1935	1960	1734
Average Delay per Vehicle (Average over all arms in seconds)	19	22	24	11
LoS (Overall)	B	B	B	A
DoS (Worst Movement)	0.79	0.83	0.87	0.57
B.18 Marrickville Road / Victoria Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	2034	2234	2234	2856
Average Delay per Vehicle (Average over all arms in seconds)	30	49	49	202
LoS (Overall)	C	D	D	F
DoS (Worst Movement)	0.79	1.03	1.03	1.30

Illawarra Road Overbridge – Northbound Diversion AM Peak				
Scenario	Existing	Future	Construction	Traffic Diversion
Carrington Road / Warren Road (Priority Controlled)				**Year Capped: 2023**
Demand Flow (veh)	1216	1335	1335	1427
Average Delay per Vehicle (Average over all arms in seconds)	4	6	6	7
Average Delay per Vehicle (Worst Movement in seconds)	19	30	30	31
LoS (Worst Movement)	C	C	C	C
DoS (Worst Movement)	0.58	0.75	0.75	0.78

For three of the four intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and traffic diversion results in a level of service 'C' or better. A level of service 'C' would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The Marrickville Road / Victoria Road intersection is forecast to experience a decline in amenity as a result of the northbound traffic diversion. The intersection has a LoS of 'D' for the future and construction scenarios, worsening to a LoS 'F' for the Traffic Diversion scenario.

Movements from the Victoria Road south approach are the worst performing movements with delays of over five minutes. The total additional 686 diverted vehicles from the Victoria Road south approaches totals more than the existing total traffic flow at that approach. Although the higher traffic flow secures a longer green time for the Victoria Road south approach, this is still not enough to address the effects of additional vehicles.

Like the southbound diversion, it is expected that the delays for the worst movement would be much lower than the model predicts as drivers would pull out in less than satisfactory gaps, during amber periods or reroute with potential negative safety impacts.

PM Peak Intersection Performance

Table 6.9 below shows a summary of the intersection assessment undertaken for this bridge.

Table 6.9 Illawarra Road Overbridge Northbound Closure Assessment – PM Peak

Illawarra Road Overbridge – Northbound Diversion PM Peak				
Scenario	Existing	Future	Construction	Traffic Diversion
B.16 Illawarra Road / Warren Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1671	1847	1847	1395
Average Delay per Vehicle (Average over all arms in seconds)	19	22	22	22
LoS (Overall)	B	B	B	B
DoS (Worst Movement)	0.69	0.89	0.89	0.90
B.17 Marrickville Road / Illawarra Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1824	2016	2041	1870
Average Delay per Vehicle (Average over all arms in seconds)	19	20	23	16
LoS (Overall)	B	B	B	B
DoS (Worst Movement)	0.60	0.73	0.81	0.82

Illawarra Road Overbridge – Northbound Diversion PM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
B.18 Marrickville Road / Victoria Road (Signals)				**Year Capped: 2023**
Demand Flow (veh)	2353	2600	2600	2954
Average Delay per Vehicle (Average over all arms in seconds)	38	66	66	103
LoS (Overall)	C	E	E	F
DoS (Worst Movement)	0.95	1.07	1.07	1.14
Carrington Road / Warren Road (Priority Controlled)				**Year Capped: 2023**
Demand Flow (veh)	1328	1468	1468	1544
Average Delay per Vehicle (Average over all arms in seconds)	3	5	5	5
Average Delay per Vehicle (Worst Movement in seconds)	20	34	34	36
LoS (Worst Movement)	B	C	C	C
DoS (Worst Movement)	0.47	0.65	0.65	0.69

For three of the four intersections modelled, the increase in delay resulting from future traffic growth, construction haulage traffic and traffic diversion results in a LoS ‘C’ or better. A LoS ‘C’ would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The Marrickville Road / Victoria Road intersection is forecast to experience a decline in amenity as a result of the northbound traffic diversion. The intersection has a LoS of ‘E’ for the future and construction scenarios, worsening to a LoS ‘F’ for the Traffic Diversion scenario.

While the average delay has increased from 38 seconds in the existing scenario to 103 seconds in the traffic diversion scenario, nearly half of this additional delay occurs as a result of the future traffic growth. Future growth is not a result of the Sydney Metro Sydenham to Bankstown Project and can therefore not be attributed to the project.

The left turn movement from the Marrickville Road east approach is the worst performing movement with average delays of over three minutes.

The high delay for this movement can be attributed to the additional eastbound through movement along Marrickville Road which prevents right turn traffic making the movement in gaps between oncoming traffic. Not being able to make the right turn, the traffic blocks the middle westbound lane and reduces the throughput capacity which in turn reduces the left-turn and through capacity and increases the delays.

Inevitably, some traffic would reroute and other traffic would turn right in less than satisfactory gaps. This would reduce the delays through the intersection.

6.6.3 Bus Network

The bridge works result in a half road closure during day and night works on Illawarra Road Bridge.

Currently the bus route 423 and L23 crosses the Illawarra Road Overbridge. The diversion routes are shown in **Figure 6.3**. During the southbound bridge closure period, the route would be redirected via Victoria Road, across the Charlotte Avenue Underbridge, along Myrtle Street and Carrington Road and then would re-join the existing bus route via Warren Road. During the northbound bridge closure and given there would be no right turn provision at Illawarra Road / Warren Road intersection, buses would turn right onto Schwebel Street and continue through Carrington Road and Myrtle Street, cross the Charlotte Avenue Underbridge and join the existing bus route via Victoria Road.

Northbound buses are redirected through Schwebel Street due to the existing “No Right Turn” restriction from Illawarra Road into Warren Road. Whilst southbound buses can be redirected through Schwebel Street, this is not recommended due to the narrow carriageway width and on-street parking. Allowing both directional bus routes would potentially require parking restrictions and as such two way bus diversions via Schwebel Street may not be feasible. Therefore the above separate north and southbound diversion routes are those most likely to be adopted for the short full closure period.

The northbound bus diversion would result in two stops on Marrickville Road not being served. The nearest northbound stop to Marrickville station would remain in operation. The southbound bus diversion would result in two stops on Marrickville Road and two stops on Illawarra Road not being served. The provision of a temporary stop on Illawarra Road, south of Warren Road would assist transfer between bus and Marrickville station albeit these stops would be approximately 400m from the station entrance.

6.6.4 Pedestrians and Cyclists

There are footpaths on both sides of Illawarra Road. During the half lane closures, pedestrians and cyclists would be diverted to the other side of the road which has remained open. Temporary traffic management would need to be in place at both ends of the bridge to aid pedestrians and cyclists. During the two day full closure, the shortest diversion route for pedestrians would be to use the Livingstone Road overbridge which is approximately 650m to the west. Signage would be required to direct pedestrians. Due to the lack of footpaths on Herb Greedy Place, pedestrians would be required to walk through McNeilly Park. Further assessment in relation to the suitability of this route would be undertaken during the preparation of CEMP, including consultation with the local Council. In the event that this route is not considered to be appropriate, pedestrians would be directed to follow the northbound traffic diversion route.

6.7 Livingstone Road Overbridge

Livingstone Road Overbridge in Marrickville, as shown on **Figure 6.4** is a steel girder bridge with a concrete bridge deck. The bridge deck spans 4 tracks; two ARTC Goods Lines and two T3 Bankstown Lines. The Overbridge carries approximately 12,200 vehicles per day.

Some 40 construction haulage vehicle trips are expected to be made using Livingstone Road Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours, construction haulage trips would comprise of four heavy vehicle trips.

6.7.1 Diversion Route

The Livingstone Road Bridge requires a full closure for 48 hours to waterproof and asphalt the bridge. During that time traffic would be diverted to Illawarra Road Overbridge shown in **Figure 6.4**. This would not have a major impact on the traffic network as the road closure would occur during a weekend as the bridge services residential catchments.

The remaining upgrade works requiring narrow lane closures one at a time over an eight month period, are unlikely to have a major impact on the traffic network as they would occur during nights and weekends. These works would be covered by a detailed traffic management plan which would take account of the high levels of demand, including weekend levels at this location.

6.7.2 Bus Network

Currently bus route 412 crosses the Livingstone Road Overbridge (refer to **Figure 6.4**). During the full bridge closure period, the bus route would be redirected along Warren Road and Illawarra Road, over the Illawarra Road Overbridge, across Petersham Road and then join the existing route via Marrickville Road as shown in **Figure 6.4.** The return route follows the same road network in reverse. The diversion would result in three northbound and three southbound stops not being served, and buses calling at the existing stops on Illawarra Road and Marrickville Road instead,

6.7.3 Pedestrians and Cyclists

This bridge has footpaths on either side and during the narrow lane closures, it is likely that pedestrians and cyclists would be diverted to one side of the bridge. Temporary traffic management would be in place at either end of the bridge to aid pedestrians and cyclists.

During the 48 hour close down period pedestrians and cyclists would be unable to use the Livingstone Road Overbridge. They would be diverted to Illawarra Road Overbridge some 650m to the east or 450m to Albermarle Street Overbridge to the west.

Location of Livingstone Road Overbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during narrow closure (8 months during weekends and nights)	1	1
Number of lanes during full closure works (2 days)	0	0

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Location and diversion routes - Livingstone Road overbridge

FIGURE 6.4

6.8 Albermarle Street Overbridge

The Albermarle Street Overbridge located in Marrickville, as shown in **Figure 6.5**, is a three span steel girder bridge with a concrete bridge deck of approximately 30m in length. The bridge spans four tracks; two ARTC Goods Lines, two tracks across the T3 Bankstown Line.

his bridge is on a haulage route, but the volumes are anticipated to be extremely low, in the order of two to three construction haulage vehicle trips a day.

6.8.1 Diversion Route

The bridge requires a full closure for four weeks. This would be followed by weekend and night works for a further seven months. The weekend and night works are expected to entail a series of half lane and full lane closures. During these closure periods, traffic would be diverted to the Livingstone Road Over Bridge, as shown in **Figure 6.5**.

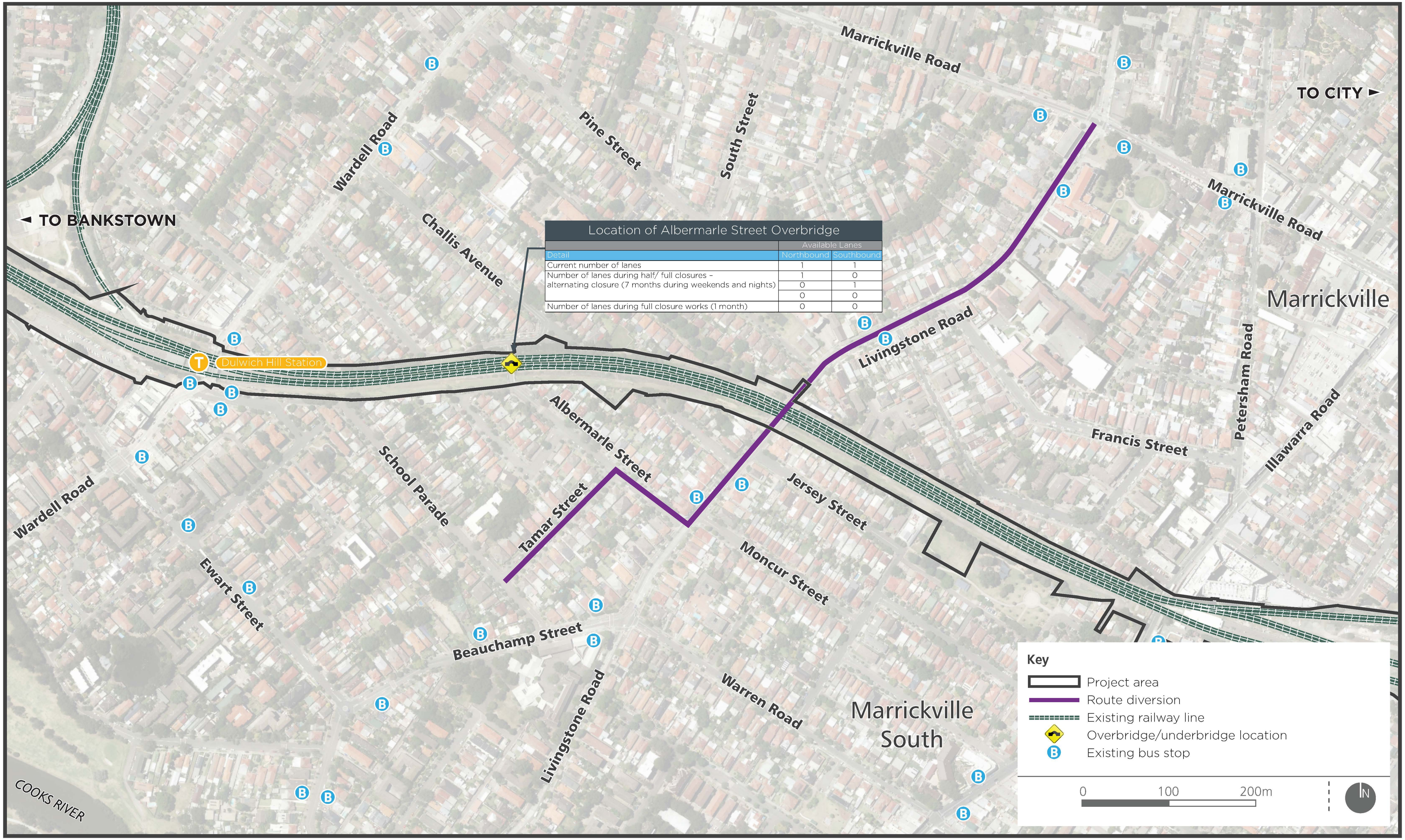
This is not expected to have a significant impact on the surrounding local road network as the bridge services a small residential catchment. These works would be covered by a detailed traffic management plan.

6.8.2 Bus Network

Currently no bus routes cross the Albermarle Street Overbridge and no bus routes would be affected by work undertaken on the bridge.

6.8.3 Pedestrians and Cyclists

Bridge works would require closure of the footpath on the eastern side of the bridge. This footpath would be closed during weekend half lane closures of the westbound lane and during the four week full bridge closure. Pedestrians would need to use the Livingstone Road Overbridge to the east or Wardell Road Overbridge to the west, if they wish to cross the railway lines during this time, these each being some 500m away.



Location of Albermarle Street Overbridge

Detail	Available Lanes: Northbound	Available Lanes: Southbound
Current number of lanes	1	1
Number of lanes during half/ full closures – alternating closure (7 months during weekends and nights)	1	0
	0	1
	0	0
Number of lanes during full closure works (1 month)	0	0

Location and diversion route - Albermarle Street overbridge

FIGURE 6.5

6.9 Wardell Road Overbridge

Wardell Road Overbridge located in Dulwich Hill, as shown in **Figure 6.6**, is a three span concrete girder bridge with a total length of approximately 27m. The bridge carries one lane of traffic in each direction and provides direct access to Dulwich Hill Station. The bridge spans four railway lines; two ARTC Goods Lines and two Bankstown Lines. Approximately 14,400 vehicles per day (estimated from September 2016 peak hour traffic counts) use the Overbridge.

In the order of 240 construction haulage vehicle trips are expected to be made using Illawarra Road Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours it is are expected that 10 light vehicle and 12 heavy vehicles trips would be performed using this route.

6.9.1 Diversion Route

The Wardell Road Overbridge upgrade works require half lane closures periodically during weekends and nights over six months. During these half lane closures, northbound or southbound traffic would be diverted to Livingstone Road Overbridge, as shown in **Figure 6.6**.

Traffic volumes are similar for northbound and southbound movements and as a consequence during the northbound closure, the southbound traffic would be diverted to Livingstone Road Overbridge and during the southbound closure, the northbound traffic again diverted to Livingstone Road Overbridge. These works would be covered by a detailed traffic management plan. Although the works for this diversion route would occur during weekends and nights, the following high volume intersections would be impacted:

- Marrickville Road / Livingstone Road[45]
- Warren Road / Livingstone Road[46]

Traffic has not been diverted to the Albermarle Street Overbridge despite it being the closest bridge to the east, as the bridge currently serves a small residential catchment and is therefore assumed to be incapable of carrying the diverted traffic from Wardell Road Overbridge.

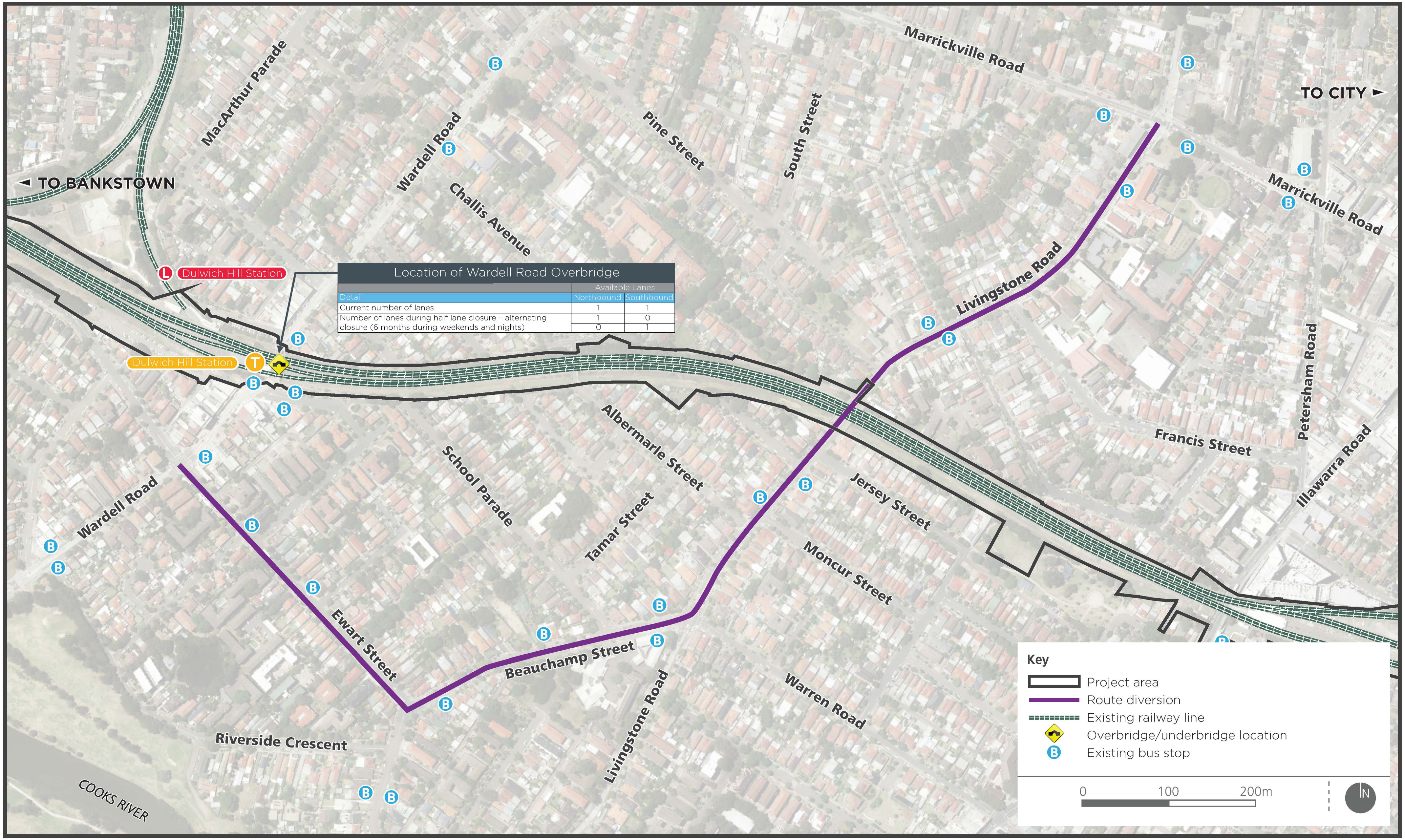
6.9.2 Bus Network

Currently no service bus routes cross the Wardell Road Overbridge.

6.9.3 Pedestrians and Cyclists

Construction activities required for the bridge upgrade would result in a half closure during construction. This bridge has footpaths on either side and during the half lane night and weekend closures, pedestrians and cyclists would be diverted to the side of the bridge which remains open. An uncontrolled pedestrian crossing exists on the southern end of the bridge and can be used to aid pedestrian and cyclist movements. Temporary traffic management would be in place at the northern end of the bridge to aid pedestrians and cyclists.

[45] Due to insufficient data at the time of reporting, this intersection has not been modelled
[46] Due to insufficient data at the time of reporting, this intersection has not been modelled



Location of Wardell Road Overbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during half lane closure – alternating closure (6 months during weekends and nights)	1	0
	0	1

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Location and diversion route - Wardell Road overbridge

FIGURE 6.6

6.10 Ness Avenue / Terrace Road Underbridge

The Ness Avenue / Terrace Road Underbridge located in Dulwich Hill, as shown in **Figure 6.7** is a three span steel girder bridge with a concrete deck that has a length of approximately 28m. The underbridge is estimated to carry approximately 1,300 vehicles per day (estimated from December 2016 peak hour traffic counts).

The bridge carries traffic over the ARTC Goods Lines and Bankstown Lines.

In the order of 460 construction haulage vehicle trips are expected to be made using Ness Avenue / Terrace Road Underbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours there is expected to be 20 light vehicle and 22 heavy vehicles trips.

6.10.1 Diversion Routes

The bridge requires half lane closures during weekends and nights over a six month period to complete the upgrade works. During the half lane closures, it is assumed that half of the traffic would divert to Wardell Road Overbridge and the remainder to Garnet Street Overbridge, as shown in **Figure 6.7**. As the work is only occurring during weekends and nights, diversions would be addressed in detailed traffic management plans.

The following intersection would likely be impacted by the diversion:

- Marrickville Road / Wardell Road[47].

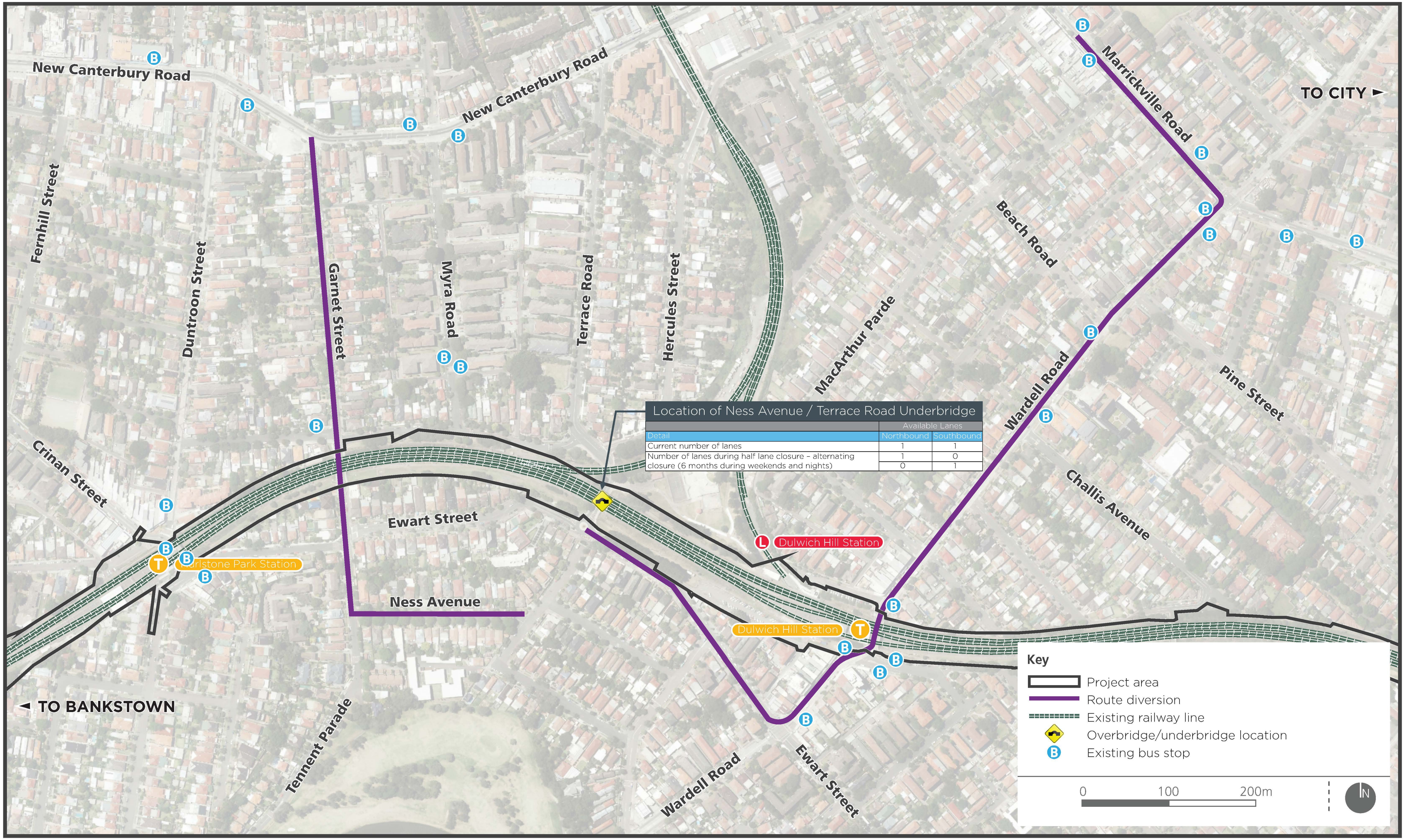
6.10.2 Bus Network

Currently no bus routes use the Ness Avenue / Terrace Road Underbridge and consequently the works required on the bridge would not affect existing public transport.

6.10.3 Pedestrians and Cyclists

Construction activities required for the bridge upgrade would result in a half closure during construction. There are footpaths outside of the brick piers on both sides of the road and during the half lane night and weekend closures, pedestrians and cyclists would be diverted to the side of the road which has remained open. Temporary traffic management would be in place at both ends of the bridge to aid pedestrians and cyclists.

[47] Due to insufficient data at the time of reporting, this intersection has not been modelled



Location of Ness Avenue / Terrace Road Underbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during half lane closure – alternating closure (6 months during weekends and nights)	1	0
	0	1

sydney METRO | city & southwest

Location and diversion routes - Ness Avenue / Terrace Road underbridge

FIGURE 6.7

6.11 Garnet Street Overbridge

Garnet Street Overbridge located in Hurlstone Park, as shown in **Figure 6.8** is a three span concrete girder bridge of approximately 26m in length. The bridge has one lane of traffic in each direction and is estimated to carry less than 2,200 vehicles per day (estimated from December 2016 peak hour traffic counts).

The bridge spans four rail lines; two ARTC Goods Lines and two Bankstown Lines.

Some 40 construction haulage vehicle trips are expected to be made using Garnet Street Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours, construction haulage traffic would comprise of four heavy vehicle trips.

6.11.1 Diversion Routes

Garnet Street Overbridge requires half lane closures during weekend and night works over a period of eight months. The bridge also requires 48 hours of full closure for waterproofing and asphalt works. The full closure would occur during a weekend and would be managed by a detailed traffic management plan; therefore no modelling has been undertaken.

The diversion route assumes half of all traffic would reroute to Duntroon Street Overbridge and the remainder to Ness Avenue / Terrace Road Overbridge, as shown in **Figure 6.8**.

6.11.2 Bus Network

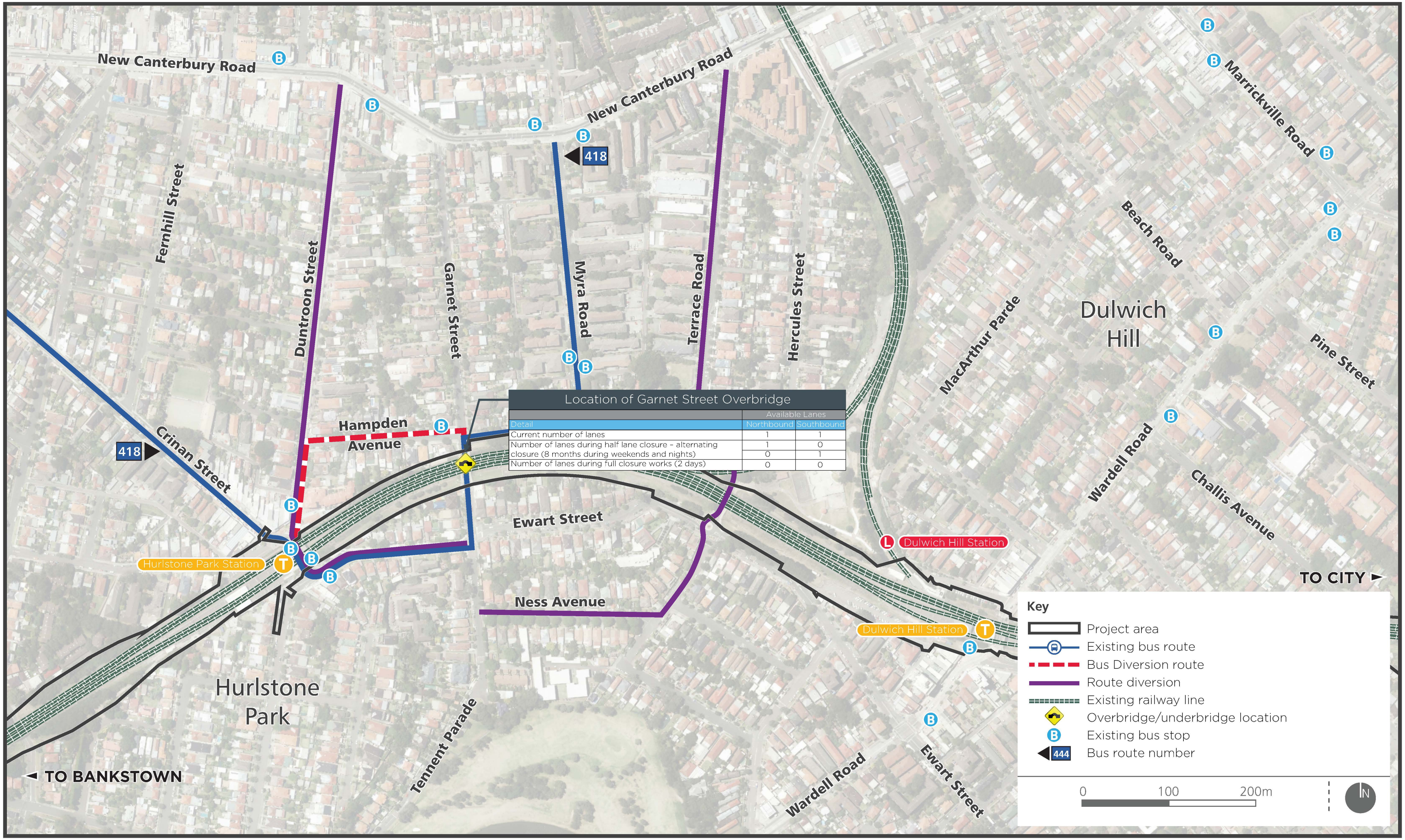
Bus route 418 crosses the Garnet Street Overbridge. During the full bridge closure period, it would be redirected along Garnet Street where it would re-join the existing route via Duntroon Street as shown in Figure **6.8**.

The return route travels the same route in reverse.

6.11.3 Pedestrians and Cyclists

A half lane closure would be required for the works at Garnet Street Overbridge. The bridge has a footpath on the eastern side and a narrow footpath on the western side and during the half lane night and weekend closures, pedestrians and cyclist would be diverted to the side of the road which remains open. Temporary traffic management would be in place at both ends of the bridge to aid pedestrians and cyclists.

During the 48 hour full closure, pedestrians and cyclists wishing to cross the railway lines would need to be diverted 400m to Ness Avenue / Terrace Road Underbridge to the east or 350m to Duntroon Street Overbridge to the west.



Location of Garnet Street Overbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during half lane closure – alternating closure (8 months during weekends and nights)	1	0
	0	1
Number of lanes during full closure works (2 days)	0	0

sydney METRO | city & southwest

Location and diversion routes - Garnet Street Overbridge

FIGURE 6.8

6.12 Duntroon Street Overbridge

Duntroon Street Overbridge located at Hurlstone Park, as shown in **Figure 6.9**, is a three span jack arch girder bridge deck with an overall length of approximately 27m. The bridge carries two lanes of traffic providing access to Hurlstone Park Station. The Overbridge carries approximately 2,000 vehicles per day (estimated from September 2016 peak hour traffic counts).

The bridge spans four railway lines; two ARTC Goods Lines and two Bankstown Lines.

In the order of 220 construction haulage vehicle trips are expected to be made using Duntroon Street Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours there is expected to comprise of 10 light vehicle and 10 heavy vehicle trips.

6.12.1 Diversion Routes

Duntroon Street Overbridge requires half lane closures for weekends and nights over an eight month period. The bridge also requires 48 hours of full closure for waterproofing and asphalt works. The full closure would occur over a weekend and would be managed by a detailed traffic management plan.

The diversion route during half lane and full lane closure would be via Garnet Street Overbridge, as shown in **Figure 6.9**. The diversion route is not expected to impact any high volume intersections, and therefore no modelling has occurred.

6.12.2 Bus Network

Currently the bus routes 406, 418 and N40 cross the Duntroon Street Overbridge.

During the full bridge closure period, the bus routes 406 and N40 would be redirected through Floss Street and Garnet Street, across the Garnet Street Overbridge and then join the existing bus route via Duntroon Street as shown in **Figure 6.9**. The return route would follow the same path in reverse. These diversions would result in one northbound and one southbound stop not being served. These stops are the closest stops to Hurlstone Park station; the provision of a pair of stops on Duntroon Street (immediately before the diversion) would aid transfer between these buses and the station and could also be served by route 418.

The bus route 418 would be redirected through Garnet Street where it would join the existing route via Duntroon Street as shown in the **Figure 6.9**. The return route would follow the same path but in the opposite direction. This diversion would result in three northbound stops and one southbound stop not being served, including the stops closest to Hurlstone Park station.

6.12.3 Pedestrians and Cyclists

Duntroon Street Overbridge has wide footpaths on either side of the bridge and during the half lane night and weekend closures, pedestrians and cyclists would be diverted to the side of the road which has remained open. The uncontrolled pedestrian crossing at the northern end of the bridge can be used to aid pedestrian and cyclists movement during the diversion. Temporary traffic management would need to be in place at the southern end of the bridge to aid the pedestrians and cyclists in the absence of a pedestrian crossing.

During the 48 hour full closure, pedestrians and cyclists wishing to cross the railway lines would be diverted 350m to Garnet Street Overbridge to the east or 600m to Foord Avenue Underbridge to the west.

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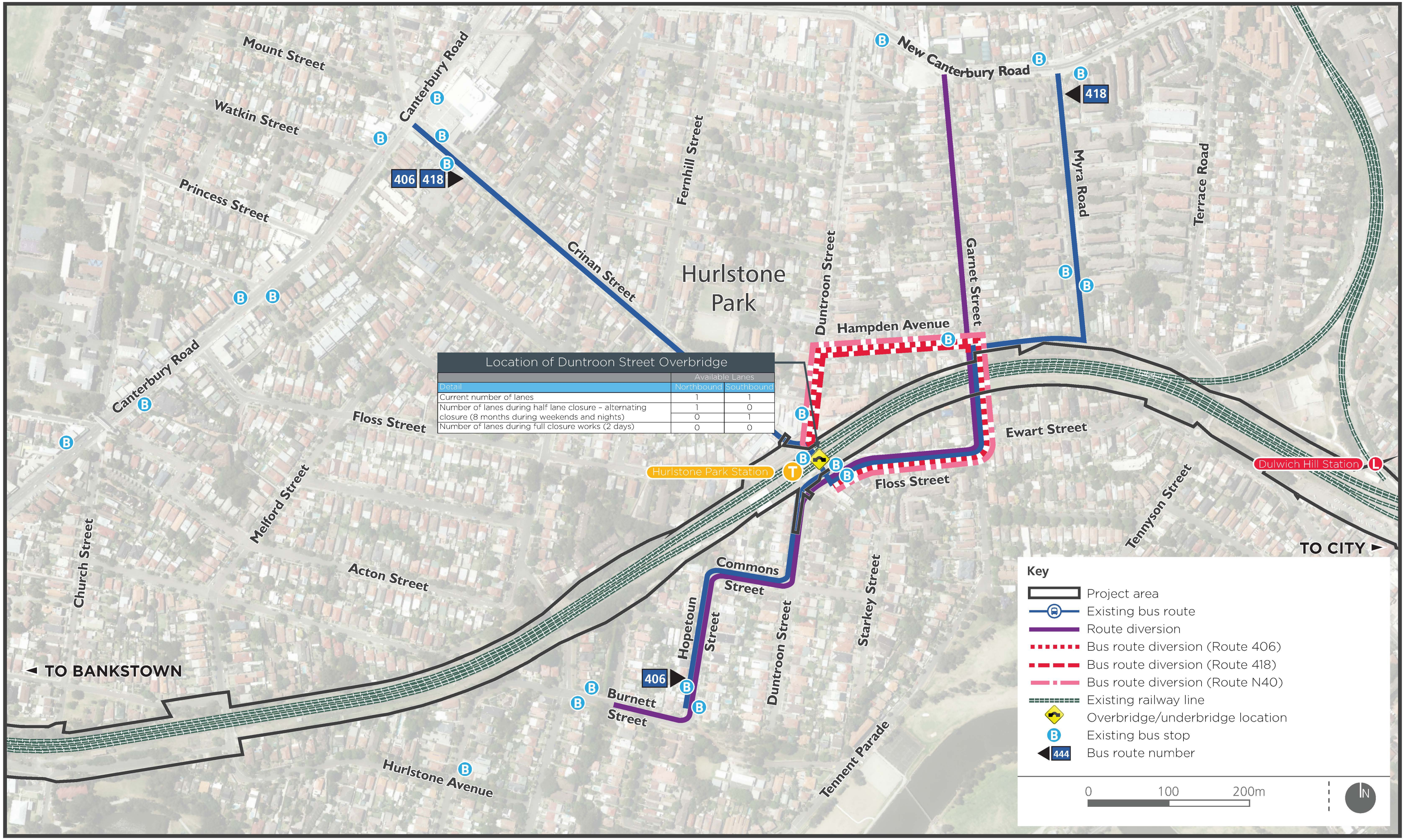


Location of Duntroon Street Overbridge

Detail	Available Lanes: Northbound	Available Lanes: Southbound
Current number of lanes	1	1
Number of lanes during half lane closure – alternating closure (8 months during weekends and nights)	1	0
	0	1
Number of lanes during full closure works (2 days)	0	0

Sydney Metro | city & southwest

Location and diversion routes - Duntroon Street overbridge

FIGURE 6.9

6.13 Foord Avenue Underbridge

Foord Avenue Underbridge located in Hurlstone Park, as shown in **Figure 6.10**, is a two span concrete girder bridge deck of approximately 11m in length. The bridge carries the ARTC Goods Lines and the Bankstown Lines.

This bridge is on a construction haulage route, but the volumes are anticipated to be extremely low, in the order of two to three construction haulage vehicle trips a day.

6.13.1 Diversion Routes

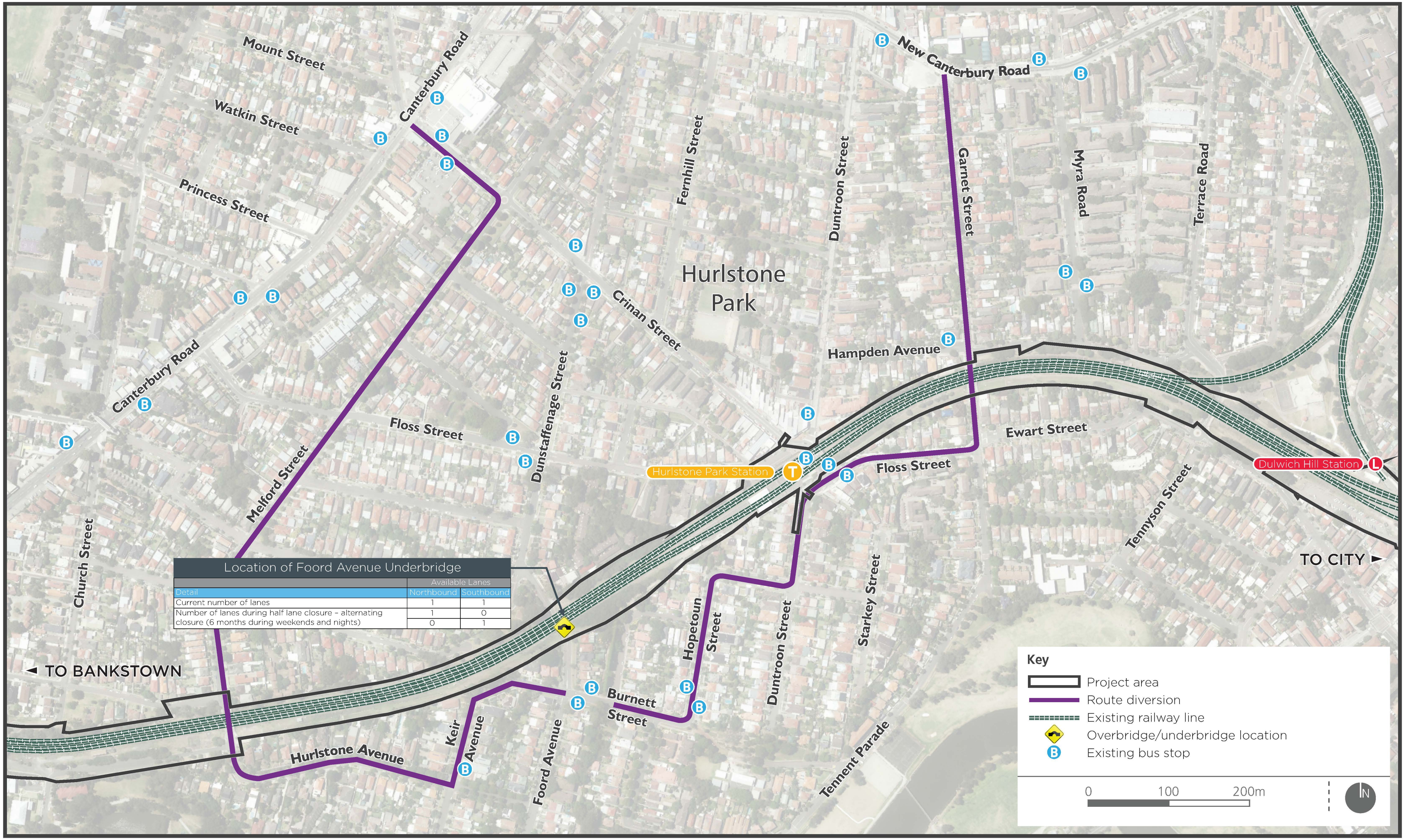
Foord Avenue Underbridge requires half lane closures during weekend and night works over a six month period to complete the works. Half of the traffic would be diverted to Melford Street Overbridge and the remainder to Duntroon Street Overbridge during the half lane closures, as shown in **Figure 6.10**. These weekend and night works would be covered by detailed traffic management plans. Diversions from closures have not been modelled as closures would be during weekends and nights.

6.13.2 Bus Network

Currently no bus routes use the Foord Avenue Underbridge and therefore no bus route would be impacted by the bridge works.

6.13.3 Pedestrians and Cyclists

This bridge does not have any footpaths and consequently the closure of Foord Avenue would not affect pedestrians. The bridge construction would require half lane night and weekend closures which would mean cyclists would be diverted to the side of the road which has remained open.



Location of Foord Avenue Underbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during half lane closure – alternating closure (6 months during weekends and nights)	1	0
	0	1

sydney METRO | city & southwest

Location and diversion routes - Foord Avenue underbridge

FIGURE 6.10

6.14 Melford Street Overbridge

Melford Street Overbridge located at Hurlstone Park, as shown in **Figure 6.11** is a three span concrete girder bridge of approximately 26m in length. The bridge has one lane of traffic in each direction. It crosses four railway tracks; two ARTC Goods Lines and two Bankstown Lines.

This bridge is on a construction haulage route, but the volumes are anticipated to be extremely low, in the order of two to three construction haulage vehicle trips a day.

6.14.1 Diversion Routes

The Melford Street Overbridge is narrow and therefore requires full closure during upgrade works. The full closure would occur during weekends and nights over an eight month period. Diverted traffic would use Foord Avenue, as shown in **Figure 6.11**.

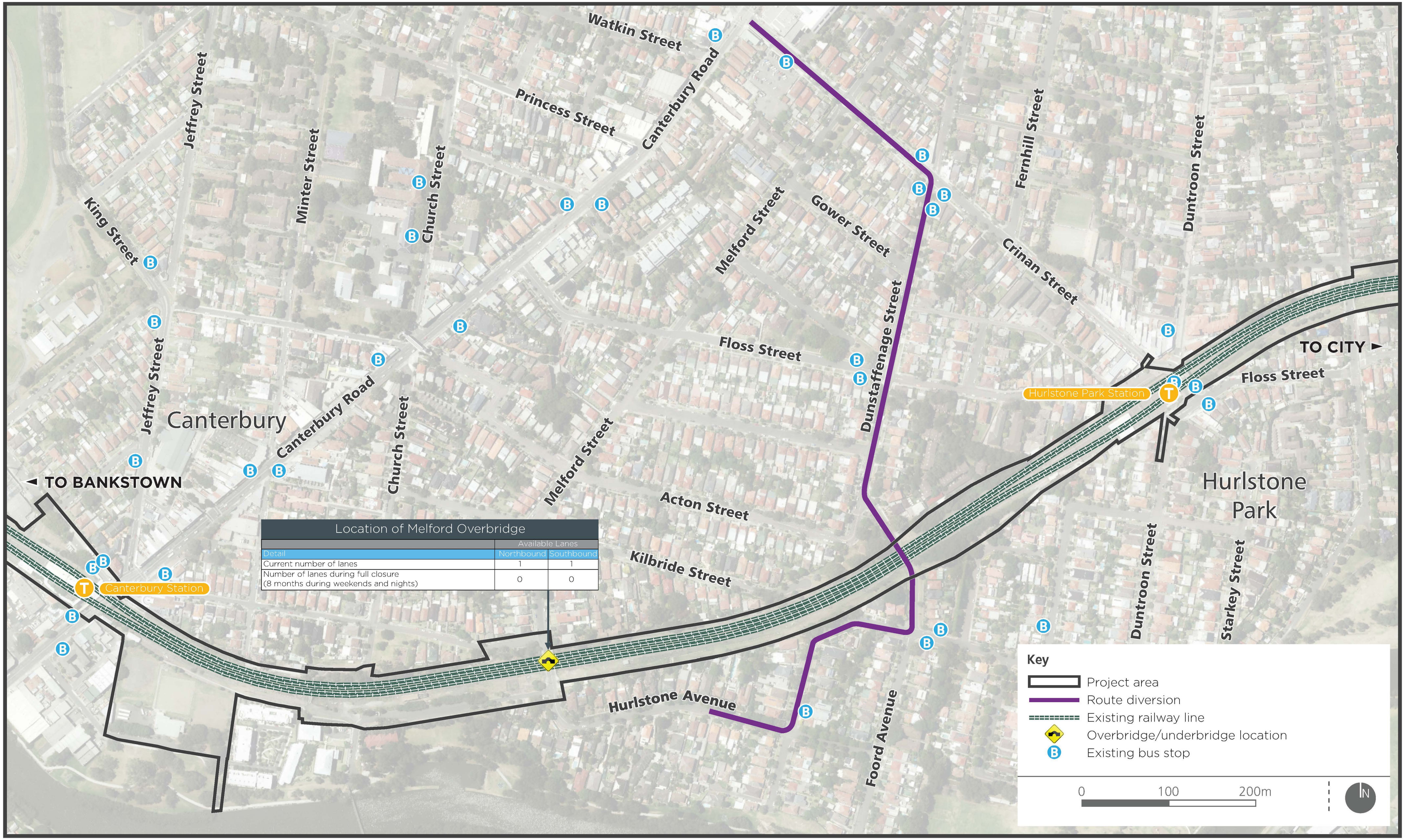
These weekend and night works would be covered by a detailed traffic management plan.

6.14.2 Bus Network

Currently no bus route crosses the Melford Street Overbridge and therefore no bus route would be impacted by the bridge works.

6.14.3 Pedestrians and Cyclists

Construction activities associated with the bridge upgrade would impact on pedestrian and cycle paths. The bridge has footpaths on either side and during the closure pedestrians and cyclists would be diverted to the Church Street/Hutton Street Footbridge approximately 350m to the west. Cyclists could also be diverted to the Foord Avenue Underbridge.



Location of Melford Overbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during full closure (8 months during weekends and nights)	0	0

Location and diversion route - Melford Street overbridge

FIGURE 6.11

6.15 Church Street / Hutton Street Footbridge

The Church Street / Hutton Street Footbridge located near Canterbury Station, as shown in **Figure 6.12** , is a two span steel girder bridge of approximately 23m in length. The bridge is used to allow pedestrians to cross four railway lines; two ARTC Goods Lines and two Bankstown Lines

6.15.1 Diversion Routes

This bridge is used for pedestrians only and therefore would not require the diversion of vehicles.

6.15.2 Pedestrians and Cyclists

The bridge works would require the footbridge to be closed periodically over six months. During these closure periods, pedestrians and cyclists wishing to cross the railway lines would be diverted 350m to Melford Street Overbridge to the east or 450m to Canterbury Road Overbridge to the west.

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Location of the Church Street / Hutton Street footbridge

FIGURE 6.12

6.16 Canterbury Road Overbridge

Canterbury Road Overbridge near Canterbury Station, as shown in **Figure 6.13**, is a three span jack arch girder bridge deck of approximately 28m in length. The bridge carries two lanes of traffic in each direction and is adjacent to Canterbury Station. The Overbridge carries approximately 51,300 vehicles per day.

It spans four railway lines; two ARTC Goods Lines and two Bankstown Lines.

In the order of 260 construction haulage vehicle trips are expected to be made using Canterbury Road Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours there is expected to be 10 light vehicle and 14 heavy vehicle trips.

6.16.1 Diversion Routes

Canterbury Road Overbridge would require traffic barriers and safety screen upgrades, general maintenance, waterproofing, throw screens, bridge parapet replacement and asphalt works. These works would require lane closures during weekends and nights over an eight month period to upgrade the bridge. During these lane closures, the number of lanes would be reduced to one lane in each direction. This allows the bridge to retain contra flow while enabling the upgrade works to continue.

These traffic diversions occur during weekends and nights and would therefore be managed by detailed traffic management plans. Any works related to the creation of traffic management plans would be done in consultation with RMS.

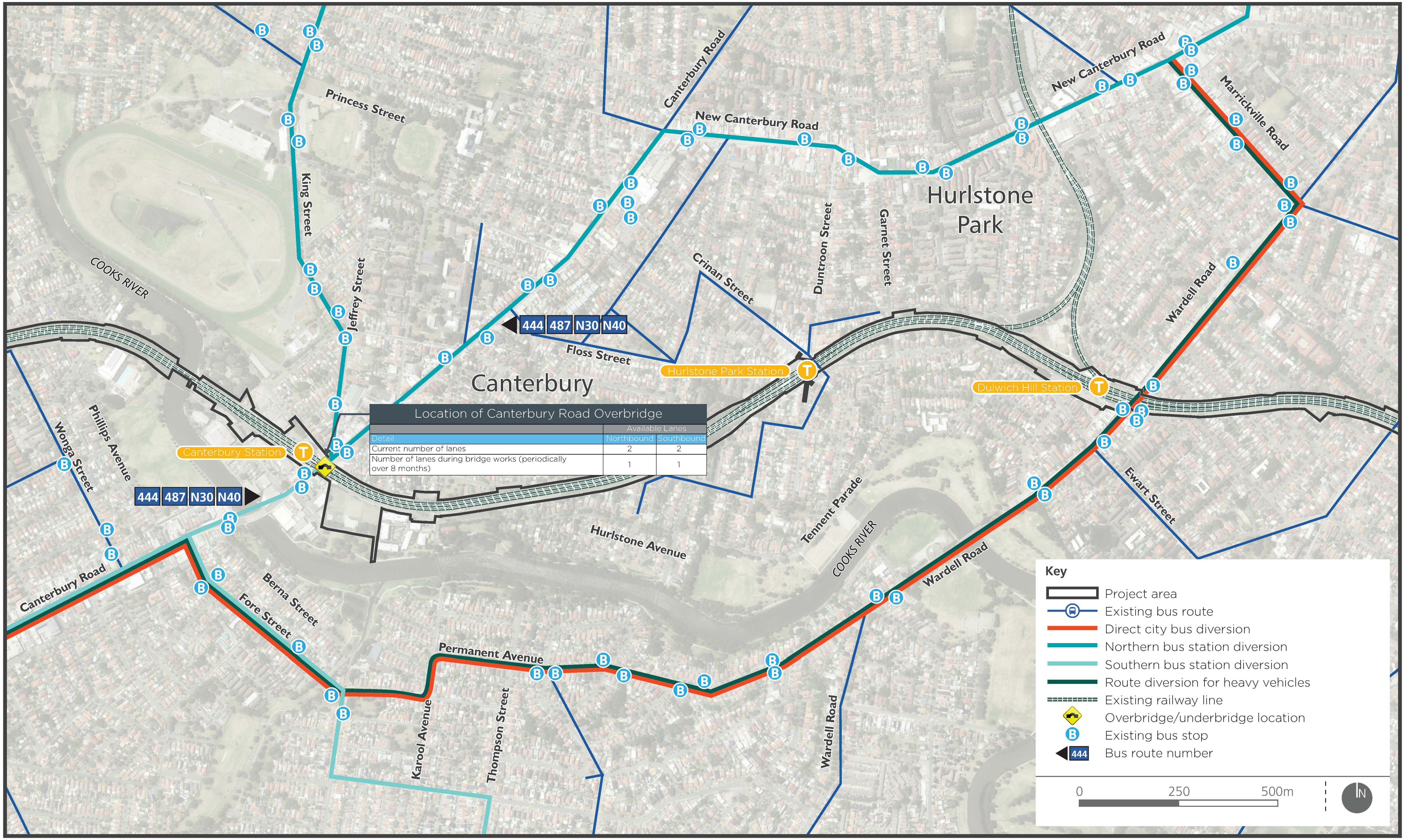
The Broughton Street approach could be closed while the reduced numbers of lanes are in operation. This would increase the phase split provided to the through movement. The impact on Broughton Street would be insignificant as it is a closed loop, providing a quick diversion to the Charles Street – Canterbury Road intersection for light vehicles.

6.16.2 Bus Network

Currently the bus routes 444, 487, 491, N30, N40 and 632s cross the Canterbury Road Overbridge. As the bridge would remain operative in both directions, the bus routes can continue their normal operation, however, they would be impacted by traffic management measures such as stop/go operations or by traffic congestion.

6.16.3 Pedestrians and Cyclists

The bridge has footpaths on either side and during the half lane closures pedestrians and cyclists would be diverted to the side of the bridge which has not been closed. Traffic management would be in place to facilitate the safe movement of pedestrians and cyclists across the road.



Location of Canterbury Road Overbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	2	2
Number of lanes during bridge works (periodically over 8 months)	1	1

sydney METRO | city & southwest

Location and diversion routes - Canterbury Road overbridge

FIGURE 6.13

6.17 Cooks River / Charles Street Underbridge

The bridge (located in Canterbury) is made up of two separate structures; a masonry arch structures and a steel girder structure with a concrete bridge deck. The bridge is approximately 73.5m in length carrying the ARTC Goods Lines and Bankstown Lines across the river as shown in **Figure 6.14**.

In the order of 260 construction haulage vehicle trips are expected to be made using Canterbury Road Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours there is expected to be 10 light vehicle and 14 heavy vehicle trips.

6.17.1 Diversion Routes

The Cooks River / Charles Street Underbridge requires a series of full and half closures during weekends and nights over a six month period to complete the upgrade works. During this time traffic would be diverted to the Canterbury Road Overbridge, as shown in **Figure 6.14**.

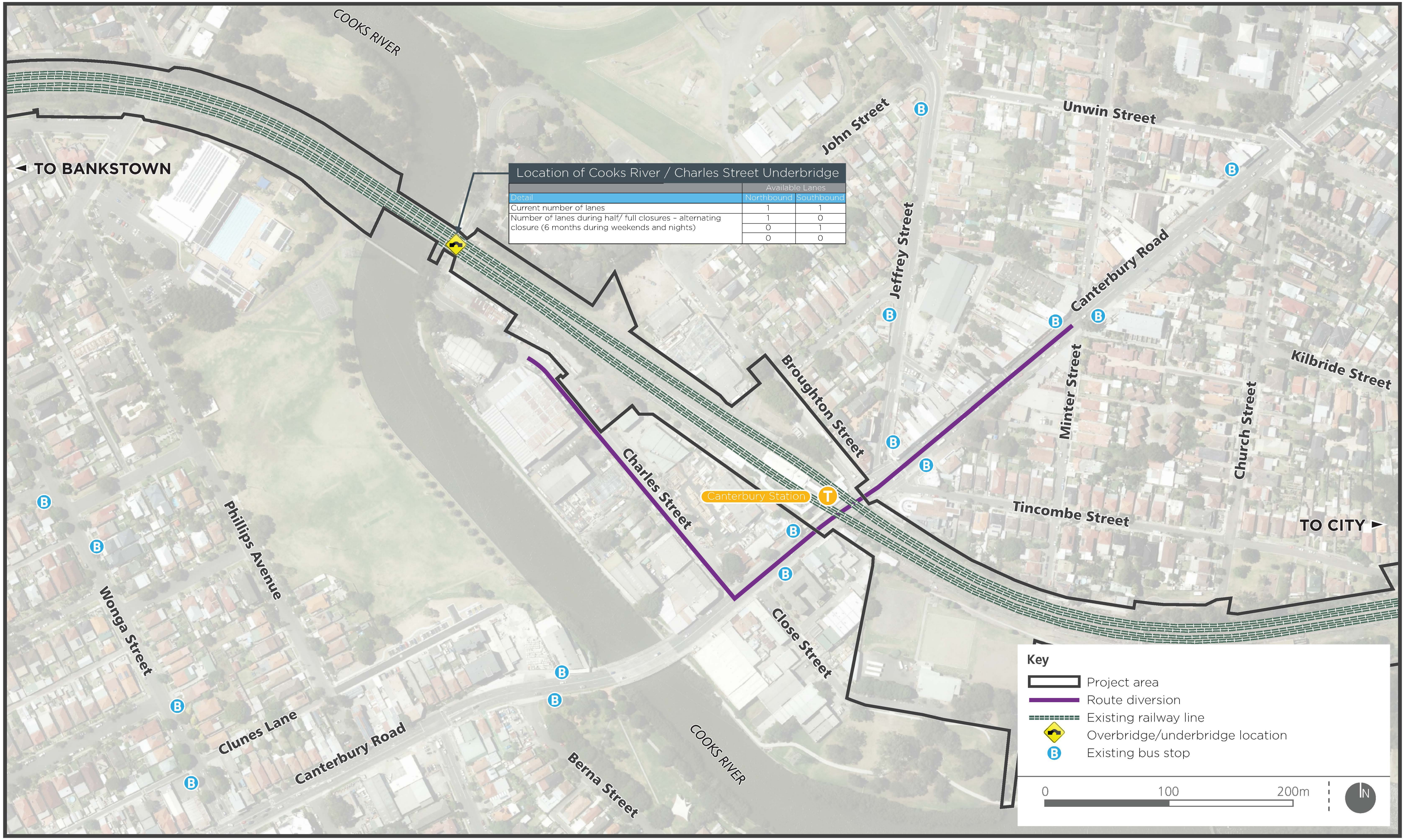
As shown above, this bridge forms a small closed loop (i.e. the road starts and ends at Canterbury Road like a crescent) and would therefore entail insignificant impacts from the closures and therefore no modelling has been undertaken. These closures would be managed with detailed traffic management plans.

6.17.2 Bus Network

Currently no bus route uses the Cooks River / Charles Street Underbridge and therefore no bus route would be affected by the bridge works.

6.17.3 Pedestrians and Cyclists

The Cooks River/Charles Street Underbridge has very narrow footpaths. It forms part of the Cooks River Cycleway and therefore generates high volumes of pedestrian and cyclist traffic, particularly on weekends. Works would therefore be encouraged to occur during night periods to minimise disruption to active transport modes. During closures, pedestrians and cyclists currently using this Underbridge would be required to divert 550m to the Canterbury Road Overbridge to the east.



Location of Cooks River / Charles Street Underbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during half/ full closures – alternating closure (6 months during weekends and nights)	1	0
	0	1
	0	0

Location and diversion route - Cooks River / Charles Street underbridge

FIGURE 6.14

6.18 Wairoa M24 Street Underbridge

The Wairoa M24 Street Underbridge (located in Canterbury) is approximately 27.5m in length and made up of two separate structures; a masonry arch structure and a steel girder with concrete deck. The structures carry two ARTC Goods Lines and two Bankstown Lines as shown in **Figure 6.15**.

The underbridge carries approximately 10,100 vehicles per day (estimated from December 2016 peak hour traffic counts).

Construction haulage vehicles are not expected to use Wairoa M24 Street Underbridge.

6.18.1 Diversion Routes

Wairoa Street Underbridge requires half lane closures during weekends on nights over a six month period during which time traffic would be subject to traffic management measures contained in a Traffic Management Plan including measures such as manual traffic control and diversions. Traffic control work has been assessed during peak hours and the volume of traffic is sufficiently low to enable this type of traffic management without significant delays. **Figure 6.15** shows the diversion route during the Wairoa Street Underbridge closure.

A full closure would be required overnight to install the crash barrier. During the full closure traffic would be diverted to the Beamish Street Overbridge as this is the closest bridge with north – south movements.

Measures to manage weekend and night works would be addressed in detailed traffic management plans and no additional modelling work is required.

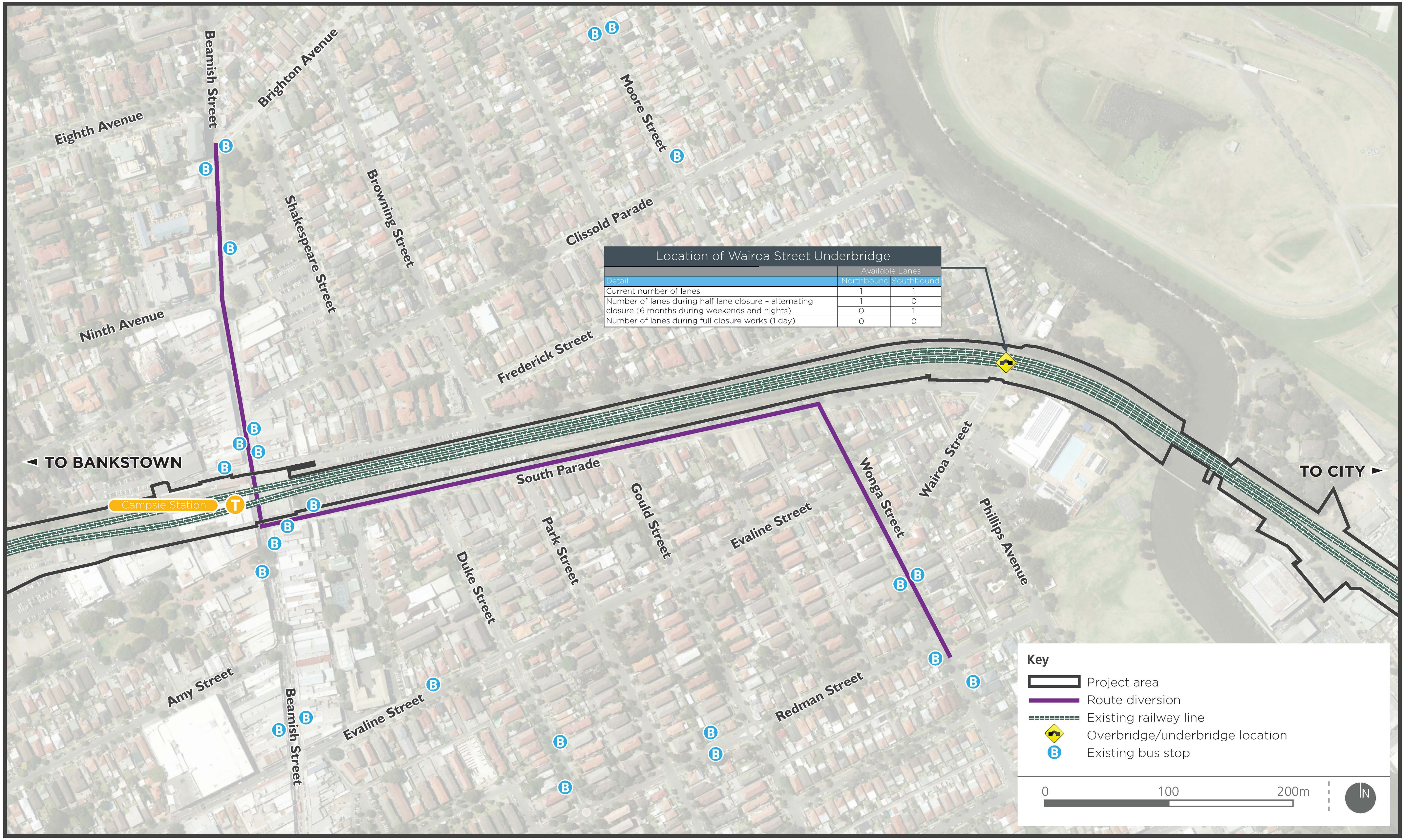
6.18.2 Bus Network

Currently no bus routes use the Wairoa Street Underbridge and therefore no bus route would be impacted by the bridge works.

6.18.3 Pedestrians and Cyclists

Construction activities near the Wairoa M24 Street Overbridge would require half a lane night and weekend closures, during which pedestrians and cyclists would be diverted to the side of the road which has remained open. Temporary traffic management would need to be in place at both ends of the bridge to aid pedestrians and cyclists.

It is expected that pedestrian and cyclist volumes during the full lane closure would be minimal during the night works. Pedestrians would be diverted 700m to the Duke Street Footbridge to the west. It is not expected that any pedestrians or cyclists would divert to Canterbury Road Overbridge as it follows a north east – south west route rather than a north – south route.



Location of Wairoa Street Underbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during half lane closure – alternating closure (6 months during weekends and nights)	1	0
	0	1
Number of lanes during full closure works (1 day)	0	0

Location and diversion route - Wairoa M24 Street underbridge

FIGURE 6.15

6.19 Duke Street Footbridge

The Duke Street Footbridge located in Campsie is a multi-span structure. The bridge crosses four railway lines; two ARTC Goods Lines and two Bankstown Lines as shown in **Figure 6.16**.

6.19.1 Diversion Routes

This bridge is used for pedestrians and cyclists only and therefore would not require the diversion of vehicles.

6.19.2 Pedestrians and Cyclists

Construction activities required for the Footbridge upgrade requires periodic closures over a six month period. During this time pedestrians and cyclists would need to divert 700m to Wairoa M24 Street Underbridge to the east or 200m to Beamish Street Overbridge to the west.

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Location of the Duke Street Footbridge

FIGURE 6.16

6.20 Beamish Street Overbridge

The Beamish Street Overbridge located in Campsie, is a three span jack arch girder bridge deck with an overall length of approximately 26m. Two lanes of traffic cross the bridge in each direction and it provides access to Campsie Station. The bridge spans four railway lines; two ARTC Goods Lines and two Bankstown Lines as shown in **Figure 6.17**.

Approximately 18,900 vehicles per day use the bridge.

In the order of 120 construction haulage vehicle trips are expected to be made using Beamish Street Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours there is expected to be five light vehicle and five heavy vehicle trips.

6.20.1 Diversion Routes

The bridge requires lane closures during nights and weekends over a six month period. One way traffic would be implemented and the diverted traffic would use Loch Street Overbridge, as shown in **Figure 6.17**. Management measures for weekend and night diversion works would be in detailed traffic management plans.

It is recognised that the retail nature of the land uses adjacent to this bridge result in demand flows on weekends which are closer to weekday commuter peak levels than for other areas. However, whilst weekend ‘retail’ peaks are generally much longer than weekday morning and evening peaks, potentially spanning most of the day from mid- morning to late afternoon, the absolute levels are generally below the shorter and sharper weekday peaks. As such, the assessment has been based on data collected during weekday peaks, but recognising that the effects would occur during a weekend, as a conservative assessment.

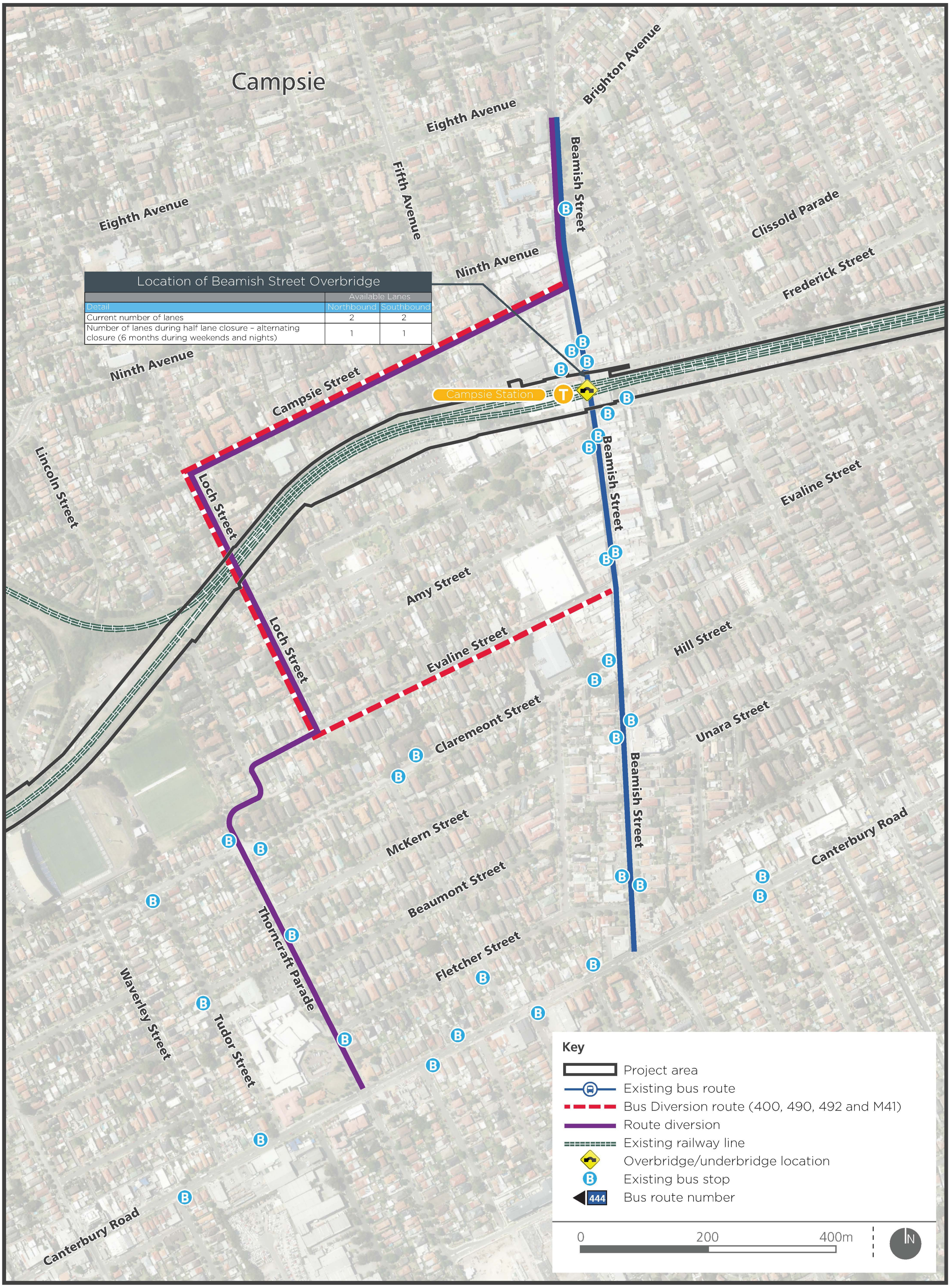
6.20.2 Bus Network

Currently bus routes 400, 490, 492 and M41 cross the Beamish Street Overbridge. During the one-way bridge closure periods, the blocked direction of all of these bus routes would be redirected through Evaline Street and Loch Street, cross the Loch Street Overbridge and join the existing paths via Campsie Street as shown in **Figure 6.17**. The return route similarly travels the route in the opposite direction.

These diversions would result in routes bypassing several bus stops and therefore temporary bus facilities would be required on the diversion route which may include stops on Campsie Street and Evaline Street.

6.20.3 Pedestrians and Cyclists

The Beamish Street Overbridge has footpaths on either side and during the half lane night and weekend closures, pedestrians and cyclists would be diverted to the side of the road which remains open. Temporary traffic management would be put in place at both ends of the bridge to aid pedestrians and cyclists.



Location of Beamish Street Overbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	2	2
Number of lanes during half lane closure – alternating closure (6 months during weekends and nights)	1	1

Location and diversion routes - Beamish Street overbridge

FIGURE 6.17

6.21 Loch Street Overbridge

Loch Street Overbridge located in Campsie, is a four span concrete girder structure with an overall length of approximately 36.5m as shown in **Figure 6.18**. The bridge carries one lane of traffic in each direction and spans four railway lines; two ARTC Goods Lines and two Bankstown Lines.

Approximately 15,600 vehicles per day use the bridge.

In the order of 20 construction haulage vehicle trips are expected to be made using Beamish Street Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours there is expected to be two light vehicle trips.

6.21.1 Diversion Routes

The bridge requires half lane closures during weekend and nights over a six month period to complete the upgrade works. During this time traffic would be diverted to the Beamish Street Overbridge, as shown in **Figure 6.18**. These night and weekend works would be managed in accordance with detailed traffic management plans.

6.21.2 Bus Network

Currently no bus routes cross the Loch Street Bridge and therefore no bus routes would be impacted by the bridge closure program.

6.21.3 Pedestrians and Cyclists

The Loch Street Overbridge has footpaths on either side of the bridge. During the half lane night and weekend closures, pedestrians and cyclists would be diverted to the side of the road which remains open. Temporary traffic management would be in place at both ends of the bridge to aid pedestrians and cyclists.

Location of Loch Street Overbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during half lane closure – alternating closure (6 months during weekends and nights)	1	0
	0	1

Location and diversion route - Loch Street overbridge

FIGURE 6.18

6.22 Pedestrian Access Oval Underbridge

The Pedestrian Access Oval Underbridge located in Belmore, is a 7m span concrete footbridge which provides pedestrian access to Belmore Sportsground as shown in **Figure 6.19**. The bridge currently spans two Bankstown Lines; however the bridge may need to be widened in the future to accommodate a new turnback for rail.

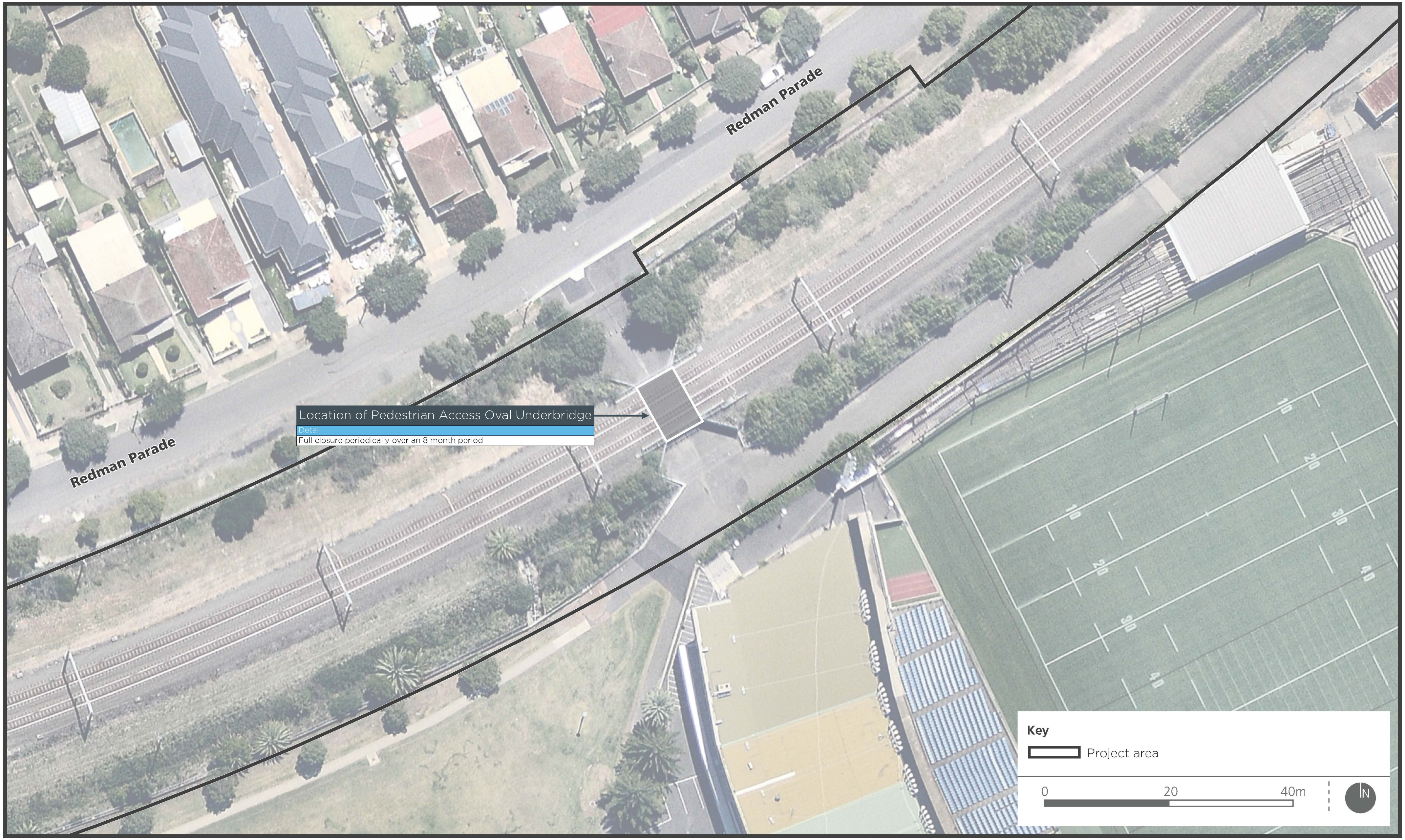
6.22.1 Diversion Routes

This Underbridge is used for pedestrians only and therefore would not require the diversion of vehicles.

6.22.2 Pedestrians and Cyclists

The bridge construction works require full closure during weekends and nights periodically over an eight month period. During this time pedestrians and cyclists would divert 550m to the Loch Street Overbridge to the east or 650m to the Burwood Road Overbridge to the west.

The timing of these closures would be co-ordinated to avoid conflict with events at the Belmore Sportsground.



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Location of the Pedestrian Access Oval underbridge

FIGURE 6.19

6.23 Other Bridges

The Sewer Line Underbridge requires construction works, but does not perform a transport function. The bridge is accessed via the specific location within the worksite described and assessed in Chapter 5. The nature of these works results in minor vehicle movements (less than 10 a day), would not have a significant effect on intersection performance and as such has not been explicitly modelled.

6.24 Belmore to Bankstown Bridge Closures

Works which result in lane or total closure of bridges closures between Belmore and Bankstown are assumed to occur outside of the periods when the TTS is operating during school holiday periods in December and July. In some cases works not requiring possessions could be undertaken during term one and three school holidays to reduce the impacts of the works where the impacts have been assessed to be significant.

It has been assumed that some works at track level requiring possessions can occur during the times that Baseline TTP or Refined Baseline TTP is operating, such as activities to increase the impact protection to piers.

These assumptions are applied to the assessment of the following bridges:

- Burwood Road Overbridge
- Moreton Street Overbridge
- Haldon Street Overbridge
- King Georges Road Overbridge
- Punchbowl Road Overbridge
- Stacey Street Overbridge
- North Terrace to South Terrace Overbridge; and
- Chapel Road Overbridge.

Further detail regarding these assumptions is provided in Chapter 4.

6.25 Burwood Road Overbridge

Burwood Road Overbridge, as shown in **Figure 6.20,** is a two span concrete girder structure with an overall length of approximately 34m which crosses both tracks of the Bankstown Line. There are two lanes of traffic in each direction providing access to Belmore Station. The Overbridge is estimated to carry approximately 19,700 vehicles per day (estimated from April 2016 peak hour traffic counts).

Some 440 construction haulage vehicle trips are expected to be made using Burwood Road Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours, there would be in the order of 20 light vehicle and 20 heavy vehicle trips using the bridge.

6.25.1 Diversion Route

The bridge works would occur over six months of weekend works which are not dependent on school holiday periods and four weeks of half lane closures (two weeks per side).

The bridge works cannot occur while the TTS is in operation as Burwood Road Overbridge is directly adjacent to Belmore Railway Station and the TTS routes are likely to travel along Burwood Road Overbridge. The lane closure works would therefore need to occur while the TTP is not in operation.

During the half lane closures, southbound traffic would divert to Moreton Street Overbridge, as shown in **Figure 6.20**. As the half lane closures are not limited to night works or weekends, the affected intersections have been modelled to determine the likely level of impact from diversions.

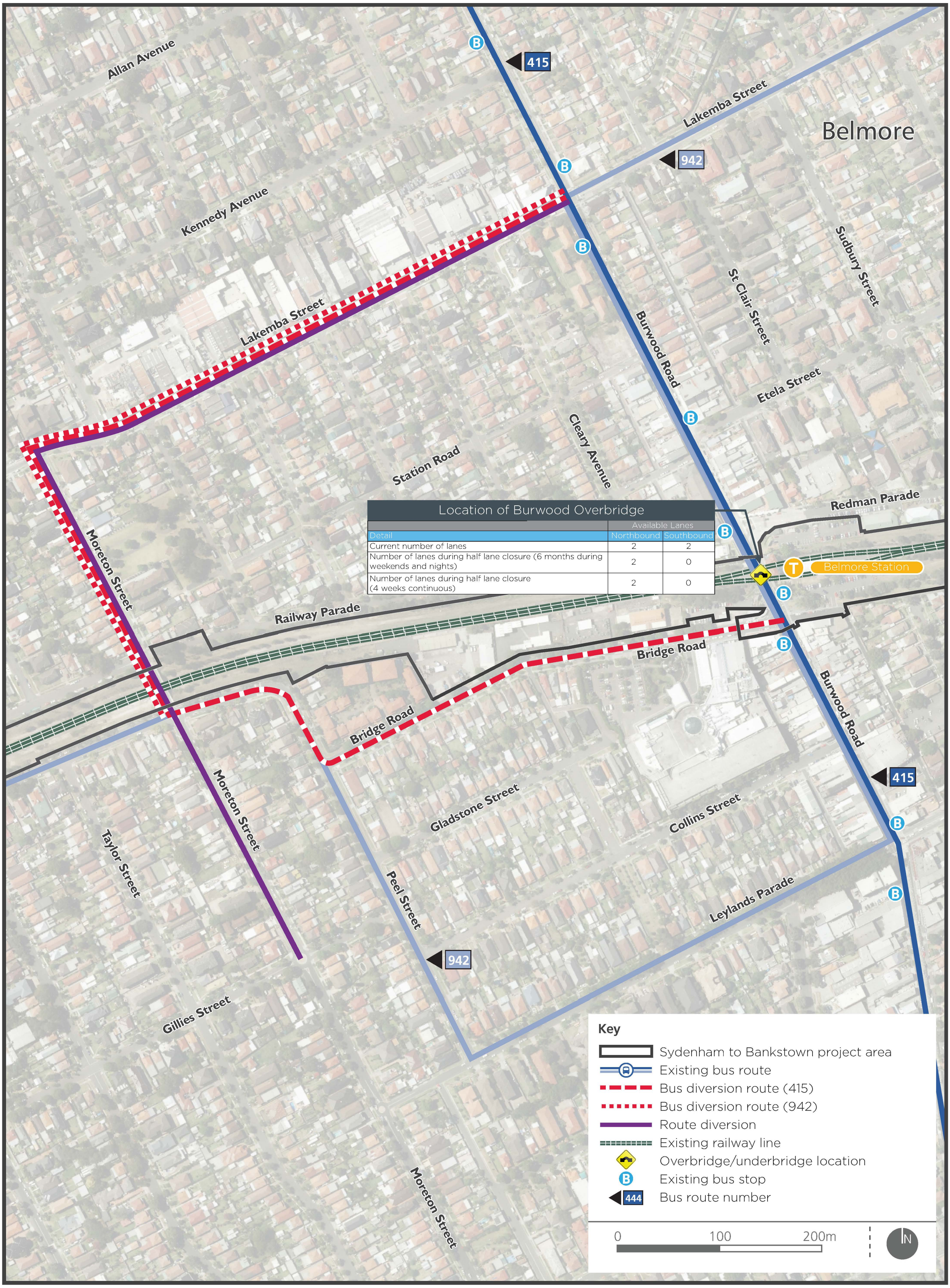
The following intersections were modelled:

- Burwood Road / Bridge Road
- Burwood Road / Redman Parade
- Burwood Road / Lakemba Road
- Moreton Street / Lakemba Road[48]
- Moreton Street / The Boulevarde[49].

In order for the Burwood Road / Lakemba Road intersection to perform adequately during the Traffic Diversion scenario, it was assumed for modelling purposes that parking would be removed from the Lakemba Road approaches in both the AM and PM peak periods. This would be a temporary measure in order to improve the throughput in the given green time and reduce the conflict time with the opposed right turn for the Burwood Road **north** approach.

An alternative option which has not been investigated further is for the southbound traffic to be run contraflow down Burwood Road. These assumptions would be further considered during detailed design.

[48] Due to insufficient data at the time of reporting, this intersection has not been modelled
[49] Due to insufficient data at the time of reporting, this intersection has not been modelled



Location of Burwood Overbridge

Detail	Available Lanes Northbound	Available Lanes Southbound
Current number of lanes	2	2
Number of lanes during half lane closure (6 months during weekends and nights)	2	0
Number of lanes during half lane closure (4 weeks continuous)	2	0

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Location and diversion routes - Burwood Road overbridge

FIGURE 6.20

6.25.2 AM Peak Intersection Performance

Table 6.10 below shows a summary of the intersection assessment undertaken for this bridge.

Table 6.10 Burwood Road Overbridge Intersection Assessment – AM Peak

Burwood Road Overbridge Closure – AM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
Demand Flow (veh)	1736	1760	1795	1021
Average Delay per Vehicle (Average over all arms in seconds)	11	12	20	3
Average Delay per Vehicle (Worst Movement in seconds)	266	322	611	28
LoS (Worst Movement)				
DoS (Worst Movement)	0.95	1.03	1.39	0.40
Demand Flow (veh)	1652	1813	1845	1044
Average Delay per Vehicle (Average over all arms in seconds)	3	4	4	2
Average Delay per Vehicle (Worst Movement in seconds)	55	93	110	9
LoS (Worst Movement)				
DoS (Worst Movement)	0.63	0.69	0.72	0.38
Demand Flow (veh)	2149	2300	2309	2202
Average Delay per Vehicle (Average over all arms in seconds)	24	36	34	46
LoS (Overall)				
DoS (Worst Movement)	0.84	0.96	0.92	1.03
Demand Flow (veh)	1821	1999	1999	2763
Average Delay per Vehicle (Worst Movement in seconds)	9	11	11	307
Average Delay per Vehicle (Average over all arms in seconds)	11	14	14	750
LoS (Overall)				
DoS (Worst Movement)	0.73	0.83	0.83	1.81
Demand Flow (veh)	1527	1677	1677	2441
Average Delay per Vehicle (Worst Movement in seconds)	8	10	10	241
Average Delay per Vehicle (Average over all arms in seconds)	16	19	19	375
LoS (Overall)				
DoS (Worst Movement)	0.67	0.75	0.75	1.40

For two of the five intersections modelled, the level of service resulting from the traffic diversion is 'C' or better. A LoS 'C' would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

Burwood Road / Bridge Road and Burwood Road / Redman Parade have a level of service 'F' for the construction scenario. The assessment and proposed mitigation for the construction effects is discussed in **Section 5.8** in the previous Chapter. Under the diversion scenarios the intersections perform satisfactorily without mitigation.

The Lakemba Street / Moreton Street and The Boulevarde / Moreton Street intersections are forecast to experience a decline in amenity as a result of the addition of the diverted traffic. Both intersections have LoS of 'B' in the Future and Construction scenarios, worsening to a LoS 'F' in the Traffic Diversion scenario.

At the Lakemba Street / Moreton Street intersection, the movements from the Lakemba Street east approach are the worst performing movements with delays of over 12 minutes.

At The Boulevarde / Moreton Street intersection, the movements from the Moreton Street north approach are the worst performing movements with delays of over six minutes.

The diversion route assumes all diverted traffic uses Moreton Street Bridge and traffic waits for satisfactory gaps before moving into the traffic stream. Outside the modelled assumptions drivers would choose a range of diversion routes, particularly the Loch Street Bridge, and would pull out into less than satisfactory gaps. This would reduce the demand and delays at the two intersections noted.

It is noted that whilst the demand has been demonstrated to reduce by up to 15% in the holiday periods, this would still be insufficient to allow the diversion to occur with only local effects. As such the CTMP would be required to consider additional mitigation measures, including those detailed in Chapter 9.

6.25.3 PM Peak Intersection Performance

Table 6.11 below shows a summary of the intersection assessment undertaken for this bridge.

Table 6.11 Burwood Road Overbridge Intersection Assessment – PM Peak

Burwood Road Overbridge Closure – PM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
B.08 Burwood Road / Bridge Road (Priority Controlled)				**Year Capped: 2018**
Demand Flow (veh)	1735	1787	1822	911
Average Delay per Vehicle (Average over all arms in seconds)	10	14	22	3
Average Delay per Vehicle (Worst Movement in seconds)	198	297	581	12
LoS (Worst Movement)	F	F	F	A
DoS (Worst Movement)	0.89	1.05	1.39	0.34
B.09 Burwood Road / Redman Parade (Priority Controlled)				**Year Capped: 2023**
Demand Flow (veh)	1625	1795	1826	970
Average Delay per Vehicle (Worst Movement in seconds)	3	4	4	2
Average Delay per Vehicle (Average over all arms in seconds)	56	103	124	8
LoS (Worst Movement)	D	F	F	A
DoS (Worst Movement)	0.65	0.72	0.74	0.35

Burwood Road Overbridge Closure – PM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
H.20 Burwood Road / Lakemba Street (Signals)				**Year Capped: 2023**
Demand Flow (veh)	2315	2558	2567	2442
Average Delay per Vehicle (Average over all arms in seconds)	21	27	28	57
LoS (Overall)	B	B	B	D
DoS (Worst Movement)	0.62	0.90	0.90	1.12
Lakemba Street / Moreton Street (Roundabout)				**Year Capped: 2023**
Demand Flow (veh)	1977	2185	2185	3079
Average Delay per Vehicle (Worst Movement in seconds)	11	17	17	521
Average Delay per Vehicle (Average over all arms in seconds)	14	24	24	1125
LoS (Overall)	A	B	B	F
DoS (Worst Movement)	0.74	0.88	0.88	2.23
The Boulevarde / Moreton Street (Roundabout)				**Year Capped: 2023**
Demand Flow (veh)	1723	1904	1904	2798
Average Delay per Vehicle (Worst Movement in seconds)	12	17	17	365
Average Delay per Vehicle (Average over all arms in seconds)	22	43	43	822
LoS (Overall)	B	C	C	F
DoS (Worst Movement)	0.70	0.87	0.87	1.86

For three of the five intersections modelled, the increase in delay resulting from the traffic diversion is ‘D’ or better. A level of service ‘D’ would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

Like the AM Peak, Burwood Road / Bridge Road and Burwood Road / Redman Parade have a level of service ‘F’ for the construction scenario

The Lakemba Street / Moreton Street and The Boulevarde / Moreton Street intersections are forecast to experience a decline in amenity as a result of the addition of the diverted traffic. The intersections have LoS of ‘B’ and ‘C’ in the Future and Construction scenarios, worsening to a LoS ‘F’ in the Traffic Diversion scenario.

The movements from the Lakemba Street east approach at the Lakemba Street / Moreton Street intersection have a modelled delay of over 18 minutes in the traffic diversion scenario.

The movements from the The Boulevarde east approach at the The Boulevarde / Moreton Street intersection would also deteriorate to an average delay of nearly 14 minutes.

As with the AM Peak, the diversion route assumes all diverted traffic uses Moreton Street Bridge and traffic waits for satisfactory gaps before moving into the traffic stream. In reality, drivers would choose a range of diversion routes, particularly the Loch Street Bridge, and would pull out into less than satisfactory gaps. This would reduce the demand and delays at the two intersections noted.

Timing the works to co-incide with the term one or three holidays would not be sufficient mitigation to provide acceptable levels of service and therefore further mitigations should be developed as part of the CTMP.

6.25.4 Bus Network

During the northbound closure periods bus route 415 would be redirected through Bridge Road, across the Moreton Street Bridge and along Lakemba Street. The reverse would occur during southbound closure periods. These diversion routes are shown in **Figure 6.20**.

A temporary bus stop could be established on Lakemba Street to reduce the distance that bus passengers north of the railway line need to walk to access an operational bus stop. The maximum additional walking distance would then be 550m. There should be no extra walking distance required for passengers south of the railway line as the diversion route joins the existing route immediately south of the station.

During the north and southbound bridge closure periods bus route 942 would be redirected across the Moreton Street bridge and along Lakemba Street as shown in **Figure 6.20**. This service would not serve the area to the south of Belmore station during these bridge closure periods.

This diversion route misses six bus stops in one direction and five in the other. The diversion is expected to occur during weekend works and two sets of two week school holiday periods. During this time bus passengers would need to walk up to 1.2km to reach the closest operational bus stop.

6.25.5 Pedestrians and Cyclists

Burwood Road Overbridge has footpaths on either side and during the half lane closures, pedestrians and cyclists would be diverted to the side of the road which remains open. Temporary traffic management would be in place at both ends of the bridge to aid pedestrians and cyclists.

6.26 Moreton Street Overbridge

Moreton Street Overbridge located in Lakemba, as shown in **Figure 6.21**, is a four span bridge with concrete girders of approximately 30m in length. The bridge carries one lane of traffic in each direction across two Bankstown Lines. The Overbridge is estimated to carry approximately 16,800 vehicles per day.

Some 90 construction haulage vehicle trips are expected to be performed using Moreton Street Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours eight heavy vehicle trips would use the bridge.

6.26.1 Diversion Route

The bridge works result in six months of weekend works (half-lane closures) which are not dependent on school holiday periods and four weeks of half lane closures (two weeks per side). During the half lane closures, traffic would divert to Burwood Road Overbridge, as shown **Figure 6.21**. Following this diversion, the following intersection are impacted:

- Moreton Street / Leylands Parade[50]
- Burwood Road / Leylands Parade[51].

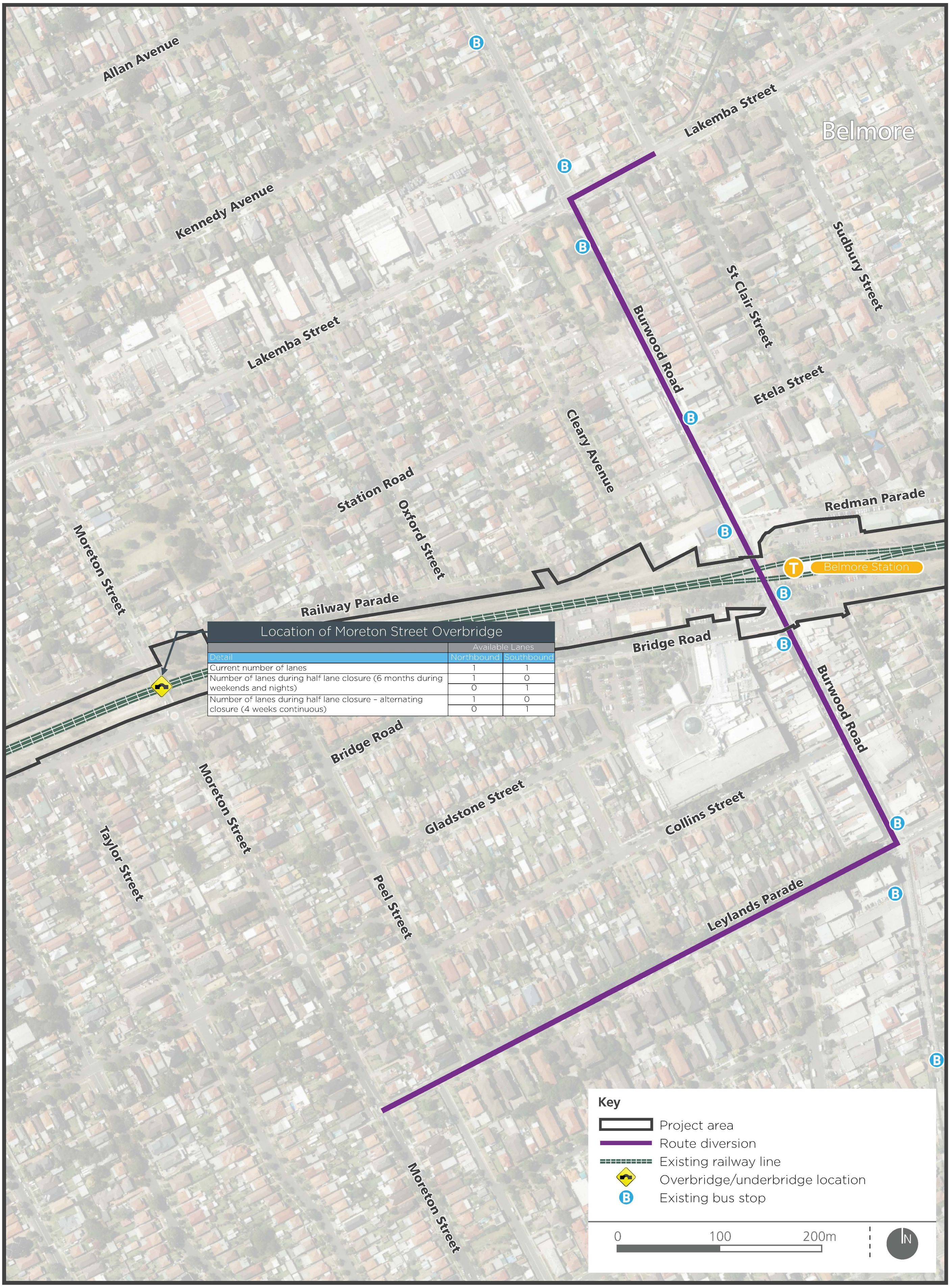
6.26.2 Bus Network

Currently no bus routes cross the Moreton Street Overbridge and therefore no bus routes would be affected by the works on Moreton Street Overbridge.

6.26.3 Pedestrians and Cyclists

The bridge has footpaths on either side. During the half lane closures, pedestrians and cyclists would be diverted to the side of the road which remains open. Temporary traffic management would be in place at both ends of the bridge to aid pedestrians and cyclists.

[50] Due to insufficient data at the time of reporting, this intersection has not been modelled
[51] Due to insufficient data at the time of reporting, this intersection has not been modelled



Location of Moreton Street Overbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	1	1
Number of lanes during half lane closure (6 months during weekends and nights)	1	0
	0	1
Number of lanes during half lane closure – alternating closure (4 weeks continuous)	1	0
	0	1

Location and diversion route - Moreton Street overbridge

FIGURE 6.21

6.27 Haldon Street Overbridge

Haldon Street Overbridge located in Lakemba, as shown on **Figure 6.22**, is a two span concrete girder structure with an overall length of approximately 27m. The Overbridge carries approximately 15,000 vehicles per day (estimated from April 2016 peak hour traffic counts).

There are two lanes in each direction which span two Bankstown Lines.

In the order of 220 construction haulage vehicle trips are expected to be performed using Haldon Street Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours there is expected to be 10 light vehicle and 10 heavy vehicle trips.

6.27.1 Diversion Route

The bridge works result in six months of weekend works (half-lane closures) which are not dependent on school holiday periods and four weeks of full lane closures.

The bridge works cannot occur while the TTS is in operation as Haldon Street Overbridge is directly adjacent to Lakemba Railway Station.

During the full lane closures, both southbound and northbound traffic would divert to Moreton Street Overbridge, as shown in **Figure 6.22**. As the full lane closures are not limited to night works or weekends, the affected intersections have been modelled to determine the level of impact to the operation of intersections.

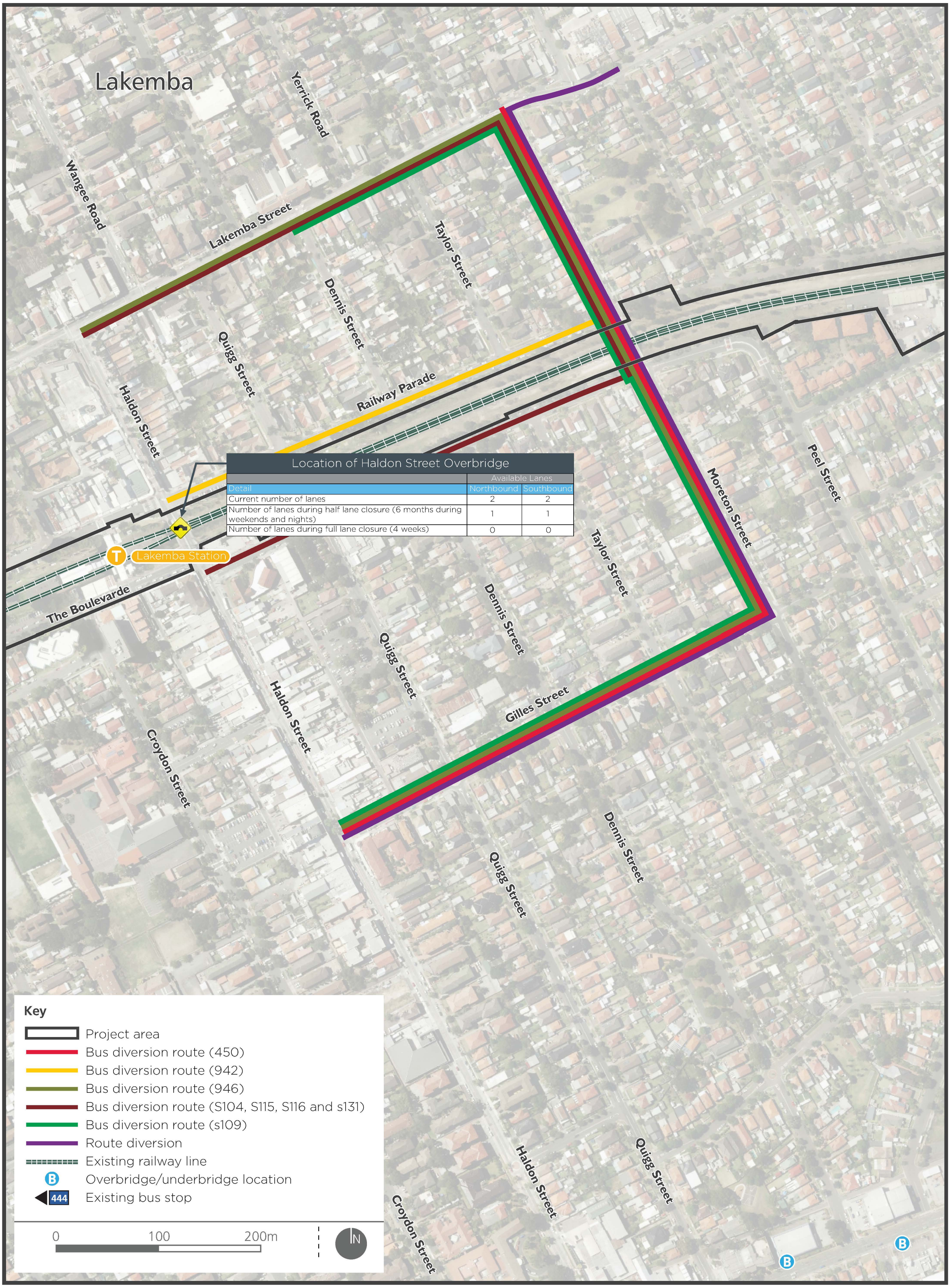
The following intersections were modelled:

- The Boulevarde / Haldon Street
- Haldon Street / Railway Parade
- Lakemba Street / Haldon Street
- Lakemba Street / Moreton Street
- The Boulevarde / Moreton Street.

As a result of the bridge closure, the **east** and **west** approaches for the Lakemba Street / Haldon Street intersection have become double through movements.

6.27.2 AM Peak Intersection Performance

Table 6.12 below shows a summary of the intersection assessment undertaken for this bridge.



Location of Haldon Street Overbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	2	2
Number of lanes during half lane closure (6 months during weekends and nights)	1	1
Number of lanes during full lane closure (4 weeks)	0	0

Location and diversion routes - Haldon Street overbridge

FIGURE 6.22

Table 6.12 Haldon Street Overbridge Intersection Assessment – AM Peak

Haldon Street Overbridge Closure – AM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
B.07 The Boulevarde / Haldon Street (Signals)		**Year Capped: 2021**		
Demand Flow (veh)	1964	2102	2139	1223
Average Delay per Vehicle (Average over all arms in seconds)	29	65	91	18
LoS (Overall)	C	E	F	B
DoS (Worst Movement)	0.93	1.05	1.12	0.52
H.08 Haldon Street / Railway Parade (Priority Controlled)				**Year Capped: 2023**
Demand Flow (veh)	1376	1511	1527	154
Average Delay per Vehicle (Average over all arms in seconds)	8	20	32	4
Average Delay per Vehicle (Worst Movement in seconds)	65	186	326	7
LoS (Worst Movement)	E	F	F	A
DoS (Worst Movement)	0.72	1.03	1.22	0.08
H.09 Lakemba Street / Haldon Street (Signals)		**Year Capped: 2023**		
Demand Flow (veh)	1757	1929	1929	1393
Average Delay per Vehicle (Average over all arms in seconds)	15	15	15	19
LoS (Overall)	B	B	B	B
DoS (Worst Movement)	0.58	0.59	0.59	0.43
Lakemba Street / Moreton Street (Roundabout)		**Year Capped: 2023**		
Demand Flow (veh)	1821	1999	1999	2652
Average Delay per Vehicle (Average over all arms in seconds)	9	11	11	100
Average Delay per Vehicle (Worst Movement in seconds)	11	14	14	200
LoS (Overall)	A	B	B	F
DoS (Worst Movement)	0.73	0.83	0.83	1.19
The Boulevarde / Moreton Street (Roundabout)			**Year Capped: 2023**	
Demand Flow (veh)	1527	1677	1677	2014
Average Delay per Vehicle (Average over all arms in seconds)	8	10	10	66
Average Delay per Vehicle (Worst Movement in seconds)	16	19	19	216
LoS (Overall)	B	B	B	F
DoS (Worst Movement)	0.67	0.75	0.75	1.20

For three of the five intersections modelled, the increase in delay resulting from the traffic diversion is 'B' or better. A level of service 'B' would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The Lakemba Street / Moreton Street and The Boulevarde / Moreton Street intersections are forecast to experience a decline in amenity as a result of the addition of the diverted traffic. In the future and construction scenarios both intersections have LoS of 'B', worsening to a LoS 'F' in the traffic diversion scenario.

The movements from the Lakemba Street west approach at the Lakemba Street / Moreton Street intersection are shown to deteriorate to an average delay of over three minutes.

The movements from the The Boulevarde west approach at the The Boulevarde / Moreton Street intersection are also shown to deteriorate to an average delay of over three minutes.

The model assumes all traffic currently using Haldon Street Overbridge would divert to Moreton Street Overbridge. In practice, some vehicles would divert to King Georges Road Overbridge which would reduce the delays on both of the heavily impacted intersections.

The three minute delays for Lakemba Street / Moreton Street and The Boulevarde / Moreton Street are for the worst movement. These result from all of the additional traffic being added to the major movement which provides no gaps in the traffic flow for vehicles from the side arms to join into the priority movement. Some of the diverted traffic that uses the Moreton Street Bridge would approach the intersections from different directions. This would reduce the volume of additional traffic taking the major movement and provide more gaps for the minor flow.

Noting the Degree of Saturation is showing the intersection is some 30% above the practical capacity of the intersection, significant delays would be expected.

6.27.3 PM Peak Intersection Performance

Table 6.13 below shows a summary of the intersection assessment undertaken for this bridge.

Table 6.13 Haldon Street Overbridge Intersection Assessment – PM Peak

Haldon Street Overbridge Closure – PM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
B.07 The Boulevarde / Haldon Street (Signals)		**Year Capped: 2021**		
Demand Flow (veh)	1988	2138	2175	1364
Average Delay per Vehicle (Average over all arms in seconds)	31	61	79	16
LoS (Overall)	C	E	F	B
DoS (Worst Movement)	0.95	1.10	1.16	0.73
H.08 Haldon Street / Railway Parade (Priority Controlled)				**Year Capped: 2023**
Demand Flow (veh)	1381	1526	1541	70
Average Delay per Vehicle (Average over all arms in seconds)	10	22	31	4
Average Delay per Vehicle (Worst Movement in seconds)	57	177	271	6
LoS (Worst Movement)	E	F	F	A
DoS (Worst Movement)	0.74	1.06	1.18	0.03

Haldon Street Overbridge Closure – PM Peak				
Scenario	**Existing**	**Future**	**Construction**	**Traffic Diversion**
H.09 Lakemba Street / Haldon Street (Signals)				**Year Capped: 2023**
Demand Flow (veh)	1905	2105	2105	1492
Average Delay per Vehicle (Average over all arms in seconds)	14	13	13	21
LoS (Overall)	B	A	A	B
DoS (Worst Movement)	0.52	0.57	0.57	0.93
Lakemba Street / Moreton Street (Roundabout)				**Year Capped: 2023**
Demand Flow (veh)	1977	2185	2185	2751
Average Delay per Vehicle (Worst Movement in seconds)	11	17	17	165
Average Delay per Vehicle (Average over all arms in seconds)	14	24	24	360
LoS (Overall)	A	B	B	F
DoS (Worst Movement)	0.74	0.88	0.88	1.38
The Boulevarde / Moreton Street (Roundabout)				**Year Capped: 2023**
Demand Flow (veh)	1723	1904	1904	2488
Average Delay per Vehicle (Worst Movement in seconds)	12	17	17	250
Average Delay per Vehicle (Average over all arms in seconds)	22	43	43	785
LoS (Overall)	B	C	C	F
DoS (Worst Movement)	0.70	0.87	0.87	1.84

For three of the five intersections modelled, the increase in delay resulting from the traffic diversion is ‘B’ or better. A LoS ‘B’ would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The Lakemba Street / Moreton Street and The Boulevarde / Moreton Street intersections are forecast to experience a decline in amenity as a result of the addition of the diverted traffic. In the future and construction scenarios both intersections have LoS of ‘C’ or better, worsening to a LoS ‘F’ in the traffic diversion scenario.

The movements from the Lakemba Street east approach at the Lakemba Street / Moreton Street intersection would have an average delay of six minutes.

The movements from The Boulevarde west approach at The Boulevarde / Moreton Street intersection have an average delay of 13 minutes.

The model assumes all traffic currently using Haldon Street Overbridge would divert to Moreton Street Overbridge. It is anticipated some vehicles would divert to King Georges Road Overbridge which would reduce the delays on both of the heavily impacted intersections.

The delays of over six minutes for Lakemba Street / Moreton Street and The Boulevarde / Moreton Street are for the worst movement. These result from all of the additional traffic joining the major movement which provides no gaps in the traffic flow for vehicles from the minor flow. As with the AM Peak, some of the diverted traffic that uses the Moreton Street Bridge would approach the intersections from different directions. This would reduce the volume of additional traffic using the major movement and provide more gaps for the minor flow.

Noting the Degree of Saturation is showing the intersection is some 30% above the practical capacity of the intersection, significant delays would be expected.

6.27.4 Bus Network

Currently the bus routes 450, 942, 946, S104, S109, S115, S116 and S131 cross the Haldon Street Overbridge. During the half bridge closure periods these have been assessed as follows:

Bus Route 450 Diversion

The bus route 450 would be redirected through Gillies Street and Moreton Street, then cross the Moreton Street Overbridge and join the existing route as shown in **Figure 6.22**. The return route similarly travels the same route in the opposite direction. The Boulevarde has not been used for the diversion route as the left and right turn movements at Haldon Street / The Boulevarde appear to be too sharp for bus movements. Swept path analyses would be undertaken to confirm this.

During the closure period the three bus stops of 219591, 219592 and 219593 in the Burwood to Hurstville direction and the four bus stops of 219583, 219584 and 219585 in the Hurstville to Burwood direction are missed as a result of the proposed diversion. The bus stops of 219591 and 219592 need to be temporarily relocated (by 230 and 500 metres, respectively) to the location of the bus stop 219590 at Lakemba Street / Moreton Street intersection which needs to be temporarily relocated by 40 metres from the western side of the intersection to the eastern side. Bus stops 219593 and 219594 would need to be temporarily relocated by 280 metres and 40 metres respectively to the southern side of Haldon Street / Gillies Street intersection. Space for a temporary bus stop would be achieved through temporarily removing three on-street car parks.

The bus stop 219583 needs to be temporarily relocated by 280 metres to the location of the bus stop 219582 to the south of the Haldon Street / Gillies Street intersection. The bus stops 219584 and 219585 need to be temporarily relocated (by 500 and 250 metres, respectively) to the location of the bus stop 219520 at the Lakemba Street / Moreton Street intersection. This bus stop needs to be temporarily relocated by 90 metres from the western side of the intersection to the eastern side by temporarily removing three on-street car parks.

Bus Route 942 Diversion

The bus route 942 would be redirected through Railway Parade, across the Moreton Street Overbridge and then re-join the existing bus route as shown in **Figure 6.22**. The return route follows the path in the reverse direction.

The diverted bus route misses one bus stop in the eastbound direction on The Boulevarde and no bus stops in the westbound direction. Bus passengers walking to a bus stop would need to walk up to 350m further as a result of the diversion.

Bus Route 946 Diversion

The bus route 946 would be redirected through Gillies Street and Moreton Street, across the Moreton Street Overbridge and then to re-join the existing bus route as shown in **Figure 6.22.** The return route similarly travels the route in the opposite direction.

Bus Route S104 Diversion

The bus route S104 would be redirected through The Boulevarde, across the Moreton Street Overbridge where it re-joins the existing bus route via Lakemba Street as shown in the **Figure 6.22.** The return route similarly travels the route in the opposite direction.

Bus Route S109 Diversion

Bus route S109 would be redirected through Gillies Street and Moreton Street, across the Moreton Street Overbridge where it re-joins the existing bus route as shown in **Figure 6.22.** The return route similarly travels the route in the opposite direction.

Bus Routes S115, S116 and S131 Diversions

The bus routes S115, S116 and S131 would be redirected through The Boulevarde, across the Moreton Street Overbridge and the re-join the existing paths via Lakemba Street as shown in the **Figure 6.22.** The return route similarly travels the route in the opposite direction.

6.27.5 Pedestrians and Cyclists

Haldon Street Bridge has footpaths on either side and during the closure pedestrians and cyclists would divert 550m to Moreton Street Overbridge to the east or 950m to King Georges Road Overbridge to the west.

6.28 King Georges Road Overbridge

The King Georges Road Overbridge in Wiley Park, as shown in **Figure 6.23** , is a three span concrete girder structure with an overall span of approximately 31m. The bridge has seven lanes of traffic across two Bankstown Lines with approximately 96,800 vehicles a day at this location.

In the order of 220 construction haulage vehicle trips are expected to be made using King Georges Road Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak, 10 light vehicle and 10 heavy vehicle trips would be made using the bridge.

6.28.1 Diversion Route

The bridge works result in one south bound lane closure on the eastern side of the bridge for a maximum of three weeks.

The bridge works cannot occur while the TTS is in operation as King Georges Road Overbridge is directly adjacent to Wiley Park Railway Station. The lane closure works would therefore occur while the TTS in not running.

During the lane closure, the number of lanes would remain the same in the northbound direction but reduce from four to three lanes in the southbound direction. This allows the bridge to retain its flows while enabling the upgrade works to continue.

As the lane closure is not limited to night works or weekends, the affected intersections have been modelled with weekday flows.

As the works only require one lane closure, no traffic diversion routes are needed.

6.28.2 AM Peak Intersection Performance

Table 6.14 below shows a summary of the intersection assessment undertaken for this bridge.

Table 6.14 King Georges Overbridge Intersection Assessment – AM Peak

King Georges Road Overbridge – AM Peak				
Scenario	Existing	Future	Construction	Traffic Diversion
H.06 King George Road / Lakemba Street (Signals)				**Year Capped: 2023**
Demand Flow (PCU)	5881	6483	6528	6528
Average Delay per Vehicle (Average over all arms in seconds)	23	30	31	32
LoS (Overall)	B	C	C	C
DoS (Worst Movement)	0.86	0.95	0.97	0.97
B.06 King George Road / The Boulevarde (Signals)				**Year Capped: 2023**
Demand Flow (PCU)	5868	6468	6517	6517
Average Delay per Vehicle (Average over all arms in seconds)	35	45	48	46
LoS (Overall)	C	D	D	D
DoS (Worst Movement)	0.95	0.98	1.02	1.01

Location of King Georges Road Overbridge

	Available Lanes	
	Northbound	Southbound
Current number of lanes	3	4
Number of lanes during bridge works (3 weeks)	3	3

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Location and diversion route - for King Georges Road overbridge

FIGURE 6.23

Both of the intersections modelled have a level of service 'D' or better with the traffic diversion. A level of service 'D' would not cause delays above that which could be reasonably expected in the peak hour in Sydney.

The minor reduction in delay and degree of saturation at the King Georges Road / The Boulevarde intersection is a result of the improved optimisation of signal timings in the Traffic Diversion scenario.

6.28.3 PM Peak Intersection Performance

Table 6.15 below shows a summary of the intersection assessment undertaken for this bridge.

Table 6.15 King Georges Overbridge Intersection Assessment – PM Peak

King Georges Road Overbridge – PM Peak				
Scenario	Existing	Future	Construction	Traffic Diversion
H.06 King Georges Road / Lakemba Street (Signals)				**Year Capped: 2023**
Demand Flow (PCU)	5656	6277	6322	6322
Average Delay per Vehicle (Average over all arms in seconds)	25	43	45	121
LoS (Overall)	B	D	D	F
DoS (Worst Movement)	0.83	0.98	0.98	1.11
B.06 King Georges Road / The Boulevarde (Signals)				**Year Capped: 2023**
Demand Flow (PCU)	5796	6432	6481	6481
Average Delay per Vehicle (Average over all arms in seconds)	35	55	55	60
LoS (Overall)	C	D	D	E
DoS (Worst Movement)	0.84	0.98	0.98	0.99

The King Georges Road / Lakemba Street intersection has a current level of service 'B'. The intersection performance deteriorates to a LoS 'D' with future and construction traffic, deteriorating further to 'F' with the traffic diversion. This decline in amenity is a result of the lane closure on the King Georges Road Overbridge causing longer queues on the bridge and increasing the modelled average delay per vehicle to two minutes.

The King Georges Road / The Boulevarde intersection has a current level of service 'C'. The intersection is forecast to experience a decline in amenity as a result of the lane closure on the King Georges Road Overbridge with a LoS of 'D' in the construction scenario worsening to LoS 'E' in the traffic diversion scenario with a delay of one minute. As there was no traffic diversion, this decline can be attributed to lane reduction while maintaining the same volume through the intersection.

In reality some vehicles would reroute to Haldon Street Overbridge or Punchbowl Road Overbridge while the bridge works are occurring. This would reduce the demand through the King Georges Road / Lakemba Street and the King Georges Road / The Boulevarde intersections. Whilst it is noted that these intersections are already somewhat congested in the peak periods, with the dispersion of the traffic across multiple routes and with the additional mitigation measures discussed in Chapter 9, it can be expected that the additional delays can be managed.

Should the bridge works be performed during the term 1-3 school holiday periods (when there is no TTS running), the worst movement at the King Georges Road / Lakemba Street intersections would be improved, although demand would still be likely to exceed capacity meaning that people would either divert from the area or change travel time to avoid the peak.

6.28.4 Bus Network

Currently the bus routes 942 and S128 cross the King Georges Road Overbridge. As the bridge closure only requires one of the four southbound lanes to be closed, no bus diversions are necessary.

6.28.5 Pedestrians and Cyclists

King Georges Road Overbridge has footpaths on either side and during the one lane closure, pedestrians and cyclists would be diverted to the western side of the road. Temporary traffic management would be in place at both ends of the bridge to aid pedestrians and cyclists.

6.29 Punchbowl Road Overbridge

Punchbowl Road Overbridge located in Punchbowl, as shown in **Figure 6.24** is a two span concrete girder structure with an approximate length of 48m. The bridge carries two lanes of traffic in each direction over two Bankstown Lines. The bridge is estimated to carry approximately 50,500 vehicles per day.

In the order of 180 construction haulage vehicle trips are expected to use Punchbowl Road Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours there is expected to be eight light vehicle and eight heavy vehicle trips.

6.29.1 Diversion Route

The bridge would undergo maintenance works over a period of 6 months of weekend works. These weekend works are not dependent on school holiday periods.

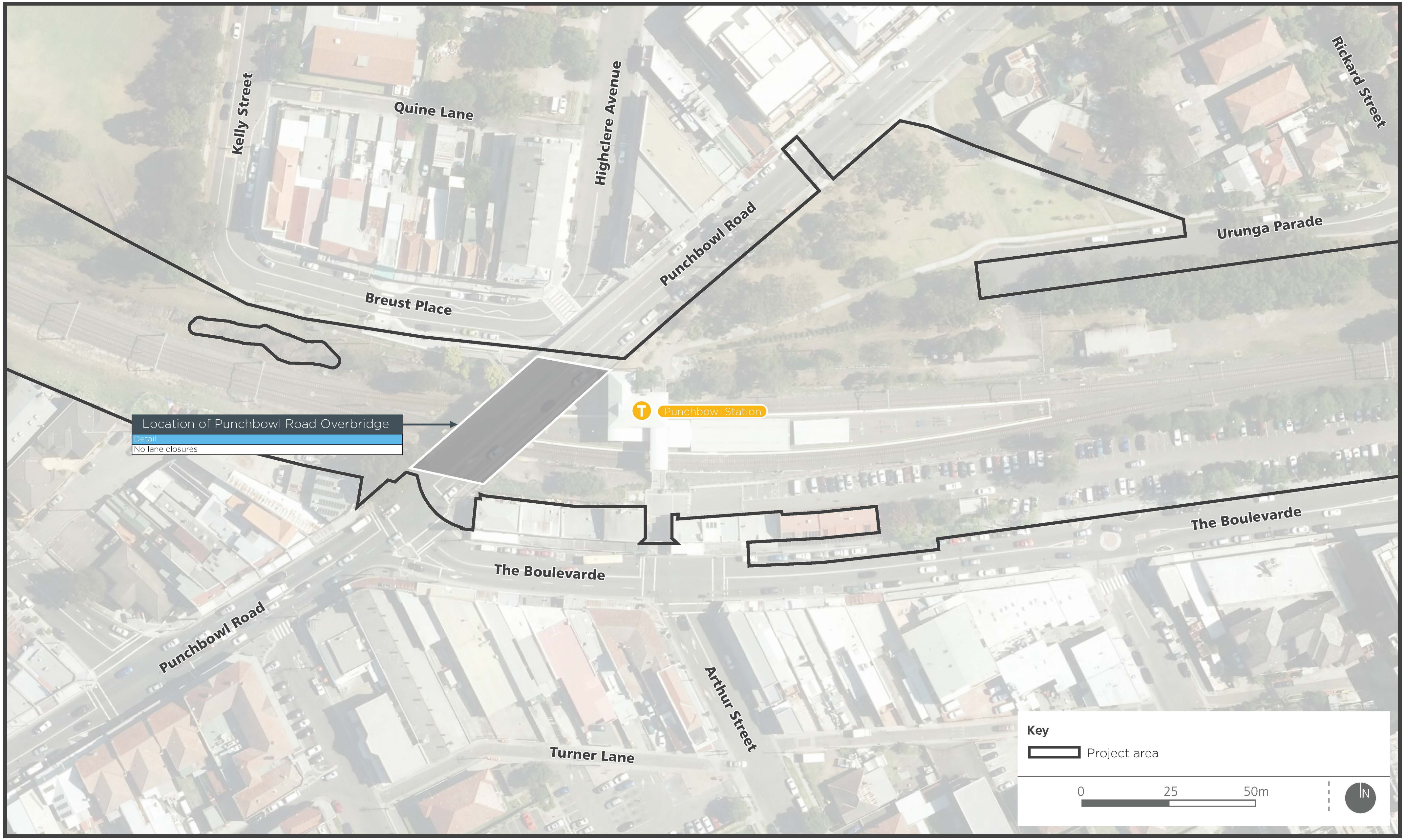
The works do not require any lane closures and thus no diversion routes.

6.29.2 Bus Network

Currently the bus routes 940, 941, S14, S114 and S126 cross the Punchbowl Road Overbridge. Given the bridge remains operative in both directions, the bus routes can continue their normal operation, however, they may be impacted due to the use of traffic management such as stop/go traffic control or owing to congestion.

6.29.3 Pedestrians and Cyclists

It is expected that one side of the footpath on the Punchbowl Road Overbridge would be closed to enable the maintenance works to be undertaken. Pedestrians and cyclists would be diverted to the side of the road which remains open during construction. Temporary traffic management would be in place at both ends of the bridge to aid pedestrians and cyclists.



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Location of the Punchbowl Road Overbridge

FIGURE 6.24

6.30 Stacey Street Overbridge

Stacey Street Overbridge in Bankstown, as shown in **Figure 6.25**, is a three span concrete girder structure with an overall length of approximately 90m. The bridge carries three lanes of traffic in each direction across the rail lines and North Terrace. The AADT of the Overbridge is estimated to be in the order of 66,000 vehicles per day.

Some 500 construction haulage vehicle trips are expected to use Stacey Street Overbridge over a 24 hour period while compound or worksite activities are occurring. During the AM and PM peak hours there is expected to be 12 light vehicle and 34 heavy vehicle trips.

6.30.1 Diversion Route

The bridge works result in six months of weekend works (half-lane closures) which are not dependent on school holiday periods and four weeks of half lane closures (two weeks per side).

During these half lane closures, the number of lanes would be reduced to two lanes in each direction. This allows the bridge to retain two directional flow while enabling the upgrade works to continue. As the half lane closures are not limited to night works or weekends, the Stacey Street / Wattle Street intersection has been modelled to determine the impact of bridge works.

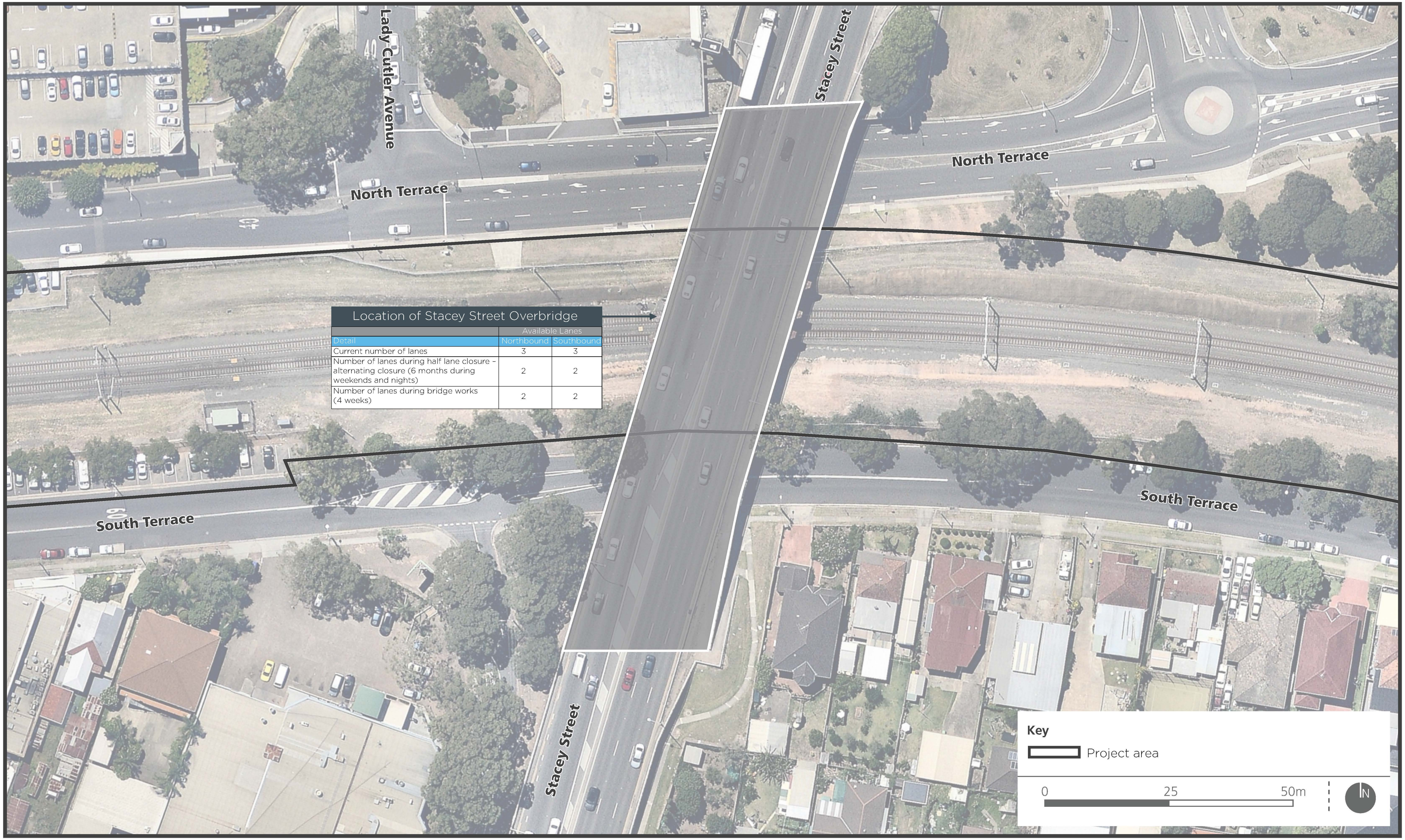
The through lane from the eastern approach at Stacey Street – Wattle Street would carry the left turning traffic during the southbound closure as the slip lane would be blocked.

6.30.2 Assessment of diversion

The proposed temporary traffic management strategy for lane reduction at the Stacey Street Overbridge would be as follow:

- The length of the northbound right-turn bay at the Stacey Street / Wattle Street intersection would be reduced from the existing 100 metres to 30 metres.
- The northbound kerbside lane over the bridge would be closed but two northbound lanes are retained using the existing hatched area prior to the northbound right turn bay and the space provided by reducing the length of the northbound right-turn bay.
- The southbound kerbside lane over the bridge would be closed. The southbound kerbside lane north of the Stacey Street / Wattle Street intersection is blocked for the through traffic, converting the lane into a left-turn only lane.
- The Give-way configuration from the Wattle Street east approach to the Stacey Street south at the Stacey Street / Wattle Street intersection would be retained.

No traffic diversion has been modelled as a result of the lane reduction at the Stacey Street Overbridge due to retention of at least two lanes of contra flow.



Location of Stacey Street Overbridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	3	3
Number of lanes during half lane closure – alternating closure (6 months during weekends and nights)	2	2
Number of lanes during bridge works (4 weeks)	2	2

Location of the Stacey Street overbridge

FIGURE 6.25

6.30.3 AM Peak Intersection Performance

Table 6.16 below shows a summary of the intersection assessment undertaken for this bridge.

Table 6.16 Stacey Street Overbridge Intersection Assessment – AM Peak

Stacey Street Overbridge – AM Peak				
Scenario	Existing	Future	Construction	Traffic Diversion
H.02 Stacey Street / Wattle Street (Signals)				**Year Capped: 2023**
Demand Flow (Veh)	4598	5049	5064	5064
Average Delay per Vehicle (Average over all arms in seconds)	16	16	17	154
LoS (Overall)	B	B	B	F
DoS (Worst Movement)	0.80	0.89	0.89	1.14

The Stacey Street / Wattle Street intersection is forecast to experience a decline in amenity as a result of the lane closures. The intersection has a LoS of 'B' in the existing, future and construction scenarios, worsening to a LoS 'F' in the traffic diversion scenario.

Right turn movement from the Stacey Street south approach is the worst performing movement with congestion and delay increasing from the construction scenario(1.5 minutes of delay) to the traffic diversion scenario (over six minutes of delay). The through movement from the Stacey Street south approach is also noticeably deteriorated with delays increasing from 12 seconds to over three minutes.

During the four weeks of half lane closures it is anticipated that a number of drivers travelling to / from the north-east would reroute to Punchbowl Road Overbridge. It is also expected that a number of vehicles travelling between the south and the Bankstown shops would turn onto Stanley Street at the Stanley Street / Stacey Street intersection and use the North Terrace to South Terrace Underbridge. This would reduce the demand on the Stacey Street / Wattle Street intersection, but increase the demand on the Stacey Street / Stanley Street and North to South Terrace Underbridge intersections.

If the works were performed during the term 2 school holiday period then the anticipated reduction in traffic for the worst movement at the Stacey Street / Wattle Street intersection would not be improved sufficiently enough to operate at below capacity ..

6.30.4 PM Peak Intersection Performance

Table 6.17 below shows a summary of the intersection assessment undertaken for this station. .

Table 6.17 Stacey Street Overbridge Intersection Assessment – PM Peak

Stacey Street Overbridge – PM Peak				
Scenario	Existing	Future	Construction	Traffic Diversion
H.02 Stacey Street / Wattle Street (Signals)				**Year Capped: 2018**
Demand Flow (Veh)	5882	6058	6074	6074
Average Delay per Vehicle (Average over all arms in seconds)	33	39	40	199
LoS (Overall)	C	C	C	F
DoS (Worst Movement)	0.91	1.10	1.10	1.34

The Stacey Street / Wattle Street intersection is forecast to experience a decline in amenity as a result of the lane closures. The intersection has a LoS of 'C' in the existing, future and construction scenarios, worsening to a LoS 'F' in the traffic diversion scenario.

Right turn movement from the Stacey Street south approach is the worst performing movement with delays increasing from approximately 1.5 minutes to nearly eight minutes.

The additional delay is primarily due to the reduction of the length and capacity of the northbound right-turn bay in both peak hours. The northbound queues in the AM peak and southbound queues in the PM peak, are likely to exceed the upstream intersections.

Like the AM Peak, it is expected that a number of vehicles would divert to adjacent bridges, reducing the demand at the Stacey Street / Wattle Street intersection.

The anticipated reduction in traffic for the worst movement at the Stacey Street / Wattle Street intersection would not be improved sufficiently enough to operate at below capacity during school holiday periods.

6.30.5 Bus Network

There are currently no bus routes crossing this bridge. Bus routes 939 and 970 travel from the east to north and reverse at the Stacey Street / Wattle Street intersection and would not be affected by the bridge works.

6.30.6 Pedestrians and Cyclists

Stacey Street Overbridge has a footpath on the eastern side only and during the northbound closure pedestrians can continue to use this footpath.

During the southbound closure pedestrians would need to reroute and it is expected that pedestrians would divert 300m to the North Terrace / South Terrace Underbridge to the west. A diversion to Punchbowl Overbridge would be 1.6 km. Temporary traffic management would be in place at both ends of the bridge to aid pedestrians and this would cater for the pedestrian demands to the shopping centre.

6.31 North Terrace to South Terrace Underbridge

The North Terrace to South Terrace Underbridge is an 18m single span steel arch truss bridge with track slab above, as shown in **Figure 6.26** .

Construction haulage vehicles are not expected to use North Terrace to South terrace Underbridge while compound or worksite activities are occurring.

6.31.1 Diversion Route

The bridge works would result in six months of weekend works (half-lane closures) and four weeks of full lane closures.

During the half lane closures, traffic would divert to Stacey Street Overbridge. The full closure is not expected to have a significant impact on traffic as the bridge is used to connect one high rise/mixed use area to another high rise/mixed use area. It is not used to connect residential dwellings to an arterial road or motorway. There are connections to Stacey Street north and south of the railway line which are used to connect these high rise/mixed use areas in Bankstown to main arterials and motorways. This underbridge is recognised as an important local link to the shopping centre in the north, but the diverted traffic would need to use Stacey Street Overbridge as the alternative route.

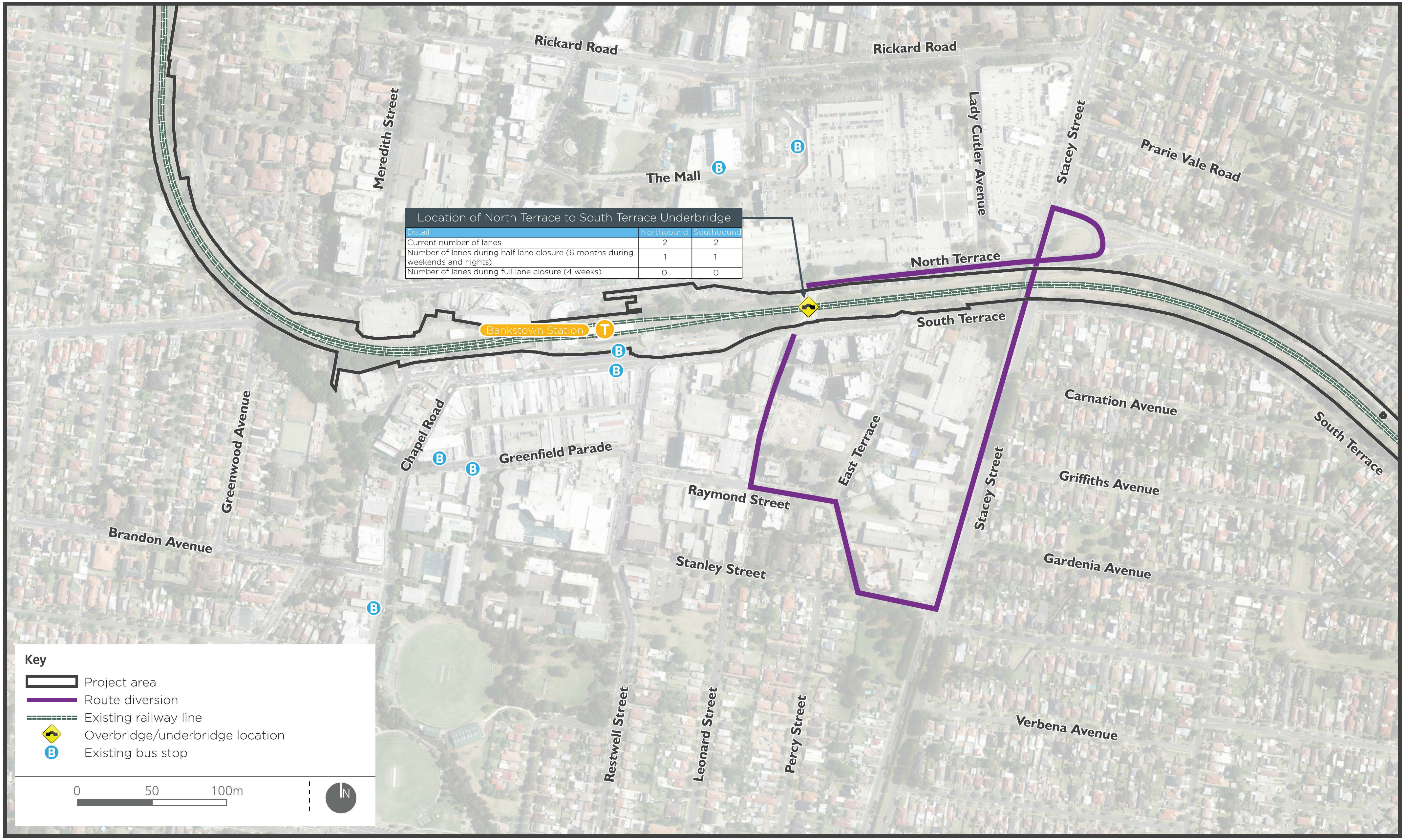
Due to the low impact of this underbridge, the bridge does not require modelling and works can instead be managed by detailed traffic management plans.

6.31.2 Bus Network

There are currently no bus routes using this underbridge. Bus routes N40 and 487 cross the South Terrace / West Terrace intersection and would not be affected by the bridge closure program.

6.31.3 Pedestrians and Cyclists

The underbridge has footpaths on either side and during the closure pedestrians and cyclists would need to reroute. They would likely divert 300m to the Stacey Street Overbridge to the east or 300m to the Chapel Road Overbridge to the west.



Location of North Terrace to South Terrace Underbridge

Detail	Northbound	Southbound
Current number of lanes	2	2
Number of lanes during half lane closure (6 months during weekends and nights)	1	1
Number of lanes during full lane closure (4 weeks)	0	0

Location and diversion routes - North Terrace to South Terrace underbridge

FIGURE 6.26

6.32 Chapel Road Overbridge

The Chapel Road Overbridge is a four span concrete plank bridge deck with an approximate length of 26m, as shown in **Figure 6.27**. The bridge is restricted to bus traffic only and carries bus lanes in each direction.

The Overbridge carries approximately 34,800 vehicles per day (estimated from September 2016 peak hour traffic counts).

Construction haulage vehicles are not expected to use Chapel Road Overbridge while compound or worksite activities are occurring.

6.32.1 Diversion Route

The bridge would undergo maintenance works and collision protection works over six months of weekend works not dependent on school holiday periods. These works would not require any lane closures.

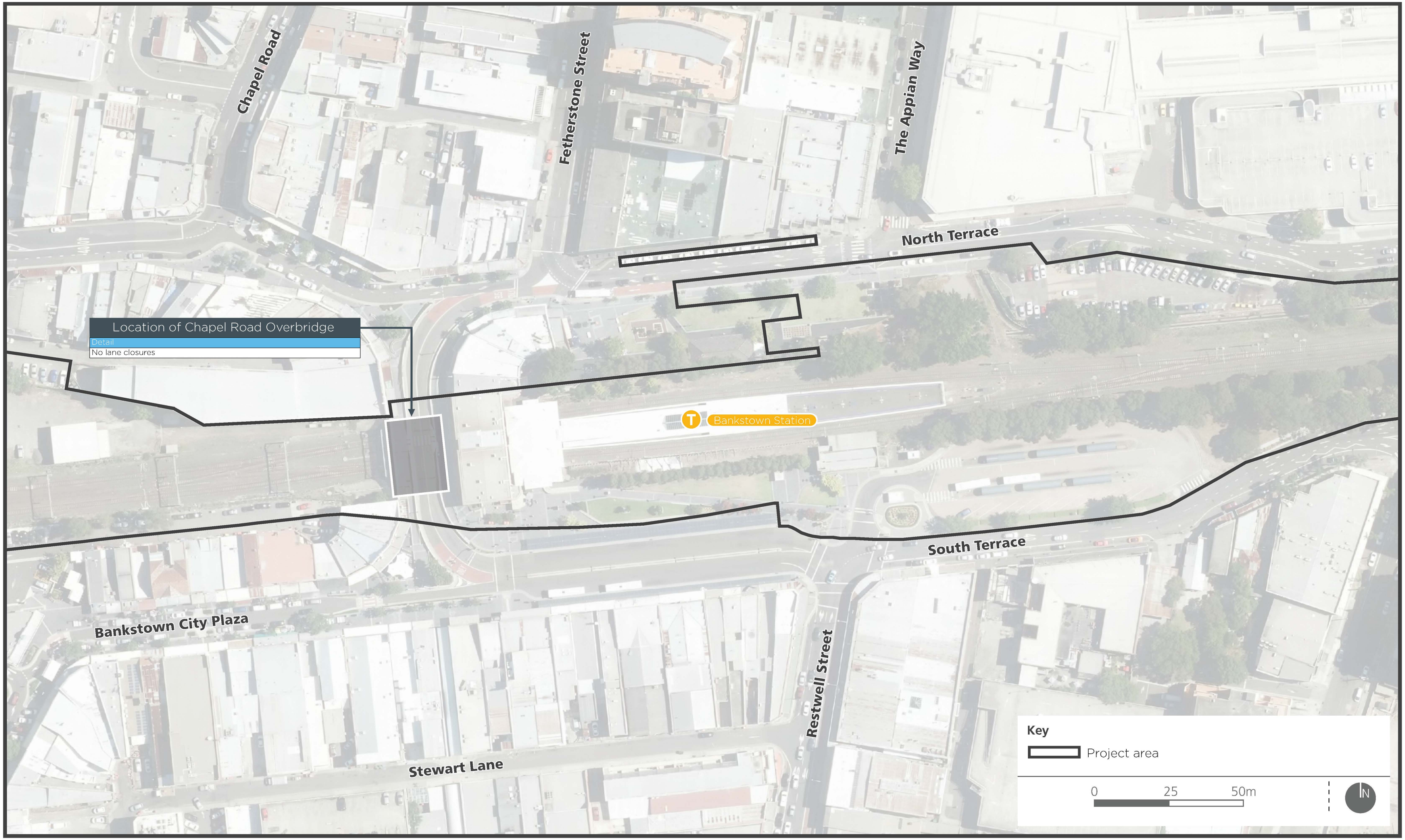
The works are expected to be constructed from the wide pedestrian footpaths with no lane closures.

6.32.2 Bus Network

Currently a large number of bus routes cross the Chapel Road Overbridge. Given the bridge remains operative in both directions, the bus routes can continue their normal operation, however, they might be impacted by the use of traffic management measures such as stop/go traffic control management.

6.32.3 Pedestrians and Cyclists

Chapel Road Overbridge includes a footpath on both sides of the bridge. It is expected that one footpath would be closed to enable the works to be undertaken. Pedestrians would be diverted to the footpath which remains open. Temporary traffic management would be in place at both ends of the bridge to aid pedestrians and cyclists.



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Location of the Chapel Road overbridge

FIGURE 6.27

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7.0 Additional construction period effects considered

7.1 Major Special Events

The RMS special events management guidelines identify the following classes of special events:

- class 1: an event that impacts major traffic and transport systems and there is significant disruption to the non-event community
- class 2: is an event that impacts local traffic and transport systems and there is low scale disruption to the non-event community. For example, an event that blocks off the main town street or shopping centre but does not impact a principal transport route
- class 3: is an event with minimal impact on local roads and negligible impact on the non-event community
- class 4: is an event conducted entirely under Police control (but is not a protest or demonstration).

Examples of class 1 events that would occur during the construction of the project include New Year's Eve, Mardi Gras Parade and City 2 Surf.

An example of a class 2 event that would occur during the operation of the project include game days for the Canterbury Bulldogs at Belmore Oval.

There is an off-road dedicated shared path adjacent to the railway corridor, between Bridge Road/Tobruk Avenue and Edison Lane. Bridge works on the pedestrian access oval underbridge near the Belmore Sports Ground would potentially require closure intermittent full of the shared pathway and bridge. Local diversions would be put in place when required; however, impacts in this area would not coincide with games days at Belmore Oval or other busy periods along the shared path (refer to **Section 6.22**).

Event specific CTMPs and/or TTPs would be prepared, in consultation with event organisers, where construction impacts may impact on the ability for customers to travel to these events, either due to possessions or road closures. These plans would include measures tailored to managing event transport demands while minimising disruption to background demand. This may involve measures such as temporary adjustment to construction haulage routes, working hours or potentially stopping works for the duration of the event. Where possible travel options would be communicated directly to event attendees via the event organisers' existing marketing channels.

7.2 Emergency Vehicles

As identified in the above sections, the introduction of TTS is anticipated to result in significant impacts to intersection performance in a number of areas and some partial and full road closures would be required during construction activities. Ongoing consultation would be carried out with emergency service providers in relation to changed traffic conditions and appropriate diversion routes for emergency services would be planned in conjunction with the providers in advance of closures.

Construction compounds and the wider project worksite would be arranged to ensure emergency vehicle access to nearby buildings and precincts is maintained and that emergency services can access stations during construction works. Construction compounds may also be made available for emergency vehicle passage if required.

The appropriate emergency service providers would be consulted ahead of works to ensure impacts are minimised during works. This would be part of the process that is used to develop CTMPs.

7.3 Power Supply Routes

The project includes the construction of a new 33kV feeder cable along a number of streets located between Campsie Station and the Ausgird Canterbury Substation located at Earlwood. The works for the installation of the cable would require trenching activities within road reserves which has the potential to result in impacts on the operation of these roads. Roads which are likely to be impacted by the construction of the power supply routes are identified in Chapter 8 of the EIS (Project description – construction). This trenching work would result in temporary changes to traffic arrangements potentially including the occupation of traffic lanes, parking areas or the footpath.

Where major roads are crossed by the route, alternative construction methods would be used such as under boring in order to avoid impacts to the road network. For example, these measures are being considered where the cable crosses Canterbury Road.

For the majority of the construction period two-way traffic would be maintained, however there may be some periods when full road or lane closures are required depending on the preferred construction method and the nature of the street to be impacted. These are most likely to occur at night when traffic volumes are lower. The community would be made aware of any changes to both the road or pedestrian networks as a result of the installation of the cable and appropriate traffic management would be put in place.

Where pedestrian footpaths are impacted, a suitable alternative route around the work area would be provided and signposted. In addition, the work may result in reduced access to some properties for short periods of time. Alternate access would be provided where practicable, this could include for example the use of road plates to cross the trench when a particularly section is not being worked on. Consultation with adjacent property owners would be undertaken to confirm the impacts to their access and to discuss any specific access arrangements and the measures which are to be implemented to minimise impacts.

7.4 Cumulative Construction Impacts

The project is being delivered in a constantly changing landscape, with multiple concurrent projects being planned, constructed and coming into use. This includes changes to land use, transport networks for both car and other modes, and commercial developments. The timescales of many of these are unknown at this time, and the overall duration of the project construction is such that there are many interdependencies and opportunities that would require management as the program evolves.

As with all construction activities, co-ordination with other temporary works, events and planned maintenance would be required as part of the mitigation of effects, and this would include known projects such as WestConnex, and the Chatswood to Sydenham component of the Sydney Metro. These cumulative effects are considered in more detail in Chapter 10 of this Technical Paper.

8.0 Operational Assessment

8.1 Operational Transport Assessment Methodology

This chapter provides an assessment of the effects of the project on the local transport network once operational and considers:

- pedestrian routes to stations, including accessibility for the mobility impaired
- cycle routes to the stations and the provision of bike parking
- interchange amenity for bus passengers
- interaction with the local and wider road network, including any modifications to pedestrian crossings and road intersections
- changes to dedicated commuter parking and loading zones, provision of kiss and ride facilities and the provision for vehicle parking spaces at the stations.

An overview of the transport hierarchy is provided, which aims to encourage changes in mode share towards the higher order modes of walking, cycling and public transport. This, in conjunction with the expected land use intensification causing an increase in the overall travel demand, would result in impacts in and around stations. As a result of the project there would potentially be alterations to the road network conditions arising from the changes in mode share and therefore the forecast changes in people who access and egress Sydney Metro between Bankstown and Sydenham.

Both qualitative and quantitative assessments of the operation of the project have been carried out, including a description of the transport integration of each station and assessment of the potential traffic and transport impacts.

The basis for the assessment of operational effects is the patronage forecast produced by the Sydney Public Transport Planning Model (PTPM) for 2026, prepared specifically for the purpose of assessing the project. This strategic transport model is able to forecast patronage numbers, and especially relevant to this study, the multi-modal journey chains that form a journey which would include the Metro. Any Metro journey includes at least three journey legs, a journey to the station where a passenger boards the Metro; the Metro journey; and then the journey from the station at which they alight to the passenger's destination. The first and last journey legs could be as a pedestrian, bus passenger, other light or heavy passenger or driver using a vehicle which is parked at a station.

The strategic transport model forecasts the anticipated daily station patronage and the mode of access and egress to the station. The access and egress modes are limited to Walking, Vehicle (parking), Vehicle (drop off), Bus, and Light Rail. However the use of a cycle is not a modelled mode.

The model has in some cases forecast that the mode share for walking decreases in the future. However, this is a proportion reduction on of an overall increased patronage, and therefore still reflects an increase in the total number of passengers who are walking to stations. There are several factors that lead to the reduction in walk mode share, including significant increases in other public transport services feeding into the Metro, increased kiss and ride which is potentially related to trips being undertaken by shared car and Metro in place of a fully car mode journey, and increases in passengers transferring from the Sydney Trains network outside of Sydenham to Bankstown onto Metro as the overall journey becomes quicker and more convenient.

It is recognised that there are trips being undertaken using bicycles from the stations currently as part of journeys using the Sydney Trains services. In the future, cycling as an access mode is likely to be an increasingly important mode as discussed in Chapter 2 and Chapter 3. However, also as shown in Chapter 3, the current baseline for cycling is still very much the smallest cohort of mode choice, with the patronage ranging from 0.1% to 0.4% share.

For the purposes of the assessment, the observed mode share from cycling has been used and the number of cyclists increased in proportion to the increased station patronage. This yields an increase in forecast cycling trips to a station of more than 50% by 2026 compared to the observed 2016 data.

Despite this rapid projected growth in cycling, there are many reasons to consider that this may be an underestimate. In addition to the cycling infrastructure at stations delivered through this project, and discussed within this chapter, further investment in cycle infrastructure in the project area is proposed, most of which connects to the stations directly or indirectly. Furthermore, there is a growing amenity for cyclists at workplaces (such as the access to showers, lockers, secure storage, etc) and so overall this offers significant potential for the growth in cycling as a means of accessing the Metro.

However, in terms of the assessment of the impacts of the project, a relatively conservative approach to the growth has been taken. Firstly, a growth in cycling does not necessarily result in greater trips linking to the Metro. The investment in cycle routes that run parallel to the Metro could conceivably see some people cycling further and not interchanging with Metro. In addition, with the exception of bike parking, the cycle infrastructure is not capacity constrained in the way that driving, parking or bus services are. The opportunities to address any localised cycle parking issues within the precincts are much greater than those required to address issues related to other modes. As such the operational assessment, as with the construction phase assessment, has been undertaken on a 'worst case' basis.

Having forecast the cycling patronage using this method, the data for station data entry and exits (AM peak) was used to calculate the number of users who would arrive by each mode to allow assessment of the proposed infrastructure to support walking, cycling (racks), bus stop locations and for car trips taxi/drop off zones and commuter parking. The model is only available for the AM peak. However, the approach was to 'mirror' the data for the PM peak, in order to provide daily data.

In undertaking this assessment we have used the station designs as available at July 2017. It is recognised that the detailed design of the stations would continue to evolve prior to implementation which may result in some minor details of the assessment changing. The dimensions between parking bays, pedestrian crossings and station entrances are provided to give context in this assessment, but are subject to minor changes as the designs are refined.

8.2 Strategic Traffic and Transport Benefits

8.2.1 Sydney Train and Metro

The project would see the upgrade of 13 km of existing railway along the T3 Bankstown Line to Metro, providing a more frequent service and removing the bottleneck which currently occurs downstream of Sydenham towards Sydney CBD. Through the provision of faster and more frequent metro services it is expected that the proportion of travellers who chose train compared to car would increase. As a result this would improve traffic conditions for those journeys made by road, and facilitate increased population within the Metro catchment.

The Sydney Metro City & Southwest Business Case estimates a growth in passenger demand of 58 percent by 2026 on the T3 Bankstown Line including 20,000 trips in the AM peak transferred from road bound travel. The upgraded Metro network would provide twice as many trains per hour in peak periods. This would reduce waiting time at Metro stations for passengers and provides the ability to "turn up and go", as opposed to pre-planning to co-ordinate with a specific train.

As well as reduced wait times, the project would reduce on board travel times by up to 10 minutes on a train journey from Bankstown to Central compared to the current journey on Sydney Trains. However these passenger benefits would be further realised through an increased reliability which arises from the segregation of the Metro from the Sydney Trains network.

The upgrade of the Bankstown Line would enable a direct connection to the Chatswood to Sydenham section of the Sydney Metro City and Southwest project. Connections would also extend further to major CBD stations such as Pitt Street and employment hubs such as North Sydney, St Leonards and Macquarie Park.

Travel time savings would be experienced by existing rail service passengers (who would directly benefit from shorter travel times), new Metro passengers (who would transfer from road-based transport such as buses and cars to rail) and road users (who would potentially experience less congestion).

The proposed conversion to Metro from Sydney Trains includes the introduction of single deck carriages. Whilst this marginally reduces the number of passengers who can be accommodated on each train, the doubling of the frequency results in an increase in the total capacity of the line of approximately 30 percent.

In addition to the increased service frequency, improved amenity and accessibility for customers between Sydenham and Bankstown stations, the removal of the T3 Bankstown Line services from the City Circle would:

- release train paths and facilitate extra services to operate on the T2 Airport Line and T2 Inner West and South Line, therefore improving capacity to meet demand and alleviate crowding on trains
- eliminating several merges that currently occur with the T2 Airport Line and T2 Inner West and South Line services, thus reducing operational complexity and the risk of service unreliability
- potentially reduce the number of different service types/patterns operating through City Circle stations, improving service legibility and reducing the risk of platform congestion due to passengers having to dwell at these stations to wait for their desired service in the PM.

8.2.2 Changes to station servicing arrangements

Sydney Metro trains would operate between Bankstown and Cudgegong Road stations, via the Sydney CBD and Chatswood. Between Sydenham and Chatswood, Sydney Metro trains would service Central Station (via new platforms), and the following new stations to be constructed as part of the Chatswood to Sydenham project:

- Pitt Street Station
- Martin Place Station
- Barangaroo Station
- Victoria Cross Station (in North Sydney)
- Crows Nest Station.

The project would result in changes to service patterns for some stations along the T3 Bankstown Line and the City Circle. Proposed arrangements with the operation of the project as part of Sydney Metro City & Southwest are shown in **Figure 8.1** and summarised in **Table 8.1**, **Table 8.2** and **Table 8.3.**

As shown in the tables and figure, Sydney Metro customers would be able to change between Sydney Metro and Sydney Trains services at Sydenham, Bankstown, and Central stations.

West of Bankstown, the T3 Bankstown Line would continue to be operated by Sydney Trains between Liverpool, Lidcombe, and Bankstown. Sydney Trains would no longer operate on the T3 Bankstown Line between Sydenham and Bankstown stations.

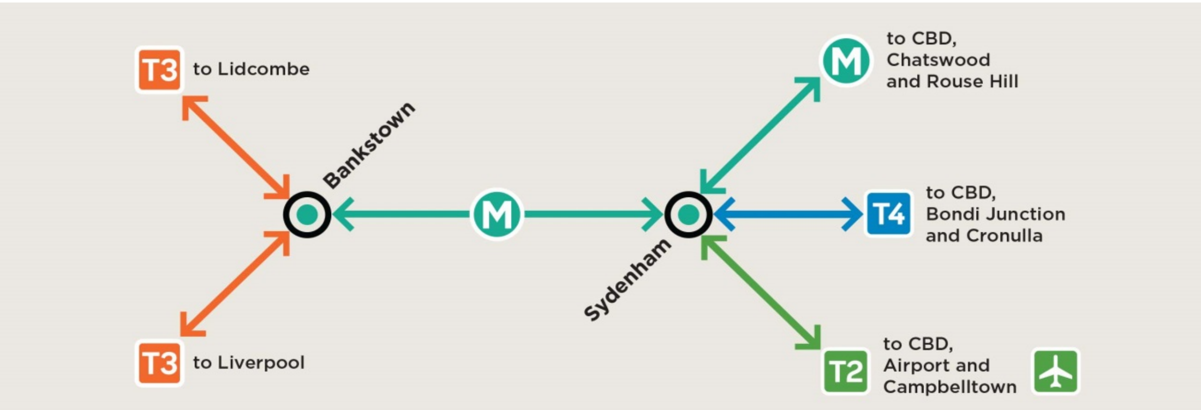


Figure 8.1 Interchanging with Sydney Trains services

Table 8.1 Proposed service arrangements for travel from existing stations on the T3 Bankstown Line

Existing station - origin	Service availability
Stations east of Sydenham: St Peters, Erskineville and Redfern Stations on the City Circle	St Peters, Erskineville and Redfern would continue to be serviced by Sydney Trains, operating on the T2 Airport Line or the T4 Illawarra Line. City Circle Stations would continue to be served by T2 services Customers needing to access Sydney Metro services could change at Sydenham or Central stations.
Stations between Sydenham and Bankstown	Stations would be serviced by Sydney Metro. Customers needing to access Sydney Trains services could change at Bankstown, Sydenham, or Central stations.
Stations west of Bankstown: Yagoona, Birrong, Regents Park, Berala Sefton, Chester Hill, Leightonfield, Villawood, Carramar.	Stations would continue to be serviced by Sydney Trains, via trains operating between Liverpool, Bankstown, and Lidcombe stations on the truncated T3 Bankstown Line. Customers wishing to access Sydney Metro services would be able to change at Bankstown Station. Customers wishing to travel via Sydney Trains to other destinations could change at: • Lidcombe Station, for travel via the T1 Western Line or the T2 Inner West and South Line • Cabramatta Station, for travel via the T2 South Line or the T5 Cumberland Line.
Lidcombe	Lidcombe Station would continue to be serviced by Sydney Trains, operating on the existing T1 and T2 lines, and the truncated T3 Bankstown Line. Customers wishing to access Sydney Metro services would be able to change at Bankstown Station.
Cabramatta	Cabramatta would continue to be serviced by Sydney Trains, operating on the T2 South Line, the T5 Cumberland Line, and the truncated T3 Bankstown Line. Customers wishing to access Sydney Metro services would be able to change at Bankstown Station.
Warwick Farm and Liverpool	Stations would continue to be serviced by Sydney Trains, operating on the T2 Inner West and South Line and the T5 Cumberland Line. Customers wishing to access Sydney Metro services would need to change at Cabramatta to Sydney Trains services to Bankstown Station.

Table 8.2 Proposed service arrangements for travel to existing stations on the T3 Bankstown Line and City Circle

Existing station – destination	Service availability
Stations east of Sydenham	
Central Station	Sydney Metro customers would have direct access to Central Station. New metro platforms, below the existing Central platforms 13, 14 and 15, will be constructed at Central Station as part of the Chatswood to Sydenham project. Central Station would continue to be serviced by Sydney Trains operating on the T1 North Shore, Northern & Western Line, the T2 Airport, Inner West and South Line, and the T4 Eastern Suburbs & Illawarra Line.

Existing station – destination	Service availability
Town Hall Station	Sydney Metro customers would need to change at either Sydenham or Central stations to access Town Hall Station via Sydney Trains services. The closest Sydney Metro station to Town Hall would be the new Pitt Street Station, to be located about 150 metres east of Town Hall Station. Town Hall Station would continue to be serviced by Sydney Trains operating on the T1, T2, and T4 lines.
Wynyard Station	Sydney Metro customers would need to change at either Sydenham or Central stations to access Wynyard Station via Sydney Trains services. The closet Sydney Metro station to Wynyard would be the new Martin Place and Barangaroo stations, to be located about 400 metres east and 650 metres north-west of Wynyard, respectively. Wynyard Station would continue to be serviced by Sydney Trains operating on the T1, T2, and T4 lines.
Other City Circle stations (Circular Quay, St James and Museum)	These stations would continue to be serviced by Sydney Trains via trains operating on the T2 Line. Sydney Metro customers would need to change at either Sydenham or Central stations to access these stations via Sydney Trains services.
Sydenham	Customers would access Sydenham via Sydney Metro, or Sydney Trains services operating on the T2 and T4 lines.
Erskineville, St Peters, Redfern	These stations would continue to be serviced by Sydney Trains, via trains operating on either the T2 or T4 lines. Sydney Metro customers would need to change at either Sydenham or Central stations to access these stations via Sydney Trains services.
Stations west of Bankstown	
Yagoona, Birrong, Regents Park, Berala, Sefton, Chester Hill, Leighton Field, Villawood, Carramar and Cabramatta	Sydney Metro customers would access these stations by changing at Bankstown to Sydney Trains services. Sydney Trains customers could travel between these stations via services operating on the truncated T3 Bankstown Line. Other Sydney Trains customers could access these stations by changing at Lidcombe or Cabramatta to Sydney Trains services.
Lidcombe	Sydney Metro customers would access Lidcombe station by changing at Bankstown to Sydney Trains services. Sydney Trains customers could access Lidcombe Station directly via services operating on the T1 and T2 lines, or (for local customers) the truncated T3 line.
Liverpool and Warwick Farm	Sydney Metro customers would access these stations by changing at Bankstown to Sydney Trains services. Sydney Trains customers would access these stations directly via services operating on the T1 and T5 lines, or via the truncated T3 line by changing at Cabramatta Station.

Table 8.3 Potential travel patterns for travel to key centres from existing stations on the T3 Bankstown Line

	Servicing patterns to key centres				
Origin	**Sydney CBD**	**Liverpool**	**Parramatta**	**Chatswood**	**Macquarie Park**
Stations east of Sydenham (St Peters, Erskineville and Redfern)	Travel directly via Sydney Trains services	Travel via Sydney Trains and Sydney Metro services by changing trains at Sydenham and Bankstown	Travel via Sydney Trains, changing trains at Redfern Station	Travel via Sydney Trains and then Sydney Metro, by changing at Central or Sydenham, or by Sydney Trains only, changing at Redfern	Travel via Sydney Trains and then Sydney Metro, by changing at Central, Sydenham or Chatswood
Stations between Sydenham and Bankstown	Travel directly via Sydney Metro	Travel via Sydney Metro and Sydney Trains services, by changing trains at Bankstown	Travel via Sydney Metro and Sydney Trains, by changing trains at Bankstown and Lidcombe, or at Sydenham and Redfern	Travel directly via Sydney Metro	Travel directly via Sydney Metro
Yagoona, Birrong, Regents Park, Berala, Sefton, Chester Hill, Leightonfield, Villawood, Carramar	Travel via Sydney Trains and Sydney Metro, changing trains at Bankstown, or by Sydney Trains only, changing at Lidcombe/Cabramatta	Travel via Sydney Trains	Travel via Sydney Trains, by changing trains at Lidcombe or Cabramatta	Travel via Sydney Trains and then Sydney Metro, by changing at Bankstown	Travel via Sydney Trains and then Sydney Metro, by changing at Bankstown
Cabramatta, Warwick Farm	Travel via by Sydney Trains only on the T2 line, or by Sydney Trains and Sydney Metro, changing trains at Bankstown	Travel directly via the Sydney Trains on the T2 line	Travel directly via the Sydney Trains on the T5 line	Travel via Sydney Trains and then Sydney Metro, by changing at Bankstown, or by Sydney Trains only, changing at Central	Travel via Sydney Trains and then Sydney Metro, by changing at Bankstown, or by Sydney Trains only, changing at Central

As a result of the upgrade to Metro the journey times for passengers would improve. As shown in in **Figure 8.2** overleaf, there would be an improvement of some 15 to 16 minutes for a journey from Campsie to Macquarie Park, and this journey can be achieved without interchange. In the existing situation the fastest journey requires two interchanges, and the most direct, but slower journey still requires an interchange at Central Station.

Transport for NSW would provide further details on changes to the wider transport network, when the design of future suburban rail timetables is confirmed.

8.2.3 Bus network benefits

The project is a component of an integrated public transport network which includes the bus network. By providing passengers with a high level of amenity for mode changes this would enable a significant increase to the effective catchment of the project, and correspondingly would increase the accessibility of a much larger population.

The project may provide benefits to bus patrons through:

- integrating with existing bus routes to provide connections between bus and rail services
- potentially reducing crowding on buses by bus customers transferring to Metro
- optimising connections between bus and rail services where possible including locating bus stops as close as practical to station entries.

8.2.4 Road network benefits

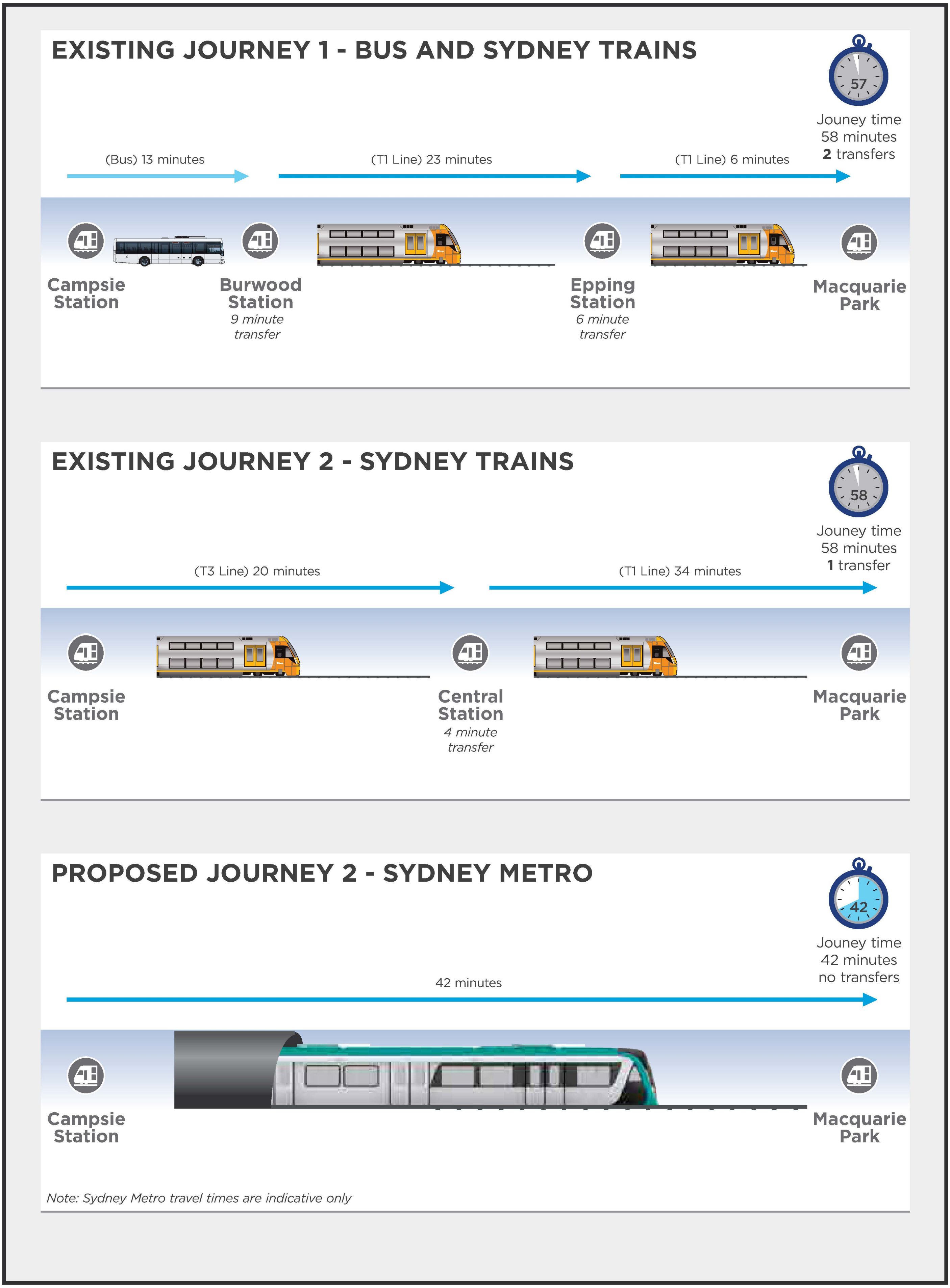
The demand for road travel is expected to increase into the future, including as a result of population growth and urban renewal initiatives outlined in the draft *Sydenham to Bankstown Urban Renewal Strategy*. The travel time savings resulting from the project are one of the factors that would encourage more people to use the rail network. TfNSW is seeking to encourage rail patrons to access a station using active or public transport modes. Providing the necessary infrastructure such as readily visible bus stops and bike storage close to station entrances would encourage a more seamless transfer to rail. The specific measures are discussed later in this chapter for each station.

This may assist in encouraging a mode shift towards rail, and a reduction in the proportion of car to rail linked journeys, allowing a growth in total travel without the corresponding increase in delays on the road network.

8.2.5 The transport hierarchy

Customers require a seamless, well integrated and safe journey when using multiple travel modes to access their destination. Transport for NSW's modal hierarchy aims to ensure that station plans give highest priority to the most efficient and sustainable access modes. Pedestrians and cyclists are the highest priority access modes, followed by buses and taxis, kiss-and-ride, and lastly park-and-ride.

Figure 8.3 below shows a diagrammatic representation of the modal hierarchy and **Figure 8.4** shows the integration of the project with other modes.



Indicative journey time changes between Campsie and Macquarie Park

FIGURE 8.2

Figure 8.3 Modal hierarchy

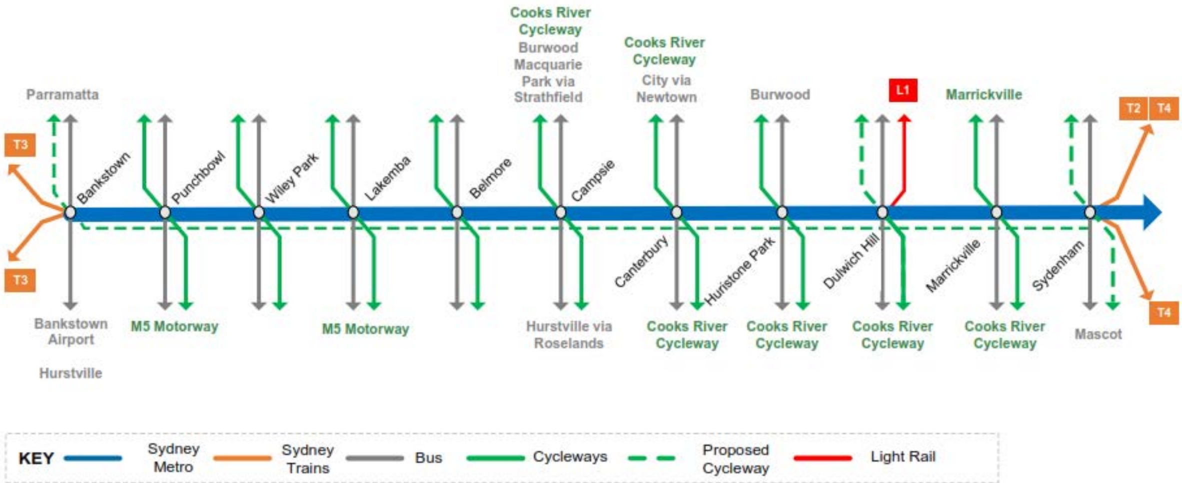


Figure 8.4 Metro integration with other travel modes

Walking and cycling: The modal hierarchy recognises transfers from sustainable modes, such as walking and cycling, as the most important modes. These modes are cost-effective, equitable and accessible, while typically requiring the least amount of space.

The project design would safeguard for an Active Transport Corridor. Components of walking and cycling infrastructure within the Active Transport Corridor may be delivered as part of station precinct work. Other parts, such as in areas between stations, may be staged as funding becomes available through development activity associated with the Department of Planning and Environment's Sydenham to Bankstown Urban Renewal Corridor investigations.

An Active Transport Corridor would facilitate strategic walking and cycling connections to a number of important destinations, including linking public transport interchanges between Sydenham and Bankstown, residential areas, schools, and retail and commercial precincts.

As a major east-west spine, the corridor would link to existing and future local walking and cycling networks. The corridor could allow for the following elements:

- footpaths
- separated cycleways
- shared zones
- designated pedestrian and cyclist road crossings.

The Active Transport Corridor has been incorporated within the Sydney Metro station precinct and rail corridor designs as well as existing and known future local infrastructure (such as parks and transport networks), with the view to these being delivered should funding be available.

The Active Transport Corridor has been designed to generally be along existing routes as the stations are in well-established urban areas.

Where practicable, appropriate footpath widths and gradients would be provided outside of station exits and throughout the public domain to link transport modes and provide safe and equitable pedestrian access. Vision and mobility impaired customers would be considered in the pavement designs, for example by keeping one side of the travel path clear of fittings and fixtures and providing tactile ground surface indicators on travel paths to warn of hazards and assist wayfinding where required.

Cycling connections would also be provided where practicable linking customers with the stations. These works would include local improvements within the interchange area of the station and provisioning for a cycling route that links the project length adjacent or near the railway corridor.

Planning for cyclists at Metro stations, and joining Metro stations via an Active Transport Corridor, provides an opportunity to improve traffic congestion, reduce greenhouse gas emissions and provide opportunities to partake in healthier lifestyle pursuits. The cycling catchment for a rail station is generally taken to be up to 2.5 kilometres, or approximately 10 minutes travel time.

It is proposed to increase the provision of bike parking spaces at stations as part of the project the type of bike parking provided at stations would be based on the NSW Government Bike and Ride Program, as stated within *Sydney's Cycling Future* (TfNSW, 2013). The facilities are likely to be upgraded from the current facilities to be similar to those being introduced at several Sydney Trains stations, including those currently at Blacktown and Campbelltown.

For all stations, the day one supply would meet current demands with additional spaces safeguarded to support increases in cycling mode share above that which has been forecasted. The number of bike parking spaces would reflect forecast passenger demand at each station. Indicatively this is likely to be around one to two per cent of station entries.

At each station, a mixture of secure OPAL access Bike Sheds and undercover bike racks are likely to be provided which allow train customers to leave their bikes and transfer to train. For each station, the bike parking facility would be located at a reasonable distance from the gate line to encourage use. Where practicable, the bike parking would connect with the local cycle network so customers can safely leave their bikes and catch a train.

The design of the Active Transport Corridor would be completed in consultation with local councils, local community groups, bike user groups as well as RMS and relevant utility providers.

Given the importance of active transport for the first and last mile of passengers' journeys, walking and cycling modes are discussed with specific details for each station below in **Sections 8.3** to **8.13**.

Public Transport: Sufficient and convenient customer transfer between Sydney Trains and Metro services at Bankstown and Sydenham would be assisted by the provision of clear and intuitive wayfinding and signage. Customers connecting to other services at the remaining stations along the T3 Bankstown Line would be required to exit the station and use existing footpaths.

Other public transport modes are the third most important mode on the hierarchy. Public transport services enable the Sydney Metro catchment area to expand its reach. Connections between Metro and other public transport services would be provided via safe and accessible paths.

Taxis: Taxis enhance the public transport network by providing access to areas which would not be possible via public transport. Taxis are therefore given the highest priority of the car-based modes. Parking and access with shelters and seating would be provided where practicable at stations.

Kiss and ride: Kiss and ride is prioritised above Park and Ride because it reduces the number of single-occupant vehicles accessing stations. Spaces for Kiss and Ride vehicles would be provided if high vehicle turnover and safe and efficient vehicle access is available.

Park and Ride: Although 'park and ride' is the lowest priority in the TfNSW modal hierarchy, the project has been designed to result in a 'no net loss' of dedicated commuter car parking spaces across the project. This commitment applies to parking that is not currently time restricted and is on RailCorp land or formally line marked and/or signposted as a dedicated commuter car parking area. It is assumed that people who intend to park and ride would use both dedicated commuter parking and other unrestricted parking within the station catchment area.

The proposed parking infrastructure for day one operational state is summarised in **Table 8.4**. Belmore and Bankstown have a potential 58 parking space decrease as a result of reconstruction following the use of the carpark during construction.

In some cases these changes may result in the provision of an increased number of commuter parking spaces, such as at Campsie Station where 80 dedicated commuter parking spaces would be added as a result of changes to associated rail facilities.

There would be some loss of on-street spaces (short-term and long-term) and off-street (short-term) spaces at some stations due to expanded and improved station interchanges. There would also be a change to the nature of some on-street parking at some stations to enable the Metro station interchange to provide accessible parking, kiss and ride and taxi spaces, where short-term parking spaces may currently exist.

Overall, the loss of these spaces is considered to be minor in a traffic and transport context due to the current levels of available parking. It is also noted that the project objective of no net loss of dedicated commuter spaces on Rail Corp land can be achieved and is aimed at facilitating access for existing users with a focus on customers with accessibility needs.

Transport for NSW would work with local councils to minimise adverse impacts from adjustments to parking and other kerbside uses (e.g. taxi ranks, accessible parking and kiss and ride facilities) in local streets.

Table 8.4 Parking infrastructure for day one operational state

Station	Existing on-street parking	Existing off-street parking	Increase / decrease in day one carpark spaces on-street	Increase / decrease in day one carpark spaces off-street	Increase / decrease in dedicated commuter parking	Approximate total number of spaces on-street	Approximate total number of spaces off-street	Total number of spaces	Demand for spaces (2026)*	Net surplus/ deficit
Marrickville	1,519	0	-1	0	0	1,518	0	1,518	1,365	153
Dulwich Hill	1,332	57	-5	0	0	1,270	57	1,327	1,209	118
Hurlstone Park	1,208	23	0	0	0	1,185	23	1,208	821	387
Canterbury	849	233	0	0	0	616	233	849	707	142
Campsie	1,539	494	-20	0	80	1,025	494	1,599	1,818	-219
Belmore	1,220	142	0	-48	0	1,078	94	1,172	1,325	-153
Lakemba	1498	537	0	0	0	961	537	1,498	1,648	-150
Wiley Park	746	25	0	0	0	721	25	746	537	209
Punchbowl	1123	285	0	0	0	838	285	1,123	1,345	-222
Bankstown	1696	1108	0	-10	0	588	1,098	1,686	2,479	-793
Grand Total	**12,730**	**2,904**	**-26**	**-58**	**80**					**-526**

*Note 1: The 2026 demand to for parking spaces has been calculated using the current utilisation of spaces and adding the change in park and ride customers. This does not allow for any increases in demand from residential intensification, population growth etc.
*Note 2: The numbers above are approximate and indicative for assessment purposes only and subject to detailed design and consultation.

Existing parking areas would be managed in such a way that there would be no disruption to walking connections between stations and town centres. Clearly marked pedestrian circulation would be provided in all of the carparks. As limited additional car parking is to be provided at the Metro stations, there is a constraint on induced traffic demand once the project is in the operational phase.

More sustainable modes of travel (i.e. not private passenger vehicle) would be promoted to absorb some of the demand forecast to be generated by park and ride users. Well planned interchanges and service provisions would be provided to assist the sustainable travel modes. Transport for NSW would also investigate opportunities for 'shared use parking' whereby rail patrons could use nearby commercial and industrial car parking facilities in the vicinity of the stations for commuter parking, where this does not conflict with business times.

8.2.6 Accessibility to Stations

Upgraded stations and platforms would comply as far as practicable with the objectives of the *Disability Discrimination Act 1992* (i.e. DDA compliant) and *Disability Standards for Accessible Public Transport 2002* including:

- stations, plazas, interchanges, walkways, fixtures and fittings and retail precincts would be designed to meet DDA requirements.
- Interchanges would incorporate accessible facilities and accessible paths of travel between the station and other transport modes, and resting seats would be provided along pathways.

The Disability Standards for Accessible Public Transport requires a maximum distance of 60m between interchange points, or where this is not possible seating must be provided every 60m. In addition, the Sydney Metro City and Southwest System Requirements Specification has a requirement for bus stops to be within 100m of the gateline.

As a result of the grade of the rail corridor, stations are located mostly in cuttings. The associated road overbridges generally grade sharply up to negotiate the minimum clearance height above rail. This results in non-DDA compliant grades on most of the footpaths on overbridges, which generally also serve as access paths to stations. At some stations, adjacent steep topography heightens this issue. Providing a design that complies with accessibility standards is challenging at many of the stations. In certain instances, this may not be achievable, for instance, provision of an accessible path of travel from station entries to bus stops on Canterbury Road at Canterbury Station.

Where the existing terrain does not allow for DDA compliant grading of paths, the following features have been incorporated in the design:

- adjustment to surface levels to achieve full or partial compliance
- reviewing station and precinct arrangements to locate accessible facilities in areas with acceptable gradients.

8.3 Marrickville Station

The Marrickville Station interchange plan is provided in **Figure 8.5**.

8.3.1 Metro Patronage and Access Mode to Station

The current and future travel modes to/from the station per day for Marrickville Station are shown in **Table 8.5**. These mode share increases are discussed in the relevant sections following.

Table 8.5 Current and future volumes of travel to/from Marrickville Station

Travel Mode to the Station	Entry			Exit			Mode Share 2016	Mode Share 2026
	2016	2026	Change	2016	2026	Change		
Walking	3,931	5,730	+1,799	3,727	5,730	+2,003	85.6%	83.0%
Cycling	13	21	+8	13	21	+8	0.3%	0.3%
Park and Ride	232	258	+26	220	258	+38	5.1%	3.7%
Kiss and Ride	186	651	+465	176	651	+475	4.0%	9.5%
Bus	232	240	+8	220	240	+20	5.1%	3.5%
Total	4,594	6,900		4,356	6,900		100.0%	100.0%

Source: Transport for NSW and extrapolated data

The overall walking mode share is forecast to decline slightly between 2016 and 2026, however this is set against a backdrop of increasing patronage therefore the total number of passengers walking to the station is forecast to increase.

The 2016 cycling trip data was unavailable for Marrickville Station. Therefore to calculate the cyclist mode share for Marrickville, the average cyclist mode share was taken from across all stations. This equated to 0.3% of total trips, and was assumed to equate to the cyclist trips at Marrickville station.

8.3.2 Integration with Walking Network

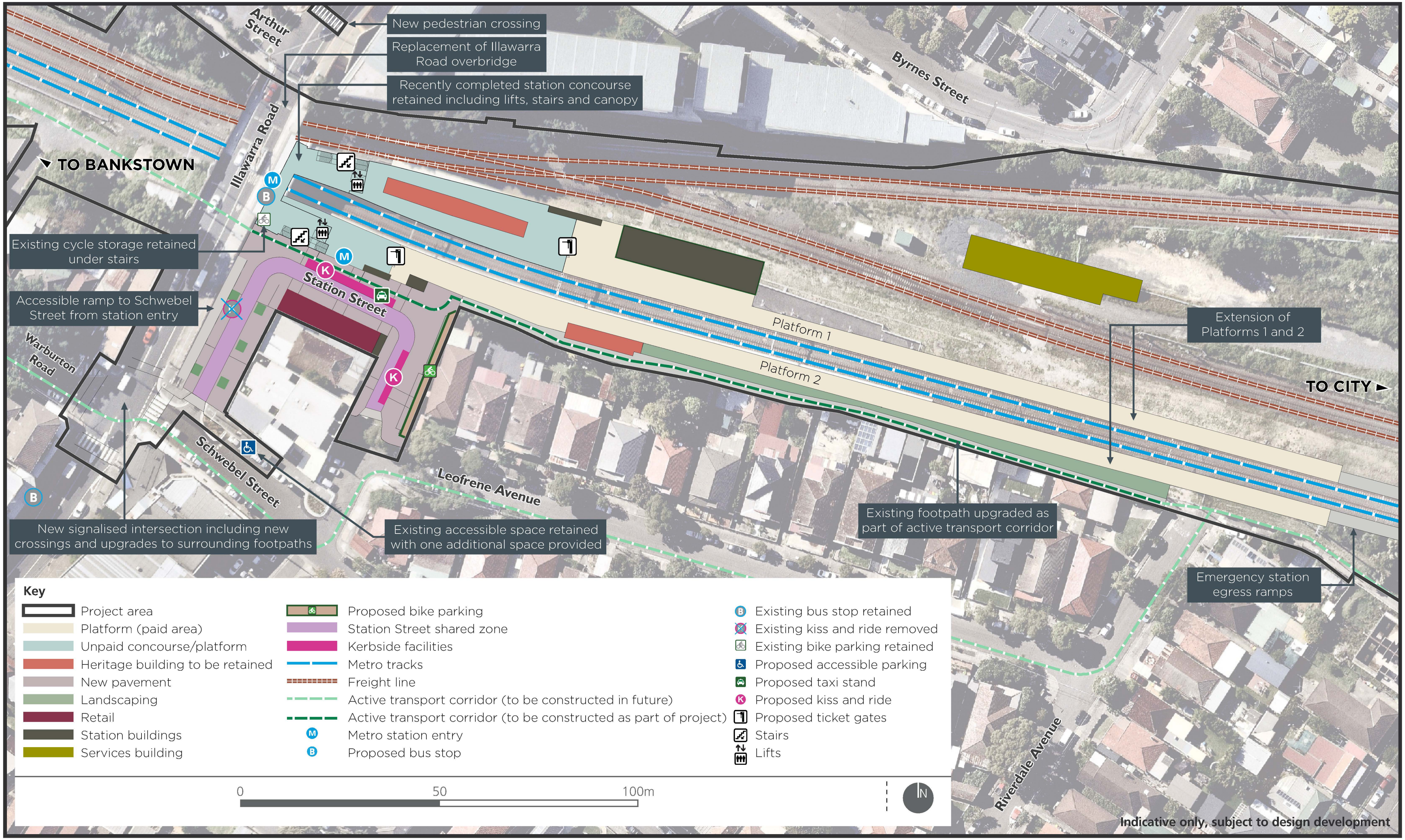
Table 8.5 shows a large increase in pedestrian demand at Marrickville Station as well as a very high proportion overall. The expected total increase in demand would be 1,799 additional entries and 2,003 additional exits for Metro passengers walking to the station. The growth in passenger demand would increase the need for accessibility and increase the potential for pedestrian/ vehicle conflict in the area surrounding the station. The proposed upgrades to Marrickville Station address a number of the issues of accessibility and provide a zebra crossings to aid the safe movement of pedestrians across Illawarra Road.

A shared zone is to be constructed on Station Street with a compliant access ramp for pedestrian connections to the northbound bus stop on Illawarra Road and proposed accessible bays on Schwebel Street. This would improve the pedestrian experience by providing greater accessibility for customers.

There is currently a signalised crossing for pedestrians on Illawarra Road Overbridge. This is to be removed and replaced with a fully signalised intersection at Illawarra Road and Schwebel/Warburton Streets that accounts for pedestrians and vehicles. The change to a fully signalised intersection would achieve the following:

- a safe and accessible path to the northbound bus stop on Illawarra Road
- a safe crossing of Illawarra Road for cyclists.

The removal of the signalised crossing on Illawarra Road Overbridge creates a potential access issue for pedestrians walking from the northwest to the station which is some 150m from the station entry. The proposed zebra crossing at Arthur Street/Illawarra Road would deliver an alternative route on the primary desire line.



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Marrickville Station interchange plan

FIGURE 8.5

Whilst the pedestrian volumes to and from the station are set to rise by over 3800 people per day, the adjacent footpaths provide adequate capacity for these volumes. Flows of up to 8000 pedestrians per hour can be accommodated immediately adjacent to the station and as the distance from the station increases, the pedestrian volumes would become more disperse. The southbound bus stop would provide a potential constraint to the flows, however the expected demand would be well below capacity and it is considered that the footpath network in the area would be able to cater for the increased pedestrian flows associated with the project. Overall the new Metro station layout would facilitate safe and direct access to the Metro from existing and potential new urban areas and the new entrance on Station Street would provide a more seamless transition to the village beyond.

8.3.3 Integration with Cycle Network

There are currently eight bike rails at Marrickville Station. At least 40 additional bike parking spaces would be provided, including a mix of secure and sheltered spaces. It is proposed that the bike parking facilities would be provided at the Illawarra Road station entrance, as well as on Station Street (**Figure 8.5**). Both of these facilities are adjacent to an existing cycle route.

8.3.4 Integration with Buses

Table 8.5 shows a total increase in demand of eight entries and 20 exits for Metro passengers travelling by bus to the station.

Bus routes 423 and L23 service the Marrickville precinct, arriving approximately every 10 minutes in peak periods (Sydney Buses 2016). These routes travel along Illawarra Road, past Marrickville Station and turn onto Marrickville Road connecting Kingsgrove to Marrickville Station and the city centre.

There is currently no accessible path from Marrickville Station to the northbound bus stop. The upgrade works at Marrickville Station do not propose any changes to the locations of bus stops, but the connectivity would be improved with an accessible ramp from Station Street to the Schwebel Street / Illawarra Road intersection.

The northbound bus stop would be approximately 180m from the platform 1 gate line and 140m from the platform 2 gate line which exceeds the City and Southwest Metro Project system requirements by 80 and 40m respectively. The southbound bus stop conforms to the system requirements with a distance of approximately 80m from the platform 1 gate line and 40m from the platform 2 gate line. For both stops, seating would be provided on the route to the station where practicable to enhance accessibility.

8.3.5 Integration with Road Network

Park and Ride and Kiss and Ride currently account for 9% of the modal share collectively. **Table 8.5** shows an increase in demand for Park and Ride passengers of 26 entries and 38 exits, and an increase in Kiss and Ride passenger entries of 465 and 475 exits.

The introduction of the fully signalised intersection at Illawarra Road and Schwebel/Warburton Streets would achieve the following:

- allowance for the anticipated increase in vehicle traffic from increased taxi and Kiss and Ride activity on Station Street
- allowance for heavy vehicles on Warburton Street during the construction period.

Marrickville Station currently has a taxi bay on Station Street West. The proposed layout allows for two taxi bays on Station Street North opposite the Station Street entry. The taxi bays would be clearly visible and accessible from the Station Street entry.

Three Kiss and Ride bays are currently available on Station Street. These bays are not compliant with the TfNSW requirements for accessibility. The proposed design would increase the number of spaces to five and, where practicable, create space in areas with flatter grades so that the Kiss and Ride bays would be visible and accessible from Station Street close to the station southern entry. Some of the spaces proposed would potentially not meet accessibility standards due to the gradient of Station Street.

No dedicated commuter parking spaces facilities are currently available or proposed in the Marrickville Station future design. The 5% of Metro passengers who drive to the station and park their car use one of the 1257 on street unrestricted car parks or the 262 on street time restricted car parks (AECOM 2016). These car parking areas are currently operating at 82% and 76% utilisation respectively. This provides spare on street capacity for the further 26 passengers that are expected to drive to the station by 2026, assuming population growth and intensification do not provide a further demand for these spaces.

There is a single accessible parking bay currently provided on Schwebel Street which would be retained. The steep gradient on Station Street is non-compliant, making it difficult to walk from the accessible bay to Station Street. A ramp is to be provided as part of the Project and would link Station Street West to Schwebel Street.

It is not anticipated that loading zones would be impacted by the project design.

8.4 Dulwich Hill Station

The Dulwich Hill Station interchange plan is provided in **Figure 8.6**.

8.4.1 Metro Patronage and Access Mode to Station

The current and future travel modes to/from the station per day for Dulwich Hill Station are shown in **Table 8.6** below. These mode share increases are discussed in the relevant sections following.

Table 8.6 Current and future volumes of travel to/from Dulwich Hill Station

Travel Mode to the Station	Entry			Exit			Mode Share 2014	Mode Share 2026
	2014	2026	Change	2014	2026	Change		
Walking	2,057	4,899	+2,842	1,872	4,899	+3,027	76.0%	72.0%
Cycling	10	27	+17	10	27	+17	0.4%	0.4%
Park and Ride	389	377	-12	354	377	+23	14.4%	5.5%
Kiss and Ride	167	537	+370	152	537	+385	6.2%	7.9%
Bus	83	282	+199	76	282	+206	3.1%	4.1%
LRT[52]	-	678		-	678		-	10.0%
Total	2,706	6,800		2,464	6,800		100.0%	100.0%

Source: Transport for NSW and extrapolated data

8.4.2 Integration with Walking Network

Table 8.6 shows a total increase in demand of 2,842 entries and 3,027 exits for Metro passengers walking to the station. The growth in passenger demand would increase the need for accessibility in the area surrounding the station.

No further pedestrian or signalised crossings are proposed at Dulwich Hill Station. The southern plaza provides an accessible connection between the station and the pedestrian crossing at Wardell Road and the village beyond and would provide a legible entrance, easily visible to pedestrians. The location of proposed taxi bays and Kiss and Ride facilities on Bedford Crescent enable better access for pedestrians transferring from these modes to the station. The Bedford Crescent entry would also be clearly visible from the northern section of Wardell Road.

Whilst the pedestrian volumes to and from the station are set to rise by over 5,800 people per day, the adjacent footpaths provide adequate capacity for these volumes. Flows of up to 4,000 pedestrians per hour can be accommodated immediately adjacent to the station on Wardell Road Overbridge. As the distance from the station increases the increased pedestrian volumes would become more disperse. The southbound bus stop would provide a potential constraint to the flows, however the expected demand would be well below capacity and it is considered that the footpath network in the area would be able to cater for the increased pedestrian flows associated form the project.

8.4.3 Integration with Cycle Network

There are currently 20 bike rails (up to 20 spaces) in Dulwich Hill (Bedford Crescent and Wardell Road). It is proposed that bike parking provision at this station would be tripled with the addition of around 60 spaces, some covered and some secured. It is proposed that the bike parking facilities would be provided south of the station, west of the station entrance (**Figure 8.6**). This location is adjacent to the existing cycle route on Ewart Lane.

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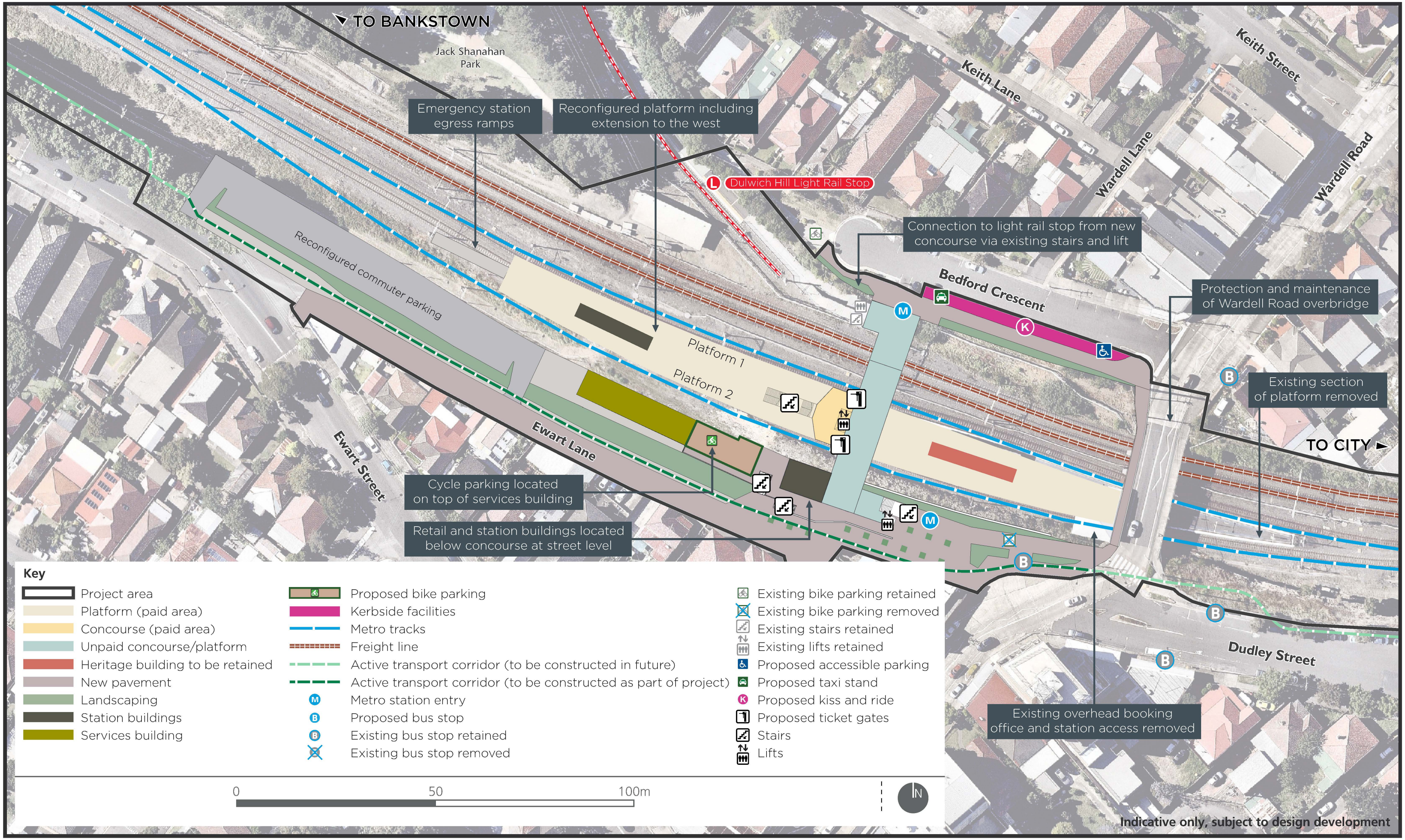
[52] *The 2014 trip count survey was conducted prior to the introduction of LRT, as a result these values are not available.*



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Dulwich Hill Station interchange plan

FIGURE 8.6

8.4.4 Integration with Buses

Table 8.6 shows a total increase in demand of 199 entries and 206 exits from Metro passengers busing to the station. Dulwich Hill centre is serviced by bus route 412. Three further bus routes travel along the northern section of the precinct.

The eastbound and westbound bus stops for the bus 412 route are located adjacent to the station on Dudley Street. Bus stops immediately north and south of Wardell Road overbridge service school buses. There are no planned changes to any of these bus stops.

The eastern bus stops on Dudley Street are accessible from the station as the southern plaza connects the station to the existing pedestrian crossing at Wardell Road. The bus stop is approximately 120m from the gate line. This exceeds the system requirements by 20m.

The westbound bus stop is not easily accessible as there is no pedestrian crossing across Dudley Street. The bus stop is approximately 145m from the gate line which exceeds the system requirements by 45m. For both stops, seating would be provided on the route to the station where practicable to enhance accessibility. Bus stops would be visible from the southern station entry and the plaza.

8.4.5 Integration with Road Network

Park and Ride and Kiss and Ride currently account for a fifth of the modal share collectively. **Table 8.6** shows negligible change in demand for Park and Ride passengers, and an increase in Kiss and Ride passenger entries of 370 entries and 385 exits.

Dulwich Hill Station does not currently have any taxi facilities. One taxi space is to be provided, in accordance with the system requirements, on Bedford Crescent adjacent to the northern entry. This would ensure compliant access from the taxi bay to the station. The taxi bay is clearly visible from the Bedford Crescent entry.

Three Kiss and Ride spaces are currently available on Bedford Crescent. A further two spaces are to be provided on Bedford Crescent to comply with the system requirements. The location of the extra two spaces is proposed adjacent to the northern entry to ensure compliant access to the station. The Kiss and Ride bays would be clearly visible from the Bedford Crescent entry.

Dulwich Hill Station currently has 55 dedicated commuter parking spaces on RailCorp land on Ewart Lane. Five short term on-street parking bays would also be lost on Bedford Crescent as a result of the station interchange zone.

The 14% of Metro passengers who drive to the station and park their car use one of the 55 dedicated commuter spaces, one of the 1202 unrestricted on-street spaces, or one of the 73 on-street time restricted spaces (AECOM 2016). These car parks are currently operating at 100%, 72% and 86% of capacity respectively. This provides spare capacity for the further 30 passengers that are expected to drive to the station, assuming population growth and intensification do not provide a further demand for these spaces.

It is not anticipated that loading zones would be impacted by the project design.

8.5 Hurlstone Park Station

The Hurlstone Park Station interchange plan is provided in **Figure 8.7**.

8.5.1 Metro Patronage and Access Mode to Station

The current and future travel modes to/from the station per day for Hurlstone Park Station are shown in **Table 8.7**. These mode share increases are discussed in the relevant sections below.

Table 8.7 Current and future volumes of travel to/from Hurlstone Park Station

Travel Mode to the Station	Entry			Exit			Mode Share 2016	Mode Share 2026
	2016	2026	Change	2016	2026	Change		
Walking	1,239	3,189	+1,950	1,061	3,189	+2,128	80.9%	67.9%
Cycling	2	5	+3	2	5	+3	0.1%	0.1%
Park and Ride	153	457	+304	131	457	+326	10.0%	9.7%
Kiss and Ride	92	246	+154	79	246	+167	6.0%	5.2%
Bus	46	802	+756	39	802	+763	3.0%	17.1%
Total	1,532	4,700		1,312	4,700		100.0%	100.0%

Source: Transport for NSW and extrapolated data

8.5.2 Integration with Walking Network

Table 8.7 shows a total increase in demand of 1,950 entries and 2,128 exits for Metro passengers walking to the station. The growth in passenger demand would increase the need for accessibility in the area surrounding the station.

Pedestrian crossings are proposed at Hurlstone Park Station. The unpaid concourse area and adjacent pavements provide connections between the station and the pedestrian crossings at Crinan Street and Duntroon Street.

Whilst the pedestrian volumes to and from the station are set to rise by over 4,000 people per day, the adjacent footpaths provide adequate capacity for these volumes. Flows of approximately 7,500 pedestrians per hour can be accommodated within the proposed unpaid plaza and adjacent Crinan Street Overbridge. It is considered that the footpath network in the area would be able to cater for the increased pedestrian flows associated from the project.

8.5.3 Integration with Cycle Network

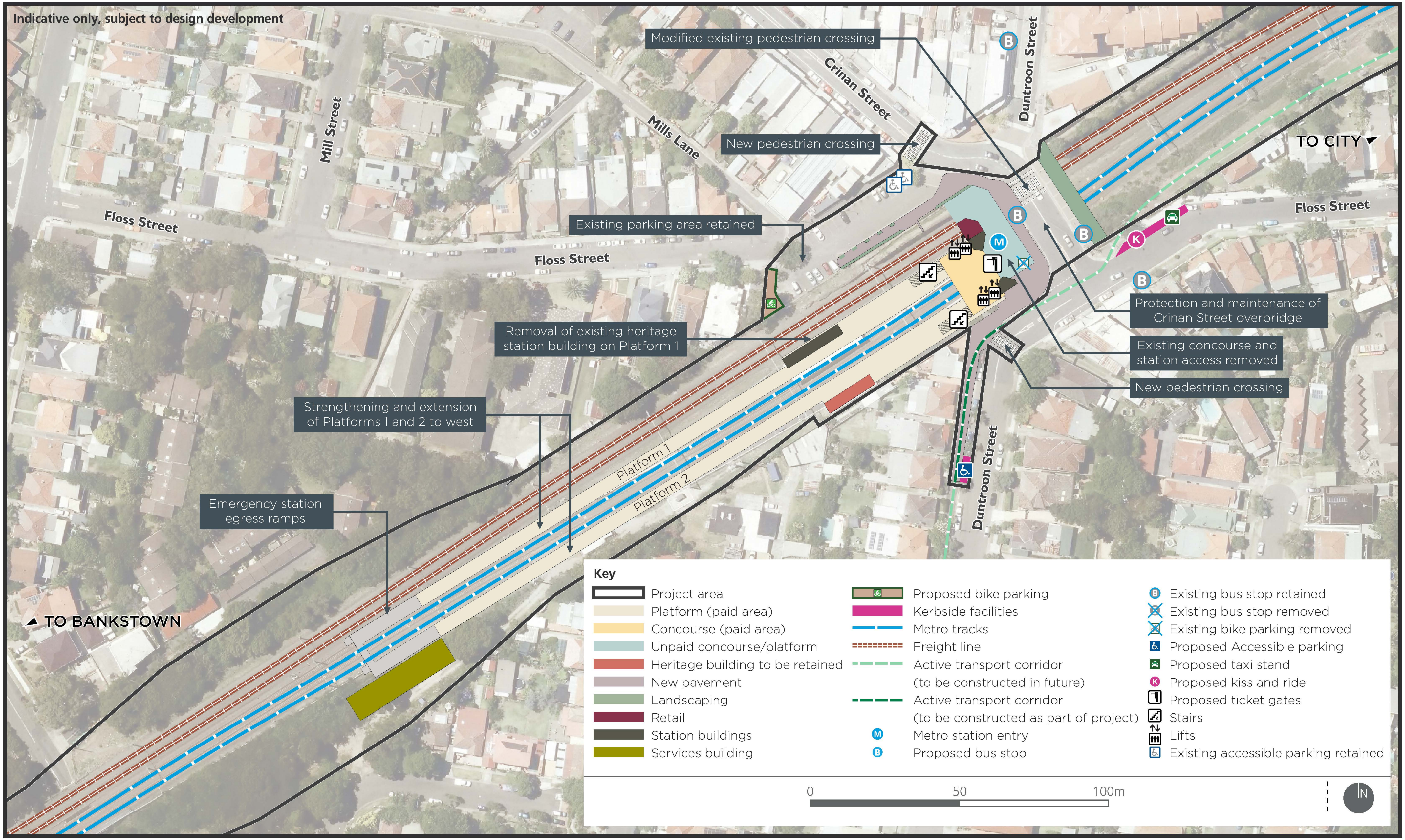
There are currently 12 bike parking spaces located at the entry of Hurlstone Park Station. It is proposed to provide around 60 bike parking spaces at this station, some of which would be secure. It is proposed that the bike parking facilities would be provided north of the station, west of the station entrance (**Figure 8.7**). These facilities can be access from the existing cycle route on Crinan street, via Floss Street.

8.5.4 Integration with Buses

Table 8.7 shows a total increase in demand of 756 entries and 763 exits for Metro passengers busing to the station.

Hurlstone Park is serviced by two bus routes that provide access to surrounding suburbs including Five Dock, Burwood, Mascot and Bondi Junction. These bus routes stop on the Crinan Street Overbridge which provides access to Hurlstone Park Station. The location of this bus stop is not proposed to change, however the unpaid concourse and kerb buildout improves the sight line issues from the station to the bus stop and the pedestrian crossing.

The northbound and southbound stops are both visible from the station entry. The northbound stop is 50m from the gate line and the southbound stop is just over 100m from the gate line. For the southbound stop, seating would be provided on the route to the station where practicable to enhance accessibility.



Hurlstone Park Station interchange plan

FIGURE 8.7

8.5.5 Integration with Road Network

Park and Ride and Kiss and Ride currently account for 16% of the modal share collectively. **Table 8.7** shows an increase in demand for park and ride passenger entries of 304 and 326 exits. There is also an increase in demand for kiss and ride passenger entries of 154 and 167 exits.

There are currently no taxi spaces at Hurlstone Park Station. One bay is to be added on Floss Street. This taxi bay would displace an unrestricted on-street parking space.

There are no existing kiss and ride spaces. Two bays are proposed on Floss Street adjacent to the southern entry, replacing unrestricted on-street parking. The Kiss and Ride bays are clearly visible from the southern entry.

The 10% of Metro passengers who drive to Hurlstone Park Station and park their car use one of the 1135 unrestricted car parks or the 73 on street time restricted car parks (AECOM 2016). These car parks are currently operating at 53% and 74% utilisation respectively. This provides spare on street capacity for the further 304 passengers that are expected to drive to the station by 2026, assuming population growth and intensification do not provide a further demand for these spaces.

There are currently two accessible parking bays in the Floss Street carpark and one accessible bay on Duntroon Street. None of these parking bays have an accessible path to the station entry. One untimed accessible bay would be provided on Duntroon Street adjacent to the southern entry adjacent to a footpath providing a clear accessible path of travel to the station entry.

It is not anticipated that loading zones would be impacted by the project design.

8.6 Canterbury Station

The Canterbury Station interchange plan is provided in **Figure 8.8**.

8.6.1 Metro Patronage and Access Mode to Station

The current and future travel modes to/from the station per day for Canterbury Station are shown in **Table 8.8**. These mode share increases are discussed in the relevant sections following.

Table 8.8 Current and future volumes of travel to/from Canterbury Station

Travel Mode to the Station	Entry			Exit			Mode Share 2016	Mode Share 2026
	2016	2026	Change	2016	2026	Change		
Walking	2,033	4,710	+2,677	1,814	4,710	+2,896	83.8%	66.3%
Cycling	5	14	+9	5	14	+9	0.2%	0.2%
Park and Ride	218	718	+500	194	718	+524	9.0%	10.1%
Kiss and Ride	97	745	+648	86	745	+659	4.0%	10.5%
Bus	73	913	+840	65	913	+848	3.0%	12.9%
Total	2,426	7,100		2,164	7,100		100.0%	100.0%

Source: Transport for NSW and extrapolated data

8.6.2 Integration with Walking Network

Table 8.8 shows a total increase in demand of 2,677 entries and 2,896 exits for Metro passengers walking to the station. The growth in passenger demand would increase the need for accessibility in the area surrounding the station.

Accessibility to bus infrastructure, taxi bays, Kiss and Ride bays and accessible parking bays would be improved in the area by providing paths and constructing infrastructure closer to the station. Two new entrances on, Broughton Street and Canterbury Road would provide connections to surrounding residential areas and interchange areas, replacing the current entrance on the corner of Canterbury Road and Broughton Street. The design also provides for the future provision of a further entrance on Charles Street.

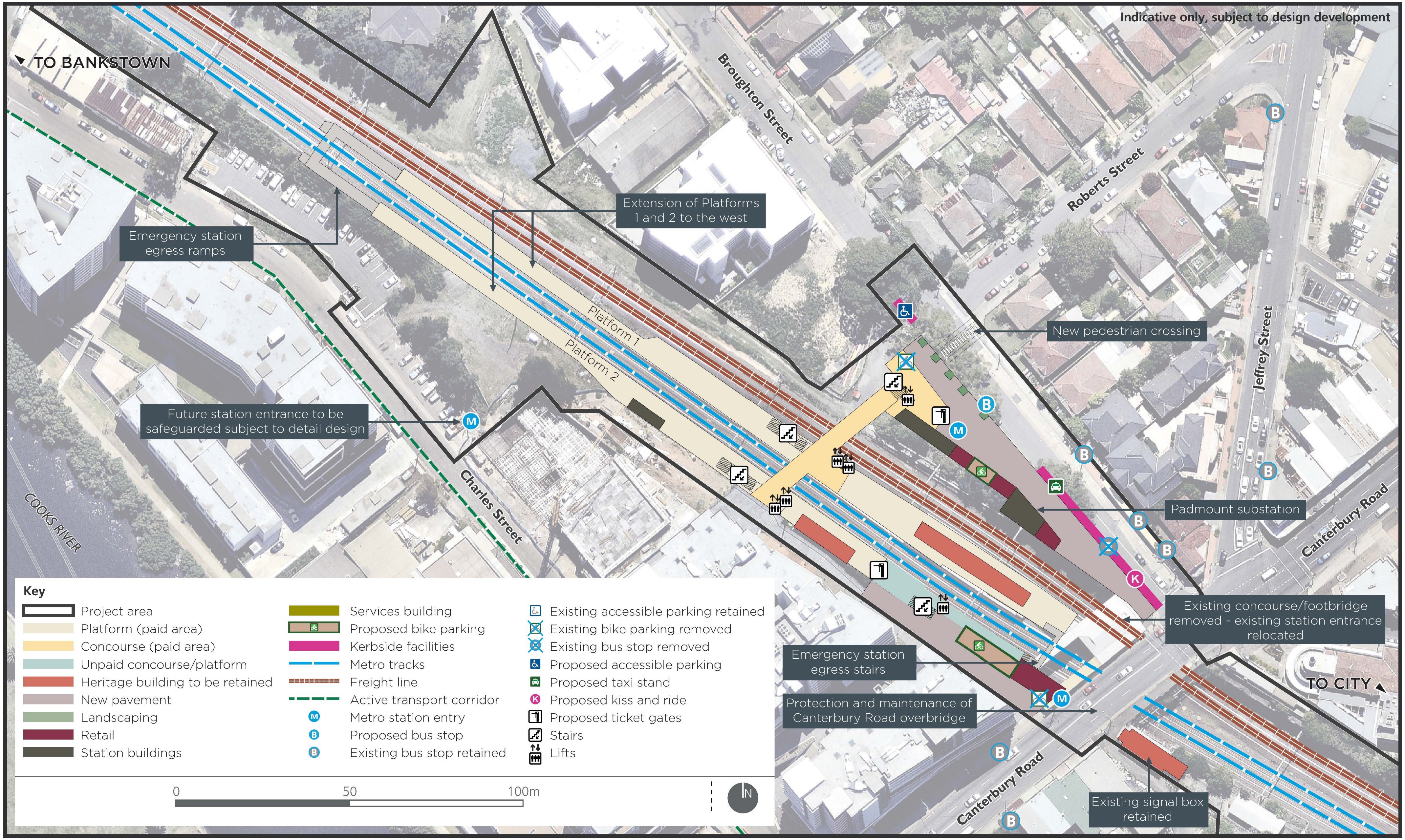
A signalised intersection at Broughton Street – Canterbury Road provides pedestrian access to the station. A pedestrian crossing is proposed on Broughton Street in line with the concourse.

Whilst the pedestrian volumes to and from the station are set to rise by over 5,500 people per day, the adjacent footpaths provide adequate capacity for these volumes. Flows of up to 9,000 pedestrians per hour can be accommodated on the footpaths immediately adjacent to the station exits on Canterbury Road Overbridge and Broughton Street. As the distance from the station increases, the pedestrian volumes would become more disperse.

The signalised crossing at Broughton Street / Jeffrey Street would provide a potential constraint to the flows as pedestrians heading north from the station would need to wait for the pedestrian phase. However the expected pedestrian demand would be well below the footpath capacity and it is considered that the footpath network in the area, including the new pavement area to be installed, would be able to cater for the increased pedestrian flows associated form the project.

8.6.3 Integration with Cycle Network

There are currently four bike parking spaces in a shed at Canterbury Station. It is proposed to increase this provision with the addition of approximately 60 spaces, some of which would be secure. Facilities can be accessed from the existing cycle route on Broughton Street. Cyclists using the existing cycle route along Crooks River can access bike parking facilities via Canterbury Road.



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Canterbury Station interchange plan

FIGURE 8.8

8.6.4 Integration with Buses

Table 8.8 shows a total increase in demand of 840 entries 848 exits for Metro passengers busing to the station.

Canterbury Station is serviced by a number of bus routes, including high frequency routes from Sydney CBD, Campsie and Hurstville. Routes 428, L28 and 487 stop on Broughton Street, and routes 415, 444, 445 and 491 stop on Canterbury Road. The northbound bus stop on Broughton Street is proposed to be relocated closer to the station exit. No changes are proposed to the other bus stops.

The Broughton Street bus stops would have an accessible path to the northern station entry. These stops are between 20m and 100m from the central concourse gate line, conform to the system requirements. The stops would be visible from the northern station entrance only.

The Canterbury Road bus stops would also now have an accessible path to the station. The stops are approximately 180m from the central concourse gate line which exceeds the system requirements by 80m. For both stops, seating would be provided on the route to the station where practicable to enhance accessibility.

8.6.5 Integration with Road Network

Park and Ride and Kiss and Ride currently account for 13% of the modal share collectively. **Table 8.8** shows an increase in demand for Park and Ride passenger entries of 500 and 524 exits. There is also an increase in demand for Kiss and Ride passenger entries of 648 and 659 exits.

There are currently no taxi bays at Canterbury Station. The proposed design includes three taxi spaces on Broughton Street and one space on Charles Street. The bays would be clearly visible and accessible from the station.

Canterbury Station does not have any Kiss and Ride facilities. The proposed design includes approximately four spaces on Broughton Street and two spaces on Charles Street. The bays would be clearly visible and accessible from the station.

The 9% of Metro passengers who drive to Canterbury Station and park their cars use one of 704 unrestricted carparks or the 145 time restricted carparks (AECOM 2016). These carparks are currently operating at 64% and 90% capacity respectively. This provides spare on street capacity for the further 500 passengers that are expected to drive to the station by 2026, assuming population growth and intensification do not provide a further demand for these spaces.

It is not anticipated that loading zones would be impacted by the project design.

8.7 Campsie Station

The Campsie Station interchange plan is provided in **Figure 8.9**.

8.7.1 Metro Patronage and Access Mode to Station

The current and future travel modes to/from the station per day for Campsie Station are shown in **Table 8.9**. These mode share increases are discussed in the relevant sections below.

Table 8.9 Current and future volumes of travel to/from Campsie Station

Travel Mode to the Station	Entry			Exit			Mode Share 2016	Mode Share 2026
	2016	2026	Change	2016	2026	Change		
Walking	5,969	6,942	+973	5,825	6,942	+1,117	72.5%	64.9%
Cycling	28	32	+4	28	32	4	0.3%	0.3%
Park and Ride	747	1,090	+343	729	1,090	+361	9.1%	10.2%
Kiss and Ride	912	769	-143	890	769	-121	11.1%	7.2%
Bus	581	1,867	+1,286	567	1,867	+1,300	7.1%	17.5%
Total	8,237	10,700		8,039	10,700		100.0%	100.0%

Source: Transport for NSW and extrapolated data

8.7.2 Integration with Walking Network

Table 8.9 shows a total increase in demand of 973 entries and 1,117 exits for Metro passengers walking to the station. The existing pedestrian facilities and proposed upgrades to Campsie Station address a number of the accessibility issues.

The new shared zone on Lillian Lane between Beamish Street and Dewar Street would improve pedestrian and cyclist amenity and safety. The proposed widening of the public domain/plaza at the station entry between South and North Parade, and the retention of the at-grade station entry on Beamish Street with an additional (lift and stair) entry on North Parade, would improve accessibility and provide more direct, safe routes to the station for passengers. The station would be easily seen from the town centre and pedestrian focussed infrastructure would contribute to the pedestrian amenity of surrounding streets.

Whilst the pedestrian volumes to and from the station are set to rise by just over 2,000 people per day, the adjacent footpaths provide adequate capacity for these volumes. Flows of approximately 7,000 pedestrians per hour can be accommodated on the footpaths immediately adjacent to the station exit on Beamish Street.

The signalised crossing at Beamish Street / South Parade would provide a potential constraint to the flows as pedestrians heading south from the station would need to wait for the pedestrian phase, however the expected demand would be well below capacity. It is considered that the footpath network in the area would therefore be able to cater for the increased pedestrian flows associated from the project.

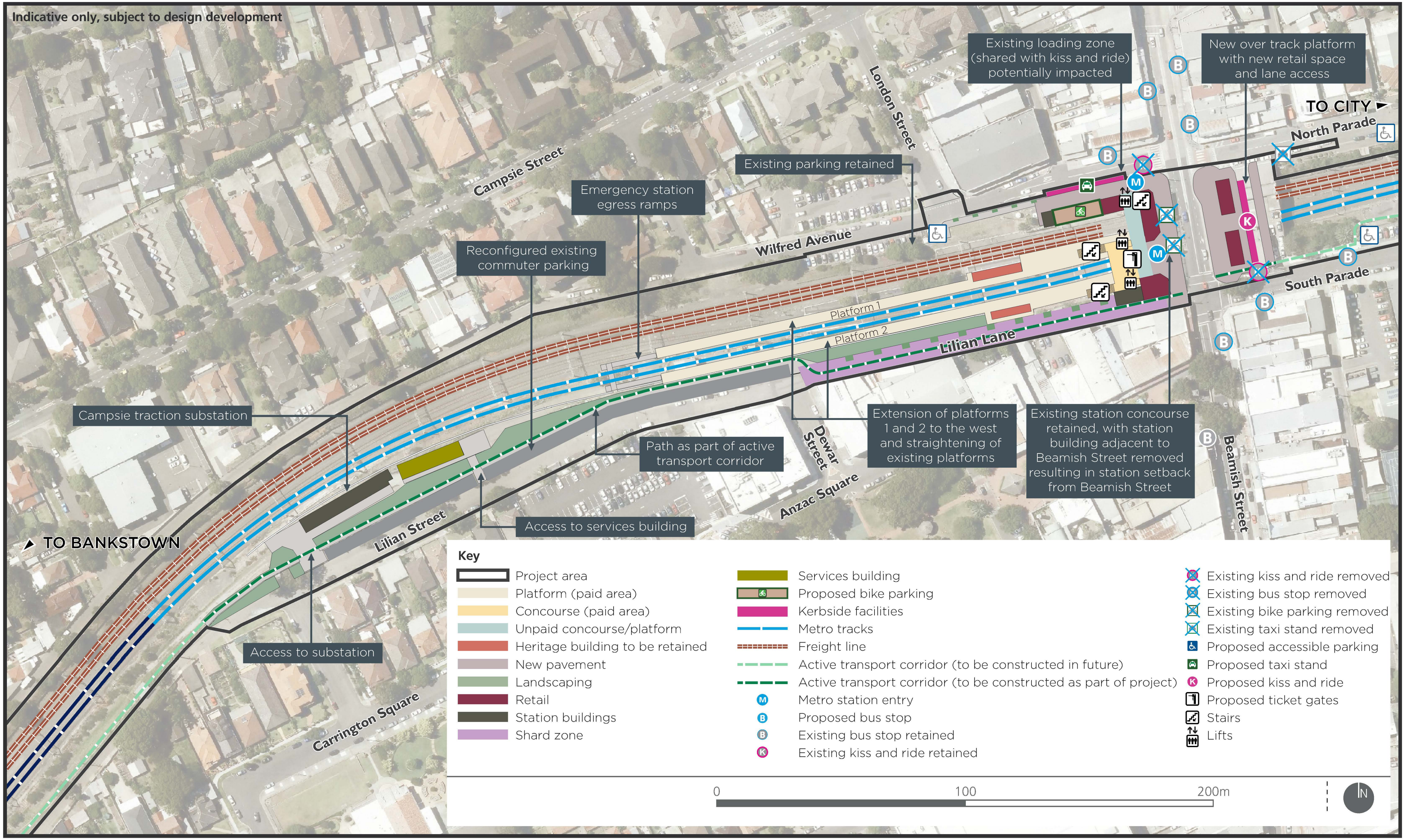
8.7.3 Integration with Cycle Network

There are currently ten bike parking spaces at Campsie Station. It is proposed that this provision would be increased to around 80 spaces, some of which would be secure spaces. It is proposed that the bike parking facilities would be provided north of the station, west of the station entrance (Figure 8.9). There are no existing cycle routes adjacent to Campsie station. Cyclists using existing routes on Campsie Street and Evaline Street can access the station via Beamish Street.

8.7.4 Integration with Buses

Table 8.9 shows a total increase in demand of 1,286 entries and 1,300 exits for Metro passengers busing to the station.

Bus routes 400, 412, 415, 444, 445, 473, 487, 490, and 492 services the Campsie precinct, arriving approximately every 15 minutes in peak periods (Sydney Buses 2016). These routes provide connections to Macquarie Park.



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Campsie Station interchange plan

FIGURE 8.9

The bus stop arrangements would remain in the same locations (**Figure 8.9**).

The bus stops on South Parade and Beamish Street, south of the station have accessible paths of travel to the station entry.

The bus stops on North Parade, on the western side of Beamish Street, north of the station, would have accessible paths of travel to the station entry as a result of the additional lift from the station concourse to North Parade. The stop on the eastern side of Beamish Street has an indirect accessible path due to the lack of a Beamish Street crossing immediately north of the station.

All bus stops are generally visible from the public domain on Beamish Street or North Parade at station entries. South of the station: South Parade bus stops are between 95m and 120m from the gate line while the southbound Beamish Street stop is 95m from the gate line and north bound stop approximately 110m.

North of the station: North Parade bus stop is 85m from the gate line, northbound Beamish Street stop 100m and the southbound stop approximately 170m. For both stops, opportunities to provide seating would be considered in detail design where practicable to enhance accessibility.

8.7.5 Integration with Road Network

Park and Ride and Kiss and Ride currently account for a fifth of the modal share collectively. **Table 8.9** shows an increase in demand for Park and Ride passenger entries of 343 and 361 exits. There is also a decrease in demand for Kiss and Ride passenger entries of 143 and exits of 121.

A number of changes have been incorporated into the proposed station design to address the issues of increased road traffic and increased demand for pick up / drop off facilities.

The current one signalised crossing for South Parade and two on Beamish Street are retained. Pedestrian crossings on North Parade would also be retained.

The taxi spaces on North Parade (east) are to be relocated to North Parade (west). The taxi bays would be adjacent and visible to the North Parade station entry and more prominent being only 10m from the entry.

Currently, the station has two five minute bays on North Parade and two five minute bays on South Parade as Kiss and Ride facilities. The proposed design would relocate these bays to provide approximately 5-6 Kiss and Ride Bays in a one-way northbound service lane on the eastern side of Beamish Street. These bays have a direct, accessible path of travel to and from the station and are 50m from the station entry.

Campsie Station currently has four parking areas. The 9% of Metro passengers who drive to the station and park their cars use one of the 1045 on-street car parks and 494 off-street car parks (AECOM 2016). These car parks are currently operating at 85% and 100% utilisation respectively. A dedicated off-street commuter parking area for approximately 80 cars is proposed, although this is subject to design resolution in relation to drainage infrastructure, services and sub-station buildings. There is also expected to be loss of 20 on-street car parks. This provides spare on street capacity for the further 343 passengers that are expected to drive to the station by 2026, assuming population growth and intensification do not provide a further demand for these spaces.

The two existing accessible parking bays on North Parade and the two off-street car parks on South Parade have accessible paths of travel from them to station entries. Two bays on North Parade only have an indirect accessible path due to the lack of a Beamish Street crossing immediately north of the station. These six accessible bays are proposed to remain.

There is one loading zone on North Parade, west of Beamish Street, which may be impacted by the new proposed kerbside facilities (taxi zone). This impact would be confirmed and mitigated as part of the detailed design of the project. A potential outcome could be to relocate the loading bay slightly east or west of the proposed taxi zone, or during detailed design refine the extent of the taxi bay to avoid impacts on this zone.

8.8 Belmore Station

The Belmore Station interchange plan is provided in **Figure 8.10**.

8.8.1 Metro Patronage and Access Mode to Station

The current and future travel modes to/from the station per day for Belmore Station are shown in **Table 8.10**. These mode share increases are discussed in the relevant sections following.

Table 8.10 Current and future volumes of travel to/from Belmore Station

Travel Mode to the Station	Entry			Exit			Mode Share 2016	Mode Share 2026
	2016	2026	Change	2016	2026	Change		
Walking	1,952	4,150	+2,198	1,837	4,150	+2,313	64.5%	63.8%
Cycling	4	7	+3	4	7	+3	0.1%	0.1%
Park and Ride	641	1,121	+480	603	1,121	+518	21.2%	17.2%
Kiss and Ride	336	582	+246	316	582	+266	11.1%	9.0%
Bus	92	641	+549	87	641	+554	3.0%	9.9%
Total	3,025	6,500		2,847	6,500		100.0%	100.0%

Source: Transport for NSW and extrapolated data

8.8.2 Integration with Walking Network

Table 8.10 shows a total increase in demand of 2,198 entries and 2,313 exits for Metro passengers walking to the station. The growth in passenger demand would increase the need for an accessible pedestrian environment.

Tobruk Avenue/ Bridge Road/ Burwood Road intersection would be upgraded to be a signalised intersection, including works to improve footpaths. This would improve accessibility and provide more direct, safe routes to the station for passengers. The shared zone and plaza on Tobruk Avenue would provide a clear legible entry to the station easily visible for pedestrians from Burwood Road.

An additional station entry would be included on the northern side of the station, into the existing dedicated commuter car park to improve accessibility and movement to the station in this area.

Whilst the pedestrian volumes to and from the station are set to rise by nearly 4,500 people per day, the adjacent improved footpaths and station plaza provide adequate capacity for these volumes. Flows of some 8,000 pedestrians per hour would be accommodated on the footpaths immediately adjacent to the station exits on Burwood Road Overbridge. The expected demand would be well below capacity and as a result the footpath network in the area would be able to cater for the increased pedestrian flows associated form the project.

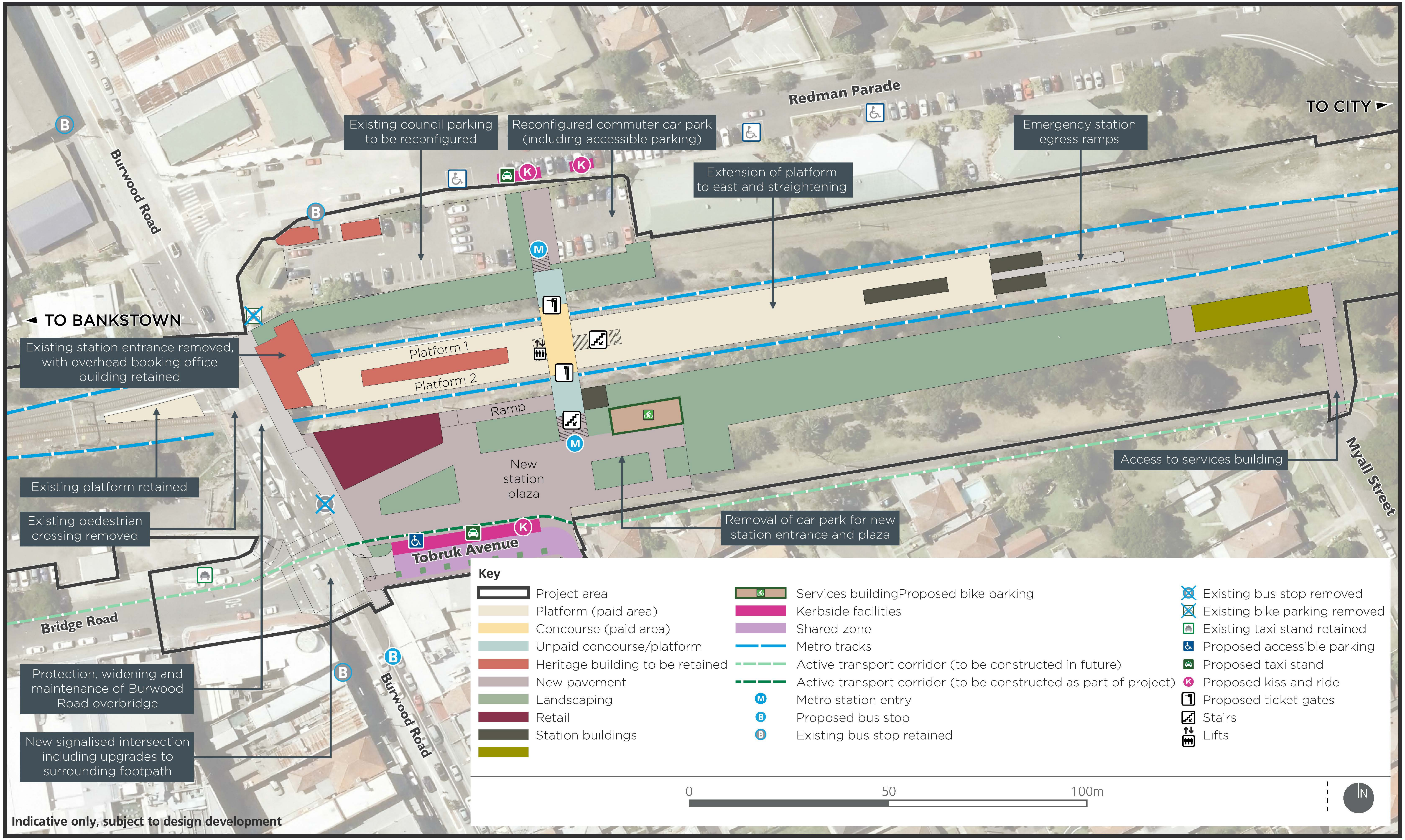
8.8.3 Integration with Cycle Network

There are currently five bike parking spaces at Belmore Station. It is proposed to increase this provision by approximately 60 additional spaces, some of which would be secure spaces. It is proposed that the bike parking facilities would be provided in the new station plaza south of the station (**Figure 8.10**). These facilities can be accessed from the existing cycle route on Bridge Road.

8.8.4 Integration with Buses

Table 8.10 shows a total increase in demand of 549 entries and 554 exits for Metro passengers travelling by bus to the station.

Bus routes 415 and 942 service the Belmore precinct, arriving approximately every 30 minutes (Sydney Buses 2016). These routes connect the precinct to Haberfield, Burwood, Strathfield, Campsie and Roselands.



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Belmore Station interchange plan

FIGURE 8.10

The southbound stop (routes 415 and 942) on Burwood Road would be moved south of Tobruk Avenue on the departure side of the proposed signalised intersection. There would be no change to the northbound stop. Bus stops would be visible from the southern station plaza but not from the station entry. The northbound and southbound bus stops would be approximately 150m from the Metro gate line and would have accessible paths to connect the stops to the station entry. For both stops, seating would be provided on the route to the station where practicable to enhance accessibility.

8.8.5 Integration with Road Network

Park and Ride and Kiss and Ride currently account for almost a third (32%) of the modal share collectively. **Table 8.10** shows an increase in demand for Park and Ride passenger entries of 480 and 518 exits. There is also an increase in demand for Kiss and Ride passenger entries of 246 and 266 exits.

Changes including the full signalisation of the intersection of Tobruk Avenue/ Bridge Road/ Burwood Road have been incorporated into the proposed station design to address the issues of increased road traffic.

Currently there are four Taxi spaces on Bridge Road immediately west of Burwood Road. It is proposed that these spaces be retained however; they may be affected by changes to Bridge/Burwood Road intersection when the detailed design occurs. One additional bay would be provided on Tobruk Avenue. This new bay would be visible and accessible from the station entry; at a distance of 60m.

Currently, the station has no Kiss and Ride parking facilities. The proposed design would provide four bays on Tobruk Avenue. Kiss and ride bays would be visible and accessible from the station. These Kiss and Ride bays would be approximately 60m from the station entry. Further new kerbside facilities would be provided outside the new station entrance to the north, on Redman Parade, including a taxi bay and Kiss and Ride facilities. These facilities would require alterations to the layout of on-street parking, and are therefore subject to further discussion with Council in order to minimise the potential impacts on parking.

The project would affect the existing council car park located off Tobruk Avenue, with a total of 48 spaces lost permanently lost as a result of the projectThis car park is timed and primarily services the retail area located along Burwood Road. The loss of these spaces are considered to be offset by capacity in surrounding streets with only about 80 per cent of spaces within 400 metres of the station utilised currently. This includes about 14 per cent of on-street timed parking in the vicinity of the station which would assist in offsetting the loss of the timed spaces within the car park.

Belmore Station currently has four parking areas. The 21% of Metro passengers who drive to the station and park their cars use one of the 914 on-street unrestricted car parks, 164 on-street time restricted car parks, 63 off-street unrestricted car parks, or one of the 79 off-street time restricted car parks (AECOM 2016). These car parks are currently operating at 75%, 84%, 82% and 100% utilisation respectively. This provides spare on street capacity for the further 480 passengers that are expected to drive to the station by 2026, assuming population growth and intensification do not provide a further demand for these spaces.

One accessible parking bay is proposed on Tobruk Avenue. It is not anticipated that loading zones would be impacted by the project design.

8.9 Lakemba Station

The Lakemba Station interchange plan is provided in **Figure 8.11**.

8.9.1 Metro Patronage and Access Mode to Station

The current and future travel modes to/from the station per day for Lakemba Station are shown in **Table 8.11**. These mode share increases are discussed in the relevant sections following.

Table 8.11 Current and future volumes of travel to/from Lakemba Station

Travel Mode to the Station	Entry			Exit			Mode Share 2016	Mode Share 2026
	2016	2026	Change	2016	2026	Change		
Walking	3,103	4,980	+1,877	2,979	4,980	+2,001	72.1%	67.3%
Cycling	8	15	+7	8	15	+7	0.2%	0.2%
Park and Ride	638	1,357	+719	612	1,357	+745	14.8%	18.3%
Kiss and Ride	425	534	+109	408	534	+126	9.9%	7.2%
Bus	128	514	+386	123	514	+391	3.0%	6.9%
Total	4,302	7,400		4,130	7,400		100.0%	100.0%

Source: Transport for NSW and extrapolated data

8.9.2 Integration with Walking Network

Table 8.11 shows a total increase in demand of 1,877 entries and 2,001 exits for Metro passengers walking to the station. The growth in passenger demand would increase the need for accessibility. The existing pedestrian facilities and proposed upgrades to Lakemba Station address a number of the issue of accessibility.

The current pedestrian crossing facilities are sufficient for safe crossing of pedestrians. However, improved permeability, re-grading and reconstruction of the southern plaza as part of the project would improve accessibility and provide more direct, safe routes to the station for passengers. An Opal card would be required to cross the concourse from The Boulevarde to Railway Parade. Whilst the pedestrian volumes to and from the station are set to rise by just over 3,800 people per day, the adjacent footpaths provide adequate capacity for these volumes. Flows of up to 13,000 pedestrians per hour can be accommodated on the footpaths immediately adjacent to the station exits on The Boulevarde and Railway Parade.

The signalised crossing at Haldon Street / The Boulevarde would provide a potential constraint to the flows as pedestrians heading south from the station would need to wait for the pedestrian phase; however the expected demand would be well below capacity. It considered that the footpath network in the area would be able to cater for the increased pedestrian flows associated form the project.

8.9.3 Integration with Cycle Network

There are currently eight bike parking spaces at Lakemba Station. It is proposed to increase bike parking capacity with approximately 60 additional spaces, some of which would be secure spaces. It is proposed that the bike parking facilities would be provided on either side of the station (**Figure 8.11**). Facilities to the south of the station can be accessed from the existing cycle route on The Boulevard.

8.9.4 Integration with Buses

Table 8.11 shows a total increase in demand of 386 entries and 391 exits for Metro passengers travelling by bus to the station.

Bus routes 450, 942, and 946 service the Lakemba precinct, arriving approximately every 15 minutes in peak periods (Sydney Buses 2016). Frequent services are provided to Roselands, Greenacre, Bankstown, Hurstville, Burwood and Strathfield.

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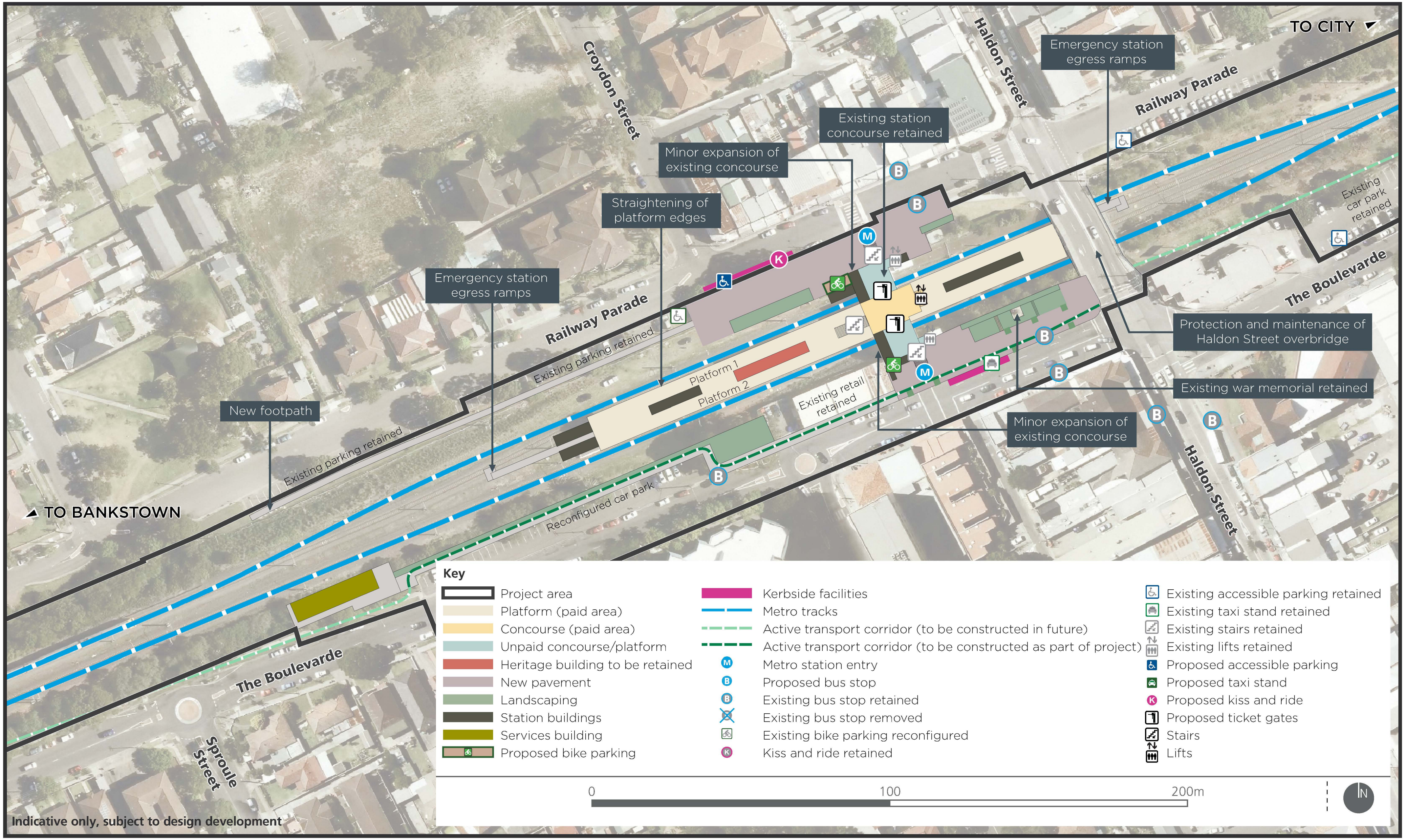

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Lakemba Station interchange plan

FIGURE 8.11

The Railway Parade (northern side) does not have an accessible path from the station entry. The Railway Parade (southern side) and The Boulevarde bus stops would be directly visible from the station plazas and entries. Accessible paths would connect the station entries to these bus stops. The Boulevarde (S14 stop) would be 50m from Metro gate line; Railway Parade bus stops (942 westbound) would be 40m from the Metro gateline; Haldon Street northbound bus stops (450, 946) would be 115m form the Metro gate line and Haldon Street southbound bus stops (450, 946) would be 140m from the Metro gate line. Where stops are more than 60m from the gatelines, seating would be provided on the route to the station where practicable to enhance accessibility.

8.9.5 Integration with Road Network

Park and Ride and Kiss and Ride currently account for a quarter of the modal share collectively. **Table 8.11** shows an increase in demand for Park and Ride passenger entries of 719 and 745 exits. There is also an increase in demand for Kiss and Ride passenger entries of 109 and 126 exits.

It is proposed that three Kiss and Ride spaces on Railway Parade, directly next to a new pavement area, would be provided as part of the project.

There are currently three signalised crossings for pedestrians to cross The Boulevarde and one on Haldon Street. In addition two pedestrian crossings on Railway Parade, one on Haldon Street, and one on Quigg Street North provide access to the footpath network around the station. The current pedestrian crossings are sufficient and no changes are proposed for the station.

Currently there are three taxi spaces on The Boulevarde. These spaces would be retained. The taxi facilities would be visible and accessible from the station entrance.

Lakemba Station currently has four parking areas. The 15% of Metro passengers who drive to the station and park their cars use one of the 775 on-street unrestricted car parks, 186 on-street time restricted car parks, 190 off-street unrestricted car parks, or one of the 347 off-street time restricted car parks (AECOM 2016). These car parks are currently operating at 86%, 83%, 100% and 77% utilisation respectively. This provides spare on street capacity for the further 719 passengers that are expected to drive to the station by 2026, assuming population growth and intensification do not provide a further demand for these spaces.

There are currently two existing accessible bays on Railway Parade, east of Haldon Street and two bays west of Haldon Street. However, neither location has an accessible path. There are two further bays off-street on The Boulevarde, east of Haldon Street. One additional accessible bay is proposed in Railway Parade adjacent to the Kiss and Ride spaces.

It is not anticipated that loading zones would be impacted by the project design.

8.10 Wiley Park Station

The Wiley Park Station interchange plan is provided in **Figure 8.12**.

8.10.1 Metro Patronage and Access Mode to Station

The current and future travel modes to/from the station per day for Wiley Park Station are shown in **Table 8.12.** These mode shares are discussed in the sections that follow.

Table 8.12 Current and future volumes of travel to/from Wiley Park Station

Travel Mode to the Station	Entry			Exit			Mode Share 2016	Mode Share 2026
	2016	2026	Change	2016	2026	Change		
Walking	1,800	4,440	+2,640	1,620	4,440	+2,820	89.7%	77.9%
Cycling	6	17	+11	6	17	+11	0.3%	0.3%
Park and Ride	120	534	+414	108	534	+426	6.0%	9.4%
Kiss and Ride	80	655	+575	72	655	+583	4.0%	11.5%
Bus	0	53	+53	0	53	+53	0.0%	0.9%
Total	2,006	5,700		1,806	5,700		100.0%	100.0%

Source: Transport for NSW and extrapolated data

8.10.2 Integration with Walking Network

Table 8.12 shows a total increase in demand of 2,640 entries and 2820 exits for Metro passengers walking to the station. The existing pedestrian facilities and proposed upgrades to Wiley Park Station address a number of the issue of accessibility.

Improved permeability at the station entry, including through the secondary entries south to The Boulevarde and north to Stanlea Parade which would provide direct access to the aerial concourse, would improve accessibility and provide more direct routes to the station for pedestrians.

Whilst the pedestrian volumes to and from the station are set to rise by over 5,400 people per day, the adjacent footpaths provide adequate capacity for these volumes. Flows of up to 5,000 pedestrians per hour can be accommodated on the footpath immediately adjacent to the station exit on King Georges Road.

The signalised crossing at The Boulevarde / King Georges Road would provide a potential constraint to the flows as pedestrians heading south from the station would need to wait for the pedestrian phase which may reduce the available footpath width due to crowding at certain times. However the expected demand would be well below the capacity and so it is considered that the footpath network in the area would be able to cater for the increased pedestrian flows associated form the project.

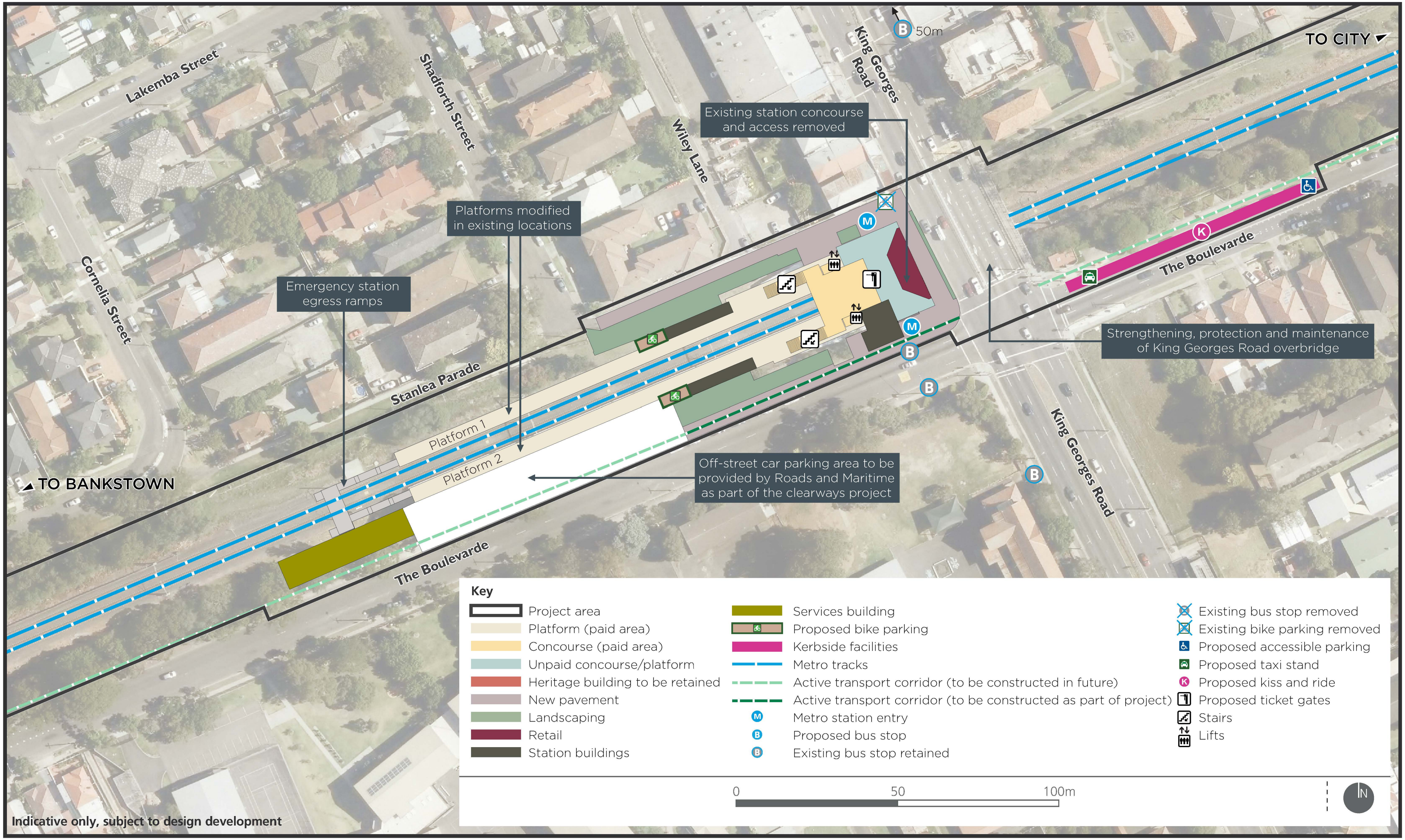
8.10.3 Integration with Cycle Network

Four bike parking spaces are provided at Wiley Park Station. It is proposed to increase this provision with approximately 30 additional spaces, some of which would be secure spaces. The bike parking facilities would be provided at platform level. These facilities can be accessed from the existing cycle route on The Boulevard and the south entrance.

8.10.4 Integration with Buses

Wiley Park is serviced by two local bus routes that provide access to Campsie, Roselands and Riverwood. Although bus route 942 travels directly past Wiley Park Station and there is a bus stop near the station on King Georges Road, Arup (2015) found that no commuters used the bus to connect to the station.

No changes are to be made to the current bus stop arrangement on The Boulevarde or King Georges Road. The King Georges Road (942) stops are not clearly visible from the station entry but are accessible. The northbound stop is approximately 75m from the station entry; the southbound stop is approximately 160m. For both stops, seating would be provided on the route to the station where practicable to enhance accessibility.



Wiley Park Station interchange plan

FIGURE 8.12

8.10.5 Integration with Road Network

Park and Ride and Kiss and Ride currently account for 10% of the modal share collectively. **Table 8.12** shows an increase in demand for Park and Ride passenger entries of 414 and 426 exits. There is also an increase in demand for Kiss and Ride passenger entries of 575 and 583 exits.

Improved permeability at the station entry with entries south to The Boulevarde and north to Stanlea Parade, both providing direct access to an aerial concourse has been incorporated into the proposed station design to address the issues of increased road traffic and increased demand for pick up / drop off facilities.

There are currently two signalised crossings for pedestrians to cross The Boulevarde and two on King Georges Road. No additional pedestrian crossings are proposed.

Currently there are no Taxi spaces at the Station. One Taxi space would be provided on The Boulevarde east of King Georges Road. The taxi facilities would be accessible from the station entrance but not easily visible.

No Kiss and Ride bays are currently available at the station. The proposed design would provide five spaces on The Boulevarde east of King Georges Road. Kiss and ride bays would be accessible from the station although not easily visible. These Kiss and Ride bays would be approximately 90m from the station entry.

Wiley Park Station currently has no dedicated commuter parking areas. The 6% of Metro passengers who drive to the station and park their cars use one of the 693 on-street unrestricted car parks, 28 on-street time restricted car parks, or one of the 25 off-street unrestricted car parks (AECOM 2016). These car parks are currently operating at 64%, 32%, and 60% utilisation respectively. This provides spare on street capacity for the further 414 passengers that are expected to drive to the station by 2026, assuming population growth and intensification do not provide a further demand for these spaces.

It is proposed to provide one accessible bay on The Boulevarde, east of King Georges Road.It is not anticipated that loading zones would be impacted by the project design.

8.11 Punchbowl Station

The Punchbowl Station interchange plan is provided in **Figure 8.13**.

8.11.1 Metro Patronage and Access Mode to Station

The current and future travel modes to/from the station per day for Punchbowl Station are shown in **Table 8.13**. These mode share increases are discussed in the relevant sections following.

Table 8.13 Current and future volumes of travel to/from Punchbowl Station

Travel Mode to the Station	Entry			Exit			Mode Share 2016	Mode Share 2026
	2016	2026	Change	2016	2026	Change		
Walking	1,645	3,612	+1,967	1,573	3,612	+2,039	56.1%	55.6%
Cycling	3	7	+4	3	7	+4	0.1%	0.1%
Park and Ride	688	1,089	+401	658	1,089	+431	23.4%	16.8%
Kiss and Ride	509	991	+482	486	991	+505	17.3%	15.2%
Bus	90	801	+711	86	801	+715	3.1%	12.3%
Total	2,935	6,500		2,806	6,500		100.0%	100.0%

Source: Transport for NSW and extrapolated data

8.11.2 Integration with Walking Network

Table 8.13 shows a total increase in demand of 1,967 entries and 2,039 exits for Metro passengers walking to the station. The growth in passenger demand increases the need for accessible pedestrian links.

There are a number of improvements as part of the project including a new path connection and new pedestrian crossing on Punchbowl Road, an accessible ramp and path connection to Urunga Parade, relocated concourse and new entry plazas. These upgrades would improve accessibility and station legibility and provide more direct routes to the station for passengers from the nearby town centre and residential areas.

Whilst the pedestrian volumes to and from the station are set to rise by just over 4,000 people per day, the adjacent footpaths provide adequate capacity for these volumes. Flows of over 11,000 pedestrians per hour can be accommodated on the multiple footpaths which radiate from both sides of the station on Punchbowl Road (via pedestrian bridge) and The Boulevarde. Demand would be well below the footpath capacity and it is considered that the footpath network in the area would be well able to cater for the increased pedestrian flows expected.

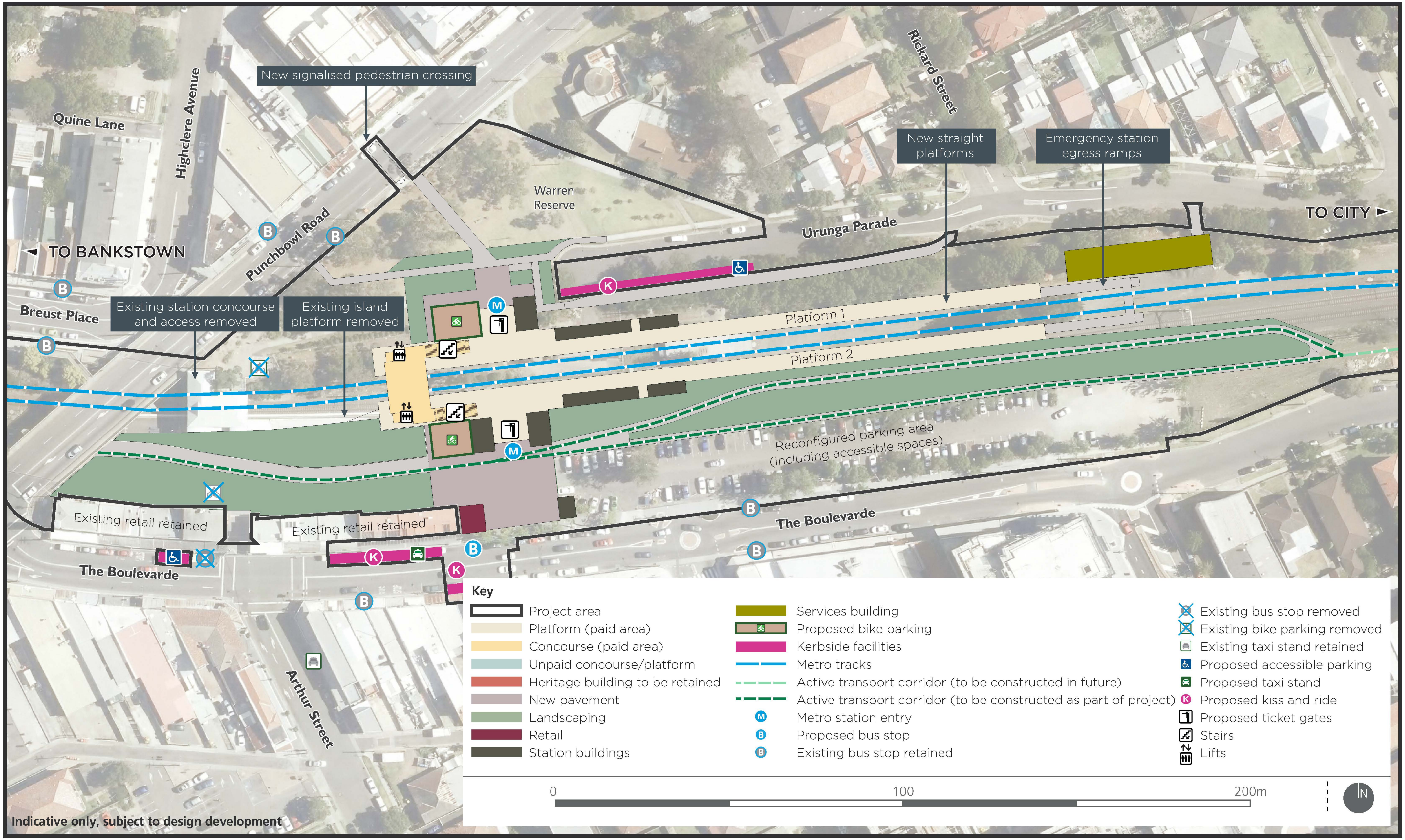
8.11.3 Integration with Cycle Network

There are currently 12 bike parking spaces at Punchbowl Station. It is proposed that this provision would be increased with approximately 60 additional spaces, some of which would be secure spaces. It is proposed that the bike parking facilities would be provided in the two station plazas, north and south of the station (**Figure 8.13**). These facilities can be accessed from the existing cycle route on The Boulevarde to the south and Urunga Parade to the north.

8.11.4 Integration with Buses

Table 8.13 shows a total increase in demand of 711 entries and 715 exits for Metro passengers travelling by bus to the station.

Bus routes 487, 940, 941, 944, and S14 service the Punchbowl precinct, arriving approximately every 20 minutes in peak periods (Sydney Buses 2016). These routes connect Punchbowl to Bankstown, Roselands, Riverwood and Hurstville.



Punchbowl Station interchange plan

FIGURE 8.13

Only one change is proposed to be made to the current bus stop arrangement which involves the eastbound bus stop on The Boulevarde which is proposed to be moved slightly east to align it with the new station plaza. The stops would be visible from the southern station plaza and the station entry. Punchbowl Road stops would not necessarily be clearly visible from the northern station entry, requiring wayfinding signage which would be provided. Accessible paths of travel to bus stops from the station entry would be available. Bus stops on Punchbowl Road are between 65m and 115m from the Metro gate line and the bus stops on The Boulevarde are 38m and 130m from the Metro gate line. For both stops, seating would be provided on the route to the station where practicable to enhance accessibility.

8.11.5 Integration with Road Network

Park and Ride and Kiss and Ride currently account for 40% of the modal share collectively. **Table 8.13** shows an increase in demand for Park and Ride passenger entries of 401 and 431 exits. There is also an increase in demand for Kiss and Ride passenger entries of 482 and 505 exits.

A number of changes have been incorporated into the proposed station design to address the issues of increased road traffic and increased demand for pick up / drop off facilities.

There are currently three signalised crossings for pedestrians to cross The Boulevarde and one on Punchbowl Road. There is an additional signalised crossing proposed on Punchbowl Road closer to the station than the existing crossing.

Two existing Taxi spaces on Arthur Street would be retained at Punchbowl Station. An additional Taxi space would be provided on The Boulevarde. The taxi facilities would be accessible from the southern station entrance but not visible.

No Kiss and Ride bays are currently available at the station. The proposed design would provide additional spaces on The Boulevarde and Urunga Parade. The spaces on The Boulevarde would be visible from the southern station plaza. None of the spaces on Urunga Parade would be clearly visible from the station entry and therefore wayfinding signs would be needed. Accessible paths of travel to all bays would be available.

Punchbowl Station currently has four car parking areas. The 23% of Metro passengers who drive to the station and park their cars use one of the 626 on-street unrestricted car parks, 212 on-street time restricted car parks, 197 off-street unrestricted car parks, or one of the 88 off-street time restricted car parks (AECOM 2016). These car parks are currently operating at 79%, 78%, 100%, and 100% utilisation respectively. This provides spare on street capacity for the further 401 passengers that are expected to drive to the station by 2026, assuming population growth and intensification do not provide a further demand for these spaces.

It is proposed to provide two accessible bays on Urunga Parade and one bay on The Boulevarde.

It is not anticipated that loading zones would be impacted by the project design.

8.12 Bankstown Station

The Bankstown Station interchange plan is provided in **Figure 8.14**.

8.12.1 Metro Patronage and Access Mode to Station

The current and future travel modes to/from the station per day for Bankstown Station are shown in **Table 8.14**. These mode share increases are discussed in the relevant sections following.

Table 8.14 Current and future volumes of travel to/from Bankstown Station

Travel Mode to the Station	Entry			Exit			Mode Share 2016	Mode Share 2026
	2016	2026	Change	2016	2026	Change		
Walking	4,444	6,041	+1,597	4,621	6,041	+1,420	49.4%	50.8%
Cycling	13	18	+5	13	18	+5	0.1%	0.2%
Park and Ride	1,361	754	-607	1,415	754	-661	15.1%	6.3%
Kiss and Ride	1,724	1,751	+27	1,792	1,751	-41	19.2%	14.7%
Bus	1,451	3,337	+1,886	1,509	3,337	+1,828	16.1%	28.0%
Total	8,993	11,900		9,350	11,900		100.0%	100.0%

Source: Transport for NSW and extrapolated data

8.12.2 Integration with Walking Network

Table 8.14 shows a total increase in demand of 1,597 entries and 1,420 exits for Metro passengers walking to the station. The existing pedestrian facilities and proposed upgrades to Bankstown Station address a number of the issue of accessibility.

An introduction of a secondary concourse to the east with separate gate lines to Sydney Metro and Sydney trains platforms, in addition to the modifications and extension to existing southern and northern plazas to create new station entries, would improve accessibility and provide more direct routes to the station for passengers.

Whilst the pedestrian volumes to and from the station are set to rise by nearly 3,000 people per day, the wide footpaths adjacent to the station provide adequate capacity for these volumes. Flows of up to 16,000 pedestrians per hour can be accommodated on the footpaths immediately adjacent to the station exits.

It is considered that the footpath network in the area would be able to cater for the increased pedestrian flows associated form the project. To facilitate movement there are currently five signalised crossings for pedestrians on South Terrace and two on North Terrace. There is also a pedestrian crossing on Bankstown City Plaza and one on North Terrace.

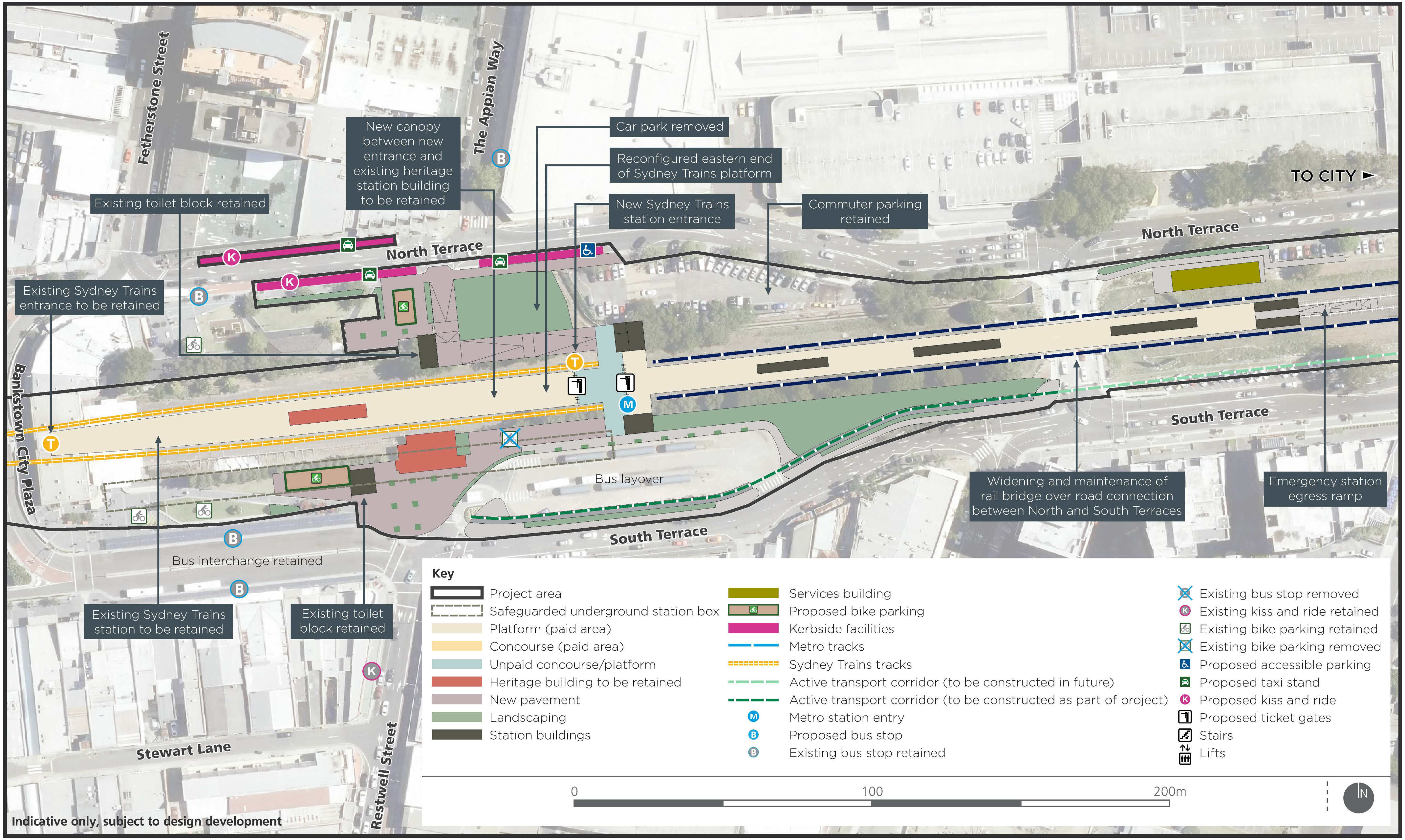
8.12.3 Integration with Cycle Network

There are currently 32 bike parking spaces at Bankstown Station. It is proposed to increase this provision with approximately 70 additional spaces, some of which would be secure spaces. It is proposed that the bike parking facilities would be provided in the two station plazas, north and south of the station entrances (**Figure 8.14**). These facilities can be accessed from the existing cycle route on South Terrace to the south and North Terrace to the north.

8.12.4 Integration with Buses

Table 8.14 shows a total increase in demand of 1,886 entries and 1,828 exits for Metro passengers travelling by bus to the station.

Bus routes 907, 908, 909, 911, 913, 922, 923, 924, 925, 926, 945, 962, M90, M91, and M92 service the Bankstown precinct, arriving approximately every ten minutes in peak periods (Sydney Buses 2016). Bankstown is serviced by a large number of buses as it is the main hub for buses serving the station on the Bankstown Line. These bus routes connect Bankstown to Parramatta, Lidcombe, Burwood, Liverpool, Fairfield, Hurstville and Sutherland.



Sydney METRO | city & southwest

Bankstown Station interchange plan

FIGURE 8.14

No changes are proposed to the arrangement of bus stops. The current bus stops on South Terrace are between 120m and 200m from the Metro gate line and the current bus stop on North Terrace is 180m from the Metro gate line. There are accessible paths of travel to all bus stops. For both stops, seating would be provided on the route to the station where practicable to enhance accessibility. The South Terrace interchange would be visible from the southern station approach ramp and plaza, if not from the gate line. The North Terrace bus stop would be less visible from the station approach ramp, plaza and gate line.

8.12.5 Integration with Road Network

Park and Ride and Kiss and Ride currently account for 34% of the modal share collectively. **Table 8.14** shows a decrease in demand for Park and Ride passenger entries of 607 and for exits of 661. There is also an increase in demand for Kiss and Ride passenger entries of 27 and a decrease for passenger exits of 41.

A number of changes have been incorporated into the proposed station design to address the issues of increased road traffic and increased demand for pick up / drop off facilities.

There are currently five signalised crossings for pedestrians on South Terrace and two on North Terrace. There is currently a pedestrian crossing on Bankstown City Plaza and one on North Terrace.

Ten existing Taxi spaces would be retained and provided at Bankstown. The taxi facilities would be easily and visible accessible from the station entrance.

Four Kiss and Ride bays are currently available on North Terrace. The proposed design would increase the number of spaces to approximately 13. These Kiss and Ride bays would be easily and visibly accessible from the Station entrance.

Bankstown Station currently has four car parking areas. The 15% of Metro passengers who drive to the station and park their cars use one of the 58 on-street unrestricted car parks, 530 on-street time restricted car parks, 20 off-street unrestricted car parks, or one of the 1088 off-street time restricted car parks (AECOM 2016). These car parks are currently operating at 98%, 93%, 100%, and 100% utilisation respectively.

The car parking area adjacent to the station would probably require reconstruction following use as a construction compound, and this could result in approximately 15% loss of parking spaces (12 spaces). With the reduction in demand of 607 passengers expected to drive to the station by 2026, there is sufficient spare capacity at Bankstown Station, assuming population growth and intensification do not provide a further demand for these spaces.

Approximately one additional accessible bay is proposed on North Terrace.

It is not anticipated that loading zones would be impacted by the project design.

9.0 Mitigation Measures

9.1 Introduction

This chapter outlines the potential mitigation measures for the construction or operational phase of the project. Recognising the very different impacts between the temporary nature of the predominantly traffic based construction phase assessed in Chapter 5 and Chapter 6, and the multi-modal long term effects assessed in Chapter 8, this Mitigation Chapter considers these separately.

As described in previous chapters the specific construction mitigations would be developed as the details of the construction methodology and program evolve prior to, and during the construction phase. This chapter contains a suite of potential complementary mitigations that would be deployed following the more detailed assessment of the impacts as part of the development of the Construction Traffic Management Plans (CTMPs) when greater detail of the mode share during possessions is available.

9.2 Construction

Consideration of the construction haulage traffic, specifically the haulage of materials, shows that across all of the stations and intersections modelled, there is only one intersection which is forecast to become oversaturated as a result of the construction haulage traffic, and in that case, it is by a relatively small degree. In reality changes in commuter behaviour would potentially lead to the delays being managed (people travelling earlier or later, avoiding peak periods etc.) without the need for specific mitigation over and above basic communications.

However, the assessment undertaken in Chapters 5 and 6 addressing the impacts of the diversions to facilitate bridge works, and during the periods of the 'possessions' to allow station and track upgrades to be undertaken, shows that these activities would potentially lead to some more significant delays.

In order to support the mitigation of the temporary suspension of the rail services to current train users during construction, TfNSW has developed a Temporary Transport Strategy (TTS) to provide an overarching framework for Temporary Transport Plans (TTP) for the multi – modal transport network which would operate during each possession of the Bankstown line. This is provided in **Appendix E** and discussed further below.

9.2.1 Temporary Transport Strategy

The TTS is an overarching document that outlines how Sydney Metro would plan and deliver an integrated, multi-modal transport network during possession periods to allow the upgrade of the stations to Metro standards and to improve accessibility. A Temporary Transport Plan (TTP), or a suite of TTPs would be developed for each possession. Each TTP would define the initiatives that would be implemented for that possession.

Each TTP would consider the following initiatives:

Temporary Rail Services

- providing additional train services on the parallel rail lines to the north (T2 South and Inner West Line), and the south (T2 Airport Line) of the Bankstown Line to accommodate anticipated increases in demand
- providing altered train services on the sections of the Bankstown Line that are not being converted to Metro operations (west of Bankstown to Lidcombe and Liverpool, and from Sydenham east to the Sydney CBD).

Temporary Bus Services

- providing temporary bus services that travel along the Bankstown Line which offer optimised stopping patterns to serve customer needs, which may be different to existing train stopping patterns

- providing temporary bus services between Bankstown Line stations and stations on other rail lines, to provide faster travel times
- considering potential additional stops for temporary bus services (i.e. in addition to railway stations) as a means of improving customer access to the temporary bus services
- providing additional frequency on regular bus routes which may offer customers a more attractive alternative to the temporary bus services
- providing specialised services for customers with impaired mobility who may not be able to use the temporary bus services.

Supporting Infrastructure

- providing bus stops, shelters and seating for customers waiting to catch temporary bus services. Stops would be designed to be safe, accessible and well-lit. Shelters could either be temporary or permanent, depending on the location
- identifying improvements to the station facilities on the other rail lines that Bankstown Line customers may be diverted to
- identifying and implementing bus priority measures to improve travel times for temporary bus services
- identifying and implementing road network improvements to mitigate increased road network demand, such as adjustments to traffic signals.

Walking and Cycling

- identifying and implementing walking and cycling connectivity and amenity improvements along the Bankstown Line to support temporary bus services
- identifying and implementing walking and cycling improvements at stations on other rail lines to enhance customer experience connecting to alternate train services at unfamiliar locations
- improving bicycle parking facilities at stations on other rail lines to retain existing customers and attract new customers who choose cycling to access rail stations
- identifying measures that encourage affected customers to cycle and walk as an alternative means of commuting.

Customer Engagement and Information

- working with stakeholders including Councils and community organisations to better understand and communicate with our different types of customers, including those with special needs or from non-English speaking backgrounds
- developing and delivering comprehensive customer information and notifications before and during the possessions
- providing wayfinding and information signage at affected stations and TTP bus stops to assist customers to use temporary transport services provided
- supporting travel demand management initiatives, such as encouraging car-pooling for customers who choose to drive instead of using the other modes available.

9.2.2 Temporary Transport Plan Assessment

For the purposes of assessment, a Baseline TTP and a Refined Baseline TTP have been developed. The Baseline TTP closely emulates the rail replacement services that are provided during scheduled weekend possessions which occur several times each year to enable maintenance works (refer **Section 4.4).** On the other hand, the Refined Baseline TTP includes a reduced number of buses (and changes to potential service patterns) in recognition of the potential impact of the complimentary measures set out above.

The TTP assessment found that the combination of construction haulage traffic and Baseline TTP and Refined Baseline TTP services led to over saturation of some intersections resulting in poor performance (LoS E and F). While the lower bus numbers associated with the Refined Baseline TTP helped to reduce the impacts, it was generally insufficient to significantly improve intersection performance. The intersections forecast to experience poor performance in the Refined Baseline TTP assessment are identified in **Table 5.50**.

The five worst performing intersections were identified and mitigation measures were tested. The outcomes of this are displayed in **Table 9.1**

Table 9.1 Intersection Mitigation Summary

Intersection	Mitigation Measure Tested	Outcome
Marrickville Road / Victoria Road	Changes to traffic signal phasing	AM peak performance remains at LoS F PM Peak performance increased to LoS D. Further options such as increasing the cycle time are available to improve the AM Peak performance.
Wardell Road / Ewart Street	Reconfiguration of and designations and changing traffic signal phasing.	AM and PM Peak performance increased to LoS D.
Marrickville Road / Wardell Road	Reconfiguration of approach lanes and lane designations and changes to traffic signal phasing.	AM Peak performance increased to LoS D PM Peak performance increased to LoS C
Burwood Road / Bridge Road	Banning the through and right turn movement from Bridge Road west *or* Early implementation of the signalled intersection that would be provided for the operational phase.	The AM and PM Peak performance remains at LoS F (as in the existing situation and TTP assessment). The degree of saturation and vehicle delays are significantly reduced. The AM and PM intersection performance would be LoS B and C respectively under the refined TTS scenario.
Burwood Road / Lakemba Street	Reconfiguration of lanes and lane designations and changes to traffic signal phase times. Removal of two parking spaces on Lakemba Street west to allow more vehicles to queue without impacting right turning vehicles.	AM and PM peak performance increased to LoS B
Haldon Street / Railway Parade	Signalisation of the intersection.	The intersection performance would be improved to a level which is significantly better than the existing situation. AM Peak performance increased to LoS B PM Peak performance increased to LoS A

9.2.3 Construction Mitigation

Travel Demand Management

One of the key opportunities for mitigating the impacts of the project would be to manage the traffic demand on the road network. This approach is known as Travel Demand Management (TDM). A TDM campaign informs the public of works and then their anticipated effect on the transport network, and highlights the opportunities for those travellers with flexibility to travel earlier or later than the peak to reduce their travel time. As a result of this spreading of the peak period, there is a reduction in the demand, and therefore delays at the height of the main peak period.

A TDM approach would also typically include measures to support the use of alternate modes of travel to the private car, including walking, cycling and public transport where appropriate. In this case the modal aspect of the TDM would be focussed on supporting existing train passengers to make use of other modes, including those rail replacement bus services detailed in the TTP, to walk and cycle to stations on alternate lines or to use scheduled bus services.

Mitigation measures

Mitigation measures to avoid, reduce and manage the potential impacts are identified in **Table 9.2**. These have been developed with the aim of minimising impacts where practicable to the travelling public by providing alternative travel options, prompt and up to date information, management of construction workforce travel and construction haulage routes, incident management and regular auditing of performance of the measures proposed. In line with the TfNSW modal hierarchy careful consideration has been given to safeguarding access for pedestrians and cyclists during bridge closures, route diversions and in the vicinity of worksites.

Table 9.2 Recommended mitigation measures during construction

Reference	Recommended Mitigation Measures	Applicable location (s)
1	Ongoing consultation would be carried out (as relevant) with Roads and Maritime Services, Sydney Trains, NSW Trains, local councils, emergency services and bus operators for the duration of the construction period.	All stations, worksites, construction haulage routes and TTS routes
2	Temporary Transport Plans (TTP) would be developed in accordance with the Temporary Transport Strategy (TTS) for the T3 Bankstown Line possession periods. As described in detail in **Section 9.2.1** each TTP would include consideration of the following: • provision of temporary bus services to help to transport displaced passengers • increasing the frequency of existing bus services at specific locations • improving cycle facilities at stations on other lines • potential road network enhancements and/or bus interchange improvements to support temporary bus service operations • reviewing the facilities and commuter parking at stations on other lines that customers may need to use. The performance of each TTP would be reviewed on a regular basis to enable continuous improvement.	All stations and extended to include Sydenham Station, Regents Park Station, Lidcombe Station, Birrong Station and Yagoona Station

Reference	Recommended Mitigation Measures	Applicable location (s)
3	Possession periods would where practicable be scheduled during school break periods when the road network is less busy. This would be a priority for the following bridges where lower levels of background network demand during school break periods would help to mitigate the impacts of closures: • Charlotte Avenue Underbridge • Illawarra Road Overbridge • Burwood Road Overbridge • Haldon Street Overbridge • King Georges Road Overbridge • Stacey Street Overbridge. The durations of all indicative closures would be reviewed and refined in consultation with key stakeholders, with additional assessment undertaken as required.	All stations affected by construction as part of this project
4	Adequate wayfinding signage would be provided during implementation of the TTP to facilitate passenger transfers to bus/ train. This would direct and guide passengers to and from temporary bus stops, station entrances, bike racks and storage, taxis, kiss and ride, park and ride facilities etc. Wayfinding would be delivered by a combination of temporary signage and additional staff to provide assistance.	All stations, including Sydenham Station, Regents Park, Lidcombe Station, Birrong Station and Yagoona Station
5	Traffic signals would be optimised to improve intersection performance at locations worst affected by the addition of construction haulage vehicles, TTP buses, diverted traffic or expected traffic growth. Optimisation measures would include: • modifying signal phase times • modifying signal sequences.	Intersections on construction or TTS routes which are identified as being worse than 'LoS E' as assessed in the CTMP's developed in advance of construction
6	Minor intersection upgrades would be considered in the detailed design to improve intersection performance at the locations most affected by the addition of construction haulage vehicles, TTS scenario buses and diverted traffic. These improvements include: • changing lane designations (line markings and signage) • removing parking or implementing no standing zones at peak times to expand lane capacity • minor kerb cut-backs to enable large vehicles to navigate through intersections • restricting specific turning movements where existing volumes are low • signalising intersections.	Intersections on construction haulage or TTS routes

Reference	Recommended Mitigation Measures	Applicable location (s)
7	A construction traffic, transport and access management plan would be prepared as part of the Construction Environmental Management Plan including a detailed list of the measures that would be implemented during construction to minimise the potential impacts on traffic, transport and access. The sub-plan would include consideration of: *Reducing the Impact of Construction Haulage Traffic on the local Road Network* • managing hours of work and deliveries • worker transport and parking • provision of on-site tool storage. *Safe Access and Egress for Construction Haulage Traffic* • road safety audits at construction sites and key locations on construction haulage routes • minimise / eliminate reversing movements into and out of sites. *Efficient Access for Construction Haulage Traffic* • directional signage and line markings in the immediate vicinity of construction sites. *Advising the Public of Potential Disruption* • variable Message Signs on the wider road network to advise of potential delays, traffic diversions, speed restrictions or alternate routes • provision of real-time information on traffic conditions on TTP routes. *Advising of Diversion Routes* • alternative routes developed and signed for pedestrians, cyclists, buses and general traffic for the periods when partial or full bridge closures are in place. The alternative routes would be developed in consultation with key stakeholders. *Bridge Construction Programming* • where feasible, design of the construction program to restrict works from being carried out simultaneously on adjacent bridges. This would reduce the number of traffic diversions required at the same time. The sub-plan would be informed by consultation with relevant organisations such as Sydney Co-ordination Office, Roads and Maritime Services, Sydney Trains, NSW Train Link, RailCorp, Police, taxi operators (as appropriate), emergency services and bus operators.	All stations affected by construction as part of this project

Reference	Recommended Mitigation Measures	Applicable location (s)
8	Construction sites would be managed to minimise the number of construction workers parking on surrounding streets by: • encouraging workers to use public or active transport • encouraging ride sharing • provision of alternative parking locations and shuttle bus transfers where feasible and reasonable.	Project as a whole
9	Minor road improvements would be considered in the detailed design to enable bus operations to occur while diversions are in place for TTS scenarios, construction scenarios and bridge works. These improvements may include: • removing or trimming trees where buses are proposed to operate in the kerbside lanes and trees currently overhang the operating envelope • extended or new clearways by removing on street parking • enabling right turn movements at intersections that currently ban the movement • traffic signal phase changes	Roads and intersections that have traffic diversions or additional buses operating
10	The closure of Illawarra Road, Canterbury Road and Beamish Street during bridge works would be assessed in detail in consultation with Roads and Maritime Services, the Sydney Co-ordination Office and the Inner West and Canterbury-Bankstown Councils to confirm impacts and mitigation measures, with the aim of minimising the impacts of bridge closures.	Illawarra Road, Canterbury Road and Beamish Street
11	Any modifications to existing bus stops and services would be undertaken in consultation with the Sydney Co-ordination Office, Roads and Maritime Services, the Inner West and Canterbury-Bankstown councils, and bus operators. Planning for during partial or full bridge closures would consider bus rerouting and timetabling, with the intention of minimising impacts to bus users.	All stations affected by construction as part of this project
12	The community would be advised in advance of proposed road and pedestrian network changes through appropriate forms of community notification. Information on route changes, delays and incidents would be provided to enable passengers to change travel plans and make alternative arrangements.	All stations, including Sydenham Station, Regents Park, Lidcombe Station, Birrong Station and Yagoona Station
13	In the event of a traffic related incident, co-ordination would be carried out with the Sydney Coordination Office and Transport Management Centre’s Operations Manager.	All stations, Construction haulage routes and TTS routes

Reference	Recommended Mitigation Measures	Applicable location (s)
14	Pedestrian, cyclists and motorist safety in the vicinity of the construction compounds and work sites would be managed by: • use of speed awareness signs in conjunction with Variable Message Signs near construction sites to provide alerts to drivers • manual supervision and /or physical barriers (as appropriate) • community educational events • specific construction driver training to understand route constraints, expectations, safety issues, human error and its relationship with fitness for work, and chain of responsibility duties, and to limit the use of compression braking • use of in vehicle monitoring systems (telematics) to monitor vehicle location and driver behaviour • safety devices on construction haulage vehicles that warn drivers of the presence of a vulnerable road user located in the vehicles' blind spots and warn the vulnerable road user that a vehicle is about to turn. • time restrictions for site vehicle movements near schools where practicable (such as near Wiley Park and Punchbowl stations) to ensure they are not occurring during school start and finish times.	Project as a whole
15	Where existing footpath routes used by pedestrians and / or cyclists are affected by construction, a condition survey would be carried out to confirm that alternative routes are of adequate width, are safe and accessible and are suitable for use (e.g. suitably paved and lit), with any necessary modifications to be carried out in consultation with the relevant local council.	All stations affected by construction as part of this project
16	Where existing cyclist facilities (eg bike parking) would be temporarily unavailable at a station, suitable replacement facilities would be provided for this duration.	All stations affected by construction as part of this project
17	Access to neighbouring properties would be maintained during construction, where possible. Where impacts are identified, consultation would be undertaken with the occupants of neighbouring properties, to confirm their access requirements and to discuss alternatives.	Project as a whole
18	Access to stations and surrounding properties for emergency vehicles would be provided at all times. Emergency service providers (i.e. police and ambulance) would be consulted during construction to ensure they are aware of changes to access including lane, bridge or road closures.	Project as a whole

Reference	Recommended Mitigation Measures	Applicable location (s)
19	Opportunities to reduce the impact on car parking would be reviewed during detailed design and construction planning, and where practicable, construction sites impacting on dedicated commuter parking would be reduced in size during non-possession periods.	All stations affected by construction as part of this project
20	Where existing parking needs to be removed to facilitate construction, alternative parking would be provided wherever feasible and reasonable. This would include consideration of other privately owned (or vacant) land within close proximity to affected stations.	All stations affected by construction as part of this project
21	Specific traffic management plans would be prepared for special events. These would be developed in conjunction with the relevant stakeholders and event organisers and would provide safe and efficient pedestrian, cycle, public transport and traffic flows during occasional events to minimise disruption to the community throughout construction.	All stations, (including Sydenham Station, Regents Park, Lidcombe Station, Birrong Station and Yagoona Station during possession periods)
22	The potential cumulative effects of construction traffic from multiple construction sites, road modifications and rail replacement buses would be further considered during the development of the construction traffic management plan. Where there is potential for cumulative impacts across the project or with other projects, these issues would be addressed by the Traffic and Transport Liaison Group.	Project as a whole

Within Chapter 5 several of the intersections that were assessed to be most likely to result in significant delays had mitigation plans developed and were then retested. These mitigation plans focussed on providing capacity enhancements, as opposed to the Travel Demand Management options that are also outlined in the above tables. As a result of these sample mitigation strategies, it was demonstrated that with realistic temporary mitigation strategies, it was possible to mitigate the effects of the construction and the Refined Baseline TTP.

These demonstrate that whilst the detailed and specific mitigations required would be identified through a detailed assessment of the impacts as part of the preparation of the individual CTMPs, the ‘toolkit’ of measures contained in the table above would enable impacts to be mitigated. The development of the selected mitigations presented in Chapter 5 are evidence of the feasibility of this approach.

9.3 Operational Phase

As identified in Chapter 8, the stations have been designed to integrate with other transport modes, including the following:

- walking and cycling
- rail and bus
- park and ride.

In addition to the measures which have already been applied to the project, mitigation measures to avoid, reduce and manage potential operation traffic and transport effects are identified in **Table 9.3**.

Table 9.3 Recommended mitigation measures during operation

Reference	Recommended Mitigation Measures	Applicable location (s)
23	Regular review and monitoring of existing pedestrian and cycle crossing facilities and connections, and implement safety and amenity related upgrades as required during initial operational years	All stations
24	Review and updating scheduled bus services adjacent to stations as required	All stations
25	Advisory and way finding signage to and from station precincts	All stations
26	Regular review and monitoring of commuter car and bike parking and kiss & ride facilities during the first few operational years, and implementing additional parking facilities / parking management as required	All stations

10.0 Cumulative Project Assessment

An assessment was undertaken of cumulative impacts from major projects being constructed or becoming operational with overlapping areas of influence including TfNSW and RMS major projects and those listed on the DP&E Major Projects Register.

10.1 Sydney Metro City & Southwest, Chatswood to Sydenham

The Chatswood to Sydenham component of the Sydney Metro City & Southwest project is to be constructed at the northern extent of the project. Whilst in operation there would be by definition cumulative impacts from the two components of the one project, the construction periods of the schemes would also overlap with potential cumulative impacts on the local and wider road network.

As previously discussed in Chapter 5**,** the extent of works that would occur in the project area includes both station upgrades and track works to enable the rail line upgrade. Designated construction haulage routes have been nominated to service the entire project area from Marrickville to Bankstown. Following a comparison of the haulage routes of the construction haulage traffic for both components of the Sydney Metro City & Southwest project; the station works for Sydenham Station and the Sydney Metro Trains Facility South were identified as the only sites which could provide cumulative impacts to the Sydenham to Bankstown component.

10.1.1 Construction Haulage Routes

From the indicative project timeline below in **Figure 10.1** below, it can be seen that there would be the potential for sequencing both the station works at Sydenham Station and the tunnel work at Sydney Metro Trains Facility South in parallel with the track and station works for the Sydenham to Bankstown component.

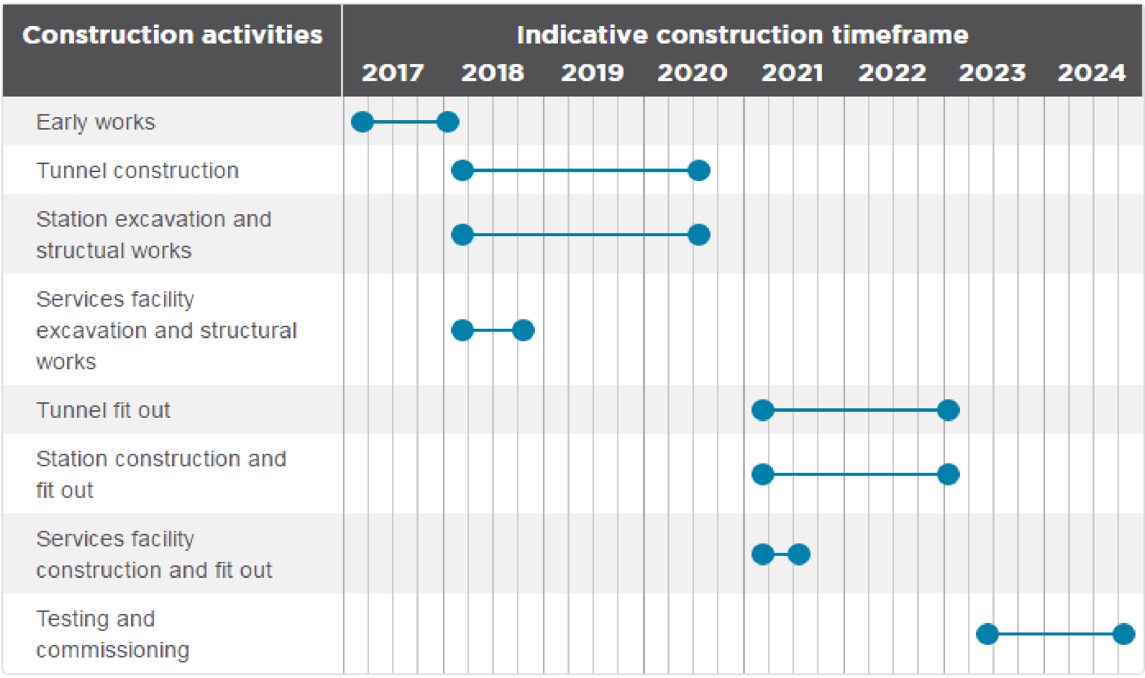
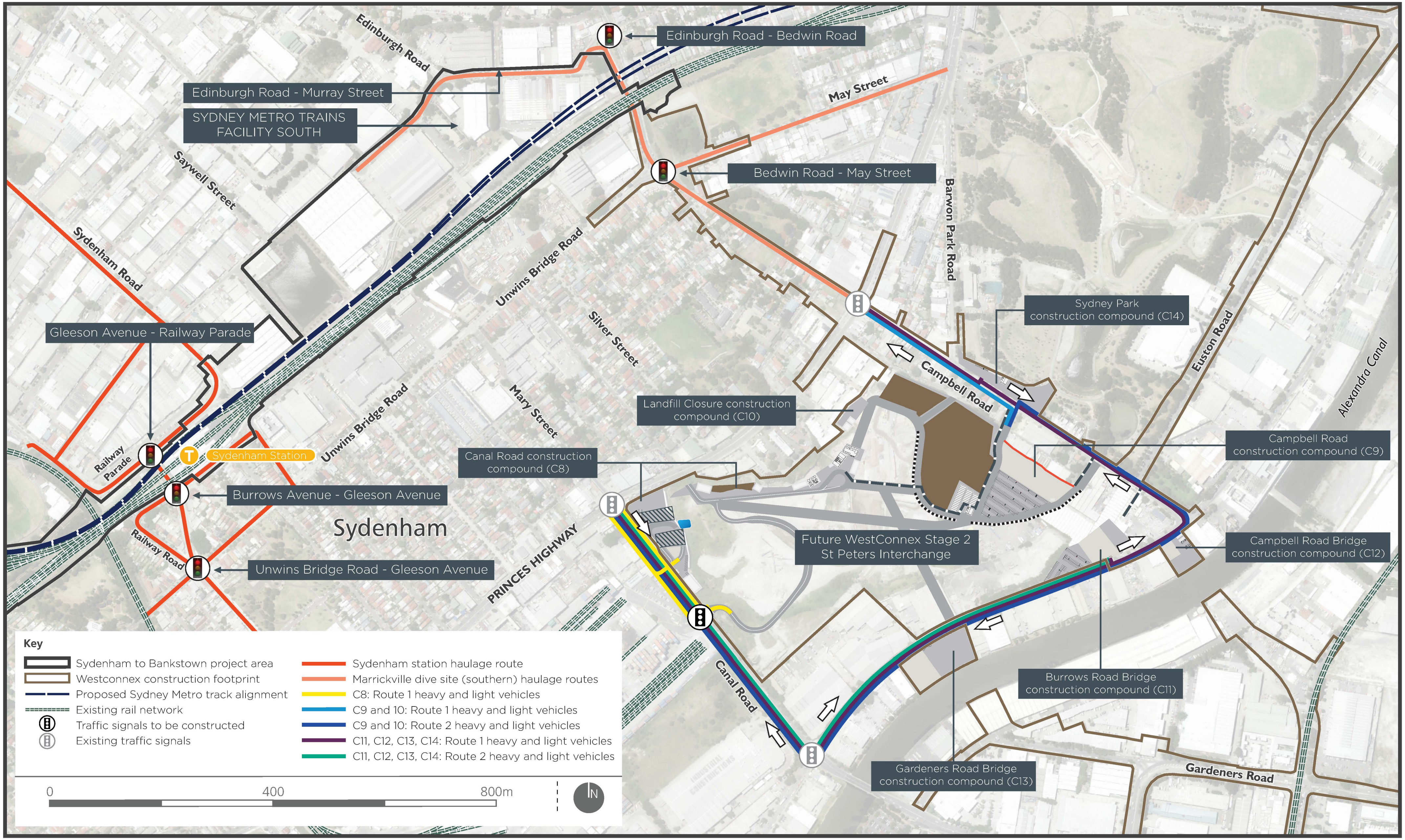


Figure 10.1 Sydney Metro City & Southwest Indicative Project Timeline

However, although the works adjacent to the C2S component are in close proximity to Marrickville Station, the designated construction haulage routes would not impact or overlap between the components. The major east-west movement for Marrickville Station uses Marrickville Road, whereas heavy vehicles at Sydenham Station would use the parallel Sydenham Road. The designated construction haulage routes for the two components are shown in **Figure 10.2** and **Figure 10.3** overleaf.



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WestConnex, Sydenham Station and Marrickville dive site (south) - haulage routes

FIGURE 10.2

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Marrickville Station modelled intersections and heavy vehicle haulage routes

FIGURE 10.3

As can be seen in **Figure 10.2** above, the designated construction haulage routes for the Sydney Metro Trains Facility South do not overlap with those of the Sydenham to Bankstown component either.

As there would be no overlap of haulage routes, there would be no cumulative impacts for the project arising from the track and station works for Sydenham Station and the Sydney Metro trains Facility South.

10.1.2 Temporary Transport Strategy

As discussed above, the upgrade of Sydenham Station and the corresponding track works could occur in parallel with the project. As such, the proposed temporary transport strategy would operate with replacement buses at the same time as the works at Sydenham Station as part of the Chatswood to Sydenham component. As the designated construction haulage routes at Sydenham Station and the TTS routes overlap (as shown in **Figure 10.4** below)**,** it would be expected that there would be a cumulative impact on the project.

The discussion below outlines this cumulative impact of the construction haulage vehicles at the previously assessed intersections at Sydenham Station with the Refined Baseline TTP volumes.

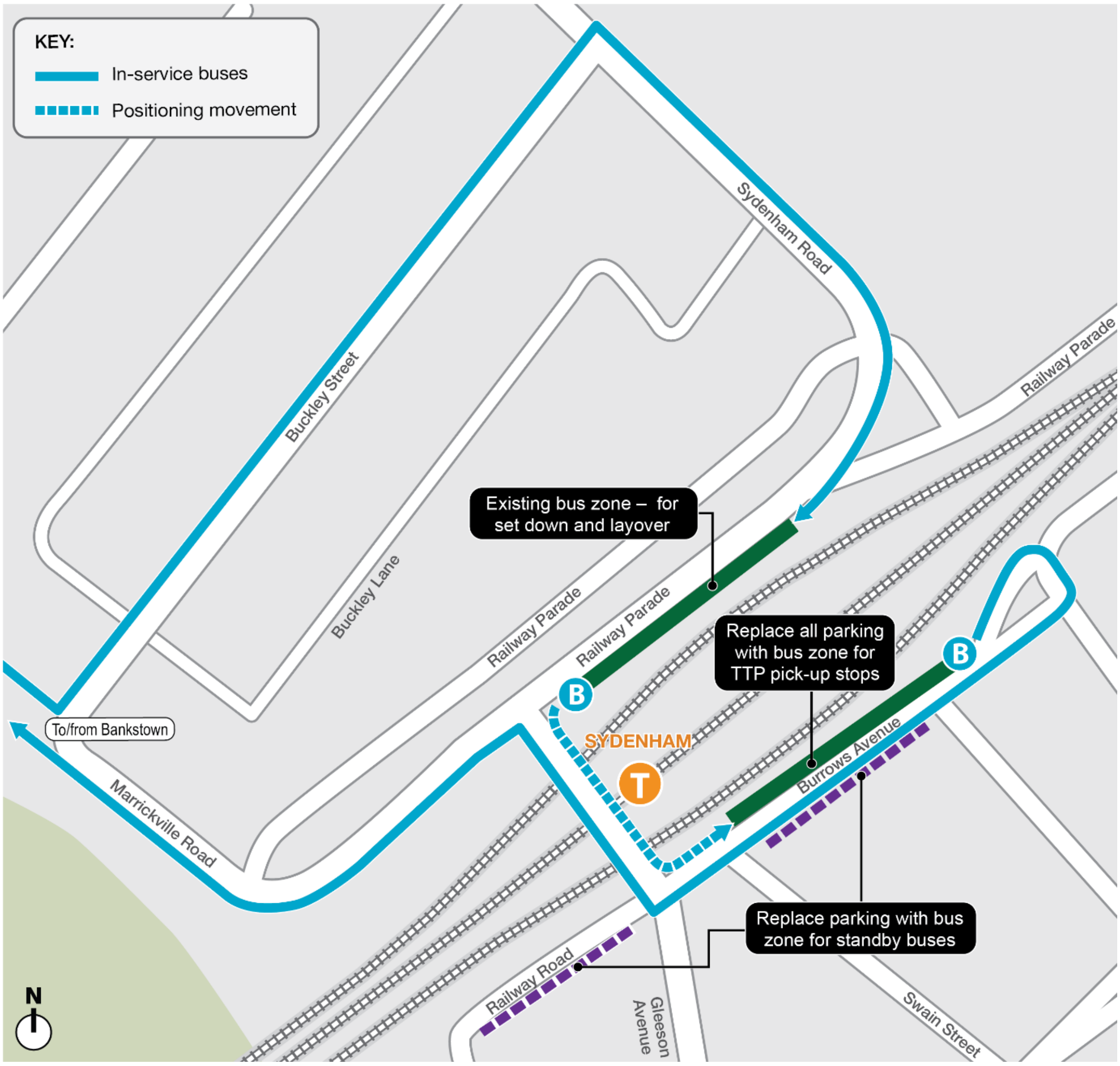


Figure 10.4 Temporary Transport Strategy - Sydenham (Sydney Metro 2016)

Road Network Performance - AM Peak

As can be seen from **Table 10.1** below, the addition of the construction haulage vehicles at Sydenham Station does not have a significant cumulative impact on the Refined Baseline TTP scenario for the key intersections assessed. All intersections maintain their LoS with the addition of the construction haulage vehicles onto the Refined Baseline TTP scenario and there would be no more than four seconds of additional delay which would be observed at the Gleeson Avenue / Unwins Bridge Road intersection.

The intersections do not decrease in amenity with the additional construction haulage vehicles as the additional volumes are low. The additional construction haulage vehicles would add a further 28 movements per hour, being approximately 1% of the background traffic and TTP flows.

Table 10.1 Sydenham Station Intersection Assessment - AM Peak Cumulative Construction Haulage Vehicles

Sydenham Station – AM Peak					
Scenario	**Existing**	**Future**	**Baseline TTP**	**Refined Baseline TTP**	**Refined Baseline TTP + construction**
B.19 Gleeson Avenue / Burrows Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	1962	2155	2363	2268	2291
Average Delay per Vehicle (Average over all arms in seconds)	16	15	20	17	18
LoS (Overall)	B	B	B	B	B
DoS (Worst Movement)	0.67	0.67	0.89	0.76	0.90
H.23 Gleeson Avenue / Railway Parade (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2413	2650	2856	2762	2788
Average Delay per Vehicle (Average over all arms in seconds)	5	5	7	5	6
LoS (Overall)	A	A	A	A	A
DoS (Worst Movement)	0.49	0.54	0.80	0.58	0.75
H.24 Gleeson Avenue / Unwins Bridge Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2082	2286	2286	2286	2313
Average Delay per Vehicle (Average over all arms in seconds)	29	37	37	37	41
LoS (Overall)	B	C	C	C	C
DoS (Worst Movement)	0.78	0.92	0.92	0.92	0.97

Road Network Performance - PM Peak

The impacts of the addition of the construction haulage vehicles to the Refined Baseline TTP scenario would be similar to those in the AM peak and it can be seen from **Table 10.2** below that there would be little to no cumulative impact on the key intersections assessed. All intersections would maintain their LoS with the addition of the construction haulage vehicles onto the Refined Baseline TTP scenario and there it would be expected that there would be no additional delays to these intersections.

The intersections do not decrease in performance with the additional construction haulage vehicles as their relative volumes are low, approximately 1% of the previously assessed traffic volumes with 27 additional movements per hour.

Table 10.2 Sydenham Station Intersection Assessment - PM Peak Cumulative Construction Haulage Vehicles

Sydenham Station – PM Peak					
Scenario	Existing	Future	Baseline TTP	Refined Baseline TTP	Refined Baseline TTP + construction
B.19 Gleeson Avenue / Burrows Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2357	2605	2811	2717	2744
Average Delay per Vehicle (Average over all arms in seconds)	28	29	35	32	32
LoS (Overall)	B	C	C	C	C
DoS (Worst Movement)	0.80	0.66	0.84	0.77	0.77
H.23 Gleeson Avenue / Railway Parade (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2661	2940	3148	3054	3079
Average Delay per Vehicle (Average over all arms in seconds)	4	4	4	5	5
LoS (Overall)	A	A	A	A	A
DoS (Worst Movement)	0.45	0.50	0.57	0.54	0.55
H.24 Gleeson Avenue / Unwins Bridge Road (Signals)					**Year Capped: 2023**
Demand Flow (veh)	2433	2688	2688	2688	2716
Average Delay per Vehicle (Average over all arms in seconds)	28	33	33	33	33
LoS (Overall)	B	C	C	C	C
DoS (Worst Movement)	0.60	0.79	0.79	0.79	0.79

As a result of this assessment, it is considered that any cumulative effect that arose from the two components would be negligible.

10.1.3 Gleeson Avenue Overbridge

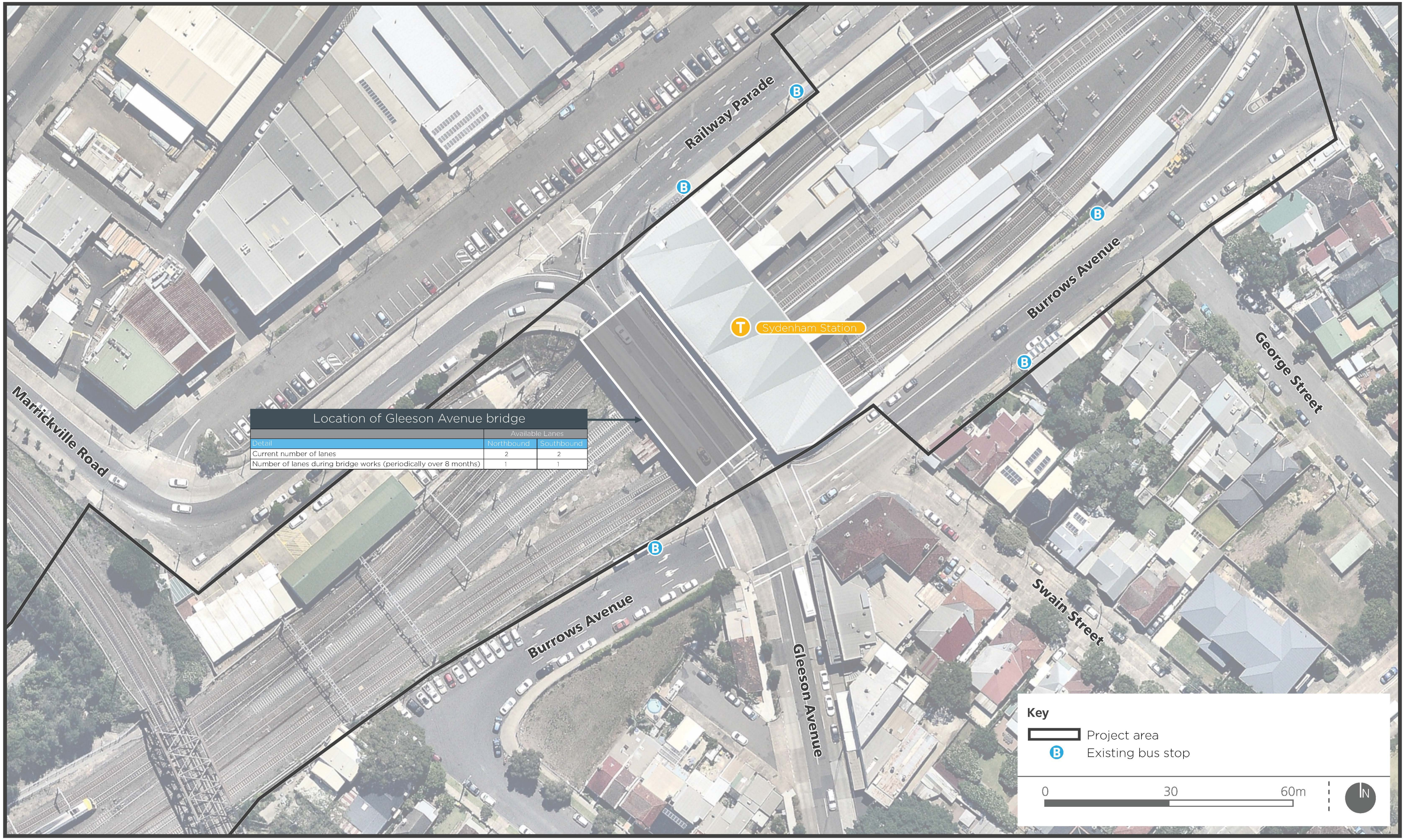
To facilitate the construction of the Chatswood to Sydenham component of the Sydney Metro City and Southwest project, Gleeson Avenue Overbridge at Sydenham Station would undergo half lane closures for eight months during weekends and night works to upgrade the bridge (refer to **Figure 10.5**).

The bridge carries two way general traffic with two lanes in each direction and hosts traffic volumes of approximately 40,800 vehicles per day.

The bridge is critical to the local road network as it provides a link between Sydenham industrial area in the north and the suburban streets in the south. The bridge is adjacent to Sydenham Station which provides links to the T2 Airport, Inner West & South Line, T3 Bankstown Line and T4 Eastern Suburbs and Illawarra Line.

The northern end of the bridge connects to a one-way loop on Railway Parade which limits the potential diversion routes. Due to the one-way restrictions and the importance of the bridge, lane closure would be restricted to one lane in each direction, while still retaining contra-flow. A diversion route is therefore not required.

As no diversion is required for the works at Gleeson Avenue Overbridge, there is no interaction with the traffic, construction or TTS buses at Marrickville Station (the nearest station to Gleeson Avenue Overbridge) or any other location within the extent of the project. Even though, at the time of reporting, sequencing of construction is subject to detailed design, as there is no diversion occurring, no cumulative impacts from these bridge works are expected to impact the project.



Location of Gleeson Avenue bridge

	Available Lanes	
Detail	Northbound	Southbound
Current number of lanes	2	2
Number of lanes during bridge works (periodically over 8 months)	1	1

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Location of the Gleeson Avenue overbridge

FIGURE 10.5

10.1.4 Chatswood to Sydenham Cumulative Conclusion

Overall, from the cumulative impacts assessments discussed above, only the TTS scenario from the project would be impacted by the Chatswood to Sydenham component of the Sydney Metro City & Southwest project. However, this cumulative impact would only affect the Gleeson Avenue / Unwins Bridge Road intersection in the AM peak period, which increases the expected average delay at the intersection by four seconds. For both the AM and PM peak periods the key intersections assessed maintain their LoS with the addition of the construction haulage vehicles.

10.2 WestConnex Assessment

WestConnex is a 33 km motorway scheme which is part of an integrated transport plan to keep Sydney moving. It encompasses the widening and extension of the M4 Western Motorway, a new inner western bypass of the CBD connecting the M4 and the M5, and a new section for the M5 South Western Motorway. These main four projects are in **Figure 10.6** below:

Figure 10.6 **WestConnex Project Extent (from westconnex.com.au)**

The M4 Widening and M4 East projects are unlikely to have any interdependencies on the Sydenham to Bankstown upgrade component as they are outside the area of influence.

The M4 – M5 Link is currently progressing through the planning phase. It is therefore assumed that the cumulative effects of the Sydenham to Bankstown component would be considered within the M4 – M5 project assessment. Furthermore, currently there are no details of the construction staging, likely construction volumes or haulage routes to enable inclusion within this cumulative assessment.

The New M5 project implementation program would be scheduled to overlap in time with the project by one year at its nearest location to Sydenham to Bankstown upgrade component. The northern end of the M5 project is around St Peters with works along Princes Highway from Campbell Road to Railway Road prior to the tunnel entry. However, this is some 2km away at the closest extent of the Sydenham to Bankstown upgrade component worksite. The WestConnex construction compounds closest to the project extent are C8 to C14 which use the routes outlined below in **Table 10.3** and shown above in **Figure 10.2**.

As can be seen from **Figure 10.3** above, the designated construction haulage routes required to facilitate the station and track works at Marrickville Station and the WestConnex works would not overlap. Therefore, there would be no expected cumulative impacts from the WestConnex project.

Table 10.3 WestConnex Construction Compound Access and Egress Points at St Peters

Construction Compound	Access and Egress Points	Roads used as part of construction compound haulage routes
Canal Road (C8)	Canal Road at a new signalised intersection (left in, left out).	Canal Road Princes Highway
Campbell Road (C9)	Campbell Road (left and right in, left and right out).	Campbell Road Burrows Road Canal Road Princes Highway
Burrows Road (C11)	Burrows Road (left and right in, left and right out).	Campbell Road Burrows Road Canal Road Princes Highway
Campbell Road Bridge (C12)	Burrows Road (right in, left out).	Campbell Road Burrows Road Princes Highway
Gardeners Road Bridge (C13)	Burrows Road (left and right in, left and right out).	Canal Road Princes Highway

10.3 RMS and NSW Government Planning & Environment Major Projects

Table 10.4 and **Table 10.5** below outline the known major RMS projects and those listed on the DP&E Major projects Register which have been assessed for any cumulative impact with the project. Given the location of the projects and their potential range of influence, it is evident that the projects listed would not contribute to the cumulative traffic impact.

Table 10.4 RMS Major Projects - Traffic Effects

Cumulative Scheme	Description	Traffic Effects	Construction Start	Construction End
Roberts Road & King Georges Road - Greenacre to Beverly Hills	• it is proposed to provide extended clearways on Roberts Road and King Georges Road from 6am to 7pm on weekdays and from 9am to 6pm in weekends. • the existing weekday clearway is from 6am – 10am and 3pm – 7pm.	This cumulative scheme would install new and extended clearways on Roberts Road and King Georges Road in both directions. Alternative parking arrangements have been outlined by RMS including: • converting existing parking on Lakemba Street and The Boulevarde at Wiley Park, to accommodate loading zones and timed parking restrictions. • a new dedicated commuter car park on The Boulevarde near Wiley Park. Although the parking is impacted, clearways at Wiley Park Station would improve the traffic through the station.	No timeframe available	No timeframe available

Cumulative Scheme	Description	Traffic Effects	Construction Start	Construction End
Gateway to the South – Pinch Point Program	The Gateway to the South Pinch Points program focuses on short to medium term solutions to improve travel time and reliability for all road traffic including buses and freight. Works could include lengthening or widening turning bays or implementing turning restrictions. Twenty intersections have been identified for further investigation and potential upgrades, which are all still in the planning stage. No additional updates have been provided.	The project would improve the performance of the following intersections which are in close proximity to the Sydenham to Bankstown upgrade component: • Stacey Street, Stanley Street & Salvia Avenue, Bankstown • Stacey Street between Stanley Street & Macauley Avenue, Bankstown • Princes Highway & King Georges Road, Blakehurst (including improvements between Torrens Street and King Georges Road) • Princes Highway & Railway Road, Sydenham	No timeframe available	No timeframe available
$246 million Pinch Point and Clearways Program	The Pinch Point and Clearways Program aims to reduce traffic delays, manage congestion and improve travel times on Sydney's major roads, particularly during weekday peak periods. Current projects: • Bigge Street and Hume Highway, Warwick Farm • Boundary Street, Roseville VMS on Cumberland Highway, Wentworthville • Cumberland Highway	No traffic impacts are expected – The Sydenham to Bankstown upgrade component is outside of the influence of this cumulative scheme.	No timeframe available	No timeframe available

Cumulative Scheme	Description	Traffic Effects	Construction Start	Construction End
	and Cabramatta Road, Cabramatta • Henry Lawson Drive and Bullecourt Avenue, Milperra • Hume Highway and Miller Road, Bass Hill • VMS on James Ruse Drive, Parramatta • Milperra Road and The River Road, Revesby • Parramatta Road and Great North Road, Five Dock • Parramatta Road and Shaftesbury Road, Five Dock • Pennant Hills Road, Pennant Hills Rooty Hill Road and Luxford Road, Oakhurst • Rooty Hill Road North, Plumpton • VMS on Windsor Road, Baulkham Hills			

Cumulative Scheme	Description	Traffic Effects	Construction Start	Construction End
$300 million Urban Roads Pinch Point Program	In February 2015, the NSW Government committed $300 million to ease congestion on 32 of Sydney's busiest road corridors over the next 10 years. Current projects include: • Bexley Road and Canterbury Road, Campsie • VMS on Burns Bay Road, Penrose • VMS on Heathcote Road, Lucas Heights • Hoxton Park Road & Hill Road, Lurnea • Hume Highway and Memorial Avenue, Liverpool • Pacific Highway & Mona Vale/Ryde Road Pymble • VMS on Pacific Highway, Gordon • VMS on Willoughby Road, Willoughby	No traffic impacts are expected – The Sydenham to Bankstown upgrade component is outside of the influence of this cumulative scheme.	No timeframe available	No Timeframe available

Table 10.5 Department of Planning & Environmental Major Projects Register - Traffic Effects

Cumulative Scheme	Description	Traffic Effects	Construction Start	Construction End
Western Sydney Stadium (Stage 2 Design & Construction)	The Western Sydney Stadium Project will provide the community of Western Sydney with a first class precinct comprising of a brand new 30,000 seat stadium and an activated public realm. The venue will have the ability to service major sporting and entertainment events.	No traffic impacts are expected – The Sydenham to Bankstown upgrade component is outside of the influence of this cumulative scheme.	2017	2019
Modification 2 to MP 10_0229 - Concept Plan - Mixed Use Development, Cronulla Sharks	Residential and hotel development - Captain Cook Drive Wooloware	No traffic impacts are expected – The Sydenham to Bankstown upgrade component is outside of the influence of this cumulative scheme.	Not applicable	Not applicable
The University of Sydney, Darlington Campus	The development will comprise of approximately 15,205sqm of new mixed-use development. The student accommodation component will include up to 656 single dorm style bedrooms and 2 x 2 bedroom apartments	From the Transport Impact Assessment: *"Against existing traffic volumes in the vicinity of the site, any additional traffic generated by the proposal would be negligible and would not be expected to compromise the safety or function of the surrounding road network."*	Not applicable	Not applicable
Regiment Mixed Use Redevelopment				
Berry and Walker Street, North Sydney	Private development	No traffic impacts are expected – The Sydenham to Bankstown upgrade component is outside of the influence of this cumulative scheme.	Not applicable	Not applicable
Modification to MP08_0238 - Commercial and Hotel development Berry/Walker Street MOD 7				

Cumulative Scheme	Description	Traffic Effects	Construction Start	Construction End
Berry and Walker Street, North Sydney Modification to MP08_0238 - Commercial and Hotel development Berry/Walker Street MOD 6	Private development	No traffic impacts are expected – The Sydenham to Bankstown upgrade component is outside of the influence of this cumulative scheme.	Not applicable	Not applicable
Wild Mouse Tenancy Fitout, Luna Park	Retail development	No traffic impacts are expected – The Sydenham to Bankstown upgrade component is outside of the influence of this cumulative scheme.	Not applicable	Not applicable
Lighthouse Fitout & External Alterations, Luna Park	Retail development	No traffic impacts are expected – The Sydenham to Bankstown upgrade component is outside of the influence of this cumulative scheme.	Not applicable	Not applicable
M2 Motorway Signage Conversion of Existing Signage to Digital Signage - M2 Motorway - Ryde LGA	Converting exiting signage to digital signage	No traffic impacts are expected – The Sydenham to Bankstown upgrade component is outside of the influence of this cumulative scheme.	Not applicable	Not applicable

Cumulative Scheme	Description	Traffic Effects	Construction Start	Construction End
SSD 7246, Foreshore and Public Domain Improvements, Campbell's Cove	The proposal seeks approval for public domain improvements and associated works to the area known as Campbell's Cove, The Rocks, including: • a new 10-metre-wide promenade, designed to improve drainage and accessibility; • a new waterfront leisure area and amphitheatre for public events; • a shared plaza / pedestrian square with existing levels lowered to allow better drainage, pedestrian circulation and truck access to the new Overseas Passenger Terminal wharf extension; • new east-west connections from the Campbell's Cove promenade to Hickson Road and The Rocks.	No traffic impacts are expected – The Sydenham to Bankstown upgrade component is outside of the influence of this cumulative scheme.	Not applicable	Not applicable

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Appendix A

Turning Count and Queue Length Data

Sydenham Area

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP	Cumulative Construction
AM	300	336	0	0	0	0	0
PM	300	342	0	0	0	0	0
AM	1327	1487	0	0	101	55	13
PM	997	1136	0	0	101	55	13

95%ile Observed Queue	E	S
AM Peak (m)	53	0
PM Peak (m)	65	0

	AM	PM
Current	738	1284
2023	827	1463
Construction	0	0
Bridges	0	0
Baseline TTP	101	101
Refined Baseline TTP	55	55
Cumulative Construction	13	13

	AM	PM	AM	PM
Current	791	660	330	267
2023	895	744	374	301
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	101	101
Refined Baseline TTP	0	0	55	55
Cumulative Construction	8	13	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP	Cumulative Construction
AM	9	10	0	0	0	0	0
PM	32	36	0	0	0	0	0
AM	2	2	0	0	0	0	0
PM	3	3	0	0	0	0	0
AM	4	5	0	0	0	0	2
PM	9	10	0	0	0	0	2

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP	Cumulative Construction
AM	213	241	0	0	101	55	0
PM	468	528	0	0	101	55	0
AM	21	24	0	0	0	0	0
PM	36	40	0	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	70	46	65	11
PM Peak (m)	124	86	121	25

	AM	PM
Current	533	835
2023	603	942
Construction	0	0
Bridges	0	0
Baseline TTP	0	0
Refined Baseline TTP	0	0
Cumulative Construction	13	13

	AM	PM	AM	PM	AM	PM
Current	238	81	579	479	98	61
2023	264	92	642	546	109	69
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0
Cumulative Construction	15	15	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	117	35	63	74
PM Peak (m)	59	65	82	27

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP	Cumulative Construction
AM	1	1	0	0	0	0	13
PM	1	1	0	0	0	0	13
AM	289	321	0	0	0	0	0
PM	150	171	0	0	0	0	0
AM	35	39	0	0	0	0	0
PM	28	32	0	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP	Cumulative Construction
AM	24	27	0	0	0	0	0
PM	66	75	0	0	0	0	0
AM	314	348	0	0	0	0	0
PM	591	673	0	0	0	0	0
AM	47	52	0	0	0	0	0
PM	59	67	0	0	0	0	0

	AM	PM	AM	PM	AM	PM
Current	27	150	362	654	47	40
2023	30	171	401	745	52	46
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0
Cumulative Construction	0	0	0	0	0	0

Marrickville Area

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

Note:

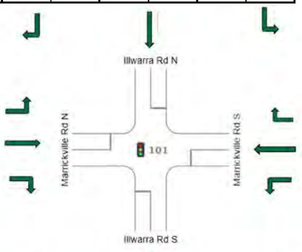
Bridges NBD - Northbound traffic to be split 50% to Charlotte Avenue Underbridge and 50% to Livingstone Road Overbridge.

Bridges SBD - Southbound traffic to be split 50% to Charlotte

	AM	PM	AM	PM	AM	PM
Current	15	36	79	230	14	20
2023	17	40	89	257	16	22
Construction	0	0	0	0	0	0
Bridges NBD	0	0	0	0	0	0
Bridges SBD	39	115	-77	-230	39	115
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	21	103	54	96
PM Peak (m)	65	67	82	60

	Current	2023	Construction	Bridges NBD	Bridges SBD	Baseline TTP	Refined Baseline TTP
AM	67	75	0	0	0	0	0
PM	42	47	0	0	0	0	0
AM	639	716	0	0	45	68	40
PM	340	379	0	0	31	68	40
AM	49	55	0	0	-45	0	0
PM	91	102	0	0	-91	0	0



	Current	2023	Construction	Bridges NBD	Bridges SBD	Baseline TTP	Refined Baseline TTP
AM	8	9	0	103	0	0	0
PM	10	11	0	69	0	0	0
AM	313	351	0	0	72	68	40
PM	602	672	0	0	141	68	40
AM	83	93	13	0	-72	33	15
PM	154	172	13	0	-141	33	15

	AM	PM	AM	PM	AM	PM
Current	25	36	250	130	185	115
2023	28	40	280	145	207	128
Construction	0	0	0	0	13	13
Bridges NBD	-15	-29	-179	-102	-117	-88
Bridges SBD	21	60	0	0	21	60
Baseline TTP	0	0	0	0	33	33
Refined Baseline TTP	0	0	0	0	15	15

	AM	PM	AM	PM	AM	PM
Current	92	167	151	415	53	31
2023	99	185	163	460	57	34
Construction	0	0	0	0	0	0
Bridges NBD	0	0	0	0	0	0
Bridges SBD	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	Current	2023	Construction	Bridges NBD	Bridges SBD	Baseline TTP	Refined Baseline TTP
AM	185	200	0	-30	0	0	0
PM	135	150	0	-29	0	0	0
AM	485	524	0	-86	0	101	55
PM	240	266	0	-58	0	101	55
AM	30	32	0	0	105	0	0
PM	78	86	0	0	266	0	0

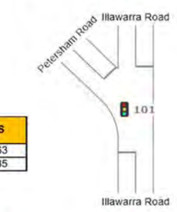
	Current	2023	Construction	Bridges NBD	Bridges SBD	Baseline TTP	Refined Baseline TTP
AM	40	44	0	0	0	0	0
PM	42	47	0	0	0	0	0
AM	251	271	0	0	0	101	55
PM	489	542	0	0	0	101	55
AM	66	71	0	0	0	0	0
PM	295	327	0	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	65	128	51	128
PM Peak (m)	123	117	175	75

	AM	PM	AM	PM	AM	PM
Current	48	53	358	184	255	153
2023	52	59	387	204	276	170
Construction	0	0	0	0	0	0
Bridges NBD	103	69	367	189	216	139
Bridges SBD	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	AM	PM	AM	PM
Current	27	66	183	532
2023	31	74	207	600
Construction	0	0	13	13
Bridges NBD	N/A	N/A	N/A	N/A
Bridges SBD	N/A	N/A	N/A	N/A
Baseline TTP	0	0	33	33
Refined Baseline TTP	0	0	15	15

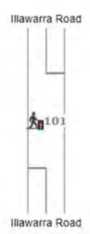
	AM	PM	AM	PM
Current	189	179	65	31
2023	214	202	74	35
Construction	0	0	0	0
Bridges NBD	N/A	N/A	N/A	N/A
Bridges SBD	N/A	N/A	N/A	N/A
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0



95%ile Observed Queue	W	N	S
AM Peak (m)	57	78	63
PM Peak (m)	56	78	35

	AM	PM	AM	PM
Current	184	113	475	304
2023	208	127	538	343
Construction	0	0	13	13
Bridges NBD	N/A	N/A	N/A	N/A
Bridges SBD	N/A	N/A	N/A	N/A
Baseline TTP	0	0	33	33
Refined Baseline TTP	0	0	15	15

	AM	PM
Current	370	704
2023	415	794
Construction	13	13
Bridges NBD	N/A	N/A
Bridges SBD	N/A	N/A
Baseline TTP	33	33
Refined Baseline TTP	15	15



	AM	PM
Current	648	411
2023	726	463
Construction	13	13
Bridges NBD	N/A	N/A
Bridges SBD	N/A	N/A
Baseline TTP	33	33
Refined Baseline TTP	15	15

	AM	PM	AM	PM	AM	PM
Current	16	47	259	652	14	16
2023	18	53	284	735	15	18
Construction	0	0	0	0	0	0
Bridges NBD	0	0	118	0	6	0
Bridges SBD	-14	-39	-211	-530	-11	-14
Baseline TTP	33	33	0	0	0	0
Refined Baseline TTP	15	15	0	0	0	0

	Current	2023	Construction	Bridges NBD	Bridges SBD	Baseline TTP	Refined Baseline TTP
AM	30	33	0	-29	0	33	15
PM	35	39	0	-35	0	33	15
AM	124	137	0	29	0	0	0
PM	100	113	0	35	0	0	0
AM	156	171	0	0	38	0	0
PM	152	171	0	0	0	0	0

	Current	2023	Construction	Bridges NBD	Bridges SBD	Baseline TTP	Refined Baseline TTP
AM	68	75	0	-67	0	0	0
PM	87	98	0	-87	0	0	0
AM	108	119	0	0	0	0	0
PM	167	188	0	0	0	0	0
AM	11	12	0	0	0	0	0
PM	25	28	0	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	81	68	61	96
PM Peak (m)	75	89	96	54

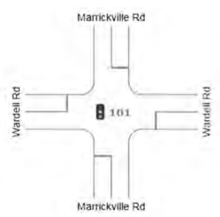
	AM	PM	AM	PM
Current	20	21	601	336
2023	22	24	660	379
Construction	0	0	0	0
Bridges NBD	-15	0	-584	-332
Bridges SBD	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

Dulwich Hill Area (Map 1)

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM	AM	PM
Current	33	55	600	257	38	42
2023	37	63	665	296	42	48
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	68	68	0	0
Refined Baseline TTP	0	0	25	25	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	19	21	0	0	0	0
PM	40	46	0	0	0	0
AM	387	429	0	0	0	0
PM	256	295	0	0	0	0
AM	160	177	9	0	15	15
PM	100	115	9	0	15	15



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	201	223	0	0	0	0
PM	523	602	0	0	0	0
AM	50	55	0	0	0	0
PM	33	38	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	127	42	57	140
PM Peak (m)	57	99	119	70

	AM	PM	AM	PM	AM	PM
Current	100	253	304	483	22	37
2023	111	291	337	556	24	43
Construction	9	9	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	68	68	0	0
Refined Baseline TTP	15	15	25	25	0	0

	AM	PM	AM	PM
Current	372	741	372	34
2023	425	827	35	38
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	15	15	0	0

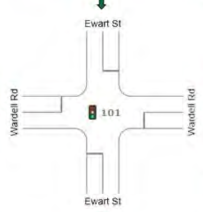
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	22	25	0	0	0	0
PM	24	27	0	0	0	0
AM	50	57	0	0	33	15
PM	70	78	0	0	33	15

95%ile Observed Queue	N	E	W
AM Peak (m)	21	7	91
PM Peak (m)	92	14	29

	AM	PM	AM	PM
Current	663	474	18	25
2023	758	529	21	28
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	33	33
Refined Baseline TTP	15	15	15	15

	AM	PM	AM	PM	AM	PM
Current	68	87	248	203	131	89
2023	76	97	248	227	174	99
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	33	33
Refined Baseline TTP	0	0	0	0	30	30

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	22	25	0	0	0	0
PM	15	17	0	0	0	0
AM	569	638	0	0	0	0
PM	340	379	0	0	0	0



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	48	54	15	0	33	30
PM	104	116	15	0	33	30
AM	308	345	0	0	0	0
PM	715	798	0	0	0	0
AM	29	32	0	0	0	0
PM	41	46	0	0	0	0

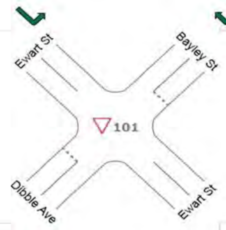
95%ile Observed Queue	N	S	E	W
AM Peak (m)	107	70	135	170
PM Peak (m)	91	103	235	109

	AM	PM	AM	PM	AM	PM
Current	46	94	141	267	21	53
2023	52	105	158	298	24	59
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	AM	PM	AM	PM	AM	PM
Current	2	17	299	234	1	14
2023	2	19	346	264	1	16
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	AM	PM	AM	PM	AM	PM
Current	8	18	1	7	30	36
2023	9	20	1	8	35	41
Construction	0	0	0	0	2	2
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	33	33
Refined Baseline TTP	0	0	0	0	15	15

95%ile Observed Queue	N	S	E	W
AM Peak (m)	14	7	3	0
PM Peak (m)	17	7	48	140



	AM	PM	AM	PM	AM	PM
Current	10	8	5	3	15	11
2023	12	9	6	3	17	12
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

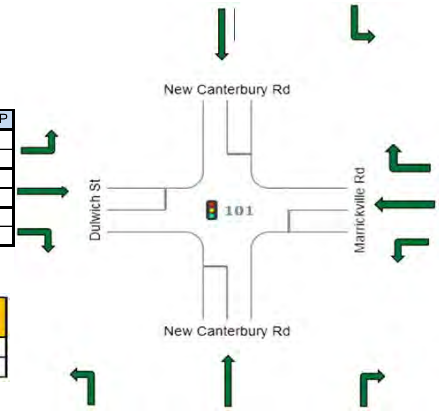
	AM	PM	AM	PM	AM	PM
Current	5	15	220	398	14	19
2023	6	17	254	449	16	21
Construction	0	0	0	0	2	2
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	33	33
Refined Baseline TTP	0	0	0	0	15	15

Dulwich Hill Area (Map 2)

Traffic volume diagrams for modelled intersections measured in number of vehicles

	AM	PM	AM	PM
Current	364	973	73	77
2023	408	1086	82	86
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	14	16	0	0	0	0
PM	8	9	0	0	0	0
AM	119	133	0	0	0	0
PM	70	78	0	0	0	0
AM	6	7	0	0	0	0
PM	4	4	0	0	0	0

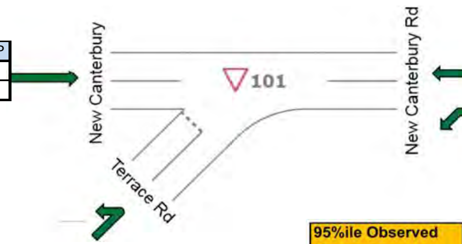


	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	56	63	0	0	0	0
PM	49	55	0	0	0	0
AM	55	62	0	0	0	0
PM	58	65	0	0	0	0
AM	177	198	0	0	68	25
PM	304	339	0	0	68	25

95%ile Observed Queue	N	S	E	W
AM Peak (m)	145	121	45	144
PM Peak (m)	140	147	93	86

	AM	PM	AM	PM	AM	PM
Current	5	5	1081	577	410	204
2023	6	6	1211	644	459	228
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	68	68
Refined Baseline TTP	0	0	0	0	25	25

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	1528	1712	0	0	68	25
PM	747	860	0	0	68	25



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	599	671	0	0	68	25
PM	1242	1430	0	0	68	25
AM	21	24	16	0	0	0
PM	102	117	16	0	0	0

	AM	PM
Current	78	74
2023	87	85
Construction	16	16
Bridges	0	0
Baseline TTP	0	0
Refined Baseline TTP	0	0

95%ile Observed Queue	S	E	W
AM Peak (m)	14	17	48
PM Peak (m)	28	14	28

Hurlstone Park Area

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM
Current	420	748	28	42
2023	466	852	31	48
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	67	140	117	91
PM Peak (m)	110	105	140	65

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	14	16	0	0	0	0
PM	10	11	0	0	0	0
AM	300	333	0	0	0	0
PM	303	345	0	0	0	0
AM	9	10	0	0	0	0
PM	23	26	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	23	26	0	0	0	0
PM	32	36	0	0	0	0
AM	257	285	0	0	0	0
PM	414	472	0	0	0	0
AM	364	393	0	0	68	25
PM	665	758	0	0	68	25

	AM	PM	AM	PM	AM	PM
Current	31	23	686	559	889	492
2023	34	26	761	637	961	560
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	68	68
Refined Baseline TTP	0	0	0	0	25	25

	AM	PM	AM	PM
Current	784	1358	16	78
2023	861	1516	18	87
Construction	0	0	17	17
Bridges	0	0	0	0
Baseline TTP	68	68	0	0
Refined Baseline TTP	25	25	0	0

	AM	PM	AM	PM	AM	PM
Current	43	64	147	198	26	10
2023	47	71	161	221	29	11
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	31	34	17	0	0	0
PM	25	28	17	0	0	0
AM	217	238	0	0	0	0
PM	195	218	0	0	0	0
AM	65	71	0	0	11	15
PM	95	106	0	0	11	15

95%ile Observed Queue	N	S	E	W
AM Peak (m)	93	154	56	47
PM Peak (m)	113	171	95	102

	AM	PM	AM	PM	AM	PM
Current	79	57	1529	1046	88	94
2023	87	64	1679	1168	97	105
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	68	68	0	0
Refined Baseline TTP	0	0	25	25	15	15

	AM	PM	AM	PM	AM	PM
Current	8	14	288	243	100	59
2023	9	16	333	271	116	66
Construction	8	8	8	8	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	11	11	0	0
Refined Baseline TTP	0	0	30	30	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	1	1	8	0	0	0
PM	12	13	8	0	0	0
AM	1	1	0	0	0	0
PM	7	8	0	0	0	0
AM	1	1	0	0	0	0
PM	8	9	0	0	0	0

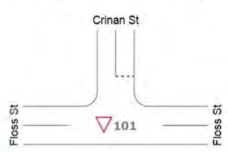
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	44	51	0	0	0	0
PM	51	57	0	0	0	0
AM	4	5	0	0	0	0
PM	7	8	0	0	0	0
AM	22	25	0	0	0	0
PM	30	33	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	7	2	3	7
PM Peak (m)	7	5	7	3

	AM	PM	AM	PM	AM	PM
Current	20	10	208	232	27	37
2023	23	11	240	259	31	41
Construction	0	0	8	8	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	11	11	0	0
Refined Baseline TTP	0	0	15	15	15	15

	AM	PM	AM	PM
Current	24	43	295	231
2023	28	48	345	258
Construction	8	8	0	0
Bridges	0	0	0	0
TTP	0	0	11	11
Refined Baseline TTP	0	0	30	30

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	45	53	8	0	0	0
PM	41	46	8	0	0	0
AM	54	63	0	0	0	0
PM	45	50	0	0	0	0

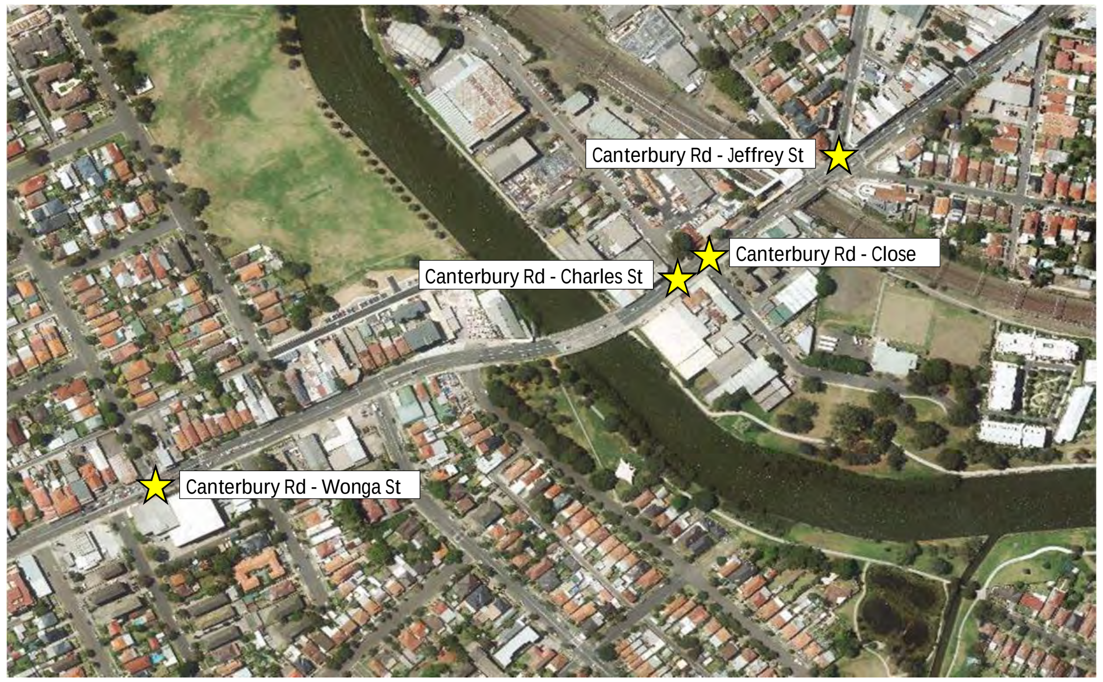


	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	218	255	0	0	11	30
PM	229	256	0	0	11	30
AM	25	29	0	0	0	0
PM	48	54	0	0	0	0

95%ile Observed Queue	N	E	W
AM Peak (m)	21	7	0
PM Peak (m)	14	7	0

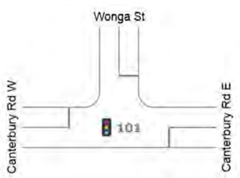
Canterbury Area (Map 1)

Traffic volume diagrams for modelled intersections (measured in number of vehicles)



	AM	PM	AM	PM
Current	76	114	307	295
2023	84	126	340	326
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	15	17	0	0	0	0
PM	65	72	0	0	0	0
AM	1682	1866	13	0	79	40
PM	1218	1346	13	0	79	40

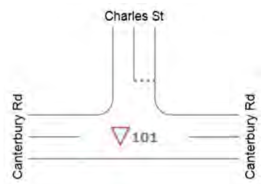


	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	233	258	0	0	0	0
PM	419	463	0	0	0	0
AM	1046	1160	19	0	79	40
PM	1594	1761	19	0	79	40

95%ile Observed Queue	N	E	W
AM Peak (m)	140	387	244
PM Peak (m)	152	593	215

	AM	PM	AM	PM
Current	4	4	21	21
2023	4	4	23	23
Construction	0	0	2	2
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	20	22	2	0	0	0
PM	36	40	2	0	0	0
AM	1904	2091	11	0	79	40
PM	1464	1618	11	0	79	40

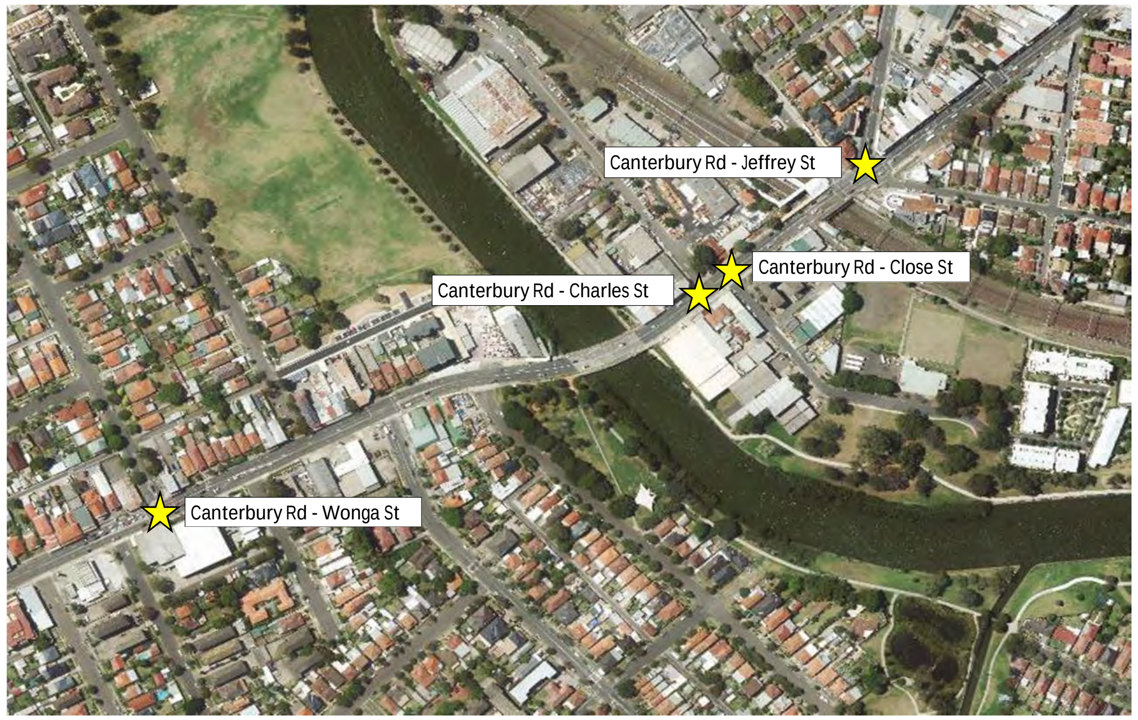


	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	11	12	0	0	0	0
PM	16	18	0	0	0	0
AM	1175	1290	19	0	79	40
PM	1961	2167	19	0	79	40

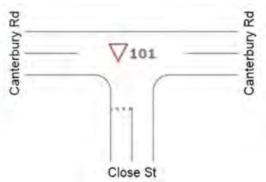
95%ile Observed Queue	N	W
AM Peak (m)	11	123
PM Peak (m)	7	89

Canterbury Area (Map 2)

Traffic volume diagrams for modelled intersections (measured in number of vehicles)



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	1904	2091	13	0	79	40
PM	1464	1618	13	0	79	40
AM	1	1	0	0	0	0
PM	11	12	0	0	0	0



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	1175	1290	0	0	79	40
PM	1961	2167	0	0	79	40
AM	1	1	19	0	0	0
PM	14	15	19	0	0	0

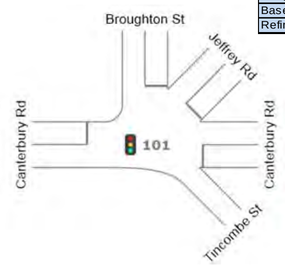
95%ile Observed Queue	S	E
AM Peak (m)	7	28
PM Peak (m)	7	67

	AM	PM
Current	20	18
2023	22	20
Construction	19	19
Bridges	0	0
Baseline TTP	0	0
Refined Baseline TTP	0	0

	AM	PM	AM	PM	AM	PM	AM	PM
Current	125	179	14	7	29	24	2	2
2023	139	202	16	8	32	27	2	2
Construction	0	0	0	0	11	11	0	0
Bridges	0	0	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0	0	0

	AM	PM	AM	PM	AM	PM
Current	223	311	8	9	21	18
2023	247	351	9	10	23	20
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	28	31	11	0	0	0
PM	23	26	11	0	0	0
AM	265	294	2	0	0	0
PM	287	324	2	0	0	0
AM	1639	1818	0	0	79	40
PM	1155	1302	0	0	79	40



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	12	13	0	0	0	0
PM	18	20	0	0	0	0
AM	839	931	19	0	79	40
PM	1510	1703	19	0	79	40
AM	12	13	0	0	0	0
PM	20	23	0	0	0	0

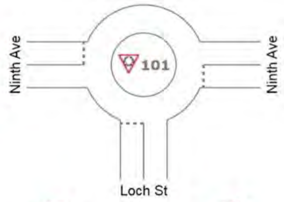
95%ile Observed Queue	N	NE	E	W
AM Peak (m)	39	70	98	112
PM Peak (m)	72	103	98	112

Campsie Area (Map 1)

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

95%ile Observed Queue	S	E	W
AM Peak (m)	63	68	90
PM Peak (m)	73	85	45

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	285	323	0	0	46	15
PM	248	280	0	0	46	15
AM	353	400	0	0	0	0
PM	326	368	0	0	0	0

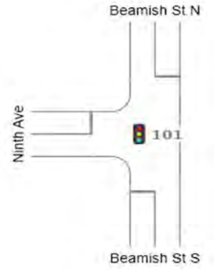


	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	196	222	0	0	46	15
PM	279	315	0	0	46	15
AM	417	472	0	0	0	0
PM	575	648	0	0	0	0

	AM	PM	AM	PM
Current	244	370	510	435
2023	276	417	577	490
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

	AM	PM	AM	PM
Current	100	184	304	428
2023	111	207	337	483
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	292	324	0	0	0	0
PM	184	207	0	0	0	0
AM	316	351	0	0	46	15
PM	330	372	0	0	46	15

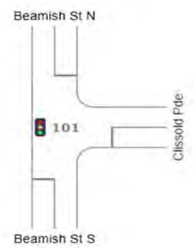


95%ile Observed Queue	N	S	W
AM Peak (m)	56	90	86
PM Peak (m)	87	96	72

	AM	PM	AM	PM
Current	380	366	361	340
2023	421	412	400	383
Construction	0	0	15	15
Bridges	0	0	0	0
Baseline TTP	46	46	0	0
Refined Baseline TTP	15	15	0	0

	AM	PM	AM	PM
Current	604	644	44	64
2023	683	726	50	72
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	46	46	0	0
Refined Baseline TTP	40	40	0	0

95%ile Observed Queue	N	S	E
AM Peak (m)	168	191	32
PM Peak (m)	184	186	44



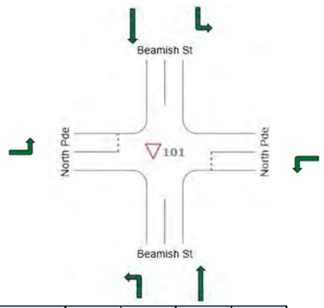
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	38	43	0	0	0	0
PM	100	113	0	0	0	0
AM	47	53	0	0	0	0
PM	64	72	0	0	0	0

	AM	PM	AM	PM
Current	654	585	63	107
2023	740	660	71	121
Construction	15	15	0	0
Bridges	0	0	0	0
Baseline TTP	46	46	0	0
Refined Baseline TTP	40	40	0	0

Campsie Area (Map 2)

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM
Current	627	626	34	29
2023	710	703	38	33
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	46	46	0	0
Refined Baseline TTP	40	40	0	0



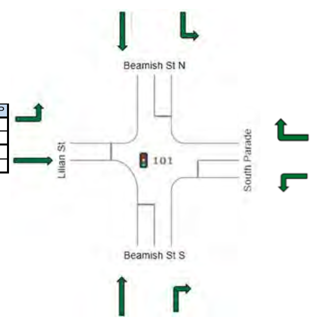
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	54	61	8	0	0	0
PM	43	48	8	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	34	38	0	0	0	0
PM	34	38	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	16	7	9	16
PM Peak (m)	44	9	20	14

	AM	PM	AM	PM
Current	47	57	607	647
2023	53	64	687	727
Construction	8	8	8	8
Bridges	0	0	0	0
Baseline TTP	0	0	46	46
Refined Baseline TTP	25	25	15	15

	AM	PM	AM	PM
Current	462	560	187	175
2023	513	618	207	193
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	46	46
Refined Baseline TTP	0	0	40	40



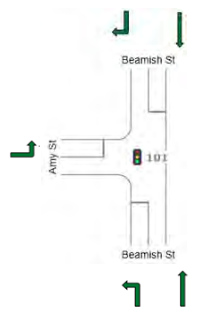
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	36	40	8	0	0	0
PM	39	43	8	0	0	0
AM	47	52	0	0	0	0
PM	35	39	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	121	134	0	0	46	40
PM	110	122	0	0	46	40
AM	47	52	2	0	0	0
PM	32	35	2	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	159	147	54	32
PM Peak (m)	196	158	49	26

	AM	PM	AM	PM
Current	559	571	12	10
2023	620	631	13	11
Construction	8	8	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

	AM	PM	AM	PM
Current	4	2	518	583
2023	4	2	580	651
Construction	0	0	2	2
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

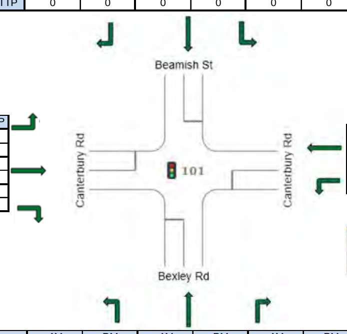


	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	36	40	0	0	0	0
PM	79	88	0	0	0	0

95%ile Observed Queue	N	S	W
AM Peak (m)	70	83	17
PM Peak (m)	66	112	38

	AM	PM	AM	PM
Current	73	101	491	488
2023	82	113	550	545
Construction	0	0	8	8
Bridges	0	0	0	0
TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

	AM	PM	AM	PM	AM	PM
Current	64	115	356	384	47	45
2023	76	130	420	434	55	51
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	69	81	0	0	0	0
PM	89	100	0	0	0	0
AM	1260	1487	0	0	33	0
PM	926	1044	0	0	33	0
AM	256	302	0	0	0	0
PM	169	191	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	664	784	0	0	33	0
PM	1024	1154	0	0	33	0
AM	246	291	0	0	0	0
PM	173	195	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	90	104	104	126
PM Peak (m)	105	112	112	126

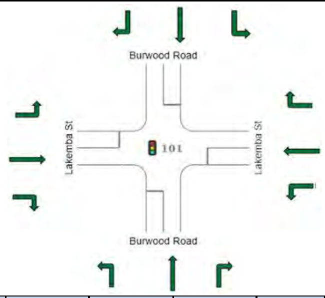
	AM	PM	AM	PM	AM	PM
Current	81	88	558	410	332	348
2023	96	99	658	462	392	392
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

Belmore Area

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM	AM	PM
Current	38	48	465	586	52	46
2023	42	54	513	654	57	51
Construction	9	9	0	0	0	0
Bridges	465	586	-465	-586	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	89	116	48	143
PM Peak (m)	56	96	56	103



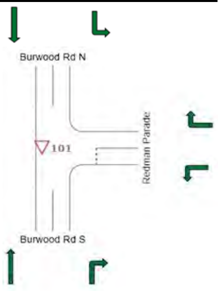
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	57	63	0	0	0	0
PM	55	61	0	0	0	0
AM	402	443	0	0	0	0
PM	314	350	0	0	0	0
AM	117	129	0	117	0	0
PM	111	124	0	111	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	48	53	0	0	0	0
PM	58	65	0	0	0	0
AM	248	274	0	86	46	0
PM	353	394	0	88	46	0
AM	86	95	0	-86	0	15
PM	88	98	0	-88	0	15

	AM	PM	AM	PM	AM	PM
Current	74	89	457	483	41	61
2023	82	99	504	539	45	68
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	46	46
Refined Baseline TTP	0	0	0	0	15	15

	AM	PM	AM	PM
Current	646	701	55	52
2023	723	782	62	58
Construction	10	10	0	0
Bridges	-646	-701	-55	-52
Baseline TTP	46	46	0	0
Refined Baseline TTP	15	15	0	0

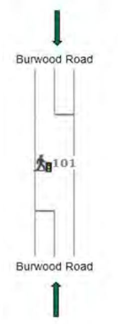
95%ile Observed Queue	N	S	E
AM Peak (m)	229	215	65
PM Peak (m)	249	215	75



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	15	17	0	0	0	0
PM	20	22	0	0	0	0
AM	135	151	0	0	0	0
PM	163	182	0	0	0	0

	AM	PM	AM	PM
Current	605	562	163	110
2023	678	628	183	123
Construction	10	10	0	0
Bridges	0	0	0	0
Baseline TTP	46	46	0	0
Refined Baseline TTP	15	15	0	0

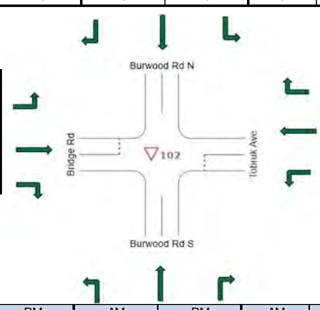
	AM	PM
Current	780	864
2023	802	1005
Construction	10	10
Bridges	Not Modelled	Not Modelled
Baseline TTP	46	46
Refined Baseline TTP	15	15



	AM	PM
Current	812	674
2023	939	784
Construction	10	10
Bridges	Not Modelled	Not Modelled
Baseline TTP	46	46
Refined Baseline TTP	15	15

	AM	PM	AM	PM	AM	PM
Current	108	112	546	565	79	82
2023	132	137	628	653	101	105
Construction	0	0	10	10	0	0
Bridges	-108	-112	-546	-565	-79	-82
Baseline TTP	11	11	0	0	0	0
Refined Baseline TTP	15	15	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	175	181	0	0	11	15
PM	137	143	0	0	11	15
AM	7	7	0	0	0	0
PM	6	6	0	0	0	0
AM	30	31	2	0	0	0
PM	37	38	2	0	0	0



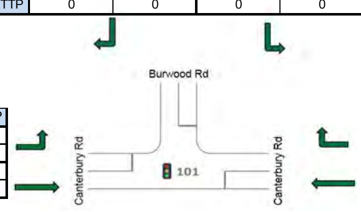
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	3	3	0	0	0	0
PM	9	9	0	0	0	0
AM	1	1	0	0	0	0
PM	7	7	0	0	0	0
AM	10	10	0	0	0	0
PM	8	8	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	163	268	5	44
PM Peak (m)	284	203	11	40

	AM	PM	AM	PM	AM	PM
Current	56	74	634	528	52	51
2023	58	77	656	549	54	53
Construction	2	2	10	10	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	AM	PM	AM	PM
Current	105	163	94	108
2023	115	188	103	124
Construction	0	0	0	0
Bridges	Not Modelled	Not Modelled	Not Modelled	Not Modelled
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

95%ile Observed Queue	N	E	W
AM Peak (m)	74	61	98
PM Peak (m)	61	61	112



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	71	78	0	Not Modelled	0	0
PM	49	56	0	Not Modelled	0	0
AM	1444	1586	0	Not Modelled	0	0
PM	959	1104	0	Not Modelled	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	180	198	0	Not Modelled	0	0
PM	210	242	0	Not Modelled	0	0
AM	632	694	0	Not Modelled	0	0
PM	1209	1392	0	Not Modelled	0	0

Lakemba Area

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

Lakemba St - Wangee Rd

	AM	PM	AM	PM
Current	332	403	65	87
2023	382	464	75	100
Construction	0	0	0	0
Haldon Bridge	0	0	0	0
King Georges Bridge	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

95%ile Observed Queue	N	E	W
AM Peak (m)	82	48	37
PM Peak (m)	121	49	11

Wangee Rd

Lakemba St

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	354	407	0	0	118	0	0
PM	293	337	0	0	967	0	0
AM	447	515	0	0	-221	0	0
PM	355	409	0	0	-124	0	0

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	44	51	0	0	152	0	0
PM	60	69	0	0	262	0	0
AM	260	299	0	0	-152	0	0
PM	453	521	0	0	-262	0	0

Haldon St - Lakemba St

Lakemba St

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	509	570	0	0	-348	0	0
PM	431	491	0	0	-285	0	0
AM	193	216	0	-193	591	0	0
PM	171	195	0	-171	213	0	0

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	252	282	0	0	-252	0	0
PM	473	539	0	0	-494	0	0
AM	340	381	0	-340	118	0	0
PM	367	418	0	-367	232	0	0

95%ile Observed Queue	S	E	W
AM Peak (m)	63	3	63
PM Peak (m)	63	39	49

Haldon St

	AM	PM	AM	PM
Current	131	176	297	230
2023	147	200	333	262
Construction	0	0	0	0
Haldon Bridge	15	0	35	0
King Georges Bridge	63	76	181	1045
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

Haldon St - Railway Pde

	AM	PM	AM	PM	AM	PM
Current	37	26	459	473	24	42
2023	44	29	548	523	29	46
Construction	0	0	0	0	0	0
Haldon Bridge	-37	-26	-459	-473	-24	-42
King Georges Bridge	0	0	700	437	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	60	56	21	32
PM Peak (m)	63	53	28	35

Haldon St

Railway Pde

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	43	51	0	0	0	0	0
PM	33	36	0	0	0	0	0
AM	13	16	0	0	0	0	0
PM	10	11	0	0	0	0	0
AM	57	68	3	-64	0	0	0
PM	84	93	3	-84	0	0	0

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	4	5	0	0	0	0	0
PM	4	4	0	0	0	0	0
AM	9	11	0	57	0	0	0
PM	16	18	0	0	0	0	0
AM	64	76	5	-57	0	0	0
PM	108	119	5	-108	0	0	0

Haldon St

	AM	PM	AM	PM	AM	PM
Current	108	168	376	367	72	50
2023	129	186	449	406	86	55
Construction	3	3	0	0	5	5
Haldon Bridge	-108	-168	-376	-367	-72	-50
King Georges Bridge	0	0	244	1121	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

The Boulevarde Ped Crossing

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	554	640	0	0	132	44	15
PM	454	529	0	0	152	44	15

The Blvd

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	407	470	0	45	407	44	15
PM	548	638	0	141	336	44	15

The Boulevarde - Haldon St

	AM	PM	AM	PM	AM	PM
Current	211	224	318	308	129	143
2023	238	253	358	349	145	162
Construction	0	0	8	8	0	0
Haldon Bridge	-211	-224	-318	-308	-129	-143
King Georges Bridge	407	336	293	101	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	135	96	65	107
PM Peak (m)	138	81	95	103

Haldon St N

The Boulevard W

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	264	297	0	-264	132	0	0
PM	244	277	0	-244	152	0	0
AM	232	261	0	264	0	11	15
PM	164	186	0	244	0	11	15
AM	58	65	5	0	0	33	0
PM	46	52	5	0	0	33	0

The Boulevard E

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	77	87	0	-77	0	0	0
PM	122	138	0	-122	0	0	0
AM	139	157	0	141	0	11	15
PM	228	258	0	230	0	11	15
AM	34	38	9	0	0	0	0
PM	43	49	9	0	0	0	0

Haldon St S

New right turn

	AM	PM	AM	PM	AM	PM
Current	57	96	347	270		
2023	64	109	391	306		
Construction	7	7	8	8		
Haldon Bridge	115	135	-116	-135	116	135
King Georges Bridge	0	0	118	969		
Baseline TTP	33	33	0	0		
Refined Baseline TTP	0	0	0	0	0	0

Canterbury Rd - Haldon St

	AM	PM	AM	PM
Current	235	267	55	64
2023	261	311	61	74
Construction	0	0	0	0
Haldon Bridge	0	0	0	0
King Georges Bridge	73	25	73	25
Baseline TTP	0	0	33	33
Refined Baseline TTP	0	0	0	0

Haldon St

Canterbury Rd

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	163	181	0	0	59	0	0
PM	162	189	0	0	485	0	0
AM	1492	1655	0	0	0	0	0
PM	1058	1230	0	0	0	0	0

	Current	2023	Construction	Haldon Bridge	King Georges Bridge	Baseline TTP	Refined Baseline TTP
AM	76	84	0	0	0	33	0
PM	94	109	0	0	0	33	0
AM	730	810	0	0	0	0	0
PM	1253	1457	0	0	0	0	0

95%ile Observed Queue	N	E	W
AM Peak (m)	53	70	105
PM Peak (m)	62	83	95

Wiley Park Area

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM
Current	2056	2237	114	98
2023	2304	2472	128	108
Construction	0	0	0	0
Bridges	-591	-231	591	213
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	206	83	56	69
PM Peak (m)	349	21	195	49

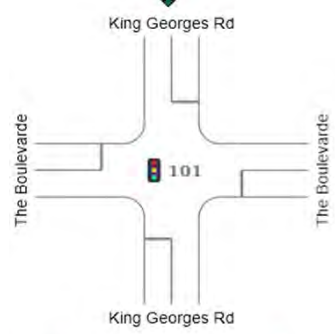
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	15	17	8	0	0	0
PM	9	10	8	0	0	0
AM	221	248	0	-221	0	0
PM	124	137	0	-124	0	0
AM	90	101	0	-90	0	0
PM	58	64	0	-58	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	59	66	0	-59	0	0
PM	139	154	0	-139	0	0
AM	95	106	0	-95	0	0
PM	134	148	0	-134	0	0
AM	121	136	0	-121	0	0
PM	242	267	0	-242	0	0

	AM	PM	AM	PM	AM	PM
Current	31	51	2517	2003	127	161
2023	35	56	2820	2213	142	178
Construction	8	8	8	8	0	0
Bridges	0	0	0	-969	-127	-161
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	AM	PM	AM	PM	AM	PM
Current	124	292	2008	2567	153	102
2023	139	311	2250	2737	171	109
Construction	0	0	0	0	0	0
Bridges	-124	-292	-483	-201	-8	-8
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	160	179	8	-8	0	0
PM	156	166	8	-11	0	0
AM	251	281	0	8	44	15
PM	221	236	0	11	44	15



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	128	143	0	-128	0	0
PM	146	156	0	-146	0	0
AM	195	218	0	7	44	15
PM	370	395	0	213	44	15
AM	18	20	2	292	0	0
PM	17	18	2	106	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	256	288	133	147
PM Peak (m)	323	231	175	168

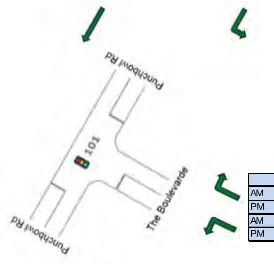
	AM	PM	AM	PM
Current	18	49	2555	2020
2023	20	52	2863	2153
Construction	8	8	8	8
Bridges	0	0	-118	-969
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

Punchbowl Area

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM
Current	605	704	87	126
2023	684	785	98	141
Construction	3	3	3	3
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

95%ile Observed Queue	S	E	W
AM Peak (m)	89	104	175
PM Peak (m)	120	136	136

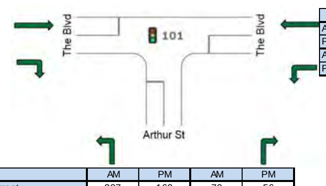


	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	274	310	3	0	0	0
PM	232	259	3	0	0	0
AM	310	350	0	0	44	15
PM	533	595	0	0	44	15

	AM	PM	AM	PM
Current	1000	618	291	383
2023	1132	690	329	427
Construction	3	3	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	44	44
Refined Baseline TTP	0	0	15	15

95%ile Observed Queue	N	S	E	W
AM Peak (m)	0	42	42	77
PM Peak (m)	0	35	56	77

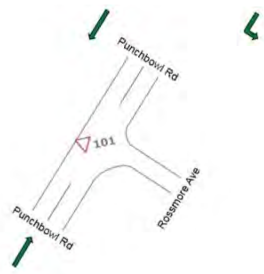
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	380	430	3	0	44	15
PM	425	474	3	0	44	15
AM	41	46	0	0	0	0
PM	71	79	0	0	0	0



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	493	558	3	0	44	15
PM	608	679	3	0	44	15
AM	58	66	0	0	0	0
PM	68	76	0	0	0	0

	AM	PM	AM	PM
Current	207	169	70	56
2023	234	189	79	63
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

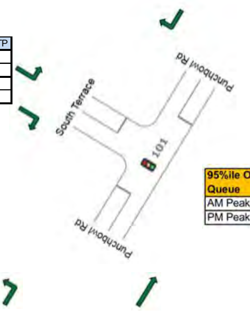
	AM	PM	AM	PM
Current	873	1145	139	126
2023	1009	1332	161	147
Construction	3	3	0	0
Bridges	0	0	0	0
Baseline TTP	44	44	0	0
Refined Baseline TTP	15	15	0	0



	AM	PM
Current	1229	971
2023	1420	1129
Construction	3	3
Bridges	0	0
Baseline TTP	44	44
Refined Baseline TTP	15	15

	AM	PM	AM	PM
Current	319	508	450	630
2023	365	562	515	697
Construction	3	3	0	0
Bridges	0	0	0	0
Baseline TTP	44	44	0	0
Refined Baseline TTP	15	15	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	524	599	3	0	44	15
PM	529	585	3	0	44	15
AM	97	111	0	0	0	0
PM	155	171	0	0	0	0



95%ile Observed Queue	N	E	W
AM Peak (m)	228	163	226
PM Peak (m)	208	159	152

	AM	PM	AM	PM
Current	11	30	786	472
2023	13	33	899	522
Construction	0	0	3	3
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

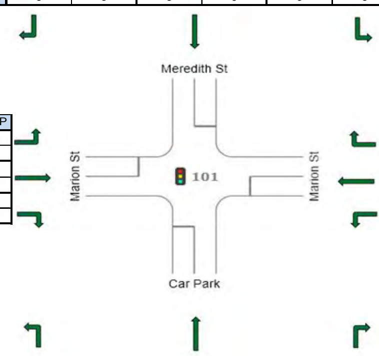
Bankstown Area (Map 1)

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM	AM	PM
Current	422	912	42	18	33	38
2023	468	1018	47	20	37	42
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	84	18	56	153
PM Peak (m)	155	28	79	120

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	875	970	0	0	0	0
PM	497	555	0	0	0	0
AM	676	750	0	0	0	0
PM	456	509	0	0	0	0
AM	92	102	0	0	0	0
PM	36	40	0	0	0	0

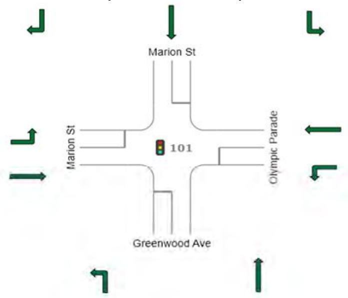


	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	71	79	0	0	0	0
PM	51	57	0	0	0	0
AM	336	373	0	0	0	0
PM	559	624	0	0	0	0
AM	42	47	0	0	0	0
PM	16	18	0	0	0	0

	AM	PM	AM	PM	AM	PM
Current	19	81	7	48	4	24
2023	21	90	8	54	4	27
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	AM	PM	AM	PM	AM	PM
Current	430	741	252	578	87	100
2023	482	836	282	652	97	113
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	1191	1334	0	0	0	0
PM	638	719	0	0	0	0
AM	450	504	0	0	0	0
PM	337	380	0	0	0	0



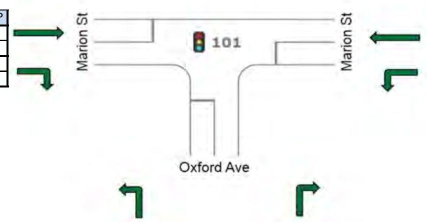
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	365	409	0	0	0	0
PM	563	635	0	0	0	0
AM	39	44	0	0	0	0
PM	57	64	0	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	101	175	74	336
PM Peak (m)	128	70	126	63

	AM	PM	AM	PM
Current	22	65	503	400
2023	25	73	564	451
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

95%ile Observed Queue	S	E	W
AM Peak (m)	84	81	49
PM Peak (m)	84	112	49

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	1285	1425	0	0	0	0
PM	602	672	0	0	0	0
AM	239	264	0	0	0	0
PM	315	352	0	0	0	0



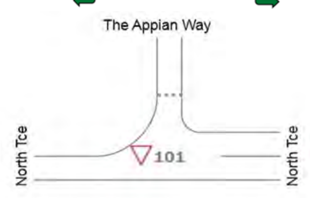
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	648	719	0	0	0	0
PM	1100	1228	0	0	0	0
AM	114	126	0	0	0	0
PM	190	212	0	0	0	0

	AM	PM	AM	PM
Current	71	187	291	196
2023	79	209	323	219
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

Bankstown Area (Map 2)

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM
Current	123	208	525	695
2023	145	231	620	773
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	20	20	0	0
Refined Baseline TTP	20	20	0	0



95%ile Observed Queue	N	E
AM Peak (m)	36	48
PM Peak (m)	71	42

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	527	622	0	0	0	0
PM	437	486	0	0	0	0

	AM	PM	AM	PM
Current	375	439	276	434
2023	424	490	312	484
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

95%ile Observed Queue	N	E	W
AM Peak (m)	99	97	130
PM Peak (m)	120	90	114

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	550	623	0	0	0	0
PM	383	427	0	0	0	0
AM	241	273	8	0	15	15
PM	277	309	8	0	15	15
AM	118	133	0	0	0	0
PM	124	138	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	494	559	0	0	0	0
PM	373	416	0	0	0	0
AM	199	225	0	0	15	15
PM	237	265	0	0	15	15

	AM	PM	AM	PM
Current	19	20	1	4
2023	21	23	1	5
Construction	0	0	8	8
Bridges	0	0	0	0
Baseline TTP	20	20	15	15
Refined Baseline TTP	20	20	15	15

95%ile Observed Queue	N	S	E
AM Peak (m)	14	150	30
PM Peak (m)	25	125	26

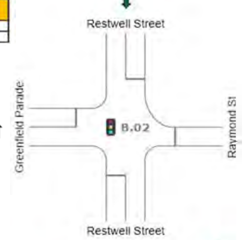
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	21	24	0	0	20	20
PM	24	28	0	0	20	20
AM	36	40	0	0	0	0
PM	34	39	0	0	0	0

	AM	PM	AM	PM
Current	143	132	939	777
2023	160	152	1052	894
Construction	0	0	8	8
Bridges	0	0	0	0
Baseline TTP	0	0	15	15
Refined Baseline TTP	0	0	15	15

	AM	PM
Current	35	39
2023	41	44
Construction	0	0
Bridges	0	0
Baseline TTP	0	0
Refined Baseline TTP	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	18	140	180	0
PM Peak (m)	25	105	210	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	163	190	0	0	0	0
PM	1	1	0	0	0	0



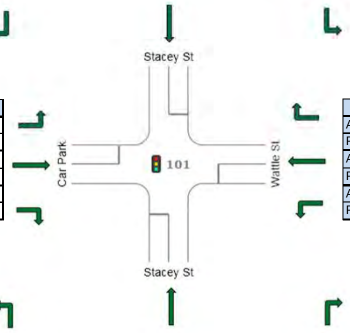
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	450	526	0	0	15	15
PM	523	596	0	0	15	15
AM	1	1	0	0	0	0
PM	10	11	0	0	0	0
AM	241	282	0	0	0	0
PM	319	363	0	0	0	0

	AM	PM	AM	PM
Current	1	1	468	385
2023	1	1	547	439
Construction	0	0	0	0
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

Bankstown Area (Map 3)

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM	AM	PM
Current	16	68	1693	2592	180	160
2023	18	71	1897	2724	202	168
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0



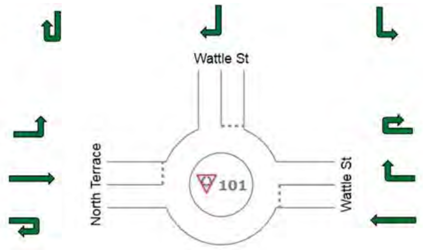
	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	21	24	0	0	0	0
PM	102	107	0	0	0	0
AM	10	11	0	0	0	0
PM	33	35	0	0	0	0
AM	12	13	0	0	0	0
PM	156	164	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	127	142	0	0	0	0
PM	92	97	0	0	0	0
AM	20	22	0	0	0	0
PM	52	55	0	0	0	0
AM	275	308	8	0	0	0
PM	617	648	8	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	137	263	56	7
PM Peak (m)	377	287	210	46

	AM	PM	AM	PM	AM	PM
Current	57	150	1926	1476	169	266
2023	64	158	2158	1551	189	280
Construction	0	0	0	0	8	8
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

	AM	PM	AM	PM	AM	PM
Current	9	11	48	92	399	314
2023	10	12	55	103	456	350
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0

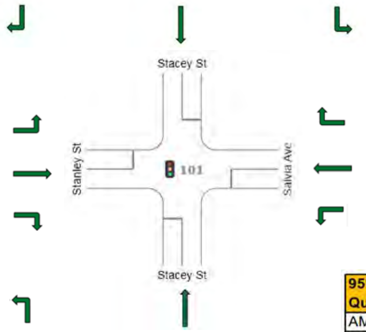


	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	246	281	8	0	0	0
PM	83	93	8	0	0	0
AM	627	717	0	0	0	0
PM	678	757	0	0	0	0
AM	13	15	0	0	0	0
PM	7	8	0	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	3	3	0	0	0	0
PM	9	10	0	0	0	0
AM	509	582	0	0	0	0
PM	322	359	0	0	0	0
AM	756	865	0	0	0	0
PM	871	972	0	0	0	0

95%ile Observed Queue	N	E	W
AM Peak (m)	53	21	53
PM Peak (m)	67	63	67

	AM	PM	AM	PM	AM	PM
Current	71	83	1847	2955	25	83
2023	80	86	2069	3061	28	86
Construction	0	0	8	8	0	0
Bridges	0	0	0	0	0	0
Baseline TTP	0	0	0	0	0	0
Refined Baseline TTP	0	0	0	0	0	0



	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	116	130	0	0	0	0
PM	57	59	0	0	0	0
AM	46	52	0	0	0	0
PM	46	48	0	0	0	0
AM	105	118	13	0	0	0
PM	155	161	13	0	0	0

	Current	2023	Construction	Bridges	Baseline TTP	Refined Baseline TTP
AM	190	213	0	0	0	0
PM	134	139	0	0	0	0
AM	37	41	0	0	0	0
PM	62	64	0	0	0	0
AM	1	1	0	0	0	0
PM	1	1	0	0	0	0

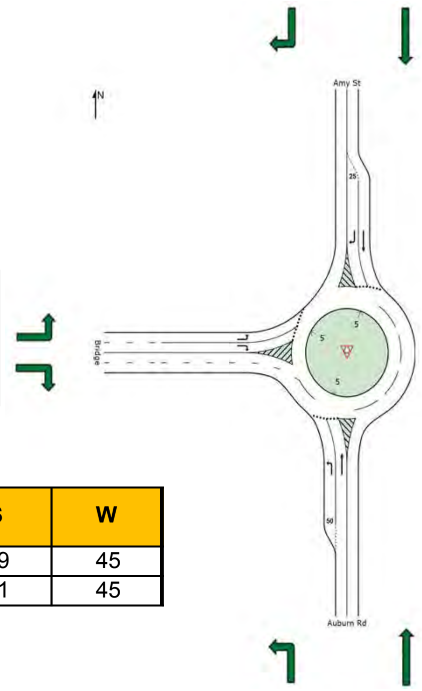
95%ile Observed Queue	N	S	E	W
AM Peak (m)	419	252	49	83
PM Peak (m)	226	200	77	145

	AM	PM	AM	PM
Current	27	50	1895	1811
2023	30	52	2123	1876
Construction	8	8	13	13
Bridges	0	0	0	0
Baseline TTP	0	0	0	0
Refined Baseline TTP	0	0	0	0

Regents Park Area

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM
Current	342	414	277	472
2023	404	457	327	522
Construction	0	0	0	0
Bridges	0	0	0	0
TTP	0	0	0	0



	Current	2023	Construction	Bridges	TTP
AM	326	385	0	0	0
PM	337	372	0	0	0
AM	251	296	0	0	6
PM	331	366	0	0	6

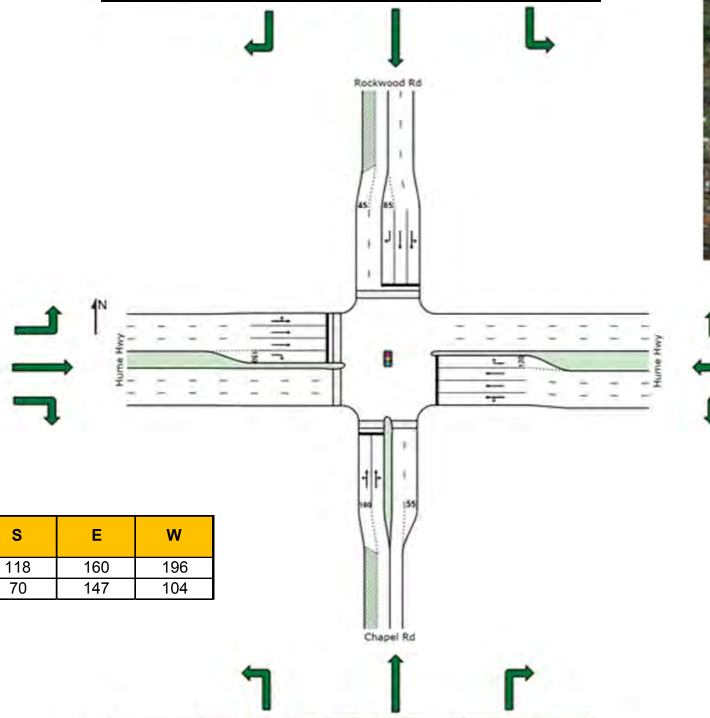
95%ile Observed Queue	N	S	W
AM Peak (m)	38	59	45
PM Peak (m)	38	31	45

	AM	PM	AM	PM
Current	405	213	460	218
2023	478	235	543	241
Construction	0	0	0	0
Bridges	0	0	0	0
TTP	6	6	0	0

Yagoona Area

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM	AM	PM
Current	146	273	261	770	33	32
2023	158	314	282	886	36	37
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
TTP	0	0	0	0	0	0



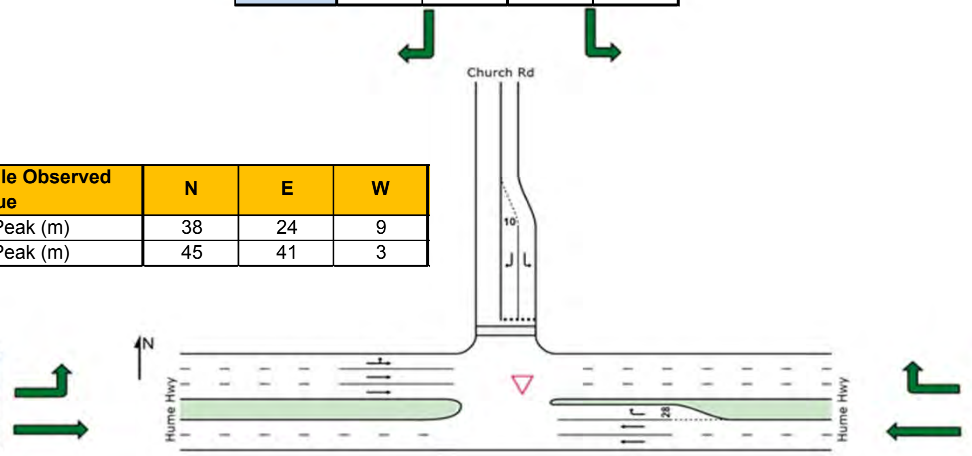
	Current	2023	Construction	Bridges	TTP
AM	213	230	0	0	0
PM	137	158	0	0	0
AM	1663	1797	0	0	0
PM	1238	1425	0	0	0
AM	165	178	0	0	20
PM	228	262	0	0	20

	Current	2023	Construction	Bridges	TTP
AM	45	49	0	0	0
PM	87	100	0	0	0
AM	1104	1193	0	0	0
PM	1427	1643	0	0	0
AM	103	111	0	0	0
PM	58	67	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	97	118	160	196
PM Peak (m)	133	70	147	104

	AM	PM	AM	PM	AM	PM
Current	182	289	394	314	8	4
2023	197	333	426	361	9	5
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
TTP	20	20	0	0	0	0

	AM	PM	AM	PM
Current	12	14	91	122
2023	14	16	103	136
Construction	0	0	0	0
Bridges	0	0	0	0
TTP	0	0	20	20



95%ile Observed Queue	N	E	W
AM Peak (m)	38	24	9
PM Peak (m)	45	41	3

	Current	2023	Construction	Bridges	TTP
AM	42	48	0	0	0
PM	56	63	0	0	0
AM	2277	2577	0	0	0
PM	1822	2034	0	0	0

	Current	2023	Construction	Bridges	TTP
AM	5	6	0	0	20
PM	30	33	0	0	20
AM	1483	1679	0	0	0
PM	2090	2333	0	0	0

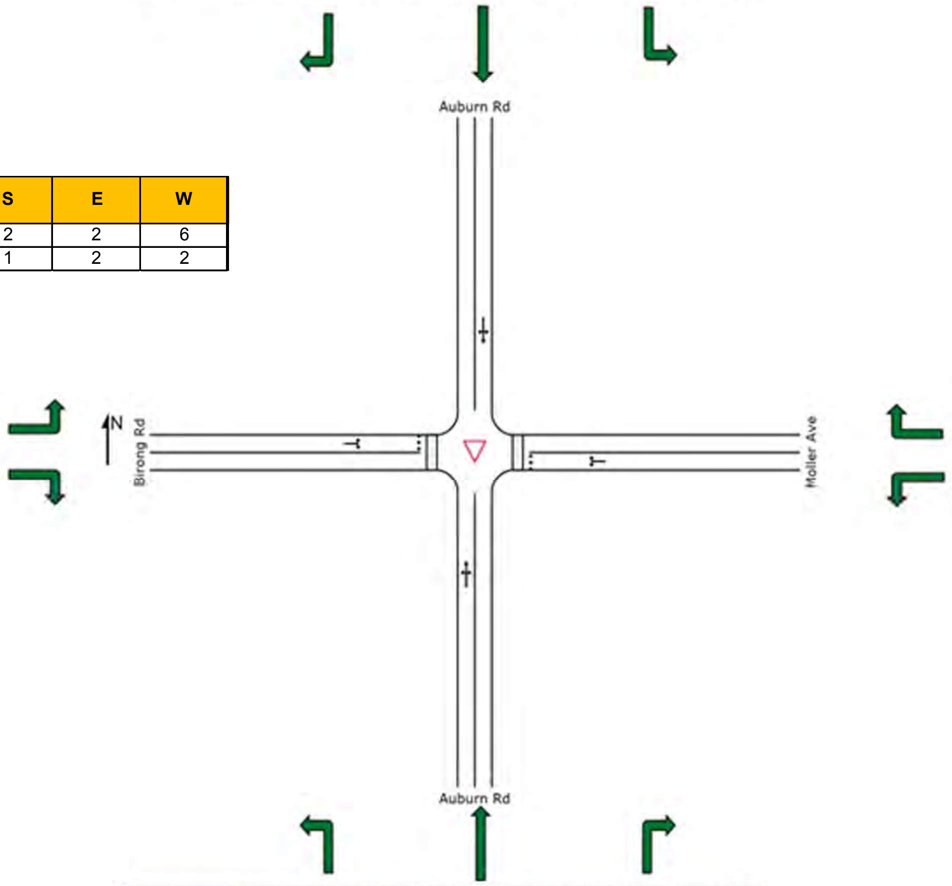
Birrong Area

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM	AM	PM
Current	3	3	580	664	1	2
2023	3	3	650	749	1	2
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
TTP	0	0	20	20	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	1	2	2	6
PM Peak (m)	0	1	2	2

	Current	2023	Construction	Bridges	TTP
AM	8	9	0	0	0
PM	4	5	0	0	0
AM	8	9	0	0	0
PM	2	2	0	0	0



	Current	2023	Construction	Bridges	TTP
AM	1	1	0	0	0
PM	1	1	0	0	0
AM	10	11	0	0	0
PM	3	3	0	0	0

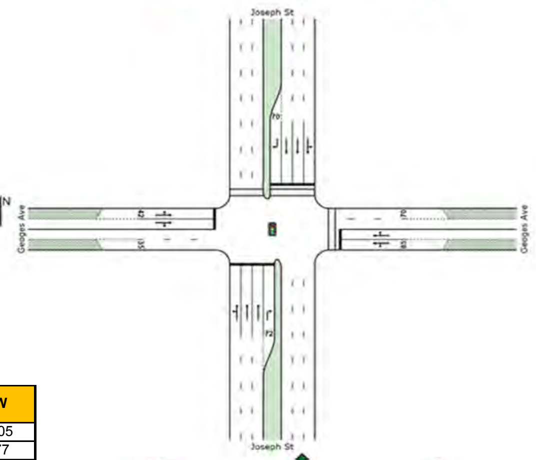
	AM	PM	AM	PM	AM	PM
Current	4	4	623	592	8	2
2023	4	5	698	668	9	2
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
TTP	0	0	20	20	0	0

Lidcombe Area (Map 1)

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM	AM	PM
Current	81	202	1400	2213	79	24
2023	90	228	1553	2495	88	27
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
TTP	0	0	0	0	0	0

	Current	2023	Construction	Bridges	TTP
AM	185	205	0	0	14
PM	84	95	0	0	14
AM	249	276	0	0	0
PM	187	211	0	0	0
AM	89	99	0	0	0
PM	26	29	0	0	0

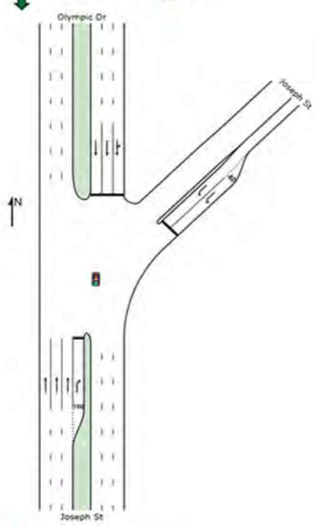


	Current	2023	Construction	Bridges	TTP
AM	11	12	0	0	0
PM	33	37	0	0	0
AM	161	179	0	0	0
PM	391	441	0	0	0
AM	96	106	0	0	0
PM	304	343	0	0	0

95%ile Observed Queue	N	S	E	W
AM Peak (m)	133	112	49	105
PM Peak (m)	134	105	126	77

	AM	PM	AM	PM	AM	PM
Current	44	58	2585	1583	352	89
2023	49	65	2867	1785	390	100
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
TTP	0	0	0	0	0	0

	AM	PM	AM	PM
Current	1531	2309	113	81
2023	1698	2577	125	90
Construction	0	0	0	0
Bridges	0	0	0	0
TTP	0	0	0	0



	Current	2023	Construction	Bridges	TTP
AM	181	201	0	0	0
PM	376	420	0	0	0

95%ile Observed Queue	N	NE	S
AM Peak (m)	60	46	140
PM Peak (m)	28	99	29

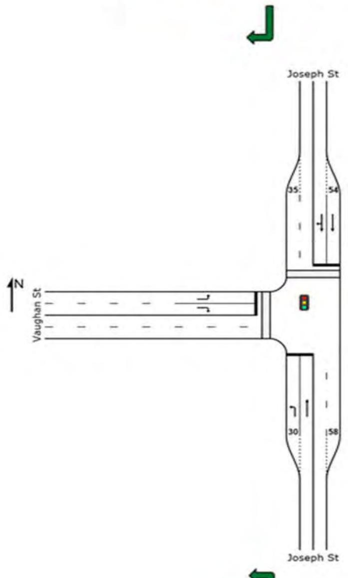
	AM	PM	AM	PM
Current	2181	1373	608	311
2023	2419	1532	674	347
Construction	0	0	0	0
Bridges	0	0	0	0
TTP	0	0	14	14

Lidcombe Area (Map 2)

Traffic volume diagrams for modelled intersections (measured in number of vehicles)

	AM	PM	AM	PM
Current	120	124	103	167
2023	139	144	119	194
Construction	0	0	0	0
Bridges	0	0	0	0
TTP	0	0	0	0

	Current	2023	Construction	Bridges	TTP
AM	184	213	0	0	0
PM	149	173	0	0	0
AM	242	280	0	0	0
PM	261	304	0	0	0

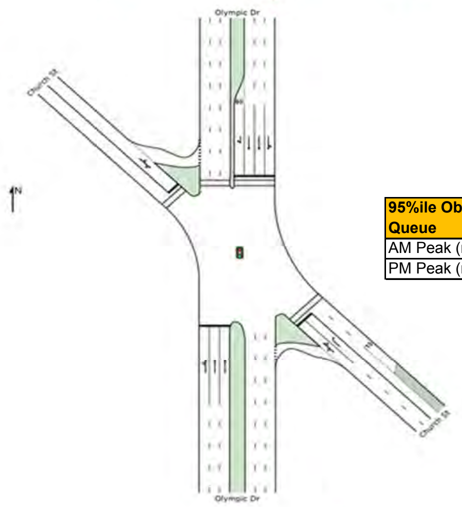


95%ile Observed Queue	N	S	W
AM Peak (m)	21	69	73
PM Peak (m)	42	70	77

	AM	PM	AM	PM
Current	351	477	257	190
2023	406	555	297	221
Construction	0	0	0	0
Bridges	0	0	0	0
TTP	0	0	14	14

	AM	PM	AM	PM	AM	PM
Current	17	16	1419	2020	153	138
2023	19	18	1558	2255	168	154
Construction	0	0	0	0	0	0
Bridges	0	0	0	0	0	0
TTP	0	0	0	0	0	0

	Current	2023	Construction	Bridges	TTP
AM	11	12	0	0	0
PM	25	28	0	0	0
AM	67	74	0	0	0
PM	57	64	0	0	0
AM	7	8	0	0	0
PM	63	70	0	0	0



95%ile Observed Queue	N	S	E	W
AM Peak (m)	96	49	56	34
PM Peak (m)	126	56	84	60

	Current	2023	Construction	Bridges	TTP
AM	138	152	0	0	0
PM	284	317	0	0	0
AM	11	12	0	0	0
PM	9	10	0	0	0
AM	243	267	0	0	14
PM	485	541	0	0	14

	AM	PM	AM	PM
Current	132	84	2690	1573
2023	145	94	2954	1756
Construction	0	0	0	0
Bridges	0	0	0	0
TTP	0	0	0	0

Appendix B

Construction and TTS Swept Path Tracking

Station	Direction	Intersection
Marrickville Station	Inbound	Station Street / Schwebel Street
		Schwebel Street / Illawarra Road
	Outbound	Schwebel Street / Leofrene Avenue
		Schwebel Street / Illawarra Road
Dulwich Hill Station	Inbound	Ewart Street / Ewart Lane
		Terrace Road / Ewart Street
	Outbound	Ewart Street / Wardell Road
		Terrace Road / Ewart Street
Hurlstone Park Station	Inbound	Crinan Street / Floss Street
	Outbound	Crinan Street / Floss Street
	Inbound	Duntroon Street / Crinan Street
	Outbound	Duntroon Street / Crinan Street
Canterbury Station	Inbound	Canterbury Road / Charles Street
	Outbound	Canterbury Road / Charles Street
	Inbound	Canterbury Road / Close Street
	Outbound	Canterbury Road / Close Street
	Inbound	Close Street / 15 Close Street
	Outbound	Close Street / 15 Close Street
	Inbound	Canterbury Road / Broughton Street
	Outbound	Canterbury Road / Broughton Street
Campsie Station	Inbound	North Parade / Beamish Street
	Outbound	North Parade / Beamish Street
	Inbound	Lilian Lane / Carrington Street
		Carrington Square / Carrington Street
		Anglo Road / Carrington Square
		Loch Street / Anglo Street
	Outbound	Lilian Lane / Beamish Street
Belmore Station	Inbound	Burwood Road / Tobruk Avenue
	Outbound	Arcadia Lane/ Leylands Parade
	Inbound	Burwood Road / Redman Parade
	Outbound	Burwood Road / Redman Parade
	Inbound	Burwood Road / Dean Avenue
	Outbound	Burwood Road / Dean Avenue
Lakemba Station	Inbound	Moreton Street / The Boulevarde
		Moreton Street / Lakemba Street
		Burwood Road / Lakemba Street
	Outbound	The Boulevarde / Haldon Street
	Inbound	Haldon Street / Railway Parade
	Outbound	Haldon Street / Railway Parade
	Inbound	Haldon Street / Railway Parade
	Outbound	Haldon Street / Railway Parade
	Inbound	The Boulevarde / Haldon Street
	Outbound	The Boulevarde / Haldon Street

Station	Direction	Intersection
Wiley Park	Inbound	The Boulevarde / King Georges Road
	Outbound	The Boulevarde / King Georges Road
	Inbound	Shadforth Street / Lakemba Street
		King Georges Road / Lakemba Street
	Outbound	Shadforth Street / Lakemba Street
		King Georges Road / Lakemba Street
Punchbowl	Inbound	Punchbowl Road / The Boulevarde
	Outbound	Punchbowl Road / The Boulevarde
	Inbound	Urunga Parade / Dudley Street
		Dudley Street / Punchbowl Road
	Outbound	Urunga Parade / Dudley Street
		Dudley Street / Punchbowl Road
	Inbound	Wattle Street / Highclere Avenue
	Outbound	Wattle Street / Highclere Avenue
	Inbound	South Terrace / Loder Lane
	Outbound	South Terrace / Loder Lane
Bankstown	Inbound	Raymond Street / Restwell Street
		Cross Street / Raymond Street
		Stanley Street / Cross Street
	Outbound	South Terrace / East Terrace
		Stanley Street / Stacey Street
	Inbound	Wattle Street / North Terrace
	Outbound	Wattle Street / North Terrace
		Wattle Street / Stacey Street

SYDNEY METRO
8.8m MEDIUM RIGID VEHICLE SWEPT PATHS
ILLAWARRA RD / STATION ST
Project No.: 60489141

Issue Status: DRAFT

SYDNEY METRO
8.8m MEDIUM RIGID VEHICLE SWEPT PATHS
N PDE / BEAMISH ST
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
SCHWEBEL ST / ILLAWARRA RD
Project No.: 60489141

Issue Status: DRAFT

Transport for NSW

HASSELL

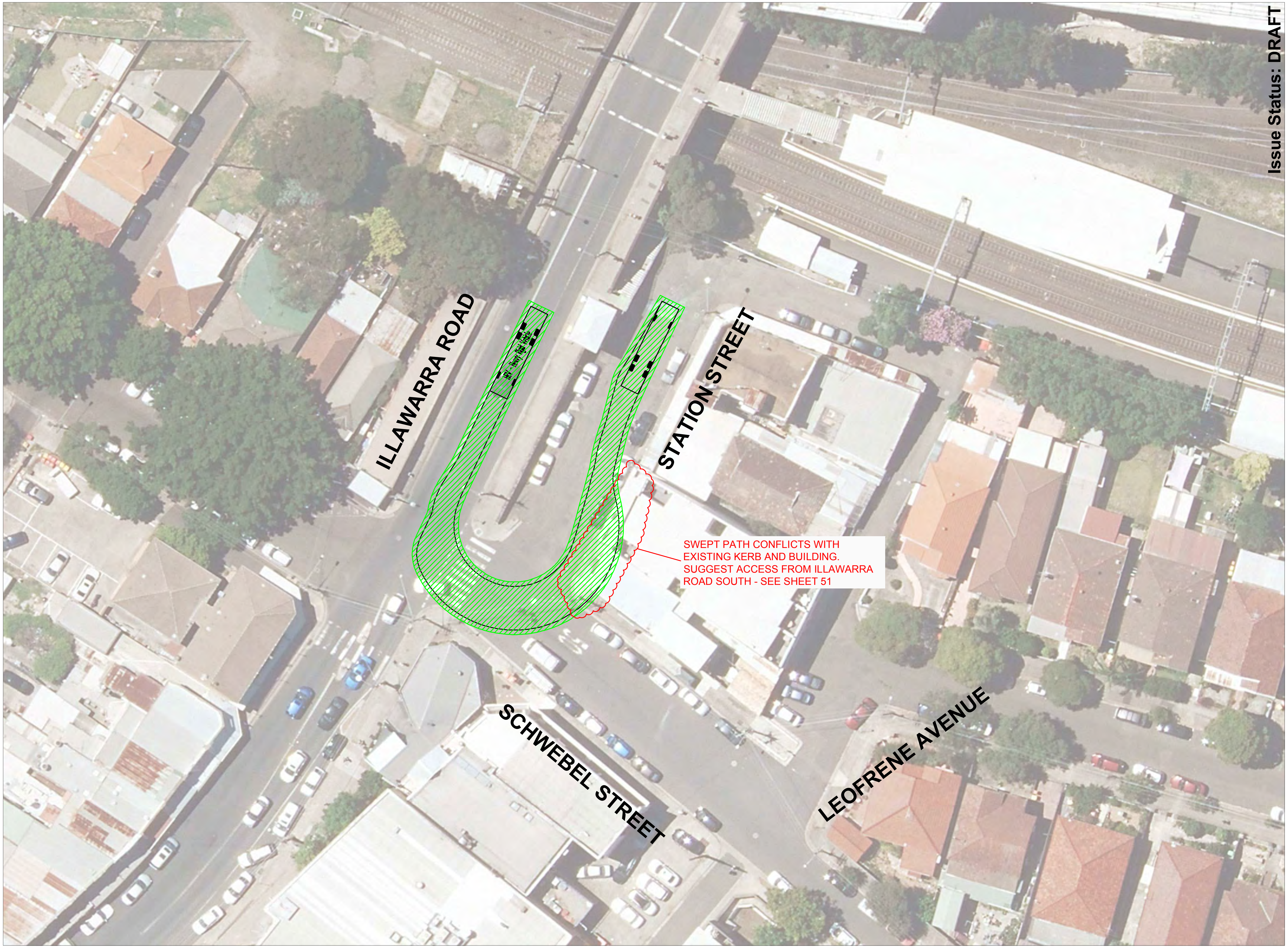
PARSONS BRINCKERHOFF

AECOM

COX

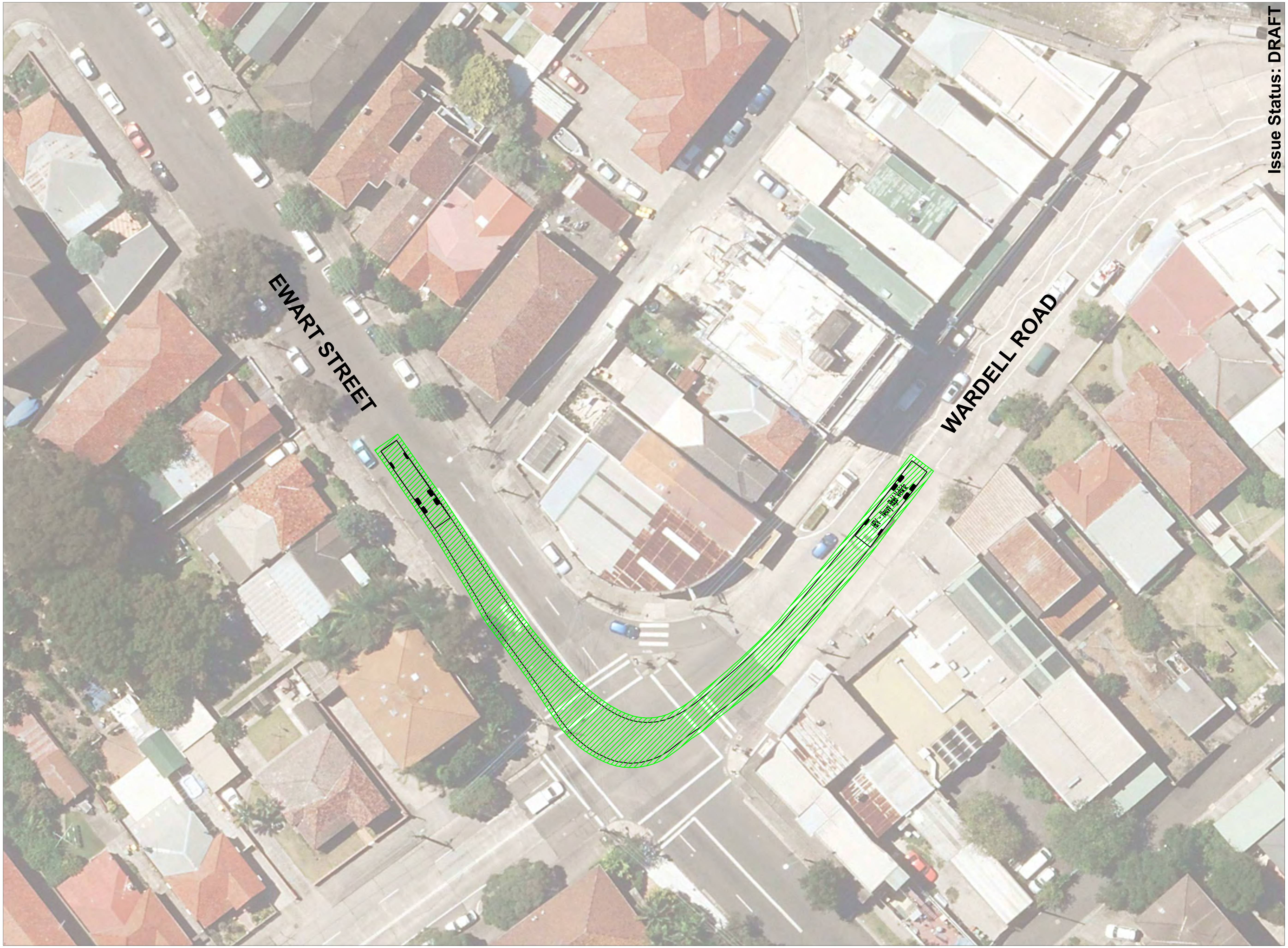
SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
LEOFRENE AVE / SCHWEBEL ST
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
ILLAWARRA RD / SCHWEBEL ST / STATION ST
Project No.: 60489141



Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
ILLAWARRA RD / SCHWEBEL ST / STATION ST
Project No.: 60489141



Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
WARDELL RD / EWART ST
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
EWART ST / TERRACE RD
Project No.: 60489141

Issue Status: DRAFT

AECOM

COX

HASSELL

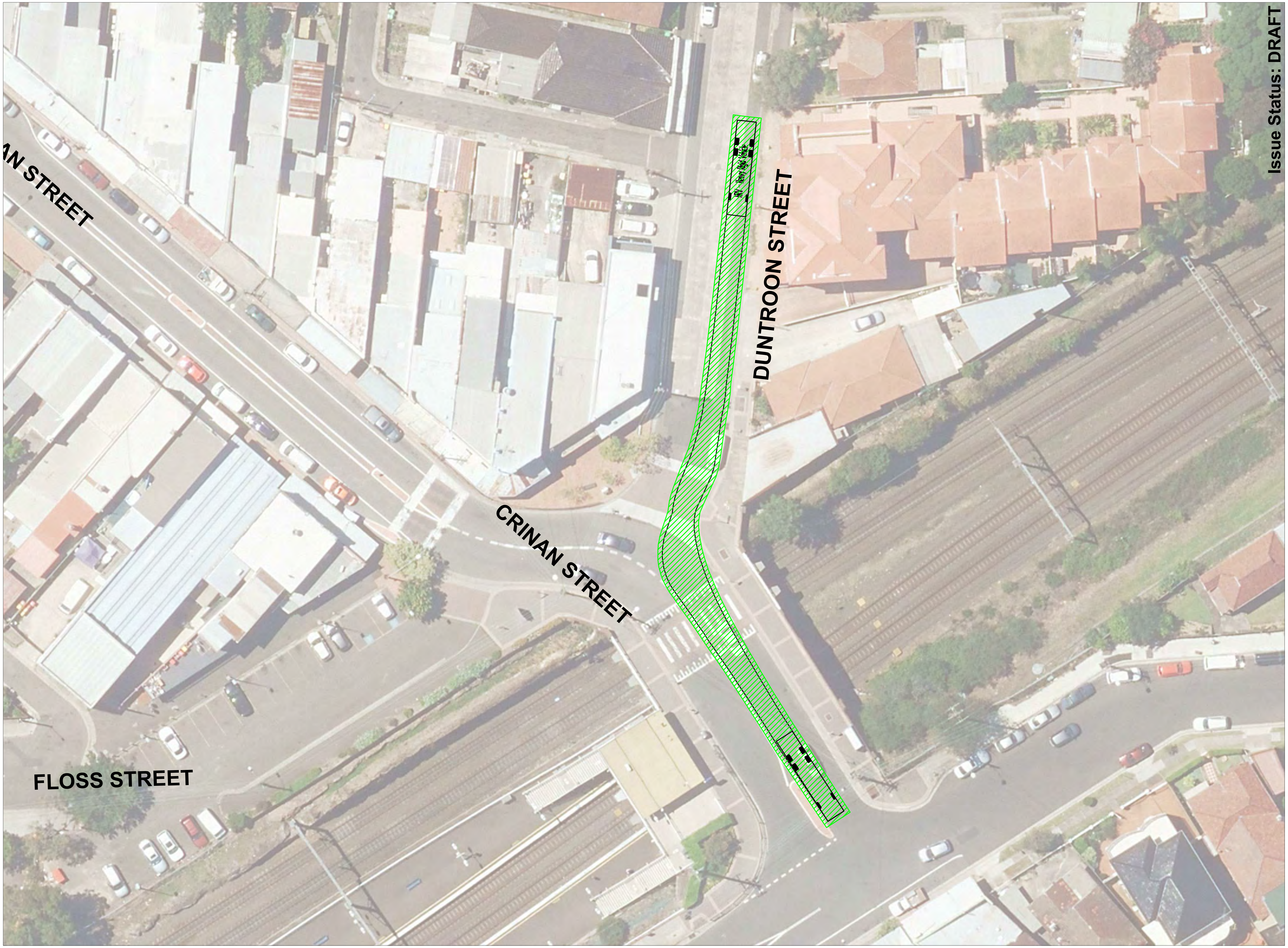
PARSONS BRINCKERHOFF

NSW Transport for NSW

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
TERRACE RD / EWART ST
Project No.: 60489141

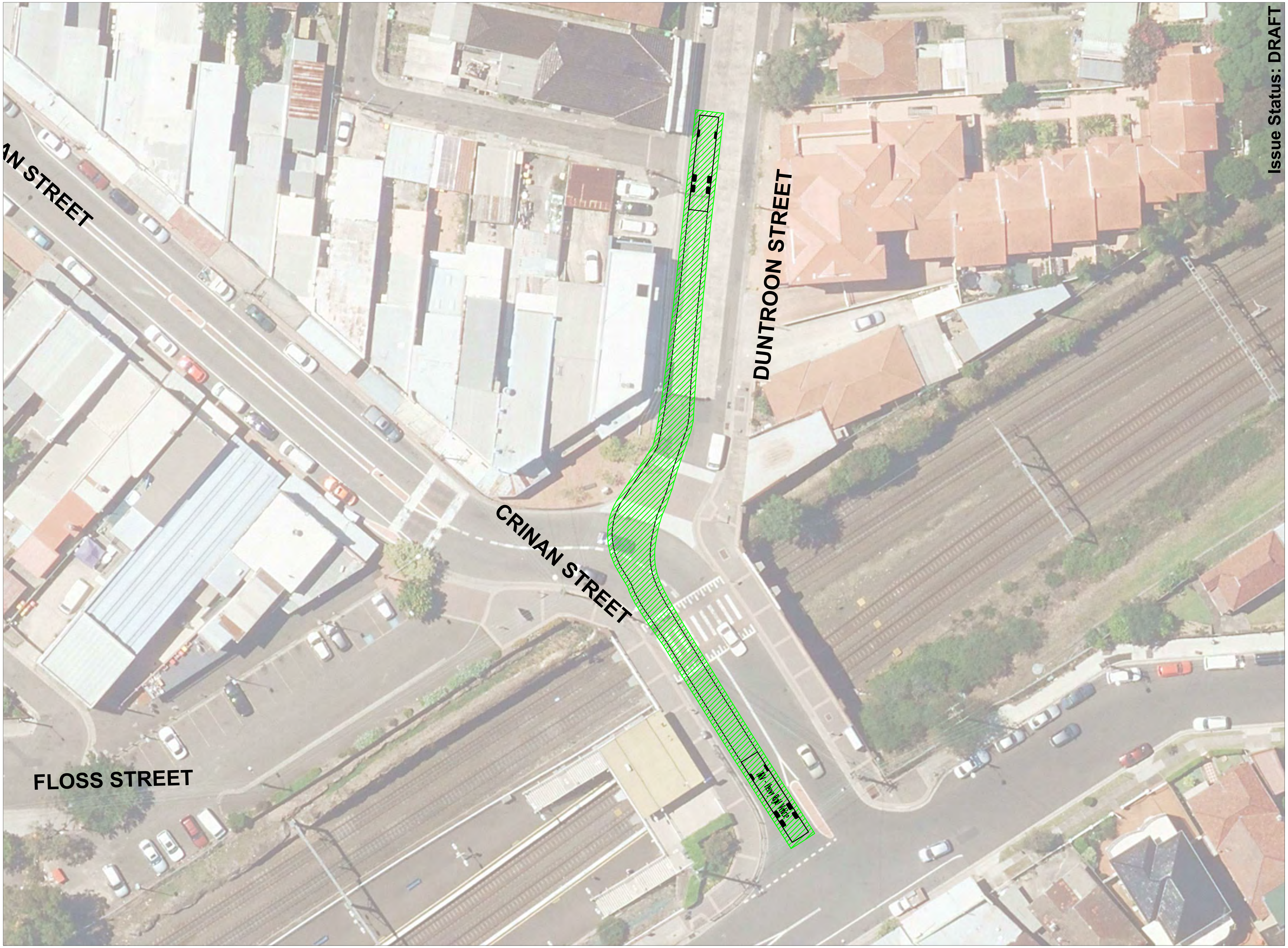
Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
EWART ST / EWART LN
Project No.: 60489141



Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
DUNTROON ST / CRINAN ST
Project No.: 60489141



Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
CRINAN ST / DUNTRON ST
Project No.: 60489141

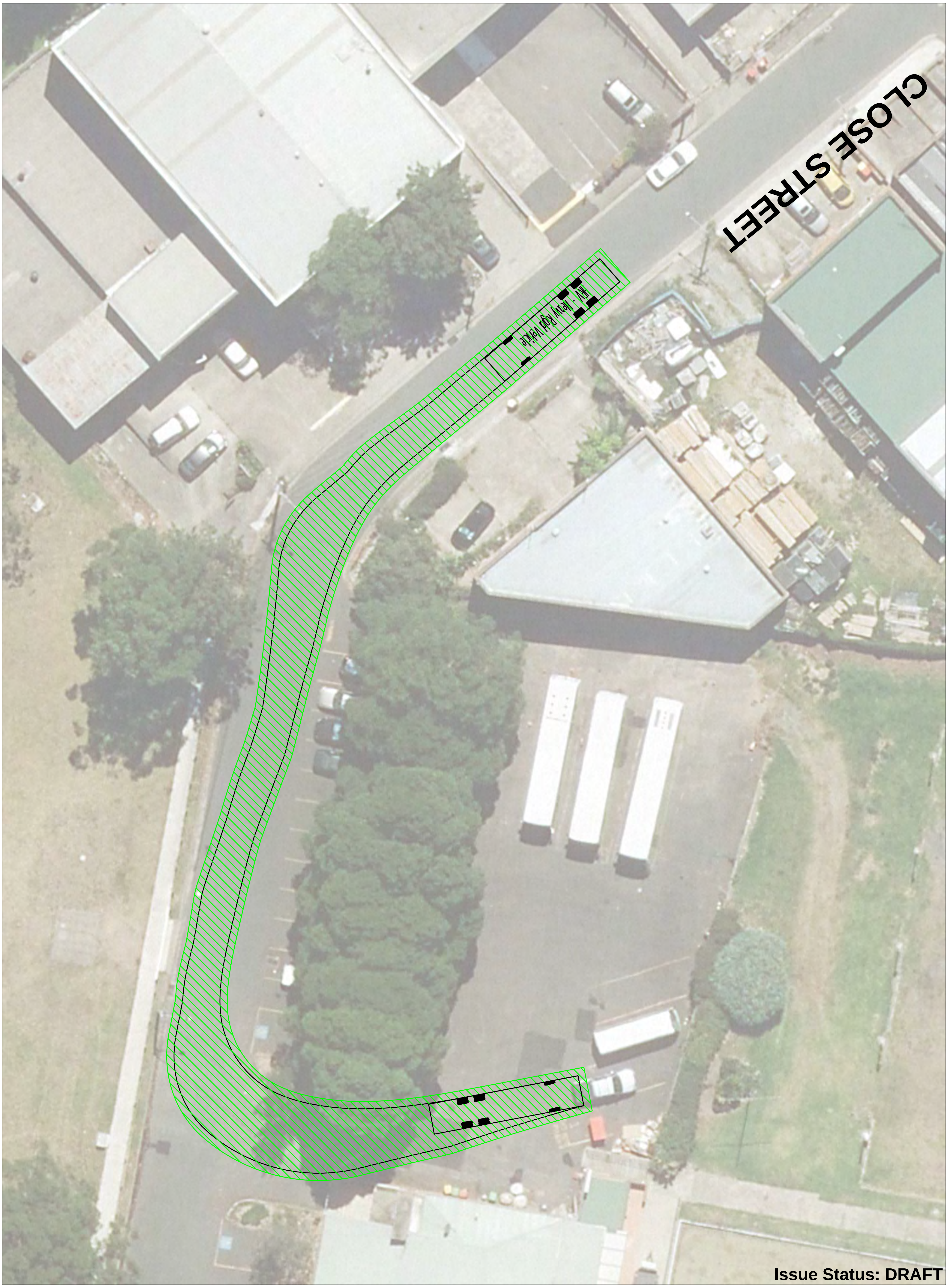
SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
CRINAN ST / FLOSS ST
Project No.: 60489141

Issue Status: DRAFT

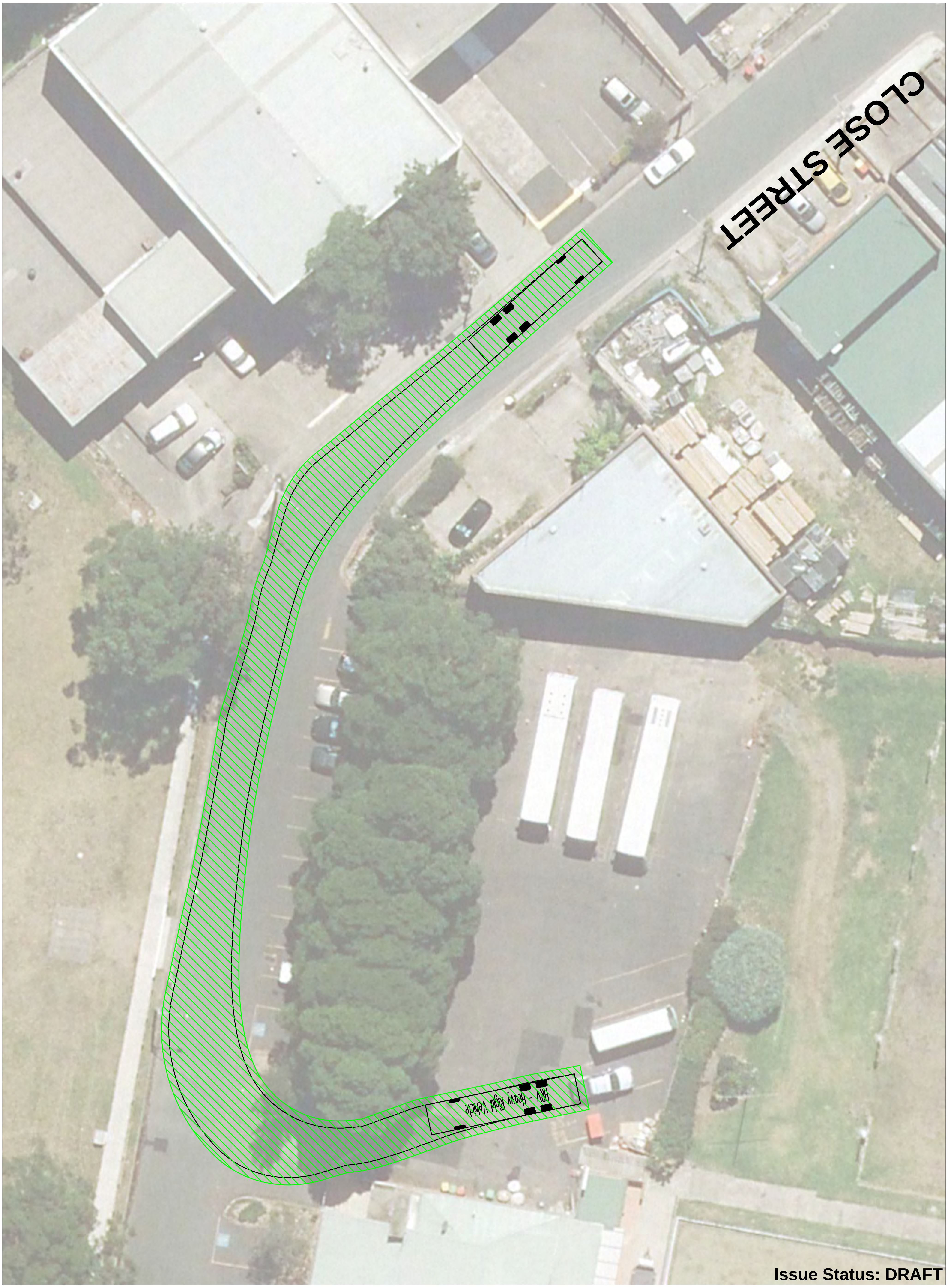
SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
FLOSS ST / CRINAN ST
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
CANTERBURY RD / CHARLES ST
Project No.: 60489141

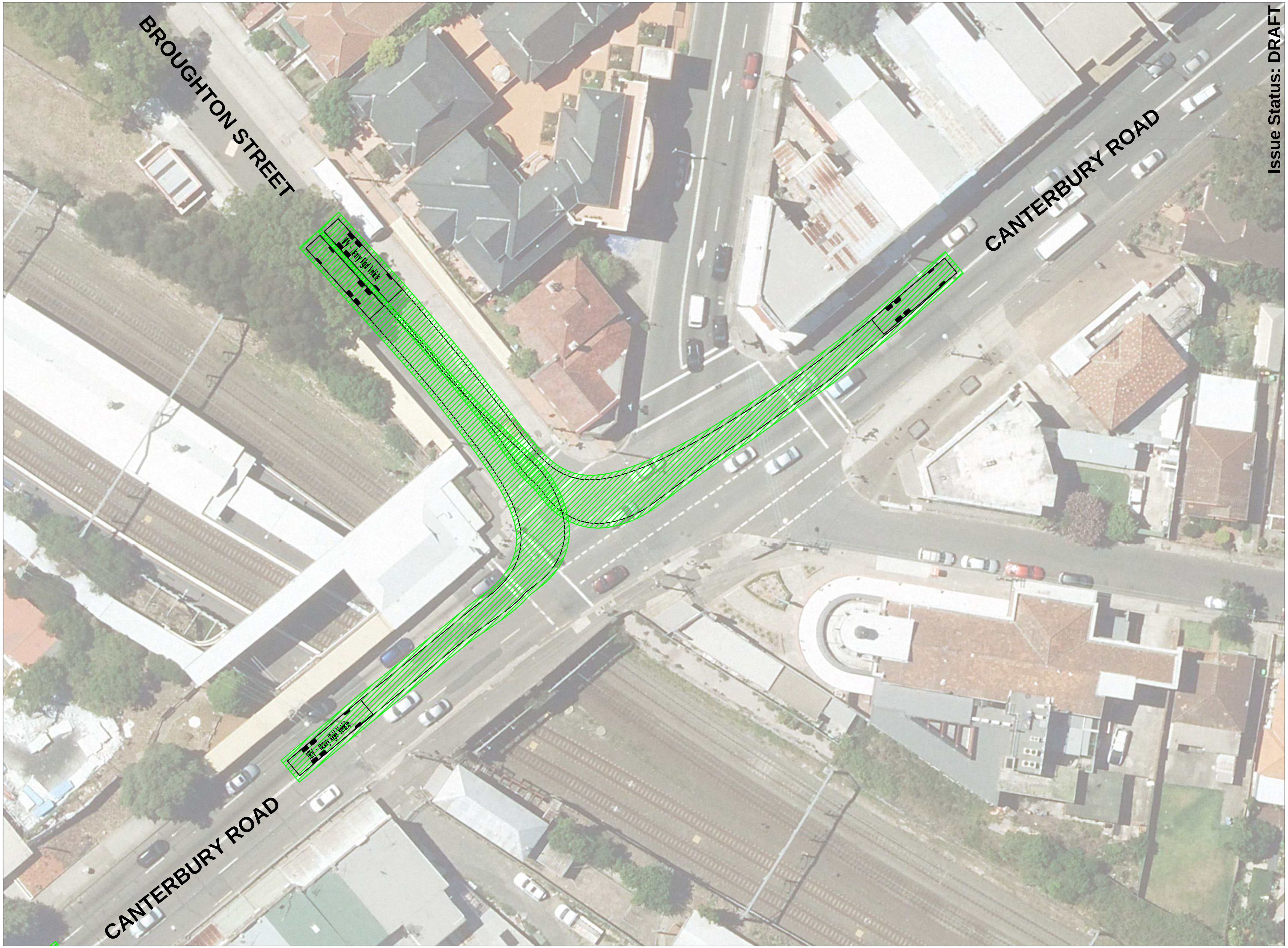
SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
CANTERBURY RD / CLOSE ST
Project No.: 60489141



SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
CLOSE ST
Project No.: 60489141



SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
CLOSE ST
Project No.: 60489141



SYDNEY METRO
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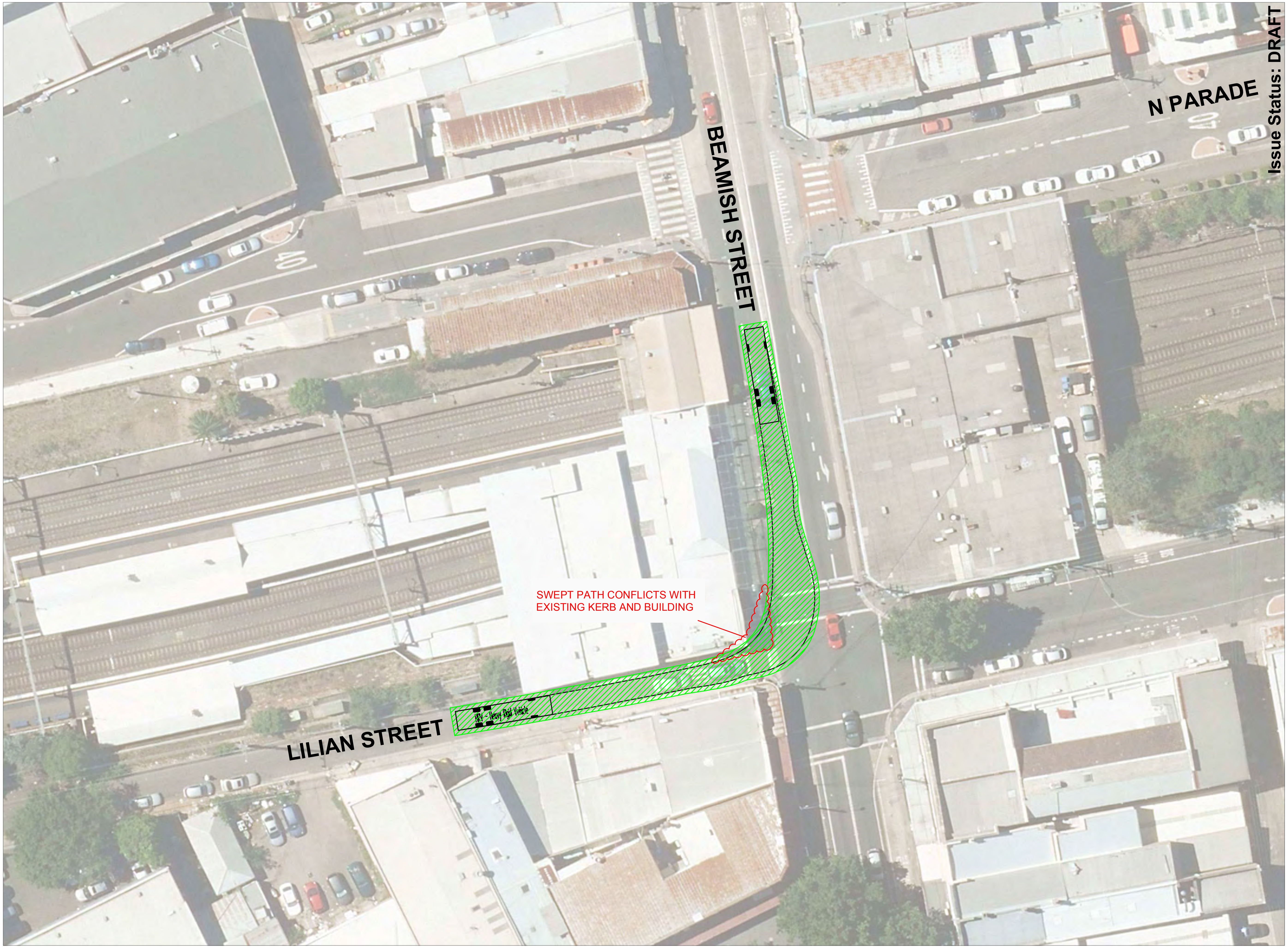
CANTERBURY RD / BROUGHTON ST
Project No.: 60489141



Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
LILIAN ST / BEAMISH ST
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
LOCH ST / ANGLO RD
Project No.: 60489141

NSW GOVERNMENT Transport for NSW HASSELL AECOM PARSONS BRINCKERHOFF COX

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
ANGLO RD / CARRINGTON SQ
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
CARRINGTON SQ / CARRINGTON ST
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
CARRINGTON ST / LILIAN ST
Project No.: 60489141

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
N PDE / BEAMISH ST
Project No.: 60489141

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
BEAMISH ST / N PDE
Project No.: 60489141

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
DEAN AVE / BURWOOD RD
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
BURWOOD RD / DEAN AVE
Project No.: 60489141

NSW GOVERNMENT Transport for NSW
HASSELL
AECOM
PARSONS BRINCKERHOFF
COX

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
REDMAN PDE / BURWOOD RD
Project No.: 60489141

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
BURWOOD RD / REDMAN PDE
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
ARCADIA LN / LEYLANDS PDE
Project No.: 60489141

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
BURWOOD RD / TOBRUK AVE
Project No.: 60489141

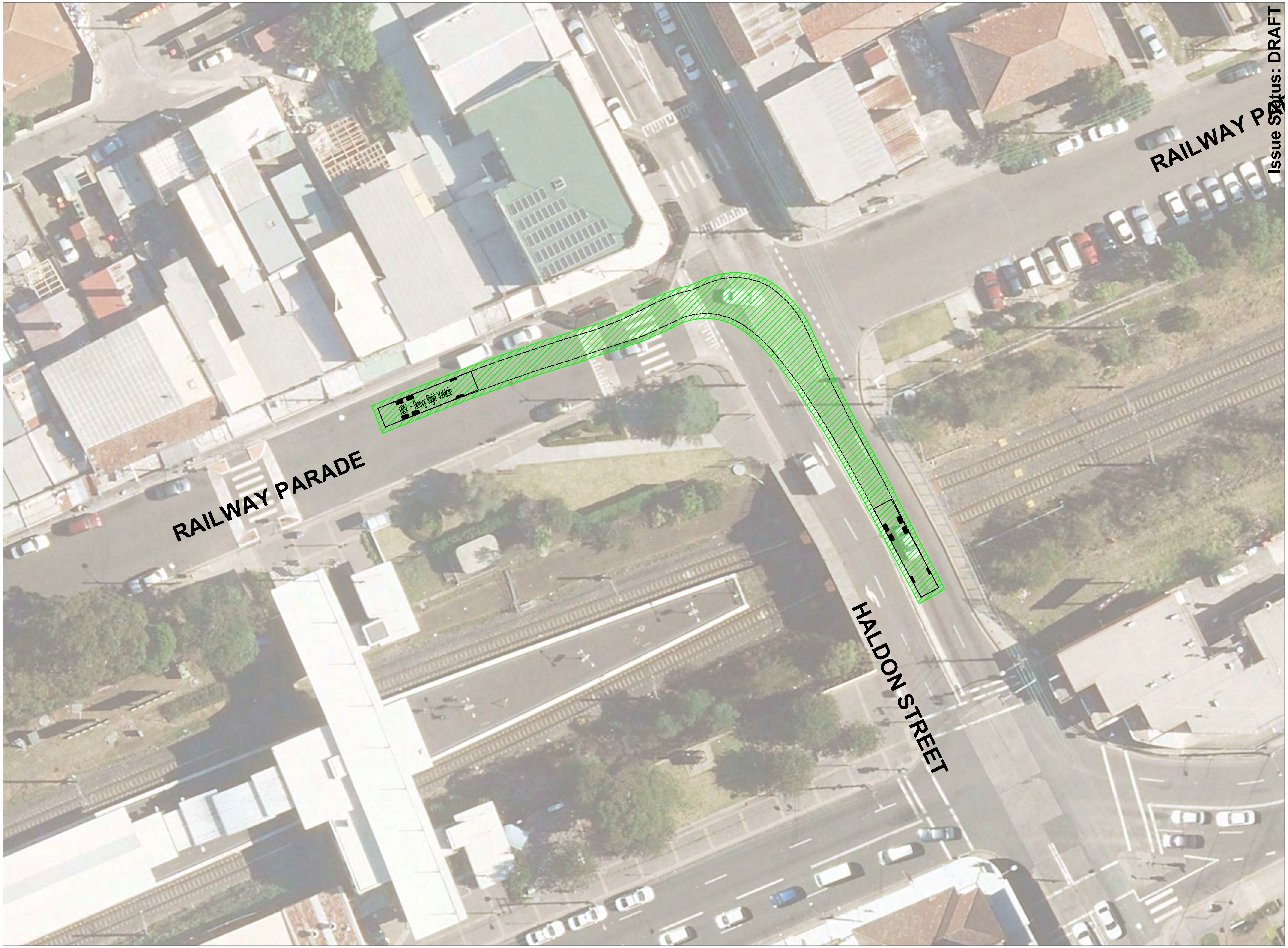
SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
BURWOOD RD / LAKEMBA ST
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
HALDON STREET / THE BOULEVARDE
Project No.: 60489141

NSW GOVERNMENT | Transport for NSW
HASSELL
AECOM
PARSONS BRINCKERHOFF
COX

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
HALDON STREET / THE BOULEVARDE
Project No.: 60489141

Transport for NSW
HASSELL
AECOM
PARSONS BRINCKERHOFF
COX



Issue Status: DRAFT

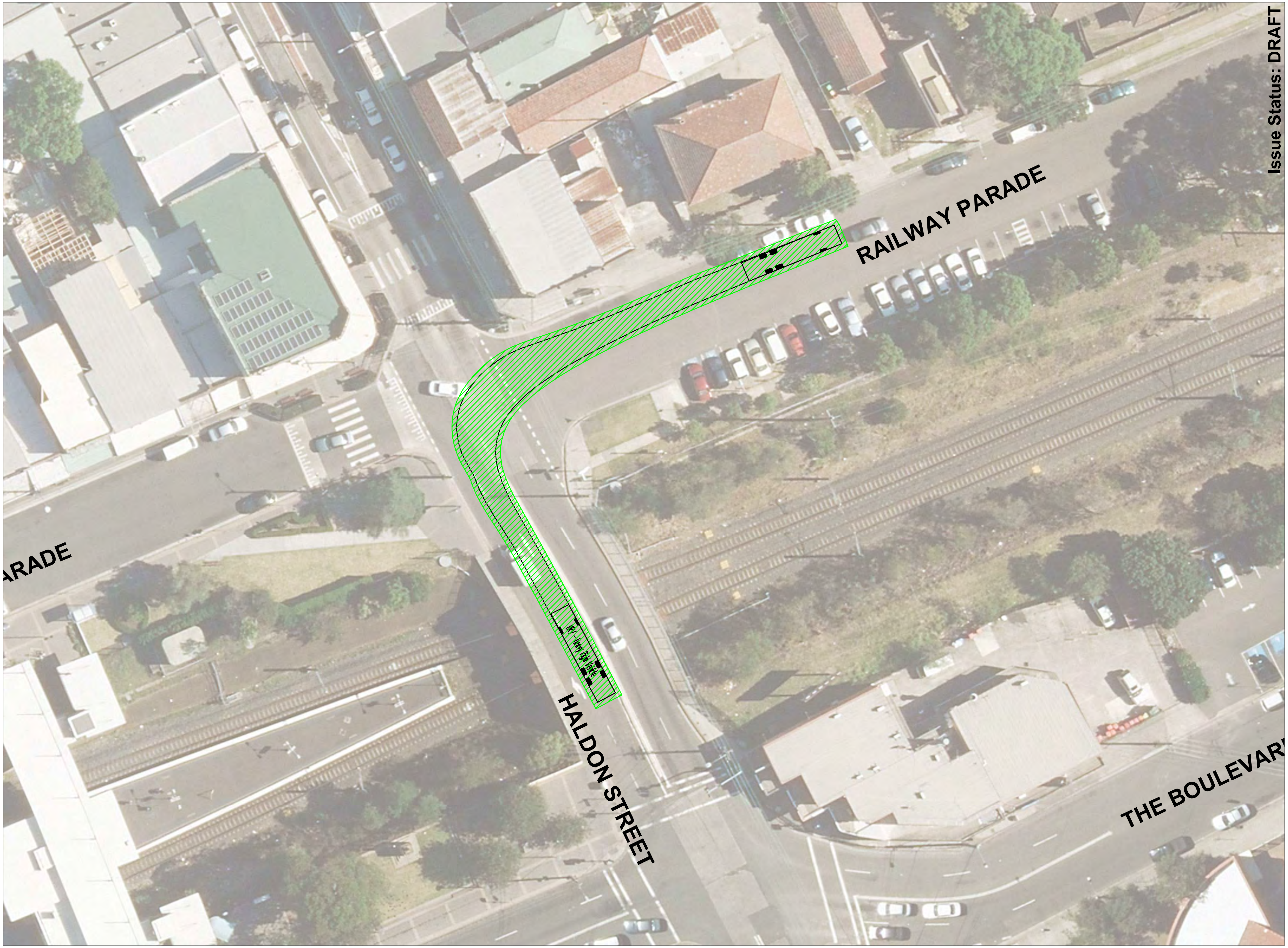
SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
HALDON STREET / RAILWAY PARADE
Project No.: 60489141

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
HALDON STREET / RAILWAY PARADE
Project No.: 60489141

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
HALDON STREET / RAILWAY PARADE
Project No.: 60489141



Issue Status: DRAFT

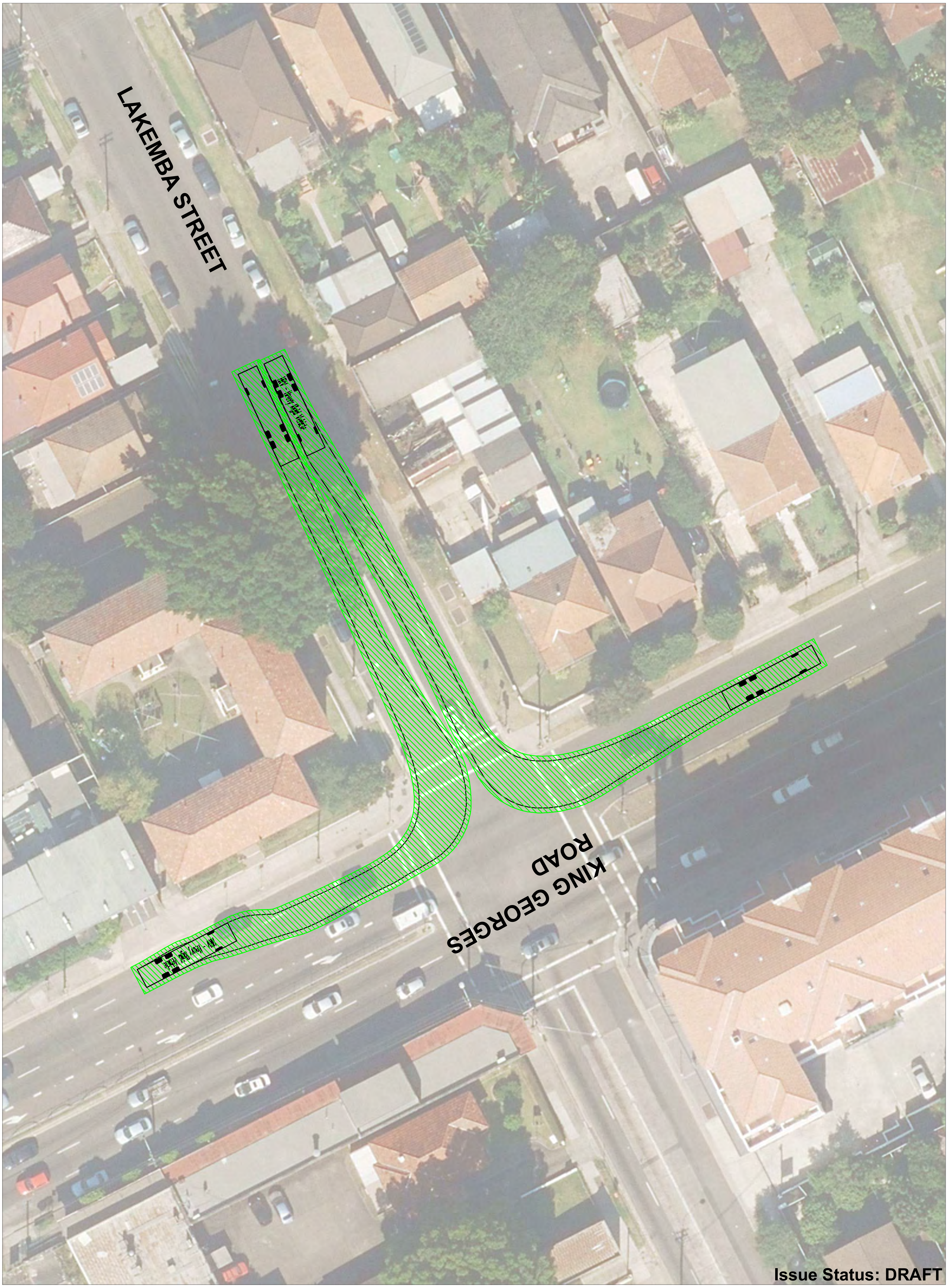
SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
HALDON STREET / RAILWAY PARADE
Project No.: 60489141

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
THE BOULEVARDE / HALDON STREET
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
MORETON STREET / LAKEMBA STREET
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
MORETON STREET / THE BOULEVARDE
Project No.: 60489141

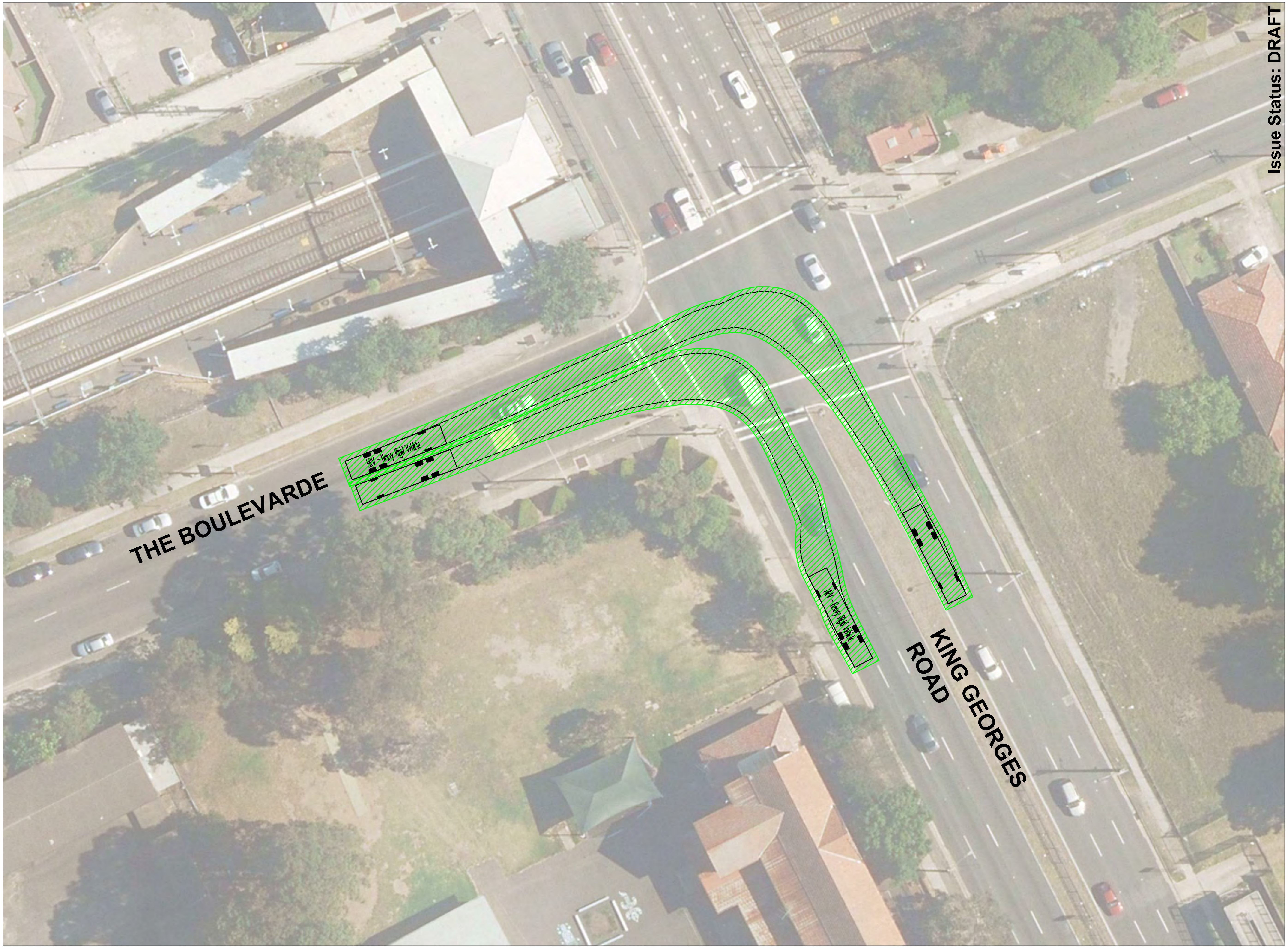


SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
KING GEORGES RD / LAKEMBA ST
Project No.: 60489141

NSW GOVERNMENT Transport for NSW · HASSELL · AECOM · PARSONS BRINCKERHOFF · COX

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
LAKEMBA ST / SHADFORTH ST
Project No.: 60489141



Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
KING GEORGES RD / THE BOULEVARDE
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
LODER LN / SOUTH TCE
Project No.: 60489141

NSW GOVERNMENT | Transport for NSW
HASSELL
AECOM
PARSONS BRINCKERHOFF
COX

Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
SOUTH TCE / LODER LN
Project No.: 60489141

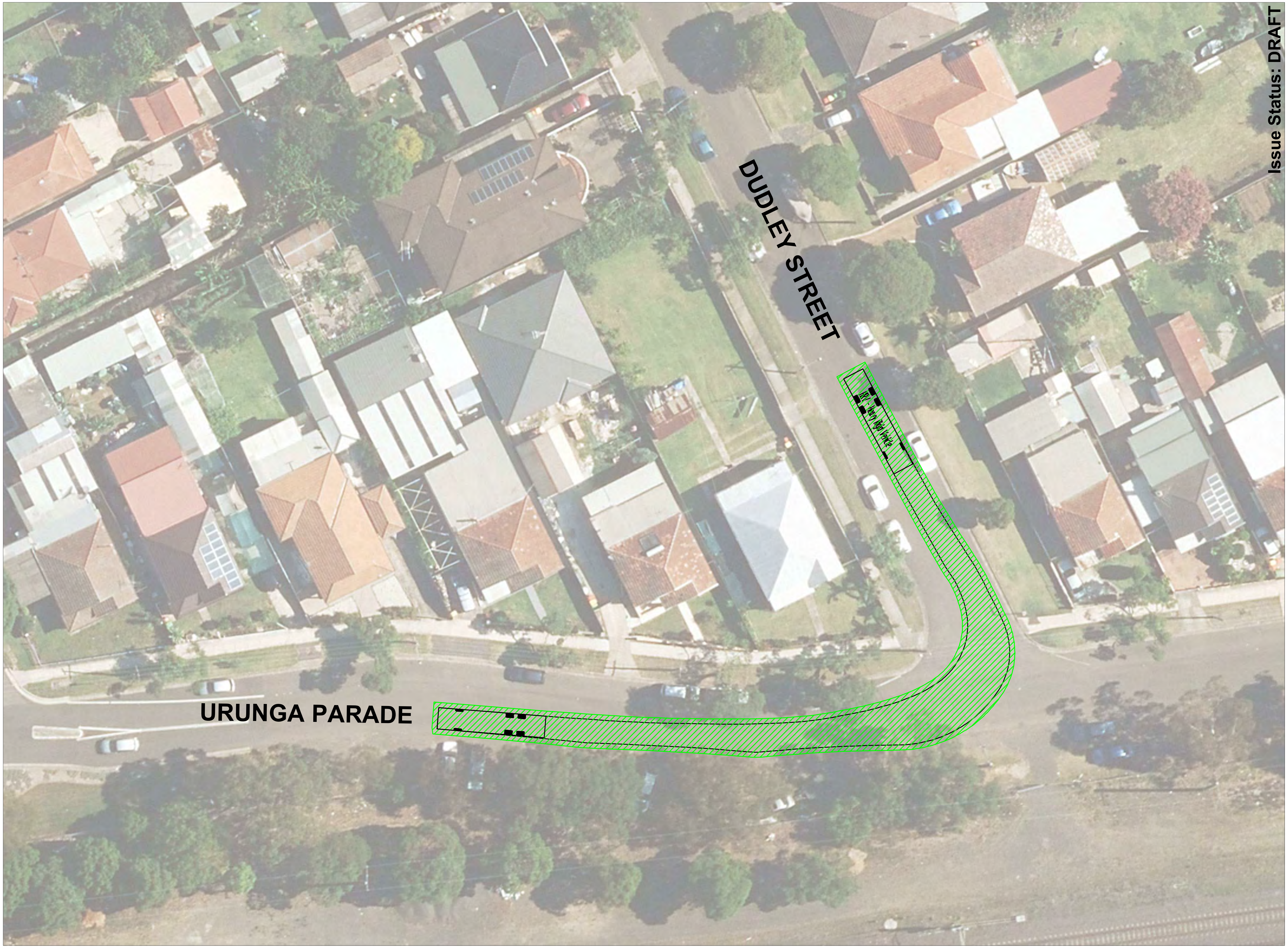
Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
WATTLE ST / HIGHCLERE AVE
Project No.: 60489141

Issue Status: DRAFT

AECOM
COX
HASSELL
PARSONS BRINCKERHOFF
NSW Transport for NSW

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
PUNCHBOWL RD / DUDLEY ST
Project No.: 60489141

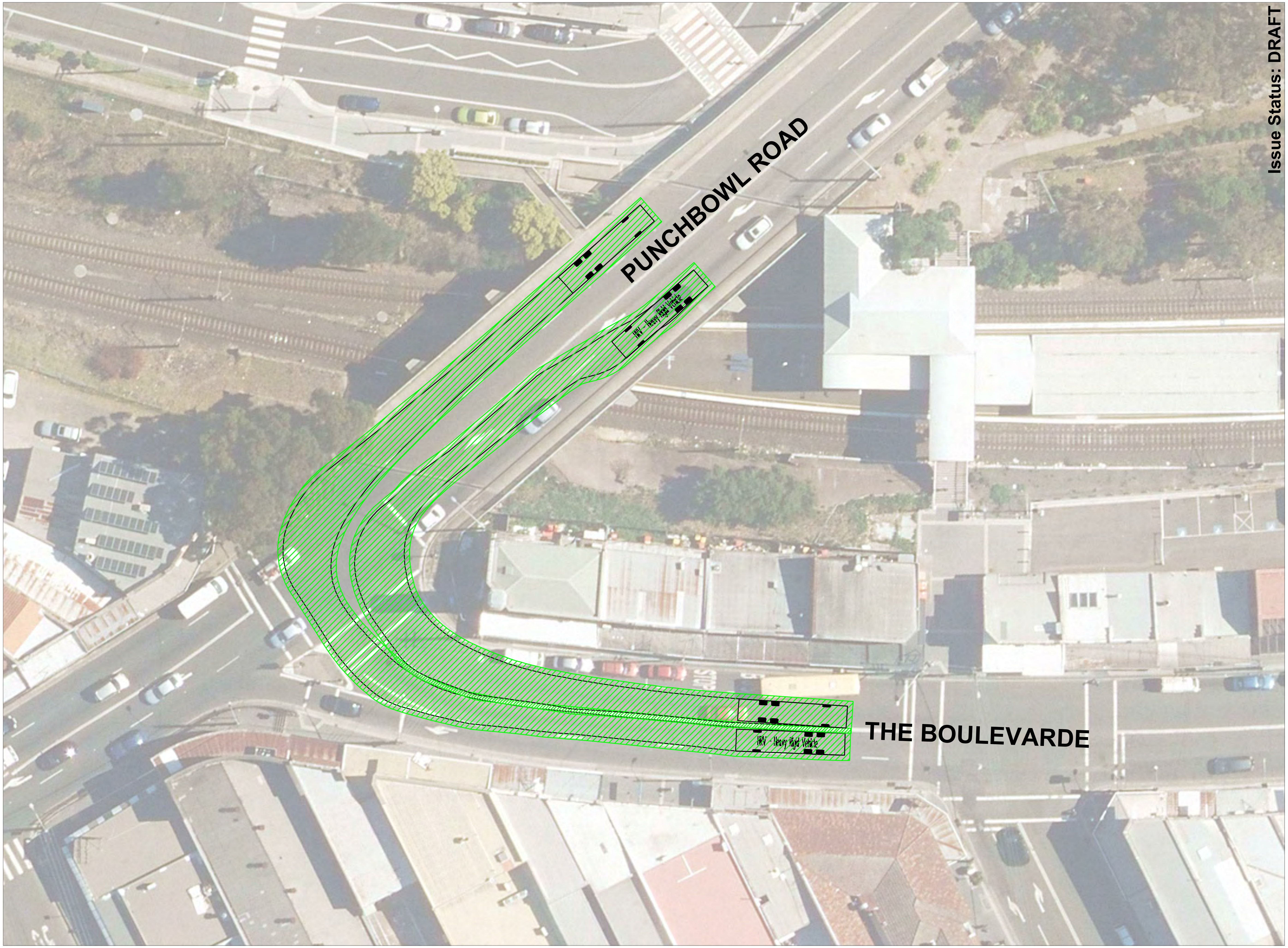


Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
DUDLEY ST / URUNGA PDE
Project No.: 60489141

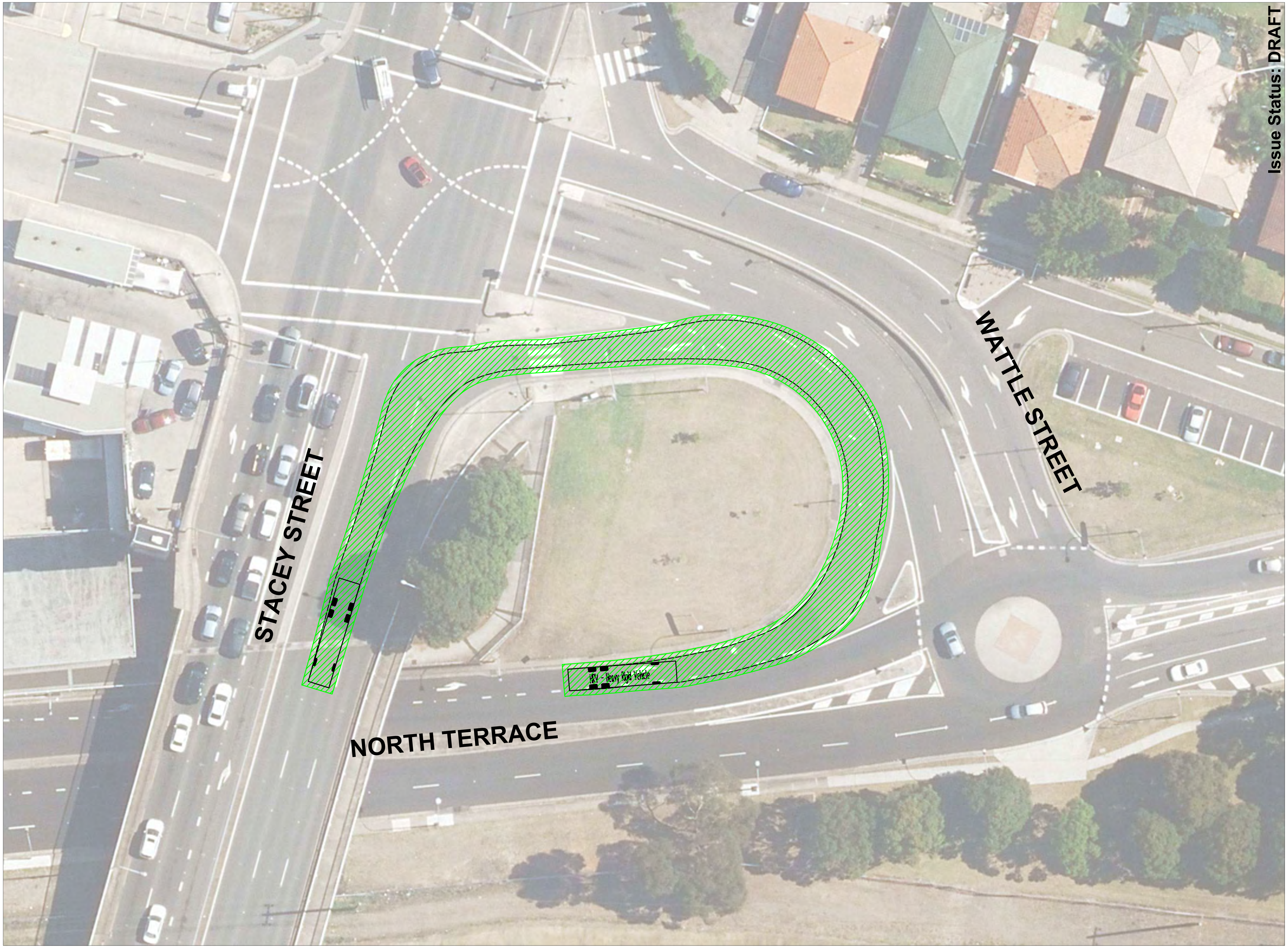
Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
DUDLEY ST / URUNGA PDE
Project No.: 60489141

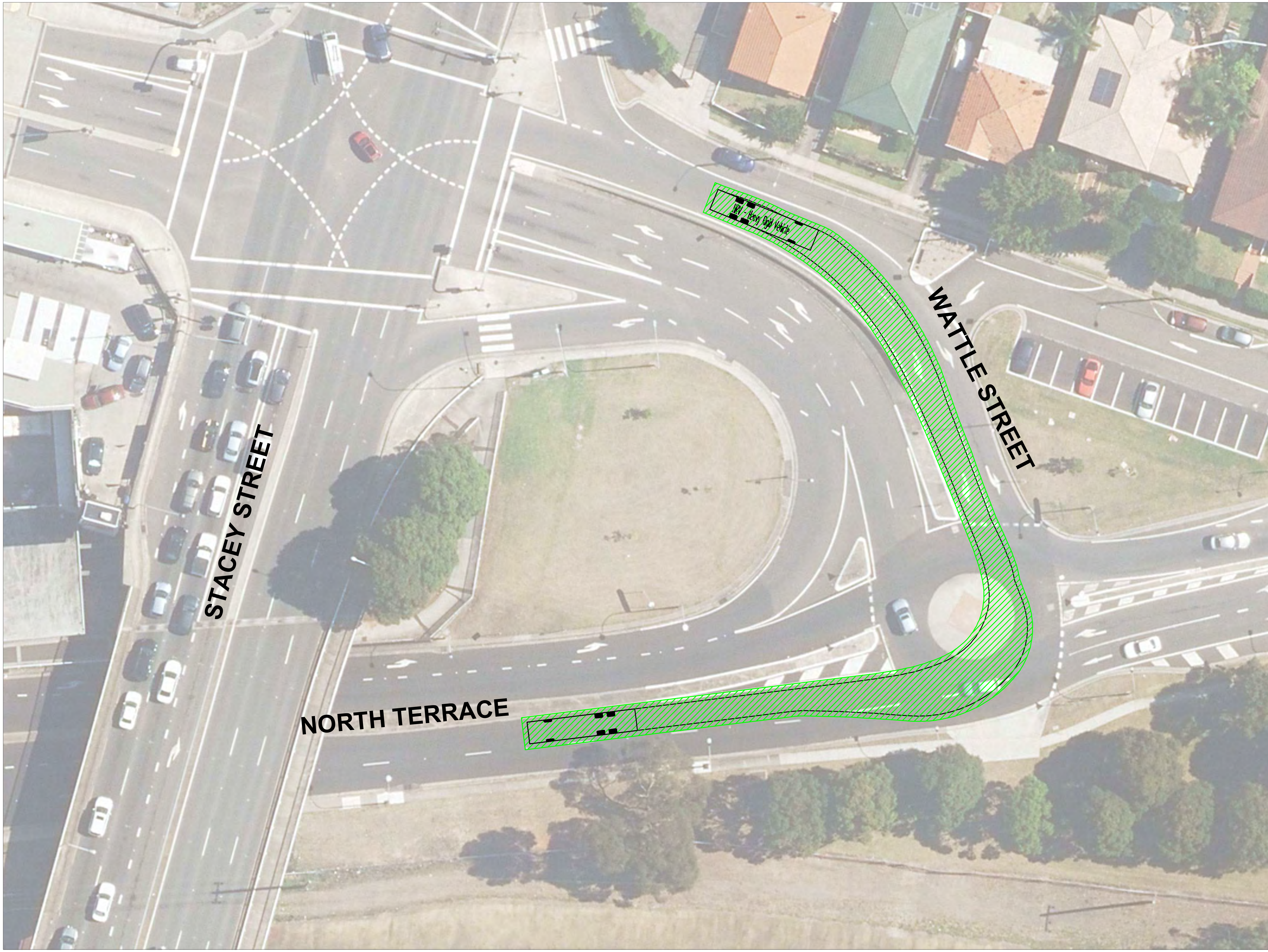


Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
PUNCHBOWL RD / THE BOULEVARDE
Project No.: 60489141

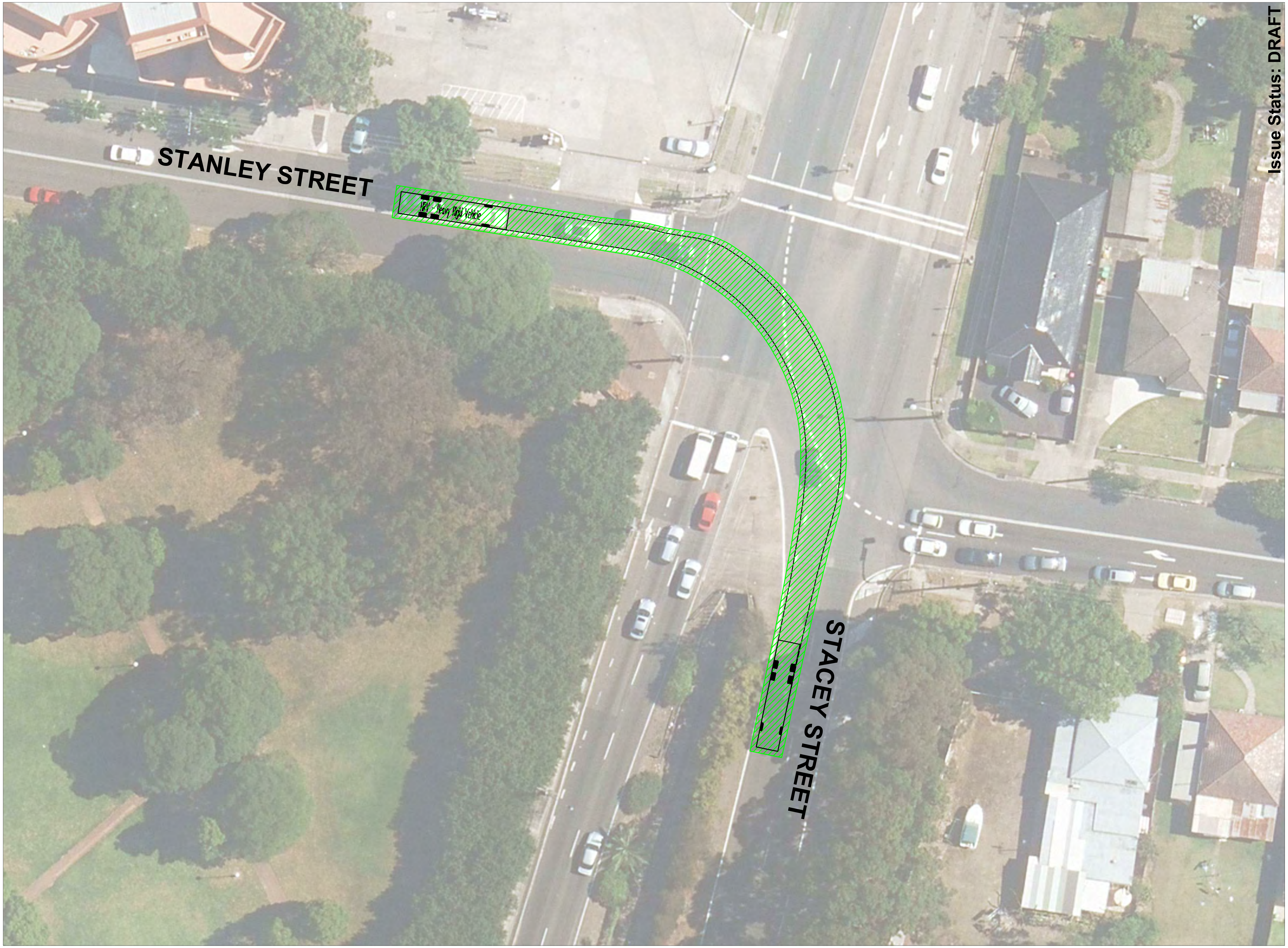


SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
NORTH TCE / WATTLE ST / STACEY ST
Project No.: 60489141



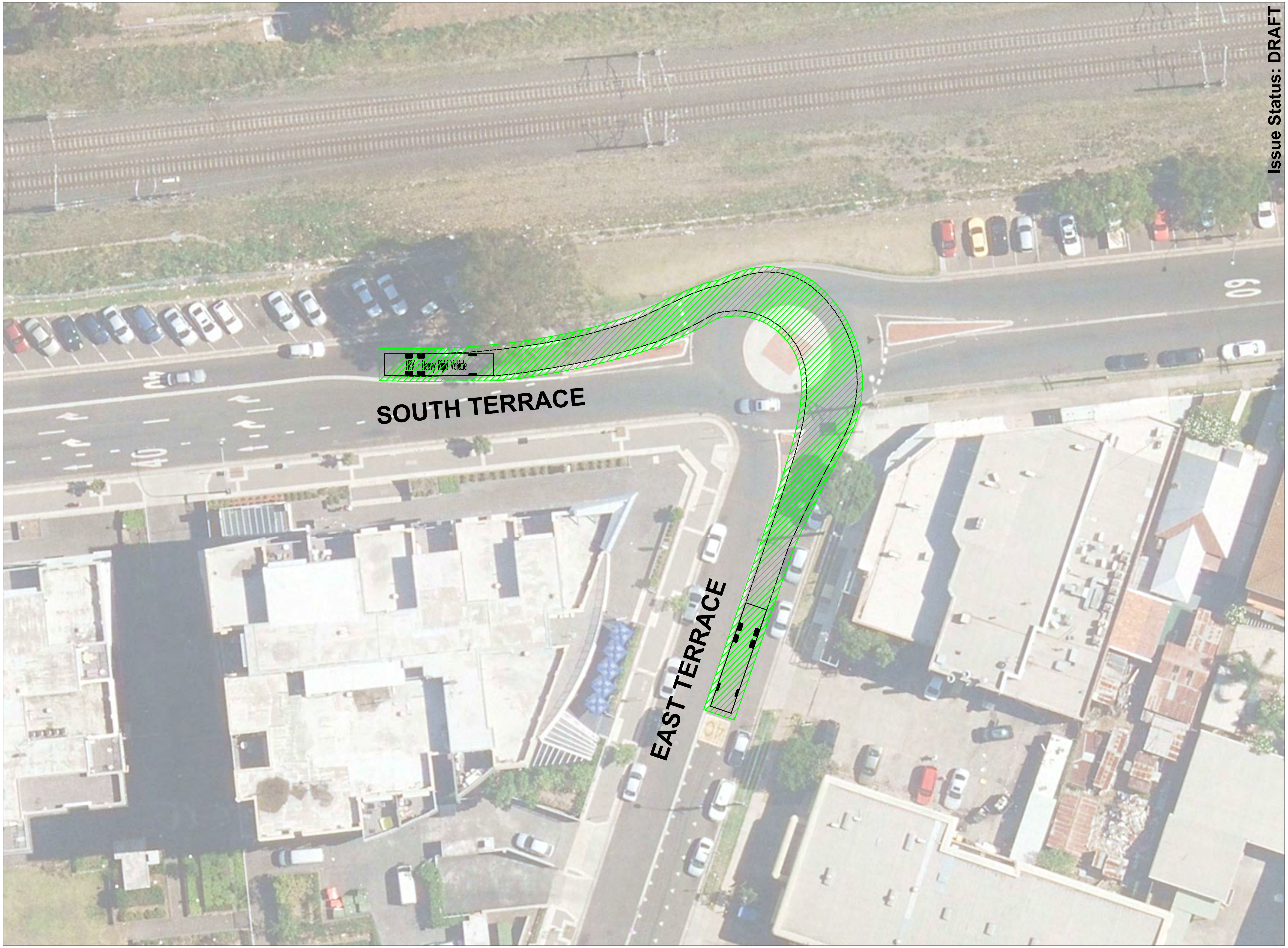
Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
WATTLE ST / NORTH TCE
Project No.: 60489141



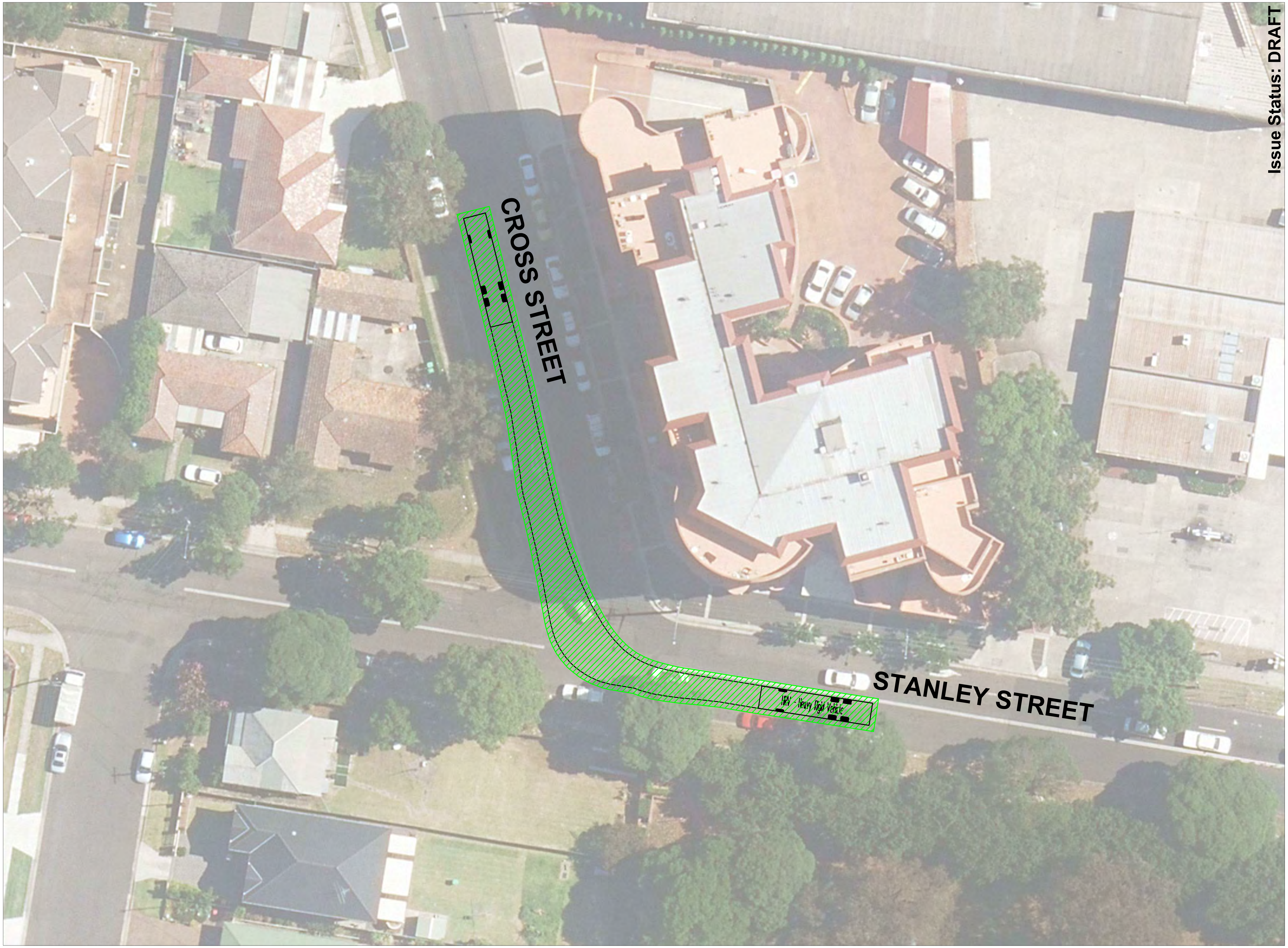
Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
STANLEY ST / STACEY ST
Project No.: 60489141



Issue Status: DRAFT

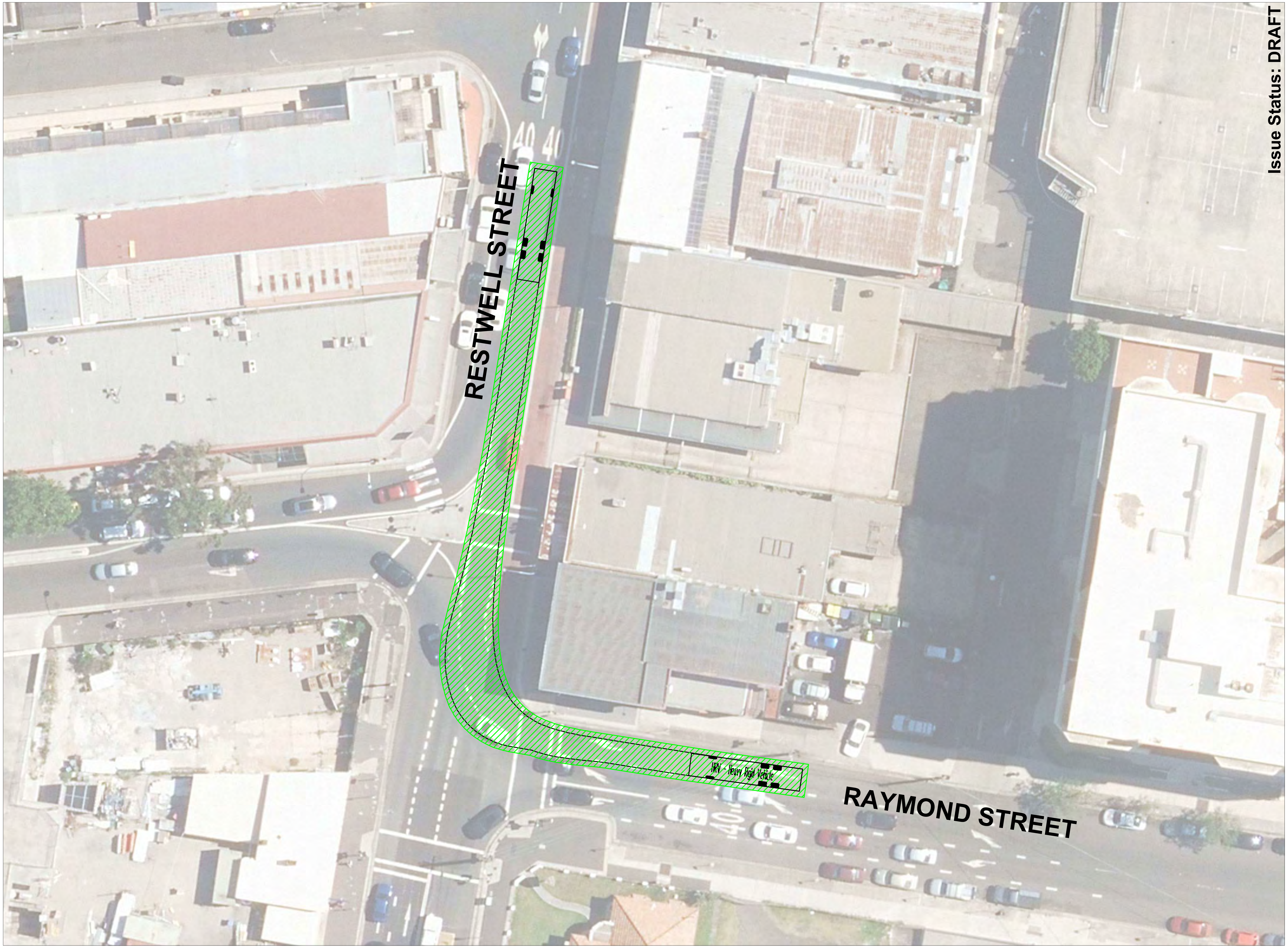
SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
SOUTH TCE / EAST TCE
Project No.: 60489141



Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
STANLEY ST / CROSS ST
Project No.: 60489141

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
CROSS ST / RAYMOND ST
Project No.: 60489141



Issue Status: DRAFT

SYDNEY METRO
12.5m HEAVY RIGID VEHICLE SWEPT PATHS
RAYMOND ST / RESTWELL ST
Project No.: 60489141

Appendix C

Construction Material and Haulage Volumes

Assumptions:
1. Peaking factors were determined from back calculating from daily traffic volumes and peak hour flows from RMS Traffic Volume Viewer.
2. Due to lack of count sites, the opposite diectional peaking factors have been used for appropriate routes.
3. Due to lack of count sites, peaking factors for similar routes at other stations have been used.
4. Due to lack of count sites, older count sites (2009) have been used to complete the analysis.
5. For traffic modelling purposes construction hours 7am to 6pm (11 hours) - flat profile of trucks arriving per hour and all during the day
6. TTS hours 7am to 10pm (15 hours) - flat profile of buses assumed.
7. The EMME link values were validated against surved count data and have been used for the routes outlined in the table below.
8. for noise modelling purposes:
- Up to 9 heavy vehicles trips as a maximum in a night 1 hour period
- Up to 5 light vehicles trips as a maximum in a night 1 hour period
- Up to 117 heavy vehicle trips overnight (from 6pm-7am) (i.e. 9 trips * 13 hours)
- Up to 20 light vehicles trips in this same period, reflecting shifts.
- The 24 hour traffic now reflects day plus night volumes.

9. A trip is a one-way vehicular movement from one point to another excluding the return journey. Therefore a vehicle entering and leaving a land use is counted as two trips.
10. For the Baseline TTP night service, only the all-stops service would operate (Route 1/Option 1), therefore a frequency of 10 buses per hour was assumed (E.g. for route 1 of the baseline TTP in the period from 2200 – 0700 (minus 2 hours from 0200-0400) there will be 70 buses. The night peak 1 hour will be 10 buses).
10. For the refined baseline TTP night service, only the all-stops service would operate (Route 1/Option 1), therefore a frequency of 5 buses per hour was assumed (E.g. for route 1 of the baseline TTP in the period from 2200 – 0700 (minus 2 hours from

Key
No data on Emme links or link not in model
Using 2016 surveyd count data
Used a parallel road with similar road hierachy
Has construction route but volumes are too low or infrequent

Area	Route	Emme link (i-j node)	Emme link (j-i node)	EMME i-j node LV vol	EMME j-I node LV vol	Existing Traffic - EMME											Construction Traffic (trips)										Refined Baseline TTP					Baseline TTP				
						ADT (AM Base)	Total 24 Hr Light	Total 24 Hr heavy	Day (0700-2200		Night (2200-0700)		EMME total 1 hr LV vol AM	EMME total 1 hr HV vol AM	EMME total 1 hr LV vol PM	EMME total 1 hr HV vol PM	24 hour traffic		Day (0700-1800)		Night (1800-0700)		Day Peak 1hour		Night Peak 1hour		24 hour traffic	Day (0700-2200)	Night (2200-0700)	Day Peak 1hour	Night Peak 1hour	24 hour traffic	Day (0700-2200)	Night (2200-0700)	Day Peak 1hour	Night Peak 1hour
									Light	Heavy	Light	Heavy					Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	TTS	TTS	TTS	TTS	TTS	TTS	TTS	TTS	TTS	TTS
Marrickville	Myrtle St	15126-7012	7012-15126	41	114	1,042	951	90	867	82	84	8	79	7	77	7	110	110	90	52	20	58	10	10	5	9	0	0	0	0	0	0	0	0	0	0
	Carrington Rd (Between Schwebel St and Myrtle St)	15125-23979	23979-15125	293	1,004	8,755	7,996	758	7,290	693	706	67	661	63	643	61	110	110	90	52	20	58	10	10	5	9	0	0	0	0	0	0	0	0	0	0
	Richardson Crescent	12248-12249	12249-12248	1,298	1,522	18,592	17,384	1,208	15,849	1,129	1,535	107	1,438	100	1,399	97	110	110	90	52	20	58	10	10	5	9	0	0	0	0	0	0	0	0	0	0
	Illawarra Rd (between Marrickville Rd and Calvert St)	12245-24334	24334-12245	401	1,406	11,967	11,141	826	10,158	769	983	73	922	68	896	66	110	220	90	103	20	117	10	20	5	9	225	225	0	15	0	495	495	0	33	0
	Marrickville Rd (Between Illawarra Rd and Silver St)	12245-13708	13708-12245	1,609	678	16,171	14,098	2,073	12,853	1,807	1,244	183	1,166	171	1,134	167	0	0	0	0	0	0	0	0	0	0	860	825	35	55	5	1585	1515	70	101	10
	Victoria Road (Between Marrickville Road and Fernbank Street)	12246-15127	15127-12246	296	898	7,828	7,363	466	6,713	438	650	41	609	39	592	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Warren Rd (Between Illawarra Rd and Moyes St)	13827-14266	14266-13827	495	1,066	11,039	9,625	1,414	8,776	1,233	850	125	796	117	774	114	110	110	90	52	20	58	10	10	5	9	260	225	35	15	5	565	495	70	33	10
Dulwich Hill	Livingstone Rd (between Warren Rd and Jersey St)	12259-14266	14266-12259	585	1,156	12,117	11,754	363	10,732	352	1,021	32	888	27	952	29	0	44	0	21	0	23	0	4	0	4	0	0	0	0	0	0	0	0	0	0
	Marrickville Rd (Between Darley St and Wardell Rd)	12111-12112	12112-12111	1,110	553	12,596	11,224	1,371	10,249	1,222	975	119	848	104	909	111	110	132	90	62	20	70	10	12	5	9	600	600	0	40	0	1020	1020	0	68	0
	Dudley St (Between School Pde and Wardell Rd)	24732-17306	17306-24732	198	406	4,292	4,083	209	3,728	199	355	18	309	16	331	17	0	0	0	0	0	0	0	0	0	0	35	0	35	0	5	565	495	70	33	10
	Bayley St (Between Ewart St and Dudley St)	24730-24731	24731-24730	-	-	781	662	119	604	109	58	10	50	9	89	8	0	44	0	21	0	23	0	4	0	4	35	0	35	0	5	565	495	70	33	10
	Ewart St (Between Bayley st and Wicks Ave)	24730-17323	17323-24730	692	364	7,491	7,123	367	6,504	349	619	32	538	28	577	30	0	44	0	21	0	23	0	4	0	4	485	450	35	30	5	565	495	70	33	10
	Beauchamp St (Between School Pde and Ewart St)	19804-17323	17323-19804	364	692	7,491	7,123	367	6,504	349	619	32	538	28	577	30	0	44	0	21	0	23	0	4	0	4	260	225	35	15	5	565	495	70	33	10
	Livingstone Rd (between Warren Rd and Jersey St)	12259-14266	14266-12259	585	1,156	12,117	11,754	363	10,732	352	1,021	32	888	27	952	29	0	44	0	21	0	23	0	4	0	4	0	0	0	0	0	0	0	0	0	0
	Marrickville Rd (Between Darley St and Wardell Rd)	12111-12112	12112-12111	1,110	553	12,596	11,224	1,371	10,249	1,222	975	119	848	104	909	111	110	132	90	62	20	70	10	12	5	9	600	600	0	40	0	1020	1020	0	68	0
	Wardell Rd (Between Marrickville Rd and Pine St)	12111-22707	22707-12111	681	1,394	14,377	14,005	372	12,788	363	1,217	32	1,058	28	1,134	30	110	132	90	62	20	70	10	12	5	9	225	225	0	15	0	0	0	0	0	0
	Marrickville Rd (Between Darley St and Wardell Rd)	12111-12112	12112-12111	1,110	553	12,596	11,224	1,371	10,249	1,222	975	119	848	104	909	111	110	132	90	62	20	70	10	12	5	9	600	600	0	40	0	1020	1020	0	68	0
	Wardell Rd (Between Marrickville Rd and Pine St)	12111-22707	22707-12111	681	1,394	14,377	14,005	372	12,788	363	1,217	32	1,058	28	1,134	30	110	132	90	62	20	70	10	12	5	9	0	0	0	0	0	0	0	0	0	0
	Marrickville Rd (Between Darley St and Wardell Rd)	12111-12112	12112-12111	1,110	553	12,596	11,224	1,371	10,249	1,222	975	119	848	104	909	111	110	132	90	62	20	70	10	12	5	9	600	600	0	40	0	1020	1020	0	68	0
	Ewart St (Between Bayley st and Wicks Ave)	24730-17323	17323-24730	692	364	7,491	7,123	367	6,504	349	619	32	538	28	577	30	0	44	0	21	0	23	0	4	0	4	485	450	35	30	5	565	495	70	33	10
	Terrace Rd (Between New Canterbury Rd and Consett St)	-	-	-	-	1,310	1,297	13	1,184	12	113	1	98	1	174	2	220	242	200	125	20	117	20	22	5	9	0	0	0	0	0	0	0	0	0	0
	New Canterbury Rd (Between Kintore St and Terrace Rd)	22977-13699	13699-22977	3,128	993	28,846	27,813	1,033	25,396	996	2,417	90	2,102	78	2,253	84	220	242	200	125	20	117	20	22	5	9	375	375	0	25	0	1020	1020	0	68	0
Hurlstone Park	Garnet St (Between Canterbury Road and Hampden St)	25047-20538	20538-25047	71	254	2,221	2,193	29	2,002	28	191	2	166	2	178	2	0	44	0	21	0	23	0	4	0	4	0	0	0	0	0	0	0	0	0	0
	New Canterbury Rd (Between Wattle Lane and Old Canterbury Road)	19739-12423	12423-19739	1,212	2,341	25,040	23,976	1,064	21,892	1,019	2,084	92	1,812	80	1,942	86	220	242	200	125	20	117	20	22	5	9	375	375	0	25	0	1020	1020	0	68	0
	Duntroon St			-	-	1,959	1,892	66	1,728	60	164	6	143	5	173	4	110	110	90	52	20	58	10	10	5	9	0	0	0	0	0	0	0	0	0	0
	Crinan St (Between Floss St and Fernhil St)	17284-12425	12425-17284	452	710	8,514	7,845	669	7,163	617	682	58	593	51	635	54	220	138	200	65	20	73	20	13	5	9	260	225	35	15	5	235	165	70	11	10
	Canterbury Rd (Between Queen St and Wattle Ln)	19728-12424	12424-19728	1,146	2,342	25,477	23,542	1,935	21,496	1,788	2,046	168	1,779	146	1,907	157	220	264	200	147	20	117	20	24	5	9	600	600	0	40	0	1020	1020	0	68	0
	Dunstaffenage St (Between Crinan St and Floss st)	12425-17285	17285-12425	31	6	251	251	-	229	-	22	-	19	-	20	-	0	66	0	31	0	35	0	6	0	6	0	0	0	0	0	0	0	0	0	0
	Crinan St (Between Melford Street and Dunstaffenage Street)	17287-12425	12425-17287	514	371	6,642	5,974	669	5,455	601	519	58	451	51	484	54	220	264	200	147	20	117	20	24	5	9	260	225	35	15	5	235	165	70	11	10
	Canterbury Rd (Between Queen St and Wattle Ln)	19728-12424	12424-19728	1,146	2,342	25,477	23,542	1,935	21,496	1,788	2,046	168	1,779	146	1,907	157	220	264	200	147	20	117	20	24	5	9	600	600	0	40	0	1020	1020	0	68	0
	Canterbury Rd (Between Queen St and Princess St)	24628-17288	17288-24628	1,442	2,646	29,769	27,593	2,176	25,195	2,017	2,398	189	2,085	164	2,235	176	220	264	200	147	20	117	10	24	5	9	635	600	35	40	5	1255	1185	70	79	10

Area	Route	Emme link (i-j node)	Emme link (j-i node)	EMME i-j node LV vol	EMME j-I node LV vol	Existing Traffic - EMME											Construction Traffic (trips)										Refined Baseline TTP					Baseline TTP				
						ADT (AM Base)	Total 24 Hr Light	Total 24 Hr heavy	Day (0700-2200		Night (2200-0700)		EMME total 1 hr LV vol AM	EMME total 1 hr HV vol AM	EMME total 1 hr LV vol PM	EMME total 1 hr HV vol PM	24 hour traffic		Day (0700-1800)		Night (1800-0700)		Day Peak 1hour		Night Peak 1hour		24 hour traffic	Day (0700-2200)	Night (2200-0700)	Day Peak 1hour	Night Peak 1hour	24 hour traffic	Day (0700-2200)	Night (2200-0700)	Day Peak 1hour	Night Peak 1hour
									Light	Heavy	Light	Heavy					Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	TTS	TTS	TTS	TTS	TTS	TTS	TTS	TTS	TTS	TTS
Canterbury	Crinan St (Between Melford Street and Dunstaffenage Street)	17287-12425	12425-17287	514	371	8,636	7,767	869	6,698	782	1,068	120	451	51	545	61	220	264	200	147	20	117	20	24	5	9	260	225	35	15	5	235	165	70	11	10
	Canterbury Rd (Between Close St and Broughton St)	12446-12441	12441-12446	3,411	2,041	51,361	47,837	3,525	41,257	3,283	6,580	485	2,780	205	3,356	247	110	242	90	125	20	117	10	22	5	9	635	600	35	40	5	1255	1185	70	79	10
	Close St	-	-	-	-	801	630	171	529	144	100	27	42	9	51	11	242	176	222	83	20	93	22	16	5	9	0	0	0	0	0	0	0	0	0	0
	Canterbury Rd (Between Jeffrey St and Minter St)	24518-19697	19697-24518	2,455	1,302	35,738	32,965	2,773	28,431	2,558	4,534	381	1,916	161	2,313	195	110	242	90	125	20	117	10	22	5	9	635	600	35	40	5	1255	1185	70	79	10
	Charles St	-	-	-	-	929	757	172	691	157	66	15	44	10	69	6	22	22	10	10	12	12	2	2	2	2	0	0	0	0	0	0	0	0	0	0
	Canterbury Rd (Between Charles St and Close St)					50,686	47,333	3,353	40,784	3,127	6,549	470	2,751	195	3,305	241	110	242	90	125	20	117	10	22	5	9	635	600	35	40	5	1255	1185	70	79	10
	Wairoa St (between Wonga St and Nowra St)	16605-16606	16606-16605	637	509	10,131	10,049	81	8,667	81	1,382	11	584	5	705	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
	Wonga St	13676-19645	19645-13676	720	736	12,925	12,771	153	11,015	151	1,757	21	742	9	896	11	0	0	0	0	0	0	0	0	0	0	635	600	35	40	5	760	690	70	46	10
	Canterbury Road (Between Wonga St and Cooks Avenue)	12439-13676	13676-12439	2,668	1,804	38,635	35,439	3,195	29,794	2,686	5,645	509	2,281	189	2,753	228	110	242	90	125	20	117	10	22	5	9	0	0	0	-	0	495	495	0	33	0
	Canterbury Rd (Between Fore St and Charles St)	12446-12442	12442-12446	2,017	3,464	51,615	48,090	3,525	41,475	3,284	6,615	485	2,795	205	3,374	247	110	242	90	125	20	117	10	22	5	9	635	600	35	40	5	1255	1,185	70	79	10
	Canterbury Rd (Between Wonga St and Fore St)	13676-12440	12440-13676	3,036	2,156	44,468	41,210	3,259	34,645	2,740	6,565	519	2,648	194	3,196	234	110	242	90	125	20	117	10	22	5	9	0	0	0	0	0	495	495	0	33	0
Campsie	South Parade (Between Beamish St and Harold St)	17516-17515	17515-17516	-	-	6,916	6,469	447	5,907	408	562	39	376	26	333	19	0	22	0	10	0	12	0	2	0	2	635	600	35	40	5	760	690	70	46	10
	Canterbury Rd (Between Beamish Street and Scahill Street)	12436-17316	17316-12436	2,416	1,934	41,161	38,170	2,991	32,920	2,774	5,250	411	2,219	174	2,678	210	55	55	35	26	20	29	5	5	5	5	0	0	0	0	0	495	495	0	33	0
	South Parade (Between Beamish St and Harold St)	17516-17515	17515-17516	-	-	6,916	6,414	503	5,856	459	557	44	376	26	333	19	0	22	0	10	0	12	0	2	0	2	635	600	35	40	5	760	690	70	46	10
	Beamish St (Between Ninth Ave and Campsie St)	12433-25161	25161-12433	942	951	14,492	14,119	373	12,783	364	1,336	35	965	26	1,071	28	55	55	35	26	20	29	5	5	5	5	635	600	35	40	5	760	690	70	46	10
	Canterbury Rd (Between Beamish Street and Scahill Street)	12436-17316	17316-12436	2,416	1,934	41,161	38,170	2,991	32,920	2,774	5,250	411	2,219	174	2,678	210	55	55	35	26	20	29	5	5	5	5	0	0	0	0	0	495	495	0	33	0
	North Parade (Between Browning St and Beamish St)	13675-22726	22726-13675	103	165	2,366	2,351	15	2,028	15	323	2	137	1	165	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Beamish St (Between South Parade and Amy St)	17516-25266	25266-17516	1,143	1,332	18,858	18,457	400	16,711	392	1,747	38	1,262	27	1,400	30	55	55	35	26	20	29	5	5	5	5	0	0	0	0	0	0	0	0	0	0
	Brighton Ave (Between Browning St and Shakespeare St)	25164-25163	25163-25164	777	907	12,631	12,557	74	11,369	74	1,188	7	859	5	952	6	55	55	35	26	20	29	5	5	5	5	0	0	0	0	0	0	0	0	0	0
	Ninth Ave (Between Beamish St and Fifth Ave)	12465-12433	12433-12465	915	895	16,272	15,879	393	13,695	383	2,184	54	923	23	1,114	28	0	22	0	10	0	12	0	2	0	2	260	225	35	15	5	760	690	70	46	10
	Loch St (Between Evaline St and Lillian St)	23972-23970	23970-23972	909	1,013	15,588	14,333	1,255	12,977	1,154	1,356	119	980	86	1,087	95	0	22	0	10	0	12	0	2	0	2	0	0	0	0	0	0	0	0	0	0
	Evaline St (Between Loch St and Beamish St)	25265-23973	23973-25265	296	305	5,437	5,273	164	4,548	159	725	23	307	10	370	12	0	22	0	10	0	12	0	2	0	2	0	0	0	0	0	0	0	0	0	0
	Thorncraft Pde (Between Canterbury Road and Claremont St)	19547-13677	13677-19547	439	579	8,206	7,594	612	6,875	566	719	58	519	42	576	46	0	22	0	10	0	12	0	2	0	2	0	0	0	0	0	0	0	0	0	0
	Canterbury Rd (Between Beamish Street and Scahill Street)	12436-17316	17316-12436	2,416	1,934	41,161	38,170	2,991	32,920	2,774	5,250	411	2,219	174	2,678	210	55	55	35	26	20	29	5	5	5	5	0	0	0	0	0	495	495	0	33	0
	Thorncraft Pde (Between Canterbury Road and Claremont St)	19547-13677	13677-19547	439	579	8,206	7,594	612	6,875	566	719	58	519	42	576	46	0	22	0	10	0	12	0	2	0	2	0	0	0	0	0	0	0	0	0	0
	Canterbury Rd (Between Beamish Street and Scahill Street)	12436-17316	17316-12436	2,416	1,934	41,161	38,170	2,991	32,920	2,774	5,250	411	2,219	174	2,678	210	55	55	35	26	20	29	5	5	5	5	0	0	0	0	0	495	495	0	33	0
	Palmer St	15066-19547	19547-15066	628	471	10,335	9,648	687	8,321	641	1,327	95	561	40	677	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Thorncraft Pde (Between Canterbury Road and Claremont St)	19547-13677	13677-19547	439	579	8,206	7,594	612	6,875	566	719	58	519	42	576	46	0	22	0	10	0	12	0	2	0	2	0	0	0	0	0	0	0	0	0	0
	Canterbury Rd (Between Beamish Street and Scahill Street)	12436-17316	17316-12436	2,416	1,934	41,161	38,170	2,991	32,920	2,774	5,250	411	2,219	174	2,678	210	55	55	35	26	20	29	5	5	5	5	0	0	0	0	0	495	495	0	33	0
Belmore	Redman Pde (Between Burwood Rd and Sudbury St)	22729-22728	22728-22729	-	-	6,267	6,131	136	5,598	124	533	12	360	8	339	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Burwood Rd (Between Redman Parade and Bridge Rd)	22975-12462	12462-22975	975	1,055	19,742	17,629	2,114	15,101	1,887	2,527	303	1,035	124	1,077	129	220	220	200	103	20	117	20	20	5	9	260	225	35	15	5	760	690	70	46	10
	Bridge Rd (Between Marie Lane and Burwood Ave)	22975-22730	22730-22975	565	588	10,543	10,019	524	8,583	498	1,436	75	588	31	612	32	0	0	0	0	0	0	0	0	0	0	260	225	35	15	5	760	690	70	46	10
	Burwood Rd (Between Bridge Rd and Collins St)	22975-12461	12461-22975	1,116	1,110	21,492	19,332	2,160	16,560	1,943	2,772	310	1,135	127	1,181	132	220	264	200	147	20	117	20	24	5	9	0	0	0	0	0	0	0	0	0	0
Lakemba	The Boulevarde (Between Haldon St and Croydon St)	13530-24237	24237-13530	355	558	8,099	7,924	174	6,788	170	1,136	25	465	10	484	11	55	55	35	26	20	29	5	5	5	5	260	225	35	15	5	730	660	70	44	10
	Moreton St (Between Lakemba St and The Boulevarde)	11379-19444	19444-11379	996	797	16,735	15,567	1,168	13,335	1,086	2,232	167	914	69	951	71	0	88	0	41	0	47	0	8	0	8	0	0	0	0	0	0	0	0	0	0
	Lakemba St (Between King Georges Rd and Shadforth St)	12473-23966	23966-12473	250	150	3,542	3,472	70	2,974	69	498	10	204	4	212	4	110	110	90	52	20	58	10	10	5	9	0	0	0	0	0	0	0	0	0	0
	Burwood Rd (Between Redman Parade and Bridge Rd)	22975-12462	12462-22975	975	1,055	19,742	17,629	2,114	15,101	1,887	2,527	303	1,035	124	1,077	129	220	220	200	103	20	117	20	20	5	9	260	225	35	15	5	760	690	70	46	10
	Railway Pde (Between Haldon St and Croydon St)	19424-23968	23968-19424	-	-	4,547	4,445	102	4,059	93	386	9	261	6	328	9	44	44	24	21	20	23	4	4	4	4	0	0	0	0	0	0	0	0	0	0
	Haldon St (Between Railway Parade and The Boulevarde)	19424-13530	13530-19424	892	729	14,972	14,072	900	12,054	846	2,017	129	826	53	860	55	110	110	90	52	20	58	10	10	5	9	0	0	0	0	0	0	0	0	0	0
	The Boulevarde (Between Haldon St and Croyden St)	13530-24237	24237-13530	355	558	8,099	7,924	174	6,788	170	1,136	25	465	10	484	11	33	33	16	16	17	17	3	3	3	3	260	225	35	15	5	730	660	70	44	10
	Haldon St (Between The Boulevarde and Oneata St)	13530-15067	15067-13530	540	484	9,750	8,898	852	7,622	777	1,276	122	522	50	544	52	165	330	145	213	20	117	15	30	5	9	0	0	0	0	0	495	495	0	33	0
	Canterbury Rd (Between Haldon St and Legge St)	15067-12478	12478-15067	2,544	2,061	43,840	39,990	3,850	34,257	3,512	5,733	552	2,348	226	2,443	235	0	44	0	21	0	23	0	4	0	4	0	0	0	0	0	495	495	0	33	0
Wiley Park	The Boulevarde (Between Renown Ave and King Georges Rd)	12475-15869	15869-12475	615	936	13,893	13,471	422	11,540	410	1,931	61	791	25	823	26	110	110	90	52	20	58	10	10	5	9	260	225	35	15	5	730	660	70	44	10
	King Georges Rd (Between The Boulevarde and Mary St)	12475-13612	13612-12475	3,691	5,301	88,000	78,094	9,906	66,898	8,791	11,196	1,420	4,586	582	4,770	605	110	132	90	62	20	70	10	12	5	9	0	0	0	0	0	0	0	0	0	0
	Lakemba St (Between King Georges Rd and Shadforth St)	12473-23966	23966-12473	250	150	3,542	3,472	70	2,974	69	498	10	204	4	212	4	110	110	90	52	20	58	10	10	5	9	0	0	0	0	0	0	0	0	0	0
	King Georges Rd (Between Lakemba St and The Boulevarde)	12475-24425	24425-12475	5,758	4,224	96,775	86,699	10,076	74,269	9,027	12,430	1,445	5,091	592	5,296	615	110	110	90	52	20	58	10	10	5	9	0	0	0	0	0	0	0	0	0	0
Punchbowl	Punchbowl Rd (Between The Boulevarde and Acacia Ave)	14309-12493	12493-14309	3,171	2,236	50,477	46,962	3,515	40,229	3,270	6,733	504	2,758	206	2,869	215	88	88	68	41	20	47	8	8	5	8	0	0	0	0	0	0	0	0	0	0
	The Boulevarde (Between Punchbowl Rd and Arthur St)	14309-19324	19324-14309	1,238	1,454	24,810	23,376	1,434	20,024	1,351	3,351	206	1,373	84	1,428	88	44	44	24	21	20	23	4	4	4	4	260	225	35	15	5	730	660	70	44	10
	Punchbowl Rd (Between The Boulevarde and Acacia Ave)	14309-12493	12493-14309	3,171	2,236	50,477	46,962	3,515	40,229	3,270	6,733	504	2,758	206	2,869	215	88	88	68	41	20	47	8	8	5	8	0	0	0	0	0	0	0	0	0	0
	South Terrace (Between Loder Lane and Punchbowl Rd)	10364-13606	13606-10364	785	784	14,041	13,630	412	11,676	400	1,954	59	800	24	833	25	44	44	24	21	20	23	4	4	4	4	260	225	35	15	5	730	660	70	44	10
	Punchbowl Rd (Between South Terrace and The Boulevarde)	13606-14310	14310-13606	4,050	2,468	60,737	56,612	4,125	48,495	3,845	8,116	591	3,324	242	3,458	252	44	44	24	21	20	23	4	4	4	4	0	0	0	0	0	0	0	0	0	0
	Wattle St (Between Highclere Ave and Acacia Ave)	25733-16612	16612-25733	1,154	930	18,393	18,095	298	15,500	293	2,594	43	1,062	18	1,105	18	44	44	24	21	20	23	4	4	4	4	0	0	0	0	0	0	0	0	0	0

Area	Route	Emme link (i-j node)	Emme link (j-i node)	EMME i-j node LV vol	EMME j-I node LV vol	Existing Traffic - EMME											Construction Traffic (trips)										Refined Baseline TTP					Baseline TTP				
						ADT (AM Base)	Total 24 Hr Light	Total 24 Hr heavy	Day (0700-2200		Night (2200-0700)		EMME total 1 hr LV vol AM	EMME total 1 hr HV vol AM	EMME total 1 hr LV vol PM	EMME total 1 hr HV vol PM	24 hour traffic		Day (0700-1800)		Night (1800-0700)		Day Peak 1hour		Night Peak 1hour		24 hour traffic	Day (0700-2200)	Night (2200-0700)	Day Peak 1hour	Night Peak 1hour	24 hour traffic	Day (0700-2200)	Night (2200-0700)	Day Peak 1hour	Night Peak 1hour
									Light	Heavy	Light	Heavy					Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	TTS	TTS	TTS	TTS	TTS	TTS	TTS	TTS	TTS	TTS
Bankstown	South Terrace (Between West Terrace and East Terrace)	12516-25166	25166-12516	639	646	12,018	11,777	241	10,168	236	1,609	33	655	13	863	18	55	55	35	26	20	29	5	5	5	5	260	225	35	15	5	730	660	70	44	10
	Stacey St (Between Verbena Ave and Stanley St)	15882-12528	12528-15882	2,576	3,565	66,028	56,288	9,740	48,597	8,303	7,692	1,331	3,132	542	4,124	714	132	374	112	257	20	117	12	34	5	9	0	0	0	0	0	0	0	0	0	0
	Restwell St (Between Stewart Lane and Raymond St)	15019-21617	21617-15019	928	-	8,794	8,510	284	7,347	275	1,163	39	473	16	623	21	55	55	35	26	20	29	5	5	5	5	260	225	35	15	5	730	660	70	44	10
	Raymond St (Between Restwell St and West Terrace)	15019-14556	14556-15019	-	328	3,239	3,005	234	2,594	217	411	32	167	13	220	17	55	55	35	26	20	29	5	5	5	5	260	225	35	15	5	730	660	70	44	10
	Stacey St (Between Verbena Ave and Stanley St)	15882-12528	12528-15882	2,576	3,565	66,028	56,288	9,740	48,597	8,303	7,692	1,331	3,132	542	4,124	714	132	374	112	257	20	117	12	34	5	9	0	0	0	0	0	0	0	0	0	0
	South Terrace (Between West Terrace and Restwell St)	21617-12514	12514-21617	656	-	6,298	6,014	284	5,192	271	822	39	335	16	441	21	55	55	35	26	20	29	5	5	5	5	260	225	35	15	5	730	660	70	44	10
	North Terrace (Between The Appian Way and Fetherstone St)	19231-12519	12519-19231	984	-	9,066	9,023	43	7,790	42	1,233	6	502	2	661	3	55	55	35	26	20	29	5	5	5	5	148	113	35	8	5	153	83	70	6	10
	Wattle St (Between Stacey St and North Terrace)	13579-14163	14163-13579	675	641	12,391	12,062	329	10,414	321	1,648	45	671	18	884	24	55	55	35	26	20	29	5	5	5	5	0	0	0	0	0	0	0	0	0	0
	Stacey St (Between Verbena Ave and Stanley St)	15882-12528	12528-15882	2,576	3,565	66,028	56,288	9,740	48,597	8,303	7,692	1,331	3,132	542	4,124	714	132	374	112	257	20	117	12	34	5	9	0	0	0	0	0	0	0	0	0	0
	Marion St (Between Bungalow Cres and Meredith St)	13573-12523	12523-13573	867	2,480	34,733	30,672	4,061	26,481	3,586	4,191	555	1,707	226	2,247	298	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Meredith St (Between Marion St and Gordan St)	13573-14555	14555-13573	1,682	616	24,572	21,064	3,508	18,185	3,007	2,878	479	1,172	195	1,543	257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rickard Rd (Between Jacobs St and Chapel Rd)	19240-12521	12521-19240	176	444	6,114	5,688	426	4,911	396	777	58	316	24	417	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Stacey St (Between Verbena Ave and Stanley St)	15882-12528	12528-15882	2,576	3,565	66,028	56,288	9,740	48,597	8,303	7,692	1,331	3,132	542	4,124	714	132	374	112	257	20	117	12	34	5	9	0	0	0	0	0	0	0	0	0	0
TTS Routes	Railway Pde (Between Gleeson Ave and Sydenham Rd)	12241-13710	13710-12241	-	2,518	25,643	21,663	3,980	18,629	3,362	3,034	557	1,284	236	1,455	267	0	0	0	0	0	0	0	0	0	0	448	413	35	28	5	835	765	70	51	10
	Sydneham Rd (Between Buckley St and Railway Pde)	13717-13710	13710-13717	2,518	-	25,643	21,663	3,980	18,629	3,362	3,034	557	1,284	236	1,455	267	0	0	0	0	0	0	0	0	0	0	448	413	35	28	5	835	765	70	51	10
	Buckley St (Between Marrickville Rd and Sydenham Rd)	13724-13717	13717-13724	2,084	-	20,555	17,926	2,629	15,415	2,293	2,511	368	1,063	156	1,204	177	0	0	0	0	0	0	0	0	0	0	448	413	35	28	5	835	765	70	51	10
	Marrickville Rd (Between Illawarra Rd and Silver St)	12245-13708	13708-12245	1,609	678	16,171	14,098	2,073	12,853	1,807	1,244	183	1,166	171	1,134	167	0	0	0	0	0	0	0	0	0	0	860	825	35	55	5	1585	1515	70	101	10
	Marrickville Rd (Between Livingstone Rd and Wardell Rd)	12112-12111	12111-12112	553	1,110	11,506	10,253	1,253	9,348	1,116	905	111	848	104	825	101	0	0	0	0	0	0	0	0	0	0	600	600	0	40	0	1020	1020	0	68	0
	Marrickville Rd (Between Wardell Rd and New Canterbury Rd)	12111-17343	17343-12111	689	1,263	13,232	12,032	1,200	10,970	1,091	1,062	106	995	99	968	97	110	132	90	62	20	70	10	12	5	9	375	375	0	25	0	1020	1020	0	68	0
	Illawarra Rd (between Marrickville Rd and Calvert St)	12245-24334	24334-12245	401	1,406	11,967	11,141	826	10,158	769	983	73	922	68	896	66	110	220	90	103	20	117	10	20	5	9	260	225	35	15	5	565	495	70	33	10
	Warren Rd (Between Illawarra Rd and Moyes St)	13827-14266	14266-13827	495	1,066	11,039	9,625	1,414	8,776	1,233	850	125	796	117	774	114	110	110	90	52	20	58	10	10	5	9	260	225	35	15	5	565	495	70	33	10
	Beauchamp St (Between School Pde and Ewart St)	19804-17323	17323-19804	364	692	6,843	6,507	335	5,933	319	574	30	538	28	524	27	0	44	0	21	0	23	0	4	0	4	260	225	35	15	5	565	495	70	33	10
	Ewart St (Between Bayley st and Wicks Ave)	24730-17323	17323-24730	692	364	7,491	7,123	367	6,504	349	619	32	538	28	577	30	0	44	0	21	0	23	0	4	0	4	485	450	35	30	5	565	495	70	33	10
	Bayley St (Between Ewart St and Dudley St)	24730-24731	24731-24730	-	-	781	662	119	604	109	58	10	50	9	89	8	0	44	0	21	0	23	0	4	0	4	35	0	35	0	5	565	495	70	33	10
	Dudley St (Between School Pde and Wardell Rd)	24732-17306	17306-24732	198	406	4,292	4,083	209	3,728	199	355	18	309	16	331	17	0	44	0	21	0	23	0	4	0	4	35	0	35	0	5	565	495	70	33	10
	Wardell Rd (Between Marrickville Rd and Pine St)	12111-22707	22707-12111	681	1,394	14,377	14,005	372	12,788	363	1,217	32	1,058	28	1,134	30	110	132	90	62	20	70	10	12	5	9	0	0	0	0	0	0	0	0	0	0
	Ewart St (between Wardell and Ness Ave)	12277-946	946-12277	3	25	187	187	0	171	0	16	0	14	0	15	0	0	44	0	21	0	23	0	4	0	4	485	450	35	30	5	565	495	70	33	10
	Floss St (Between Garnet St and Crinan St)	20539-13697	13697-20539	394	738	8,305	7,636	669	6,973	615	664	58	577	51	619	54	0	0	0	0	0	0	0	0	0	0	485	450	35	30	5	565	495	70	33	10
	Crinan St (Between Floss St and Fernhil St)	17284-12425	12425-17284	452	710	8,514	7,845	669	7,163	617	682	58	593	51	635	54	220	138	200	65	20	73	20	13	5	9	260	225	35	15	5	235	165	70	11	10
	New Canterbury Rd (between Marrickville Rd and Beach Rd)	12278-13699	13699-12278	974	3,416	31,181	29,630	1,551	27,055	1,474	2,575	135	2,239	117	2,400	126	220	242	200	125	20	117	20	22	5	9	375	375	0	25	0	1020	1020	0	68	0
	Canterbury Rd (Between New Canterbury Rd and Broughton St)	19728-12424	12424-19728	1,146	2,342	33,124	30,608	2,516	26,398	2,325	4,210	346	1,779	146	2,147	177	220	264	200	147	20	117	20	24	5	9	635	600	35	40	5	1255	1185	70	79	10
	Canterbury Rd (Between Northcote St and Beamish St)	12436-17316	17316-12436	2,416	1,934	41,161	38,170	2,991	32,920	2,774	5,250	411	2,219	174	2,678	210	220	264	200	147	20	117	20	24	5	9	0	0	0	0	0	495	495	0	33	0
	Canterbury Rd (Between Beamish St and Kingsgrove Rd)	12436-12459	12459-12436	2,078	2,475	43,029	39,949	3,081	34,454	2,860	5,495	424	2,322	179	2,803	216	220	264	200	147	20	117	20	24	5	9	0	0	0	0	0	495	495	0	33	0
	Canterbury Rd (Between Kingsgrove Rd and Haldon St)	12478-12460	12460-12478	2,417	1,971	42,056	38,509	3,546	33,212	3,247	5,297	488	2,238	206	2,702	249	220	264	200	147	20	117	20	24	5	9	0	0	0	0	0	495	495	0	33	0
	Gould St (Between Canterbury Rd and Redman St)			-	-	2,794	2,558	236	2,336	215	222	20	158	4	191	5	0	0	0	0	0	0	0	0	0	0	635	600	35	40	5	760	690	70	46	10
	South Parade (Between Beamish St and Harold St)	17516-17515	17515-17516	-	-	5,879	5,499	380	5,021	347	478	33	376	26	333	19	0	22	0	10	0	12	0	2	0	2	635	600	35	40	5	760	690	70	46	10
	Beamish St (Between South Parade and Amy St)	17516-25266	25266-17516	1,143	1,332	18,858	18,457	400	16,711	392	1,747	38	1,262	27	1,400	30	55	55	35	26	20	29	5	5	5	5	0	0	0	0	0	0	0	0	0	0
	Ninth Ave (Between Beamish St and Fifth Ave)	12465-12433	12433-12465	915	895	13,831	13,497	334	12,220	326	1,277	32	923	23	1,024	25	0	22	0	10	0	12	0	2	0	2	260	225	35	15	5	760	690	70	46	10
	Albert St (Between Lincoln St and Baltimore St)	19518-13674	13674-19518	965	601	12,057	11,682	375	10,577	363	1,106	35	799	26	886	28	0	22	0	10	0	12	0	2	0	2	260	225	35	15	5	760	690	70	46	10
	Burwood Rd (Between Redman Parade and Bridge Rd)	22975-12462	12462-22975	975	1,055	19,742	17,629	2,114	15,101	1,887	2,527	303	1,035	124	1,077	129	220	220	200	103	20	117	20	20	5	9	260	225	35	15	5	760	690	70	46	10
	Bridge Rd (Between Marie Lane and Burwood Ave)	22975-22730	22730-22975	565	588	10,543	10,019	524	8,583	498	1,436	75	588	31	612	32	0	0	0	0	0	0	0	0	0	0	260	225	35	15	5	235	165	70	11	10
	The Boulevarde (Between Haldon St and Croyden St)	13530-24237	24237-13530	355	558	8,099	7,924	174	6,788	170	1,136	25	465	10	484	11	33	33	16	16	17	17	3	3	3	3	260	225	35	15	5	730	660	70	44	10
	The Bouldvarde (between King Georges Rd and Dudley St)	12475-15869	15869-12475	615	936	13,893	13,471	422	11,540	410	1,931	61	791	25	823	26	33	33	16	16	17	17	3	3	3	3	260	225	35	15	5	730	660	70	44	10

Appendix D

Bridge Works Assumptions Memo

Memorandum

To	TfNSW	Page	1
CC			
Subject	S-B Metro Traffic Assessment – Bridge Works Assumptions		
From			
File/Ref No.	60489141	Date	28-April-2017

1.0 Background

This memo provides a summary of the confirmed assumptions for the assessment of traffic impacts arising from the proposed bridge works associated with the Sydenham to Bankstown component of Metro City and Southeast .

2.0 Confirmation / Clarifications from TfNSW

The following has been clarified / confirmed by TfNSW from their comments on the assumptions memo:

- There are no bridges that require 8 months closure. The overall works period may be up to 8 months but this includes mobilisation and demobilisation. In general, a barrier replacement would entail a number of weekend closures to waterproof and resurface the bridge.
- Duration of works and level of disruption according to work type on bridges not defined as of yet.
- Sequencing and programming of bridge works is not confirmed at this stage. TfNSW recommends the Traffic Team to determine via modelling which bridges cannot have simultaneous half-lane bridge closures.
- Regarding sequencing and programming of bridge works, it has been confirmed that all overbridge construction activities shall be undertaken during school holidays in order to utilise the possession period. The bridge works as a project are needed to be viewed in two separate packages, Sydenham to Belmore and Belmore to Bankstown.
  - **Sydenham to Belmore** - bridge works in this area will as a rule will not be undertaken during the school holiday periods as the works are controlled by the available ARTC possessions which do not align with the School breaks. The staging of the works in this area has been planned to ensure that when a bridge is being upgraded the adjacent bridges are clear of all works and the minimum of disruption to traffic flows occurs. The bridge replacements in this area will close the bridge (Illawarra & Abermarle) for periods of up to 4 weeks due to the shortness of possessions and the volume of works to be undertaken to return the bridge to traffic. The planning and timing of these works will be determined to limit the closure impacts but the road will need to be closed as stated.
  - **Belmore to Bankstown** - the bridges along this alignment will be undertaken as much as possible within the school holiday period. Due to the number of bridges (as bridge works at stations cannot be upgraded during stations works), there are a number of bridge upgrades which will be required to be undertaken outside of school breaks . Every effort will be made to minimise the impacts where possible.
- Bulk traffic movements for bridge works has been provided for in the compound vehicle numbers and shall be used for modelling purposes.
- Construction traffic and haulage routes to be used for traffic modelling are the same as what has been provided till date for compound haulage routes.
- Assessment of traffic modelling of impacts is subject to:
  - Type of construction activity

- Existing bridge width
- Based on the activity and available widths, some overbridges will have insufficient width for two narrow lanes and allow two way traffic flow.

· Construction traffic, temporary transport plans and track possessions are currently planned to occur between 2019 and 2023. Therefore, 2023 was agreed with TfNSW and RMS as the future year to be modelled in SIDRA as it is considered to be the worst-case scenario in terms of traffic when considering land use changes, traffic growth, the TTS buses and construction vehicles. However, the current sequencing and programming information provided by TfNSW for bridge replacement works has the potential to result in a different worst case scenario than 2023, which is currently the planned worst case assessment year for the TIA.

· Sequencing and programming of bridge works is not confirmed at this stage. TfNSW recommended the Traffic Team was to determine via modelling which bridges cannot have simultaneous half-lane bridge closures.

· The Bridge Assumptions table has been updated as per TfNSW comments (updated table is presented overleaf).

· TfNSW comments regarding individual bridge scope is acknowledged. Based on the feedback, the following additional intersections are recommended for traffic modelling assessment. This list reflects additional intersections to be assessed as per TfNSW feedback. The primary reason for these additional intersections are:

- Closures required where existing bridge is narrow and parapet walls, throw screens and barrier works requiring lane closures (traffic redirection)
- Waterproofing and re-surfacing requiring lane closures (traffic redirection)
- Further review of Tech Papers' 1 and 2

Bridge impacted by works	Intersections to be assessed	Bridge impacted by works	Intersections to be assessed
Illawarra Road Overbridge	Warren Rd/ Carrington Rd Warren Rd/ Livingstone Rd Warren Rd/ Illawarra Rd Marrickville Rd / Illawarra Rd Marrickville Rd / Petersham Rd / Fletcher St Marrickville Rd / Victoria Rd	Beamish Street Overbridge	Beamish St / N Parade counts Beamish St / Campsie St Campsie St / Loch St Loch St / Lilian Ln Lilian Ln / Beamish St
Moreton Street Bridge	Moreton Street / The Boulevarde roundabout Lakemba St / Burwood Rd Burwood Rd / Leylands Parade Burwood Rd / Bridge Rd	Loch Street Overbridge	Campsie / Loch St Campsie / Beamish St
		Burwood Road Overbridge	Burwood Rd / Bridge Rd counts Lakemba St / Burwood Rd counts Lakemba St / Moreton St counts Moreton St / The Boulevarde
Meeks Road Dive Underbridge	Not required, impacts rail only	Haldon Street Overbridge	The Boulevarde - Haldon St Lakemba - Haldon St
Charlotte Avenue Underbridge	Charlotte Ave/ Myrtle St Warren rd / Illawarra Rd Marrickville Rd / Illawarra Rd Marrickville Rd / Victoria Rd	King Georges Road Overbridge	The Boulevarde - King Georges Ave King Georges Ave - Lakemba St

Livingstone Road Overbridge	Livingstone Rd - Jersey St Marrickville Road - Illawarra Rd Petersham Rd - Illawarra Rd Marrickville Station overbridge Warren Rd - Illawarra Rd Livingstone Rd - Warren Rd	Punchbowl Road Overbridge	Punchbowl Rd - The Boulevarde Punchbowl Rd - Sth Terrace Punchbowl Rd - Acacia Ave
Wardell Road Overbridge	Wardell Rd - Dudley St Marrickville - Livingstone Rd Livingstone Rd - Warren Rd Beauchamp St - Ewart St Wardell Rd - Ewart St	Stacey Street Overbridge	Stacey Street - Wattle St Stacey St - Stanley St
Ness Avenue / Terrace Road	Ewart St - Ness Avenue Wardell Rd - Marrickville Rd Wardell Rd - Ewart St	North Terrace to South Terrace Underbridge	South Terrace - Railway underpass Stacey St - Wattle St Stacey St - Stanley St
Melford Street Overbridge	Melford Street / Floss St Floss St / Dunstaffenage St		
Wairoa M24 Street Underbridge	Clissoid Parade / Beamish St S Parade / Beamish St		

· The following work types have been clarified by TfNSW:

- Maintenance works include new asphalt, roadmarking and local drainage modifications
- Majority of overbridges require waterproofing (except KGR & Stacey St). Assume all underbridges require new waterproofing.
- Impact barrier installation
- Throw screen installation
- Service diversions – off and back onto the bridge/s
- Steel upgrades including needle gunning and shot blasting (Cook River-over water)
- Line marking

Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
Marrickville	Canal Underbridge	8 months during weekends and nights	Full closure	· Canal under rail	Maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
	Meeks Road Dive Underbridge	6 months during weekends and nights	No closures required for pedestrians or vehicles.	· Rail under rail and road	Strengthening and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers

Note that the following tables have been reformatted in this note for clarity whilst retaining the same content.

Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
	Illawarra Road Overbridge	28 days	Half lane closure	· Road over rail.	Replacement bridge including: · Demolition of bridge deck · New parapets · Throw Screens · Waterproofing · Asphalt (removal and re-application) · New abutments · New bridge beams · Concrete slab · Utility modifications/relocations · Bridge drainage · Line markings · Road level adjustments · Makeup panels
		2 days	Full closure		
	Livingstone Road Overbridge	2 days	Full Closure	· Road over rail.	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
		8 months during weekends and nights	Narrow lanes		

Note that the following tables have been reformatted in this note for clarity whilst retaining the same content.

Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
	Albermale Street Overbridge	1 month	Full closure	· Road over rail.	Replacement bridge including: · Demolition of bridge deck · New parapets · Throw Screens · Waterproofing · Asphalt (removal and re-application) · New abutments · New bridge beams · Concrete slab · Utility modifications/relocations · Bridge drainage · Line markings · Road level adjustments · Makeup panels
		7 months during weekends and nights	Mix of half lane and full closure		
	Charlotte Avenue Underbridge	14 weeks	Half lane closure	· Road under rail.	Strengthening, protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
		3 days	Full closure		

Note that the following tables have been reformatted in this note for clarity whilst retaining the same content.

Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
	Sewer Line Underbridge	6 months during weekends and nights	No closures required for pedestrians or vehicles.	· Drainage under road.	Maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
Dulwich Hill	Wardell Road Overbridge	6 months during weekends and nights	Half lane closure	· Road over rail.	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
	Ness Avenue / Terrace Road Underbridge	6 months during weekends and nights	Half lane closure	· Road under rail.	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets

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Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
					· Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
	Canal 1&2/M24 Underbridges	6 months during weekends and nights	No closures required for pedestrians or vehicles.	· Drainage under rail and road.	· Maintenance
Hurlstone Park	Duntroon Street Overbridge	8 months during weekends and nights	Half lane closures	· Road over rail.	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
		2 days	Full closure		
	Garnet Street Overbridge	8 months during weekends and nights	Half lane closures	· Road over rail.	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application)

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Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
		2 days	Full closure		· Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
	Foord Avenue Overbridge	6 months during weekends and nights	Half lane closures	· Road under rail.	Maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
	Melford Street Overbridge	8 months during weekends and nights	Full closure	· Road over rail.	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings

Note that the following tables have been reformatted in this note for clarity whilst retaining the same content.

Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
					· Adjusting tie-ins · Adjusting fencing and traffic barriers
Canterbury	Canterbury Road Overbridge	8 months during weekends and nights	One northbound and one southbound lane closure (reduction from 2 to 1 lane in each direction).	· Road over rail	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
	Cooks River / Charles Street Underbridge	6 months during weekends and nights	Mix of half lane and full closure	· Road under rail.	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers

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Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
	Wairoa M24 Street Underbridge	6 months during weekends and nights	Half lane closure	· Road under rail.	· Retaining wall works · Protection and maintenance works including: o Utility modifications/relocations o Removal of parapets o Asphalt (removal and re-application) o Cleaning and waterproofing o New precast parapets using cranes (screens pre-installed) o Line markings o Adjusting tie-ins o Adjusting fencing and traffic barriers
		1 day (overnight)	Full closure		
	Church Street / Hutton Street Footbridge	Periodically over 6 months.	Full closure	· Pedestrian walkway over rail	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers

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Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
Campsie	Beamish Street Overbridge	6 months during weekends and nights	Half lane closure	· Road over rail.	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
	Loch Street Overbridge	6 months during weekends and nights	Half lane closure	· Road over rail.	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
	Duke Street Footbridge	Periodically over 6 months.	Full closure	· Pedestrian walkway over rail	Protection and maintenance works including: · Utility modifications/relocations

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Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
					· Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
Belmore	Burwood Road Overbridge	6 months during weekends and nights	Half lane closure	· Road over rail.	· Bridge widening works · Retaining wall works · Protection and maintenance works including: o Utility modifications/relocations o Removal of parapets o Asphalt (removal and re-application) o Cleaning and waterproofing o New precast parapets using cranes (screens pre-installed) o Line markings o Adjusting tie-ins o Adjusting fencing and traffic barriers
		4 weeks continuous	Half lane closure		
	Pedestrian access to Belmore Oval, Belmore	Periodically over 8 months.	Full closure	· Pedestrian walkway under rail	· Bridge widening works · Retaining wall works · Protection and

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Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
					maintenance works including: o Utility modifications/relocations o Removal of parapets o Asphalt (removal and re-application) o Cleaning and waterproofing o New precast parapets using cranes (screens pre-installed) o Line markings o Adjusting tie-ins o Adjusting fencing and traffic barriers
Lakemba	Moreton Street Overbridge	6 months during weekends and nights	Half lane closure	· Road over rail.	Maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
		4 weeks continuous	Half lane closure		

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Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
	Haldon Street Overbridge	6 months during weekends and nights	Half lane closure	· Road over rail.	· Retaining wall works · Protection and maintenance works including: o Utility modifications/relocations o Removal of parapets o Asphalt (removal and re-application) o Cleaning and waterproofing o New precast parapets using cranes (screens pre-installed) o Line markings o Adjusting tie-ins o Adjusting fencing and traffic barriers
		4 weeks continuous	Full lane closure		
Wiley Park	King Georges Road Overbridge	3 weeks	One southbound lane closure (reduction from 4 to 3 lanes southbound).	· Road over rail.	Strengthening, protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers
Punchbowl	Punchbowl Road	6 months during	No closure necessary	· Road over rail.	· Retaining wall works

Note that the following tables have been reformatted in this note for clarity whilst retaining the same content.

Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
	Overbridge	weekends and nights			· Maintenance works including: o Utility modifications/relocations o Removal of parapets o Asphalt (removal and re-application) o Cleaning and waterproofing o New precast parapets using cranes (screens pre-installed) o Line markings o Adjusting tie-ins o Adjusting fencing and traffic barriers
Bankstown	Chapel Road Overbridge	6 months during weekends	No closures necessary	· Road over rail.	Protection and maintenance works including: · Utility modifications/relocations · Removal of parapets · Asphalt (removal and re-application) · Cleaning and waterproofing · New precast parapets using cranes (screens pre-installed) · Line markings · Adjusting tie-ins · Adjusting fencing and traffic barriers

Note that the following tables have been reformatted in this note for clarity whilst retaining the same content.

Station Precinct	Road	Closure Time	Closure Type	Function	Works Required
	Stacey Street Overbridge	6 months during weekends and nights	One northbound and southbound closure (reduction for 3 to 2 lanes in each direction).	· Road over rail.	· Retaining wall works · Protection and maintenance works including: o Utility modifications/relocations o Removal of parapets o Asphalt (removal and re-application) o Cleaning and waterproofing o New precast parapets using cranes (screens pre-installed) o Line markings o Adjusting tie-ins o Adjusting fencing and traffic barriers
		4 weeks continuous	One northbound and southbound closure (reduction for 3 to 2 lanes in each direction).		
	North Terrace to South Terrace Underbridge	6 months during weekends and nights	Half lane closures	· Road under rail.	· Bridge widening works · Maintenance works including: o Utility modifications/relocations o Removal of parapets o Asphalt (removal and re-application) o Cleaning and waterproofing o New precast parapets using cranes (screens pre-installed) o Line markings o Adjusting tie-ins o Adjusting fencing and traffic barriers
		4 weeks continuous	Full lane closure		

Note that the following tables have been reformatted in this note for clarity whilst retaining the same content.

Appendix E

Temporary Transport Strategy (TTS)

Temporary Transport Strategy

Sydney Metro City & Southwest Sydenham to Bankstown

Project:	Sydenham to Bankstown	**Date:**	29 August 2017
Group:	City & Southwest	**Status:**	Final
Author:	B. Watkins	**Revision:**	3.0
File name:	Sydenham to Bankstown Temporary Transport Strategy_EIS FINAL.docx		

Version	Revision date	Status	Reason for update	Author	Reviewer	Approver	Signature
1.0	30/03/2017	Draft	First Draft	B. Watkins Sydney Metro	A. Walsh Sydney Metro	A. Walsh Sydney Metro	
2.0	10/07/2017	Draft	Second Draft	B. Watkins Sydney Metro	C. Gorman Sydney Metro		
3.0	28/08/2017	Final	Final	B. Watkins Sydney Metro	C. Gorman Sydney Metro		

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APPENDIX A Baseline Temporary Transport Plan 33

1. Introduction

1.1 Background

The Sydney Metro City & Southwest Sydenham to Bankstown project will upgrade all 11 stations between Sydenham and Bankstown to meet current accessibility standards before converting the T3 Bankstown Line to Metro operations. This upgrade will include a variety of construction activities that require the temporary closure of part or all of the line, during periods known as ‘possessions’.

This *Temporary Transport Strategy (TTS)* is a framework document that describes how the project will plan and deliver an integrated, multi-modal transport network that will support customer movements during temporary possessions of the Bankstown Line.

Given the conversion of the Bankstown Line will occur in stages over a number of years, each of the possessions will be slightly different. The nature of Metro construction activities will vary each possession, potentially requiring different temporary transport arrangements in response. Additionally, population growth along the Bankstown Line corridor will result in gradually increasing demand, while the delivery of improvements in the road and transport networks may create changed opportunities for travel.

Sydney Metro has investigated several options for how construction work should be scheduled and has determined that a staged program, where the majority of works are completed during school holiday periods, would minimise the overall impact on customers.

This approach will require multiple possessions over a five-year period commencing in July 2019. During each possession period up to 100,000 Bankstown Line customer journeys could be affected each weekday by closures of the line, and most customers would need to travel by other modes to reach their destination.

Transport for NSW is committed to assisting its customers during these periods through the planning and provision of alternative temporary transport services.

Acknowledging this, a *Temporary Transport Plan (TTP)* will be developed for each possession period which will include a *Services Plan* defining the temporary rail and bus services that will operate, and a *Management Plan* describing how wider impacts on the transport network will be managed during the possession. Effectively, the TTS provides guidance on what each individual TTP needs to include, and the process by which it will be developed. Each TTP will be developed to best meet customer needs and minimise adverse impacts to regular public transport services and the road network.

The success of each TTP will be measured in terms of the number of customers who choose to take public transport, walk or cycle during each possession. Each TTP will aim to be sufficiently attractive to encourage as many rail customers as possible to travel via one of these sustainable transport modes.

1.2 Objectives of the Temporary Transport Strategy

The overall objectives of the TTS are to:

- Present the proposed schedule of Bankstown Line possession periods, and temporary alternative transport arrangements that will be needed.
- Define the Bankstown Line stations that will be closed or experience changes to rail services during possessions.
- Identify the types of customers that the Bankstown Line currently serves, and the level of demand they generate.
- Identify the customer objectives to be met by each TTP.
- Define Sydney Metro's approach to planning and managing the requirements of, and impacts on each transport mode as part of developing a TTP for each possession.

1.3 Scope of the Temporary Transport Strategy

The scope of the TTS includes:

- Defining the specific objectives of each component of a TTP.
- Temporary train service plans that provide additional capacity on other rail lines where affected customers may be diverted to, and altered services on sections of the Bankstown Line that are not being converted to Metro operations.
- Integrated temporary bus services to allow customers to travel between closed stations on the Bankstown Line, and to stations on other lines. This includes understanding the opportunities that the regular bus network can provide.
- Planning specialised services for customers who may not be able to use the temporary bus services, such as those with mobility impairments or other special needs.
- Initiatives to encourage and assist customers to walk or cycle to stations on other lines, or to their destinations.
- Infrastructure to support temporary bus services including bus stops and shelters, improvements to walkways and lighting, and wayfinding and information signage.
- Improvements to the road network, such as bus priority measures to support the temporary bus services, and adjustments to traffic signals to mitigate changes in road network demand.
- Understanding the changes in parking demand near rail stations, their impacts, and measures to manage those impacts.
- Customer and stakeholder engagement strategies, including communication, information provision and supporting travel demand management initiatives.

2. Possession Schedule and Affected Customers

2.1 Possession planning and schedule

Conversion of the Bankstown Line to Metro operations will require construction activities that vary in nature, including track realignment, station works, major earthworks and bridge works. As many of these activities need to be undertaken within the rail corridor, to ensure the safety of construction workers and the travelling public, it is necessary to cease rail operations and close the line for extended periods of time.

A variety of options on how to undertake the required closures were considered by Sydney Metro. Based on the potential impacts that closures of the Bankstown Line will have on customers, it was determined to focus construction and rail possessions during school holiday periods for the following reasons:

- Lower demand on the Bankstown Line due to the number of people taking holidays during these periods and the lack of school student travel;
- Reduced traffic volumes on the road network due to the removal of school-based traffic, potentially delivering faster and more reliable journeys on replacement buses;
- Lower demand on parallel rail lines resulting in increased capacity to accommodate Bankstown Line customers who are diverted to these lines; and
- Increased bus fleet and driver availability to operate replacement services as school bus operations cease during holidays.

Only the July and December-January school holiday periods are currently proposed. April and October school holidays were also considered, but these periods are typically busier and can coincide with Easter and sporting finals, respectively.

This indicative possession program would be reviewed during detailed design in line with construction planning to ensure the available possessions are sufficient to complete the works. The schedule of possessions would be reviewed to reduce the overall impacts to the community as far as possible.

Table 1: Draft Schedule for Major Possessions

Possession	Description	Commences	Ends
1	2 Week July Possession	Sat, 6 Jul 2019	Sun, 21 Jul 2019
2	6 Week Dec/Jan Possession	Sat, 21 Dec 2019	Sun, 2 Feb 2020
3	2 Week July Possession	Sat, 4 Jul 2020	Sun, 19 Jul 2020
4	6 Week Dec/Jan Possession	Sat, 19 Dec 2020	Sun, 31 Jan 2021
5	2 Week July Possession	Sat, 3 Jul 2021	Sun, 18 Jul 2021
6	6 Week Dec/Jan Possession	Sat, 18 Dec 2021	Sun, 30 Jan 2022
7	2 Week July Possession	Sat, 9 Jul 2022	Sun, 24 Jul 2022
8	6 Week Dec/Jan Possession	Sat, 17 Dec 2022	Sun, 29 Jan 2023
9	2 Week July Possession	Sat, 8 Jul 2023	Sun, 23 Jul 2023
10	6 Week Dec/Jan Possession	Sat, 16 Dec 2023	Sun, 28 Jan 2024
11	Final Possession	To be determined	By late 2024

The development of the Management Plan for each possession would need to reflect the construction methodology and staging developed by the Contractor. Sydney Metro will work with the Contractor to encourage an approach that minimises impacts associated with possession related works.

The final rail possession for the project is expected to extend for a period of up to six months during 2024 which may include the preceding December/January school holiday period. This possession is required to allow the finalisation of works and the establishment of Metro operations including train testing, system integration and final commissioning. The duration of the final possession cannot be confirmed at this stage and will be dependent on the system operators’ testing and commissioning processes.

At the time of the final possession, the first component of Sydney Metro City & Southwest – from Chatswood to Sydenham – is anticipated to have commenced operating, which would provide additional rail capacity northwards from Sydenham towards the Sydney CBD and the broader rail network.

In addition to the ten multi-week possessions described in four additional weekend possessions of the Bankstown Line are planned each year, similar to those currently carried out for track maintenance.

2.2 Geographic extent

2.2.1 West of Sydenham

The Bankstown Line extends from Sydenham to Bankstown and then further west to Yagoona and Birrong before branching into two lines, north to Lidcombe and west to Liverpool via Cabramatta.

Figure 1: Plan of the T3 Bankstown Line

Source: Transport for NSW

Each of the proposed rail possessions would involve closing Marrickville Station through to Punchbowl Station, inclusive.

During the earlier possessions, the construction activity at Bankstown would not allow trains to operate from the Liverpool and Lidcombe branches into Bankstown Station. Due to how the existing tracks are configured, this will also result in the temporary suspension of train services from Yagoona and Birrong. The remaining stations between Liverpool and Lidcombe[1] would remain open during possessions but would be served by altered train services, such as a shuttle service travelling between these two terminus stations.

During later possessions after the works at Bankstown Station are completed, trains would be able to operate from Liverpool to Bankstown, and/or from Lidcombe to Bankstown.

The planning of temporary services will consider the needs of customers west of Bankstown, including those who use Yagoona and Birrong stations, who will no longer be able to travel via the Bankstown Line to destinations east of Bankstown including the CBD.

[1] Warwick Farm, Cabramatta, Carramar, Villawood, Leightonfield, Chester Hill, Sefton, Regents Park and Berala.

2.2.2 East of Marrickville

East of Marrickville, the Bankstown Line continues to the City Circle via Sydenham, St Peters and Erskineville Stations.

Sydenham Station is generally expected to remain operational during possessions and services on the T4 Illawarra Line and T8 Airport & South Line will continue to operate.

St Peters and Erskineville Stations are currently served by Bankstown Line trains, but it is possible to modify train operations so that they are served by either T8 Airport & South Line trains, or T4 Illawarra Line trains. Planning for each TTP will need to consider the best option for serving these two stations given the operating constraints in the rail network at the time.

To enable works to be undertaken at Sydenham Junction, short closures of the entire station and all lines passing through it may be required for up to five days, though this is yet to be confirmed and would be scheduled during early January when customer demand levels are at their lowest.

2.3 Identifying affected customers and demand levels

Customers that use each station along the Bankstown Line have a variety of travel demands especially when comparing the areas in the eastern part of the corridor to those further to the west. As part of the development and refinement of each TTP, a detailed assessment of customer demand will be undertaken to determine who our customers are, where they are travelling to, and when they need to travel. The Opal ticketing system provides a rich dataset for planners to gain this understanding, but this may need to be supported with information from other sources.

The following provides an example of the data that will be used to inform the development of each TTP. The data in this section is based on Opal ticketing data of customer travel from a typical weekday in August 2016.

2.3.1 Daily weekday demand

Currently, up to 54,000 customers travel on the Bankstown Line each weekday resulting in up to 90,000 customer trips. Of these, approximately 72,000 trips start or end at one of the ten stations from Marrickville to Bankstown that will be upgraded.

Over the next seven years, demand is forecast to grow by around 6% per annum. By 2019 when closures of the line commence, demand to travel on the Bankstown Line is expected to exceed 100,000 customer trips per weekday. Fortunately, demand levels during school holiday period are typically at least 15% lower than during school term.

The typical number of weekday customers recorded entering and exiting Bankstown Line stations is presented in Table 2.

Table 2: Typical daily weekday station entries and exits at Bankstown Line stations (2016)

Station	Entries	Exits
Stations west of Bankstown	**9,120**	**8,420**
Carramar	530	480
Villawood	550	480
Leightonfield	240	300
Chester Hill	1,130	1,010
Sefton	680	560
Berala	1,880	1,800
Regents Park	1,200	1,170
Birrong	1,110	1,000
Yagoona	1,800	1,620
Stations to be converted to Metro	**45,410**	**43,990**
Bankstown	8,920	9,440
Punchbowl	2,800	2,690
Wiley Park	1,880	1,730
Lakemba	3,970	3,800
Belmore	2,860	2,690
Campsie	8,150	8,100
Canterbury	2,280	2,020
Hurlstone Park	1,440	1,250
Dulwich Hill	2,610	2,370
Marrickville	4,320	4,090
Sydenham*	6,180	5,810
Stations east of Sydenham	**6,630**	**5,520**
St Peters	3,880	3,100
Erskineville	2,750	2,420
TOTAL	**61,160**	**57,930**

Source: Opal data station entries and exits, 17 August 2016 (regular school term weekday)

Notes: 1) Data for Sydenham Station includes patronage on T8 Airport & South Line and T4 Illawarra Line services.

2) Journeys that start and end at a Bankstown Line station will be recorded in both the entries and exits columns.

2.3.2 Weekday AM peak period demand

2.3.2.1 Defining the peak period

For the planning of temporary transport services, the weekday morning peak period represents the most significant challenge as this is when the highest travel demand is observed when measured on an hourly basis. This peak period is typically defined as having a 3.5 hour duration, from 6:00am to 9:30am, in which the hour with the highest observed demand is defined as the AM peak hour. The AM peak hour is also the busiest hour of the day, and represents the highest levels of customer demand that will need to be accommodated by each TTP.

The exact time that the AM peak hour occurs varies depending on location, with locations closer to the Sydney CBD experiencing it later than locations further out. For commuters travelling to the Sydney CBD, the highest demand occurs between 8:00am and 9:00am.

2.3.2.2 Station groupings

For assessment purposes, the Bankstown Line stations that will be converted to Metro between Marrickville and Bankstown are considered ‘internal’ to the corridor.

Other Bankstown Line stations are considered here as ‘external’, i.e. east of Marrickville (Sydenham, St Peters and Erskineville), and west of Bankstown (Yagoona, Birrong, Regents Park, Berala, Sefton, Chester Hill, Leightonfield, Villawood and Carramar).

Typical demand levels for the weekday AM peak period are presented in Figure 2 showing the number of customers boarding and alighting at each station on the Bankstown Line, and the station group where they travelled from or to.

2.3.2.3 Travel to and from external stations

In the eastbound direction, currently around 8,800 customers are onboard Bankstown Line trains as they approach Sydenham in the AM peak hour each weekday. 79% of these customers board at one of the ten internal stations – Bankstown to Marrickville – while the remainder board at external stations west of Bankstown.

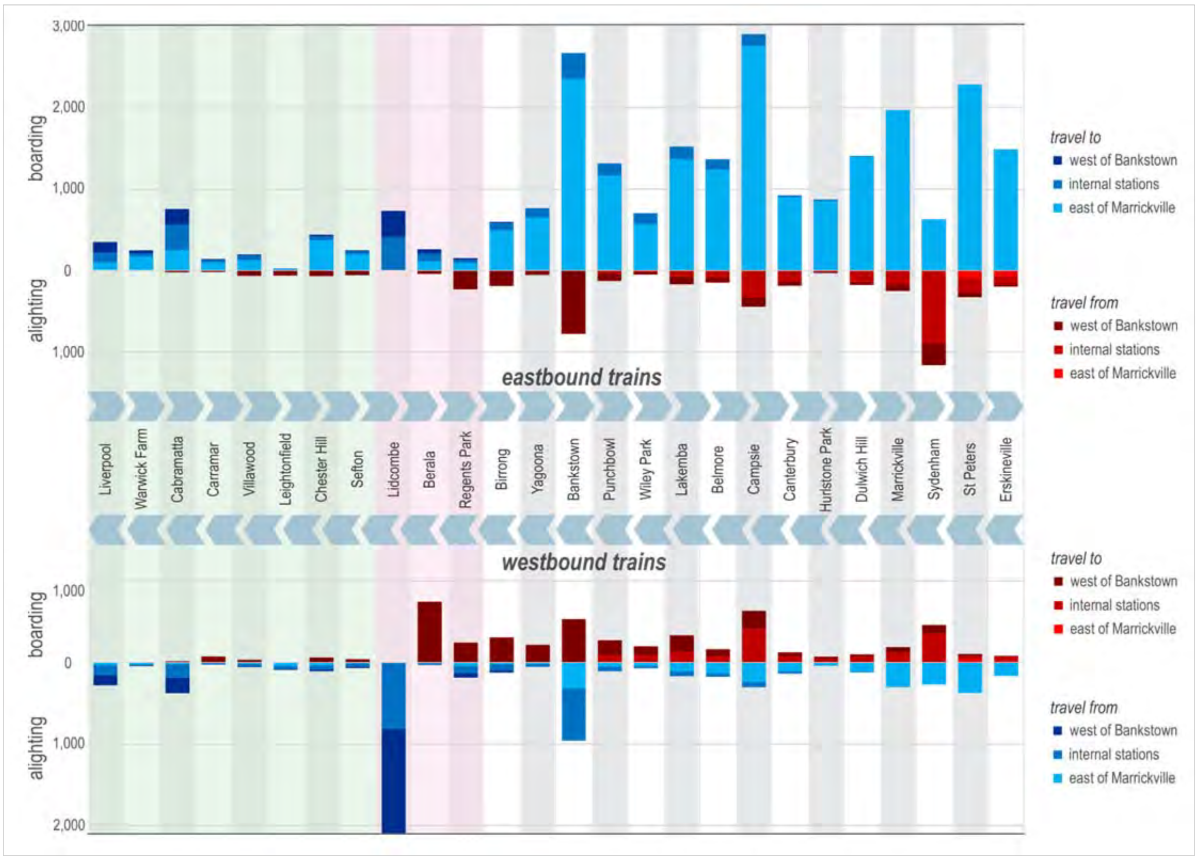
Demand in the westbound direction through Sydenham is lower, with approximately 700 customers onboard in the busiest one-hour period. 82% of these customers alight between Marrickville and Bankstown inclusive, while the remainder continue west of Bankstown. Internal Bankstown to Marrickville customers generate approximately 1,000 westbound journeys in the busiest one-hour period. Of these journeys, 62% continue west of Bankstown.

Lidcombe Station generates a large demand for westbound travel from customers transferring to the T1 Western Line and the T2 Inner West & Leppington Line.

2.3.2.4 Travel between internal stations

The internal stations also generate demand to travel between them – approximately 1,200 customers alight at one of these stations during the busiest one-hour period in the morning peak. Of these customers, 17% commence their journey west of Bankstown, 51% commence their journey from an internal station, and the remainder travel from stations east of Sydenham.

Figure 2: Typical morning peak period travel demand on the Bankstown Line (weekday 6:00am - 9:30am)



Source: Opal card data, 17 August 2016.

2.3.2.5 Observations

Customer travel patterns and their likely destination vary along the corridor. Figure 3 presents the destinations that customers travel to in the AM peak period, and it can be seen that in the eastern part of the Bankstown Line corridor, nearly 70% of customer travel demand is to stations in the Sydney CBD. Further west, this drops to just over 50%. The share of passengers travelling to the City stations from Sydenham is significantly lower than the other stations in the eastern part of the Bankstown Line corridor because these customers have three rail options to the City from Sydenham Station -- T4 Eastern Suburbs & Illawarra Line, T8 Airport & South Line and T3 Bankstown Line.

Figure 3: Distribution of destinations from Bankstown Line stations (typical weekday, 6:00am to 9:30am)

Source: Opal card data, 17 August 2016

Figure 4 shows the distribution of customer types at each station in the AM peak period, as recorded by Opal ticketing data. In the eastern part of the Bankstown Line corridor, over 80% of customers are classified as adults, reducing to 63% at Bankstown. The higher percentage of school students at some stations reflects that a number of schools are located close to those stations.

Figure 4: Proportion of customer types at Bankstown Line stations (typical weekday, 6:00am to 9:30am)

Source: Opal card data, 17 August 2016.

The “Other” category includes concession card holders and customers entitled to free travel.

2.3.3 Weekday PM Peak period demand

The afternoon peak period is defined as the 3.5 hour period from 3:30pm to 7:00pm although the demand to travel during this period is more evenly distributed across it when compared to the morning peak period. Consequently, the demand in the PM peak one-hour is lower than in the AM peak one-hour.

Approximately 6,000 customers are onboard a westbound Bankstown Line train departing Sydenham Station in the busiest hour each weekday afternoon. Approximately 75% of these customers alight between Bankstown and Marrickville inclusive, while the remaining 25% alight west of Bankstown.

Eastbound demand in the afternoon peak is significantly lower, with approximately 1,500 customers onboard Bankstown Line trains as they approach Sydenham in the PM peak hour.

Demand to travel between internal stations in the afternoon peak period is up to approximately 1,100 customers per hour, of which around 60% is westbound. However, this internal travel demand peak occurs around two hours earlier than the regular commuter peak hour, reflecting the use of the line for travel by school students. During school holidays periods, this student travel demand does not occur although minor increases in travel demand across the off-peak period is observed compared to school term.

3. Temporary Transport Plan Development

3.1 Temporary Transport: Services Planning and Management Planning

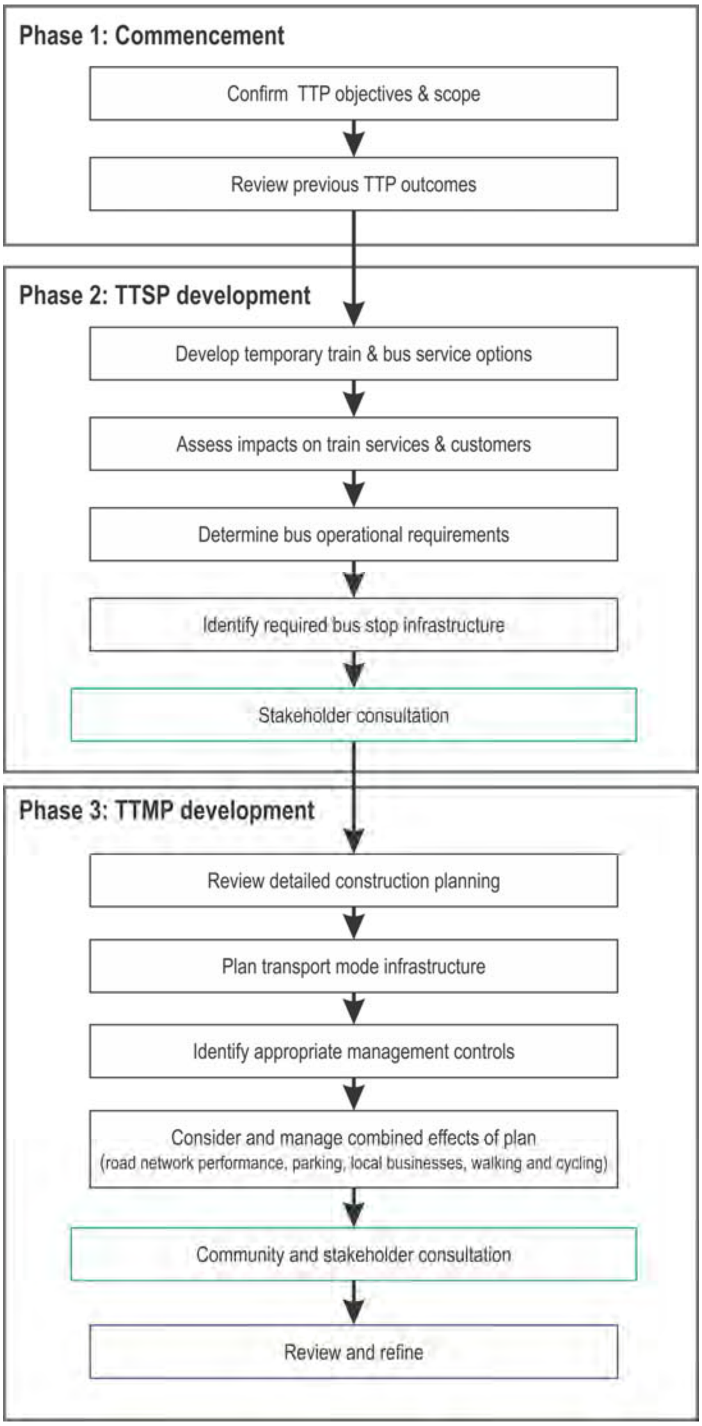
The tasks required to develop each TTP occur in a series of three phases, as shown in Figure 5.

The first phase involves confirming the objectives and scope for the TTP, and reviewing the performance of previous TTPs to determine learnings that can be applied. Development of the first TTP for the Bankstown Line will include a review of Sydney Metro's Epping to Chatswood TTP which will have concluded by that time, and subsequent Bankstown Line TTPs will learn from the ones that preceded it, in an ongoing process of revision and refinement.

The second phase involves the preparation of a *Temporary Transport Service Plan (TTSP),* which will present the temporary rail and bus services that operate during the possession to meet the needs of affected Bankstown Line customers.

The third phase will result in the preparation of a *Temporary Transport Management Plan (TTMP),* which will consider the wider impacts created during possessions including those of the line closure, the operation of temporary transport services and the interactions of construction activities.

Figure 5: Process for developing a TTP



3.2 Temporary Transport Plan objectives

The objectives for each of the TTPs have taken into account established Transport for NSW customer service satisfaction drivers, and the Program Objectives and Guiding Principles for Sydney Metro.

Five overarching TTP objectives have been identified and are listed below. Additionally, specific objectives have been developed for the different TTP planning tasks, and these are presented in the following chapters.

Overarching TTP Objectives
Minimise the impact for Bankstown Line customers of temporarily removing train services between Sydenham and Bankstown (or Regents Park) by delivering a comprehensive and effective temporary transport service plan
Minimise, manage or mitigate wider disruptions to other public transport services, local businesses, the community and the road network.
Be accessible by all customers.
Provide a safe environment for customers and workers by eliminating or mitigating conflicts generated by Metro construction works.
Provide a balance between minimising customer impacts and the efficient use of the resources available to deliver temporary transport services.

3.3 Temporary Transport Plan scope

Each TTP will be similar in nature, but would need to consider different construction impacts or changes in the transport network to develop the most effective multi-modal response to the closure of the line. The development of each TTP will require consideration of its scope.

As a minimum, the following would be considered in the development of each TTP.

Temporary Transport Services Plan Scope
Temporary Rail Services
Providing additional train services on the parallel rail lines to the north (T2 Inner West & Leppington Line), and the south (T8 Airport & South Line) of the Bankstown Line to accommodate anticipated increases in demand.
Providing altered train services on the sections of the Bankstown Line that are not being converted to Metro operations (west of Bankstown to Lidcombe and Liverpool, and from Sydenham east to the Sydney CBD).
Temporary Bus Services
Providing temporary bus services that travel along the Bankstown Line which offer optimised stopping patterns to serve customer needs, which may be different to existing train stopping patterns.
Providing temporary bus services between Bankstown Line stations and stations on other rail lines to provide faster travel times.

Temporary Transport Services Plan Scope
Considering potential additional stops for temporary bus services (i.e. in addition to railway stations) as a means of improving customer access to the temporary bus services.
Providing additional frequency on regular bus routes which may offer customers a more attractive alternative to the temporary bus services.
Providing specialised services for customers with impaired mobility who may not be able to use the temporary bus services.
Walking and Cycling
Identifying initiatives that encourage affected customers to cycle and walk as an alternative means of commuting, either to access temporary transport services or to travel all the way to their destination.
Temporary Transport Management Plan Scope
Supporting Infrastructure
Providing bus stops, shelters and seating for customers waiting to catch temporary bus services. Stops will be designed to be safe, accessible and well-lit. Shelters could either be temporary or permanent, depending on the location.
Identifying improvements to the station facilities on the other rail lines that Bankstown Line customers may be diverted to.
Identifying and implementing bus priority measures to improve travel times for temporary bus services.
Identifying and implementing road network improvements to mitigate increased road network demand, such as adjustments to traffic signals.
Walking and Cycling
Identifying and implementing walking and cycling connectivity and amenity improvements along the Bankstown Line to support temporary bus services.
Identifying and implementing walking and cycling improvements at stations on other rail lines to enhance customer experience connecting to alternate train services at unfamiliar locations.
Improving bicycle parking facilities at stations on other rail lines to retain existing customers and attract new customers who choose cycling to access rail stations.
Customer Engagement and Information
Working with stakeholders, including Councils and community organisations, to better understand and communicate with our different types of customers, including those with special needs or from non-English speaking backgrounds.
Developing and delivering comprehensive customer information and notifications before and during the possessions.
Providing wayfinding and information signage at affected stations and TTP bus stops to assist customers to use temporary transport services.
Supporting travel demand management initiatives, such as encouraging car-pooling for customers who choose to drive instead of using the other modes available.

Temporary Transport Services Plan Scope **Out of Scope** *The following will not be considered within the scope of each TTP*
Providing temporary bus routes directly into the Sydney CBD or to destinations beyond the railway lines surrounding the Bankstown Line (excepting providing additional frequency on regular bus routes, or dedicated services required during special events). This ensures that any temporary bus routes operating beyond the closed section of the Bankstown line will be designed to take customers quickly and efficiently to a nearby point where they can access the rail network.
Constructing new parking or major new bus interchange facilities at stations on other rail lines.

3.4 TTP development, revision and refinement

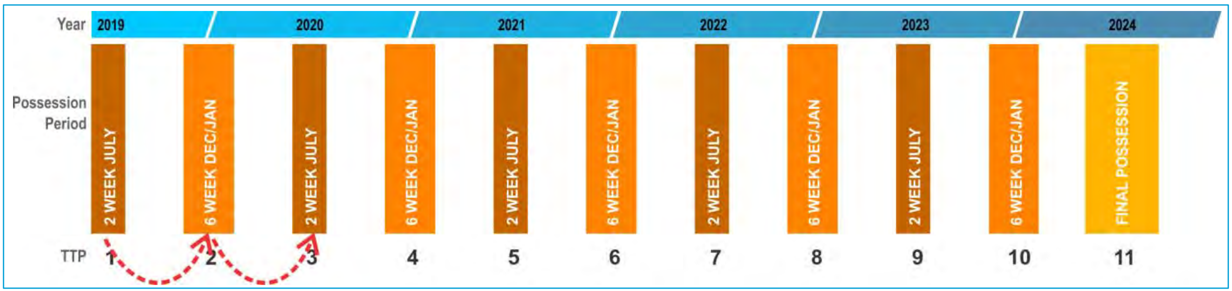
The development of each TTP involves a variety of tasks which are discussed in detail in the following chapters.

The completion of these tasks may not necessarily be sequential, and the successful development of each TTP will be an iterative process where the findings from one task may require that a previous task be revisited. This could include the need to revise the design of bus routes included in the TTSP, if the development of the TTMP finds that their operation would create unacceptable impacts.

Given that construction of the Bankstown Line will occur in stages over nearly five years, each of the possessions will be slightly different. The nature of Metro construction activities will vary from one possession to the next, potentially requiring different temporary transport arrangements in response. Additionally, population growth in the Bankstown Line corridor will result in increased demand, while the delivery of improvements in the road and transport networks may create new opportunities for travel.

A new TTP will be developed for each possession period which will define the initiatives that will be implemented prior to that possession. Following the completion of each possession period, the performance of the TTP will be assessed to determine learnings that can be used to ensure that the next TTP better meets the needs of our customers. Planning for the new TTP would retain the most effective parts of the previous plan while making adjustments necessary for any changes that might occur in the road, rail or bus networks.

Figure 6: Revision of the Temporary Transport Plan between Possessions



The revision and refinement process will apply to both the TTSP which will consider the how well temporary services performed and how well customers responded to them, and the TTMP which will review the previous impacts on and management of the road network, parking, local businesses, active transport, customer accessibility and special event management.

3.5 Baseline Temporary Transport Plan

As an input to the Sydney Metro City & Southwest Sydenham to Bankstown Environmental Impact Statement, a “Baseline” Temporary Transport Plan was developed to provide preliminary estimates of the volume of temporary bus services required to meet customer demand during a possession (refer Appendix A). The traffic and transport assessment of the Baseline TTP is provided in Chapter 10 of the *Environmental Impact Statement* and *Technical Paper* and an assessment of the noise and vibration and business impacts of the Baseline TTP is provided in Chapters 12 and 18, respectively, of the *Environmental Impact Statement*.

4. Temporary Transport Service Plan

The preparation of a Temporary Transport Service Plan requires the planning the rail, bus and specialised support transport services that will operate during possession of the Bankstown Line. This process will be guided by the following service planning objectives.

Primary Objective
Minimise the impact for Bankstown Line customers during possessions by developing an integrated network of rail and bus services that enables them to travel to their intended destinations conveniently, comfortably and safely.
Supporting Objectives
Provide adequate capacity on train services operating on other rail lines where customers could be diverted to.
Minimise disruption to existing train services and customers on other lines resulting from changes in train operations, including the sections of the Bankstown Line not being converted to Metro operations (west of Bankstown to Lidcombe and Liverpool, and east of Sydenham to the Sydney CBD).
Provide temporary bus services of adequate frequency and capacity to convey customers between Bankstown Line stations, and to stations on other lines where adequate capacity on train services is available.
Plan temporary bus routes between stations where regular bus routes already operate, providing additional service options for customers.
Plan temporary bus routes to travel along roads that are already used by regular bus routes, wherever possible.
Ensure that regular bus routes are able to accommodate customers who may choose to travel using these services instead of temporary bus services.
Ensure consistency of temporary bus routes across the day and week, so that customers only need to remember one alternate train station they need to travel to.
Provide an efficient and customer-focussed transfer experience between services and modes.
Provide specialised transport services to ensure that customers with specific mobility needs are able to travel during possessions.

4.1 Options for providing temporary additional rail capacity

For most Bankstown Line customers, travelling to their intended destination would still require them to access train services provided on other rail lines. It has been assumed that many would do so using temporary bus services delivered during each possession, while other affected customers would make their own way to the other rail lines either by car, regular bus services, cycling or walking.

Fortunately, the closure of the Bankstown Line means that the trains that would normally operate on the line may be able to be used to increase the frequency of services on other lines. For example, additional trains could be added to the T2 Inner West & Leppington Line, and/or added to the T8 Airport & South Line.

An important step in the development of each TTSP will be to determine opportunities for increasing rail capacity on parallel lines. Adding services to other lines is a complex undertaking and a number of constraints exist in terms of the capacity of lines, junctions, train fleet and stations.

This planning of temporary train services would be undertaken jointly by Transport for NSW and Sydney Trains.

4.2 Options for temporary bus services

A number of different approaches have been considered by Sydney Metro for providing temporary bus services. Each approach will form a component of the overall temporary bus service plan and provide customers with different choices on how they can travel. These components, shown schematically in Figure 7, are:

- Buses that stop at all stations along the corridor (component 1).
- Buses that only stop at a limited number of stations before continuing an express service to another station (component 2).
- Buses that move passengers to another rail line such as the T8 Airport & South Line and the T2 Inner West & Leppington Line (component 3).
- Increasing the frequency of regular bus services at specific locations, acknowledging that customers may prefer to use those instead of the temporary bus route service (component 4).

These components have been assessed in the Environmental Impact Statement, particularly impacts on traffic and transport performance, infrastructure and facilities, noise and vibration and local business operations.

4.2.1 Buses that stop at all stations along the corridor

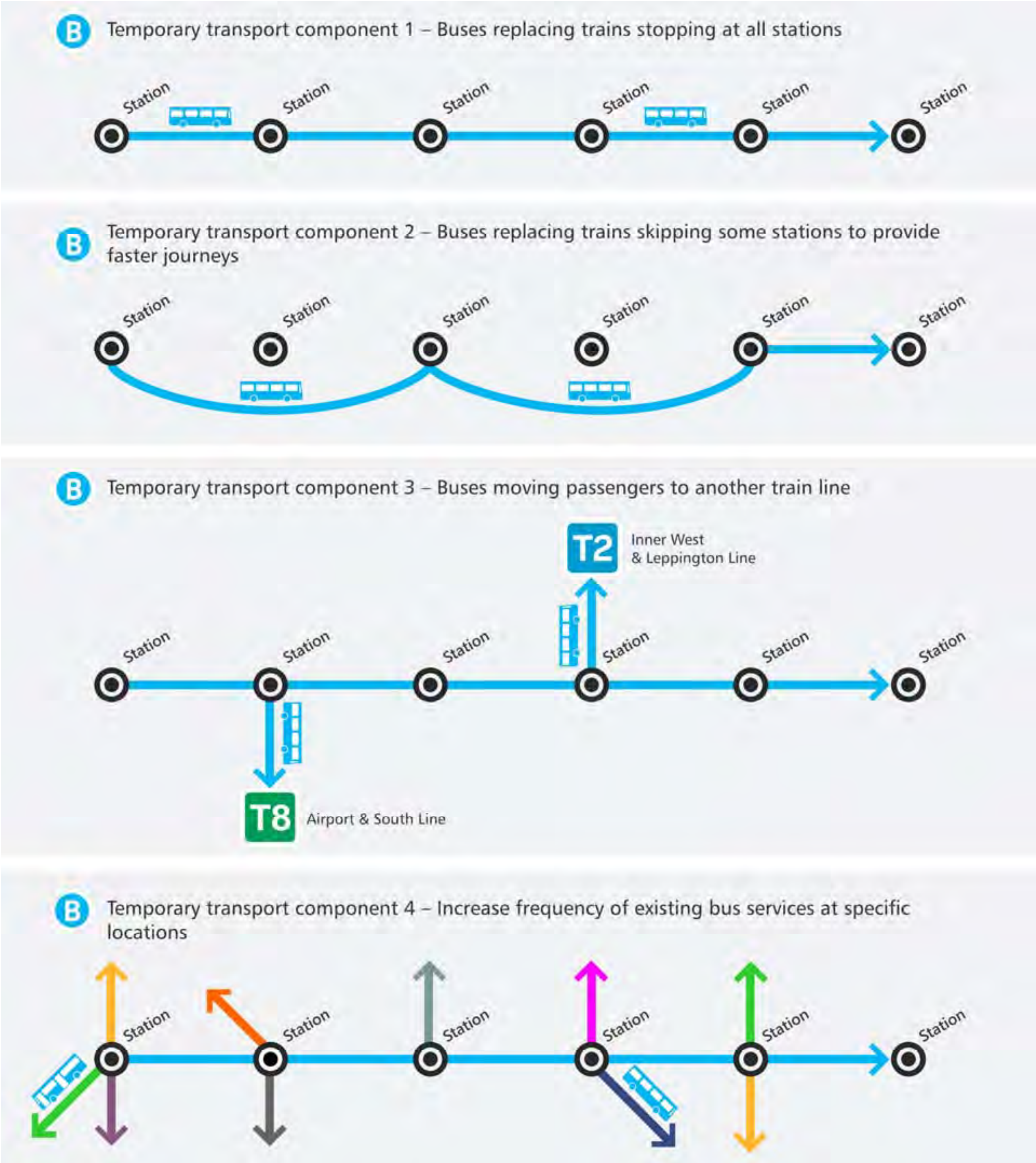
The TTSP will include an all-stations replacement bus service between Lidcombe and Sydenham. This will:

- Provide consistency between the existing train service and the temporary bus service; and
- Ensure that customers who are unaware of the temporary interruption to train services would be provided with a like-for-like replacement bus service at all times (during the hours of normal rail operation in the possession periods).

4.2.2 Buses that only stop at a limited number of stations

To provide faster journeys for customers, the TTSP may include limited stops services that skip some stations as part of their journey to or from Sydenham Station. The need for these services is influenced by the number of customers and bus loads that each station will generate at different times of the day.

Figure 7: Temporary Transport Bus Services



4.2.3 Buses that travel to stations on the T8 Airport & South Line, and T2 Inner West & Leppington Line

It is feasible that a TTSP would provide temporary bus services that travel south to stations on the T8 Airport & South Line, and/or north to stations on the T2 Inner West & Leppington Line.

Candidate stations for the transfer of Bankstown Line customers between bus and train would include:

- Revesby, Padstow, Riverwood, Narwee, Beverly Hills, Kingsgrove, Bexley North, and Bardwell Park stations on the T8 Airport & South Line; and
- Lidcombe, Strathfield, Burwood, Ashfield, Lewisham and Petersham stations on the T2 Inner West & Leppington Line.

Each of these stations can be accessed via reasonably direct routes from one or more Bankstown Line stations. The TTSP, referencing the customer markets, will determine how these stations will be included in the network of temporary bus services.

4.2.4 Increasing the frequency of regular bus services

The regular bus route network provides customers with additional options to travel. Many customers already have the choice to travel by either bus or rail, and the temporary closure of the Bankstown Line may mean they will choose to travel by a local bus route rather than a temporary bus service. Often customers will have a local bus stop closer to their home than the train station, making this option more attractive than the temporary bus service.

In the eastern part of the corridor, from Canterbury to Sydenham, several bus routes travel through the areas surrounding the stations and continue on to the CBD. These routes include the 412, 413, 423 and 428. Other routes such as the 418, 425, 444 and 491 provide connections to stations on other rail lines. The current Opal fare structure offers an inter-modal transfer discount, which allows customers to travel up to 3 km on a bus for negligible cost[2] if they transfer to or from a train, making the use of regular buses to access other train stations a potentially attractive option.

No bus routes travel directly to the CBD from west of Campsie. However, several bus services provide attractive connections to stations on other rail lines. These include:

- Routes M41 and 400 that connect Campsie to Bexley North Station and to Burwood Station;
- Routes M91 and M92 that connect Bankstown Station to Padstow Station; and
- Route M90 which connects Bankstown Station with Liverpool Station and Strathfield Station.

It is anticipated that these routes would experience increases in demand during closures of the Bankstown Line and additional services may be included to ensure overcrowding does not occur.

[2] As of June 2017, the Adult Opal fare for a bus journey up to 3 km is $2.15. A discount of $2.00 is awarded when customers using an Opal card transfer between bus and rail services, reducing the cost to $0.15 for a short bus journey taken before or after a train journey.

4.3 Review of temporary train and bus route strategies

The TTSP will review issues and risks associated with providing temporary rail and bus services under each of the identified strategies. This may include:

- Comparison of travel times between different strategies for journeys between the same origins and destinations;
- Adequate train capacity to accommodate customers transferring to or from temporary buses;
- Station accessibility:
  - lifts and/or ramp access;
  - bus access and manoeuvrability;
  - bus stop locations and capacity; and
  - connectivity between bus stops and rail platforms.
- Opportunities for bus turnaround and layover;
- Managing transition periods if the connections to surrounding train lines only operate during limited hours (e.g. peak periods only), to avoid a customer travelling to a station at a time when the connecting services do not operate, or operate at a lower frequency; and
- Managing or mitigating impacts on the performance of the road network (discussed further in Section 5.4).

4.4 Determining service frequencies for temporary train and bus services

The potential demand for temporary rail and bus services was assessed as part of the Environmental Impact Statement and will be further reviewed in the development of the TTSP. Expected customer demand during each possession will help determine the capacity and frequency of service required on both rail and bus services.

For train services, the process will determine whether the volume of demand diverted to the other rail lines can be accommodated by the capacity of train services. This includes the regular train services and any additional temporary services added during possessions.

Capital expenditure requirements (e.g. bus fleet) will also be informed by the outcomes of the demand review process i.e. the frequency of service required to meet the identified level of demand at the nominated travel times.

Key steps in the demand estimation for the TTSP include:

Step 1: Quantification of candidate trips

Candidate trips are customers who may choose to use the temporary bus and train services during the morning peak hour. These trips will be estimated from Opal patronage data and/or from forecast pre-closure rail patronage on the Bankstown Line.

Step 2: Allocation of candidate trips to temporary bus routes

Allocation of candidate trips to the most appropriate temporary bus route, based on their origins and destinations.

Step 3: Determining preliminary peak hour bus frequencies

Determination of preliminary peak hour bus frequencies required to meet customer demand for each bus route in each strategy, as an input into the model. This is done by assuming all existing rail customers are potential TTP bus customers, and providing enough buses to accommodate them all (e.g. dividing the total demand per hour for each route by 50, which is the assumed capacity of a standard bus).

Minimum frequencies could also be set at a policy level to increase customer convenience, rather than be purely demand-driven. For example, a policy decision could be made that if a temporary bus route is to operate at all, then it should operate at 10 minute headways or better.

Step 4: Determining bus route travel times

Determination of travel times for all temporary bus routes in each identified bus strategy, during weekday peak hours and other times of the day and week.

This will use a combination of existing travel time data for buses and general traffic to determine bus travel time estimates that reflect the limited stop nature of the temporary bus routes compared to the network of regular route buses, and include appropriate estimates for bus dwell times at each of the railway stations served.

Step 5: Strategic transport modelling of TTP train and bus services

Each TTSP will be modelled using Transport for NSW's *Public Transport Project Model (PTPM)*[3], specifically adapted for the Bankstown Line TTS. The PTPM will provide forecasts of customer demand:

- On each temporary bus route;
- On all operational rail lines;
- On regular bus and light rail services; and
- Demand for park and ride at rail stations.

Model inputs will include future land use projections for the Bankstown Line and Greater Sydney, anticipated changes to the regular bus route network, anticipated road network changes (e.g. WestConnex Stages 2 and 3) and proposed train service plans for the Bankstown Line possessions. The accuracy of travel times estimated in the previous step will be important, as the allocation of demand to public transport services within the model is sensitive to travel time differences between alternative options.

The modelling process will incorporate sensitivity testing which will result in a range of demand forecasts rather than a single point estimate of demand to ensure the following extremes are assessed:

- The highest possible retention of existing Bankstown Line customers as public transport users, representing the maximum possible demand for temporary bus services; and

[3] The PTPM is an incremental multi-modal strategic transport model developed by Transport for NSW, and is used on many major public transport planning projects in NSW to calculate transport user benefits to inform economic evaluations and the preparation of project business cases. This model is adapted to meet the specific requirements of individual projects, and for the Bankstown Line TTS this has included refinement of travel zones adjacent to the rail line, coding of alternate rail plans with the Bankstown Line closed, and the development of new park and ride assessment capability.

- The lowest foreseeable retention of existing Bankstown Line customers as public transport users representing the greatest diversion to car travel and the highest impact on road network performance.

Step 7: Estimation of demand outside of peak periods

Estimation of demand for the temporary bus and rail services across the remainder of the weekday (i.e. outside of the morning peak period) and on weekends will be undertaken by proportioning demand experienced at those times against peak hours.

- Opal ticketing data will be used to estimate the relative demand for early morning, off peak, evening peak, night and weekend services compared to the demand for services during the morning peak hour;
- Corresponding service frequencies across the day and across the week will be determined for each temporary bus route (e.g. if the demand at midday is 50% of the morning peak hour demand, the frequency of midday services will most likely be set at half of that during the peak hour);
- Service frequencies will be compared against target minimum service levels to determine whether or not each temporary bus service will be required to run during all time periods, or for example, only during weekday peak periods; and
- Established factors for changes in rail customer demand during school holiday periods will be applied to the demand for temporary bus routes in all time periods to determine if any adjustment in service frequency may be required, depending on the time of year in which each possession of the rail line takes place.

4.5 Assessing impacts on train services and customers on other rail lines

Each TTSP will quantify the potential increase in rail patronage on surrounding lines, and assess this against available capacity, both on the trains and at the stations themselves. The TTSP may then recommend temporary train service changes which would provide additional capacity on surrounding train lines to accommodate the anticipated increases in demand.

Due to the complexities of planning train services, the addition of temporary services will require the preparation of an alternative working timetable. This means that adjustments will be required to the timing and stopping patterns of trains that travel on the T8 Airport & South Line and T2 Inner West & Leppington Line, resulting in impacts to the regular customers of those lines.

In some cases, these impacts may be beneficial as the addition of temporary additional train services will increase the frequency of services at some stations which may in turn change the demand for train services at these stations.

Some of the changes to train services may result in changes to operations in the Sydney CBD, such as trains travelling a different direction around the City Circle.

The following will be assessed, as a minimum:

- Changes in travel times to the most common destinations (e.g. Central, Town Hall, North Sydney, Parramatta) from all rail stations at which timetable changes occur;
- Forecast changes in customer demand from all stations;
- The impact of demand changes on train loads and crowding; and

- Changes to the locations and number of passengers who need to transfer to other rail services.

If the operation of the TTSP results in substantial changes in customer behaviour and impacts on stations, such as the volume of people accessing or transferring at CBD stations, these findings will inform the TTMP and may trigger the need for specific management measures to be developed.

4.6 Determining bus operational requirements

When the numbers of temporary bus routes and frequencies are known, the bus operational requirements for implementing the TTSP will be determined. This will allow a final analysis of the cost and resource requirements for the temporary bus services.

Operational requirements will include:

- Identifying the peak number of buses required to provide the temporary bus services and enhancements to regular bus services identified in the TTSP. The bus fleet calculation will also include spare buses (to cover for maintenance requirements) and standby buses.
- Identifying the pick-up and set-down arrangements for each temporary bus route at each station served.
- Identifying the stations at which standby buses may be required, how many and where they would be positioned.
- At terminal points, identifying the requirement for and location of bus layover areas.
- Identifying how TTP buses and regular bus services will interact at locations served by both.
- Testing the capacity of bus stops to accommodate increased numbers of buses and customers, particularly where TTP buses are required to share bus stop space with buses serving existing bus routes (bus stop capacity constraints at particular locations may influence whether or not an additional intermediate stop for TTP buses is appropriate).
- Identifying the bus stop management requirements, i.e. staff to provide customer information to manage boarding and alighting, and to direct the movement of buses.
- Identifying changes to the provision or location of car parking in station areas in order to accommodate TTSP requirements.
- Identifying road network changes that may deliver improved outcomes for customers and for bus service reliability during possession periods, for example:
    - traffic signal timing changes, and
    - bus priority measures.

The analysis of these requirements including any required supporting infrastructure will be undertaken as part of the development of TTMP.

4.7 Identifying required bus stop infrastructure

To support the operation of temporary buses, supporting infrastructure works associated with the functional and operational needs of the TTSP will be identified for each station. In some cases, permanent infrastructure that provides a benefit outside of possessions may be delivered. Examples of supporting infrastructure include:

- Directional signs to/from the rail station;
- Bus route information displays;
- Temporary or permanent bus shelters that include seating and marquees for weather protection;
- Relocation of bus stop poles;
- Changes to bus zone signs; and
- Improvements to existing infrastructure required to meet DDA requirements in accordance with *Disability Discrimination Act 1992* and *Disability Standards for Accessible Public Transport 2002*.

Managing potential impacts associated with the development of this infrastructure will be undertaken as part of the development of TTMP.

4.8 Specialised transport services

4.8.1 Recognising specific customer mobility impairments and needs

Many Bankstown Line customers have an impairment that restricts their mobility, or may require assistance when using public transport. This includes:

- Mobility impaired users;
- Visual and auditory impairments;
- Cognitive impairments;
- Families with young children;
- Customers travelling with carers or assistance animals;
- Customers travelling with bulky items; and
- Customers with medical conditions.

During closures of the line, the needs of these customers will need to be met by each TTP and in some instances this may require the development of tailored solutions.

Some customers will be able to use the temporary bus services which will be designed to meet or exceed current accessibility standards. It is anticipated that all buses will be equipped with wheelchair ramps and dedicated wheelchair spaces, and bus stops will be designed to ease boarding.

However, some customers who currently travel by train will not be able to travel by bus, such as users of mobility scooters that buses are unable to accommodate. Other customers may have difficulty navigating the temporary bus stops and unfamiliar train stations that temporary bus services will travel to. For these customers, specialised transport services may be required.

4.8.2 Process for planning specialised transport services

Transport for NSW is committed to ensuring that the needs of these customers will be met during closures of the Bankstown Line through a process of:

- Gathering information on the number and types of customers who require any form of assistance when travelling;
- Engaging with community groups and disability support groups who represent customers with specific needs;
- Working with community transport providers to determine the most effective way to provide mobility for affected customers; and
- Committing to provide best practice in information provision for users with visual, hearing or learning impairments.

4.9 Option analysis

The feasibility of scenarios identified for temporary rail and bus services will be assessed against a number of considerations, including:

- Train services and customers on other train lines;
- Impacts on existing bus services;
- Impacts to road network performance and parking availability;
- Walking and cycling opportunities;
- Community and stakeholder feedback, including local businesses;
- Special event requirements; and
- Accessibility requirements for customers.

5. Temporary Transport Management Plan

The Temporary Transport Management Plan will define the processes by which the impacts created by closures of the Bankstown Line, and the operation of temporary train and bus services, will be managed.

Primary Objective
Minimise, manage or mitigate the impacts of closures of the Bankstown Line on other public transport services, local businesses, the community and the road network.
Supporting Objectives
Ensure that bus stop and train station facilities are safe, accessible and of adequate capacity.
Minimise the impacts of temporary bus service operations on the performance of the road network.
Manage or mitigate the impact of temporary bus service operations on on-street parking near rail stations.
Maximise walking and cycling as modes for customers to access stations, or to travel to their destinations.
Ensure the safety of people who walk or cycle during possessions.

5.1 Construction activities

The construction activities required to convert the Bankstown Line to Metro operations will, at times, impact the operation of temporary transport services. The TTMP will be developed in close coordination with construction planning to:

- Understand the impacts of specific construction activities, including bridge closures that will require diversion of buses and other traffic, and station construction that may impact locations intended for use as bus stops or customer access paths.
- Understand construction haulage activities and their impact on road network performance. The use of some local streets by construction vehicles may worsen traffic conditions resulting in the need to divert rail replacement bus services to avoid the roads they use.
- Ensure the safety of customers when as they walk or cycle to access train services, or to other destinations.

5.2 Public transport infrastructure and services

As described in Chapter 4, the operation of the TTSP and the implementation of supporting infrastructure have the potential to create wider impacts.

The TTMP will define how the following will be approached:

- Implementation of temporary bus stops and possible improvements to existing stops, including the planning, design, deployment and removal.
- Operational management of the bus stops including bus marshalls and customer assistance staff.

- Development and management of facilities to support bus operations, such as bus turnarounds and layovers.
- Increases in customer volumes at stations on other rail lines where Bankstown Line customers may divert to, and at CBD stations.
- Increases in customer volumes on the Inner West Light Rail where, unlike the regular bus network, providing additional service frequency may not be possible.

5.3 Specialised transport services

The operation of specialised transport services for customers with mobility requirements will need to be managed carefully to assist customers in using them. Depending on the nature of the services provided, a management framework will be needed to:

- Identify and register the customers who will need to use the services.
- Establish a booking and despatch system to enable customers to request these services.
- Plan for the operation and staffing of pick-up and set-down zones suitable for use by these services.

5.4 Road network performance

The closure of the Bankstown Line and the provision of temporary bus services will impact the performance of the road network, as assessed in the *Environmental Impact Statement*. This is due to a combination of the number of buses required to provide temporary bus services, and the decision some customers will make to drive to their destination or to drive to a different train station to access the rail network. Each TTP will address impacts to general traffic and on the operation of the temporary bus services. This will involve the analysis of key intersections and the development of options to improve their performance, such as modifying how the intersection operates, or by changing the routes that temporary bus services take between stations to avoid congested intersections.

5.5 Parking

The temporary closure of the Bankstown Line will affect the demand for parking at stations along the Bankstown Line, and at stations on the parallel rail lines where people may choose to drive to instead. The TTP will provide an estimate of the changes in demand for park and ride at all stations, allowing an identification of locations where intervention may be required to mitigate the impact of increased demand.

Parking areas along the corridor may be affected by construction activities and the need to provide temporary bus stops. This may affect both designated commuter parking spaces and general on-street parking.

Each TTP will identify what changes would be required to parking arrangements during each possession, potentially including:

- The temporary conversion of commuter car parking spaces and/or on-street parking spaces at some Bankstown Line stations to full-time bus zones to accommodate customer and operational needs of the TTP buses. This occurs at present during weekend possessions when rail replacement bus services are provided;

- Reducing the available hours of kerbside parking spaces at or near selected train stations so that the spaces can operate as a bus zone at certain times of high demand to accommodate customer and operational needs of the TTP buses;
- The provision of temporary park and ride facilities at other locations within the Bankstown Line catchment, supported by temporary bus routes to connect to rail stations on the parallel rail lines; and
- Temporary changes to on-street parking restrictions near affected stations.

5.6 Walking and cycling

5.6.1 Sydenham to Bankstown Walking and Cycling Strategy

Sydney Metro is developing a *Sydenham to Bankstown Walking and Cycling Strategy* as part of the overall planning for the project. The purpose of the Walking and Cycling Strategy is to investigate recommendations to support the increase of Sydney Metro patronage and overall walking and cycling mode share, and support the reduction in traffic congestion.

This strategy will consider improvements to walking and cycling throughout the Bankstown Line corridor, providing benefit in both the short and long term. The development of the strategy would consider:

- Existing walking conditions. Existing walking network and pedestrian demands within 800 m of each station. This task would consider the existing pedestrian mobility and accessibility requirements.

- Existing cycling conditions. Existing cycling network and bicycle rider demand within a 2.5 km catchment would consider connectivity, on and off-road safety and amenity. This task would identify network gaps and areas of conflict with other road users. Additionally, existing bike parking supply, parking type and user demands would be investigated and assessed for each station.

- Future walking assessment. Future desire lines and demands would identify preferred walking routes and identify priorities for network upgrade.

- Future cycling assessment. A cycling demand assessment would be completed to understand the future context of cycling surrounding and connecting to the Sydenham to Bankstown corridor. This work would also discuss how Sydney Metro and the proposed Active Transport Corridor, to be partially delivered by the project, could change demands and routes for future users. The demand assessment would inform the future provision of bike parking to ensure future mode share is accommodated.

- Mitigation recommendations. Initiatives identified in the strategy would assist in improving the mode share for walking and cycling to and from each station within the project.

5.6.2 Walking and cycling initiatives during possessions

Where feasible, the proposed initiatives will be delivered as early as possible so that they provide benefit during possession of the Bankstown Line and support the TTPs.

Each TTP will consider the potential impacts of the Bankstown Line closure on cyclists and on pedestrians, including:

- Identifying the extent to which pedestrians and bicycle riders may divert to stations on the parallel rail lines;
- Assessing the availability and capacity of end-of-trip facilities at stations which may attract increased numbers of bicycle riders; and
- Assessing the suitability of existing walking and cycling infrastructure to support diverted demand to/from other stations, or for customers who may choose to walk or cycle to their destination rather than use temporary bus services.

5.7 Local businesses

Closures of the Bankstown Line and the implementation of each TTSP have the potential to impact local businesses around the station precincts. This has been assessed in Chapter 18 of the Environmental Impact Statement.

The development of each TTMP will identify location specific requirements, such as the establishment of temporary bus stops near stations that consider the specific needs of adjacent businesses. If possible, options will be considered that benefit local businesses if diverted customers walking past or waiting for buses may generate positive exposure for those businesses.

5.8 Special event management

As discussed in Section 2.1, the possession schedule has been planned to avoid the April school holidays when events such as the Easter Show are held, and the October school holidays when sporting finals are often held.

However, there may still be special events that Bankstown Line customers would want to access, such as concerts held at Sydney Olympic Park or Moore Park.

The needs of each special event will be considered separately. In many cases, the standard TTSP would be able to accommodate the increased customer demand, subject to increasing bus frequencies to peak hour levels if the event occurs during the evening or on a weekend. If customer demand levels are high enough, an adapted version of the TTSP could be implemented where special services carry customers all the way to event destination.

The TTMP framework will also take a proactive approach to inform event organisers of when the Bankstown Line possessions will occur and encourage them to consider this when planning their events, eg the NRL’s annual ‘Back to Belmore’ game.

6. Stakeholder and Customer Engagement

Objectives
Work with councils and other stakeholders to ensure the successful implementation of each TTP.
Develop effective customer communication and information strategies.

6.1 Stakeholder and community engagement

Stakeholder and community engagement has been a hallmark of Sydney Metro and will be critical in developing and delivering each TTP. Sydney Metro has used community feedback over the years to refine various aspects of the project and deliver better outcomes for people affected by construction disruption. That same approach will apply for the TTPs with our commitment to be responsive to community feedback.

Sydney Metro will work closely with community groups to understand the different needs of customers, including those with special needs, or from non-English speaking backgrounds. Sydney Metro has already begun working closely with Sydney Trains, Sydney Coordination Office, bus operators, Councils and other relevant stakeholders to ensure impacts on the community or the local transport network are properly addressed, such as the temporary reallocation of parking spaces for use as bus stops.

The approach to stakeholder and community engagement is outlined in Chapter 4 of the Sydney Metro City & Southwest Sydenham to Bankstown Environmental Impact Statement. Feedback from stakeholders and the community regarding the TTS will be invited during the exhibition of the Environmental Impact Statement and this feedback will inform development of the subsequent TTPs.

6.2 Customer information

Comprehensive customer information and communication strategies will be developed to ensure the community are aware of upcoming possessions, and the temporary rail and bus services that will be available. Information will be tailored to meet the needs of the different customer groups along the corridor, with specific materials to be developed for customers at each Bankstown Line station.

As part of the implementation of each TTP, wayfinding and information signage will be installed at each of the affected stations and TTP bus stops to assist customers to use temporary transport services provided. Sydney Metro will also investigate ways to support travel demand management initiatives to either reduce our customers' need to travel, or reduce the impact of their travel, such as encouraging car-pooling for customers who choose to drive instead of using the other modes available.

TTP 1 will be released to the community in 2018. Community and stakeholder input will be invited at that time, and will be carefully considered as we refine and finalise this first TTP, ready for implementation.

7. Summary

Conversion of the Bankstown Line to Metro operations will require temporary closures of the train line, commencing in July 2019. During these possession periods, up to 100,000 customer journeys could be affected each weekday. Sydney Metro has investigated several options for how these possessions should be scheduled and has determined that a program of multiple possessions, predominantly in school holiday periods, would yield the best outcome for customers.

The Temporary Transport Strategy (TTS) provides a framework that outlines how Sydney Metro will plan and deliver an integrated, multi-modal transport network during these possession periods. Because the possessions will occur over a period of nearly five years, the nature of each possession will be different due to progression in construction activities, and forecasted transport demand growth along the corridor. Therefore, a Temporary Transport Plan (TTP) will be developed for each possession. Each TTP will comprise a service plan (TTSP) and management plan (TTMP), that will define the initiatives to will be implemented for that possession.

The initiatives that each TTP will consider are:

- Temporary train service plans that provide additional capacity on other rail lines where affected customers may be diverted to, and altered services on sections of the Bankstown Line that are not being converted to Metro operations.
- Integrated temporary bus services to allow customers to travel between stations on the Bankstown Line, and to stations on the other lines. This includes understanding the opportunities that the regular bus network can provide.
- Planning specialised services for customers who may not be able to use the temporary bus services, such as those with mobility impairments or other special needs.
- Initiatives to encourage and assist customers to walk or cycle to stations on other lines, or to their destinations.
- Infrastructure to support temporary bus services including bus stops and shelters, improvements to walkways and lighting, and wayfinding and information signage.
- Improvements to the road network, such as bus priority measures to support the temporary bus services, and adjustments to traffic signals to mitigate changes in road network demand.
- Understanding the changes in demand for parking near rail stations, the impacts this may cause and measures to manage those impacts.
- Customer and stakeholder engagement strategies, including communication, information provision and supporting travel demand management initiatives.

APPENDIX A Baseline Temporary Transport Plan

A.1 Overview

As an input to the *Sydney Metro City & Southwest Sydenham to Bankstown Environmental Impact Statement* (EIS), a *"Baseline" Temporary Transport Plan* was developed to provide preliminary estimates of the volume of temporary bus services required to meet customer demand during a possession. These estimates were then used to assess the impact of the proposed bus services on the performance of the road network.

The Baseline TTP was developed for this purpose. It focusses solely on the planning of temporary bus services, and does not explore the other multi-modal elements described in the TTS.

A.2 Temporary bus service assumptions

Many customers are already familiar with the rail replacement buses that operate on weekends when rail lines are closed to allow for track maintenance. For the purposes of assessment, a Baseline TTP was developed that closely emulates these weekend rail replacement services. Some adjustments have been made to the weekend service plan to better serve the volume of customers travelling during weekday peak periods.

The Baseline TTP provides bus routes that travel along the Bankstown Line corridor, delivering customers with destinations in the CBD or beyond, to Sydenham Station. Subsequently, customers transfer to train services operating on the T8 Airport & South Line or T4 Illawarra Line.

This section explores how such a plan would operate and whether its performance outcomes for customers and impact on the road network would be acceptable.

A.3 Customer service objectives

Customer service objectives to inform the baseline temporary bus service requirements are:

- Ensure that all stations accessible on the existing train service between Lidcombe and Sydenham will be accessible by temporary bus services without the need to transfer between temporary bus services (i.e. a single seat journey);
- Minimise increases in travel times for the majority of customers who are travelling to/from east of Sydenham, including the CBD;
- Ensure that service frequencies in the peak hours are a minimum of 10 buses per hour. At other times, a minimum of 6 buses per hour are to be provided; and
- Provide adequate bus capacity so that passengers travelling the longest distances on temporary bus services are guaranteed a seat.

A.4 Rail service assumptions

The development of the Baseline TTP is premised on the assumption that Bankstown Station is unavailable for trains to travel to or from the west, and that the Bankstown Line stations will be closed from Marrickville through to Birrong inclusive.

The assumed rail network changes during the possession period are:

- A rail shuttle service is provided on the Bankstown Line between Liverpool and Lidcombe via Regents Park; and
- St Peters and Erskineville will be served by trains operating on the T8 Airport & South Line, or the T4 Illawarra Line.

Consequently, in the Baseline TTP Sydenham, Regents Park and Lidcombe Stations are the focal points for the transfer of customers between temporary bus routes and train services.

A.5 Temporary bus routes

As on weekends, the Baseline TTP is underpinned by an all-stops route that travels from Sydenham to Bankstown, and further to Lidcombe. This route will be part of any TTP, providing a promise to our customers of a simple, easily understood route that will enable them to travel to any of the closed stations on the Bankstown Line, at any time.

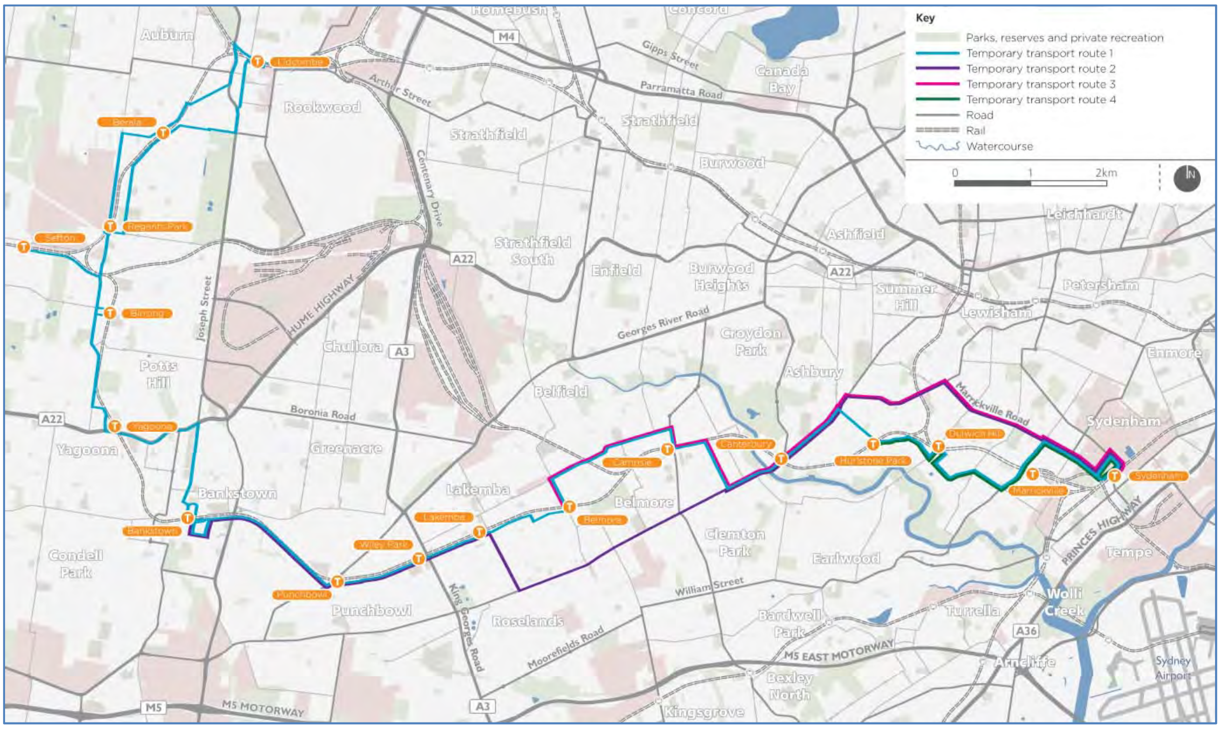
However, to meet the customer service objectives, the introduction of additional bus routes with express sections will be required to provide faster connections from the western parts of the corridor, to Sydenham. The proposed routes are described in Table A.1 and shown in Figures A.1 and A.2.

Table A.1: Temporary bus routes serving only stations between Lidcombe and Sydenham

Route	Description	Rationale
1	Lidcombe to Sydenham, all stations	• Will provide a consistent, all-hours service during each possession. • All station origin/destination combinations on the existing rail service between Lidcombe and Sydenham are also provided by the replacement bus service. • Some services will operate from Regents Park, instead of Lidcombe, to better serve customers travelling to/from the stations between Regents Park and Liverpool.
2	Bankstown to Sydenham, via Punchbowl, Wiley Park and Lakemba	• Travel times to Sydenham for customers from Bankstown, Punchbowl, Wiley Park and Lakemba are reduced compared to the all stops alternative. • The road alignment between Bankstown and Lakemba is reasonably direct and broadly parallel to the rail line. • From Lakemba Station, there is a direct route available to Sydenham via Haldon Street, Canterbury Road and Marrickville Road (i.e. not diverting via the remaining stations).
3	Belmore to Sydenham, via Campsie and Canterbury	• Travel times to Sydenham for customers from Belmore, Campsie and Canterbury are reduced compared to the all-stops alternative. • Service reliability and customer capacity are provided for customers at Belmore, Campsie and Canterbury travelling to Sydenham (buses at these locations will be more reliable than if they are required to travel all the way from Lidcombe or Bankstown; capacity constraints are reduced by limiting the number of stations served). • From Canterbury Station there is a direct route available to Sydenham via Canterbury Road and Marrickville Road (i.e. not diverting via the remaining stations).
4	Hurlstone Park to Sydenham, via Dulwich Hill and Marrickville	• Service reliability and customer capacity are provided for customers at Hurlstone Park, Dulwich Hill and Marrickville travelling to Sydenham (buses at these locations will be more reliable than if they are required to travel all the way from Lidcombe or Bankstown – important at these stations as travel times to Sydenham are relatively short; capacity constraints are reduced by limiting the number of stations served).

Figure A.1: Schematic representation of Baseline TTP bus routes

Figure A.2: Geographic representation of Baseline TTP bus route alignments



A.6 Required service frequencies

Preliminary transport modelling using PTPM4 was undertaken to inform the minimum bus service frequencies required to serve the volume of customers who travel eastbound in the AM peak hour. These are presented in Table A.2.

Table A.2: Required minimum bus temporary bus route frequencies for the AM peak hour (2023)

Route	Description	Eastbound Frequency	Westbound Frequency
1	Lidcombe to Sydenham, all stations	11 per hour	10 per hour
2	Bankstown to Sydenham, via Punchbowl, Wiley Park and Lakemba	33 per hour	10 per hour
3	Belmore to Sydenham, via Campsie and Canterbury	35 per hour	10 per hour
4	Hurlstone Park to Sydenham, via Dulwich Hill and Marrickville	22 per hour	10 per hour

Note: Additional bus volumes would be generated in the westbound direction, as buses return out-of-service to the route starting point.

A.7 Outcomes

If the Baseline TTP was implemented, it would provide a temporary transport solution that would allow customers to continue to travel to their current destinations. However, a number of issues would arise:

- A minimum of 101 buses per hour would travel through Marrickville destined for Sydenham Station in the AM peak period. This may not be feasible as this number of buses is likely to cause traffic congestion through Marrickville and Sydenham. An assessment of the impact of these buses on intersections throughout the Bankstown Line showed that delays would increase to unacceptable levels at a number of intersections. This analysis is detailed in *Sydney Metro City & Southwest Sydenham to Bankstown upgrade. Technical Paper 1 - Traffic, Transport and Access. AECOM, July 2017*.
- Having this many buses arrive at Sydenham Station in one hour would be difficult to manage given the limited space available to provide bus stops. The large number of passengers arriving on these buses could also be too great for the station to accommodate comfortably, crowding footpath areas and causing queues at the ticket gates.
- Trains arriving at Sydenham Station will have travelled via many other stations, and it is unlikely that passengers boarding would secure a seat. Potentially, the number of passengers arriving at Sydenham would exceed the available capacity on the trains travelling through the station to the CBD.
- Travel times from stations in the western half of the corridor would become unattractively long. It is expected that a trip from Bankstown Station to Sydenham Station would take at least 45 minutes in the AM peak period (compared to 21 minutes on the current limited-stops train services). Additionally, traffic conditions in peak periods often results in delays on the road network and customers would be unable to rely on the temporary bus services to get them to their destinations on time.

These issues demonstrate that a temporary bus plan designed to convey all Bankstown Line customers to Sydenham Station would be unfeasible during weekday peak periods, and that an alternative approach is required.

A.8 Next steps for developing temporary bus service strategies

To mitigate the identified impacts and to provide a better customer outcome, it will be necessary to convey some customers by temporary bus services to stations on other rail lines instead of Sydenham Station.

The Customer Service Objectives will guide the development of each TTP, which will be undertaken to achieve a workable balance between the following key requirements:

- Minimising customer travel times including the reduction of customer waiting and transfer times;
- Conveying customers to rail stations where adequate capacity is available (or can be added) to prevent overloading of train services;
- Distributing temporary bus services so that they travel to several rail stations to reduce the impact on any one station; and
- Achieving consistency between services provided in peak periods and those at other times, where possible.

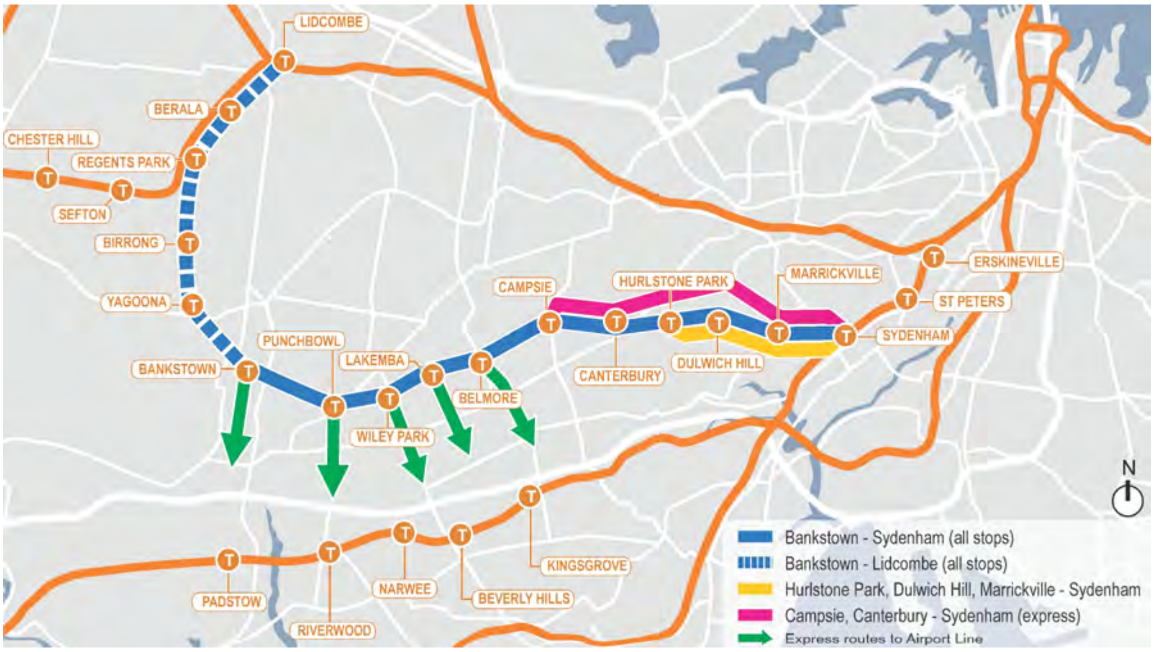
For customers travelling towards the CBD from west of Campsie, their total journey time would be reduced if a temporary bus service took them to a station on the T8 Airport & South Line. For example, a bus journey from Bankstown Station to Padstow Station would be as short as ten minutes and experience less of the traffic congestion that exists further east. If customers were to board a train at Padstow that had commenced its journey one station to the west, at Revesby, they would be likely to get a seat for their entire journey to the CBD.

Taking this approach for each of the stations from Belmore through to Bankstown could reduce the number of buses that need to travel to Sydenham, creating a more manageable outcome. It would also cost less to operate, require fewer buses, and reduce the impact of these buses on the road network.

A preliminary approach to refining the temporary bus plan, as presented in Figure A.3, would reduce the number of buses that travel to Sydenham Station by 45%, compared to the Baseline TTP.

It may also be possible to convey customers from Campsie and Canterbury Stations to other train lines, which would not necessarily provide a faster journey than travelling via Sydenham, but would act to further reduce the number of buses travelling through Marrickville and Sydenham.

Figure A.3: Refined temporary bus plan approach to reduce bus volumes to Sydenham



Appendix F

Detailed Intersection Assessment Tables

1.0 Sydenham Station

1.1 Sydenham Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	South	T1	549	27%	12.53	LOS A	7.5
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	East	L2	22	11%	55.25	LOS D	1.1
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	East	R2	220	67%	58.17	LOS E	8.3
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	North	T1	815	57%	6.62	LOS A	9.6
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	North	L2	341	57%	10.13	LOS A	9.1
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	R2	4	2%	49.45	LOS D	0.2
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	T1	2	4%	51.43	LOS D	0.3
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	L2	9	4%	55.97	LOS D	0.3
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	South	T1	852	45%	15.97	LOS B	12.2
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	East	L2	36	10%	48.62	LOS D	1.8
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	East	R2	478	80%	56.02	LOS D	17.9
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	North	T1	673	51%	20.10	LOS B	18.3
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	North	L2	272	51%	24.82	LOS B	17.7
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	R2	9	4%	52.86	LOS D	0.5
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	T1	3	14%	55.28	LOS D	1.0
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	L2	33	14%	59.48	LOS E	1.0
H.23 Gleeson Ave / Railway Pde - AM Peak	Gleeson Ave	South	L2	753	27%	2.91	LOS A	0.0
H.23 Gleeson Ave / Railway Pde - AM Peak	Railway Pde	East	L2	1354	49%	6.58	LOS A	12.0
H.23 Gleeson Ave / Railway Pde - AM Peak	Railway Pde	East	T1	306	19%	2.61	LOS A	3.8
H.23 Gleeson Ave / Railway Pde - PM Peak	Gleeson Ave	South	L2	1324	45%	2.90	LOS A	0.0
H.23 Gleeson Ave / Railway Pde - PM Peak	Railway Pde	East	L2	1028	36%	6.46	LOS A	8.5
H.23 Gleeson Ave / Railway Pde - PM Peak	Railway Pde	East	T1	309	20%	3.24	LOS A	4.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	R2	47	34%	36.32	LOS C	4.6
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	T1	366	34%	17.22	LOS B	10.0
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	L2	27	34%	17.78	LOS B	10.0
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	L2	47	13%	34.18	LOS C	2.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	R2	24	64%	43.14	LOS D	15.6
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	T1	317	64%	37.88	LOS C	15.6
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	T1	585	68%	18.82	LOS B	26.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	L2	99	68%	22.24	LOS B	26.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	R2	240	78%	49.84	LOS D	13.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	R2	35	35%	48.16	LOS D	5.3
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	T1	292	35%	34.28	LOS C	9.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	L2	1	35%	35.83	LOS C	9.4
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	R2	41	58%	33.11	LOS C	14.6
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	T1	674	58%	23.82	LOS B	16.9
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	L2	155	58%	22.19	LOS B	16.9
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	L2	61	60%	30.92	LOS C	18.0
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	R2	68	54%	41.00	LOS C	12.4
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	T1	609	60%	29.82	LOS C	18.0
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	T1	494	53%	24.72	LOS B	19.4
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	L2	63	53%	25.71	LOS B	19.4
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	R2	84	53%	42.84	LOS D	7.7
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	R2	29	31%	40.48	LOS C	6.2
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	T1	155	31%	31.78	LOS C	6.2
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	L2	1	6%	27.29	LOS B	1.7
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	R2	3	3%	12.21	LOS A	0.1
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	T1	4	3%	9.19	LOS A	0.1
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	L2	3	3%	9.45	LOS A	0.1

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	L2	14	50%	5.67	LOS A	3.6
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	R2	84	50%	7.91	LOS A	3.6
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	T1	271	50%	5.02	LOS A	3.6
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	T1	5	23%	8.82	LOS A	1.0
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	L2	57	23%	9.13	LOS A	1.0
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	R2	37	23%	11.94	LOS A	1.0
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	R2	17	53%	8.77	LOS A	3.4
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	T1	296	53%	5.77	LOS A	3.4
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	L2	16	53%	6.12	LOS A	3.4
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	R2	14	13%	18.21	LOS B	0.6
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	T1	3	13%	15.11	LOS B	0.6
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	L2	18	13%	15.53	LOS B	0.6
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	L2	3	60%	5.70	LOS A	5.4
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	R2	144	60%	7.83	LOS A	5.4
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	T1	439	60%	4.83	LOS A	5.4
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	T1	5	49%	8.97	LOS A	3.0
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	L2	168	49%	9.20	LOS A	3.0
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	R2	68	49%	11.96	LOS A	3.0
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	R2	7	43%	9.96	LOS A	2.3
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	T1	209	43%	6.69	LOS A	2.3
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	L2	22	43%	6.93	LOS A	2.3
H.40 Edinburgh Rd / Bedwin Rd AM	Bedwin Rd	South	R1	608	34%	3.36	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Bedwin Rd	South	L2	255	15%	4.47	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	SouthEast	L3	195	54%	36.22	LOS C	5.1
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L1	574	49%	3.77	LOS A	3.5
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L2	43	8%	3.54	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L3	78	8%	4.11	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edinburgh Rd	West	R2	155	92%	72.31	LOS F	6.4
H.40 Edinburgh Rd / Bedwin Rd AM	Edinburgh Rd	West	L1	66	10%	6.94	LOS A	0.3
H.40 Edinburgh Rd / Bedwin Rd PM	Bedwin Rd	South	R1	744	40%	3.33	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Bedwin Rd	South	L2	348	19%	4.40	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	SouthEast	L3	261	59%	28.57	LOS C	5.6
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L1	612	53%	4.62	LOS A	4.5
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L2	37	6%	3.51	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L3	51	6%	4.11	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edinburgh Rd	West	R2	125	92%	87.84	LOS F	5.8
H.40 Edinburgh Rd / Bedwin Rd PM	Edinburgh Rd	West	L1	66	12%	8.25	LOS A	0.4
H.41 Bedwin Rd / May St AM Peak	Campbell St	South	T1	140	76%	61.00	LOS E	5.2
H.41 Bedwin Rd / May St AM Peak	Campbell St	South	L2	31	76%	65.96	LOS E	4.9
H.41 Bedwin Rd / May St AM Peak	May St	East	L2	25	31%	31.04	LOS C	7.3
H.41 Bedwin Rd / May St AM Peak	May St	East	R2	133	95%	87.57	LOS F	11.0
H.41 Bedwin Rd / May St AM Peak	May St	East	T1	189	95%	31.31	LOS C	11.0
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	T1	316	67%	19.57	LOS B	24.6
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	L2	320	67%	24.21	LOS B	24.6
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	R2	305	38%	27.79	LOS B	10.1
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	R2	98	80%	45.84	LOS D	23.0
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	T1	522	80%	30.13	LOS C	23.0
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	L2	569	72%	15.42	LOS B	21.7
H.41 Bedwin Rd / May St PM Peak	Campbell St	South	T1	226	88%	61.76	LOS E	9.2
H.41 Bedwin Rd / May St PM Peak	Campbell St	South	L2	76	88%	67.11	LOS E	8.7
H.41 Bedwin Rd / May St PM Peak	May St	East	L2	32	90%	46.86	LOS D	27.8
H.41 Bedwin Rd / May St PM Peak	May St	East	R2	269	95%	77.47	LOS F	18.3
H.41 Bedwin Rd / May St PM Peak	May St	East	T1	505	90%	42.34	LOS C	27.8
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	T1	277	79%	32.78	LOS C	23.4

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	L2	276	79%	37.35	LOS C	23.4
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	R2	494	79%	45.09	LOS D	23.4
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	R2	14	40%	28.67	LOS C	11.1
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	T1	288	40%	23.99	LOS B	11.1
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	L2	599	62%	11.42	LOS A	12.2

1.2 Sydenham Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	South	T1	603	31%	15.01	LOS B	9.1
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	East	L2	24	8%	48.83	LOS D	1.1
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	East	R2	241	51%	51.14	LOS D	8.4
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	North	T1	895	67%	6.61	LOS A	12.8
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	North	L2	374	67%	10.16	LOS A	11.9
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	R2	5	2%	51.60	LOS D	0.2
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	T1	2	6%	54.03	LOS D	0.4
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	L2	10	6%	58.65	LOS E	0.4
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	South	T1	942	57%	18.92	LOS B	15.2
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	East	L2	40	8%	41.44	LOS C	1.8
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	East	R2	528	66%	46.25	LOS D	17.4
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	North	T1	744	65%	27.31	LOS B	24.5
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	North	L2	301	65%	32.15	LOS C	22.9
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	R2	10	5%	52.93	LOS D	0.5
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	T1	3	15%	55.42	LOS D	1.2
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	L2	36	15%	59.62	LOS E	1.2
H.23 Gleeson Ave / Railway Pde - AM Peak	Gleeson Ave	South	L2	827	29%	2.91	LOS A	0.0
H.23 Gleeson Ave / Railway Pde - AM Peak	Railway Pde	East	L2	1487	54%	6.83	LOS A	14.0
H.23 Gleeson Ave / Railway Pde - AM Peak	Railway Pde	East	T1	336	21%	2.66	LOS A	4.2
H.23 Gleeson Ave / Railway Pde - PM Peak	Gleeson Ave	South	L2	1463	50%	2.90	LOS A	0.0
H.23 Gleeson Ave / Railway Pde - PM Peak	Railway Pde	East	L2	1136	40%	6.62	LOS A	9.8
H.23 Gleeson Ave / Railway Pde - PM Peak	Railway Pde	East	T1	342	22%	3.31	LOS A	4.9
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	R2	52	41%	39.16	LOS C	5.5
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	T1	401	41%	16.98	LOS B	11.0
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	L2	30	41%	16.93	LOS B	11.0
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	L2	52	18%	37.99	LOS C	4.1
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	R2	27	91%	69.57	LOS E	22.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	T1	348	91%	61.00	LOS E	22.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	T1	642	72%	18.46	LOS B	30.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	L2	109	72%	21.88	LOS B	30.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	R2	264	92%	76.60	LOS F	20.1
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	R2	39	50%	62.82	LOS E	4.1
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	T1	321	50%	38.52	LOS C	13.9
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	L2	1	50%	40.99	LOS C	13.9
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	R2	46	79%	50.89	LOS D	18.6
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	T1	745	79%	34.86	LOS C	27.9
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	L2	171	79%	30.23	LOS C	27.9
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	L2	67	70%	26.97	LOS B	24.0
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	R2	75	64%	52.46	LOS D	10.5
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	T1	673	70%	27.13	LOS B	24.0
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	T1	546	75%	30.30	LOS C	29.3
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	L2	69	75%	33.30	LOS C	29.3
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	R2	92	75%	63.17	LOS E	6.2
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	R2	32	43%	50.37	LOS D	6.6
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	T1	171	43%	33.78	LOS C	6.6
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	L2	1	9%	23.45	LOS B	2.5
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	R2	3	3%	12.96	LOS A	0.1
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	T1	4	3%	9.94	LOS A	0.1
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	L2	3	3%	10.21	LOS A	0.1
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	L2	16	55%	5.94	LOS A	4.4
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	R2	92	55%	8.15	LOS A	4.4
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	T1	298	55%	5.27	LOS A	4.4
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	T1	6	27%	9.57	LOS A	1.2

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	L2	63	27%	9.87	LOS A	1.2
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	R2	40	27%	12.69	LOS A	1.2
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	R2	19	60%	9.19	LOS A	4.2
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	T1	325	60%	6.18	LOS A	4.2
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	L2	18	60%	6.54	LOS A	4.2
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	R2	15	17%	20.09	LOS B	0.7
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	T1	3	17%	16.99	LOS B	0.7
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	L2	20	17%	17.42	LOS B	0.7
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	L2	3	67%	6.09	LOS A	6.8
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	R2	159	67%	8.12	LOS A	6.8
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	T1	485	67%	5.13	LOS A	6.8
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	T1	6	57%	10.88	LOS A	3.9
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	L2	186	57%	11.11	LOS A	3.9
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	R2	76	57%	13.87	LOS A	3.9
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	R2	8	49%	10.67	LOS A	2.9
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	T1	231	49%	7.40	LOS A	2.9
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	L2	24	49%	7.64	LOS A	2.9
H.40 Edinburgh Rd / Bedwin Rd AM	Bedwin Rd	South	R1	642	36%	3.36	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Bedwin Rd	South	L2	269	16%	4.47	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	SouthEast	L3	206	60%	38.97	LOS C	5.7
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L1	606	52%	4.12	LOS A	4.2
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L2	46	8%	3.54	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L3	83	8%	4.11	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edinburgh Rd	West	R2	163	109%	159.00	LOS F	15.1
H.40 Edinburgh Rd / Bedwin Rd AM	Edinburgh Rd	West	L1	70	11%	7.28	LOS A	0.4
H.40 Edinburgh Rd / Bedwin Rd PM	Bedwin Rd	South	R1	778	42%	3.33	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Bedwin Rd	South	L2	364	20%	4.40	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	SouthEast	L3	273	63%	30.56	LOS C	6.2
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L1	639	56%	4.98	LOS A	5.1
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L2	38	6%	3.51	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L3	53	6%	4.11	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edinburgh Rd	West	R2	131	107%	166.05	LOS F	12.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edinburgh Rd	West	L1	69	13%	8.67	LOS A	0.4
H.41 Bedwin Rd / May St AM Peak	Campbell St	South	T1	154	50%	51.71	LOS D	5.1
H.41 Bedwin Rd / May St AM Peak	Campbell St	South	L2	34	50%	56.44	LOS D	4.9
H.41 Bedwin Rd / May St AM Peak	May St	East	L2	27	30%	27.09	LOS B	7.8
H.41 Bedwin Rd / May St AM Peak	May St	East	R2	146	108%	162.05	LOS F	15.0
H.41 Bedwin Rd / May St AM Peak	May St	East	T1	207	30%	22.49	LOS B	7.8
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	T1	348	85%	33.48	LOS C	36.5
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	L2	351	85%	38.12	LOS C	36.5
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	R2	335	52%	34.96	LOS C	12.9
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	R2	108	82%	41.18	LOS C	26.9
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	T1	573	82%	27.43	LOS B	26.9
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	L2	625	74%	9.46	LOS A	13.6
H.41 Bedwin Rd / May St PM Peak	Campbell St	South	T1	250	100%	106.27	LOS F	13.6
H.41 Bedwin Rd / May St PM Peak	Campbell St	South	L2	84	100%	108.06	LOS F	11.9
H.41 Bedwin Rd / May St PM Peak	May St	East	L2	36	92%	51.41	LOS D	32.2
H.41 Bedwin Rd / May St PM Peak	May St	East	R2	297	101%	134.35	LOS F	27.2
H.41 Bedwin Rd / May St PM Peak	May St	East	T1	558	92%	46.89	LOS D	32.2
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	T1	306	100%	61.63	LOS E	45.8
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	L2	305	100%	66.20	LOS E	45.8
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	R2	546	100%	62.71	LOS E	45.8
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	R2	16	77%	30.58	LOS C	13.0
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	T1	318	77%	25.89	LOS B	13.0

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	L2	662	96%	65.20	LOS E	36.0

1.3 Sydenham Station: Future + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	South	T1	616	33%	16.34	LOS B	9.7
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	East	L2	24	8%	46.84	LOS D	1.1
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	East	R2	345	89%	62.81	LOS E	15.4
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	North	T1	903	79%	8.27	LOS A	19.3
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	North	L2	478	79%	14.56	LOS B	19.0
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	R2	7	4%	52.70	LOS D	0.3
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	T1	2	6%	54.03	LOS D	0.4
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	L2	10	6%	58.65	LOS E	0.4
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	South	T1	954	66%	18.37	LOS B	17.1
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	East	L2	40	7%	36.52	LOS C	1.7
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	East	R2	631	84%	47.85	LOS D	21.6
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	North	T1	757	86%	42.33	LOS C	37.6
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	North	L2	404	86%	47.66	LOS D	32.2
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	R2	12	6%	53.52	LOS D	0.6
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	T1	3	15%	55.42	LOS D	1.2
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	L2	36	15%	59.62	LOS E	1.2
H.23 Gleeson Ave / Railway Pde - AM Peak	Gleeson Ave	South	L2	943	37%	2.96	LOS A	0.0
H.23 Gleeson Ave / Railway Pde - AM Peak	Railway Pde	East	L2	1603	81%	11.25	LOS A	27.0
H.23 Gleeson Ave / Railway Pde - AM Peak	Railway Pde	East	T1	336	21%	2.66	LOS A	4.2
H.23 Gleeson Ave / Railway Pde - PM Peak	Gleeson Ave	South	L2	1580	58%	2.93	LOS A	0.0
H.23 Gleeson Ave / Railway Pde - PM Peak	Railway Pde	East	L2	1253	48%	6.73	LOS A	11.5
H.23 Gleeson Ave / Railway Pde - PM Peak	Railway Pde	East	T1	342	22%	3.31	LOS A	4.9
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	R2	52	39%	37.45	LOS C	5.3
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	T1	401	39%	16.23	LOS B	10.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	L2	30	39%	16.39	LOS B	10.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	L2	52	19%	38.90	LOS C	4.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	R2	27	97%	89.01	LOS F	25.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	T1	348	97%	77.53	LOS F	25.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	T1	642	71%	17.70	LOS B	30.1
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	L2	109	71%	21.13	LOS B	30.1
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	R2	279	96%	90.22	LOS F	23.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	R2	39	59%	65.72	LOS E	4.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	T1	321	59%	40.39	LOS C	14.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	L2	14	59%	43.32	LOS D	14.8
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	R2	46	70%	40.78	LOS C	17.4
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	T1	745	70%	28.74	LOS C	23.2
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	L2	171	70%	25.73	LOS B	23.2
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	L2	67	79%	32.46	LOS C	29.3
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	R2	75	72%	59.22	LOS E	10.0
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	T1	673	79%	31.83	LOS C	29.3
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	T1	546	70%	26.52	LOS B	27.9
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	L2	69	70%	29.93	LOS C	27.9
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	R2	107	77%	62.38	LOS E	6.9
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	R2	32	52%	52.82	LOS D	7.8
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	T1	171	52%	39.22	LOS C	7.8
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	L2	14	10%	26.94	LOS B	2.5
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	R2	3	3%	12.96	LOS A	0.1
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	T1	4	3%	9.94	LOS A	0.1
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	L2	3	3%	10.21	LOS A	0.1
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	L2	16	55%	5.94	LOS A	4.4
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	R2	92	55%	8.15	LOS A	4.4
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	T1	298	55%	5.27	LOS A	4.4
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	T1	6	27%	9.57	LOS A	1.2

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	L2	63	27%	9.87	LOS A	1.2
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	R2	40	27%	12.69	LOS A	1.2
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	R2	19	60%	9.19	LOS A	4.2
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	T1	325	60%	6.18	LOS A	4.2
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	L2	18	60%	6.54	LOS A	4.2
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	R2	15	17%	20.09	LOS B	0.7
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	T1	3	17%	16.99	LOS B	0.7
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	L2	20	17%	17.42	LOS B	0.7
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	L2	3	67%	6.09	LOS A	6.8
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	R2	159	67%	8.12	LOS A	6.8
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	T1	485	67%	5.13	LOS A	6.8
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	T1	6	57%	10.88	LOS A	3.9
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	L2	186	57%	11.11	LOS A	3.9
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	R2	76	57%	13.87	LOS A	3.9
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	R2	8	49%	10.67	LOS A	2.9
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	T1	231	49%	7.40	LOS A	2.9
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	L2	24	49%	7.64	LOS A	2.9
H.40 Edinburgh Rd / Bedwin Rd AM	Bedwin Rd	South	R1	642	36%	3.36	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Bedwin Rd	South	L2	269	16%	4.47	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	SouthEast	L3	206	60%	38.97	LOS C	5.7
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L1	606	52%	4.12	LOS A	4.2
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L2	46	8%	3.54	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L3	83	8%	4.11	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edinburgh Rd	West	R2	163	109%	159.00	LOS F	15.1
H.40 Edinburgh Rd / Bedwin Rd AM	Edinburgh Rd	West	L1	70	11%	7.28	LOS A	0.4
H.40 Edinburgh Rd / Bedwin Rd PM	Bedwin Rd	South	R1	778	42%	3.33	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Bedwin Rd	South	L2	364	20%	4.40	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	SouthEast	L3	273	63%	30.56	LOS C	6.2
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L1	639	56%	4.98	LOS A	5.1
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L2	38	6%	3.51	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L3	53	6%	4.11	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edinburgh Rd	West	R2	131	107%	166.05	LOS F	12.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edinburgh Rd	West	L1	69	13%	8.67	LOS A	0.4
H.41 Bedwin Rd / May St AM Peak	Campbell St	South	T1	154	50%	51.71	LOS D	5.1
H.41 Bedwin Rd / May St AM Peak	Campbell St	South	L2	34	50%	56.44	LOS D	4.9
H.41 Bedwin Rd / May St AM Peak	May St	East	L2	27	30%	27.09	LOS B	7.8
H.41 Bedwin Rd / May St AM Peak	May St	East	R2	146	108%	162.05	LOS F	15.0
H.41 Bedwin Rd / May St AM Peak	May St	East	T1	207	30%	22.49	LOS B	7.8
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	T1	348	85%	33.48	LOS C	36.5
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	L2	351	85%	38.12	LOS C	36.5
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	R2	335	52%	34.96	LOS C	12.9
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	R2	108	82%	41.18	LOS C	26.9
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	T1	573	82%	27.43	LOS B	26.9
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	L2	625	74%	9.46	LOS A	13.6
H.41 Bedwin Rd / May St PM Peak	Campbell St	South	T1	250	100%	106.27	LOS F	13.6
H.41 Bedwin Rd / May St PM Peak	Campbell St	South	L2	84	100%	108.06	LOS F	11.9
H.41 Bedwin Rd / May St PM Peak	May St	East	L2	36	92%	51.41	LOS D	32.2
H.41 Bedwin Rd / May St PM Peak	May St	East	R2	297	101%	134.35	LOS F	27.2
H.41 Bedwin Rd / May St PM Peak	May St	East	T1	558	92%	46.89	LOS D	32.2
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	T1	306	100%	61.63	LOS E	45.8
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	L2	305	100%	66.20	LOS E	45.8
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	R2	546	100%	62.71	LOS E	45.8
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	R2	16	77%	30.58	LOS C	13.0
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	T1	318	77%	25.89	LOS B	13.0

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	L2	662	96%	65.20	LOS E	36.0

1.4 Sydenham Station: Future + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	South	T1	616	31%	13.4	LOS B	8.8
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	East	L2	24	10%	52.0	LOS D	1.2
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	East	R2	298	90%	66.6	LOS E	13.3
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	North	T1	903	70%	7.6	LOS A	14.6
B.19 Gleeson Ave / Burrows Road - AM Peak	Gleeson Ave	North	L2	431	70%	11.3	LOS A	13.9
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	R2	7	4%	52.7	LOS D	0.3
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	T1	2	6%	54.03	LOS D	0.4
B.19 Gleeson Ave / Burrows Road - AM Peak	Burrows Ave	West	L2	10	6%	58.65	LOS E	0.4
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	South	T1	954	62%	20.1	LOS B	16.3
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	East	L2	40	7%	38.9	LOS C	1.7
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	East	R2	584	77%	46.4	LOS D	19.3
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	North	T1	757	77%	31.5	LOS C	29.8
B.19 Gleeson Ave / Burrows Road - PM Peak	Gleeson Ave	North	L2	357	77%	36.9	LOS C	26.2
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	R2	12	6%	53.52	LOS D	0.6
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	T1	3	15%	55.42	LOS D	1.2
B.19 Gleeson Ave / Burrows Road - PM Peak	Burrows Ave	West	L2	36	15%	59.62	LOS E	1.2
H.23 Gleeson Ave / Railway Pde - AM Peak	Gleeson Ave	South	L2	869	34%	2.93	LOS A	0.0
H.23 Gleeson Ave / Railway Pde - AM Peak	Railway Pde	East	L2	1556	76%	8.5	LOS A	24.9
H.23 Gleeson Ave / Railway Pde - AM Peak	Railway Pde	East	T1	336	21%	2.66	LOS A	4.2
H.23 Gleeson Ave / Railway Pde - PM Peak	Gleeson Ave	South	L2	1532	55%	2.93	LOS A	0.0
H.23 Gleeson Ave / Railway Pde - PM Peak	Railway Pde	East	L2	1205	45%	6.9	LOS A	11.1
H.23 Gleeson Ave / Railway Pde - PM Peak	Railway Pde	East	T1	342	22%	3.31	LOS A	4.9
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	R2	52	39%	37.45	LOS C	5.3
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	T1	401	39%	16.23	LOS B	10.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Railway Rd	South	L2	30	39%	16.39	LOS B	10.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	L2	52	19%	38.90	LOS C	4.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	R2	27	97%	89.01	LOS F	25.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	East	T1	348	97%	77.53	LOS F	25.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	T1	642	71%	17.70	LOS B	30.1
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	L2	109	71%	21.13	LOS B	30.1
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Gleeson Ave	North	R2	279	96%	90.22	LOS F	23.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	R2	39	59%	65.72	LOS E	4.4
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	T1	321	59%	40.39	LOS C	14.8
H.24 Gleeson Ave / Unwins Bridge Rd AM Peak	Unwins Bridge Rd	West	L2	14	59%	43.32	LOS D	14.8
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	R2	46	70%	40.78	LOS C	17.4
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	T1	745	70%	28.74	LOS C	23.2
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Railway Rd	South	L2	171	70%	25.73	LOS B	23.2
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	L2	67	79%	32.46	LOS C	29.3
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	R2	75	72%	59.22	LOS E	10.0
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	East	T1	673	79%	31.83	LOS C	29.3
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	T1	546	70%	26.52	LOS B	27.9
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	L2	69	70%	29.93	LOS C	27.9
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Gleeson Ave	North	R2	107	77%	62.38	LOS E	6.9
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	R2	32	52%	52.82	LOS D	7.8
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	T1	171	52%	39.22	LOS C	7.8
H.24 Gleeson Ave / Unwins Bridge Rd PM Peak	Unwins Bridge Rd	West	L2	14	10%	26.94	LOS B	2.5
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	R2	3	3%	12.96	LOS A	0.1
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	T1	4	3%	9.94	LOS A	0.1
H.39 Edinburgh Rd / Murray St AM peak	Murray St	South	L2	3	3%	10.21	LOS A	0.1
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	L2	16	55%	5.94	LOS A	4.4
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	R2	92	55%	8.15	LOS A	4.4
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	East	T1	298	55%	5.27	LOS A	4.4
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	T1	6	27%	9.57	LOS A	1.2

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	L2	63	27%	9.87	LOS A	1.2
H.39 Edinburgh Rd / Murray St AM peak	Murray St	North	R2	40	27%	12.69	LOS A	1.2
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	R2	19	60%	9.19	LOS A	4.2
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	T1	325	60%	6.18	LOS A	4.2
H.39 Edinburgh Rd / Murray St AM peak	Edinburgh Rd	West	L2	18	60%	6.54	LOS A	4.2
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	R2	15	17%	20.09	LOS B	0.7
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	T1	3	17%	16.99	LOS B	0.7
H.39 Edinburgh Rd / Murray St PM peak	Murray St	South	L2	20	17%	17.42	LOS B	0.7
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	L2	3	67%	6.09	LOS A	6.8
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	R2	159	67%	8.12	LOS A	6.8
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	East	T1	485	67%	5.13	LOS A	6.8
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	T1	6	57%	10.88	LOS A	3.9
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	L2	186	57%	11.11	LOS A	3.9
H.39 Edinburgh Rd / Murray St PM peak	Murray St	North	R2	76	57%	13.87	LOS A	3.9
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	R2	8	49%	10.67	LOS A	2.9
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	T1	231	49%	7.40	LOS A	2.9
H.39 Edinburgh Rd / Murray St PM peak	Edinburgh Rd	West	L2	24	49%	7.64	LOS A	2.9
H.40 Edinburgh Rd / Bedwin Rd AM	Bedwin Rd	South	R1	642	36%	3.36	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Bedwin Rd	South	L2	269	16%	4.47	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	SouthEast	L3	206	60%	38.97	LOS C	5.7
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L1	606	52%	4.12	LOS A	4.2
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L2	46	8%	3.54	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edgeware Rd	NorthEast	L3	83	8%	4.11	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd AM	Edinburgh Rd	West	R2	163	109%	159.00	LOS F	15.1
H.40 Edinburgh Rd / Bedwin Rd AM	Edinburgh Rd	West	L1	70	11%	7.28	LOS A	0.4
H.40 Edinburgh Rd / Bedwin Rd PM	Bedwin Rd	South	R1	778	42%	3.33	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Bedwin Rd	South	L2	364	20%	4.40	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	SouthEast	L3	273	63%	30.56	LOS C	6.2
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L1	639	56%	4.98	LOS A	5.1
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L2	38	6%	3.51	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edgeware Rd	NorthEast	L3	53	6%	4.11	LOS A	0.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edinburgh Rd	West	R2	131	107%	166.05	LOS F	12.0
H.40 Edinburgh Rd / Bedwin Rd PM	Edinburgh Rd	West	L1	69	13%	8.67	LOS A	0.4
H.41 Bedwin Rd / May St AM Peak	Campbell St	South	T1	154	50%	51.71	LOS D	5.1
H.41 Bedwin Rd / May St AM Peak	Campbell St	South	L2	34	50%	56.44	LOS D	4.9
H.41 Bedwin Rd / May St AM Peak	May St	East	L2	27	30%	27.09	LOS B	7.8
H.41 Bedwin Rd / May St AM Peak	May St	East	R2	146	108%	162.05	LOS F	15.0
H.41 Bedwin Rd / May St AM Peak	May St	East	T1	207	30%	22.49	LOS B	7.8
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	T1	348	85%	33.48	LOS C	36.5
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	L2	351	85%	38.12	LOS C	36.5
H.41 Bedwin Rd / May St AM Peak	Bedwin Rd	North	R2	335	52%	34.96	LOS C	12.9
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	R2	108	82%	41.18	LOS C	26.9
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	T1	573	82%	27.43	LOS B	26.9
H.41 Bedwin Rd / May St AM Peak	Unwins Bridge Rd	West	L2	625	74%	9.46	LOS A	13.6
H.41 Bedwin Rd / May St PM Peak	Campbell St	South	T1	250	100%	106.27	LOS F	13.6
H.41 Bedwin Rd / May St PM Peak	Campbell St	South	L2	84	100%	108.06	LOS F	11.9
H.41 Bedwin Rd / May St PM Peak	May St	East	L2	36	92%	51.41	LOS D	32.2
H.41 Bedwin Rd / May St PM Peak	May St	East	R2	297	101%	134.35	LOS F	27.2
H.41 Bedwin Rd / May St PM Peak	May St	East	T1	558	92%	46.89	LOS D	32.2
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	T1	306	100%	61.63	LOS E	45.8
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	L2	305	100%	66.20	LOS E	45.8
H.41 Bedwin Rd / May St PM Peak	Bedwin Rd	North	R2	546	100%	62.71	LOS E	45.8
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	R2	16	77%	30.58	LOS C	13.0
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	T1	318	77%	25.89	LOS B	13.0

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.41 Bedwin Rd / May St PM Peak	Unwins Bridge Rd	West	L2	662	96%	65.20	LOS E	36.0

2.0 Marrickville Station

2.1 Marrickville Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	T1	601	53%	12.39	LOS A	17.0
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	L2	20	53%	17.04	LOS B	17.0
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	L2	11	44%	37.30	LOS C	7.4
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	R2	68	44%	37.32	LOS C	7.4
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	T1	108	44%	32.74	LOS C	7.4
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	T1	259	53%	18.50	LOS B	10.1
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	L2	14	3%	18.98	LOS B	0.4
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	R2	16	53%	23.06	LOS B	10.1
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	R2	156	76%	42.69	LOS D	14.3
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	T1	124	76%	38.10	LOS C	14.3
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	L2	30	76%	42.69	LOS D	14.3
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	T1	343	33%	12.94	LOS A	9.4
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	L2	21	33%	17.51	LOS B	9.4
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	L2	26	53%	34.65	LOS C	11.2
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	R2	89	53%	34.65	LOS C	11.2
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	T1	170	53%	30.09	LOS C	11.2
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	T1	665	64%	7.96	LOS A	11.7
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	L2	16	13%	10.00	LOS A	1.3
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	R2	48	64%	13.01	LOS A	11.7
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	R2	155	69%	39.06	LOS C	12.8
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	T1	102	69%	34.47	LOS C	12.8
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	L2	36	69%	39.03	LOS C	12.8
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	R2	189	72%	45.76	LOS D	8.2
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	T1	255	79%	40.15	LOS C	12.2
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	L2	26	79%	44.89	LOS D	12.2
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	L2	85	9%	13.48	LOS A	1.6
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	R2	8	32%	13.85	LOS A	6.9
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	T1	319	32%	9.28	LOS A	6.9
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	T1	81	27%	25.16	LOS B	3.4
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	L2	14	27%	29.73	LOS C	3.4
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	R2	15	27%	29.79	LOS C	3.4
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	R2	50	69%	12.29	LOS A	11.4
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	T1	652	69%	7.50	LOS A	11.4
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	L2	68	14%	10.85	LOS A	1.6
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	R2	116	43%	48.52	LOS D	5.5
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	T1	131	38%	39.27	LOS C	7.5
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	L2	36	38%	43.83	LOS D	7.5
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	L2	156	17%	12.66	LOS A	2.2
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	R2	10	56%	12.47	LOS A	11.2
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	T1	608	56%	7.90	LOS A	11.2
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	T1	232	57%	25.24	LOS B	10.3
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	L2	20	57%	29.80	LOS C	10.3
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	R2	36	57%	29.81	LOS C	10.3
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	R2	92	60%	21.09	LOS B	11.6
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	T1	343	60%	15.81	LOS B	11.6
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	L2	42	12%	17.43	LOS B	2.6
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	R2	258	70%	42.45	LOS C	14.0
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	T1	362	78%	40.44	LOS C	17.2
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	L2	48	78%	45.45	LOS D	17.2
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	L2	67	20%	22.01	LOS B	4.4
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	R2	41	39%	31.80	LOS C	7.6
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	T1	254	39%	23.68	LOS B	7.6
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	T1	153	79%	42.03	LOS C	9.1

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	L2	54	47%	36.52	LOS C	4.1
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	R2	92	79%	54.80	LOS D	9.1
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	R2	30	78%	21.49	LOS B	17.0
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	T1	490	78%	16.89	LOS B	17.0
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	L2	187	18%	8.17	LOS A	2.7
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	R2	158	95%	72.84	LOS F	16.6
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	T1	190	95%	57.41	LOS E	16.6
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	L2	55	52%	48.71	LOS D	6.6
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	L2	304	76%	26.33	LOS B	25.2
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	R2	43	45%	38.34	LOS C	8.5
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	T1	504	76%	25.59	LOS B	25.2
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	T1	428	91%	49.10	LOS D	17.5
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	L2	32	91%	55.18	LOS D	17.5
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	R2	172	91%	50.60	LOS D	16.6
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	R2	80	53%	44.92	LOS D	5.0
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	T1	247	53%	17.75	LOS B	10.1
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	L2	139	42%	19.41	LOS B	10.1
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	South	T1	490	41%	7.66	LOS A	10.3
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	South	L1	190	12%	5.04	LOS A	0.9
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	North	T1	189	22%	7.79	LOS A	4.2
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	North	R3	28	22%	13.02	LOS A	4.2
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	NorthWest	R1	195	47%	44.21	LOS D	11.3
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	NorthWest	L3	67	47%	45.70	LOS D	11.3
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	South	T1	310	24%	5.41	LOS A	5.0
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	South	L1	115	8%	5.29	LOS A	0.6
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	North	T1	543	51%	7.01	LOS A	12.7
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	North	R3	67	51%	12.20	LOS A	12.7
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	NorthWest	R1	183	36%	40.79	LOS C	8.6
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	NorthWest	L3	32	36%	42.30	LOS C	8.6
H.38 Marrickville Station Overbridge AM	Illawarra Road	South	T1	661	45%	4.02	LOS A	10.6
H.38 Marrickville Station Overbridge AM	Illawarra Road	North	T1	378	26%	3.28	LOS A	4.9
H.38 Marrickville Station Overbridge PM	Illawarra Road	South	T1	419	28%	3.54	LOS A	5.6
H.38 Marrickville Station Overbridge PM	Illawarra Road	North	T1	718	49%	4.43	LOS A	12.1

2.2 Marrickville Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	T1	660	59%	13.66	LOS A	20.1
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	L2	22	59%	18.31	LOS B	20.1
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	L2	12	48%	37.70	LOS C	8.3
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	R2	75	48%	37.72	LOS C	8.3
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	T1	119	48%	33.14	LOS C	8.3
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	T1	284	60%	20.76	LOS B	11.6
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	L2	15	3%	20.02	LOS B	0.5
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	R2	18	60%	25.32	LOS B	11.6
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	R2	171	81%	45.04	LOS D	16.4
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	T1	137	81%	40.45	LOS C	16.4
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	L2	33	81%	45.04	LOS D	16.4
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	T1	379	35%	11.50	LOS A	9.9
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	L2	24	35%	16.07	LOS B	9.9
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	L2	28	65%	38.99	LOS C	13.4
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	R2	98	65%	38.99	LOS C	13.4
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	T1	188	65%	34.42	LOS C	13.4
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	T1	735	69%	7.95	LOS A	13.7
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	L2	18	14%	9.82	LOS A	1.5
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	R2	53	69%	13.04	LOS A	13.7
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	R2	171	89%	58.25	LOS E	18.4
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	T1	113	89%	53.66	LOS D	18.4
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	L2	39	89%	58.22	LOS E	18.4
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	R2	207	82%	48.64	LOS D	9.4
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	T1	280	83%	40.74	LOS C	13.6
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	L2	28	83%	45.48	LOS D	13.6
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	L2	93	10%	14.53	LOS B	1.9
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	R2	9	37%	15.77	LOS B	8.4
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	T1	351	37%	11.21	LOS A	8.4
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	T1	89	28%	23.10	LOS B	3.5
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	L2	16	28%	27.66	LOS B	3.5
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	R2	17	28%	27.73	LOS B	3.5
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	R2	55	82%	18.42	LOS B	18.2
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	T1	716	82%	13.16	LOS A	18.2
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	L2	75	16%	12.70	LOS A	2.2
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	R2	128	60%	53.61	LOS D	6.3
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	T1	145	53%	42.79	LOS D	8.6
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	L2	40	53%	47.35	LOS D	8.6
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	L2	172	18%	11.58	LOS A	2.3
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	R2	11	59%	10.81	LOS A	10.9
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	T1	672	59%	6.24	LOS A	10.9
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	T1	257	73%	31.27	LOS C	13.4
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	L2	22	73%	35.84	LOS C	13.4
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	R2	40	73%	35.84	LOS C	13.4
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	R2	102	66%	19.97	LOS B	12.7
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	T1	379	66%	14.57	LOS B	12.7
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	L2	47	13%	15.96	LOS B	2.9
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	R2	283	93%	65.65	LOS E	20.5
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	T1	397	103%	100.72	LOS F	32.0
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	L2	53	103%	111.87	LOS F	32.0
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	L2	73	19%	18.44	LOS B	4.4
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	R2	45	38%	28.12	LOS B	7.8

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	T1	278	38%	20.01	LOS B	7.8
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	T1	167	102%	71.35	LOS F	14.5
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	L2	59	61%	42.10	LOS C	5.0
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	R2	101	102%	103.87	LOS F	14.5
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	R2	33	78%	23.32	LOS B	18.5
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	T1	538	78%	18.73	LOS B	18.5
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	L2	205	20%	8.45	LOS A	2.7
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	R2	174	87%	57.72	LOS E	16.0
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	T1	210	87%	47.68	LOS D	16.0
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	L2	60	48%	45.69	LOS D	7.1
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	L2	336	107%	136.45	LOS F	70.0
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	R2	48	64%	45.93	LOS D	10.1
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	T1	557	107%	104.43	LOS F	70.0
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	T1	473	80%	36.57	LOS C	16.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	L2	35	80%	42.57	LOS D	16.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	R2	190	80%	38.22	LOS C	15.6
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	R2	89	72%	54.40	LOS D	5.6
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	T1	273	72%	23.79	LOS B	14.5
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	L2	154	58%	26.60	LOS B	14.5
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	South	T1	538	50%	8.98	LOS A	12.5
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	South	L1	208	13%	5.17	LOS A	1.1
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	North	T1	207	26%	9.87	LOS A	5.3
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	North	R3	31	26%	15.10	LOS B	5.3
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	NorthWest	R1	214	48%	43.44	LOS D	12.3
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	NorthWest	L3	74	48%	44.93	LOS D	12.3
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	South	T1	343	25%	4.05	LOS A	4.8
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	South	L1	127	8%	5.30	LOS A	0.7
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	North	T1	600	53%	5.49	LOS A	12.9
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	North	R3	74	53%	10.69	LOS A	12.9
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	NorthWest	R1	202	53%	45.37	LOS D	10.1
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	NorthWest	L3	35	53%	46.88	LOS D	10.1
H.38 Marrickville Station Overbridge AM	Illawarra Road	South	T1	726	49%	4.24	LOS A	12.3
H.38 Marrickville Station Overbridge AM	Illawarra Road	North	T1	415	28%	3.36	LOS A	5.6
H.38 Marrickville Station Overbridge PM	Illawarra Road	South	T1	463	31%	3.64	LOS A	6.4
H.38 Marrickville Station Overbridge PM	Illawarra Road	North	T1	794	54%	4.73	LOS A	14.2

2.3 Marrickville Station: Future + Construction

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	T1	660	59%	13.66	LOS A	20.1
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	L2	22	59%	18.31	LOS B	20.1
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	L2	12	48%	37.70	LOS C	8.3
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	R2	75	48%	37.72	LOS C	8.3
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	T1	119	48%	33.14	LOS C	8.3
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	T1	284	60%	20.76	LOS B	11.6
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	L2	15	3%	20.02	LOS B	0.5
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	R2	18	60%	25.32	LOS B	11.6
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	R2	171	81%	45.04	LOS D	16.4
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	T1	137	81%	40.45	LOS C	16.4
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	L2	33	81%	45.04	LOS D	16.4
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	T1	379	35%	11.50	LOS A	9.9
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	L2	24	35%	16.07	LOS B	9.9
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	L2	28	65%	38.99	LOS C	13.4
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	R2	98	65%	38.99	LOS C	13.4
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	T1	188	65%	34.42	LOS C	13.4
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	T1	735	69%	7.95	LOS A	13.7
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	L2	18	14%	9.82	LOS A	1.5
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	R2	53	69%	13.04	LOS A	13.7
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	R2	171	89%	58.25	LOS E	18.4
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	T1	113	89%	53.66	LOS D	18.4
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	L2	39	89%	58.22	LOS E	18.4
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	R2	220	84%	48.98	LOS D	10.2
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	T1	280	79%	37.70	LOS C	13.2
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	L2	28	79%	42.43	LOS C	13.2
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	L2	106	13%	15.87	LOS B	2.3
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	R2	9	39%	17.02	LOS B	8.8
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	T1	351	39%	12.46	LOS A	8.8
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	T1	89	25%	20.89	LOS B	3.3
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	L2	16	25%	25.45	LOS B	3.3
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	R2	17	25%	25.52	LOS B	3.3
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	R2	55	87%	24.40	LOS B	22.3
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	T1	716	87%	18.61	LOS B	22.3
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	L2	75	17%	14.00	LOS A	2.4
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	R2	141	51%	47.70	LOS D	6.6

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	T1	145	42%	38.12	LOS C	8.3
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	L2	40	42%	42.68	LOS D	8.3
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	L2	185	22%	15.85	LOS B	3.4
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	R2	11	74%	16.03	LOS B	16.7
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	T1	672	74%	11.46	LOS A	16.7
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	T1	257	58%	23.33	LOS B	11.0
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	L2	22	58%	27.89	LOS B	11.0
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	R2	40	58%	27.90	LOS B	11.0
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	R2	102	81%	35.36	LOS C	17.3
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	T1	379	81%	26.94	LOS B	17.3
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	L2	47	16%	19.44	LOS B	3.6
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	R2	283	93%	65.65	LOS E	20.5
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	T1	397	103%	100.72	LOS F	32.0
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	L2	53	103%	111.87	LOS F	32.0
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	L2	73	19%	18.44	LOS B	4.4
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	R2	45	38%	28.12	LOS B	7.8
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	T1	278	38%	20.01	LOS B	7.8
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	T1	167	102%	71.35	LOS F	14.5
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	L2	59	61%	42.10	LOS C	5.0
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	R2	101	102%	103.87	LOS F	14.5
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	R2	33	78%	23.32	LOS B	18.5
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	T1	538	78%	18.73	LOS B	18.5
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	L2	205	20%	8.45	LOS A	2.7
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	R2	174	87%	57.72	LOS E	16.0
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	T1	210	87%	47.68	LOS D	16.0
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	L2	60	48%	45.69	LOS D	7.1
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	L2	336	107%	136.45	LOS F	70.0
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	R2	48	64%	45.93	LOS D	10.1
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	T1	557	107%	104.43	LOS F	70.0
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	T1	473	80%	36.57	LOS C	16.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	L2	35	80%	42.57	LOS D	16.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	R2	190	80%	38.22	LOS C	15.6
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	R2	89	72%	54.40	LOS D	5.6
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	T1	273	72%	23.79	LOS B	14.5
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	L2	154	58%	26.60	LOS B	14.5
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	South	T1	551	52%	8.62	LOS A	12.7

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	South	L1	208	13%	5.17	LOS A	1.1
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	North	T1	220	27%	9.52	LOS A	5.5
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	North	R3	31	27%	14.76	LOS B	5.5
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	NorthWest	R1	214	48%	43.46	LOS D	12.3
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	NorthWest	L3	74	48%	44.95	LOS D	12.3
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	South	T1	356	27%	4.12	LOS A	5.1
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	South	L1	127	8%	5.30	LOS A	0.7
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	North	T1	613	55%	5.62	LOS A	13.4
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	North	R3	74	55%	10.82	LOS A	13.4
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	NorthWest	R1	202	53%	45.37	LOS D	10.1
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	NorthWest	L3	35	53%	46.88	LOS D	10.1
H.38 Marrickville Station Overbridge AM	Illawarra Road	South	T1	739	50%	4.33	LOS A	12.8
H.38 Marrickville Station Overbridge AM	Illawarra Road	North	T1	427	30%	3.42	LOS A	5.8
H.38 Marrickville Station Overbridge PM	Illawarra Road	South	T1	476	33%	3.71	LOS A	6.7
H.38 Marrickville Station Overbridge PM	Illawarra Road	North	T1	807	56%	4.83	LOS A	14.8

2.4 Marrickville Station: Future + Construction + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	T1	660	60%	14.36	LOS A	20.6
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	L2	22	60%	19.01	LOS B	20.6
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	L2	12	53%	39.73	LOS C	8.5
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	R2	75	53%	39.75	LOS C	8.5
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	T1	119	53%	35.17	LOS C	8.5
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	T1	284	84%	38.16	LOS C	17.1
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	L2	15	4%	20.10	LOS B	0.6
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	R2	51	84%	43.62	LOS D	17.1
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	R2	171	89%	55.04	LOS D	20.8
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	T1	137	89%	50.45	LOS D	20.8
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	L2	66	89%	55.47	LOS D	20.8
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	T1	379	37%	13.27	LOS A	10.7
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	L2	24	37%	17.84	LOS B	10.7
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	L2	28	64%	38.13	LOS C	13.3
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	R2	98	64%	38.13	LOS C	13.3
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	T1	188	64%	33.57	LOS C	13.3
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	T1	735	90%	16.02	LOS B	23.2
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	L2	18	18%	10.17	LOS A	1.9
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	R2	87	90%	23.71	LOS B	23.2
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	R2	171	90%	57.92	LOS E	20.6
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	T1	113	90%	53.33	LOS D	20.6
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	L2	73	90%	58.30	LOS E	20.6
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	R2	254	108%	162.94	LOS F	22.9
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	T1	280	88%	44.00	LOS D	14.4
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	L2	28	88%	48.73	LOS D	14.4
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	L2	139	20%	16.02	LOS B	3.0
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	R2	9	60%	21.15	LOS B	12.8
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	T1	420	60%	16.58	LOS B	12.8
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	T1	89	26%	21.98	LOS B	3.4
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	L2	16	26%	26.54	LOS B	3.4
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	R2	17	26%	26.61	LOS B	3.4
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	R2	55	109%	137.07	LOS F	64.1
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	T1	785	109%	113.88	LOS F	64.1
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	L2	75	22%	13.16	LOS A	2.9
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	R2	174	90%	64.24	LOS E	9.8

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	T1	145	49%	39.63	LOS C	8.4
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	L2	40	49%	44.20	LOS D	8.4
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	L2	218	28%	15.82	LOS B	4.2
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	R2	11	98%	57.84	LOS E	41.3
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	T1	741	98%	53.80	LOS D	41.3
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	T1	257	62%	25.67	LOS B	11.7
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	L2	22	62%	30.24	LOS C	11.7
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	R2	40	62%	30.24	LOS C	11.7
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	R2	102	108%	160.05	LOS F	42.4
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	T1	448	108%	114.22	LOS F	42.4
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	L2	47	22%	18.36	LOS B	4.6
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	R2	283	116%	216.18	LOS F	39.6
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	T1	397	129%	307.99	LOS F	58.6
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	L2	53	129%	328.74	LOS F	58.6
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	L2	73	43%	16.82	LOS B	9.8
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	R2	45	86%	61.93	LOS E	7.3
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	T1	380	86%	22.42	LOS B	9.8
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	T1	167	138%	239.06	LOS F	31.7
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	L2	59	83%	62.04	LOS E	6.7
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	R2	101	138%	405.31	LOS F	31.7
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	R2	33	132%	337.27	LOS F	89.1
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	T1	640	132%	294.91	LOS F	89.1
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	L2	205	29%	9.25	LOS A	3.5
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	R2	174	112%	181.65	LOS F	30.6
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	T1	210	112%	118.33	LOS F	30.6
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	L2	60	62%	50.57	LOS D	7.5
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	L2	336	118%	231.40	LOS F	112.6
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	R2	48	71%	50.82	LOS D	9.0
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	T1	661	118%	190.65	LOS F	112.6
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	T1	473	91%	48.96	LOS D	19.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	L2	35	91%	55.78	LOS D	19.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	R2	190	91%	48.81	LOS D	18.3
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	R2	89	104%	123.75	LOS F	12.0
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	T1	378	104%	41.29	LOS C	20.5
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	L2	154	83%	33.33	LOS C	20.5
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	South	T1	585	55%	7.52	LOS A	12.9

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	South	L1	208	13%	5.17	LOS A	1.1
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	North	T1	254	32%	8.47	LOS A	6.1
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	North	R3	31	32%	13.70	LOS A	6.1
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	NorthWest	R1	214	55%	45.70	LOS D	12.7
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	NorthWest	L3	74	55%	47.19	LOS D	12.7
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	South	T1	389	31%	3.97	LOS A	5.6
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	South	L1	127	8%	5.30	LOS A	0.7
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	North	T1	646	60%	5.97	LOS A	15.0
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	North	R3	74	60%	11.17	LOS A	15.0
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	NorthWest	R1	202	58%	46.58	LOS D	10.3
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	NorthWest	L3	35	58%	48.09	LOS D	10.3
H.38 Marrickville Station Overbridge AM	Illawarra Road	South	T1	772	55%	4.60	LOS A	14.2
H.38 Marrickville Station Overbridge AM	Illawarra Road	North	T1	461	34%	3.59	LOS A	6.6
H.38 Marrickville Station Overbridge PM	Illawarra Road	South	T1	510	37%	3.90	LOS A	7.5
H.38 Marrickville Station Overbridge PM	Illawarra Road	North	T1	840	60%	5.15	LOS A	16.4

2.5 Marrickville Station: Future + Construction + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	T1	660	58%	12.98	LOS A	19.5
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	L2	22	58%	17.62	LOS B	19.5
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	L2	12	54%	40.64	LOS C	8.6
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	R2	75	54%	40.65	LOS C	8.6
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	T1	119	54%	36.07	LOS C	8.6
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	T1	284	68%	23.08	LOS B	12.8
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	L2	15	3%	19.04	LOS B	0.5
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	R2	33	68%	28.07	LOS B	12.8
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	R2	171	89%	55.41	LOS D	19.7
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	T1	137	89%	50.82	LOS D	19.7
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	L2	48	89%	55.68	LOS D	19.7
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	T1	379	36%	12.67	LOS A	10.4
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	L2	24	36%	17.23	LOS B	10.4
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	L2	28	63%	38.01	LOS C	13.2
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	R2	98	63%	38.02	LOS C	13.2
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	T1	188	63%	33.45	LOS C	13.2
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	T1	735	79%	10.11	LOS A	16.8
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	L2	18	16%	9.99	LOS A	1.6
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	R2	68	79%	15.93	LOS B	16.8
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	R2	171	88%	55.18	LOS D	18.8
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	T1	113	88%	50.59	LOS D	18.8
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	L2	55	88%	55.40	LOS D	18.8
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	R2	235	95%	65.11	LOS E	12.9
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	T1	280	82%	38.77	LOS C	13.4
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd S	South	L2	28	82%	43.50	LOS D	13.4
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	L2	121	16%	16.21	LOS B	2.6
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	R2	9	47%	18.40	LOS B	10.7
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd S	East	T1	392	47%	13.83	LOS A	10.7
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	T1	89	25%	20.89	LOS B	3.3
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	L2	16	25%	25.45	LOS B	3.3
B.17 Marrickville Road / Illwarra Road - AM	Illwarra Rd N	North	R2	17	25%	25.52	LOS B	3.3
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	R2	55	98%	56.23	LOS D	38.0
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	T1	757	98%	46.16	LOS D	38.0
B.17 Marrickville Road / Illwarra Road - AM	Marrickville Rd N	West	L2	75	20%	13.59	LOS A	2.6
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	R2	156	77%	54.39	LOS D	7.8
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	T1	145	49%	40.40	LOS C	8.4
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd S	South	L2	40	49%	44.97	LOS D	8.4
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	L2	200	24%	14.49	LOS A	3.5
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	R2	11	81%	17.22	LOS B	19.0
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd S	East	T1	712	81%	12.95	LOS A	19.0
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	T1	257	65%	26.89	LOS B	12.1
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	L2	22	65%	31.45	LOS C	12.1
B.17 Marrickville Road / Illwarra Road - PM	Illwarra Rd N	North	R2	40	65%	31.45	LOS C	12.1
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	R2	102	90%	50.24	LOS D	22.6
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	T1	420	90%	37.62	LOS C	22.6
B.17 Marrickville Road / Illwarra Road - PM	Marrickville Rd N	West	L2	47	18%	17.46	LOS B	3.8
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	R2	283	116%	216.18	LOS F	39.6
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	T1	397	129%	307.99	LOS F	58.6
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	L2	53	129%	328.74	LOS F	58.6
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	L2	73	41%	16.64	LOS B	9.8
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	R2	45	82%	62.90	LOS E	4.2
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	T1	334	82%	16.36	LOS B	9.8

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	T1	167	138%	239.11	LOS F	31.8
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	L2	59	83%	61.72	LOS E	6.7
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	R2	101	138%	405.54	LOS F	31.8
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	R2	33	127%	278.90	LOS F	72.9
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	T1	593	127%	242.42	LOS F	72.9
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	L2	205	27%	9.07	LOS A	3.5
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	R2	174	104%	122.39	LOS F	24.5
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	T1	210	104%	84.85	LOS F	24.5
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	L2	60	57%	49.15	LOS D	7.3
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	L2	336	105%	120.80	LOS F	70.1
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	R2	48	63%	41.98	LOS C	10.7
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	T1	614	105%	91.63	LOS F	70.1
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	T1	473	91%	47.69	LOS D	19.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	L2	35	91%	53.94	LOS D	19.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	R2	190	91%	48.81	LOS D	18.3
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	R2	89	82%	58.92	LOS E	7.6
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	T1	330	82%	23.96	LOS B	14.8
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	L2	154	66%	23.65	LOS B	14.8
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	South	T1	566	54%	8.31	LOS A	12.9
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	South	L1	208	13%	5.17	LOS A	1.1
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	North	T1	235	30%	9.23	LOS A	5.8
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	North	R3	31	30%	14.46	LOS A	5.8
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	NorthWest	R1	214	51%	44.55	LOS D	12.5
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	NorthWest	L3	74	51%	46.04	LOS D	12.5
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	South	T1	371	29%	4.21	LOS A	5.4
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	South	L1	127	8%	5.30	LOS A	0.7
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	North	T1	628	58%	6.24	LOS A	14.6
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	North	R3	74	58%	11.43	LOS A	14.6
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	NorthWest	R1	202	53%	45.37	LOS D	10.1
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	NorthWest	L3	35	53%	46.88	LOS D	10.1
H.38 Marrickville Station Overbridge AM	Illawarra Road	South	T1	754	53%	4.45	LOS A	13.4
H.38 Marrickville Station Overbridge AM	Illawarra Road	North	T1	443	32%	3.49	LOS A	6.2
H.38 Marrickville Station Overbridge PM	Illawarra Road	South	T1	491	35%	3.79	LOS A	7.1
H.38 Marrickville Station Overbridge PM	Illawarra Road	North	T1	822	58%	4.97	LOS A	15.5

3.0 Dulwich Hill Station

3.1 Dulwich Hill Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	R2	21	48%	42.68	LOS D	7.1
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	T1	144	48%	38.12	LOS C	7.1
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	L2	47	11%	35.92	LOS C	1.7
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	L2	30	16%	12.84	LOS A	1.4
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	R2	49	78%	28.51	LOS C	13.1
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	T1	314	78%	20.77	LOS B	13.1
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	T1	253	94%	54.74	LOS D	16.6
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	L2	134	19%	18.18	LOS B	4.0
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	R2	69	94%	69.07	LOS E	16.6
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	West	T1	581	64%	20.91	LOS B	17.1
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	West	L2	22	14%	22.64	LOS B	3.3
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	R2	54	91%	63.10	LOS E	8.3
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	T1	270	91%	43.62	LOS D	11.2
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	L2	95	72%	39.56	LOS C	11.2
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	L2	41	17%	13.74	LOS A	3.1
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	R2	105	85%	32.33	LOS C	27.7
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	T1	722	85%	23.72	LOS B	27.7
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	T1	205	91%	28.91	LOS C	9.5
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	L2	90	54%	30.51	LOS C	9.5
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	R2	88	91%	65.68	LOS E	5.8
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	West	T1	343	52%	29.08	LOS C	11.2
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	West	L2	15	12%	31.34	LOS C	2.2
H.16 Wardell Road / Dudley Street AM Peak	Dudley St	East	R3	23	26%	37.57	LOS C	0.8
H.16 Wardell Road / Dudley Street AM Peak	Dudley St	East	L1	52	26%	8.22	LOS A	0.8
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	NorthEast	L3	32	46%	9.87	LOS A	4.0
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	NorthEast	T1	387	46%	4.50	LOS A	4.0
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	SouthWest	R1	19	78%	16.80	LOS B	15.4
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	SouthWest	T1	691	78%	11.04	LOS A	15.4
H.16 Wardell Road / Dudley Street PM Peak	Dudley St	East	R3	24	32%	35.34	LOS C	1.1
H.16 Wardell Road / Dudley Street PM Peak	Dudley St	East	L1	71	32%	11.88	LOS A	1.1
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	NorthEast	L3	34	72%	11.69	LOS A	13.9
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	NorthEast	T1	748	72%	6.27	LOS A	13.9
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	SouthWest	R1	25	48%	14.83	LOS B	4.5
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	SouthWest	T1	479	48%	2.85	LOS A	4.5
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	R2	418	72%	13.43	LOS A	14.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	T1	1103	72%	1.56	LOS A	14.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	L2	5	72%	5.35	LOS A	3.9
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	L2	181	33%	35.40	LOS C	7.8
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	R2	57	60%	59.01	LOS E	6.5
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	T1	56	60%	55.53	LOS D	6.5
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	North	T1	371	22%	24.92	LOS B	10.7
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	North	L2	74	22%	29.55	LOS C	10.6
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	R2	6	46%	54.17	LOS D	6.8
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	T1	121	46%	50.76	LOS D	6.8
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	L2	14	7%	54.39	LOS D	0.7
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	R2	206	48%	30.90	LOS C	10.1
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	T1	583	44%	8.23	LOS A	14.6
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	L2	5	44%	12.95	LOS A	14.6
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	L2	307	46%	32.37	LOS C	13.2
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	R2	49	37%	50.54	LOS D	5.6
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	T1	59	37%	47.07	LOS D	5.6
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	North	T1	983	55%	21.38	LOS B	21.0
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	North	L2	78	55%	25.94	LOS B	20.8

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	R2	4	22%	48.31	LOS D	3.7
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	T1	71	22%	45.05	LOS D	3.7
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	L2	8	3%	49.44	LOS D	0.4
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	R2	15	22%	7.48	LOS A	1.2
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	T1	232	22%	0.09	LOS A	1.2
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	L2	5	0%	4.61	LOS A	0.0
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	L2	32	7%	6.73	LOS A	0.2
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	R2	8	7%	12.95	LOS A	0.2
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	T1	1	7%	9.77	LOS A	0.2
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	T1	315	27%	0.16	LOS A	1.6
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	L2	1	0%	4.76	LOS A	0.0
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	R2	2	27%	6.04	LOS A	1.6
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	R2	16	6%	12.12	LOS A	0.2
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	T1	5	6%	8.97	LOS A	0.2
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	L2	11	6%	5.50	LOS A	0.2
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	R2	19	36%	6.83	LOS A	2.4
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	T1	406	36%	0.02	LOS A	2.4
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	L2	15	1%	4.59	LOS A	0.0
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	L2	37	12%	5.78	LOS A	0.4
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	R2	18	12%	15.49	LOS B	0.4
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	T1	7	12%	11.79	LOS A	0.4
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	T1	239	22%	0.11	LOS A	1.2
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	L2	14	1%	4.62	LOS A	0.0
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	R2	17	22%	7.30	LOS A	1.2
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	R2	11	6%	15.94	LOS B	0.2
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	T1	3	6%	11.37	LOS A	0.2
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	L2	8	6%	6.46	LOS A	0.2
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	East	T1	611	39%	0.22	LOS A	2.3
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	East	L1	21	8%	5.19	LOS A	0.3
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	West	T1	1559	58%	0.47	LOS A	6.0
H.36 New Canterbury Rd / Terrace Rd AM	Terrace Rd	SouthWest	L3	80	13%	9.50	LOS A	0.4
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	East	T1	1294	50%	0.10	LOS A	3.5
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	East	L1	106	50%	5.27	LOS A	3.5
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	West	T1	778	55%	0.11	LOS A	4.3
H.36 New Canterbury Rd / Terrace Rd PM	Terrace Rd	SouthWest	L3	77	24%	17.44	LOS B	0.8
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	R2	22	32%	21.26	LOS B	7.4
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	T1	307	32%	14.40	LOS A	7.4
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	L2	101	16%	15.19	LOS B	3.5
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	East	L2	51	19%	44.01	LOS D	2.1
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	East	T1	203	60%	40.69	LOS C	9.1
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	T1	606	65%	15.50	LOS B	17.3
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	L2	38	14%	17.03	LOS B	3.0
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	R2	33	65%	21.81	LOS B	17.3
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	R2	162	90%	59.45	LOS E	18.5
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	T1	391	90%	40.30	LOS C	18.5
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	L2	19	36%	31.31	LOS C	8.0
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	R2	39	59%	31.60	LOS C	14.5
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	T1	503	59%	22.92	LOS B	14.5
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	L2	264	47%	21.74	LOS B	12.6
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	East	L2	34	34%	33.53	LOS C	7.0
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	East	T1	545	86%	38.21	LOS C	19.0
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	T1	268	51%	23.94	LOS B	7.9
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	L2	44	20%	21.53	LOS B	4.7
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	R2	57	51%	36.70	LOS C	7.9
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	R2	104	74%	42.01	LOS C	12.5
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	T1	267	74%	30.79	LOS C	12.5
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	L2	42	17%	23.33	LOS B	4.0

3.2 Dulwich Hill Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	R2	24	42%	38.01	LOS C	7.2
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	T1	158	42%	33.31	LOS C	7.2
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	L2	52	8%	27.08	LOS B	1.7
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	L2	32	22%	18.63	LOS B	2.2
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	R2	54	110%	157.81	LOS F	34.8
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	T1	345	110%	130.67	LOS F	34.8
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	T1	278	106%	119.49	LOS F	28.4
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	L2	147	21%	13.90	LOS A	3.6
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	R2	76	106%	138.31	LOS F	28.4
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	West	T1	638	107%	122.61	LOS F	49.9
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	West	L2	25	24%	33.28	LOS C	4.8
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	R2	59	94%	70.54	LOS F	9.4
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	T1	298	94%	44.61	LOS D	12.6
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	L2	105	75%	38.27	LOS C	12.6
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	L2	46	20%	15.33	LOS B	3.8
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	R2	116	101%	74.14	LOS F	49.3
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	T1	798	101%	58.73	LOS E	49.3
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	T1	227	90%	30.67	LOS C	10.9
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	L2	99	54%	32.30	LOS C	10.9
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	R2	97	90%	64.60	LOS E	6.5
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	West	T1	379	99%	74.50	LOS F	21.8
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	West	L2	17	22%	41.60	LOS C	3.0
H.16 Wardell Road / Dudley Street AM Peak	Dudley St	East	R3	25	45%	64.81	LOS E	1.5
H.16 Wardell Road / Dudley Street AM Peak	Dudley St	East	L1	57	45%	14.72	LOS B	1.5
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	NorthEast	L3	35	54%	11.59	LOS A	5.4
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	NorthEast	T1	425	54%	6.20	LOS A	5.4
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	SouthWest	R1	21	91%	29.76	LOS C	28.8
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	SouthWest	T1	758	91%	23.21	LOS B	28.8
H.16 Wardell Road / Dudley Street PM Peak	Dudley St	East	R3	27	51%	57.55	LOS E	1.8
H.16 Wardell Road / Dudley Street PM Peak	Dudley St	East	L1	78	51%	18.49	LOS B	1.8
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	NorthEast	L3	38	82%	16.08	LOS B	22.4
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	NorthEast	T1	827	82%	10.64	LOS A	22.4
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	SouthWest	R1	28	57%	19.81	LOS B	6.5
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	SouthWest	T1	529	57%	4.33	LOS A	6.5
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	R2	459	65%	12.31	LOS A	11.4
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	T1	1211	65%	2.20	LOS A	11.4
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	L2	6	65%	5.21	LOS A	3.0
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	L2	198	17%	9.32	LOS A	3.7
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	R2	63	95%	85.37	LOS F	9.0
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	T1	62	95%	81.89	LOS F	9.0
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	North	T1	408	73%	58.08	LOS E	14.5
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	North	L2	82	73%	62.77	LOS E	14.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	R2	7	66%	60.88	LOS E	8.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	T1	133	66%	57.47	LOS E	8.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	L2	16	10%	57.97	LOS E	0.8
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	R2	228	46%	31.51	LOS C	10.9
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	T1	644	45%	5.59	LOS A	13.6
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	L2	6	45%	10.31	LOS A	13.6
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	L2	339	61%	33.91	LOS C	15.2
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	R2	55	59%	59.00	LOS E	6.9
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	T1	65	59%	55.53	LOS D	6.9
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	North	T1	1086	60%	21.56	LOS B	23.8
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	North	L2	86	60%	26.12	LOS B	23.5
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	R2	4	35%	56.04	LOS D	4.5
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	T1	78	35%	52.78	LOS D	4.5
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	L2	9	4%	56.84	LOS E	0.5

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	R2	16	24%	7.98	LOS A	1.3
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	T1	254	24%	0.11	LOS A	1.3
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	L2	6	0%	4.61	LOS A	0.0
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	L2	35	8%	7.03	LOS A	0.3
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	R2	9	8%	14.58	LOS B	0.3
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	T1	1	8%	10.94	LOS A	0.3
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	T1	346	30%	0.19	LOS A	1.8
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	L2	1	0%	4.79	LOS A	0.0
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	R2	2	30%	6.30	LOS A	1.8
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	R2	17	7%	13.49	LOS A	0.3
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	T1	6	7%	9.92	LOS A	0.3
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	L2	12	7%	5.62	LOS A	0.3
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	R2	21	40%	7.26	LOS A	2.8
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	T1	449	40%	0.02	LOS A	2.8
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	L2	17	1%	4.59	LOS A	0.0
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	L2	41	14%	5.94	LOS A	0.5
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	R2	20	14%	18.01	LOS B	0.5
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	T1	8	14%	13.60	LOS A	0.5
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	T1	264	25%	0.14	LOS A	1.4
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	L2	16	1%	4.62	LOS A	0.0
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	R2	19	25%	7.83	LOS A	1.4
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	R2	12	7%	18.59	LOS B	0.2
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	T1	3	7%	13.06	LOS A	0.2
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	L2	9	7%	6.76	LOS A	0.2
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	East	T1	671	43%	0.23	LOS A	2.7
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	East	L1	24	9%	5.20	LOS A	0.4
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	West	T1	1712	64%	0.54	LOS A	7.4
H.36 New Canterbury Rd / Terrace Rd AM	Terrace Rd	SouthWest	L3	87	15%	10.22	LOS A	0.5
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	East	T1	1430	55%	0.11	LOS A	4.3
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	East	L1	117	55%	5.32	LOS A	4.3
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	West	T1	860	61%	0.13	LOS A	5.4
H.36 New Canterbury Rd / Terrace Rd PM	Terrace Rd	SouthWest	L3	85	33%	22.49	LOS B	1.2
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	R2	24	41%	28.62	LOS C	9.3
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	T1	337	41%	19.90	LOS B	9.3
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	L2	111	21%	16.99	LOS B	4.7
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	East	L2	55	20%	44.15	LOS D	2.4
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	East	T1	223	67%	41.81	LOS C	10.2
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	T1	665	83%	25.83	LOS B	25.1
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	L2	42	18%	18.39	LOS B	3.9
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	R2	37	83%	34.24	LOS C	25.1
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	R2	177	110%	140.78	LOS F	44.2
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	T1	429	110%	99.36	LOS F	44.2
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	L2	21	44%	27.90	LOS B	5.3
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	R2	43	90%	60.76	LOS E	15.8
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	T1	556	90%	36.44	LOS C	22.7
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	L2	291	72%	27.51	LOS B	22.7
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	East	L2	38	36%	32.18	LOS C	7.8
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	East	T1	602	90%	41.35	LOS C	22.4
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	T1	296	92%	26.10	LOS B	9.2
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	L2	48	37%	24.35	LOS B	9.2
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	R2	63	92%	70.26	LOS E	6.4
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	R2	115	80%	45.59	LOS D	14.2
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	T1	295	80%	32.31	LOS C	14.2
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	L2	46	19%	22.19	LOS B	4.4

3.3 Dulwich Hill Station: Future + Construction

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	R2	24	50%	41.95	LOS C	7.4
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	T1	158	50%	36.68	LOS C	7.4
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	L2	52	10%	28.69	LOS C	2.0
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	L2	32	23%	17.60	LOS B	2.3
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	R2	69	113%	183.70	LOS F	38.4
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	T1	345	113%	149.09	LOS F	38.4
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	T1	278	109%	145.61	LOS F	32.0
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	L2	147	22%	13.32	LOS A	3.3
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	R2	76	109%	164.12	LOS F	32.0
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	West	T1	638	111%	146.05	LOS F	55.0
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	West	L2	25	25%	34.13	LOS C	4.9
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	R2	59	96%	77.39	LOS F	10.2
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	T1	298	96%	48.63	LOS D	12.7
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	L2	105	77%	39.97	LOS C	12.7
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	L2	46	21%	14.88	LOS B	3.9
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	R2	131	103%	85.32	LOS F	53.1
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	T1	798	103%	67.27	LOS E	53.1
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	T1	227	93%	31.91	LOS C	11.1
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	L2	99	56%	33.21	LOS C	11.1
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	R2	97	93%	69.98	LOS E	6.8
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	West	T1	379	99%	74.50	LOS F	21.8
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	West	L2	17	22%	41.60	LOS C	3.0
H.16 Wardell Road / Dudley Street AM Peak	Dudley St	East	R3	25	45%	64.81	LOS E	1.5
H.16 Wardell Road / Dudley Street AM Peak	Dudley St	East	L1	57	45%	14.72	LOS B	1.5
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	NorthEast	L3	35	54%	11.59	LOS A	5.4
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	NorthEast	T1	425	54%	6.20	LOS A	5.4
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	SouthWest	R1	21	91%	29.76	LOS C	28.8
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	SouthWest	T1	758	91%	23.21	LOS B	28.8
H.16 Wardell Road / Dudley Street PM Peak	Dudley St	East	R3	27	51%	57.55	LOS E	1.8
H.16 Wardell Road / Dudley Street PM Peak	Dudley St	East	L1	78	51%	18.49	LOS B	1.8
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	NorthEast	L3	38	82%	16.08	LOS B	22.4
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	NorthEast	T1	827	82%	10.64	LOS A	22.4
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	SouthWest	R1	28	57%	19.81	LOS B	6.5
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	SouthWest	T1	529	57%	4.33	LOS A	6.5
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	R2	459	65%	12.31	LOS A	11.4
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	T1	1211	65%	2.20	LOS A	11.4
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	L2	6	65%	5.21	LOS A	3.0
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	L2	198	17%	9.32	LOS A	3.7
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	R2	63	95%	85.37	LOS F	9.0
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	T1	62	95%	81.89	LOS F	9.0
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	North	T1	408	73%	58.08	LOS E	14.5
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	North	L2	82	73%	62.77	LOS E	14.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	R2	7	66%	60.88	LOS E	8.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	T1	133	66%	57.47	LOS E	8.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	L2	16	10%	57.97	LOS E	0.8
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	R2	228	46%	31.51	LOS C	10.9
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	T1	644	45%	5.59	LOS A	13.6
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	L2	6	45%	10.31	LOS A	13.6
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	L2	339	61%	33.91	LOS C	15.2
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	R2	55	59%	59.00	LOS E	6.9
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	T1	65	59%	55.53	LOS D	6.9
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	North	T1	1086	60%	21.56	LOS B	23.8
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	North	L2	86	60%	26.12	LOS B	23.5
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	R2	4	35%	56.04	LOS D	4.5
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	T1	78	35%	52.78	LOS D	4.5
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	L2	9	4%	56.84	LOS E	0.5

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	R2	18	24%	8.39	LOS A	1.3
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	T1	254	24%	0.11	LOS A	1.3
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	L2	6	0%	4.61	LOS A	0.0
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	L2	37	8%	7.20	LOS A	0.3
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	R2	9	8%	14.70	LOS B	0.3
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	T1	1	8%	11.02	LOS A	0.3
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	T1	346	30%	0.19	LOS A	1.8
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	L2	1	0%	4.79	LOS A	0.0
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	R2	2	30%	6.30	LOS A	1.8
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	R2	17	8%	13.62	LOS A	0.3
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	T1	6	8%	9.97	LOS A	0.3
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	L2	12	8%	5.62	LOS A	0.3
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	R2	23	40%	7.51	LOS A	2.8
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	T1	449	40%	0.02	LOS A	2.8
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	L2	17	1%	4.59	LOS A	0.0
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	L2	43	15%	6.04	LOS A	0.5
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	R2	20	15%	18.17	LOS B	0.5
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	T1	8	15%	13.72	LOS A	0.5
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	T1	264	25%	0.14	LOS A	1.4
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	L2	16	1%	4.62	LOS A	0.0
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	R2	19	25%	7.83	LOS A	1.4
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	R2	12	7%	18.80	LOS B	0.3
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	T1	3	7%	13.14	LOS A	0.3
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	L2	9	7%	6.76	LOS A	0.3
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	East	T1	671	45%	0.24	LOS A	2.9
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	East	L1	40	9%	5.77	LOS A	0.4
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	West	T1	1712	64%	0.54	LOS A	7.4
H.36 New Canterbury Rd / Terrace Rd AM	Terrace Rd	SouthWest	L3	104	21%	11.86	LOS A	0.8
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	East	T1	1430	56%	0.11	LOS A	4.5
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	East	L1	134	56%	5.52	LOS A	4.4
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	West	T1	860	61%	0.13	LOS A	5.4
H.36 New Canterbury Rd / Terrace Rd PM	Terrace Rd	SouthWest	L3	102	51%	32.78	LOS C	2.0
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	R2	24	44%	30.35	LOS C	9.8
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	T1	337	44%	21.50	LOS B	9.8
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	L2	119	22%	17.71	LOS B	5.0
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	East	L2	55	16%	40.01	LOS C	2.2
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	East	T1	223	54%	36.83	LOS C	9.5
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	T1	665	87%	31.31	LOS C	27.7
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	L2	42	19%	19.00	LOS B	4.2
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	R2	37	87%	40.96	LOS C	27.7
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	R2	186	114%	183.75	LOS F	48.8
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	T1	429	114%	120.24	LOS F	48.8
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	L2	21	46%	27.44	LOS B	6.0
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	R2	43	89%	59.08	LOS E	16.8
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	T1	556	89%	36.48	LOS C	22.0
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	L2	300	71%	26.86	LOS B	22.0
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	East	L2	38	36%	32.18	LOS C	7.8
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	East	T1	602	90%	41.35	LOS C	22.4
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	T1	296	90%	26.48	LOS B	8.9
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	L2	48	36%	24.27	LOS B	8.9
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	R2	63	90%	67.46	LOS E	6.7
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	R2	124	85%	49.92	LOS D	15.0
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	T1	295	85%	34.26	LOS C	15.0
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	L2	46	20%	22.27	LOS B	4.7

3.4 Dulwich Hill Station: Future + Construction + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	R2	24	58%	45.11	LOS D	7.7
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	T1	158	58%	39.94	LOS C	7.7
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	L2	52	12%	32.69	LOS C	2.1
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	L2	32	23%	15.09	LOS B	2.2
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	R2	103	115%	192.11	LOS F	41.0
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	T1	345	115%	150.21	LOS F	41.0
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	T1	278	132%	329.01	LOS F	51.7
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	L2	180	26%	11.88	LOS A	3.5
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	R2	76	132%	359.15	LOS F	51.7
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	West	T1	638	128%	267.61	LOS F	77.8
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	West	L2	25	29%	37.70	LOS C	5.1
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	R2	59	96%	76.68	LOS F	9.6
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	T1	298	96%	46.68	LOS D	13.0
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	L2	105	77%	39.07	LOS C	13.0
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	L2	46	22%	15.47	LOS B	4.3
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	R2	165	111%	146.63	LOS F	72.5
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	T1	798	111%	115.88	LOS F	72.5
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	T1	227	102%	33.33	LOS C	11.2
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	L2	133	61%	29.50	LOS C	11.2
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	R2	97	102%	105.27	LOS F	9.1
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	West	T1	379	111%	146.61	LOS F	31.8
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	West	L2	17	25%	43.69	LOS D	3.1
H.16 Wardell Road / Dudley Street AM Peak	Dudley St	East	R3	25	61%	85.02	LOS F	2.6
H.16 Wardell Road / Dudley Street AM Peak	Dudley St	East	L1	92	61%	22.60	LOS B	2.6
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	NorthEast	L3	35	54%	11.59	LOS A	5.4
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	NorthEast	T1	425	54%	6.20	LOS A	5.4
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	SouthWest	R1	55	100%	62.00	LOS E	46.9
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	SouthWest	T1	758	100%	48.41	LOS D	46.9
H.16 Wardell Road / Dudley Street PM Peak	Dudley St	East	R3	27	71%	72.81	LOS F	3.2
H.16 Wardell Road / Dudley Street PM Peak	Dudley St	East	L1	111	71%	31.33	LOS C	3.2
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	NorthEast	L3	38	82%	16.08	LOS B	22.4
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	NorthEast	T1	827	82%	10.64	LOS A	22.4
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	SouthWest	R1	61	76%	40.52	LOS C	13.7
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	SouthWest	T1	529	76%	10.67	LOS A	13.7
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	R2	529	71%	14.03	LOS A	14.5
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	T1	1211	71%	2.03	LOS A	14.5
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	L2	6	71%	5.27	LOS A	3.8
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	L2	268	27%	9.70	LOS A	5.3
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	R2	63	95%	85.22	LOS F	9.0
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	T1	62	95%	81.73	LOS F	9.0
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	North	T1	408	77%	59.54	LOS E	14.7
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	North	L2	82	77%	64.23	LOS E	14.3
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	R2	7	66%	60.91	LOS E	8.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	T1	133	66%	57.50	LOS E	8.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	L2	16	10%	57.97	LOS E	0.8
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	R2	296	58%	37.33	LOS C	13.0
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	T1	644	44%	4.85	LOS A	12.7
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	L2	6	44%	9.57	LOS A	12.7
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	L2	408	71%	29.66	LOS C	17.8
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	R2	55	69%	62.96	LOS E	7.2
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	T1	65	69%	59.49	LOS E	7.2
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	North	T1	1086	70%	28.91	LOS C	27.7
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	North	L2	86	70%	33.48	LOS C	27.3
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	R2	4	40%	58.43	LOS E	4.6
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	T1	78	40%	55.17	LOS D	4.6
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	L2	9	5%	58.00	LOS E	0.5

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	R2	53	31%	10.99	LOS A	1.7
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	T1	254	31%	0.11	LOS A	1.7
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	L2	6	0%	4.61	LOS A	0.0
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	L2	72	16%	8.78	LOS A	0.6
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	R2	9	16%	16.70	LOS B	0.6
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	T1	1	16%	12.52	LOS A	0.6
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	T1	346	30%	0.19	LOS A	1.8
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	L2	1	0%	4.79	LOS A	0.0
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	R2	2	30%	6.30	LOS A	1.8
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	R2	17	9%	16.06	LOS B	0.3
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	T1	6	9%	10.83	LOS A	0.3
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	L2	12	9%	5.62	LOS A	0.3
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	R2	57	46%	9.40	LOS A	3.3
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	T1	449	46%	0.03	LOS A	3.3
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	L2	17	1%	4.59	LOS A	0.0
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	L2	76	21%	7.05	LOS A	0.8
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	R2	20	21%	21.08	LOS B	0.8
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	T1	8	21%	15.86	LOS B	0.8
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	T1	264	25%	0.14	LOS A	1.4
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	L2	16	1%	4.62	LOS A	0.0
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	R2	19	25%	7.83	LOS A	1.4
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	R2	12	9%	22.64	LOS B	0.3
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	T1	3	9%	14.52	LOS B	0.3
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	L2	9	9%	6.76	LOS A	0.3
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	East	T1	741	52%	0.29	LOS A	3.6
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	East	L1	40	10%	5.78	LOS A	0.4
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	West	T1	1781	68%	0.62	LOS A	8.5
H.36 New Canterbury Rd / Terrace Rd AM	Terrace Rd	SouthWest	L3	104	25%	13.97	LOS A	0.9
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	East	T1	1500	60%	0.13	LOS A	5.2
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	East	L1	134	60%	5.57	LOS A	5.1
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	West	T1	931	69%	0.17	LOS A	7.3
H.36 New Canterbury Rd / Terrace Rd PM	Terrace Rd	SouthWest	L3	102	63%	44.47	LOS D	2.6
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	R2	24	65%	41.75	LOS C	10.8
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	T1	406	65%	24.80	LOS B	10.8
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	L2	119	32%	16.50	LOS B	7.2
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	East	L2	55	34%	51.41	LOS D	2.6
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	East	T1	223	104%	116.82	LOS F	18.0
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	T1	734	117%	170.56	LOS F	71.9
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	L2	42	25%	16.89	LOS B	5.5
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	R2	37	117%	231.33	LOS F	71.9
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	R2	186	97%	81.02	LOS F	24.9
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	T1	429	97%	52.77	LOS D	24.9
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	L2	21	39%	32.34	LOS C	8.5
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	R2	43	98%	84.46	LOS F	15.8
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	T1	627	98%	37.27	LOS C	27.5
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	L2	300	78%	24.24	LOS B	27.5
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	East	L2	38	50%	40.64	LOS C	8.7
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	East	T1	602	125%	222.75	LOS F	60.2
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	T1	367	131%	74.20	LOS F	19.9
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	L2	48	52%	19.48	LOS B	9.6
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	R2	63	131%	348.09	LOS F	19.9
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	R2	124	111%	146.83	LOS F	28.6
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	T1	295	111%	92.89	LOS F	28.6
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	L2	46	26%	28.94	LOS C	5.7

3.5 Dulwich Hill Station: Future + Construction + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	R2	24	57%	45.02	LOS D	7.7
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	T1	158	57%	39.71	LOS C	7.7
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	South	L2	52	11%	31.88	LOS C	2.1
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	L2	32	23%	15.58	LOS B	2.3
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	R2	100	115%	197.75	LOS F	41.6
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	East	T1	345	115%	155.44	LOS F	41.6
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	T1	278	121%	232.16	LOS F	41.8
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	L2	177	24%	13.29	LOS A	3.7
B.15 Wardell Road / Ewart Street - AM Peak	Ewart St	North	R2	76	121%	266.08	LOS F	41.8
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	West	T1	638	128%	267.61	LOS F	77.8
B.15 Wardell Road / Ewart Street - AM Peak	Wardell Rd	West	L2	25	29%	37.70	LOS C	5.1
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	R2	59	99%	86.86	LOS F	10.0
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	T1	298	99%	50.79	LOS D	13.6
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	South	L2	105	79%	41.24	LOS C	13.6
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	L2	46	22%	14.95	LOS B	4.1
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	R2	162	108%	123.01	LOS F	65.4
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	East	T1	798	108%	96.90	LOS F	65.4
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	T1	227	108%	32.69	LOS C	12.1
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	L2	130	65%	31.31	LOS C	12.1
B.15 Wardell Road / Ewart Street - PM Peak	Ewart St	North	R2	97	108%	147.51	LOS F	9.7
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	West	T1	379	111%	146.62	LOS F	31.8
B.15 Wardell Road / Ewart Street - PM Peak	Wardell Rd	West	L2	17	25%	43.69	LOS D	3.1
H.16 Wardell Road / Dudley Street AM Peak	Dudley St	East	R3	25	58%	85.38	LOS F	2.2
H.16 Wardell Road / Dudley Street AM Peak	Dudley St	East	L1	73	58%	22.42	LOS B	2.2
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	NorthEast	L3	35	57%	12.13	LOS A	6.1
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	NorthEast	T1	441	57%	6.91	LOS A	6.1
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	SouthWest	R1	36	99%	55.41	LOS D	44.1
H.16 Wardell Road / Dudley Street AM Peak	Wardell Rd	SouthWest	T1	774	99%	43.34	LOS D	44.1
H.16 Wardell Road / Dudley Street PM Peak	Dudley St	East	R3	27	65%	73.28	LOS F	2.6
H.16 Wardell Road / Dudley Street PM Peak	Dudley St	East	L1	93	65%	27.84	LOS B	2.6
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	NorthEast	L3	38	85%	17.55	LOS B	25.4
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	NorthEast	T1	842	85%	12.32	LOS A	25.4
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	SouthWest	R1	43	68%	33.04	LOS C	10.3
H.16 Wardell Road / Dudley Street PM Peak	Wardell Rd	SouthWest	T1	544	68%	7.42	LOS A	10.3
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	R2	485	68%	13.61	LOS A	13.2
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	T1	1211	68%	2.28	LOS A	13.2
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	South	L2	6	68%	5.23	LOS A	3.3
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	L2	224	21%	9.60	LOS A	4.3
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	R2	63	95%	85.31	LOS F	9.0
B.28 New Canterbury Road / Marrickville Road - AM Peak	Marrickville Rd	East	T1	62	95%	81.83	LOS F	9.0
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	North	T1	408	73%	58.08	LOS E	14.5
B.28 New Canterbury Road / Marrickville Road - AM Peak	New Canterbury Rd	North	L2	82	73%	62.77	LOS E	14.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	R2	7	66%	60.89	LOS E	8.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	T1	133	66%	57.48	LOS E	8.1
B.28 New Canterbury Road / Marrickville Road - AM Peak	Dulwich St	West	L2	16	10%	57.97	LOS E	0.8
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	R2	253	49%	34.74	LOS C	11.6
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	T1	644	44%	5.21	LOS A	13.2
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	South	L2	6	44%	9.93	LOS A	13.2
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	L2	365	64%	30.96	LOS C	15.8
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	R2	55	64%	60.93	LOS E	7.0
B.28 New Canterbury Road / Marrickville Road - PM Peak	Marrickville Rd	East	T1	65	64%	57.46	LOS E	7.0
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	North	T1	1086	65%	25.50	LOS B	26.0
B.28 New Canterbury Road / Marrickville Road - PM Peak	New Canterbury Rd	North	L2	86	65%	30.07	LOS C	25.6

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	R2	4	38%	57.22	LOS E	4.5
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	T1	78	38%	53.95	LOS D	4.5
B.28 New Canterbury Road / Marrickville Road - PM Peak	Dulwich St	West	L2	9	4%	56.84	LOS E	0.5
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	R2	34	27%	10.08	LOS A	1.5
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	T1	254	27%	0.11	LOS A	1.5
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	SouthEast	L2	6	0%	4.61	LOS A	0.0
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	L2	53	12%	8.11	LOS A	0.4
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	R2	9	12%	15.58	LOS B	0.4
H.25 Ewart Street / Bayley Street AM Peak	Bayley St	NorthEast	T1	1	12%	11.69	LOS A	0.4
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	T1	346	30%	0.19	LOS A	1.8
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	L2	1	0%	4.79	LOS A	0.0
H.25 Ewart Street / Bayley Street AM Peak	Ewart St	NorthWest	R2	2	30%	6.30	LOS A	1.8
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	R2	17	8%	14.68	LOS B	0.3
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	T1	6	8%	10.35	LOS A	0.3
H.25 Ewart Street / Bayley Street AM Peak	Dibble Ave	SouthWest	L2	12	8%	5.62	LOS A	0.3
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	R2	39	43%	8.67	LOS A	3.0
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	T1	449	43%	0.03	LOS A	3.0
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	SouthEast	L2	17	1%	4.59	LOS A	0.0
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	L2	58	18%	6.61	LOS A	0.6
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	R2	20	18%	19.43	LOS B	0.6
H.25 Ewart Street / Bayley Street PM Peak	Bayley St	NorthEast	T1	8	18%	14.65	LOS B	0.6
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	T1	264	25%	0.14	LOS A	1.4
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	L2	16	1%	4.62	LOS A	0.0
H.25 Ewart Street / Bayley Street PM Peak	Ewart St	NorthWest	R2	19	25%	7.83	LOS A	1.4
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	R2	12	8%	20.44	LOS B	0.3
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	T1	3	8%	13.75	LOS A	0.3
H.25 Ewart Street / Bayley Street PM Peak	Dibble Ave	SouthWest	L2	9	8%	6.76	LOS A	0.3
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	East	T1	697	47%	0.26	LOS A	3.1
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	East	L1	40	9%	5.77	LOS A	0.4
H.36 New Canterbury Rd / Terrace Rd AM	New Canterbury Rd	West	T1	1737	65%	0.57	LOS A	7.8
H.36 New Canterbury Rd / Terrace Rd AM	Terrace Rd	SouthWest	L3	104	23%	12.58	LOS A	0.8
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	East	T1	1456	58%	0.12	LOS A	4.7
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	East	L1	134	58%	5.54	LOS A	4.7
H.36 New Canterbury Rd / Terrace Rd PM	New Canterbury Rd	West	T1	886	64%	0.14	LOS A	6.0
H.36 New Canterbury Rd / Terrace Rd PM	Terrace Rd	SouthWest	L3	102	55%	36.30	LOS C	2.2
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	R2	24	67%	43.62	LOS D	11.2
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	T1	362	67%	29.35	LOS C	11.2
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	South	L2	135	33%	20.48	LOS B	7.4
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	East	L2	55	18%	42.03	LOS C	2.3
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	East	T1	223	60%	38.96	LOS C	9.8
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	T1	691	120%	194.92	LOS F	73.1
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	L2	42	26%	21.34	LOS B	5.8
H.37 Wardell Rd / Marrickville Rd AM	Marrickville Rd	North	R2	37	120%	258.26	LOS F	73.1
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	R2	201	84%	48.36	LOS D	18.4
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	T1	429	84%	31.84	LOS C	18.4
H.37 Wardell Rd / Marrickville Rd AM	Wardell Rd	West	L2	21	34%	26.12	LOS B	8.2
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	R2	43	102%	103.59	LOS F	20.1
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	T1	582	102%	53.59	LOS D	28.9
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	South	L2	316	81%	31.57	LOS C	28.9
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	East	L2	38	40%	34.90	LOS C	8.2
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	East	T1	602	100%	80.54	LOS F	32.3
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	T1	322	125%	60.85	LOS E	15.7
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	L2	48	50%	23.48	LOS B	9.7
H.37 Wardell Rd / Marrickville Rd PM	Marrickville Rd	North	R2	63	125%	290.96	LOS F	15.7
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	R2	140	109%	130.87	LOS F	25.4
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	T1	295	109%	69.45	LOS E	25.4

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.37 Wardell Rd / Marrickville Rd PM	Wardell Rd	West	L2	46	25%	24.09	LOS B	6.2

4.0 Hurlstone Park Station

4.1 Hurlstone Park Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	R2	88	61%	18.25	LOS B	24.1
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	T1	1529	61%	10.24	LOS B	26.0
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	L1	79	61%	13.35	LOS B	26.0
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	L2	65	35%	46.26	LOS A	5.9
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	R2	31	59%	51.07	LOS A	9.7
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	R1	217	59%	48.28	LOS A	9.7
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd N	North	T1	784	47%	21.28	LOS A	14.7
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd N	North	L2	16	47%	27.03	LOS A	14.6
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	R1	43	46%	49.62	LOS A	7.3
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	L1	147	46%	48.53	LOS A	7.3
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	L3	26	23%	48.46	LOS A	3.4
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	R2	95	60%	24.56	LOS A	16.5
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	T1	1057	60%	11.14	LOS A	23.3
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	L1	58	60%	12.99	LOS A	23.3
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	L2	96	16%	36.60	LOS A	4.1
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	R2	25	74%	60.01	LOS C	13.3
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	R1	197	74%	58.47	LOS C	13.3
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd N	North	T1	1372	66%	11.63	LOS B	20.1
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd N	North	L2	79	66%	17.20	LOS B	20.0
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	R1	65	74%	59.06	LOS C	13.8
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	L1	200	74%	57.51	LOS C	13.8
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	L3	10	15%	53.23	LOS A	2.4
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	R2	898	91%	16.30	LOS B	22.5
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	T1	693	53%	1.73	LOS A	1.7
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	L2	31	53%	6.11	LOS A	1.7
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	L2	368	30%	9.92	LOS A	6.8
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	R2	23	28%	66.85	LOS E	1.4
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	T1	260	88%	61.77	LOS E	16.4
B.27 Old Canterbury Road / New Canterbury Road - AM	Old Canterbury Rd	North	T1	425	77%	55.05	LOS D	12.9
B.27 Old Canterbury Road / New Canterbury Road - AM	Old Canterbury Rd	North	L2	28	77%	59.76	LOS E	12.8
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	R2	9	85%	64.89	LOS E	13.7
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	T1	303	85%	56.30	LOS D	13.7
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	L2	14	34%	61.18	LOS E	5.3
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	R2	507	70%	31.77	LOS C	15.5
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	T1	576	48%	5.69	LOS A	7.1
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	L2	24	48%	10.03	LOS A	7.1
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	L2	686	60%	15.87	LOS B	19.9
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	R2	33	26%	55.94	LOS D	1.7
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	T1	427	85%	47.07	LOS D	22.8
B.27 Old Canterbury Road / New Canterbury Road - PM	Old Canterbury Rd	North	T1	771	81%	46.59	LOS D	21.1
B.27 Old Canterbury Road / New Canterbury Road - PM	Old Canterbury Rd	North	L2	43	81%	52.92	LOS D	20.8
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	R2	24	72%	51.79	LOS D	11.0
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	T1	312	72%	42.64	LOS D	11.0
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	L2	10	29%	40.03	LOS C	5.6
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	East	R2	232	17%	4.97	LOS A	0.8
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	East	T1	27	17%	0.08	LOS A	0.8
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Crinan St	North	L2	314	25%	12.42	LOS A	2.7
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Crinan St	North	R2	26	25%	8.33	LOS A	2.7
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	West	T1	57	5%	0.00	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	West	L2	48	5%	4.62	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	East	R2	231	17%	4.89	LOS A	0.9
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	East	T1	48	17%	0.30	LOS A	0.9
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Crinan St	North	L2	233	21%	13.79	LOS A	2.3

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Crinan St	North	R2	43	21%	8.00	LOS A	2.3
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	West	T1	45	4%	0.00	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	West	L2	41	4%	4.60	LOS A	0.0
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	R2	28	15%	5.45	LOS A	0.4
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	T1	219	15%	0.32	LOS A	0.4
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	L2	21	15%	3.64	LOS A	0.4
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	L2	23	14%	5.73	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	R2	46	14%	11.70	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	T1	4	14%	7.13	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	T1	303	23%	0.04	LOS A	0.8
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	L2	105	23%	4.59	LOS A	0.8
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	R2	8	23%	5.84	LOS A	0.8
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	R2	1	0%	9.97	LOS A	0.0
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	T1	1	0%	6.96	LOS A	0.0
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	L2	1	0%	5.84	LOS A	0.0
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	R2	37	15%	5.03	LOS A	0.4
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	T1	234	15%	0.34	LOS A	0.4
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	L2	10	15%	4.16	LOS A	0.4
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	L2	30	13%	6.10	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	R2	52	13%	9.21	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	T1	7	13%	8.04	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	T1	245	18%	0.17	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	L2	60	18%	4.79	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	R2	14	18%	6.15	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	R2	8	4%	12.24	LOS A	0.1
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	T1	7	4%	7.83	LOS A	0.1
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	L2	12	4%	5.79	LOS A	0.1

4.2 Hurlstone Park Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	R2	97	67%	22.02	LOS B	30.0
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	T1	1679	67%	12.23	LOS B	31.1
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	L1	87	67%	14.09	LOS B	31.1
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	L2	71	39%	46.61	LOS A	6.5
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	R2	34	64%	51.76	LOS B	10.8
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	R1	238	64%	48.87	LOS B	10.8
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd N	North	T1	861	62%	29.27	LOS B	19.3
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd N	North	L2	18	62%	35.02	LOS B	19.1
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	R1	47	50%	50.04	LOS A	8.0
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	L1	161	50%	48.89	LOS A	8.0
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	L3	29	25%	48.68	LOS A	3.7
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	R2	105	74%	33.08	LOS C	18.5
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	T1	1168	74%	14.29	LOS C	36.3
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	L1	64	74%	15.92	LOS C	36.3
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	L2	106	21%	40.92	LOS A	4.9
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	R2	28	78%	59.91	LOS C	14.9
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	R1	218	78%	58.36	LOS C	14.9
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd N	North	T1	1516	68%	8.56	LOS B	19.0
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd N	North	L2	87	68%	14.13	LOS B	18.9
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	R1	71	77%	58.59	LOS C	15.2
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	L1	221	77%	56.74	LOS C	15.2
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	L3	11	16%	51.44	LOS A	2.7
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	R2	961	91%	14.85	LOS B	15.7
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	T1	742	55%	1.72	LOS A	1.9
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	L2	34	55%	6.10	LOS A	1.9
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	L2	393	31%	9.00	LOS A	6.7
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	R2	25	36%	69.52	LOS E	1.5
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	T1	278	103%	120.08	LOS F	24.8
B.27 Old Canterbury Road / New Canterbury Road - AM	Old Canterbury Rd	North	T1	454	99%	93.67	LOS F	19.2
B.27 Old Canterbury Road / New Canterbury Road - AM	Old Canterbury Rd	North	L2	30	99%	98.63	LOS F	19.2
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	R2	10	103%	124.67	LOS F	20.8
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	T1	324	103%	98.71	LOS F	20.8
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	L2	15	41%	63.66	LOS E	6.0
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	R2	560	81%	38.96	LOS C	22.0
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	T1	637	54%	6.50	LOS A	9.3
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	L2	26	54%	10.84	LOS A	9.3
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	L2	758	66%	16.67	LOS B	23.5
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	R2	36	33%	57.72	LOS E	1.9
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	T1	472	91%	53.95	LOS D	27.5
B.27 Old Canterbury Road / New Canterbury Road - PM	Old Canterbury Rd	North	T1	852	90%	56.43	LOS D	26.2
B.27 Old Canterbury Road / New Canterbury Road - PM	Old Canterbury Rd	North	L2	48	90%	63.81	LOS E	26.1
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	R2	26	80%	55.82	LOS D	12.4
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	T1	345	80%	44.58	LOS D	12.4
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	L2	11	32%	39.54	LOS C	6.4
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	East	R2	255	18%	5.02	LOS A	0.9
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	East	T1	29	18%	0.08	LOS A	0.9
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Crinan St	North	L2	345	28%	12.01	LOS A	2.9
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Crinan St	North	R2	28	28%	8.61	LOS A	2.9
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	West	T1	63	6%	0.00	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	West	L2	53	6%	4.62	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	East	R2	256	18%	4.93	LOS A	1.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	East	T1	54	18%	0.34	LOS A	1.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Crinan St	North	L2	258	24%	13.20	LOS A	2.5
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Crinan St	North	R2	48	24%	8.25	LOS A	2.5
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	West	T1	50	5%	0.00	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	West	L2	46	5%	4.60	LOS A	0.0

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	R2	31	16%	5.75	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	T1	240	16%	0.37	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	L2	23	16%	3.64	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	L2	25	17%	5.90	LOS A	0.6
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	R2	51	17%	13.31	LOS A	0.6
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	T1	5	17%	7.74	LOS A	0.6
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	T1	333	25%	0.04	LOS A	0.9
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	L2	116	25%	4.59	LOS A	0.9
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	R2	9	25%	6.02	LOS A	0.9
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	R2	1	1%	11.00	LOS A	0.0
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	T1	1	1%	7.56	LOS A	0.0
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	L2	1	1%	6.06	LOS A	0.0
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	R2	41	17%	5.26	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	T1	259	17%	0.40	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	L2	11	17%	4.24	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	L2	33	16%	6.38	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	R2	57	16%	10.10	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	T1	8	16%	8.99	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	T1	271	19%	0.20	LOS A	0.7
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	L2	66	19%	4.82	LOS A	0.7
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	R2	16	19%	6.45	LOS A	0.7
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	R2	9	6%	14.13	LOS A	0.2
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	T1	8	6%	8.76	LOS A	0.2
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	L2	13	6%	6.00	LOS A	0.2

4.3 Hurlstone Park Station: Future + Construction

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	R2	97	68%	24.02	LOS B	29.8
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	T1	1679	68%	13.41	LOS B	32.6
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	L1	87	68%	14.75	LOS B	32.6
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	L2	71	41%	46.76	LOS A	7.1
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	R2	51	68%	52.27	LOS B	11.2
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	R1	238	68%	48.84	LOS B	11.2
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd N	North	T1	861	66%	30.55	LOS B	20.5
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd N	North	L2	35	66%	36.77	LOS B	19.7
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	R1	47	48%	48.95	LOS A	7.9
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	L1	161	48%	47.82	LOS A	7.9
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	L3	29	24%	47.65	LOS A	3.7
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	R2	105	78%	44.21	LOS C	19.3
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	T1	1168	78%	17.86	LOS C	41.0
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	L1	64	78%	18.21	LOS C	41.0
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	L2	106	19%	38.42	LOS A	4.7
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	R2	45	80%	59.67	LOS C	16.1
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	R1	218	80%	57.81	LOS C	16.1
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd N	North	T1	1516	73%	11.01	LOS C	23.7
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd N	North	L2	104	73%	16.76	LOS C	23.1
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	R1	71	67%	52.71	LOS B	14.2
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	L1	221	67%	51.42	LOS B	14.2
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	L3	11	14%	48.53	LOS A	2.6
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	R2	961	91%	14.85	LOS B	15.7
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	T1	742	55%	1.72	LOS A	1.9
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	L2	34	55%	6.10	LOS A	1.9
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	L2	393	31%	9.00	LOS A	6.7
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	R2	25	36%	69.52	LOS E	1.5
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	T1	278	103%	120.08	LOS F	24.8
B.27 Old Canterbury Road / New Canterbury Road - AM	Old Canterbury Rd	North	T1	454	99%	93.67	LOS F	19.2
B.27 Old Canterbury Road / New Canterbury Road - AM	Old Canterbury Rd	North	L2	30	99%	98.63	LOS F	19.2
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	R2	10	103%	124.67	LOS F	20.8
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	T1	324	103%	98.71	LOS F	20.8
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	L2	15	41%	63.66	LOS E	6.0
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	R2	560	81%	38.96	LOS C	22.0
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	T1	637	54%	6.50	LOS A	9.3
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	L2	26	54%	10.84	LOS A	9.3
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	L2	758	66%	16.67	LOS B	23.5
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	R2	36	33%	57.72	LOS E	1.9
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	T1	472	91%	53.95	LOS D	27.5
B.27 Old Canterbury Road / New Canterbury Road - PM	Old Canterbury Rd	North	T1	852	90%	56.43	LOS D	26.2
B.27 Old Canterbury Road / New Canterbury Road - PM	Old Canterbury Rd	North	L2	48	90%	63.81	LOS E	26.1
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	R2	26	80%	55.82	LOS D	12.4
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	T1	345	80%	44.58	LOS D	12.4
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	L2	11	32%	39.54	LOS C	6.4
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	East	R2	255	19%	5.07	LOS A	1.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	East	T1	29	19%	0.08	LOS A	1.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Crinan St	North	L2	345	29%	12.11	LOS A	3.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Crinan St	North	R2	36	29%	9.52	LOS A	3.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	West	T1	63	7%	0.00	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	West	L2	61	7%	4.73	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	East	R2	256	19%	4.97	LOS A	1.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	East	T1	54	19%	0.38	LOS A	1.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Crinan St	North	L2	258	25%	13.31	LOS A	2.6
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Crinan St	North	R2	56	25%	8.81	LOS A	2.6
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	West	T1	50	5%	0.00	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	West	L2	53	5%	4.72	LOS A	0.0

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	R2	31	17%	5.84	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	T1	248	17%	0.38	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	L2	23	17%	3.64	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	L2	25	18%	5.95	LOS A	0.6
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	R2	51	18%	14.19	LOS A	0.6
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	T1	5	18%	8.10	LOS A	0.6
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	T1	341	27%	0.12	LOS A	1.1
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	L2	116	27%	4.59	LOS A	1.1
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	R2	17	27%	7.16	LOS A	1.1
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	R2	1	2%	11.75	LOS A	0.1
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	T1	1	2%	8.06	LOS A	0.1
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	L2	9	2%	8.37	LOS A	0.1
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	R2	41	18%	5.34	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	T1	267	18%	0.40	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	L2	11	18%	4.25	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	L2	33	17%	6.44	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	R2	57	17%	10.68	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	T1	8	17%	9.41	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	T1	279	21%	0.36	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	L2	66	21%	4.83	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	R2	23	21%	7.67	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	R2	9	7%	15.00	LOS B	0.2
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	T1	8	7%	9.25	LOS A	0.2
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	L2	21	7%	6.79	LOS A	0.2

4.4 Hurlstone Park Station: Future + Construction + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	R2	97	73%	26.40	LOS C	30.4
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	T1	1747	73%	14.43	LOS C	36.2
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	L1	87	73%	14.98	LOS C	36.2
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	L2	82	45%	47.43	LOS A	7.3
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	R2	51	74%	55.18	LOS C	12.3
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	R1	238	74%	51.31	LOS C	12.3
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd N	North	T1	929	73%	31.18	LOS C	22.8
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd N	North	L2	35	73%	37.41	LOS C	22.1
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	R1	47	50%	50.04	LOS A	8.0
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	L1	161	50%	48.89	LOS A	8.0
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	L3	29	25%	48.68	LOS A	3.7
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	R2	105	84%	56.57	LOS C	22.3
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	T1	1237	84%	21.31	LOS C	45.8
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	L1	64	84%	18.94	LOS C	45.8
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	L2	117	22%	37.48	LOS A	5.1
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	R2	45	86%	65.25	LOS C	17.0
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	R1	218	86%	63.39	LOS C	17.0
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd N	North	T1	1584	81%	13.52	LOS C	30.7
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd N	North	L2	104	81%	19.28	LOS C	30.1
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	R1	71	70%	54.40	LOS C	14.5
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	L1	221	70%	52.98	LOS C	14.5
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	L3	11	15%	49.49	LOS A	2.6
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	R2	1030	104%	69.48	LOS E	69.7
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	T1	742	56%	1.74	LOS A	1.9
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	L2	34	56%	6.12	LOS A	1.9
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	L2	462	40%	9.27	LOS A	8.4
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	R2	25	39%	69.93	LOS E	1.5
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	T1	278	98%	87.37	LOS F	21.3
B.27 Old Canterbury Road / New Canterbury Road - AM	Old Canterbury Rd	North	T1	454	106%	114.35	LOS F	23.8
B.27 Old Canterbury Road / New Canterbury Road - AM	Old Canterbury Rd	North	L2	30	106%	95.56	LOS F	23.8
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	R2	10	99%	96.44	LOS F	18.2
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	T1	324	99%	78.45	LOS F	18.2
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	L2	15	39%	62.59	LOS E	6.0
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	R2	631	88%	41.24	LOS C	29.0
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	T1	637	52%	4.83	LOS A	6.9
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	L2	26	52%	9.18	LOS A	6.9
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	L2	828	75%	16.50	LOS B	27.4
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	R2	36	48%	63.08	LOS E	2.0
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	T1	472	100%	87.01	LOS F	35.3
B.27 Old Canterbury Road / New Canterbury Road - PM	Old Canterbury Rd	North	T1	852	101%	81.40	LOS F	35.0
B.27 Old Canterbury Road / New Canterbury Road - PM	Old Canterbury Rd	North	L2	48	101%	70.28	LOS E	29.4
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	R2	26	94%	73.32	LOS F	14.4
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	T1	345	94%	55.70	LOS D	14.4
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	L2	11	37%	42.54	LOS D	7.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	East	R2	266	20%	5.13	LOS A	1.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	East	T1	29	20%	0.08	LOS A	1.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Crinan St	North	L2	345	32%	12.27	LOS A	3.1
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Crinan St	North	R2	48	32%	10.58	LOS A	3.1
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	West	T1	63	7%	0.00	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	West	L2	61	7%	4.73	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	East	R2	267	20%	5.03	LOS A	1.1
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	East	T1	54	20%	0.40	LOS A	1.1
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Crinan St	North	L2	269	26%	13.49	LOS A	2.7
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Crinan St	North	R2	56	26%	8.98	LOS A	2.7
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	West	T1	50	5%	0.00	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	West	L2	53	5%	4.72	LOS A	0.0

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	R2	31	18%	6.00	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	T1	260	18%	0.38	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	L2	23	18%	3.64	LOS A	0.5
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	L2	25	19%	6.04	LOS A	0.6
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	R2	51	19%	14.92	LOS B	0.6
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	T1	5	19%	8.47	LOS A	0.6
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	T1	352	28%	0.13	LOS A	1.1
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	L2	116	28%	4.59	LOS A	1.1
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	R2	17	28%	7.36	LOS A	1.1
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	R2	1	2%	12.30	LOS A	0.1
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	T1	1	2%	8.42	LOS A	0.1
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	L2	9	2%	8.60	LOS A	0.1
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	R2	41	19%	5.46	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	T1	278	19%	0.41	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	L2	11	19%	4.26	LOS A	0.5
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	L2	33	18%	6.54	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	R2	57	18%	11.14	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	T1	8	18%	9.83	LOS A	0.6
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	T1	290	22%	0.37	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	L2	66	22%	4.84	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	R2	23	22%	7.87	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	R2	9	7%	15.72	LOS B	0.2
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	T1	8	7%	9.67	LOS A	0.2
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	L2	21	7%	6.92	LOS A	0.2

4.5 Hurlstone Park Station: Future + Construction + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	R2	112	73%	27.29	LOS C	29.2
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	T1	1704	73%	14.82	LOS C	36.4
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd S	South	L1	87	73%	15.37	LOS C	36.4
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	L2	86	43%	45.76	LOS A	7.1
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	R2	51	72%	53.54	LOS C	12.2
B.14 Canterbury Road / Crinan Street - AM	Crinan St	East	R1	238	72%	49.76	LOS C	12.2
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd N	North	T1	886	71%	32.05	LOS C	21.8
B.14 Canterbury Road / Crinan Street - AM	Canterbury Rd N	North	L2	35	71%	38.27	LOS C	21.0
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	R1	47	48%	48.95	LOS A	7.9
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	L1	161	48%	47.82	LOS A	7.9
B.14 Canterbury Road / Crinan Street - AM	Queen St	NorthWest	L3	29	24%	47.65	LOS A	3.7
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	R2	120	82%	57.35	LOS C	20.0
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	T1	1193	82%	20.65	LOS C	44.1
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd S	South	L1	64	82%	18.92	LOS C	44.1
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	L2	121	21%	33.79	LOS A	5.0
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	R2	45	83%	61.76	LOS C	16.5
B.14 Canterbury Road / Crinan Street - PM	Crinan St	East	R1	218	83%	59.90	LOS C	16.5
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd N	North	T1	1541	83%	18.52	LOS C	35.1
B.14 Canterbury Road / Crinan Street - PM	Canterbury Rd N	North	L2	104	83%	24.40	LOS C	34.4
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	R1	71	67%	52.71	LOS B	14.2
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	L1	221	67%	51.42	LOS B	14.2
B.14 Canterbury Road / Crinan Street - PM	Queen St	NorthWest	L3	11	14%	48.53	LOS A	2.6
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	R2	986	97%	31.74	LOS C	40.4
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	T1	742	56%	1.74	LOS A	1.9
B.27 Old Canterbury Road / New Canterbury Road - AM	Canterbury Rd	South	L2	34	56%	6.12	LOS A	1.9
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	L2	419	35%	9.23	LOS A	7.4
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	R2	25	39%	69.93	LOS E	1.5
B.27 Old Canterbury Road / New Canterbury Road - AM	New Canterbury Rd	East	T1	278	98%	87.37	LOS F	21.3
B.27 Old Canterbury Road / New Canterbury Road - AM	Old Canterbury Rd	North	T1	454	99%	95.69	LOS F	19.2
B.27 Old Canterbury Road / New Canterbury Road - AM	Old Canterbury Rd	North	L2	30	99%	102.84	LOS F	19.2
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	R2	10	99%	96.44	LOS F	18.2
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	T1	324	99%	78.45	LOS F	18.2
B.27 Old Canterbury Road / New Canterbury Road - AM	Griffiths St	West	L2	15	39%	62.59	LOS E	6.0
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	R2	586	89%	46.71	LOS D	27.6
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	T1	637	54%	6.50	LOS A	9.3
B.27 Old Canterbury Road / New Canterbury Road - PM	Canterbury Rd	South	L2	26	54%	10.84	LOS A	9.3
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	L2	783	70%	17.36	LOS B	25.7
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	R2	36	33%	57.71	LOS E	1.9
B.27 Old Canterbury Road / New Canterbury Road - PM	New Canterbury Rd	East	T1	472	91%	53.93	LOS D	27.5
B.27 Old Canterbury Road / New Canterbury Road - PM	Old Canterbury Rd	North	T1	852	90%	56.99	LOS E	26.2
B.27 Old Canterbury Road / New Canterbury Road - PM	Old Canterbury Rd	North	L2	48	90%	64.99	LOS E	26.1
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	R2	26	80%	55.86	LOS D	12.4
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	T1	345	80%	44.60	LOS D	12.4
B.27 Old Canterbury Road / New Canterbury Road - PM	Griffiths St	West	L2	11	32%	39.54	LOS C	6.4
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	East	R2	287	22%	5.24	LOS A	1.1
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	East	T1	29	22%	0.08	LOS A	1.1
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Crinan St	North	L2	345	37%	12.55	LOS A	3.5
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Crinan St	North	R2	68	37%	12.05	LOS A	3.5
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	West	T1	63	7%	0.00	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - AM peak	Floss St	West	L2	61	7%	4.73	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	East	R2	286	22%	5.13	LOS A	1.2
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	East	T1	54	22%	0.44	LOS A	1.2
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Crinan St	North	L2	288	29%	13.81	LOS A	3.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Crinan St	North	R2	56	29%	9.31	LOS A	3.0

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	West	T1	50	5%	0.00	LOS A	0.0
H.17 Crinan St / Floss St (Sth of Railway) - PM peak	Floss St	West	L2	53	5%	4.72	LOS A	0.0
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	R2	47	22%	7.41	LOS A	0.9
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	T1	264	22%	0.98	LOS A	0.9
H.18 Floss / Crinan / Duntroon - AM	Crinan St	South	L2	23	22%	3.64	LOS A	0.9
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	L2	25	21%	6.40	LOS A	0.7
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	R2	51	21%	16.50	LOS B	0.7
H.18 Floss / Crinan / Duntroon - AM	Duntroon Street	East	T1	5	21%	9.36	LOS A	0.7
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	T1	372	30%	0.13	LOS A	1.1
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	L2	116	30%	4.60	LOS A	1.1
H.18 Floss / Crinan / Duntroon - AM	Crinan Street	North	R2	17	30%	7.49	LOS A	1.1
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	R2	1	2%	13.34	LOS A	0.1
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	T1	1	2%	9.10	LOS A	0.1
H.18 Floss / Crinan / Duntroon - AM	Floss Street	West	L2	9	2%	8.69	LOS A	0.1
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	R2	56	22%	6.40	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	T1	282	22%	0.85	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Crinan St	South	L2	11	22%	4.28	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	L2	33	19%	6.71	LOS A	0.7
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	R2	57	19%	12.01	LOS A	0.7
H.18 Floss / Crinan / Duntroon - PM	Duntroon Street	East	T1	8	19%	10.63	LOS A	0.7
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	T1	309	24%	0.36	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	L2	66	24%	4.84	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Crinan Street	North	R2	23	24%	8.01	LOS A	0.8
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	R2	9	8%	17.10	LOS B	0.3
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	T1	8	8%	10.45	LOS A	0.3
H.18 Floss / Crinan / Duntroon - PM	Floss Street	West	L2	21	8%	6.97	LOS A	0.3

5.0 Canterbury Station

5.1 Canterbury Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd E	East	R2	235	63%	28.95	LOS C	9.7
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd E	East	T1	1057	42%	10.20	LOS A	24.4
B.13 Canterbury Road / Wonga Street AM Peak	Wonga St	North	L2	310	63%	42.79	LOS D	20.4
B.13 Canterbury Road / Wonga Street AM Peak	Wonga St	North	R2	77	63%	42.88	LOS D	20.4
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd W	West	T1	1699	79%	15.15	LOS B	32.8
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd W	West	L2	15	79%	20.69	LOS B	32.8
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd E	East	R2	419	76%	31.29	LOS C	18.3
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd E	East	T1	1593	70%	10.64	LOS A	39.4
B.13 Canterbury Road / Wonga Street PM Peak	Wonga St	North	L2	295	48%	29.11	LOS C	17.3
B.13 Canterbury Road / Wonga Street PM Peak	Wonga St	North	R2	114	48%	29.15	LOS C	17.3
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd W	West	T1	1219	76%	27.28	LOS B	29.8
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd W	West	L2	65	76%	32.95	LOS C	29.6
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	East	R2	11	43%	103.17	LOS F	22.4
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	East	T1	1175	43%	12.97	LOS A	22.4
H.14 Canterbury Road / Charles Street AM Peak	Charles St	North	L2	21	9%	18.49	LOS B	0.3
H.14 Canterbury Road / Charles Street AM Peak	Charles St	North	R2	4	67%	812.67	LOS F	1.5
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	West	T1	1904	52%	0.08	LOS A	0.4
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	West	L2	20	52%	8.00	LOS A	0.4
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	East	R2	16	55%	37.29	LOS C	2.8
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	East	T1	1961	55%	1.49	LOS A	2.8
H.14 Canterbury Road / Charles Street PM Peak	Charles St	North	L2	21	2%	4.80	LOS A	0.0
H.14 Canterbury Road / Charles Street PM Peak	Charles St	North	R2	4	53%	560.86	LOS F	1.1
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	West	T1	1464	40%	0.04	LOS A	0.4
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	West	L2	36	40%	6.16	LOS A	0.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	L3	12	36%	19.83	LOS B	14.3
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	R2	12	51%	22.80	LOS B	14.3
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	T1	847	51%	14.76	LOS B	14.3
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	L2	8	80%	71.89	LOS F	8.2
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	L3	21	80%	72.89	LOS F	8.2
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	R1	225	80%	70.50	LOS E	8.6
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L1	14	24%	55.61	LOS D	2.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L2	29	24%	57.49	LOS E	2.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L3	2	24%	58.02	LOS E	2.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	R2	126	74%	68.45	LOS E	8.0
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	T1	1656	73%	5.39	LOS A	17.2
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	L1	268	73%	9.87	LOS A	16.8
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	L2	28	73%	10.94	LOS A	16.8
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	L3	20	59%	12.47	LOS A	15.0
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	R2	18	59%	13.39	LOS A	14.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	T1	1541	59%	6.68	LOS A	15.0
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	L2	9	91%	81.13	LOS F	12.4
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	L3	18	91%	81.97	LOS F	12.4
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	R1	317	91%	79.83	LOS F	12.6
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L1	7	16%	56.14	LOS D	1.9
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L2	24	16%	57.87	LOS E	1.9
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L3	2	16%	58.55	LOS E	1.9
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	R2	183	84%	72.60	LOS F	12.3
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	T1	1179	58%	12.61	LOS A	20.4
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	L1	293	58%	17.05	LOS B	20.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	L2	23	58%	18.16	LOS B	20.1
H.14 Canterbury Road / Close Street AM Peak - Copy	Close St	South	L2	20	3%	7.85	LOS A	0.1
H.14 Canterbury Road / Close Street AM Peak - Copy	Canterbury Rd	East	L2	1	31%	5.98	LOS A	0.0
H.14 Canterbury Road / Close Street AM Peak - Copy	Canterbury Rd	East	T1	1175	31%	0.01	LOS A	0.0

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.14 Canterbury Road / Close Street AM Peak - Copy	Canterbury Rd	West	R2	1	51%	21.48	LOS B	0.1
H.14 Canterbury Road / Close Street AM Peak - Copy	Canterbury Rd	West	T1	1904	51%	0.04	LOS A	0.1
H.14 Canterbury Road / Close Street PM Peak - Copy	Close St	South	L2	18	4%	11.36	LOS A	0.1
H.14 Canterbury Road / Close Street PM Peak - Copy	Canterbury Rd	East	L2	14	52%	5.86	LOS A	0.2
H.14 Canterbury Road / Close Street PM Peak - Copy	Canterbury Rd	East	T1	1961	52%	0.02	LOS A	0.2
H.14 Canterbury Road / Close Street PM Peak - Copy	Canterbury Rd	West	R2	11	43%	51.44	LOS D	15.8
H.14 Canterbury Road / Close Street PM Peak - Copy	Canterbury Rd	West	T1	1464	43%	2.92	LOS A	15.8

5.2 Canterbury Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd E	East	R2	258	66%	73.98	LOS F	15.9
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd E	East	T1	1160	55%	6.58	LOS A	25.6
B.13 Canterbury Road / Wonga Street AM Peak	Wonga St	North	L2	340	82%	55.47	LOS D	26.7
B.13 Canterbury Road / Wonga Street AM Peak	Wonga St	North	R2	84	82%	55.56	LOS D	26.7
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd W	West	T1	1866	80%	14.36	LOS A	36.2
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd W	West	L2	17	80%	19.90	LOS B	36.2
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd E	East	R2	463	66%	59.60	LOS E	23.1
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd E	East	T1	1761	83%	8.06	LOS A	45.7
B.13 Canterbury Road / Wonga Street PM Peak	Wonga St	North	L2	326	64%	39.01	LOS C	23.1
B.13 Canterbury Road / Wonga Street PM Peak	Wonga St	North	R2	126	64%	39.05	LOS C	23.1
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd W	West	T1	1346	77%	23.39	LOS B	31.4
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd W	West	L2	72	77%	29.06	LOS C	31.2
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	East	R2	12	57%	177.04	LOS F	25.7
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	East	T1	1290	57%	22.99	LOS B	25.7
H.14 Canterbury Road / Charles Street AM Peak	Charles St	North	L2	23	13%	24.24	LOS B	0.4
H.14 Canterbury Road / Charles Street AM Peak	Charles St	North	R2	4	67%	724.77	LOS F	1.4
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	West	T1	2091	57%	0.10	LOS A	0.6
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	West	L2	22	57%	8.65	LOS A	0.6
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	East	R2	18	62%	53.24	LOS D	18.2
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	East	T1	2167	62%	2.68	LOS A	18.2
H.14 Canterbury Road / Charles Street PM Peak	Charles St	North	L2	23	2%	4.94	LOS A	0.0
H.14 Canterbury Road / Charles Street PM Peak	Charles St	North	R2	4	53%	483.57	LOS F	1.1
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	West	T1	1618	44%	0.04	LOS A	0.4
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	West	L2	40	44%	6.31	LOS A	0.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	L3	13	38%	19.10	LOS B	15.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	R2	13	54%	22.71	LOS B	16.0
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	T1	931	54%	14.33	LOS A	16.0
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	L2	9	88%	77.54	LOS F	9.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	L3	23	88%	78.54	LOS F	9.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	R1	247	88%	76.07	LOS F	9.9
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L1	16	29%	58.18	LOS E	2.9
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L2	32	29%	60.06	LOS E	2.9
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L3	2	29%	60.59	LOS E	2.9
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	R2	139	88%	77.35	LOS F	9.6
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	T1	1818	78%	5.61	LOS A	21.8
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	L1	294	78%	10.09	LOS A	21.3
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	L2	31	78%	11.15	LOS A	21.3
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	L3	23	67%	14.84	LOS B	22.3
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	R2	20	67%	20.09	LOS B	25.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	T1	1703	67%	11.01	LOS A	25.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	L2	10	87%	74.96	LOS F	13.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	L3	20	87%	75.80	LOS F	13.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	R1	351	87%	73.67	LOS F	13.3
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L1	8	17%	55.22	LOS D	2.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L2	27	17%	56.95	LOS E	2.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L3	2	17%	57.63	LOS E	2.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	R2	202	93%	82.84	LOS F	14.8
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	T1	1302	79%	25.40	LOS B	38.2
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	L1	324	79%	29.84	LOS C	37.5
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	L2	26	79%	30.95	LOS C	37.5
H.14 Canterbury Road / Close Street AM Peak - Copy	Close St	South	L2	22	3%	8.37	LOS A	0.1
H.14 Canterbury Road / Close Street AM Peak - Copy	Canterbury Rd	East	L2	1	35%	6.07	LOS A	0.0
H.14 Canterbury Road / Close Street AM Peak - Copy	Canterbury Rd	East	T1	1290	35%	0.01	LOS A	0.0
H.14 Canterbury Road / Close Street AM Peak - Copy	Canterbury Rd	West	R2	1	56%	28.58	LOS C	0.1
H.14 Canterbury Road / Close Street AM Peak - Copy	Canterbury Rd	West	T1	2091	56%	0.06	LOS A	0.1
H.14 Canterbury Road / Close Street PM Peak - Copy	Close St	South	L2	20	6%	13.19	LOS A	0.2

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.14 Canterbury Road / Close Street PM Peak - Copy	Canterbury Rd	East	L2	15	57%	5.96	LOS A	0.2
H.14 Canterbury Road / Close Street PM Peak - Copy	Canterbury Rd	East	T1	2167	57%	0.02	LOS A	0.2
H.14 Canterbury Road / Close Street PM Peak - Copy	Canterbury Rd	West	R2	12	50%	78.24	LOS F	23.6
H.14 Canterbury Road / Close Street PM Peak - Copy	Canterbury Rd	West	T1	1618	50%	6.21	LOS A	23.6

5.3 Canterbury Station: Future + Construction

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd E	East	R2	258	66%	71.31	LOS F	15.0
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd E	East	T1	1175	59%	7.70	LOS A	28.8
B.13 Canterbury Road / Wonga Street AM Peak	Wonga St	North	L2	340	78%	50.78	LOS D	25.2
B.13 Canterbury Road / Wonga Street AM Peak	Wonga St	North	R2	84	78%	50.87	LOS D	25.2
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd W	West	T1	1878	83%	15.18	LOS B	38.6
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd W	West	L2	17	83%	20.72	LOS B	38.6
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd E	East	R2	463	66%	59.85	LOS E	23.2
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd E	East	T1	1776	84%	8.36	LOS A	46.7
B.13 Canterbury Road / Wonga Street PM Peak	Wonga St	North	L2	326	64%	39.01	LOS C	23.1
B.13 Canterbury Road / Wonga Street PM Peak	Wonga St	North	R2	126	64%	39.05	LOS C	23.1
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd W	West	T1	1359	78%	23.62	LOS B	32.2
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd W	West	L2	72	78%	29.29	LOS C	32.0
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	East	R2	12	46%	94.14	LOS F	20.5
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	East	T1	1305	46%	10.70	LOS A	20.5
H.14 Canterbury Road / Charles Street AM Peak	Charles St	North	L2	25	7%	13.79	LOS A	0.2
H.14 Canterbury Road / Charles Street AM Peak	Charles St	North	R2	4	47%	494.22	LOS F	1.1
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	West	T1	2101	58%	0.11	LOS A	0.6
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	West	L2	23	58%	8.89	LOS A	0.6
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	East	R2	18	61%	40.23	LOS C	3.0
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	East	T1	2182	61%	1.53	LOS A	3.0
H.14 Canterbury Road / Charles Street PM Peak	Charles St	North	L2	25	2%	4.90	LOS A	0.0
H.14 Canterbury Road / Charles Street PM Peak	Charles St	North	R2	4	53%	573.01	LOS F	1.2
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	West	T1	1628	44%	0.05	LOS A	0.4
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	West	L2	41	44%	6.38	LOS A	0.4
H.14 Canterbury Road / Close Street AM Peak	Close St	South	L2	37	7%	9.71	LOS A	0.3
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	East	L2	16	36%	7.78	LOS A	0.3
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	East	T1	1290	36%	0.03	LOS A	0.3
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	West	R2	1	57%	22.33	LOS B	0.1
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	West	T1	2103	57%	0.04	LOS A	0.1
H.14 Canterbury Road / Close Street PM Peak	Close St	South	L2	35	12%	16.76	LOS B	0.4
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	East	L2	31	59%	6.76	LOS A	0.6
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	East	T1	2167	59%	0.03	LOS A	0.6
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	West	R2	12	47%	47.44	LOS D	3.0
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	West	T1	1630	47%	2.33	LOS A	3.0
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	L3	13	39%	19.18	LOS B	15.6
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	R2	13	55%	22.86	LOS B	16.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	T1	946	55%	14.46	LOS A	16.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	L2	9	88%	77.54	LOS F	9.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	L3	23	88%	78.54	LOS F	9.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	R1	247	88%	76.07	LOS F	9.9
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L1	16	39%	59.31	LOS E	3.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L2	43	39%	61.34	LOS E	3.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L3	2	39%	61.73	LOS E	3.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	R2	139	88%	77.35	LOS F	9.6
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	T1	1819	79%	5.69	LOS A	22.8
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	L1	294	79%	10.20	LOS A	21.9
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	L2	42	79%	11.54	LOS A	21.9
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	L3	23	69%	14.96	LOS B	23.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	R2	20	69%	20.25	LOS B	25.7
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	T1	1718	69%	11.13	LOS A	25.7
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	L2	10	87%	74.96	LOS F	13.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	L3	20	87%	75.80	LOS F	13.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	R1	351	87%	73.67	LOS F	13.3
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L1	8	25%	56.41	LOS D	2.7

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L2	38	25%	58.35	LOS E	2.7
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L3	2	25%	58.82	LOS E	2.7
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	R2	202	93%	82.84	LOS F	14.8
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	T1	1304	78%	24.56	LOS B	38.2
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	L1	324	78%	29.02	LOS C	37.0
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	L2	37	78%	30.44	LOS C	37.0

5.4 Canterbury Station: Future + Construction + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd E	East	R2	258	73%	70.59	LOS F	13.8
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd E	East	T1	1255	70%	9.94	LOS A	36.2
B.13 Canterbury Road / Wonga Street AM Peak	Wonga St	North	L2	340	76%	48.86	LOS D	24.6
B.13 Canterbury Road / Wonga Street AM Peak	Wonga St	North	R2	84	76%	48.95	LOS D	24.6
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd W	West	T1	1958	90%	24.80	LOS B	53.8
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd W	West	L2	17	90%	30.34	LOS C	53.8
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd E	East	R2	463	71%	64.79	LOS E	24.1
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd E	East	T1	1855	88%	10.50	LOS A	52.3
B.13 Canterbury Road / Wonga Street PM Peak	Wonga St	North	L2	326	68%	40.95	LOS C	23.8
B.13 Canterbury Road / Wonga Street PM Peak	Wonga St	North	R2	126	68%	40.99	LOS C	23.8
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd W	West	T1	1438	83%	23.40	LOS B	35.7
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd W	West	L2	72	83%	29.07	LOS C	35.7
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	East	R2	12	53%	121.20	LOS F	25.8
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	East	T1	1384	53%	14.88	LOS B	25.8
H.14 Canterbury Road / Charles Street AM Peak	Charles St	North	L2	25	7%	15.05	LOS B	0.3
H.14 Canterbury Road / Charles Street AM Peak	Charles St	North	R2	4	62%	737.33	LOS F	1.5
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	West	T1	2180	62%	0.12	LOS A	0.7
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	West	L2	23	62%	9.23	LOS A	0.7
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	East	R2	18	66%	51.02	LOS D	16.4
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	East	T1	2261	66%	2.08	LOS A	16.4
H.14 Canterbury Road / Charles Street PM Peak	Charles St	North	L2	25	3%	5.03	LOS A	0.0
H.14 Canterbury Road / Charles Street PM Peak	Charles St	North	R2	4	53%	569.54	LOS F	1.2
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	West	T1	1707	48%	0.05	LOS A	0.5
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	West	L2	41	48%	6.45	LOS A	0.5
H.14 Canterbury Road / Close Street AM Peak	Close St	South	L2	37	7%	10.44	LOS A	0.3
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	East	L2	16	40%	7.87	LOS A	0.3
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	East	T1	1369	40%	0.04	LOS A	0.3
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	West	R2	1	61%	28.21	LOS B	0.1
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	West	T1	2182	61%	0.05	LOS A	0.1
H.14 Canterbury Road / Close Street PM Peak	Close St	South	L2	35	13%	18.44	LOS B	0.5
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	East	L2	31	63%	6.84	LOS A	0.6
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	East	T1	2246	63%	0.04	LOS A	0.6
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	West	R2	12	52%	59.48	LOS E	17.1
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	West	T1	1709	52%	3.12	LOS A	17.1
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	L3	13	42%	19.59	LOS B	16.6
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	R2	13	60%	24.76	LOS B	20.3
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	T1	1026	60%	15.70	LOS B	20.3
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	L2	9	88%	77.54	LOS F	9.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	L3	23	88%	78.54	LOS F	9.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	R1	247	88%	76.07	LOS F	9.9
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L1	16	39%	59.31	LOS E	3.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L2	43	39%	61.34	LOS E	3.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L3	2	39%	61.73	LOS E	3.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	R2	139	88%	77.35	LOS F	9.6
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	T1	1899	85%	6.10	LOS A	28.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	L1	294	85%	10.61	LOS A	27.7
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	L2	42	85%	11.95	LOS A	27.7
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	L3	23	75%	15.60	LOS B	27.7
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	R2	20	75%	22.56	LOS B	30.8
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	T1	1799	75%	12.51	LOS A	30.8
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	L2	10	87%	74.96	LOS F	13.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	L3	20	87%	75.80	LOS F	13.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	R1	351	87%	73.67	LOS F	13.3
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L1	8	25%	56.41	LOS D	2.7

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L2	38	25%	58.35	LOS E	2.7
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L3	2	25%	58.82	LOS E	2.7
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	R2	202	93%	82.84	LOS F	14.8
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	T1	1384	84%	26.09	LOS B	43.2
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	L1	324	84%	30.57	LOS C	43.0
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	L2	37	84%	32.00	LOS C	43.0

5.5 Canterbury Station: Future + Construction + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd E	East	R2	258	69%	75.80	LOS F	15.5
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd E	East	T1	1216	61%	6.54	LOS A	27.5
B.13 Canterbury Road / Wonga Street AM Peak	Wonga St	North	L2	340	84%	58.48	LOS E	27.6
B.13 Canterbury Road / Wonga Street AM Peak	Wonga St	North	R2	84	84%	58.57	LOS E	27.6
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd W	West	T1	1919	83%	14.87	LOS B	39.6
B.13 Canterbury Road / Wonga Street AM Peak	Canterbury Rd W	West	L2	17	83%	20.41	LOS B	39.6
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd E	East	R2	463	69%	63.37	LOS E	23.8
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd E	East	T1	1816	86%	9.32	LOS A	49.4
B.13 Canterbury Road / Wonga Street PM Peak	Wonga St	North	L2	326	66%	39.89	LOS C	23.4
B.13 Canterbury Road / Wonga Street PM Peak	Wonga St	North	R2	126	66%	39.93	LOS C	23.4
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd W	West	T1	1399	80%	22.34	LOS B	33.0
B.13 Canterbury Road / Wonga Street PM Peak	Canterbury Rd W	West	L2	72	80%	28.00	LOS B	32.9
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	East	R2	12	49%	106.88	LOS F	23.0
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	East	T1	1345	49%	12.62	LOS A	23.0
H.14 Canterbury Road / Charles Street AM Peak	Charles St	North	L2	25	7%	14.40	LOS A	0.2
H.14 Canterbury Road / Charles Street AM Peak	Charles St	North	R2	4	54%	608.21	LOS F	1.3
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	West	T1	2141	60%	0.12	LOS A	0.7
H.14 Canterbury Road / Charles Street AM Peak	Canterbury Rd	West	L2	23	60%	9.06	LOS A	0.7
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	East	R2	18	64%	45.32	LOS D	3.5
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	East	T1	2222	64%	1.78	LOS A	3.5
H.14 Canterbury Road / Charles Street PM Peak	Charles St	North	L2	25	3%	4.96	LOS A	0.0
H.14 Canterbury Road / Charles Street PM Peak	Charles St	North	R2	4	53%	570.38	LOS F	1.2
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	West	T1	1668	46%	0.05	LOS A	0.5
H.14 Canterbury Road / Charles Street PM Peak	Canterbury Rd	West	L2	41	46%	6.42	LOS A	0.5
H.14 Canterbury Road / Close Street AM Peak	Close St	South	L2	37	7%	10.07	LOS A	0.3
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	East	L2	16	38%	7.82	LOS A	0.3
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	East	T1	1330	38%	0.03	LOS A	0.3
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	West	R2	1	59%	25.10	LOS B	0.1
H.14 Canterbury Road / Close Street AM Peak	Canterbury Rd	West	T1	2143	59%	0.04	LOS A	0.1
H.14 Canterbury Road / Close Street PM Peak	Close St	South	L2	35	12%	17.58	LOS B	0.4
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	East	L2	31	61%	6.80	LOS A	0.6
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	East	T1	2207	61%	0.03	LOS A	0.6
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	West	R2	12	49%	53.14	LOS D	15.6
H.14 Canterbury Road / Close Street PM Peak	Canterbury Rd	West	T1	1670	49%	2.69	LOS A	15.6
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	L3	13	41%	19.39	LOS B	16.1
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	R2	13	58%	23.82	LOS B	18.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	East	T1	986	58%	15.08	LOS B	18.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	L2	9	88%	77.54	LOS F	9.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	L3	23	88%	78.54	LOS F	9.4
H.15 Canterbury Road / Jeffrey Road AM Peak	Jeffrey Rd	NorthEast	R1	247	88%	76.07	LOS F	9.9
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L1	16	39%	59.31	LOS E	3.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L2	43	39%	61.34	LOS E	3.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	L3	2	39%	61.73	LOS E	3.5
H.15 Canterbury Road / Jeffrey Road AM Peak	Broughton St	North	R2	139	88%	77.35	LOS F	9.6
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	T1	1860	82%	5.89	LOS A	25.3
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	L1	294	82%	10.40	LOS A	24.6
H.15 Canterbury Road / Jeffrey Road AM Peak	Canterbury Rd	West	L2	42	82%	11.74	LOS A	24.6
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	L3	23	72%	15.29	LOS B	25.4
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	R2	20	72%	20.71	LOS B	27.6
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	East	T1	1759	72%	11.51	LOS A	27.6
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	L2	10	87%	74.96	LOS F	13.1

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	L3	20	87%	75.80	LOS F	13.1
H.15 Canterbury Road / Jeffrey Road PM Peak	Jeffrey Rd	NorthEast	R1	351	87%	73.67	LOS F	13.3
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L1	8	25%	56.41	LOS D	2.7
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L2	38	25%	58.35	LOS E	2.7
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	L3	2	25%	58.82	LOS E	2.7
H.15 Canterbury Road / Jeffrey Road PM Peak	Broughton St	North	R2	202	93%	82.84	LOS F	14.8
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	T1	1345	80%	23.16	LOS B	38.5
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	L1	324	80%	27.60	LOS B	37.8
H.15 Canterbury Road / Jeffrey Road PM Peak	Canterbury Rd	West	L2	37	80%	29.03	LOS C	37.8

6.0 Campsie Station

6.1 Campsie Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St S	South	T1	365	60%	15.61	LOS B	12.0
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St S	South	L2	383	41%	4.43	LOS A	3.2
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St N	North	T1	307	43%	9.05	LOS A	7.3
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St N	North	R2	101	34%	24.25	LOS B	3.4
B.10 Beamish Street / Ninth Avenue AM Peak	Ninth Ave	West	R2	320	57%	25.93	LOS B	10.8
B.10 Beamish Street / Ninth Avenue AM Peak	Ninth Ave	West	L2	295	43%	19.60	LOS B	7.5
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St S	South	T1	347	61%	20.25	LOS B	12.9
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St S	South	L2	373	42%	6.21	LOS A	5.2
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St N	North	T1	437	52%	10.57	LOS A	11.9
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St N	North	R2	188	54%	28.81	LOS C	7.5
B.10 Beamish Street / Ninth Avenue PM Peak	Ninth Ave	West	R2	337	59%	27.57	LOS B	12.1
B.10 Beamish Street / Ninth Avenue PM Peak	Ninth Ave	West	L2	188	22%	12.41	LOS A	2.7
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St S	South	R2	65	70%	16.87	LOS B	25.5
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St S	South	T1	674	70%	13.06	LOS A	25.5
B.11 Beamish Street / Clissold Parade AM Peak	Clissold Pde	East	L2	48	16%	41.30	LOS C	2.0
B.11 Beamish Street / Clissold Parade AM Peak	Clissold Pde	East	R2	39	17%	46.23	LOS D	1.7
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St N	North	T1	622	40%	10.53	LOS A	10.4
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St N	North	L2	45	40%	13.81	LOS A	10.2
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St S	South	R2	109	82%	20.70	LOS B	25.5
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St S	South	T1	597	82%	16.82	LOS B	25.5
B.11 Beamish Street / Clissold Parade PM Peak	Clissold Pde	East	L2	65	18%	40.79	LOS C	2.8
B.11 Beamish Street / Clissold Parade PM Peak	Clissold Pde	East	R2	102	74%	56.76	LOS E	5.4
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St N	North	T1	657	79%	13.93	LOS A	22.7
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St N	North	L2	65	6%	4.18	LOS A	0.4
B.12 Beamish Street / South Parade AM Peak	Beamish St S	South	R2	12	59%	18.26	LOS B	20.3
B.12 Beamish Street / South Parade AM Peak	Beamish St S	South	T1	565	59%	14.51	LOS B	20.3
B.12 Beamish Street / South Parade AM Peak	South Parade	East	L2	47	39%	51.53	LOS D	2.3
B.12 Beamish Street / South Parade AM Peak	South Parade	East	R2	122	73%	53.61	LOS D	6.1
B.12 Beamish Street / South Parade AM Peak	Beamish St N	North	T1	467	66%	12.77	LOS A	15.8
B.12 Beamish Street / South Parade AM Peak	Beamish St N	North	L2	189	23%	14.22	LOS A	5.5
B.12 Beamish Street / South Parade AM Peak	Lilian St	West	T1	47	33%	41.44	LOS C	3.7
B.12 Beamish Street / South Parade AM Peak	Lilian St	West	L2	36	33%	44.87	LOS D	3.7
B.12 Beamish Street / South Parade PM Peak	Beamish St S	South	R2	10	65%	18.30	LOS B	21.8
B.12 Beamish Street / South Parade PM Peak	Beamish St S	South	T1	571	65%	14.56	LOS B	21.8
B.12 Beamish Street / South Parade PM Peak	South Parade	East	L2	32	44%	58.36	LOS E	1.7
B.12 Beamish Street / South Parade PM Peak	South Parade	East	R2	110	83%	61.04	LOS E	6.1
B.12 Beamish Street / South Parade PM Peak	Beamish St N	North	T1	559	76%	13.75	LOS A	20.8
B.12 Beamish Street / South Parade PM Peak	Beamish St N	North	L2	175	21%	12.70	LOS A	5.0
B.12 Beamish Street / South Parade PM Peak	Lilian St	West	T1	35	41%	48.24	LOS D	3.6
B.12 Beamish Street / South Parade PM Peak	Lilian St	West	L2	39	41%	51.65	LOS D	3.6
H.11 Beamish Street / North Parade AM Peak	Beamish St	South	T1	626	32%	0.32	LOS A	0.8
H.11 Beamish Street / North Parade AM Peak	Beamish St	South	L2	48	19%	13.74	LOS A	0.8
H.11 Beamish Street / North Parade AM Peak	North Pde	East	L2	35	35%	41.70	LOS C	1.0
H.11 Beamish Street / North Parade AM Peak	Beamish St	North	T1	646	42%	0.57	LOS A	1.1
H.11 Beamish Street / North Parade AM Peak	Beamish St	North	L2	35	42%	7.71	LOS A	1.1
H.11 Beamish Street / North Parade AM Peak	North Pde	West	L2	56	56%	49.98	LOS D	1.9
H.11 Beamish Street / North Parade PM Peak	Beamish St	South	T1	667	34%	0.40	LOS A	1.1
H.11 Beamish Street / North Parade PM Peak	Beamish St	South	L2	59	27%	19.59	LOS B	1.1
H.11 Beamish Street / North Parade PM Peak	North Pde	East	L2	35	27%	31.23	LOS C	0.8
H.11 Beamish Street / North Parade PM Peak	Beamish St	North	T1	645	40%	0.45	LOS A	0.8
H.11 Beamish Street / North Parade PM Peak	Beamish St	North	L2	30	40%	7.58	LOS A	0.8
H.11 Beamish Street / North Parade PM Peak	North Pde	West	L2	44	55%	63.84	LOS E	1.8
H.12 Beamish Street / Amy Street AM Peak	Beamish St	South	T1	501	45%	7.43	LOS A	13.8

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.12 Beamish Street / Amy Street AM Peak	Beamish St	South	L2	74	45%	10.84	LOS A	13.8
H.12 Beamish Street / Amy Street AM Peak	Beamish St	North	T1	529	37%	3.28	LOS A	8.3
H.12 Beamish Street / Amy Street AM Peak	Beamish St	North	R2	4	37%	6.81	LOS A	8.3
H.12 Beamish Street / Amy Street AM Peak	Amy St	West	L2	37	40%	67.72	LOS E	2.3
H.12 Beamish Street / Amy Street PM Peak	Beamish St	South	T1	493	84%	8.01	LOS A	15.0
H.12 Beamish Street / Amy Street PM Peak	Beamish St	South	L2	102	84%	11.43	LOS A	15.0
H.12 Beamish Street / Amy Street PM Peak	Beamish St	North	T1	589	36%	1.45	LOS A	8.0
H.12 Beamish Street / Amy Street PM Peak	Beamish St	North	R2	2	36%	4.98	LOS A	8.0
H.12 Beamish Street / Amy Street PM Peak	Amy St	West	L2	80	57%	69.95	LOS E	5.2
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	R2	357	90%	50.98	LOS D	18.9
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	T1	599	90%	61.01	LOS E	21.5
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	L2	87	68%	62.76	LOS E	21.5
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	East	L2	265	40%	28.85	LOS C	17.2
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	East	T1	714	40%	23.24	LOS B	17.5
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	T1	382	94%	73.53	LOS F	15.2
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	L2	51	85%	70.02	LOS E	15.2
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	R2	69	23%	58.72	LOS E	3.9
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	R2	275	93%	78.30	LOS F	19.1
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	T1	1354	47%	13.42	LOS A	17.5
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	L2	74	38%	18.88	LOS B	17.5
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	R2	355	83%	41.85	LOS C	16.4
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	T1	418	66%	46.42	LOS D	13.1
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	L2	90	43%	53.87	LOS D	13.1
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	East	L2	177	42%	22.99	LOS B	18.0
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	East	T1	1044	42%	17.42	LOS B	18.1
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	T1	392	94%	70.28	LOS E	15.5
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	L2	46	84%	67.89	LOS E	15.5
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	R2	117	58%	59.83	LOS E	6.7
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	R2	172	61%	67.48	LOS E	10.5
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	T1	945	34%	17.95	LOS B	17.6
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	L2	91	27%	23.36	LOS B	17.6
H.34 Ninth Ave / Loch St AM	Loch St	South	R2	526	66%	7.15	LOS A	7.0
H.34 Ninth Ave / Loch St AM	Loch St	South	L2	252	66%	5.26	LOS A	7.0
H.34 Ninth Ave / Loch St AM	Ninth Ave	East	L2	430	66%	7.42	LOS A	7.3
H.34 Ninth Ave / Loch St AM	Ninth Ave	East	T1	202	66%	6.78	LOS A	7.3
H.34 Ninth Ave / Loch St AM	Ninth Ave	West	R2	364	81%	18.14	LOS B	12.9
H.34 Ninth Ave / Loch St AM	Ninth Ave	West	T1	294	81%	15.55	LOS B	12.9
H.34 Ninth Ave / Loch St PM	Loch St	South	R2	444	78%	11.99	LOS A	11.7
H.34 Ninth Ave / Loch St PM	Loch St	South	L2	378	78%	9.92	LOS A	11.7
H.34 Ninth Ave / Loch St PM	Ninth Ave	East	L2	587	84%	11.51	LOS A	15.4
H.34 Ninth Ave / Loch St PM	Ninth Ave	East	T1	285	84%	11.11	LOS A	15.4
H.34 Ninth Ave / Loch St PM	Ninth Ave	West	R2	333	68%	13.05	LOS A	8.0
H.34 Ninth Ave / Loch St PM	Ninth Ave	West	T1	253	68%	10.40	LOS A	8.0

6.2 Campsie Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St S	South	T1	400	101%	108.27	LOS F	35.5
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St S	South	L2	421	48%	5.96	LOS A	5.8
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St N	North	T1	337	56%	15.67	LOS B	10.9
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St N	North	R2	111	63%	48.74	LOS D	5.3
B.10 Beamish Street / Ninth Avenue AM Peak	Ninth Ave	West	R2	351	46%	14.89	LOS B	7.1
B.10 Beamish Street / Ninth Avenue AM Peak	Ninth Ave	West	L2	324	31%	5.39	LOS A	1.3
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St S	South	T1	383	81%	36.78	LOS C	19.9
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St S	South	L2	412	51%	9.87	LOS A	9.0
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St N	North	T1	483	58%	11.18	LOS A	13.9
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St N	North	R2	207	60%	37.45	LOS C	9.0
B.10 Beamish Street / Ninth Avenue PM Peak	Ninth Ave	West	R2	372	65%	28.05	LOS B	14.0
B.10 Beamish Street / Ninth Avenue PM Peak	Ninth Ave	West	L2	207	20%	5.59	LOS A	0.9
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St S	South	R2	71	75%	21.99	LOS B	28.0
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St S	South	T1	740	75%	17.95	LOS B	28.0
B.11 Beamish Street / Clissold Parade AM Peak	Clissold Pde	East	L2	53	6%	16.84	LOS B	1.3
B.11 Beamish Street / Clissold Parade AM Peak	Clissold Pde	East	R2	43	23%	48.81	LOS D	2.0
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St N	North	T1	683	81%	38.39	LOS C	18.4
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St N	North	L2	50	81%	41.31	LOS C	18.1
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St S	South	R2	121	105%	104.37	LOS F	66.6
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St S	South	T1	660	105%	98.49	LOS F	66.6
B.11 Beamish Street / Clissold Parade PM Peak	Clissold Pde	East	L2	72	22%	41.96	LOS C	3.1
B.11 Beamish Street / Clissold Parade PM Peak	Clissold Pde	East	R2	113	84%	61.19	LOS E	6.3
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St N	North	T1	726	87%	23.79	LOS B	32.2
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St N	North	L2	72	6%	4.06	LOS A	0.4
B.12 Beamish Street / South Parade AM Peak	Beamish St S	South	R2	13	65%	19.92	LOS B	23.4
B.12 Beamish Street / South Parade AM Peak	Beamish St S	South	T1	620	65%	16.17	LOS B	23.4
B.12 Beamish Street / South Parade AM Peak	South Parade	East	L2	52	43%	51.77	LOS D	2.5
B.12 Beamish Street / South Parade AM Peak	South Parade	East	R2	134	83%	57.64	LOS E	7.1
B.12 Beamish Street / South Parade AM Peak	Beamish St N	North	T1	513	73%	14.09	LOS A	18.2
B.12 Beamish Street / South Parade AM Peak	Beamish St N	North	L2	207	25%	14.42	LOS A	6.1
B.12 Beamish Street / South Parade AM Peak	Lilian St	West	T1	52	36%	41.68	LOS C	4.1
B.12 Beamish Street / South Parade AM Peak	Lilian St	West	L2	40	36%	45.11	LOS D	4.1
B.12 Beamish Street / South Parade PM Peak	Beamish St S	South	R2	11	74%	21.23	LOS B	25.9
B.12 Beamish Street / South Parade PM Peak	Beamish St S	South	T1	631	74%	17.50	LOS B	25.9
B.12 Beamish Street / South Parade PM Peak	South Parade	East	L2	35	41%	56.80	LOS E	1.8
B.12 Beamish Street / South Parade PM Peak	South Parade	East	R2	122	86%	62.78	LOS E	6.8
B.12 Beamish Street / South Parade PM Peak	Beamish St N	North	T1	618	86%	24.88	LOS B	28.8
B.12 Beamish Street / South Parade PM Peak	Beamish St N	North	L2	193	24%	13.32	LOS A	5.7
B.12 Beamish Street / South Parade PM Peak	Lilian St	West	T1	39	41%	47.18	LOS D	3.9
B.12 Beamish Street / South Parade PM Peak	Lilian St	West	L2	43	41%	50.58	LOS D	3.9
H.11 Beamish Street / North Parade AM Peak	Beamish St	South	T1	687	35%	0.41	LOS A	1.0
H.11 Beamish Street / North Parade AM Peak	Beamish St	South	L2	53	24%	16.82	LOS B	1.0
H.11 Beamish Street / North Parade AM Peak	North Pde	East	L2	38	57%	72.79	LOS F	1.7
H.11 Beamish Street / North Parade AM Peak	Beamish St	North	T1	710	46%	0.76	LOS A	1.4
H.11 Beamish Street / North Parade AM Peak	Beamish St	North	L2	38	46%	8.83	LOS A	1.4
H.11 Beamish Street / North Parade AM Peak	North Pde	West	L2	61	91%	130.46	LOS F	4.3
H.11 Beamish Street / North Parade PM Peak	Beamish St	South	T1	727	37%	0.53	LOS A	1.5
H.11 Beamish Street / North Parade PM Peak	Beamish St	South	L2	64	35%	24.76	LOS B	1.5
H.11 Beamish Street / North Parade PM Peak	North Pde	East	L2	38	42%	48.88	LOS D	1.2
H.11 Beamish Street / North Parade PM Peak	Beamish St	North	T1	703	43%	0.58	LOS A	1.0
H.11 Beamish Street / North Parade PM Peak	Beamish St	North	L2	33	43%	8.51	LOS A	1.0
H.11 Beamish Street / North Parade PM Peak	North Pde	West	L2	48	103%	241.51	LOS F	5.7
H.12 Beamish Street / Amy Street AM Peak	Beamish St	South	T1	550	51%	8.77	LOS A	16.9
H.12 Beamish Street / Amy Street AM Peak	Beamish St	South	L2	82	51%	12.18	LOS A	16.9
H.12 Beamish Street / Amy Street AM Peak	Beamish St	North	T1	580	41%	3.42	LOS A	9.6
H.12 Beamish Street / Amy Street AM Peak	Beamish St	North	R2	4	41%	6.96	LOS A	9.6

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.12 Beamish Street / Amy Street AM Peak	Amy St	West	L2	40	44%	67.93	LOS E	2.5
H.12 Beamish Street / Amy Street PM Peak	Beamish St	South	T1	545	106%	93.47	LOS F	68.2
H.12 Beamish Street / Amy Street PM Peak	Beamish St	South	L2	113	106%	96.88	LOS F	68.2
H.12 Beamish Street / Amy Street PM Peak	Beamish St	North	T1	651	40%	1.88	LOS A	10.7
H.12 Beamish Street / Amy Street PM Peak	Beamish St	North	R2	2	40%	5.42	LOS A	10.7
H.12 Beamish Street / Amy Street PM Peak	Amy St	West	L2	88	52%	67.46	LOS E	5.6
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	R2	392	95%	61.08	LOS E	23.1
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	T1	658	81%	49.18	LOS D	23.1
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	L2	96	61%	56.09	LOS D	23.1
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	East	L2	291	50%	34.28	LOS C	22.3
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	East	T1	784	50%	28.66	LOS C	22.7
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	T1	420	88%	64.20	LOS E	15.8
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	L2	55	79%	65.01	LOS E	15.8
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	R2	76	37%	65.80	LOS E	4.6
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	R2	302	92%	73.79	LOS F	20.3
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	T1	1487	53%	14.47	LOS A	20.7
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	L2	81	42%	19.93	LOS B	20.7
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	R2	392	94%	55.74	LOS D	21.5
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	T1	462	64%	42.93	LOS D	14.1
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	L2	99	41%	51.38	LOS D	14.1
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	East	L2	195	46%	22.48	LOS B	19.9
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	East	T1	1154	46%	16.91	LOS B	20.1
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	T1	434	88%	62.31	LOS E	16.5
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	L2	51	80%	63.71	LOS E	16.5
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	R2	130	92%	81.75	LOS F	9.2
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	R2	191	84%	73.72	LOS F	12.4
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	T1	1044	38%	18.86	LOS B	20.1
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	L2	100	30%	24.28	LOS B	20.1
H.34 Ninth Ave / Loch St AM	Loch St	South	R2	577	75%	8.73	LOS A	10.2
H.34 Ninth Ave / Loch St AM	Loch St	South	L2	276	75%	6.84	LOS A	10.2
H.34 Ninth Ave / Loch St AM	Ninth Ave	East	L2	472	75%	9.90	LOS A	10.3
H.34 Ninth Ave / Loch St AM	Ninth Ave	East	T1	222	75%	9.26	LOS A	10.3
H.34 Ninth Ave / Loch St AM	Ninth Ave	West	R2	400	97%	43.84	LOS D	29.9
H.34 Ninth Ave / Loch St AM	Ninth Ave	West	T1	323	97%	41.25	LOS C	29.9
H.34 Ninth Ave / Loch St PM	Loch St	South	R2	490	88%	17.49	LOS B	19.5
H.34 Ninth Ave / Loch St PM	Loch St	South	L2	417	88%	15.41	LOS B	19.5
H.34 Ninth Ave / Loch St PM	Ninth Ave	East	L2	648	97%	28.71	LOS C	33.8
H.34 Ninth Ave / Loch St PM	Ninth Ave	East	T1	315	97%	28.31	LOS B	33.8
H.34 Ninth Ave / Loch St PM	Ninth Ave	West	R2	368	80%	17.81	LOS B	12.3
H.34 Ninth Ave / Loch St PM	Ninth Ave	West	T1	280	80%	15.15	LOS B	12.3

6.3 Campsie Station: Future + Construction

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St S	South	T1	416	104%	123.76	LOS F	39.6
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St S	South	L2	421	46%	5.15	LOS A	4.8
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St N	North	T1	337	56%	15.67	LOS B	10.9
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St N	North	R2	111	77%	54.53	LOS D	5.6
B.10 Beamish Street / Ninth Avenue AM Peak	Ninth Ave	West	R2	351	46%	14.89	LOS B	7.1
B.10 Beamish Street / Ninth Avenue AM Peak	Ninth Ave	West	L2	324	33%	7.60	LOS A	2.7
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St S	South	T1	399	103%	117.13	LOS F	37.0
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St S	South	L2	412	52%	10.34	LOS A	9.4
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St N	North	T1	483	59%	11.79	LOS A	14.3
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St N	North	R2	207	67%	45.58	LOS D	9.2
B.10 Beamish Street / Ninth Avenue PM Peak	Ninth Ave	West	R2	372	63%	26.75	LOS B	13.4
B.10 Beamish Street / Ninth Avenue PM Peak	Ninth Ave	West	L2	207	19%	4.31	LOS A	0.4
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St S	South	R2	71	78%	21.45	LOS B	31.0
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St S	South	T1	756	78%	17.44	LOS B	31.0
B.11 Beamish Street / Clissold Parade AM Peak	Clissold Pde	East	L2	53	7%	19.76	LOS B	1.4
B.11 Beamish Street / Clissold Parade AM Peak	Clissold Pde	East	R2	43	23%	48.81	LOS D	2.0
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St N	North	T1	683	71%	29.82	LOS C	16.3
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St N	North	L2	50	71%	32.80	LOS C	16.0
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St S	South	R2	121	107%	121.71	LOS F	73.2
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St S	South	T1	675	107%	115.47	LOS F	73.2
B.11 Beamish Street / Clissold Parade PM Peak	Clissold Pde	East	L2	72	22%	41.96	LOS C	3.1
B.11 Beamish Street / Clissold Parade PM Peak	Clissold Pde	East	R2	113	84%	61.19	LOS E	6.3
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St N	North	T1	726	87%	23.79	LOS B	32.2
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St N	North	L2	72	6%	4.06	LOS A	0.4
B.12 Beamish Street / South Parade AM Peak	Beamish St S	South	R2	13	67%	20.18	LOS B	23.9
B.12 Beamish Street / South Parade AM Peak	Beamish St S	South	T1	628	67%	16.42	LOS B	23.9
B.12 Beamish Street / South Parade AM Peak	South Parade	East	L2	54	45%	52.00	LOS D	2.6
B.12 Beamish Street / South Parade AM Peak	South Parade	East	R2	134	85%	58.92	LOS E	7.2
B.12 Beamish Street / South Parade AM Peak	Beamish St N	North	T1	513	73%	14.09	LOS A	18.2
B.12 Beamish Street / South Parade AM Peak	Beamish St N	North	L2	207	25%	14.42	LOS A	6.1
B.12 Beamish Street / South Parade AM Peak	Lilian St	West	T1	52	42%	43.15	LOS D	4.5
B.12 Beamish Street / South Parade AM Peak	Lilian St	West	L2	48	42%	46.66	LOS D	4.5
B.12 Beamish Street / South Parade PM Peak	Beamish St S	South	R2	11	75%	21.61	LOS B	26.5
B.12 Beamish Street / South Parade PM Peak	Beamish St S	South	T1	639	75%	17.86	LOS B	26.5
B.12 Beamish Street / South Parade PM Peak	South Parade	East	L2	37	45%	57.08	LOS E	1.9
B.12 Beamish Street / South Parade PM Peak	South Parade	East	R2	122	94%	72.60	LOS F	7.4
B.12 Beamish Street / South Parade PM Peak	Beamish St N	North	T1	618	86%	24.88	LOS B	28.8
B.12 Beamish Street / South Parade PM Peak	Beamish St N	North	L2	193	24%	13.32	LOS A	5.7
B.12 Beamish Street / South Parade PM Peak	Lilian St	West	T1	39	49%	47.96	LOS D	4.4
B.12 Beamish Street / South Parade PM Peak	Lilian St	West	L2	51	49%	51.46	LOS D	4.4
H.11 Beamish Street / North Parade AM Peak	Beamish St	South	T1	695	36%	0.52	LOS A	1.4
H.11 Beamish Street / North Parade AM Peak	Beamish St	South	L2	61	31%	20.23	LOS B	1.4
H.11 Beamish Street / North Parade AM Peak	North Pde	East	L2	38	57%	72.79	LOS F	1.7
H.11 Beamish Street / North Parade AM Peak	Beamish St	North	T1	710	46%	0.76	LOS A	1.4
H.11 Beamish Street / North Parade AM Peak	Beamish St	North	L2	38	46%	8.83	LOS A	1.4
H.11 Beamish Street / North Parade AM Peak	North Pde	West	L2	69	121%	320.66	LOS F	12.0
H.11 Beamish Street / North Parade PM Peak	Beamish St	South	T1	735	39%	0.01	LOS A	0.0
H.11 Beamish Street / North Parade PM Peak	Beamish St	South	L2	72	44%	29.96	LOS C	1.6
H.11 Beamish Street / North Parade PM Peak	North Pde	East	L2	38	42%	48.88	LOS D	1.2
H.11 Beamish Street / North Parade PM Peak	Beamish St	North	T1	703	43%	0.58	LOS A	1.0
H.11 Beamish Street / North Parade PM Peak	Beamish St	North	L2	33	43%	8.51	LOS A	1.0
H.11 Beamish Street / North Parade PM Peak	North Pde	West	L2	56	178%	876.97	LOS F	20.2
H.12 Beamish Street / Amy Street AM Peak	Beamish St	South	T1	558	52%	8.87	LOS A	17.3
H.12 Beamish Street / Amy Street AM Peak	Beamish St	South	L2	82	52%	12.28	LOS A	17.3
H.12 Beamish Street / Amy Street AM Peak	Beamish St	North	T1	582	41%	3.44	LOS A	9.6
H.12 Beamish Street / Amy Street AM Peak	Beamish St	North	R2	4	41%	6.97	LOS A	9.6

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.12 Beamish Street / Amy Street AM Peak	Amy St	West	L2	40	44%	67.93	LOS E	2.5
H.12 Beamish Street / Amy Street PM Peak	Beamish St	South	T1	552	107%	106.55	LOS F	72.5
H.12 Beamish Street / Amy Street PM Peak	Beamish St	South	L2	113	107%	109.96	LOS F	72.5
H.12 Beamish Street / Amy Street PM Peak	Beamish St	North	T1	653	40%	1.88	LOS A	10.7
H.12 Beamish Street / Amy Street PM Peak	Beamish St	North	R2	2	40%	5.41	LOS A	10.7
H.12 Beamish Street / Amy Street PM Peak	Amy St	West	L2	88	52%	67.46	LOS E	5.6
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	R2	392	95%	61.08	LOS E	23.1
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	T1	658	81%	49.18	LOS D	23.1
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	L2	96	61%	56.09	LOS D	23.1
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	East	L2	291	50%	34.28	LOS C	22.3
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	East	T1	784	50%	28.66	LOS C	22.7
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	T1	420	88%	64.20	LOS E	15.8
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	L2	55	79%	65.01	LOS E	15.8
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	R2	76	37%	65.80	LOS E	4.6
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	R2	302	92%	73.79	LOS F	20.3
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	T1	1487	53%	14.47	LOS A	20.7
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	L2	81	42%	19.93	LOS B	20.7
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	R2	392	94%	55.74	LOS D	21.5
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	T1	462	64%	42.93	LOS D	14.1
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	L2	99	41%	51.38	LOS D	14.1
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	East	L2	195	46%	22.48	LOS B	19.9
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	East	T1	1154	46%	16.91	LOS B	20.1
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	T1	434	88%	62.31	LOS E	16.5
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	L2	51	80%	63.71	LOS E	16.5
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	R2	130	92%	81.75	LOS F	9.2
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	R2	191	84%	73.72	LOS F	12.4
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	T1	1044	38%	18.86	LOS B	20.1
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	L2	100	30%	24.28	LOS B	20.1
H.34 Ninth Ave / Loch St AM	Loch St	South	R2	577	75%	8.73	LOS A	10.2
H.34 Ninth Ave / Loch St AM	Loch St	South	L2	276	75%	6.84	LOS A	10.2
H.34 Ninth Ave / Loch St AM	Ninth Ave	East	L2	472	75%	9.90	LOS A	10.3
H.34 Ninth Ave / Loch St AM	Ninth Ave	East	T1	222	75%	9.26	LOS A	10.3
H.34 Ninth Ave / Loch St AM	Ninth Ave	West	R2	400	97%	43.84	LOS D	29.9
H.34 Ninth Ave / Loch St AM	Ninth Ave	West	T1	323	97%	41.25	LOS C	29.9
H.34 Ninth Ave / Loch St PM	Loch St	South	R2	490	88%	17.49	LOS B	19.5
H.34 Ninth Ave / Loch St PM	Loch St	South	L2	417	88%	15.41	LOS B	19.5
H.34 Ninth Ave / Loch St PM	Ninth Ave	East	L2	648	97%	28.71	LOS C	33.8
H.34 Ninth Ave / Loch St PM	Ninth Ave	East	T1	315	97%	28.31	LOS B	33.8
H.34 Ninth Ave / Loch St PM	Ninth Ave	West	R2	368	80%	17.81	LOS B	12.3
H.34 Ninth Ave / Loch St PM	Ninth Ave	West	T1	280	80%	15.15	LOS B	12.3

6.4 Campsie Station: Future + Construction + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St S	South	T1	416	105%	135.19	LOS F	41.3
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St S	South	L2	467	57%	5.80	LOS A	6.6
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St N	North	T1	337	55%	14.97	LOS B	10.6
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St N	North	R2	111	72%	52.22	LOS D	5.5
B.10 Beamish Street / Ninth Avenue AM Peak	Ninth Ave	West	R2	397	59%	16.73	LOS B	10.0
B.10 Beamish Street / Ninth Avenue AM Peak	Ninth Ave	West	L2	324	33%	7.60	LOS A	2.7
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St S	South	T1	399	104%	126.19	LOS F	38.3
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St S	South	L2	459	60%	8.55	LOS A	9.6
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St N	North	T1	483	64%	15.87	LOS B	16.6
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St N	North	R2	207	88%	62.56	LOS E	11.3
B.10 Beamish Street / Ninth Avenue PM Peak	Ninth Ave	West	R2	419	65%	20.60	LOS B	13.2
B.10 Beamish Street / Ninth Avenue PM Peak	Ninth Ave	West	L2	207	19%	4.31	LOS A	0.4
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St S	South	R2	71	81%	26.68	LOS B	27.8
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St S	South	T1	803	81%	21.47	LOS B	27.8
B.11 Beamish Street / Clissold Parade AM Peak	Clissold Pde	East	L2	53	6%	16.29	LOS B	1.3
B.11 Beamish Street / Clissold Parade AM Peak	Clissold Pde	East	R2	43	23%	48.81	LOS D	2.0
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St N	North	T1	731	94%	59.55	LOS E	24.6
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St N	North	L2	50	94%	61.80	LOS E	24.1
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St S	South	R2	121	141%	416.97	LOS F	136.0
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St S	South	T1	722	141%	377.61	LOS F	136.0
B.11 Beamish Street / Clissold Parade PM Peak	Clissold Pde	East	L2	72	22%	41.96	LOS C	3.1
B.11 Beamish Street / Clissold Parade PM Peak	Clissold Pde	East	R2	113	84%	61.19	LOS E	6.3
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St N	North	T1	773	97%	61.33	LOS E	54.4
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St N	North	L2	72	6%	4.06	LOS A	0.4
B.12 Beamish Street / South Parade AM Peak	Beamish St S	South	R2	13	73%	24.47	LOS B	25.7
B.12 Beamish Street / South Parade AM Peak	Beamish St S	South	T1	628	73%	20.72	LOS B	25.7
B.12 Beamish Street / South Parade AM Peak	South Parade	East	L2	54	29%	45.46	LOS D	2.4
B.12 Beamish Street / South Parade AM Peak	South Parade	East	R2	181	91%	66.31	LOS E	10.8
B.12 Beamish Street / South Parade AM Peak	Beamish St N	North	T1	513	88%	32.97	LOS C	25.1
B.12 Beamish Street / South Parade AM Peak	Beamish St N	North	L2	254	61%	18.45	LOS B	8.5
B.12 Beamish Street / South Parade AM Peak	Lilian St	West	T1	52	31%	37.56	LOS C	4.2
B.12 Beamish Street / South Parade AM Peak	Lilian St	West	L2	48	31%	41.08	LOS C	4.2
B.12 Beamish Street / South Parade PM Peak	Beamish St S	South	R2	11	79%	26.36	LOS B	28.7
B.12 Beamish Street / South Parade PM Peak	Beamish St S	South	T1	639	79%	22.61	LOS B	28.7
B.12 Beamish Street / South Parade PM Peak	South Parade	East	L2	37	31%	52.45	LOS D	1.8
B.12 Beamish Street / South Parade PM Peak	South Parade	East	R2	168	112%	185.47	LOS F	17.9
B.12 Beamish Street / South Parade PM Peak	Beamish St N	North	T1	618	98%	68.35	LOS E	43.4
B.12 Beamish Street / South Parade PM Peak	Beamish St N	North	L2	239	58%	16.10	LOS B	7.9
B.12 Beamish Street / South Parade PM Peak	Lilian St	West	T1	39	38%	44.17	LOS D	4.2
B.12 Beamish Street / South Parade PM Peak	Lilian St	West	L2	51	38%	47.67	LOS D	4.2
H.11 Beamish Street / North Parade AM Peak	Beamish St	South	T1	742	36%	1.46	LOS A	2.2
H.11 Beamish Street / North Parade AM Peak	Beamish St	South	L2	61	35%	21.34	LOS B	2.2
H.11 Beamish Street / North Parade AM Peak	North Pde	East	L2	38	78%	130.12	LOS F	2.6
H.11 Beamish Street / North Parade AM Peak	Beamish St	North	T1	757	51%	0.78	LOS A	1.6
H.11 Beamish Street / North Parade AM Peak	Beamish St	North	L2	38	51%	9.37	LOS A	1.6
H.11 Beamish Street / North Parade AM Peak	North Pde	West	L2	69	157%	643.61	LOS F	20.4
H.11 Beamish Street / North Parade PM Peak	Beamish St	South	T1	782	44%	0.09	LOS A	1.6
H.11 Beamish Street / North Parade PM Peak	Beamish St	South	L2	72	44%	29.94	LOS C	1.6
H.11 Beamish Street / North Parade PM Peak	North Pde	East	L2	38	56%	73.42	LOS F	1.7
H.11 Beamish Street / North Parade PM Peak	Beamish St	North	T1	751	48%	0.59	LOS A	1.1
H.11 Beamish Street / North Parade PM Peak	Beamish St	North	L2	33	48%	9.00	LOS A	1.1
H.11 Beamish Street / North Parade PM Peak	North Pde	West	L2	56	138%	510.88	LOS F	14.0
H.12 Beamish Street / Amy Street AM Peak	Beamish St	South	T1	558	52%	8.87	LOS A	17.3
H.12 Beamish Street / Amy Street AM Peak	Beamish St	South	L2	82	52%	12.28	LOS A	17.3
H.12 Beamish Street / Amy Street AM Peak	Beamish St	North	T1	582	41%	3.44	LOS A	9.6
H.12 Beamish Street / Amy Street AM Peak	Beamish St	North	R2	4	41%	6.97	LOS A	9.6

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.12 Beamish Street / Amy Street AM Peak	Amy St	West	L2	40	44%	67.93	LOS E	2.5
H.12 Beamish Street / Amy Street PM Peak	Beamish St	South	T1	552	107%	106.55	LOS F	72.5
H.12 Beamish Street / Amy Street PM Peak	Beamish St	South	L2	113	107%	109.96	LOS F	72.5
H.12 Beamish Street / Amy Street PM Peak	Beamish St	North	T1	653	40%	1.88	LOS A	10.7
H.12 Beamish Street / Amy Street PM Peak	Beamish St	North	R2	2	40%	5.41	LOS A	10.7
H.12 Beamish Street / Amy Street PM Peak	Amy St	West	L2	88	52%	67.46	LOS E	5.6
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	R2	392	90%	49.22	LOS D	20.3
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	T1	658	81%	48.81	LOS D	23.1
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	L2	96	61%	55.36	LOS D	23.1
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	East	L2	291	57%	37.89	LOS C	25.6
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	East	T1	819	57%	32.28	LOS C	25.6
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	T1	420	88%	64.24	LOS E	15.7
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	L2	55	79%	65.17	LOS E	15.7
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	R2	76	32%	63.40	LOS E	4.5
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	R2	302	91%	71.54	LOS F	20.0
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	T1	1523	56%	16.15	LOS B	23.0
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	L2	81	45%	21.57	LOS B	22.9
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	R2	392	94%	55.74	LOS D	21.5
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	T1	462	64%	42.93	LOS D	14.1
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	L2	99	41%	51.38	LOS D	14.1
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	East	L2	195	48%	22.67	LOS B	20.9
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	East	T1	1188	48%	17.10	LOS B	21.0
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	T1	434	88%	62.40	LOS E	16.5
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	L2	51	80%	63.90	LOS E	16.5
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	R2	130	92%	81.75	LOS F	9.2
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	R2	191	84%	73.72	LOS F	12.4
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	T1	1078	40%	19.07	LOS B	20.8
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	L2	100	32%	24.47	LOS B	20.8
H.34 Ninth Ave / Loch St AM	Loch St	South	R2	577	81%	12.15	LOS A	13.8
H.34 Ninth Ave / Loch St AM	Loch St	South	L2	276	81%	10.26	LOS A	13.8
H.34 Ninth Ave / Loch St AM	Ninth Ave	East	L2	472	79%	10.37	LOS A	11.9
H.34 Ninth Ave / Loch St AM	Ninth Ave	East	T1	269	79%	10.27	LOS A	11.9
H.34 Ninth Ave / Loch St AM	Ninth Ave	West	R2	400	110%	122.87	LOS F	68.7
H.34 Ninth Ave / Loch St AM	Ninth Ave	West	T1	370	110%	120.98	LOS F	68.7
H.34 Ninth Ave / Loch St PM	Loch St	South	R2	490	94%	27.42	LOS B	28.0
H.34 Ninth Ave / Loch St PM	Loch St	South	L2	417	94%	25.34	LOS B	28.0
H.34 Ninth Ave / Loch St PM	Ninth Ave	East	L2	648	104%	63.33	LOS E	59.0
H.34 Ninth Ave / Loch St PM	Ninth Ave	East	T1	362	104%	63.47	LOS E	59.0
H.34 Ninth Ave / Loch St PM	Ninth Ave	West	R2	368	89%	24.98	LOS B	18.5
H.34 Ninth Ave / Loch St PM	Ninth Ave	West	T1	327	89%	23.05	LOS B	18.5

6.5 Campsie Station: Future + Construction + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St S	South	T1	416	71%	18.36	LOS B	15.5
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St S	South	L2	436	47%	4.20	LOS A	3.3
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St N	North	T1	337	50%	11.13	LOS A	9.1
B.10 Beamish Street / Ninth Avenue AM Peak	Beamish St N	North	R2	111	53%	33.40	LOS C	4.5
B.10 Beamish Street / Ninth Avenue AM Peak	Ninth Ave	West	R2	366	61%	23.00	LOS B	11.8
B.10 Beamish Street / Ninth Avenue AM Peak	Ninth Ave	West	L2	324	46%	18.76	LOS B	8.1
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St S	South	T1	399	63%	15.78	LOS B	13.6
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St S	South	L2	427	46%	4.67	LOS A	4.2
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St N	North	T1	483	57%	10.57	LOS A	13.5
B.10 Beamish Street / Ninth Avenue PM Peak	Beamish St N	North	R2	207	79%	40.53	LOS C	10.6
B.10 Beamish Street / Ninth Avenue PM Peak	Ninth Ave	West	R2	387	74%	30.14	LOS C	16.0
B.10 Beamish Street / Ninth Avenue PM Peak	Ninth Ave	West	L2	207	31%	20.27	LOS B	5.1
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St S	South	R2	71	81%	26.61	LOS B	27.8
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St S	South	T1	797	81%	21.52	LOS B	27.8
B.11 Beamish Street / Clissold Parade AM Peak	Clissold Pde	East	L2	53	6%	16.29	LOS B	1.3
B.11 Beamish Street / Clissold Parade AM Peak	Clissold Pde	East	R2	43	23%	48.81	LOS D	2.0
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St N	North	T1	724	92%	55.74	LOS D	23.6
B.11 Beamish Street / Clissold Parade AM Peak	Beamish St N	North	L2	50	92%	58.08	LOS E	23.2
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St S	South	R2	121	135%	365.25	LOS F	127.0
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St S	South	T1	716	135%	333.20	LOS F	127.0
B.11 Beamish Street / Clissold Parade PM Peak	Clissold Pde	East	L2	72	22%	41.96	LOS C	3.1
B.11 Beamish Street / Clissold Parade PM Peak	Clissold Pde	East	R2	113	84%	61.19	LOS E	6.3
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St N	North	T1	766	96%	54.37	LOS D	50.8
B.11 Beamish Street / Clissold Parade PM Peak	Beamish St N	North	L2	72	6%	4.06	LOS A	0.4
B.12 Beamish Street / South Parade AM Peak	Beamish St S	South	R2	13	71%	23.70	LOS B	25.3
B.12 Beamish Street / South Parade AM Peak	Beamish St S	South	T1	628	71%	19.94	LOS B	25.3
B.12 Beamish Street / South Parade AM Peak	South Parade	East	L2	54	31%	46.66	LOS D	2.4
B.12 Beamish Street / South Parade AM Peak	South Parade	East	R2	175	91%	66.56	LOS E	10.4
B.12 Beamish Street / South Parade AM Peak	Beamish St N	North	T1	513	86%	27.55	LOS B	23.4
B.12 Beamish Street / South Parade AM Peak	Beamish St N	North	L2	248	55%	17.67	LOS B	8.2
B.12 Beamish Street / South Parade AM Peak	Lilian St	West	T1	52	32%	38.62	LOS C	4.2
B.12 Beamish Street / South Parade AM Peak	Lilian St	West	L2	48	32%	42.13	LOS C	4.2
B.12 Beamish Street / South Parade PM Peak	Beamish St S	South	R2	11	73%	20.11	LOS B	25.8
B.12 Beamish Street / South Parade PM Peak	Beamish St S	South	T1	639	73%	16.36	LOS B	25.8
B.12 Beamish Street / South Parade PM Peak	South Parade	East	L2	37	62%	61.70	LOS E	2.1
B.12 Beamish Street / South Parade PM Peak	South Parade	East	R2	162	179%	777.73	LOS F	38.2
B.12 Beamish Street / South Parade PM Peak	Beamish St N	North	T1	618	90%	31.76	LOS C	31.5
B.12 Beamish Street / South Parade PM Peak	Beamish St N	North	L2	233	43%	13.43	LOS A	7.1
B.12 Beamish Street / South Parade PM Peak	Lilian St	West	T1	39	61%	51.21	LOS D	4.6
B.12 Beamish Street / South Parade PM Peak	Lilian St	West	L2	51	61%	54.71	LOS D	4.6
H.11 Beamish Street / North Parade AM Peak	Beamish St	South	T1	710	66%	0.94	LOS A	3.0
H.11 Beamish Street / North Parade AM Peak	Beamish St	South	L2	87	66%	36.59	LOS C	3.0
H.11 Beamish Street / North Parade AM Peak	North Pde	East	L2	38	75%	118.50	LOS F	2.4
H.11 Beamish Street / North Parade AM Peak	Beamish St	North	T1	751	51%	0.78	LOS A	1.6
H.11 Beamish Street / North Parade AM Peak	Beamish St	North	L2	38	51%	9.29	LOS A	1.6
H.11 Beamish Street / North Parade AM Peak	North Pde	West	L2	69	134%	434.10	LOS F	15.4
H.11 Beamish Street / North Parade PM Peak	Beamish St	South	T1	750	90%	1.63	LOS A	5.6
H.11 Beamish Street / North Parade PM Peak	Beamish St	South	L2	98	90%	82.96	LOS F	5.6
H.11 Beamish Street / North Parade PM Peak	North Pde	East	L2	38	54%	69.10	LOS E	1.6
H.11 Beamish Street / North Parade PM Peak	Beamish St	North	T1	745	48%	0.59	LOS A	1.1
H.11 Beamish Street / North Parade PM Peak	Beamish St	North	L2	33	48%	8.93	LOS A	1.1
H.11 Beamish Street / North Parade PM Peak	North Pde	West	L2	56	178%	876.97	LOS F	20.2
H.12 Beamish Street / Amy Street AM Peak	Beamish St	South	T1	558	52%	8.87	LOS A	17.3
H.12 Beamish Street / Amy Street AM Peak	Beamish St	South	L2	82	52%	12.28	LOS A	17.3

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.12 Beamish Street / Amy Street AM Peak	Beamish St	North	T1	582	41%	3.44	LOS A	9.6
H.12 Beamish Street / Amy Street AM Peak	Beamish St	North	R2	4	41%	6.97	LOS A	9.6
H.12 Beamish Street / Amy Street AM Peak	Amy St	West	L2	40	44%	67.93	LOS E	2.5
H.12 Beamish Street / Amy Street PM Peak	Beamish St	South	T1	552	95%	28.13	LOS B	38.1
H.12 Beamish Street / Amy Street PM Peak	Beamish St	South	L2	113	95%	31.54	LOS C	38.1
H.12 Beamish Street / Amy Street PM Peak	Beamish St	North	T1	653	40%	1.38	LOS A	8.4
H.12 Beamish Street / Amy Street PM Peak	Beamish St	North	R2	2	40%	4.92	LOS A	8.4
H.12 Beamish Street / Amy Street PM Peak	Amy St	West	L2	88	90%	83.49	LOS F	6.5
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	R2	392	95%	59.51	LOS E	22.6
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	T1	658	83%	50.68	LOS D	23.3
H.13 Canterbury Road / Beamish Street AM Peak	Bexley Rd	South	L2	96	62%	56.50	LOS E	23.3
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	East	L2	291	53%	36.43	LOS C	23.4
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	East	T1	784	53%	30.80	LOS C	23.9
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	T1	420	88%	64.15	LOS E	15.7
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	L2	55	79%	64.97	LOS E	15.7
H.13 Canterbury Road / Beamish Street AM Peak	Beamish St	North	R2	76	32%	63.40	LOS E	4.5
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	R2	302	90%	69.01	LOS E	19.5
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	T1	1487	53%	15.20	LOS B	21.4
H.13 Canterbury Road / Beamish Street AM Peak	Canterbury Rd	West	L2	81	43%	20.64	LOS B	21.3
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	R2	392	89%	46.94	LOS D	19.4
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	T1	462	61%	41.88	LOS C	13.8
H.13 Canterbury Road / Beamish Street PM Peak	Bexley Rd	South	L2	99	40%	50.12	LOS D	13.8
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	East	L2	195	47%	23.36	LOS B	20.7
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	East	T1	1154	47%	17.79	LOS B	20.9
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	T1	434	88%	62.31	LOS E	16.5
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	L2	51	80%	63.71	LOS E	16.5
H.13 Canterbury Road / Beamish Street PM Peak	Beamish St	North	R2	130	92%	81.75	LOS F	9.2
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	R2	191	84%	73.72	LOS F	12.4
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	T1	1044	39%	19.48	LOS B	20.5
H.13 Canterbury Road / Beamish Street PM Peak	Canterbury Rd	West	L2	100	31%	24.89	LOS B	20.5
H.34 Ninth Ave / Loch St AM	Loch St	South	R2	577	77%	9.72	LOS A	11.4
H.34 Ninth Ave / Loch St AM	Loch St	South	L2	276	77%	7.83	LOS A	11.4
H.34 Ninth Ave / Loch St AM	Ninth Ave	East	L2	472	77%	10.48	LOS A	11.1
H.34 Ninth Ave / Loch St AM	Ninth Ave	East	T1	237	77%	10.04	LOS A	11.1
H.34 Ninth Ave / Loch St AM	Ninth Ave	West	R2	400	101%	63.01	LOS E	40.2
H.34 Ninth Ave / Loch St AM	Ninth Ave	West	T1	338	101%	60.66	LOS E	40.2
H.34 Ninth Ave / Loch St PM	Loch St	South	R2	490	91%	20.50	LOS B	22.3
H.34 Ninth Ave / Loch St PM	Loch St	South	L2	417	91%	18.42	LOS B	22.3
H.34 Ninth Ave / Loch St PM	Ninth Ave	East	L2	648	99%	37.00	LOS C	40.7
H.34 Ninth Ave / Loch St PM	Ninth Ave	East	T1	330	99%	36.79	LOS C	40.7
H.34 Ninth Ave / Loch St PM	Ninth Ave	West	R2	368	83%	19.50	LOS B	13.9
H.34 Ninth Ave / Loch St PM	Ninth Ave	West	T1	295	83%	17.09	LOS B	13.9
B.12 Beamish Street / South Parade PM Peak - Copy	Beamish St S	South	R2	11	76%	22.74	LOS B	27.0
B.12 Beamish Street / South Parade PM Peak - Copy	Beamish St S	South	T1	639	76%	19.00	LOS B	27.0
B.12 Beamish Street / South Parade PM Peak - Copy	South Parade	East	L2	37	39%	55.43	LOS D	1.9
B.12 Beamish Street / South Parade PM Peak - Copy	South Parade	East	R2	131	95%	74.32	LOS F	8.1
B.12 Beamish Street / South Parade PM Peak - Copy	Beamish St N	North	T1	618	89%	31.01	LOS C	31.4
B.12 Beamish Street / South Parade PM Peak - Copy	Beamish St N	North	L2	202	26%	14.01	LOS A	6.1
B.12 Beamish Street / South Parade PM Peak - Copy	Lilian St	West	T1	39	45%	46.65	LOS D	4.3
B.12 Beamish Street / South Parade PM Peak - Copy	Lilian St	West	L2	51	45%	50.14	LOS D	4.3

7.0 Belmore Station

7.1 Belmore Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	R2	53	71%	25.78	LOS B	13.2
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	T1	647	71%	3.77	LOS A	13.2
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	L2	57	4%	4.93	LOS A	0.2
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	L2	10	21%	15.67	LOS B	0.6
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	R2	3	21%	186.52	LOS F	0.6
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	T1	1	21%	102.46	LOS F	0.6
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	T1	557	59%	0.92	LOS A	5.2
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	L2	81	59%	5.13	LOS A	5.2
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	R2	110	20%	8.39	LOS A	0.7
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	R2	31	95%	258.01	LOS F	4.4
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	T1	7	95%	265.75	LOS F	4.4
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	L2	179	32%	10.53	LOS A	1.3
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	R2	52	61%	19.16	LOS B	7.7
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	T1	533	61%	2.91	LOS A	7.7
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	L2	75	6%	5.06	LOS A	0.2
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	L2	8	41%	31.40	LOS C	1.3
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	R2	9	41%	129.03	LOS F	1.3
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	T1	7	41%	91.67	LOS F	1.3
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	T1	634	70%	2.98	LOS A	10.7
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	L2	102	70%	5.26	LOS A	10.7
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	R2	133	20%	7.28	LOS A	0.8
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	R2	37	89%	197.66	LOS F	3.9
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	T1	6	89%	194.17	LOS F	3.9
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	L2	138	20%	8.32	LOS A	0.7
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	R2	166	31%	10.78	LOS A	1.3
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	T1	617	54%	0.36	LOS A	4.8
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	L2	138	25%	10.82	LOS A	1.0
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	R2	15	20%	54.77	LOS D	0.6
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd N	North	T1	659	63%	0.43	LOS A	6.4
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd N	North	L2	56	63%	6.83	LOS A	6.4
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	R2	111	22%	10.33	LOS A	0.8
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	T1	568	49%	0.05	LOS A	4.0
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	L2	165	31%	11.82	LOS A	1.3
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	R2	20	26%	56.39	LOS D	0.8
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd N	North	T1	708	65%	0.08	LOS A	7.2
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd N	North	L2	53	65%	6.83	LOS A	7.2
Burwod Road / Belmore Station AM Peak	Burwood Road	South	T1	855	52%	2.69	LOS A	14.6
Burwod Road / Belmore Station AM Peak	Burwood Road	North	T1	822	49%	2.59	LOS A	13.5
Burwod Road / Belmore Station PM Peak	Burwood Road	South	T1	709	43%	2.44	LOS A	10.6
Burwod Road / Belmore Station PM Peak	Burwood Road	North	T1	909	54%	2.89	LOS A	16.1
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	R2	42	70%	26.15	LOS B	15.1
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	T1	471	70%	20.97	LOS B	15.1
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	L2	76	15%	20.38	LOS B	2.8
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	L2	89	10%	19.30	LOS B	2.1
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	R2	49	43%	28.96	LOS C	9.6
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	T1	256	43%	24.38	LOS B	9.6
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	T1	479	67%	20.91	LOS B	15.0
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	L2	54	13%	20.91	LOS B	2.4
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	R2	39	67%	26.03	LOS B	15.0
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	R2	121	84%	38.97	LOS C	16.4
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	T1	414	84%	28.51	LOS C	16.4
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	L2	59	19%	20.00	LOS B	4.5
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	R2	62	61%	24.61	LOS B	14.8

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	T1	488	61%	19.33	LOS B	14.8
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	L2	90	15%	18.86	LOS B	3.4
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	L2	89	10%	21.08	LOS B	2.2
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	R2	59	49%	26.35	LOS B	12.8
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	T1	357	49%	21.79	LOS B	12.8
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	T1	592	54%	18.08	LOS B	13.8
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	L2	46	22%	19.35	LOS B	5.1
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	R2	48	54%	23.96	LOS B	13.8
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	R2	112	62%	28.38	LOS B	11.4
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	T1	317	62%	21.93	LOS B	11.4
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	L2	56	14%	20.65	LOS B	3.3
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	East	R2	180	72%	28.39	LOS B	8.0
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	East	T1	632	45%	0.55	LOS A	1.4
H.33 Canterbury Rd / Burwood Rd - AM Peak	Burwood Rd	North	L2	94	23%	46.22	LOS D	4.7
H.33 Canterbury Rd / Burwood Rd - AM Peak	Burwood Rd	North	R2	105	49%	62.87	LOS E	6.4
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	West	T1	1444	63%	5.96	LOS A	13.5
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	West	L2	71	63%	11.57	LOS A	13.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	East	R2	219	68%	10.50	LOS A	7.3
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	East	T1	1259	68%	1.65	LOS A	7.3
H.33 Canterbury Rd / Burwood Rd - PM Peak	Burwood Rd	North	L2	112	18%	34.64	LOS C	4.8
H.33 Canterbury Rd / Burwood Rd - PM Peak	Burwood Rd	North	R2	170	85%	73.31	LOS F	11.7
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	West	T1	999	49%	12.49	LOS A	13.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	West	L2	51	49%	18.03	LOS B	13.3

7.2 Belmore Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	R2	54	73%	27.37	LOS B	14.4
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	T1	656	73%	4.24	LOS A	14.4
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	L2	58	4%	4.93	LOS A	0.2
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	L2	10	24%	18.13	LOS B	0.6
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	R2	3	24%	204.48	LOS F	0.6
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	T1	1	24%	111.84	LOS F	0.6
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	T1	565	60%	0.96	LOS A	5.3
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	L2	82	60%	5.21	LOS A	5.3
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	R2	112	20%	8.57	LOS A	0.8
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	R2	31	103%	312.64	LOS F	5.5
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	T1	7	103%	322.04	LOS F	5.5
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	L2	181	33%	10.76	LOS A	1.4
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	R2	53	64%	21.13	LOS B	8.9
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	T1	549	64%	3.48	LOS A	8.9
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	L2	77	6%	5.08	LOS A	0.2
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	L2	8	49%	44.13	LOS D	1.5
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	R2	9	49%	157.66	LOS F	1.5
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	T1	7	49%	113.47	LOS F	1.5
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	T1	653	73%	3.82	LOS A	13.0
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	L2	105	73%	6.02	LOS A	13.0
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	R2	137	22%	7.56	LOS A	0.8
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	R2	38	105%	297.16	LOS F	6.2
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	T1	6	105%	293.99	LOS F	6.2
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	L2	143	22%	8.55	LOS A	0.8
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	R2	183	42%	14.23	LOS A	1.9
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	T1	678	60%	0.46	LOS A	5.9
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	L2	151	33%	13.22	LOS A	1.3
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	R2	17	34%	93.31	LOS F	1.0
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd N	North	T1	723	69%	0.58	LOS A	8.2
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd N	North	L2	62	69%	7.65	LOS A	8.2
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	R2	123	31%	13.70	LOS A	1.2
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	T1	628	54%	0.07	LOS A	4.9
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	L2	182	43%	15.11	LOS B	1.8
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	R2	22	45%	103.16	LOS F	1.3
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd N	North	T1	782	72%	0.11	LOS A	9.7
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd N	North	L2	58	72%	7.77	LOS A	9.7
Burwod Road / Belmore Station AM Peak	Burwood Road	South	T1	939	81%	12.63	LOS A	21.4
Burwod Road / Belmore Station AM Peak	Burwood Road	North	T1	902	77%	10.29	LOS A	18.4
Burwod Road / Belmore Station PM Peak	Burwood Road	South	T1	784	67%	7.32	LOS A	13.0
Burwod Road / Belmore Station PM Peak	Burwood Road	North	T1	1005	85%	15.93	LOS B	25.9
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	R2	45	96%	63.30	LOS E	26.7
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	T1	504	96%	54.17	LOS D	26.7
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	L2	82	21%	23.31	LOS B	3.6
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	L2	95	9%	16.59	LOS B	2.0
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	R2	53	42%	25.61	LOS B	9.5
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	T1	274	42%	21.03	LOS B	9.5
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	T1	513	93%	43.84	LOS D	24.0
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	L2	57	19%	23.85	LOS B	3.1
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	R2	42	93%	51.70	LOS D	24.0
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	R2	129	79%	32.26	LOS C	15.7
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	T1	443	79%	23.13	LOS B	15.7
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	L2	63	18%	17.18	LOS B	4.2
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	R2	68	90%	44.18	LOS D	22.6
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	T1	539	90%	35.70	LOS C	22.6
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	L2	99	22%	22.00	LOS B	5.1
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	L2	98	10%	18.52	LOS B	2.2

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	R2	65	51%	25.20	LOS B	13.9
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	T1	394	51%	20.63	LOS B	13.9
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	T1	654	81%	26.07	LOS B	17.7
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	L2	51	32%	22.83	LOS B	7.8
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	R2	54	81%	35.02	LOS C	17.7
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	R2	124	67%	27.98	LOS B	12.1
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	T1	350	67%	20.64	LOS B	12.1
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	L2	61	15%	18.23	LOS B	3.7
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	East	R2	198	54%	28.12	LOS B	7.1
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	East	T1	694	46%	0.45	LOS A	1.6
H.33 Canterbury Rd / Burwood Rd - AM Peak	Burwood Rd	North	L2	103	23%	42.98	LOS D	5.0
H.33 Canterbury Rd / Burwood Rd - AM Peak	Burwood Rd	North	R2	115	91%	85.21	LOS F	8.6
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	West	T1	1586	73%	9.22	LOS A	22.2
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	West	L2	78	73%	14.82	LOS B	22.1
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	East	R2	242	74%	26.05	LOS B	19.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	East	T1	1392	74%	5.68	LOS A	19.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Burwood Rd	North	L2	124	14%	21.90	LOS B	4.0
H.33 Canterbury Rd / Burwood Rd - PM Peak	Burwood Rd	North	R2	188	97%	98.16	LOS F	15.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	West	T1	1104	76%	32.78	LOS C	29.1
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	West	L2	56	76%	38.32	LOS C	29.0

7.3 Belmore Station: Future + Construction

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	R2	54	76%	30.60	LOS C	16.9
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	T1	672	76%	5.17	LOS A	16.9
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	L2	60	5%	4.97	LOS A	0.2
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	L2	10	27%	23.34	LOS B	0.7
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	R2	3	27%	240.28	LOS F	0.7
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	T1	1	27%	132.03	LOS F	0.7
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	T1	581	62%	1.02	LOS A	5.8
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	L2	82	62%	5.32	LOS A	5.8
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	R2	112	21%	9.04	LOS A	0.8
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	R2	33	139%	611.13	LOS F	11.5
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	T1	7	139%	607.52	LOS F	11.5
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	L2	181	34%	11.24	LOS A	1.4
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	R2	53	67%	23.21	LOS B	10.3
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	T1	565	67%	4.09	LOS A	10.3
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	L2	79	6%	5.12	LOS A	0.3
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	L2	8	57%	60.87	LOS E	1.7
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	R2	9	57%	191.50	LOS F	1.7
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	T1	7	57%	140.66	LOS F	1.7
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	T1	669	77%	4.72	LOS A	15.6
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	L2	105	77%	6.84	LOS A	15.6
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	R2	137	22%	7.94	LOS A	0.9
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	R2	41	139%	580.57	LOS F	12.7
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	T1	6	139%	565.50	LOS F	12.7
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	L2	143	22%	8.88	LOS A	0.8
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	R2	183	44%	15.22	LOS B	2.0
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	T1	693	62%	0.50	LOS A	6.4
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	L2	151	34%	13.90	LOS A	1.4
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	R2	17	39%	109.54	LOS F	1.1
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd N	North	T1	739	72%	0.62	LOS A	8.9
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd N	North	L2	62	72%	7.84	LOS A	8.9
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	R2	123	32%	14.58	LOS B	1.3
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	T1	643	56%	0.07	LOS A	5.3
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	L2	182	45%	16.01	LOS B	1.9
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	R2	22	52%	124.00	LOS F	1.5
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd N	North	T1	798	74%	0.12	LOS A	10.6
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd N	North	L2	58	74%	8.00	LOS A	10.6
Burwod Road / Belmore Station AM Peak	Burwood Road	South	T1	955	84%	14.74	LOS B	23.6
Burwod Road / Belmore Station AM Peak	Burwood Road	North	T1	918	80%	11.76	LOS A	20.1
Burwod Road / Belmore Station PM Peak	Burwood Road	South	T1	795	69%	7.45	LOS A	13.4
Burwod Road / Belmore Station PM Peak	Burwood Road	North	T1	1016	87%	17.98	LOS B	27.9
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	R2	45	89%	42.68	LOS D	21.4
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	T1	504	89%	35.73	LOS C	21.4
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	L2	82	19%	21.78	LOS B	3.4
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	L2	95	10%	17.81	LOS B	2.1
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	R2	53	50%	30.02	LOS C	10.5
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	T1	274	50%	25.42	LOS B	10.5
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	T1	513	91%	38.77	LOS C	22.8
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	L2	57	18%	22.38	LOS B	3.2
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	R2	51	91%	46.63	LOS D	22.8
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	R2	129	92%	49.11	LOS D	19.4
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	T1	443	92%	33.99	LOS C	19.4
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	L2	63	21%	18.59	LOS B	5.0
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	R2	68	90%	44.83	LOS D	22.8
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	T1	539	90%	36.20	LOS C	22.8
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	L2	99	22%	22.00	LOS B	5.1
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	L2	98	10%	18.52	LOS B	2.2

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	R2	65	51%	25.20	LOS B	13.9
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	T1	394	51%	20.63	LOS B	13.9
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	T1	654	87%	29.86	LOS C	19.2
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	L2	51	35%	23.06	LOS B	8.6
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	R2	63	87%	42.03	LOS C	19.2
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	R2	124	67%	27.98	LOS B	12.1
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	T1	350	67%	20.64	LOS B	12.1
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	L2	61	15%	18.23	LOS B	3.7
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	East	R2	198	54%	28.12	LOS B	7.1
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	East	T1	694	46%	0.45	LOS A	1.6
H.33 Canterbury Rd / Burwood Rd - AM Peak	Burwood Rd	North	L2	103	23%	42.98	LOS D	5.0
H.33 Canterbury Rd / Burwood Rd - AM Peak	Burwood Rd	North	R2	115	91%	85.21	LOS F	8.6
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	West	T1	1586	73%	9.22	LOS A	22.2
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	West	L2	78	73%	14.82	LOS B	22.1
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	East	R2	242	74%	26.05	LOS B	19.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	East	T1	1392	74%	5.68	LOS A	19.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Burwood Rd	North	L2	124	14%	21.90	LOS B	4.0
H.33 Canterbury Rd / Burwood Rd - PM Peak	Burwood Rd	North	R2	188	97%	98.16	LOS F	15.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	West	T1	1104	76%	32.78	LOS C	29.1
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	West	L2	56	76%	38.32	LOS C	29.0

7.4 Belmore Station: Future + Construction + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	R2	54	76%	30.60	LOS C	16.9
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	T1	672	76%	5.17	LOS A	16.9
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	L2	60	5%	4.97	LOS A	0.2
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	L2	10	29%	26.69	LOS B	0.8
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	R2	3	29%	264.08	LOS F	0.8
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	T1	1	29%	139.03	LOS F	0.8
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	T1	581	62%	1.02	LOS A	5.8
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	L2	82	62%	5.32	LOS A	5.8
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	R2	123	25%	10.20	LOS A	1.0
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	R2	33	144%	660.13	LOS F	12.2
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	T1	7	144%	655.81	LOS F	12.2
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	L2	192	38%	12.17	LOS A	1.7
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	R2	53	67%	23.21	LOS B	10.3
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	T1	565	67%	4.09	LOS A	10.3
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	L2	79	6%	5.12	LOS A	0.3
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	L2	8	60%	71.87	LOS F	1.9
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	R2	9	60%	214.32	LOS F	1.9
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	T1	7	60%	154.42	LOS F	1.9
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	T1	669	77%	4.83	LOS A	15.9
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	L2	105	77%	6.95	LOS A	15.9
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	R2	148	26%	8.74	LOS A	1.1
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	R2	41	144%	626.79	LOS F	13.5
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	T1	6	144%	611.00	LOS F	13.5
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	L2	154	26%	9.61	LOS A	1.0
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	R2	183	53%	19.14	LOS B	2.4
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	T1	740	68%	0.62	LOS A	8.1
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	L2	151	40%	16.41	LOS B	1.6
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	R2	17	58%	194.71	LOS F	1.6
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd N	North	T1	786	78%	0.81	LOS A	11.7
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd N	North	L2	62	78%	8.58	LOS A	11.7
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	R2	123	39%	17.96	LOS B	1.5
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	T1	690	62%	0.09	LOS A	6.6
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	L2	182	53%	19.52	LOS B	2.3
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	R2	22	77%	248.11	LOS F	2.4
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd N	North	T1	844	80%	0.16	LOS A	14.4
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd N	North	L2	58	80%	8.92	LOS A	14.4
Burwod Road / Belmore Station AM Peak	Burwood Road	South	T1	1003	83%	12.69	LOS A	25.9
Burwod Road / Belmore Station AM Peak	Burwood Road	North	T1	967	79%	10.00	LOS A	22.1
Burwod Road / Belmore Station PM Peak	Burwood Road	South	T1	848	70%	6.77	LOS A	15.6
Burwod Road / Belmore Station PM Peak	Burwood Road	North	T1	1069	86%	16.39	LOS B	31.5
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	R2	93	99%	77.69	LOS F	29.6
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	T1	504	99%	59.02	LOS E	29.6
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	L2	82	21%	16.28	LOS B	4.1
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	L2	142	26%	24.84	LOS B	3.9
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	R2	53	68%	36.49	LOS C	11.9
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	T1	274	68%	31.90	LOS C	11.9
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	T1	513	76%	22.60	LOS B	16.7
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	L2	57	15%	17.00	LOS B	2.8
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	R2	51	76%	29.13	LOS C	16.7
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	R2	129	130%	329.01	LOS F	55.7
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	T1	443	130%	206.08	LOS F	55.7
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	L2	63	30%	24.66	LOS B	6.5
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	R2	115	99%	77.30	LOS F	29.1
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	T1	539	99%	52.35	LOS D	29.1
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	L2	99	25%	16.60	LOS B	6.1
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	L2	145	27%	26.40	LOS B	4.2

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	R2	65	113%	176.44	LOS F	44.1
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	T1	394	113%	171.87	LOS F	44.1
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	T1	654	67%	18.23	LOS B	14.4
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	L2	51	27%	16.78	LOS B	6.9
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	R2	63	67%	26.80	LOS B	14.4
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	R2	124	144%	448.89	LOS F	47.7
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	T1	350	144%	211.30	LOS F	47.7
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	L2	61	33%	25.53	LOS B	7.4
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	East	R2	198	54%	28.12	LOS B	7.1
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	East	T1	694	46%	0.45	LOS A	1.6
H.33 Canterbury Rd / Burwood Rd - AM Peak	Burwood Rd	North	L2	103	23%	42.98	LOS D	5.0
H.33 Canterbury Rd / Burwood Rd - AM Peak	Burwood Rd	North	R2	115	91%	85.21	LOS F	8.6
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	West	T1	1586	73%	9.22	LOS A	22.2
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	West	L2	78	73%	14.82	LOS B	22.1
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	East	R2	242	74%	26.05	LOS B	19.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	East	T1	1392	74%	5.68	LOS A	19.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Burwood Rd	North	L2	124	14%	21.90	LOS B	4.0
H.33 Canterbury Rd / Burwood Rd - PM Peak	Burwood Rd	North	R2	188	97%	98.16	LOS F	15.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	West	T1	1104	76%	32.78	LOS C	29.1
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	West	L2	56	76%	38.32	LOS C	29.0

7.5 Belmore Station: Future + Construction + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	R2	54	76%	30.60	LOS C	16.9
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	T1	672	76%	5.17	LOS A	16.9
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	L2	60	5%	4.97	LOS A	0.2
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	L2	10	30%	28.11	LOS B	0.8
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	R2	3	30%	273.42	LOS F	0.8
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	T1	1	30%	141.82	LOS F	0.8
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	T1	581	62%	1.02	LOS A	5.8
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	L2	82	62%	5.32	LOS A	5.8
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd N	North	R2	127	27%	10.62	LOS A	1.1
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	R2	33	146%	678.64	LOS F	12.5
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	T1	7	146%	674.06	LOS F	12.5
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	L2	196	40%	12.52	LOS A	1.8
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	R2	53	67%	23.21	LOS B	10.3
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	T1	565	67%	4.09	LOS A	10.3
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	L2	79	6%	5.12	LOS A	0.3
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	L2	8	62%	76.53	LOS F	1.9
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	R2	9	62%	223.56	LOS F	1.9
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	T1	7	62%	160.12	LOS F	1.9
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	T1	669	77%	4.88	LOS A	16.0
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	L2	105	77%	7.00	LOS A	16.0
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd N	North	R2	152	27%	9.02	LOS A	1.1
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	R2	41	146%	644.19	LOS F	13.8
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	T1	6	146%	628.12	LOS F	13.8
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	L2	158	27%	9.87	LOS A	1.1
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	R2	183	47%	16.31	LOS B	2.1
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	T1	709	64%	0.53	LOS A	6.9
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	L2	151	36%	14.63	LOS B	1.4
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	R2	17	44%	129.89	LOS F	1.3
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd N	North	T1	754	74%	0.68	LOS A	9.7
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd N	North	L2	62	74%	8.05	LOS A	9.7
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	R2	123	34%	15.55	LOS B	1.4
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	T1	658	58%	0.08	LOS A	5.7
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	L2	182	47%	17.00	LOS B	2.0
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	R2	22	59%	151.56	LOS F	1.7
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd N	North	T1	813	76%	0.13	LOS A	11.6
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd N	North	L2	58	76%	8.25	LOS A	11.6
Burwod Road / Belmore Station AM Peak	Burwood Road	South	T1	970	86%	17.62	LOS B	26.4
Burwod Road / Belmore Station AM Peak	Burwood Road	North	T1	934	83%	13.68	LOS A	22.2
Burwod Road / Belmore Station PM Peak	Burwood Road	South	T1	816	65%	6.37	LOS A	14.1
Burwod Road / Belmore Station PM Peak	Burwood Road	North	T1	1037	81%	11.28	LOS A	25.3
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	R2	61	69%	22.52	LOS B	14.8
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	T1	504	69%	16.99	LOS B	14.8
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	L2	82	15%	16.41	LOS B	2.8
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	L2	110	17%	23.86	LOS B	2.9
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	R2	53	70%	37.83	LOS C	12.1
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	T1	274	70%	33.25	LOS C	12.1
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	T1	513	64%	16.90	LOS B	14.6
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	L2	57	13%	16.84	LOS B	2.3
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	R2	51	64%	22.24	LOS B	14.6
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	R2	129	151%	521.02	LOS F	76.9
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	T1	443	151%	347.61	LOS F	76.9
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	L2	63	35%	24.42	LOS B	5.9

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	R2	83	71%	24.86	LOS B	16.1
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	T1	539	71%	18.56	LOS B	16.1
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	L2	99	18%	16.11	LOS B	4.2
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	L2	113	22%	24.99	LOS B	4.2
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	R2	65	111%	160.77	LOS F	38.8
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	T1	394	111%	144.05	LOS F	38.8
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	T1	654	60%	16.24	LOS B	14.3
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	L2	51	24%	16.56	LOS B	6.0
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	R2	63	60%	23.11	LOS B	14.3
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	R2	124	155%	550.17	LOS F	52.6
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	T1	350	155%	248.94	LOS F	52.6
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	L2	61	36%	25.59	LOS B	7.6
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	East	R2	198	54%	28.12	LOS B	7.1
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	East	T1	694	46%	0.45	LOS A	1.6
H.33 Canterbury Rd / Burwood Rd - AM Peak	Burwood Rd	North	L2	103	23%	42.98	LOS D	5.0
H.33 Canterbury Rd / Burwood Rd - AM Peak	Burwood Rd	North	R2	115	91%	85.21	LOS F	8.6
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	West	T1	1586	73%	9.22	LOS A	22.2
H.33 Canterbury Rd / Burwood Rd - AM Peak	Canterbury Rd	West	L2	78	73%	14.82	LOS B	22.1
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	East	R2	242	74%	26.05	LOS B	19.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	East	T1	1392	74%	5.68	LOS A	19.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Burwood Rd	North	L2	124	14%	21.90	LOS B	4.0
H.33 Canterbury Rd / Burwood Rd - PM Peak	Burwood Rd	North	R2	188	97%	98.16	LOS F	15.4
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	West	T1	1104	76%	32.78	LOS C	29.1
H.33 Canterbury Rd / Burwood Rd - PM Peak	Canterbury Rd	West	L2	56	76%	38.32	LOS C	29.0

8.0 Lakemba Station

8.1 Lakemba Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	T1	365	90%	38.30	LOS C	12.7
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	L2	60	31%	30.22	LOS C	3.2
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	L2	36	14%	15.81	LOS B	1.8
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	R2	81	63%	33.39	LOS C	5.7
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	T1	146	63%	22.38	LOS B	5.7
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	T1	335	93%	31.55	LOS C	19.2
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	L2	136	28%	13.56	LOS A	4.8
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	R2	222	93%	51.35	LOS D	19.2
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	R2	61	69%	30.61	LOS C	9.7
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	T1	244	69%	26.00	LOS B	9.7
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	L2	278	26%	11.89	LOS A	4.5
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	T1	284	87%	34.14	LOS C	10.0
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	L2	102	39%	31.97	LOS C	2.9
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	L2	45	28%	18.16	LOS B	3.0
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	R2	128	94%	52.99	LOS D	10.9
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	T1	240	94%	31.51	LOS C	10.9
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	T1	324	95%	33.27	LOS C	19.5
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	L2	151	29%	13.85	LOS A	4.6
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	R2	236	95%	51.19	LOS D	19.5
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	R2	48	58%	28.65	LOS C	6.2
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	T1	173	58%	24.06	LOS B	6.2
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	L2	257	24%	10.90	LOS A	3.7
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	R2	46	23%	21.58	LOS B	2.8
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	T1	271	23%	14.68	LOS B	5.6
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	L2	68	11%	27.32	LOS B	2.1
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	R2	346	55%	29.31	LOS C	12.4
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	T1	466	49%	5.54	LOS A	6.0
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	L2	369	24%	4.40	LOS A	1.8
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	R2	63	32%	19.28	LOS B	5.8
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	T1	472	32%	14.20	LOS A	8.3
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	L2	91	15%	28.68	LOS C	2.9
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	R2	420	73%	33.11	LOS C	16.6
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	T1	370	38%	2.99	LOS A	2.5
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	L2	305	19%	4.37	LOS A	1.4
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	R2	78	49%	7.81	LOS A	4.1
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	T1	409	49%	2.32	LOS A	4.1
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	L2	117	9%	4.41	LOS A	0.4
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	L2	70	16%	6.44	LOS A	0.5
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	R2	4	16%	35.48	LOS C	0.5
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	T1	10	16%	27.16	LOS B	0.5
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	T1	499	59%	3.44	LOS A	6.7
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	L2	26	59%	7.15	LOS A	6.7
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	R2	40	59%	14.22	LOS A	6.7
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	R2	62	72%	64.91	LOS E	3.4
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	T1	14	72%	49.83	LOS D	3.4
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	L2	47	72%	29.96	LOS C	3.4
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	R2	50	46%	7.34	LOS A	3.6
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	T1	367	46%	3.37	LOS A	3.6
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	L2	168	14%	4.82	LOS A	0.6
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	L2	108	20%	6.37	LOS A	0.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	R2	4	20%	29.51	LOS C	0.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	T1	16	20%	24.13	LOS B	0.7
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	T1	473	62%	5.48	LOS A	7.4

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	L2	42	62%	8.62	LOS A	7.4
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	R2	26	62%	18.49	LOS B	7.4
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	R2	84	74%	57.32	LOS E	3.5
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	T1	10	74%	45.34	LOS D	3.5
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	L2	33	74%	30.52	LOS C	3.5
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	R2	303	45%	28.66	LOS C	10.5
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	L2	134	23%	30.00	LOS C	4.5
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	East	L2	347	22%	3.76	LOS A	0.2
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	East	T1	257	27%	0.58	LOS A	0.3
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	West	R2	197	58%	22.59	LOS B	10.8
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	West	T1	519	58%	16.31	LOS B	11.0
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	R2	237	37%	28.70	LOS C	8.0
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	L2	181	32%	31.06	LOS C	6.3
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	East	L2	378	24%	3.78	LOS A	0.2
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	East	T1	488	49%	4.51	LOS A	5.3
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	West	R2	176	52%	22.70	LOS B	9.1
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	West	T1	444	52%	15.07	LOS B	9.1
H.10 Ped Crossing on The Boulevard AM Peak	The Blvd	East	T1	428	25%	2.70	LOS A	3.6
H.10 Ped Crossing on The Boulevard AM Peak	The Blvd	West	T1	583	41%	3.27	LOS A	6.9
H.10 Ped Crossing on The Boulevard PM Peak	The Blvd	East	T1	577	34%	2.84	LOS A	5.0
H.10 Ped Crossing on The Boulevard PM Peak	The Blvd	West	T1	478	34%	2.95	LOS A	5.0
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	East	R2	77	43%	19.98	LOS B	3.8
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	East	T1	737	43%	4.98	LOS A	10.3
H.21 Canterbury Rd / Haldon St - AM Peak	Haldon St	North	L2	56	45%	55.86	LOS D	8.5
H.21 Canterbury Rd / Haldon St - AM Peak	Haldon St	North	R2	237	45%	56.74	LOS E	8.5
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	West	T1	1507	58%	6.53	LOS A	14.9
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	West	L2	165	58%	12.12	LOS A	14.9
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	East	R2	98	57%	12.99	LOS A	10.8
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	East	T1	1319	57%	5.25	LOS A	11.1
H.21 Canterbury Rd / Haldon St - PM Peak	Haldon St	North	L2	67	44%	50.99	LOS D	9.7
H.21 Canterbury Rd / Haldon St - PM Peak	Haldon St	North	R2	281	44%	51.95	LOS D	9.7
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	West	T1	1113	60%	7.75	LOS A	12.4
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	West	L2	171	60%	13.34	LOS A	12.2

8.2 Lakemba Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	T1	391	103%	92.22	LOS F	22.3
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	L2	64	36%	31.43	LOS C	3.5
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	L2	38	22%	19.69	LOS B	3.2
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	R2	87	102%	89.72	LOS F	8.0
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	T1	157	102%	36.60	LOS C	8.0
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	T1	358	103%	58.43	LOS E	29.3
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	L2	145	31%	14.29	LOS A	5.4
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	R2	238	103%	96.04	LOS F	29.3
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	R2	65	105%	109.10	LOS F	22.5
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	T1	261	105%	104.49	LOS F	22.5
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	L2	297	27%	11.46	LOS A	4.7
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	T1	306	110%	142.48	LOS F	23.9
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	L2	109	62%	36.69	LOS C	3.5
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	L2	49	31%	19.24	LOS B	3.4
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	R2	138	103%	93.43	LOS F	15.8
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	T1	258	103%	49.93	LOS D	15.8
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	T1	349	102%	61.11	LOS E	29.8
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	L2	162	32%	15.19	LOS B	5.0
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	R2	253	102%	88.23	LOS F	29.8
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	R2	52	64%	29.61	LOS C	6.9
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	T1	186	64%	25.03	LOS B	6.9
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	L2	277	24%	9.99	LOS A	3.7
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	R2	51	21%	14.27	LOS A	2.2
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	T1	299	21%	8.60	LOS A	4.9
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	L2	75	18%	36.76	LOS C	2.8
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	R2	382	92%	58.64	LOS E	21.4
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	T1	515	44%	0.52	LOS A	0.8
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	L2	407	26%	4.42	LOS A	2.0
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	R2	69	35%	17.77	LOS B	6.0
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	T1	521	35%	12.69	LOS A	9.0
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	L2	100	19%	32.15	LOS C	3.5
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	R2	464	90%	51.84	LOS D	24.6
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	T1	409	40%	2.86	LOS A	2.9
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	L2	337	22%	4.39	LOS A	1.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	R2	86	55%	9.15	LOS A	5.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	T1	449	55%	3.32	LOS A	5.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	L2	129	10%	4.50	LOS A	0.4
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	L2	76	21%	6.71	LOS A	0.7
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	R2	5	21%	45.24	LOS D	0.7
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	T1	11	21%	33.86	LOS C	0.7
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	T1	548	67%	5.10	LOS A	9.5
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	L2	29	67%	8.59	LOS A	9.5
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	R2	44	67%	17.79	LOS B	9.5
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	R2	68	103%	185.58	LOS F	10.8
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	T1	16	103%	160.86	LOS F	10.8
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	L2	51	103%	129.50	LOS F	10.8
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	R2	55	53%	8.56	LOS A	4.9
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	T1	406	53%	4.59	LOS A	4.9
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	L2	186	16%	4.97	LOS A	0.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	L2	119	26%	6.98	LOS A	1.0
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	R2	4	26%	37.57	LOS C	1.0
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	T1	18	26%	30.24	LOS C	1.0
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	T1	523	72%	8.16	LOS A	10.7
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	L2	46	72%	10.92	LOS A	10.7
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	R2	29	72%	24.32	LOS B	10.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	R2	93	106%	176.76	LOS F	12.1

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	T1	11	106%	159.41	LOS F	12.1
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	L2	36	106%	138.46	LOS F	12.1
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	R2	333	58%	33.68	LOS C	12.9
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	L2	147	31%	34.59	LOS C	5.4
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	East	L2	381	25%	3.77	LOS A	0.2
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	East	T1	282	27%	0.52	LOS A	0.3
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	West	R2	216	59%	19.81	LOS B	10.7
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	West	T1	570	59%	13.49	LOS A	11.6
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	R2	262	57%	37.43	LOS C	10.5
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	L2	200	51%	40.01	LOS C	8.2
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	East	L2	418	27%	3.79	LOS A	0.3
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	East	T1	539	46%	0.53	LOS A	0.9
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	West	R2	195	50%	15.50	LOS B	7.8
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	West	T1	491	50%	9.61	LOS A	8.2
H.10 Ped Crossing on The Boulevard AM Peak	The Blvd	East	T1	470	28%	3.10	LOS A	4.3
H.10 Ped Crossing on The Boulevard AM Peak	The Blvd	West	T1	640	46%	3.84	LOS A	8.4
H.10 Ped Crossing on The Boulevard PM Peak	The Blvd	East	T1	638	38%	3.32	LOS A	6.1
H.10 Ped Crossing on The Boulevard PM Peak	The Blvd	West	T1	529	38%	3.45	LOS A	6.0
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	East	R2	84	43%	16.23	LOS B	4.3
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	East	T1	810	43%	3.84	LOS A	11.4
H.21 Canterbury Rd / Haldon St - AM Peak	Haldon St	North	L2	61	86%	76.78	LOS F	11.7
H.21 Canterbury Rd / Haldon St - AM Peak	Haldon St	North	R2	261	86%	77.05	LOS F	11.7
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	West	T1	1655	58%	3.00	LOS A	9.2
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	West	L2	181	58%	8.58	LOS A	9.2
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	East	R2	109	54%	11.79	LOS A	12.3
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	East	T1	1457	54%	4.14	LOS A	12.3
H.21 Canterbury Rd / Haldon St - PM Peak	Haldon St	North	L2	74	90%	78.65	LOS F	14.5
H.21 Canterbury Rd / Haldon St - PM Peak	Haldon St	North	R2	311	90%	79.03	LOS F	14.5
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	West	T1	1230	66%	7.96	LOS A	15.1
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	West	L2	189	66%	13.54	LOS A	14.9

8.3 Lakemba Station: Future + Construction

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	T1	399	110%	138.98	LOS F	30.0
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	L2	71	38%	31.78	LOS C	3.5
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	L2	48	23%	17.94	LOS B	3.3
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	R2	87	104%	103.30	LOS F	8.9
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	T1	157	104%	40.58	LOS C	8.9
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	T1	366	109%	81.97	LOS F	36.2
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	L2	145	32%	14.97	LOS B	5.7
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	R2	238	109%	135.85	LOS F	36.2
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	R2	70	112%	161.57	LOS F	29.1
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	T1	261	112%	156.90	LOS F	29.1
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	L2	297	29%	11.47	LOS A	4.7
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	T1	314	116%	197.59	LOS F	30.3
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	L2	116	70%	37.87	LOS C	3.8
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	L2	58	31%	17.96	LOS B	3.5
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	R2	138	104%	100.13	LOS F	16.6
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	T1	258	104%	53.19	LOS D	16.6
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	T1	357	108%	89.22	LOS F	37.7
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	L2	162	34%	15.93	LOS B	5.3
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	R2	253	108%	129.25	LOS F	37.7
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	R2	57	66%	30.24	LOS C	7.2
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	T1	186	66%	25.58	LOS B	7.2
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	L2	277	24%	9.99	LOS A	3.7
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	R2	51	21%	14.27	LOS A	2.2
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	T1	299	21%	8.60	LOS A	4.9
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	L2	75	18%	36.76	LOS C	2.8
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	R2	382	92%	58.64	LOS E	21.4
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	T1	515	44%	0.52	LOS A	0.8
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	L2	407	26%	4.42	LOS A	2.0
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	R2	69	35%	17.77	LOS B	6.0
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	T1	521	35%	12.69	LOS A	9.0
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	L2	100	19%	32.15	LOS C	3.5
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	R2	464	90%	51.84	LOS D	24.6
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	T1	409	40%	2.86	LOS A	2.9
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	L2	337	22%	4.39	LOS A	1.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	R2	91	56%	9.54	LOS A	5.8
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	T1	449	56%	3.43	LOS A	5.8
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	L2	132	11%	4.52	LOS A	0.4
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	L2	81	22%	7.03	LOS A	0.8
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	R2	5	22%	47.39	LOS D	0.8
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	T1	11	22%	35.46	LOS C	0.8
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	T1	548	67%	5.10	LOS A	9.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	L2	29	67%	8.60	LOS A	9.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	R2	44	67%	17.87	LOS B	9.6
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	R2	71	122%	326.19	LOS F	21.2
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	T1	16	122%	294.18	LOS F	21.2
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	L2	51	122%	261.63	LOS F	21.2
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	R2	60	53%	8.97	LOS A	5.0
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	T1	406	53%	4.69	LOS A	5.0
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	L2	189	17%	5.00	LOS A	0.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	L2	124	27%	7.22	LOS A	1.1
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	R2	4	27%	38.55	LOS C	1.1
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	T1	18	27%	31.10	LOS C	1.1
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	T1	523	72%	8.16	LOS A	10.7
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	L2	46	72%	10.93	LOS A	10.7
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	R2	29	72%	24.40	LOS B	10.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	R2	96	118%	270.87	LOS F	19.7

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	T1	11	118%	249.97	LOS F	19.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	L2	36	118%	228.60	LOS F	19.7
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	R2	333	58%	33.68	LOS C	12.9
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	L2	147	31%	34.59	LOS C	5.4
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	East	L2	381	25%	3.77	LOS A	0.2
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	East	T1	282	27%	0.52	LOS A	0.3
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	West	R2	216	59%	19.81	LOS B	10.7
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	West	T1	570	59%	13.49	LOS A	11.6
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	R2	262	57%	37.43	LOS C	10.5
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	L2	200	51%	40.01	LOS C	8.2
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	East	L2	418	27%	3.79	LOS A	0.3
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	East	T1	539	46%	0.53	LOS A	0.9
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	West	R2	195	50%	15.50	LOS B	7.8
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	West	T1	491	50%	9.61	LOS A	8.2
H.10 Ped Crossing on The Boulevard AM Peak	The Blvd	East	T1	470	28%	3.10	LOS A	4.3
H.10 Ped Crossing on The Boulevard AM Peak	The Blvd	West	T1	640	46%	3.84	LOS A	8.4
H.10 Ped Crossing on The Boulevard PM Peak	The Blvd	East	T1	638	38%	3.32	LOS A	6.1
H.10 Ped Crossing on The Boulevard PM Peak	The Blvd	West	T1	529	38%	3.45	LOS A	6.0
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	East	R2	84	43%	16.23	LOS B	4.3
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	East	T1	810	43%	3.84	LOS A	11.4
H.21 Canterbury Rd / Haldon St - AM Peak	Haldon St	North	L2	61	86%	76.78	LOS F	11.7
H.21 Canterbury Rd / Haldon St - AM Peak	Haldon St	North	R2	261	86%	77.05	LOS F	11.7
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	West	T1	1655	58%	3.00	LOS A	9.2
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	West	L2	181	58%	8.58	LOS A	9.2
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	East	R2	109	54%	11.79	LOS A	12.3
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	East	T1	1457	54%	4.14	LOS A	12.3
H.21 Canterbury Rd / Haldon St - PM Peak	Haldon St	North	L2	74	90%	78.65	LOS F	14.5
H.21 Canterbury Rd / Haldon St - PM Peak	Haldon St	North	R2	311	90%	79.03	LOS F	14.5
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	West	T1	1230	66%	7.96	LOS A	15.1
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	West	L2	189	66%	13.54	LOS A	14.9

8.4 Lakemba Station: Future + Construction + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	T1	399	132%	342.90	LOS F	56.1
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	L2	106	92%	54.75	LOS D	4.6
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	L2	48	21%	16.46	LOS B	3.2
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	R2	87	98%	69.99	LOS E	7.4
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	T1	168	98%	30.18	LOS C	7.4
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	T1	366	128%	171.98	LOS F	57.8
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	L2	145	38%	17.83	LOS B	6.8
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	R2	238	128%	303.83	LOS F	57.8
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	R2	105	147%	471.58	LOS F	60.9
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	T1	273	147%	433.88	LOS F	60.9
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	L2	297	37%	12.55	LOS A	5.6
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	T1	314	117%	212.41	LOS F	31.5
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	L2	151	123%	265.48	LOS F	17.3
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	L2	58	40%	20.04	LOS B	4.7
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	R2	138	132%	331.90	LOS F	27.9
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	T1	270	132%	94.10	LOS F	27.9
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	T1	357	126%	174.59	LOS F	57.9
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	L2	162	39%	17.59	LOS B	6.2
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	R2	253	126%	279.11	LOS F	57.9
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	R2	92	116%	196.48	LOS F	26.8
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	T1	197	116%	180.66	LOS F	26.8
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	L2	277	29%	11.71	LOS A	4.4
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	R2	51	21%	14.27	LOS A	2.2
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	T1	299	21%	8.60	LOS A	4.9
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	L2	75	18%	36.76	LOS C	2.8
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	R2	382	92%	58.64	LOS E	21.4
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	T1	515	44%	0.52	LOS A	0.8
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	L2	407	26%	4.42	LOS A	2.0
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	R2	69	35%	17.77	LOS B	6.0
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	T1	521	35%	12.69	LOS A	9.0
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	L2	100	19%	32.15	LOS C	3.5
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	R2	464	90%	51.84	LOS D	24.6
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	T1	409	40%	2.86	LOS A	2.9
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	L2	337	22%	4.39	LOS A	1.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	R2	91	56%	9.54	LOS A	5.8
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	T1	449	56%	3.43	LOS A	5.8
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	L2	132	11%	4.52	LOS A	0.4
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	L2	81	22%	7.03	LOS A	0.8
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	R2	5	22%	47.39	LOS D	0.8
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	T1	11	22%	35.46	LOS C	0.8
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	T1	548	67%	5.10	LOS A	9.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	L2	29	67%	8.60	LOS A	9.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	R2	44	67%	17.87	LOS B	9.6
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	R2	71	122%	326.19	LOS F	21.2
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	T1	16	122%	294.18	LOS F	21.2
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	L2	51	122%	261.63	LOS F	21.2
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	R2	60	53%	8.97	LOS A	5.0
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	T1	406	53%	4.69	LOS A	5.0
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	L2	189	17%	5.00	LOS A	0.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	L2	124	27%	7.22	LOS A	1.1
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	R2	4	27%	38.55	LOS C	1.1
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	T1	18	27%	31.10	LOS C	1.1
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	T1	523	72%	8.16	LOS A	10.7
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	L2	46	72%	10.93	LOS A	10.7
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	R2	29	72%	24.40	LOS B	10.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	R2	96	118%	270.87	LOS F	19.7

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	T1	11	118%	249.97	LOS F	19.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	L2	36	118%	228.60	LOS F	19.7
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	R2	333	58%	33.68	LOS C	12.9
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	L2	147	31%	34.59	LOS C	5.4
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	East	L2	381	25%	3.77	LOS A	0.2
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	East	T1	282	27%	0.52	LOS A	0.3
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	West	R2	216	59%	19.81	LOS B	10.7
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	West	T1	570	59%	13.49	LOS A	11.6
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	R2	262	57%	37.43	LOS C	10.5
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	L2	200	51%	40.01	LOS C	8.2
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	East	L2	418	27%	3.79	LOS A	0.3
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	East	T1	539	46%	0.53	LOS A	0.9
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	West	R2	195	50%	15.50	LOS B	7.8
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	West	T1	491	50%	9.61	LOS A	8.2
H.10 Ped Crossing on The Boulevard AM Peak	The Blvd	East	T1	524	34%	3.29	LOS A	5.2
H.10 Ped Crossing on The Boulevard AM Peak	The Blvd	West	T1	691	53%	4.18	LOS A	9.9
H.10 Ped Crossing on The Boulevard PM Peak	The Blvd	East	T1	691	46%	3.61	LOS A	7.4
H.10 Ped Crossing on The Boulevard PM Peak	The Blvd	West	T1	580	45%	3.74	LOS A	7.2
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	East	R2	118	58%	42.94	LOS D	7.7
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	East	T1	810	45%	3.78	LOS A	12.2
H.21 Canterbury Rd / Haldon St - AM Peak	Haldon St	North	L2	94	92%	85.21	LOS F	13.6
H.21 Canterbury Rd / Haldon St - AM Peak	Haldon St	North	R2	261	92%	83.96	LOS F	13.6
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	West	T1	1655	60%	4.56	LOS A	13.0
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	West	L2	181	60%	10.14	LOS A	13.0
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	East	R2	143	60%	16.61	LOS B	13.9
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	East	T1	1457	60%	5.52	LOS A	14.2
H.21 Canterbury Rd / Haldon St - PM Peak	Haldon St	North	L2	109	90%	79.06	LOS F	15.4
H.21 Canterbury Rd / Haldon St - PM Peak	Haldon St	North	R2	311	90%	78.70	LOS F	15.4
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	West	T1	1230	67%	8.07	LOS A	15.4
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	West	L2	189	67%	13.66	LOS A	15.2

8.5 Lakemba Station: Future + Construction + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	T1	399	110%	138.98	LOS F	30.0
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	L2	71	38%	31.78	LOS C	3.5
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	L2	48	24%	18.36	LOS B	3.3
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	R2	87	112%	159.79	LOS F	12.9
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	T1	172	112%	66.56	LOS E	12.9
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	T1	366	109%	81.97	LOS F	36.2
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	L2	145	32%	14.97	LOS B	5.7
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St N	North	R2	238	109%	135.85	LOS F	36.2
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	R2	70	121%	244.45	LOS F	39.7
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	T1	277	121%	239.78	LOS F	39.7
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	L2	297	33%	11.82	LOS A	4.9
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	T1	314	116%	197.59	LOS F	30.3
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	L2	116	70%	37.87	LOS C	3.8
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	L2	58	35%	19.31	LOS B	4.0
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	R2	138	118%	212.58	LOS F	25.2
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	T1	274	118%	91.87	LOS F	25.2
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	T1	357	113%	113.30	LOS F	43.7
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	L2	162	35%	16.65	LOS B	5.5
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St N	North	R2	253	113%	164.77	LOS F	43.7
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	R2	57	78%	34.67	LOS C	8.5
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	T1	201	78%	30.01	LOS C	8.5
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	L2	277	26%	10.07	LOS A	3.7
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	R2	51	21%	14.27	LOS A	2.2
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	T1	299	21%	8.60	LOS A	4.9
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	L2	75	18%	36.76	LOS C	2.8
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	R2	382	92%	58.64	LOS E	21.4
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	T1	515	44%	0.52	LOS A	0.8
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	L2	407	26%	4.42	LOS A	2.0
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	R2	69	35%	17.77	LOS B	6.0
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	T1	521	35%	12.69	LOS A	9.0
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	L2	100	19%	32.15	LOS C	3.5
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	R2	464	90%	51.84	LOS D	24.6
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	T1	409	40%	2.86	LOS A	2.9
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	L2	337	22%	4.39	LOS A	1.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	R2	91	56%	9.54	LOS A	5.8
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	T1	449	56%	3.43	LOS A	5.8
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	South	L2	132	11%	4.52	LOS A	0.4
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	L2	81	22%	7.03	LOS A	0.8
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	R2	5	22%	47.39	LOS D	0.8
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	T1	11	22%	35.46	LOS C	0.8
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	T1	548	67%	5.10	LOS A	9.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	L2	29	67%	8.60	LOS A	9.6
H.08 Haldon Street / Railway Parade AM Peak	Haldon St	North	R2	44	67%	17.87	LOS B	9.6
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	R2	71	122%	326.19	LOS F	21.2
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	T1	16	122%	294.18	LOS F	21.2
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	L2	51	122%	261.63	LOS F	21.2
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	R2	60	53%	8.97	LOS A	5.0
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	T1	406	53%	4.69	LOS A	5.0
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	South	L2	189	17%	5.00	LOS A	0.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	L2	124	27%	7.22	LOS A	1.1
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	R2	4	27%	38.55	LOS C	1.1
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	T1	18	27%	31.10	LOS C	1.1
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	T1	523	72%	8.16	LOS A	10.7

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	L2	46	72%	10.93	LOS A	10.7
H.08 Haldon Street / Railway Parade PM Peak	Haldon St	North	R2	29	72%	24.40	LOS B	10.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	R2	96	118%	270.87	LOS F	19.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	T1	11	118%	249.97	LOS F	19.7
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	L2	36	118%	228.60	LOS F	19.7
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	R2	333	58%	33.68	LOS C	12.9
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	L2	147	31%	34.59	LOS C	5.4
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	East	L2	381	25%	3.77	LOS A	0.2
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	East	T1	282	27%	0.52	LOS A	0.3
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	West	R2	216	59%	19.81	LOS B	10.7
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	West	T1	570	59%	13.49	LOS A	11.6
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	R2	262	57%	37.43	LOS C	10.5
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	L2	200	51%	40.01	LOS C	8.2
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	East	L2	418	27%	3.79	LOS A	0.3
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	East	T1	539	46%	0.53	LOS A	0.9
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	West	R2	195	50%	15.50	LOS B	7.8
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	West	T1	491	50%	9.61	LOS A	8.2
H.10 Ped Crossing on The Boulevard AM Peak	The Blvd	East	T1	493	31%	3.19	LOS A	4.7
H.10 Ped Crossing on The Boulevard AM Peak	The Blvd	West	T1	661	49%	3.97	LOS A	9.0
H.10 Ped Crossing on The Boulevard PM Peak	The Blvd	East	T1	661	42%	3.47	LOS A	6.8
H.10 Ped Crossing on The Boulevard PM Peak	The Blvd	West	T1	549	41%	3.56	LOS A	6.5
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	East	R2	84	43%	16.23	LOS B	4.3
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	East	T1	810	43%	3.84	LOS A	11.4
H.21 Canterbury Rd / Haldon St - AM Peak	Haldon St	North	L2	61	86%	76.78	LOS F	11.7
H.21 Canterbury Rd / Haldon St - AM Peak	Haldon St	North	R2	261	86%	77.05	LOS F	11.7
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	West	T1	1655	58%	3.00	LOS A	9.2
H.21 Canterbury Rd / Haldon St - AM Peak	Canterbury Rd	West	L2	181	58%	8.58	LOS A	9.2
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	East	R2	109	54%	11.79	LOS A	12.3
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	East	T1	1457	54%	4.14	LOS A	12.3
H.21 Canterbury Rd / Haldon St - PM Peak	Haldon St	North	L2	74	90%	78.65	LOS F	14.5
H.21 Canterbury Rd / Haldon St - PM Peak	Haldon St	North	R2	311	90%	79.03	LOS F	14.5
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	West	T1	1230	66%	7.96	LOS A	15.1
H.21 Canterbury Rd / Haldon St - PM Peak	Canterbury Rd	West	L2	189	66%	13.54	LOS A	14.9

9.0 Wiley Park Station

9.1 Wiley Park Station: Base

Note: Wiley Park Station was modelled in LinSig

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	Mean Maximum Queue (Veh)
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	South	Ahead Left	917	78.8%	29.9	LOS C	30.6
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	South	Ahead	913	78.4%	29.7	LOS C	30.5
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	South	Ahead	916	78.7%	29.9	LOS C	30.6
B.06 King Georges Road / The Boulevarde AM Peak	The boulevarde	West	Left Ahead	419	94.5%	105.	LOS F	16.3
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	North	Ahead Left	107	77.5%	9	LOS A	7.7
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	North	Ahead	113	81.8%	9.5	LOS A	6.6
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	North	Ahead Right	149	92.8%	153.	LOS F	9.8
B.06 King Georges Road / The Boulevarde AM Peak	The boulevarde	East	Right Left Ahead	348	69.0%	105.	LOS F	9.8
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	South	Ahead Left	987	65.2%	4.6	LOS A	2.7
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	South	Ahead	996	66.0%	4.6	LOS A	2.6
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	South	Ahead Right	103	67.1%	12.7	LOS A	17.2
H.06 King Georges Road / Lakemba Street AM Peak	Lakemba St	West	Left Ahead Right	331	80.2%	81.3	LOS F	11.7
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	North	Left Ahead	106	86.0%	31.7	LOS C	38.6
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	North	Ahead	104	84.4%	30.2	LOS C	36.7
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	North	Ahead	137	11.0%	12.1	LOS A	2.3
H.06 King Georges Road / Lakemba Street AM Peak	Lakemba St	East	Right Ahead Left	282	76.8%	73	LOS F	7.9
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	South	Ahead Left	760	82.8%	45.3	LOS D	29.6
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	South	Ahead	762	83.0%	45.4	LOS D	29.9
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	South	Ahead	704	76.7%	40.9	LOS C	25.7
B.06 King Georges Road / The Boulevarde PM Peak	The boulevarde	West	Left Ahead	379	82.2%	71	LOS F	11.1
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	North	Ahead Left	923	69.9%	9.2	LOS A	7.4
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	North	Ahead	967	73.3%	8.5	LOS A	5.9
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	North	Ahead Right	768	83.3%	27.8	LOS B	12.3
B.06 King Georges Road / The Boulevarde PM Peak	The boulevarde	East	Right Left Ahead	533	84.1%	75.1	LOS F	17.5
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	South	Ahead Left	862	59.9%	3.6	LOS A	1.9
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	South	Ahead	848	59.0%	3.4	LOS A	1.4
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	South	Ahead Right	770	76.8%	20.9	LOS B	9.1
H.06 King Georges Road / Lakemba Street PM Peak	Lakemba St	West	Left Ahead Right	193	53.3%	65.1	LOS E	4.1
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	North	Left Ahead	879	77.2%	30.3	LOS C	29.3
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	North	Ahead	865	76.0%	29.6	LOS C	28.2
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	North	Ahead	706	62.0%	24.3	LOS B	19.8
H.06 King Georges Road / Lakemba Street PM Peak	Lakemba St	East	Right Ahead Left	533	83.2%	64.9	LOS E	13.6

9.2 Wiley Park Station: Future

Note: Wiley Park Station was modelled in LinSig

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	Mean Maximum Queue (Veh)
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	South	Ahead Left	101	90.0%	42.6	LOS D	41.1
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	South	Ahead	101	89.9%	42.3	LOS D	40.9
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	South	Ahead	100	89.1%	41.1	LOS C	40
B.06 King Georges Road / The Boulevarde AM Peak	The boulevarde	West	Left Ahead	462	98.3%	124.	LOS F	21.5
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	North	Ahead Left	119	87.8%	14.6	LOS B	12.2
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	North	Ahead	123	91.2%	16.8	LOS B	9.5
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	North	Ahead Right	165	94.6%	157.	LOS F	11.1
B.06 King Georges Road / The Boulevarde AM Peak	The boulevarde	East	Right Left Ahead	384	72.4%	111.	LOS F	11.5
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	South	Ahead Left	111	73.2%	5.5	LOS A	3.2
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	South	Ahead	112	74.2%	5.6	LOS A	3.1
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	South	Ahead Right	108	78.9%	14.7	LOS B	25.5
H.06 King Georges Road / Lakemba Street AM Peak	Lakemba St	West	Left Ahead Right	366	89.4%	97.9	LOS F	15.2
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	North	Left Ahead	117	94.5%	46.3	LOS D	51.4
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	North	Ahead	115	93.3%	43.1	LOS D	49.3
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	North	Ahead	151	12.2%	12.2	LOS A	2.5
H.06 King Georges Road / Lakemba Street AM Peak	Lakemba St	East	Right Ahead Left	311	73.9%	68.1	LOS E	8
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	South	Ahead Left	942	95.8%	66.9	LOS E	45.6
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	South	Ahead	941	95.7%	66.4	LOS E	45.5
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	South	Ahead	587	59.7%	30.7	LOS C	18
B.06 King Georges Road / The Boulevarde PM Peak	The boulevarde	West	Left Ahead	420	91.0%	88.3	LOS F	14.2
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	North	Ahead Left	123	92.7%	22.4	LOS B	23.6
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	North	Ahead	125	94.1%	23	LOS B	12.6
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	North	Ahead Right	460	97.7%	99.8	LOS F	19.9
B.06 King Georges Road / The Boulevarde PM Peak	The boulevarde	East	Right Left Ahead	592	97.4%	121.	LOS F	26.1
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	South	Ahead Left	107	73.0%	5.3	LOS A	3
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	South	Ahead	106	72.8%	5	LOS A	2.3
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	South	Ahead Right	610	95.3%	60.7	LOS E	15.1
H.06 King Georges Road / Lakemba Street PM Peak	Lakemba St	West	Left Ahead Right	214	67.6%	73	LOS F	4.9
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	North	Left Ahead	115	97.7%	64.5	LOS E	57.5
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	North	Ahead	114	97.1%	61.1	LOS E	55.8
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	North	Ahead	426	36.2%	17.3	LOS B	9.2
H.06 King Georges Road / Lakemba Street PM Peak	Lakemba St	East	Right Ahead Left	592	95.5%	95	LOS F	20.3

9.3 Wiley Park Station: Future + Construction

Note: Wiley Park Station was modelled in LinSig

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn.	Average Delay (sec)	Level of Service	Mean Maximum Queue (Veh)[1]
King Georges Road / Lakemba Street AM Peak	King Georges Road	North	Left	1174	94%	43.0	LOS D	50.0
King Georges Road / Lakemba Street AM Peak	King Georges Road	North	Ahead	1161	93%	40.5	LOS C	47.8
King Georges Road / Lakemba Street AM Peak	King Georges Road	North	Ahead	148	12%	11.8	LOS A	2.4
King Georges Road / Lakemba Street AM Peak	King Georges Road	South	Ahead Left	1109	72%	5.4	LOS A	3.2
King Georges Road / Lakemba Street AM Peak	King Georges Road	South	Ahead	1136	74%	5.6	LOS A	3.2
King Georges Road / Lakemba Street AM Peak	King Georges Road	South	Ahead Right	1108	77%	13.8	LOS A	18.3
King Georges Road / Lakemba Street AM Peak	Lakemba Street	West	Left Ahead Right	381	97%	133.4	LOS F	20.1
King Georges Road / Lakemba Street AM Peak	Lakemba Street	East	Right Ahead Left	311	80%	75.4	LOS F	8.6
King Georges Road / The Boulevarde AM Peak	King Georges Road	South	Ahead Left	1022	90%	41.6	LOS C	41.3
King Georges Road / The Boulevarde AM Peak	King Georges Road	South	Ahead	1018	89%	41.0	LOS C	40.7
King Georges Road / The Boulevarde AM Peak	King Georges Road	South	Ahead	1016	89%	40.8	LOS C	40.6
King Georges Road / The Boulevarde AM Peak	The Boulevarde	East	Right Left Ahead	388	75%	113.5	LOS F	11.7
King Georges Road / The Boulevarde AM Peak	King Georges Road	North	Ahead Left	1198	87%	14.0	LOS B	12.1
King Georges Road / The Boulevarde AM Peak	King Georges Road	North	Ahead	1236	90%	15.3	LOS B	9.7
King Georges Road / The Boulevarde AM Peak	King Georges Road	North	Ahead Right	162	95%	160.2	LOS F	11.0
King Georges Road / The Boulevarde AM Peak	The Boulevarde	West	Left Ahead	477	101%	153.9	LOS F	25.9
King Georges Road / Lakemba Street PM Peak	King Georges Road	North	Left	1178	94%	43.9	LOS D	50.4
King Georges Road / Lakemba Street PM Peak	King Georges Road	North	Ahead	1160	93%	40.3	LOS C	47.7
King Georges Road / Lakemba Street PM Peak	King Georges Road	North	Ahead	145	12%	11.8	LOS A	2.4
King Georges Road / Lakemba Street PM Peak	King Georges Road	South	Ahead Left	1131	73%	4.6	LOS A	2.4
King Georges Road / Lakemba Street PM Peak	King Georges Road	South	Ahead	1130	73%	4.6	LOS A	2.2
King Georges Road / Lakemba Street PM Peak	King Georges Road	South	Ahead Right	1092	79%	13.9	LOS A	16.9
King Georges Road / Lakemba Street PM Peak	Lakemba Street	West	Left Ahead Right	381	98%	136.2	LOS F	20.5
King Georges Road / Lakemba Street PM Peak	Lakemba Street	East	Right Ahead Left	311	80%	75.7	LOS F	8.6
King Georges Road / The Boulevarde PM Peak	King Georges Road	South	Ahead Left	1020	101%	106.0	LOS F	62.0
King Georges Road / The Boulevarde PM Peak	King Georges Road	South	Ahead	1018	101%	103.5	LOS F	61.2
King Georges Road / The Boulevarde PM Peak	King Georges Road	South	Ahead	1018	101%	103.5	LOS F	61.2
King Georges Road / The Boulevarde PM Peak	The Boulevarde	East	Right Left Ahead	476	74%	97.0	LOS F	13.1
King Georges Road / The Boulevarde PM Peak	King Georges Road	North	Ahead Left	1213	98%	45.5	LOS D	52.5
King Georges Road / The Boulevarde AM Peak	King Georges Road	North	Ahead	1224	99%	46.3	LOS D	34.1
King Georges Road / The Boulevarde PM Peak	King Georges Road	North	Ahead Right	159	95%	161.7	LOS F	11.0
King Georges Road / The Boulevarde PM Peak	The Boulevarde	West	Left Ahead	565	101%	141.0	LOS F	32.2

9.4 Wiley Park Station: Future + Construction + TTP

Note: Wiley Park Station was modelled in LinSig

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn.	Average Delay (sec)	Level of Service	Mean Maximum Queue (Veh) [2]
King Georges Road / Lakemba Street AM Peak	King Georges Road	North	Left	1178	94%	43.9	LOS D	50.4
King Georges Road / Lakemba Street AM Peak	King Georges Road	North	Ahead	1160	93%	40.3	LOS C	47.7
King Georges Road / Lakemba Street AM Peak	King Georges Road	North	Ahead	145	12%	11.8	LOS A	2.4
King Georges Road / Lakemba Street AM Peak	King Georges Road	South	Ahead Left	1131	73%	4.6	LOS A	2.4
King Georges Road / Lakemba Street AM Peak	King Georges Road	South	Ahead	1130	73%	4.6	LOS A	2.2
King Georges Road / Lakemba Street AM Peak	King Georges Road	South	Ahead Right	1092	79%	13.9	LOS A	16.9
King Georges Road / Lakemba Street AM Peak	Lakemba Street	West	Left Ahead Right	381	98%	136.2	LOS F	20.5
King Georges Road / Lakemba Street AM Peak	Lakemba Street	East	Right Ahead Left	311	80%	75.7	LOS F	8.6
King Georges Road / The Boulevarde AM Peak	King Georges Road	South	Ahead Left	1020	101%	106	LOS F	62
King Georges Road / The Boulevarde AM Peak	King Georges Road	South	Ahead	1018	101%	103.5	LOS F	61.2
King Georges Road / The Boulevarde AM Peak	King Georges Road	South	Ahead	1018	101%	103.5	LOS F	61.2
King Georges Road / The Boulevarde AM Peak	The Boulevarde	East	Right Left Ahead	476	74%	97	LOS F	13.1
King Georges Road / The Boulevarde AM Peak	King Georges Road	North	Ahead Left	1213	98%	45.5	LOS D	52.5
King Georges Road / The Boulevarde AM Peak	King Georges Road	North	Ahead	1224	99%	46.3	LOS D	34.1
King Georges Road / The Boulevarde AM Peak	King Georges Road	North	Ahead Right	159	95%	161.7	LOS F	11
King Georges Road / The Boulevarde AM Peak	The Boulevarde	West	Left Ahead	565	101%	141	LOS F	32.2
King Georges Road / Lakemba Street PM Peak	King Georges Road	North	Left	1162	99%	71.4	LOS F	61.2
King Georges Road / Lakemba Street PM Peak	King Georges Road	North	Ahead	1156	98%	67.8	LOS E	59.1
King Georges Road / Lakemba Street PM Peak	King Georges Road	North	Ahead	401	34%	16.9	LOS B	8.5
King Georges Road / Lakemba Street PM Peak	King Georges Road	South	Ahead Left	1021	69%	4.3	LOS A	2.4
King Georges Road / Lakemba Street PM Peak	King Georges Road	South	Ahead	1006	68%	4.1	LOS A	1.9
King Georges Road / Lakemba Street PM Peak	King Georges Road	South	Ahead Right	755	95%	50	LOS D	21.8
King Georges Road / Lakemba Street PM Peak	Lakemba Street	West	Left Ahead Right	229	64%	69.2	LOS E	5
King Georges Road / Lakemba Street PM Peak	Lakemba Street	East	Right Ahead Left	592	98%	111.7	LOS F	23
King Georges Road / The Boulevarde PM Peak	King Georges Road	South	Ahead Left	884	99%	92.8	LOS F	49.3
King Georges Road / The Boulevarde PM Peak	King Georges Road	South	Ahead	884	99%	92.8	LOS F	49.3
King Georges Road / The Boulevarde PM Peak	King Georges Road	South	Ahead	732	82%	46	LOS D	28.7
King Georges Road / The Boulevarde PM Peak	The Boulevarde	East	Right Left Ahead	684	100%	136.4	LOS F	33.7
King Georges Road / The Boulevarde PM Peak	King Georges Road	North	Ahead Left	1253	101%	74	LOS F	73
King Georges Road / The Boulevarde AM Peak	King Georges Road	North	Ahead	1261	102%	78.5	LOS F	76.6
King Georges Road / The Boulevarde PM Peak	King Georges Road	North	Ahead Right	436	98%	104.4	LOS F	19.7
King Georges Road / The Boulevarde PM Peak	The Boulevarde	West	Left Ahead	523	99%	118.7	LOS F	25.9

9.5 Wiley Park Station: Future + Construction + Refined Baseline TTP

Note: Wiley Park Station was modelled in LinSig

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	Mean Maximum Queue (Veh)
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	South	Ahead Left	101	96.1%	63.1	LOS E	49.1
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	South	Ahead	101	96.1%	63.1	LOS E	49.1
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	South	Ahead	101	96.0%	62.6	LOS E	49.0
B.06 King Georges Road / The Boulevarde AM Peak	The boulevarde	West	Left Ahead	507	95.4%	99.6	LOS F	21.1
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	North	Ahead Left	121	93.7%	26.9	LOS C	41.5
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	North	Ahead	122	94.6%	24.3	LOS C	24
B.06 King Georges Road / The Boulevarde AM Peak	King Georges Rd	North	Ahead Right	159	94.6%	162.	LOS F	11.0
B.06 King Georges Road / The Boulevarde AM Peak	The boulevarde	East	Right Left Ahead	418	70.3%	102.	LOS F	11.3
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	South	Ahead Left	113	73.9%	5.7	LOS A	3.5
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	South	Ahead	113	74.5%	5.6	LOS A	3.0
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	South	Ahead Right	109	82.1%	15.3	LOS B	27.6
H.06 King Georges Road / Lakemba Street AM Peak	Lakemba St	West	Left Ahead Right	381	94.5%	116	LOS F	18.3
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	North	Left Ahead	117	93.9%	43.9	LOS D	50.4
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	North	Ahead	116	92.5%	40.3	LOS D	47.7
H.06 King Georges Road / Lakemba Street AM Peak	King Georges Rd	North	Ahead	145	11.6%	11.8	LOS B	2.4
H.06 King Georges Road / Lakemba Street AM Peak	Lakemba St	East	Right Ahead Left	311	79.4%	74	LOS E	8.5
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	South	Ahead Left	867	93.1%	60.5	LOS E	39.7
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	South	Ahead	866	93.0%	60.2	LOS E	39.3
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	South	Ahead	767	82.4%	44.2	LOS D	29.8
B.06 King Georges Road / The Boulevarde PM Peak	The boulevarde	West	Left Ahead	465	96.6%	108.	LOS F	19.5
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	North	Ahead Left	118	91.8%	22.2	LOS C	32.7
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	North	Ahead	120	92.9%	20.9	LOS C	11.7
B.06 King Georges Road / The Boulevarde PM Peak	King Georges Rd	North	Ahead Right	561	94.8%	69.2	LOS E	17.9
B.06 King Georges Road / The Boulevarde PM Peak	The boulevarde	East	Right Left Ahead	626	94.9%	100.	LOS F	25.2
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	South	Ahead Left	100	68.4%	4.7	LOS A	2.5
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	South	Ahead	990	67.9%	4.3	LOS A	1.9
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	South	Ahead Right	790	95.5%	48.2	LOS D	23.1
H.06 King Georges Road / Lakemba Street PM Peak	Lakemba St	West	Left Ahead Right	229	64.1%	69.2	LOS E	5
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	North	Left Ahead	110	94.0%	48.4	LOS D	48.7
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	North	Ahead	109	92.8%	45.2	LOS D	46.3
H.06 King Georges Road / Lakemba Street PM Peak	King Georges Rd	North	Ahead	521	44.3%	18.6	LOS B	12
H.06 King Georges Road / Lakemba Street PM Peak	Lakemba St	East	Right Ahead Left	592	98.2%	111.	LOS F	23

10.0 Punchbowl Station

10.1 Punchbowl Station: Base

Note: Punchbowl Station was modelled in LinSig

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	Mean Maximum Queue (Veh)
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	East	Ahead	554	43.0%	8	LOS A	6.3
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	East	Right	365	82.2%	55.4	LOS D	12.3
B.04 Punchbowl Road / South Terrace AM Peak	South Tce	West	Ahead Left	872	94.8%	56.1	LOS E	31.9
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	North	Left Right	634	78.7%	39.7	LOS C	18.3
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	East	Ahead Left	562	64.7%	28.4	LOS C	14.5
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	East	Ahead	229	26.4%	20.6	LOS B	4.5
B.05 Punchbowl Road / The Boulevarde AM Peak	The Boulevarde	South	Left	375	48.3%	27.9	LOS B	9.7
B.05 Punchbowl Road / The Boulevarde AM Peak	The Boulevarde	South	Right	338	94.7%	105.9	LOS F	16.4
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	West	Ahead	1064	82.6%	17.4	LOS B	29.9
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	West	Ahead Right	333	59.4%	32.8	LOS C	9.8
H.05 Punchbowl Road / Rossmore Ave AM Peak	Punchbowl Rd	East	Left Ahead	696	38.7%	1.6	LOS A	0.3
H.05 Punchbowl Road / Rossmore Ave AM Peak	Punchbowl Rd	East	Ahead	365	20.3%	1.3	LOS A	0.1
H.22 The Boulevarde / Arthur Street AM Peak	The Boulevarde	East	Ahead Left	567	44.3%	9.5	LOS A	3.2
H.22 The Boulevarde / Arthur Street AM Peak	Arthur St	South	Left Right	273	45.5%	22.3	LOS B	3.1
H.22 The Boulevarde / Arthur Street AM Peak	The Boulevarde	West	Right Ahead	438	60.0%	17	LOS B	11.2
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	East	Ahead	660	53.4%	10.7	LOS A	8.7
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	East	Right	516	74.7%	34.6	LOS C	14.6
B.04 Punchbowl Road / South Terrace PM Peak	South Tce	West	Ahead Left	532	64.0%	31.1	LOS C	11.5
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	North	Left Right	689	79.4%	35.6	LOS C	17.9
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	East	Ahead Left	593	79.3%	41.5	LOS C	18.7
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	East	Ahead	293	39.2%	28.1	LOS C	7
B.05 Punchbowl Road / The Boulevarde PM Peak	The Boulevarde	South	Left	550	61.1%	23.7	LOS B	12.9
B.05 Punchbowl Road / The Boulevarde PM Peak	The Boulevarde	South	Right	245	59.5%	48.1	LOS D	8
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	West	Ahead	648	52.4%	11.2	LOS A	13.6
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	West	Ahead Right	387	70.6%	43.2	LOS D	11.2
H.05 Punchbowl Road / Rossmore AvePM Peak	Punchbowl Rd	East	Left Ahead	786	43.7%	1.8	LOS A	0.4
H.05 Punchbowl Road / Rossmore Ave PM Peak	Punchbowl Rd	East	Ahead	516	28.7%	1.4	LOS A	0.2
H.22 The Boulevarde / Arthur Street PM Peak	The Boulevarde	East	Ahead Left	691	56.8%	9.8	LOS A	5.2
H.22 The Boulevarde / Arthur Street PM Peak	Arthur St	South	Left Right	228	43.3%	24.7	LOS B	2.7
H.22 The Boulevarde / Arthur Street PM Peak	The Boulevarde	West	Right Ahead	521	79.5%	34	LOS C	10.5

10.2 Punchbowl Station: Future

Note: Punchbowl Station was modelled in LinSig

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	Mean Maximum Queue (Veh)
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	East	Ahead	603	47.4%	8.3	LOS A	6.6
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	East	Right	396	102.1%	154.8	LOS F	25.2
B.04 Punchbowl Road / South Terrace AM Peak	South Tce	West	Ahead Left	948	101.3%	102.3	LOS F	49
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	North	Left Right	690	87.3%	48.2	LOS D	22.6
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	East	Ahead Left	611	69.1%	29.2	LOS C	16.2
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	East	Ahead	249	28.2%	20.3	LOS B	4.9
B.05 Punchbowl Road / The Boulevarde AM Peak	The Boulevarde	South	Left	407	53.5%	30.2	LOS C	9.4
B.05 Punchbowl Road / The Boulevarde AM Peak	The Boulevarde	South	Right	367	98.5%	126.2	LOS F	20
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	West	Ahead	1157	90.2%	26	LOS B	36.7
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	West	Ahead Right	362	71.7%	43	LOS D	11.5
H.05 Punchbowl Road / Rossmore Ave AM Peak	Punchbowl Rd	East	Left Ahead	757	42.1%	1.7	LOS A	0.4
H.05 Punchbowl Road / Rossmore Ave AM Peak	Punchbowl Rd	East	Ahead	396	22.0%	1.3	LOS A	0.1
H.22 The Boulevarde / Arthur Street AM Peak	The Boulevarde	East	Ahead Left	616	45.0%	9.5	LOS A	4.9
H.22 The Boulevarde / Arthur Street AM Peak	Arthur St	South	Left Right	296	62.9%	48.7	LOS D	7.6
H.22 The Boulevarde / Arthur Street AM Peak	The Boulevarde	West	Right Ahead	476	49.1%	5.9	LOS A	4.5
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	East	Ahead	722	58.4%	11.5	LOS A	9.8
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	East	Right	563	86.4%	49.2	LOS D	19.4
B.04 Punchbowl Road / South Terrace PM Peak	South Tce	West	Ahead Left	581	69.9%	33.2	LOS C	13.5
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	North	Left Right	754	87.0%	42.3	LOS D	23.9
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	East	Ahead Left	649	86.8%	48.7	LOS D	22.4
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	East	Ahead	320	42.8%	28.7	LOS C	7.8
B.05 Punchbowl Road / The Boulevarde PM Peak	The Boulevarde	South	Left	601	66.8%	28.6	LOS C	15.3
B.05 Punchbowl Road / The Boulevarde PM Peak	The Boulevarde	South	Right	268	65.1%	54.6	LOS D	8.2
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	West	Ahead	708	57.3%	12.7	LOS A	15.9
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	West	Ahead Right	423	81.3%	54.2	LOS D	14.4
H.05 Punchbowl Road / Rossmore AvePM Peak	Punchbowl Rd	East	Left Ahead	860	47.8%	1.9	LOS A	0.5
H.05 Punchbowl Road / Rossmore Ave PM Peak	Punchbowl Rd	East	Ahead	563	31.3%	1.5	LOS A	0.2
H.22 The Boulevarde / Arthur Street PM Peak	The Boulevarde	East	Ahead Left	755	56.3%	10.2	LOS A	9
H.22 The Boulevarde / Arthur Street PM Peak	Arthur St	South	Left Right	249	57.8%	50.1	LOS D	6.3
H.22 The Boulevarde / Arthur Street PM Peak	The Boulevarde	West	Right Ahead	570	71.1%	10.7	LOS A	12

10.3 Punchbowl Station: Future + Construction

Note: Punchbowl Station was modelled in LinSig

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	Mean Maximum Queue (Veh)
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	East	Ahead	603	47.4%	8.3	LOS A	6.6
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	East	Right	402	99.6%	126.2	LOS F	22.4
B.04 Punchbowl Road / South Terrace AM Peak	South Tce	West	Ahead Left	948	103.0%	125.4	LOS F	55.2
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	North	Left Right	696	86.4%	46.3	LOS D	22.3
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	East	Ahead Left	617	71.0%	30.7	LOS C	16.8
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	East	Ahead	255	29.3%	21	LOS B	5.1
B.05 Punchbowl Road / The Boulevarde AM Peak	The Boulevarde	South	Left	407	52.5%	30.6	LOS C	9.4
B.05 Punchbowl Road / The Boulevarde AM Peak	The Boulevarde	South	Right	373	100.2%	141.8	LOS F	21.8
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	West	Ahead	1163	89.7%	25.2	LOS B	35.9
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	West	Ahead Right	362	70.4%	42.2	LOS D	11.2
H.05 Punchbowl Road / Rossmore Ave AM Peak	Punchbowl Rd	East	Left Ahead	757	42.1%	1.7	LOS A	0.4
H.05 Punchbowl Road / Rossmore Ave AM Peak	Punchbowl Rd	East	Ahead	402	22.3%	1.3	LOS A	0.1
H.22 The Boulevarde / Arthur Street AM Peak	The Boulevarde	East	Ahead Left	622	44.8%	9.1	LOS A	4.7
H.22 The Boulevarde / Arthur Street AM Peak	Arthur St	South	Left Right	296	65.0%	50.5	LOS D	7.7
H.22 The Boulevarde / Arthur Street AM Peak	The Boulevarde	West	Right Ahead	482	48.6%	7	LOS A	4.6
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	East	Ahead	722	58.4%	11.5	LOS A	9.8
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	East	Right	569	87.3%	50.5	LOS D	19.8
B.04 Punchbowl Road / South Terrace PM Peak	South Tce	West	Ahead Left	581	69.9%	33.2	LOS C	13.5
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	North	Left Right	760	87.2%	42.6	LOS D	24.1
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	East	Ahead Left	655	87.6%	49.9	LOS D	23
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	East	Ahead	326	43.6%	28.9	LOS C	8
B.05 Punchbowl Road / The Boulevarde PM Peak	The Boulevarde	South	Left	601	66.8%	29.9	LOS C	15.1
B.05 Punchbowl Road / The Boulevarde PM Peak	The Boulevarde	South	Right	274	66.5%	56.5	LOS E	8.4
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	West	Ahead	714	57.8%	12.9	LOS A	16.3
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	West	Ahead Right	423	81.9%	55.4	LOS D	14.6
H.05 Punchbowl Road / Rossmore AvePM Peak	Punchbowl Rd	East	Left Ahead	860	47.8%	1.9	LOS A	0.5
H.05 Punchbowl Road / Rossmore Ave PM Peak	Punchbowl Rd	East	Ahead	569	31.6%	1.5	LOS A	0.2
H.22 The Boulevarde / Arthur Street PM Peak	The Boulevarde	East	Ahead Left	761	53.6%	7.9	LOS A	7.3
H.22 The Boulevarde / Arthur Street PM Peak	Arthur St	South	Left Right	249	70.2%	61.5	LOS E	7.1
H.22 The Boulevarde / Arthur Street PM Peak	The Boulevarde	West	Right Ahead	576	63.7%	8	LOS A	11.9

10.4 Punchbowl Station: Future + Construction + Baseline TTP

Note: Punchbowl Station was modelled in LinSig

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	Mean Maximum Queue (Veh)
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	East	Ahead	603	46.8%	7.5	LOS A	6
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	East	Right	490	105.3%	182.9	LOS F	35.3
B.04 Punchbowl Road / South Terrace AM Peak	South Tce	West	Ahead Left	948	108.5%	208.8	LOS F	75.6
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	North	Left Right	784	92.4%	54.4	LOS D	28.1
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	East	Ahead Left	617	75.0%	34.7	LOS C	17.8
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	East	Ahead	255	31.0%	23.1	LOS B	5.4
B.05 Punchbowl Road / The Boulevarde AM Peak	The Boulevarde	South	Left	495	60.2%	31.3	LOS C	12.1
B.05 Punchbowl Road / The Boulevarde AM Peak	The Boulevarde	South	Right	373	104.5%	195	LOS F	27.4
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	West	Ahead	1163	85.9%	20.5	LOS B	33.1
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	West	Ahead Right	450	78.8%	48.8	LOS D	13.8
H.05 Punchbowl Road / Rossmore Ave AM Peak	Punchbowl Rd	East	Left Ahead	757	42.1%	1.7	LOS A	0.4
H.05 Punchbowl Road / Rossmore Ave AM Peak	Punchbowl Rd	East	Ahead	490	27.2%	1.4	LOS A	0.2
H.22 The Boulevarde / Arthur Street AM Peak	The Boulevarde	East	Ahead Left	710	50.5%	8.5	LOS A	5.8
H.22 The Boulevarde / Arthur Street AM Peak	Arthur St	South	Left Right	296	72.4%	57.7	LOS E	8.4
H.22 The Boulevarde / Arthur Street AM Peak	The Boulevarde	West	Right Ahead	570	56.1%	7.6	LOS A	8.4
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	East	Ahead	722	57.0%	10.6	LOS A	9.2
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	East	Right	657	94.0%	63.9	LOS E	26.1
B.04 Punchbowl Road / South Terrace PM Peak	South Tce	West	Ahead Left	581	73.9%	37.2	LOS C	14.6
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	North	Left Right	848	93.3%	52.2	LOS D	30.7
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	East	Ahead Left	655	93.3%	65.6	LOS E	26.2
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	East	Ahead	326	46.5%	31.6	LOS C	8.3
B.05 Punchbowl Road / The Boulevarde PM Peak	The Boulevarde	South	Left	689	72.9%	31.3	LOS C	18.5
B.05 Punchbowl Road / The Boulevarde PM Peak	The Boulevarde	South	Right	274	71.8%	62.2	LOS E	8.9
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	West	Ahead	714	56.4%	11.1	LOS A	15.3
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	West	Ahead Right	511	88.4%	60.5	LOS E	18.7
H.05 Punchbowl Road / Rossmore AvePM Peak	Punchbowl Rd	East	Left Ahead	860	47.8%	1.9	LOS A	0.5
H.05 Punchbowl Road / Rossmore Ave PM Peak	Punchbowl Rd	East	Ahead	657	36.5%	1.6	LOS A	0.3
H.22 The Boulevarde / Arthur Street PM Peak	The Boulevarde	East	Ahead Left	849	59.0%	7.9	LOS A	9.2
H.22 The Boulevarde / Arthur Street PM Peak	Arthur St	South	Left Right	249	76.8%	69.7	LOS E	7.7
H.22 The Boulevarde / Arthur Street PM Peak	The Boulevarde	West	Right Ahead	664	76.8%	16.1	LOS B	15.9

10.5 Punchbowl Station: Future + Construction + Refined Baseline TTP

Note: Punchbowl Station was modelled in LinSig

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	Mean Maximum Queue (Veh)
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	East	Ahead	603	46.8%	7.5	LOS A	6.1
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	East	Right	432	103.1%	160.8	LOS F	28.5
B.04 Punchbowl Road / South Terrace AM Peak	South Tce	West	Ahead Left	948	103.0%	124.7	LOS F	55.2
B.04 Punchbowl Road / South Terrace AM Peak	Punchbowl Rd	North	Left Right	726	90.3%	52.3	LOS D	25
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	East	Ahead Left	617	71.0%	30.7	LOS C	16.8
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	East	Ahead	255	29.3%	21.0	LOS C	5.1
B.05 Punchbowl Road / The Boulevarde AM Peak	The Boulevarde	South	Left	437	56.3%	22.4	LOS C	8.4
B.05 Punchbowl Road / The Boulevarde AM Peak	The Boulevarde	South	Right	373	104.5%	185.1	LOS F	27
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	West	Ahead	1163	88.6%	23.5	LOS C	35.5
B.05 Punchbowl Road / The Boulevarde AM Peak	Punchbowl Rd	West	Ahead Right	392	74.0%	45	LOS D	12.2
H.05 Punchbowl Road / Rossmore Ave AM Peak	Punchbowl Rd	East	Left Ahead	757	42.1%	1.7	LOS A	0.4
H.05 Punchbowl Road / Rossmore Ave AM Peak	Punchbowl Rd	East	Ahead	432	24.0%	1.3	LOS A	0.2
H.22 The Boulevarde / Arthur Street AM Peak	The Boulevarde	East	Ahead Left	652	45.8%	8.1	LOS A	4.8
H.22 The Boulevarde / Arthur Street AM Peak	Arthur St	South	Left Right	296	72.4%	57.7	LOS E	8.4
H.22 The Boulevarde / Arthur Street AM Peak	The Boulevarde	West	Right Ahead	512	49.7%	24.5	LOS C	9.9
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	East	Ahead	722	57.0%	11	LOS B	9.2
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	East	Right	599	85.7%	44.1	LOS D	19.8
B.04 Punchbowl Road / South Terrace PM Peak	South Tce	West	Ahead Left	581	73.9%	37.2	LOS D	14.6
B.04 Punchbowl Road / South Terrace PM Peak	Punchbowl Rd	North	Left Right	790	91.4%	48.1	LOS D	27.5
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	East	Ahead Left	655	93.3%	65.6	LOS E	26.2
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	East	Ahead	326	46.5%	31.6	LOS C	8.3
B.05 Punchbowl Road / The Boulevarde PM Peak	The Boulevarde	South	Left	631	68.7%	28.8	LOS C	15.8
B.05 Punchbowl Road / The Boulevarde PM Peak	The Boulevarde	South	Right	274	71.8%	62.4	LOS E	8.9
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	West	Ahead	714	56.4%	10.3	LOS B	14.2
B.05 Punchbowl Road / The Boulevarde PM Peak	Punchbowl Rd	West	Ahead Right	453	78.4%	46.6	LOS D	14.5
H.05 Punchbowl Road / Rossmore AvePM Peak	Punchbowl Rd	East	Left Ahead	722	47.8%	1.9	LOS A	0.5
H.05 Punchbowl Road / Rossmore Ave PM Peak	Punchbowl Rd	East	Ahead	599	33.3%	1.5	LOS A	0.2
H.22 The Boulevarde / Arthur Street PM Peak	The Boulevarde	East	Ahead Left	791	54.7%	7.3	LOS A	7.4
H.22 The Boulevarde / Arthur Street PM Peak	Arthur St	South	Left Right	249	76.8%	69.7	LOS E	7.7
H.22 The Boulevarde / Arthur Street PM Peak	The Boulevarde	West	Right Ahead	606	66.1%	8.5	LOS A	13.1

11.0 Bankstown Station

11.1 Bankstown Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.01 South Terrace / Restwell Street AM Peak	Restwell Street	South	R2	958	71%	30.84	LOS C	24.9
B.01 South Terrace / Restwell Street AM Peak	Restwell Street	South	L2	146	71%	30.22	LOS C	23.4
B.01 South Terrace / Restwell Street AM Peak	Local Access Road	North	L2	1	81%	76.58	LOS F	1.4
B.01 South Terrace / Restwell Street AM Peak	Local Access Road	North	R2	19	81%	77.36	LOS F	1.4
B.01 South Terrace / Restwell Street AM Peak	Bankstown City Plaza	West	R2	37	27%	41.98	LOS C	2.6
B.01 South Terrace / Restwell Street AM Peak	Bankstown City Plaza	West	T1	21	27%	38.25	LOS C	2.6
B.01 South Terrace / Restwell Street PM Peak	Restwell Street	South	R2	809	68%	31.36	LOS C	20.6
B.01 South Terrace / Restwell Street PM Peak	Restwell Street	South	L2	137	68%	30.36	LOS C	18.9
B.01 South Terrace / Restwell Street PM Peak	Local Access Road	North	L2	4	53%	63.56	LOS E	1.4
B.01 South Terrace / Restwell Street PM Peak	Local Access Road	North	R2	21	53%	64.34	LOS E	1.4
B.01 South Terrace / Restwell Street PM Peak	Bankstown City Plaza	West	R2	35	27%	39.60	LOS C	2.6
B.01 South Terrace / Restwell Street PM Peak	Bankstown City Plaza	West	T1	25	27%	35.87	LOS C	2.6
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	South	T1	498	65%	19.67	LOS B	15.6
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	South	L2	1	1%	40.60	LOS C	0.0
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	L2	256	34%	20.55	LOS B	6.9
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	R2	479	92%	52.95	LOS D	24.5
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	T1	1	0%	21.89	LOS B	0.0
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	North	T1	37	9%	14.85	LOS B	0.9
B.02 Restwell Street / Raymond Street AM Peak	Greenfield Parade	West	L2	173	9%	2.89	LOS A	0.0
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	South	T1	397	63%	21.68	LOS B	12.2
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	South	L2	1	1%	37.32	LOS C	0.0
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	L2	329	37%	16.73	LOS B	7.6
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	R2	539	89%	42.60	LOS D	23.9
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	T1	10	2%	17.83	LOS B	0.3
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	North	T1	40	11%	17.74	LOS B	1.0
B.02 Restwell Street / Raymond Street PM Peak	Greenfield Parade	West	L2	1	0%	2.88	LOS A	0.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	East	L2	205	60%	51.67	LOS D	11.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	East	R2	509	74%	54.68	LOS D	14.4
B.03 South Terrace / West Terrace AM Peak	Underpass	North	T1	387	49%	27.62	LOS B	16.3
B.03 South Terrace / West Terrace AM Peak	Underpass	North	L2	285	24%	12.16	LOS A	6.7
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	R2	121	7%	3.93	LOS A	0.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	T1	248	51%	40.85	LOS C	12.3
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	L2	567	43%	10.84	LOS A	13.3
B.03 South Terrace / West Terrace PM Peak	South Terrace	East	L2	239	71%	54.83	LOS D	13.6
B.03 South Terrace / West Terrace PM Peak	South Terrace	East	R2	377	55%	52.21	LOS D	10.2
B.03 South Terrace / West Terrace PM Peak	Underpass	North	T1	443	54%	27.36	LOS B	19.1
B.03 South Terrace / West Terrace PM Peak	Underpass	North	L2	438	36%	12.52	LOS A	11.2
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	R2	125	7%	3.91	LOS A	0.0
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	T1	280	67%	43.76	LOS D	14.6
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	L2	387	29%	9.80	LOS A	7.9
H.01 Meredith St / Marion St AM Peak	Car Park	South	R2	4	24%	70.45	LOS E	0.3
H.01 Meredith St / Marion St AM Peak	Car Park	South	T1	7	30%	39.48	LOS C	1.2
H.01 Meredith St / Marion St AM Peak	Car Park	South	L2	19	30%	39.48	LOS C	1.2
H.01 Meredith St / Marion St AM Peak	Marion St	East	L2	42	19%	21.12	LOS B	5.2
H.01 Meredith St / Marion St AM Peak	Marion St	East	R2	72	47%	58.17	LOS E	3.9
H.01 Meredith St / Marion St AM Peak	Marion St	East	T1	339	19%	14.23	LOS A	5.3
H.01 Meredith St / Marion St AM Peak	RoadName	North	T1	42	78%	59.95	LOS E	14.0
H.01 Meredith St / Marion St AM Peak	RoadName	North	L2	33	78%	55.17	LOS D	14.0
H.01 Meredith St / Marion St AM Peak	RoadName	North	R2	426	78%	55.53	LOS D	14.0
H.01 Meredith St / Marion St AM Peak	Marion St	West	R2	93	61%	64.01	LOS E	5.1
H.01 Meredith St / Marion St AM Peak	Marion St	West	T1	683	74%	21.55	LOS B	26.6
H.01 Meredith St / Marion St AM Peak	Marion St	West	L2	884	69%	10.14	LOS A	17.4
H.01 Meredith St / Marion St PM Peak	Car Park	South	R2	24	13%	47.40	LOS D	1.2

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.01 Meredith St / Marion St PM Peak	Car Park	South	T1	48	58%	29.86	LOS C	4.0
H.01 Meredith St / Marion St PM Peak	Car Park	South	L2	82	58%	29.86	LOS C	4.0
H.01 Meredith St / Marion St PM Peak	Marion St	East	L2	16	52%	38.03	LOS C	12.7
H.01 Meredith St / Marion St PM Peak	Marion St	East	R2	52	49%	58.04	LOS E	2.7
H.01 Meredith St / Marion St PM Peak	Marion St	East	T1	565	52%	30.83	LOS C	12.7
H.01 Meredith St / Marion St PM Peak	RoadName	North	T1	18	88%	56.83	LOS E	27.6
H.01 Meredith St / Marion St PM Peak	RoadName	North	L2	38	88%	52.05	LOS D	27.6
H.01 Meredith St / Marion St PM Peak	RoadName	North	R2	921	88%	52.25	LOS D	27.6
H.01 Meredith St / Marion St PM Peak	Marion St	West	R2	36	34%	61.85	LOS E	1.9
H.01 Meredith St / Marion St PM Peak	Marion St	West	T1	461	81%	39.96	LOS C	22.6
H.01 Meredith St / Marion St PM Peak	Marion St	West	L2	502	45%	10.45	LOS A	7.5
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	R2	172	73%	81.47	LOS F	13.2
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	T1	1965	80%	11.98	LOS A	37.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	L2	58	4%	6.51	LOS A	0.2
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	L2	281	32%	7.43	LOS A	5.0
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	R2	130	52%	84.58	LOS F	5.1
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	T1	20	32%	3.03	LOS A	5.0
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	T1	1728	57%	8.64	LOS A	15.7
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	L2	184	57%	10.56	LOS A	8.9
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	R2	16	8%	73.80	LOS F	1.1
H.02 Stacey St / Wattle St AM Peak	Car Park	West	R2	12	5%	79.90	LOS F	0.5
H.02 Stacey St / Wattle St AM Peak	Car Park	West	T1	10	23%	75.87	LOS F	2.4
H.02 Stacey St / Wattle St AM Peak	Car Park	West	L2	21	23%	80.17	LOS F	2.4
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	R2	271	80%	73.16	LOS F	19.5
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	T1	1506	85%	23.90	LOS B	35.8
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	L2	153	12%	13.01	LOS A	2.3
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	L2	630	81%	42.04	LOS C	33.9
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	R2	94	51%	83.56	LOS F	3.5
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	T1	53	81%	37.65	LOS C	33.9
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	T1	2645	87%	24.75	LOS B	53.1
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	L2	163	87%	27.95	LOS B	50.3
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	R2	69	20%	63.03	LOS E	4.1
H.02 Stacey St / Wattle St PM Peak	Car Park	West	R2	159	91%	95.95	LOS F	6.7
H.02 Stacey St / Wattle St PM Peak	Car Park	West	T1	34	50%	63.81	LOS E	9.4
H.02 Stacey St / Wattle St PM Peak	Car Park	West	L2	104	50%	68.11	LOS E	9.4
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	U	3	32%	8.83	LOS A	2.7
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	R2	530	32%	7.31	LOS A	2.7
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	T1	787	34%	3.62	LOS A	3.1
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	L2	416	62%	13.53	LOS A	6.9
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	U	9	16%	16.75	LOS B	0.9
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	R2	50	16%	15.19	LOS B	0.9
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	T1	653	66%	10.28	LOS A	7.7
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	L2	256	25%	6.25	LOS A	1.7
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	U	14	66%	15.31	LOS B	7.7
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	U	9	35%	9.78	LOS A	2.8
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	R2	325	35%	8.32	LOS A	2.8
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	T1	880	65%	4.62	LOS A	8.3
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	L2	317	77%	27.97	LOS B	9.1
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	U	11	43%	26.12	LOS B	2.6
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	R2	93	43%	24.55	LOS B	2.6
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	T1	685	74%	10.68	LOS A	10.0
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	L2	84	9%	5.39	LOS A	0.5
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	U	7	74%	15.73	LOS B	10.0
H.04 Stanley St / Stacey St AM Peak	Stacey St	South	T1	1934	72%	11.95	LOS A	35.2
H.04 Stanley St / Stacey St AM Peak	Stacey St	South	L2	28	2%	12.50	LOS A	0.4
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	L2	1	86%	94.34	LOS F	9.9
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	R2	194	86%	94.37	LOS F	9.9
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	T1	38	86%	89.78	LOS F	9.9
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	T1	1885	66%	20.59	LOS B	54.9

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	L2	26	2%	17.04	LOS B	1.0
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	R2	72	87%	97.70	LOS F	6.0
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	R2	107	71%	80.40	LOS F	12.1
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	T1	47	71%	75.83	LOS F	12.1
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	L2	118	45%	71.89	LOS F	8.5
H.04 Stanley St / Stacey St PM Peak	Stacey St	South	T1	1848	71%	13.30	LOS A	32.5
H.04 Stanley St / Stacey St PM Peak	Stacey St	South	L2	51	4%	14.28	LOS A	0.8
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	L2	1	75%	83.02	LOS F	7.7
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	R2	137	75%	83.05	LOS F	7.7
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	T1	63	75%	78.46	LOS F	7.7
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	T1	3015	96%	5.11	LOS A	40.2
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	L2	85	5%	6.88	LOS A	0.1
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	R2	85	79%	82.86	LOS F	6.4
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	R2	158	87%	83.45	LOS F	16.3
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	T1	47	87%	78.89	LOS F	16.3
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	L2	58	15%	55.44	LOS D	3.4
H.30 The Appian Way / Nth Tce AM	North Tce	East	T1	567	60%	3.98	LOS A	7.3
H.30 The Appian Way / Nth Tce AM	The Appian Way	North	L2	565	42%	6.79	LOS A	3.2
H.30 The Appian Way / Nth Tce AM	The Appian Way	North	R2	132	43%	17.72	LOS B	1.6
H.30 The Appian Way / Nth Tce PM	North Tce	East	T1	446	55%	5.55	LOS A	5.5
H.30 The Appian Way / Nth Tce PM	The Appian Way	North	L2	709	57%	8.88	LOS A	8.2
H.30 The Appian Way / Nth Tce PM	The Appian Way	North	R2	212	74%	26.36	LOS B	3.7
H.31 Marion St / Oxford Ave AM	Oxford Ave	South	R2	294	65%	53.83	LOS D	9.9
H.31 Marion St / Oxford Ave AM	Oxford Ave	South	L2	72	65%	52.91	LOS D	9.9
H.31 Marion St / Oxford Ave AM	Marion St	East	L2	115	35%	17.80	LOS B	11.1
H.31 Marion St / Oxford Ave AM	Marion St	East	T1	655	35%	13.21	LOS A	11.2
H.31 Marion St / Oxford Ave AM	Marion St	West	R2	241	73%	12.39	LOS A	11.1
H.31 Marion St / Oxford Ave AM	Marion St	West	T1	1298	73%	2.21	LOS A	11.1
H.31 Marion St / Oxford Ave PM	Oxford Ave	South	R2	198	86%	61.60	LOS E	11.4
H.31 Marion St / Oxford Ave PM	Oxford Ave	South	L2	189	35%	36.79	LOS C	7.8
H.31 Marion St / Oxford Ave PM	Marion St	East	L2	192	58%	13.14	LOS A	13.0
H.31 Marion St / Oxford Ave PM	Marion St	East	T1	1111	58%	8.57	LOS A	13.1
H.31 Marion St / Oxford Ave PM	Marion St	West	R2	318	42%	18.34	LOS B	10.6
H.31 Marion St / Oxford Ave PM	Marion St	West	T1	608	42%	0.58	LOS A	10.6
H.32 Marion St / Greenwood Ave AM	Greenwood Ave	South	T1	513	91%	66.55	LOS E	17.8
H.32 Marion St / Greenwood Ave AM	Greenwood Ave	South	L2	22	91%	71.44	LOS F	17.5
H.32 Marion St / Greenwood Ave AM	Olympic Parade	East	L2	40	23%	21.60	LOS B	6.1
H.32 Marion St / Greenwood Ave AM	Olympic Parade	East	T1	372	23%	17.62	LOS B	6.6
H.32 Marion St / Greenwood Ave AM	Marion St	North	T1	257	46%	26.40	LOS B	14.0
H.32 Marion St / Greenwood Ave AM	Marion St	North	L2	89	46%	30.99	LOS C	14.0
H.32 Marion St / Greenwood Ave AM	Marion St	North	R2	439	67%	45.31	LOS D	8.8
H.32 Marion St / Greenwood Ave AM	Marion St	West	T1	459	75%	22.04	LOS B	17.5
H.32 Marion St / Greenwood Ave AM	Marion St	West	L2	1215	50%	17.84	LOS B	28.5
H.32 Marion St / Greenwood Ave PM	Greenwood Ave	South	T1	408	75%	49.57	LOS D	12.9
H.32 Marion St / Greenwood Ave PM	Greenwood Ave	South	L2	66	75%	54.32	LOS D	12.5
H.32 Marion St / Greenwood Ave PM	Olympic Parade	East	L2	58	61%	42.06	LOS C	14.3
H.32 Marion St / Greenwood Ave PM	Olympic Parade	East	T1	574	61%	37.17	LOS C	14.6
H.32 Marion St / Greenwood Ave PM	Marion St	North	T1	590	61%	14.74	LOS B	22.7
H.32 Marion St / Greenwood Ave PM	Marion St	North	L2	102	61%	19.34	LOS B	22.7
H.32 Marion St / Greenwood Ave PM	Marion St	North	R2	756	56%	30.37	LOS C	12.4
H.32 Marion St / Greenwood Ave PM	Marion St	West	T1	344	94%	32.70	LOS C	14.9
H.32 Marion St / Greenwood Ave PM	Marion St	West	L2	651	23%	8.56	LOS A	4.9

11.2 Bankstown Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.01 South Terrace / Restwell Street AM Peak	Restwell Street	South	R2	1052	64%	22.80	LOS B	23.4
B.01 South Terrace / Restwell Street AM Peak	Restwell Street	South	L2	160	64%	22.19	LOS B	21.8
B.01 South Terrace / Restwell Street AM Peak	Local Access Road	North	L2	1	45%	65.07	LOS E	1.3
B.01 South Terrace / Restwell Street AM Peak	Local Access Road	North	R2	21	45%	65.84	LOS E	1.3
B.01 South Terrace / Restwell Street AM Peak	Bankstown City Plaza	West	R2	40	63%	59.98	LOS E	3.6
B.01 South Terrace / Restwell Street AM Peak	Bankstown City Plaza	West	T1	24	63%	56.25	LOS D	3.6
B.01 South Terrace / Restwell Street PM Peak	Restwell Street	South	R2	894	61%	24.65	LOS B	20.2
B.01 South Terrace / Restwell Street PM Peak	Restwell Street	South	L2	152	61%	23.68	LOS B	18.3
B.01 South Terrace / Restwell Street PM Peak	Local Access Road	North	L2	5	49%	61.47	LOS E	1.5
B.01 South Terrace / Restwell Street PM Peak	Local Access Road	North	R2	23	49%	62.24	LOS E	1.5
B.01 South Terrace / Restwell Street PM Peak	Bankstown City Plaza	West	R2	39	57%	54.10	LOS D	3.5
B.01 South Terrace / Restwell Street PM Peak	Bankstown City Plaza	West	T1	28	57%	50.37	LOS D	3.5
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	South	T1	547	83%	31.03	LOS C	22.4
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	South	L2	1	1%	41.93	LOS C	0.0
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	L2	282	32%	17.27	LOS B	6.8
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	R2	526	81%	33.48	LOS C	20.8
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	T1	1	0%	17.50	LOS B	0.0
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	North	T1	41	11%	18.48	LOS B	1.1
B.02 Restwell Street / Raymond Street AM Peak	Greenfield Parade	West	L2	190	10%	2.89	LOS A	0.0
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	South	T1	439	81%	31.12	LOS C	16.8
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	South	L2	1	1%	38.61	LOS C	0.0
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	L2	363	37%	14.36	LOS A	7.7
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	R2	596	82%	31.02	LOS C	22.3
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	T1	11	1%	14.39	LOS A	0.2
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	North	T1	44	15%	21.11	LOS B	1.2
B.02 Restwell Street / Raymond Street PM Peak	Greenfield Parade	West	L2	1	0%	2.88	LOS A	0.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	East	L2	225	50%	44.97	LOS D	11.3
B.03 South Terrace / West Terrace AM Peak	South Terrace	East	R2	559	61%	46.36	LOS D	14.4
B.03 South Terrace / West Terrace AM Peak	Underpass	North	T1	424	63%	34.45	LOS C	20.3
B.03 South Terrace / West Terrace AM Peak	Underpass	North	L2	312	26%	12.33	LOS A	7.5
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	R2	133	8%	3.93	LOS A	0.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	T1	273	61%	41.49	LOS C	13.8
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	L2	623	51%	14.73	LOS B	18.4
B.03 South Terrace / West Terrace PM Peak	South Terrace	East	L2	265	69%	51.74	LOS D	14.6
B.03 South Terrace / West Terrace PM Peak	South Terrace	East	R2	416	54%	49.61	LOS D	11.0
B.03 South Terrace / West Terrace PM Peak	Underpass	North	T1	490	69%	34.44	LOS C	24.2
B.03 South Terrace / West Terrace PM Peak	Underpass	North	L2	484	42%	14.91	LOS B	14.1
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	R2	138	8%	3.91	LOS A	0.0
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	T1	309	68%	40.56	LOS C	15.7
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	L2	427	33%	11.21	LOS A	9.8
H.01 Meredith St / Marion St AM Peak	Car Park	South	R2	4	4%	55.41	LOS D	0.2
H.01 Meredith St / Marion St AM Peak	Car Park	South	T1	8	17%	30.93	LOS C	1.1
H.01 Meredith St / Marion St AM Peak	Car Park	South	L2	21	17%	30.93	LOS C	1.1
H.01 Meredith St / Marion St AM Peak	Marion St	East	L2	47	22%	23.02	LOS B	6.2
H.01 Meredith St / Marion St AM Peak	Marion St	East	R2	79	67%	62.39	LOS E	4.5
H.01 Meredith St / Marion St AM Peak	Marion St	East	T1	373	22%	16.15	LOS B	6.2
H.01 Meredith St / Marion St AM Peak	RoadName	North	T1	47	90%	72.42	LOS F	17.7
H.01 Meredith St / Marion St AM Peak	RoadName	North	L2	37	90%	67.64	LOS E	17.7
H.01 Meredith St / Marion St AM Peak	RoadName	North	R2	468	90%	67.77	LOS E	17.7
H.01 Meredith St / Marion St AM Peak	Marion St	West	R2	102	86%	73.02	LOS F	6.2
H.01 Meredith St / Marion St AM Peak	Marion St	West	T1	750	85%	31.37	LOS C	36.5
H.01 Meredith St / Marion St AM Peak	Marion St	West	L2	970	80%	12.67	LOS A	21.2
H.01 Meredith St / Marion St PM Peak	Car Park	South	R2	27	17%	48.81	LOS D	1.3
H.01 Meredith St / Marion St PM Peak	Car Park	South	T1	54	70%	35.21	LOS C	5.0
H.01 Meredith St / Marion St PM Peak	Car Park	South	L2	90	70%	35.21	LOS C	5.0
H.01 Meredith St / Marion St PM Peak	Marion St	East	L2	18	59%	39.66	LOS C	14.6

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.01 Meredith St / Marion St PM Peak	Marion St	East	R2	57	54%	58.39	LOS E	3.0
H.01 Meredith St / Marion St PM Peak	Marion St	East	T1	624	59%	32.40	LOS C	14.6
H.01 Meredith St / Marion St PM Peak	RoadName	North	T1	20	91%	62.10	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	RoadName	North	L2	42	91%	57.33	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	RoadName	North	R2	1018	91%	57.46	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	Marion St	West	R2	40	37%	62.04	LOS E	2.1
H.01 Meredith St / Marion St PM Peak	Marion St	West	T1	509	92%	55.62	LOS D	30.6
H.01 Meredith St / Marion St PM Peak	Marion St	West	L2	555	49%	10.37	LOS A	8.2
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	R2	189	85%	87.21	LOS F	15.3
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	T1	2158	86%	11.42	LOS A	44.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	L2	64	4%	7.02	LOS A	0.3
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	L2	308	36%	8.12	LOS A	6.5
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	R2	142	89%	99.63	LOS F	6.2
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	T1	22	36%	3.72	LOS A	6.5
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	T1	1897	61%	7.88	LOS A	17.0
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	L2	202	61%	9.80	LOS A	9.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	R2	18	9%	75.04	LOS F	1.2
H.02 Stacey St / Wattle St AM Peak	Car Park	West	R2	13	8%	85.90	LOS F	0.5
H.02 Stacey St / Wattle St AM Peak	Car Park	West	T1	11	20%	72.13	LOS F	2.5
H.02 Stacey St / Wattle St AM Peak	Car Park	West	L2	24	20%	76.43	LOS F	2.5
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	R2	280	90%	82.59	LOS F	22.0
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	T1	1551	88%	27.22	LOS B	39.8
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	L2	158	13%	13.51	LOS A	2.5
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	L2	648	84%	47.69	LOS D	36.7
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	R2	97	61%	85.98	LOS F	3.7
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	T1	55	84%	43.29	LOS D	36.7
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	T1	2724	90%	28.38	LOS B	59.6
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	L2	168	90%	31.57	LOS C	57.4
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	R2	71	23%	65.15	LOS E	4.3
H.02 Stacey St / Wattle St PM Peak	Car Park	West	R2	164	110%	188.57	LOS F	10.0
H.02 Stacey St / Wattle St PM Peak	Car Park	West	T1	35	46%	60.68	LOS E	9.4
H.02 Stacey St / Wattle St PM Peak	Car Park	West	L2	107	46%	64.98	LOS E	9.4
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	U	3	35%	8.88	LOS A	3.1
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	R2	582	35%	7.36	LOS A	3.1
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	T1	865	38%	3.65	LOS A	3.6
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	L2	456	77%	21.95	LOS B	11.1
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	U	10	20%	17.84	LOS B	1.2
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	R2	55	20%	16.28	LOS B	1.2
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	T1	717	76%	14.27	LOS A	11.5
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	L2	281	29%	6.73	LOS A	2.0
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	U	15	76%	19.30	LOS B	11.5
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	U	10	40%	9.99	LOS A	3.3
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	R2	359	40%	8.53	LOS A	3.3
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	T1	972	73%	4.96	LOS A	10.5
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	L2	350	99%	81.34	LOS F	22.6
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	U	12	57%	35.22	LOS C	3.9
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	R2	103	57%	34.00	LOS C	3.9
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	T1	757	85%	16.47	LOS B	16.2
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	L2	93	11%	5.65	LOS A	0.6
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	U	8	85%	21.51	LOS B	16.2
H.04 Stanley St / Stacey St AM Peak	Stacey St	South	T1	2123	80%	13.43	LOS A	45.4
H.04 Stanley St / Stacey St AM Peak	Stacey St	South	L2	30	2%	12.63	LOS A	0.5
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	L2	1	95%	104.13	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	R2	213	95%	104.18	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	T1	41	95%	99.56	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	T1	2069	71%	19.01	LOS B	59.3
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	L2	28	2%	16.06	LOS B	1.1
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	R2	80	32%	87.77	LOS F	6.1
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	R2	118	92%	99.85	LOS F	15.3

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	T1	52	92%	95.28	LOS F	15.3
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	L2	130	48%	71.34	LOS F	9.4
H.04 Stanley St / Stacey St PM Peak	Stacey St	South	T1	1876	68%	9.05	LOS A	25.0
H.04 Stanley St / Stacey St PM Peak	Stacey St	South	L2	52	4%	11.69	LOS A	0.6
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	L2	1	105%	152.10	LOS F	11.1
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	R2	139	105%	152.18	LOS F	11.1
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	T1	64	105%	147.53	LOS F	11.1
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	T1	3061	90%	1.21	LOS A	19.2
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	L2	86	5%	6.80	LOS A	0.1
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	R2	86	70%	80.33	LOS F	6.3
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	R2	161	110%	193.88	LOS F	26.1
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	T1	48	110%	189.32	LOS F	26.1
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	L2	59	17%	58.30	LOS E	3.6
H.30 The Appian Way / Nth Tce AM	North Tce	East	T1	622	68%	5.93	LOS A	10.6
H.30 The Appian Way / Nth Tce AM	The Appian Way	North	L2	620	47%	6.96	LOS A	3.9
H.30 The Appian Way / Nth Tce AM	The Appian Way	North	R2	145	61%	25.74	LOS B	2.5
H.30 The Appian Way / Nth Tce PM	North Tce	East	T1	486	63%	7.51	LOS A	7.4
H.30 The Appian Way / Nth Tce PM	The Appian Way	North	L2	773	63%	10.15	LOS A	11.0
H.30 The Appian Way / Nth Tce PM	The Appian Way	North	R2	231	107%	121.48	LOS F	17.0
H.31 Marion St / Oxford Ave AM	Oxford Ave	South	R2	323	74%	55.19	LOS D	11.3
H.31 Marion St / Oxford Ave AM	Oxford Ave	South	L2	79	74%	54.40	LOS D	11.3
H.31 Marion St / Oxford Ave AM	Marion St	East	L2	126	75%	44.94	LOS D	21.9
H.31 Marion St / Oxford Ave AM	Marion St	East	T1	719	75%	40.31	LOS C	22.1
H.31 Marion St / Oxford Ave AM	Marion St	West	R2	265	74%	18.69	LOS B	15.7
H.31 Marion St / Oxford Ave AM	Marion St	West	T1	1425	74%	4.47	LOS A	15.7
H.31 Marion St / Oxford Ave PM	Oxford Ave	South	R2	219	90%	65.79	LOS E	13.2
H.31 Marion St / Oxford Ave PM	Oxford Ave	South	L2	209	35%	34.58	LOS C	8.4
H.31 Marion St / Oxford Ave PM	Marion St	East	L2	212	67%	15.98	LOS B	18.5
H.31 Marion St / Oxford Ave PM	Marion St	East	T1	1228	67%	11.40	LOS A	18.7
H.31 Marion St / Oxford Ave PM	Marion St	West	R2	352	49%	27.81	LOS B	15.9
H.31 Marion St / Oxford Ave PM	Marion St	West	T1	672	48%	0.49	LOS A	1.3
H.32 Marion St / Greenwood Ave AM	Greenwood Ave	South	T1	564	87%	60.28	LOS E	18.8
H.32 Marion St / Greenwood Ave AM	Greenwood Ave	South	L2	25	87%	65.15	LOS E	18.4
H.32 Marion St / Greenwood Ave AM	Olympic Parade	East	L2	44	25%	22.98	LOS B	7.1
H.32 Marion St / Greenwood Ave AM	Olympic Parade	East	T1	409	25%	18.88	LOS B	7.5
H.32 Marion St / Greenwood Ave AM	Marion St	North	T1	282	49%	26.58	LOS B	15.7
H.32 Marion St / Greenwood Ave AM	Marion St	North	L2	97	49%	31.16	LOS C	15.7
H.32 Marion St / Greenwood Ave AM	Marion St	North	R2	482	85%	42.96	LOS D	11.0
H.32 Marion St / Greenwood Ave AM	Marion St	West	T1	504	89%	40.60	LOS C	26.7
H.32 Marion St / Greenwood Ave AM	Marion St	West	L2	1334	58%	20.11	LOS B	33.5
H.32 Marion St / Greenwood Ave PM	Greenwood Ave	South	T1	451	88%	59.06	LOS E	16.0
H.32 Marion St / Greenwood Ave PM	Greenwood Ave	South	L2	73	88%	63.89	LOS E	15.4
H.32 Marion St / Greenwood Ave PM	Olympic Parade	East	L2	64	54%	37.47	LOS C	14.3
H.32 Marion St / Greenwood Ave PM	Olympic Parade	East	T1	635	54%	31.40	LOS C	14.7
H.32 Marion St / Greenwood Ave PM	Marion St	North	T1	652	75%	20.70	LOS B	31.0
H.32 Marion St / Greenwood Ave PM	Marion St	North	L2	113	75%	25.30	LOS B	31.0
H.32 Marion St / Greenwood Ave PM	Marion St	North	R2	836	90%	40.70	LOS C	18.2
H.32 Marion St / Greenwood Ave PM	Marion St	West	T1	380	57%	13.95	LOS A	9.9
H.32 Marion St / Greenwood Ave PM	Marion St	West	L2	719	25%	8.35	LOS A	5.3

11.3 Bankstown Station: Future + Construction

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.01 South Terrace / Restwell Street AM Peak	Restwell Street	South	R2	1060	65%	22.93	LOS B	23.7
B.01 South Terrace / Restwell Street AM Peak	Restwell Street	South	L2	160	65%	22.32	LOS B	22.1
B.01 South Terrace / Restwell Street AM Peak	Local Access Road	North	L2	9	60%	67.02	LOS E	1.8
B.01 South Terrace / Restwell Street AM Peak	Local Access Road	North	R2	21	60%	67.37	LOS E	1.8
B.01 South Terrace / Restwell Street AM Peak	Bankstown City Plaza	West	R2	40	63%	59.98	LOS E	3.6
B.01 South Terrace / Restwell Street AM Peak	Bankstown City Plaza	West	T1	24	63%	56.25	LOS D	3.6
B.01 South Terrace / Restwell Street PM Peak	Restwell Street	South	R2	902	62%	24.79	LOS B	20.4
B.01 South Terrace / Restwell Street PM Peak	Restwell Street	South	L2	152	62%	23.81	LOS B	18.6
B.01 South Terrace / Restwell Street PM Peak	Local Access Road	North	L2	13	54%	60.86	LOS E	2.0
B.01 South Terrace / Restwell Street PM Peak	Local Access Road	North	R2	23	54%	61.33	LOS E	2.0
B.01 South Terrace / Restwell Street PM Peak	Bankstown City Plaza	West	R2	39	61%	56.00	LOS D	3.6
B.01 South Terrace / Restwell Street PM Peak	Bankstown City Plaza	West	T1	28	61%	52.27	LOS D	3.6
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	South	T1	547	83%	31.03	LOS C	22.4
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	South	L2	1	1%	41.93	LOS C	0.0
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	L2	282	32%	17.27	LOS B	6.8
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	R2	534	83%	35.47	LOS C	22.0
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	T1	1	0%	17.50	LOS B	0.0
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	North	T1	41	11%	18.48	LOS B	1.1
B.02 Restwell Street / Raymond Street AM Peak	Greenfield Parade	West	L2	190	10%	2.89	LOS A	0.0
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	South	T1	439	81%	31.12	LOS C	16.8
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	South	L2	1	1%	38.61	LOS C	0.0
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	L2	363	37%	14.36	LOS A	7.7
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	R2	604	85%	33.10	LOS C	23.6
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	T1	11	1%	14.39	LOS A	0.2
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	North	T1	44	15%	21.11	LOS B	1.2
B.02 Restwell Street / Raymond Street PM Peak	Greenfield Parade	West	L2	1	0%	2.88	LOS A	0.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	East	L2	225	52%	45.96	LOS D	11.4
B.03 South Terrace / West Terrace AM Peak	South Terrace	East	R2	559	63%	47.40	LOS D	14.6
B.03 South Terrace / West Terrace AM Peak	Underpass	North	T1	424	64%	35.38	LOS C	20.6
B.03 South Terrace / West Terrace AM Peak	Underpass	North	L2	312	27%	13.26	LOS A	7.9
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	R2	133	8%	3.93	LOS A	0.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	T1	281	62%	39.93	LOS C	13.9
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	L2	623	51%	14.18	LOS A	17.9
B.03 South Terrace / West Terrace PM Peak	South Terrace	East	L2	265	69%	51.74	LOS D	14.6
B.03 South Terrace / West Terrace PM Peak	South Terrace	East	R2	416	54%	49.61	LOS D	11.0
B.03 South Terrace / West Terrace PM Peak	Underpass	North	T1	490	70%	35.38	LOS C	24.5
B.03 South Terrace / West Terrace PM Peak	Underpass	North	L2	484	42%	15.46	LOS B	14.4
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	R2	138	8%	3.91	LOS A	0.0
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	T1	317	69%	40.00	LOS C	16.0
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	L2	427	33%	11.21	LOS A	9.8
H.01 Meredith St / Marion St AM Peak	Car Park	South	R2	4	4%	55.41	LOS D	0.2
H.01 Meredith St / Marion St AM Peak	Car Park	South	T1	8	17%	30.93	LOS C	1.1
H.01 Meredith St / Marion St AM Peak	Car Park	South	L2	21	17%	30.93	LOS C	1.1
H.01 Meredith St / Marion St AM Peak	Marion St	East	L2	47	22%	23.02	LOS B	6.2
H.01 Meredith St / Marion St AM Peak	Marion St	East	R2	79	67%	62.39	LOS E	4.5
H.01 Meredith St / Marion St AM Peak	Marion St	East	T1	373	22%	16.15	LOS B	6.2
H.01 Meredith St / Marion St AM Peak	RoadName	North	T1	47	90%	72.42	LOS F	17.7
H.01 Meredith St / Marion St AM Peak	RoadName	North	L2	37	90%	67.64	LOS E	17.7
H.01 Meredith St / Marion St AM Peak	RoadName	North	R2	468	90%	67.77	LOS E	17.7
H.01 Meredith St / Marion St AM Peak	Marion St	West	R2	102	86%	73.02	LOS F	6.2
H.01 Meredith St / Marion St AM Peak	Marion St	West	T1	750	85%	31.37	LOS C	36.5
H.01 Meredith St / Marion St AM Peak	Marion St	West	L2	970	80%	12.67	LOS A	21.2
H.01 Meredith St / Marion St PM Peak	Car Park	South	R2	27	17%	48.81	LOS D	1.3
H.01 Meredith St / Marion St PM Peak	Car Park	South	T1	54	70%	35.21	LOS C	5.0
H.01 Meredith St / Marion St PM Peak	Car Park	South	L2	90	70%	35.21	LOS C	5.0
H.01 Meredith St / Marion St PM Peak	Marion St	East	L2	18	59%	39.66	LOS C	14.6

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.01 Meredith St / Marion St PM Peak	Marion St	East	R2	57	54%	58.39	LOS E	3.0
H.01 Meredith St / Marion St PM Peak	Marion St	East	T1	624	59%	32.40	LOS C	14.6
H.01 Meredith St / Marion St PM Peak	RoadName	North	T1	20	91%	62.10	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	RoadName	North	L2	42	91%	57.33	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	RoadName	North	R2	1018	91%	57.46	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	Marion St	West	R2	40	37%	62.04	LOS E	2.1
H.01 Meredith St / Marion St PM Peak	Marion St	West	T1	509	92%	55.62	LOS D	30.6
H.01 Meredith St / Marion St PM Peak	Marion St	West	L2	555	49%	10.37	LOS A	8.2
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	R2	197	86%	87.75	LOS F	16.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	T1	2158	87%	12.23	LOS A	47.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	L2	64	4%	7.30	LOS A	0.3
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	L2	316	37%	8.44	LOS A	7.0
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	R2	142	89%	99.63	LOS F	6.2
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	T1	22	37%	4.05	LOS A	7.0
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	T1	1897	61%	8.50	LOS A	17.9
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	L2	202	61%	10.35	LOS A	10.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	R2	18	9%	73.91	LOS F	1.2
H.02 Stacey St / Wattle St AM Peak	Car Park	West	R2	13	8%	85.90	LOS F	0.5
H.02 Stacey St / Wattle St AM Peak	Car Park	West	T1	11	20%	72.13	LOS F	2.5
H.02 Stacey St / Wattle St AM Peak	Car Park	West	L2	24	20%	76.42	LOS F	2.5
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	R2	287	91%	83.59	LOS F	22.9
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	T1	1551	88%	27.85	LOS B	40.6
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	L2	158	13%	13.51	LOS A	2.5
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	L2	656	86%	50.70	LOS D	38.5
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	R2	97	61%	85.98	LOS F	3.7
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	T1	55	86%	46.30	LOS D	38.5
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	T1	2724	90%	28.41	LOS B	59.6
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	L2	168	90%	31.65	LOS C	57.4
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	R2	71	22%	64.12	LOS E	4.3
H.02 Stacey St / Wattle St PM Peak	Car Park	West	R2	164	110%	188.57	LOS F	10.0
H.02 Stacey St / Wattle St PM Peak	Car Park	West	T1	35	47%	61.76	LOS E	9.5
H.02 Stacey St / Wattle St PM Peak	Car Park	West	L2	107	47%	66.06	LOS E	9.5
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	U	3	36%	8.94	LOS A	3.2
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	R2	582	36%	7.42	LOS A	3.2
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	T1	865	38%	3.68	LOS A	3.6
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	L2	456	77%	22.07	LOS B	11.1
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	U	10	24%	18.00	LOS B	1.4
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	R2	63	24%	17.55	LOS B	1.4
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	T1	717	77%	14.43	LOS A	11.7
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	L2	289	31%	6.84	LOS A	2.1
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	U	15	77%	19.46	LOS B	11.7
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	U	10	41%	10.15	LOS A	3.4
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	R2	359	41%	8.70	LOS A	3.4
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	T1	972	74%	5.14	LOS A	10.8
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	L2	350	99%	81.34	LOS F	22.6
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	U	12	60%	36.27	LOS C	4.3
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	R2	110	60%	36.02	LOS C	4.3
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	T1	757	85%	16.63	LOS B	16.4
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	L2	100	12%	5.86	LOS A	0.7
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	U	8	85%	21.66	LOS B	16.4
H.04 Stanley St / Stacey St AM Peak	Stacey St	South	T1	2136	83%	14.40	LOS A	50.0
H.04 Stanley St / Stacey St AM Peak	Stacey St	South	L2	38	3%	13.37	LOS A	0.6
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	L2	1	95%	104.13	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	R2	213	95%	104.18	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	T1	41	95%	99.56	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	T1	2077	73%	22.00	LOS B	62.5
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	L2	28	2%	17.05	LOS B	1.1
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	R2	80	32%	87.77	LOS F	6.1
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	R2	131	91%	98.15	LOS F	16.5

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	T1	52	91%	93.49	LOS F	16.5
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	L2	130	43%	68.13	LOS E	9.1
H.04 Stanley St / Stacey St PM Peak	Stacey St	South	T1	1889	68%	8.46	LOS A	24.5
H.04 Stanley St / Stacey St PM Peak	Stacey St	South	L2	60	5%	11.54	LOS A	0.7
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	L2	1	120%	276.14	LOS F	15.4
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	R2	139	120%	276.20	LOS F	15.4
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	T1	64	120%	271.58	LOS F	15.4
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	T1	3068	90%	1.19	LOS A	18.5
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	L2	86	5%	6.79	LOS A	0.1
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	R2	86	70%	80.33	LOS F	6.3
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	R2	173	124%	307.48	LOS F	35.7
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	T1	48	124%	302.86	LOS F	35.7
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	L2	59	17%	58.30	LOS E	3.6
H.30 The Appian Way / Nth Tce AM	North Tce	East	T1	622	68%	5.93	LOS A	10.6
H.30 The Appian Way / Nth Tce AM	The Appian Way	North	L2	620	47%	6.96	LOS A	3.9
H.30 The Appian Way / Nth Tce AM	The Appian Way	North	R2	145	61%	25.74	LOS B	2.5
H.30 The Appian Way / Nth Tce PM	North Tce	East	T1	486	63%	7.51	LOS A	7.4
H.30 The Appian Way / Nth Tce PM	The Appian Way	North	L2	773	63%	10.15	LOS A	11.0
H.30 The Appian Way / Nth Tce PM	The Appian Way	North	R2	231	107%	121.48	LOS F	17.0
H.31 Marion St / Oxford Ave AM	Oxford Ave	South	R2	323	74%	55.19	LOS D	11.3
H.31 Marion St / Oxford Ave AM	Oxford Ave	South	L2	79	74%	54.40	LOS D	11.3
H.31 Marion St / Oxford Ave AM	Marion St	East	L2	126	75%	44.94	LOS D	21.9
H.31 Marion St / Oxford Ave AM	Marion St	East	T1	719	75%	40.31	LOS C	22.1
H.31 Marion St / Oxford Ave AM	Marion St	West	R2	265	74%	18.69	LOS B	15.7
H.31 Marion St / Oxford Ave AM	Marion St	West	T1	1425	74%	4.47	LOS A	15.7
H.31 Marion St / Oxford Ave PM	Oxford Ave	South	R2	219	90%	65.79	LOS E	13.2
H.31 Marion St / Oxford Ave PM	Oxford Ave	South	L2	209	35%	34.58	LOS C	8.4
H.31 Marion St / Oxford Ave PM	Marion St	East	L2	212	67%	15.98	LOS B	18.5
H.31 Marion St / Oxford Ave PM	Marion St	East	T1	1228	67%	11.40	LOS A	18.7
H.31 Marion St / Oxford Ave PM	Marion St	West	R2	352	49%	27.81	LOS B	15.9
H.31 Marion St / Oxford Ave PM	Marion St	West	T1	672	48%	0.49	LOS A	1.3
H.32 Marion St / Greenwood Ave AM	Greenwood Ave	South	T1	564	87%	60.28	LOS E	18.8
H.32 Marion St / Greenwood Ave AM	Greenwood Ave	South	L2	25	87%	65.15	LOS E	18.4
H.32 Marion St / Greenwood Ave AM	Olympic Parade	East	L2	44	25%	22.98	LOS B	7.1
H.32 Marion St / Greenwood Ave AM	Olympic Parade	East	T1	409	25%	18.88	LOS B	7.5
H.32 Marion St / Greenwood Ave AM	Marion St	North	T1	282	49%	26.58	LOS B	15.7
H.32 Marion St / Greenwood Ave AM	Marion St	North	L2	97	49%	31.16	LOS C	15.7
H.32 Marion St / Greenwood Ave AM	Marion St	North	R2	482	85%	42.96	LOS D	11.0
H.32 Marion St / Greenwood Ave AM	Marion St	West	T1	504	89%	40.60	LOS C	26.7
H.32 Marion St / Greenwood Ave AM	Marion St	West	L2	1334	58%	20.11	LOS B	33.5
H.32 Marion St / Greenwood Ave PM	Greenwood Ave	South	T1	451	88%	59.06	LOS E	16.0
H.32 Marion St / Greenwood Ave PM	Greenwood Ave	South	L2	73	88%	63.89	LOS E	15.4
H.32 Marion St / Greenwood Ave PM	Olympic Parade	East	L2	64	54%	37.47	LOS C	14.3
H.32 Marion St / Greenwood Ave PM	Olympic Parade	East	T1	635	54%	31.40	LOS C	14.7
H.32 Marion St / Greenwood Ave PM	Marion St	North	T1	652	75%	20.70	LOS B	31.0
H.32 Marion St / Greenwood Ave PM	Marion St	North	L2	113	75%	25.30	LOS B	31.0
H.32 Marion St / Greenwood Ave PM	Marion St	North	R2	836	90%	40.70	LOS C	18.2
H.32 Marion St / Greenwood Ave PM	Marion St	West	T1	380	57%	13.95	LOS A	9.9
H.32 Marion St / Greenwood Ave PM	Marion St	West	L2	719	25%	8.35	LOS A	5.3

11.4 Bankstown Station: Future + Construction + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.01 South Terrace / Restwell Street AM Peak	Restwell Street	South	R2	1105	88%	45.13	LOS D	38.1
B.01 South Terrace / Restwell Street AM Peak	Restwell Street	South	L2	160	88%	45.55	LOS D	34.9
B.01 South Terrace / Restwell Street AM Peak	Local Access Road	North	L2	54	88%	74.21	LOS F	6.4
B.01 South Terrace / Restwell Street AM Peak	Local Access Road	North	R2	42	88%	74.49	LOS F	6.4
B.01 South Terrace / Restwell Street AM Peak	Bankstown City Plaza	West	R2	40	83%	67.60	LOS E	5.2
B.01 South Terrace / Restwell Street AM Peak	Bankstown City Plaza	West	T1	44	83%	63.86	LOS E	5.2
B.01 South Terrace / Restwell Street PM Peak	Restwell Street	South	R2	948	88%	46.15	LOS D	34.0
B.01 South Terrace / Restwell Street PM Peak	Restwell Street	South	L2	152	88%	47.55	LOS D	27.9
B.01 South Terrace / Restwell Street PM Peak	Local Access Road	North	L2	33	84%	64.82	LOS E	6.2
B.01 South Terrace / Restwell Street PM Peak	Local Access Road	North	R2	69	84%	65.16	LOS E	6.2
B.01 South Terrace / Restwell Street PM Peak	Bankstown City Plaza	West	R2	39	87%	68.95	LOS E	5.4
B.01 South Terrace / Restwell Street PM Peak	Bankstown City Plaza	West	T1	48	87%	65.21	LOS E	5.4
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	South	T1	547	89%	39.61	LOS C	25.6
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	South	L2	1	1%	41.93	LOS C	0.0
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	L2	282	31%	15.96	LOS B	6.5
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	R2	581	91%	47.32	LOS D	29.1
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	T1	1	0%	16.16	LOS B	0.0
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	North	T1	41	12%	20.02	LOS B	1.1
B.02 Restwell Street / Raymond Street AM Peak	Greenfield Parade	West	L2	190	10%	2.89	LOS A	0.0
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	South	T1	439	89%	40.16	LOS C	19.3
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	South	L2	1	1%	38.61	LOS C	0.0
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	L2	363	35%	13.12	LOS A	7.3
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	R2	649	91%	43.42	LOS D	30.4
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	T1	11	1%	13.11	LOS A	0.2
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	North	T1	44	16%	22.88	LOS B	1.3
B.02 Restwell Street / Raymond Street PM Peak	Greenfield Parade	West	L2	1	0%	2.88	LOS A	0.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	East	L2	225	58%	49.06	LOS D	11.8
B.03 South Terrace / West Terrace AM Peak	South Terrace	East	R2	559	71%	51.37	LOS D	15.4
B.03 South Terrace / West Terrace AM Peak	Underpass	North	T1	424	69%	38.26	LOS C	21.5
B.03 South Terrace / West Terrace AM Peak	Underpass	North	L2	312	29%	16.32	LOS B	9.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	R2	133	8%	3.93	LOS A	0.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	T1	326	71%	37.22	LOS C	16.1
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	L2	623	49%	12.62	LOS A	16.6
B.03 South Terrace / West Terrace PM Peak	South Terrace	East	L2	265	75%	55.49	LOS D	15.3
B.03 South Terrace / West Terrace PM Peak	South Terrace	East	R2	416	58%	51.74	LOS D	11.3
B.03 South Terrace / West Terrace PM Peak	Underpass	North	T1	490	75%	38.71	LOS C	25.7
B.03 South Terrace / West Terrace PM Peak	Underpass	North	L2	484	45%	18.38	LOS B	16.0
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	R2	138	8%	3.91	LOS A	0.0
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	T1	361	77%	40.27	LOS C	19.1
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	L2	427	32%	10.38	LOS A	9.3
H.01 Meredith St / Marion St AM Peak	Car Park	South	R2	4	4%	55.41	LOS D	0.2
H.01 Meredith St / Marion St AM Peak	Car Park	South	T1	8	17%	30.93	LOS C	1.1
H.01 Meredith St / Marion St AM Peak	Car Park	South	L2	21	17%	30.93	LOS C	1.1
H.01 Meredith St / Marion St AM Peak	Marion St	East	L2	47	22%	23.02	LOS B	6.2
H.01 Meredith St / Marion St AM Peak	Marion St	East	R2	79	67%	62.39	LOS E	4.5
H.01 Meredith St / Marion St AM Peak	Marion St	East	T1	373	22%	16.15	LOS B	6.2
H.01 Meredith St / Marion St AM Peak	RoadName	North	T1	47	90%	72.42	LOS F	17.7
H.01 Meredith St / Marion St AM Peak	RoadName	North	L2	37	90%	67.64	LOS E	17.7
H.01 Meredith St / Marion St AM Peak	RoadName	North	R2	468	90%	67.77	LOS E	17.7
H.01 Meredith St / Marion St AM Peak	Marion St	West	R2	102	86%	73.02	LOS F	6.2
H.01 Meredith St / Marion St AM Peak	Marion St	West	T1	750	85%	31.37	LOS C	36.5
H.01 Meredith St / Marion St AM Peak	Marion St	West	L2	970	80%	12.67	LOS A	21.2
H.01 Meredith St / Marion St PM Peak	Car Park	South	R2	27	17%	48.81	LOS D	1.3
H.01 Meredith St / Marion St PM Peak	Car Park	South	T1	54	70%	35.21	LOS C	5.0
H.01 Meredith St / Marion St PM Peak	Car Park	South	L2	90	70%	35.21	LOS C	5.0
H.01 Meredith St / Marion St PM Peak	Marion St	East	L2	18	59%	39.66	LOS C	14.6

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.01 Meredith St / Marion St PM Peak	Marion St	East	R2	57	54%	58.39	LOS E	3.0
H.01 Meredith St / Marion St PM Peak	Marion St	East	T1	624	59%	32.40	LOS C	14.6
H.01 Meredith St / Marion St PM Peak	RoadName	North	T1	20	91%	62.10	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	RoadName	North	L2	42	91%	57.33	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	RoadName	North	R2	1018	91%	57.46	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	Marion St	West	R2	40	37%	62.04	LOS E	2.1
H.01 Meredith St / Marion St PM Peak	Marion St	West	T1	509	92%	55.62	LOS D	30.6
H.01 Meredith St / Marion St PM Peak	Marion St	West	L2	555	49%	10.37	LOS A	8.2
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	R2	197	86%	87.75	LOS F	16.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	T1	2158	87%	12.23	LOS A	47.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	L2	64	4%	7.30	LOS A	0.3
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	L2	316	37%	8.44	LOS A	7.0
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	R2	142	89%	99.63	LOS F	6.2
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	T1	22	37%	4.05	LOS A	7.0
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	T1	1897	61%	8.50	LOS A	17.9
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	L2	202	61%	10.35	LOS A	10.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	R2	18	9%	73.91	LOS F	1.2
H.02 Stacey St / Wattle St AM Peak	Car Park	West	R2	13	8%	85.90	LOS F	0.5
H.02 Stacey St / Wattle St AM Peak	Car Park	West	T1	11	20%	72.13	LOS F	2.5
H.02 Stacey St / Wattle St AM Peak	Car Park	West	L2	24	20%	76.42	LOS F	2.5
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	R2	287	91%	83.59	LOS F	22.9
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	T1	1551	88%	27.85	LOS B	40.6
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	L2	158	13%	13.51	LOS A	2.5
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	L2	656	86%	50.70	LOS D	38.5
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	R2	97	61%	85.98	LOS F	3.7
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	T1	55	86%	46.30	LOS D	38.5
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	T1	2724	90%	28.41	LOS B	59.6
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	L2	168	90%	31.65	LOS C	57.4
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	R2	71	22%	64.12	LOS E	4.3
H.02 Stacey St / Wattle St PM Peak	Car Park	West	R2	164	110%	188.57	LOS F	10.0
H.02 Stacey St / Wattle St PM Peak	Car Park	West	T1	35	47%	61.76	LOS E	9.5
H.02 Stacey St / Wattle St PM Peak	Car Park	West	L2	107	47%	66.06	LOS E	9.5
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	U	3	36%	8.94	LOS A	3.2
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	R2	582	36%	7.42	LOS A	3.2
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	T1	865	38%	3.68	LOS A	3.6
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	L2	456	77%	22.07	LOS B	11.1
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	U	10	24%	18.00	LOS B	1.4
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	R2	63	24%	17.55	LOS B	1.4
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	T1	717	77%	14.43	LOS A	11.7
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	L2	289	31%	6.84	LOS A	2.1
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	U	15	77%	19.46	LOS B	11.7
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	U	10	41%	10.15	LOS A	3.4
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	R2	359	41%	8.70	LOS A	3.4
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	T1	972	74%	5.14	LOS A	10.8
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	L2	350	99%	81.34	LOS F	22.6
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	U	12	60%	36.27	LOS C	4.3
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	R2	110	60%	36.02	LOS C	4.3
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	T1	757	85%	16.63	LOS B	16.4
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	L2	100	12%	5.86	LOS A	0.7
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	U	8	85%	21.66	LOS B	16.4
H.04 Stanley St / Stacey St AM Peak	Stacey St	South	T1	2136	83%	14.40	LOS A	50.0
H.04 Stanley St / Stacey St AM Peak	Stacey St	South	L2	38	3%	13.37	LOS A	0.6
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	L2	1	95%	104.13	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	R2	213	95%	104.18	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	T1	41	95%	99.56	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	T1	2077	73%	22.00	LOS B	62.5
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	L2	28	2%	17.05	LOS B	1.1
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	R2	80	32%	87.77	LOS F	6.1
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	R2	131	91%	98.15	LOS F	16.5

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	T1	52	91%	93.49	LOS F	16.5
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	L2	130	43%	68.13	LOS E	9.1
H.04 Stanley St / Stacey St PM Peak	Stacey St	South	T1	1889	68%	8.46	LOS A	24.5
H.04 Stanley St / Stacey St PM Peak	Stacey St	South	L2	60	5%	11.54	LOS A	0.7
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	L2	1	120%	276.14	LOS F	15.4
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	R2	139	120%	276.20	LOS F	15.4
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	T1	64	120%	271.58	LOS F	15.4
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	T1	3068	90%	1.19	LOS A	18.5
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	L2	86	5%	6.79	LOS A	0.1
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	R2	86	70%	80.33	LOS F	6.3
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	R2	173	124%	307.48	LOS F	35.7
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	T1	48	124%	302.86	LOS F	35.7
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	L2	59	17%	58.30	LOS E	3.6
H.30 The Appian Way / Nth Tce AM	North Tce	East	T1	622	68%	5.93	LOS A	10.6
H.30 The Appian Way / Nth Tce AM	The Appian Way	North	L2	620	47%	6.96	LOS A	3.9
H.30 The Appian Way / Nth Tce AM	The Appian Way	North	R2	167	76%	34.37	LOS C	3.6
H.30 The Appian Way / Nth Tce PM	North Tce	East	T1	486	63%	7.51	LOS A	7.4
H.30 The Appian Way / Nth Tce PM	The Appian Way	North	L2	773	63%	10.15	LOS A	11.0
H.30 The Appian Way / Nth Tce PM	The Appian Way	North	R2	252	125%	267.48	LOS F	37.3
H.31 Marion St / Oxford Ave AM	Oxford Ave	South	R2	323	74%	55.19	LOS D	11.3
H.31 Marion St / Oxford Ave AM	Oxford Ave	South	L2	79	74%	54.40	LOS D	11.3
H.31 Marion St / Oxford Ave AM	Marion St	East	L2	126	75%	44.94	LOS D	21.9
H.31 Marion St / Oxford Ave AM	Marion St	East	T1	719	75%	40.31	LOS C	22.1
H.31 Marion St / Oxford Ave AM	Marion St	West	R2	265	74%	18.69	LOS B	15.7
H.31 Marion St / Oxford Ave AM	Marion St	West	T1	1425	74%	4.47	LOS A	15.7
H.31 Marion St / Oxford Ave PM	Oxford Ave	South	R2	219	90%	65.79	LOS E	13.2
H.31 Marion St / Oxford Ave PM	Oxford Ave	South	L2	209	35%	34.58	LOS C	8.4
H.31 Marion St / Oxford Ave PM	Marion St	East	L2	212	67%	15.98	LOS B	18.5
H.31 Marion St / Oxford Ave PM	Marion St	East	T1	1228	67%	11.40	LOS A	18.7
H.31 Marion St / Oxford Ave PM	Marion St	West	R2	352	49%	27.81	LOS B	15.9
H.31 Marion St / Oxford Ave PM	Marion St	West	T1	672	48%	0.49	LOS A	1.3
H.32 Marion St / Greenwood Ave AM	Greenwood Ave	South	T1	549	85%	57.96	LOS E	17.8
H.32 Marion St / Greenwood Ave AM	Greenwood Ave	South	L2	24	85%	62.81	LOS E	17.5
H.32 Marion St / Greenwood Ave AM	Olympic Parade	East	L2	43	25%	22.87	LOS B	6.9
H.32 Marion St / Greenwood Ave AM	Olympic Parade	East	T1	399	25%	18.79	LOS B	7.3
H.32 Marion St / Greenwood Ave AM	Marion St	North	T1	275	48%	26.40	LOS B	15.2
H.32 Marion St / Greenwood Ave AM	Marion St	North	L2	95	48%	30.98	LOS C	15.2
H.32 Marion St / Greenwood Ave AM	Marion St	North	R2	469	83%	41.14	LOS C	10.5
H.32 Marion St / Greenwood Ave AM	Marion St	West	T1	491	86%	33.91	LOS C	23.8
H.32 Marion St / Greenwood Ave AM	Marion St	West	L2	1300	56%	20.12	LOS B	32.8
H.32 Marion St / Greenwood Ave PM	Greenwood Ave	South	T1	451	88%	59.06	LOS E	16.0
H.32 Marion St / Greenwood Ave PM	Greenwood Ave	South	L2	73	88%	63.89	LOS E	15.4
H.32 Marion St / Greenwood Ave PM	Olympic Parade	East	L2	64	54%	37.47	LOS C	14.3
H.32 Marion St / Greenwood Ave PM	Olympic Parade	East	T1	635	54%	31.40	LOS C	14.7
H.32 Marion St / Greenwood Ave PM	Marion St	North	T1	652	75%	20.70	LOS B	31.0
H.32 Marion St / Greenwood Ave PM	Marion St	North	L2	113	75%	25.30	LOS B	31.0
H.32 Marion St / Greenwood Ave PM	Marion St	North	R2	836	90%	40.70	LOS C	18.2
H.32 Marion St / Greenwood Ave PM	Marion St	West	T1	380	57%	13.95	LOS A	9.9
H.32 Marion St / Greenwood Ave PM	Marion St	West	L2	719	25%	8.35	LOS A	5.3

11.5 Bankstown Station: Future + Construction + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.01 South Terrace / Restwell Street AM Peak	Restwell Street	South	R2	1075	79%	31.90	LOS C	30.4
B.01 South Terrace / Restwell Street AM Peak	Restwell Street	South	L2	160	79%	31.54	LOS C	27.3
B.01 South Terrace / Restwell Street AM Peak	Local Access Road	North	L2	24	79%	66.86	LOS E	4.1
B.01 South Terrace / Restwell Street AM Peak	Local Access Road	North	R2	42	79%	67.15	LOS E	4.1
B.01 South Terrace / Restwell Street AM Peak	Bankstown City Plaza	West	R2	40	76%	63.00	LOS E	5.0
B.01 South Terrace / Restwell Street AM Peak	Bankstown City Plaza	West	T1	44	76%	59.26	LOS E	5.0
B.01 South Terrace / Restwell Street PM Peak	Restwell Street	South	R2	918	79%	34.51	LOS C	27.8
B.01 South Terrace / Restwell Street PM Peak	Restwell Street	South	L2	152	79%	34.90	LOS C	22.3
B.01 South Terrace / Restwell Street PM Peak	Local Access Road	North	L2	33	78%	62.66	LOS E	4.2
B.01 South Terrace / Restwell Street PM Peak	Local Access Road	North	R2	39	78%	63.00	LOS E	4.2
B.01 South Terrace / Restwell Street PM Peak	Bankstown City Plaza	West	R2	39	74%	58.38	LOS E	4.9
B.01 South Terrace / Restwell Street PM Peak	Bankstown City Plaza	West	T1	48	74%	54.63	LOS D	4.9
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	South	T1	547	86%	34.66	LOS C	23.8
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	South	L2	1	1%	41.93	LOS C	0.0
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	L2	282	31%	16.60	LOS B	6.6
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	R2	550	85%	37.08	LOS C	23.5
B.02 Restwell Street / Raymond Street AM Peak	Raymond St	East	T1	1	0%	16.82	LOS B	0.0
B.02 Restwell Street / Raymond Street AM Peak	Restwell Street	North	T1	41	12%	19.24	LOS B	1.1
B.02 Restwell Street / Raymond Street AM Peak	Greenfield Parade	West	L2	190	10%	2.89	LOS A	0.0
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	South	T1	439	85%	34.75	LOS C	17.9
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	South	L2	1	1%	38.61	LOS C	0.0
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	L2	363	36%	13.73	LOS A	7.5
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	R2	619	86%	34.40	LOS C	25.0
B.02 Restwell Street / Raymond Street PM Peak	Raymond St	East	T1	11	1%	13.74	LOS A	0.2
B.02 Restwell Street / Raymond Street PM Peak	Restwell Street	North	T1	44	16%	21.98	LOS B	1.3
B.02 Restwell Street / Raymond Street PM Peak	Greenfield Parade	West	L2	1	0%	2.88	LOS A	0.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	East	L2	241	62%	48.06	LOS D	12.6
B.03 South Terrace / West Terrace AM Peak	South Terrace	East	R2	559	66%	48.44	LOS D	14.8
B.03 South Terrace / West Terrace AM Peak	Underpass	North	T1	424	66%	36.33	LOS C	20.9
B.03 South Terrace / West Terrace AM Peak	Underpass	North	L2	312	28%	14.24	LOS A	8.3
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	R2	133	8%	3.93	LOS A	0.0
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	T1	296	67%	38.83	LOS C	14.6
B.03 South Terrace / West Terrace AM Peak	South Terrace	West	L2	623	50%	13.65	LOS A	17.5
B.03 South Terrace / West Terrace PM Peak	South Terrace	East	L2	280	74%	53.09	LOS D	15.9
B.03 South Terrace / West Terrace PM Peak	South Terrace	East	R2	416	52%	48.57	LOS D	10.9
B.03 South Terrace / West Terrace PM Peak	Underpass	North	T1	490	74%	37.30	LOS C	25.2
B.03 South Terrace / West Terrace PM Peak	Underpass	North	L2	484	43%	16.02	LOS B	14.8
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	R2	138	8%	3.91	LOS A	0.0
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	T1	332	74%	41.24	LOS C	17.4
B.03 South Terrace / West Terrace PM Peak	South Terrace	West	L2	427	34%	11.64	LOS A	10.1
H.01 Meredith St / Marion St AM Peak	Car Park	South	R2	4	4%	55.41	LOS D	0.2
H.01 Meredith St / Marion St AM Peak	Car Park	South	T1	8	17%	30.93	LOS C	1.1
H.01 Meredith St / Marion St AM Peak	Car Park	South	L2	21	17%	30.93	LOS C	1.1
H.01 Meredith St / Marion St AM Peak	Marion St	East	L2	47	22%	23.02	LOS B	6.2
H.01 Meredith St / Marion St AM Peak	Marion St	East	R2	79	67%	62.39	LOS E	4.5
H.01 Meredith St / Marion St AM Peak	Marion St	East	T1	373	22%	16.15	LOS B	6.2
H.01 Meredith St / Marion St AM Peak	RoadName	North	T1	47	90%	72.42	LOS F	17.7
H.01 Meredith St / Marion St AM Peak	RoadName	North	L2	37	90%	67.64	LOS E	17.7
H.01 Meredith St / Marion St AM Peak	RoadName	North	R2	468	90%	67.77	LOS E	17.7
H.01 Meredith St / Marion St AM Peak	Marion St	West	R2	102	86%	73.02	LOS F	6.2
H.01 Meredith St / Marion St AM Peak	Marion St	West	T1	750	85%	31.37	LOS C	36.5
H.01 Meredith St / Marion St AM Peak	Marion St	West	L2	970	80%	12.67	LOS A	21.2
H.01 Meredith St / Marion St PM Peak	Car Park	South	R2	27	17%	48.81	LOS D	1.3
H.01 Meredith St / Marion St PM Peak	Car Park	South	T1	54	70%	35.21	LOS C	5.0
H.01 Meredith St / Marion St PM Peak	Car Park	South	L2	90	70%	35.21	LOS C	5.0

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.01 Meredith St / Marion St PM Peak	Marion St	East	L2	18	59%	39.66	LOS C	14.6
H.01 Meredith St / Marion St PM Peak	Marion St	East	R2	57	54%	58.39	LOS E	3.0
H.01 Meredith St / Marion St PM Peak	Marion St	East	T1	624	59%	32.40	LOS C	14.6
H.01 Meredith St / Marion St PM Peak	RoadName	North	T1	20	91%	62.10	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	RoadName	North	L2	42	91%	57.33	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	RoadName	North	R2	1018	91%	57.46	LOS E	32.8
H.01 Meredith St / Marion St PM Peak	Marion St	West	R2	40	37%	62.04	LOS E	2.1
H.01 Meredith St / Marion St PM Peak	Marion St	West	T1	509	92%	55.62	LOS D	30.6
H.01 Meredith St / Marion St PM Peak	Marion St	West	L2	555	49%	10.37	LOS A	8.2
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	R2	197	86%	87.75	LOS F	16.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	T1	2158	87%	12.23	LOS A	47.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	South	L2	64	4%	7.30	LOS A	0.3
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	L2	316	37%	8.44	LOS A	7.0
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	R2	142	89%	99.63	LOS F	6.2
H.02 Stacey St / Wattle St AM Peak	Wattle St	East	T1	22	37%	4.05	LOS A	7.0
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	T1	1897	61%	8.50	LOS A	17.9
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	L2	202	61%	10.35	LOS A	10.1
H.02 Stacey St / Wattle St AM Peak	Stacey St	North	R2	18	9%	73.91	LOS F	1.2
H.02 Stacey St / Wattle St AM Peak	Car Park	West	R2	13	8%	85.90	LOS F	0.5
H.02 Stacey St / Wattle St AM Peak	Car Park	West	T1	11	20%	72.13	LOS F	2.5
H.02 Stacey St / Wattle St AM Peak	Car Park	West	L2	24	20%	76.42	LOS F	2.5
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	R2	287	91%	83.59	LOS F	22.9
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	T1	1551	88%	27.85	LOS B	40.6
H.02 Stacey St / Wattle St PM Peak	Stacey St	South	L2	158	13%	13.51	LOS A	2.5
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	L2	656	86%	50.70	LOS D	38.5
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	R2	97	61%	85.98	LOS F	3.7
H.02 Stacey St / Wattle St PM Peak	Wattle St	East	T1	55	86%	46.30	LOS D	38.5
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	T1	2724	90%	28.41	LOS B	59.6
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	L2	168	90%	31.65	LOS C	57.4
H.02 Stacey St / Wattle St PM Peak	Stacey St	North	R2	71	22%	64.12	LOS E	4.3
H.02 Stacey St / Wattle St PM Peak	Car Park	West	R2	164	110%	188.57	LOS F	10.0
H.02 Stacey St / Wattle St PM Peak	Car Park	West	T1	35	47%	61.76	LOS E	9.5
H.02 Stacey St / Wattle St PM Peak	Car Park	West	L2	107	47%	66.06	LOS E	9.5
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	U	3	36%	8.94	LOS A	3.2
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	R2	582	36%	7.42	LOS A	3.2
H.03 North Terrace / Wattle St AM Peak	Wattle St	East	T1	865	38%	3.68	LOS A	3.6
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	L2	456	77%	22.07	LOS B	11.1
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	U	10	24%	18.00	LOS B	1.4
H.03 North Terrace / Wattle St AM Peak	Wattle St	North	R2	63	24%	17.55	LOS B	1.4
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	T1	717	77%	14.43	LOS A	11.7
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	L2	289	31%	6.84	LOS A	2.1
H.03 North Terrace / Wattle St AM Peak	North Terrace	West	U	15	77%	19.46	LOS B	11.7
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	U	10	41%	10.15	LOS A	3.4
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	R2	359	41%	8.70	LOS A	3.4
H.03 North Terrace / Wattle St PM Peak	Wattle St	East	T1	972	74%	5.14	LOS A	10.8
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	L2	350	99%	81.34	LOS F	22.6
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	U	12	60%	36.27	LOS C	4.3
H.03 North Terrace / Wattle St PM Peak	Wattle St	North	R2	110	60%	36.02	LOS C	4.3
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	T1	757	85%	16.63	LOS B	16.4
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	L2	100	12%	5.86	LOS A	0.7
H.03 North Terrace / Wattle St PM Peak	North Terrace	West	U	8	85%	21.66	LOS B	16.4
H.04 Stanley St / Stacey St AM Peak	Stacey St	South	T1	2136	83%	14.40	LOS A	50.0
H.04 Stanley St / Stacey St AM Peak	Stacey St	South	L2	38	3%	13.37	LOS A	0.6
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	L2	1	95%	104.13	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	R2	213	95%	104.18	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Salvia Ave	East	T1	41	95%	99.56	LOS F	11.6
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	T1	2077	73%	22.00	LOS B	62.5
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	L2	28	2%	17.05	LOS B	1.1

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.04 Stanley St / Stacey St AM Peak	Stacey St	North	R2	80	32%	87.77	LOS F	6.1
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	R2	131	91%	98.15	LOS F	16.5
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	T1	52	91%	93.49	LOS F	16.5
H.04 Stanley St / Stacey St AM Peak	Stanley St	West	L2	130	43%	68.13	LOS E	9.1
H.04 Stanley St / Stacey St PM Peak	Stacey St	South	T1	1889	68%	8.46	LOS A	24.5
H.04 Stanley St / Stacey St PM Peak	Stacey St	South	L2	60	5%	11.54	LOS A	0.7
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	L2	1	120%	276.14	LOS F	15.4
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	R2	139	120%	276.20	LOS F	15.4
H.04 Stanley St / Stacey St PM Peak	Salvia Ave	East	T1	64	120%	271.58	LOS F	15.4
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	T1	3068	90%	1.19	LOS A	18.5
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	L2	86	5%	6.79	LOS A	0.1
H.04 Stanley St / Stacey St PM Peak	Stacey St	North	R2	86	70%	80.33	LOS F	6.3
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	R2	173	124%	307.48	LOS F	35.7
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	T1	48	124%	302.86	LOS F	35.7
H.04 Stanley St / Stacey St PM Peak	Stanley St	West	L2	59	17%	58.30	LOS E	3.6
H.30 The Appian Way / Nth Tce AM	North Tce	East	T1	622	68%	5.93	LOS A	10.6
H.30 The Appian Way / Nth Tce AM	The Appian Way	North	L2	620	47%	6.96	LOS A	3.9
H.30 The Appian Way / Nth Tce AM	The Appian Way	North	R2	167	76%	34.37	LOS C	3.6
H.30 The Appian Way / Nth Tce PM	North Tce	East	T1	486	63%	7.51	LOS A	7.4
H.30 The Appian Way / Nth Tce PM	The Appian Way	North	L2	773	63%	10.15	LOS A	11.0
H.30 The Appian Way / Nth Tce PM	The Appian Way	North	R2	252	125%	267.48	LOS F	37.3
H.31 Marion St / Oxford Ave AM	Oxford Ave	South	R2	323	74%	55.19	LOS D	11.3
H.31 Marion St / Oxford Ave AM	Oxford Ave	South	L2	79	74%	54.40	LOS D	11.3
H.31 Marion St / Oxford Ave AM	Marion St	East	L2	126	75%	44.94	LOS D	21.9
H.31 Marion St / Oxford Ave AM	Marion St	East	T1	719	75%	40.31	LOS C	22.1
H.31 Marion St / Oxford Ave AM	Marion St	West	R2	265	74%	18.69	LOS B	15.7
H.31 Marion St / Oxford Ave AM	Marion St	West	T1	1425	74%	4.47	LOS A	15.7
H.31 Marion St / Oxford Ave PM	Oxford Ave	South	R2	219	90%	65.79	LOS E	13.2
H.31 Marion St / Oxford Ave PM	Oxford Ave	South	L2	209	35%	34.58	LOS C	8.4
H.31 Marion St / Oxford Ave PM	Marion St	East	L2	212	67%	15.98	LOS B	18.5
H.31 Marion St / Oxford Ave PM	Marion St	East	T1	1228	67%	11.40	LOS A	18.7
H.31 Marion St / Oxford Ave PM	Marion St	West	R2	352	49%	27.81	LOS B	15.9
H.31 Marion St / Oxford Ave PM	Marion St	West	T1	672	48%	0.49	LOS A	1.3
H.32 Marion St / Greenwood Ave AM	Greenwood Ave	South	T1	564	87%	60.28	LOS E	18.8
H.32 Marion St / Greenwood Ave AM	Greenwood Ave	South	L2	25	87%	65.15	LOS E	18.4
H.32 Marion St / Greenwood Ave AM	Olympic Parade	East	L2	44	25%	22.98	LOS B	7.1
H.32 Marion St / Greenwood Ave AM	Olympic Parade	East	T1	409	25%	18.88	LOS B	7.5
H.32 Marion St / Greenwood Ave AM	Marion St	North	T1	282	49%	26.58	LOS B	15.7
H.32 Marion St / Greenwood Ave AM	Marion St	North	L2	97	49%	31.16	LOS C	15.7
H.32 Marion St / Greenwood Ave AM	Marion St	North	R2	482	85%	42.96	LOS D	11.0
H.32 Marion St / Greenwood Ave AM	Marion St	West	T1	504	89%	40.60	LOS C	26.7
H.32 Marion St / Greenwood Ave AM	Marion St	West	L2	1334	58%	20.11	LOS B	33.5
H.32 Marion St / Greenwood Ave PM	Greenwood Ave	South	T1	451	88%	59.06	LOS E	16.0
H.32 Marion St / Greenwood Ave PM	Greenwood Ave	South	L2	73	88%	63.89	LOS E	15.4
H.32 Marion St / Greenwood Ave PM	Olympic Parade	East	L2	64	52%	36.87	LOS C	14.1
H.32 Marion St / Greenwood Ave PM	Olympic Parade	East	T1	635	52%	30.64	LOS C	14.4
H.32 Marion St / Greenwood Ave PM	Marion St	North	T1	652	77%	21.55	LOS B	31.6
H.32 Marion St / Greenwood Ave PM	Marion St	North	L2	113	77%	26.15	LOS B	31.6
H.32 Marion St / Greenwood Ave PM	Marion St	North	R2	836	91%	44.55	LOS D	19.2
H.32 Marion St / Greenwood Ave PM	Marion St	West	T1	380	55%	12.88	LOS A	9.3
H.32 Marion St / Greenwood Ave PM	Marion St	West	L2	719	25%	8.35	LOS A	5.3

12.0 Regents Park Station

12.1 Regents Park Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.35 Auburn Rd / Amy St AM Peak	Auburn Rd	South	T1	495	70%	11.13	LOS A	7.8
H.35 Auburn Rd / Amy St AM Peak	Auburn Rd	South	L2	435	62%	10.52	LOS A	5.8
H.35 Auburn Rd / Amy St AM Peak	Amy St	North	T1	298	38%	5.33	LOS A	2.6
H.35 Auburn Rd / Amy St AM Peak	Amy St	North	R2	368	49%	8.45	LOS A	3.5
H.35 Auburn Rd / Amy St AM Peak	Bridge	West	R2	270	45%	11.40	LOS A	3.5
H.35 Auburn Rd / Amy St AM Peak	Bridge	West	L2	351	59%	12.88	LOS A	5.6
H.35 Auburn Rd / Amy St PM Peak	Auburn Rd	South	T1	218	40%	9.06	LOS A	2.4
H.35 Auburn Rd / Amy St PM Peak	Auburn Rd	South	L2	213	39%	10.17	LOS A	2.4
H.35 Auburn Rd / Amy St PM Peak	Amy St	North	T1	472	56%	7.85	LOS A	4.8
H.35 Auburn Rd / Amy St PM Peak	Amy St	North	R2	414	50%	9.88	LOS A	3.8
H.35 Auburn Rd / Amy St PM Peak	Bridge	West	R2	331	47%	8.41	LOS A	3.3
H.35 Auburn Rd / Amy St PM Peak	Bridge	West	L2	337	48%	6.91	LOS A	3.4

12.2 Regents Park Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.35 Auburn Rd / Amy St AM Peak	Auburn Rd	South	T1	543	81%	16.21	LOS B	11.7
H.35 Auburn Rd / Amy St AM Peak	Auburn Rd	South	L2	478	71%	13.52	LOS A	8.1
H.35 Auburn Rd / Amy St AM Peak	Amy St	North	T1	327	44%	5.72	LOS A	3.1
H.35 Auburn Rd / Amy St AM Peak	Amy St	North	R2	404	55%	9.74	LOS A	4.7
H.35 Auburn Rd / Amy St AM Peak	Bridge	West	R2	296	54%	14.01	LOS A	4.8
H.35 Auburn Rd / Amy St AM Peak	Bridge	West	L2	385	70%	17.65	LOS B	8.1
H.35 Auburn Rd / Amy St PM Peak	Auburn Rd	South	T1	241	47%	10.86	LOS A	3.2
H.35 Auburn Rd / Amy St PM Peak	Auburn Rd	South	L2	235	46%	11.96	LOS A	3.1
H.35 Auburn Rd / Amy St PM Peak	Amy St	North	T1	522	65%	9.74	LOS A	6.7
H.35 Auburn Rd / Amy St PM Peak	Amy St	North	R2	457	58%	11.38	LOS A	5.1
H.35 Auburn Rd / Amy St PM Peak	Bridge	West	R2	366	53%	9.37	LOS A	4.2
H.35 Auburn Rd / Amy St PM Peak	Bridge	West	L2	372	55%	8.11	LOS A	4.5

12.3 Regents Park Station: Future + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.35 Auburn Rd / Amy St AM Peak	Auburn Rd	South	T1	550	82%	17.38	LOS B	12.5
H.35 Auburn Rd / Amy St AM Peak	Auburn Rd	South	L2	478	71%	13.55	LOS A	8.1
H.35 Auburn Rd / Amy St AM Peak	Amy St	North	T1	327	44%	5.83	LOS A	3.1
H.35 Auburn Rd / Amy St AM Peak	Amy St	North	R2	404	56%	10.01	LOS A	4.8
H.35 Auburn Rd / Amy St AM Peak	Bridge	West	R2	303	56%	14.85	LOS B	5.1
H.35 Auburn Rd / Amy St AM Peak	Bridge	West	L2	385	71%	18.33	LOS B	8.3
H.35 Auburn Rd / Amy St PM Peak	Auburn Rd	South	T1	241	47%	10.87	LOS A	3.2
H.35 Auburn Rd / Amy St PM Peak	Auburn Rd	South	L2	241	48%	12.50	LOS A	3.4
H.35 Auburn Rd / Amy St PM Peak	Amy St	North	T1	522	65%	10.02	LOS A	6.8
H.35 Auburn Rd / Amy St PM Peak	Amy St	North	R2	457	58%	11.60	LOS A	5.3
H.35 Auburn Rd / Amy St PM Peak	Bridge	West	R2	372	55%	9.65	LOS A	4.4
H.35 Auburn Rd / Amy St PM Peak	Bridge	West	L2	372	55%	8.11	LOS A	4.5

12.4 Regents Park Station: Future + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.35 Auburn Rd / Amy St AM Peak	Auburn Rd	South	T1	550	82%	17.38	LOS B	12.5
H.35 Auburn Rd / Amy St AM Peak	Auburn Rd	South	L2	478	71%	13.55	LOS A	8.1
H.35 Auburn Rd / Amy St AM Peak	Amy St	North	T1	327	44%	5.83	LOS A	3.1
H.35 Auburn Rd / Amy St AM Peak	Amy St	North	R2	404	56%	10.01	LOS A	4.8
H.35 Auburn Rd / Amy St AM Peak	Bridge	West	R2	303	56%	14.85	LOS B	5.1
H.35 Auburn Rd / Amy St AM Peak	Bridge	West	L2	385	71%	18.33	LOS B	8.3
H.35 Auburn Rd / Amy St PM Peak	Auburn Rd	South	T1	241	47%	10.87	LOS A	3.2
H.35 Auburn Rd / Amy St PM Peak	Auburn Rd	South	L2	241	48%	12.50	LOS A	3.4
H.35 Auburn Rd / Amy St PM Peak	Amy St	North	T1	522	65%	10.02	LOS A	6.8
H.35 Auburn Rd / Amy St PM Peak	Amy St	North	R2	457	58%	11.60	LOS A	5.3
H.35 Auburn Rd / Amy St PM Peak	Bridge	West	R2	372	55%	9.65	LOS A	4.4
H.35 Auburn Rd / Amy St PM Peak	Bridge	West	L2	372	55%	8.11	LOS A	4.5

13.0 Lidcombe Station

13.1 Lidcombe Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.26 Joseph St / Geoges Ave AM Peak	Joseph St	South	R2	356	73%	55.56	LOS D	16.4
H.26 Joseph St / Geoges Ave AM Peak	Joseph St	South	T1	2611	75%	4.69	LOS A	16.1
H.26 Joseph St / Geoges Ave AM Peak	Joseph St	South	L2	44	75%	11.15	LOS A	16.1
H.26 Joseph St / Geoges Ave AM Peak	Geoges Ave	East	L2	97	30%	50.95	LOS D	7.9
H.26 Joseph St / Geoges Ave AM Peak	Geoges Ave	East	R2	11	43%	64.81	LOS E	8.8
H.26 Joseph St / Geoges Ave AM Peak	Geoges Ave	East	T1	163	43%	56.75	LOS E	8.8
H.26 Joseph St / Geoges Ave AM Peak	Joseph St	North	T1	1414	54%	16.69	LOS B	17.8
H.26 Joseph St / Geoges Ave AM Peak	Joseph St	North	L2	80	54%	23.24	LOS B	17.8
H.26 Joseph St / Geoges Ave AM Peak	Joseph St	North	R2	82	27%	68.86	LOS E	5.4
H.26 Joseph St / Geoges Ave AM Peak	Georges Ave	West	R2	90	89%	79.41	LOS F	19.1
H.26 Joseph St / Geoges Ave AM Peak	Georges Ave	West	T1	252	89%	67.56	LOS E	19.1
H.26 Joseph St / Geoges Ave AM Peak	Georges Ave	West	L2	187	71%	59.60	LOS E	17.8
H.26 Joseph St / Geoges Ave PM Peak	Joseph St	South	R2	91	32%	67.74	LOS E	5.8
H.26 Joseph St / Geoges Ave PM Peak	Joseph St	South	T1	1615	52%	12.99	LOS A	15.9
H.26 Joseph St / Geoges Ave PM Peak	Joseph St	South	L2	59	52%	19.38	LOS B	15.9
H.26 Joseph St / Geoges Ave PM Peak	Geoges Ave	East	L2	310	47%	50.52	LOS D	23.4
H.26 Joseph St / Geoges Ave PM Peak	Geoges Ave	East	R2	34	47%	60.94	LOS E	20.7
H.26 Joseph St / Geoges Ave PM Peak	Geoges Ave	East	T1	399	47%	53.74	LOS D	23.4
H.26 Joseph St / Geoges Ave PM Peak	Joseph St	North	T1	2258	71%	8.89	LOS A	19.8
H.26 Joseph St / Geoges Ave PM Peak	Joseph St	North	L2	24	71%	15.25	LOS B	19.8
H.26 Joseph St / Geoges Ave PM Peak	Joseph St	North	R2	206	70%	72.30	LOS F	14.3
H.26 Joseph St / Geoges Ave PM Peak	Geoges Ave	West	R2	27	58%	62.94	LOS E	11.1
H.26 Joseph St / Geoges Ave PM Peak	Geoges Ave	West	T1	191	58%	55.02	LOS D	11.1
H.26 Joseph St / Geoges Ave PM Peak	Geoges Ave	West	L2	86	26%	49.12	LOS D	7.3
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	South	R1	614	75%	12.26	LOS A	13.6
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	South	T1	2203	33%	0.02	LOS A	0.0
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	NorthEast	L1	183	14%	37.28	LOS C	4.4
H.27 Olympic Dr / Joseph St AM Peak	Olympic Dr	North	T1	1546	55%	5.11	LOS A	8.1
H.27 Olympic Dr / Joseph St AM Peak	Olympic Dr	North	L3	114	55%	12.51	LOS A	7.8
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	South	R1	314	69%	9.67	LOS A	3.9
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	South	T1	1387	25%	0.02	LOS A	0.0
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	NorthEast	L1	380	49%	54.97	LOS D	11.7
H.27 Olympic Dr / Joseph St PM Peak	Olympic Dr	North	T1	2332	63%	1.52	LOS A	4.5
H.27 Olympic Dr / Joseph St PM Peak	Olympic Dr	North	L3	82	63%	8.95	LOS A	4.4
H.28 Vaughan St / Joseph St AM peak	Joseph St	South	T1	271	57%	12.32	LOS A	4.0
H.28 Vaughan St / Joseph St AM peak	Joseph St	South	L2	369	35%	8.30	LOS A	3.1
H.28 Vaughan St / Joseph St AM peak	Joseph St	North	T1	108	22%	4.54	LOS A	1.6
H.28 Vaughan St / Joseph St AM peak	Joseph St	North	R2	126	22%	10.67	LOS A	1.6
H.28 Vaughan St / Joseph St AM peak	Vaughan St	West	R2	255	75%	21.13	LOS B	4.5
H.28 Vaughan St / Joseph St AM peak	Vaughan St	West	L2	194	26%	11.69	LOS A	2.1
H.28 Vaughan St / Joseph St PM peak	Joseph St	South	T1	200	46%	18.62	LOS B	4.4
H.28 Vaughan St / Joseph St PM peak	Joseph St	South	L2	502	44%	9.55	LOS A	6.2
H.28 Vaughan St / Joseph St PM peak	Joseph St	North	T1	176	38%	9.19	LOS A	3.3
H.28 Vaughan St / Joseph St PM peak	Joseph St	North	R2	131	38%	16.59	LOS B	3.3
H.28 Vaughan St / Joseph St PM peak	Vaughan St	West	R2	275	52%	21.09	LOS B	5.8
H.28 Vaughan St / Joseph St PM peak	Vaughan St	West	L2	157	16%	10.96	LOS A	1.9
H.29 Olympic Dr / Church St AM peak	Olympic Dr	South	T1	2690	80%	20.67	LOS B	49.4
H.29 Olympic Dr / Church St AM peak	Olympic Dr	South	L1	132	80%	27.75	LOS B	49.4
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	L3	243	77%	26.06	LOS B	10.3
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	R1	138	77%	68.10	LOS E	10.3
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	T1	11	77%	20.58	LOS B	10.3
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	T1	1419	42%	9.55	LOS A	15.8
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	L1	153	42%	15.67	LOS B	15.8

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	R3	17	58%	98.11	LOS F	1.4
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	R1	7	31%	67.72	LOS E	4.8
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	T1	67	31%	64.53	LOS E	4.8
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	L3	11	31%	70.13	LOS E	4.8
H.29 Olympic Dr / Church St PM peak	Olympic Dr	South	T1	1589	53%	20.45	LOS B	24.0
H.29 Olympic Dr / Church St PM peak	Olympic Dr	South	L1	85	53%	26.77	LOS B	23.9
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	L3	490	90%	65.95	LOS E	39.2
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	R1	287	86%	74.24	LOS F	21.8
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	T1	9	90%	60.49	LOS E	39.2
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	T1	2040	62%	17.15	LOS B	30.9
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	L1	139	62%	23.26	LOS B	30.9
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	R3	16	48%	93.95	LOS F	1.3
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	R1	64	66%	68.97	LOS E	9.1
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	T1	58	66%	65.76	LOS E	9.1
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	L3	25	66%	71.25	LOS F	9.1

13.2 Lidcombe Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.26 Joseph St / Georges Ave AM Peak	Joseph St	South	R2	390	96%	67.95	LOS E	24.6
H.26 Joseph St / Georges Ave AM Peak	Joseph St	South	T1	2867	75%	1.14	LOS A	5.3
H.26 Joseph St / Georges Ave AM Peak	Joseph St	South	L2	49	75%	7.60	LOS A	5.3
H.26 Joseph St / Georges Ave AM Peak	Geoges Ave	East	L2	106	30%	47.78	LOS D	8.4
H.26 Joseph St / Georges Ave AM Peak	Geoges Ave	East	R2	12	43%	61.39	LOS E	9.5
H.26 Joseph St / Georges Ave AM Peak	Geoges Ave	East	T1	179	43%	53.46	LOS D	9.5
H.26 Joseph St / Georges Ave AM Peak	Joseph St	North	T1	1553	60%	17.47	LOS B	21.1
H.26 Joseph St / Georges Ave AM Peak	Joseph St	North	L2	88	60%	24.07	LOS B	21.1
H.26 Joseph St / Georges Ave AM Peak	Joseph St	North	R2	90	70%	85.44	LOS F	6.8
H.26 Joseph St / Georges Ave AM Peak	Georges Ave	West	R2	99	90%	80.24	LOS F	21.0
H.26 Joseph St / Georges Ave AM Peak	Georges Ave	West	T1	276	90%	66.70	LOS E	21.0
H.26 Joseph St / Georges Ave AM Peak	Georges Ave	West	L2	205	72%	56.51	LOS E	19.3
H.26 Joseph St / Georges Ave PM Peak	Joseph St	South	R2	100	41%	71.51	LOS F	6.7
H.26 Joseph St / Georges Ave PM Peak	Joseph St	South	T1	1785	53%	14.00	LOS A	17.7
H.26 Joseph St / Georges Ave PM Peak	Joseph St	South	L2	65	53%	20.39	LOS B	17.6
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	East	L2	343	77%	57.81	LOS E	32.7
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	East	R2	37	77%	73.48	LOS F	20.7
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	East	T1	441	77%	62.51	LOS E	32.7
H.26 Joseph St / Georges Ave PM Peak	Joseph St	North	T1	2495	75%	8.56	LOS A	25.8
H.26 Joseph St / Georges Ave PM Peak	Joseph St	North	L2	27	75%	15.21	LOS B	25.8
H.26 Joseph St / Georges Ave PM Peak	Joseph St	North	R2	228	91%	89.45	LOS F	18.3
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	West	R2	29	89%	87.14	LOS F	12.4
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	West	T1	211	89%	69.70	LOS E	12.4
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	West	L2	95	41%	55.10	LOS D	10.8
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	South	R1	674	76%	11.79	LOS A	15.3
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	South	T1	2419	44%	0.04	LOS A	0.0
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	NorthEast	L1	201	12%	26.46	LOS B	4.0
H.27 Olympic Dr / Joseph St AM Peak	Olympic Dr	North	T1	1698	76%	6.67	LOS A	14.0
H.27 Olympic Dr / Joseph St AM Peak	Olympic Dr	North	L3	125	76%	14.07	LOS A	13.6
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	South	R1	347	72%	9.67	LOS A	4.7
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	South	T1	1532	27%	0.02	LOS A	0.0
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	NorthEast	L1	420	55%	53.71	LOS D	12.8
H.27 Olympic Dr / Joseph St PM Peak	Olympic Dr	North	T1	2577	71%	1.72	LOS A	6.2
H.27 Olympic Dr / Joseph St PM Peak	Olympic Dr	North	L3	90	71%	9.15	LOS A	6.1
H.28 Vaughan St / Joseph St AM peak	Joseph St	South	T1	297	69%	13.98	LOS A	4.7
H.28 Vaughan St / Joseph St AM peak	Joseph St	South	L2	406	39%	8.53	LOS A	3.5
H.28 Vaughan St / Joseph St AM peak	Joseph St	North	T1	119	33%	4.29	LOS A	1.5
H.28 Vaughan St / Joseph St AM peak	Joseph St	North	R2	139	33%	11.99	LOS A	1.5
H.28 Vaughan St / Joseph St AM peak	Vaughan St	West	R2	280	80%	21.77	LOS B	5.0
H.28 Vaughan St / Joseph St AM peak	Vaughan St	West	L2	213	28%	11.26	LOS A	2.2
H.28 Vaughan St / Joseph St PM peak	Joseph St	South	T1	221	56%	20.01	LOS B	5.0
H.28 Vaughan St / Joseph St PM peak	Joseph St	South	L2	555	48%	9.76	LOS A	7.1
H.28 Vaughan St / Joseph St PM peak	Joseph St	North	T1	194	44%	10.16	LOS A	3.8
H.28 Vaughan St / Joseph St PM peak	Joseph St	North	R2	144	44%	18.35	LOS B	3.8
H.28 Vaughan St / Joseph St PM peak	Vaughan St	West	R2	304	54%	20.41	LOS B	6.3
H.28 Vaughan St / Joseph St PM peak	Vaughan St	West	L2	173	17%	10.47	LOS A	2.1
H.29 Olympic Dr / Church St AM peak	Olympic Dr	South	T1	2954	96%	55.47	LOS D	88.4
H.29 Olympic Dr / Church St AM peak	Olympic Dr	South	L1	145	96%	62.84	LOS E	86.9
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	L3	267	49%	13.58	LOS A	10.4
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	R1	152	44%	61.62	LOS E	9.9
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	T1	12	49%	8.10	LOS A	10.4
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	T1	1558	48%	12.36	LOS A	20.2
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	L1	168	48%	18.50	LOS B	20.2
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	R3	19	32%	89.59	LOS F	1.4
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	R1	8	82%	100.20	LOS F	7.8
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	T1	74	82%	97.00	LOS F	7.8

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	L3	12	82%	102.60	LOS F	7.8
H.29 Olympic Dr / Church St PM peak	Olympic Dr	South	T1	1756	88%	54.16	LOS D	45.3
H.29 Olympic Dr / Church St PM peak	Olympic Dr	South	L1	94	88%	60.65	LOS E	44.7
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	L3	541	71%	35.61	LOS C	24.9
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	R1	317	46%	41.01	LOS C	17.1
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	T1	10	71%	30.14	LOS C	24.9
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	T1	2255	94%	60.62	LOS E	66.2
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	L1	154	94%	66.67	LOS E	66.2
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	R3	18	27%	86.18	LOS F	1.3
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	R1	70	84%	90.94	LOS F	12.2
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	T1	64	84%	87.73	LOS F	12.2
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	L3	28	84%	93.22	LOS F	12.2

13.3 Lidcombe Station: Future + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.26 Joseph St / Georges Ave AM Peak	Joseph St	South	R2	390	96%	67.37	LOS E	24.1
H.26 Joseph St / Georges Ave AM Peak	Joseph St	South	T1	2867	77%	1.18	LOS A	5.7
H.26 Joseph St / Georges Ave AM Peak	Joseph St	South	L2	49	77%	7.64	LOS A	5.7
H.26 Joseph St / Georges Ave AM Peak	Geoges Ave	East	L2	106	28%	46.08	LOS D	8.2
H.26 Joseph St / Georges Ave AM Peak	Geoges Ave	East	R2	12	41%	60.27	LOS E	9.4
H.26 Joseph St / Georges Ave AM Peak	Geoges Ave	East	T1	179	41%	52.22	LOS D	9.4
H.26 Joseph St / Georges Ave AM Peak	Joseph St	North	T1	1553	62%	17.91	LOS B	21.5
H.26 Joseph St / Georges Ave AM Peak	Joseph St	North	L2	88	62%	24.52	LOS B	21.5
H.26 Joseph St / Georges Ave AM Peak	Joseph St	North	R2	90	70%	85.44	LOS F	6.8
H.26 Joseph St / Georges Ave AM Peak	Georges Ave	West	R2	99	89%	75.04	LOS F	21.1
H.26 Joseph St / Georges Ave AM Peak	Georges Ave	West	T1	276	89%	63.41	LOS E	21.1
H.26 Joseph St / Georges Ave AM Peak	Georges Ave	West	L2	219	71%	53.96	LOS D	19.0
H.26 Joseph St / Georges Ave PM Peak	Joseph St	South	R2	100	41%	71.51	LOS F	6.7
H.26 Joseph St / Georges Ave PM Peak	Joseph St	South	T1	1785	55%	14.65	LOS B	18.1
H.26 Joseph St / Georges Ave PM Peak	Joseph St	South	L2	65	55%	21.04	LOS B	18.1
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	East	L2	343	67%	53.71	LOS D	29.9
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	East	R2	37	67%	69.18	LOS E	21.5
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	East	T1	441	67%	59.12	LOS E	29.9
H.26 Joseph St / Georges Ave PM Peak	Joseph St	North	T1	2495	79%	8.97	LOS A	27.9
H.26 Joseph St / Georges Ave PM Peak	Joseph St	North	L2	27	79%	15.63	LOS B	27.9
H.26 Joseph St / Georges Ave PM Peak	Joseph St	North	R2	228	91%	89.45	LOS F	18.3
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	West	R2	29	94%	95.45	LOS F	14.6
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	West	T1	211	94%	77.02	LOS F	14.6
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	West	L2	109	43%	52.02	LOS D	10.3
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	South	R1	688	78%	11.90	LOS A	16.6
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	South	T1	2419	44%	0.04	LOS A	0.0
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	NorthEast	L1	201	11%	25.87	LOS B	3.9
H.27 Olympic Dr / Joseph St AM Peak	Olympic Dr	North	T1	1698	77%	6.75	LOS A	14.4
H.27 Olympic Dr / Joseph St AM Peak	Olympic Dr	North	L3	125	77%	14.15	LOS A	14.0
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	South	R1	361	72%	9.68	LOS A	5.0
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	South	T1	1532	27%	0.02	LOS A	0.0
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	NorthEast	L1	420	50%	50.92	LOS D	12.5
H.27 Olympic Dr / Joseph St PM Peak	Olympic Dr	North	T1	2577	73%	1.59	LOS A	6.6
H.27 Olympic Dr / Joseph St PM Peak	Olympic Dr	North	L3	90	73%	9.02	LOS A	6.5
H.28 Vaughan St / Joseph St AM peak	Joseph St	South	T1	312	76%	15.34	LOS B	5.3
H.28 Vaughan St / Joseph St AM peak	Joseph St	South	L2	406	39%	8.53	LOS A	3.5
H.28 Vaughan St / Joseph St AM peak	Joseph St	North	T1	119	12%	4.27	LOS A	1.0
H.28 Vaughan St / Joseph St AM peak	Joseph St	North	R2	139	34%	12.85	LOS A	1.5
H.28 Vaughan St / Joseph St AM peak	Vaughan St	West	R2	280	80%	21.77	LOS B	5.0
H.28 Vaughan St / Joseph St AM peak	Vaughan St	West	L2	213	28%	11.26	LOS A	2.2
H.28 Vaughan St / Joseph St PM peak	Joseph St	South	T1	236	58%	19.38	LOS B	5.3
H.28 Vaughan St / Joseph St PM peak	Joseph St	South	L2	555	48%	9.76	LOS A	7.1
H.28 Vaughan St / Joseph St PM peak	Joseph St	North	T1	194	43%	9.45	LOS A	3.7
H.28 Vaughan St / Joseph St PM peak	Joseph St	North	R2	144	43%	17.65	LOS B	3.7
H.28 Vaughan St / Joseph St PM peak	Vaughan St	West	R2	304	58%	21.42	LOS B	6.5
H.28 Vaughan St / Joseph St PM peak	Vaughan St	West	L2	173	18%	11.03	LOS A	2.2
H.29 Olympic Dr / Church St AM peak	Olympic Dr	South	T1	2954	98%	69.02	LOS E	97.1
H.29 Olympic Dr / Church St AM peak	Olympic Dr	South	L1	145	98%	76.32	LOS F	95.2
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	L3	281	53%	15.43	LOS B	13.0
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	R1	152	41%	59.57	LOS E	9.7
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	T1	12	53%	9.91	LOS A	13.0
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	T1	1558	49%	13.39	LOS A	21.0
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	L1	168	49%	19.54	LOS B	21.0
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	R3	19	32%	89.59	LOS F	1.4
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	R1	8	82%	100.53	LOS F	8.0
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	T1	74	82%	97.33	LOS F	8.0

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	L3	12	82%	102.93	LOS F	8.0
H.29 Olympic Dr / Church St PM peak	Olympic Dr	South	T1	1756	91%	62.98	LOS E	49.0
H.29 Olympic Dr / Church St PM peak	Olympic Dr	South	L1	94	91%	69.52	LOS E	48.4
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	L3	555	73%	35.80	LOS C	25.0
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	R1	317	45%	39.36	LOS C	16.7
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	T1	10	73%	30.31	LOS C	25.0
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	T1	2255	97%	74.57	LOS F	72.8
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	L1	154	97%	80.61	LOS F	72.8
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	R3	18	27%	86.18	LOS F	1.3
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	R1	70	84%	92.03	LOS F	12.6
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	T1	64	84%	88.82	LOS F	12.6
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	L3	28	84%	94.31	LOS F	12.6

13.4 Lidcombe Station: Future + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.26 Joseph St / Georges Ave AM Peak	Joseph St	South	R2	390	96%	67.37	LOS E	24.1
H.26 Joseph St / Georges Ave AM Peak	Joseph St	South	T1	2867	77%	1.18	LOS A	5.7
H.26 Joseph St / Georges Ave AM Peak	Joseph St	South	L2	49	77%	7.64	LOS A	5.7
H.26 Joseph St / Georges Ave AM Peak	Geoges Ave	East	L2	106	28%	46.08	LOS D	8.2
H.26 Joseph St / Georges Ave AM Peak	Geoges Ave	East	R2	12	41%	60.27	LOS E	9.4
H.26 Joseph St / Georges Ave AM Peak	Geoges Ave	East	T1	179	41%	52.22	LOS D	9.4
H.26 Joseph St / Georges Ave AM Peak	Joseph St	North	T1	1553	62%	17.91	LOS B	21.5
H.26 Joseph St / Georges Ave AM Peak	Joseph St	North	L2	88	62%	24.52	LOS B	21.5
H.26 Joseph St / Georges Ave AM Peak	Joseph St	North	R2	90	70%	85.44	LOS F	6.8
H.26 Joseph St / Georges Ave AM Peak	Georges Ave	West	R2	99	89%	75.04	LOS F	21.1
H.26 Joseph St / Georges Ave AM Peak	Georges Ave	West	T1	276	89%	63.41	LOS E	21.1
H.26 Joseph St / Georges Ave AM Peak	Georges Ave	West	L2	219	71%	53.96	LOS D	19.0
H.26 Joseph St / Georges Ave PM Peak	Joseph St	South	R2	100	41%	71.51	LOS F	6.7
H.26 Joseph St / Georges Ave PM Peak	Joseph St	South	T1	1785	55%	14.65	LOS B	18.1
H.26 Joseph St / Georges Ave PM Peak	Joseph St	South	L2	65	55%	21.04	LOS B	18.1
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	East	L2	343	67%	53.71	LOS D	29.9
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	East	R2	37	67%	69.18	LOS E	21.5
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	East	T1	441	67%	59.12	LOS E	29.9
H.26 Joseph St / Georges Ave PM Peak	Joseph St	North	T1	2495	79%	8.97	LOS A	27.9
H.26 Joseph St / Georges Ave PM Peak	Joseph St	North	L2	27	79%	15.63	LOS B	27.9
H.26 Joseph St / Georges Ave PM Peak	Joseph St	North	R2	228	91%	89.45	LOS F	18.3
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	West	R2	29	94%	95.45	LOS F	14.6
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	West	T1	211	94%	77.02	LOS F	14.6
H.26 Joseph St / Georges Ave PM Peak	Geoges Ave	West	L2	109	43%	52.02	LOS D	10.3
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	South	R1	688	78%	11.90	LOS A	16.6
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	South	T1	2419	44%	0.04	LOS A	0.0
H.27 Olympic Dr / Joseph St AM Peak	Joseph St	NorthEast	L1	201	11%	25.87	LOS B	3.9
H.27 Olympic Dr / Joseph St AM Peak	Olympic Dr	North	T1	1698	77%	6.75	LOS A	14.4
H.27 Olympic Dr / Joseph St AM Peak	Olympic Dr	North	L3	125	77%	14.15	LOS A	14.0
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	South	R1	361	72%	9.68	LOS A	5.0
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	South	T1	1532	27%	0.02	LOS A	0.0
H.27 Olympic Dr / Joseph St PM Peak	Joseph St	NorthEast	L1	420	50%	50.92	LOS D	12.5
H.27 Olympic Dr / Joseph St PM Peak	Olympic Dr	North	T1	2577	73%	1.59	LOS A	6.6
H.27 Olympic Dr / Joseph St PM Peak	Olympic Dr	North	L3	90	73%	9.02	LOS A	6.5
H.28 Vaughan St / Joseph St AM peak	Joseph St	South	T1	312	76%	15.34	LOS B	5.3
H.28 Vaughan St / Joseph St AM peak	Joseph St	South	L2	406	39%	8.53	LOS A	3.5
H.28 Vaughan St / Joseph St AM peak	Joseph St	North	T1	119	12%	4.27	LOS A	1.0
H.28 Vaughan St / Joseph St AM peak	Joseph St	North	R2	139	34%	12.85	LOS A	1.5
H.28 Vaughan St / Joseph St AM peak	Vaughan St	West	R2	280	80%	21.77	LOS B	5.0
H.28 Vaughan St / Joseph St AM peak	Vaughan St	West	L2	213	28%	11.26	LOS A	2.2
H.28 Vaughan St / Joseph St PM peak	Joseph St	South	T1	236	58%	19.38	LOS B	5.3
H.28 Vaughan St / Joseph St PM peak	Joseph St	South	L2	555	48%	9.76	LOS A	7.1
H.28 Vaughan St / Joseph St PM peak	Joseph St	North	T1	194	43%	9.45	LOS A	3.7
H.28 Vaughan St / Joseph St PM peak	Joseph St	North	R2	144	43%	17.65	LOS B	3.7
H.28 Vaughan St / Joseph St PM peak	Vaughan St	West	R2	304	58%	21.42	LOS B	6.5
H.28 Vaughan St / Joseph St PM peak	Vaughan St	West	L2	173	18%	11.03	LOS A	2.2
H.29 Olympic Dr / Church St AM peak	Olympic Dr	South	T1	2954	98%	69.02	LOS E	97.1
H.29 Olympic Dr / Church St AM peak	Olympic Dr	South	L1	145	98%	76.32	LOS F	95.2
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	L3	281	53%	15.43	LOS B	13.0
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	R1	152	41%	59.57	LOS E	9.7
H.29 Olympic Dr / Church St AM peak	Church St	SouthEast	T1	12	53%	9.91	LOS A	13.0
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	T1	1558	49%	13.39	LOS A	21.0
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	L1	168	49%	19.54	LOS B	21.0
H.29 Olympic Dr / Church St AM peak	Olympic Dr	North	R3	19	32%	89.59	LOS F	1.4
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	R1	8	82%	100.53	LOS F	8.0
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	T1	74	82%	97.33	LOS F	8.0

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.29 Olympic Dr / Church St AM peak	Church St	NorthWest	L3	12	82%	102.93	LOS F	8.0
H.29 Olympic Dr / Church St PM peak	Olympic Dr	South	T1	1756	91%	62.98	LOS E	49.0
H.29 Olympic Dr / Church St PM peak	Olympic Dr	South	L1	94	91%	69.52	LOS E	48.4
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	L3	555	73%	35.80	LOS C	25.0
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	R1	317	45%	39.36	LOS C	16.7
H.29 Olympic Dr / Church St PM peak	Church St	SouthEast	T1	10	73%	30.31	LOS C	25.0
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	T1	2255	97%	74.57	LOS F	72.8
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	L1	154	97%	80.61	LOS F	72.8
H.29 Olympic Dr / Church St PM peak	Olympic Dr	North	R3	18	27%	86.18	LOS F	1.3
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	R1	70	84%	92.03	LOS F	12.6
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	T1	64	84%	88.82	LOS F	12.6
H.29 Olympic Dr / Church St PM peak	Church St	NorthWest	L3	28	84%	94.31	LOS F	12.6

14.0 Birrong Station

14.1 Birrong Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	R2	8	35%	11.63	LOS A	0.3
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	T1	636	35%	0.17	LOS A	0.3
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	L2	4	35%	5.97	LOS A	0.3
H.44 Auburn Rd / Moller Ave AM Peak	Moller Ave	East	L2	10	3%	12.26	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Moller Ave	East	R2	1	3%	22.42	LOS B	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	T1	592	32%	0.07	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	L2	1	32%	5.72	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	R2	3	32%	11.85	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Birong Rd	West	R2	8	9%	30.81	LOS C	0.3
H.44 Auburn Rd / Moller Ave AM Peak	Birong Rd	West	L2	8	9%	13.01	LOS A	0.3
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	R2	2	33%	12.47	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	T1	604	33%	0.04	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	L2	4	33%	5.56	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Moller Ave	East	L2	3	1%	13.54	LOS A	0.0
H.44 Auburn Rd / Moller Ave PM Peak	Moller Ave	East	R2	1	1%	21.77	LOS B	0.0
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	T1	678	36%	0.06	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	L2	2	36%	5.60	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	R2	3	36%	11.53	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Birong Rd	West	R2	2	2%	21.74	LOS B	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Birong Rd	West	L2	4	2%	11.73	LOS A	0.1

14.2 Birrong Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	R2	9	39%	13.27	LOS A	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	T1	698	39%	0.24	LOS A	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	L2	4	39%	6.00	LOS A	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Moller Ave	East	L2	11	4%	14.02	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Moller Ave	East	R2	1	4%	28.52	LOS C	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	T1	650	36%	0.10	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	L2	1	36%	5.76	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	R2	3	36%	13.54	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Birong Rd	West	R2	9	12%	40.58	LOS C	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Birong Rd	West	L2	9	12%	15.01	LOS B	0.4
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	R2	2	37%	14.53	LOS B	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	T1	668	37%	0.06	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	L2	5	37%	5.57	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Moller Ave	East	L2	3	2%	15.94	LOS B	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Moller Ave	East	R2	1	2%	27.80	LOS B	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	T1	749	40%	0.08	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	L2	2	40%	5.62	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	R2	3	40%	13.24	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Birong Rd	West	R2	2	3%	27.72	LOS B	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Birong Rd	West	L2	5	3%	13.41	LOS A	0.1

14.3 Birrong Station: Future + Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	R2	9	41%	14.27	LOS A	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	T1	718	41%	0.26	LOS A	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	L2	4	41%	6.02	LOS A	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Moller Ave	East	L2	11	5%	14.99	LOS B	0.2
H.44 Auburn Rd / Moller Ave AM Peak	Moller Ave	East	R2	1	5%	32.17	LOS C	0.2
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	T1	670	38%	0.11	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	L2	1	38%	5.77	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	R2	3	38%	14.55	LOS B	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Birong Rd	West	R2	9	14%	46.63	LOS D	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Birong Rd	West	L2	9	14%	16.08	LOS B	0.4
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	R2	2	39%	15.68	LOS B	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	T1	688	39%	0.06	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	L2	5	39%	5.58	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Moller Ave	East	L2	3	2%	17.11	LOS B	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Moller Ave	East	R2	1	2%	31.10	LOS C	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	T1	769	42%	0.09	LOS A	0.2
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	L2	2	42%	5.62	LOS A	0.2
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	R2	3	42%	14.24	LOS A	0.2
H.44 Auburn Rd / Moller Ave PM Peak	Birong Rd	West	R2	2	3%	31.01	LOS C	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Birong Rd	West	L2	5	3%	14.31	LOS A	0.1

14.4 Birrong Station: Future + Refined Baseline TTP

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	R2	9	41%	14.27	LOS A	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	T1	718	41%	0.26	LOS A	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	South	L2	4	41%	6.02	LOS A	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Moller Ave	East	L2	11	5%	14.99	LOS B	0.2
H.44 Auburn Rd / Moller Ave AM Peak	Moller Ave	East	R2	1	5%	32.17	LOS C	0.2
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	T1	670	38%	0.11	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	L2	1	38%	5.77	LOS A	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Auburn Rd	North	R2	3	38%	14.55	LOS B	0.1
H.44 Auburn Rd / Moller Ave AM Peak	Birong Rd	West	R2	9	14%	46.63	LOS D	0.4
H.44 Auburn Rd / Moller Ave AM Peak	Birong Rd	West	L2	9	14%	16.08	LOS B	0.4
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	R2	2	39%	15.68	LOS B	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	T1	688	39%	0.06	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	South	L2	5	39%	5.58	LOS A	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Moller Ave	East	L2	3	2%	17.11	LOS B	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Moller Ave	East	R2	1	2%	31.10	LOS C	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	T1	769	42%	0.09	LOS A	0.2
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	L2	2	42%	5.62	LOS A	0.2
H.44 Auburn Rd / Moller Ave PM Peak	Auburn Rd	North	R2	3	42%	14.24	LOS A	0.2
H.44 Auburn Rd / Moller Ave PM Peak	Birong Rd	West	R2	2	3%	31.01	LOS C	0.1
H.44 Auburn Rd / Moller Ave PM Peak	Birong Rd	West	L2	5	3%	14.31	LOS A	0.1

15.0 Yagoona Station

15.1 Yagoona Station: Base

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	R2	8	69%	58.79	LOS E	19.4
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	T1	398	69%	55.53	LOS D	19.4
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	L2	184	69%	59.56	LOS E	18.3
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	L2	104	45%	37.63	LOS C	20.6
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	R2	45	20%	68.07	LOS E	3.0
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	T1	1115	45%	33.67	LOS C	21.3
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	T1	264	34%	37.67	LOS C	11.4
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	L2	33	13%	37.55	LOS C	4.0
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	R2	147	82%	57.57	LOS E	9.0
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	R2	167	67%	73.02	LOS F	11.8
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	T1	1680	71%	20.29	LOS B	27.8
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	L2	215	71%	23.15	LOS B	26.8
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	R2	4	74%	66.26	LOS E	20.1
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	T1	327	74%	60.52	LOS E	23.5
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	L2	301	74%	59.79	LOS E	23.5
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	L2	60	69%	30.27	LOS C	23.5
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	R2	91	29%	68.69	LOS E	6.0
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	T1	1486	69%	24.54	LOS B	24.2
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	T1	802	69%	34.51	LOS C	23.2
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	L2	33	52%	38.67	LOS C	21.9
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	R2	284	80%	53.77	LOS D	17.1
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	R2	237	76%	75.55	LOS F	17.4
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	T1	1290	64%	23.70	LOS B	20.9
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	L2	143	64%	28.62	LOS C	20.1
H.43 Church Rd / Hume Hwy AM	Hume Hwy	East	R2	5	62%	608.23	LOS F	1.5
H.43 Church Rd / Hume Hwy AM	Hume Hwy	East	T1	1529	42%	0.01	LOS A	0.0
H.43 Church Rd / Hume Hwy AM	Church Rd	North	L2	94	70%	53.62	LOS D	2.7
H.43 Church Rd / Hume Hwy AM	Church Rd	North	R2	12	91%	438.75	LOS F	2.2
H.43 Church Rd / Hume Hwy AM	Hume Hwy	West	T1	2347	44%	0.03	LOS A	0.5
H.43 Church Rd / Hume Hwy AM	Hume Hwy	West	L2	43	44%	5.99	LOS A	0.5
H.43 Church Rd / Hume Hwy PM	Hume Hwy	East	R2	30	34%	53.26	LOS D	1.0
H.43 Church Rd / Hume Hwy PM	Hume Hwy	East	T1	2111	38%	0.01	LOS A	0.0
H.43 Church Rd / Hume Hwy PM	Church Rd	North	L2	123	58%	30.40	LOS C	2.3
H.43 Church Rd / Hume Hwy PM	Church Rd	North	R2	14	91%	316.74	LOS F	1.9
H.43 Church Rd / Hume Hwy PM	Hume Hwy	West	T1	1840	51%	0.03	LOS A	0.7
H.43 Church Rd / Hume Hwy PM	Hume Hwy	West	L2	57	51%	5.86	LOS A	0.7

15.2 Yagoona Station: Future

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	R2	9	82%	67.55	LOS E	23.1
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	T1	426	82%	64.16	LOS E	23.1
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	L2	197	82%	67.80	LOS E	22.2
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	L2	111	52%	38.30	LOS C	22.6
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	R2	49	24%	69.81	LOS E	3.3
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	T1	1193	52%	34.33	LOS C	23.6
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	T1	282	36%	37.99	LOS C	12.3
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	L2	36	14%	37.68	LOS C	4.3
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	R2	158	81%	53.67	LOS D	9.4
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	R2	178	83%	79.64	LOS F	13.6
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	T1	1797	82%	20.71	LOS B	34.3
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	L2	230	82%	22.99	LOS B	32.7
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	R2	5	89%	82.51	LOS F	25.5
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	T1	361	89%	76.91	LOS F	31.5
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	L2	333	89%	77.43	LOS F	31.5
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	L2	67	77%	31.05	LOS C	28.5
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	R2	100	34%	70.12	LOS E	6.7
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	T1	1643	77%	25.32	LOS B	29.2
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	T1	886	77%	34.94	LOS C	25.5
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	L2	37	58%	39.21	LOS C	25.5
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	R2	314	76%	47.08	LOS D	17.7
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	R2	262	88%	85.03	LOS F	21.0
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	T1	1425	71%	24.39	LOS B	25.0
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	L2	158	71%	29.30	LOS C	24.1
H.43 Church Rd / Hume Hwy AM	Hume Hwy	East	R2	6	91%	943.42	LOS F	2.3
H.43 Church Rd / Hume Hwy AM	Hume Hwy	East	T1	1679	70%	30.55	LOS C	137.6
H.43 Church Rd / Hume Hwy AM	Church Rd	North	L2	103	110%	211.72	LOS F	11.0
H.43 Church Rd / Hume Hwy AM	Church Rd	North	R2	14	91%	375.47	LOS F	2.0
H.43 Church Rd / Hume Hwy AM	Hume Hwy	West	T1	2577	49%	0.03	LOS A	0.6
H.43 Church Rd / Hume Hwy AM	Hume Hwy	West	L2	48	49%	6.07	LOS A	0.6
H.43 Church Rd / Hume Hwy PM	Hume Hwy	East	R2	33	58%	103.99	LOS F	1.8
H.43 Church Rd / Hume Hwy PM	Hume Hwy	East	T1	2333	42%	0.01	LOS A	0.0
H.43 Church Rd / Hume Hwy PM	Church Rd	North	L2	136	88%	69.96	LOS E	4.6
H.43 Church Rd / Hume Hwy PM	Church Rd	North	R2	16	91%	283.52	LOS F	1.9
H.43 Church Rd / Hume Hwy PM	Hume Hwy	West	T1	2034	56%	0.04	LOS A	0.8
H.43 Church Rd / Hume Hwy PM	Hume Hwy	West	L2	63	56%	5.96	LOS A	0.8

15.3 Yagoona Station: Future + Baseline TTP

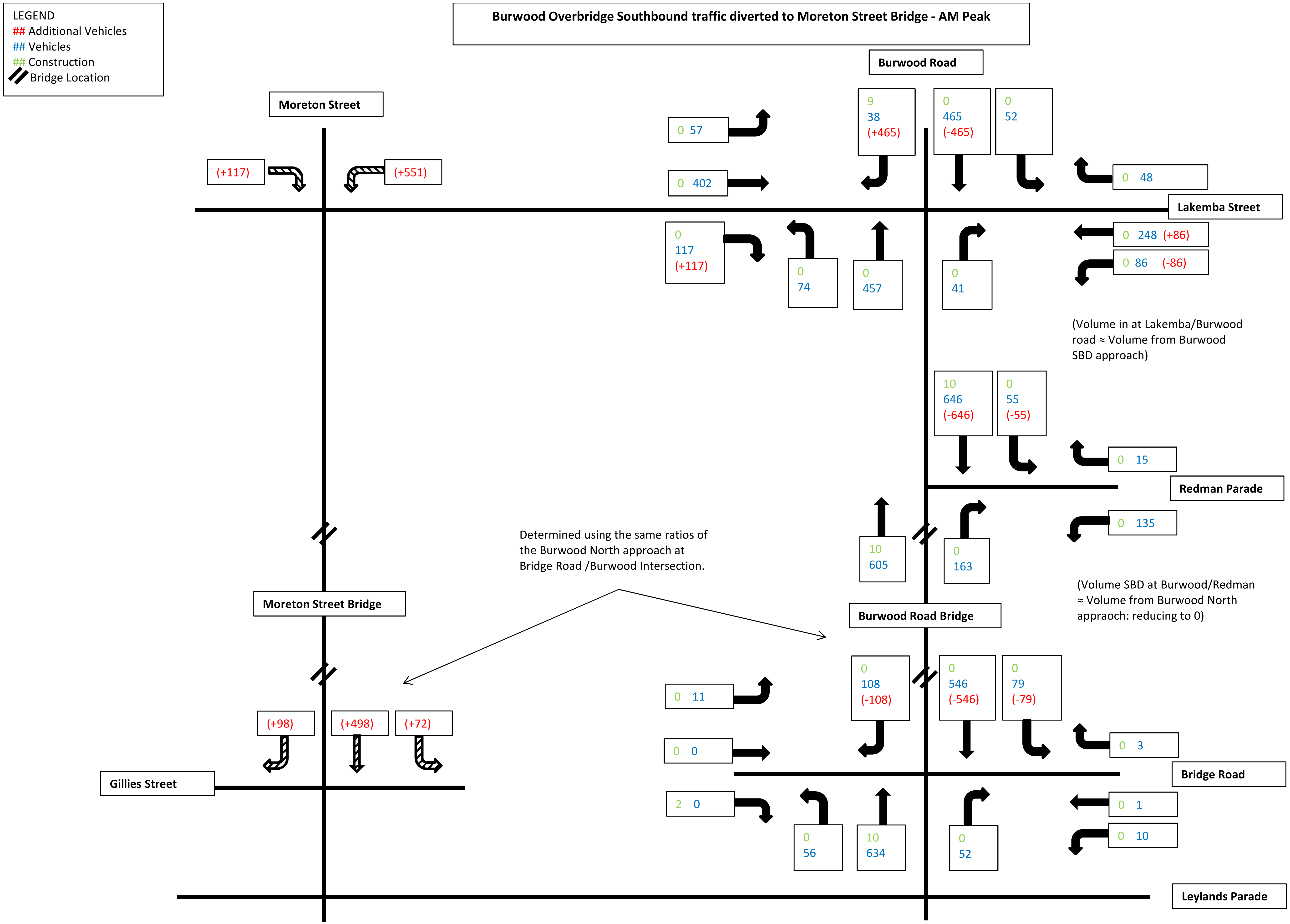
Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	R2	9	89%	74.69	LOS F	26.1
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	T1	426	89%	71.39	LOS F	26.1
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	L2	217	89%	75.42	LOS F	24.5
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	L2	111	56%	41.61	LOS C	23.7
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	R2	49	20%	65.32	LOS E	3.2
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	T1	1193	56%	37.63	LOS C	24.7
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	T1	282	36%	37.99	LOS C	12.3
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	L2	36	14%	37.68	LOS C	4.3
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	R2	158	78%	51.87	LOS D	9.2
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	R2	199	82%	76.56	LOS F	14.9
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	T1	1797	90%	31.14	LOS C	46.0
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	L2	230	90%	34.45	LOS C	46.0
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	R2	5	89%	81.58	LOS F	26.3
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	T1	361	89%	76.04	LOS F	32.3
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	L2	353	89%	75.93	LOS F	32.3
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	L2	67	86%	37.56	LOS C	35.0
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	R2	100	30%	66.88	LOS E	6.6
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	T1	1643	86%	31.60	LOS C	36.0
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	T1	886	76%	33.92	LOS C	25.1
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	L2	37	57%	38.37	LOS C	25.1
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	R2	314	76%	47.21	LOS D	17.6
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	R2	283	89%	84.88	LOS F	22.9
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	T1	1425	77%	29.29	LOS C	28.8
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	L2	158	77%	34.18	LOS C	28.0
H.43 Church Rd / Hume Hwy AM	Hume Hwy	East	R2	26	100%	292.62	LOS F	3.3
H.43 Church Rd / Hume Hwy AM	Hume Hwy	East	T1	1679	72%	6.68	LOS A	28.8
H.43 Church Rd / Hume Hwy AM	Church Rd	North	L2	124	176%	777.78	LOS F	38.7
H.43 Church Rd / Hume Hwy AM	Church Rd	North	R2	14	91%	372.70	LOS F	2.0
H.43 Church Rd / Hume Hwy AM	Hume Hwy	West	T1	2577	49%	0.03	LOS A	0.6
H.43 Church Rd / Hume Hwy AM	Hume Hwy	West	L2	48	49%	6.07	LOS A	0.6
H.43 Church Rd / Hume Hwy PM	Hume Hwy	East	R2	54	179%	926.40	LOS F	19.7
H.43 Church Rd / Hume Hwy PM	Hume Hwy	East	T1	2333	61%	2.52	LOS A	4.4
H.43 Church Rd / Hume Hwy PM	Church Rd	North	L2	156	125%	297.95	LOS F	24.7
H.43 Church Rd / Hume Hwy PM	Church Rd	North	R2	16	91%	287.55	LOS F	1.9
H.43 Church Rd / Hume Hwy PM	Hume Hwy	West	T1	2034	56%	0.04	LOS A	0.8
H.43 Church Rd / Hume Hwy PM	Hume Hwy	West	L2	63	56%	5.96	LOS A	0.8

15.4 Yagoona Station: Future + Refined Baseline TTP

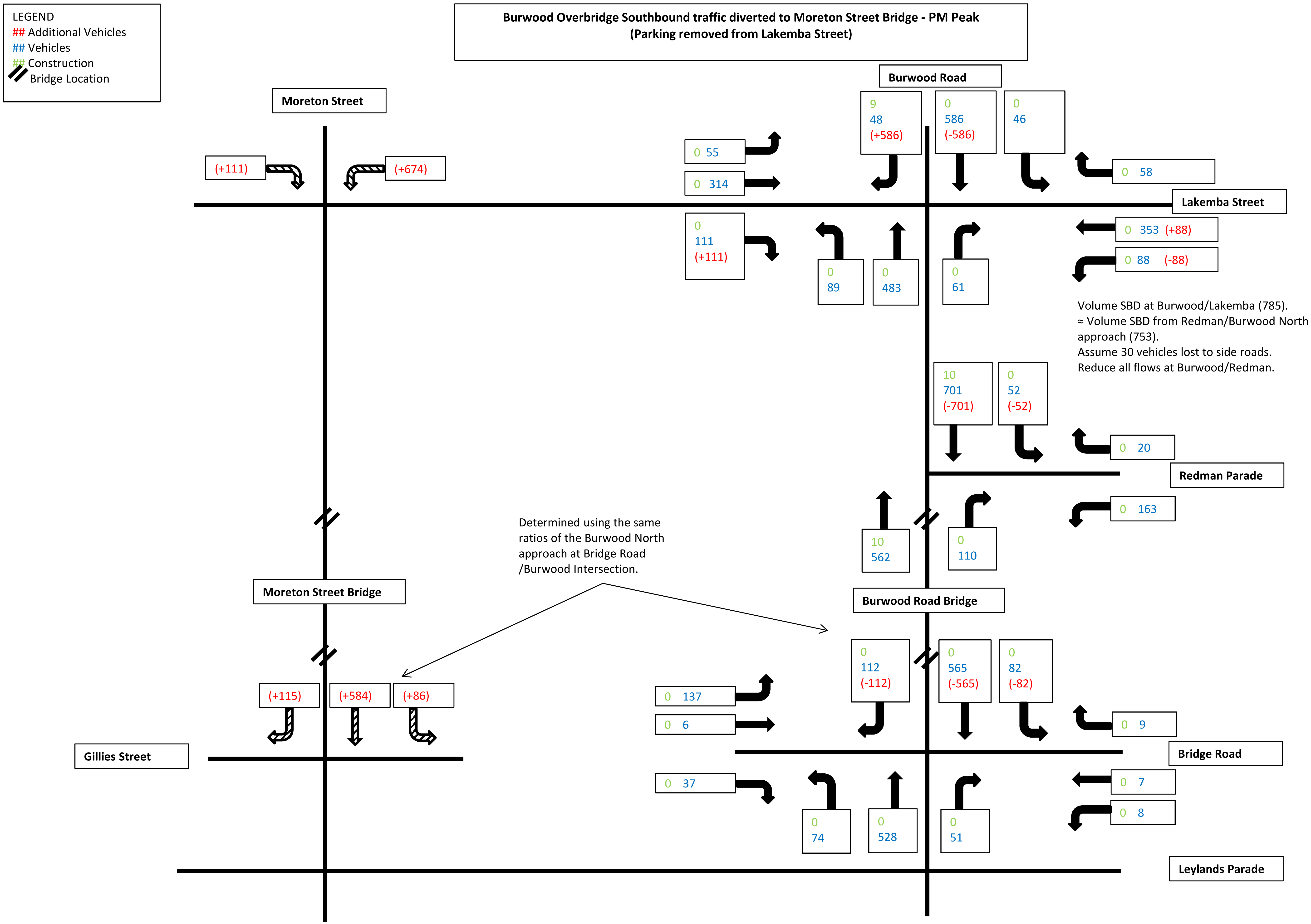
Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	R2	9	89%	74.69	LOS F	26.1
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	T1	426	89%	71.39	LOS F	26.1
H.42 Chapel Rd / Hume Hwy AM peak	Chapel Rd	South	L2	217	89%	75.42	LOS F	24.5
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	L2	111	56%	41.61	LOS C	23.7
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	R2	49	20%	65.32	LOS E	3.2
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	East	T1	1193	56%	37.63	LOS C	24.7
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	T1	282	36%	37.99	LOS C	12.3
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	L2	36	14%	37.68	LOS C	4.3
H.42 Chapel Rd / Hume Hwy AM peak	Rockwood Rd	North	R2	158	78%	51.87	LOS D	9.2
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	R2	199	82%	76.56	LOS F	14.9
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	T1	1797	90%	31.14	LOS C	46.0
H.42 Chapel Rd / Hume Hwy AM peak	Hume Hwy	West	L2	230	90%	34.45	LOS C	46.0
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	R2	5	89%	81.58	LOS F	26.3
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	T1	361	89%	76.04	LOS F	32.3
H.42 Chapel Rd / Hume Hwy PM peak	Chapel Rd	South	L2	353	89%	75.93	LOS F	32.3
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	L2	67	86%	37.56	LOS C	35.0
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	R2	100	30%	66.88	LOS E	6.6
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	East	T1	1643	86%	31.60	LOS C	36.0
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	T1	886	76%	33.92	LOS C	25.1
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	L2	37	57%	38.37	LOS C	25.1
H.42 Chapel Rd / Hume Hwy PM peak	Rockwood Rd	North	R2	314	76%	47.21	LOS D	17.6
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	R2	283	89%	84.88	LOS F	22.9
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	T1	1425	77%	29.29	LOS C	28.8
H.42 Chapel Rd / Hume Hwy PM peak	Hume Hwy	West	L2	158	77%	34.18	LOS C	28.0
H.43 Church Rd / Hume Hwy AM	Hume Hwy	East	R2	26	100%	292.62	LOS F	3.3
H.43 Church Rd / Hume Hwy AM	Hume Hwy	East	T1	1679	72%	6.68	LOS A	28.8
H.43 Church Rd / Hume Hwy AM	Church Rd	North	L2	124	176%	777.78	LOS F	38.7
H.43 Church Rd / Hume Hwy AM	Church Rd	North	R2	14	91%	372.70	LOS F	2.0
H.43 Church Rd / Hume Hwy AM	Hume Hwy	West	T1	2577	49%	0.03	LOS A	0.6
H.43 Church Rd / Hume Hwy AM	Hume Hwy	West	L2	48	49%	6.07	LOS A	0.6
H.43 Church Rd / Hume Hwy PM	Hume Hwy	East	R2	54	179%	926.40	LOS F	19.7
H.43 Church Rd / Hume Hwy PM	Hume Hwy	East	T1	2333	61%	2.52	LOS A	4.4
H.43 Church Rd / Hume Hwy PM	Church Rd	North	L2	156	125%	297.95	LOS F	24.7
H.43 Church Rd / Hume Hwy PM	Church Rd	North	R2	16	91%	287.55	LOS F	1.9
H.43 Church Rd / Hume Hwy PM	Hume Hwy	West	T1	2034	56%	0.04	LOS A	0.8
H.43 Church Rd / Hume Hwy PM	Hume Hwy	West	L2	63	56%	5.96	LOS A	0.8

Appendix G

Bridge Works Diversion Routes



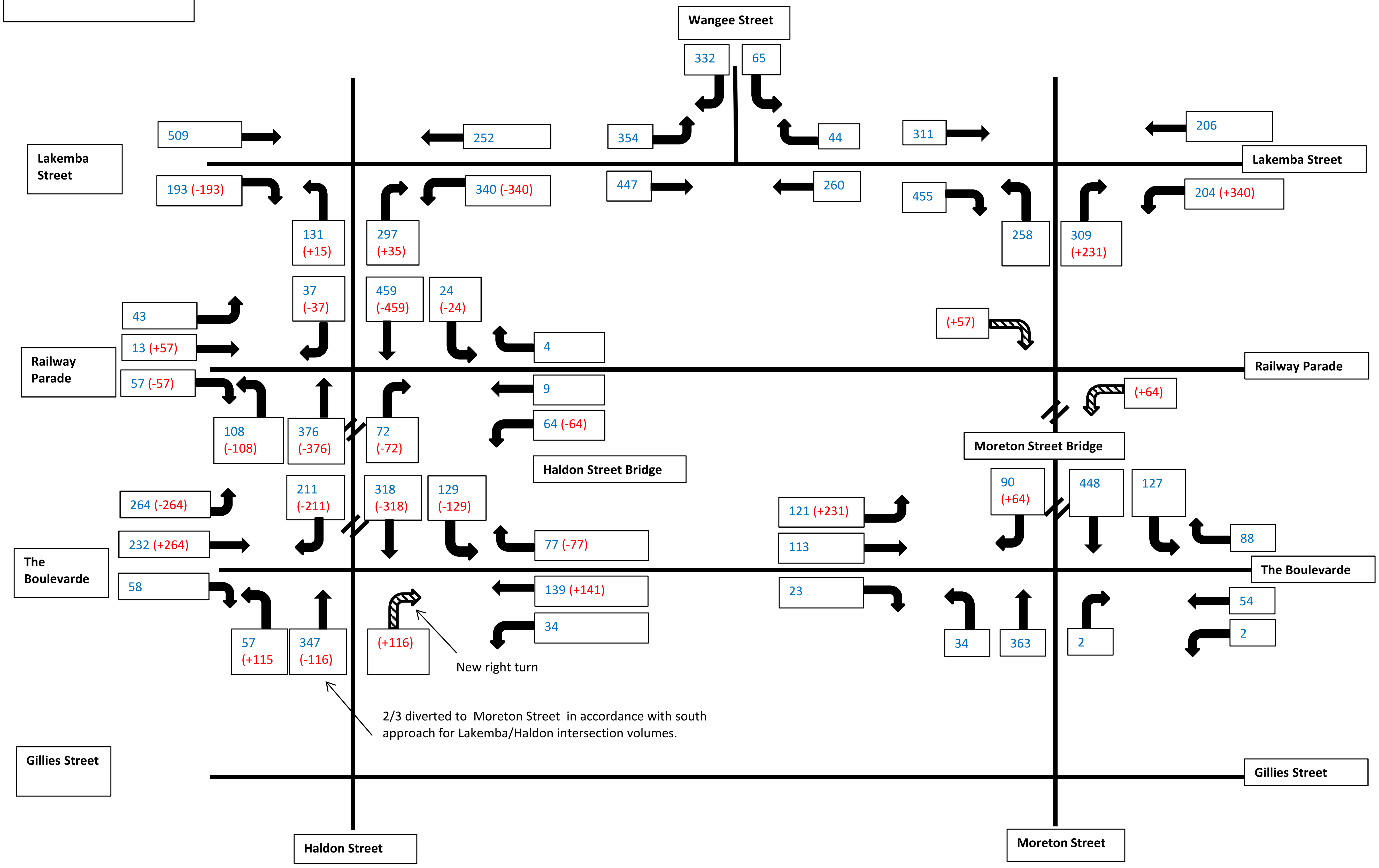
LEGEND
Additional Vehicles
Vehicles
Construction
Bridge Location
Burwood Overbridge Southbound traffic diverted to Moreton Street Bridge - AM Peak
Burwood Road
Moreton Street
(+117)
(+551)
0 57
0 402
9 38 (+465)
0 465 (-465)
0 52
0 48
Lakemba Street
0 117 (+117)
0 74
0 457
0 41
0 248 (+86)
0 86 (-86)
(Volume in at Lakemba/Burwood road ≈ Volume from Burwood SBD approach)
10 646 (-646)
0 55 (-55)
0 15
Redman Parade
0 135
10 605
0 163
Determined using the same ratios of the Burwood North approach at Bridge Road /Burwood Intersection.
(Volume SBD at Burwood/Redman ≈ Volume from Burwood North appraoch: reducing to 0)
Moreton Street Bridge
Burwood Road Bridge
0 11
0 108 (-108)
0 546 (-546)
0 79 (-79)
0 3
0 0
Bridge Road
(+98)
(+498)
(+72)
Gillies Street
2 0
0 56
10 634
0 52
0 1
0 10
Leylands Parade

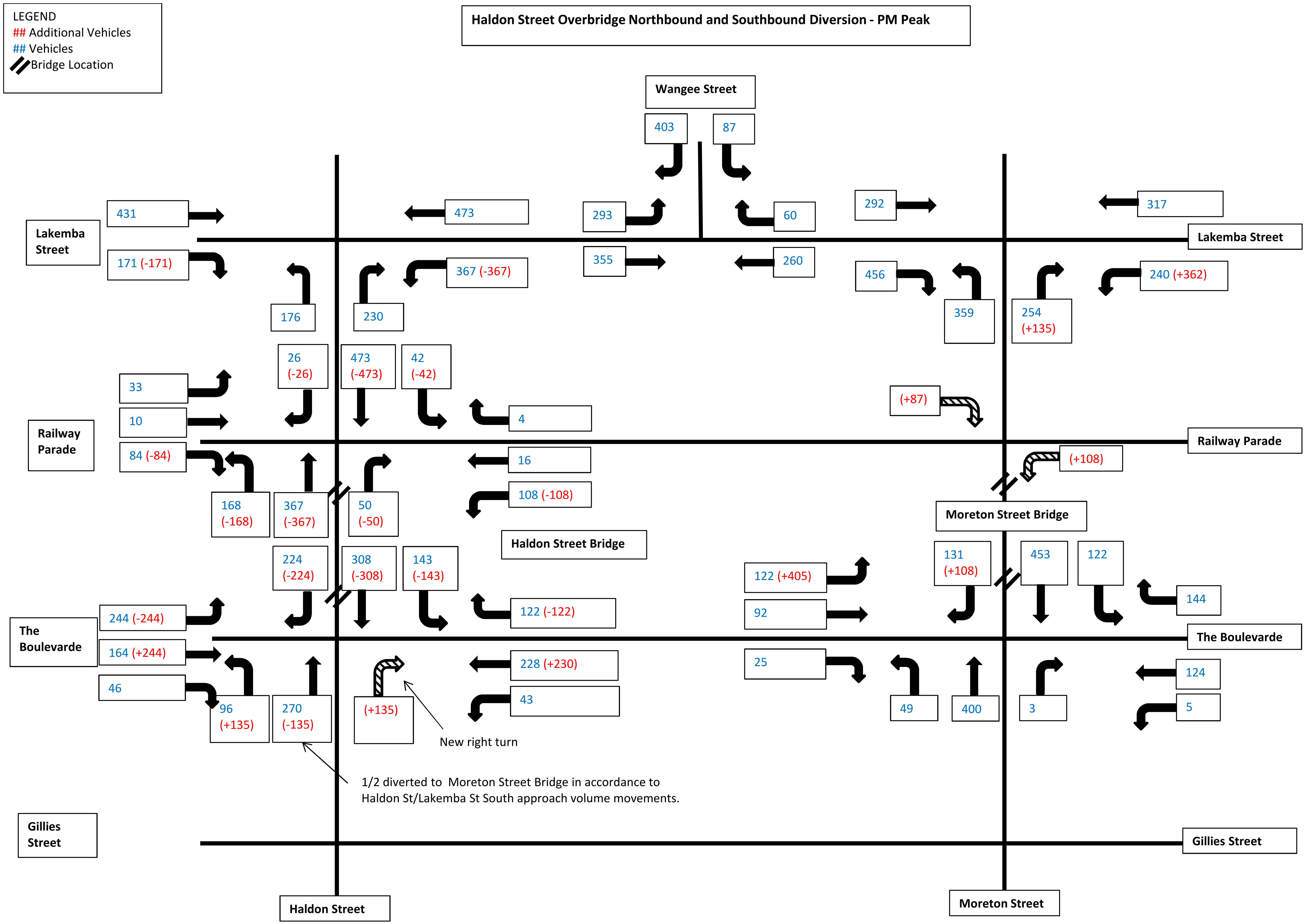


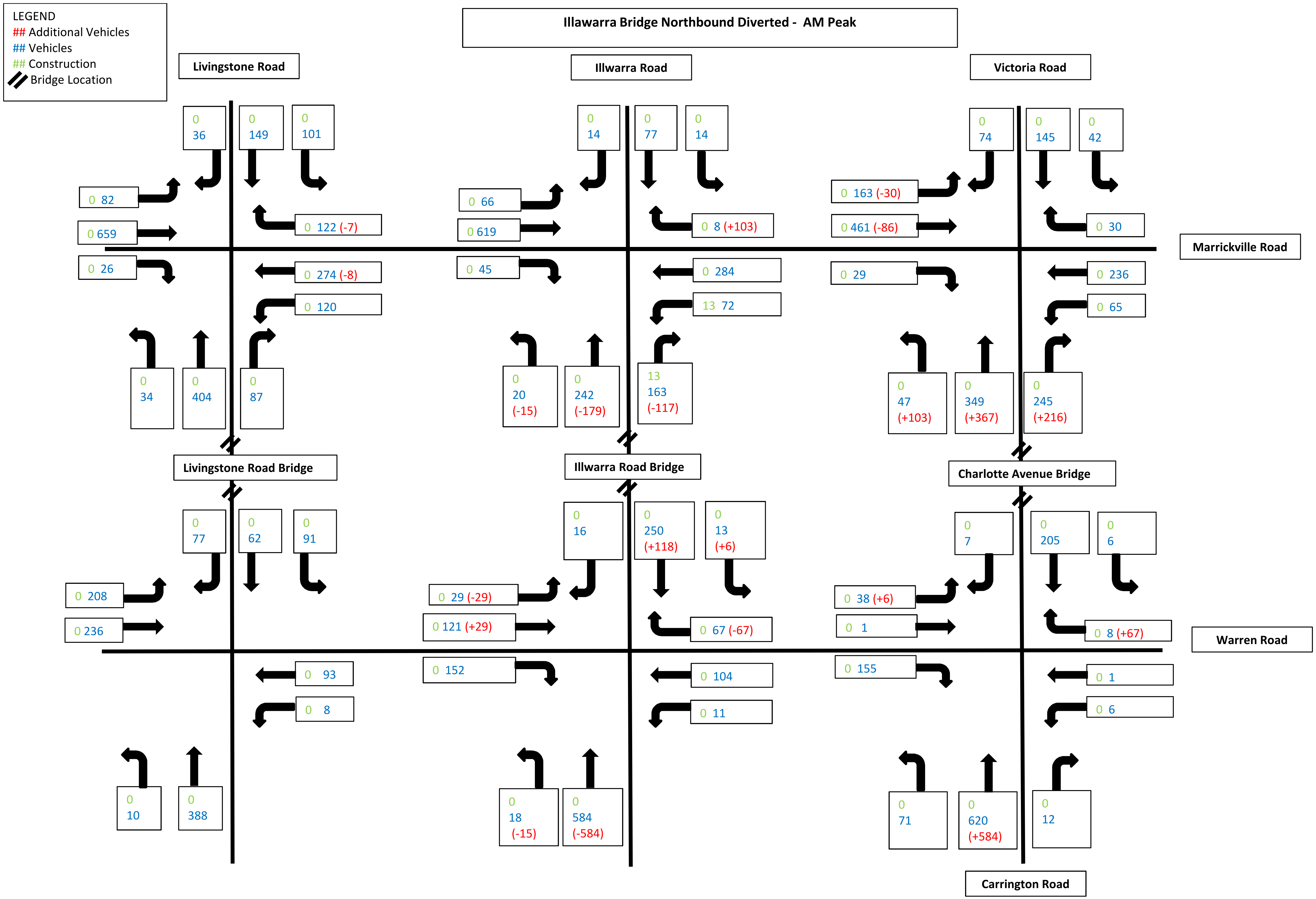
LEGEND
Additional Vehicles
Vehicles
Construction
Bridge Location
Burwood Overbridge Southbound traffic diverted to Moreton Street Bridge - PM Peak
(Parking removed from Lakemba Street)
Moreton Street
Burwood Road
Lakemba Street
(+111)
(+674)
0 55
0 314
9 48 (+586)
0 586 (-586)
0 46
0 58
0 111 (+111)
0 89
0 483
0 61
0 353 (+88)
0 88 (-88)
Volume SBD at Burwood/Lakemba (785).
≈ Volume SBD from Redman/Burwood North approach (753).
Assume 30 vehicles lost to side roads.
Reduce all flows at Burwood/Redman.
10 701 (-701)
0 52 (-52)
0 20
Redman Parade
10 562
0 110
0 163
Determined using the same ratios of the Burwood North approach at Bridge Road /Burwood Intersection.
Moreton Street Bridge
Burwood Road Bridge
0 112 (-112)
0 565 (-565)
0 82 (-82)
0 137
0 6
0 9
(+115)
(+584)
(+86)
Gillies Street
Bridge Road
0 37
0 74
0 528
0 51
0 7
0 8
Leylands Parade

LEGEND
Additional Vehicles
Vehicles
Bridge Location

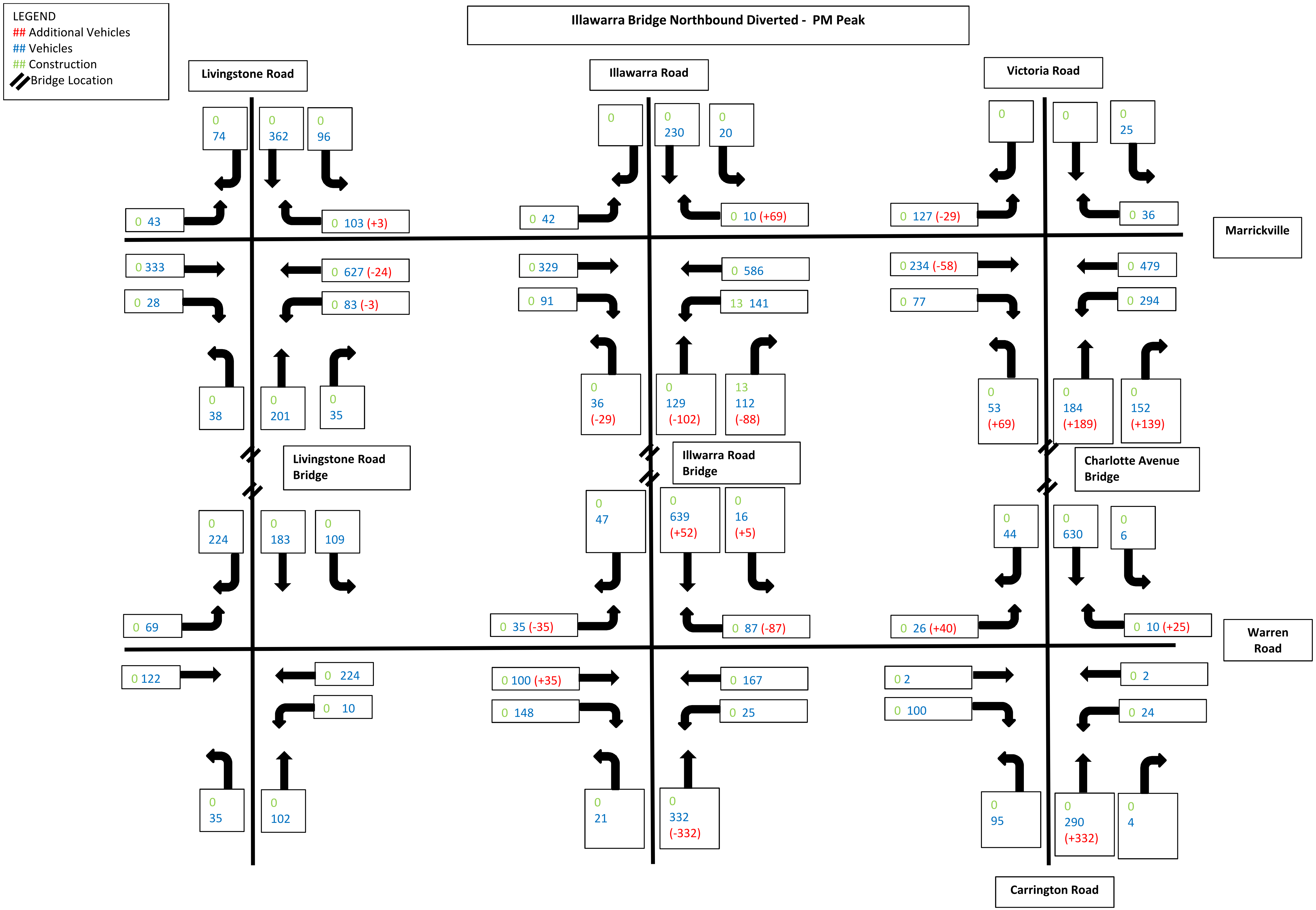
Haldon Street Overbridge Northbound and Southbound Diversion - AM Peak

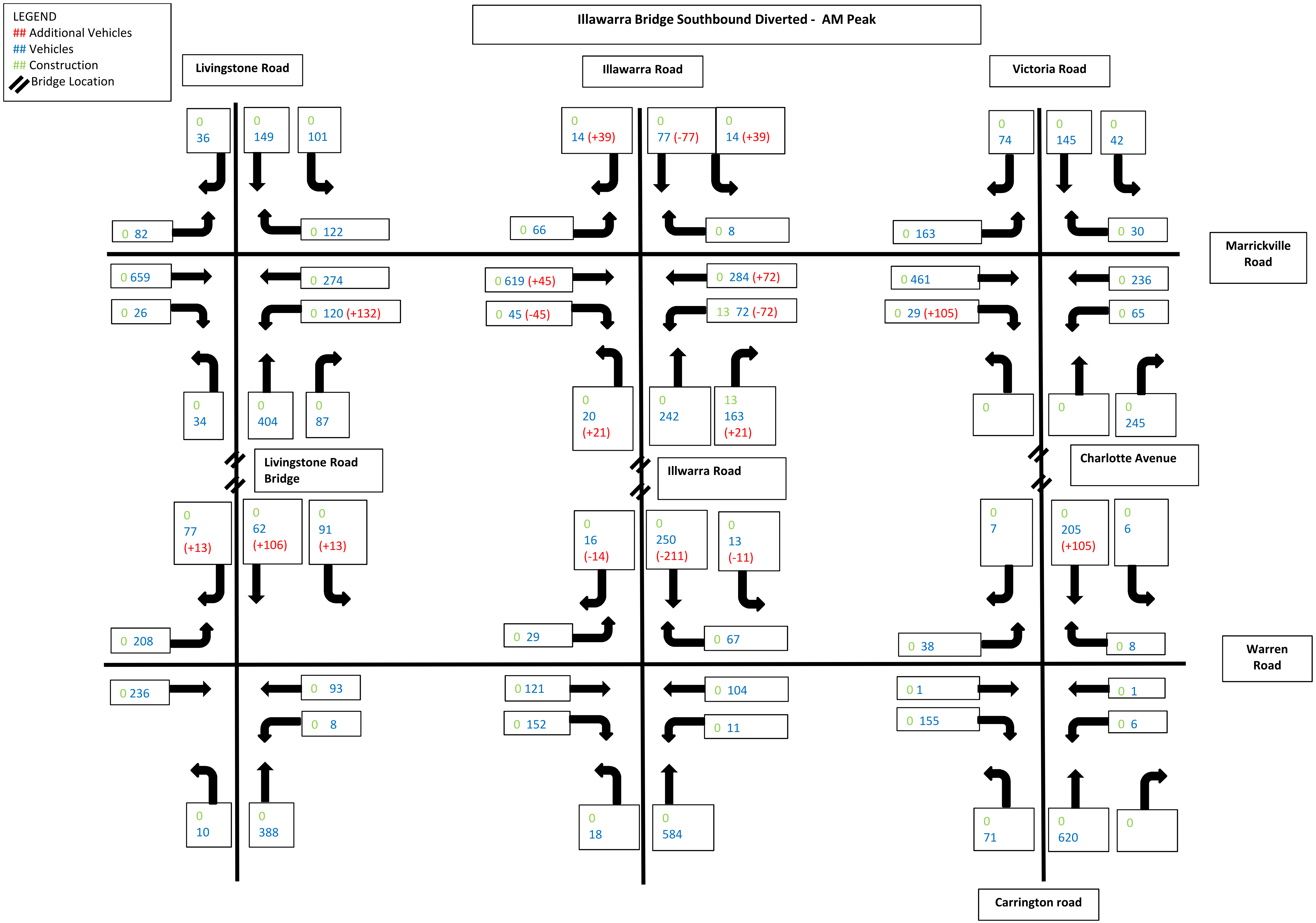


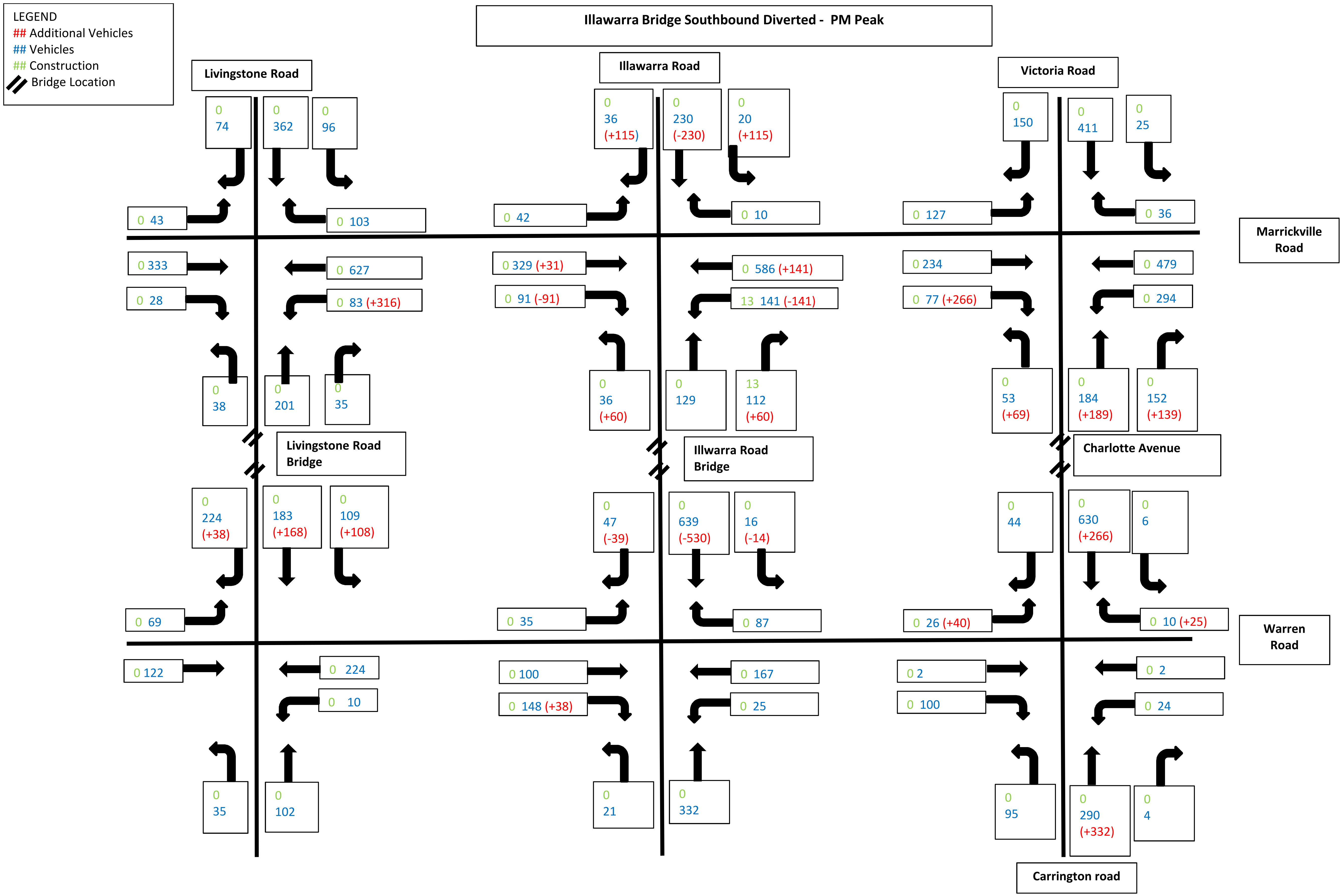

LEGEND
Additional Vehicles
Vehicles
Bridge Location
Haldon Street Overbridge Northbound and Southbound Diversion - PM Peak
Wangee Street
403
87
431
473
293
60
292
317
Lakemba Street
171 (-171)
367 (-367)
355
260
456
240 (+362)
176
230
359
254 (+135)
26 (-26)
473 (-473)
42 (-42)
33
10
4
(+87)
Railway Parade
84 (-84)
16
(+108)
168 (-168)
367 (-367)
50 (-50)
108 (-108)
Moreton Street Bridge
Haldon Street Bridge
224 (-224)
308 (-308)
143 (-143)
122 (+405)
131 (+108)
453
122
244 (-244)
122 (-122)
92
144
The Boulevarde
164 (+244)
228 (+230)
25
124
46
43
96 (+135)
270 (-135)
(+135)
49
400
3
5
New right turn
1/2 diverted to Moreton Street Bridge in accordance to Haldon St/Lakemba St South approach volume movements.
Gillies Street
Haldon Street
Moreton Street


LEGEND
Additional Vehicles
Vehicles
Construction
Bridge Location
Illawarra Bridge Northbound Diverted - AM Peak
Livingstone Road
Illwarra Road
Victoria Road
Marrickville Road
Livingstone Road Bridge
Illwarra Road Bridge
Charlotte Avenue Bridge
Warren Road
Carrington Road
0 36
0 149
0 101
0 82
0 659
0 26
0 122 (-7)
0 274 (-8)
0 120
0 34
0 404
0 87
0 14
0 77
0 14
0 66
0 619
0 45
0 8 (+103)
0 284
13 72
0 20 (-15)
0 242 (-179)
13 163 (-117)
0 74
0 145
0 42
0 163 (-30)
0 461 (-86)
0 29
0 30
0 236
0 65
0 47 (+103)
0 349 (+367)
0 245 (+216)
0 77
0 62
0 91
0 208
0 236
0 93
0 8
0 10
0 388
0 16
0 250 (+118)
0 13 (+6)
0 29 (-29)
0 121 (+29)
0 152
0 67 (-67)
0 104
0 11
0 18 (-15)
0 584 (-584)
0 7
0 205
0 6
0 38 (+6)
0 1
0 155
0 8 (+67)
0 1
0 6
0 71
0 620 (+584)
0 12

Illawarra Bridge Northbound Diverted - PM Peak



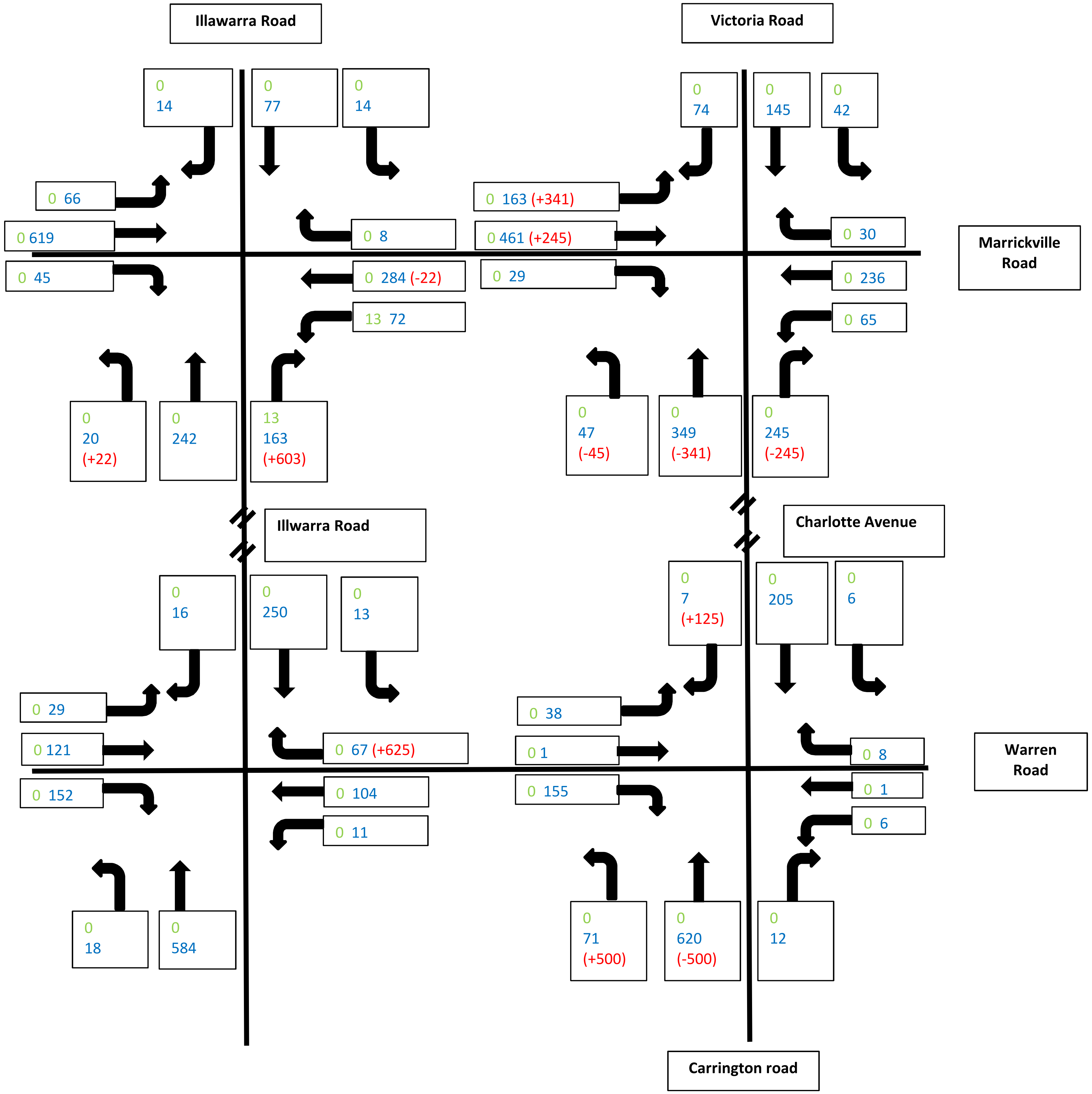

LEGEND
Additional Vehicles
Vehicles
Construction
Bridge Location
Illawarra Bridge Southbound Diverted - AM Peak
Livingstone Road
Illawarra Road
Victoria Road
Marrickville Road
Livingstone Road Bridge
Illwarra Road
Charlotte Avenue
Warren Road
Carrington road
0 36
0 149
0 101
0 82
0 122
0 659
0 274
0 26
0 120 (+132)
0 34
0 404
0 87
0 77 (+13)
0 62 (+106)
0 91 (+13)
0 208
0 236
0 93
0 8
0 10
0 388
0 14 (+39)
0 77 (-77)
0 14 (+39)
0 66
0 8
0 619 (+45)
0 284 (+72)
0 45 (-45)
13 72 (-72)
0 20 (+21)
0 242
13 163 (+21)
0 16 (-14)
0 250 (-211)
0 13 (-11)
0 29
0 67
0 121
0 104
0 152
0 11
0 18
0 584
0 74
0 145
0 42
0 163
0 30
0 461
0 236
0 29 (+105)
0 65
0
0
0 245
0 7
0 205 (+105)
0 6
0 38
0 8
0 1
0 1
0 155
0 6
0 71
0 620
0

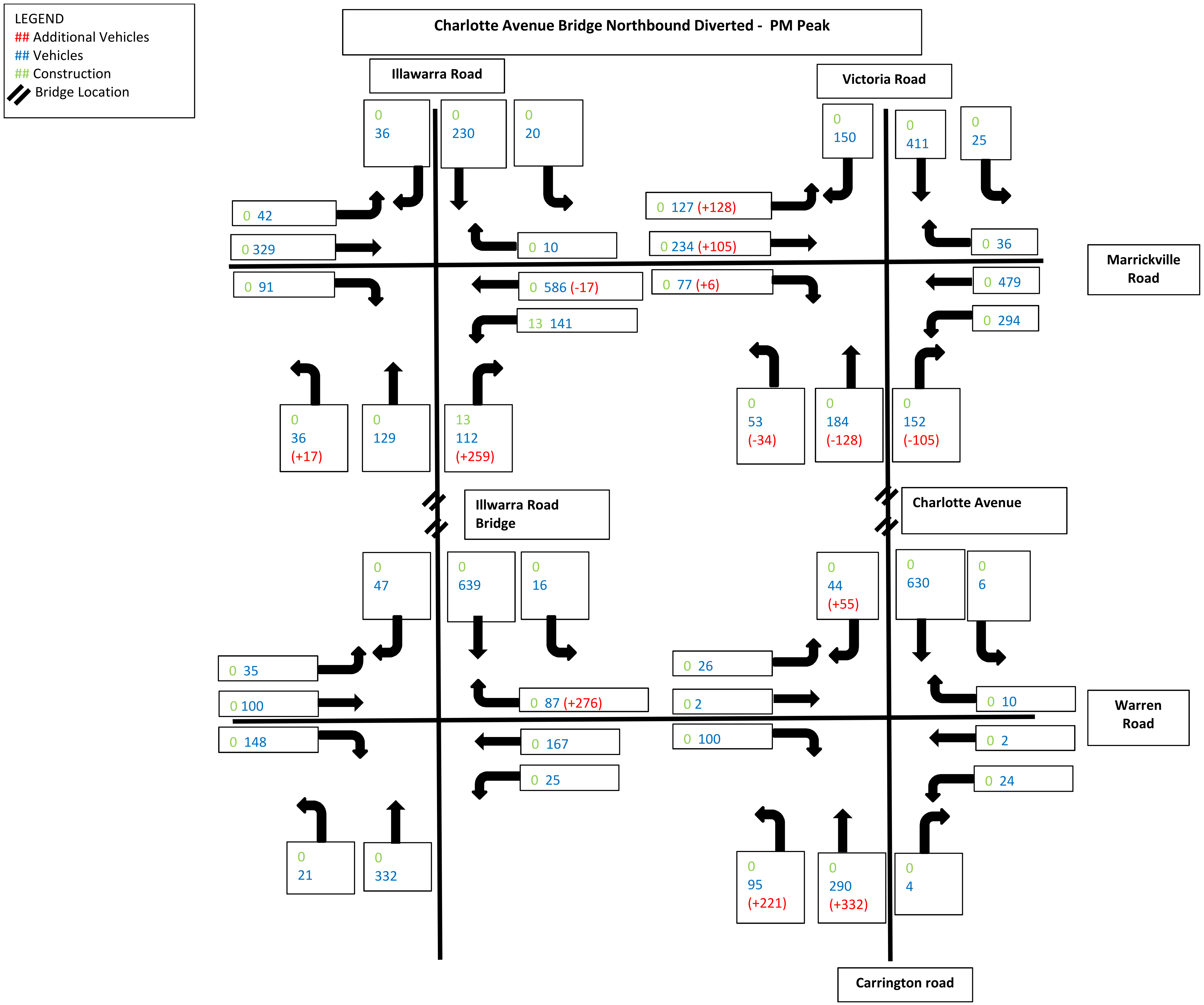


LEGEND
Additional Vehicles
Vehicles
Construction
Bridge Location
Illawarra Bridge Southbound Diverted - PM Peak
Livingstone Road
Illawarra Road
Victoria Road
Marrickville Road
0 74
0 362
0 96
0 43
0 103
0 333
0 627
0 28
0 83 (+316)
0 38
0 201
0 35
Livingstone Road Bridge
0 224 (+38)
0 183 (+168)
0 109 (+108)
0 69
0 122
0 224
0 10
0 35
0 102
0 36 (+115)
0 230 (-230)
0 20 (+115)
0 42
0 10
0 329 (+31)
0 586 (+141)
0 91 (-91)
13 141 (-141)
0 36 (+60)
0 129
13 112 (+60)
Illwarra Road Bridge
0 47 (-39)
0 639 (-530)
0 16 (-14)
0 35
0 87
0 100
0 167
0 148 (+38)
0 25
0 21
0 332
0 150
0 411
0 25
0 127
0 36
0 234
0 479
0 77 (+266)
0 294
0 53 (+69)
0 184 (+189)
0 152 (+139)
Charlotte Avenue
0 44
0 630 (+266)
0 6
0 26 (+40)
0 10 (+25)
Warren Road
0 2
0 2
0 100
0 24
0 95
0 290 (+332)
0 4
Carrington road

LEGEND
Additional Vehicles
Vehicles
Construction
Bridge Location

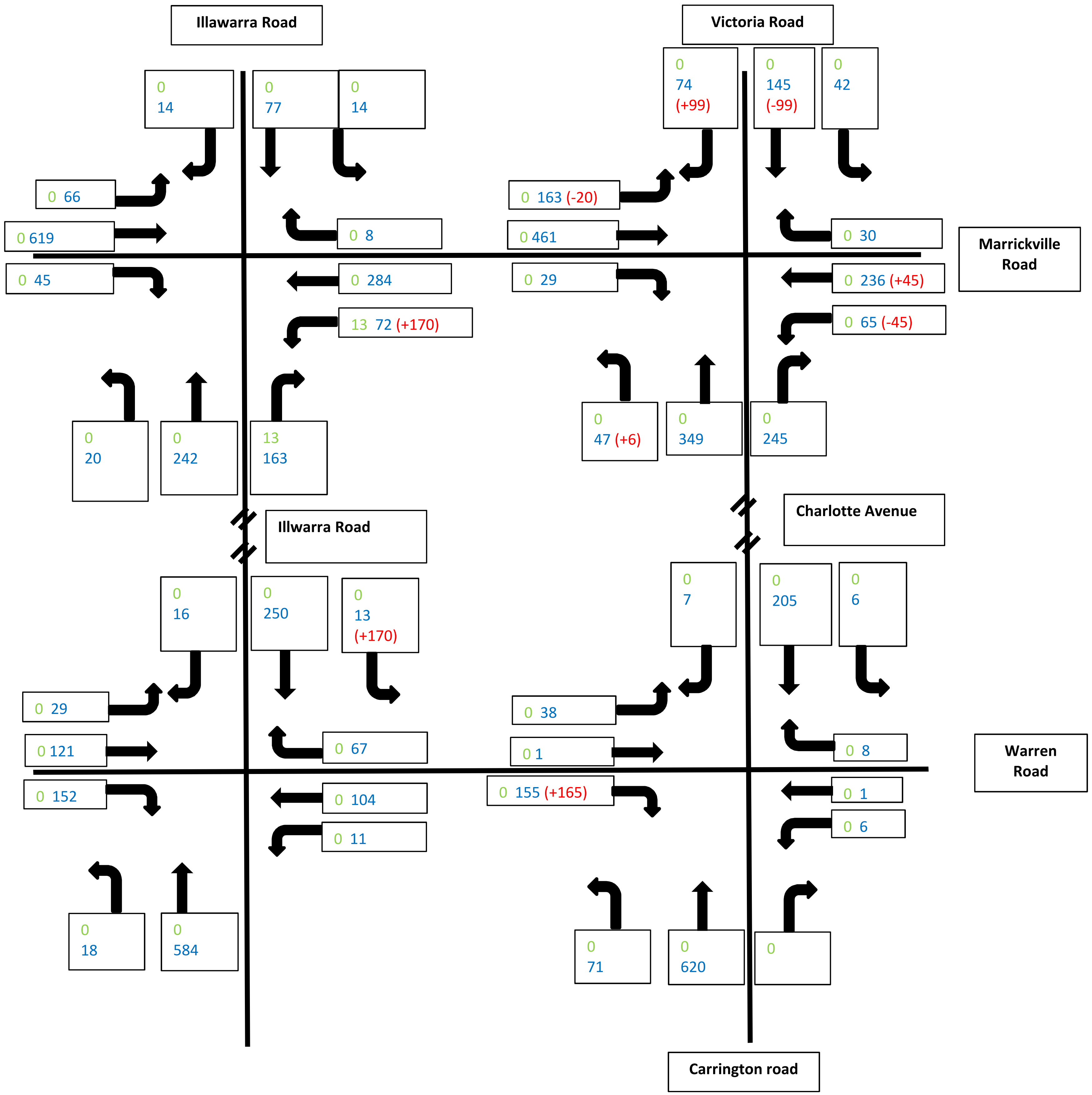
Charlotte Avenue Bridge Northbound Diverted - AM Peak

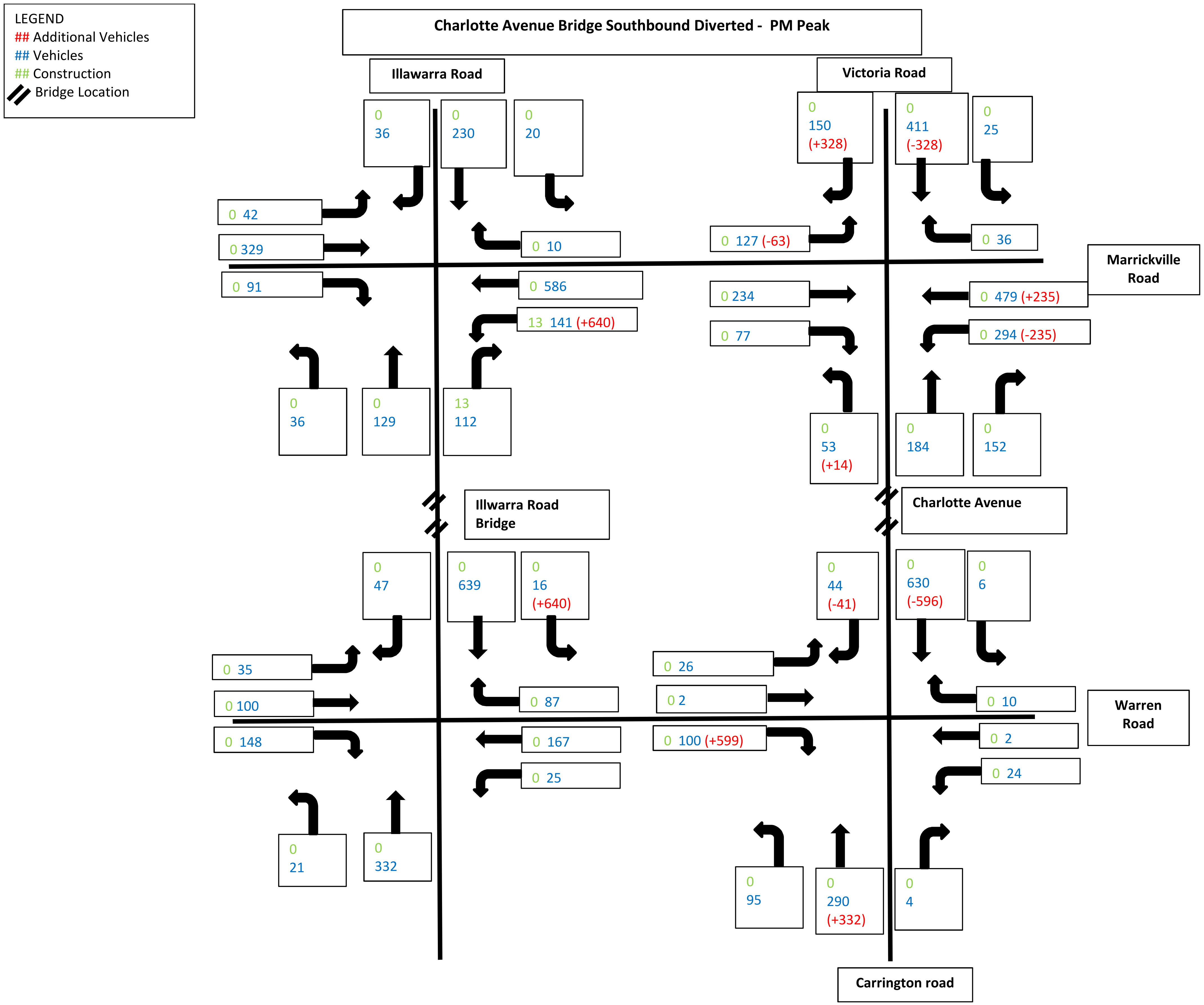



LEGEND
Additional Vehicles
Vehicles
Construction
Bridge Location
Charlotte Avenue Bridge Northbound Diverted - PM Peak
Illawarra Road
Victoria Road
Marrickville Road
Illawarra Road Bridge
Charlotte Avenue
Warren Road
Carrington road
0 36
0 230
0 20
0 42
0 329
0 10
0 91
0 586 (-17)
13 141
0 36 (+17)
0 129
13 112 (+259)
0 150
0 411
0 25
0 127 (+128)
0 234 (+105)
0 36
0 77 (+6)
0 479
0 294
0 53 (-34)
0 184 (-128)
0 152 (-105)
0 47
0 639
0 16
0 35
0 100
0 87 (+276)
0 148
0 167
0 25
0 21
0 332
0 44 (+55)
0 630
0 6
0 26
0 2
0 10
0 100
0 2
0 24
0 95 (+221)
0 290 (+332)
0 4

LEGEND
Additional Vehicles
Vehicles
Construction
Bridge Location

Charlotte Avenue Bridge Southbound Diverted - AM Peak




LEGEND
Additional Vehicles
Vehicles
Construction
Bridge Location
Charlotte Avenue Bridge Southbound Diverted - PM Peak
Illawarra Road
Victoria Road
Marrickville Road
Illwarra Road Bridge
Charlotte Avenue
Warren Road
Carrington road
0 36
0 230
0 20
0 42
0 329
0 91
0 10
0 586
13 141 (+640)
0 36
0 129
13 112
0 150 (+328)
0 411 (-328)
0 25
0 127 (-63)
0 36
0 234
0 479 (+235)
0 77
0 294 (-235)
0 53 (+14)
0 184
0 152
0 47
0 639
0 16 (+640)
0 35
0 100
0 148
0 87
0 167
0 25
0 21
0 332
0 44 (-41)
0 630 (-596)
0 6
0 26
0 2
0 100 (+599)
0 10
0 2
0 24
0 95
0 290 (+332)
0 4

Appendix H

Detailed Intersection Summary Tables - Bridge Construction Phase

H.1 Illawarra Road Overbridge

H.1.1 Northbound

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	L2	22	2%	15.01	LOS B	0.5
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	L2	12	23%	31.84	LOS C	4.6
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	T1	119	23%	27.28	LOS B	4.6
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	T1	414	81%	28.76	LOS C	20.5
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	L2	15	4%	19.58	LOS B	0.6
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	R2	31	81%	33.61	LOS C	20.5
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	R2	171	83%	47.71	LOS D	17.2
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	T1	170	83%	43.12	LOS D	17.2
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	South	R2	73	55%	51.42	LOS D	3.3
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	South	T1	84	52%	44.14	LOS D	4.9
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	South	L2	28	52%	48.88	LOS D	4.9
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	East	L2	106	10%	8.86	LOS A	1.4
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	East	R2	50	43%	9.75	LOS A	8.1
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	East	T1	426	43%	5.16	LOS A	8.1
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd N	North	T1	89	57%	37.76	LOS C	4.9
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd N	North	L2	16	57%	42.32	LOS C	4.9
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd N	North	R2	17	57%	42.39	LOS C	4.9
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd N	West	R2	55	57%	5.51	LOS A	2.3
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd N	West	T1	716	57%	0.93	LOS A	2.3
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd N	West	L2	75	11%	6.01	LOS A	0.5
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	R2	525	130%	333.68	LOS F	114.3
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	T1	809	130%	329.25	LOS F	116.1
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	L2	169	130%	333.89	LOS F	116.1
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	L2	73	54%	30.32	LOS C	13.2
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	R2	45	23%	42.43	LOS C	1.9
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	T1	278	54%	25.74	LOS B	13.2
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	T1	167	117%	191.59	LOS F	22.8
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	L2	59	117%	196.25	LOS F	22.8
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	R2	101	64%	53.88	LOS D	5.0
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	R2	33	19%	19.74	LOS B	1.2
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	T1	434	90%	26.77	LOS B	26.2
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	L2	163	90%	32.13	LOS C	26.2
Carrington Rd \ Warren Rd - AM	Carrington Rd	South	R2	14	43%	6.10	LOS A	0.2
Carrington Rd \ Warren Rd - AM	Carrington Rd	South	T1	729	43%	0.05	LOS A	0.2
Carrington Rd \ Warren Rd - AM	Carrington Rd	South	L2	82	43%	4.80	LOS A	0.2
Carrington Rd \ Warren Rd - AM	Warren Rd	East	L2	8	34%	7.50	LOS A	1.3
Carrington Rd \ Warren Rd - AM	Warren Rd	East	R2	88	34%	19.57	LOS C	1.3
Carrington Rd \ Warren Rd - AM	Warren Rd	East	T1	1	34%	16.13	LOS C	1.3
Carrington Rd \ Warren Rd - AM	Carrington Rd	North	T1	248	15%	0.54	LOS A	0.3

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
Carrington Rd \ Warren Rd - AM	Carrington Rd	North	L2	7	15%	9.65	LOS A	0.3
Carrington Rd \ Warren Rd - AM	Carrington Rd	North	R2	9	15%	10.95	LOS B	0.3
Carrington Rd \ Warren Rd - AM	Warren Rd	West	R2	180	78%	31.32	LOS D	4.8
Carrington Rd \ Warren Rd - AM	Warren Rd	West	T1	1	78%	26.43	LOS D	4.8
Carrington Rd \ Warren Rd - AM	Warren Rd	West	L2	58	78%	21.43	LOS C	4.8
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	L2	24	2%	14.67	LOS B	0.5
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	L2	28	41%	36.22	LOS C	8.5
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	T1	188	41%	31.66	LOS C	8.5
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	T1	794	68%	7.38	LOS A	14.2
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	L2	18	14%	10.22	LOS A	1.5
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	R2	59	68%	12.26	LOS A	14.2
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	R2	132	90%	60.50	LOS E	16.3
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	T1	152	90%	55.90	LOS D	16.3
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	South	R2	43	31%	53.93	LOS D	2.1
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	South	T1	30	9%	39.54	LOS C	1.6
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	South	L2	6	9%	44.10	LOS D	1.6
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	East	L2	185	80%	11.67	LOS A	16.7
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	East	R2	88	16%	13.31	LOS A	1.4
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	East	T1	672	80%	6.98	LOS A	16.7
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd N	North	T1	257	82%	35.83	LOS C	14.7
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd N	North	L2	22	82%	40.40	LOS C	14.7
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd N	North	R2	40	82%	40.40	LOS C	14.7
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd N	West	R2	102	37%	22.80	LOS B	3.2
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd N	West	T1	379	52%	9.86	LOS A	10.0
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd N	West	L2	47	52%	14.42	LOS A	10.0
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	R2	333	113%	185.26	LOS F	64.2
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	T1	425	113%	120.08	LOS F	64.2
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	L2	140	62%	39.25	LOS C	13.8
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	L2	336	114%	193.50	LOS F	75.9
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	R2	48	68%	43.59	LOS D	13.0
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	T1	557	114%	126.25	LOS F	75.9
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	T1	473	91%	46.76	LOS D	19.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	L2	35	91%	52.58	LOS D	19.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	R2	190	91%	48.81	LOS D	18.3
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	R2	89	68%	52.79	LOS D	5.3
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	T1	207	68%	26.95	LOS B	11.4
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	L2	121	54%	30.04	LOS C	11.4
Carrington Rd \ Warren Rd - PM	Carrington Rd	South	R2	5	25%	10.01	LOS B	0.1
Carrington Rd \ Warren Rd - PM	Carrington Rd	South	T1	347	25%	0.15	LOS A	0.1
Carrington Rd \ Warren Rd - PM	Carrington Rd	South	L2	112	25%	4.95	LOS A	0.1
Carrington Rd \ Warren Rd - PM	Warren Rd	East	L2	28	27%	9.86	LOS A	0.9
Carrington Rd \ Warren Rd - PM	Warren Rd	East	R2	42	27%	24.31	LOS C	0.9
Carrington Rd \ Warren Rd - PM	Warren Rd	East	T1	2	27%	19.45	LOS C	0.9

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
Carrington Rd \ Warren Rd - PM	Carrington Rd	North	T1	751	45%	0.46	LOS A	1.1
Carrington Rd \ Warren Rd - PM	Carrington Rd	North	L2	8	45%	7.83	LOS A	1.1
Carrington Rd \ Warren Rd - PM	Carrington Rd	North	R2	52	45%	7.97	LOS A	1.1
Carrington Rd \ Warren Rd - PM	Warren Rd	West	R2	117	69%	35.78	LOS E	3.8
Carrington Rd \ Warren Rd - PM	Warren Rd	West	T1	2	69%	29.14	LOS D	3.8
Carrington Rd \ Warren Rd - PM	Warren Rd	West	L2	77	69%	16.19	LOS C	3.8

H.1.2 Southbound

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	T1	660	68%	18.94	LOS B	23.7
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	South	L2	22	68%	23.59	LOS B	23.7
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	L2	12	37%	30.45	LOS C	7.3
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	R2	75	37%	30.47	LOS C	7.3
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	East	T1	119	37%	25.89	LOS B	7.3
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	T1	53	14%	18.12	LOS B	1.8
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	L2	2	1%	22.13	LOS B	0.1
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	North	R2	2	14%	22.68	LOS B	1.8
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	R2	180	67%	33.43	LOS C	14.0
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	T1	137	67%	28.80	LOS C	14.0
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	West	L2	33	67%	33.39	LOS C	14.0
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	South	R2	266	84%	46.35	LOS D	12.1
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	South	T1	280	76%	34.45	LOS C	13.8
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	South	L2	52	76%	39.11	LOS C	13.8
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	East	L2	14	9%	17.28	LOS B	1.6
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	East	R2	9	47%	20.77	LOS B	11.2
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	East	T1	444	47%	15.62	LOS B	11.2
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd N	North	L2	61	38%	30.85	LOS C	3.9
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd N	North	R2	61	38%	30.85	LOS C	3.9
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd N	West	T1	771	86%	20.03	LOS B	23.5
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd N	West	L2	75	17%	16.74	LOS B	2.5
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	R2	283	315%	2004.06	LOS F	114.8
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	T1	397	350%	2265.51	LOS F	133.9
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	South	L2	53	350%	2319.84	LOS F	133.9
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	L2	73	27%	10.18	LOS A	5.7
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	R2	45	54%	55.18	LOS D	3.2
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	East	T1	278	54%	8.60	LOS A	5.7
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	T1	167	180%	452.65	LOS F	44.0
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	L2	59	108%	116.64	LOS F	12.2
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	North	R2	101	180%	788.76	LOS F	44.0
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	R2	154	206%	984.16	LOS F	95.7
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	T1	538	206%	388.54	LOS F	95.7
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	West	L2	205	44%	11.62	LOS A	11.3
Carrington Rd \ Warren Rd - AM	Carrington Rd	South	R2	14	44%	7.09	LOS A	0.3
Carrington Rd \ Warren Rd - AM	Carrington Rd	South	T1	729	44%	0.09	LOS A	0.3
Carrington Rd \ Warren Rd - AM	Carrington Rd	South	L2	82	44%	5.00	LOS A	0.3
Carrington Rd \ Warren Rd - AM	Warren Rd	East	L2	8	7%	6.18	LOS A	0.2
Carrington Rd \ Warren Rd - AM	Warren Rd	East	R2	10	7%	21.34	LOS C	0.2
Carrington Rd \ Warren Rd - AM	Warren Rd	East	T1	1	7%	15.72	LOS C	0.2
Carrington Rd \ Warren Rd - AM	Carrington Rd	North	T1	371	22%	0.41	LOS A	0.3
Carrington Rd \ Warren Rd - AM	Carrington Rd	North	L2	7	22%	10.14	LOS B	0.3
Carrington Rd \ Warren Rd - AM	Carrington Rd	North	R2	9	22%	11.56	LOS B	0.3

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
Carrington Rd \ Warren Rd - AM	Warren Rd	West	R2	180	90%	52.98	LOS F	7.2
Carrington Rd \ Warren Rd - AM	Warren Rd	West	T1	1	90%	47.16	LOS E	7.2
Carrington Rd \ Warren Rd - AM	Warren Rd	West	L2	44	90%	38.27	LOS E	7.2
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	T1	379	50%	23.31	LOS B	14.2
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	South	L2	24	50%	27.88	LOS B	14.2
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	L2	28	40%	23.61	LOS B	9.9
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	R2	98	40%	23.61	LOS B	9.9
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	East	T1	188	40%	19.04	LOS B	9.9
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	T1	133	19%	6.97	LOS A	1.3
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	L2	2	4%	11.13	LOS A	0.2
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	North	R2	9	19%	11.61	LOS A	1.3
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	R2	171	51%	25.67	LOS B	11.1
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	T1	113	51%	21.08	LOS B	11.1
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	West	L2	39	51%	25.64	LOS B	11.1
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	South	R2	208	69%	46.54	LOS D	9.7
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	South	T1	145	67%	39.43	LOS C	11.5
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	South	L2	107	67%	44.00	LOS D	11.5
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	East	L2	13	16%	14.58	LOS B	2.5
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	East	R2	11	81%	20.85	LOS B	22.3
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	East	T1	839	81%	15.19	LOS B	22.3
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd N	North	L2	151	80%	36.52	LOS C	14.2
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd N	North	R2	167	80%	36.52	LOS C	14.2
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd N	West	T1	481	50%	15.42	LOS B	13.2
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd N	West	L2	47	10%	21.91	LOS B	2.1
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	R2	174	177%	755.14	LOS F	68.2
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	T1	210	177%	460.90	LOS F	68.2
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	South	L2	60	97%	82.53	LOS F	10.0
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	L2	336	64%	21.79	LOS B	21.0
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	R2	48	39%	21.11	LOS B	9.8
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	East	T1	557	64%	16.83	LOS B	21.0
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	T1	473	91%	44.20	LOS D	19.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	L2	35	91%	48.85	LOS D	19.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	North	R2	190	91%	48.81	LOS D	18.3
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	R2	392	188%	864.00	LOS F	98.7
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	T1	273	48%	14.19	LOS A	12.1
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	West	L2	154	48%	18.73	LOS B	12.1
Carrington Rd \ Warren Rd - PM	Carrington Rd	South	R2	5	25%	16.82	LOS C	0.4
Carrington Rd \ Warren Rd - PM	Carrington Rd	South	T1	347	25%	0.52	LOS A	0.4
Carrington Rd \ Warren Rd - PM	Carrington Rd	South	L2	112	25%	5.90	LOS A	0.4
Carrington Rd \ Warren Rd - PM	Warren Rd	East	L2	28	58%	27.71	LOS D	2.0
Carrington Rd \ Warren Rd - PM	Warren Rd	East	R2	42	58%	60.51	LOS F	2.0
Carrington Rd \ Warren Rd - PM	Warren Rd	East	T1	2	58%	52.40	LOS F	2.0
Carrington Rd \ Warren Rd - PM	Carrington Rd	North	T1	1061	61%	0.53	LOS A	1.6

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
Carrington Rd \ Warren Rd - PM	Carrington Rd	North	L2	8	61%	9.12	LOS A	1.6
Carrington Rd \ Warren Rd - PM	Carrington Rd	North	R2	52	61%	9.36	LOS A	1.6
Carrington Rd \ Warren Rd - PM	Warren Rd	West	R2	117	144%	489.12	LOS F	43.8
Carrington Rd \ Warren Rd - PM	Warren Rd	West	T1	2	144%	473.23	LOS F	43.8
Carrington Rd \ Warren Rd - PM	Warren Rd	West	L2	77	144%	429.55	LOS F	43.8

H.2 Charlotte Avenue Underbridge

H.2.1 Northbound Closure

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	SouthEast	R2	761	130%	330.19	LOS F	139.6
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	SouthEast	T1	119	130%	325.61	LOS F	139.6
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	SouthEast	L2	12	130%	330.17	LOS F	139.6
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	NorthEast	L2	15	22%	33.80	LOS C	2.4
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	NorthEast	R2	18	110%	163.69	LOS F	25.8
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	NorthEast	T1	284	110%	138.61	LOS F	25.8
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	NorthWest	T1	137	42%	14.12	LOS A	9.4
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	NorthWest	L2	33	42%	18.71	LOS B	9.4
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	NorthWest	R2	171	42%	18.71	LOS B	9.4
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	SouthWest	T1	660	109%	143.85	LOS F	65.9
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	SouthWest	L2	22	109%	148.50	LOS F	65.9
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	SouthEast	R2	9	88%	50.30	LOS D	16.4
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	SouthEast	T1	326	88%	45.73	LOS D	16.4
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	SouthEast	L2	106	30%	35.42	LOS C	3.8
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd N	NorthEast	L2	16	68%	44.98	LOS D	5.2
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd N	NorthEast	R2	17	68%	45.05	LOS D	5.2
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd N	NorthEast	T1	89	68%	40.42	LOS C	5.2
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd N	NorthWest	T1	716	129%	313.03	LOS F	64.8
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd N	NorthWest	L2	75	129%	319.06	LOS F	64.8
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd N	NorthWest	R2	55	129%	315.95	LOS F	54.0
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	SouthWest	R2	896	125%	281.36	LOS F	117.0
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	SouthWest	T1	280	66%	17.60	LOS B	11.8
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	SouthWest	L2	53	66%	22.25	LOS B	11.8
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	SouthEast	R2	45	19%	20.66	LOS B	1.3
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	SouthEast	T1	278	27%	4.20	LOS A	5.3
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	SouthEast	L2	73	27%	8.78	LOS A	5.3
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	NorthEast	L2	59	93%	69.64	LOS E	13.1
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	NorthEast	R2	101	60%	52.35	LOS D	4.9
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	NorthEast	T1	167	93%	64.98	LOS E	13.1
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	NorthWest	T1	810	95%	45.19	LOS D	44.2
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	NorthWest	L2	583	44%	7.10	LOS A	8.8
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	NorthWest	R2	33	95%	49.79	LOS D	44.2
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	SouthWest	R2	11	12%	55.99	LOS D	0.5
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	SouthWest	T1	19	10%	41.43	LOS C	1.0
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	SouthWest	L2	3	10%	46.29	LOS D	1.0
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	NorthEast	R3	31	78%	51.00	LOS D	12.4
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	NorthEast	T1	220	78%	45.77	LOS D	12.4
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	North	L3	74	93%	63.98	LOS E	15.7
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	North	R1	214	93%	62.48	LOS E	15.7
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	SouthWest	T1	1258	101%	74.55	LOS F	102.9

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	SouthWest	L1	208	13%	5.17	LOS A	1.1
H.38 Marrickville Station Overbridge AM	Illawarra Road	NorthEast	T1	427	30%	3.42	LOS A	5.8
H.38 Marrickville Station Overbridge AM	Illawarra Road	SouthWest	T1	1439	98%	48.02	LOS D	96.9
Carrington Rd \ Warren Rd - AM	Warren Rd	SouthEast	R2	10	3%	9.26	LOS A	0.1
Carrington Rd \ Warren Rd - AM	Warren Rd	SouthEast	T1	1	3%	16.23	LOS C	0.1
Carrington Rd \ Warren Rd - AM	Warren Rd	SouthEast	L2	8	3%	5.59	LOS A	0.1
Carrington Rd \ Warren Rd - AM	Carrington Rd	NorthEast	L2	7	37%	11.41	LOS B	2.9
Carrington Rd \ Warren Rd - AM	Carrington Rd	NorthEast	R2	154	37%	11.49	LOS B	2.9
Carrington Rd \ Warren Rd - AM	Carrington Rd	NorthEast	T1	248	37%	5.23	LOS A	2.9
Carrington Rd \ Warren Rd - AM	Warren Rd	NorthWest	T1	1	53%	13.91	LOS B	2.7
Carrington Rd \ Warren Rd - AM	Warren Rd	NorthWest	L2	44	53%	8.02	LOS A	2.7
Carrington Rd \ Warren Rd - AM	Warren Rd	NorthWest	R2	180	53%	17.59	LOS C	2.7
Carrington Rd \ Warren Rd - AM	Carrington Rd	SouthWest	R2	14	45%	6.15	LOS A	0.3
Carrington Rd \ Warren Rd - AM	Carrington Rd	SouthWest	T1	153	45%	0.16	LOS A	0.3
Carrington Rd \ Warren Rd - AM	Carrington Rd	SouthWest	L2	659	45%	4.63	LOS A	0.3
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	SouthEast	R2	409	104%	113.73	LOS F	54.6
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	SouthEast	T1	188	104%	109.15	LOS F	54.6
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	SouthEast	L2	28	104%	113.71	LOS F	54.6
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	NorthEast	L2	18	20%	11.31	LOS A	1.7
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	NorthEast	R2	53	101%	61.35	LOS E	38.8
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	NorthEast	T1	735	101%	47.68	LOS D	38.8
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	NorthWest	T1	113	59%	26.80	LOS B	12.5
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	NorthWest	L2	39	59%	31.36	LOS C	12.5
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	NorthWest	R2	171	59%	31.39	LOS C	12.5
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	SouthWest	T1	379	45%	20.14	LOS B	13.2
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	SouthWest	L2	24	45%	24.70	LOS B	13.2
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	SouthEast	R2	11	88%	31.43	LOS C	26.5
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	SouthEast	T1	653	88%	26.86	LOS B	26.5
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	SouthEast	L2	185	25%	20.31	LOS B	4.3
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd N	NorthEast	L2	22	47%	21.50	LOS B	8.7
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd N	NorthEast	R2	40	47%	21.50	LOS B	8.7
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd N	NorthEast	T1	257	47%	16.94	LOS B	8.7
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd N	NorthWest	T1	379	103%	87.05	LOS F	31.6
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd N	NorthWest	L2	47	21%	23.49	LOS B	4.6
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd N	NorthWest	R2	102	103%	118.93	LOS F	31.6
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	SouthWest	R2	305	104%	129.61	LOS F	25.4
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	SouthWest	T1	145	52%	34.92	LOS C	8.9
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	SouthWest	L2	59	52%	39.48	LOS C	8.9
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	SouthEast	R2	48	52%	43.17	LOS D	8.1
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	SouthEast	T1	557	87%	31.82	LOS C	35.8
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	SouthEast	L2	336	87%	34.29	LOS C	35.8
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	NorthEast	L2	35	91%	55.14	LOS D	19.3
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	NorthEast	R2	190	91%	48.81	LOS D	18.3

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	NorthEast	T1	473	91%	48.52	LOS D	19.3
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	NorthWest	T1	393	96%	39.82	LOS C	18.1
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	NorthWest	L2	300	77%	17.84	LOS B	15.0
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	NorthWest	R2	96	96%	83.83	LOS F	18.1
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	SouthWest	R2	55	64%	56.84	LOS E	4.8
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	SouthWest	T1	64	64%	51.52	LOS D	4.8
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	SouthWest	L2	22	35%	54.96	LOS D	2.3
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	NorthEast	R3	74	62%	12.71	LOS A	15.9
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	NorthEast	T1	613	62%	7.51	LOS A	15.9
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	North	L3	35	58%	48.09	LOS D	10.3
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	North	R1	202	58%	46.58	LOS D	10.3
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	SouthWest	T1	667	50%	4.80	LOS A	11.6
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	SouthWest	L1	127	8%	5.30	LOS A	0.7
H.38 Marrickville Station Overbridge PM	Illawarra Road	NorthEast	T1	807	56%	4.83	LOS A	14.8
H.38 Marrickville Station Overbridge PM	Illawarra Road	SouthWest	T1	787	54%	4.75	LOS A	14.2
Carrington Rd \ Warren Rd - PM	Warren Rd	SouthEast	R2	13	14%	25.93	LOS D	0.4
Carrington Rd \ Warren Rd - PM	Warren Rd	SouthEast	T1	2	14%	30.51	LOS D	0.4
Carrington Rd \ Warren Rd - PM	Warren Rd	SouthEast	L2	28	14%	8.45	LOS A	0.4
Carrington Rd \ Warren Rd - PM	Carrington Rd	NorthEast	L2	8	55%	12.26	LOS B	3.8
Carrington Rd \ Warren Rd - PM	Carrington Rd	NorthEast	R2	116	55%	12.32	LOS B	3.8
Carrington Rd \ Warren Rd - PM	Carrington Rd	NorthEast	T1	751	55%	2.50	LOS A	3.8
Carrington Rd \ Warren Rd - PM	Warren Rd	NorthWest	T1	2	93%	81.74	LOS F	7.0
Carrington Rd \ Warren Rd - PM	Warren Rd	NorthWest	L2	30	93%	61.81	LOS F	7.0
Carrington Rd \ Warren Rd - PM	Warren Rd	NorthWest	R2	117	93%	90.71	LOS F	7.0
Carrington Rd \ Warren Rd - PM	Carrington Rd	SouthWest	R2	5	39%	11.40	LOS B	0.2
Carrington Rd \ Warren Rd - PM	Carrington Rd	SouthWest	T1	347	39%	0.19	LOS A	0.2
Carrington Rd \ Warren Rd - PM	Carrington Rd	SouthWest	L2	369	39%	4.75	LOS A	0.2

H.2.2 Southbound Closure

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	SouthEast	R2	75	48%	37.72	LOS C	8.3
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	SouthEast	T1	119	48%	33.14	LOS C	8.3
B.16 Illawarra Road / Warren Road - AM	Warren Rd S	SouthEast	L2	12	48%	37.70	LOS C	8.3
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	NorthEast	L2	202	44%	24.50	LOS B	7.4
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	NorthEast	R2	18	60%	25.32	LOS B	11.6
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd N	NorthEast	T1	284	60%	20.76	LOS B	11.6
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	NorthWest	T1	137	81%	40.45	LOS C	16.4
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	NorthWest	L2	33	81%	45.04	LOS D	16.4
B.16 Illawarra Road / Warren Road - AM	Warren Rd N	NorthWest	R2	171	81%	45.04	LOS D	16.4
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	SouthWest	T1	660	59%	13.66	LOS A	20.1
B.16 Illawarra Road / Warren Road - AM	Illawarra Rd S	SouthWest	L2	22	59%	18.31	LOS B	20.1
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	SouthEast	R2	9	38%	16.40	LOS B	8.6
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	SouthEast	T1	351	38%	11.83	LOS A	8.6
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd S	SouthEast	L2	296	32%	16.59	LOS B	7.0
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd N	NorthEast	L2	16	26%	26.54	LOS B	3.4
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd N	NorthEast	R2	17	26%	26.61	LOS B	3.4
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd N	NorthEast	T1	89	26%	21.98	LOS B	3.4
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd N	NorthWest	T1	716	87%	18.01	LOS B	21.7
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd N	NorthWest	L2	75	17%	13.36	LOS A	2.4
B.17 Marrickville Road / Illawarra Road - AM	Marrickville Rd N	NorthWest	R2	55	87%	23.87	LOS B	21.7
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	SouthWest	R2	220	88%	52.82	LOS D	10.6
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	SouthWest	T1	280	82%	39.61	LOS C	13.5
B.17 Marrickville Road / Illawarra Road - AM	Illawarra Rd S	SouthWest	L2	28	82%	44.35	LOS D	13.5
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	SouthEast	R2	45	45%	33.24	LOS C	8.4
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	SouthEast	T1	328	45%	23.39	LOS B	8.4
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd S	SouthEast	L2	23	23%	22.30	LOS B	5.2
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	NorthEast	L2	59	43%	32.20	LOS C	3.3
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	NorthEast	R2	211	87%	59.58	LOS E	11.6
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd N	NorthEast	T1	58	43%	27.54	LOS B	3.3
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	NorthWest	T1	538	80%	16.90	LOS B	18.0
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	NorthWest	L2	205	20%	8.39	LOS A	3.0
B.18 Marrickville Road / Victoria Road - AM	Marrickville Rd N	NorthWest	R2	11	80%	21.56	LOS B	18.0
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	SouthWest	R2	283	82%	48.96	LOS D	17.4
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	SouthWest	T1	397	91%	53.88	LOS D	22.9
B.18 Marrickville Road / Victoria Road - AM	Victoria Rd S	SouthWest	L2	60	91%	60.33	LOS E	22.9
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	NorthEast	R3	31	42%	14.92	LOS B	10.5
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	NorthEast	T1	412	42%	9.69	LOS A	10.5
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	North	L3	74	48%	44.95	LOS D	12.3
H.19 Petersham Road / Illawarra Road - AM	Petersham Road	North	R1	214	48%	43.46	LOS D	12.3
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	SouthWest	T1	551	52%	8.62	LOS A	12.7
H.19 Petersham Road / Illawarra Road - AM	Illawarra Road	SouthWest	L1	208	13%	5.17	LOS A	1.1
H.38 Marrickville Station Overbridge AM	Illawarra Road	NorthEast	T1	618	43%	3.94	LOS A	9.7

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.38 Marrickville Station Overbridge AM	Illawarra Road	SouthWest	T1	739	50%	4.33	LOS A	12.8
Carrington Rd \ Warren Rd - AM	Warren Rd	SouthEast	R2	10	4%	13.64	LOS B	0.1
Carrington Rd \ Warren Rd - AM	Warren Rd	SouthEast	T1	1	4%	10.07	LOS B	0.1
Carrington Rd \ Warren Rd - AM	Warren Rd	SouthEast	L2	8	4%	4.90	LOS A	0.1
Carrington Rd \ Warren Rd - AM	Carrington Rd	NorthEast	L2	7	5%	8.98	LOS A	0.2
Carrington Rd \ Warren Rd - AM	Carrington Rd	NorthEast	R2	6	5%	10.72	LOS B	0.2
Carrington Rd \ Warren Rd - AM	Carrington Rd	NorthEast	T1	62	5%	1.15	LOS A	0.2
Carrington Rd \ Warren Rd - AM	Warren Rd	NorthWest	T1	1	110%	125.04	LOS F	35.0
Carrington Rd \ Warren Rd - AM	Warren Rd	NorthWest	L2	44	110%	122.04	LOS F	35.0
Carrington Rd \ Warren Rd - AM	Warren Rd	NorthWest	R2	366	110%	129.29	LOS F	35.0
Carrington Rd \ Warren Rd - AM	Carrington Rd	SouthWest	R2	14	43%	4.95	LOS A	0.2
Carrington Rd \ Warren Rd - AM	Carrington Rd	SouthWest	T1	729	43%	0.01	LOS A	0.2
Carrington Rd \ Warren Rd - AM	Carrington Rd	SouthWest	L2	82	43%	4.61	LOS A	0.2
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	SouthEast	R2	98	233%	1261.90	LOS F	90.1
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	SouthEast	T1	188	233%	1257.33	LOS F	90.1
B.16 Illawarra Road / Warren Road - PM	Warren Rd S	SouthEast	L2	28	233%	1261.89	LOS F	90.1
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	NorthEast	L2	740	105%	110.11	LOS F	55.7
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	NorthEast	R2	53	92%	34.72	LOS C	28.0
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd N	NorthEast	T1	735	92%	30.16	LOS C	28.0
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	NorthWest	T1	113	324%	2076.85	LOS F	108.6
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	NorthWest	L2	39	324%	2081.41	LOS F	108.6
B.16 Illawarra Road / Warren Road - PM	Warren Rd N	NorthWest	R2	171	324%	2081.44	LOS F	108.6
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	SouthWest	T1	379	25%	2.71	LOS A	4.8
B.16 Illawarra Road / Warren Road - PM	Illawarra Rd S	SouthWest	L2	24	25%	7.28	LOS A	4.8
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	SouthEast	R2	11	114%	188.09	LOS F	67.7
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	SouthEast	T1	672	114%	183.52	LOS F	67.7
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd S	SouthEast	L2	899	113%	168.64	LOS F	80.9
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd N	NorthEast	L2	22	113%	175.66	LOS F	32.7
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd N	NorthEast	R2	40	113%	175.67	LOS F	32.7
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd N	NorthEast	T1	257	113%	171.10	LOS F	32.7
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd N	NorthWest	T1	379	143%	101.83	LOS F	32.5
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd N	NorthWest	L2	47	29%	11.08	LOS A	6.4
B.17 Marrickville Road / Illawarra Road - PM	Marrickville Rd N	NorthWest	R2	102	143%	451.47	LOS F	32.5
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	SouthWest	R2	141	139%	419.47	LOS F	23.8
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	SouthWest	T1	145	77%	49.82	LOS D	9.1
B.17 Marrickville Road / Illawarra Road - PM	Illawarra Rd S	SouthWest	L2	40	77%	54.39	LOS D	9.1
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	SouthEast	R2	48	105%	124.35	LOS F	16.0
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	SouthEast	T1	825	174%	623.51	LOS F	173.4
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd S	SouthEast	L2	68	174%	732.77	LOS F	173.4
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	NorthEast	L2	35	13%	5.09	LOS A	0.1
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	NorthEast	R2	564	90%	17.59	LOS B	10.8
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd N	NorthEast	T1	99	13%	0.45	LOS A	0.1
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	NorthWest	T1	273	101%	87.58	LOS F	30.5

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	NorthWest	L2	154	101%	93.47	LOS F	30.5
B.18 Marrickville Road / Victoria Road - PM	Marrickville Rd N	NorthWest	R2	17	34%	59.11	LOS E	1.4
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	SouthWest	R2	174	22%	13.84	LOS A	3.8
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	SouthWest	T1	210	25%	8.06	LOS A	5.9
B.18 Marrickville Road / Victoria Road - PM	Victoria Rd S	SouthWest	L2	76	25%	12.81	LOS A	5.9
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	NorthEast	R3	74	99%	60.58	LOS E	99.3
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	NorthEast	T1	1334	99%	55.38	LOS D	99.3
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	North	L3	35	84%	55.21	LOS D	11.4
H.19 Petersham Road / Illawarra Road - PM	Petersham Road	North	R1	202	84%	53.70	LOS D	11.4
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	SouthWest	T1	356	25%	2.86	LOS A	4.2
H.19 Petersham Road / Illawarra Road - PM	Illawarra Road	SouthWest	L1	127	8%	5.30	LOS A	0.7
H.38 Marrickville Station Overbridge PM	Illawarra Road	NorthEast	T1	1528	105%	98.98	LOS F	136.4
H.38 Marrickville Station Overbridge PM	Illawarra Road	SouthWest	T1	476	33%	3.71	LOS A	6.7
Carrington Rd \ Warren Rd - PM	Warren Rd	SouthEast	R2	13	4%	7.60	LOS A	0.1
Carrington Rd \ Warren Rd - PM	Warren Rd	SouthEast	T1	2	4%	5.90	LOS A	0.1
Carrington Rd \ Warren Rd - PM	Warren Rd	SouthEast	L2	28	4%	4.73	LOS A	0.1
Carrington Rd \ Warren Rd - PM	Carrington Rd	NorthEast	L2	8	4%	5.44	LOS A	0.1
Carrington Rd \ Warren Rd - PM	Carrington Rd	NorthEast	R2	5	4%	6.32	LOS A	0.1
Carrington Rd \ Warren Rd - PM	Carrington Rd	NorthEast	T1	58	4%	0.21	LOS A	0.1
Carrington Rd \ Warren Rd - PM	Warren Rd	NorthWest	T1	2	133%	310.60	LOS F	145.5
Carrington Rd \ Warren Rd - PM	Warren Rd	NorthWest	L2	30	133%	309.14	LOS F	145.5
Carrington Rd \ Warren Rd - PM	Warren Rd	NorthWest	R2	814	133%	314.13	LOS F	145.5
Carrington Rd \ Warren Rd - PM	Carrington Rd	SouthWest	R2	5	25%	4.82	LOS A	0.0
Carrington Rd \ Warren Rd - PM	Carrington Rd	SouthWest	T1	347	25%	0.00	LOS A	0.0
Carrington Rd \ Warren Rd - PM	Carrington Rd	SouthWest	L2	112	25%	4.58	LOS A	0.0

H.3 Burwood Road Overbridge

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	R2	54	40%	4.65	LOS A	0.0
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	T1	672	40%	0.03	LOS A	0.0
B.08 Burwood Road / Bridge Road AM Peak	Burwood Rd S	South	L2	60	4%	4.66	LOS A	0.0
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	L2	10	1%	4.56	LOS A	0.1
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	R2	3	1%	28.13	LOS B	0.1
B.08 Burwood Road / Bridge Road AM Peak	Tobruk Ave	East	T1	1	1%	17.37	LOS B	0.1
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	R2	33	9%	11.21	LOS A	0.3
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	T1	7	9%	7.39	LOS A	0.3
B.08 Burwood Road / Bridge Road AM Peak	Bridge Rd	West	L2	181	24%	8.56	LOS A	1.0
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	R2	53	34%	4.59	LOS A	0.0
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	T1	565	34%	0.02	LOS A	0.0
B.08 Burwood Road / Bridge Road PM Peak	Burwood Rd S	South	L2	79	4%	4.60	LOS A	0.0
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	L2	8	3%	4.56	LOS A	0.1
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	R2	9	3%	12.06	LOS A	0.1
B.08 Burwood Road / Bridge Road PM Peak	Tobruk Ave	East	T1	7	3%	8.22	LOS A	0.1
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	R2	41	8%	9.03	LOS A	0.3
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	T1	6	8%	6.49	LOS A	0.3
B.08 Burwood Road / Bridge Road PM Peak	Bridge Rd	West	L2	143	16%	7.27	LOS A	0.6
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	R2	183	10%	3.17	LOS A	0.0
B.09 Burwood Road / Redman Parade AM Peak	Burwood Rd S	South	T1	693	38%	0.01	LOS A	0.0
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	L2	151	8%	4.60	LOS A	0.0
B.09 Burwood Road / Redman Parade AM Peak	Redman Parade	East	R2	17	3%	8.89	LOS A	0.1
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	R2	123	7%	3.17	LOS A	0.0
B.09 Burwood Road / Redman Parade PM Peak	Burwood Rd S	South	T1	643	35%	0.00	LOS A	0.0
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	L2	182	10%	4.58	LOS A	0.0
B.09 Burwood Road / Redman Parade PM Peak	Redman Parade	East	R2	22	3%	8.35	LOS A	0.1
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	R2	45	36%	9.55	LOS A	7.9
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	T1	504	36%	4.78	LOS A	7.9
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	South	L2	82	8%	8.70	LOS A	1.2
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	R2	53	78%	46.52	LOS D	6.8
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	East	T1	366	78%	39.74	LOS C	10.2
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	L2	57	5%	9.65	LOS A	0.8
H.20 Burwood Road / Lakemba Street AM Peak	Burwood Road	North	R2	588	103%	104.21	LOS F	48.3
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	T1	443	71%	36.51	LOS C	10.7
H.20 Burwood Road / Lakemba Street AM Peak	Lakemba St	West	L2	63	71%	41.53	LOS C	8.8
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	R2	68	112%	182.84	LOS F	44.2
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	T1	539	112%	134.99	LOS F	44.2
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	South	L2	99	28%	22.46	LOS B	6.6
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	R2	65	28%	19.87	LOS B	6.5
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	East	T1	493	28%	14.91	LOS B	7.2
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	L2	705	92%	47.22	LOS D	34.4
H.20 Burwood Road / Lakemba Street PM Peak	Burwood Road	North	R2	60	45%	47.30	LOS D	2.5

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	T1	350	18%	13.78	LOS A	5.2
H.20 Burwood Road / Lakemba Street PM Peak	Lakemba St	West	L2	61	18%	18.40	LOS B	4.3
Lakemba St / Moreton St AM peak - Bridge	Moreton St	South	R2	359	55%	7.70	LOS A	5.4
Lakemba St / Moreton St AM peak - Bridge	Moreton St	South	L2	295	55%	5.43	LOS A	5.4
Lakemba St / Moreton St AM peak - Bridge	Lakemba St	East	L2	864	181%	749.51	LOS F	328.8
Lakemba St / Moreton St AM peak - Bridge	Lakemba St	East	T1	236	181%	749.42	LOS F	328.8
Lakemba St / Moreton St AM peak - Bridge	Lakemba St	West	R2	654	93%	21.03	LOS B	23.5
Lakemba St / Moreton St AM peak - Bridge	Lakemba St	West	T1	356	93%	18.40	LOS B	23.5
Lakemba St / Moreton St PM peak - Bridge	Moreton St	South	R2	289	61%	8.08	LOS A	6.3
Lakemba St / Moreton St PM peak - Bridge	Moreton St	South	L2	409	61%	5.82	LOS A	6.3
Lakemba St / Moreton St PM peak - Bridge	Lakemba St	East	L2	1041	223%	1125.44	LOS F	507.5
Lakemba St / Moreton St PM peak - Bridge	Lakemba St	East	T1	361	223%	1125.18	LOS F	507.5
Lakemba St / Moreton St PM peak - Bridge	Lakemba St	West	R2	646	93%	21.12	LOS B	24.7
Lakemba St / Moreton St PM peak - Bridge	Lakemba St	West	T1	333	93%	18.61	LOS B	24.7
The Blvd / Moreton St AM peak - Bridge	Moreton St	South	R2	6	53%	8.97	LOS A	4.1
The Blvd / Moreton St AM peak - Bridge	Moreton St	South	T1	415	53%	6.43	LOS A	4.1
The Blvd / Moreton St AM peak - Bridge	Moreton St	South	L2	39	53%	7.03	LOS A	4.1
The Blvd / Moreton St AM peak - Bridge	The Blvd	East	L2	2	87%	68.11	LOS E	8.8
The Blvd / Moreton St AM peak - Bridge	The Blvd	East	R2	101	87%	70.32	LOS E	8.8
The Blvd / Moreton St AM peak - Bridge	The Blvd	East	T1	59	87%	68.71	LOS E	8.8
The Blvd / Moreton St AM peak - Bridge	Moreton St	North	T1	1276	140%	372.73	LOS F	311.2
The Blvd / Moreton St AM peak - Bridge	Moreton St	North	L2	145	140%	373.28	LOS F	311.2
The Blvd / Moreton St AM peak - Bridge	Moreton St	North	R2	103	140%	375.33	LOS F	311.2
The Blvd / Moreton St AM peak - Bridge	The Blvd	West	R2	26	63%	18.56	LOS B	4.9
The Blvd / Moreton St AM peak - Bridge	The Blvd	West	T1	129	63%	16.26	LOS B	4.9
The Blvd / Moreton St AM peak - Bridge	The Blvd	West	L2	138	63%	16.59	LOS B	4.9
The Blvd / Moreton St PM peak - Bridge	Moreton St	South	R2	3	61%	10.38	LOS A	5.6
The Blvd / Moreton St PM peak - Bridge	Moreton St	South	T1	456	61%	7.84	LOS A	5.6
The Blvd / Moreton St PM peak - Bridge	Moreton St	South	L2	56	61%	8.50	LOS A	5.6
The Blvd / Moreton St PM peak - Bridge	The Blvd	East	L2	6	186%	819.81	LOS F	103.2
The Blvd / Moreton St PM peak - Bridge	The Blvd	East	R2	164	186%	821.85	LOS F	103.2
The Blvd / Moreton St PM peak - Bridge	The Blvd	East	T1	141	186%	819.51	LOS F	103.2
The Blvd / Moreton St PM peak - Bridge	Moreton St	North	T1	1410	148%	445.51	LOS F	390.5
The Blvd / Moreton St PM peak - Bridge	Moreton St	North	L2	139	148%	446.12	LOS F	390.5
The Blvd / Moreton St PM peak - Bridge	Moreton St	North	R2	150	148%	448.08	LOS F	390.5
The Blvd / Moreton St PM peak - Bridge	The Blvd	West	R2	28	61%	18.93	LOS B	4.6
The Blvd / Moreton St PM peak - Bridge	The Blvd	West	T1	105	61%	16.26	LOS B	4.6
The Blvd / Moreton St PM peak - Bridge	The Blvd	West	L2	139	61%	16.62	LOS B	4.6

H.4 Haldon Road Bridge

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	R2	256	52%	22.14	LOS B	6.2
B.07 The Boulevarde / Haldon Street AM Peak	Haldon St S	South	L2	211	30%	15.14	LOS B	4.0
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	L2	48	10%	12.59	LOS A	1.3
B.07 The Boulevarde / Haldon Street AM Peak	The Boulevard E	East	T1	312	48%	19.61	LOS B	7.7
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	R2	70	49%	20.64	LOS B	7.0
B.07 The Boulevarde / Haldon Street AM Peak	The Bouldevard W	West	T1	327	49%	14.76	LOS B	7.0
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	R2	169	68%	31.49	LOS C	4.9
B.07 The Boulevarde / Haldon Street PM Peak	Haldon St S	South	L2	266	61%	23.17	LOS B	6.6
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	L2	58	22%	12.08	LOS A	2.9
B.07 The Boulevarde / Haldon Street PM Peak	The Boulevard E	East	T1	519	73%	14.33	LOS A	9.6
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	R2	57	34%	12.27	LOS A	4.0
B.07 The Boulevarde / Haldon Street PM Peak	The Bouldevard W	West	T1	295	34%	6.98	LOS A	4.0
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	R2	51	21%	14.27	LOS A	2.2
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	East	T1	299	21%	8.60	LOS A	4.9
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	L2	75	18%	36.76	LOS C	2.8
H.07 Lakemba Street / Wangee Road AM Peak	Wangee Rd	North	R2	382	92%	58.64	LOS E	21.4
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	T1	515	44%	0.52	LOS A	0.8
H.07 Lakemba Street / Wangee Road AM Peak	Lakemba St	West	L2	407	26%	4.42	LOS A	2.0
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	R2	69	35%	17.77	LOS B	6.0
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	East	T1	521	35%	12.69	LOS A	9.0
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	L2	100	19%	32.15	LOS C	3.5
H.07 Lakemba Street / Wangee Road PM Peak	Wangee Rd	North	R2	464	90%	51.84	LOS D	24.6
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	T1	409	40%	2.86	LOS A	2.9
H.07 Lakemba Street / Wangee Road PM Peak	Lakemba St	West	L2	337	22%	4.39	LOS A	1.6
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	R2	5	1%	6.79	LOS A	0.0
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	East	T1	11	1%	3.17	LOS A	0.0
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	T1	87	8%	3.24	LOS A	0.0
H.08 Haldon Street / Railway Parade AM Peak	Railway Pde	West	L2	51	8%	4.59	LOS A	0.0
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	R2	4	1%	5.81	LOS A	0.1
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	East	T1	18	1%	3.17	LOS A	0.1
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	T1	11	3%	3.18	LOS A	0.0
H.08 Haldon Street / Railway Parade PM Peak	Railway Pde	West	L2	36	3%	4.59	LOS A	0.0
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	R2	372	42%	21.14	LOS B	10.9
H.09 Lakemba Street / Haldon Street AM Peak	Haldon St	South	L2	168	21%	22.20	LOS B	4.8
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	East	T1	282	32%	8.16	LOS A	3.3
H.09 Lakemba Street / Haldon Street AM Peak	Lakemba St	West	T1	570	43%	22.50	LOS B	11.8
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	R2	262	91%	60.37	LOS E	14.3
H.09 Lakemba Street / Haldon Street PM Peak	Haldon St	South	L2	200	93%	66.00	LOS E	11.4
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	East	T1	539	33%	0.36	LOS A	0.6
H.09 Lakemba Street / Haldon Street PM Peak	Lakemba St	West	T1	491	21%	4.74	LOS A	4.7
The Blvd / Moreton St AM peak - Bridge	Moreton St	South	R2	6	60%	11.73	LOS A	5.3
The Blvd / Moreton St AM peak - Bridge	Moreton St	South	T1	415	60%	9.21	LOS A	5.3

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
The Blvd / Moreton St AM peak - Bridge	Moreton St	South	L2	39	60%	9.82	LOS A	5.3
The Blvd / Moreton St AM peak - Bridge	The Blvd	East	L2	2	49%	17.42	LOS B	3.3
The Blvd / Moreton St AM peak - Bridge	The Blvd	East	R2	101	49%	19.57	LOS B	3.3
The Blvd / Moreton St AM peak - Bridge	The Blvd	East	T1	59	49%	17.60	LOS B	3.3
The Blvd / Moreton St AM peak - Bridge	Moreton St	North	T1	512	78%	6.57	LOS A	11.6
The Blvd / Moreton St AM peak - Bridge	Moreton St	North	L2	145	78%	7.08	LOS A	11.6
The Blvd / Moreton St AM peak - Bridge	Moreton St	North	R2	176	78%	9.12	LOS A	11.6
The Blvd / Moreton St AM peak - Bridge	The Blvd	West	R2	26	120%	216.57	LOS F	75.1
The Blvd / Moreton St AM peak - Bridge	The Blvd	West	T1	129	120%	214.35	LOS F	75.1
The Blvd / Moreton St AM peak - Bridge	The Blvd	West	L2	403	120%	214.56	LOS F	75.1
The Blvd / Moreton St PM peak - Bridge	Moreton St	South	R2	3	88%	30.86	LOS C	15.0
The Blvd / Moreton St PM peak - Bridge	Moreton St	South	T1	456	88%	28.39	LOS B	15.0
The Blvd / Moreton St PM peak - Bridge	Moreton St	South	L2	56	88%	29.14	LOS C	15.0
The Blvd / Moreton St PM peak - Bridge	The Blvd	East	L2	6	100%	88.36	LOS F	20.7
The Blvd / Moreton St PM peak - Bridge	The Blvd	East	R2	164	100%	90.39	LOS F	20.7
The Blvd / Moreton St PM peak - Bridge	The Blvd	East	T1	141	100%	88.01	LOS F	20.7
The Blvd / Moreton St PM peak - Bridge	Moreton St	North	T1	516	76%	5.12	LOS A	12.1
The Blvd / Moreton St PM peak - Bridge	Moreton St	North	L2	139	76%	5.68	LOS A	12.1
The Blvd / Moreton St PM peak - Bridge	Moreton St	North	R2	273	76%	7.68	LOS A	12.1
The Blvd / Moreton St PM peak - Bridge	The Blvd	West	R2	28	184%	784.64	LOS F	225.1
The Blvd / Moreton St PM peak - Bridge	The Blvd	West	T1	105	184%	781.95	LOS F	225.1
The Blvd / Moreton St PM peak - Bridge	The Blvd	West	L2	600	184%	782.16	LOS F	225.1
Lakemba St / Moreton St AM peak - Bridge	Moreton St	South	R2	623	86%	14.03	LOS A	17.5
Lakemba St / Moreton St AM peak - Bridge	Moreton St	South	L2	295	86%	11.79	LOS A	17.5
Lakemba St / Moreton St AM peak - Bridge	Lakemba St	East	L2	622	107%	90.89	LOS F	62.9
Lakemba St / Moreton St AM peak - Bridge	Lakemba St	East	T1	236	107%	90.76	LOS F	62.9
Lakemba St / Moreton St AM peak - Bridge	Lakemba St	West	R2	520	119%	200.15	LOS F	109.3
Lakemba St / Moreton St AM peak - Bridge	Lakemba St	West	T1	356	119%	197.52	LOS F	109.3
Lakemba St / Moreton St PM peak - Bridge	Moreton St	South	R2	443	84%	14.50	LOS B	15.8
Lakemba St / Moreton St PM peak - Bridge	Moreton St	South	L2	409	84%	12.26	LOS A	15.8
Lakemba St / Moreton St PM peak - Bridge	Lakemba St	East	L2	686	138%	360.32	LOS F	201.8
Lakemba St / Moreton St PM peak - Bridge	Lakemba St	East	T1	361	138%	360.03	LOS F	201.8
Lakemba St / Moreton St PM peak - Bridge	Lakemba St	West	R2	519	105%	76.55	LOS F	52.8
Lakemba St / Moreton St PM peak - Bridge	Lakemba St	West	T1	333	105%	74.07	LOS F	52.8

H.5 King Georges Road Bridge

Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn.	Average Delay (sec)	Level of Service	Mean Maximum Queue (Veh)[1]
King Georges Road / Lakemba Street AM Peak	King Georges Road	North	Left	129	10%	11.60	LOS A	2.1
King Georges Road / Lakemba Street AM Peak	King Georges Road	North	Ahead	1173	94%	42.80	LOS C	49.9
King Georges Road / Lakemba Street AM Peak	King Georges Road	North	Ahead	1181	94%	44.60	LOS D	51.1
King Georges Road / Lakemba Street AM Peak	King Georges Road	South	Ahead Left	1118	72%	5.50	LOS A	3.3
King Georges Road / Lakemba Street AM Peak	King Georges Road	South	Ahead	1117	73%	5.40	LOS A	3.0
King Georges Road / Lakemba Street AM Peak	King Georges Road	South	Ahead Right	1118	76%	13.80	LOS A	17.7
King Georges Road / Lakemba Street AM Peak	Lakemba Street	West	Left Ahead Right	381	97%	134.80	LOS F	20.4
King Georges Road / Lakemba Street AM Peak	Lakemba Street	East	Right Ahead Left	311	80%	75.50	LOS F	8.6
King Georges Road / The Boulevarde AM Peak	King Georges Road	South	Ahead Left	1021	89%	39.30	LOS C	40.0
King Georges Road / The Boulevarde AM Peak	King Georges Road	South	Ahead	1019	89%	39.00	LOS C	39.9
King Georges Road / The Boulevarde AM Peak	King Georges Road	South	Ahead	1016	88%	38.70	LOS C	39.7
King Georges Road / The Boulevarde AM Peak	The Boulevarde	East	Right Left Ahead	388	75%	113.50	LOS F	11.7
King Georges Road / The Boulevarde AM Peak	King Georges Road	North	Ahead Left	1292	94%	22.60	LOS B	27.5
King Georges Road / The Boulevarde AM Peak	King Georges Road	North	Ahead Right	1304	93%	26.00	LOS B	49.7
King Georges Road / The Boulevarde AM Peak	The Boulevarde	West	Left Ahead	477	101%	154.30	LOS F	25.9
King Georges Road / Lakemba Street PM Peak	King Georges Road	North	Left	111	9%	14.00	LOS B	2.0
King Georges Road / Lakemba Street PM Peak	King Georges Road	North	Ahead	1303	111%	241.40	LOS F	127.4
King Georges Road / Lakemba Street PM Peak	King Georges Road	North	Ahead	1305	111%	244.10	LOS F	128.5
King Georges Road / Lakemba Street PM Peak	King Georges Road	South	Ahead Left	1073	73%	5.30	LOS A	3.2
King Georges Road / Lakemba Street PM Peak	King Georges Road	South	Ahead	1067	73%	5.10	LOS A	2.5
King Georges Road / Lakemba Street PM Peak	King Georges Road	South	Ahead Right	642	95%	58.10	LOS E	15.2
King Georges Road / Lakemba Street PM Peak	Lakemba Street	West	Left Ahead Right	229	64%	69.20	LOS E	5.0
King Georges Road / Lakemba Street PM Peak	Lakemba Street	East	Right Ahead Left	592	98%	111.70	LOS F	23.0
King Georges Road / The Boulevarde PM Peak	King Georges Road	South	Ahead Left	941	96%	66.40	LOS E	45.5
King Georges Road / The Boulevarde PM Peak	King Georges Road	South	Ahead	940	96%	66.00	LOS E	45.3
King Georges Road / The Boulevarde PM Peak	King Georges Road	South	Ahead	619	63%	31.70	LOS C	19.4
King Georges Road / The Boulevarde PM Peak	The Boulevarde	East	Right Left Ahead	596	98%	125.90	LOS F	27.1
King Georges Road / The Boulevarde PM Peak	King Georges Road	North	Ahead Left	1440	99%	42.60	LOS C	22.2
King Georges Road / The Boulevarde PM Peak	King Georges Road	North	Ahead Right	1510	98%	48.40	LOS D	51.4
King Georges Road / The Boulevarde PM Peak	The Boulevarde	West	Left Ahead	435	91%	87.50	LOS F	14.3

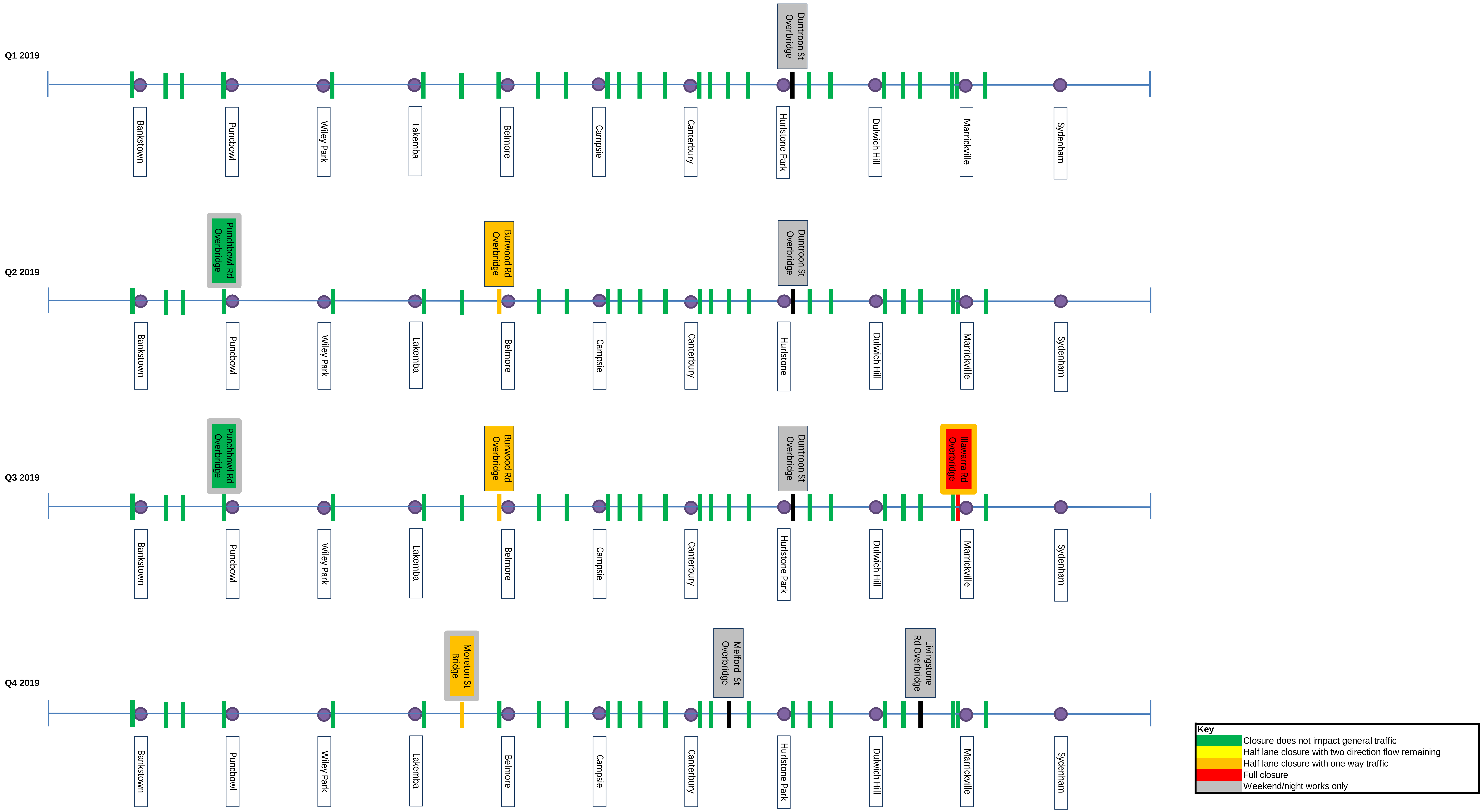
[1] Mean Maximum Queue: The average of the maximum queue lengths from each cycle during the analysis time period.

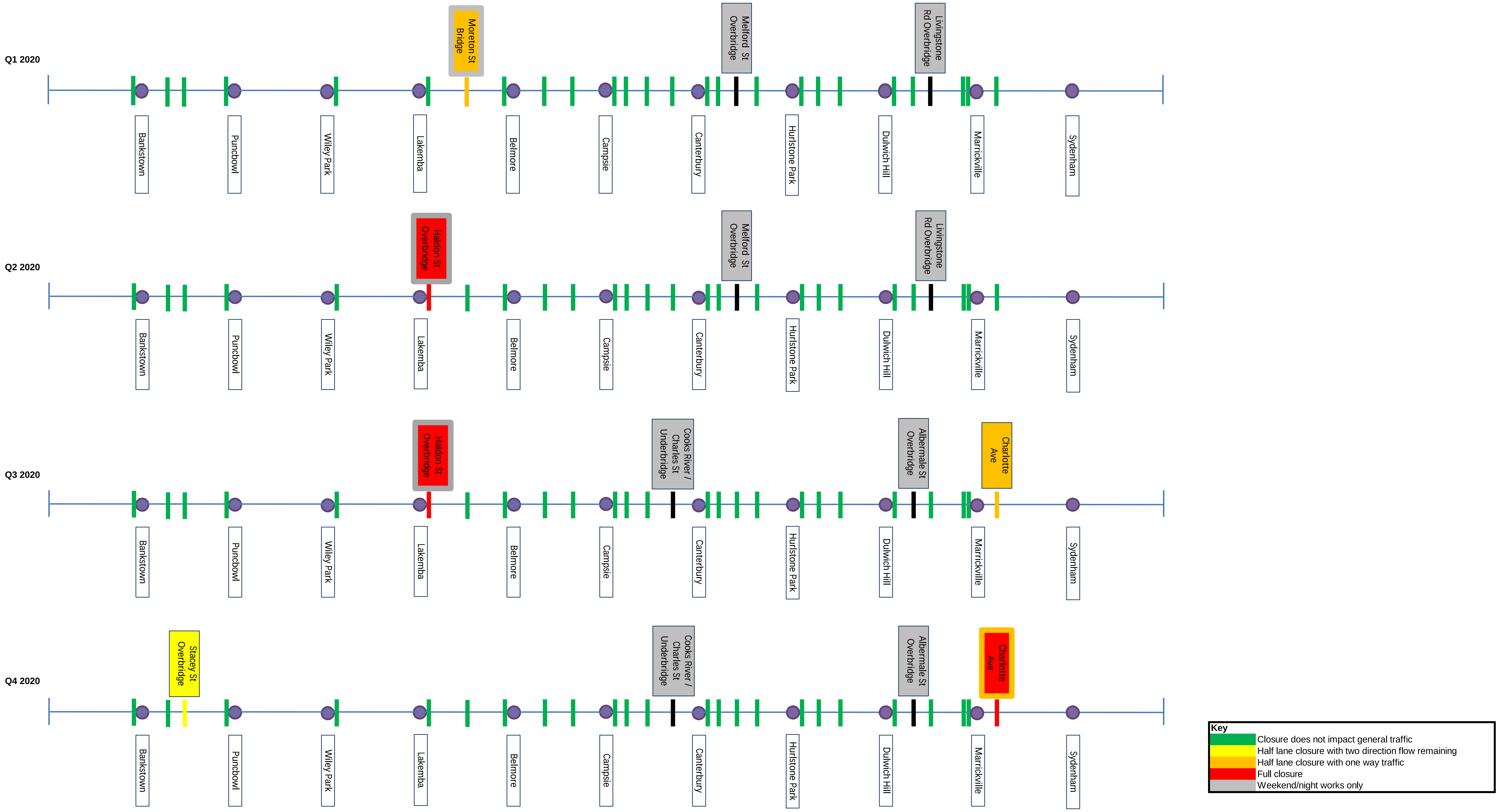
H.6 Stacey Street Bridge

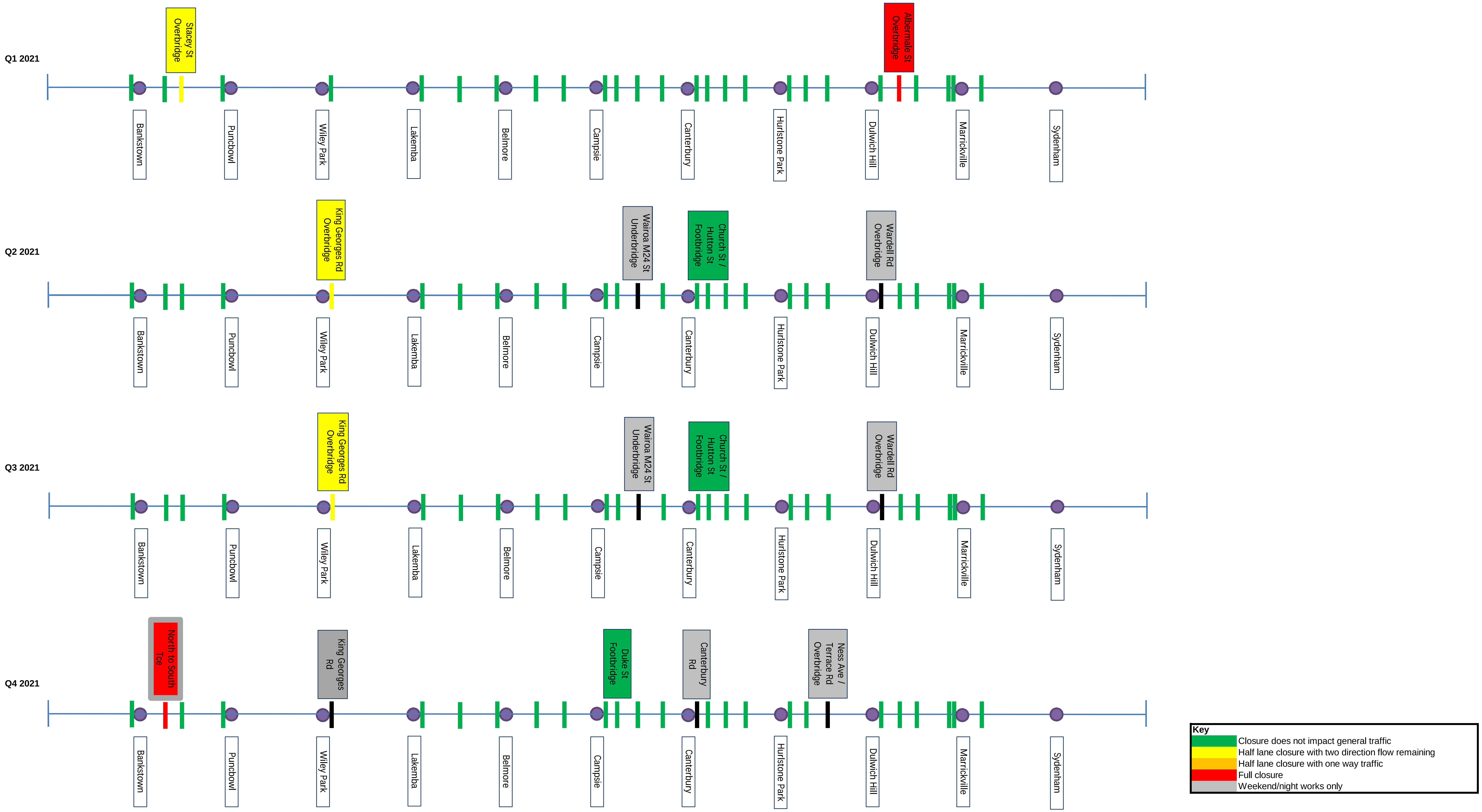
Scenario	Approach Name	Approach Direction	OD Movement	Demand Volumes	Deg. Satn	Average Delay (sec)	Level of Service	95th Percentile Queue (Veh)
H.02 Stacey St / Wattle St AM Peak - Bridge	Stacey St	South	R2	197	114%	367.03	LOS F	27.3
H.02 Stacey St / Wattle St AM Peak - Bridge	Stacey St	South	T1	2158	113%	176.39	LOS F	154.0
H.02 Stacey St / Wattle St AM Peak - Bridge	Stacey St	South	L2	64	5%	12.36	LOS A	1.2
H.02 Stacey St / Wattle St AM Peak - Bridge	Wattle St	East	L2	316	47%	40.49	LOS C	17.4
H.02 Stacey St / Wattle St AM Peak - Bridge	Wattle St	East	R2	142	104%	150.49	LOS F	7.8
H.02 Stacey St / Wattle St AM Peak - Bridge	Wattle St	East	T1	22	47%	36.09	LOS C	17.4
H.02 Stacey St / Wattle St AM Peak - Bridge	Stacey St	North	T1	1897	109%	150.80	LOS F	123.6
H.02 Stacey St / Wattle St AM Peak - Bridge	Stacey St	North	L2	202	18%	11.01	LOS A	2.7
H.02 Stacey St / Wattle St AM Peak - Bridge	Stacey St	North	R2	18	3%	48.94	LOS D	0.9
H.02 Stacey St / Wattle St AM Peak - Bridge	Car Park	West	R2	13	10%	87.69	LOS F	0.5
H.02 Stacey St / Wattle St AM Peak - Bridge	Car Park	West	T1	11	31%	79.02	LOS F	2.7
H.02 Stacey St / Wattle St AM Peak - Bridge	Car Park	West	L2	24	31%	83.32	LOS F	2.7
H.02 Stacey St / Wattle St PM Peak - Bridge	Stacey St	South	R2	287	134%	467.45	LOS F	52.1
H.02 Stacey St / Wattle St PM Peak - Bridge	Stacey St	South	T1	1551	93%	40.38	LOS C	51.7
H.02 Stacey St / Wattle St PM Peak - Bridge	Stacey St	South	L2	158	13%	10.41	LOS A	2.6
H.02 Stacey St / Wattle St PM Peak - Bridge	Wattle St	East	L2	656	96%	81.61	LOS F	54.8
H.02 Stacey St / Wattle St PM Peak - Bridge	Wattle St	East	R2	97	61%	85.98	LOS F	3.7
H.02 Stacey St / Wattle St PM Peak - Bridge	Wattle St	East	T1	55	96%	77.21	LOS F	54.8
H.02 Stacey St / Wattle St PM Peak - Bridge	Stacey St	North	T1	2724	130%	327.97	LOS F	248.1
H.02 Stacey St / Wattle St PM Peak - Bridge	Stacey St	North	L2	168	13%	8.95	LOS A	1.5
H.02 Stacey St / Wattle St PM Peak - Bridge	Stacey St	North	R2	71	14%	51.91	LOS D	3.6
H.02 Stacey St / Wattle St PM Peak - Bridge	Car Park	West	R2	164	110%	188.57	LOS F	10.0
H.02 Stacey St / Wattle St PM Peak - Bridge	Car Park	West	T1	35	95%	97.36	LOS F	12.5
H.02 Stacey St / Wattle St PM Peak - Bridge	Car Park	West	L2	107	95%	101.65	LOS F	12.5

Appendix I

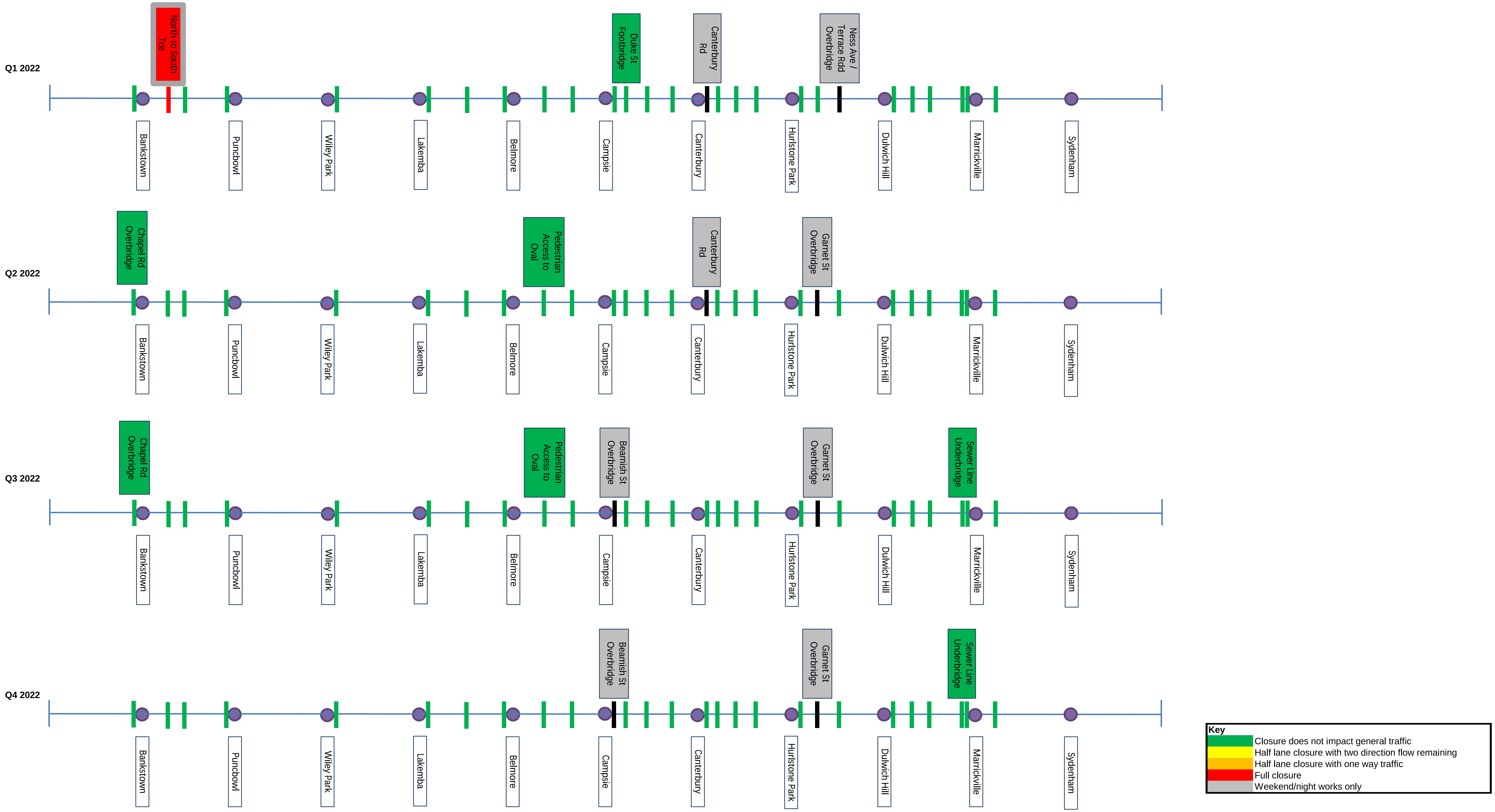
Bridge Closure Timeline


Q1 2019
Duntroon St Overbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Q2 2019
Punchbowl Rd Overbridge
Burwood Rd Overbridge
Duntroon St Overbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone
Dulwich Hill
Marrickville
Sydenham
Q3 2019
Punchbowl Rd Overbridge
Burwood Rd Overbridge
Duntroon St Overbridge
Illawarra Rd Overbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Q4 2019
Moreton St Bridge
Melford St Overbridge
Livingstone Rd Overbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Key
Closure does not impact general traffic
Half lane closure with two direction flow remaining
Half lane closure with one way traffic
Full closure
Weekend/night works only

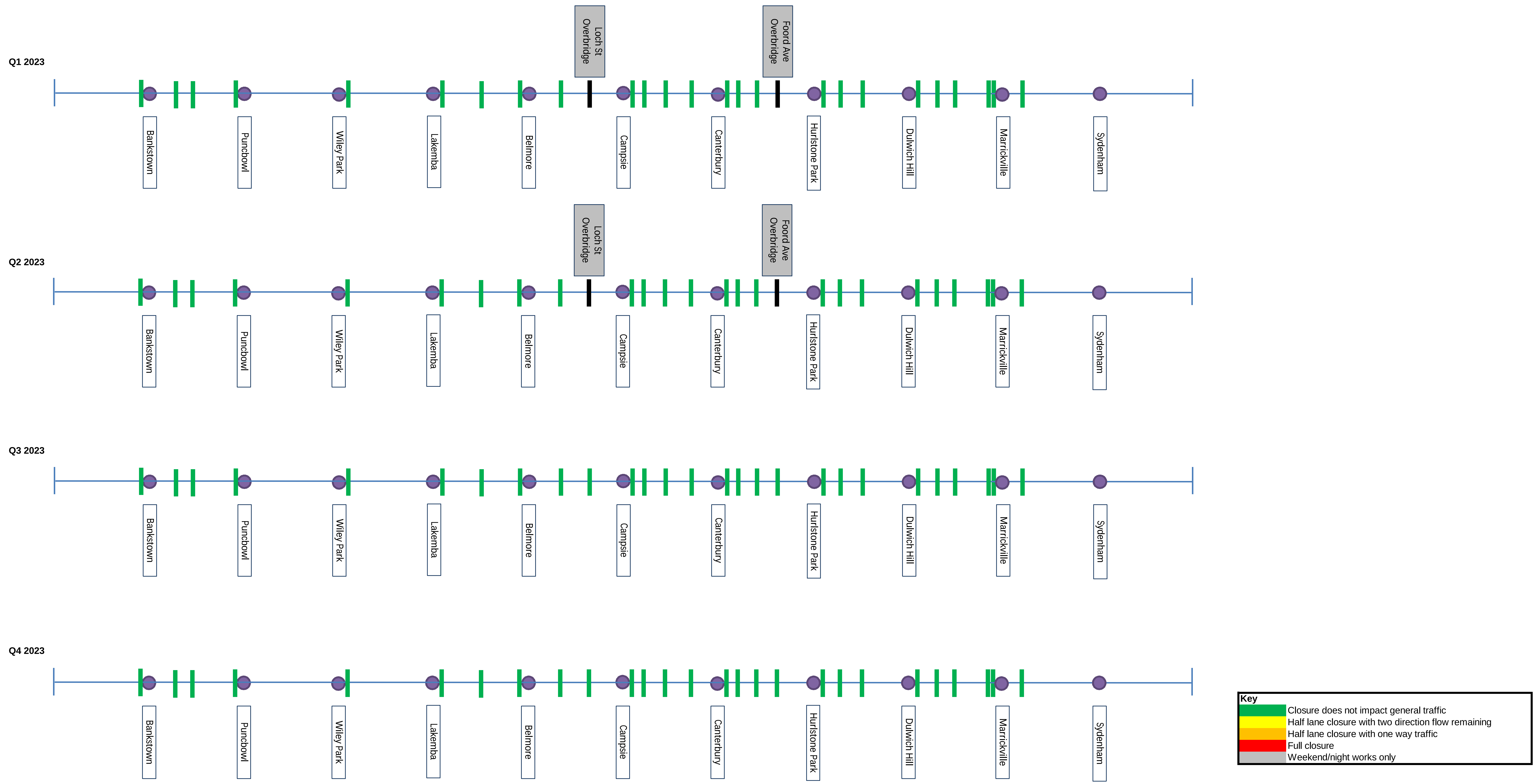

Q1 2020
Moreton St Bridge
Melford St Overbridge
Livingstone Rd Overbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Q2 2020
Haldon St Overbridge
Melford St Overbridge
Livingstone Rd Overbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Q3 2020
Haldon St Overbridge
Cooks River / Charles St Underbridge
Albermale St Overbridge
Charlotte Ave
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Q4 2020
Stacey St Overbridge
Cooks River / Charles St Underbridge
Albermale St Overbridge
Charlotte Ave
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Key
Closure does not impact general traffic
Half lane closure with two direction flow remaining
Half lane closure with one way traffic
Full closure
Weekend/night works only



Q1 2021
Stacey St Overbridge
Albermale St Overbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Q2 2021
King Georges Rd Overbridge
Wairoa M24 St Underbridge
Church St / Hutton St Footbridge
Wardell Rd Overbridge
Q3 2021
King Georges Rd Overbridge
Wairoa M24 St Underbridge
Church St / Hutton St Footbridge
Wardell Rd Overbridge
Q4 2021
North to South Tce
King Georges Rd
Duke St Footbridge
Canterbury Rd
Ness Ave / Terrace Rd Overbridge
Key
Closure does not impact general traffic
Half lane closure with two direction flow remaining
Half lane closure with one way traffic
Full closure
Weekend/night works only



Q1 2022
North to South Tce
Duke St Footbridge
Canterbury Rd
Ness Ave / Terrace Rdd Overbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Q2 2022
Chapel Rd Overbridge
Pedestrian Access to Oval
Canterbury Rd
Garnet St Overbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Q3 2022
Chapel Rd Overbridge
Pedestrian Access to Oval
Beamish St Overbridge
Garnet St Overbridge
Sewer Line Underbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Q4 2022
Beamish St Overbridge
Garnet St Overbridge
Sewer Line Underbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Key
Closure does not impact general traffic
Half lane closure with two direction flow remaining
Half lane closure with one way traffic
Full closure
Weekend/night works only


Q1 2023
Q2 2023
Q3 2023
Q4 2023
Loch St Overbridge
Foord Ave Overbridge
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Sydenham
Key
Closure does not impact general traffic
Half lane closure with two direction flow remaining
Half lane closure with one way traffic
Full closure
Weekend/night works only

SYDENHAM TO BANKSTOWN

ENVIRONMENTAL IMPACT STATEMENT

> Technical Paper 1 – Traffic, transport and access assessment