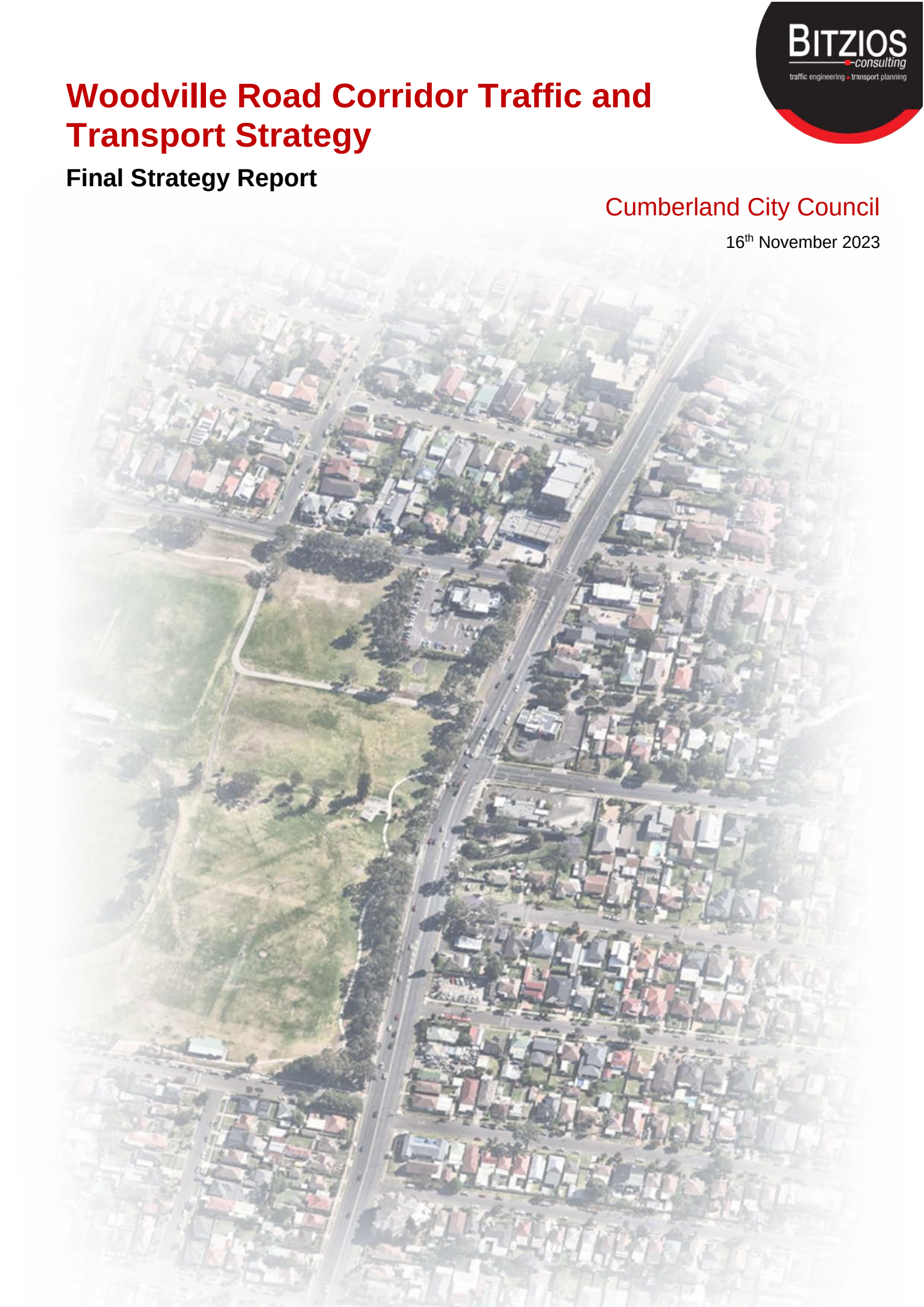
Woodville Road Corridor Traffic and Transport Strategy

Final Strategy Report

Cumberland City Council

16th November 2023



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Document Issue History

Report File Name	Prepared	Reviewed	Issued	Date	Issued to
P5825.001R Woodville Road Corridor Traffic and Transport Strategy Report	M. Shin, R. Jain, J. Yang	A. Grey	J. Yang	08/08/2023	Janine Saab <Janine.saab@cumberland.nsw.gov.au>
P5825.002R Woodville Road Corridor Traffic and Transport Strategy Report	R. Jain, J. Yang	A. Grey	J. Yang	19/09/2023	Janine Saab <Janine.saab@cumberland.nsw.gov.au>
P5825.003R Woodville Road Corridor Traffic and Transport Strategy Report	R. Jain, J. Yang	A. Grey	J. Yang	06/10/2023	Janine Saab <Janine.saab@cumberland.nsw.gov.au>
P5825.004R Woodville Road Corridor Traffic and Transport Strategy Report	R. Jain, J. Yang	A. Grey	J. Yang	13/10/2023	Janine Saab <Janine.saab@cumberland.nsw.gov.au>
P5825.005R Woodville Road Corridor Traffic and Transport Strategy Report	R. Jain, J. Yang	A. Grey	J. Yang	27/10/2023	Matthew Bagshaw <Matthew.Bagshaw@cumberland.nsw.gov.au>
P5825.006R Woodville Road Corridor Traffic and Transport Strategy Report	J. Yang	A. Grey	J. Yang	16/11/2023	Janine Saab <Janine.saab@cumberland.nsw.gov.au>

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1. INTRODUCTION

1.1 Background

Cumberland City Council (Council) engaged Bitzios Consulting to undertake a Traffic and Transport Study (TTS) to support the delivery of the new planning framework for the Woodville Road corridor. This study complements the urban design and land use planning undertaken by CM+ for Council, and aims to identify the major traffic and transport issues, constraints and development opportunities along the corridor.

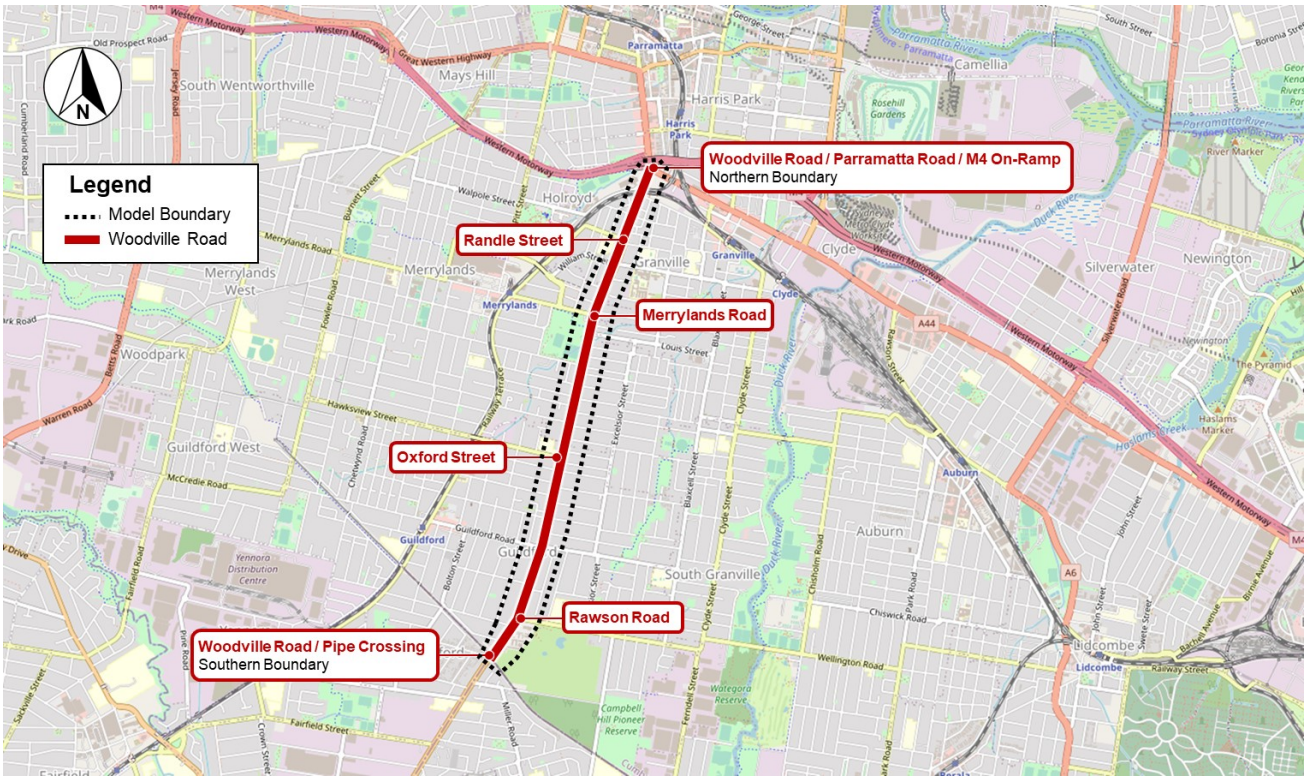
Woodville Road is a six-lane arterial road connecting Hume Highway (in the south near Villawood) with Parramatta Road and the M4 Interchange (in the north near Harris Park). As one of the major north-south arterial roads connecting Parramatta with the surrounding suburbs of the Central River City, Woodville Road services over 40,000 vehicles per day, presenting a challenge to increases in land use density along its length.

Microscopic traffic modelling was undertaken as part of this study to evaluate the traffic and transport implications of the proposed uplift at key sites along the corridor. The findings, outcomes and recommendations in this TTS are intended to be used as a tool to support the ongoing development of the corridor's urban design in line with a consistent vision for the corridor informed by the key planning principles.

1.2 Woodville Road Corridor

The TTS focuses on the 4.3km section of Woodville Road between Parramatta Road and the M4 to the north and the water supply pipe crossing near Springfield Street to the south.

The study area and model boundary are shown in Figure 1.1.



Adapted from OpenStreetMap

Figure 1.1: Model Boundary and Study Area

1.3 Study Objectives

The objectives of this study include:

- Supplement previous work to identify traffic and transport opportunities and constraints for the Woodville Road Corridor
- Evaluate existing and future traffic conditions along the road corridor, highlighting current local pinch points and areas of congestion
- Support the preparation of and provide input into the development of the Woodville Road Corridor Planning Proposal
- Coordinate with the Urban Design team to identify the traffic, transport and parking impacts caused by proposed uplift in key precincts along the road corridor
- Identify any subsequent road infrastructure requirements at key intersections to support the proposed uplift density levels
- Investigate opportunities to improve sustainable transport options along and surrounding the corridor, particularly to and from the key uplift sites, through the recommendation of an integrated transport strategy
- Investigate other opportunities for travel demand management to alleviate private car traffic pressures along the Woodville Road corridor.

1.4 Reference Documents

The following documents were reviewed and inform the traffic modelling and strategy development components of this study:

- Transport for NSW (TfNSW) Traffic Modelling Guidelines (Roads and Maritime, March 2013)
- Transport Advice for Woodville Road Urban Design (GTA Consultants, 2014)
- Draft Woodville Road Planning Strategy (Parramatta City Council, 2016)
- Woodville Road Corridor Early Consultation Submission Summary (Cumberland City Council, 2020)
- Woodville Road Corridor Traffic and Transport Study (SCT Consulting, 2021)
- Scoping Report Woodville Road Corridor (Cumberland City Council, 2022)
- Planning Proposal Woodville Road Corridor (Cumberland City Council, 2022)
- Council Meeting – CLPP Resolution on the Planning Proposal Request for Merrylands East Local Centre (Cumberland City Council, 2022)
- Draft Walking and Cycling Strategy (Cumberland City Council, 2023).

2. CORRIDOR CONTEXT

2.1 Strategic Context

2.1.1 Metropolis of Three Cities

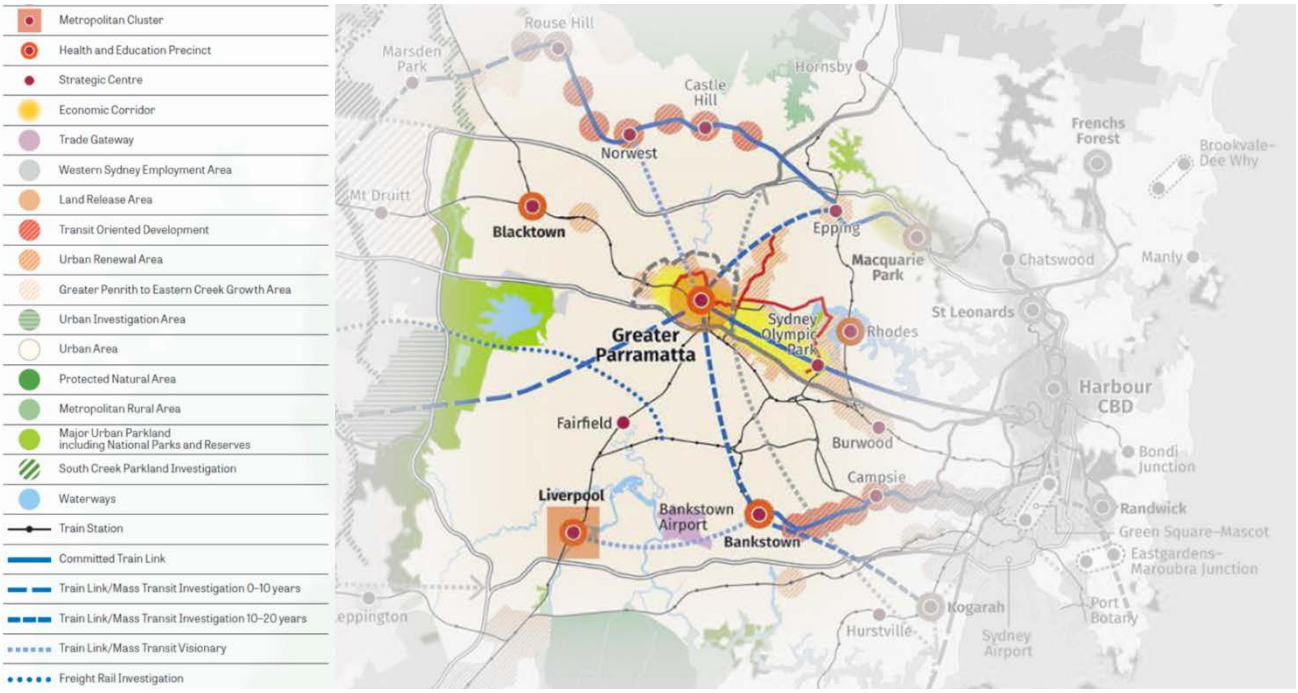
The Greater Sydney Region Plan – A Metropolis of Three Cities describes the current metropolitan strategy for Greater Sydney. The Plan builds on a vision of three major cities across Sydney to meet the needs of a growing and changing population:

- The Western Parkland City
- The Central River City
- The Eastern Harbour City.

The Plan aims to align new infrastructure projects with the distribution of growth across the three cities, including the development of the Central River City through an investment in new infrastructure and services to improve the region-wide population amenity. The Central River City is geographically centred on the Metropolitan Centre of Greater Parramatta, with links to nearby strategic centres like Fairfield and the Sydney Olympic Park.

One of the core elements of the Greater Sydney Region Plan is the realisation of a '30-minute city', where the interconnectivity of transport systems allows for people to move between home, work, schools and services within a 30-minute catchment.

The Central River City extents and the surrounding key metropolitan and strategic centres are shown in Figure 2.1.



Source: Greater Sydney Region Plan (Greater Sydney Commission, 2018)

Figure 2.1: Central River City Extents

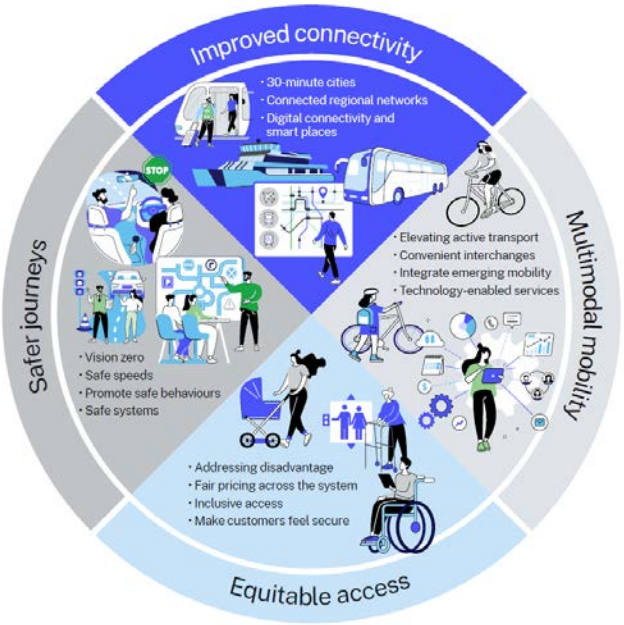
The Woodville Road Corridor is the main arterial connection between Parramatta CBD and Fairfield and Liverpool which highlights its importance to the Central River City in facilitating a connected and efficient transport network.

2.1.2 Future Transport Strategy (updated Future Transport 2056)

TfNSW first released Future Transport 2056: Shaping the Future in 2018 to plot the direction for NSW transport systems over the next 40-year period. The strategy was recently updated in 2022 to reflect the social and economic changes wrought by recent health and environmental events, most notably being the COVID-19 pandemic. As a result of these, traffic and transport patterns saw a drastic shift due to behavioural changes in how we work, learn and shop – the primary drivers of daily travel.

The Future Transport Strategy outlines a multi-modal approach to managing transport and a vision for investment, services and transport policy in NSW based on three (3) key outcomes:

- Connecting our customers' whole lives
- Successful places for communities
- Enabling economic activity.



The transport strategy aligns with the Metropolis of Three Cities, exploring the means of facilitating a 30-minute connection via sustainable travel modes between jobs, housing, health care and social connections.

The development of the Woodville Road Planning Framework has considered the strategic directions of the Future Transport Strategy, with a focus on but not limited to:

- *Enhancing the 30-minute metropolitan city* due to the close proximity to Parramatta CBD
- *Supporting car-free, active and sustainable transport options* for all uplift sites and roadside environments to ensure transport-orientated urban design
- *Facilitating efficient freight connectivity and access* by maintaining optimal traffic performance along the corridor
- *Improving the safety of people walking and cycling* by providing active transport infrastructure to support the uplift and existing areas
- *Improving parking provision and management* by reviewing and evaluating parking rates across the study area
- *Supporting thriving and healthy 15-minute neighbourhoods* through coordination between the traffic and urban design components of the framework
- *Improving the amenity of places along State Roads* like the Woodville Road corridor
- *Improving the use and efficiency of our roads through road space allocation* by exploring improved road layouts as part of the uplift scenario modelling.

2.1.3 TfNSW Road User Space Allocation

The TfNSW Road User Space Allocation policy outlines the physical and temporary allocation of road user space safely and equitably, including bicycle riders and pedestrians.

The main objectives of the policy aim to support the movement of people, goods, and place, summarised below:

- Consideration of Place and Movement function requirements of all roads
- Alignment to the outcomes of state-wide, metropolitan, and regional plans and strategies
- Commitment to achieving a Movement and Place vision for a corridor or network
- Implementing measures over time to achieve the strategic intent and outcomes of long-term regional planning
- Tracking how road space allocation principles are being implemented against the strategic intent and outcomes.

The strategies of implementing this policy include:

- Establishing a network vision and primary road functions
- Reimagining the road user space allocations with consideration of the following priority order:
  - Walking
  - Cycling
  - Public transport
  - Freight and deliveries
  - Private motorised transport.
- Ensuring alignment and consistency with the local Movement and Place context.

These principles and aims generally define the approach to which the Woodville Road Corridor is explored as a part of this study, with a target of:

- Achieving an alleviation in private vehicle traffic pressures through a reduction in trips in built-up areas
- Avoiding (if possible) an overall increase in general traffic lanes for private vehicles
- Avoiding the reduction of access of people of abilities to a place or service (where reasonably practicable and feasible).

2.1.4 Movement and Place Framework

The Movement and Place Framework is a toolkit to help plan, design, deliver and operate transport networks and areas around them. It allows the analysis of built environments based on the following functions:

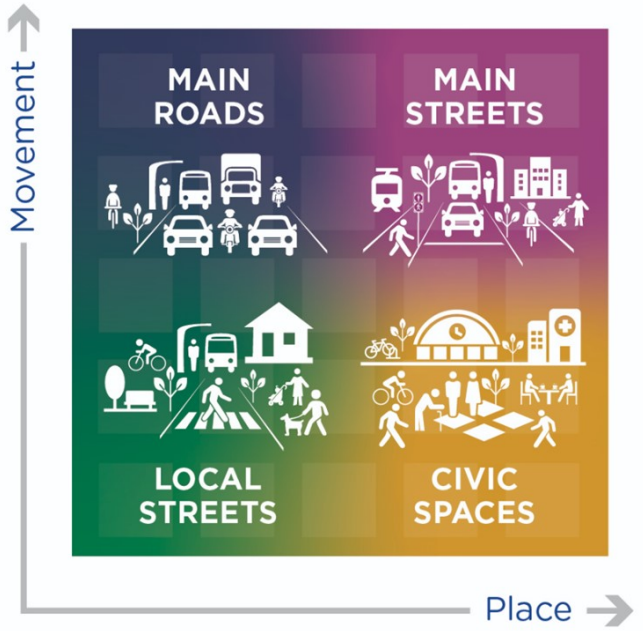
- **Movement**: Aspects of built environment enabling access to and providing connection with 'Place', as well as providing efficient delivery of goods and services
- **Place**: Spaces attracting / generating trips for a variety of purposes e.g. leisure and recreation, employment, education.

The Movement and Place Framework defines four (4) street environments based on the combination of the 'Movement' and 'Place' functions:

- **Civic Spaces**: Serve as the "heart of our communities and have a significant meaning, activity function or built environment"
- **Local Streets**: "They often have important local place qualities. Activity levels are less intense than for civic spaces, but these streets can have significant meaning to local people"

- **Main Streets**: “These streets are some of the most vibrant places in our cities and towns. They have both significant movement functions and place qualities. Balancing the function of these streets is a common challenge.”
- **Main Roads**: “These roads and routes are central to the efficient movement of people and goods. These roads and routes can have significant meaning to local people”.

The combination of the levels of ‘Movement’ and ‘Place’ function associated with these street environments is provided in Figure 2.2.



Source (left): Movement and Place, Identifying Street Environments (NSW Government, 2023)

Figure 2.2: Identification of Street Environments

To apply a Movement and Place approach, the following six step process must be undertaken:

- Establish the project scope, vision and objectives
- Understand the Place qualities of the area
- Understand the Movement demands of the area
- Overlay Place and Movement and identify the conflicts, issues and opportunities
- Develop options
- Select the preferred option.

A high-level application of the Movement and Place framework can be used to approach the vision of the corridor as simultaneously being a high-quality Movement corridor with the desire for heightened Place qualities at certain key precincts. The corridor ranges from functioning as a ‘Main Road’ to ‘Main Street’ within each of the key precincts.

It is noted that as this corridor study is prepared with a traffic and transport perspective, it did not comprise a ‘complete’ Movement and Place assessment which would otherwise require multi-disciplinary input from social, cultural, environmental and economic agencies. However, the development of an understanding of the changing Movement and Place characteristics along the corridor supported the identification of key conflict areas and informed the study’s strategic approach.

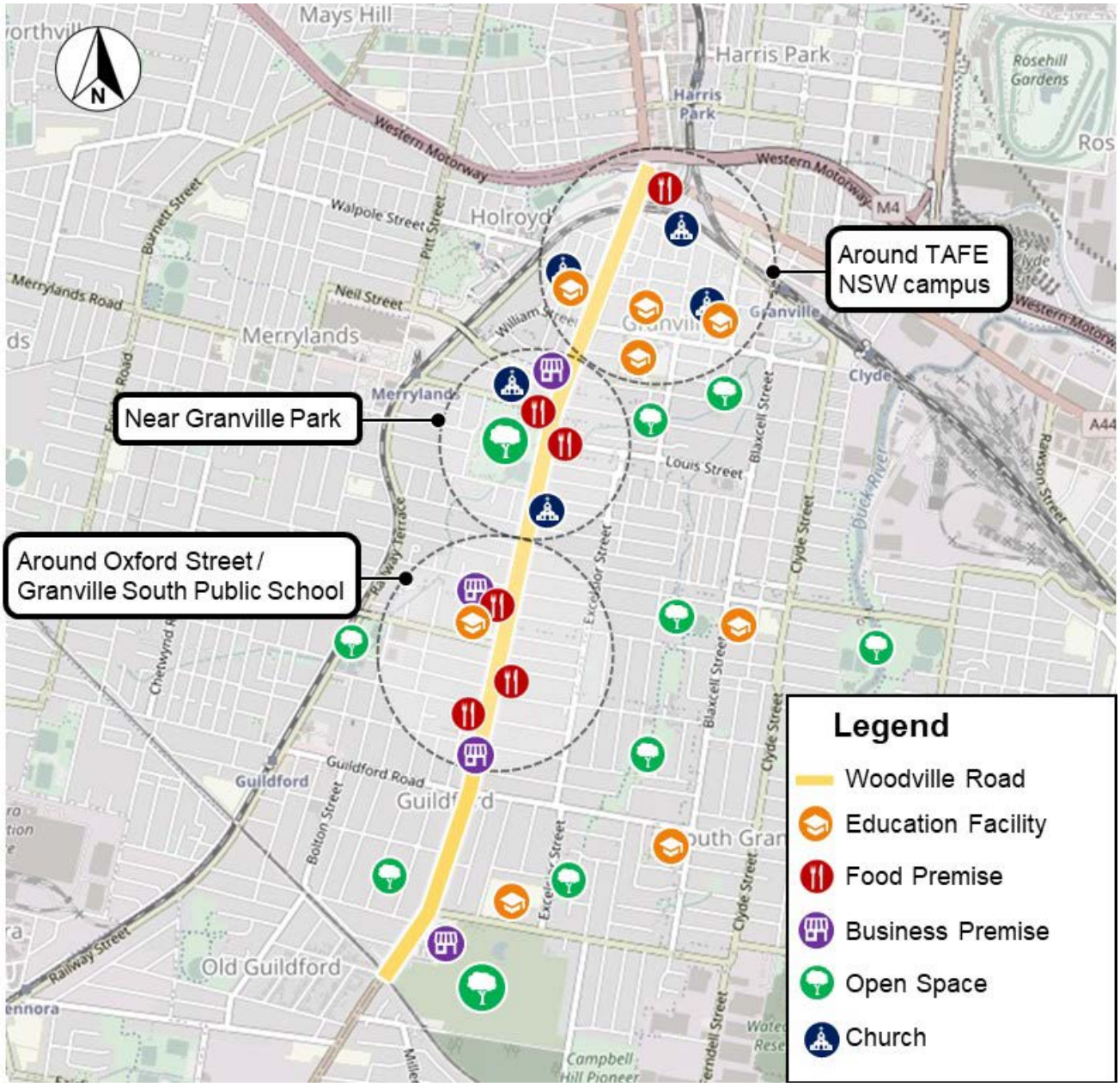
2.2 Corridor Characteristics

2.2.1 Corridor Road Environment

Woodville Road is the primary north-south arterial road servicing the surrounding region, functioning as a movement corridor for high-speed regional traffic. However, there are a number of points of interest along the corridor including parks, fast food restaurants and cafes, retail, schools and churches. These are generally concentrated in a few areas:

- Around the Granville TAFE NSW campus
- Near Granville Park
- Around Oxford Street and Granville South Public School.

The road environment and points of interest along the Woodville Road Corridor are highlighted in Figure 2.3.



Adapted from OpenStreetMap

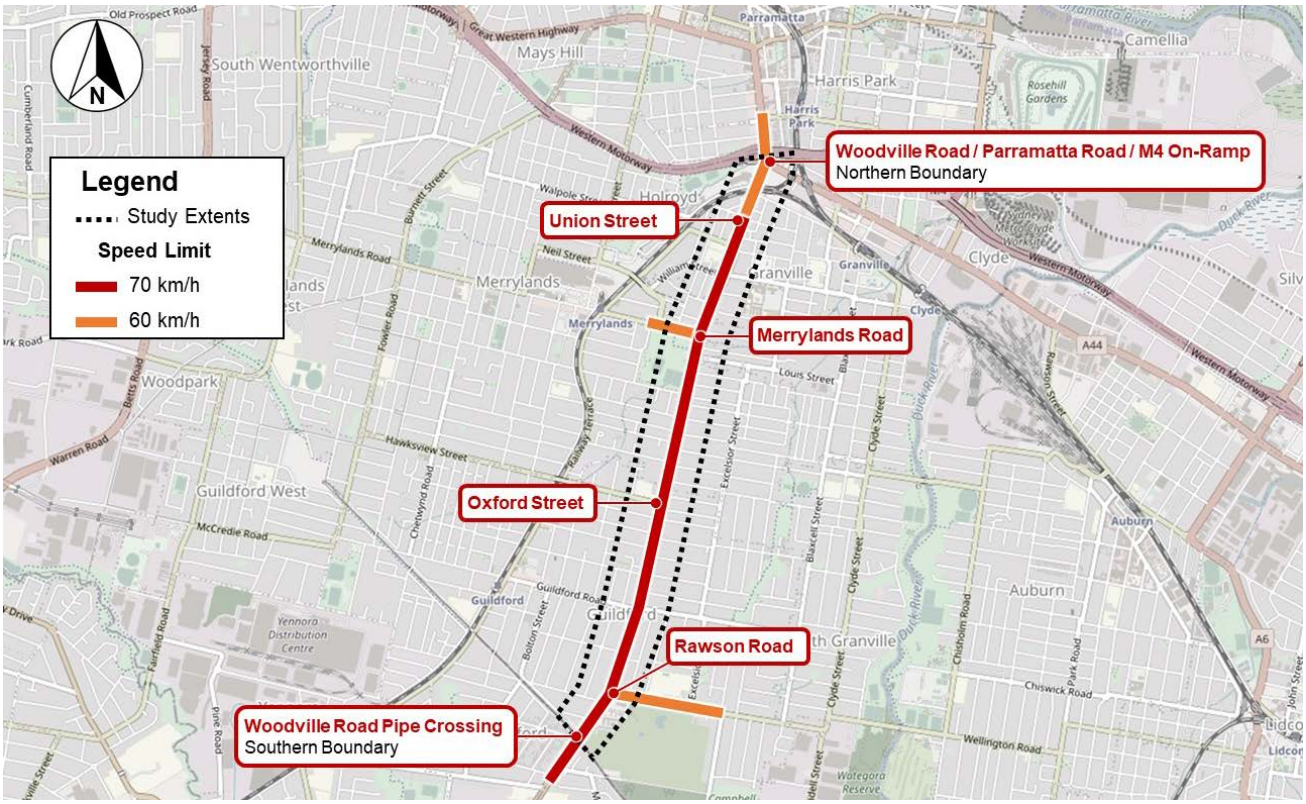
Figure 2.3: Woodville Road Corridor – Existing Road Environment

2.2.2 Existing Speed Limits

The speed limits of the road network within the study area can be described as following:

- 70 km/h – Woodville Road south of Union Street
- 60 km/h – Woodville Road north of Union Street, Merrylands Road and Rawson Road
- 50 km/h – all other roads.

The notable speed limits of roads within the study area are shown in Figure 2.4.



Adapted from OpenStreetMap

Figure 2.4: Road Network – Speed Limits

2.2.3 School Zones

Four (4) school zones are located within close proximity to the Woodville Road Corridor for the following schools:

- Delany College
- Granville Public School
- Granville South Public School
- Granville South Creative Performing Arts High School.

These school zones are 40km/h speed limit areas, operating between:

- 8:00AM and 9:30AM in the morning
- 2:30PM and 4:00PM in the afternoon.

The school zone for the Granville South Public School includes a 400m section of Woodville Road between Woodstock Street and Kimberley Street.

2.2.4 Public Transport

The study area is serviced by four (4) public bus routes and 13 school bus routes, operated by Transdev NSW. Bus routes and service frequencies during the modelled periods are summarised in Table 2.1. All bus timetable and stop information were obtained from transoportnsw.info in November 2022.

Table 2.1: Public Bus Services

Route No.	Route Description	Departure Times	
		AM	PM
Public Buses			
M91	Hurstville to Parramatta via Padstow & Chester Hill	7:36AM, 7:43AM, 7:51AM, 7:54AM, 8:01AM, 8:04AM, 8:06AM, 8:11AM, 8:16AM, 8:25AM, 8:29AM, 8:39AM, 8:49AM, 8:55AM, 8:59AM, 9:05AM, 9:11AM, 9:15AM, 9:19AM, 9:25AM, 9:29AM	4:12PM, 4:22PM, 4:32PM, 4:42PM, 4:54PM, 5:04PM, 5:14PM, 5:24PM, 5:32PM, 5:41PM, 5:51PM
	Parramatta to Hurstville via Chester Hill & Padstow	7:35AM, 7:45AM, 7:55AM, 8:05AM, 8:15AM, 8:25AM, 8:35AM, 8:45AM, 8:55AM, 9:04AM, 9:19AM	4:04PM, 4:14PM, 4:24PM, 4:34PM, 4:44PM, 4:54PM, 5:04PM, 5:14PM, 5:24PM, 5:34PM, 5:44PM, 5:54PM
906	Fairfield to Parramatta	7:37AM, 8:07AM, 8:37AM, 9:07AM	4:14PM, 4:57PM, 5:27PM, 5:57PM
	Parramatta to Fairfield	7:56AM, 8:26AM, 8:56AM, 9:26AM	4:15PM, 4:45PM, 5:15PM, 5:45PM
907	Bankstown to Parramatta via Bass Hill	7:37AM, 7:52AM, 8:12AM, 8:32AM, 8:52AM, 9:22AM	4:19PM, 4:39PM, 4:59PM, 5:19PM, 5:39PM, 5:59PM
	Parramatta to Bankstown via Bass Hill	7:49AM, 8:14AM, 8:34AM, 8:54AM, 9:24AM	4:04PM, 4:24PM, 4:39PM, 4:59PM, 5:19PM, 5:39PM, 5:59PM
908	Bankstown to Merrylands Birrong & Auburn	7:37AM, 8:12AM, 8:45AM	4:15PM, 5:30PM
	Merrylands to Bankstown via Birrong & Auburn	7:53AM, 8:37AM, 9:07AM	4:37PM, 5:47PM
School Buses			
S426	Normanby St before Tangerine St, Fairfield East to Our Lady of Lebanon	7:30AM	No Service
S432	Old Guildford PS to Holy Trinity PS	8:22AM	No Service
S435	Donald St at Orchardleigh St, Guildford to Our Lady of Lebanon	7:31AM	No Service

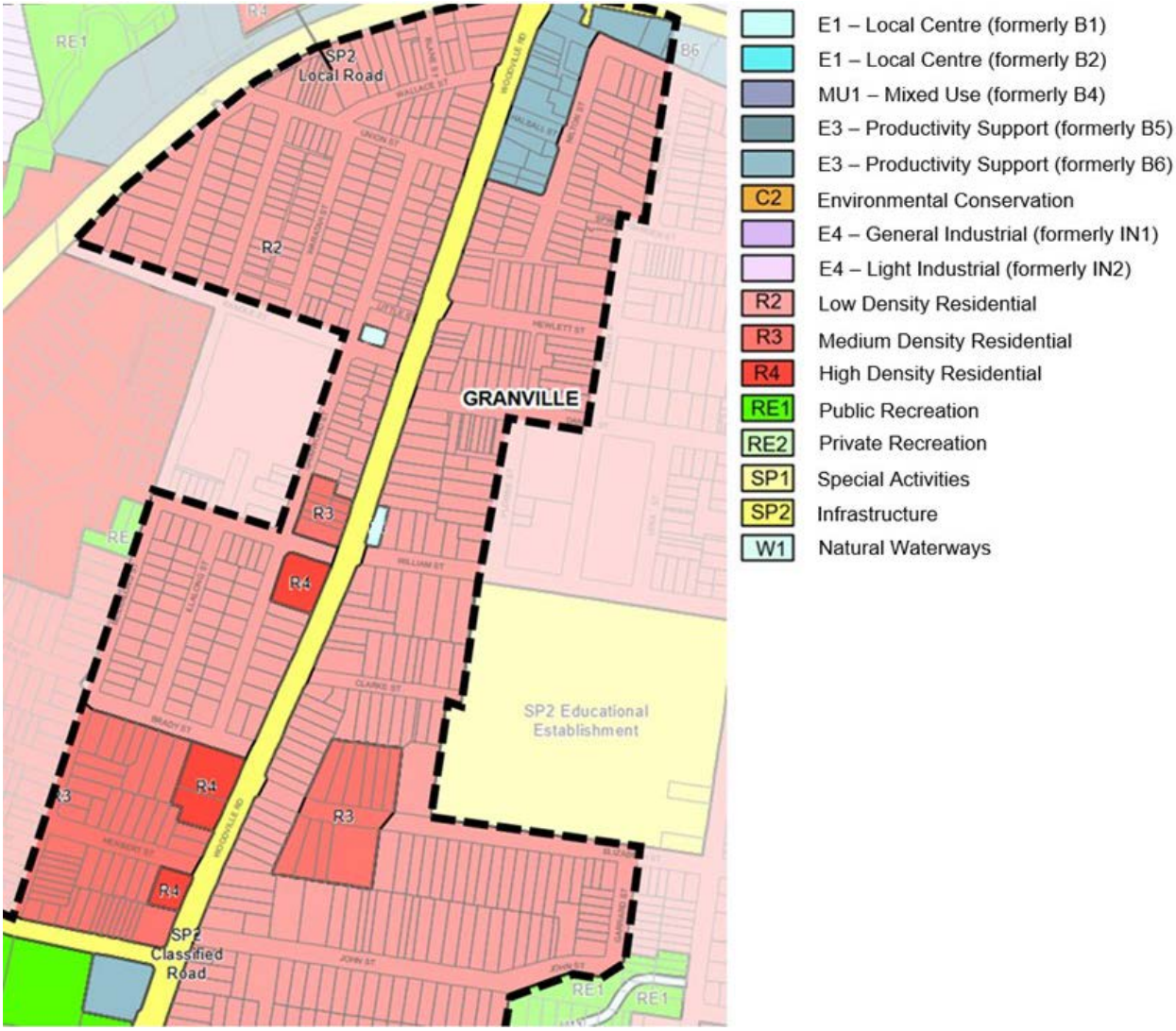
Route No.	Route Description	Departure Times	
		AM	PM
S440	Granville Station to Merrylands HS	8:18AM	No Service
S443	Granville PS to Delany College via South Granville	8:22AM	No Service
S447	Broughton St after Shackel Av, Old Guildford to Our Lady of Lebanon	7:47AM	No Service
S567	Amity College to Bridge St at New St E, Lidcombe via Auburn	No Service	4:17PM
S570	Amity College to Lidbury St before Park Rd, Berala via Auburn	No Service	4:17PM
S577	Guildford Station to Blackcell Street PS	8:30AM	No Service
S579	Guildford Station to Kingsland Rd before Wilga St via Auburn	7:42AM	No Service
S581	Kingsland Rd before Wyatt Av Regents Park to Guildford Station	No Service	4:24PM
S582	Guildford Station to Malek Fahd School via South Granville	7:36AM	No Service
S584	Malek Fahd School to Guildford Station	No Service	4:24PM

2.3 Existing Land Use of the Key Precincts

2.3.1 Woodville North Precinct

The Woodville North Precinct is predominantly a residential area under the current land zoning, and is located at a gateway location providing key access to Parramatta CBD and major road networks. The northern section of the precinct includes a few E3 Productivity Support lots on the east side of Woodville Road, with the remainder of the precinct primarily a range of R2 Low Density to R4 High Density residential zones. Lot density increases on the southern side of the precinct near Merrylands Road, near Granville Park.

The existing land zoning of Woodville North Precinct is shown in Figure 2.5.



Source: Cumberland Local Environmental Plan 2021 (Department of Planning and Environment)

Figure 2.5: Woodville North Precinct Land Zoning Map

2.3.2 Merrylands East Precinct

The Merrylands East Precinct is situated at the centre of the corridor and is currently characterised as the Local Centre for the study area. The precinct has a E1 – Local Centre (formerly B2) on the where the existing Monster Furniture Depot is located, with nearby land zoned for E3 Productivity Support (Formerly B6) with supporting retail and business services.

At the centre of the Merrylands East Precinct around Oxford Street and Lansdowne Street, land use on the frontage to the corridor is predominantly commercial or high-density residential, with transition to lower density residential further to the north and south.

The existing land zoning of Merrylands East Precinct is shown in Figure 2.6.

Source: Cumberland Local Environmental Plan 2021 (Department of Planning and Environment)

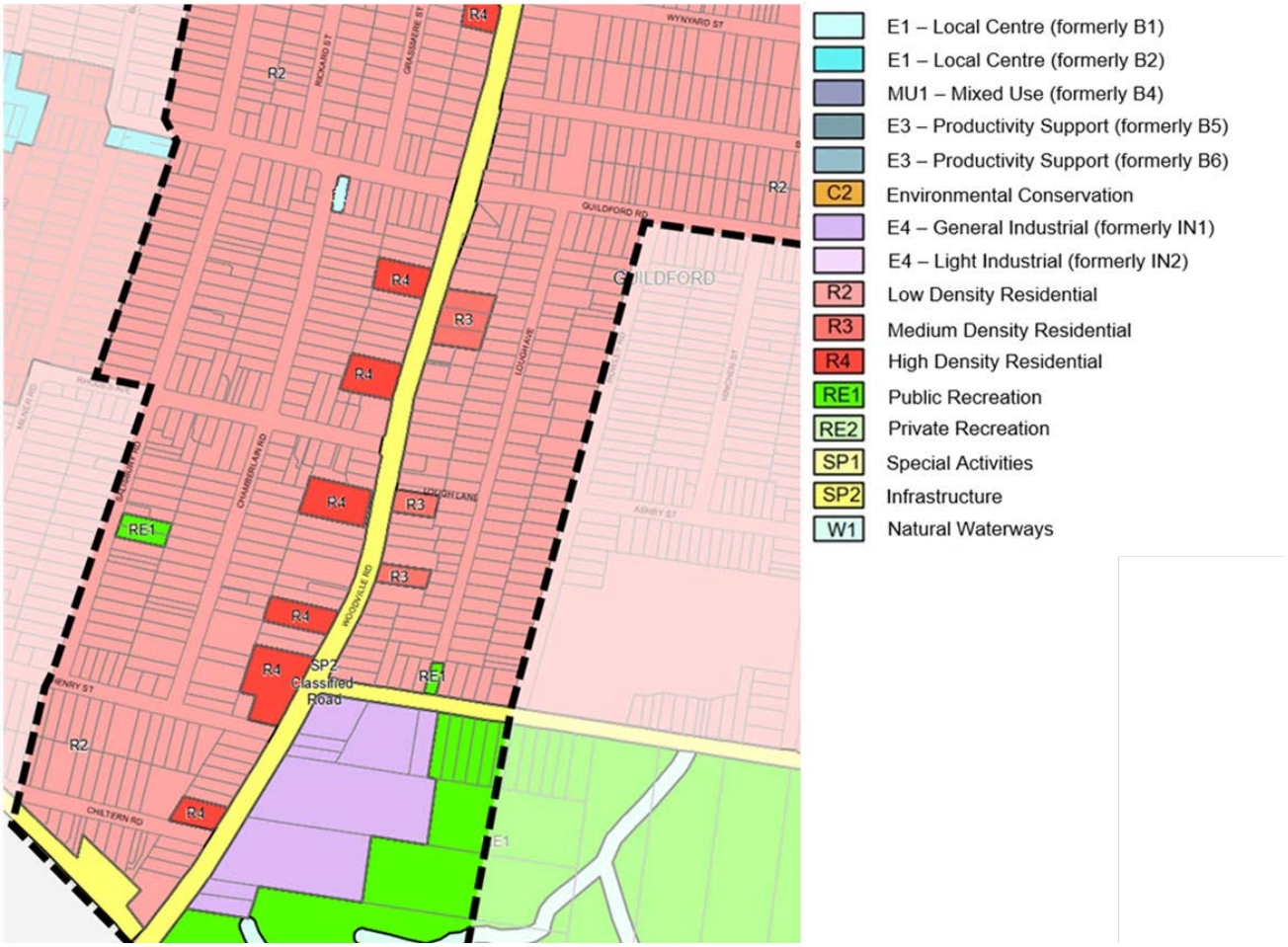
Figure 2.6: Merrylands East Precinct Land Zoning Map

2.3.3 Woodville South Precinct

The Woodville South Precinct is predominantly a residential area under the existing land use. The majority of the lots fronting the corridor are R2 Low Density to R4 High Density residential, with some larger high-density lots on the western side of Woodville Road.

On the south-east side of the Woodville Road / Rawson Street intersection, there is an E4 General Industrial sub-precinct bordering the Woodville Golf Course.

The existing land zoning of Woodville South Precinct is shown in Figure 2.7.



Source: Cumberland Local Environmental Plan 2021 (Department of Planning and Environment)

Figure 2.7: Woodville South Precinct Land Zoning Map

2.4 Existing Corridor Challenges and Opportunities

The existing challenges and opportunities along the Woodville Road Corridor are summarised below in Table 2.2.

Table 2.2: Challenges and Opportunities for the Woodville Road Corridor

Challenges	Opportunities
Traffic Network and Performance	
▪ Limited right-turning opportunities along the Woodville Road, particularly for southbound traffic. The first opportunity for southbound traffic is at Merrylands Roads (approximately 1.3km from the M4 interchange) ▪ Long right-turn bays up to 200-300m long on Woodville Road are inefficiently catering for the high right turning demands. ▪ Extensive queueing on the side streets like Oxford Street where drivers may have to potentially wait for multiple traffic light cycles	▪ Optimise signal phasing at signalised intersections to better accommodate traffic movements ▪ New signalised intersections to increase turning opportunities on/off Woodville Road ▪ Increase right turn capacity at major signalised intersections with additional right-turn bays ▪ Additional intersection capacity through the implementation of peak hour parking restrictions ▪ Encourage use of alternative transport modes (e.g. cycling) to discourage short-distance private vehicle trips with safe and comfortable off-road cycle routes
Walking	
▪ While a cohesive footpath network is provided along the Woodville Road Corridor, there are limited crossing facilities with some crossing facilities spaced at 0.6km-1km particularly in the Woodville South Precinct and Merrylands East Precinct.	▪ Increase pedestrian crossing facilities at existing signalised intersection or provide new signalised intersections/mid-block crossings ▪ Public domain improvements to improve attractiveness of walking along and across the corridor
Cycling	
▪ Lack of continuous and consistent cycle routes connecting allowing for east-west movements across the Woodville Road, effectively resulting in a disjointed network with isolated cycling paths. ▪ Insufficient crossing facilities to allow cyclists to safely cross Woodville Road ▪ Some cycle routes include on-road mixed traffic routes (such as on Guildford Road) which see relatively high traffic volumes, thus raising safety concerns ▪ Some on-road cycle routes transition into parking lanes (such as on Merrylands Road), thus creating confusion on the extent cycling route.	▪ New safe and comfortable cycle routes within the Woodville Road Corridor with connections provided to nearby and existing cycling network ▪ Provide separated and dedicated cycling infrastructure through public domain improvements ▪ 'Capture' the new traffic demand for uplift sites to establish travel patterns for the new demographic ▪ Appropriate signage and/or line marking clearly indicating the provided cycling facility ▪ Upgrade existing or provide new signalised intersections with shared crossings (wider crossings and kerb ramps with cyclist signal lanterns).
Public Transport	
▪ Limited route choice for bus services along the Woodville Road corridor; the corridor is only directly serviced by a single bus service with mostly in-lane bus stops ▪ The east-west services interfacing with the corridor are concentrated on the major side roads like Guildford Road and William Street, increasing traffic pressures and affecting travel time reliability of services. ▪ Train stations are nearby, but generally just outside of a comfortable walking distance.	▪ Provide and strengthen active transport corridors to the major transport hubs (e.g. Merrylands, Guildford and Granville train stations). ▪ Increase peak hour service frequencies to improve wait times for the public transport options ▪ Explore options for new routes, particularly in the east-west direction, as a result of addressing and aligning with development transport needs ▪ Add new or relocate existing bus stops to be better positioned to service the new uplift sites.

3. PLANNING PRINCIPLES

3.1 Urban Design Masterplan

3.1.1 Overview

CM+ has recently developed an urban design study for the Woodville Road Corridor (WRC) to support the development of the planning framework for future residential and business development within the WRC by providing an appropriate structure plan strategy. Development of the structure plan strategy was guided by the urban design vision and principles outlined in the *Cumberland 2030: Our Local Strategic Planning Statement (LSPS)* which envisions renewal opportunities for the WRC to enhance its amenity and development complimenting the existing network of town centres.

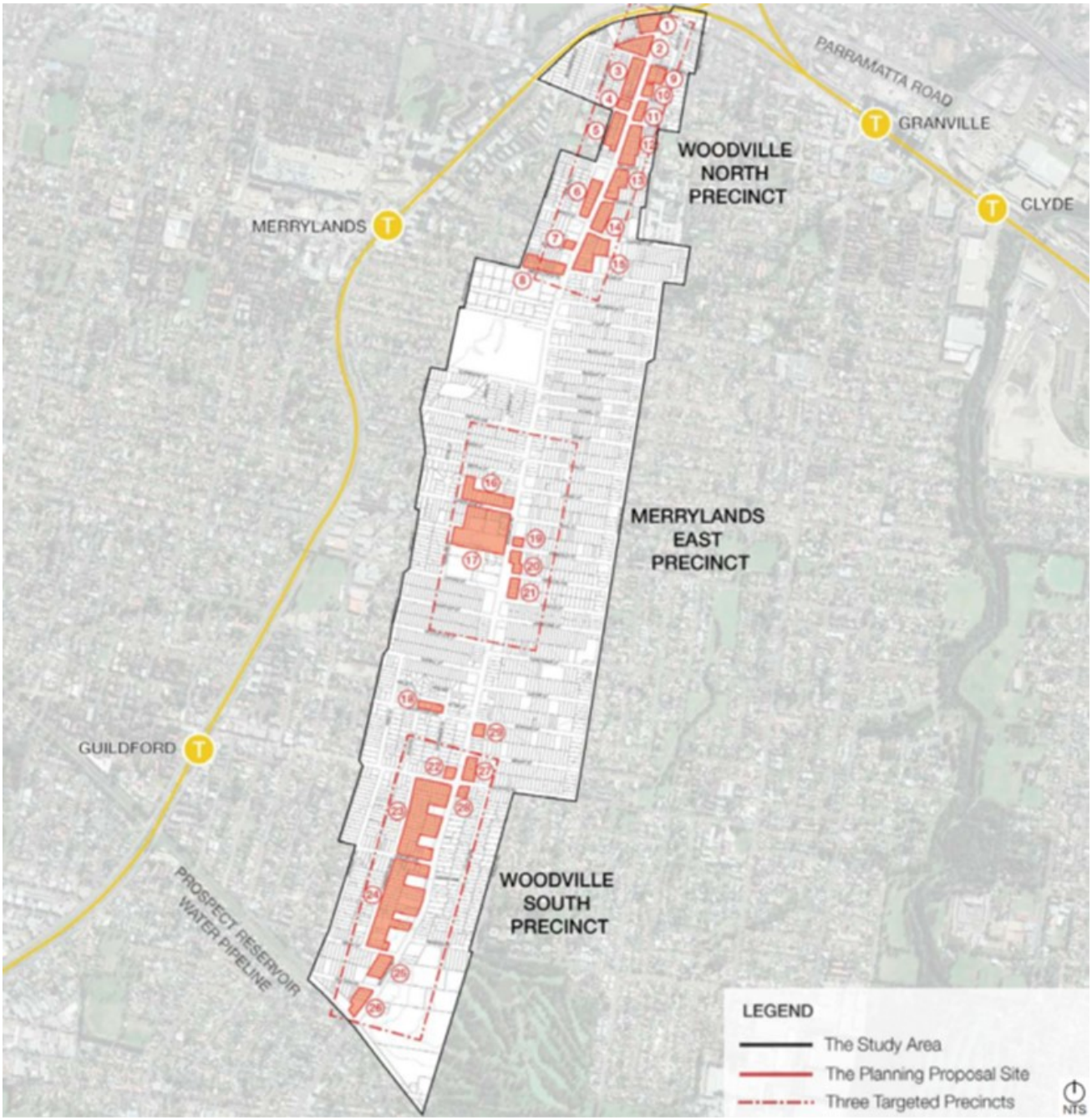
The *LSPS* has outlined various transport planning principles which inform the strategic aim of the Urban Design Masterplan's development of the three target precincts. These transport planning include:

- Improve active transport:
  - Improve walking and cycling facilities for safe and comfortable active transport mode use
  - Enhance pedestrian safety and amenity with more vibrant and pedestrian-friendly street spaces
  - Improved permeability of study area to support east-west and north-south pedestrian movements to enhance pedestrian activity at the street level
- Improve public transport:
  - Enhance accessibility to public transport facilities
  - Prioritise investment in public transport initiatives to realise 30-minute city
- Less dependency on private vehicle:
  - Promote and enhance alternative transport options to help achieve a multi-modal network
  - Reduce car park spaces to encourage shifts towards alternative and sustainable modes of transport.

The structure plan strategy selected for the WRC is the 'Spine with Three Centres' where three target precincts along Woodville Road, comprising a total of 29 planning proposal sites, have been identified to provide urban renewal opportunities and uplift development to cater for future residential and employment growth:

- Woodville North Precinct
- Merrylands East Precinct
- Woodville South Precinct.

The location and extent of the target precincts are shown below in Figure 3.1.



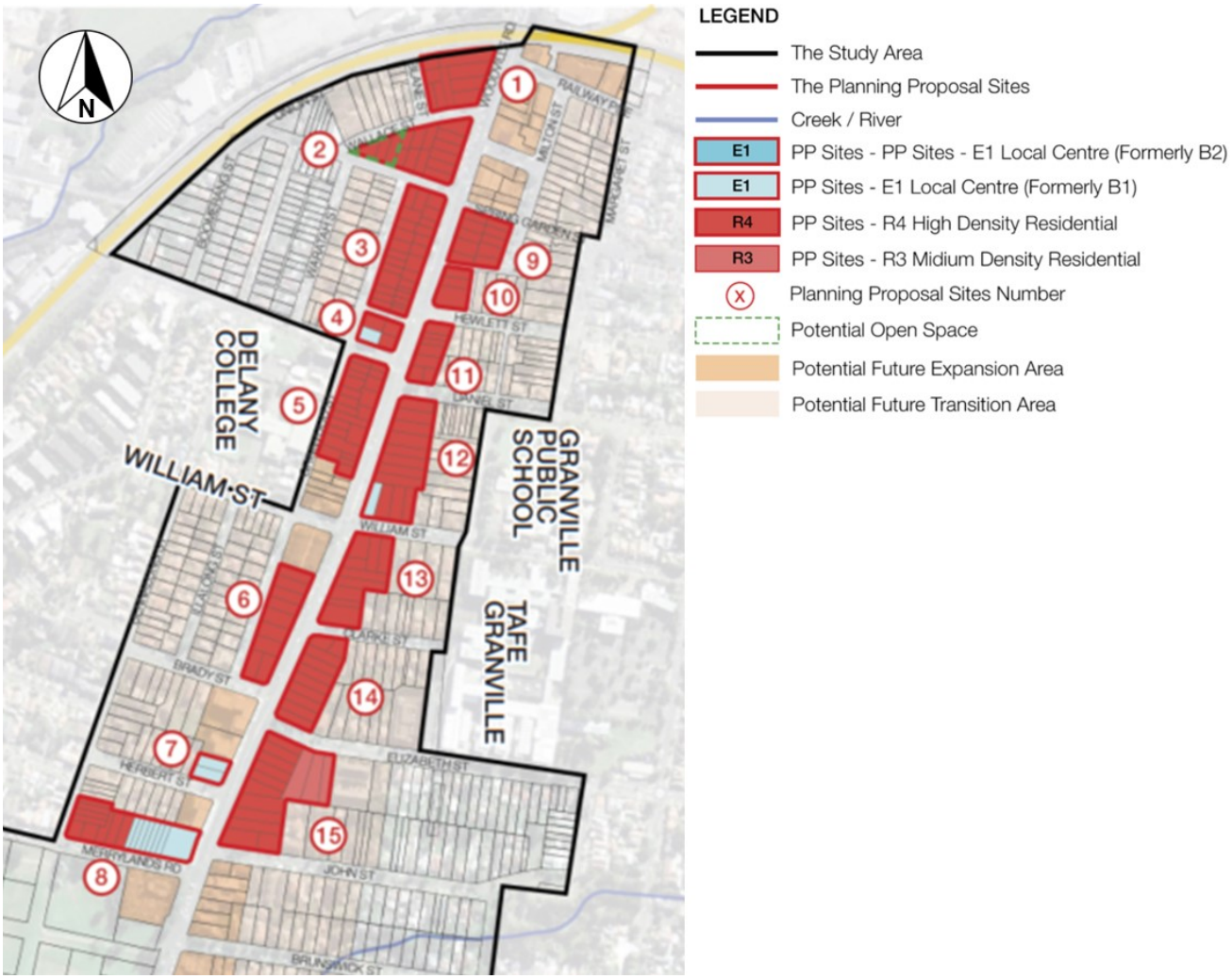
Source: CM+ Woodville Road Corridor Planning Framework Urban Design Report – Stages 1+2 Report (CM+, 2023)

Figure 3.1: Three Target Precincts – Woodville Road Corridor

3.1.2 Woodville North Precinct

The Woodville North Precinct comprises 15 of 29 key sites. The planned uplift in the Woodville North Precinct is noted to be primarily residential in nature, with a relatively small allocation of land for ancillary retail and commercial facilities near Merrylands Road. The Masterplan aims to realise the benefits of greater access to open spaces, local spaces and public transport facilities within this precinct, with heightened levels of importance due to its close proximity to the Parramatta CBD. Due to the spread of the precinct sites along Woodville Road and away from Granville Park, the Masterplan aims to deliver new open spaces.

The proposed land zoning for the Woodville North Precinct is shown in Figure 3.2.



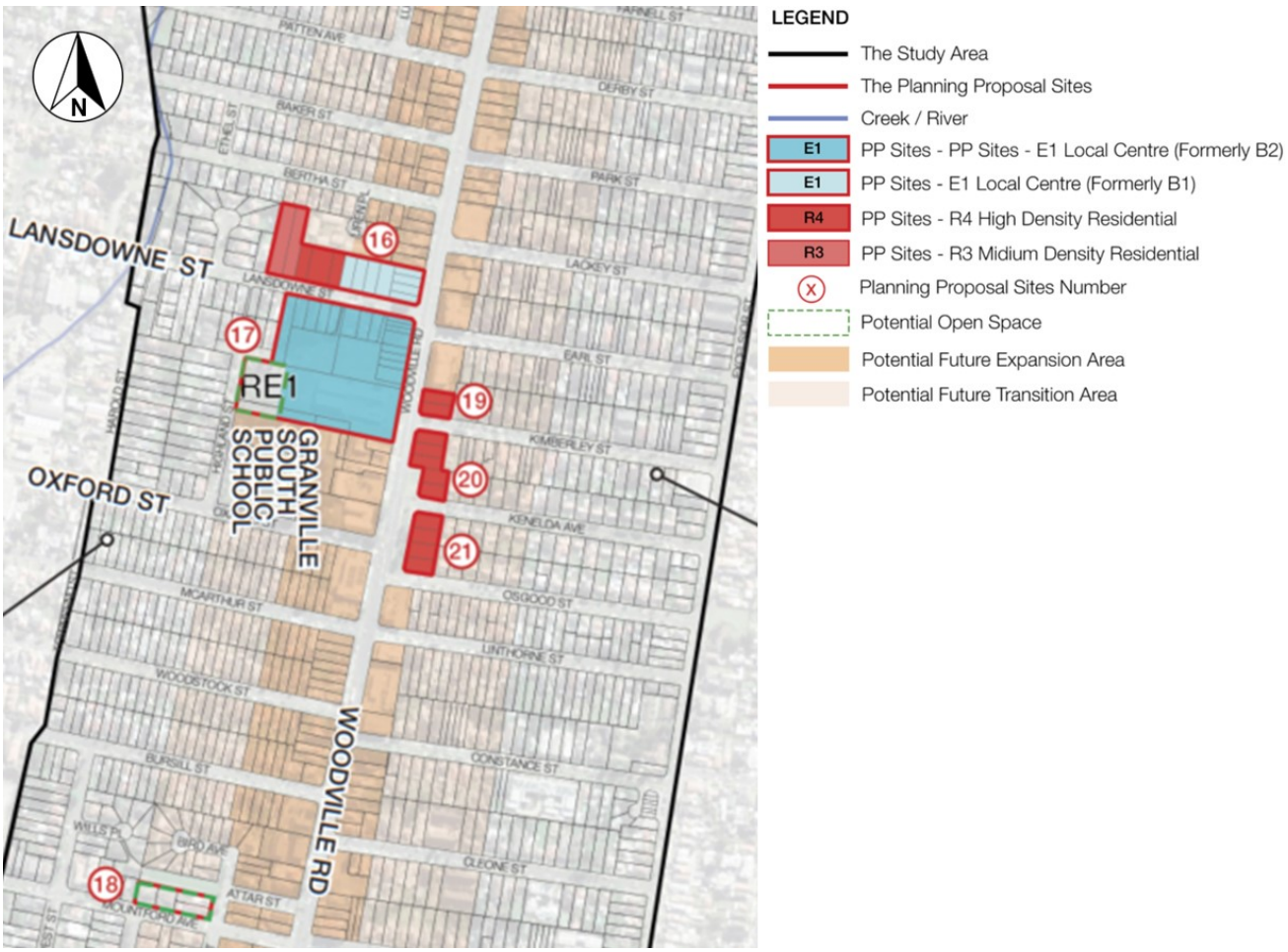
Source: Draft Woodville Road Corridor Urban Design Report (CM+, 2023)

Figure 3.2: Proposed Woodville North Precinct Land Zoning Map

3.1.3 Merrylands East Precinct

The Merrylands East Precinct comprises six (6) of 29 key sites. The planned uplift in the Merrylands East Precinct is noted to comprise significant levels of both residential and retail/commercial growth. The core of this precinct is the Merrylands East Local Centre, previously known as the John Cootes site, located at Site 17 which is aimed to provide a new neighbourhood centre with an attractive place for a mix of retail, social and business activities.

The proposed land zoning for the Merrylands East Precinct is shown in Figure 3.3.



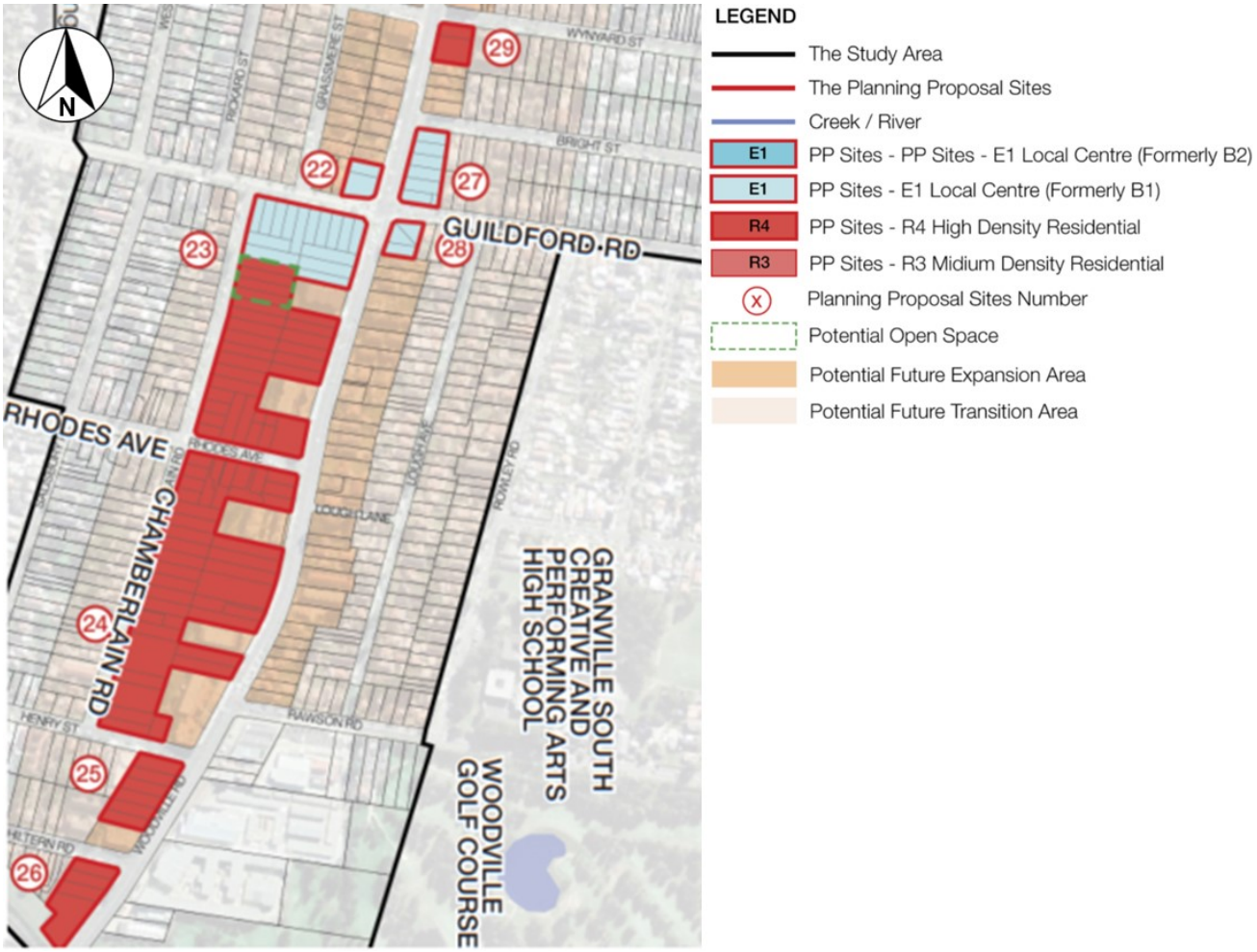
Source: Draft Woodville Road Corridor Urban Design Report (CM+, 2023)

Figure 3.3: Proposed Merrylands East Precinct Land Zoning Map

3.1.4 Woodville South Precinct

The Woodville South Precinct comprises eight (8) of 29 key sites. The planned uplift in the Woodville South Precinct is divided between both residential and retail/commercial growth. There is a moderate amount of growth for retail/commercial land use, with a neighbourhood centre located around the intersection of Woodville Road and Guildford Road. It is anticipated that the area would be characterised by mixed-use buildings and new open spaces. These mixed-use building would include ground-level food retail like restaurants and cafés, as well as some commercial offices; however, it is noted that specifics on tenancies will be determined at a later stage.

The proposed land zoning for the Woodville South Precinct is shown in Figure 3.4.



Source: Draft Woodville Road Corridor Urban Design Report (CM+, 2023)

Figure 3.4: Proposed Woodville South Precinct Land Zoning Map

3.2 Transport Planning Principles

The *LSPS* has outlined various transport planning principles which inform the strategic aim of the Urban Design Masterplan's development of the three target precincts. These transport planning principles can be categorised into the following three types:

- Improving active transport:
  - Improve walking and cycling facilities for safe and comfortable active transport mode use
  - Enhance pedestrian safety and amenity with more vibrant and pedestrian-friendly street spaces
  - Improved permeability of study area to support east-west and north-south pedestrian movements to enhance pedestrian activity at the street level.
- Improving public transport:
  - Enhance accessibility to public transport facilities
  - Prioritise investment in public transport initiatives to realise 30-minute city.
- Facilitating less dependency on private vehicles:
  - Promote and enhance alternative transport options to help achieve a multi-modal network
  - Reduce car park spaces to encourage shifts towards alternative and sustainable modes of transport.

4. CORRIDOR MODEL DEVELOPMENT

4.1 Base Model

4.1.1 Model Extents

The 2022 traffic model was developed in AIMSUN to reflect an up-to-date road network, with the network coding checked, updated and refined to accurately resemble the geometric road layouts from satellite imagery and as observed during a site inspection.

Detailed intersection geometries were coded for all traffic signals, roundabouts, and priority-controlled intersections within the model boundary, including lanes, lane allocations, turn restrictions, and turning bay lengths.

The modelled road network with the assigned road types is shown in Figure 4.1.

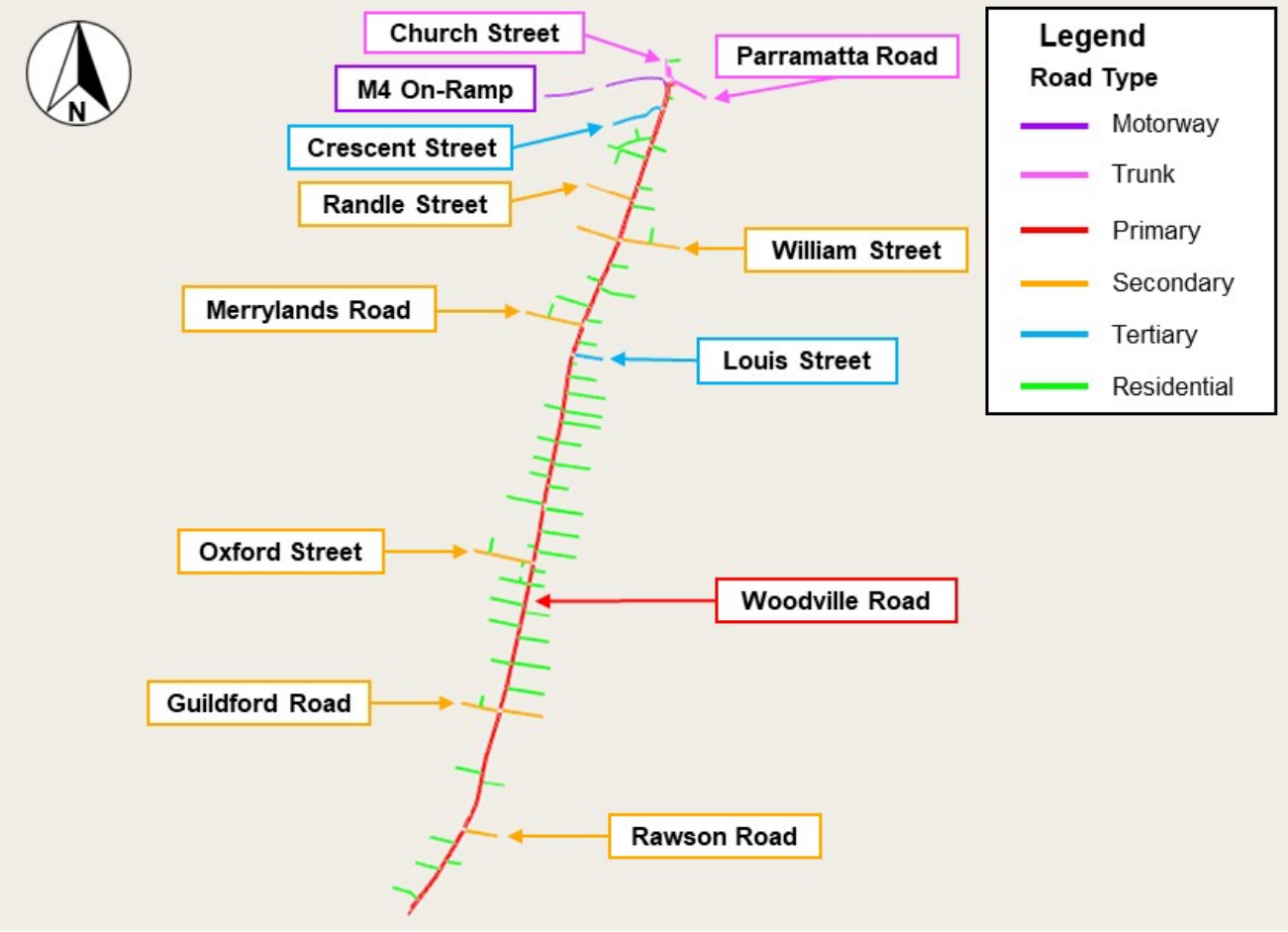


Figure 4.1: Base Model Network – Road Types

4.1.2 Corridor Peak Hour Periods

The network traffic peak hours periods were determined from the analysis of existing corridor traffic data analysis. The peak hours are:

AM Peak Period

- **7:30AM – 8:00AM:** 30-min warm-up period
- **8:00AM – 9:00AM:** 60-min peak evaluation period.

PM Peak Period

- **4:00PM – 4:30PM:** 30-min warm-up period
- **4:30PM – 5:30PM:** 60-min peak evaluation period.

The traffic profiles are shown in Figure 4.2 and Figure 4.3.

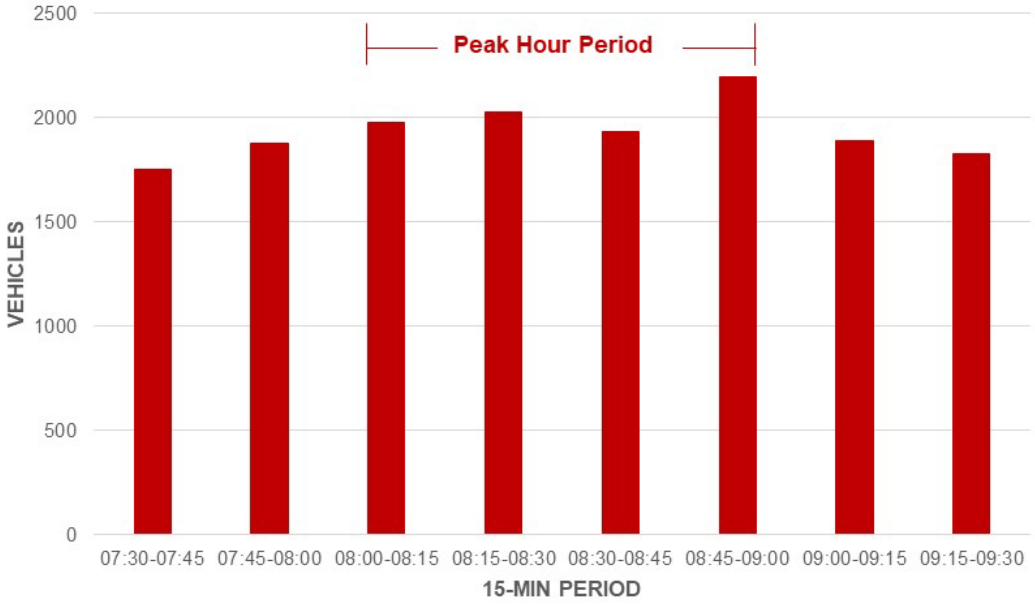


Figure 4.2: Network Peak Hour Period – AM Peak

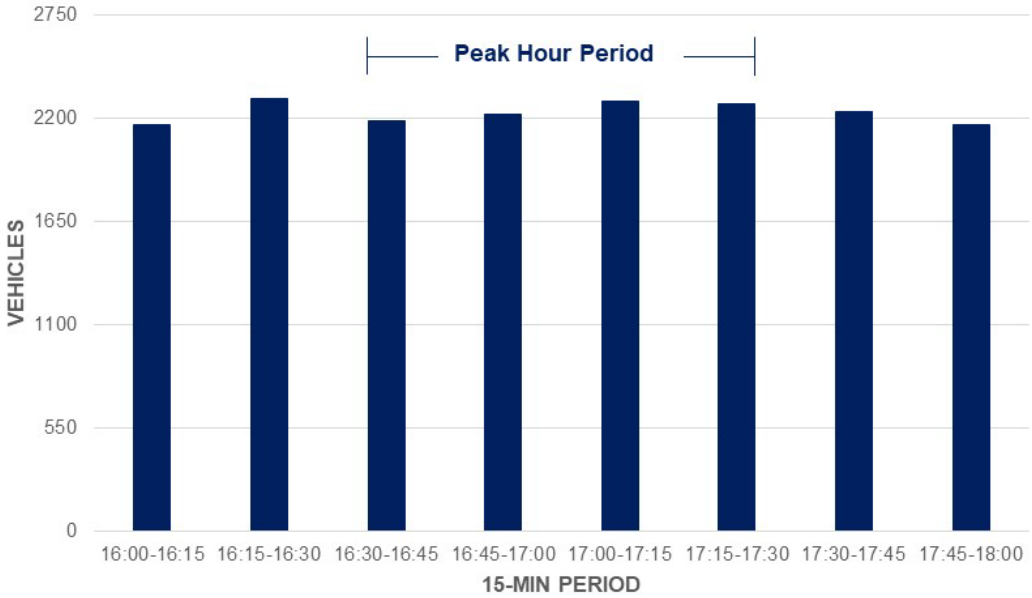


Figure 4.3: Network Peak Hour Period – PM Peak

4.1.3 Vehicle Type Composition

The vehicle type composition adopted in the model was based on traffic data collected by counters at key locations on Woodville Road within the study area network. The vehicle types are divided into the following three (3) classes:

- **Light vehicles:** Austroads Classes 1-2, representing short and short towing vehicles
- **Rigid trucks:** Austroads Classes 3-5, representing rigid trucks (and buses) from two axles up to five axles
- **Articulated trucks:** Austroads Classes 6-12, representing articulated trucks, B doubles and triple road trains.

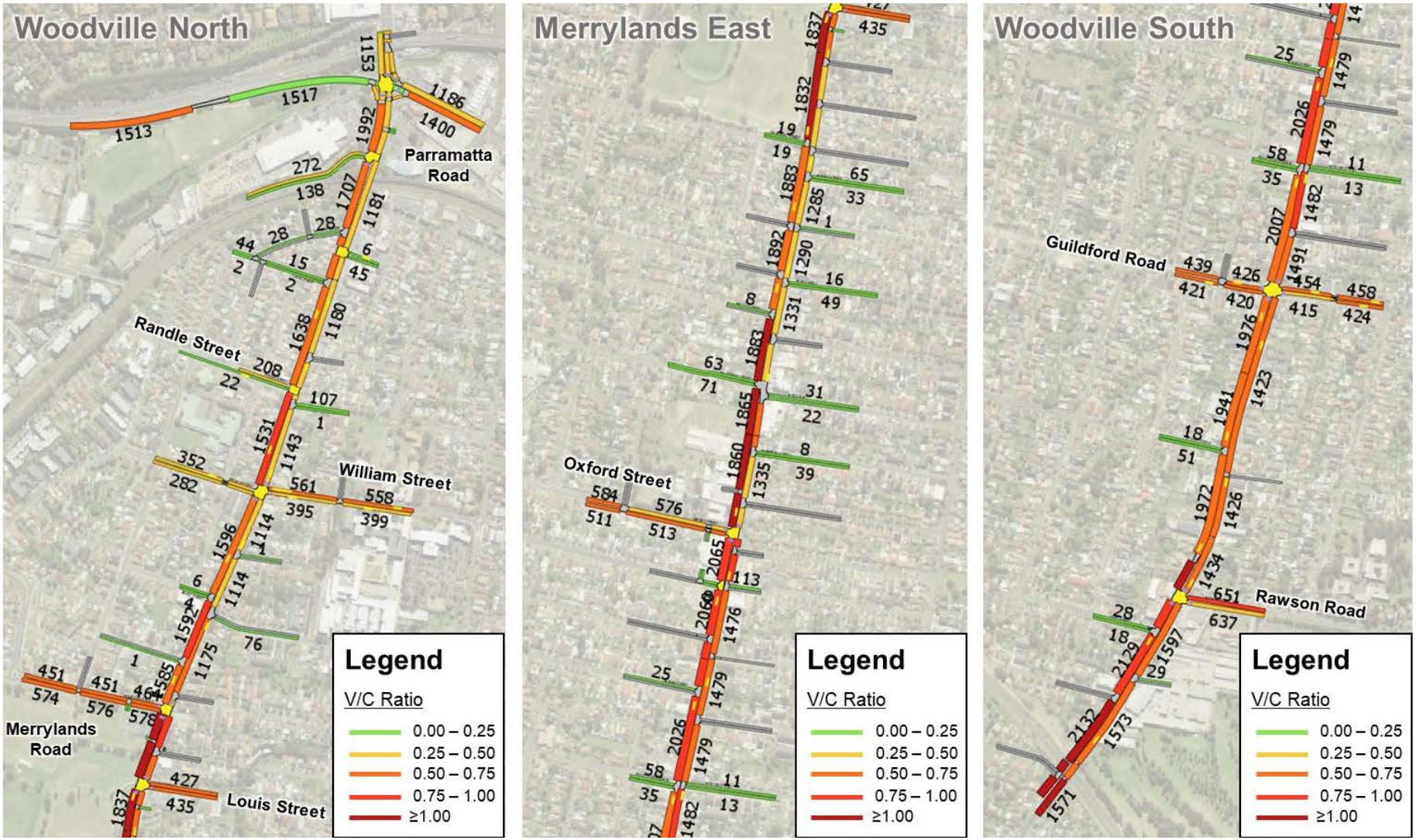
The traffic composition is summarised in Table 4.1.

Table 4.1: Vehicle Type Composition

Time Period	Light Vehicles	Medium Vehicles	Heavy Vehicles
AM	92.4%	6.0%	1.6%
PM	95.8%	3.2%	1.0%

4.1.4 Traffic Volumes – AM Peak

The AM peak hour traffic volumes and volume/capacity (V/C) ratios along the corridor are shown in Figure 4.4.

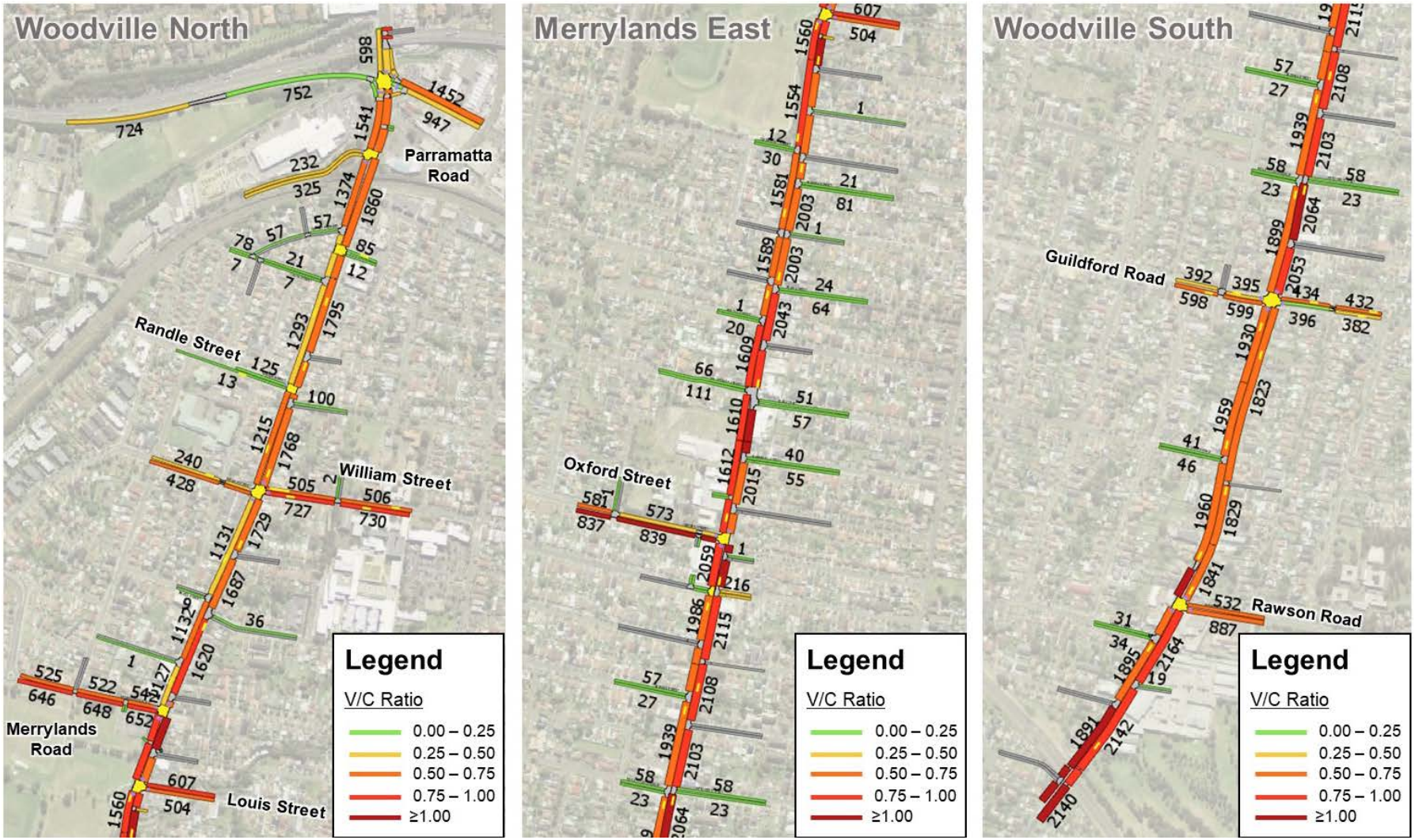


V/C Ratio (Volume to Capacity Ratio) – Degree of Road Section Capacity used (i.e. Level of Congestion)

Figure 4.4: Peak Hour Traffic Flows – AM Peak

4.1.5 Traffic Volumes – PM Peak

The PM peak hour traffic volumes and volume/capacity (V/C) ratios along the corridor are shown in Figure 4.5.



V/C Ratio (Volume to Capacity Ratio) – Degree of Road Section Capacity used (i.e. Level of Congestion)

Figure 4.5: Peak Hour Traffic Flows – PM Peak

4.2 Forecast Corridor Growth

4.2.1 Background Traffic Growth

Traffic growth between the current base year and the future base year was adopted from strategic growth projections in TfNSW's Strategic Traffic Forecasting Model (STFM), as informed by the Travel Zone Projections (2019) dataset. The estimated corridor-wide growth is summarised in Table 4.2.

Table 4.2 Network Traffic Growth (2hr)

Year	Total Trips Generated – 2 Hour Peak (Veh)	
	AM Peak	PM Peak
2021	21,241	22,745
2031	26,231	27,412
2021 – 2031 Growth	**+4,989 trips**	**+4,667 trips**

This level of growth represents a linear increase in traffic volumes by **2.4%** and **2.1% p.a**. for the AM peak and PM peak respectively.

Due to the corridor nature of the study area, the majority of this traffic growth was in the form of regional 'external-to-external' trips. Some of the key increases in traffic flows occurred between:

- Rawson Road and Woodville Road (to the south)
- Parramatta Road and Woodville Road (to the north)
- Parramatta Road and Crescent Street
- Both sides of William Street
- Both sides of Guildford Road
- Louis Street and Merrylands Road
- Along the length of the corridor (north and south boundaries on Woodville Road).

A preliminary analysis of the external traffic growth patterns from the strategic modelling indicates that the projected increased use of Woodville Road as a movement corridor tends towards short-distance trips, with a significant increase in trips which traverse sections of Woodville Road between 'paired' minor roads. The breakdown of the growth matrices are summarised below:

- An average of around 5% of the total growth can be attributed to the increase in north-south traffic along Woodville Road through the length of the study area
- An average of around 50% of the total growth does not travel to or from the northern and southern model boundaries on Woodville Road
- A combined average of around 17% of the total growth can be associated with 'paired' side road movements, such as:
  - William Street (W) to William Street I and vice versa
  - Merrylands Road to Louis Street and vice versa
  - Guildford Road (W) to Guildford Road I and vice versa.
- An average of around 15% of the total growth can be associated to each of Rawson Road and Oxford Street, which independently represent the highest levels of traffic growth across the network.

4.2.2 Uplift Population and Employment Growth

The proposed land use intensification comprises an increase in land density at the 29 key sites, resulting in:

- A total aggregate site area of 219,474m^2
- A total residential gross floor area (GFA) yield of 370,364m^2
- A total increase in dwellings by around 3,696 dwellings
- A corresponding increase in population by around 10,349 persons
- A total non-residential GFA yield of 20,788m^2.

The expected level of growth is broken down to the precinct level and summarised in Table 4.3.

Table 4.3: Proposed Uplift in Key Precincts

Precinct	Overall Site Area (m^2)	Residential GFA (m^2)	Dwellings	Population	Non-residential GFA (m^2)
Woodville North Precinct	80,724	138,813	1,384	3,875	1,776
Merrylands East Precinct	48,759	82,700	823	2,306	11,871
Woodville South Precinct	89,991	148,851	1,489	4,168	7,141
TOTAL	**219,474**	**370,364**	**3,696**	**10,349**	**20,788**

4.2.3 Uplift Traffic Growth

Traffic generation calculations were prepared as part of a separate technical note (*P5825.003T Woodville Road Corridor Planning Framework TTS Demand Development,* Bitzios Consulting 2023), attached in **Appendix A**. The summary of the gross increase, existing potential and resulting net increase in traffic is outlined in Table 4.4.

Table 4.4 Trips Generated (Net Uplift Growth)

Precinct	Total Trip Potential (veh)					
	AM Peak			PM Peak		
	Uplift Total	Existing Potential	Net Increase	Uplift Total	Existing Potential	Net Increase
Woodville North Precinct	314	138	176	302	140	162
Merrylands East Precinct	435	38	397	671	41	630
Woodville South Precinct	450	136	314	489	140	349
Total	**1,199 veh**	**312 veh**	**887 veh**	**1,462 veh**	**321 veh**	**1,141 veh**

4.3 Future Model Development

4.3.1 Modelling Scenarios

Table 4.5 summarises the 2031 future year model scenarios that were prepared and compared as part of this study.

Table 4.5: Modelling Scenarios

Scenario	Background Traffic Growth	Uplift Traffic Growth	Upgrades and Mitigation Measures
2031 Future Base *The expected future traffic conditions with minimal changes to the road network.*	☑	☒	☒
2031 Future Uplift *The expected future traffic conditions if the masterplan is realised without interventions.*	☑	☑	☒
2031 Future Uplift with Upgrades *The 'preferred' scenario where the traffic impacts caused by the masterplan uplift are alleviated.*	☑	☑	☑

4.3.2 Traffic Modelling Process

The traffic modelling process in calculating the future year demands for each scenario is shown in Figure 4.6.

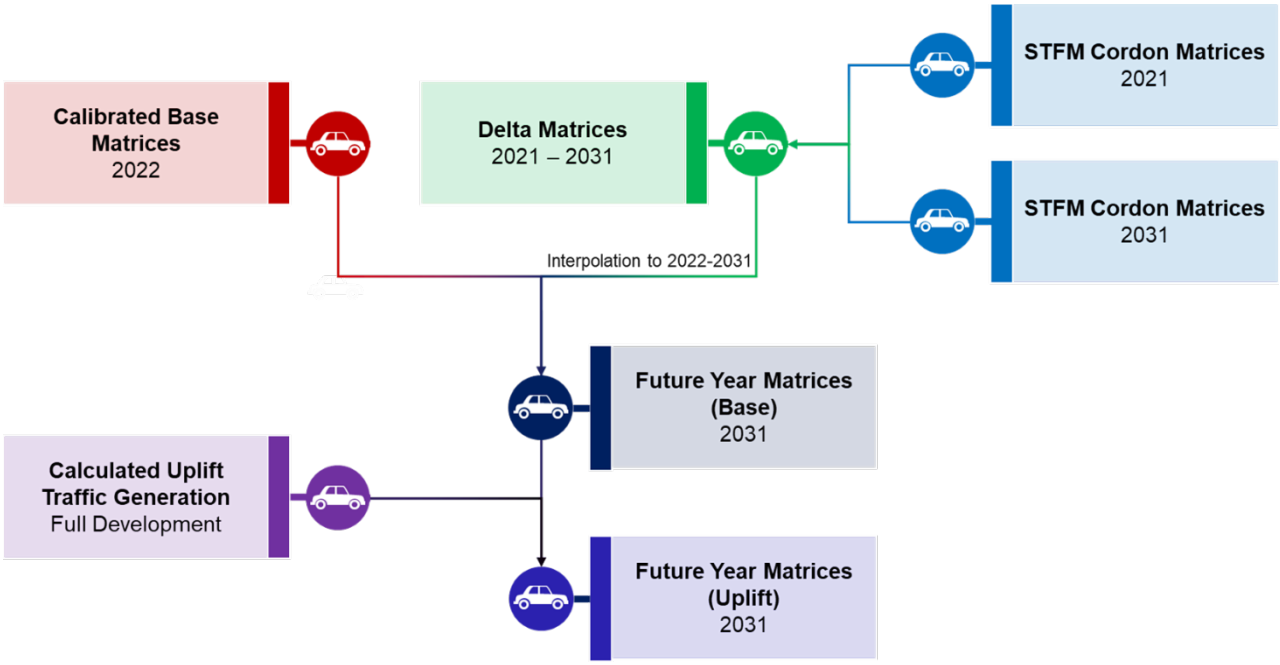


Figure 4.6: Future Year Traffic Demands Calculation Process

4.3.3 Modelling Targets

The uplift scenarios were modelled with consideration of the targets in Table 4.6 for key network performance indicators. The overall aim was to aim for a 'no net worsening' of traffic conditions relative to the future base scenario.

Table 4.6: Network Performance Indicator Targets

Indicator	Expected change due to Uplift	Desired Outcome
Travel time along Woodville Road (general traffic)	Longer travel times due to increase in traffic demands caused by increased land use density	Target travel times in peak direction of travel to be no worse than future base scenario
Travel time along Woodville Road (buses)	Longer travel times due to increased network congestion at signalised intersections as a result of uplift	Target travel times in peak direction of travel to be no worse than future base scenario
Network Speeds	Decreased network speeds due to increased traffic congestion throughout the network	Average speed of vehicles to be as close to future base levels as possible
Waiting to Enter	Increased at key side roads to the corridor due to additional traffic on these links	Vehicles waiting to enter to be as close to future base levels as possible
Average Delay Time	Increased due to increased traffic congestion throughout the network	Average delay time to be as close to future base levels as possible

5. TRAFFIC PERFORMANCE ANALYSIS

5.1 Traffic Congestion and Pinch Points

5.1.1 Intersection Performance

The performance of each key intersection was evaluated through an assessment of its overall intersection delay and resulting Level of Service (LOS). LOS is a measure of an intersection's operational performance and is related to the average delay time experienced by drivers travelling through an intersection. Table 5.1 shows the LOS criteria used for the intersection assessment.

Table 5.1: Intersection Level of Service Criteria

Level of Service	Average Delay (sec/veh)	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	> 70	Flow breakdown; forced flow	Intersection failure

Source: Roads and Maritime Guide to Traffic Generating Developments (2002) Table 4.2

When applying the above criteria, the LOS is calculated as follows:

- Traffic signals: average vehicle delay at the intersection
- Roundabouts and priority-controlled intersections: intersection movement with the longest delay.

The peak hour performance of the key intersections along the corridor is summarised in Table 5.2.

Table 5.2: Intersection Performance Comparison

Intersection	AM Peak				PM Peak			
	2022		2031 Base		2022		2031 Base	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Parramatta Road[1]	24	B	51	D	44	D	54	D
Crescent Street	17	B	89	F	15	B	32	C
Randle Street	9	A	9	A	9	A	77	F
William Street	32	C	80	F	41	C	119	F
Merrylands Road	26	B	77	F	84	F	139	F
Louis Street	72	F	156	F	42	C	59	E
Lansdowne Street	36	C	51	D	34	C	33	C
Oxford Street	98	F	126	F	84	F	94	F
Guildford Road	25	B	59	E	52	D	65	E
Rawson Road	49	D	119	F	56	D	1F	

6. *Intersection of Parramatta Road / Woodville Road / M4 Ramp is expected to perform worse than reported here, as queues and delays that extend beyond the model extents are not recorded in these calculations.*

The AM peak for the 2031 base case shows a significant deterioration of intersection performance at nearly all intersections. Of the 10 key intersections along the corridor, six (6) would operate at LOS F under the projected background traffic growth in 2031. Three (3) of these are particularly egregious, with an average intersection delay around or exceeding 120s:

- Louis Street
- Oxford Street
- Rawson Road.

The PM peak shows a similar level of deterioration in traffic performance, with a concentration of issues around Merrylands Road.

5.1.2 Route Travel Time Impacts

Detailed travel time comparison tables are provided in **Appendix B**.

The change in travel times along the major direction of travel on Woodville Road in the AM peak (northbound) is depicted in Figure 5.1.

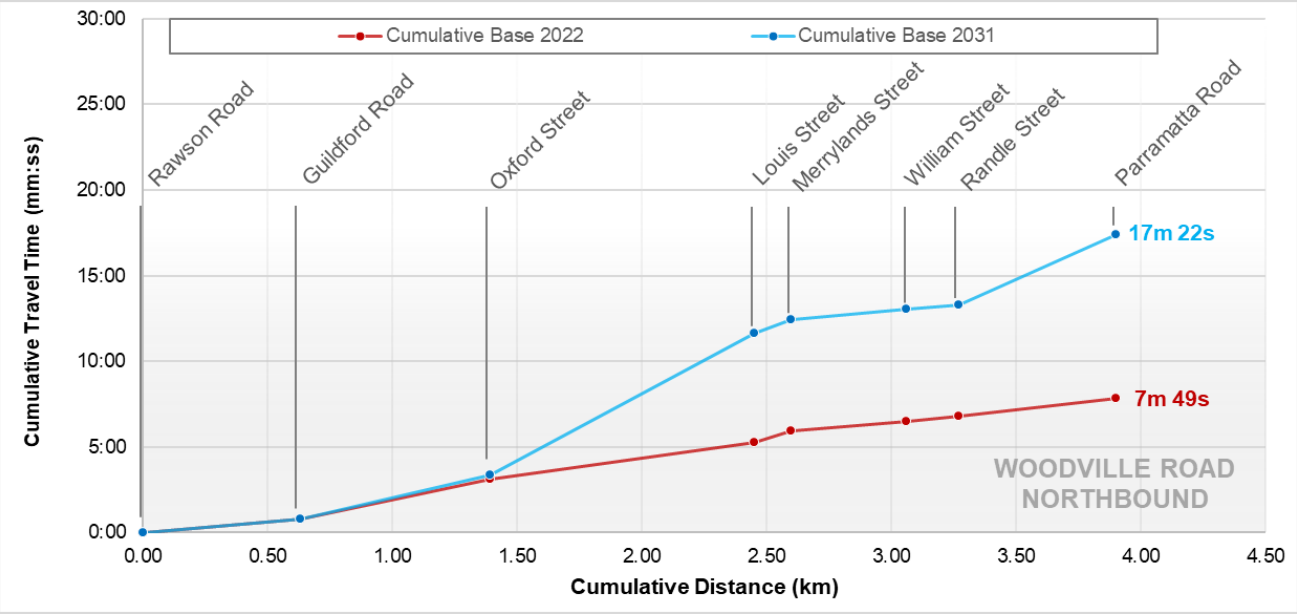


Figure 5.1: Travel Time Changes – AM Peak – Woodville Road Northbound

The results show that travel time in the northbound direction on Woodville Road in 2031 is relatively similar to the 2022 base case, except for:

- On approach to Louis Street, at which point there is a substantial increase in travel time of around 6 minutes
- On approach to Parramatta Road at the northern boundary of the model, which shows an increase in travel time of around 3 minutes.

In total, northbound travel time along the Woodville Road Corridor in the AM peak is around **10 minutes slower** in 2031. The results indicate the development of a significant network pinch point near Louis Street.

The change in travel times along the major direction of travel on Woodville Road in the PM peak (southbound) is depicted in Figure 5.2.

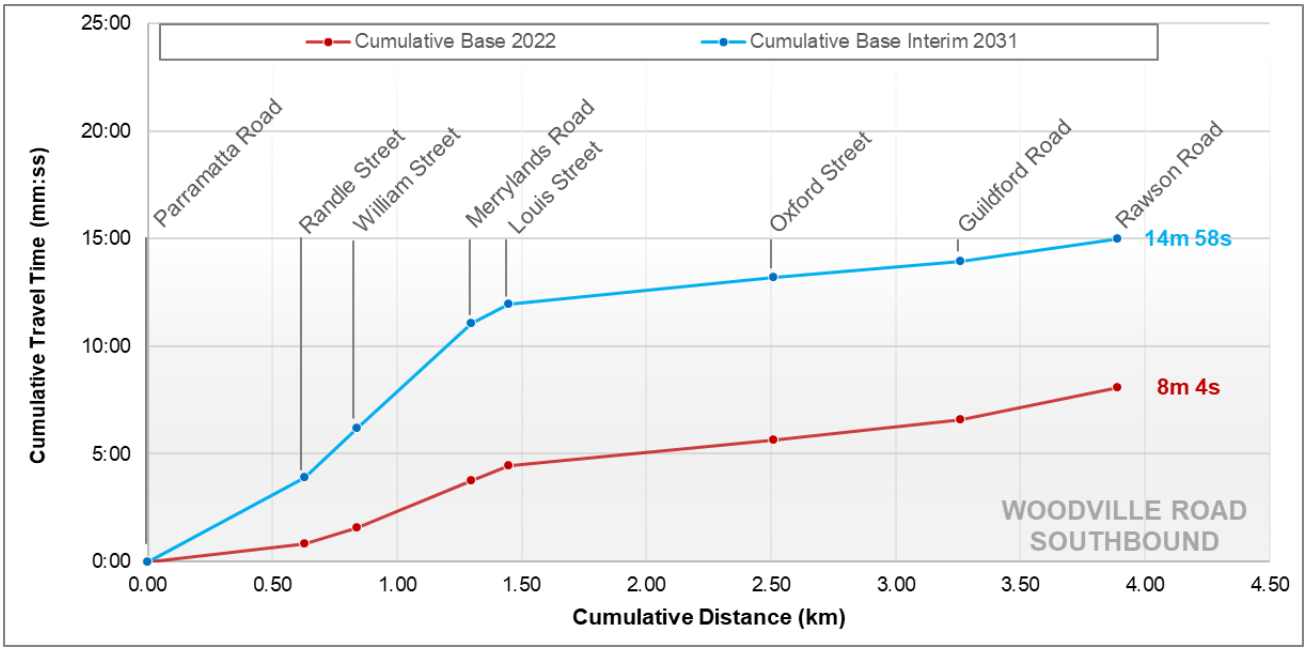


Figure 5.2: Travel Time Changes – PM Peak – Woodville Road Southbound

It is noted that some minor signal timing changes were implemented in the 2031 PM base scenario to ensure that unrealistic constriction of traffic flow on the northern edge of the network did not affect release of the traffic demands into the network.

The results show that travel in the southbound direction on Woodville Road in 2031 is notably impacted on the northern side of the network, with slow-downs:

- On approach to Randle Street, where there is an increase in travel time of around 3 minutes
- On approach to William Street, where there is an increase in travel time of around 1.5 minutes
- On approach to Merrylands Road, where there is an increase in travel time of around 3.5 minutes.

In total, southbound travel time along the Woodville Road Corridor in the PM peak is around **7 minutes slower** in 2031. The results indicate the development of a significant network pinch point at Merrylands Road exacerbating upstream congestion issues.

5.1.3 Network Statistics

Traffic performance was evaluated at a network level through the comparison of network-wide modelling output statistics. Table 5.3 explains and compares these network statistics.

Table 5.3: Network-wide Modelling Statistics

Measure	Definition	AM Peak		PM Peak	
		2022	2031	2022	2031
Total Travel Time (hr)	Total travel time experienced by all vehicles from the start to end of simulation. Also known as VHT.	745	1,313	982	1,350
Total Distance (km)	Total distance travelled by all vehicles crossing the network. Also known as VKT.	17,847	18,698	19,035	19,823
Average Speed (km/hr)	Total Distance / Total Travel Time	24.0	14.2	19.4	14.7
Average Travel Time (min/veh)	Average trip duration for all vehicles that have entered the network	4.1	6.2	4.8	5.8
Average Distance (km)	Average distance travelled for all vehicles that have entered the network	1.6	1.5	1.5	1.4
Average Delay Time (s/km)	The delay time (difference between free-flow and actual travel time) experienced per vehicle per kilometre travelled	140	294	219	264
Total Number of Stops	Number of vehicle stops during the simulation period	26,753	45,756	33,371	47,927
Unreleased Trips	Number of vehicles waiting to enter the network at the end of the simulation	98	1,115	300	1,085
Latent Demand Wait Time (hr)	Total time waiting by vehicles outside of the network at the end of simulation	6	199	12	133
Completed Trips	Number of vehicles that have crossed the network and arrived at their destination during the simulation	10,098	11,190	11,242	12,287
Incomplete Trips	Number of vehicles remaining inside the network when the simulation finishes	830	1,618	1,170	1,722
Total Number of Vehicles	Completed + Incomplete + Unreleased Trips	11,026	13,923	12,712	15,094

The notable outcomes for the 2031 scenario when compared to the 2022 scenario are summarised below:

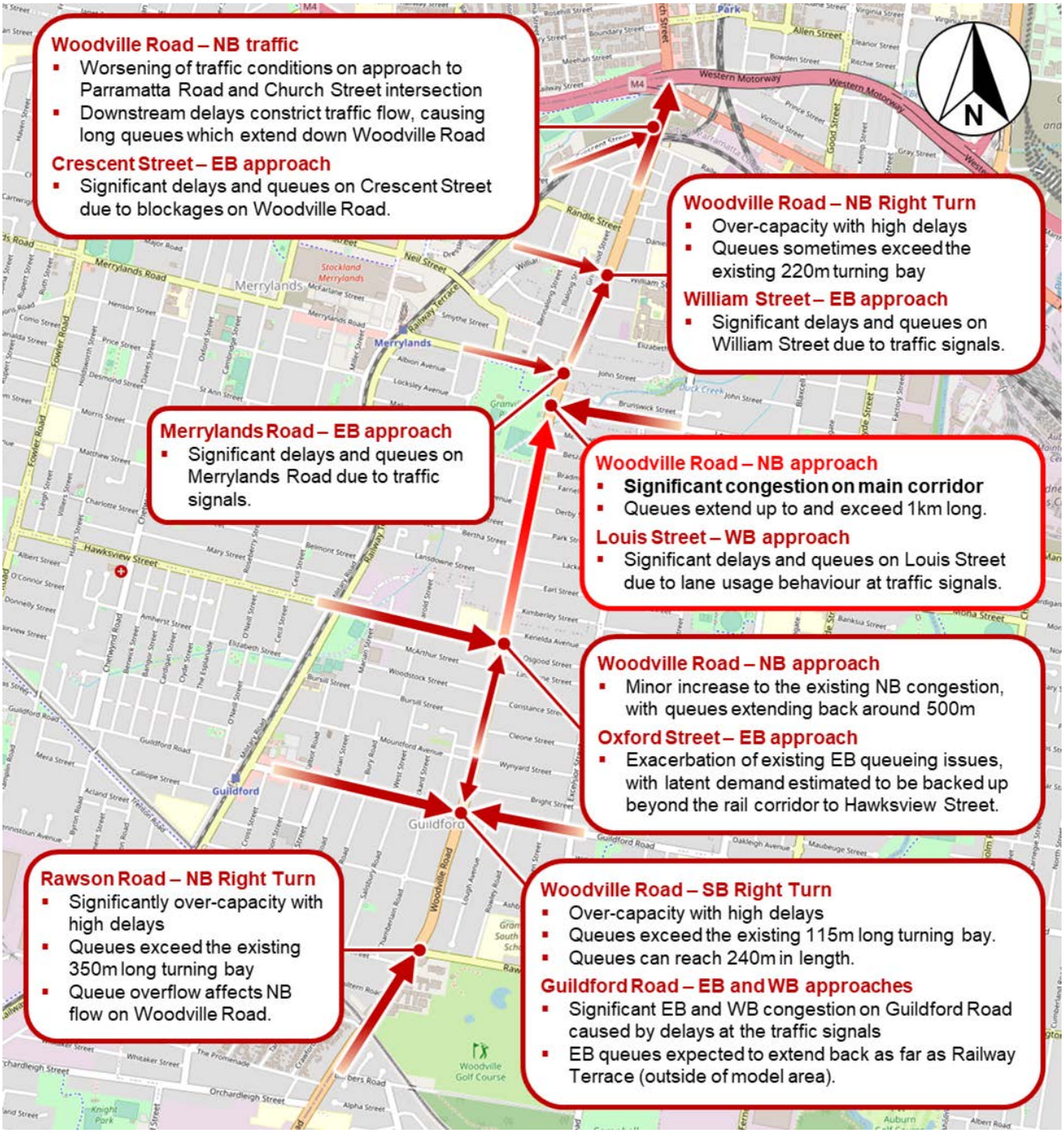
- Average speed shows a significant reduction in both peak periods, which is indicative of increased network congestion.
- Average travel time has increased despite the average trip length remaining relatively consistent at around 1.5km.
- Average delay time shows a significant increase in both peak periods, particularly in the AM peak where the average driver is expected to be delayed almost 5 minutes for every kilometre they travel.

Unreleased trips are significantly higher, with capacity constraints near the model boundary preventing vehicles from entering the network. It is noted that the volume of unreleased trips (around 1,000veh) is just under half of the total increase in traffic demand between 2022 and 2031, meaning that a large portion of the projected growth is incapable of entering the network during the modelled peak hour periods.

5.1.4 Issues Map – Morning AM Peak

The 2031 AM future base models show a significant increase in traffic congestion along the Woodville Road Corridor. While a deterioration of intersection performance was expected given the general increase in traffic demands along and across the Corridor, the level of traffic growth resulted in a few critical road capacity constraints which have significant impacts on overall traffic performance. In the AM peak, these issues were noted to be primarily in the northbound direction of travel.

The network pinch points in the 2031 AM peak are summarised in Figure 5.3.



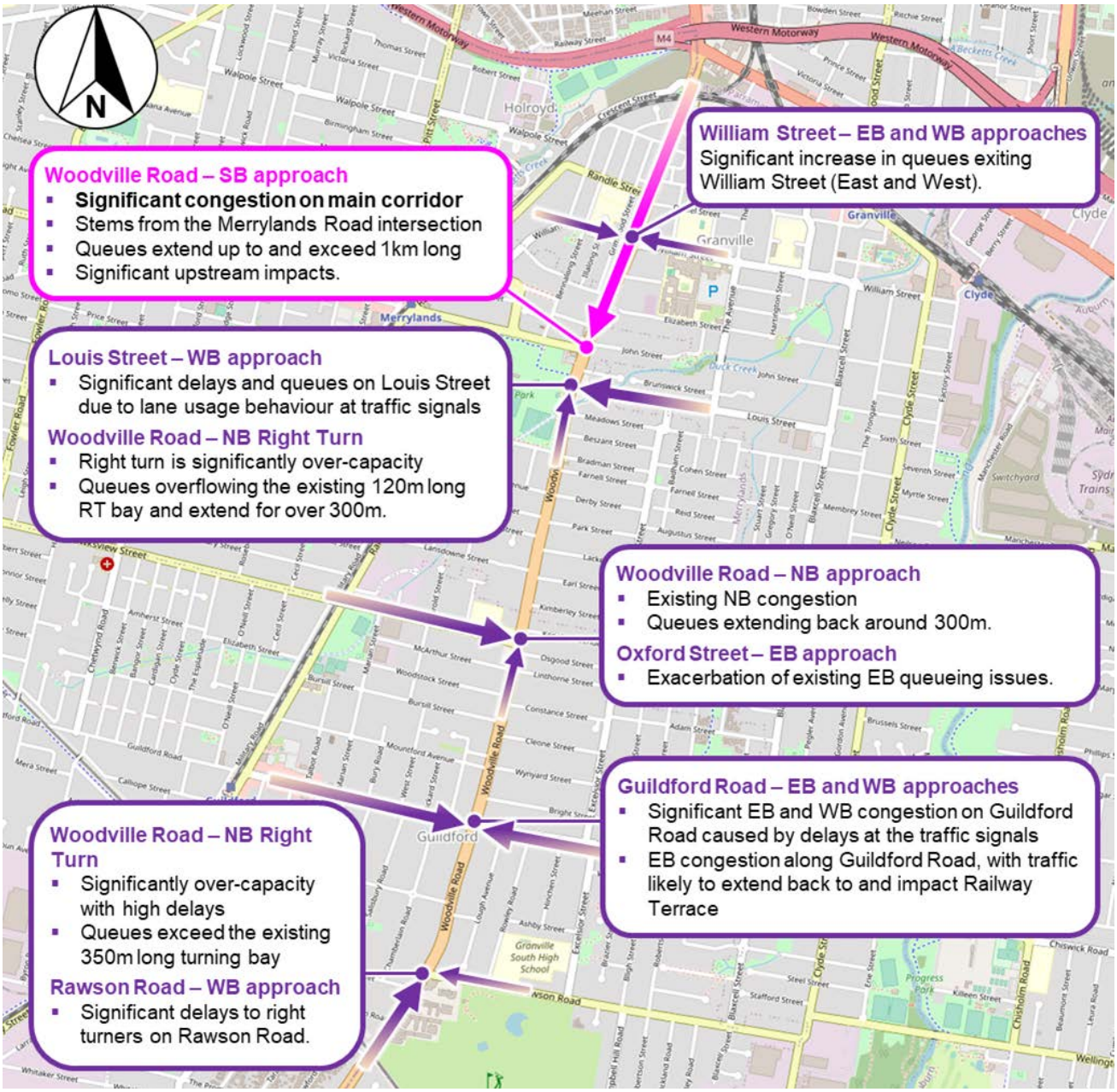
Adapted from OpenStreetMap

Figure 5.3: Traffic Congestion and Pinch Point Issues – 2031 AM Future Base Model

5.1.5 Issues Map – Afternoon PM Peak

The 2031 PM future base case model initially showed unsustainable levels of congestion and queueing at the network boundary, heavily constricting traffic inputs into the study area. Due to this, it was identified that traffic flows were lower than expected despite the increase in background traffic growth. This had the effect of hiding the actual network capacity constraints, necessitating early interventions to the model scenario to better understand the actual impacts once the full traffic demand is realised. The 'trapped' traffic was released through some minimal measures (mostly signal timing).

The network pinch points in the 2031 PM future base interim model are shown in Figure 5.4. In the PM peak, these issues were noted to be primarily in the southbound direction of travel.



Adapted from OpenStreetMap

Figure 5.4: Traffic Congestion and Pinch Point Issues – 2031 PM Future Base Model

5.1.6 'Do Minimum' Refinement of Future Base Network

The future base scenario was therefore found to be heavily congested, with significant traffic constraints at a few key locations. The extent of the traffic impacts caused by these constraints meant that testing any additional traffic would no longer yield meaningful results (i.e. any traffic performance impacts caused by uplift traffic would be masked by the severe, existing traffic issues).

To ensure that the model was capable of functioning at an operational level of performance such that a meaningful comparison could be made, further initial traffic interventions were implemented into a 'do minimum' version of the future base scenario. These measures comprised of:

- Adjustments to signal phase and offset timing to accommodate the change in future traffic flows
- Extensions of auxiliary or short lanes to provide additional lane capacity
- An alleviation of base model boundary condition proxy measures where unrealistic queue push-back was being encountered.
- Increased right turn capacity at specific locations to minimise queue overflows.

The resulting 'do minimum' scenario is used as the baseline for comparison with the uplift scenario.

5.2 Uplift Scenario Traffic Network Changes and Impacts

5.2.1 Access Assumptions

Generation and attraction of the trips associated with the planning proposal sites required the selection of appropriate access internal to the model network. The access locations were assumed based on the following principles:

- No direct access to/from State Roads like Woodville Road (i.e. access will be provided onto side streets only)
- Minimisation of the need for vehicles to 'rat-run' in search of right-turning opportunities at Woodville Road
- Minimisation of distance required travelled to access to/from Woodville Road.

5.2.2 Changes associated with the Planned Redevelopment

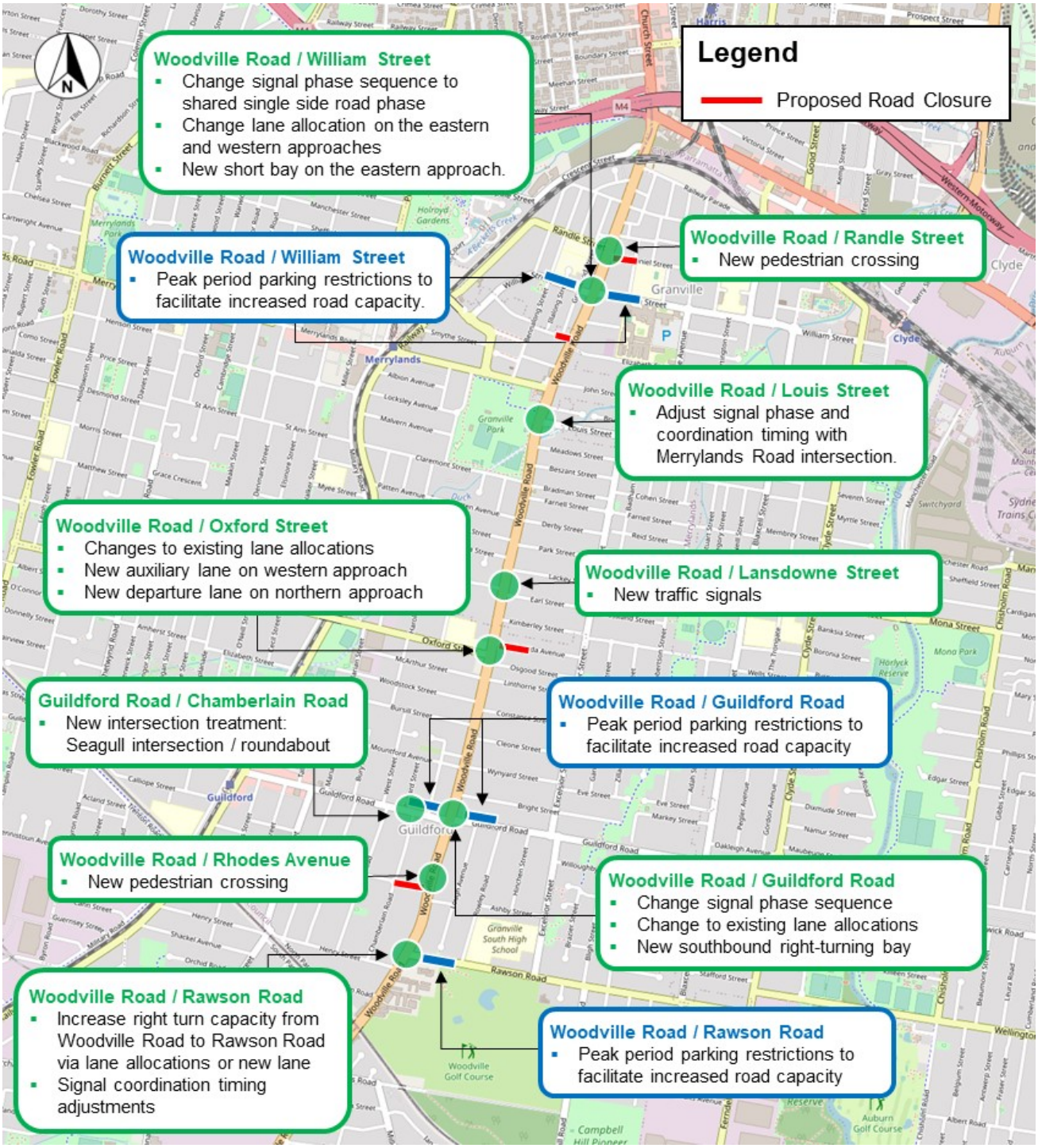
A few road network changes accompany the proposed urban design masterplan in each of the key precincts, including:

- Closing off a few side streets near Woodville Road near development site frontages to facilitate new public spaces (e.g. pocket parks)
- New signalised mid-block pedestrian crossings
- New traffic signals.

In addition to these, the deterioration of traffic performance along the corridor due to the increase in development traffic demands necessitates further interventions to alleviate any traffic impacts. These are described further in Section 5.2.3.

5.2.3 Proposed Network Upgrades

As a result of the anticipated traffic congestion issues associated with future background traffic growths and target precinct developments, road network upgrades within the Woodville Road Corridor have been proposed. These proposed network upgrades were developed in the future upgrades scenario and shown below in Figure 5.5.



Adapted from Nearmap

Figure 5.5: Proposed Network Upgrades – Woodville Road Corridor

5.3 Traffic Performance Comparison

5.3.1 Intersection Level of Service

The intersection LOS comparisons between the 2031 AM and PM future scenarios are provided in Table 5.4 and Table 5.5 respectively. Detailed movement information is provided in **Appendix C**.

Table 5.4: LOS Performance Comparison – Future AM Scenario

Intersection	2031 Do Min AM		2031 Uplift AM		2031 Uplift + Upgrades AM	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Parramatta Road	29	C	29	C	31	C
Crescent Street	22	B	28	B	26	B
Randle Street	10	A	10	A	6	A
William Street	42	C	48	D	44	D
Merrylands Road	42	C	47	D	51	D
Louis Street	106	F	85	F	105	F
Lansdowne Street	52	D	25	B	23	B
Oxford Street	116	F	151	F	85	F
Guildford Road	50	D	68	E	73	F
Rawson Road	45	D	52	D	52	D

Table 5.5: LOS Performance Comparison – Future PM Scenario

Intersection	2031 Do Min PM		2031 Uplift PM		2031 Uplift + Upgrades PM	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Parramatta Road	56	D	61	E	44	D
Crescent Street	20	B	30	C	24	B
Randle Street	11	A	12	A	14	A
William Street	45	D	81	F	49	D
Merrylands Road	32	C	30	C	32	C
Louis Street	57	E	36	C	40	C
Lansdowne Street	43	D	37	C	19	B
Oxford Street	72	F	100	F	86	F
Guildford Road	46	D	128	F	74	F
Rawson Road	80	F	133	F	89	F

The results show that the intersection LOS in the ultimate scenario is notably better than the interim Uplift scenario, and is generally similar to the Do Minimum scenario.

It is noted that Guildford Road shows a slight deterioration of intersection performance in the AM peak 'Uplift + Upgrades' scenario, owing to the significant increase in housing density in the Woodville South Precinct. Relative to the 'Uplift' scenario, the implemented traffic measures have released some of the latent, unreleased traffic demands by facilitating an increased traffic release into the road network.

It is likely that further intersection upgrades would require significant land acquisition and may compromise the public domain and Place qualities at these key areas. Alternative measures of alleviating traffic projections through travel demand management measures can be adopted instead.

5.3.2 Corridor Travel Times

AM Peak

The comparisons of the travel times for the 2031 AM future scenarios are provided below in Figure 5.6 and Figure 5.7.

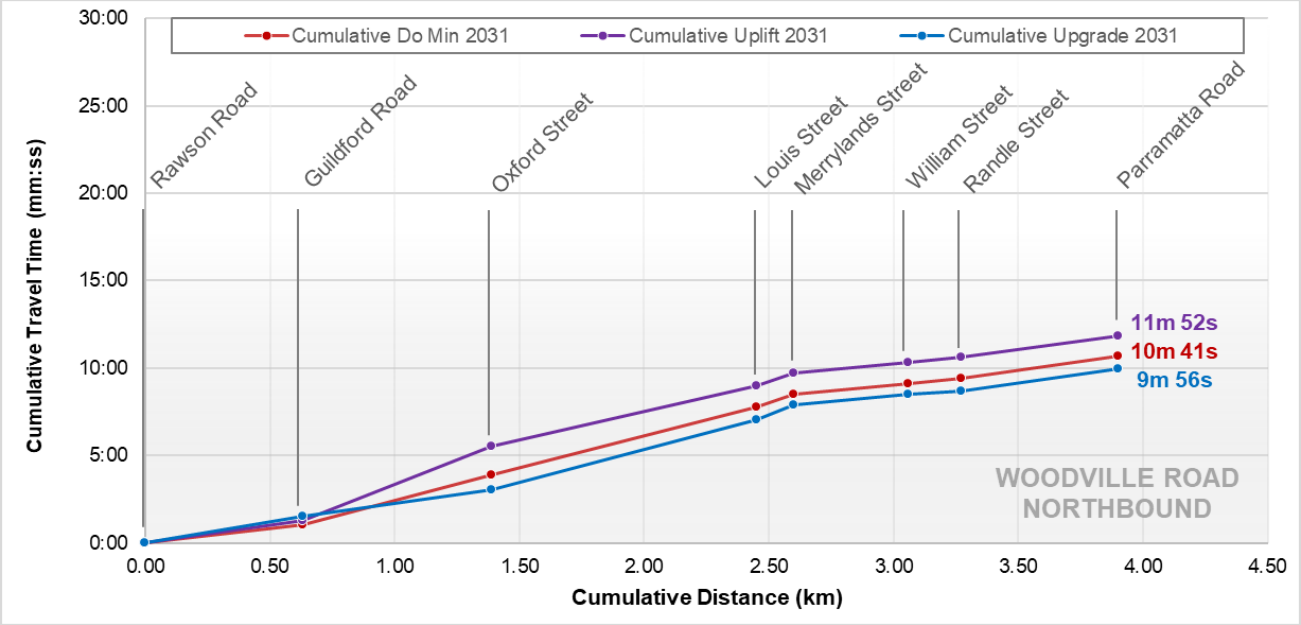


Figure 5.6: Travel Time Comparison of Future AM Scenario – Woodville Road Northbound

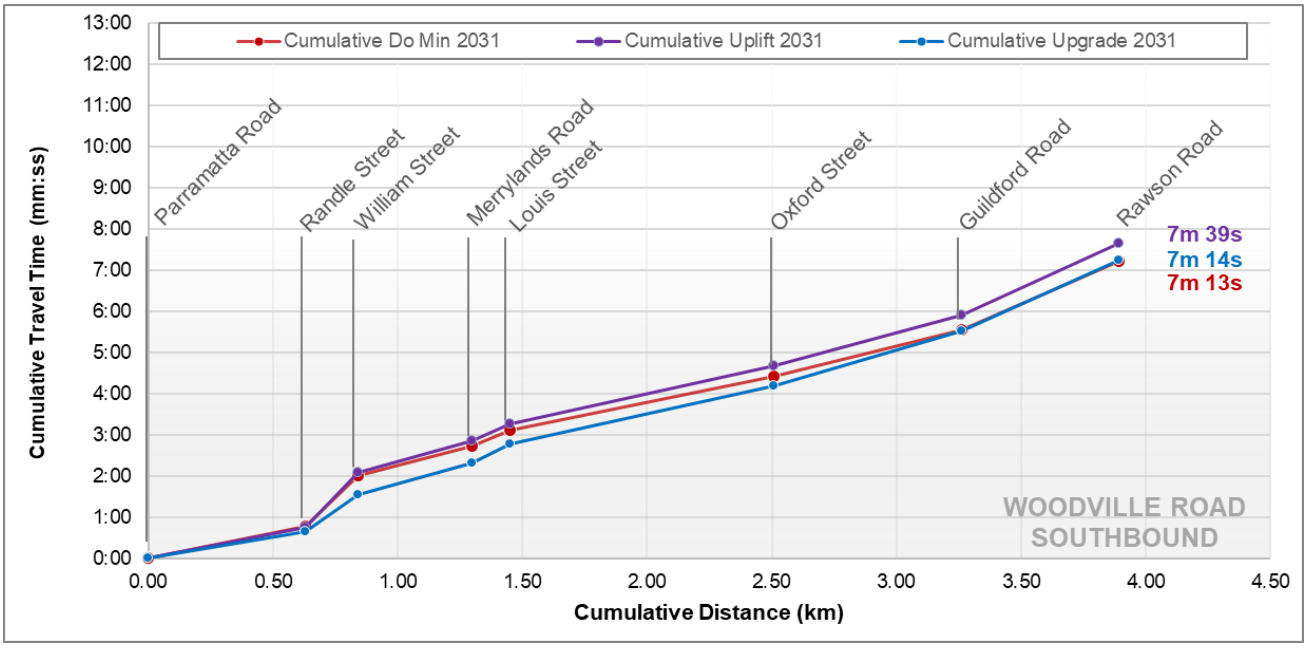


Figure 5.7: Travel Time Comparison of Future AM Scenario – Woodville Road Southbound

The AM results show that compared to the base 'Do Minimum', the 'Uplift with Upgrades' scenario:

- Shows a minor improvement in travel time by around 1 minute in the busy northbound direction
- Shows the same travel time in the southbound direction of travel.

The traffic measures can be seen to alleviate some of the delays at the Oxford Street intersection.

PM Peak

The comparisons of the travel times for the 2031 PM future scenarios are provided below in Figure 5.8 and Figure 5.9.

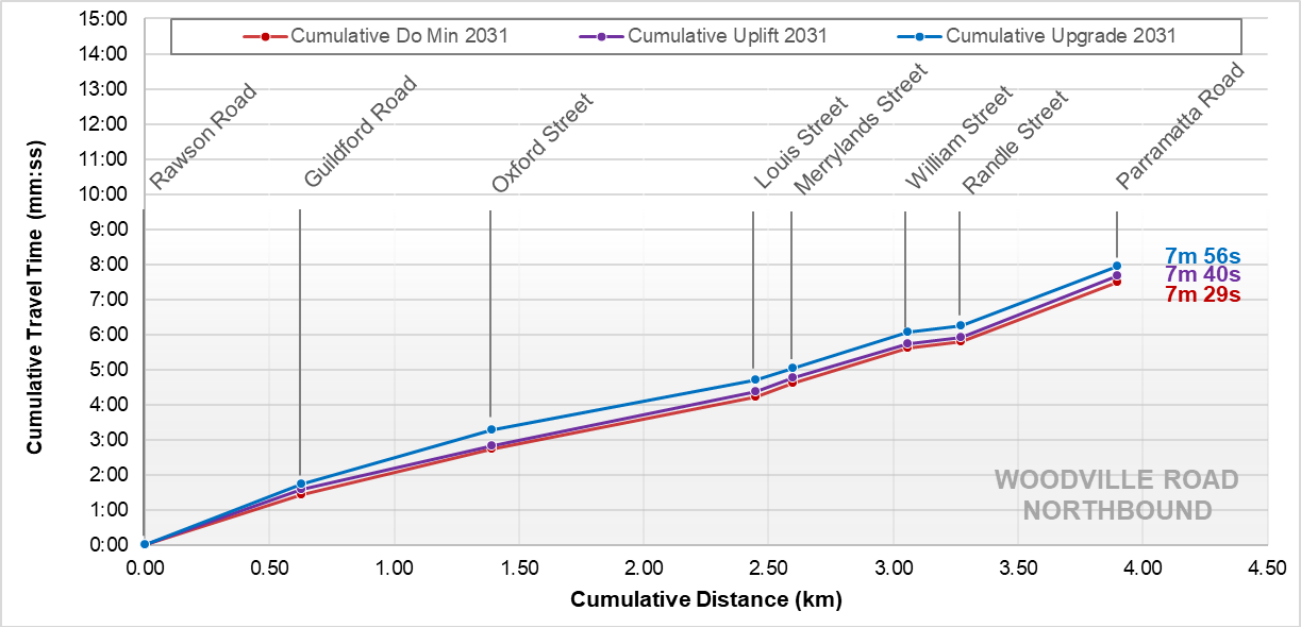


Figure 5.8: Travel Time Comparison of Future PM Scenario – Woodville Road Northbound

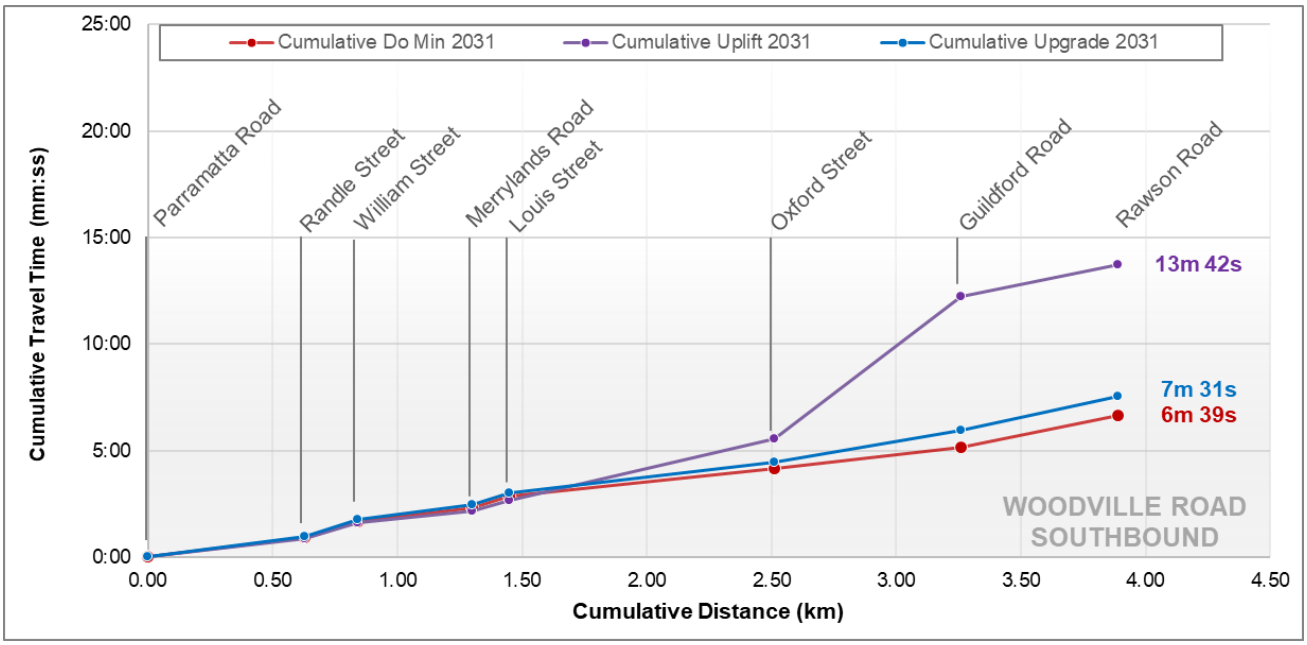


Figure 5.9: Travel Time Comparison of Future PM Scenario – Woodville Road Southbound

The PM results show that compared to the base 'Do Minimum', the 'Uplift with Upgrades' scenario:

- Shows slightly slower travel times by around 1 minute in the busy southbound direction
- Shows slightly slower travel times by less than 30 seconds in the northbound direction.

While travel times show a minor increase compared to the 'Do Minimum' scenario, it is noted that the traffic measures result in a significant improvement in travel times around the Oxford Street and Guildford Road intersections, particularly in the southbound direction.

5.3.3 Network-wide Performance Statistics

Table 5.6 compares the network performance indicators between the 2031 scenarios in the AM peak.

Table 5.6: Network Statistics Comparison – Future AM Scenarios

Measure	2031 AM Do Min	2031 AM Uplift	2031 AM Uplift + Upgrades
Total Travel Time (hr)	954	1,114	1,044
Total Distance (km)	20,388	20,967	21,249
Average Speed (km/hr)	21.4	18.8	20.4
Average Travel Time (min/veh)	4.34	4.86	4.55
Average Distance (km)	1.55	1.52	1.54
Average Delay Time (s/km)	141	172	157
Total Number of Stops	37,921	45,862	42,157
Unreleased Trips	209	711	571
Latent Demand Wait Time (hr)	26	109	150
Completed Trips	12,213	12,585	12,733
Incomplete Trips	976	1,179	1,031
Total Number of Vehicles	13,398	14,475	14,335

Table 5.7 compares the network performance indicators between the 2031 scenarios in the PM peak.

Table 5.7: Network Statistics Comparison – Future PM Scenario

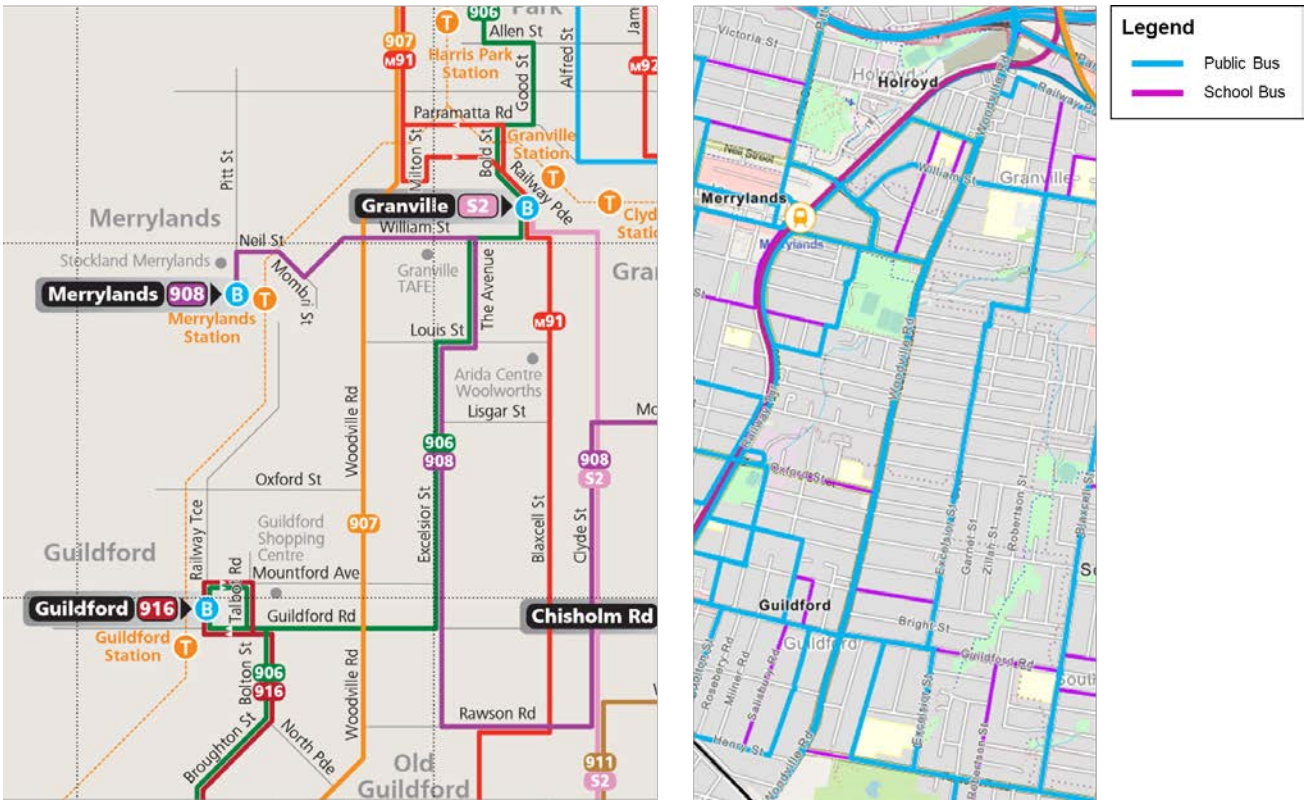
Measure	2031 PM Do Min	2031 PM Uplift	2031 PM Upgrade
Total Travel Time (hr)	1,073	1,407	1,161
Total Distance (km)	21,306	19,929	22,234
Average Speed (km/hr)	19.8	14.2	19.1
Average Travel Time (min/veh)	4.48	5.65	4.49
Average Distance (km)	1.48	1.33	1.43
Average Delay Time (s/km)	168	236	168
Total Number of Stops	37,496	49,016	44,906
Unreleased Trips	533	1,471	748
Latent Demand Wait Time (hr)	41	197	74
Completed Trips	13,193	13,035	14,079
Incomplete Trips	1,181	1,896	1,429
Total Number of Vehicles	14,907	16,402	16,256

6. CORRIDOR-WIDE STRATEGIES

6.1 Public Transport

6.1.1 Overview

The existing bus routes servicing the region along and around the Woodville Road Corridor are shown in Figure 6.1.



Source (left): NSW Network Map 13 – Parramatta, Bankstown and Liverpool bus network map (Transdev, April 2022)
Source (right): GTFS NSW Bus Route Data

Figure 6.1: Bus Services – Study Area and Surrounds

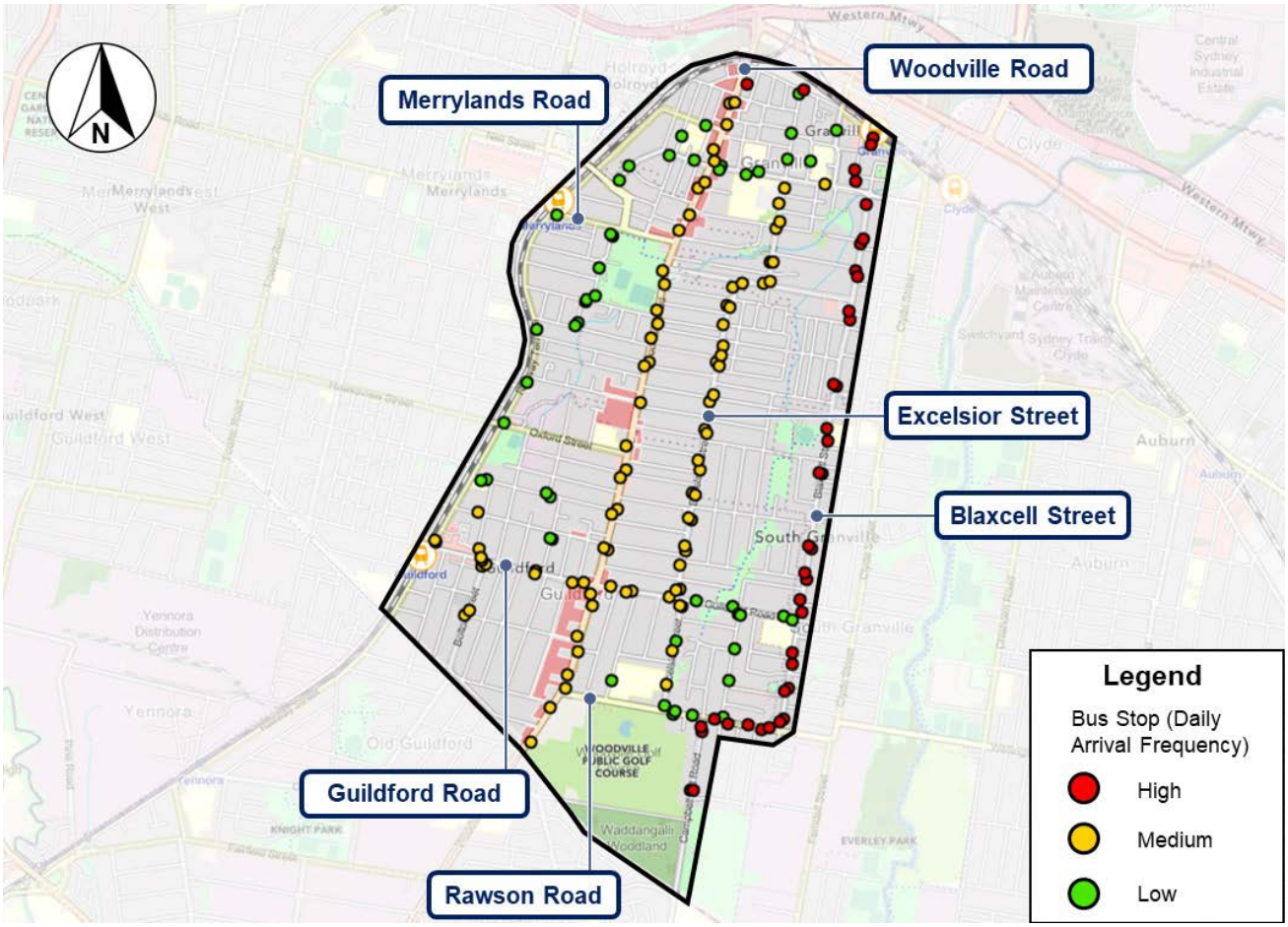
The main roads used by bus services within the study area are:

- Woodville Road
- William Street
- Merrylands Road
- Guildford Road
- Rawson Street (not directly from the main corridor).

It is observed that the limited opportunity for turning movements to and from the corridor restrict the available routes for buses within the area.

6.1.2 Bus Stop Usage and Frequency

The daily bus service frequency at bus stops within close proximity to the Woodville Road Corridor is shown below in Figure 6.2. Daily frequencies range from less than five (5) bus services per day at bus stops for local loop services to around 100 bus services per day at bus stops servicing high-frequency routes.



Adapted from OpenStreetMap

Figure 6.2: Bus Service Daily Frequency at Stops

To determine what constitutes a low, medium or high-frequency bus stop, benchmark daily frequencies were adopted for the purpose of this assessment. The justification of these benchmark frequencies is summarised below in Table 6.1.

Table 6.1: Bus Stop Usage – Benchmark Daily Frequency

Category	Benchmark Bus Frequency		Benchmark Daily Services
	Peak Hour (6 Hours of Service per Day)	Off-Peak (10 Hours of Service per Day)	
High	Every 10 minutes	Every 20 minutes	>66 Daily Services
Medium	Between 10 minutes – 30 minutes	Between 20 minutes – 60 minutes	Between 22-66 Daily Services
Low	Every 30 minutes	Every 60 minutes	<22 Daily Services

It is noted that some bus services may operate at varying frequencies during peak or off-peak periods, which do not fully align with the frequency definitions above. For the purposes of this assessment, the bus stop was categorised based on its **daily frequency.**

The majority of bus stops along Woodville Road operate at around 31 daily services.

Between the rail corridor to the west and Blaxcell Street to the east, there are a few distinct public transport corridors, mostly in the north-south alignment. These corridors and the bus stops along them include:

- Low-medium frequency bus stops along the length of Woodville Road within the LGA, serviced by Route 907 between Bankstown and Parramatta
- Medium-frequency bus stops along the Excelsior Street and The Avenue collector corridor, served by Route 906 between Fairfield and Parramatta and Route 908 between Merrylands and Bankstown
- High-frequency bus stops along Blaxcell Street and Campbell Hill Road via Rawson Road, serviced by the frequent M91 service between Hurstville and Parramatta
- Medium-frequency bus stops along Guildford Road, one of the few direct east-west bus connections crossing Woodville Road.

6.2 Active Transport

6.2.1 Overview

The proposed land use changes include an intensification of residential, mixed-use and commercial land across the three (3) precincts. Each of the precincts has a different distribution of population to employment density, ranging from the primarily residential Woodville North Precinct to the large-scale retail and commercial in the Merrylands East Precinct. As such, there is a potential opportunity to capture the new traffic demand for short-distance trips within or between the key precincts with active and sustainable modes of transport. Encouraging an increase uptake of cycling and walking through an integrated transport strategy provides a chance to alleviate the projected future traffic pressures caused by an over-reliance on private cars.

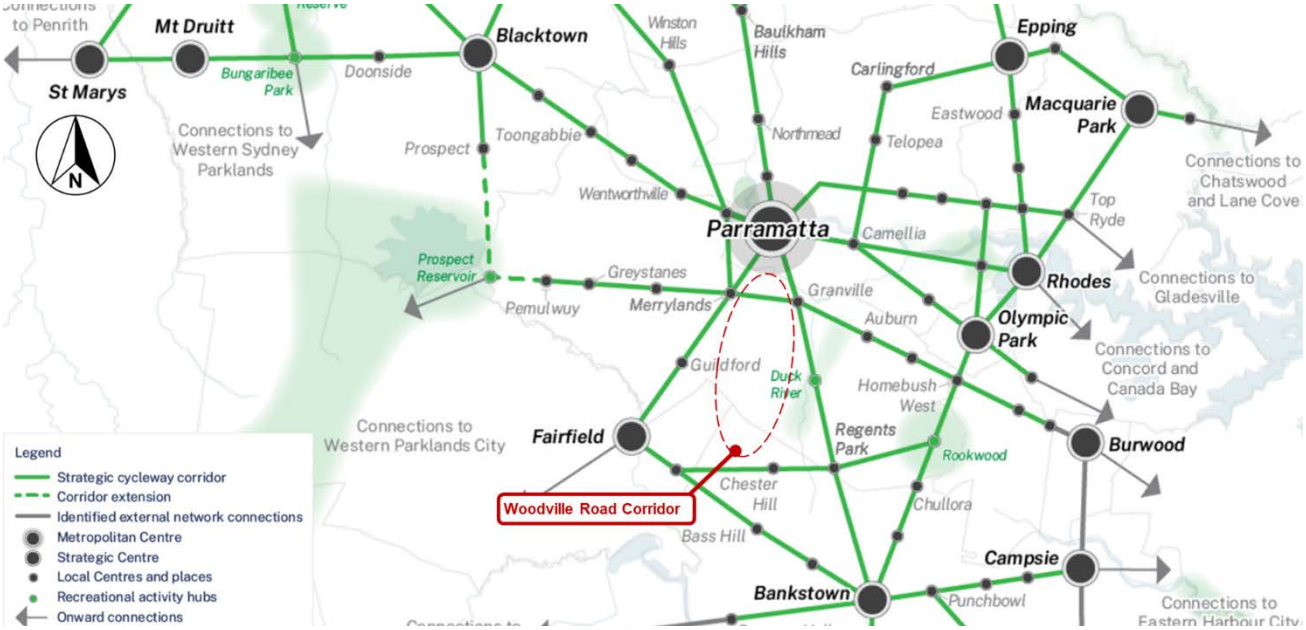
Strategic planning and cycleway guidelines for both the LGA and the wider Greater Sydney region have been reviewed and summarised below to guide the long-term planning for active transport corridors.

Strategic Cycleway Corridors for Greater Sydney (TfNSW)

The Strategic Cycleway Corridors for Greater Sydney outlines an extensive network of strategic and local centres connected with safe, direct and attractive cycling routes as a part of the NSW State Government's vision to increasing the mode share for cycling. The planning for the strategic cycleway network revolves about six (6) primary building blocks:

- Making bike riding an attractive choice
- Improving safety for all ages and abilities
- Progressively expanding and filling gaps to create a connected network
- Offering integration with local bike networks
- Connecting key centres and places across Council and project boundaries
- Delivering by working together with partners and the wider community.

The relevant area around Greater Parramatta is shown in Figure 6.3. The key strategic corridors near the study area include the Merrylands to Duck River, Parramatta to Bankstown and Parramatta to Fairfield corridors.



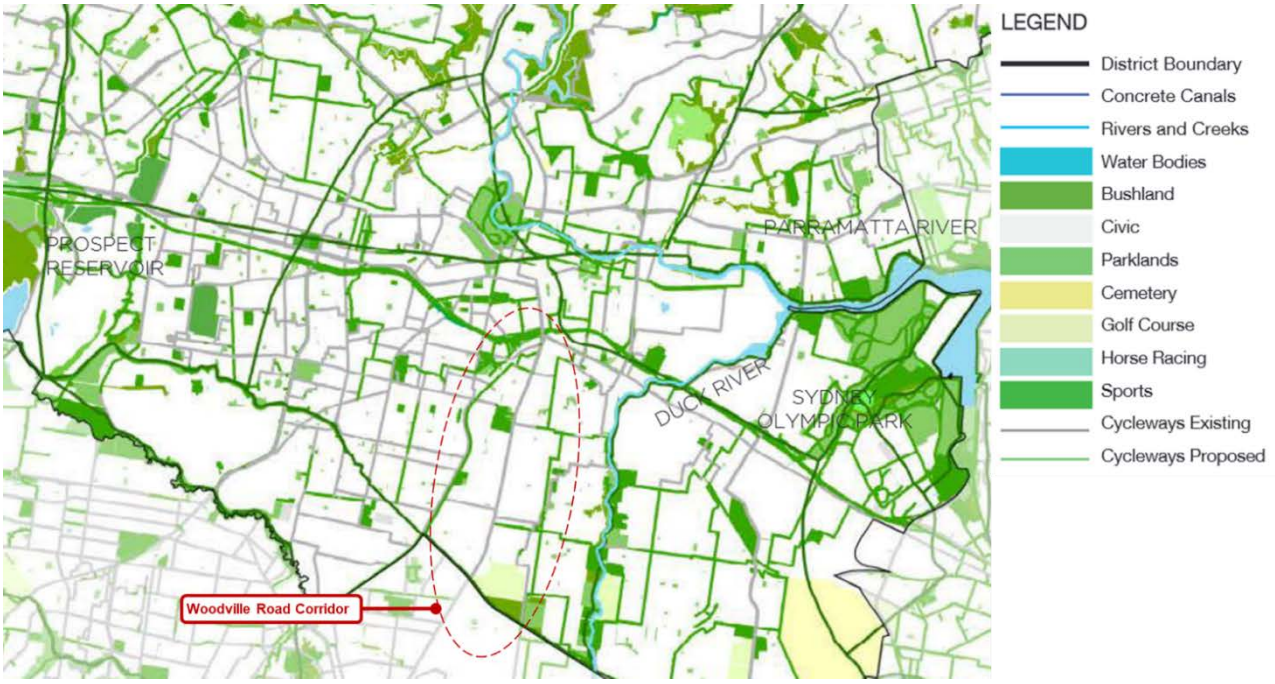
Source: Strategic Cycleway Corridors – Central River City Overview (Transport for NSW, Program Update January 2023)

Figure 6.3: Strategic Cycleway Corridors Greater Sydney – Central River City

West Central District Green Grid (Government Architect NSW)

The West Central District Green Grid identifies a network of high-quality open space areas (i.e. Green Grid) and water bodies (i.e. Blue Grid), and highlights the delivering of an interconnected network of existing and proposed transport links through the enhancement of the public realm. The urban revival of the Woodville Road Corridor is poised to add to the Green Grid of the study area, which is currently limited aside from Granville Park. The Green Grid network map is shown below in Figure 6.4.

While the corridor itself is isolated from cycleway links, there are proposed networks to the east around Duck Creek and Duck River and west at the rail corridor. There is an opportunity as a part of the WRC study to provide new east-west links to enhance the network of cycleway links in the region.



Source: West Central (Sydney) District Green Grid, Office of the Government Architect (NSW Government, 2017), Figure WC.10

Figure 6.4: Green Grid and Blue Grid – Woodville Road Corridor

Cycleway Design Toolbox (TfNSW)

The Cycleway Design Toolbox aims to guide the implementation of new cycling infrastructure with a comprehensive range of design guidelines and tools for both on-road and off-road environments. The Toolbox sets a standard for the best-practice design of all new cycle paths based on six (6) key design principles:

- Safe
- Direct
- Connected
- Attractive
- Comfortable
- Adaptable.

By achieving cycling infrastructure that aligns with these principles, the Toolbox encourages the increased accessibility of cycling and other micro-mobility transport modes for people of all ages and ability levels.

Cycling Propensity (as part of the TfNSW Strategic Business Case for Cycling)

TfNSW has developed an index for cycling propensity based on a few Census variables to provide insight into the latent demand for cycling across NSW. This index is spatially mapped in Figure 6.5, highlighting the current projection of the likelihood of cycling uptake across the study area. The map shows that there is a higher cycling propensity towards the north of the study area, particularly near the Woodville North Precinct.

Figure 6.5: Cycling Propensity in Cumberland City

Draft Walking and Cycling Strategy (Cumberland City Council).

Council is currently developing a Walking and Cycling Strategy to promote a strategic framework for enhancing and planning for safer and more attractive walking and cycling around the Cumberland LGA. For the Cumberland City LGA.

There are three (3) main proposed active transport corridors which influence the WRC study area:

Route 3: Merrylands to Auburn (via Duck River)

A strategic corridor which provides an east-west connection between Merrylands and Auburn, interfacing with existing green spaces near Duck Creek and Duck River to the east of the study area.

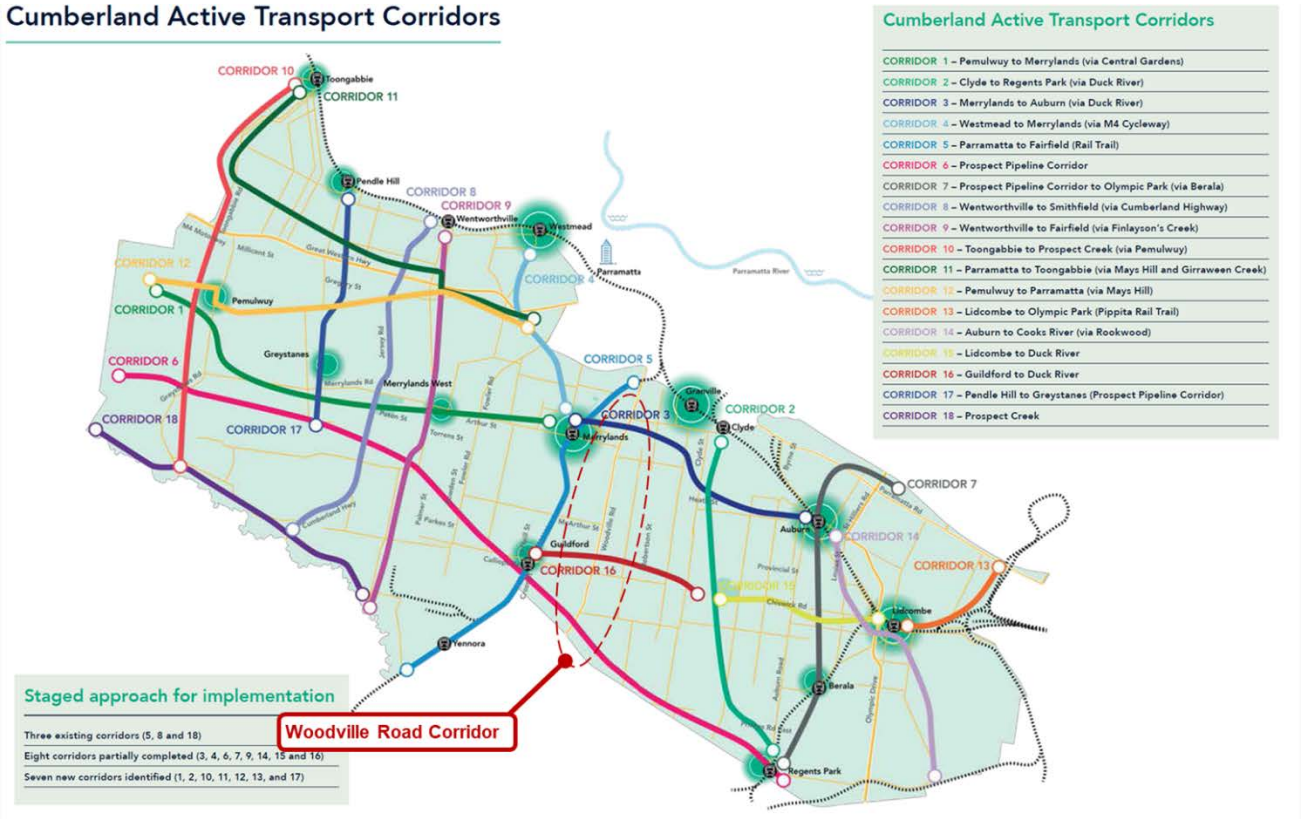
Route 5: Parramatta to Fairfield

A strategic corridor which provides a north-south connection between the northern boundary of the LGA and Fairfield to the south via the existing railway corridor.

Route 16: Guildford to Duck River

A district corridor which provides an east-west connection between Guildford and the Duck River Parklands, directly crossing the Woodville Road Corridor within the Woodville South Precinct.

The proposed active transport corridors within the Cumberland City LGA are shown below in Figure 6.6.



Source: Draft Walking and Cycling Strategy (Cumberland City Council, 2023)

Figure 6.6: Draft Active Transport Corridor – Cumberland City LGA

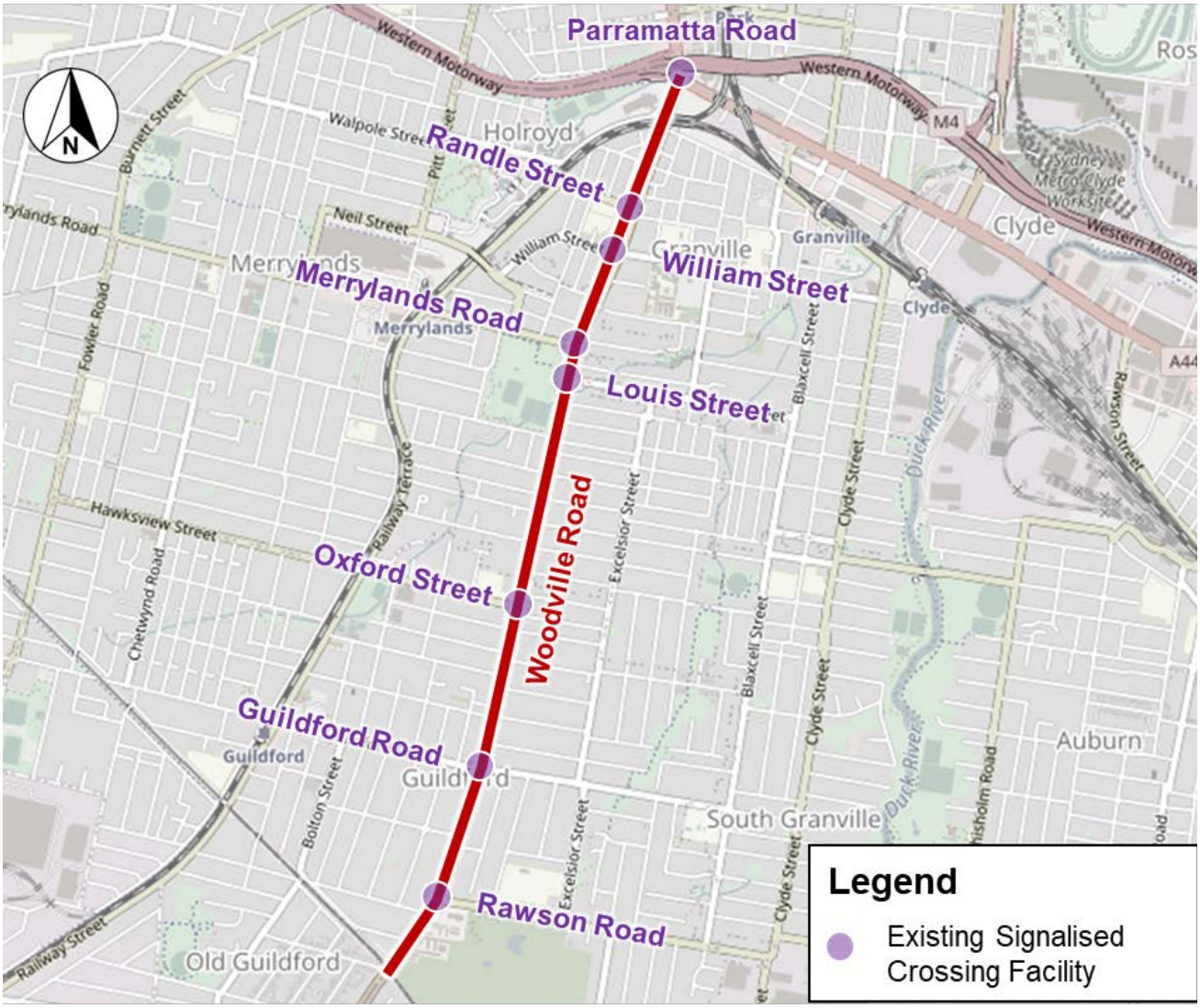
It should be noted that the active transport corridors shown in Figure 6.6 are those which are understood to be currently proposed at the time of writing of this report. These corridors are subject to change prior to final endorsement of Council's walking and cycling strategy.

6.2.2 Walking

Footpaths are generally provided along and connecting to the Woodville Road Corridor within the study area. At most of the signalised intersections along Woodville Road, signalised pedestrian crossing facilities are provided (except for the Crescent Street intersection). Given the width of Woodville Road, other pedestrian facilities like refuge islands or zebra crossings are not suitable for use along the corridor.

The pedestrian crossing opportunities allow pedestrians to safely move across the arterial Woodville Road, providing links between the nearby residential, employment, education and recreation facilities. However, there are large gaps between the crossing opportunities at certain sections of the corridor, necessitating that pedestrians walk for a considerable distance along the busy corridor to reach a safe crossing point.

A map showing the existing pedestrian crossing facilities is shown below in Figure 6.7.



Adapted from OpenStreetMap

Figure 6.7: Existing Pedestrian Crossing Facilities – Woodville Road Corridor

The Strava Heatmap shown in Figure 6.8 provides an indication of the usage levels of the existing footpath infrastructure along and around the Woodville Road Corridor. It is noted that Strava data tends to be inherently weighted towards exercise/fitness activity, and therefore may not fully reflect pedestrian activity for other purposes (e.g. walking to train stations and bus stops, walking to shops).

Source: Strava Global Heatmap

Figure 6.8: Existing Pedestrian Activity – Woodville Road Corridor

The activity map shows that the recorded pedestrian activity along the Woodville Road Corridor is relatively low, with some minor activity on the northern side of the study area which transitions to/from the local road network. Instead, the primary north-south pedestrian movement corridors are:

- Railway Parade to the west, with relatively high levels of pedestrian activity crossing the northern side of the Corridor along near Merrylands Road.
- Excelsior Street to the east, with connections to open spaces like Duck Creek and Duck River.

The main destination for pedestrian activity in the Woodville North Precinct is concentrated on Granville Park, highlighting the need for strong connections to this area.

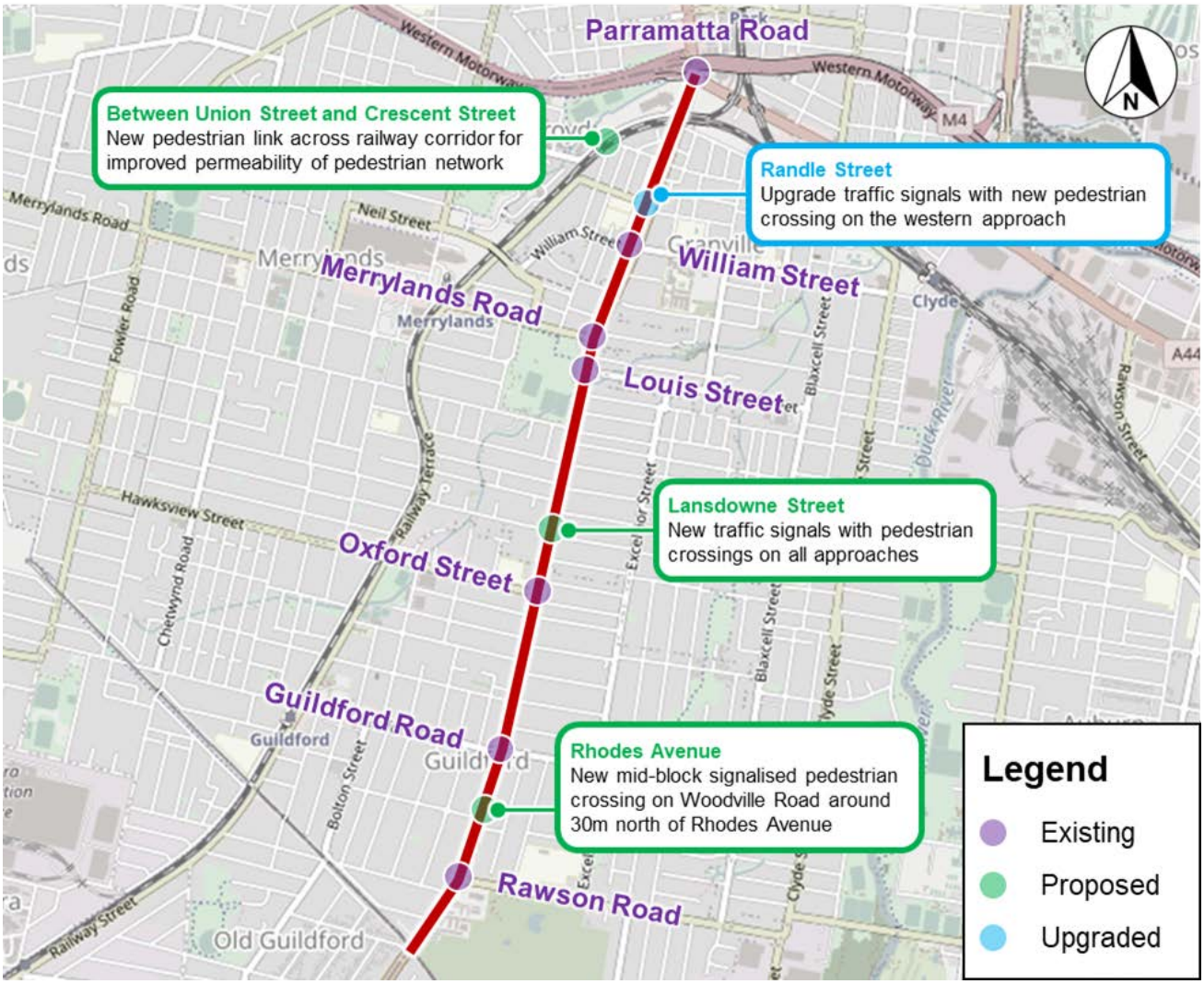
There is minimal pedestrian activity in the Merrylands East and Woodville South Precincts, which could be reflective of the relative sparsity of pedestrian infrastructure or high-quality recreation spaces in these areas.

The future intensification of residential and business development along the Woodville Road Corridor increases the demand for pedestrian connections between the uplift sites, particularly to the retail sites near Oxford Street and Guildford Road.

The existing and proposed pedestrian crossing facilities along the Woodville Road Corridor are shown below in Figure 6.9.

The proposed or upgraded facilities aim to 'fill in the gaps' in the existing provision, with new signalised crossing facilities in the Merrylands East and Woodville South Precincts. The new facilities across Woodville Road are currently proposed as at-grade facilities; however, any opportunities for grade-separated facilities like pedestrian bridges should be explored on their merits with the redevelopment of surrounding land as part of the urban uplift. It is recognised that the existing roadside environment is likely not suitable for such facilities.

There is also an opportunity for a new pedestrian connection between Union Street and Crescent Street. Access to the Woodville Road Corridor from the Holroyd catchment currently is only facilitated through the Crescent Street intersection. A more direct connection can improve the permeability of the pedestrian network, and aligns with precinct-specific targets of improving public transport accessibility. Any such facility would need to be developed in coordination with the relevant authorities, including Sydney Trains.

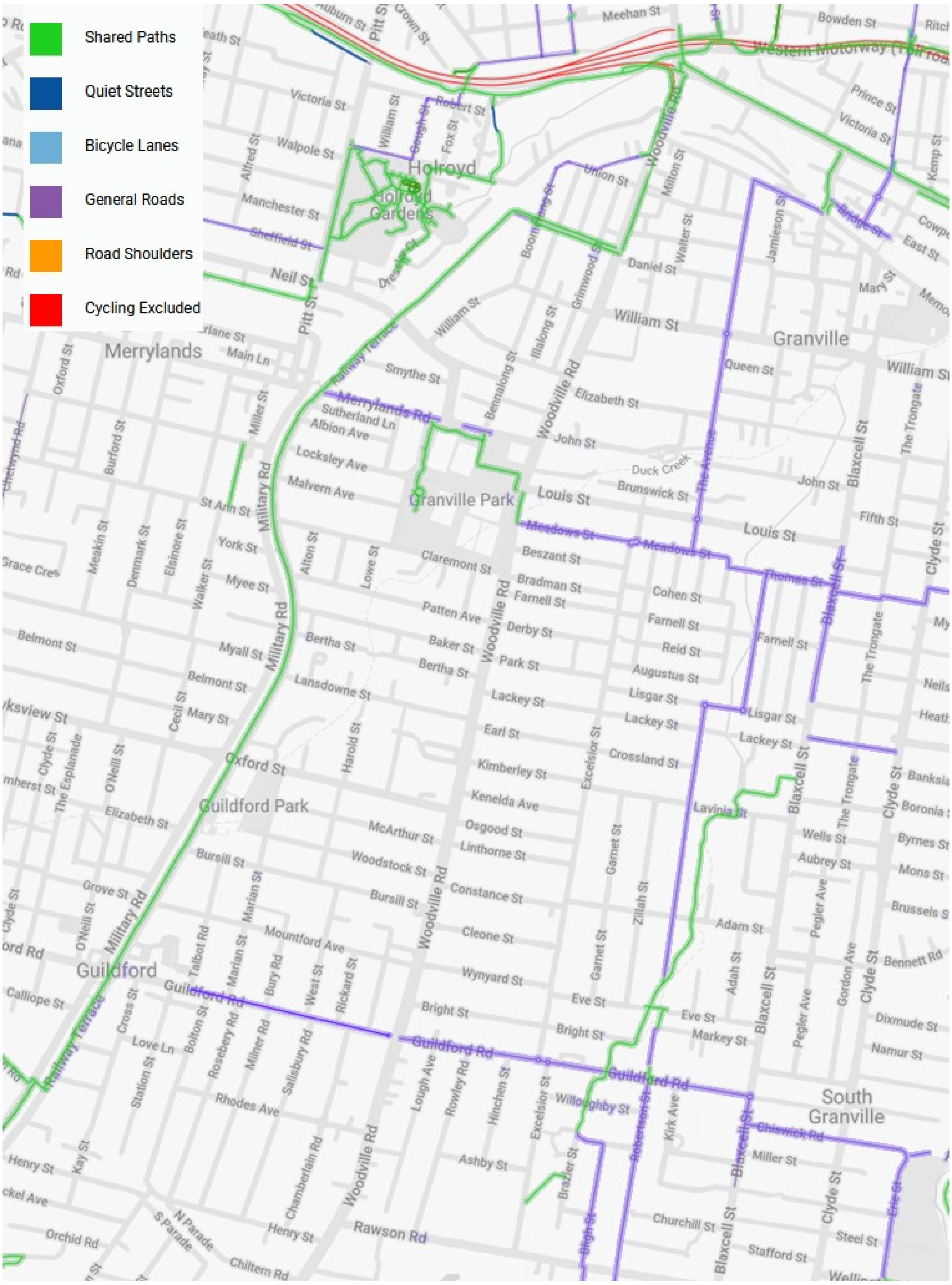


Adapted from OpenStreetMap

Figure 6.9: Existing and Proposed Pedestrian Crossing Facilities – Woodville Road Corridor

6.2.3 Cycling

The existing cycling paths and routes in vicinity of the study area is shown in Figure 6.10. There are existing shared paths along parts of Woodville Road north of Randle Street, connecting to the rail corridor to the west. There is also a network of on-road bike routes to the east, with connections to the corridor via Meadows Street and Guildford Road. The Merrylands East Precinct is not currently serviced by any cycling infrastructure.

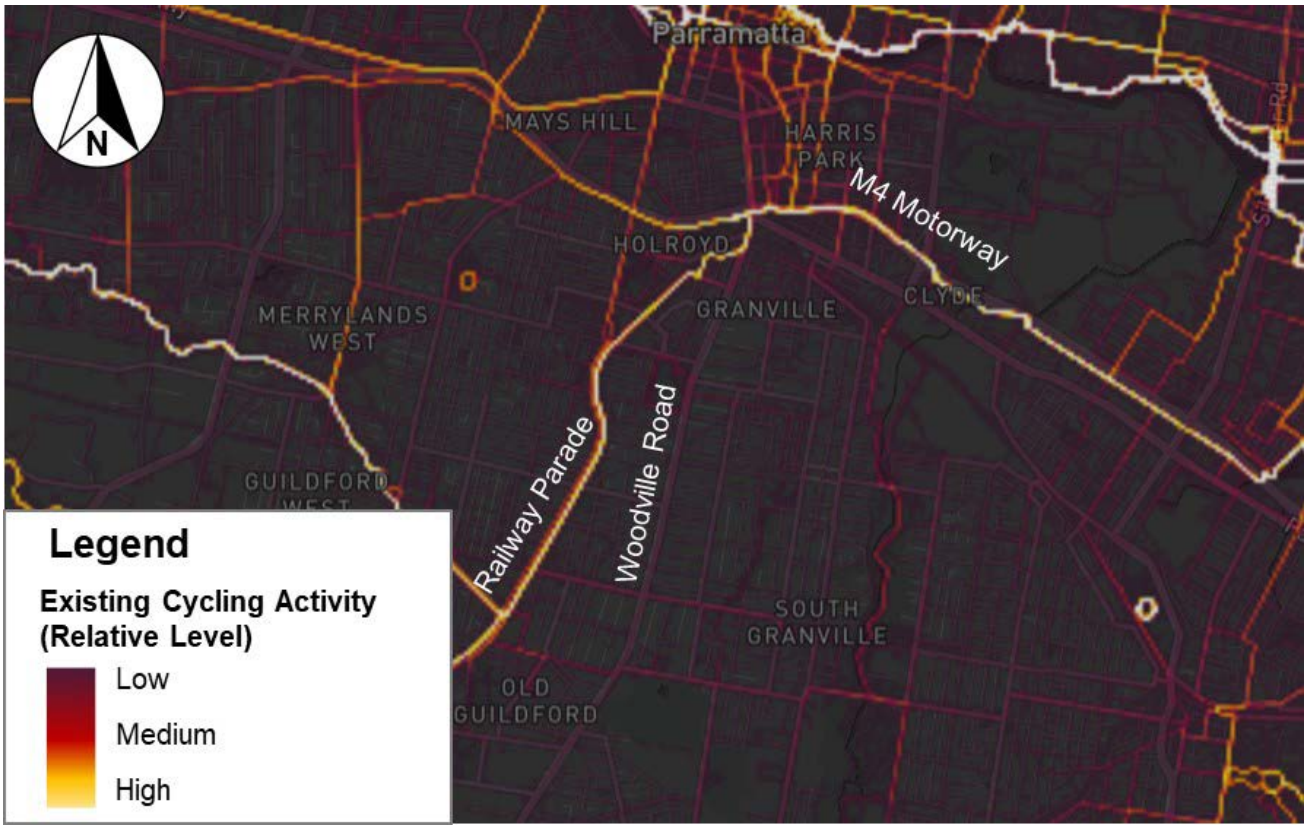


Source: Cycleway Finder (TfNSW)

Figure 6.10: Existing Cycling Infrastructure – Woodville Road Corridor

The Strava Heatmap shown in Figure 6.11 provides an indication of the usage levels of the existing cycling infrastructure and routes along and around the Woodville Road Corridor. The same caveat applies in that that Strava data tends to be inherently weighted towards exercise/fitness activity, and therefore may not fully reflect cycling activity for other purposes (e.g. commuting).

It is noted that there is very limited cycling activity recorded near or within the Woodville Road Corridor. The rail corridor route is heavily used, with cyclists preferring to travel along quiet streets like Union Street and Wallace Street to connect to Woodville Road.



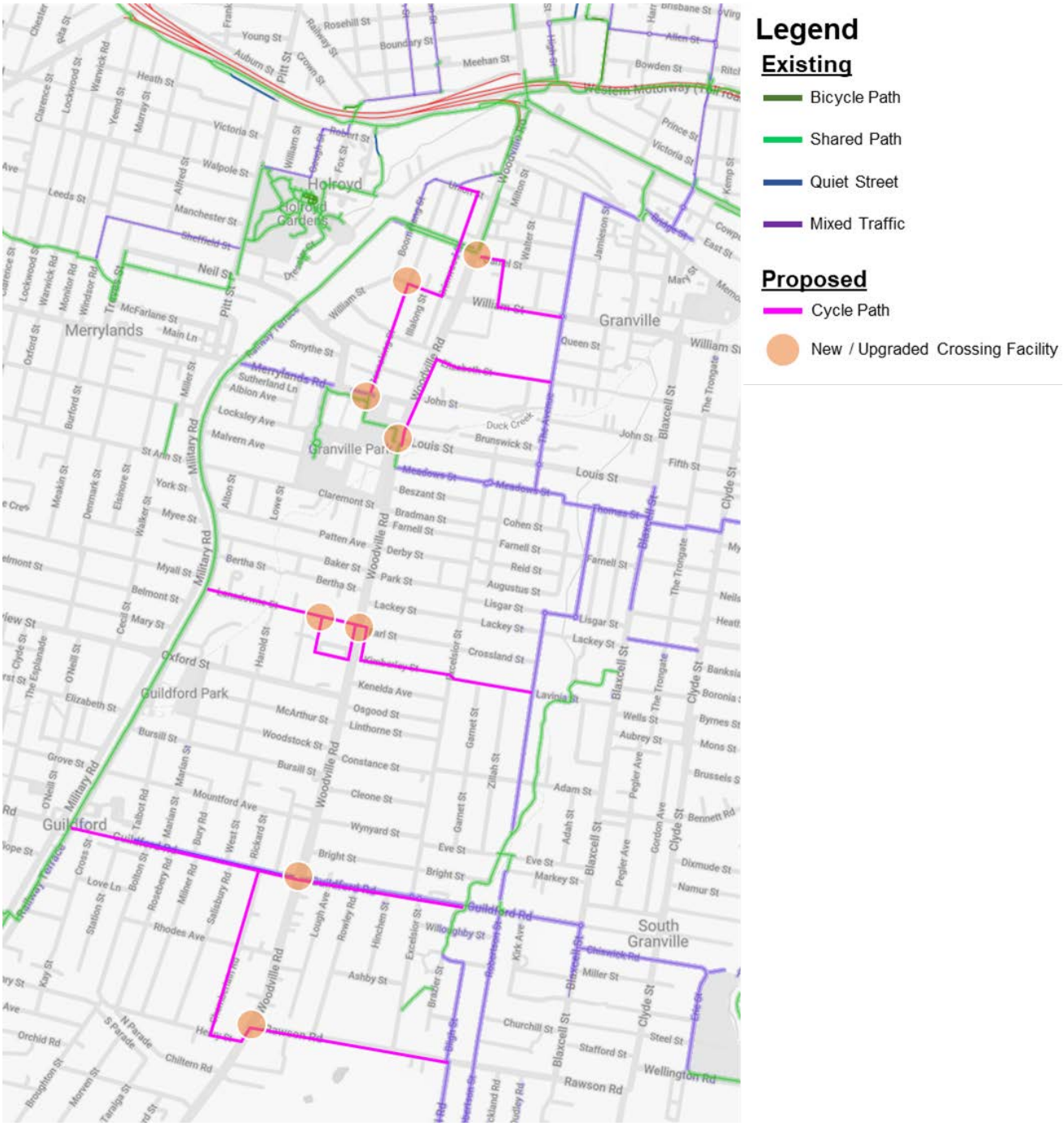
Source: Strava Global Heatmap

Figure 6.11: Existing Cycling Activity – Woodville Road Corridor

As a part of the current draft Urban Design Masterplan, a few side streets are proposed to be closed for local improvements to public domain as new open spaces. These open spaces can present opportunities for high-quality and safe active transport facilities.

In alignment with the regional and local cycling strategies, the draft Urban Design Masterplan and with consideration of the existing infrastructure, a network of new cycling paths is recommended to support east-west movements across the WRC. These paths should be supported by upgrades to existing or new intersections to accommodate cyclist crossing movements at pedestrian crossings (wider kerb ramps and crossings to allow multiple road users and cyclists to cross simultaneously, addition of cyclist signal lanterns, etc).

The existing and proposed cycling facilities within and near the WRC are shown below in Figure 6.12.



Adapted from Cycleway Finder

Figure 6.12: Existing and Proposed Cycling Facilities – Woodville Road Corridor

6.3 Parking Policies

6.3.1 Overview

There is an opportunity within the new uplift precinct sites to influence the future demographics, travel behaviours and traffic demands through parking policy controls. Medium to high density residential land use in close proximity to public and active transport hubs can benefit from parking controls for new development applications without inhibiting transport accessibility.

Lower off-street parking rates permitted for new development restricts the parking supply at individual sites. This can influence resident decisions regarding car ownership or contribute to demographic shifts away from people who rely heavily on private vehicles.

It is acknowledged that parking policy must take into consideration the impacts of restricted supply on the economic value of property. Off-street parking controls must be balanced around the availability and capacity of on-street supply to minimise negative effects of parking overflow.

Currently, during the peak hours on-street parking is prohibited on Woodville Road through a combination of 'No Stopping' and daytime 'Clearway' conditions, which is reflective of a typical high-capacity arterial movement corridor. Clearways are timed for:

- 6:00 AM – 7:00 PM on Monday to Fridays
- 9:00 AM – 6:00 PM on weekends and public holidays.

Outside of clearway times, overnight kerbside parking is permitted on-street at certain locations.

6.3.2 Development Car Parking Controls

The current car parking rates applicable to new developments as outlined in the Cumberland City Council Development Control Plan (DCP) 2021 are summarised below:

- Dwelling: 1 space per dwelling (max 2 spaces)
- Studio: 1 space per dwelling
- 1 bedroom unit: 1 space per dwelling
- 2-bedroom unit: 1 space per dwelling
- 3 or more bedrooms: 1.5 spaces per dwelling
- Visitors: 0.25 spaces per dwelling.

The majority of the stipulated parking rates in the DCP are specified to be minimum rates with no constraints on maximum parking provision. Furthermore, the minimum parking rates are noted to be relatively generous in terms of permitted parking supply, with all dwellings provided with at least one (1) parking space.

6.3.3 Benchmark Council Areas – Car Parking Controls

To understand the quality of the existing Cumberland DCP car parking controls, a comparison with other selected LGAs was undertaken. The selected LGAs include suburbs or areas with similar land uses and accessibility to the wider public transport network as the future Woodville Road Corridor. The recommended parking spaces from the Guide to Traffic Generating Developments (GTTGD) is also included for comparison purposes.

The comparison is shown in Table 6.2.

Table 6.2: DCP Car Parking Controls Benchmarking Comparison

Type	Cumberland (Minimum)	Randwick City Council HIA (Minimum)	Randwick City Council (Minimum)[1]	City of Ryde (Minimum)[1]	Macquarie Park Corridor (Maximum)	PRCUTS[2] (Maximum)	Canada Bay (Maximum)	Strathfield (Minimum)	GTTGD[3] Metro CBD (Minimum)
Dwelling	1	-	1-2	Max 2	-	-	2	2	1-2
Studio	1	0.2	0.5	0.6-1	0.6	0-0.6	0.3	-	0.4
1 bed	1	0.6	1	0.6-1	0.6	0.3-0.9	0.5	1	0.4
2 beds	1	0.8	1.2	0.9-1.2	0.9	0.7-1.2	0.9	1.5	0.7
3+ beds	1.5	1.1	1.5	1.4-1.6	1.4	1-1.5	1.2	2	1.2
Visitors	0.25	0.20	0.25	0.20	0.10	0-0.20	0.02	0.2	0.14

1. Any spaces provided above the minimum rate will be included in the GFA calculations for building FSR
2. Parramatta Road Corridor Urban Transformation Study (UrbanGrowth NSW 2016)
3. Guide to Traffic Generating Developments (RTA 2002)

The comparison indicates a range of development parking controls across the different areas. From this information, a hierarchy of permissible parking levels has been identified, ranging from P1 Low Parking to P3 High Parking. These are summarised in Table 6.3.

Table 6.3: Recommended Car Parking Controls

Type	Low Parking (P1)	Medium Parking (P2)	High Parking (P3)
Dwelling	1	1 – 2	1-2
Studio	0.2 – 0.4	0.6 – 1.0	1
1 bed	0.4 – 0.5	0.6 – 1.0	1
2 beds	0.7 – 0.9	0.9 – 1.2	1.5
3+ beds	1.1 – 1.2	1.4 – 1.6	2
Visitors	0.02 – 0.20	0.10 – 0.20	0.25

P1 rates would be appropriate where there is an excellent and direct connection to public and active transport, with the lower permissible parking aiming to reduce car ownership and encourage new residents to travel via sustainable modes. Where necessary, these areas can be supplemented with increased accessibility to car share facilities.

P2 rates would be appropriate where there is decent connectivity to the public and active transport network, or where short 'internal' trips are likely to occur due to the mix of land uses (both residential and employment). The medium parking rates would aim to encourage a mode shift away from private vehicles.

P3 rates would be appropriate for areas with little to no connectivity to the public and active transport network, with limited alternative options forcing a high dependency on car ownership.

The recommended parking zones are therefore shown in Figure 6.13.

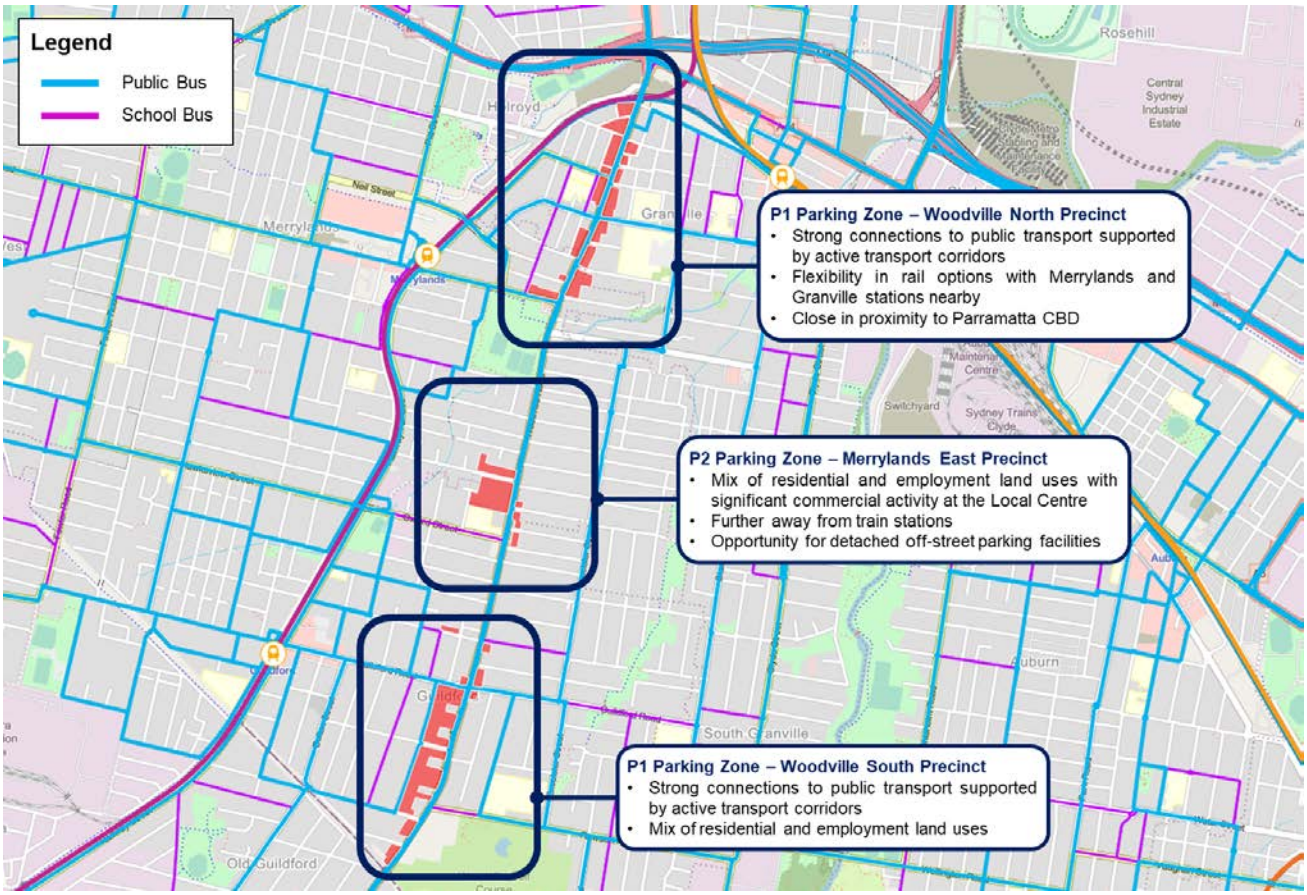


Figure 6.13: Proposed Parking Controls – Woodville Road Corridor

Furthermore, the following aspects are also recommended:

- The rates listed in Table 6.3 are adopted as maximum parking rates
- If not, then any spaces provided above the minimum will count towards development GFA for FSR calculations.

It should be noted that the traffic modelling undertaken as part of this assessment and all subsequent output reporting in this TTS report has not accounted for any traffic discounts associated with the recommended maximum parking rates listed in Table 6.3.

6.3.4 Development Bicycle and Motorcycle Parking Controls

The current bicycle parking rates applicable to new development as outlined in the Cumberland DCP 2021 for bicycles are summarised below:

- Dwelling: N/A
- Multi-dwelling residential units: 1 space per 3 units (total)
- Visitors: 1 space per 3 units (total).

The majority of the stipulated parking rates in the DCP are specified to be minimum rates with no constraints on maximum parking provision.

6.3.5 Benchmark Council Areas – Bicycle and Motorbike Parking Controls

Table 6.4 summarises a comparison of Cumberland DCP bicycle parking controls with the other selected LGAs. It is noted that not all of the selected LGAs specified relevant bicycle parking controls in their DCPs.

Table 6.4: DCP Bicycle Parking Controls Benchmarking Comparison

Type	Cumberland (Minimum)	Randwick City Council HIA	Randwick City Council (Minimum)	City of Ryde	Macquarie Park Corridor	PRCUTS[1]	Canada Bay	Strathfield	City of Parramatta	GTTGD[2] Metro CBD
Bicycles										
Dwelling	-	-	-	-	-	1	2	-	-	-
Multi-dwelling residential units	0.33	1	0.5	-	-	1	2	-	1	-
Visitors	0.33	0.1	0.1	-	-	0.1	0.2	-	0.1	-
Motorcycles										
Multi-dwelling residential units	-	-	5.0% of car spaces	-	-	-	3.3% of car spaces	-	2.0% of car spaces	-

1. Parramatta Road Corridor Urban Transformation Planning and Design Guidelines (UrbanGrowth NSW 2016)
2. Guide to Traffic Generating Developments (RTA 2002)

Based on the above benchmarking comparison and in alignment with the same P1, P2 and P3 parking zones identified in Section 6.3.3, bicycle parking controls for each zone are recommended as per Table 6.5. Furthermore, it should be noted that the rates for these parking controls are recommended to be adopted as minimum rates.

Table 6.5: Recommended Bicycle Parking Controls

Type	P1	P2	P3
Dwelling	2 spaces	1 space	0 spaces
Multi-dwelling residential units	1 space per unit	1 space per unit	1 space per 3 units
Visitors	1 space per 3 units	1 space per 5 units	1 space per 10 units

6.4 Travel Demand Management Measures

6.4.1 Overview

Upgrades to road infrastructure and traffic signal to allow for increased road capacity or better intersection performance may not be sufficient alone to manage increased traffic demands anticipated in the future due to precinct development. Measures which would achieve a reduction in the mode share of the private motor vehicle should be considered. These measures would help free up road space within the Woodville Road Corridor by distributing travel demands to increase active and public transport use or by implementing policies which would reduce travel demands.

These may include (but are not limited to) the following potential measures that would ultimately aim to encourage more sustainable travel options, reduce traffic congestion and achieve green, safe and walkable green cities:

- Programs to encourage Single-Occupancy Private Vehicle Trip/Ownership (i.e. via Green Travel Plans):
  - Programs to reduce commuter dependency on private vehicles (e.g. cycling education programmes)
  - Programs to facilitate low-cost public transport fees for participating residents
  - Provision of 'park and ride' facilities at key transport hubs to reduce long-distance car trips
  - Improvements and increased provision of cycling facilities (e.g. bicycle parking facilities and at development precincts and transport hubs)
  - Carpooling
  - Car sharing
  - Offices adopting work-from-home options
  - Online Shopping.
- Improvements to freight delivery and management:
  - Alternative modes of transport for freight delivery
  - Planning scheduled deliveries during off-peak periods
- High density and mixed land-use development:
  - Concentration of multiple land-use types to discourage short trips via motor vehicles
  - Developments with a major transport hub at the centre
  - Provision of high accessibility to public transport (e.g. bus stops/train stations within 10-minute walking distance)
  - Provision of bike shared system with docking systems at train stations and at key development precincts.
- Improvements to parking management policies:
  - Provision of shared parking spaces for commercial developments
  - Unbundled car parking spaces for residential unit development
  - Off-street parking levies on residential and retail owners
  - Efficient management of on-street parking restrictions
  - Review of on-street metered parking.

A single-solution approach should not be adopted where only one measure is considered. Instead, a combination of measures should be adopted to maximise the number of alternative options available to private vehicle use and shift the local community towards a multi-modal community.

6.4.2 Car Share Strategies

A key travel demand management measure includes the adoption of private car share schemes. Provision of sufficient dedicated car share pods may encourage less ownership of vehicles especially in the Woodville Road Corridor where major employment precincts and local centres are/will be located such as in Merrylands to the West and Parramatta to the North.

Additionally, with the appropriate locations adopted for these dedicated car share pods, they may discourage long-distance trips via private vehicle such as by locating these pods near train stations. Near the Woodville Road Corridor there are number of dedicated car share pods provided in the vicinity of nearby train stations (e.g. Guildford, Merrylands and Granville Station). Except for Woodville North Precinct, coverage of the dedicated car share pods is limited along the Woodville Road Corridor.

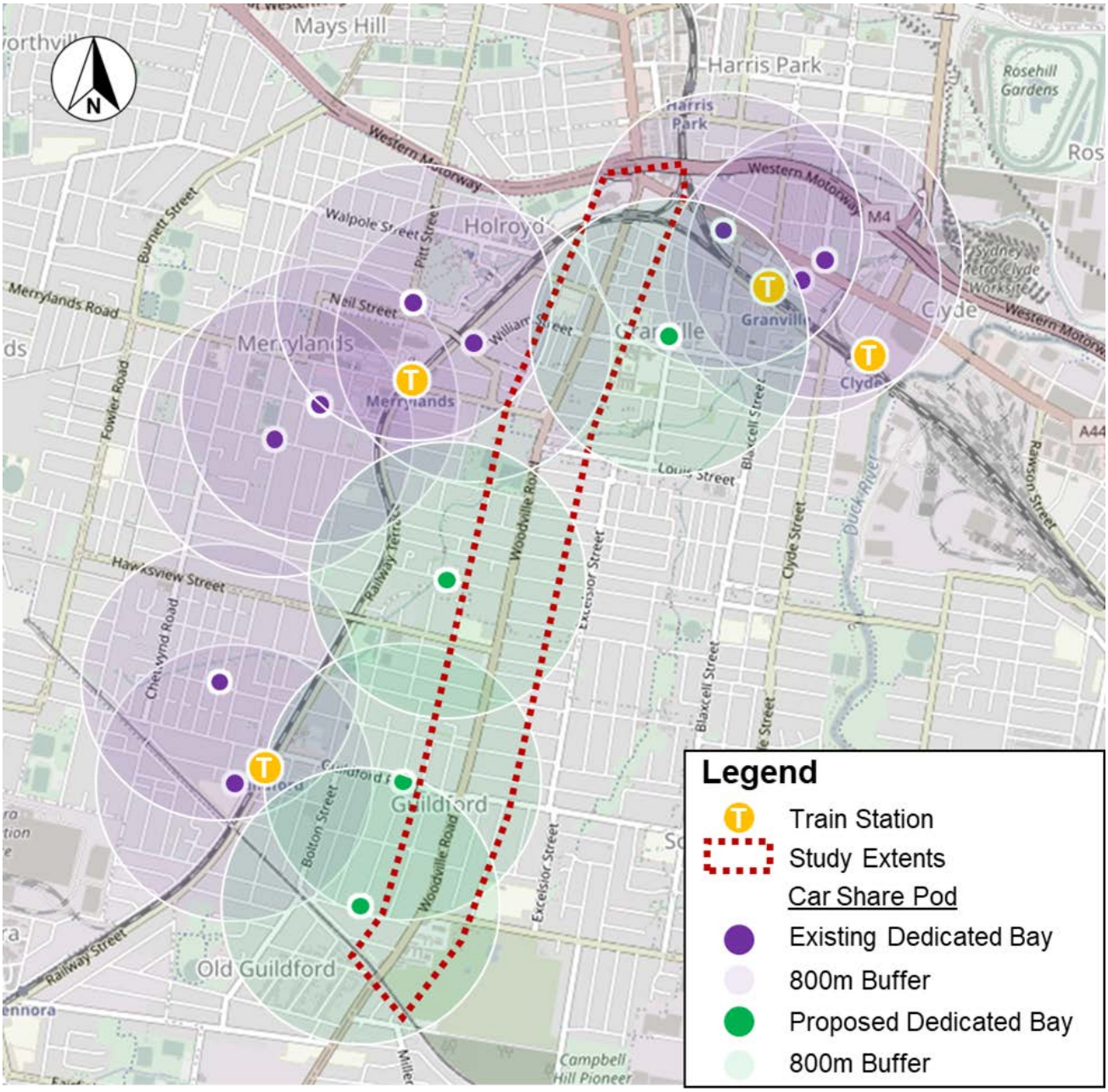
With the increased residential and business development at the three key precincts, there are opportunities to reduce the provision for dedicated parking for residents through parking policies as described in Section 6.3 to encourage a reduction in private car ownership. As part of an integrated implementation, any demand for car movements can be offset with increased car share facilities located in a convenient walking distance from the uplift sites.

To achieve a greater coverage of dedicated car share pods along the Woodville Road Corridor, dedicated car share pods are proposed in the vicinity of the following intersections:

- Lansdowne Street / Lamb Crescent
- Guildford Road / West Street
- Salisbury Road / Henry Street
- William Street / The Avenue.

These proposed dedicated car share pods would achieve connectivity from the new local centres (e.g. Merrylands East Local Centre and Guildford 'Four Corners' Local Centre) and future residential development in the Merrylands East Precinct and Woodville South Precinct with the Guildford Station.

The existing and proposed dedicated car share pod coverage near the Woodville Road Corridor is shown below in Figure 6.14.



Adapted from OpenStreetMap

Figure 6.14: Car Sharing within Woodville Road Corridor

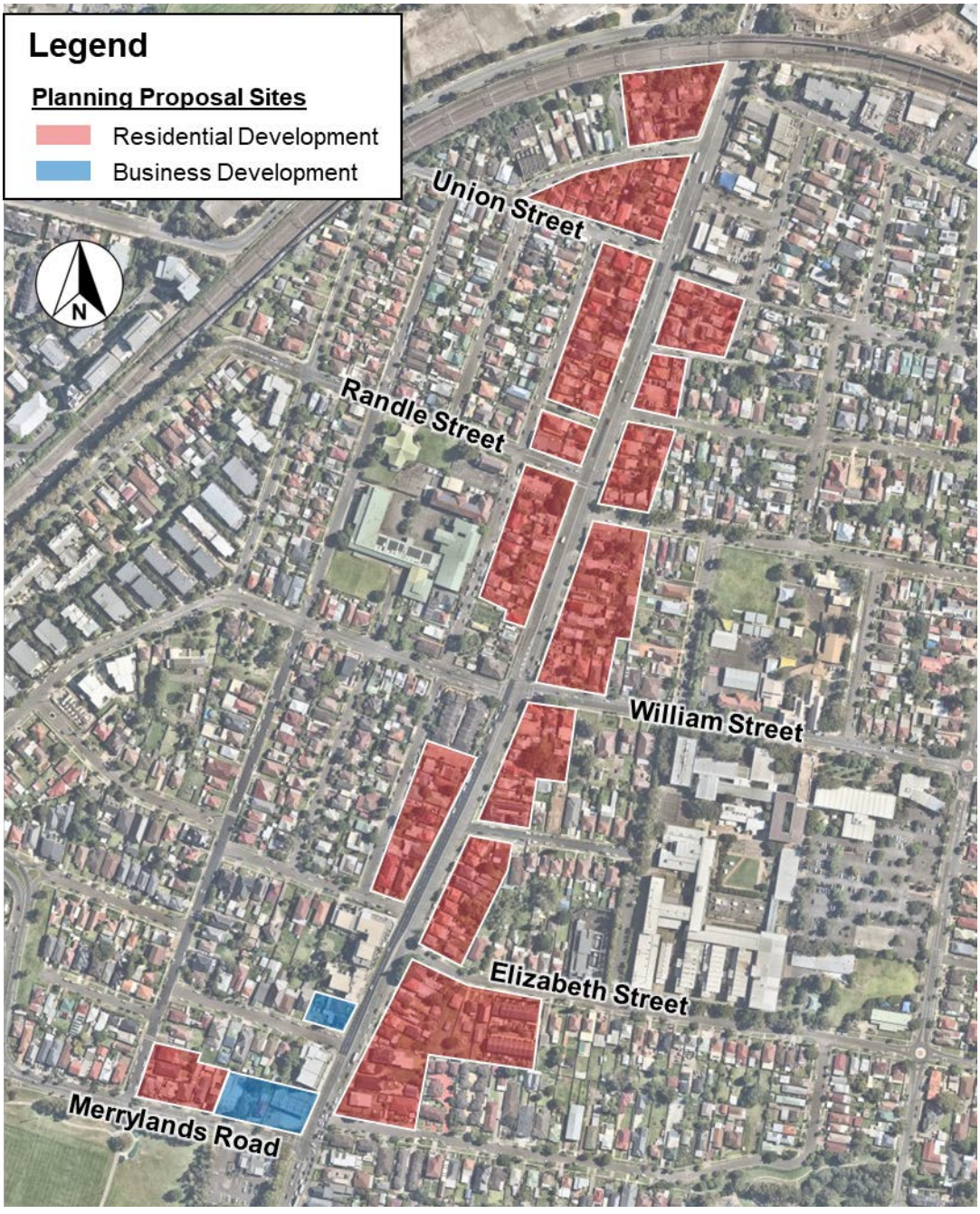
7. WOODVILLE NORTH PRECINCT

7.1 Uplift Yield Summary

The development uplift yields within the Woodville North Precinct are summarised below:

- 80,724m^2 total aggregate site area between 15 sites
- 1,384 medium and high-density residential dwellings
- 1,776m^2 GFA of retail and commercial land use

The key uplift sites and development type are shown in Figure 7.1.



Adapted from Nearmap

Figure 7.1: Proposed Uplift Land Use – Woodville North Precinct

7.2 Road Network Upgrades and Changes

7.2.1 Woodville Road / Randle Street

There is an opportunity to enhance pedestrian and cyclist facilities at the Woodville Road / Randle Street intersection, which performs a diminished Movement function compared to most of the other signalised intersections along the corridor. Improved active transport infrastructure at this location supports existing and proposed connections.

The following traffic measures and road infrastructure upgrades are proposed at the Woodville Road / Randle Street intersection:

- A new pedestrian crossing on the western approach
- An upgrade to the existing pedestrian crossing.

These are shown in Figure 7.2.

Adapted from Nearmap

Figure 7.2: Proposed Road Network Upgrades – Randle Street

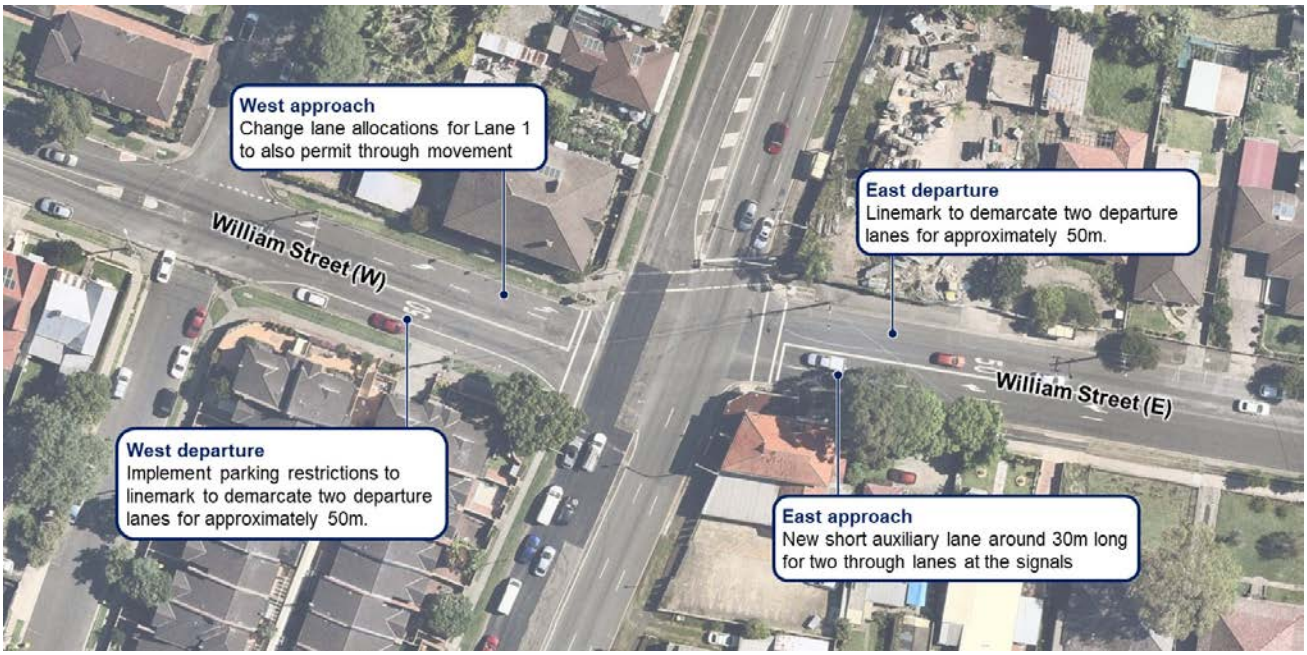
7.2.2 Woodville Road / William Street

The Woodville Road / William Street intersection is one of the key intersections in the Woodville North Precinct, facilitating east-west cross movements across the busy movement corridor. To cater for future traffic growth, increased intersection capacity is required at the traffic signals.

The following traffic measures and road infrastructure upgrades are proposed at the Woodville Road / William Street intersection:

- A new short auxiliary lane on the east approach
  - Some land acquisition or kerb adjustments may be necessary as part of the uplift to facilitate this
- Changed lane allocations on the west approach
- Upgrading both eastern and western departures to two lanes.

These are shown in Figure 7.3.



Adapted from Nearmap

Figure 7.3: Proposed Road Network Upgrades – William Street

7.3 Public Transport Initiatives

The Woodville North Precinct has excellent public transport coverage, with all uplift sites generally well serviced by public transport. The bus stops along Woodville Road and William Street are positioned at the heart of the precinct, and Merrylands train station is (or is very close to being) within a comfortable walking distance of the planned uplift sites. The precinct also benefits from strong connections to Granville and Clyde train stations via William Street.

The public transport coverage map for the Woodville North Precinct is shown in Figure 7.4.

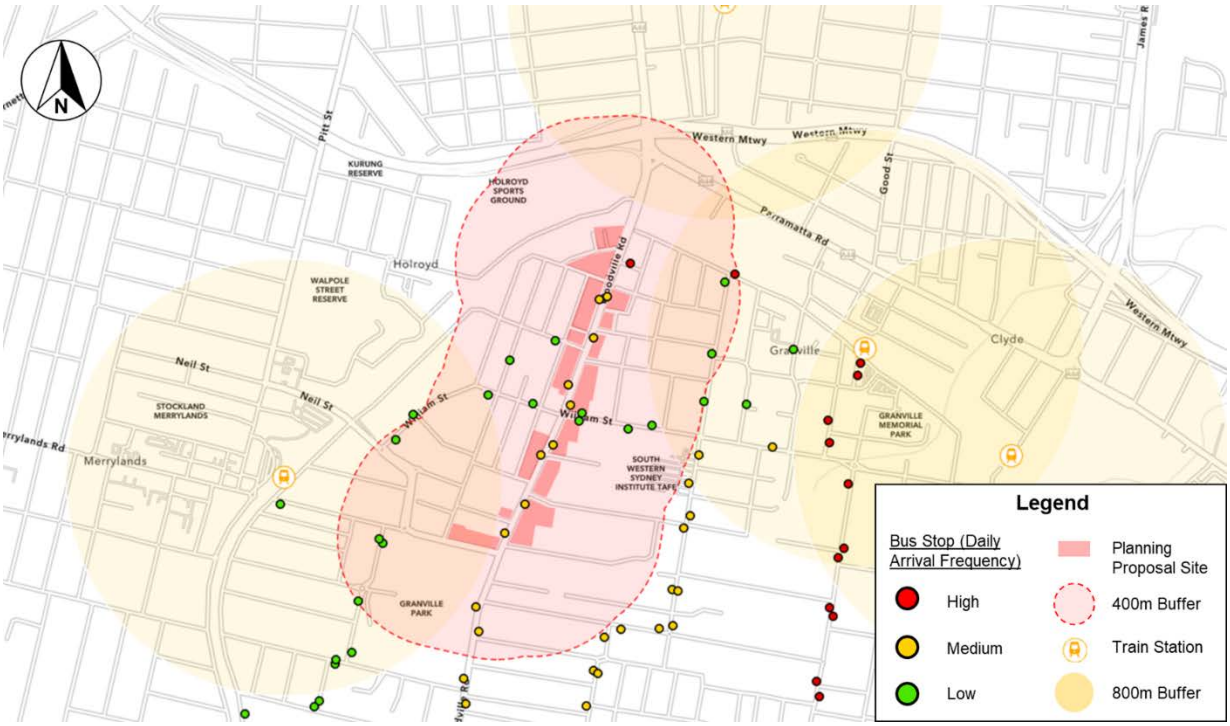


Figure 7.4: Public Transport Coverage Map – Woodville North Precinct

Based on Figure 7.4, the Woodville North Precinct's public transport coverage includes mostly medium-frequency bus stops along Woodville Road. There are a small number of high-frequency bus stops to the north-east of the catchment area which are serviced by the M91 bus route. However, these bus stops are only within a comfortable walking distance of uplift sites closer to the northern side of the Precinct and are only serviced in the southbound direction (i.e. Parramatta to Hurstville).

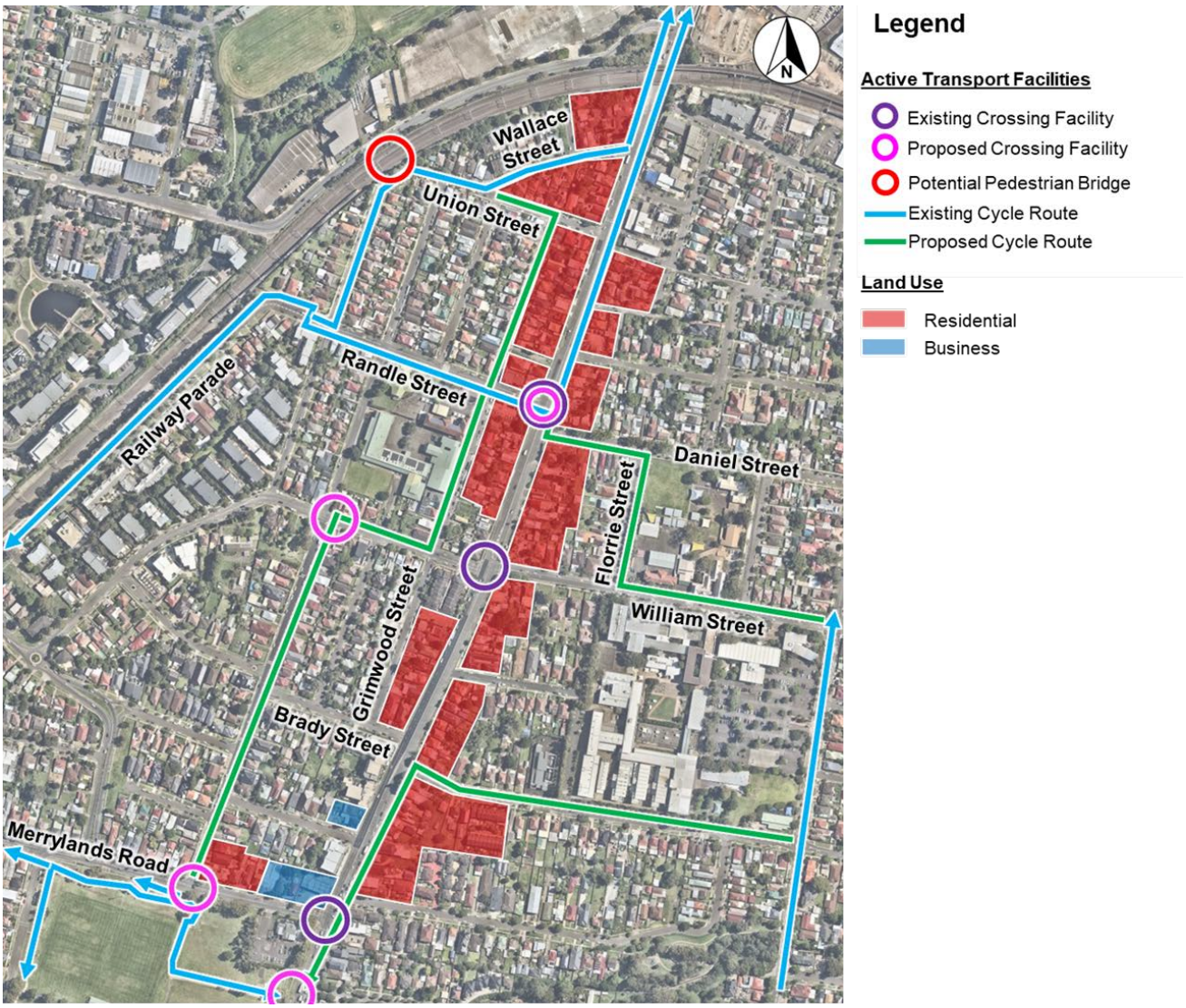
Potential measures to improve public transport near the Woodville North Precinct include:

- Increase frequency of peak hour bus services for routes travelling along Woodville Road (e.g. Route 907) to ensure all uplift sites are within walking distance of a high-frequency bus stop
- Taking advantage of the close proximity to a number of train stations to strengthen active transport connections between uplift sites and major public transport hubs
- Increase frequency of peak hour bus services for routes travelling along William Street to the nearby train stations (e.g. Route 908)
- Consider a pedestrian connection across the rail corridor between Union Street and Crescent Street to facilitate better access to/from existing bus stops
- Improve traffic performance at the key Woodville Road / William Street intersection to minimise bus travel times through this area
- Ensure all bus stops are provided with level boarding areas, tactile ground surface indicators and are otherwise compliant with DDA standards.

7.4 Active Transport Initiatives

The strategic cycleways for the area have identified the regional importance of a route connecting Merrylands to Granville. This route can be facilitated through the enhancement of the Randle Street and William Street connection via Daniel Street, supplementing the existing shared paths along Randle Street. New or upgraded crossing facilities are required at certain locations to support the new route.

The existing and proposed active transport facilities within and around the Woodville North Precinct are shown below in Figure 7.5.

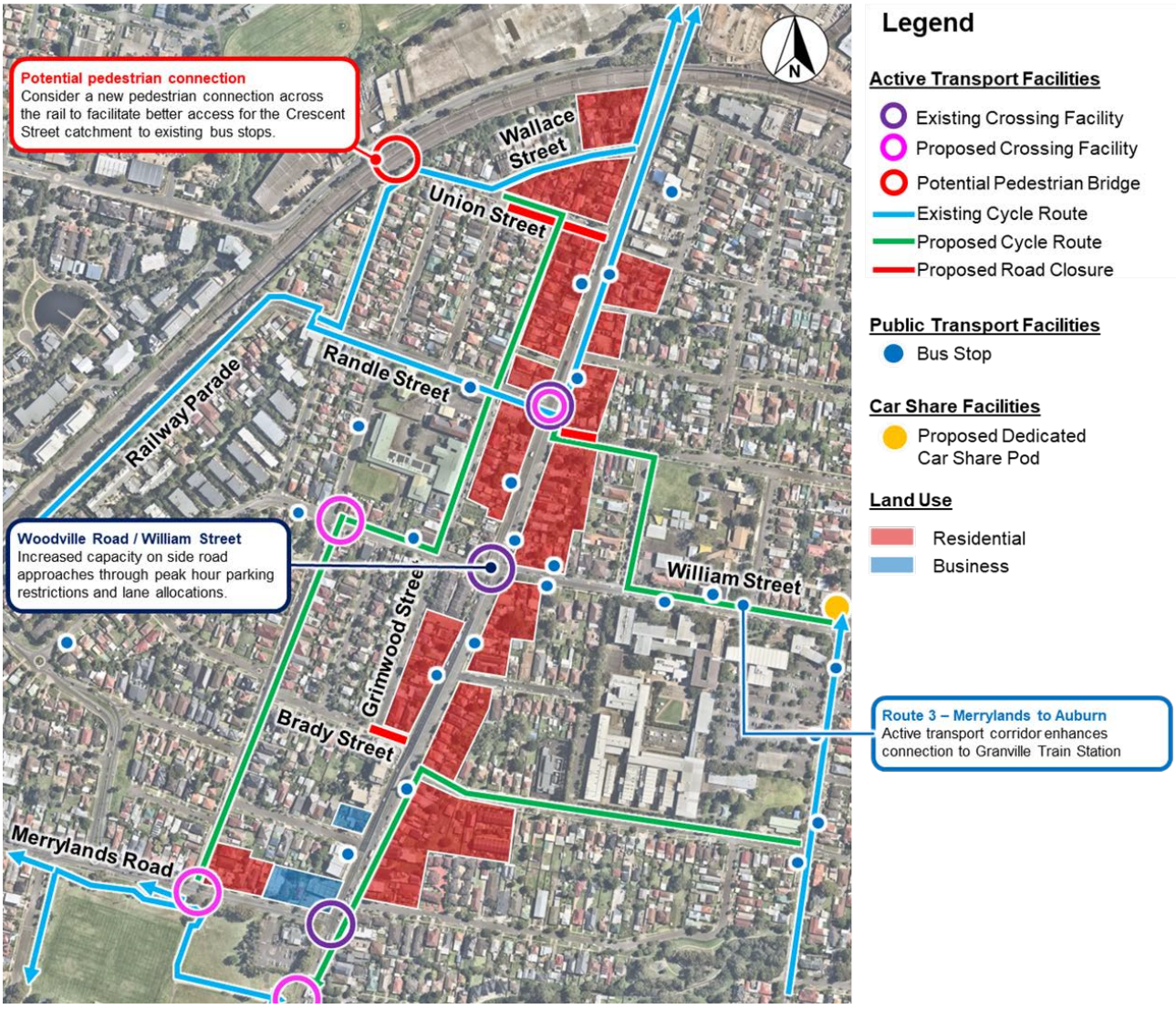


Adapted from Nearmap

Figure 7.5: Proposed Active Transport Facilities and Routes – Woodville North Precinct

7.5 Precinct Strategic Transport Measures

The integrated strategic transport measures for this precinct include new cycle routes, a number of new crossing facilities and upgrades to the existing traffic signals. The proposed strategies for the Woodville North Precinct are shown in Figure 7.6.



Adapted from Nearmap

Figure 7.6: Woodville North Precinct – Integrated Strategic Transport Measures

8. MERRYLANDS EAST PRECINCT

8.1 Uplift Yield Summary

The development uplift yields within the Woodville North Precinct are summarised below:

- 48,759m^2 total aggregate site area between 6 sites
- 823 medium and high-density residential dwellings
- 11,871m^2 GFA of retail and commercial land use.

The key uplift sites and development type are shown in Figure 8.1.

Adapted from Nearmap

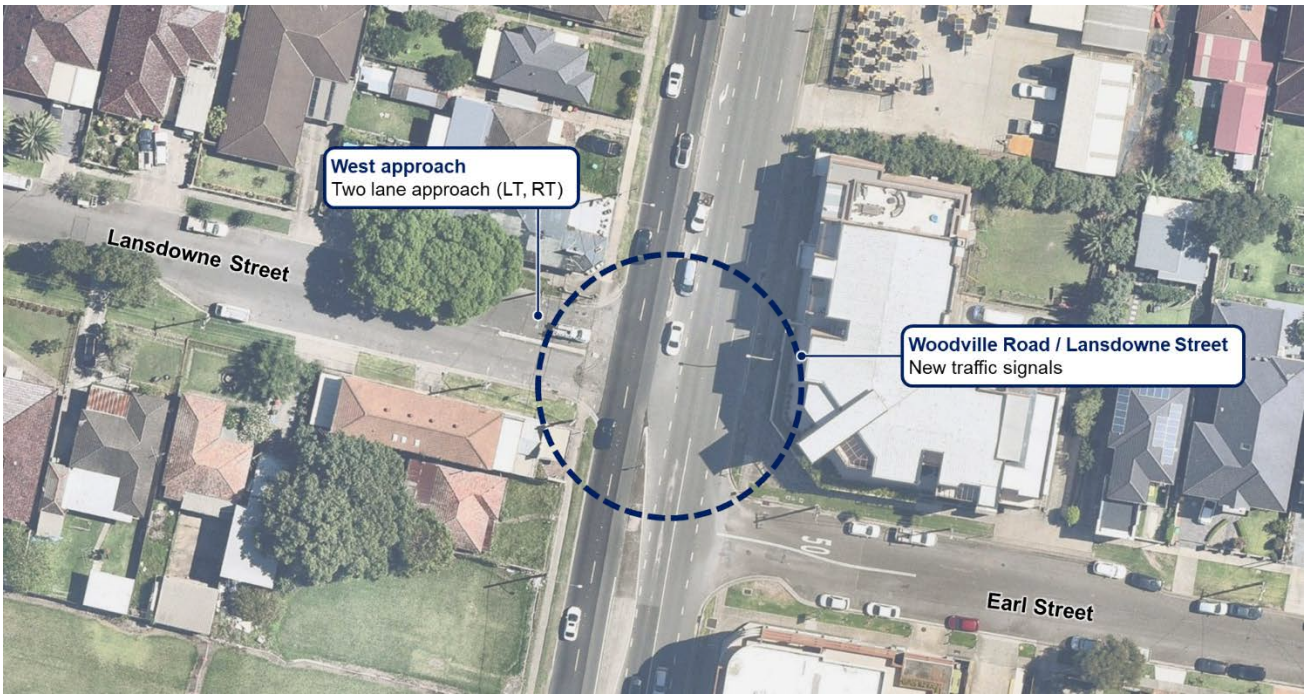
Figure 8.1: Proposed Uplift Land Use – Merrylands East Precinct

8.2 Road Network Upgrades and Changes

8.2.1 Woodville Road / Lansdowne Street

Woodville Road / Lansdowne Street is the only signalized intersection along Woodville Road which permits unprotected right turn movements. There is significant growth projected as a result of the increased site density to the south-west as part of the Merrylands East Local Centre, which has an assumed site access onto Lansdowne Street. To cater for this growth, this intersection should be converted to traffic signals. It is understood that there is currently an existing approved development application for the Merrylands East Local Centre (the 'John Cootes' DA) which received in-principle support from TfNSW for new traffic signals at this location.

This is shown in Figure 8.2.



Adapted from Nearmap

Figure 8.2: Proposed Road Network Upgrades – Lansdowne Street

Due to proximity to Earl Street, there is also an opportunity to incorporate Earl Street as part of the traffic signals into a staggered cross intersection; however, this will be subject to site geometric constraints.

8.2.2 Woodville Road / Oxford Street

Woodville Road / Oxford Street is one of the busiest intersections within the study area, with around 800 vehicles per hour in each direction. Oxford Street provides connection to Hawksview Street across the rail corridor, and currently operates over-capacity in the 2022 base case. To cater for the high traffic volumes through this intersection, intersection capacity upgrades are required.

The following traffic measures and road infrastructure upgrades are proposed at the Woodville Road / Oxford Street intersection:

- New auxiliary lane for a dedicated left turn movement on the western approach
- Utilise road space on the north departure to facilitate three departure lanes
- Change lane allocations on the south movement to permit a total of three through lanes.

This is shown in Figure 8.3.

Adapted from Nearmap

Figure 8.3: Proposed Road Network Upgrades – Oxford Street

8.3 Public Transport Initiatives

The Merrylands East Precinct has moderate public transport coverage, with the precinct sites within proximity of bus stops along Woodville Road and Excelsior Street. However, the key sites are not located within a comfortable walking distance of either the Guildford or Merrylands train stations. Furthermore, the sites are serviced only by north-south buses along Woodville Road, with no east-west bus services on Oxford Street or Lansdowne Street.

The public transport coverage map for the Merrylands East Precinct is shown in Figure 8.4.

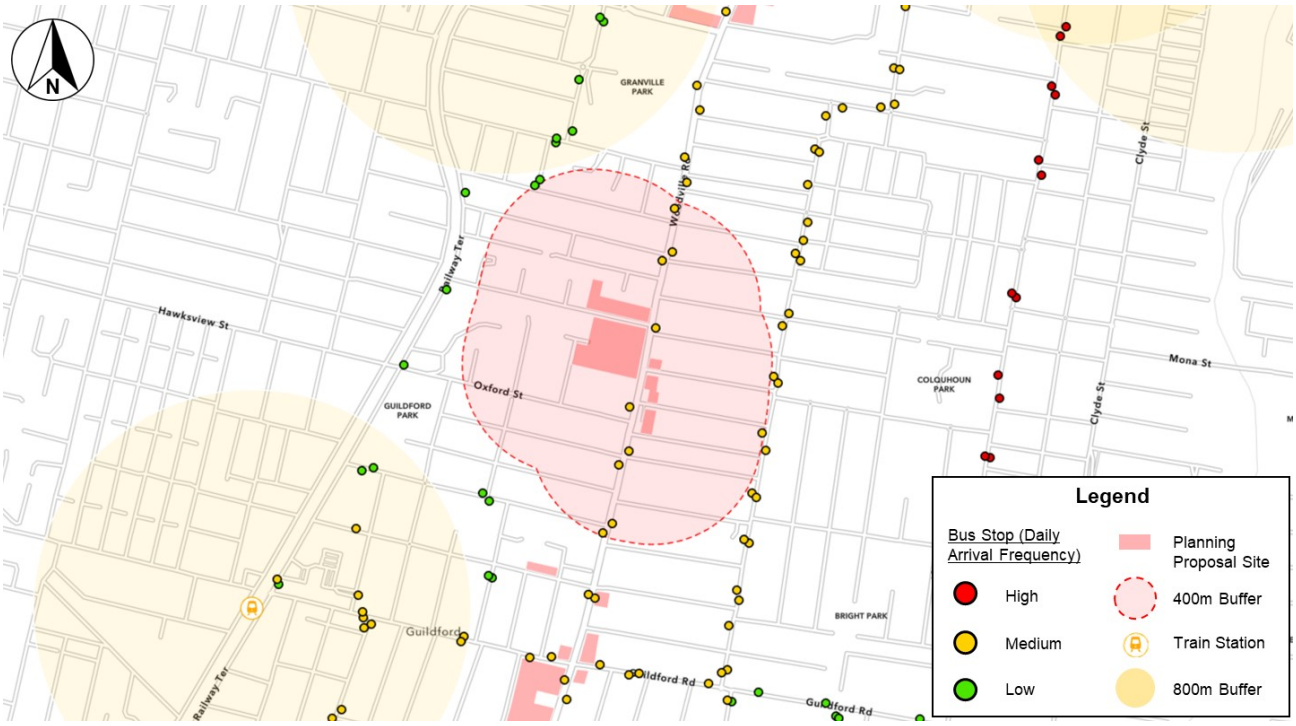


Figure 8.4: Public Transport Coverage Map – Merrylands East Precinct

Based on Figure 8.4, the Merrylands East Precinct's public transport coverage only includes medium-frequency bus stops along Woodville Road. These bus stops are serviced by the Route 907 north-south bus route.

Potential measures to improve public transport near the Merrylands East Precinct include:

- Increase frequency of peak hour bus services for routes travelling along Woodville Road (e.g. Route 907) to ensure all uplift sites are within walking distance of a high-frequency bus stop
- Investigate the implementation of new east-west bus services near this area to supplement the existing regional services on William Street and Guildford Road
  - Any new bus services will require further investigation on the projected demand and need for such a service, and be subject to coordination with STA and TfNSW
  - Potential candidates for investigation could be Oxford Street, Lansdowne Street and Earl Street
- As a part of the major commercial and retail development at Site 17, enhance bus stop amenity and accessibility to encourage public modes of transport to and from the site
- As a part of the major commercial and retail development at Site 17, relocate or add new bus stops to the site frontage as part of a new bus hub
- Install new pedestrian crossing facilities across Woodville Road to facilitate better access to bus stops on either side of the major corridor
- Improve traffic performance at the key Woodville Road / Oxford Street intersection to minimise bus travel times through this area.

8.4 Active Transport Initiatives

While there are no strategic corridors which directly interface with the Merrylands East Precinct, there is value in providing additional local infrastructure to benefit walking and cycling. The precinct is currently not serviced by any cycling infrastructure, with little to no open space or Place-orientated public domain. The only crossing facilities are located at the Woodville Road / Oxford Street intersection, which is one of the busiest intersections along the corridor.

The proposal for the Merrylands East Precinct includes business development at the Local Centre, public recreation areas and some residential development. These facilities, particularly the Place qualities exhibited by the proposed new Local Centre, can be connected with a new east-west active transport link along Lansdowne Street and Kimberley Street. This supports and reinforces the need for the signalisation of the Woodville Road / Lansdowne Street intersection. This route will provide connection to the existing cycling network further east and west of the Merrylands East Precinct along Railway Parade and Duck River.

Furthermore, in light of both the existing pedestrian demands and the anticipated increase in activity levels with future development, this precinct will benefit strongly from high-quality pedestrian facilities. Infrastructure such as a grade-separated pedestrian bridge across Woodville Road should be considered in vicinity of Granville South Public School to support existing and future activity.

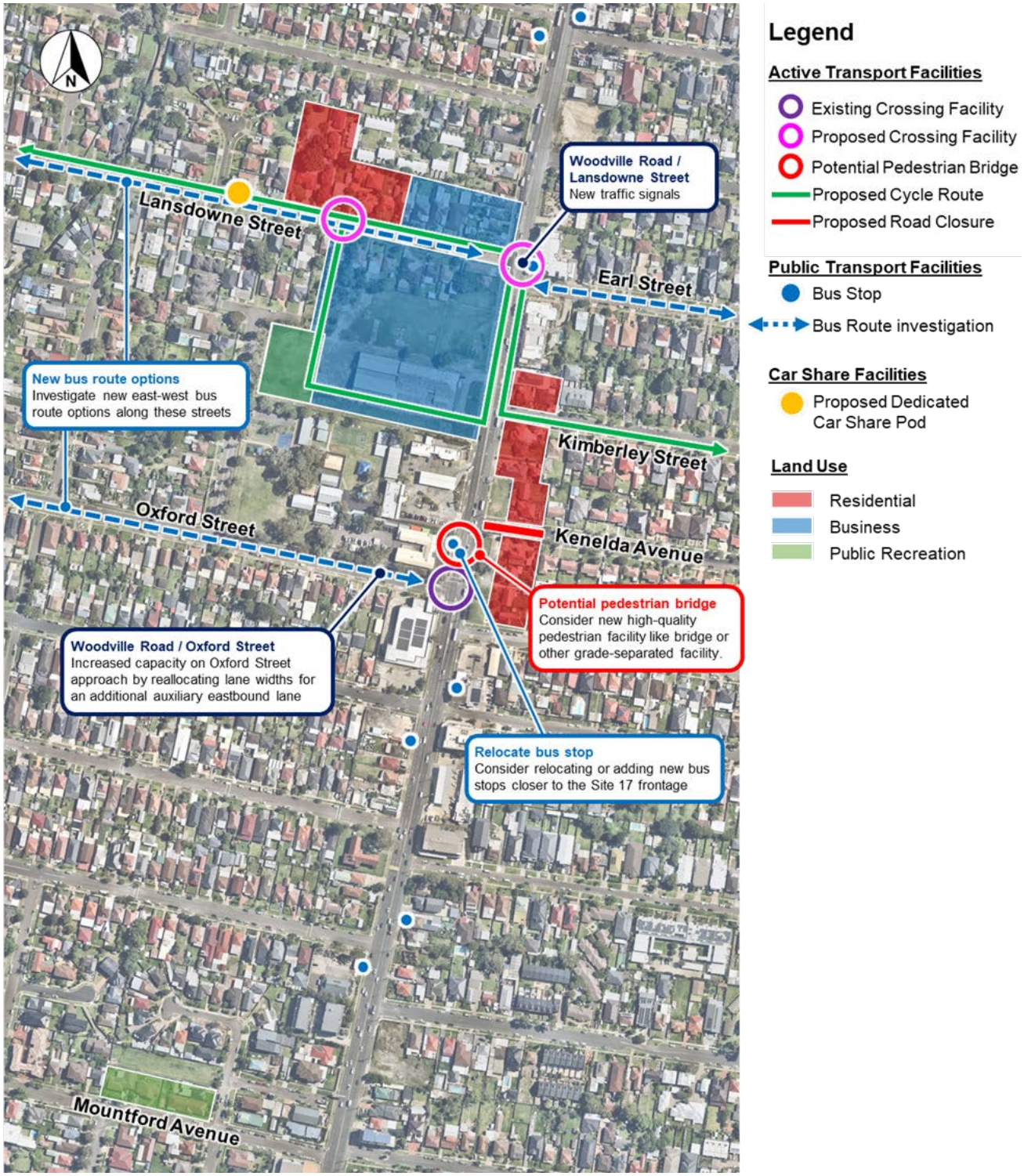
The existing and proposed active transport infrastructure within and around Merrylands East Precinct are shown below in Figure 8.5.

Adapted from Nearmap

Figure 8.5: Proposed Active Transport Facilities and Routes – Merrylands East Precinct

8.5 Precinct Strategic Transport Measures

The integrated strategic transport measures for this precinct include new cycle routes, new and upgraded traffic signals and recommendations for potential new bus routes, pedestrian infrastructure and car share pods. The proposed strategies for the Merrylands East Precinct are shown in Figure 8.6.



Adapted from Nearmap

Figure 8.6: Merrylands East Precinct – Integrated Strategic Transport Measures

9. WOODVILLE SOUTH PRECINCT

9.1 Uplift Yield Summary

The development uplift yields within the Woodville North Precinct are summarised below:

- 89,991m^2 total aggregate site area between 8 sites
- 1,489 high density residential dwellings
- 7,141m^2 GFA of retail and commercial land use

The key uplift sites and development type are shown in Figure 9.1.

Adapted from Nearmap

Figure 9.1: Proposed Uplift Land Use – Woodville South Precinct

9.2 Road Network Upgrades and Changes

9.2.1 Woodville Road / Guildford Road

Woodville Road / Guildford Road is located at the core of the Woodville South Precinct, with commercial growth on all four corners of the intersection and significant residential growth to the south between Woodville Road and Chamberlain Road.

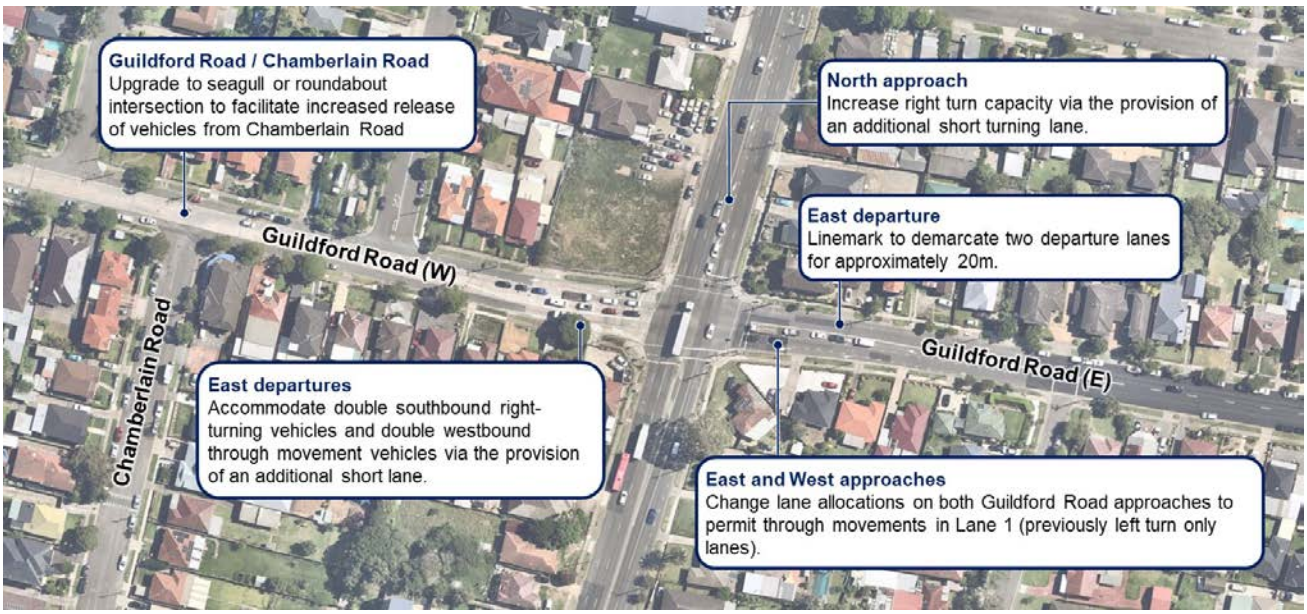
The intersection is currently one of the busiest intersections within the study area, being one of the few signalised cross intersections.

The planned uplift intensifies traffic movements at the intersection, with a concentration of through and right turn movements across the corridor. To cater for the high traffic volumes through this intersection, intersection capacity upgrades are required.

The following traffic measures and road infrastructure upgrades are proposed at and in vicinity to the Woodville Road / Guildford Road intersection:

- Add a new short right turn bay on the north approach
  - Some land acquisition or kerb adjustments may be necessary as part of the uplift to facilitate this
- Change lane allocations on both the east and west approaches to permit two through lanes (and corresponding lane realignments on the departure side to support this)
- Add a new short departure lane on each side of Guildford Road
  - On the eastern side this entails linemarking to demarcate the two departure lanes
  - On the western side some land acquisition or kerb adjustments may be necessary as part of the uplift to facilitate this
- Upgrade Guildford Road / Chamberlain Road to a seagull intersection or roundabout
  - Chamberlain Road is assumed to support the major residential developments in the Woodville South Precinct
  - Due to queues on Guildford Road, some intersection treatment is required to allow vehicles to turn right out of Chamberlain Road onto Guildford Road.

This is shown in Figure 9.2.



Adapted from Nearmap

Figure 9.2: Proposed Road Network Upgrades – Guildford Road

It is understood that a petition has been lodged with the state government for the provision of a right-turn green arrow on the eastern approach on safety grounds, and that the Minister of Roads has stated that TfNSW has nominated the matter for consideration as part of a road safety program in the 2023-2024 financial year.

As part of the proposed upgrades to the intersection, the signal phasing at this site is proposed to be changed to a 'double diamond overlap' arrangement to improve both safety and efficiency of the intersection. An example is shown in Figure 9.3. The operation of this new sequence will require the provision of a green arrow on the eastern approach.

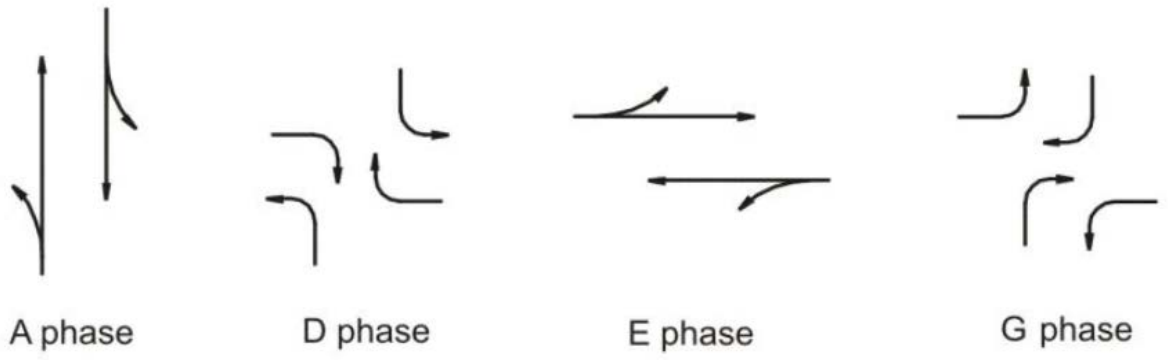


Figure 9.3: Example 'Double Diamond' Signal Phase Sequence

9.2.2 Woodville Road / Rawson Road

Woodville Road / Rawson Road is located on the southern end of the study area. The right turn movement from Woodville Road to Rawson Road is extremely high volume, with the background growth from the strategic modelling projected this movement as one of the highest increases. The movement supports a regional south-to-east traffic route towards suburbs like Lidcombe, Homebush and towards the Sydney CBD.

The right turn movement is noted to operate poorly under current conditions, with this situation deteriorating further. Increased right turn capacity is therefore a necessary requirement at this intersection. This can be facilitated through either of the following:

- A new right turn lane (dual right turn lanes)
  - Some land acquisition or kerb adjustments may be necessary as part of the uplift to facilitate this
- Changed lane allocations (shared through-right lane).
  - Converting Lane 2 to a shared through-right lane has a detrimental effect on northbound traffic
  - Sub-optimal lane arrangement on a high-speed movement corridor like Woodville Road.

The lane allocations can also be implemented as a peak hour or timed facility, controlled through intelligent transport systems or other means. Examples of similar implementations in Sydney include Princes Highway / Canal Road and Victoria Road / Darling Street.

This is shown in Figure 9.3.

Adapted from Nearmap

Figure 9.4: Proposed Road Network Upgrades – Rawson Road

9.3 Public Transport Initiatives

The Woodville South Precinct has good public transport coverage, with the planned uplift sites well-serviced by bus stops along the Woodville Road frontage and at the junction with Guildford Road. Although the key sites lie slightly outside of the 800m walking catchment to Guildford train station, transport options for residents and workers are supplement by direct bus connections along Guildford Road. However, it is observed that the southern side of the precinct is outside of the 400m walking catchment to the Guildford Road bus stops, with the sites serviced only by a single bus route on Woodville Road.

The public transport coverage map for the Woodville South Precinct is shown in Figure 9.4.

Figure 9.5: Public Transport Coverage Map – Woodville South Precinct

Based on Figure 9.4, the Woodville South Precinct's public transport coverage includes mostly medium-frequency bus stops along Woodville Road and Guildford Road. The primary bus routes servicing these stops include Route 907 which provides north-south connectivity along Woodville Road, while Routes 906 and 908 provide east-west connectivity along Guildford Road.

Potential measures to improve public transport near the Woodville South Precinct include:

- Increase frequency of peak hour bus services for routes travelling along Woodville Road and Guildford Road (e.g. Routes 906, 907 and 908) to achieve 400m coverage to high-frequency bus stops
- Strengthen the Guildford Road connection to the railway to encourage multi-modal transport trips
- Increase the number of services on the Route 822 loop service between Merrylands and Guildford during peak hours particularly to improve public transport options for new residents in the south-most sites
- Improve traffic performance at the key Woodville Road / Guildford Road intersection to minimise bus travel times through this area.

9.4 Active Transport Initiatives

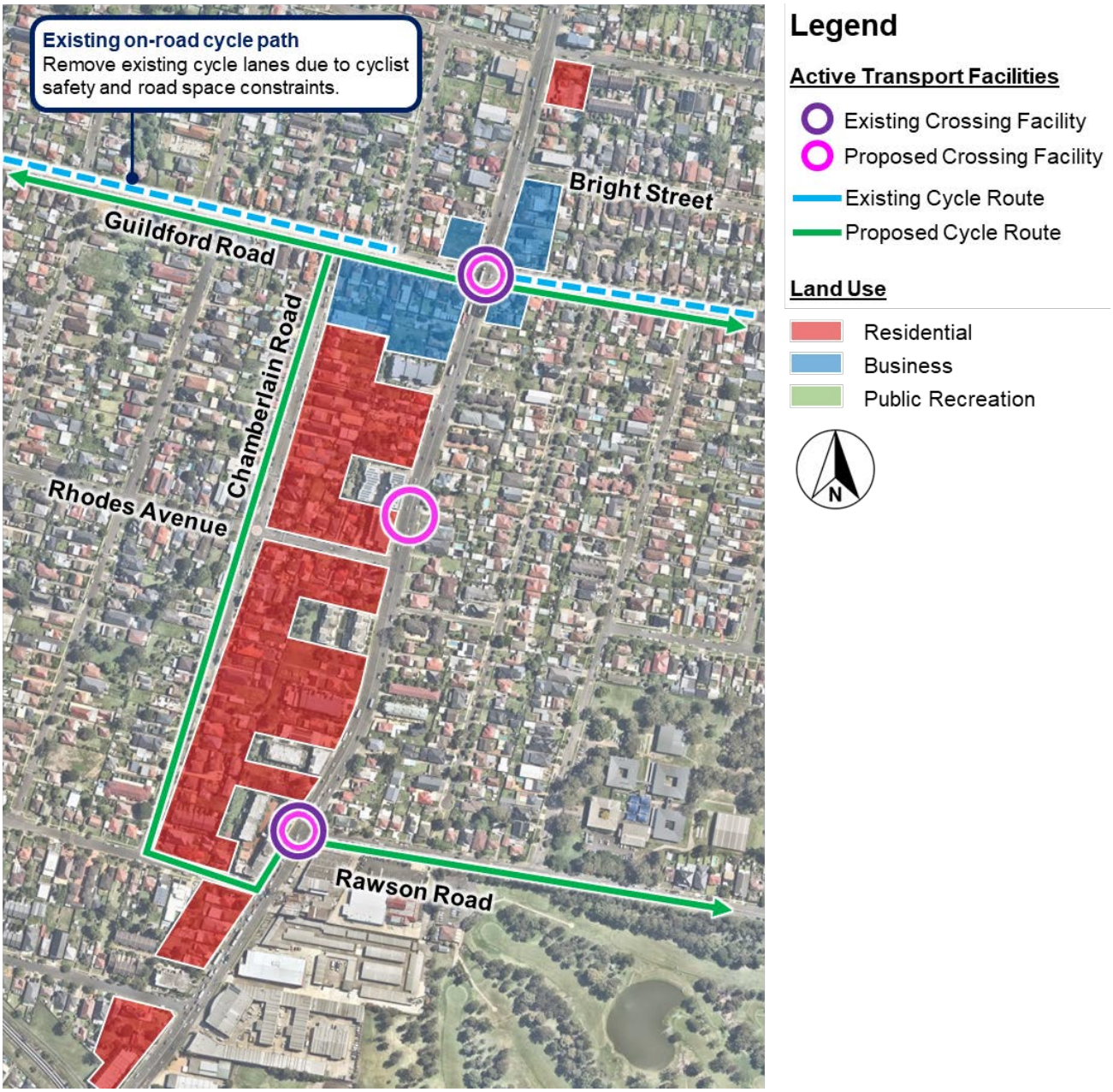
The cycleway planning for the area has identified the district-wide importance of a route connecting Guildford and Duck River. This route can be facilitated through the enhancement of the existing cycling facilities along Guildford Road. Guildford Road currently provides an on-road cycle path with either shoulder cycle lanes or mixed traffic. However, the traffic analysis has demonstrated that the Guildford Road corridor is heavily saturated, with a high demand for vehicular Movement due to the concentration of traffic to the Woodville Road / Guildford Road intersection. This situation is only exacerbated by the planned uplift just south of Guildford Road, with increases to the traffic demand caused by the large-scale high density residential.

The Place qualities and subsequent environment for safer on-street cycling is therefore compromised by the growth in traffic. Separation between drivers, pedestrians and cyclists is therefore strongly recommended at this location. Due to the need for traffic capacity, it is proposed that cyclists instead be accommodated as part of public domain improvements along Guildford Road. This can take the form of wider footpaths to cater for the rise in pedestrian traffic to/from the business sites near the traffic signals and as shared facilities for cyclists.

A similar off-road cycle route is also proposed along Rawson Road to increase the east-west active transport connections within this precinct. These are connected via the backbone of Chamberlain Road, which runs along the site frontage of the uplift sites.

A mid-block pedestrian crossing has been proposed near the Woodville Road / Rhodes Avenue intersection. With new a significant increase in residential dwellings within this precinct, the provision of additional pedestrian crossing facilities would improve connectivity with these developments since the only existing crossing facilities are at the Guildford Road and Rawson Road traffic signals.

The existing and proposed active transport facilities are shown below in Figure 9.5.

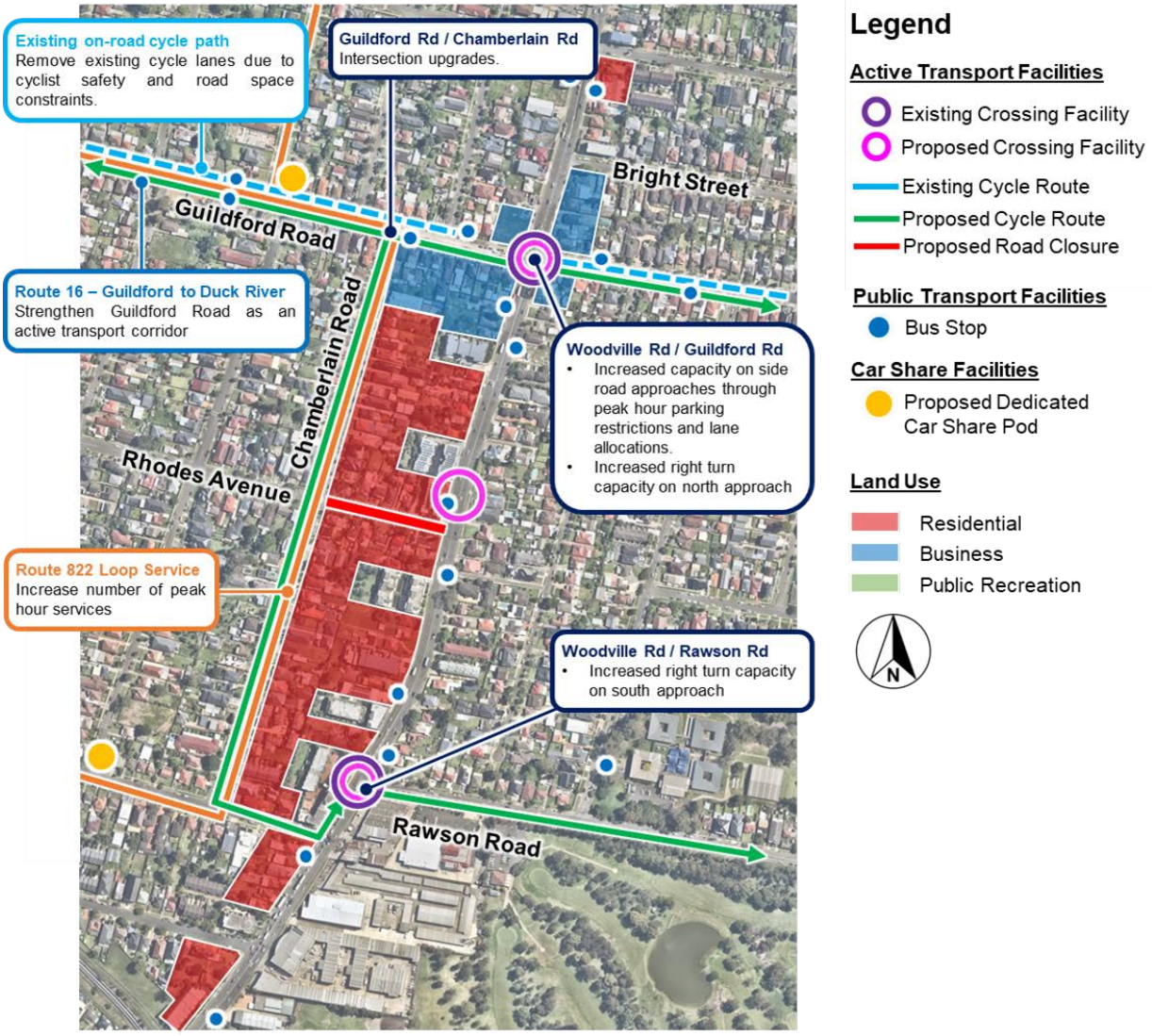


Adapted from Nearmap

Figure 9.6: Proposed Active Transport Facilities and Routes – Woodville South Precinct

9.5 Precinct Strategic Transport Measures

The integrated strategic transport measures for this precinct include new cycle routes, new and upgraded traffic signals and recommendations for potential new bus routes. The proposed strategies for the Woodville South Precinct are shown in Figure 9.6.



Adapted from Nearmap

Figure 9.7: Woodville South Precinct – Integrated Strategic Transport Measures

10. CONCLUSIONS

10.1 Key Findings

The findings of the traffic modelling and transport assessments undertaken as part of the preparation of this strategy report have revealed that there are a few challenges in the existing road network for both vehicular and active transport. These include capacity constraints at major signalised intersections resulting in high delays and long queues, minimal dedicated and continuous cycling infrastructure, and a lack of high-frequency bus services along the corridor. Over the next decade, the projected growth in future background traffic growth will exacerbate these issues, clarifying a strong need for improvements in all transport modes and infrastructure along the corridor even prior to any planning for rezoning and uplift.

This strategy recommends several road network upgrades both at the 'do minimum' level and as part of a package of works to support the planned uplift at key sites along the corridor. While they serve to alleviate the issues by reducing traffic pressures at key pinch points, further actions should be investigated at a case-by-case level during DA stages for any development within the key precincts.

This strategy report also identifies a number of pedestrian and cycling opportunities in line with the planned urban design for the road corridor. A balanced approach in future transport planning is vital to ensure that future development does not result in an overreliance of motor vehicles as the primary mode of travel along the Woodville Road Corridor. Being in such close vicinity to a car-dominated movement corridor, maintaining pedestrian and cyclist safety is vital in encouraging an uptake of active transport.

An integrated strategic response or 'action plan' has been prepared for each of the key precincts along the corridor to incorporate a coordinated approach to the recommended traffic and transport measures.

10.2 Action Plan

The multi-faceted action plan incorporates measures across all traffic and transport streams, including:

- Road network
- Public transport
- Active transport
- Parking policy
- Traffic demand management
- Local street network.

The actions are summarised below by precinct in Table 10.1. A high-level recommendation on the prioritisation of works is advised for each action item, including works to be undertaken in the short-term, medium-term and long-term. It should be noted that sensitivity testing has not been undertaken, and the suggested prioritisation hierarchy is a judgement based on the merits of each action against the severity of existing and future issues observed as a part of the traffic modelling and assessment. Further investigations to identify specific year of failure should be undertaken at the intersection or route level to provide more accurate timeframes.

Table 10.1: Consolidated Action Plan

Type/ID	Location	Description	Timing
Woodville North Precinct			
RN-1	Woodville Road / Randle Street	New pedestrian crossing on the western approach	Medium-term
RN-2	Woodville Road / William Street	Upgrades to signalised intersection	Medium-term
RN-3	Woodville Road / Randle Street	Upgrade existing pedestrian crossing to a shared pedestrian and cyclist crossing	Medium-term
RN-4	William Street / Bennalong Road	New crossing facility for cyclists across William Street	Medium-term
RN-5	Merrylands Road / Bennalong Road	New crossing facility for cyclists across Merrylands Road	Medium-term
RN-6	Woodville Road / Louis Street	Upgrade existing pedestrian crossing to a shared pedestrian and cyclist crossing	Medium-term
RN-7	Partial segment of Union Street	Road closure as part of uplift development to provide future open spaces	Long-term
RN-8	Partial segment of Elizabeth Street	Road closure as part of uplift development to provide future open spaces	Long-term
RN-9	Partial segment of Brady Street	Road closure as part of uplift development to provide future open spaces	Long-term
PT-1	Woodville North Precinct	Coordinate with TfNSW and STA to increase frequency of peak hour bus services along Woodville Road to ensure accessibility to high-frequency bus stops	Medium-term
PT-2	Woodville Road Corridor	Ensure all bus stops within the study area are provided with level boarding areas, tactile ground surface indicators and are otherwise compliant with DDA standards	Medium-term
AT-1	Between Union Street and Crescent Street	Consider a pedestrian crossing facility across the rail corridor to increase connectivity with existing bus stops	Long-term
AT-2	Between Merrylands Road and Wallace Street	Design and install new cycle path on Bennalong Street and Grimwood Street via William Street and Union Street to connect with existing cycling facilities	Medium-term
AT-3	Between Woodville Road and The Avenue	Design and install new cycle path on Daniel Street and Wlliam Street via Florrie Street to connect with existing cycling facilities	Medium-term
AT-4	Between Woodville Road and The Avenue	Design and install new cycle path on Woodville Road and Elizabeth Street to connect with existing cycling facilities	Medium-term
TDM-1	Near William Street / The Avenue	Provide new dedicated car share pod(s)	Long-term
TDM-2	Woodville North Precinct	Consider implementing ‘P1’ parking provision rates or similar as part of updates to the Cumberland Development Control Plan	Long-term

Type/ID	Location	Description	Timing
Merrylands East Precinct			
RN-10	Woodville Road / Lansdowne Street	Upgrade intersection with new traffic signals	Medium-term
RN-11	Woodville Road / Oxford Street	Upgrades to signalised intersection	Short-term
RN-12	Near Lansdowne Street / Lamb Crescent	New crossing facility for cyclists crossing Lansdowne Street	Long-term
RN-13	Partial segment of Kenelda Avenue	Road closure as part of uplift development to provide future open spaces	Long-term
PT-3	Merrylands East Precinct	Coordinate with TfNSW and STA to increase frequency of peak hour bus services along Woodville Road to ensure accessibility to high-frequency bus stops	Medium-term
PT-4	Merrylands East Precinct	Coordinate with TfNSW and STA to investigate new east-west bus services through the precinct.	Medium-term
PT-5	Furniture Store at 258 Woodville Road, Merrylands	Enhance bus stop amenity and accessibility as part of the uplift development of the John Cootes Site, including relocating or adding new bus stops close to the site	Long-term
AT-5	From Railway Terrace to Robertson Street	Design and install new cycle path on Lansdowne Street and Kimberley Street via Woodville Road to connect with existing cycling facilities	Medium-term
AT-6	Around John Cootes Site (Site 17)	Design and install new off-road cycle path around perimeter of the John Cootes Site (Site 17) as part of redevelopment of the site	Long-term
AT-7	Woodville Road near Granville South Public School	Consider new high-quality pedestrian facility like bridge or other grade-separated facility to improve pedestrian safety and crossing opportunities near Granville South Public School	Long-term
TDM-3	Near Lansdowne Street / Lamb Crescent	Provide new dedicated car share pod(s)	Long-term
TDM-4	Woodville North Precinct	Consider implementing ‘P2’ parking provision rates or similar as part of updates to the Cumberland Development Control Plan	Long-term

Type/ID	Location	Description	Timing
Woodville South Precinct			
RN-14	Woodville Road / Guildford Road	Upgrades to signalised intersection	Short-term
RN-15	Guildford Road / Chamberlain Road	Upgrade intersection to seagull or roundabout intersection	Long-term
RN-16	Woodville Road / Rawson Road	Upgrades to signalised intersection	Medium-term
RN-17	Woodville Road near Rhodes Avenue	New mid-block signalised pedestrian crossing	Long-term
RN-18	Partial segment of Rhodes Avenue	Road closure as part of uplift development to provide future open spaces	Long-term
PT-6	Woodville South Precinct	Coordinate with TfNSW and STA to increase frequency of peak hour bus services along Woodville Road to ensure accessibility to high-frequency bus stops	Medium-term
PT-7	Woodville South Precinct	Coordinate with TfNSW and STA to increase the number of peak hour bus services on the Route 822 loop service to improve public transport options	Medium-term
AT-8	Between Guildford Road and Rawson Road	Design and install new cycle path on Chamberlain Road and Henry Street	Medium-term
AT-9	Between Guildford and Duck River	Upgrade existing cycling facilities along Guildford Road to a new off-road cycling path	Medium-term
AT-10	Between Guildford and Duck River	Design and install new cycle path on Rawson Road	Medium-term
TDM-5	Woodville South Precinct	Consider implementing ‘P1’ parking provision rates or similar as part of updates to the Cumberland Development Control Plan	Long-term
TDM-6	Near Guildford Road / West Street	Provide new dedicated car share pod(s)	Long-term
TDM-7	Near Salisbury Road / Henry Street	Provide new dedicated car share pod(s)	Long-term

Appendix A: Uplift Development Traffic Generation

Issue History

File Name	Prepared	Reviewed	Issued by	Date	Issued to
P5825.001T Woodville Road Corridor Planning Framework TTS Demand Development	R. Jain	A.Grey	J. Yang	12/04/2023	Janine Saab via email: janine.saab@cumberland.nsw.gov.au
P5825.002T Woodville Road Corridor Planning Framework TTS Demand Development	J.Yang	A.Grey	J. Yang	20/04/2023	Janine Saab via email: janine.saab@cumberland.nsw.gov.au
P5825.003T Woodville Road Corridor Planning Framework TTS Demand Development	R. Jain / J.Yang	A.Grey	J. Yang	9/05/2023	Janine Saab via email: janine.saab@cumberland.nsw.gov.au

Woodville Road Corridor Traffic and Transport Study

Demand Development Technical Note

1. Introduction

1.1 Background

Cumberland City Council commissioned Bitzios Consulting to undertake a Traffic and Transport Study (TTS) to support the delivery of the new planning framework for the Woodville Road Corridor. This TTS involves coordination with the Urban Design team to provide input into the traffic and transport implications of the proposed uplift in key precincts along the Woodville Road corridor.

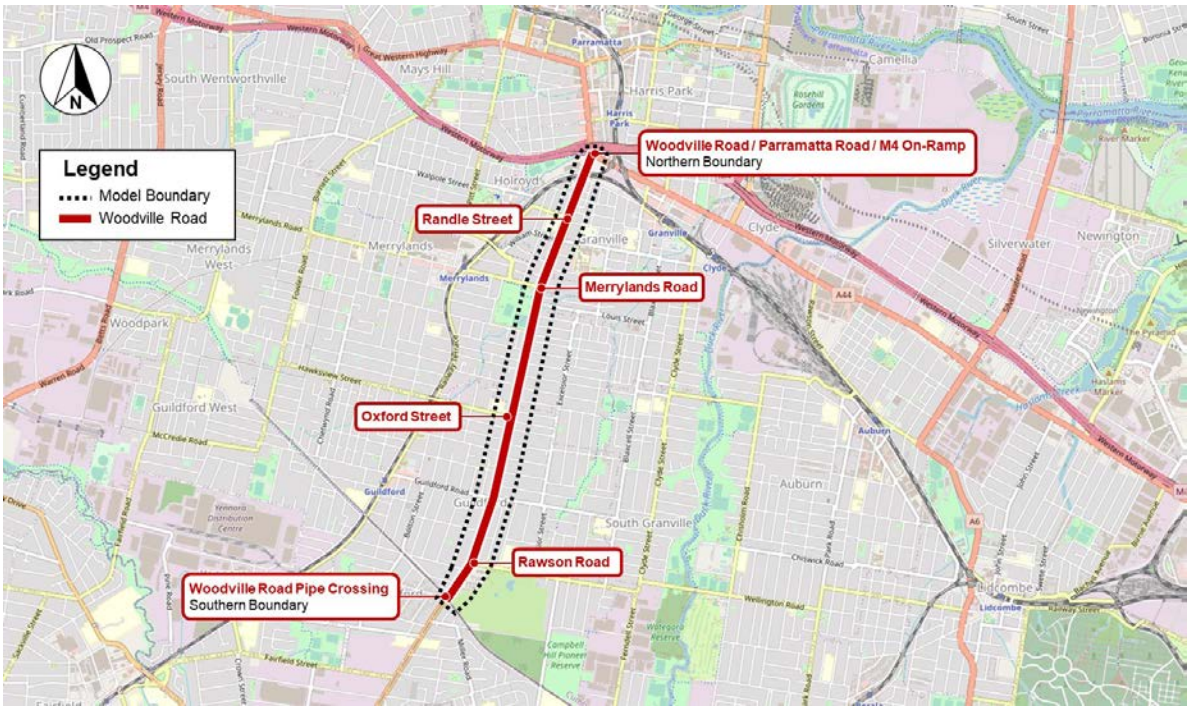
As a part of TTS, future design year AIMSUN models will be developed for future year growths based on traffic demands accounting for proposed uplift of key precincts.

This technical document outlines the future year traffic calculations associated with the proposed Planning Proposal uplift of key precincts and the relevant land use and traffic generation assumptions.

1.2 Modelled Area

The modelled area is a focused corridor cordoned close to Woodville Road, between the Parramatta and Road / M4 on-ramp intersection and the Woodville Road water supply pipe crossing near Springfield Street.

The modelled area is shown in Figure 1.1.



Adapted from OpenStreetMap

Figure 1.1: Modelled Area

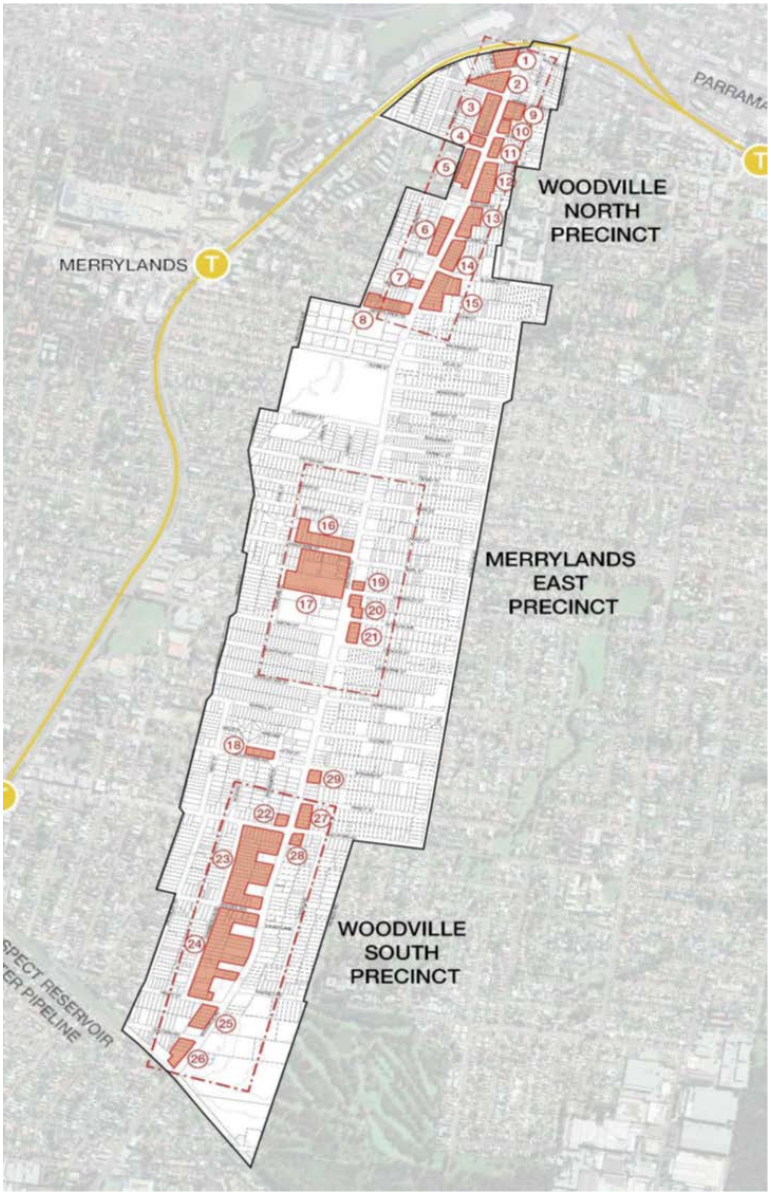
2. Planning Proposal Development

2.1 Overview

There are three (3) key precincts planned along the Woodville Road Corridor, targeting specific land use and built form density changes at 29 discrete Planning Proposal sites. The sites are divided among the precincts as follows:

- Woodville North Precinct: Sites 1-15
- Merrylands East Precinct: Sites 16-21
- Woodville South Precinct: Sites 22-29.

An overview of the precincts and planning proposal sites is shown in Figure 2.1.



Source: CM+

Figure 2.1: Overview of Development Precincts

Land use and yield information for each of the sites in terms of residential and business growth have been supplied by CM+ as part of the following documents:

- Built Form Masterplan Workshop slides (dated 28 November 2022)
- Yield Breakdown for Traffic Consultant (dated 31 March 2023).

CM+'s Yield Breakdown is provided in **Attachment A**.

Furthermore, other documents reviewed included:

- Merrylands East Neighbourhood Centre Traffic Impact Assessment (Stantec, dated 9 February 2021)
- 246-264 Woodville Road Merrylands Traffic and Parking Assessment Letter (Stantec, dated 22 April 2022)
- Planning Proposal Merrylands East Local Centre (Green Dior Holdings Pty Ltd, dated 29 April 2022).

These documents were reviewed to inform the development of traffic generation assumptions for this assessment.

The Masterplan was noted to include three (3) growth scenarios ranging from Low Growth, Medium (Base) Growth and High Growth. It is understood that Council has decided to proceed with the 'Base Case' growth scenario. Therefore, the relevant information used to form the residential and business traffic growth assumptions described in the following sections has been based on the Medium (Base) Case yields.

2.2 Residential and Employment Growth

2.2.1 Overview

The overall Masterplan comprises the following land uses and yields along the corridor:

- A total aggregate site area of 219,474m^2 across all 29 sites
- A total residential yield of 370,364m^2 gross floor area (GFA):
  - Associated increase in population projected to be around 10,349 persons
  - Corresponding increase in number of dwellings projected to be around 3,696 dwellings
- A total non-residential yield of 20,788m^2 GFA:
  - Can be formed by some combination of retail, commercial and shopping centre land uses
  - Industrial land use is not planned at any of the sites.

The proposed land zoning is shown in Figure 2.2.

Source: Draft Urban Design Masterplan (CM+)

Figure 2.2: Land Zoning Map

The floor space ratio (FSR) map is shown in Figure 2.3.

Source: Draft Urban Design Masterplan (CM+)

Figure 2.3: Floor Space Ratio Map

Most sites are exclusively a single type of land use and FSR. Where one of the sites spans multiple land uses, a portion of the site GFA was allocated to each use based on the available information.

2.2.2 Woodville North Precinct

The Woodville North Precinct comprises 15 of 29 sites, with the following proposed yields within the precinct:

- A total aggregate site area of 80,724m^2
- A total residential yield of 138,813m^2 gross floor area (GFA):
  - Associated increase in population projected to be around 3,875 persons
  - Corresponding increase in number of dwellings projected to be around 1,384 dwellings
- A total non-residential yield of 1,776m^2 GFA.

The planned uplift in the Woodville North Precinct is noted to be primarily residential in nature, with a relatively small allocation of land for ancillary retail and commercial facilities.

The following site-specific observations were made:

Site 2

Site 2 is a triangle site bounded by Woodville Road, Union Street and Wallace Street. The land zoning map indicates that it is proposed to be composed of both R4 High-Density Residential and Open Space land uses. An overall FSR of 1.8:1 applies to the subject site, with the following site yields being based on the incentive outcome with bonus uplift at the site:

- Site area: 6,301m^2
- Residential GFA: 11,342m^2.

It is understood that the base FSR control will apply to the site in the case that the site cannot be amalgamated, and no open space can be provided.

The above site yields have been adopted for the purpose of the conservative 'worst-case' traffic assessment.

Site 15

Site 15 is an irregular site bounded by Woodville Road, Elizabeth Street and John Street. The land zoning map indicates that it is proposed to be composed of both R3 Medium Density and R4 High Density Residential. As the different densities have different trip generation rates, it was necessary to determine the split of the proposed 164 dwellings between R3 and R4 units.

To do this, the site area and GFA for each portion of the site was determined by solving simultaneous equations for total site area and GFA using the proposed FSR for R3 and R4 sites. This resulted in the following land use breakdown which has been adopted for the purpose of this traffic assessment:

- R3 Medium Density: 2,307m^2 GFA (19 dwellings)
- R4 High Density: 14,523m^2 GFA (145 dwellings).

2.2.3 Merrylands East Precinct

The Merrylands East Precinct comprises 6 of 29 sites, with the following proposed yields within the precinct:

- A total aggregate site area of 48,759m^2
- A total residential yield of 82,700m^2 gross floor area (GFA):
  - Associated increase in population projected to be around 2,306 persons
  - Corresponding increase in number of dwellings projected to be around 823 dwellings
- A total non-residential yield of 11,871m^2 GFA.

The planned uplift in the Merrylands East Precinct is noted to comprise significant levels of both residential and retail/commercial growth. The core of this precinct is the Merrylands East Local Centre, previously known as the John Cootes site, located at Site 17.

The following site-specific observations were made:

Site 16

Site 16 is an irregular site adjacent to Woodville Road and Lansdowne Street comprising Other E Zone, R4 High Density Residential and R3 Medium Density Residential land uses.

To determine the dwelling splits between high and medium density units for trip generation calculations, the areas and GFAs for each portion of the site was determined from the available total site area and GFA and associated FSR for each land use. This data was supplemented by manual measurements of the site division via Sixmaps satellite imagery. The resulting land use breakdown adopted for the purposes of this traffic assessment is as follows:

- R3 Medium Density: 2,353m^2 GFA (20 dwellings)
- R4 High Density: 4,753m^2 GFA (48 dwellings)
- Other E Zone (residential development): 8,278m^2 GFA (83 dwellings).

Merrylands East Local Centre (Site 17)

Merrylands East Local Centre, previously known as the John Cootes site, located at Site 17 is planned to be a large-scale E1 Local Centre for the precinct and also for the wider Corridor as a whole, with dense uplift of both residential and retail components at the site. The proposed development yields provided include:

- Residential GFA: 54,722m^2 GFA (547 dwellings)
- Non-residential GFA: 10,951m^2 GFA.

It is noted that while these differ slightly from the original Merrylands East Local Centre Planning Proposal (April 2022), the proportions of the development types are generally similar. The aforementioned Planning Proposal uses included shopping centre, specialty retail, hotels and serviced apartments, childcare centres and car wash facilities. Based on the provided information, for the purpose of this traffic assessment the non-residential land uses at this site were assumed to be divided between specialty retail and shopping centre uses:

- Specialty Retail: 7,301m^2 GFA (67%)
- Shopping Centre: 3,650m^2 GFA (33%).

2.2.4 Woodville South Precinct

The Woodville South Precinct comprises 8 of 29 sites, with the following proposed yields within the precinct:

- A total aggregate site area of 89,991m^2
- A total residential yield of 148,851m^2 gross floor area (GFA):
  - Associated increase in population projected to be around 4,168 persons
  - Corresponding increase in number of dwellings projected to be around 1,489 dwellings
- A total non-residential yield of 7,141m^2 GFA.

The planned uplift in the Woodville South Precinct is divided between both residential and retail/commercial growth. There is a moderate amount of growth for retail/commercial land use, with a neighbour centre located around the intersection of Woodville Road and Guildford Road. It is anticipated that the area would be characterised by mixed-use buildings with ground-level food retail like restaurants and cafés, as well as some commercial offices; however, it is noted that specifics on tenancies will be determined at a later stage.

The following site-specific observations were made:

Site 24

Site 24 is an irregular site adjacent to Woodville Road, Rhodes Avenue and Henry Street planned to be exclusively R4 High Density Residential land use. Despite this, it was noted that the planned yields for the site include 1,440m^2 GFA of non-residential land use.

As commercial premises are prohibited in R4 zones, it was therefore assumed that 100% of the site's non-residential land use was for ancillary retail facilities.

It is understood that while an overall FSR of 1.8:1 applies to Site 24, two (2) sites are considered to be 'constrained' by having 8+ owners and remain unchanged in terms of planning controls or new development. Due to its resulting isolation, one of the sub-sites in Site 24 cannot be amalgamated and subsequently cannot make use of any incentives and maintains a base FSR of 1:1.

Notwithstanding the above, the adopted traffic calculations assume the worst-case development scenario based on the preferred site amalgamation and incentive outcome.

2.3 Strategic Growth

The strategic traffic growth external to the network has been acquired from the TfNSW STFM cordon matrices for the study area. This data will form the foundation of the future year base case traffic demand matrices. The total STFM traffic demand is summarised in Table 2.1.

Table 2.1 Trips Generated (Gross)

Year	Total Trips Generated (veh)	
	AM Peak	PM Peak
2021	21,241	22,745
2031	26,231	27,412
2021 – 2031 Growth	**+4,989 trips**	**+4,667 trips**

The projected 10-year growth is around 23% in the AM peak and 21% in the PM peak, corresponding to traffic growth of around **2% linear growth p.a**.

It is noted that the future year population and employment demographics for the Travel Zones which encompass the study area assumes some level of increase in line with the current land controls, but does not include any Planning Proposal land use changes.

3. Traffic Generation

3.1 Traffic Rates

The estimation of trip generation was primarily sourced from applicable traffic rates from the following documents:

- *RTA's Guide to Traffic Generating Developments, Version 2.2, October 2002 (GTTGD 2002)*
- *Technical Direction – Guide to Traffic Generating Developments Updated traffic surveys (TDT 2013/04a).*

3.2 Residential Land Use Assumptions

The proposed sites include R3 and R4 residential land use, representing medium-density and high-density housing respectively. However, residential uses are also present in Other E Zone and E1 Local Centre zones. For the purposes of this assessment, it was assumed that these would take the form of mixed-use buildings with high-density land use for the residential components of the site (e.g. apartment units with ground-floor retail).

The following ratios and calculations were adopted from CM+ assumptions on developing the proposed built form land use yields:

- Floor Space Ratio = Gross Floor Area / Site Area
- Average household size = 2.8 persons per dwelling
- For R4 High Density Residential:
  - GFA to Net Saleable Area (NSA) ratio: 85%
  - No. Dwellings = NSA / 85m^2
- For R3 Medium Density Residential:
  - No. Dwellings = GFA / 120m^2.

Trip generation rates for residential land use was adopted from *TDT 2013/04a* for high density residential and *GTTGD 2022* for medium density residential.

3.3 Non-Residential Land Use Assumptions

3.3.1 Land Use Splits

Non-residential land use was generally zoned as either E1 Local Centre or Other E Zones (B1 Neighbourhood Centre, B4 Mixed Use, B5 Business Development or B6 Enterprise Corridor). Where not directly stipulated, it was assumed non-residential land use was divided between retail and commercial uses. Industrial land use is not proposed in any of the subject sites along the Woodville Road Corridor.

In each of the key precincts, for the purpose of traffic generation calculations the non-residential GFA provided has been split between retail and commercial land use in the following ways:

- Woodville North Precinct:
  - This precinct is planned to have a strong residential character, with some minor business use around Merrylands Road. It was assumed that ancillary retail facilities (like cafés, small neighbourhood shops and services, etc) would be the most appropriate non-residential land use within this precinct.

- Therefore, the non-residential use is assumed to be **100% retail.**

- Merrylands East Precinct:
  - This precinct is planned to cater the new Local Centre for the Woodville Road Corridor, with a mix of uses including major employment opportunities. Site 17, Merrylands East Local Centre, is assumed to be a major shopping and retail centre. The remaining B Zone land uses were assumed to be divided equally between retail (like cafés, restaurants and shops) and commercial facilities (business offices) to reflect the planned mix of employment within this precinct.
  - Therefore, the non-residential use is assumed to be **50% retail** and **50% commercial** (unless otherwise stipulated).
- Woodville South Precinct:
  - This precinct is planned to offer a balance between higher density living and employment opportunities, with a smaller neighbourhood centre around Guildford Road. It was assumed that a mix of retail and commercial facilities would be appropriate for this area to reflect the mix of uses.
  - Therefore, the non-residential use is assumed to be **50% retail** and **50% commercial** (unless otherwise stipulated).

3.3.2 Shopping Centres

The peak hour trip generation rates for shopping centres were adopted from the Stantec traffic assessments for the Merrylands East Local Centre (now Site 17 as part of this Planning Proposal). These rates are based on the traffic generation rates for shopping centres from the *GTTGD 2002*.

The following reductions have been included in these rates:

- Trips to shopping centres typically result in 'chain trips' and 'multi-purpose trips'. To allow for the incidence of these, the trip generation of the shopping centre is **reduced by 25%**.
- Trips to retail land uses are reduced during the AM peak compared to the PM peak due to typical post-peak shop opening times in the morning and general trip patterns. To allow for this, the trip generation of retail facilities were **reduced by 50% in the AM peak only** (unless a specific morning rate was otherwise stipulated).

3.3.3 Retail Land Use

There are a wide range of potential retail land uses, including cafés, restaurants, neighbourhood shops, grocery stores, utility stores, hardware stores, etc. At this stage, retail tenancies are indeterminate and therefore an assumption must be adopted for the purpose of calculating traffic generation for the retail uses.

The general retail developments at the subject sites are assumed to be mainly food-orientated facilities such as restaurants and cafés. A comparison of trip generation rates for restaurants to other retail land uses generally indicates that a selection of retail rates similar to the restaurant rate is appropriate, and is unlikely to underestimate traffic generation (other facilities like bulky goods and hardware stores generally have lower trip generation rates).

Therefore, for the purpose of this assessment, the trip generation rate for 'general retail' land use has been adopted from the peak hour trip generation rate for restaurants.

The following reductions have been included in this rate:

- Trips to retail land uses are reduced during the AM peak compared to the PM peak due to typical post-peak shop opening times in the morning and general trip patterns. To allow for this, the trip generation of retail facilities were **reduced by 50% in the AM peak only** (unless a specific morning rate was otherwise stipulated).

3.3.4 Commercial Land Use

The peak hour trip generation rates for commercial offices were sourced from *TDT 2013/04a.* It was noted that these average trip generation rates were based on surveys of a number of office blocks around Greater Sydney. However, a number of these sites were located in close proximity to major public transport hubs. The planned commercial developments along the Woodville Road Corridor are typically between 1-2km walk away from either Guildford or Merrylands train stations, thereby limiting (but not excluding) the effectiveness of public transport as a mode of travel.

To reflect the nature of the site, the traffic generation rates were adopted from Site OB5 (16 Giffnock Avenue Macquarie Park) site surveys instead of the average rates. The Macquarie Park site is located around 600m walk away from the train station (now Metro station), and therefore is posited as the best representation for the planned commercial sites along the Woodville Road Corridor.

3.3.5 Open Space

Open space land use is proposed at a few locations along the corridor, comprising parks and other green spaces. It was assumed that these areas will generate a negligible number of vehicle trips during the peak hour periods.

3.4 Trip Generation Calculations

3.4.1 Traffic Generation Rates

The trip generation rates used for each land use type as part of the Planning Proposal are outlined in Table 3.1.

Table 3.1: Trips Generation Rates – Planning Proposal Uses

Land Use	Trip Generation Rate			
	AM Peak	PM Peak	Units	Source
Medium Density Residential	0.5	0.5	Trips per Dwelling	GTTGD 2002
High Density Residential	0.19	0.15	Trips per Dwelling	TDT 2013/04a
Shopping Centre (Supermarket)[1]	5.8	11.6	Trips per 100m^2 GLFA	Stantec Report (GTTGD 2002)
Shopping Centre (Speciality Retail)[1]	1.7	3.5	Trips per 100m^2 GLFA	Stantec Report (GTTGD 2002)
Retail (Generic)[1]	2.5	5	Trips per 100m^2 GFA	GTTGD 2002
Commercial (Office)	2.1	1.8	Trips per 100m^2 GFA	TDT 2013/04a
Open Space	-	-	-	-

1. Trip rate inclusive of reductions and discounts

3.4.2 Uplift Traffic Generation (Gross)

Based on the above rates and the provided development yields, the total trip generation is summarised in Table 3.2.

Table 3.2 Trips Generated (Gross)

Precinct	Total Trips Generated (veh)	
	AM Peak	PM Peak
Woodville North Precinct	314	302
Merrylands East Precinct	435	671
Woodville South Precinct	450	489
Total	**1,199 veh**	**1,462 veh**

Details on the estimated trip generation for each Planning Proposal site are provided in **Attachment B**.

These trip generation numbers include the total trip generation associated with the uplift development. However, it is noted that the sites in each precinct are not greenfield sites, and the proposed uplift is effectively a 'replacement' of the existing site. Therefore, the net traffic increase associated with the uplift must be calculated by subtracting the existing traffic generation of each site.

3.4.3 Existing Site Controls Traffic Generation

The traffic generation representing the current planning controls has been assessed based on the type of land zoning and current permitted FSR for each of the sites. This represents the trip potential for the sites under the current approved land use, but does not include the existing (and retained) trip generation of any constrained sites.

The trip generation rates used for each existing land use type is shown in Table 3.3.

Table 3.3: Trips Generation Rates – Existing Uses

Land Use	Trip Generation Rate			
	AM Peak	PM Peak	Units	Source
Low Density Residential	0.95	0.99	Trips per Dwelling	TDT 2013/04a
Medium Density Residential	0.5	0.5	Trips per Dwelling	GTTGD 2002
Open Space	-	-	-	-

Site 17 (the John Cootes site) has been evaluated separately due to its unique site context. It is understood that there is an approved Development Application (DA 2020/0493) for the site, which projects a maximum residential potential for the site of 425 dwellings under the current planning controls, along with other retail and commercial land uses. However, this approved development is not included within the future land use projections for the corresponding STFM travel zone. The site is also noted to currently be significantly under-developed comparing to the permitted land use and FSR.

For the purposes of this assessment, the future traffic yield of the subject site as assumed by the STFM is estimated based on the existing site yield and increased in line with the predicted growth rate extracted from the TZP19 dataset for the corresponding zone (TZ Code 1250). Between 2016 and 2036, an average annual growth rate of 1.4% and 2.0% has been applied to the subject zone for population and employment respectively. For a

conservative assessment, a 2.0% annual growth rate has been adopted. These calculations are summarised in Table 3.4.

Table 3.4: Trips Generated (John Cootes Site 17)

Address	Lot / DP	Description	Trips – AM (veh)	Trips – PM (veh)
244 Woodville Road	A/379850	Single dwelling	0.95	0.99
246 Woodville Road	B/379850 & C/379850	Single dwelling	0.95	0.99
248 Woodville Road	2/204284	Empty lot	0	0
256 Woodville Road	4-7/128586 &1/433824	Empty lot	0	0
258-264 Woodville Road	2581/803841 & 1/382912	Monster Furniture Clearance Depot	0[1]	0[1]
19 Highland Street	F/382911	Empty lot	0	0
2 Lansdowne Street	1/204284 & A/418199	Single dwelling	0.95	0.99
4 Lansdowne Street	A/409259	Single dwelling	0.95	0.99
8 Lansdowne Street	F/364338 &2/385967	Single dwelling	0.95	0.99
8A Lansdowne Street	1/385967	Single dwelling	0.95	0.99
10 Lansdowne Street	D/364338	Single dwelling	0.95	0.99
12 Lansdowne Street	C/364338	Single dwelling	0.95	0.99
14 Lansdowne Street	A/344408	Single dwelling	0.95	0.99
16 Lansdowne Street	81/128805	Single dwelling	0.95	0.99
		Total	**9.5 veh**	**9.9 veh**
		Total + 2.0% annual growth (to 2031)	**11.2 veh**	**11.7 veh**

1. For conservative assessment, trip generation assumed to be negligible due to site land use (furniture warehouse depot)

The calculated total trip generation potential for each of the precincts is summarised in Table 3.5.

Table 3.5 Trips Generated (Total Existing Potential)

Precinct	Total Trip Potential (veh)	
	AM Peak	PM Peak
Woodville North Precinct	138	140
Merrylands East Precinct	38	41
Woodville South Precinct	136	140
Total	**312 veh**	**321 veh**

The site-by-site breakdown is shown in **Attachment B**.

3.4.4 Uplift Traffic Generation (Net)

The gross, existing and subsequent net growth in trip generation for the Planning Proposal sites is summarised in Table 3.6.

Table 3.6 Trips Generated (Net)

Precinct	Total Trip Potential (veh)					
	AM Peak			PM Peak		
	Uplift Total	Existing Potential	Net Increase	Uplift Total	Existing Potential	Net Increase
Woodville North Precinct	314	138	176	302	140	162
Merrylands East Precinct	435	38	397	671	41	630
Woodville South Precinct	450	136	314	489	140	349
Total	**1,199 veh**	**312 veh**	**887 veh**	**1,462 veh**	**321 veh**	**1,141 veh**

3.5 Trip In/Out Splits

The in/out splits for trips generated for each land use type was based on the type of traffic behaviour (commuter, shopper, resident) in each peak, and are outlined in Table 3.7.

Table 3.7: Trip In/Out Split

Development Type	In / Out Split			
	AM		PM	
	In	Out	In	Out
Low Density Residential	30%	70%	60%	40%
Medium Density Residential	30%	70%	60%	40%
High Density Residential	30%	70%	60%	40%
Retail (Supermarket)	50%	50%	50%	50%
Retail (Specialty Retail)	50%	50%	50%	50%
Retail (Generic)	50%	50%	50%	50%
Commercial (Office)	80%	20%	20%	80%

4. Trip Distribution

4.1 Overview

The distribution of the new development trips to and from each of the sites was based on an analysis of Journey to Work data and O-D surveys data.

Journey to Work (JTW) data was collected from the Australian Bureau of Statistics, based on 2016 Census data. While 2021 Census datasets have been recently released, it is understood that the surveys were undertaken during the midst of the COVID-19 pandemic and may show impacted travel patterns due to movement restrictions and state-wide lockdowns. A subsequent analysis of the 2021 dataset revealed that there was a disproportionate weighting towards areas with a high density of industrial land use, with reduced percentages to areas characterised more strongly by retail centres and commercial offices (e.g. Sydney CBD). This could reflect the greater uptake of commercial working-from-home arrangements during this period, understating the general traffic patterns to certain origin-destination zones.

It was therefore determined that 2016 data would be a better reflection of business-as-usual travel patterns for residents and workers in vicinity of the Woodville Road Corridor.

Detailed JTW data is shown in **Attachment C.**

4.2 Journey to Work Analysis

4.2.1 Methodology

JTW data was collected for two (2) key SA2 zones to represent the study area, being:

- Granville-Clyde (Code: 1250311481)
- Guildford-South Granville (Code: 125031483).

The following data was extracted from the Census dataset:

- Places of Work for individuals with a Usual Residence located within the SA2 zones
- Usual Residence for individuals with a Place of Work located within the SA2 zones.

These two tables identified the existing traffic distribution for commuter traffic in the morning peak (outbound trips from residential sites within the study area and inbound trips to employment areas within the study area).

Trip directionality was assigned an approximate cardinal direction (North, South, East or West) for distribution through the corridor (e.g. trips from Guildford-South Granville to Parramatta would be orientated North). For the East and West directions, there were a number of different roads servicing each cardinal direction. The selected road(s) used for traffic generated by each of the Planning Proposal sites will be determined based on proximity to the major east-west roads and informed through review of OD patterns.

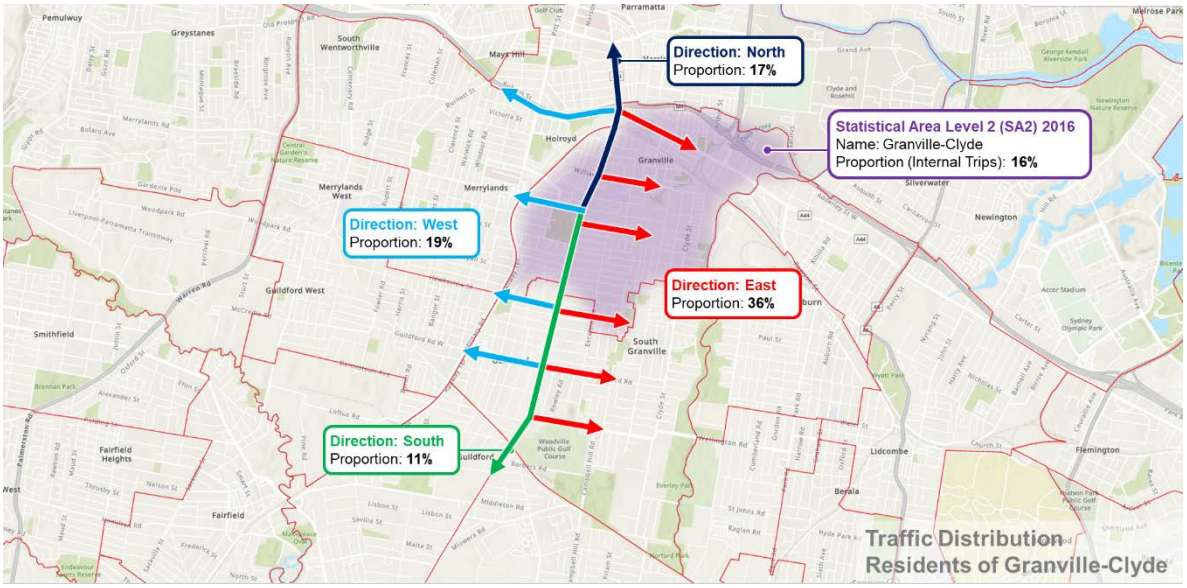
Some proportion of trips were also identified as ‘internal’ to the study area, being residents that both live and work within the two key SA2 zones. These trips will be distributed to appropriate sites / zones based on several factors, including the future projected land use, employment and retail centres and the assumed access arrangements to the corridor network.

For this assessment, the return trip was assumed to follow the same distribution in the opposite direction.

Discrete distributions were identified for each of the two key SA2 zones to reflect the change in trip distribution between sites to the northern and southern sides of the corridor.

4.2.2 Traffic Distribution - Residents

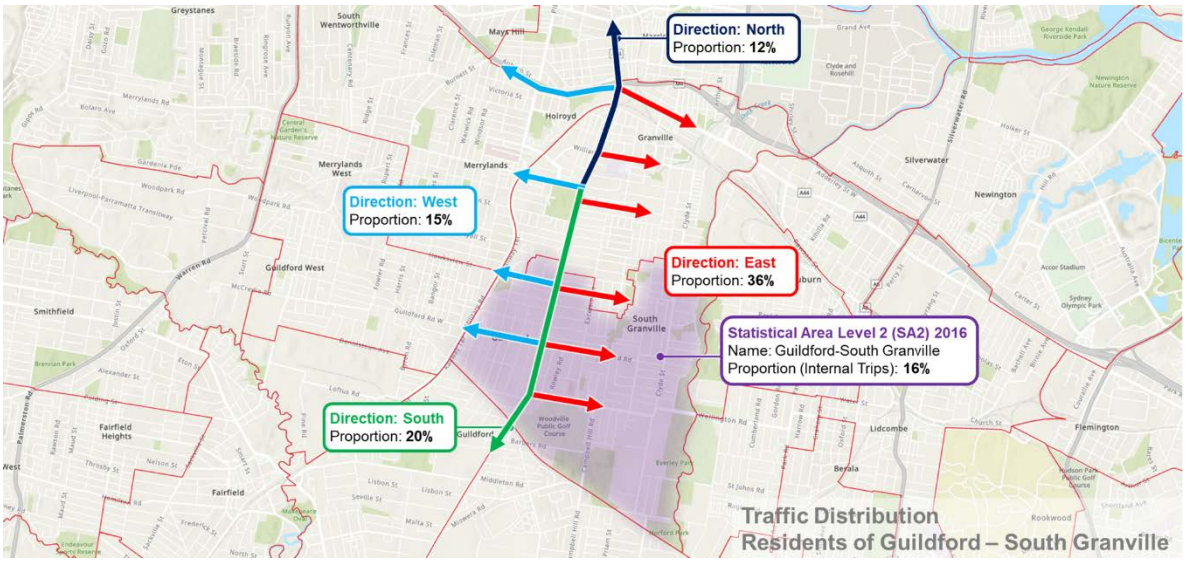
Figure 4.1 shows the residential traffic distribution based on JTW data for the shown Granville-Clyde SA2 zone, which encompasses the Woodville North Precinct and part of the Merrylands East Precinct.



Adapted from: ABS Maps

Figure 4.1: Journey to Work – Granville-Clyde SA2

Figure 4.2 shows the residential traffic distribution based on JTW data for the shown Guildford-South Granville SA2 zone, which encompasses the Woodville South Precinct and part of the Merrylands East Precinct.

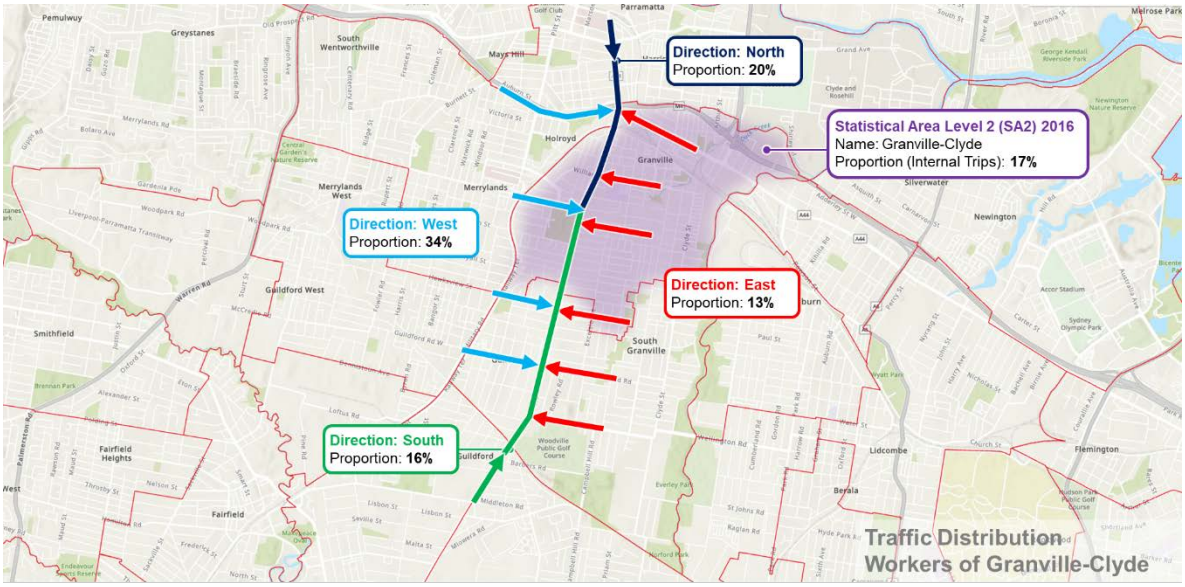


Adapted from: ABS Maps

Figure 4.2: Journey to Work – Guildford-South Granville SA2

4.2.3 Traffic Distribution – Workers

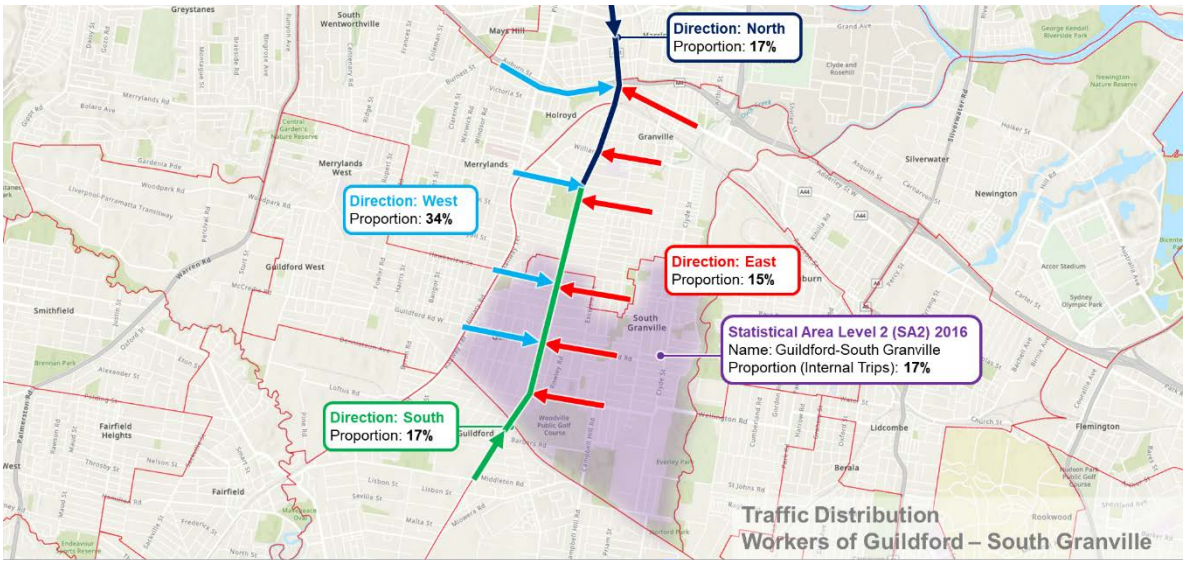
Figure 4.3 shows the employment traffic distribution based on JTW data for the shown Granville-Clyde SA2 zone, which encompasses the Woodville North Precinct and part of the Merrylands East Precinct.



Adapted from: ABS Maps

Figure 4.3: Journey to Work – Granville-Clyde SA2

Figure 4.4 shows the employment traffic distribution based on JTW data for the shown Guildford-South Granville SA2 zone, which encompasses the Woodville South Precinct and part of the Merrylands East Precinct.



Adapted from: ABS Maps

Figure 4.4: Journey to Work – Guildford-South Granville SA2

4.2.4 Summary

The resulting traffic distributions are summarised in Table 4.1.

Table 4.1: Traffic Distributions Summary

Direction	Residents (travelling to)		Workers (travelling from)	
	Granville-Clyde	Guildford-South Granville	Granville-Clyde	Guildford-South Granville
North	19%	12%	20%	17%
South	13%	20%	16%	17%
East	42%	36%	13%	15%
West	26%	15%	34%	34%
Internal	11%	16%	17%	17%

4.3 O-D Data Analysis

O-D survey data collected in 2022 as part of the calibration and validation of the Woodville Road Corridor traffic model will be used to refine and inform the traffic distribution identified from the JTW data.

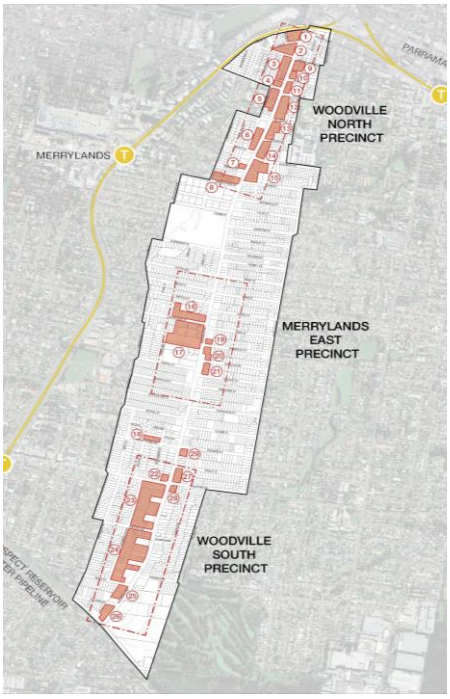
Where possible, existing origin-destination travel patterns will be used to ‘split’ trips travelling to the East or West among the identified major roads. To do this, an appropriate O-D station would need to be identified for each of the Planning Proposal sites. This selection will be developed on the basis of proximity and similar access to the road network.

Attachment A: Planning Proposal Development Site Yields (CM+)

BASE CASE

Site Number	Overall Site Area (sqm)	Constrained Site Area (sqm)	Opportunity Site Area (sqm)	Resi GFA (sqm)	No. of Proposed Dwellings (Units)*	Population Projection (person)**	Non-Resi GFA (sqm)
1	5,192	-	5,192	9,346	93		-
2	6,301	-	6,301	11,342	113		-
3	7,570	747	6,823	12,281	123		-
4	1,698	-	1,698	2,717	27		340
5	6,657	598	6,059	10,906	109		-
6	5,700	-	5,700	10,260	103		-
7	1,222	-	1,222	2,200	22		244
8	7,056	-	7,056	12,701	127		691
9	3,852	-	3,852	6,934	69		-
10	1,882	-	1,882	3,388	34		-
11	2,514	-	2,514	4,525	45		-
12	8,300	-	8,300	14,439	144		501
13	6,006	-	6,006	10,811	108		-
14	5,630	-	5,630	10,134	101		-
15	11,144	-	11,144	16,830	164		-
WOODVILLE NORTH PRECINCT TOTAL	**80,724**	**1,345**	**79,379**	**138,813**	**1,384**	**3,875**	**1,776**
16	10,377	-	10,377	15,385	150		920
17	28,747	-	28,747	54,722	547		10,951
18	2,639	-	2,639				
19	1,236	-	1,236	2,225	22		-
20	3,028	-	3,028	5,450	55		-
21	2,732	-	2,732	4,918	49		-
MERRYLANDS EAST PRECINCT TOTAL	**48,759**	**-**	**48,759**	**82,700**	**823**	**2,306**	**11,871**
22	1,713	-	1,713	3,083	31		343
23	33,949	-	33,949	59,738	597		4,277
24	36,891	4,552	32,339	54,899	549		1,440
25	5,010	-	5,010	9,018	90		-
26	4,916	-	4,916	8,849	88		-
27	3,944	143	3,801	6,842	68		760
28	1,605	-	1,605	2,889	29		321
29	1,963	-	1,963	3,533	35		-
WOODVILLE SOUTH PRECINCT TOTAL	**89,991**	**4,695**	**85,296**	**148,851**	**1,489**	**4,168**	**7,141**
TOTAL	**219,474**	**6,040**	**213,434**	**370,364**	**3,696**	**10,349**	**20,788**

open space



Site Map

NOTE:
The yield is of high level and included additional three E1 (B1) sites requested by Council on 22/02/23:
- *35 Grimwood Street is included in PP site 4*
- *161 William Street is included in PP site 12*
- *188 Guildford Road is included in PP site 23*

**** Number of dwellings assumption:***
Residential Flat Building:
Ground Floor GBA to GFA efficiency rate: 50%
GBA to GFA efficiency rate for other levels: 75%
FSR = GFA / Site Area
GFA to NSA efficiency rate for residential part: 85%
Average unit size: 85sqm
No. Dwellings = NSA / 85average unit size: 85sqm

Townhouse:
GBA to GFA efficiency rate: 90%
FSR = GFA / Site Area
Average townhouse size: 120sqm
No. Dwellings = GFA / 120

2,693

*****Population Projection***
Household Size: 2.8 ppl per dwelling

Dwelling yield has been updated

Attachment B: Planning Proposal Site Trip Generation

BITZIOS consulting

P5825 Woodville Road Corridor TTS

Uplift Trip Generation (Gross) - Planning Proposal (PP)

Precinct	PP Site	Land-use	Opportunity Site Area (m^2)	FSR	GFA (m^2)	Resi. Units	Trip Generation Rate Units	Trip Gen Rate (AM Peak)	Trips Gen (AM Peak)	TRIPS IN	TRIPS OUT	Trip Gen Rate (PM Peak)	Trips Gen (PM Peak)	TRIPS IN	TRIPS OUT
Woodville North Precinct	1	R4	5192	1.8	9346	93	trips per dwelling	0.19	18	5	13	0.15	14	8	6
Woodville North Precinct	2	R4	*6301*	1.8	11342	113	trips per dwelling	0.19	21	6	15	0.15	17	10	7
Woodville North Precinct	**2**	**Open Space**	***0***	-	-	-	**N/A**	-	-	-	-	-	-	-	-
Woodville North Precinct	3	R4	6823	1.8	12281	123	trips per dwelling	0.19	23	7	16	0.15	18	11	7
Woodville North Precinct	4	R4	1509	1.8	2717	27	trips per dwelling	0.19	5	2	3	0.15	4	2	2
Woodville North Precinct	4	Retail	189	1.8	340	-	trips per 100 m2 GFA	2.5	9	5	4	5	17	9	8
Woodville North Precinct	5	R4	6059	1.8	10906	109	trips per dwelling	0.19	21	6	15	0.15	16	10	6
Woodville North Precinct	6	R4	5700	1.8	10260	103	trips per dwelling	0.19	20	6	14	0.15	15	9	6
Woodville North Precinct	7	Retail	*122*	2	244	-	trips per 100 m2 GFA	2.5	6	3	3	5	12	6	6
Woodville North Precinct	7	R4	*1100*	2	2200	22	trips per dwelling	0.19	4	1	3	0.15	3	2	1
Woodville North Precinct	8	R4	*6699*	*1.90*	12701	127	trips per dwelling	0.19	24	7	17	0.15	19	11	8
Woodville North Precinct	8	Retail	357	*1.93*	691	-	trips per 100 m2 GFA	2.5	17	9	8	5	35	18	17
Woodville North Precinct	9	R4	3852	1.8	6934	69	trips per dwelling	0.19	13	4	9	0.15	10	6	4
Woodville North Precinct	10	R4	1882	1.8	3388	34	trips per dwelling	0.19	6	2	4	0.15	5	3	2
Woodville North Precinct	11	R4	2514	1.8	4525	45	trips per dwelling	0.19	9	3	6	0.15	7	4	3
Woodville North Precinct	12	R4	8022	1.8	14439	144	trips per dwelling	0.19	27	8	19	0.15	22	13	9
Woodville North Precinct	12	Retail	278	1.8	501	-	trips per 100 m2 GFA	2.5	13	7	6	5	25	13	12
Woodville North Precinct	13	R4	6006	1.8	10811	108	trips per dwelling	0.19	21	6	15	0.15	16	10	6
Woodville North Precinct	14	R4	5630	1.8	10134	101	trips per dwelling	0.19	19	6	13	0.15	15	9	6
Woodville North Precinct	**15**	**R3**	***3075***	**0.75**	***2307***	***19***	**trips per dwelling**	**0.5**	**10**	**3**	**7**	**0.5**	**10**	**6**	**4**
Woodville North Precinct	**15**	**R4**	***8069***	**1.8**	***14523***	***145***	**trips per dwelling**	**0.19**	**28**	**8**	**20**	**0.15**	**22**	**13**	**9**
Merrylands East Precinct	**16**	**R3**	***3215***	**0.75**	***2411***	***20***	**trips per dwelling**	**0.5**	**10**	**3**	**7**	**0.5**	**10**	**6**	**4**
Merrylands East Precinct	**16**	**R4**	***2150***	**1.8**	***3869***	***39***	**trips per dwelling**	**0.19**	**7**	**2**	**5**	**0.15**	**6**	**4**	**2**
Merrylands East Precinct	**16**	**Retail**	***230***	**2**	**460**	**-**	**trips per 100 m2 GFA**	**2.5**	**12**	**6**	**6**	**5**	**23**	**12**	**11**
Merrylands East Precinct	**16**	**Commercial**	***230***	**2**	**460**	**-**	**trips per 100 m2 GFA**	**2.1**	**10**	**8**	**2**	**1.8**	**8**	**2**	**6**
Merrylands East Precinct	**16**	**R4**	***4552***	**2**	***9104***	***91***	**trips per dwelling**	**0.19**	**17**	**5**	**12**	**0.15**	**14**	**8**	**6**
Merrylands East Precinct	17	Retail (Specialty)	*2920*	2.5	7301	-	trips per 100 m2 GLFA	1.7	93	47	46	3.5	*192*	96	96
Merrylands East Precinct	17	Retail (Shopping)	*1460*	2.5	3650	-	trips per 100 m2 GLFA	5.8	159	80	79	11.6	***318***	**159**	**159**
Merrylands East Precinct	17	R4	*21889*	2.5	54722	547	trips per dwelling	0.19	104	31	73	0.15	82	49	33
Merrylands East Precinct	17	Open Space	*2478*	-	-	-	N/A	-	-	-	-	-	-	-	-
Merrylands East Precinct	18	Open Space	2639	-	-	-	N/A	-	-	-	-	-	-	-	-
Merrylands East Precinct	19	R4	1236	1.8	2225	22	trips per dwelling	0.19	4	1	3	0.15	3	2	1
Merrylands East Precinct	20	R4	3028	1.8	5450	55	trips per dwelling	0.19	10	3	7	0.15	8	5	3
Merrylands East Precinct	21	R4	2732	1.8	4918	49	trips per dwelling	0.19	9	3	6	0.15	7	4	3
Woodville South Precinct	22	Retail	*86*	2	172	-	trips per 100 m2 GFA	2.5	4	2	2	5	9	5	4
Woodville South Precinct	22	Commercial	*86*	2	172	-	trips per 100 m2 GFA	2.1	4	3	1	1.8	3	1	2
Woodville South Precinct	22	R4	*1542*	2	3083	31	trips per dwelling	0.19	6	2	4	0.15	5	3	2
Woodville South Precinct	23	Retail	*1069*	2	2138.5	-	trips per 100 m2 GFA	2.5	53	27	26	5	107	54	53
Woodville South Precinct	23	Commercial	*1069*	2	2138.5	-	trips per 100 m2 GFA	2.1	45	36	9	1.8	38	8	30
Woodville South Precinct	23	R4	*29869*	2	59738	597	trips per dwelling	0.19	113	34	79	0.15	90	54	36
Woodville South Precinct	23	Open Space	*1942*	-	-	-	N/A	-	-	-	-	-	-	-	-
Woodville South Precinct	24	R4	*31539*	1.8	54899	549	trips per dwelling	0.19	104	31	73	0.15	82	49	33
Woodville South Precinct	24	Retail	*800*	1.8	1440	-	trips per 100 m2 GFA	2.5	36	18	18	5	72	36	36
Woodville South Precinct	25	R4	5010	1.8	9018	90	trips per dwelling	0.19	17	5	12	0.15	14	8	6
Woodville South Precinct	26	R4	4916	1.8	8849	88	trips per dwelling	0.19	17	5	12	0.15	13	8	5
Woodville South Precinct	27	Retail	*190*	2	380	-	trips per 100 m2 GFA	2.5	10	5	5	5	19	10	9
Woodville South Precinct	27	Commercial	*190*	2	380	-	trips per 100 m2 GFA	2.1	8	6	2	1.8	7	1	6
Woodville South Precinct	27	R4	*3421*	2	6842	68	trips per dwelling	0.19	13	4	9	0.15	10	6	4
Woodville South Precinct	28	Retail	*80*	2	161	-	trips per 100 m2 GFA	2.5	4	2	2	5	8	4	4
Woodville South Precinct	28	Commercial	*80*	2	161	-	trips per 100 m2 GFA	2.1	3	2	1	1.8	3	1	2
Woodville South Precinct	28	R4	*1445*	2	2889	29	trips per dwelling	0.19	6	2	4	0.15	4	2	2
Woodville South Precinct	29	R4	1963	1.8	3533	35	trips per dwelling	0.19	7	2	5	0.15	5	3	2
Total	**-**	**-**	**213434**	**-**	**391153**	**3692**		**-**	**1199**	**479**	**720**	**-**	**1462**	**773**	**689**

P5825 Woodville Road Corridor TTS
Trip Generation - Existing Site Controls

Precinct	PP Site	Land-use	Opportunity Site Area (m^2)	FSR	GFA (m^2)	Dwellings	Trip Generation Rate Units	Trip Gen Rate (AM Peak)	Trips Gen (AM Peak)	TRIPS IN	TRIPS OUT	Trip Gen Rate (PM Peak)	Trips Gen (PM Peak)	TRIPS IN	TRIPS OUT
Woodville North Precinct	1	R2	5192	1	5192	8.65	trips per dwelling	0.95	8	2	6	0.99	9	5	4
Woodville North Precinct	2	R2	*6301*	1	6301	10.50	trips per dwelling	0.95	10	3	7	0.99	10	6	4
Woodville North Precinct	3	R2	6823	1	6823	11.37	trips per dwelling	0.95	11	3	8	0.99	11	7	4
Woodville North Precinct	4	R2	1698	1	1698	2.83	trips per dwelling	0.95	3	1	2	0.99	3	2	1
Woodville North Precinct	5	R2	6059	1	6059	10.10	trips per dwelling	0.95	10	3	7	0.99	10	6	4
Woodville North Precinct	6	R2	5700	1	5700	9.50	trips per dwelling	0.95	9	3	6	0.99	9	5	4
Woodville North Precinct	7	**R3**	*1222*	0.6	733.2	6.11	trips per dwelling	0.5	3	1	2	0.5	3	2	1
Woodville North Precinct	8	**R3**	*7056*	0.6	4233.6	35.28	trips per dwelling	0.5	18	5	13	0.5	18	11	7
Woodville North Precinct	9	R2	3852	1	3852	6.42	trips per dwelling	0.95	6	2	4	0.99	6	4	2
Woodville North Precinct	10	R2	1882	1	1882	3.14	trips per dwelling	0.95	3	1	2	0.99	3	2	1
Woodville North Precinct	11	R2	2514	1	2514	4.19	trips per dwelling	0.95	4	1	3	0.99	4	2	2
Woodville North Precinct	12	R2	8300	1	8300	13.83	trips per dwelling	0.95	13	4	9	0.99	14	8	6
Woodville North Precinct	13	R2	6006	1	6006	10.01	trips per dwelling	0.95	10	3	7	0.99	10	6	4
Woodville North Precinct	14	R2	5630	1	5630	9.38	trips per dwelling	0.95	9	3	6	0.99	9	5	4
Woodville North Precinct	15	**R3**	3075	0.6	1845.26	15.38	trips per dwelling	0.5	8	2	6	0.5	8	5	3
Woodville North Precinct	15	R2	8069	1	8068.57	13.45	trips per dwelling	0.95	13	4	9	0.99	13	8	5
Merrylands East Precinct	16	R2	*10377*	1	10377.00	17.30	trips per dwelling	0.95	16	5	11	0.99	17	10	7
Merrylands East Precinct	17	B2	*26271*	2.2	57796	-	-	-	11	3	8	-	12	7	5
Merrylands East Precinct	17	Open Space	*2476*	-	-	-	N/A	-	-	-	-	-	-	-	-
Merrylands East Precinct	18	Open Space	2639	-	-	-	N/A	-	-	-	-	-	-	-	-
Merrylands East Precinct	19	R2	1236	1	1236.00	2.06	trips per dwelling	0.95	2	1	1	0.99	2	1	1
Merrylands East Precinct	20	R2	3028	1	3028.00	5.05	trips per dwelling	0.95	5	2	3	0.99	5	3	2
Merrylands East Precinct	21	R2	2732	1	2732.00	4.55	trips per dwelling	0.95	4	1	3	0.99	5	3	2
Woodville South Precinct	22	R2	*1713*	1	1713.00	2.86	trips per dwelling	0.95	3	1	2	0.99	3	2	1
Woodville South Precinct	23	R2	*33949*	1	33949.00	56.58	trips per dwelling	0.95	54	16	38	0.99	56	34	22
Woodville South Precinct	24	R2	32339	1	32339.00	53.90	trips per dwelling	0.95	51	15	36	0.99	53	32	21
Woodville South Precinct	25	R2	5010	1	5010.00	8.35	trips per dwelling	0.95	8	2	6	0.99	8	5	3
Woodville South Precinct	26	R2	4916	1	4916.00	8.19	trips per dwelling	0.95	8	2	6	0.99	8	5	3
Woodville South Precinct	27	R2	3801	1	3801.00	6.34	trips per dwelling	0.95	6	2	4	0.99	6	4	2
Woodville South Precinct	28	R2	*1605*	1	1605.00	2.68	trips per dwelling	0.95	3	1	2	0.99	3	2	1
Woodville South Precinct	29	R2	1963	1	1963.00	3.27	trips per dwelling	0.95	3	1	2	0.99	3	2	1
Total	**-**	**-**	**213434**	**-**	**235302.83**	**341.26**		**-**	**312**	**93**	**219**	**-**	**321**	**194**	**127**

P5825 Woodville Road Corridor TTS
Uplift Trip Generation (Net)

Precinct	PP Site	Trip Gen AM (PP)	Trip Gen AM (Exist)	Trip Gen AM (Net)	AM TRIPS IN	AM TRIPS OUT	Trip Gen PM (PP)	Trip Gen PM (Exist)	Trip Gen PM (Net)	PM TRIPS IN	PM TRIPS OUT
Woodville North Precinct	1	18	8	10	3	7	14	9	5	3	2
Woodville North Precinct	2	21	10	11	3	8	17	10	7	4	3
Woodville North Precinct	3	23	11	12	4	8	18	11	7	4	3
Woodville North Precinct	4	14	3	11	6	5	21	3	18	9	9
Woodville North Precinct	5	21	10	11	3	8	16	10	6	4	2
Woodville North Precinct	6	20	9	11	3	8	15	9	6	4	2
Woodville North Precinct	7	10	3	7	3	4	15	3	12	6	6
Woodville North Precinct	8	41	18	23	11	12	54	18	36	18	18
Woodville North Precinct	9	13	6	7	2	5	10	6	4	2	2
Woodville North Precinct	10	6	3	3	1	2	5	3	2	1	1
Woodville North Precinct	11	9	4	5	2	3	7	4	3	2	1
Woodville North Precinct	12	40	13	27	11	16	47	14	33	18	15
Woodville North Precinct	13	21	10	11	3	8	16	10	6	4	2
Woodville North Precinct	14	19	9	10	3	7	15	9	6	4	2
Woodville North Precinct	15	38	21	17	5	12	32	21	11	6	5
Merrylands East Precinct	**16**	**56**	**16**	**40**	**19**	**21**	**61**	**17**	**44**	**22**	**22**
Merrylands East Precinct	17	356	11	345	155	190	592	12	580	297	283
Merrylands East Precinct	18	0	0	0	0	0	0	0	0	0	0
Merrylands East Precinct	19	4	2	2	0	2	3	2	1	1	0
Merrylands East Precinct	20	10	5	5	1	4	8	5	3	2	1
Merrylands East Precinct	21	9	4	5	2	3	7	5	2	1	1
Woodville South Precinct	22	14	3	11	6	5	17	3	14	7	7
Woodville South Precinct	23	211	54	157	81	76	235	56	179	82	97
Woodville South Precinct	24	140	51	89	34	55	154	53	101	53	48
Woodville South Precinct	25	17	8	9	3	6	14	8	6	3	3
Woodville South Precinct	26	17	8	9	3	6	13	8	5	3	2
Woodville South Precinct	27	31	6	25	13	12	36	6	30	13	17
Woodville South Precinct	28	13	3	10	5	5	15	3	12	5	7
Woodville South Precinct	29	7	3	4	1	3	5	3	2	1	1
Total	**-**	**1199**	**312**	**887**	**386**	**501**	**1462**	**321**	**1141**	**579**	**562**

Attachment C: Trip Distribution Based on Journey to Work Data

P5825 Woodville Road Corridor TTS
Distribution of Workers Residing within Guildford - South Granville (2016 SA2 Region)

Place of Work (2016 SA2 Region)	Number of Workers	Proportion	Cumulative Proportion	Direction
Total	**2876**	**100%**	**-**	**-**
Guildford - South Granville	366	13%	13%	Internal
Parramatta - Rosehill	202	7%	20%	N
Granville - Clyde	131	5%	24%	Internal
Homebush Bay - Silverwater	101	4%	28%	E
Auburn - Central	100	3%	31%	E
Lidcombe	91	3%	34%	E
Merrylands - Holroyd	88	3%	38%	W
Chester Hill - Sefton	82	3%	40%	S
Northmead	72	3%	43%	N
Wetherill Park Industrial	66	2%	45%	W
Auburn - North	65	2%	47%	E
Concord West - North Strathfield	64	2%	50%	E
Ermington - Rydalmere	63	2%	52%	E
Macquarie Park - Marsfield	59	2%	54%	E
Fairfield - East	59	2%	56%	S
Smithfield Industrial	55	2%	58%	W
Greenacre - Mount Lewis	50	2%	60%	E
Condell Park	49	2%	61%	S
Bankstown - South	49	2%	63%	S
Fairfield	47	2%	65%	S
Regents Park	41	1%	66%	E
Prospect Reservoir	40	1%	67%	W
Chullora	40	1%	69%	E
Homebush	37	1%	70%	E
North Parramatta	36	1%	71%	N
Guildford West - Merrylands West	36	1%	73%	W
Greystanes - Pemulwuy	36	1%	74%	W
Baulkham Hills (West) - Bella Vista	34	1%	75%	N
Sydney - Haymarket - The Rocks	33	1%	76%	E
Bankstown - North	33	1%	77%	S
Chipping Norton - Moorebank	31	1%	78%	S
Liverpool	30	1%	79%	S
Burwood - Croydon	30	1%	81%	E
Blacktown (East) - Kings Park	26	1%	81%	W
Erskineville - Alexandria	26	1%	82%	E
Lalor Park - Kings Langley	26	1%	83%	W
Ryde	23	1%	84%	E
Auburn - South	23	1%	85%	E
Cabramatta - Lansvale	23	1%	86%	S
Strathfield South	22	1%	86%	E
Smithfield - Wetherill Park	22	1%	87%	W
Warwick Farm	21	1%	88%	S
Canterbury (South) - Campsie	20	1%	89%	E
St Leonards - Naremburn	19	1%	89%	E
Strathfield	18	1%	90%	E
Pyrmont - Ultimo	18	1%	91%	E
Yagoona - Birrong	17	1%	91%	S
Concord - Mortlake - Cabarita	17	1%	92%	E
Yennora Industrial	16	1%	92%	S
Bass Hill - Georges Hall	16	1%	93%	S
Punchbowl	16	1%	93%	S
Fairfield - West	16	1%	94%	S
Campbelltown - Woodbine	15	1%	94%	S
Waterloo - Beaconsfield	15	1%	95%	E
Mascot - Eastlakes	14	0%	95%	S
Erskine Park	14	0%	96%	W
West Ryde - Meadowbank	14	0%	96%	E
Padstow	14	0%	97%	S
Rooty Hill - Minchinbury	13	0%	97%	W
Lane Cove - Greenwich	13	0%	98%	E
Gladesville - Huntleys Point	13	0%	98%	E
Prestons - Edmondson Park	13	0%	99%	S
St Marys - North St Marys	13	0%	99%	W
Castle Hill - Central	12	0%	100%	N
Epping - North Epping	12	0%	100%	E

Direction	Proportion
N	12%
E	36%
S	20%
W	15%
Internal	17%
Total	**100%**

P5825 Woodville Road Corridor TTS
Distribution of Workers Residing within Granville - Clyde (2016 SA2 Region)

Place of Work (2016 SA2 Region)	Number of Workers	Proportion	Cumulative Proportion	Direction
Total	**3097**	**100%**	-	-
Granville - Clyde	401	13%	13%	Internal
Parramatta - Rosehill	198	6%	19%	N
Homebush Bay - Silverwater	141	5%	24%	E
Merrylands - Holroyd	108	3%	27%	W
Guildford - South Granville	92	3%	30%	Internal
Macquarie Park - Marsfield	84	3%	33%	E
Lidcombe	83	3%	36%	E
Auburn - Central	74	2%	38%	E
Ermington - Rydalmere	73	2%	40%	N
Concord West - North Strathfield	67	2%	43%	E
Prospect Reservoir	66	2%	45%	W
Northmead	65	2%	47%	N
Chester Hill - Sefton	63	2%	49%	S
North Parramatta	63	2%	51%	N
Homebush	60	2%	53%	E
Wetherill Park Industrial	59	2%	55%	W
Baulkham Hills (West) - Bella Vista	56	2%	57%	N
Fairfield - East	53	2%	58%	S
Blacktown (East) - Kings Park	53	2%	60%	W
Sydney - Haymarket - The Rocks	51	2%	62%	E
Auburn - North	49	2%	63%	E
Smithfield Industrial	47	2%	65%	W
Liverpool	40	1%	66%	S
Guildford West - Merrylands West	36	1%	67%	W
Rooty Hill - Minchinbury	36	1%	68%	W
Pendle Hill - Girraween	36	1%	70%	W
Condell Park	34	1%	71%	S
Chullora	34	1%	72%	E
Greystanes - Pemulwuy	34	1%	73%	W
Burwood - Croydon	32	1%	74%	E
Erskineville - Alexandria	31	1%	75%	E
Carlingford	30	1%	76%	N
Fairfield	29	1%	77%	S
Yennora Industrial	29	1%	78%	S
St Leonards - Naremburn	28	1%	79%	E
Chipping Norton - Moorebank	27	1%	79%	S
Strathfield	25	1%	80%	E
Ryde	23	1%	81%	E
Castle Hill - Central	22	1%	82%	N
Marrickville	22	1%	82%	E
Wentworthville - Westmead	22	1%	83%	W
Greenacre - Mount Lewis	21	1%	84%	E
Lalor Park - Kings Langley	21	1%	85%	W
Pyrmont - Ultimo	21	1%	85%	E
Mascot - Eastlakes	21	1%	86%	E
Auburn - South	20	1%	87%	E
Erskine Park	20	1%	87%	W
Penrith	19	1%	88%	W
Bankstown - South	18	1%	88%	S
Canterbury (South) - Campsie	17	1%	89%	E
Riverstone - Marsden Park	17	1%	89%	W
Regents Park	16	1%	90%	E
Cabramatta - Lansvale	16	1%	91%	S
Lane Cove - Greenwich	16	1%	91%	E
West Ryde - Meadowbank	16	1%	92%	E
Sydney Airport	16	1%	92%	E
Prestons - Edmondson Park	16	1%	93%	S
Ashfield	16	1%	93%	E
Leichhardt - Annandale	16	1%	94%	E
Bankstown - North	15	0%	94%	S
Chatswood (East) - Artarmon	15	0%	95%	E
Epping - North Epping	15	0%	95%	E
Seven Hills - Toongabbie	15	0%	96%	W
Strathfield South	14	0%	96%	E
Bass Hill - Georges Hall	14	0%	96%	S
Kingswood - Werrington	14	0%	97%	W
North Rocks	14	0%	97%	N
Frenchs Forest - Belrose	14	0%	98%	E
Newtown - Camperdown - Darlington	14	0%	98%	E
Hurstville	14	0%	99%	E
Glebe - Forest Lodge	14	0%	99%	E
North Ryde - East Ryde	13	0%	100%	E

Direction	Proportion
N	17%
E	36%
S	11%
W	19%
Internal	16%
Total	**100%**

P5825 Woodville Road Corridor TTS
Distribution of Workers Employed within Guildford - South Granville (2016 SA2 Region)

Place of Residence (2016 SA2 Region)	Number of Workers	Proportion	Cumulative Proportion	Direction
Total	**3121**	**100%**	-	-
Granville - Clyde	401	13%	13%	Internal
Merrylands - Holroyd	152	5%	18%	W
Guildford - South Granville	131	4%	22%	Internal
Greystanes - Pemulwuy	83	3%	25%	W
Guildford West - Merrylands West	81	3%	27%	W
Parramatta - Rosehill	78	2%	30%	N
Chester Hill - Sefton	62	2%	32%	S
Toongabbie - Constitution Hill	60	2%	34%	W
Seven Hills - Toongabbie	59	2%	35%	W
Carlingford	57	2%	37%	N
Oatlands - Dundas Valley	53	2%	39%	N
Auburn - Central	50	2%	41%	E
Lidcombe	50	2%	42%	E
St Clair	50	2%	44%	W
North Parramatta	46	1%	45%	N
Ermington - Rydalmere	42	1%	47%	E
Rooty Hill - Minchinbury	42	1%	48%	W
Bass Hill - Georges Hall	41	1%	49%	S
Northmead	41	1%	51%	N
Yagoona - Birrong	41	1%	52%	S
Berala	38	1%	53%	E
Bossley Park - Abbotsbury	36	1%	54%	W
Parklea - Kellyville Ridge	36	1%	55%	N
Pendle Hill - Girraween	36	1%	57%	W
Blacktown (West)	35	1%	58%	W
Fairfield	35	1%	59%	S
Smithfield - Wetherill Park	35	1%	60%	W
Baulkham Hills (West) - Bella Vista	34	1%	61%	N
Kellyville	34	1%	62%	N
Blacktown (South)	33	1%	63%	W
Fairfield - West	33	1%	64%	S
Glenmore Park - Regentville	33	1%	65%	W
Glenwood	32	1%	66%	N
Punchbowl	31	1%	67%	S
Ryde	31	1%	68%	E
Winston Hills	31	1%	69%	N
Bonnyrigg Heights - Bonnyrigg	30	1%	70%	S
Epping - North Epping	30	1%	71%	E
Fairfield - East	30	1%	72%	S
Wentworthville - Westmead	30	1%	73%	W
Baulkham Hills (East)	29	1%	74%	N
Hassall Grove - Plumpton	29	1%	75%	W
Homebush Bay - Silverwater	29	1%	76%	E
Burwood - Croydon	28	1%	77%	E
Eastwood - Denistone	28	1%	78%	E
Rouse Hill - Beaumont Hills	27	1%	79%	N
West Hoxton - Middleton Grange	27	1%	79%	S
West Ryde - Meadowbank	26	1%	80%	E
Lalor Park - Kings Langley	25	1%	81%	W
Panania - Milperra - Picnic Point	25	1%	82%	S
Auburn - South	24	1%	83%	E
Cabramatta - Lansvale	24	1%	83%	S
Cambridge Park	24	1%	84%	W
Castlereagh - Cranebrook	24	1%	85%	W
Doonside - Woodcroft	24	1%	86%	W
Quakers Hill	24	1%	87%	W
Blacktown (North) - Marayong	23	1%	87%	W
Canley Vale - Canley Heights	23	1%	88%	S
Holsworthy - Wattle Grove	23	1%	89%	S
Homebush	23	1%	89%	E
Riverstone - Marsden Park	23	1%	90%	W
Erskine Park	22	1%	91%	W
Lethbridge Park - Tregear	22	1%	92%	W
Padstow	22	1%	92%	S
Auburn - North	21	1%	93%	E
Bidwill - Hebersham - Emerton	21	1%	94%	W
Concord - Mortlake - Cabarita	21	1%	94%	E
Macquarie Fields - Glenfield	21	1%	95%	S
Dural - Kenthurst - Wisemans Ferry	20	1%	96%	N
Green Valley	20	1%	96%	W
Mount Annan - Currans Hill	20	1%	97%	S
North Rocks	20	1%	98%	N
Concord West - North Strathfield	19	1%	98%	E
Condell Park	19	1%	99%	S
Greenfield Park - Prairiewood	19	1%	99%	W
Minto - St Andrews	19	1%	100%	S

Direction	Proportion
N	17%
E	15%
S	17%
W	34%
Internal	17%
Total	**100%**

P5825 Woodville Road Corridor TTS
Distribution of Workers Employed within Granville - Clyde (2016 SA2 Region)

Place of Residence (2016 SA2 Region)	Number of Workers	Proportion	Cumulative Proportion	Direction
Total	**3121**	**100%**	-	-
Granville - Clyde	401	13%	13%	Internal
Merrylands - Holroyd	152	5%	18%	W
Guildford - South Granville	131	4%	22%	Internal
Greystanes - Pemulwuy	83	3%	25%	W
Guildford West - Merrylands West	81	3%	27%	W
Parramatta - Rosehill	78	2%	30%	N
Chester Hill - Sefton	62	2%	32%	S
Toongabbie - Constitution Hill	60	2%	34%	N
Seven Hills - Toongabbie	59	2%	35%	W
Carlingford	57	2%	37%	N
Oatlands - Dundas Valley	53	2%	39%	N
Auburn - Central	50	2%	41%	E
Lidcombe	50	2%	42%	E
St Clair	50	2%	44%	W
North Parramatta	46	1%	45%	N
Ermington - Rydalmere	42	1%	47%	N
Rooty Hill - Minchinbury	42	1%	48%	W
Bass Hill - Georges Hall	41	1%	49%	S
Northmead	41	1%	51%	N
Yagoona - Birrong	41	1%	52%	S
Berala	38	1%	53%	E
Bossley Park - Abbotsbury	36	1%	54%	W
Parklea - Kellyville Ridge	36	1%	55%	N
Pendle Hill - Girraween	36	1%	57%	W
Blacktown (West)	35	1%	58%	W
Fairfield	35	1%	59%	S
Smithfield - Wetherill Park	35	1%	60%	W
Baulkham Hills (West) - Bella Vista	34	1%	61%	N
Kellyville	34	1%	62%	N
Blacktown (South)	33	1%	63%	W
Fairfield - West	33	1%	64%	S
Glenmore Park - Regentville	33	1%	65%	W
Glenwood	32	1%	66%	N
Punchbowl	31	1%	67%	S
Ryde	31	1%	68%	E
Winston Hills	31	1%	69%	N
Bonnyrigg Heights - Bonnyrigg	30	1%	70%	W
Epping - North Epping	30	1%	71%	E
Fairfield - East	30	1%	72%	S
Wentworthville - Westmead	30	1%	73%	W
Baulkham Hills (East)	29	1%	74%	N
Hassall Grove - Plumpton	29	1%	75%	W
Homebush Bay - Silverwater	29	1%	76%	E
Burwood - Croydon	28	1%	77%	E
Eastwood - Denistone	28	1%	78%	E
Rouse Hill - Beaumont Hills	27	1%	79%	N
West Hoxton - Middleton Grange	27	1%	79%	S
West Ryde - Meadowbank	26	1%	80%	E
Lalor Park - Kings Langley	25	1%	81%	W
Panania - Milperra - Picnic Point	25	1%	82%	S
Auburn - South	24	1%	83%	E
Cabramatta - Lansvale	24	1%	83%	S
Cambridge Park	24	1%	84%	W
Castlereagh - Cranebrook	24	1%	85%	W
Doonside - Woodcroft	24	1%	86%	W
Quakers Hill	24	1%	87%	W
Blacktown (North) - Marayong	23	1%	87%	W
Canley Vale - Canley Heights	23	1%	88%	S
Holsworthy - Wattle Grove	23	1%	89%	S
Homebush	23	1%	89%	E
Riverstone - Marsden Park	23	1%	90%	W
Erskine Park	22	1%	91%	W
Lethbridge Park - Tregear	22	1%	92%	W
Padstow	22	1%	92%	S
Auburn - North	21	1%	93%	E
Bidwill - Hebersham - Emerton	21	1%	94%	W
Concord - Mortlake - Cabarita	21	1%	94%	E
Macquarie Fields - Glenfield	21	1%	95%	S
Dural - Kenthurst - Wisemans Ferry	20	1%	96%	W
Green Valley	20	1%	96%	W
Mount Annan - Currans Hill	20	1%	97%	S
North Rocks	20	1%	98%	N
Concord West - North Strathfield	19	1%	98%	E
Condell Park	19	1%	99%	S
Greenfield Park - Prairiewood	19	1%	99%	W
Minto - St Andrews	19	1%	100%	S

Direction	Proportion
N	20%
E	13%
S	16%
W	34%
Internal	17%
Total	**100%**

Appendix B: Travel Time Results Comparison

P5825 Woodville Road Corridor Planning Framework TTS
Travel Time Data Analysis: Modelling Comparison (All Vehicles)
Route 1: Woodville Road between Rawson Road and Parramatta Road
AM Peak (0800 - 0900)

Northbound

Sections	Section Distance (km)	Cumulative Distance (km)	Base 2022	Cumulative Base 2022	Base 2031	Cumulative Base 2031	Do Min 2031	Cumulative Do Min 2031	Uplift 2031	Cumulative Uplift 2031	Upgrade 2031	Cumulative Upgrade 2031
Rawson Road	0.00	0.00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
Guildford Road	0.63	0.63	00:46	0:46	00:46	0:46	01:03	1:03	01:17	1:17	01:32	1:32
Oxford Street	0.76	1.39	02:20	3:07	02:34	3:20	02:49	3:52	04:15	5:32	01:31	3:03
Louis Street	1.06	2.45	02:11	5:17	08:16	11:37	03:54	7:46	03:29	9:01	03:59	7:02
Merrylands Road	0.15	2.60	00:37	5:54	00:48	12:25	00:44	8:30	00:41	9:42	00:51	7:52
William Street	0.46	3.06	00:35	6:29	00:37	13:01	00:38	9:08	00:38	10:19	00:38	8:30
Randle Street	0.21	3.27	00:17	6:46	00:16	13:17	00:18	9:25	00:18	10:37	00:11	8:41
Parramatta Road	0.63	3.90	01:03	**7:49**	04:04	**17:22**	01:16	**10:41**	01:15	**11:52**	01:16	**9:56**

Southbound

Sections	Section Distance (km)	Cumulative Distance (km)	Base 2022	Cumulative Base 2022	Base 2031	Cumulative Base 2031	Do Min 2031	Cumulative Do Min 2031	Uplift 2031	Cumulative Uplift 2031	Upgrade 2031	Cumulative Upgrade 2031
Parramatta Road	0.00	0.00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
Randle Street	0.63	0.63	00:47	0:47	00:46	0:46	00:47	0:47	00:46	0:46	00:40	0:40
William Street	0.21	0.84	00:55	1:43	01:05	1:51	01:13	2:00	01:20	2:06	00:53	1:33
Merrylands Road	0.46	1.30	00:38	2:20	00:44	2:35	00:43	2:43	00:46	2:51	00:46	2:19
Louis Street	0.15	1.45	00:39	2:59	00:33	3:08	00:24	3:07	00:25	3:16	00:27	2:47
Oxford Street	1.06	2.51	01:19	4:18	01:21	4:29	01:18	4:25	01:25	4:41	01:25	4:12
Guildford Road	0.75	3.26	00:57	5:15	01:00	5:29	01:07	5:33	01:13	5:54	01:20	5:32
Rawson Road	0.63	3.89	01:38	**6:53**	01:39	**7:08**	01:40	**7:13**	01:45	**7:39**	01:42	**7:14**

P5825 Woodville Road Corridor Planning Framework TTS
Travel Time Data Analysis: Modelling Comparison (All Vehicles)
Route 1: Woodville Road between Rawson Road and Parramatta Road
PM Peak (1630 - 1730)

Northbound

Sections	Section Distance (km)	Cumulative Distance (km)	Base 2022	Cumulative Base 2022	Base 2031	Cumulative Base 2031	Do Min 2031	Cumulative Do Min 2031	Uplift 2031	Cumulative Uplift 2031	Upgrade 2031	Cumulative Upgrade 2031
Rawson Road	0.00	0.00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
Guildford Road	0.63	0.63	01:12	1:12	01:09	1:09	01:25	1:25	01:34	1:34	01:44	1:44
Oxford Street	0.76	1.39	01:22	2:34	01:39	2:48	01:19	2:44	01:16	2:50	01:32	3:16
Louis Street	1.06	2.45	01:14	3:49	01:20	4:07	01:29	4:13	01:31	4:21	01:26	4:42
Merrylands Road	0.15	2.60	00:17	4:06	00:23	4:30	00:24	4:36	00:24	4:45	00:20	5:02
William Street	0.46	3.06	00:56	5:02	01:03	5:34	01:00	5:36	01:00	5:44	01:01	6:03
Randle Street	0.21	3.27	00:11	5:13	00:13	5:47	00:11	5:48	00:11	5:56	00:11	6:15
Parramatta Road	0.63	3.90	01:30	**6:42**	01:37	**7:24**	01:41	**7:29**	01:45	**7:40**	01:42	**7:56**

Southbound

Sections	Section Distance (km)	Cumulative Distance (km)	Base 2022	Cumulative Base 2022	Base 2031	Cumulative Base 2031	Do Min 2031	Cumulative Do Min 2031	Uplift 2031	Cumulative Uplift 2031	Upgrade 2031	Cumulative Upgrade 2031
Parramatta Road	0.00	0.00	00:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
Randle Street	0.63	0.63	00:50	0:50	03:55	3:55	00:53	0:53	00:52	0:52	00:57	0:57
William Street	0.21	0.84	00:43	1:33	02:18	6:13	00:46	1:39	00:43	1:35	00:49	1:46
Merrylands Road	0.46	1.30	02:12	3:45	04:52	11:05	00:39	2:18	00:35	2:10	00:41	2:27
Louis Street	0.15	1.45	00:42	4:27	00:53	11:57	00:33	2:52	00:30	2:40	00:33	2:59
Oxford Street	1.06	2.51	01:13	5:40	01:14	13:12	01:18	4:10	02:52	5:32	01:27	4:26
Guildford Road	0.75	3.26	00:55	6:35	00:46	13:58	00:58	5:08	06:42	12:14	01:31	5:57
Rawson Road	0.63	3.89	01:29	**8:04**	01:01	**14:58**	01:31	**6:39**	01:28	**13:42**	01:34	**7:31**

P5825 Woodville Road Corridor Planning Framework TTS
Travel Time Data Analysis: Modelling Comparison (Buses)
Route 1: Woodville Road between Rawson Road and Parramatta Road
AM Peak (0800 - 0900)

Northbound

Sections	Section Distance (km)	Cumulative Distance (km)	Do Min 2031	Cumulative Do Min 2031	Uplift 2031	Cumulative Uplift 2031	Upgrade 2031	Cumulative Upgrade 2031
Rawson Road	0.00	0.00	0:00	0:00	0:00	0:00	0:00	0:00
Guildford Road	0.63	0.63	03:14	3:14	01:50	1:50	02:03	2:03
Oxford Street	0.76	1.39	04:03	7:17	03:48	5:39	03:27	5:30
Louis Street	1.06	2.45	06:01	13:18	06:07	11:46	07:09	12:39
Merrylands Road	0.15	2.60	00:33	13:50	00:29	12:15	00:54	13:33
William Street	0.46	3.06	01:57	15:47	02:00	14:15	02:02	15:35
Randle Street	0.21	3.27	00:48	16:35	00:52	15:07	00:44	16:19
Parramatta Road	0.63	3.90	01:58	**18:32**	02:18	**17:24**	02:07	**18:26**

Southbound

Sections	Section Distance (km)	Cumulative Distance (km)	Do Min 2031	Cumulative Do Min 2031	Uplift 2031	Cumulative Uplift 2031	Upgrade 2031	Cumulative Upgrade 2031
Parramatta Road	0.00	0.00	0:00	0:00	0:00	0:00	0:00	0:00
Randle Street	0.63	0.63	01:48	1:48	02:24	2:24	02:07	2:07
William Street	0.21	0.84	02:00	3:48	01:56	4:20	02:09	4:16
Merrylands Road	0.46	1.30	01:50	5:37	01:41	6:00	01:44	6:00
Louis Street	0.15	1.45	00:21	5:59	00:31	6:31	00:45	6:45
Oxford Street	1.06	2.51	01:23	7:22	01:48	8:20	01:16	8:01
Guildford Road	0.75	3.26	00:55	8:17	01:54	10:13	01:27	9:28
Rawson Road	0.63	3.89	01:20	**9:38**	01:48	**12:02**	01:39	**11:07**

P5825 Woodville Road Corridor Planning Framework TTS
Travel Time Data Analysis: Modelling Comparison (Buses)
Route 1: Woodville Road between Rawson Road and Parramatta Road
PM Peak (1630 - 1730)

Northbound

Sections	Section Distance (km)	Cumulative Distance (km)	Do Min 2031	Cumulative Do Min 2031	Uplift 2031	Cumulative Uplift 2031	Upgrade 2031	Cumulative Upgrade 2031
Rawson Road	0.00	0.00	0:00	0:00	0:00	0:00	0:00	0:00
Guildford Road	0.63	0.63	03:13	3:13	01:53	1:53	02:03	2:03
Oxford Street	0.76	1.39	03:01	6:13	03:10	5:02	03:19	5:22
Louis Street	1.06	2.45	04:06	10:20	03:45	8:48	03:41	9:03
Merrylands Road	0.15	2.60	00:24	10:44	00:19	9:07	00:23	9:27
William Street	0.46	3.06	02:08	12:51	01:54	11:01	01:58	11:24
Randle Street	0.21	3.27	01:07	13:58	01:00	12:01	01:07	12:31
Parramatta Road	0.63	3.90	02:22	**16:20**	02:51	**14:53**	02:05	**14:35**

Southbound

Sections	Section Distance (km)	Cumulative Distance (km)	Do Min 2031	Cumulative Do Min 2031	Uplift 2031	Cumulative Uplift 2031	Upgrade 2031	Cumulative Upgrade 2031
Parramatta Road	0.00	0.00	0:00	0:00	0:00	0:00	0:00	0:00
Randle Street	0.63	0.63	02:06	2:06	02:08	2:08	01:54	1:54
William Street	0.21	0.84	01:26	3:32	01:17	3:25	01:35	3:29
Merrylands Road	0.46	1.30	01:43	5:14	03:13	6:38	02:02	5:31
Louis Street	0.15	1.45	00:55	6:09	00:09	6:47	00:50	6:21
Oxford Street	1.06	2.51	01:15	7:25	03:33	10:20	01:50	8:12
Guildford Road	0.75	3.26	00:50	8:14	04:58	15:18	01:20	9:32
Rawson Road	0.63	3.89	01:59	**10:14**	01:20	**16:39**	02:19	**11:51**

Appendix C: Intersection Modelling Results

P5825 Woodville Road Corridor
Intersection Level of Service
AM Peak 0800-0900
2031 AM Future Year Do-Min Model

Queue outputs are calculated by software via HCM methods for each approach

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	101	Woodville Road	Woodville Road (N)	Woodville Road (S)	101-2	T	1300	34.1	C	89.9	30.7
3	101	Parramatta Road		Parramatta Road (E)	101-3	L	815	7.9	A	14.5	0.0
4	101	M4 On-Ramp	Parramatta Road (E)	Woodville Road (N)	101-4	R	345	44.2	D	189.9	44.9
5	101			M4 On-Ramp (W)	101-5	T	938	46.0	D	189.9	44.9
6	101			Woodville Road (S)	101-6	L	389	33.1	C	20.5	0.7
7	101		Woodville Road (S)	Parramatta Road (E)	101-7	R	543	68.8	E	118.6	31.6
8	101			Woodville Road (N)	101-8	T	1191	17.3	B	118.6	31.6
9	101			M4 On-Ramp (W)	101-9	L	680	4.1	A	30.0	2.1
-	-		M4 On-Ramp (W)	-	-	-	-	-	-	-	-
	101		**All**				**6201**	**29.5**	**C**	**189.9**	**44.9**
1	102	Woodville Road	Woodville Road (N)	Crescent Street (W)	102-1	R	200	67.3	E	106.0	16.2
2	102	Crescent Street		Woodville Road (S)	102-2	T	1462	1.2	A	106.0	16.2
8	102		Woodville Road (S)	Woodville Road (N)	102-8	T	1985	20.0	B	351.6	29.7
9	102			Crescent Street (W)	102-9	L	31	25.1	B	351.6	29.7
10	102		Crescent Street (W)	Woodville Road (S)	102-10	R	-	-	-	-	-
12	102			Woodville Road (N)	102-12	L	404	87.9	F	250.9	36.1
	102		**All**				**4082**	**22.3**	**B**	**351.6**	**36.1**
1	103	Woodville Road	Woodville Road (N)	Randle Street (W)	103-1	R	-	-	-	-	-
2	103	Randle Street		Woodville Road (S)	103-2	T	1476	8.2	A	217.5	10.2
8	103		Woodville Road (S)	Woodville Road (N)	103-8	T	1650	7.3	A	101.0	6.6
9	103			Randle Street (W)	103-9	L	11	13.4	A	101.0	6.6
10	103		Randle Street (W)	Woodville Road (S)	103-10	R	91	58.5	E	80.6	7.7
12	103			Woodville Road (N)	103-12	L	278	18.6	B	80.6	7.7
	103		**All**				**3506**	**9.9**	**A**	**217.5**	**10.2**
1	104	Woodville Road	Woodville Road (N)	William Street (W)	104-1	R	-	-	-	-	-
2	104	William Street		Woodville Road (S)	104-2	T	1329	60.2	E	125.7	44.3
3	104			William Street (E)	104-3	L	125	72.8	F	125.7	44.3
4	104		William Street (E)	Woodville Road (N)	104-4	R	116	66.0	E	282.5	33.8
5	104			William Street (W)	104-5	T	311	40.5	C	282.5	33.8
6	104			Woodville Road (S)	104-6	L	93	31.8	C	282.5	33.8
7	104		Woodville Road (S)	William Street (E)	104-7	R	185	142.1	F	407.5	53.4
8	104			Woodville Road (N)	104-8	T	1501	12.6	A	407.5	53.4
9	104			William Street (W)	104-9	L	20	12.9	A	407.5	53.4
10	104		William Street (W)	Woodville Road (S)	104-10	R	-	-	-	-	-
11	104			William Street (E)	104-11	T	399	37.8	C	203.6	16.8
12	104			Woodville Road (N)	104-12	L	41	40.5	C	203.6	16.8
	104		**All**				**4120**	**42.4**	**C**	**407.5**	**53.4**
1	105	Woodville Road	Woodville Road (N)	Merrylands Road (W)	105-1	R	182	94.0	F	209.6	31.3
2	105	Merrylands Road		Woodville Road (S)	105-2	T	1215	19.4	B	209.6	31.3
8	105		Woodville Road (S)	Woodville Road (N)	105-8	T	1619	39.1	C	131.8	55.9
9	105			Merrylands Road (W)	105-9	L	470	17.9	B	131.8	55.9
10	105		Merrylands Road (W)	Woodville Road (S)	105-10	R	526	99.7	F	274.0	51.4
12	105			Woodville Road (N)	105-12	L	78	104.8	F	274.0	51.4
	105		**All**				**4090**	**42.3**	**C**	**274.0**	**55.9**
2	106	Woodville Road	Woodville Road (N)	Woodville Road (S)	106-2	T	1458	21.3	B	131.6	26.0
3	106	Louis Street		Louis Street (E)	106-3	L	337	19.5	B	131.6	26.0
4	106		Louis Street (E)	Woodville Road (N)	106-4	R	431	213.4	F	134.0	88.5
6	106			Woodville Road (S)	106-6	L	42	193.5	F	134.0	88.5
7	106		Woodville Road (S)	Louis Street (E)	106-7	R	172	123.5	F	440.1	213.2
8	106			Woodville Road (N)	106-8	T	1656	165.7	F	440.1	213.2
	106		**All**				**4096**	**105.8**	**F**	**440.1**	**213.2**
1	107	Woodville Road	Woodville Road (N)	Lansdowne Street (W)	107-1	R	53	22.0	B	341.1	44.4
2	107	Earl Street		Woodville Road (S)	107-2	T	1467	0.6	A	341.1	44.4
3	107	Lansdowne Street		Earl Street (E)	107-3	L	32	2.4	A	341.1	44.4
4	107		Earl Street (E)	Woodville Road (N)	107-4	R	-	-	-	-	-
5	107			Lansdowne Street (W)	107-5	T	-	-	-	-	-
6	107			Woodville Road (S)	107-6	L	51	17.5	B	21.4	0.9
7	107		Woodville Road (S)	Earl Street (E)	107-7	R	-	-	-	-	-
8	107			Woodville Road (N)	107-8	T	1876	6.6	A	440.1	213.2
9	107			Lansdowne Street (W)	107-9	L	31	11.2	A	440.1	213.2
10	107		Lansdowne Street (W)	Woodville Road (S)	107-10	R	24	32.2	C	171.1	2.4
11	107			Earl Street (E)	107-11	T	13	52.2	D	171.1	2.4
12	107			Woodville Road (N)	107-12	L	30	14.2	A	171.1	2.4
	107		**All**					**52.2**	**D**	**440.1**	**213.2**
1	108	Woodville Road	Woodville Road (N)	Oxford Street (W)	108-1	R	237	104.8	F	341.1	44.4

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	108	Oxford Street		Woodville Road (S)	108-2	T	1267	20.0	B	341.1	44.4
8	108		Woodville Road (S)	Woodville Road (N)	108-8	T	1725	128.6	F	413.5	176.2
9	108			Oxford Street (W)	108-9	L	369	46.5	D	413.5	176.2
10	108		Oxford Street (W)	Woodville Road (S)	108-10	R	624	301.6	F	284.3	147.2
12	108			Woodville Road (N)	108-12	L	106	212.4	F	284.3	147.2
	108		**All**				**4328**	**115.5**	**F**	**413.5**	**176.2**
1	109	Woodville Road	Woodville Road (N)	Guildford Road (W)	109-1	R	117	86.9	F	438.1	30.5
2	109	Guildford Road		Woodville Road (S)	109-2	T	1517	17.6	B	438.1	30.5
3	109			Guildford Road (E)	109-3	L	186	20.9	B	438.1	30.5
4	109		Guildford Road (E)	Woodville Road (N)	109-4	R	86	143.8	F	198.6	98.5
5	109			Guildford Road (W)	109-5	T	329	185.9	F	198.6	98.5
6	109			Woodville Road (S)	109-6	L	68	189.8	F	198.6	98.5
7	109		Woodville Road (S)	Guildford Road (E)	109-7	R	-	-	-	-	-
8	109			Woodville Road (N)	109-8	T	1958	34.1	C	581.3	49.8
9	109			Guildford Road (W)	109-9	L	70	49.7	D	581.3	49.8
10	109		Guildford Road (W)	Woodville Road (S)	109-10	R	94	112.8	F	174.4	38.1
11	109			Guildford Road (E)	109-11	T	474	73.0	F	174.4	38.1
12	109			Woodville Road (N)	109-12	L	45	67.7	E	174.4	38.1
	109		**All**				**4944**	**49.7**	**D**	**581.3**	**98.5**
2	110	Woodville Road	Woodville Road (N)	Woodville Road (S)	110-2	T	1424	64.7	E	156.3	54.2
3	110	Rawson Road		Rawson Road (E)	110-3	L	243	79.0	F	156.3	54.2
4	110		Rawson Road (E)	Woodville Road (N)	110-4	R	268	131.8	F	151.6	51.3
6	110			Woodville Road (S)	110-6	L	530	23.7	B	151.6	51.3
7	110		Woodville Road (S)	Rawson Road (E)	110-7	R	520	38.2	C	397.3	119.7
8	110			Woodville Road (N)	110-8	T	1731	19.2	B	397.3	119.7
	110		**All**				**4716**	**45.0**	**D**	**397.3**	**119.7**

P5825 Woodville Road Corridor
Intersection Level of Service
PM Peak 1630-1730
2031 PM Future Year Do-Min Model

Queue outputs are calculated by software via HCM methods for each approach

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	101	Woodville Road	Woodville Road (N)	Woodville Road (S)	101-2	T	1907	46.2	D	89.9	54.0
3	101	Parramatta Road		Parramatta Road (E)	101-3	L	1230	6.9	A	14.9	0.0
4	101	M4 On-Ramp	Parramatta Road (E)	Woodville Road (N)	101-4	R	238	80.1	F	189.9	67.4
5	101			M4 On-Ramp (W)	101-5	T	433	135.6	F	189.9	67.4
6	101			Woodville Road (S)	101-6	L	397	122.0	F	20.5	1.3
7	101		Woodville Road (S)	Parramatta Road (E)	101-7	R	612	107.5	F	118.6	48.7
8	101			Woodville Road (N)	101-8	T	840	30.9	C	118.6	48.7
9	101			M4 On-Ramp (W)	101-9	L	416	60.8	E	30.0	11.3
-	-		M4 On-Ramp (W)	-	-	-	-	-	-	-	-
	101		**All**				**6073**	**56.0**	**D**	**189.9**	**67.4**
1	102	Woodville Road	Woodville Road (N)	Crescent Street (W)	102-1	R	370	61.2	E	122.4	26.9
2	102	Crescent Street		Woodville Road (S)	102-2	T	1945	1.4	A	122.4	26.9
8	102		Woodville Road (S)	Woodville Road (N)	102-8	T	1546	27.6	B	328.8	32.3
9	102			Crescent Street (W)	102-9	L	85	38.3	C	328.8	32.3
10	102		Crescent Street (W)	Woodville Road (S)	102-10	R	-	-	-	-	-
12	102			Woodville Road (N)	102-12	L	304	45.9	D	250.9	16.4
	102		**All**				**4250**	**20.0**	**B**	**328.8**	**32.3**
1	103	Woodville Road	Woodville Road (N)	Randle Street (W)	103-1	R	-	-	-	-	-
2	103	Randle Street		Woodville Road (S)	103-2	T	1945	14.4	A	362.5	19.8
8	103		Woodville Road (S)	Woodville Road (N)	103-8	T	1393	3.7	A	32.6	2.4
9	103			Randle Street (W)	103-9	L	17	9.7	A	32.6	2.4
10	103		Randle Street (W)	Woodville Road (S)	103-10	R	37	64.4	E	80.6	5.6
12	103			Woodville Road (N)	103-12	L	187	28.5	B	80.6	5.6
	103		**All**				**3579**	**11.5**	**A**	**362.5**	**19.8**
1	104	Woodville Road	Woodville Road (N)	William Street (W)	104-1	R	-	-	-	-	-
2	104	William Street		Woodville Road (S)	104-2	T	1701	35.6	C	174.0	38.1
3	104			William Street (E)	104-3	L	160	49.3	D	174.0	38.1
4	104		William Street (E)	Woodville Road (N)	104-4	R	206	96.7	F	282.5	91.1
5	104			William Street (W)	104-5	T	529	69.9	E	282.5	91.1
6	104			Woodville Road (S)	104-6	L	127	66.8	E	282.5	91.1
7	104		Woodville Road (S)	William Street (E)	104-7	R	109	103.3	F	346.3	35.7
8	104			Woodville Road (N)	104-8	T	1190	34.5	C	346.3	35.7
9	104			William Street (W)	104-9	L	18	38.8	C	346.3	35.7
10	104		William Street (W)	Woodville Road (S)	104-10	R	-	-	-	-	-
11	104			William Street (E)	104-11	T	375	30.7	C	203.6	14.5
12	104			Woodville Road (N)	104-12	L	17	37.8	C	203.6	14.5
	104		**All**				**4432**	**44.9**	**D**	**346.3**	**91.1**
1	105	Woodville Road	Woodville Road (N)	Merrylands Road (W)	105-1	R	268	116.4	F	174.7	42.1
2	105	Merrylands Road		Woodville Road (S)	105-2	T	1556	16.1	B	174.7	42.1
8	105		Woodville Road (S)	Woodville Road (N)	105-8	T	1265	20.5	B	131.8	26.7
9	105			Merrylands Road (W)	105-9	L	578	17.7	B	131.8	26.7
10	105		Merrylands Road (W)	Woodville Road (S)	105-10	R	510	73.3	F	274.0	40.1
12	105			Woodville Road (N)	105-12	L	65	80.9	F	274.0	40.1
	105		**All**				**4242**	**31.8**	**C**	**274.0**	**42.1**
2	106	Woodville Road	Woodville Road (N)	Woodville Road (S)	106-2	T	1721	31.2	C	131.6	39.5
3	106	Louis Street		Louis Street (E)	106-3	L	346	21.8	B	131.6	39.5
4	106		Louis Street (E)	Woodville Road (N)	106-4	R	480	97.8	F	134.0	54.8
6	106			Woodville Road (S)	106-6	L	68	89.7	F	134.0	54.8
7	106		Woodville Road (S)	Louis Street (E)	106-7	R	356	263.3	F	454.5	151.1
8	106			Woodville Road (N)	106-8	T	1377	29.3	C	454.5	151.1
	106		**All**				**4348**	**57.1**	**E**	**454.5**	**151.1**
1	107	Woodville Road	Woodville Road (N)	Lansdowne Street (W)	107-1	R	101	22.1	B	291.3	78.9
2	107	Earl Street		Woodville Road (S)	107-2	T	1931	1.3	A	291.3	78.9
3	107	Lansdowne Street		Earl Street (E)	107-3	L	34	2.7	A	291.3	78.9
4	107		Earl Street (E)	Woodville Road (N)	107-4	R	-	-	-	-	-
5	107			Lansdowne Street (W)	107-5	T	-	-	-	-	-
6	107			Woodville Road (S)	107-6	L	56	26.4	B	24.1	1.6
7	107		Woodville Road (S)	Earl Street (E)	107-7	R	-	-	-	-	-
8	107			Woodville Road (N)	107-8	T	1814	1.4	A	454.5	151.1
9	107			Lansdowne Street (W)	107-9	L	35	4.6	A	454.5	151.1
10	107		Lansdowne Street (W)	Woodville Road (S)	107-10	R	16	30.3	C	167.4	2.0
11	107			Earl Street (E)	107-11	T	11	42.8	D	167.4	2.0
12	107			Woodville Road (N)	107-12	L	39	17.3	B	167.4	2.0
	107		**All**					**42.8**	**D**	**454.5**	**151.1**
1	108	Woodville Road	Woodville Road (N)	Oxford Street (W)	108-1	R	319	129.4	F	291.3	78.9

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	108	Oxford Street		Woodville Road (S)	108-2	T	1647	18.3	B	291.3	78.9
8	108		Woodville Road (S)	Woodville Road (N)	108-8	T	1503	37.6	C	515.8	75.9
9	108			Oxford Street (W)	108-9	L	548	20.6	B	515.8	75.9
10	108		Oxford Street (W)	Woodville Road (S)	108-10	R	647	281.9	F	284.3	134.7
12	108			Woodville Road (N)	108-12	L	133	188.9	F	284.3	134.7
	108		**All**				**4797**	**72.3**	**F**	**515.8**	**134.7**
1	109	Woodville Road	Woodville Road (N)	Guildford Road (W)	109-1	R	185	87.5	F	443.1	43.7
2	109	Guildford Road		Woodville Road (S)	109-2	T	1873	19.3	B	443.1	43.7
3	109			Guildford Road (E)	109-3	L	153	29.6	C	443.1	43.7
4	109		Guildford Road (E)	Woodville Road (N)	109-4	R	85	99.7	F	198.6	65.1
5	109			Guildford Road (W)	109-5	T	312	116.9	F	198.6	65.1
6	109			Woodville Road (S)	109-6	L	87	129.7	F	198.6	65.1
7	109		Woodville Road (S)	Guildford Road (E)	109-7	R	-	-	-	-	-
8	109			Woodville Road (N)	109-8	T	1997	48.0	D	516.9	63.7
9	109			Guildford Road (W)	109-9	L	120	55.3	D	516.9	63.7
10	109		Guildford Road (W)	Woodville Road (S)	109-10	R	34	66.8	E	174.4	19.0
11	109			Guildford Road (E)	109-11	T	390	55.3	D	174.4	19.0
12	109			Woodville Road (N)	109-12	L	51	49.9	D	174.4	19.0
	109		**All**				**5287**	**45.8**	**D**	**516.9**	**65.1**
2	110	Woodville Road	Woodville Road (N)	Woodville Road (S)	110-2	T	1768	58.1	E	207.4	55.6
3	110	Rawson Road		Rawson Road (E)	110-3	L	245	71.3	F	207.4	55.6
4	110		Rawson Road (E)	Woodville Road (N)	110-4	R	379	178.1	F	151.6	88.4
6	110			Woodville Road (S)	110-6	L	609	29.3	C	151.6	88.4
7	110		Woodville Road (S)	Rawson Road (E)	110-7	R	439	151.4	F	397.3	161.4
8	110			Woodville Road (N)	110-8	T	1688	83.4	F	397.3	161.4
	110		**All**				**5128**	**80.5**	**F**	**397.3**	**161.4**

P5825 Woodville Road Corridor
Intersection Level of Service
AM Peak 0800-0900
2031 AM Future Year Uplift Model

Queue outputs are calculated by software via HCM methods for each approach

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	101	Woodville Road	Woodville Road (N)	Woodville Road (S)	101-2	T	1376	34.9	C	89.9	32.6
3	101	Parramatta Road		Parramatta Road (E)	101-3	L	818	7.9	A	14.5	0.0
4	101	M4 On-Ramp	Parramatta Road (E)	Woodville Road (N)	101-4	R	343	45.4	D	189.9	44.9
5	101			M4 On-Ramp (W)	101-5	T	938	46.2	D	189.9	44.9
6	101			Woodville Road (S)	101-6	L	392	34.1	C	20.5	0.7
7	101		Woodville Road (S)	Parramatta Road (E)	101-7	R	540	67.6	E	118.6	31.4
8	101			Woodville Road (N)	101-8	T	1225	15.4	B	118.6	31.4
9	101			M4 On-Ramp (W)	101-9	L	674	3.4	A	30.0	2.0
-	-		M4 On-Ramp (W)	-	-	-	-	-	-	-	-
	101		**All**				**6306**	**29.2**	**C**	**189.9**	**44.9**
1	102	Woodville Road	Woodville Road (N)	Crescent Street (W)	102-1	R	200	67.1	E	106.0	16.1
2	102	Crescent Street		Woodville Road (S)	102-2	T	1539	1.1	A	106.0	16.1
8	102		Woodville Road (S)	Woodville Road (N)	102-8	T	2018	21.1	B	395.8	33.6
9	102			Crescent Street (W)	102-9	L	30	23.3	B	395.8	33.6
10	102		Crescent Street (W)	Woodville Road (S)	102-10	R	-	-	-	-	-
12	102			Woodville Road (N)	102-12	L	394	146.3	F	250.9	39.2
	102		**All**				**4181**	**27.7**	**B**	**395.8**	**39.2**
1	103	Woodville Road	Woodville Road (N)	Randle Street (W)	103-1	R	-	-	-	-	-
2	103	Randle Street		Woodville Road (S)	103-2	T	1434	7.5	A	211.1	9.1
8	103		Woodville Road (S)	Woodville Road (N)	103-8	T	1708	7.3	A	140.6	7.2
9	103			Randle Street (W)	103-9	L	21	13.6	A	140.6	7.2
10	103		Randle Street (W)	Woodville Road (S)	103-10	R	105	56.4	D	80.6	7.9
12	103			Woodville Road (N)	103-12	L	278	19.1	B	80.6	7.9
	103		**All**				**3546**	**9.8**	**A**	**211.1**	**9.1**
1	104	Woodville Road	Woodville Road (N)	William Street (W)	104-1	R	-	-	-	-	-
2	104	William Street		Woodville Road (S)	104-2	T	1422	66.1	E	136.5	52.8
3	104			William Street (E)	104-3	L	151	81.9	F	136.5	52.8
4	104		William Street (E)	Woodville Road (N)	104-4	R	128	99.2	F	282.5	43.3
5	104			William Street (W)	104-5	T	307	55.9	D	282.5	43.3
6	104			Woodville Road (S)	104-6	L	96	53.9	D	282.5	43.3
7	104		Woodville Road (S)	William Street (E)	104-7	R	206	135.6	F	396.8	42.7
8	104			Woodville Road (N)	104-8	T	1550	12.6	A	396.8	42.7
9	104			William Street (W)	104-9	L	20	13.2	A	396.8	42.7
10	104		William Street (W)	Woodville Road (S)	104-10	R	-	-	-	-	-
11	104			William Street (E)	104-11	T	401	36.6	C	203.6	17.0
12	104			Woodville Road (N)	104-12	L	42	38.0	C	203.6	17.0
	104		**All**				**4323**	**47.5**	**D**	**396.8**	**52.8**
1	105	Woodville Road	Woodville Road (N)	Merrylands Road (W)	105-1	R	197	180.9	F	196.3	64.6
2	105	Merrylands Road		Woodville Road (S)	105-2	T	1312	21.4	B	196.3	64.6
8	105		Woodville Road (S)	Woodville Road (N)	105-8	T	1670	36.4	C	131.8	55.7
9	105			Merrylands Road (W)	105-9	L	480	21.5	B	131.8	55.7
10	105		Merrylands Road (W)	Woodville Road (S)	105-10	R	516	110.6	F	274.0	50.7
12	105			Woodville Road (N)	105-12	L	77	121.3	F	274.0	50.7
	105		**All**				**4252**	**47.3**	**D**	**274.0**	**64.6**
2	106	Woodville Road	Woodville Road (N)	Woodville Road (S)	106-2	T	1559	21.9	B	131.6	29.4
3	106	Louis Street		Louis Street (E)	106-3	L	344	19.5	B	131.6	29.4
4	106		Louis Street (E)	Woodville Road (N)	106-4	R	424	214.9	F	134.0	88.4
6	106			Woodville Road (S)	106-6	L	44	207.9	F	134.0	88.4
7	106		Woodville Road (S)	Louis Street (E)	106-7	R	180	94.3	F	519.1	328.7
8	106			Woodville Road (N)	106-8	T	1706	118.2	F	519.1	328.7
	106		**All**				**4257**	**84.5**	**F**	**519.1**	**328.7**
1	107	Woodville Road	Woodville Road (N)	Lansdowne Street (W)	107-1	R	113	58.2	E	399.1	16.3
2	107	Earl Street		Woodville Road (S)	107-2	T	1507	14.1	A	399.1	16.3
3	107	Lansdowne Street		Earl Street (E)	107-3	L	31	14.2	A	399.1	16.3
4	107		Earl Street (E)	Woodville Road (N)	107-4	R	-	-	-	-	-
5	107			Lansdowne Street (W)	107-5	T	-	-	-	-	-
6	107			Woodville Road (S)	107-6	L	51	2.6	A	15.2	0.5
7	107		Woodville Road (S)	Earl Street (E)	107-7	R	-	-	-	-	-
8	107			Woodville Road (N)	107-8	T	1819	29.4	C	277.1	38.0
9	107			Lansdowne Street (W)	107-9	L	41	41.5	C	277.1	38.0
10	107		Lansdowne Street (W)	Woodville Road (S)	107-10	R	62	67.4	E	171.1	7.9
11	107			Earl Street (E)	107-11	T	13	63.0	E	171.1	7.9
12	107			Woodville Road (N)	107-12	L	84	37.4	C	171.1	7.9
	107		**All**				**3721**	**24.7**	**B**	**399.1**	**38.0**
1	108	Woodville Road	Woodville Road (N)	Oxford Street (W)	108-1	R	247	161.3	F	237.0	70.3

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	108	Oxford Street		Woodville Road (S)	108-2	T	1328	16.4	B	237.0	70.3
8	108		Woodville Road (S)	Woodville Road (N)	108-8	T	1709	195.4	F	500.9	225.7
9	108			Oxford Street (W)	108-9	L	430	97.2	F	500.9	225.7
10	108		Oxford Street (W)	Woodville Road (S)	108-10	R	549	358.1	F	284.3	179.8
12	108			Woodville Road (N)	108-12	L	94	243.7	F	284.3	179.8
	108		**All**				**4357**	**150.7**	**F**	**500.9**	**225.7**
1	109	Woodville Road	Woodville Road (N)	Guildford Road (W)	109-1	R	161	116.5	F	202.4	38.2
2	109	Guildford Road		Woodville Road (S)	109-2	T	1533	23.2	B	202.4	38.2
3	109			Guildford Road (E)	109-3	L	182	25.2	B	202.4	38.2
4	109		Guildford Road (E)	Woodville Road (N)	109-4	R	80	276.8	F	198.6	130.6
5	109			Guildford Road (W)	109-5	T	302	243.9	F	198.6	130.6
6	109			Woodville Road (S)	109-6	L	64	252.5	F	198.6	130.6
7	109		Woodville Road (S)	Guildford Road (E)	109-7	R	-	-	-	-	-
8	109			Woodville Road (N)	109-8	T	2015	39.5	C	209.5	50.7
9	109			Guildford Road (W)	109-9	L	134	54.8	D	209.5	50.7
10	109		Guildford Road (W)	Woodville Road (S)	109-10	R	79	212.9	F	174.4	110.6
11	109			Guildford Road (E)	109-11	T	396	149.7	F	174.4	110.6
12	109			Woodville Road (N)	109-12	L	47	139.4	F	174.4	110.6
	109		**All**				**4993**	**68.2**	**E**	**209.5**	**130.6**
2	110	Woodville Road	Woodville Road (N)	Woodville Road (S)	110-2	T	1425	71.4	F	201.8	52.8
3	110	Rawson Road		Rawson Road (E)	110-3	L	242	84.1	F	201.8	52.8
4	110		Rawson Road (E)	Woodville Road (N)	110-4	R	288	167.3	F	151.6	64.0
6	110			Woodville Road (S)	110-6	L	530	23.8	B	151.6	64.0
7	110		Woodville Road (S)	Rawson Road (E)	110-7	R	521	44.1	D	397.3	141.9
8	110			Woodville Road (N)	110-8	T	1783	25.5	B	397.3	141.9
	110		**All**				**4789**	**52.5**	**D**	**397.3**	**141.9**

P5825 Woodville Road Corridor
Intersection Level of Service
PM Peak 1630-1730
2031 PM Future Year Uplift Model

Queue outputs are calculated by software via HCM methods for each approach

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	101	Woodville Road	Woodville Road (N)	Woodville Road (S)	101-2	T	1890	47.7	D	89.9	54.0
3	101	Parramatta Road		Parramatta Road (E)	101-3	L	1230	6.9	A	14.4	0.0
4	101	M4 On-Ramp	Parramatta Road (E)	Woodville Road (N)	101-4	R	244	89.7	F	189.9	69.5
5	101			M4 On-Ramp (W)	101-5	T	434	141.4	F	189.9	69.5
6	101			Woodville Road (S)	101-6	L	402	135.4	F	20.5	1.6
7	101		Woodville Road (S)	Parramatta Road (E)	101-7	R	576	136.1	F	118.6	51.1
8	101			Woodville Road (N)	101-8	T	866	29.7	C	118.6	51.1
9	101			M4 On-Ramp (W)	101-9	L	416	75.7	F	30.0	11.6
-	-		M4 On-Ramp (W)	-	-	-	-	-	-	-	-
	101		**All**				**6058**	**61.4**	**E**	**189.9**	**69.5**
1	102	Woodville Road	Woodville Road (N)	Crescent Street (W)	102-1	R	375	68.4	E	122.4	31.2
2	102	Crescent Street		Woodville Road (S)	102-2	T	1922	1.4	A	122.4	31.2
8	102		Woodville Road (S)	Woodville Road (N)	102-8	T	1541	52.0	D	354.1	56.1
9	102			Crescent Street (W)	102-9	L	93	71.7	F	354.1	56.1
10	102		Crescent Street (W)	Woodville Road (S)	102-10	R	-	-	-	-	-
12	102			Woodville Road (N)	102-12	L	315	44.1	D	250.9	16.9
	102		**All**				**4246**	**30.4**	**C**	**354.1**	**56.1**
1	103	Woodville Road	Woodville Road (N)	Randle Street (W)	103-1	R	-	-	-	-	-
2	103	Randle Street		Woodville Road (S)	103-2	T	1833	13.9	A	261.6	16.2
8	103		Woodville Road (S)	Woodville Road (N)	103-8	T	1417	3.1	A	30.2	2.2
9	103			Randle Street (W)	103-9	L	26	10.8	A	30.2	2.2
10	103		Randle Street (W)	Woodville Road (S)	103-10	R	45	82.0	F	80.6	8.6
12	103			Woodville Road (N)	103-12	L	205	45.4	D	80.6	8.6
	103		**All**				**3526**	**12.2**	**A**	**261.6**	**16.2**
1	104	Woodville Road	Woodville Road (N)	William Street (W)	104-1	R	-	-	-	-	-
2	104	William Street		Woodville Road (S)	104-2	T	1676	32.8	C	166.4	39.0
3	104			William Street (E)	104-3	L	187	41.8	C	166.4	39.0
4	104		William Street (E)	Woodville Road (N)	104-4	R	187	203.4	F	282.5	184.2
5	104			William Street (W)	104-5	T	501	164.4	F	282.5	184.2
6	104			Woodville Road (S)	104-6	L	130	153.3	F	282.5	184.2
7	104		Woodville Road (S)	William Street (E)	104-7	R	135	761.0	F	439.8	119.5
8	104			Woodville Road (N)	104-8	T	1243	34.1	C	439.8	119.5
9	104			William Street (W)	104-9	L	13	23.1	B	439.8	119.5
10	104		William Street (W)	Woodville Road (S)	104-10	R	-	-	-	-	-
11	104			William Street (E)	104-11	T	413	35.7	C	203.6	14.2
12	104			Woodville Road (N)	104-12	L	19	25.3	B	203.6	14.2
	104		**All**				**4504**	**80.8**	**F**	**439.8**	**184.2**
1	105	Woodville Road	Woodville Road (N)	Merrylands Road (W)	105-1	R	249	83.1	F	191.0	51.4
2	105	Merrylands Road		Woodville Road (S)	105-2	T	1570	11.4	A	191.0	51.4
8	105		Woodville Road (S)	Woodville Road (N)	105-8	T	1348	20.5	B	131.8	29.4
9	105			Merrylands Road (W)	105-9	L	513	16.9	B	131.8	29.4
10	105		Merrylands Road (W)	Woodville Road (S)	105-10	R	483	89.8	F	274.0	49.5
12	105			Woodville Road (N)	105-12	L	84	105.7	F	274.0	49.5
	105		**All**				**4247**	**30.0**	**C**	**274.0**	**51.4**
2	106	Woodville Road	Woodville Road (N)	Woodville Road (S)	106-2	T	1756	27.5	B	131.6	55.4
3	106	Louis Street		Louis Street (E)	106-3	L	327	21.1	B	131.6	55.4
4	106		Louis Street (E)	Woodville Road (N)	106-4	R	466	80.5	F	134.0	44.1
6	106			Woodville Road (S)	106-6	L	86	81.9	F	134.0	44.1
7	106		Woodville Road (S)	Louis Street (E)	106-7	R	331	93.1	F	302.3	68.8
8	106			Woodville Road (N)	106-8	T	1421	20.4	B	302.3	68.8
	106		**All**				**4387**	**36.4**	**C**	**302.3**	**68.8**
1	107	Woodville Road	Woodville Road (N)	Lansdowne Street (W)	107-1	R	170	79.5	F	351.4	50.0
2	107	Earl Street		Woodville Road (S)	107-2	T	1780	51.5	D	351.4	50.0
3	107	Lansdowne Street		Earl Street (E)	107-3	L	36	31.9	C	351.4	50.0
4	107		Earl Street (E)	Woodville Road (N)	107-4	R	-	-	-	-	-
5	107			Lansdowne Street (W)	107-5	T	-	-	-	-	-
6	107			Woodville Road (S)	107-6	L	49	31.4	C	47.1	2.7
7	107		Woodville Road (S)	Earl Street (E)	107-7	R	-	-	-	-	-
8	107			Woodville Road (N)	107-8	T	1691	15.1	B	277.1	20.2
9	107			Lansdowne Street (W)	107-9	L	69	35.6	C	277.1	20.2
10	107		Lansdowne Street (W)	Woodville Road (S)	107-10	R	74	78.2	F	72.2	8.3
11	107			Earl Street (E)	107-11	T	9	42.3	C	72.2	8.3
12	107			Woodville Road (N)	107-12	L	136	34.3	C	72.2	8.3
	107		**All**				**4014**	**36.5**	**C**	**351.4**	**50.0**
1	108	Woodville Road	Woodville Road (N)	Oxford Street (W)	108-1	R	291	99.3	F	237.0	117.1

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	108	Oxford Street		Woodville Road (S)	108-2	T	1526	87.2	F	237.0	117.1
8	108		Woodville Road (S)	Woodville Road (N)	108-8	T	1474	33.7	C	441.8	76.7
9	108			Oxford Street (W)	108-9	L	604	16.3	B	441.8	76.7
10	108		Oxford Street (W)	Woodville Road (S)	108-10	R	474	417.0	F	284.3	186.6
12	108			Woodville Road (N)	108-12	L	103	282.9	F	284.3	186.6
	108		**All**				**4472**	**100.2**	**F**	**441.8**	**186.6**
1	109	Woodville Road	Woodville Road (N)	Guildford Road (W)	109-1	R	223	525.4	F	529.8	342.9
2	109	Guildford Road		Woodville Road (S)	109-2	T	1432	150.2	F	529.8	342.9
3	109			Guildford Road (E)	109-3	L	137	147.3	F	529.8	342.9
4	109		Guildford Road (E)	Woodville Road (N)	109-4	R	84	207.9	F	198.6	123.3
5	109			Guildford Road (W)	109-5	T	287	204.3	F	198.6	123.3
6	109			Woodville Road (S)	109-6	L	65	211.0	F	198.6	123.3
7	109		Woodville Road (S)	Guildford Road (E)	109-7	R	-	-	-	-	-
8	109			Woodville Road (N)	109-8	T	1905	51.4	D	220.1	67.4
9	109			Guildford Road (W)	109-9	L	215	64.4	E	220.1	67.4
10	109		Guildford Road (W)	Woodville Road (S)	109-10	R	34	169.8	F	174.4	77.0
11	109			Guildford Road (E)	109-11	T	387	127.7	F	174.4	77.0
12	109			Woodville Road (N)	109-12	L	68	117.4	F	174.4	77.0
	109		**All**				**4837**	**127.6**	**F**	**529.8**	**342.9**
2	110	Woodville Road	Woodville Road (N)	Woodville Road (S)	110-2	T	1402	55.4	D	163.0	35.2
3	110	Rawson Road		Rawson Road (E)	110-3	L	177	66.3	E	163.0	35.2
4	110		Rawson Road (E)	Woodville Road (N)	110-4	R	397	198.4	F	151.6	100.6
6	110			Woodville Road (S)	110-6	L	627	29.9	C	151.6	100.6
7	110		Woodville Road (S)	Rawson Road (E)	110-7	R	413	274.3	F	397.3	237.8
8	110			Woodville Road (N)	110-8	T	1661	194.0	F	397.3	237.8
	110		**All**				**4677**	**133.1**	**F**	**397.3**	**237.8**

P5825 Woodville Road Corridor
Intersection Level of Service
AM Peak 0800-0900
2031 AM Future Upgrades Model

Queue outputs are calculated by software via HCM methods for each approach

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	101	Woodville Road	Woodville Road (N)	Woodville Road (S)	101-2	T	1376	34.8	C	89.9	32.8
3	101	Parramatta Road		Parramatta Road (E)	101-3	L	818	7.9	A	14.5	0.0
4	101	M4 On-Ramp	Parramatta Road (E)	Woodville Road (N)	101-4	R	345	44.1	D	189.9	44.7
5	101			M4 On-Ramp (W)	101-5	T	938	45.9	D	189.9	44.7
6	101			Woodville Road (S)	101-6	L	392	33.1	C	20.5	0.7
7	101		Woodville Road (S)	Parramatta Road (E)	101-7	R	552	72.2	F	118.6	36.0
8	101			Woodville Road (N)	101-8	T	1244	22.6	B	118.6	36.0
9	101			M4 On-Ramp (W)	101-9	L	654	5.2	A	30.0	2.6
-	-		M4 On-Ramp (W)	-	-	-	-	-	-	-	-
	101		**All**				**6319**	**31.2**	**C**	**189.9**	**44.7**
1	102	Woodville Road	Woodville Road (N)	Crescent Street (W)	102-1	R	200	66.9	E	106.0	16.1
2	102	Crescent Street		Woodville Road (S)	102-2	T	1539	1.2	A	106.0	16.1
8	102		Woodville Road (S)	Woodville Road (N)	102-8	T	2009	14.7	B	350.9	25.0
9	102			Crescent Street (W)	102-9	L	28	16.1	B	350.9	25.0
10	102		Crescent Street (W)	Woodville Road (S)	102-10	R	-	-	-	-	-
12	102			Woodville Road (N)	102-12	L	396	156.6	F	250.9	67.2
	102		**All**				**4172**	**25.7**	**B**	**350.9**	**67.2**
1	103	Woodville Road	Woodville Road (N)	Randle Street (W)	103-1	R	-	-	-	-	-
2	103	Randle Street		Woodville Road (S)	103-2	T	1442	5.5	A	215.6	6.7
8	103		Woodville Road (S)	Woodville Road (N)	103-8	T	1705	1.9	A	38.7	1.7
9	103			Randle Street (W)	103-9	L	20	6.4	A	38.7	1.7
10	103		Randle Street (W)	Woodville Road (S)	103-10	R	101	54.1	D	80.6	7.7
12	103			Woodville Road (N)	103-12	L	278	16.9	B	80.6	7.7
	103		**All**				**3546**	**6.1**	**A**	**215.6**	**7.7**
1	104	Woodville Road	Woodville Road (N)	William Street (W)	104-1	R	-	-	-	-	-
2	104	William Street		Woodville Road (S)	104-2	T	1410	42.6	D	125.3	33.8
3	104			William Street (E)	104-3	L	148	61.0	E	125.3	33.8
4	104		William Street (E)	Woodville Road (N)	104-4	R	127	95.0	F	282.5	44.5
5	104			William Street (W)	104-5	T	313	47.0	D	282.5	44.5
6	104			Woodville Road (S)	104-6	L	97	37.7	C	282.5	44.5
7	104		Woodville Road (S)	William Street (E)	104-7	R	213	251.5	F	404.8	81.4
8	104			Woodville Road (N)	104-8	T	1543	12.9	A	404.8	81.4
9	104			William Street (W)	104-9	L	15	19.0	B	404.8	81.4
10	104		William Street (W)	Woodville Road (S)	104-10	R	-	-	-	-	-
11	104			William Street (E)	104-11	T	401	36.7	C	203.5	16.5
12	104			Woodville Road (N)	104-12	L	43	38.9	C	203.5	16.5
	104		**All**				**4310**	**44.0**	**D**	**404.8**	**81.4**
1	105	Woodville Road	Woodville Road (N)	Merrylands Road (W)	105-1	R	187	104.8	F	229.3	35.9
2	105	Merrylands Road		Woodville Road (S)	105-2	T	1302	22.1	B	229.3	35.9
8	105		Woodville Road (S)	Woodville Road (N)	105-8	T	1639	44.6	D	131.8	64.1
9	105			Merrylands Road (W)	105-9	L	353	23.7	B	131.8	64.1
10	105		Merrylands Road (W)	Woodville Road (S)	105-10	R	518	132.5	F	274.0	74.7
12	105			Woodville Road (N)	105-12	L	79	142.5	F	274.0	74.7
	105		**All**				**4078**	**51.4**	**D**	**274.0**	**74.7**
2	106	Woodville Road	Woodville Road (N)	Woodville Road (S)	106-2	T	1581	23.7	B	131.6	28.0
3	106	Louis Street		Louis Street (E)	106-3	L	348	7.2	A	131.6	28.0
4	106		Louis Street (E)	Woodville Road (N)	106-4	R	248	420.5	F	134.0	89.0
6	106			Woodville Road (S)	106-6	L	27	416.3	F	134.0	89.0
7	106		Woodville Road (S)	Louis Street (E)	106-7	R	191	109.0	F	519.1	220.7
8	106			Woodville Road (N)	106-8	T	1747	148.9	F	519.1	220.7
	106		**All**				**4142**	**105.4**	**F**	**519.1**	**220.7**
1	107	Woodville Road	Woodville Road (N)	Lansdowne Street (W)	107-1	R	106	61.6	E	232.8	12.2
2	107	Earl Street		Woodville Road (S)	107-2	T	1492	10.4	A	232.8	12.2
3	107	Lansdowne Street		Earl Street (E)	107-3	L	29	8.7	A	232.8	12.2
4	107		Earl Street (E)	Woodville Road (N)	107-4	R	-	-	-	-	-
5	107			Lansdowne Street (W)	107-5	T	-	-	-	-	-
6	107			Woodville Road (S)	107-6	L	50	9.6	A	16.1	0.6
7	107		Woodville Road (S)	Earl Street (E)	107-7	R	-	-	-	-	-
8	107			Woodville Road (N)	107-8	T	1926	24.1	B	277.0	72.2
9	107			Lansdowne Street (W)	107-9	L	49	40.6	C	277.0	72.2
10	107		Lansdowne Street (W)	Woodville Road (S)	107-10	R	62	124.4	F	171.1	11.9
11	107			Earl Street (E)	107-11	T	15	146.9	F	171.1	11.9
12	107			Woodville Road (N)	107-12	L	88	59.6	E	171.1	11.9
	107		**All**				**3817**	**22.6**	**B**	**277.0**	**72.2**
1	108	Woodville Road	Woodville Road (N)	Oxford Street (W)	108-1	R	246	72.5	F	237.0	53.3

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	108	Oxford Street		Woodville Road (S)	108-2	T	1331	20.2	B	237.0	53.3
8	108		Woodville Road (S)	Woodville Road (N)	108-8	T	1796	49.4	D	436.0	92.6
9	108			Oxford Street (W)	108-9	L	433	67.4	E	436.0	92.6
10	108		Oxford Street (W)	Woodville Road (S)	108-10	R	584	335.6	F	284.3	178.1
12	108			Woodville Road (N)	108-12	L	101	226.5	F	284.3	178.1
	108		**All**				**4491**	**85.0**	**F**	**436.0**	**178.1**
1	109	Woodville Road	Woodville Road (N)	Guildford Road (W)	109-1	R	163	89.2	F	266.0	47.1
2	109	Guildford Road		Woodville Road (S)	109-2	T	1545	29.6	C	266.0	47.1
3	109			Guildford Road (E)	109-3	L	191	29.5	C	266.0	47.1
4	109		Guildford Road (E)	Woodville Road (N)	109-4	R	91	157.0	F	198.6	57.9
5	109			Guildford Road (W)	109-5	T	353	91.8	F	198.6	57.9
6	109			Woodville Road (S)	109-6	L	68	97.5	F	198.6	57.9
7	109		Woodville Road (S)	Guildford Road (E)	109-7	R	-	-	-	-	-
8	109			Woodville Road (N)	109-8	T	2027	57.6	E	516.9	131.7
9	109			Guildford Road (W)	109-9	L	139	67.9	E	516.9	131.7
10	109		Guildford Road (W)	Woodville Road (S)	109-10	R	91	289.1	F	238.3	153.2
11	109			Guildford Road (E)	109-11	T	447	213.5	F	238.3	153.2
12	109			Woodville Road (N)	109-12	L	45	221.0	F	238.3	153.2
	109		**All**				**5160**	**73.1**	**F**	**516.9**	**153.2**
2	110	Woodville Road	Woodville Road (N)	Woodville Road (S)	110-2	T	1464	66.9	E	443.2	115.5
3	110	Rawson Road		Rawson Road (E)	110-3	L	250	79.6	F	443.2	115.5
4	110		Rawson Road (E)	Woodville Road (N)	110-4	R	290	149.9	F	151.6	58.9
6	110			Woodville Road (S)	110-6	L	530	24.5	B	151.6	58.9
7	110		Woodville Road (S)	Rawson Road (E)	110-7	R	533	50.4	D	397.3	135.1
8	110			Woodville Road (N)	110-8	T	1808	28.9	C	397.3	135.1
	110		**All**				**4875**	**52.0**	**D**	**443.2**	**135.1**

P5825 Woodville Road Corridor
Intersection Level of Service
PM Peak 1630-1730
2031 PM Future Upgrades Model

Queue outputs are calculated by software via HCM methods for each approach

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	101	Woodville Road	Woodville Road (N)	Woodville Road (S)	101-2	T	1957	45.5	D	89.9	53.5
3	101	Parramatta Road		Parramatta Road (E)	101-3	L	1231	7.0	A	14.3	0.0
4	101	M4 On-Ramp	Parramatta Road (E)	Woodville Road (N)	101-4	R	276	50.8	D	189.9	43.0
5	101			M4 On-Ramp (W)	101-5	T	493	61.7	E	189.9	43.0
6	101			Woodville Road (S)	101-6	L	488	52.3	D	20.5	2.1
7	101		Woodville Road (S)	Parramatta Road (E)	101-7	R	613	129.8	F	118.6	53.3
8	101			Woodville Road (N)	101-8	T	911	31.4	C	118.6	53.3
9	101			M4 On-Ramp (W)	101-9	L	443	17.7	B	30.0	5.7
-	-		M4 On-Ramp (W)	-	-	-	-	-	-	-	-
	101		**All**				**6412**	**44.2**	**D**	**189.9**	**53.5**
1	102	Woodville Road	Woodville Road (N)	Crescent Street (W)	102-1	R	419	71.6	F	122.4	37.2
2	102	Crescent Street		Woodville Road (S)	102-2	T	2022	1.3	A	122.4	37.2
8	102		Woodville Road (S)	Woodville Road (N)	102-8	T	1623	36.3	C	377.1	47.6
9	102			Crescent Street (W)	102-9	L	103	38.2	C	377.1	47.6
10	102		Crescent Street (W)	Woodville Road (S)	102-10	R	-	-	-	-	-
12	102			Woodville Road (N)	102-12	L	316	43.2	D	250.9	15.9
	102		**All**				**4483**	**24.4**	**B**	**377.1**	**47.6**
1	103	Woodville Road	Woodville Road (N)	Randle Street (W)	103-1	R	-	-	-	-	-
2	103	Randle Street		Woodville Road (S)	103-2	T	1931	17.2	B	420.9	19.5
8	103		Woodville Road (S)	Woodville Road (N)	103-8	T	1499	3.1	A	49.7	2.1
9	103			Randle Street (W)	103-9	L	29	10.2	A	49.7	2.1
10	103		Randle Street (W)	Woodville Road (S)	103-10	R	44	80.6	F	80.6	8.0
12	103			Woodville Road (N)	103-12	L	206	41.3	C	80.6	8.0
	103		**All**				**3709**	**13.5**	**A**	**420.9**	**19.5**
1	104	Woodville Road	Woodville Road (N)	William Street (W)	104-1	R	-	-	-	-	-
2	104	William Street		Woodville Road (S)	104-2	T	1758	39.2	C	187.3	45.2
3	104			William Street (E)	104-3	L	191	52.2	D	187.3	45.2
4	104		William Street (E)	Woodville Road (N)	104-4	R	216	121.8	F	282.5	93.6
5	104			William Street (W)	104-5	T	544	72.2	F	282.5	93.6
6	104			Woodville Road (S)	104-6	L	150	68.4	E	282.5	93.6
7	104		Woodville Road (S)	William Street (E)	104-7	R	163	105.9	F	410.9	46.7
8	104			Woodville Road (N)	104-8	T	1287	35.9	C	410.9	46.7
9	104			William Street (W)	104-9	L	13	28.6	C	410.9	46.7
10	104		William Street (W)	Woodville Road (S)	104-10	R	-	-	-	-	-
11	104			William Street (E)	104-11	T	413	34.8	C	203.5	14.2
12	104			Woodville Road (N)	104-12	L	19	25.5	B	203.5	14.2
	104		**All**				**4754**	**49.1**	**D**	**410.9**	**93.6**
1	105	Woodville Road	Woodville Road (N)	Merrylands Road (W)	105-1	R	275	102.0	F	190.1	41.8
2	105	Merrylands Road		Woodville Road (S)	105-2	T	1645	17.0	B	190.1	41.8
8	105		Woodville Road (S)	Woodville Road (N)	105-8	T	1395	16.6	B	131.8	23.5
9	105			Merrylands Road (W)	105-9	L	498	21.1	B	131.8	23.5
10	105		Merrylands Road (W)	Woodville Road (S)	105-10	R	483	87.1	F	274.0	47.3
12	105			Woodville Road (N)	105-12	L	83	100.5	F	274.0	47.3
	105		**All**				**4379**	**32.0**	**C**	**274.0**	**47.3**
2	106	Woodville Road	Woodville Road (N)	Woodville Road (S)	106-2	T	1844	30.6	C	131.6	39.8
3	106	Louis Street		Louis Street (E)	106-3	L	337	16.7	B	131.6	39.8
4	106		Louis Street (E)	Woodville Road (N)	106-4	R	455	96.2	F	134.0	52.5
6	106			Woodville Road (S)	106-6	L	79	101.9	F	134.0	52.5
7	106		Woodville Road (S)	Louis Street (E)	106-7	R	347	124.8	F	296.7	70.9
8	106			Woodville Road (N)	106-8	T	1468	16.5	B	296.7	70.9
	106		**All**				**4530**	**40.1**	**C**	**296.7**	**70.9**
1	107	Woodville Road	Woodville Road (N)	Lansdowne Street (W)	107-1	R	182	69.0	E	148.6	24.3
2	107	Earl Street		Woodville Road (S)	107-2	T	1960	16.2	B	148.6	24.3
3	107	Lansdowne Street		Earl Street (E)	107-3	L	39	15.5	B	148.6	24.3
4	107		Earl Street (E)	Woodville Road (N)	107-4	R	-	-	-	-	-
5	107			Lansdowne Street (W)	107-5	T	-	-	-	-	-
6	107			Woodville Road (S)	107-6	L	52	12.9	A	16.5	0.7
7	107		Woodville Road (S)	Earl Street (E)	107-7	R	-	-	-	-	-
8	107			Woodville Road (N)	107-8	T	1751	14.5	B	267.8	30.0
9	107			Lansdowne Street (W)	107-9	L	80	33.2	C	267.8	30.0
10	107		Lansdowne Street (W)	Woodville Road (S)	107-10	R	69	57.6	E	72.2	8.1
11	107			Earl Street (E)	107-11	T	9	44.1	D	72.2	8.1
12	107			Woodville Road (N)	107-12	L	136	33.9	C	72.2	8.1
	107		**All**				**4278**	**19.3**	**B**	**267.8**	**30.0**
1	108	Woodville Road	Woodville Road (N)	Oxford Street (W)	108-1	R	297	152.2	F	237.0	82.1

Mvt	ID	Intersection	From	To	Code	Turn	Flow	Delay (s)	LoS	Max Queue (m)	Mean Queue (m)
2	108	Oxford Street		Woodville Road (S)	108-2	T	1727	16.8	B	237.0	82.1
8	108		Woodville Road (S)	Woodville Road (N)	108-8	T	1530	47.8	D	417.6	104.9
9	108			Oxford Street (W)	108-9	L	628	75.1	F	417.6	104.9
10	108		Oxford Street (W)	Woodville Road (S)	108-10	R	566	343.8	F	284.3	185.7
12	108			Woodville Road (N)	108-12	L	114	244.2	F	284.3	185.7
	108		**All**				**4862**	**85.7**	**F**	**417.6**	**185.7**
1	109	Woodville Road	Woodville Road (N)	Guildford Road (W)	109-1	R	281	124.0	F	421.9	106.1
2	109	Guildford Road		Woodville Road (S)	109-2	T	1847	47.9	D	421.9	106.1
3	109			Guildford Road (E)	109-3	L	172	50.1	D	421.9	106.1
4	109		Guildford Road (E)	Woodville Road (N)	109-4	R	102	200.4	F	198.6	101.2
5	109			Guildford Road (W)	109-5	T	322	157.4	F	198.6	101.2
6	109			Woodville Road (S)	109-6	L	73	167.5	F	198.6	101.2
7	109		Woodville Road (S)	Guildford Road (E)	109-7	R	-	-	-	-	-
8	109			Woodville Road (N)	109-8	T	1951	68.2	E	516.9	131.0
9	109			Guildford Road (W)	109-9	L	219	94.1	F	516.9	131.0
10	109		Guildford Road (W)	Woodville Road (S)	109-10	R	35	97.5	F	238.3	36.5
11	109			Guildford Road (E)	109-11	T	379	65.5	E	238.3	36.5
12	109			Woodville Road (N)	109-12	L	63	65.6	E	238.3	36.5
	109		**All**				**5444**	**73.7**	**F**	**516.9**	**131.0**
2	110	Woodville Road	Woodville Road (N)	Woodville Road (S)	110-2	T	1752	62.7	E	445.3	119.8
3	110	Rawson Road		Rawson Road (E)	110-3	L	203	81.3	F	445.3	119.8
4	110		Rawson Road (E)	Woodville Road (N)	110-4	R	365	217.9	F	151.6	100.7
6	110			Woodville Road (S)	110-6	L	627	30.1	C	151.6	100.7
7	110		Woodville Road (S)	Rawson Road (E)	110-7	R	420	146.3	F	397.3	180.6
8	110			Woodville Road (N)	110-8	T	1729	97.2	F	397.3	180.6
	110		**All**				**5096**	**89.2**	**F**	**445.3**	**180.6**