Parramatta Road Corridor

Traffic and Transport Study and Action Plan

Strathfield, Burwood and Canada Bay Councils

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EXECUTIVE SUMMARY

Background

The Parramatta Road Corridor Urban Transportation Strategy (PRCUTS) was released in 2016 by Urban Growth NSW and outlines the planning vision and required actions to accommodate 27,000 new homes and 50,000 new jobs along a corridor of Parramatta Road. The implementation of the strategy is driven by the PRCUTS Implementation Toolkit and Ministerial Direction s9.1, which guides the preparation of planning proposals to rezone land in accordance with the strategy.

To rezone the land and implement the strategy the Ministerial Direction s9.1 outlines:

"Prior to any rezoning commencing, a Precinct-wide traffic study and supporting modelling is required to be completed which considers the recommended land uses and densities, as well as future WestConnex conditions, and identifies the necessary road improvements and upgrades required to be delivered as part of any proposed renewal in the Precinct."

This requirement had resulted in planning proposals being on hold by local and State Governments while the precinct-wide traffic study was being undertaken. This report documents the traffic study to inform the necessary road improvements and upgrades for the Kings Bay, Burwood-Concord and Homebush precincts.

The City of Canada Bay, together with Burwood Council and Strathfield Council, commissioned Bitzios Consulting to prepare this Traffic and Transport Study for the Parramatta Road corridor area within their local government area boundaries. The methodology for the traffic modelling was agreed with TfNSW with input on assumptions for the then Department of Planning Industry and Environment (now Department of Planning and Environment (DPE)). The initial strategic modelling baseline (2019) outputs were completed in December 2020 with the uplift modelling for 2026 and 2036 and reporting occurring through 2021.

This report provides an integrated traffic and transport strategic response and action plan to support the land use densification proposed for the Kings Bay, Burwood-Concord and Homebush precincts.

Note to Reader:

It is important to highlight that like all traffic modelling, the outputs for this work are impacted by the model inputs, assumptions and only mark a point in time. The study uses 2019 base data, and was commissioned prior to the COVID-19 pandemic and therefore may not reflect current trends due to shifts in active, public and private transport usage and a reduction in migration due to border closures. The report also references work that TfNSW is currently undertaking to improve public and active transport along the corridor via a strategic business case. However, as this work is not currently complete, the report is unable to adopt these outcomes as part of the project assumptions. As such, for the purpose of this study, six lanes of vehicle traffic have been adopted for the modelling and reporting, with further work required to confirm mode shift and new configurations once the public transport solutions are confirmed by TfNSW.

Another limitation with the traffic modelling is reduced capacity of (traffic) movement modelling being able to capture place outcomes and impacts. The scope of the study was to prepare network improvements that focused on traffic impacts along the corridor, using trip travel time and speeds, and intersection queue lengths as examples of assessment criteria. In some localities slow vehicle speeds will create safer pedestrian and active transport environments, but these quantitative assessments have not been included in this report. Other disciplines work will need to be considered in decision making for this more holistic approach to preferred outcomes in the following stages of planning and design.

Whilst the Movement and Place framework has been discussed by TfNSW for a number of years, the 'Predict and Provide' and 'Vision and Validate' approaches were only introduced with the release of the TfNSW Future Transport 2056 in 2018. TfNSW's shift from utilising 'Predict and Provide' to 'Vision and Validate' in transport planning is currently in development and its application tools are yet to be released to local government and industry. Therefore, this report has not applied the 'Vision and Validate' approach directly, and instead notes the importance of this approach for future iterations of traffic and transport studies and strategies for the Parramatta Road corridor.

Modelling Outcomes

By 2036, the study area will see a 35% to 39% increase in traffic from 2019 levels with the four precinct development uplift areas included. Additionally, approximately 75% of the 2036 traffic will be traffic passing through the study area. Whilst some traffic will be diverted to WestConnex M4, a proportion will still be using surface roads, including Parramatta Road.

The AIMSUN microsimulation modelling highlighted that Parramatta Road in 2036 would have worse congestion than in 2018 – 2019 base year. The model highlighted that peak period queue lengths would impact local roads to the north and south of Parramatta Road, generating traffic re-routing through local east-west streets. These impacts need to be mitigated with public and active transport mode shifts as well as network traffic improvements which provide traffic relief on Parramatta Road. Accordingly, the traffic capacity-related measures in this report are centred around relieving pinch points and on more efficient queue storage to minimise the extent to which queues affect local road intersections while at the same time better catering for pedestrians and cyclists as precincts redevelop. Early intentions in this study to provide more opportunities for turning and cross-movements at Parramatta Road, to the benefit of local traffic, have not been able to be progressed due to the forecast congestion and the unknown outcomes of the public and active transport planning currently being progressed by TfNSW.

The redevelopment of the main growth precincts along the corridor offers an opportunity for improvements in permeability and accessibility within and through the precincts for walking, cycling and local traffic. These opportunities have been identified as a part of this study, as well as other traffic demand reduction schemes like new bus service areas and new stops, car share locations and parking management measures.

Homebush North and South Precincts

With significant growth in Parramatta Road traffic volumes and growth in traffic to the north of Parramatta Road (partly from the Homebush North precinct) and to the south of Parramatta Road (partly from the Homebush South precinct), significant congestion is seen in 2036 at:

- Parramatta Road / Concord Road / Leicester Avenue
- Parramatta Road / George Street
- Underwood Road / Pomeroy Street
- George Street / Pomeroy Street.

This congestion is extensive with queues extending well into the restricted areas either side of Parramatta Road. Without clearing out east-west congestion on Parramatta Road, there are no benefits in undertaking major road upgrades in / near the Homebush precincts.

The initiatives proposed in the **Homebush North** precinct are:

- Traffic signals adjustments at:
  - George Street / Pomeroy Street
  - Underwood Road / Pomeroy Street.
- A new bus route via George Street to a bus / rail interchange facility at Concord West station
- A number of walking and cycling connections and a fine grained street system as redevelopment allows.

The initiatives proposed in the **Homebush South** precinct are:

- Line marking changes and clearways - Parramatta Road / Bridge Road
- Upgrades to Parramatta Road / Knight Street and limiting Station Street / Parramatta Road to left in / left out movements
- New extended bus services and stops in the eastern part of the precinct, as redevelopment occurs and in consultation with TfNSW
- Additional pedestrian and cycleway connections and ensuring pedestrian links are provided between Loftus Lane and Parramatta Road with redevelopment.

Burwood-Concord Precinct

The key traffic issues in the precinct by 2036 are related to significant congestion on Parramatta Road. This generates queues back down Burwood Road, exacerbated by more traffic generated by the precinct. Burwood Road traffic then attempts to divert to other local street east-west routes and those turning movements further congest Burwood Road. Key issues were seen in the 2036 models at:

- Burwood Road / Park Avenue / Wilga Street (staggered, signalised intersections)
- Burwood Road / Burton Street.

The initiatives proposed in the Burwood- Concord precinct are:

- Burwood Road peak period, peak direct clearways, in the longer term as redevelopment occurs
- Signal phase changes at Burwood Road / Park Avenue / Wilga Street and Gipps Street / Boughton Street
- New traffic signals at Burwood Road / Burton Street
- A traffic management scheme to limit 'rat running' via Loftus Street
- Additional pedestrian links to improve the permeability of the redevelopment area and new cycle links to connect existing facilities to, from and within the precinct.

Kings Bay Precinct

As with other precincts, traffic congestion in the Kings Bay precinct is expected by 2036 because of Parramatta Road. Queues in the AM peak in particular extend from Parramatta Road back into Harris Road as well as east of the precinct into Arlington Street, Great North Road, and streets in between, also affecting Queens Road.

The initiatives proposed in the Kings Bay precinct are:

- Additional peak period clearways along Harris Road and Great North Road
- Queens Road / Harris Road minor intersection upgrade
- Great North Road / Parramatta Road lane marking changes
- Bus service extensions and stops along Queens Road as redevelopment occurs, and in consultation with TfNSW
- Additional mid-block pedestrian links and a short section of connecting cycleway
- Breaking up existing street blocks with 1-2 additional north-south streets or lanes per block.

Development Potential

Key findings regarding the development uplift potential in each precinct are:

- **Homebush North:** Uplift levels should be supportable due to the presence of Concord West Station
- **Homebush South:** Uplift levels should be reconsidered with greater densities towards Knight Street (and the rail station) and reducing levels towards Bridge Road further away from public transport
- **Burwood – Concord**: Distribution of the proposed uplift should be weighted with high densities around Parramatta Road, Burwood Road and the proposed Burwood North Metro Station, with reduced levels towards the southeast and southwest corners of the precinct
- **Kings Bay:** Due to the relatively low level of direct public transport accessibility, this precinct is expected to have the heaviest reliance on private cars. As such, the uplift traffic generation should be balanced by commensurate improvements to public and active transport services such as the currently-investigated Parramatta Road bus lanes project or better services with a direct connection between the precinct and nearby railway stations.

Consolidated Action Plan

Table 10.1 provides a consolidated action plan for the study area on the basis that the development uplift proposals in each of the four precincts are carried forward.

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Common Terms and Acronyms

Term / Acronym	Description
AIMSUN	The software used for the traffic simulation modelling
Benchmark	Growth scenarios under current planning control
CBD	Central Business District
DPIE	Department of Planning, Industry and Environment
TfNSW	Transport for New South Wales (formerly Roads and Maritime Services).
Future Transport 2056	The NSW Government's vision for provision of transport over the next 40 years.
PRCUTS	Parramatta Road Corridor Urban Transformation Strategy
PTPM	Public Transport Project Model
STFM	Strategic Traffic Forecasting Model.
STM	Strategic Travel Model
Uplift	Growth scenarios with redevelopment of the four redevelopment precincts
Vph	Vehicles per hour

1. INTRODUCTION

1.1 Background

In November 2016, Urban Growth NSW issued the final *Parramatta Road Corridor Urban Transformation Strategy (PRCUTS),* together with a package of documents within an Implementation Tool Kit. Since then a number of other relevant reports have also been released including the *Precinct Transport Report* and the *Sydney CBD to Parramatta Strategic Transport Plan*. A Section 9.1 Direction, issued on 19 December 2016, gives the Strategy and the Implementation Tool Kit statutory weight. A supplement to the Implementation Plan 2016-2023 was recently released (the PRCUTS Implementation Update 2021), which augments the original plan with new actions and permissions.

The completion of WestConnex M4 was forecast to attract longer distance traffic off Parramatta Road, providing an opportunity to reconsider the role of the corridor. Additional public transport capacity was considered to facilitate the intensification of key centres whilst also encouraging more active transport and local accessibility to, from and across Parramatta Road. The PRCUTS aimed to capitalise on the traffic relocation expected due to the WestConnex M4 as a catalyst to renew Parramatta Road and adjacent communities through investments in homes, jobs, transport, open spaces and public amenity.

In evaluating the impacts and needs of increasing the density of development in the corridor, there is need to assess the cumulative impact of traffic generated by this redevelopment on Parramatta Road and on the surrounding road network and to develop recommendations for infrastructure requirements to address these impacts. The following key action is included in the PRCUTS for the Kings Bay, Burwood–Concord and Homebush precincts:

"Prior to any rezoning commencing, a Precinct-wide traffic study and supporting modelling is required to be completed which considers the recommended land uses and densities, as well as future WestConnex conditions, and identifies the necessary road improvements and upgrades required to be delivered as part of any proposed renewal in the Precinct."

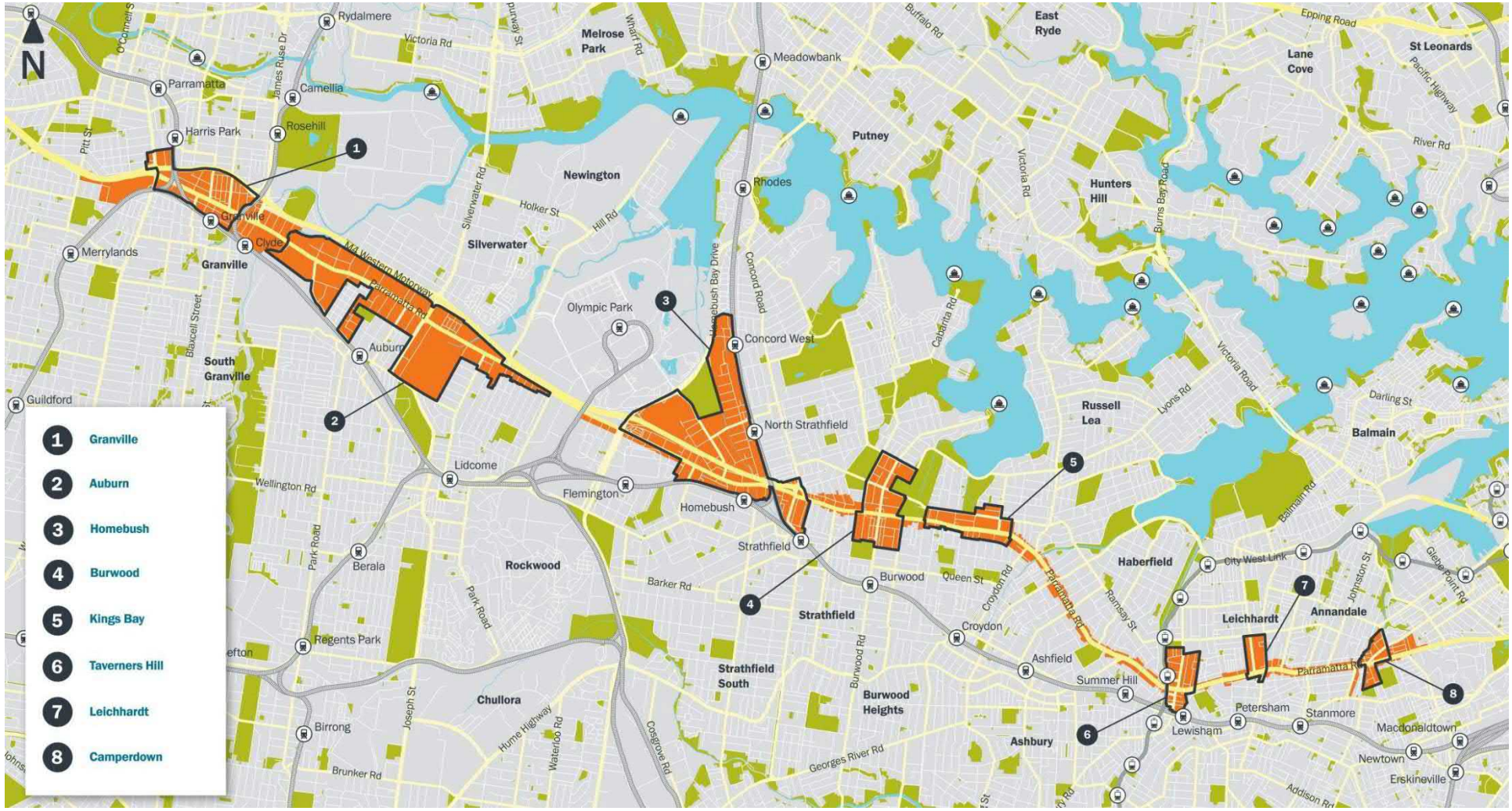
City of Canada Bay in partnership with Burwood Council and Strathfield Council commissioned Bitzios Consulting to undertake the Kings Bay, Burwood-Concord and Homebush Traffic and Transport Strategy (referred to herein as the Parramatta Road Corridor Traffic and Transport Strategy). This study draws from, complements and supplements the urban design and land use planning work completed by RobertsDay for the three Councils.

At the time of writing this report, TfNSW had commenced a study into improving public transport along Parramatta Road. As the findings of this study were unknown, and with input from stakeholders, it was assumed that no major public transport improvements would be introduced to Parramatta Road to allow its traffic levels to be reduced to a maximum of four lanes-worth of traffic by 2036. It is also noted that while Sydney Metro West was announced after the release of PRCUTS, the Metro project has informed the analysis and recommendations of the traffic study.

1.2 Parramatta Road Corridor

The Parramatta Road Corridor spans 20 kilometres from Granville in the west to Camperdown in the east (see Figure 1-1).

Within the PRCUTS, the corridor is separated into two distinct sections – Corridor West and Corridor East. Corridor East includes the land within the Strathfield, Burwood and Canada Bay Local Government Areas (LGAs) and is the subject of this study. Four renewal precincts have been identified within these LGAs: Homebush North, Homebush South, Burwood-Concord and Kings Bay.

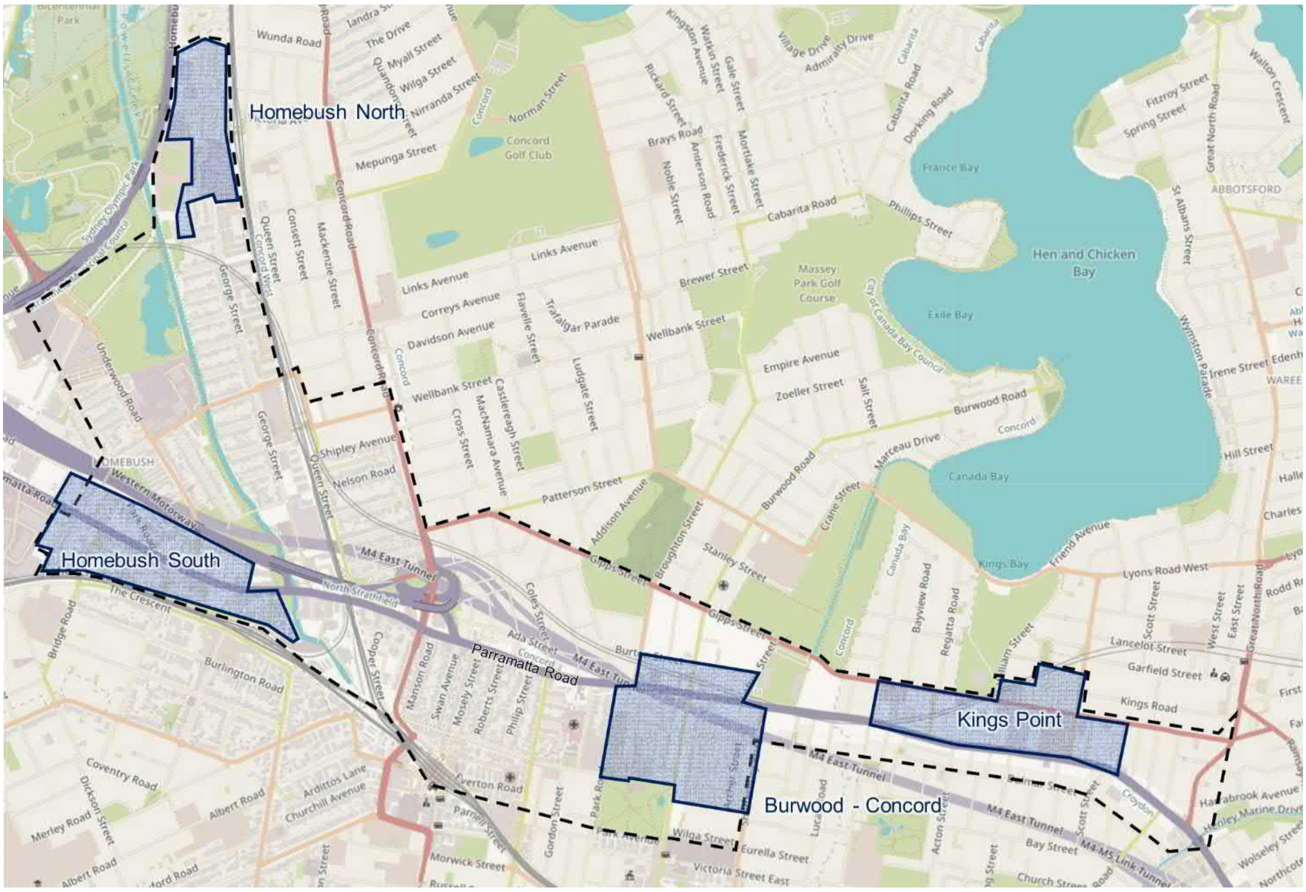


Source: Parramatta Road Implementation Tool Kit Planning and Design Guidelines

Figure 1-1: Parramatta Road Corridor

1.3 Study Area

For the purposes of the traffic and transport assessments, the study area includes Parramatta Road between Homebush Bay Drive in the west and Wattle Street in the east, extending north of Parramatta Road towards North Strathfield, Concord West and Kings Bay, and south towards Homebush, Strathfield and Burwood. The study area is shown in Figure 1-2.



Source: https://maps.six.nsw.gov.au/

Figure 1-2: Study Area

1.4 Study Development Process

The development of this study commenced in 2018 at a similar time to other council-led studies along adjacent sections of Parramatta Road. Through the course of this study, it was revealed that greater consistency of traffic modelling and evaluation processes would be required between the concurrent studies. This study was put 'on hold' and the Department of Planning, Industry and Environment (DPIE) and Transport for NSW (TfNSW) undertook an integrated study to harmonise modelling and evaluation methods. These integrated corridor-wide models have been used to calculate future traffic and transport demands, to, from, within and through the study area for this study.

The process to develop the Parramatta Road Corridor (Strathfield, Burwood, Canada Bay) Traffic and Transport Study and Action Plan involved:

- Reviewing the PRCUTS to provide the overall context in terms of key outcomes desired, corridor planning implications, proposed public and active transport infrastructure, and objectives specific to the Homebush, Burwood-Concord and Kings Bay precincts
- Reviewing the proposed on-road and off-road links, and land rezoning areas for each precinct, as detailed in the urban design frameworks prepared by Roberts Day, to determine whether any changes can be recommended to better integrate with overall Corridor planning
- Summarising other relevant transport infrastructure projects and implications for traffic on Parramatta Road and within each precinct, such as the WestConnex M4 East and the proposed Sydney Metro West project
- Identifying key traffic and transport challenges and opportunities for Parramatta Road and each precinct using available data with reference to a traffic model created for this project
- Identifying transport planning principles to guide the future development and assessment actions for the Corridor
- Assessing traffic infrastructure needs in the short and long term with the proposed redevelopment and accessibility changes
- Developing corridor-specific and precinct-specific traffic and transport strategies and a staged implementation plan aligned with the urban design strategy for the Corridor.

2. CONTEXT

2.1 Parramatta Road Corridor Urban Transportation Strategy

PRCUTS was released in 2016 and outlines a 30-year plan for 'growing the Parramatta Road Corridor and revitalising local communities living and working along the Corridor through investing in housing, jobs, transport, open spaces and public amenity. The Strategy will drive and inform land use planning and development decisions, long-term infrastructure delivery programs and provide an understanding of different aspects of the future of the Corridor'.

The PRCUTS's key road, public and active transport outcomes relevant to this study are summarised below, including those specific to the Homebush, Burwood – Concord and Kings Bay precincts.

Roads and Movement and Place

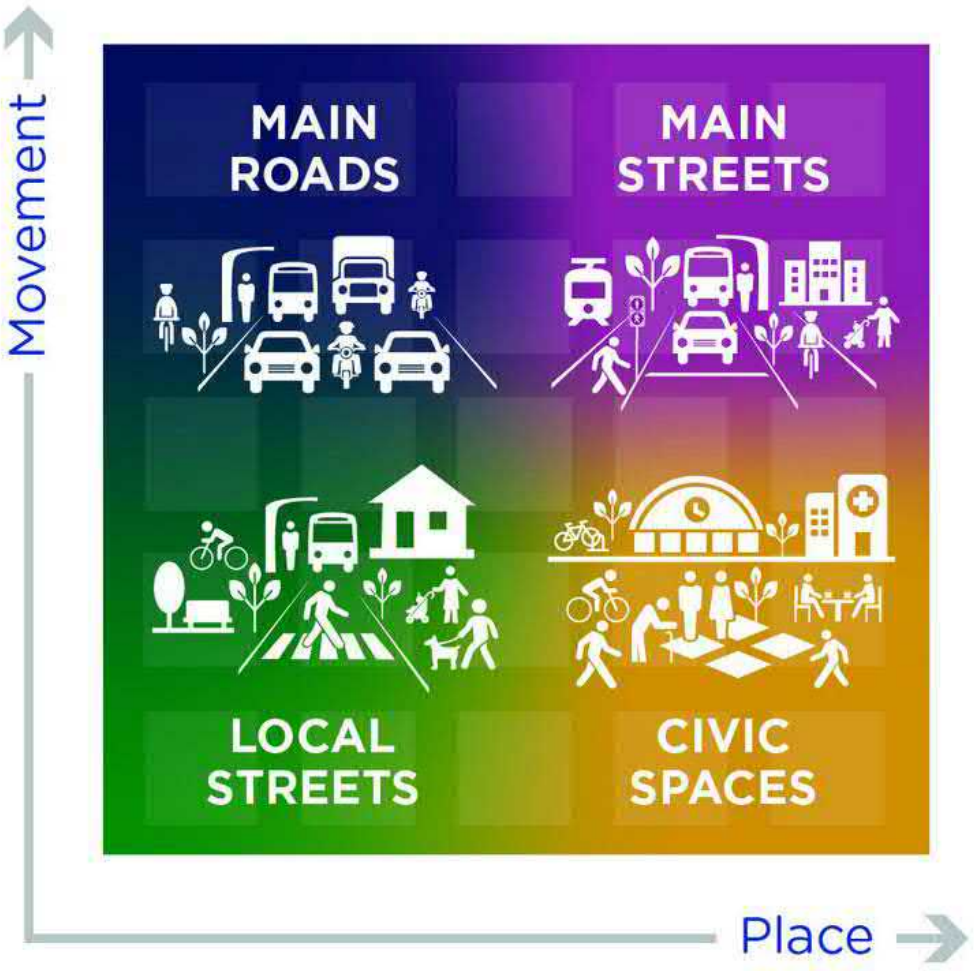
The PRCUTS placed applied the Movement and Place planning framework to the Parramatta Road corridor to define the future function of the road network and inform future planning decisions (see Figure 2-1 and Figure 2-2). This approach is based on land use and transport objectives, and desired outcomes for the four precincts. Roads in and around each precinct will provide the following two primary functions:

- **Movement:** 'links' used by customers to travel between places
- **Place:** 'nodes' which represent the locations of travel origins and destinations that customers move between.

The specific 'movement and place' classification of each road type informs the allocation of the level of access to each road transport mode during different times of the day and week, for example operating bus lanes during weekday peak hours only. This approach recognises that the movement network consists of different road and link types serving different functions within the wider transport network.

Parramatta Road will continue to function as a movement corridor along most of its length. PRCUTS envisaged that it would comprise at least one public transport lane (e.g. bus lane) and two general traffic lanes in each direction of travel along the entire Corridor.

A program of short, medium and long-term road upgrades was proposed to restructure Parramatta Road and the surrounding road network with the intention of supporting existing and emerging employment areas. At the same time, these schemes aimed to protect the amenity of residential areas and respond to urban development and travel demand growth. The introduction of 'Clearways' and 'No Stopping' zones as part of the NSW Government's Sydney Clearways Strategy was also identified as needing consideration. Extended weekday and weekend Clearways currently operate on Parramatta Road between Granville and Ashfield.



Source: Practitioner's Guide to Movement and Place

Figure 2-1: Movement and Place Function Framework

Source: Adapted from Practitioner's Guide to Movement and Place

Figure 2-2: Road Classifications and Functions

Public and Active Transport

The Integrated Land Use and Transport Concept map in PRCUTS proposes:

- A rapid or suburban bus route between Homebush and Parramatta with key stops aligned with nodes of densification along Parramatta Road
- A potential rapid transit route between Burwood and the Sydney CBD with key stops aligned with nodes of densification along Parramatta Road
- A future cycle route between Auburn and Kings Bay along various roads north of the M4.

In addition, the NSW Government has reinforced its position on the importance of Parramatta Road as one of Sydney's key growth corridors to investigate the development of rapid bus or light rail transit. As part of this position, a condition of consent for the WestConnex M4 East project requires *'at least two lanes of Parramatta Road, from Burwood Road to Haberfield, to be solely dedicated for the use of public transport unless an alternative public transport route that provides an improved public transport outcome is approved'*.

Since then, Parramatta Road traffic volumes have returned to near pre-WestConnex levels and there is no current government commitment to convert two traffic lanes for the exclusive use by public transport. Furthermore, since PRCUTS was published, Sydney Metro West has been announced by the NSW Government and its alignment and stations are within the study area.

2.2 Future Transport 2056

Following the release of the PRCUTS, the NSW Government has also released Future Transport 2056 which provides an update of NSW's Long Term Transport Master Plan and *'sets the 40 year vision, directions and outcomes framework for customer mobility in NSW, which will guide transport investment over the longer term'.*

The 40-year vision is based on the following six outcomes:

- Customer Focused
- **Successful Places**
- A Strong Economy
- **Safety and Performance**
- **Accessible Services**
- Sustainability.

The outcomes that are considered to be of particular relevance to the PRCUTS are Successful Places, Safety and Performance (of the network) and Accessible Services. Re-interpreting these outcomes for the Parramatta Road Corridor through Strathfield, Burwood and Canada Bay means:

- Transport will need to reinforce the creation of **successful places** through improved **accessibility** by all modes to and from the corridor
- The **safety and efficiency** of movement through the corridor will be a key goal.

Two major projects within Future Transport 2056 which influence traffic and transport movements in the study area are:

- WestConnex M4 East
- Sydney Metro West.

WestConnex

The WestConnex M4 East extends the M4 Western Motorway at Homebush to a new interchange at Haberfield via new tunnels with three lanes in each direction. A new interchange has been constructed along Concord Road between Parramatta Road and Patterson Street at the western end of this strategy's boundary, as shown in Figure 2-3. It includes:

- On-ramps and off-ramps between Concord Road northbound and southbound and the M4 East tunnel
- An on-ramp from Concord Road southbound to the M4 Western Motorway.

Source: SIX Maps / Nearmap

Figure 2-3: Concord WestConnex Interchange

A signalised on-ramp from Parramatta Road to the M4 Western Motorway westbound has also been constructed in Homebush, located east of the Parramatta Road/Station Street intersection.

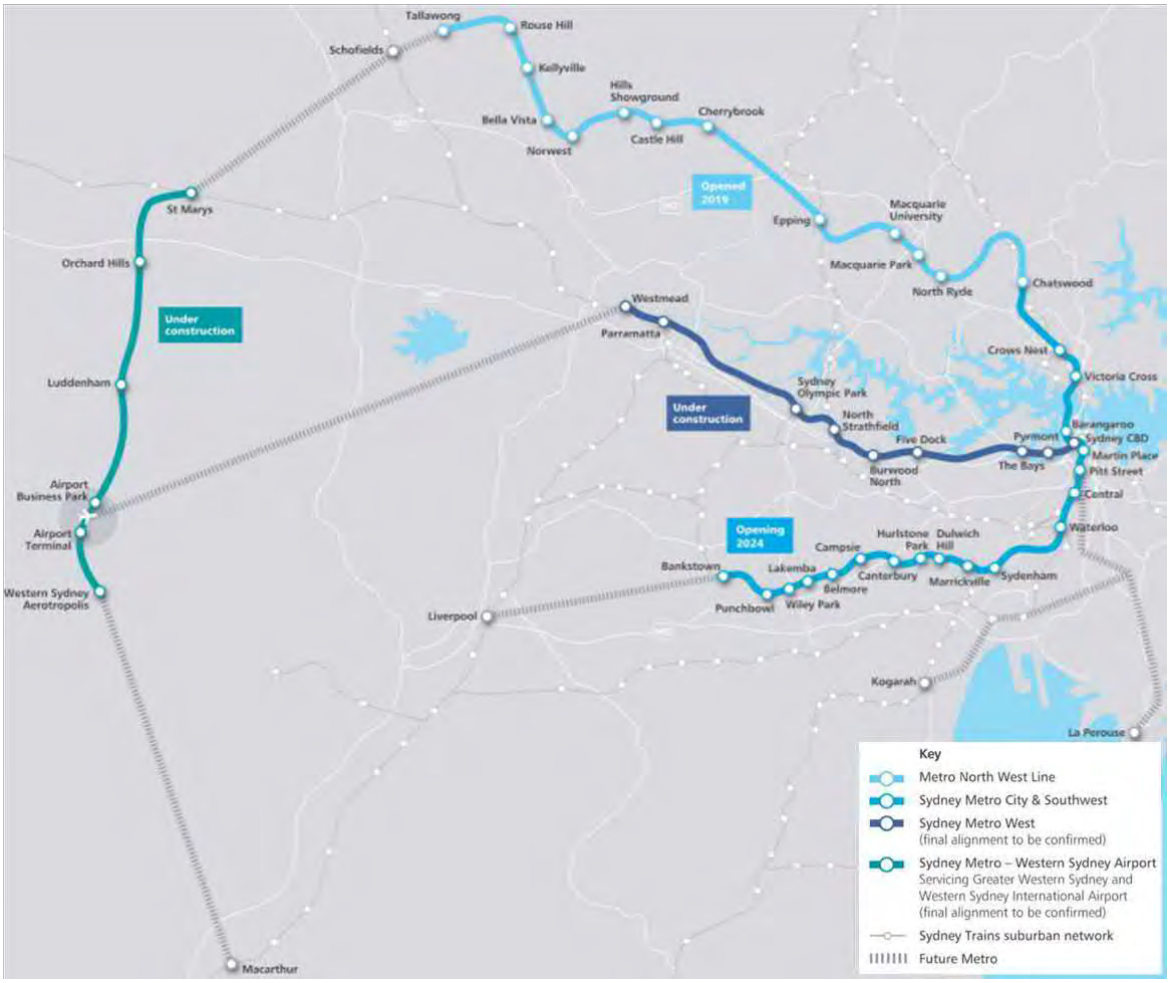
It is noted that TfNSW is currently undertaking a strategic business case which is exploring options for improvements to public transport along Parramatta Road, which will facilitate the delivery of the WestConnex conditions of consent related to public transport.

Sydney Metro West

As part of the NSW Government's Future Transport Strategy 2056, a planned underground metro railway line between the Sydney CBD and Westmead has been approved, with a potential extension to the west towards Western Sydney Airport (see Figure 2-4). The metro line is expected to be completed by 2030. A connection with the T9 Northern Line at North Strathfield at the western edge of this strategy's study area is a key consideration for land use and transport. Intermediate stations will also be located at Burwood North and Five Dock. Burwood North station will be located within the Burwood-Concord precinct, shown in Figure 2-5.

While effectively doubling the rail capacity of the T1 Western Line, Sydney Metro West will provide faster connections between Sydney and Parramatta, linking key precincts which currently rely heavily on road use and do not have any rail services. When operating together, both lines would encourage more commuters to travel by rail between the two major CBDs and beyond.

Furthermore, the intermediate stations at Burwood North and Five Dock will introduce a mass transit option to growing residential and employment areas along the Parramatta Road Corridor, offer direct access to the Sydney and Parramatta CBDs, and provide more alternative transport options through integrating the metro with local bus services. These benefits, along with WestConnex and future rapid transit services, would be expected to deliver relieved capacity on Parramatta Road which could be repositioned to enhance local accessibility by a range of transport modes.



Source: https://www.sydneymetro.info/sites/default/files/document-library/SMW_Stage_2_Scoping_Report.pdf

Figure 2-4: Planned Sydney Metro West Route

Adapted from Sydney Metro West EIS Chapter 9

Figure 2-5: Planned Burwood North Metro Station Location

2.3 Sydney CBD to Parramatta Strategic Transport Plan

The Sydney CBD to Parramatta Strategic Transport Plan was developed in 2015 to outline a vision for the Parramatta Road Corridor given the projected population and employment growth in the region. The Plan notes that the Corridor faces a number of challenges including:

- Capacity constraints for both roads and rail services during peak periods, which result in congestion and its associated economic and social impacts
- Impediments to the redevelopment such as fragmented land ownership and poor quality urban form
- Physical constraints due to heritage-listed buildings and geographic features
- Limited and less well connected bus services west of Leichardt compared to near CBD
- Limited north-south connectivity for all transport modes due to limited Parramatta River crossings
- Imbalance between the concentration of jobs in Sydney CBD and concentration of housing in Western Sydney resulting in large tidal peak flows along the corridor
- An increase in freight movements with the growth in Sydney CBD.

A number of objectives and principles were documented including:

- Developing a transport network that provides access to multiple modes of transport and a greater degree of flexibility, and improving multi-modal trip efficiency
- Improving walking and cycling facilities to cater for local trips, bus and light rail services for intermediate trips, and rail services and motorways for regional trips
- Optimising land use around the transport network to reduce travel demand, such as increasing mixed-use development and addressing the job-housing imbalance
- Protecting industrial and freight precincts and intermodal terminals

The Plan identifies an opportunity to shift regional trips to intermediate trips with appropriate land use changes and improved connections between regional centres within and outside the Corridor.

2.4 TfNSW Road User Space Allocation Policy

The TfNSW Road User Space Allocation Policy was developed to guide the design of all road environments (except motorways) and to ensure that the following principles are adhered to:

- Realise a balance between place and the movement of people and goods by first establishing a network vision and primary road functions based on strategies and plans
- When allocating road user space based on the network vision and road functions, consider all road users in order of: walking (including equitable access for people of all abilities); cycling (including larger legal micro-mobility devices); public transport; freight and deliveries; and point to point transport ahead of general traffic and on-street parking for private motorised vehicles
- Facilitate the movement of goods and servicing of property in a manner that responds to the local movement and place context
- Aim for the reduction of the mode share of private motor vehicle trips within built up areas
- Where it is not practicable to allocate physical space in line with these principles, dynamically allocate road user space
- Implement measures over time to achieve the strategic intent and outcomes identified as part of strategies or plans

- Track how these road space allocation principles are being implemented against the strategic intent and outcomes identified as part of strategies or plans
- Adhere to these principles ahead of any guidance that seeks to protect or maintain private vehicle level of service.

2.5 Challenges and Opportunities: Corridor Wide

Geometry Constraints

The Parramatta Road corridor within the study area typically includes three through traffic lanes in each direction with separate right turn pockets at all intersections where right turns are permitted. The kerbside lanes are either 'No Stopping', indicated by yellow lines adjacent to the gutter, and/or are signposted as 'Clearway' from 6:00am to 7:00pm on weekdays and from 8:00am to 8:00pm on Saturday and Sunday.

The speed limit is mostly 60 km/h with 40 km/h school zones located near Melbourne Street in Burwood and near Harris Road in Croydon.

Lane widths vary but are typically narrow and some less confident drivers are observed as being reluctant to drive parallel to trucks or buses in adjacent lanes, increasing headways and reducing mid-block capacity. Also, there are a number of property accesses directly off Parramatta Road and whilst their turning volumes are typically not high (except for service stations), there are multiple points of deceleration, turning and acceleration along the Corridor. The vertical alignment of the road corridor is best described as 'rolling' with grades on approach to Scott Street, on approach to Cheltenham Road and on approach to Grantham Street, having some effect on trucks, particularly in stop-start conditions.

Current Traffic Congestion and Pinch Points

Parramatta Road between Iron Cove Creek and the M4 intersection in Strathfield was heavily congested in 2018 not only during conventional commuter peak periods but also during much of the weekday as well as on weekends.

As shown in Figure 2-6 and Figure 2-7, 2018 intersection volumes were greatest between the M4 and Burwood Road, with a minor reduction further east in both peaks. Given that the Parramatta Road / M4 intersection was a 'T' intersection and that traffic arrivals from the M4 further west are not interrupted by intersections, this intersection was the key capacity constraint in the Corridor.

Prior to the opening of the WestConnex M4 East in 2020, there was a convergence of high volumes of through traffic eastbound from the M4 and from Parramatta Road in the west. Adding to these

through movements, local traffic from Strathfield, Burwood and Canada Bay joined Parramatta Road, or crossed at key intersections. Parramatta Road was (and is) the primary east-west route between Parramatta River and the Hume Highway.

The nature of eastbound traffic, particularly in the morning peak, was that the key pinch points vary but inevitably result in almost continual slow moving, congested conditions between the M4 intersection and the Iron Cove Creek crossing. Average morning peak speeds eastbound in 2018 were approximately 12 km/h to 15 km/h.

In the westbound direction similar to eastbound, there were continuous, slow moving, congested conditions from Great North Road all the way through to the M4 intersection. The M4 intersection was the clear source of congestion in the afternoon peak with queues often extending back past Shaftesbury Road. Average travel speeds between Iron Cove Creek in the evening peak and the M4 were often less than 10 km/h over the 4km length of Parramatta Road.

Adapted from Google Traffic Data

Figure 2-6: AM Peak Pinch Points (2018)

Adapted from Google Traffic Data

Figure 2-7: PM Peak Pinch Points (2018)

An overview of these pinch points is summarised in Table 2-1.

Table 2-1: Pinch Point Summary

Location	Description	Challenge
Bridge Road	The intersection of Parramatta Road / Bridge Road is busy, with high traffic volumes both on Parramatta Road and coming out of Bridge Road. Bridge Road serves as one of the main rail crossing locations in the area, funnelling traffic towards Parramatta Road.	▪ Nearby three-lane to two-lane transition on Parramatta Road eastbound can cause slow-downs in traffic flow. ▪ High demand for right turns out of the southern catchment served by Bridge Road
Concord Road	The intersection of Parramatta Road / Concord Road / Leicester Avenue represents a meeting point of multiple major roads, with Concord Road connecting into Concord and Leicester Road one of the main links to Strathfield town centre.	▪ Presence of the nearby M4 interchange to the north on Concord Road dictates the traffic flows in the area, and limits road widening opportunities. ▪ High volume turning movements at this intersection are constrained by single lane turning bays.
M4 On/Off Ramp	The intersection of Parramatta Road and the M4 ramps observes a significant increase in traffic due to motorway vehicles entering and exiting the traffic stream on Parramatta Road.	▪ Dual right turn lanes onto the M4 westbound restricts Parramatta Road to a single lane carriageway.
Wentworth Road & Broughton Street & Burwood Road	High volumes of peak hour traffic on Parramatta Road east of the M4 ramps through the Burwood area are slow-moving and congested, with queues extending back from the signalised intersections.	▪ Road already has a three-lane carriageway in each direction; capacity increases via widening are not a viable option. ▪ Planned revitalisation of the area including Metro projects are expected to contribute to a further worsening of the traffic environment if no mitigation measures are employed.
Shaftesbury Road	The intersection of Parramatta Road / Shaftesbury Road is one of the main opportunities for traffic entering and exiting Burwood from Parramatta Road.	▪ Turning restrictions at Parramatta Road / Burwood Road funnel traffic through the Shaftesbury Road intersection. ▪ Single-lane right turn into Shaftesbury Road is insufficient to support the turning demand.
Harris Road & Croydon Road & Great North Road	High volumes of peak hour traffic on Parramatta Road near the Great North Road are slow-moving and congested, with queues extending back from the signalised intersections.	▪ Road already has a three-lane carriageway in each direction; capacity increases via widening are not a viable option. ▪ School interactions like school zone speed limits and pick-up and drop-off near Rosebank College introduce friction to the peak hour traffic.

The Influence of WestConnex

The WestConnex Projects which directly influence traffic volumes on Parramatta Road between the previous M4 intersection and Iron Cove Creek include:

- **WestConnex M4 West:** the introduction of tolls on the M4 in 2017 increased traffic volumes on Parramatta Road west of Concord Road as a result of route choice decisions
- **WestConnex M4 East:** which opened in July 2019 allows through traffic (paying the toll) to bypass Parramatta Road through the study section via a tunnel between Concord Road and Ashfield/Haberfield
- **M4-M5 Link:** proposed to open in 2023, will introduce further travel time savings for through traffic movements with an extension of tunnels to complete the WestConnex underground network and these additional travel time savings may attract additional traffic off Parramatta Road.

The publicly available WestConnex documentation expected that after the opening of WestConnex, traffic volumes on Parramatta Road would be reduced to and maintained at 2012 levels. More detailed forecasts were provided in work completed by SGS Economics for City of Sydney in reviewing the EIS. This modelling, using the Zenith Transport model, identified that for Parramatta Road between Concord Road and Great North Road:

- Daily traffic volumes would reduce from 54,000 vpd (without WestConnex) to 39,000 vpd in 2021 (with WestConnex)
- Daily traffic volumes would be maintained at around 40,000 vpd until 2041.

This forecast reduction in traffic on Parramatta Road was approximately one-third of 2018 volumes and the reduction was expected to be disproportionately attributed to through traffic meaning a larger proportion of the traffic on Parramatta Road would be 'local' traffic movements.

In broad terms, these modelling outputs suggested that to match or even improve current levels of service, Parramatta Road could be limited to two through traffic lanes in each direction mid-block and at intersections but would possibly require additional turn pocket capacity to accommodate increasing local traffic movements. The PRCUTS suggested that WestConnex would 'release' road corridor space that could be used for a combination of alternative purposes, such as:

- Full bus lanes or bus 'jumps' at intersections
- Off-peak parking lanes via Clearways
- A separated cycleway corridor
- Wider footpaths.

SCATS detector count data from the Parramatta Road / Birnie Avenue intersection located approximately 1.8 km west of the study area recorded a rise in traffic from approximately 40,000 vpd to 60,000 vehicles per day on Parramatta Road between 2016 and 2018, coinciding with the re-introduction of tolls on the M4 West in 2017. Daily volumes have remained relatively stable between 2018 and 2021 despite the opening of the M4 East in 2019. Daily bi-directional traffic volumes between 2010 and 2021 are presented in Figure 2-8.

Traffic count data from a permanent counter located on Parramatta Road near Cheltenham Road recorded a fall in daily traffic from 65,000 vpd to 45,000 vpd when the WestConnex M4 East opened in July 2019. Daily volumes have since increased to 55,000 vpd (as at November 2020) and have remained near that level throughout 2021, except for the months where travel restrictions were implemented due to COVID-19. Daily bidirectional traffic volumes between April 2017 and November 2021 are presented in Figure 2-9

The realisation of the vision for the Parramatta Road Corridor is now limited by a relatively smaller reduction in traffic volumes (post-WestConnex) than previously forecast. Parramatta Road still maintains a primary through movement function in the network. This has hampered its ability to provide greater accessibility for local movements and to reappropriate road space to public transport or active transport uses.

Source: Artist's Impression from Urban Growth NSW

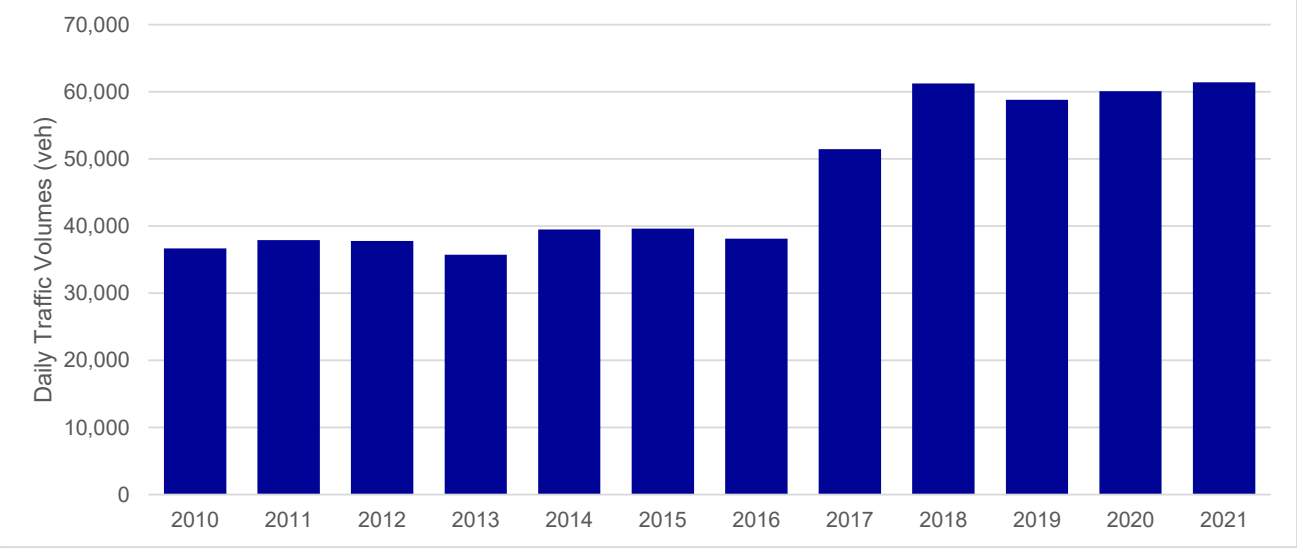


Figure 2-8: Parramatta Road Average Daily Traffic Volumes – Birnie Avenue

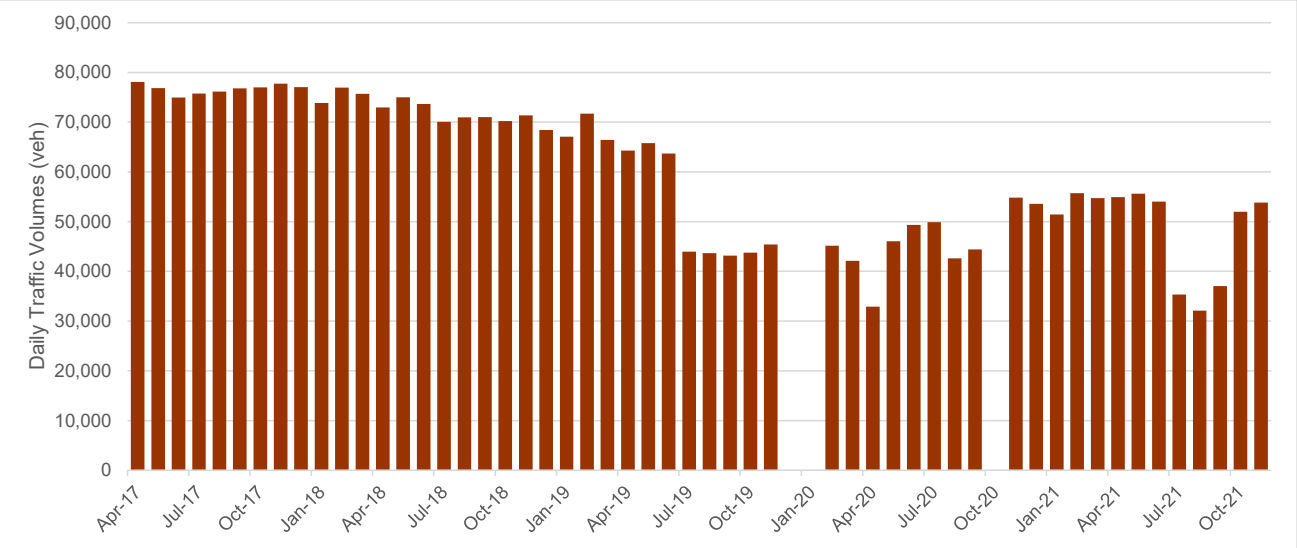


Figure 2-9: Parramatta Road Average Daily Traffic Volumes – Cheltenham Road

Parking Facilities and Restrictions

Parking is restricted along Parramatta Road by clearways and 'No Parking' zones, while on-street parking is generally unrestricted in residential areas. Regional centres such as Burwood have time-restrictions for on-street parking.

Corridor Bus Services, Stops and Bus Priority Infrastructure

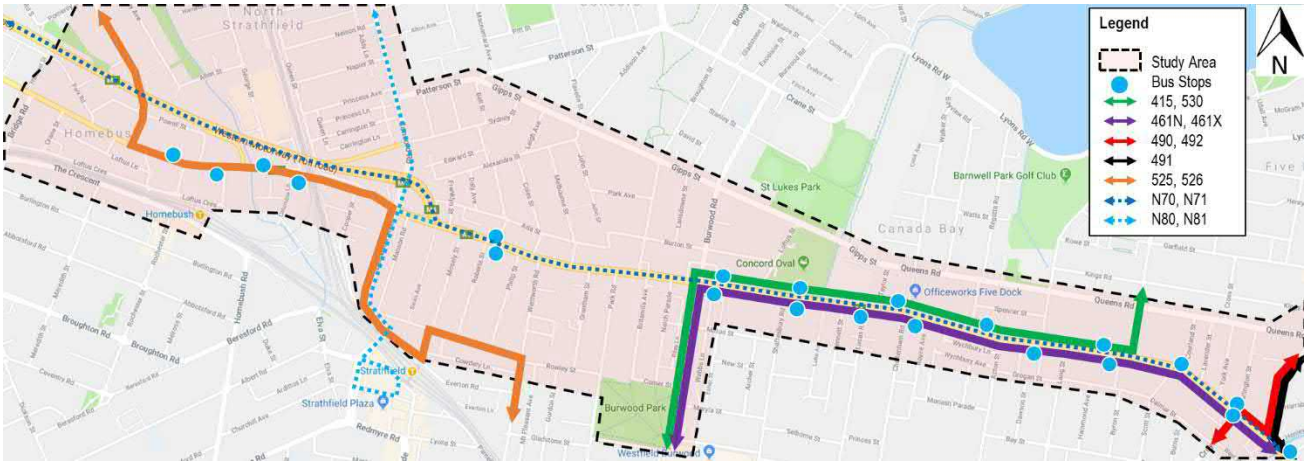
There are no bus routes running along the length of the Parramatta Road Corridor between Homebush Bay Drive and Iron Cove Creek. All existing bus routes enter Parramatta Road for short sections to typically move between suburbs north and south of Parramatta Road. The latest changes to the bus network along the Parramatta Road Corridor took effect in October 2020. Table 2-2 summarises the existing bus routes and frequencies using sections of Parramatta Road, with routes shown in Figure 2-10.

As part of the PRCUTS, 'rapid' or 'suburban' bus routes were proposed between Homebush and Parramatta, and between Burwood and the Sydney CBD.

Parramatta Road does not have any bus priority lanes between Homebush Bay Drive and Iron Cove Creek. Long-term public transport improvements are currently subject to a separate study by TfNSW. Currently, buses run with general traffic and typically use the kerbside lane due to the need to stop at kerbside bus stops. Buses stopping within kerbside lanes (as 'in-lane stops') do have the advantage of simply accelerating once they have dropped off/picked up passengers rather than having to merge back into traffic as would be the case if indented bus bays were provided.

Table 2-2: Existing Bus Routes using Parramatta Road

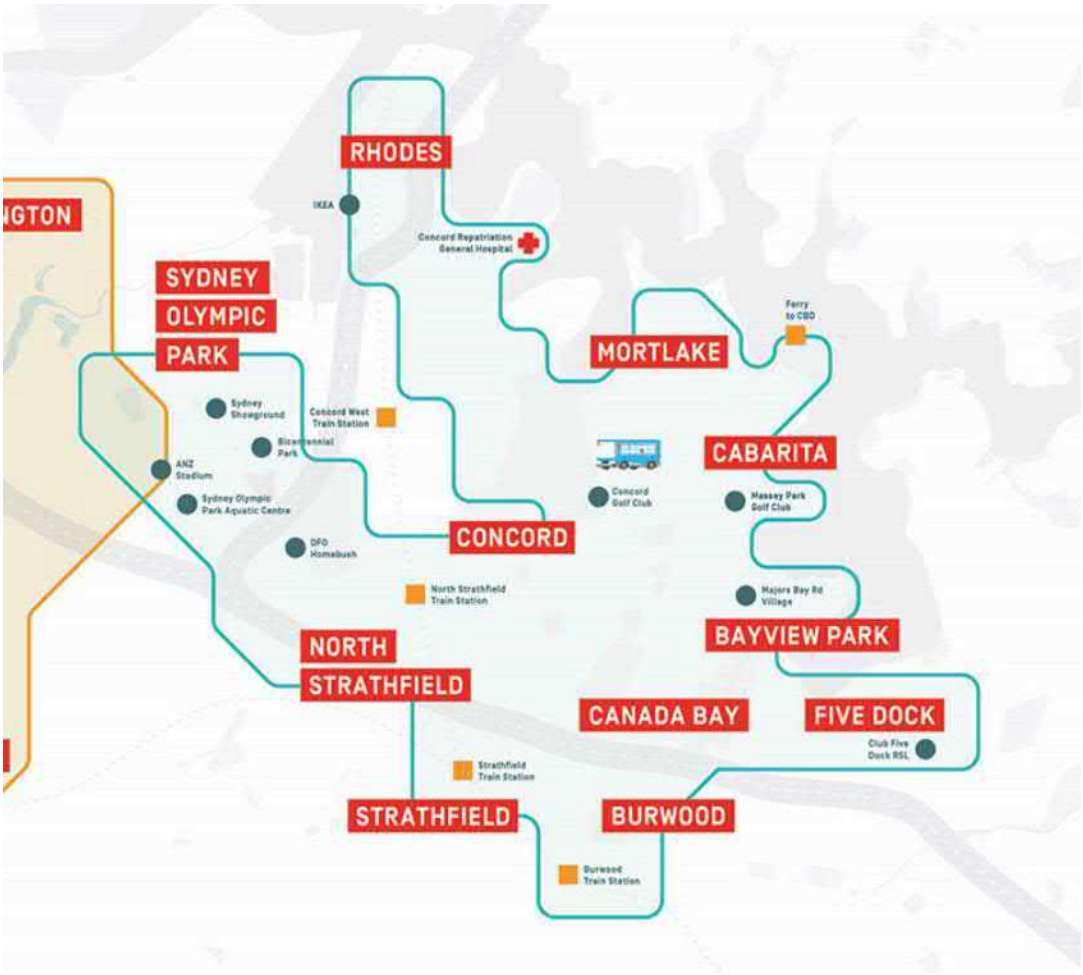
Route No.	Destination	Frequency
415	Campsie to Chiswick	15-20 mins (peak periods) 30 mins (off-peak periods and Saturday) 60 mins (Sunday)
461N	Burwood to City Hyde Park	30 mins (late night and early mornings daily)
461X	Burwood to City Domain	10-15 mins (peak periods) 15 mins (off-peak periods and weekends)
490	Drummoyne to Hurstville	30 mins (Monday to Saturday) 60 mins (Sunday)
491	Hurstville to Five Dock	30 mins (Monday to Saturday) 60 mins (Sunday)
492	Drummoyne to Rockdale	30 mins (daily)
525	Parramatta to Burwood via Sydney Olympic Park	20-25 mins (peak periods) 30 mins (off-peak periods)
526	Burwood to Rhodes Shopping Centre	15-25 mins (peak periods) 30 mins (off-peak periods)
530	Burwood to Chatswood	20-25 mins (peak periods) 30 mins (off-peak periods and weekends)
N70	Penrith to City Town Hall	60 mins (nightly)
N71	Richmond to City Town Hall	60 mins (nightly)
N80	Hornsby to City Town Hall via Strathfield	60 mins (nightly)
N81	Parramatta to City Town Hall via Sydney Olympic Park	60 mins (Monday to Saturday nights)



Adapted from Google Maps

Figure 2-10: Parramatta Bus Routes and Stops

In addition to public bus services, an Inner West 'on-demand' bus service operates across the study area. The on-demand bus service area is shown in Figure 2-11. The service does not have a fixed route or bus stops and allows buses to pick up and drop off at any safe location within the service area. The service operates every day, with the exception of Five Dock and Sydney Olympic Park which are not serviced on weekends.



Source: https://transportnsw.info/travel-info/ways-to-get-around/on-demand/inner-west

Figure 2-11: Inner West On-Demand Bus Service Area

Long Distance Cycling Routes

The main cycling related challenge is the lack of continuous and consistent cycle routes through the Parramatta Road Corridor, as shown in Figure 2-12.

The only continuous east-west route within the study area is an on-road mixed traffic route following Queens Road, Gipps Street, and Patterson Street. This route has connections for areas on the northern side of Parramatta Road. Bicycle lanes are provided inconsistently along this route, with sections where the bicycle lane transitions into parking lanes with sub-standard lane widths which force cyclists into the traffic lane. Additionally, the section between Burwood Road and Broughton Street is shared with general traffic which has volumes in excess of 1,700vph and 1,800vph during the AM and PM peaks respectively.

The only continuous north-south cycle route through the study area crosses Parramatta Road at the Bridge Street signals. Routes are also planned which cross Parramatta Road at a ramped overpass bridge at Broughton Street and at the Cheltenham Road / Walker Street signals.

As part of PRCUTS, improved cycling routes are proposed to allow for safer and more efficient connections between residential properties, commuter hubs, Parramatta, Homebush, and the Sydney CBD.

There are opportunities for modal shift from private vehicles to cycling with the provision of more continuous facilities and more off-road routes that link residential areas to major shopping and employment destinations.

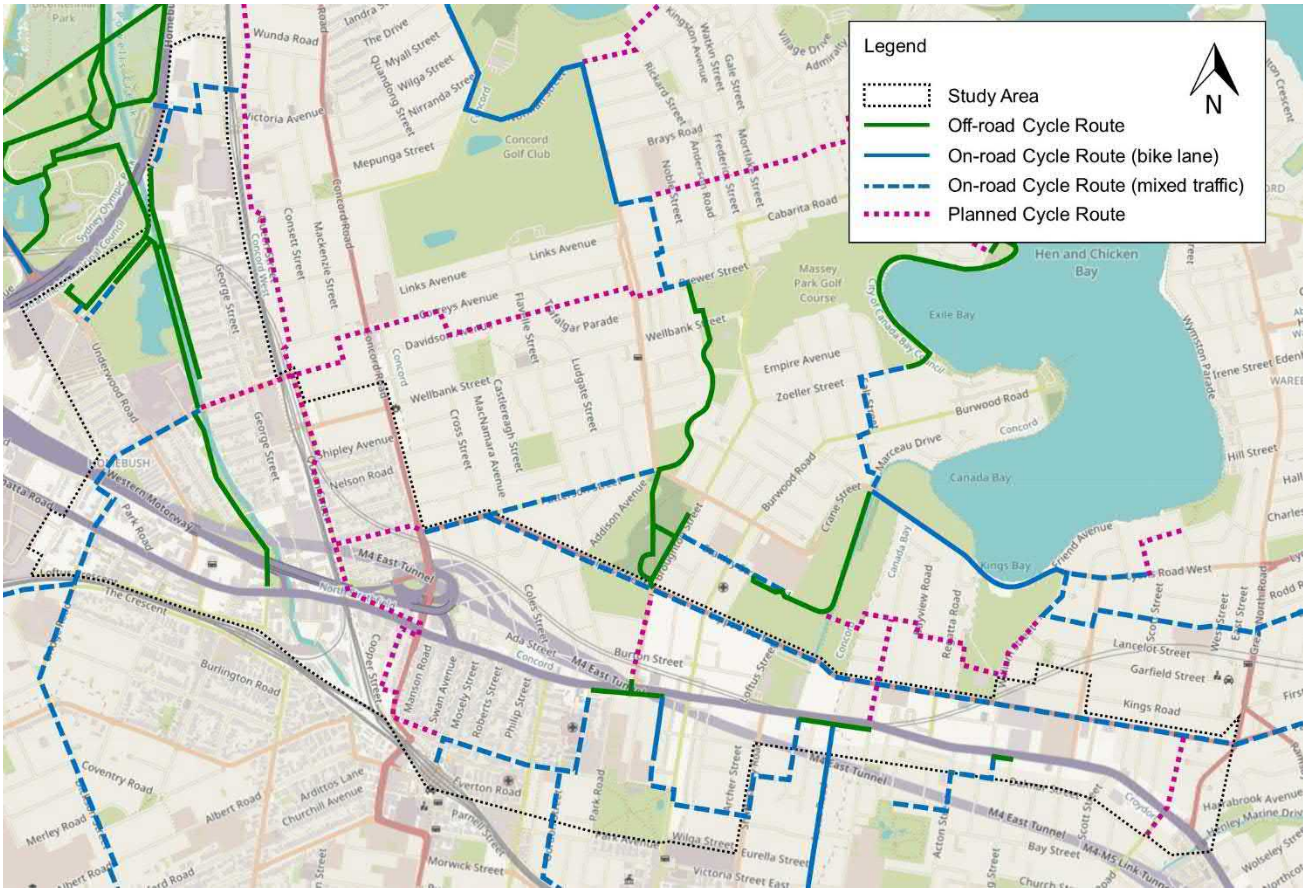


Figure 2-12: Regional Cycling Routes

Challenges and Opportunities Summary

Table 2-3 summarises the challenges and opportunities across the corridor.

Table 2-3: Challenges and Opportunities – Corridor Wide

Opportunities	Challenges
▪ Burwood is currently the main public transport hub for buses travelling through the study area. With the planned Metro stations, there is an opportunity to improve public transport as a system by providing shorter and more reliable bus routes ns between the residential areas and railway stations. ▪ Address the limited bus serviceability across the Homebush and North Strathfield areas ▪ Cycle routes within the study area are generally isolated, with limited inter-connectivity between the three LGAs. By planning for and providing these missing links, as well as more off-road or separated cycling paths, a greater shift to cycling can be encouraged.	▪ Geometric constraints along Parramatta Road limits the opportunity to widen the road for increased capacity ▪ The implementation of bus lanes along the corridor would significantly reduce the available road capacity to cater for traffic volumes which are increasing following an initial reduction with the opening of WestConnex M4 East tunnel. ▪ Certain key intersections like Parramatta Road / Concord Road have a limiting effect on the entire corridor, with consequential congestion affecting long sections of the road during peak periods. ▪ The dichotomy between the function of Parramatta Road as a high-volume, high-capacity movement corridor and the strategic vision for localised urban villages and precincts along the corridor presents a challenge in achieving a balance between the study area's Movement and Place characteristics.

2.6 Challenges and Opportunities: Homebush North

Traffic Accessibility

The Homebush North Precinct primarily connects to Parramatta Road via George Street. The intersection of Parramatta Road / George Street is a signalised four-leg intersection which provides turning facilities in all directions. No restricted movements are present at this location. Direct traffic access routes between the Homebush North Precinct and Parramatta Road are limited due to the adjacent rail corridor and the road network in the area, resulting in an increase of traffic pressure along George Street.

Congestion

As the Homebush Bay North Precinct is located 1.6km north of Parramatta Road with only local traffic using the roads, the intersections operate under capacity during both the AM and PM peak periods.

Public Transport

Concord West Train Station is located on the eastern boundary of the precinct, providing train access along the T9 Northern Line. Trains from Concord West Station travel to Hornsby via Eastwood, and Hornsby via Central every 15 minutes in both directions during the AM and PM peaks.

No bus stops are located within the precinct. The closest bus stops, northbound and southbound, are located on Concord Road to the east, which is a 600m walk from the eastern end of Victoria Avenue. These bus stops are serviced by routes 458 Ryde to Burwood and 410 Hurstville to Macquarie Park.

Walkway and Cycleways

As shown in Figure 2-13 the Homebush North Precinct has good cycling connections west of the railway line, and a planned north-south route along Queens Road.

There are a few cycleway connections into Bicentennial Park to the west, an off-road path from Victoria Avenue travelling south towards Powells Creek and a connection underneath the railway line on the western boundary at Station Avenue. The off-road cycleway along Powells Creek between Pomeroy Street and Bicentennial Park is part of the Bay to Bay Cycle and Walkway.

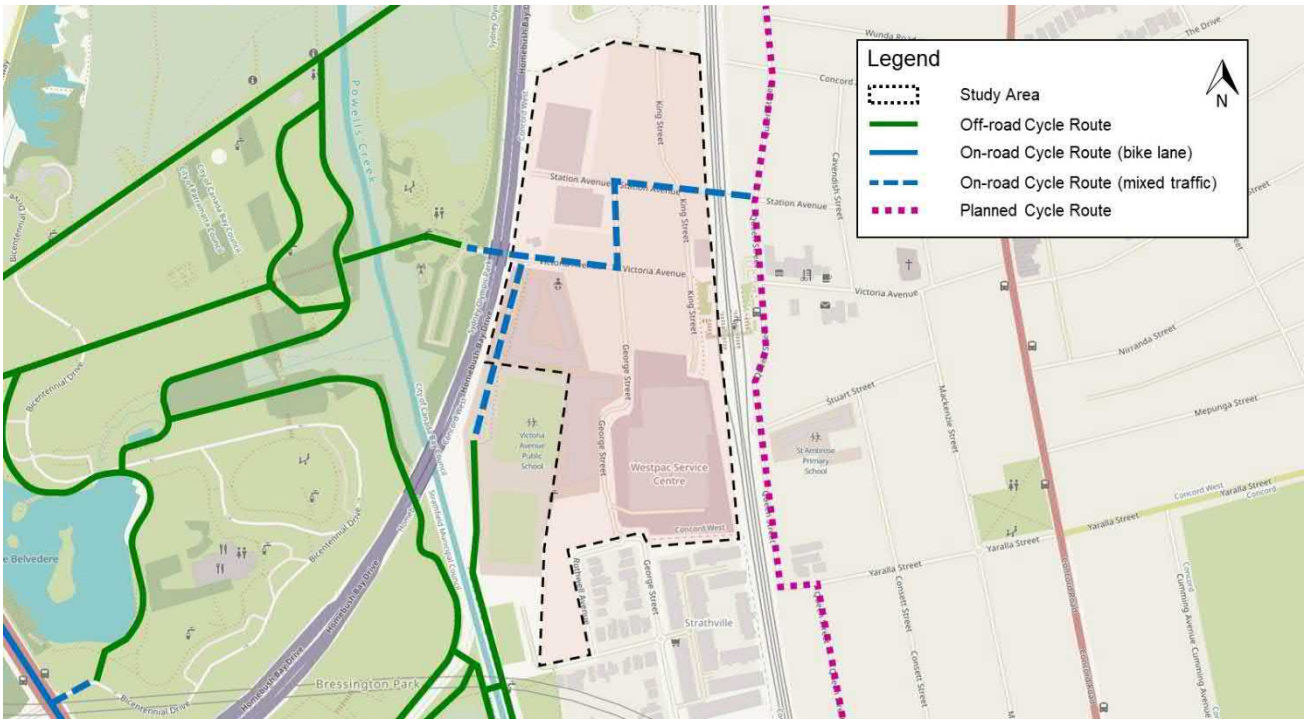


Figure 2-13: Cycleways in the Homebush North Precinct

Challenges and Opportunities Summary

Table 2-4 summarises the challenges and opportunities across the Homebush North precinct.

Table 2-4: Challenges and Opportunities – Homebush North

Opportunities	Challenges
▪ There is capacity on George Street available for additional precinct traffic ▪ New developments may be designed with constrained parking allowances to encourage use of the adjacent railway station ▪ Additional bus services may result in a shift towards public transport for short trips between the precinct and places that are not directly connected by the rail network ▪ Recreational cycling and walking facilities in the adjacent Bicentennial Park may encourage residents to reconsider active transport and then use active transport for commuting and shopping.	▪ Vehicular access to the Homebush North precinct is constrained by George Street as the primary route of travel. However, George Street through the Bakehouse Quarter serves mainly as a civic space, characterised by small roundabouts, HPAA traffic speeds, raised pedestrian crossings and a paved road surface. As it is, the precinct does not reflect a road environment suitable for high traffic volumes and bus routes. ▪ The precinct is conveniently located next to Concord West Station, so additional public transport may not be effective for increasing public transport mode share. Any measures should supplement the existing services to avoid overlaps and redundancy.

2.7 Challenges and Opportunities: Homebush South

Traffic Accessibility

Existing intersections and turning restrictions linking Parramatta Road with northern and southern areas of the Homebush South Precinct are shown in Figure 2-14.

Adapted from Google Traffic Data

Figure 2-14: Accessibility to / from Parramatta Road in the Homebush South Precinct

As shown in Figure 2-14, there are no 'cross-intersections' in the Homebush South Precinct. Drivers travelling northbound or southbound are required to enter from the local area, use short sections of Parramatta Road before turning again into the opposite local area. With a number of turn restrictions, this consolidates turning movements at a number of key intersections such as Bridge Road, Park Road, Underwood Road and Station Street. The Underwood Road intersection (for access to/from the north) and Bridge Road (for access for access to/from the south) are particularly heavily used as is the section between them along Parramatta Road. These arrangements also place pressure on local access streets such as Loftus Lane to provide a traffic circulation function in order to access intersections that can be used for turning onto Parramatta Road.

Previous planning has identified the potential for realigning the intersection of Bridge Road and Parramatta Road to provide a four-leg intersection with Hillcrest Street, enabling a direct north-south link across Parramatta Road and providing direct access to the west.

Congestion

In the AM peak, the intersections in the Homebush section of Parramatta Road generally operate under capacity, except in the case where queues from the Parramatta Road / M4 Motorway intersection spill all the way west back to Powell Street.

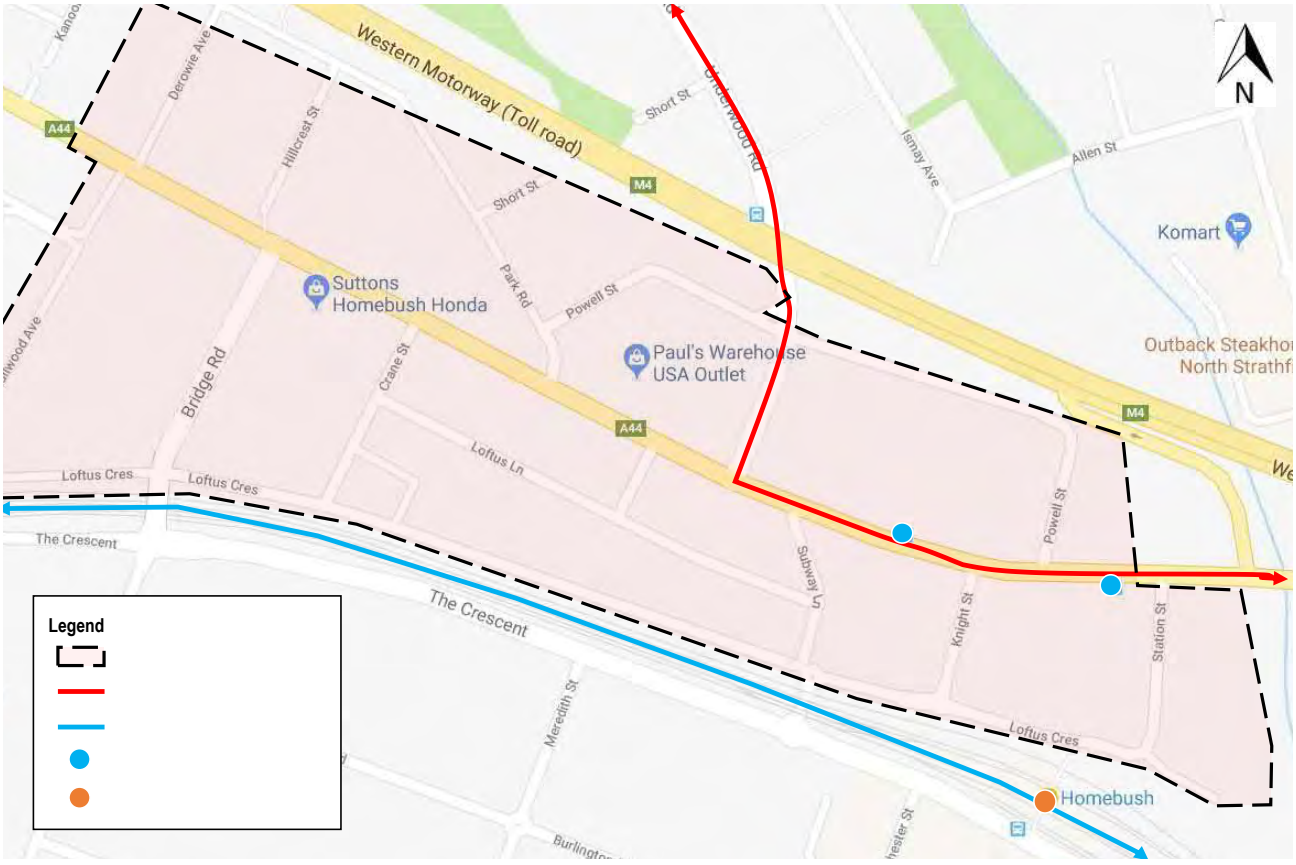
Similar conditions are also experienced in the PM peak with heavy volumes turning from Parramatta Road into the M4 Motorway demanding significant green signal time at this intersection and limiting the time available for eastbound through traffic. This can be seen in the traffic data in Figure 2-14. The ensuing queue propagates back along Parramatta Road to the west through to the Underwood Road intersection. In the westbound direction, a pinch point is formed at the George Street intersection, although queuing typically does not extend to Queen Street.

Public Transport

The Homebush South Precinct is connected to public transport by Homebush train station and two bus stops on Parramatta Road as seen in Figure 2-15. Homebush Train Station is part of the T2 Inner West & Leppington Line, with trains departing in each direction every 15 minutes during peak periods.

The two bus stops, eastbound and westbound, are serviced by routes 525 and 526. These bus routes travel along Underwood Road and then along Parramatta Road towards Concord Road, operating between Burwood and Parramatta, and Burwood and Rhodes.

With the proposed development in the precinct, there is an opportunity to increase public transport amenities with improved facilities and better connections for commuters.



Adapted from Google Maps

Figure 2-15: Homebush South Precinct Public Transport

Walkway and Cycleways

Overall, there is a lack of off-road cycle route through the Homebush South Precinct as shown in Figure 2-16. The section of the Bay to Bay Cycle and Walkway within the precinct runs from The Crescent to Pomeroy Street and is entirely on-road apart from the pedestrian bridge across the M4 Motorway. The route covers sections of road that are low-to moderate difficulty for cyclists, and are covered with footpaths. An off-road cycleway running along Powells Creek between Pomeroy Street and Parramatta Road was opened after the completion of WestConnex M4 East in 2019.

The proposed B4 Mixed Use zoning in the precinct promotes an opportunity to provide shared path connections around Parramatta Road and Homebush Train Station, and for cycleways beyond the M4 Motorway and railway line connecting the north and south.

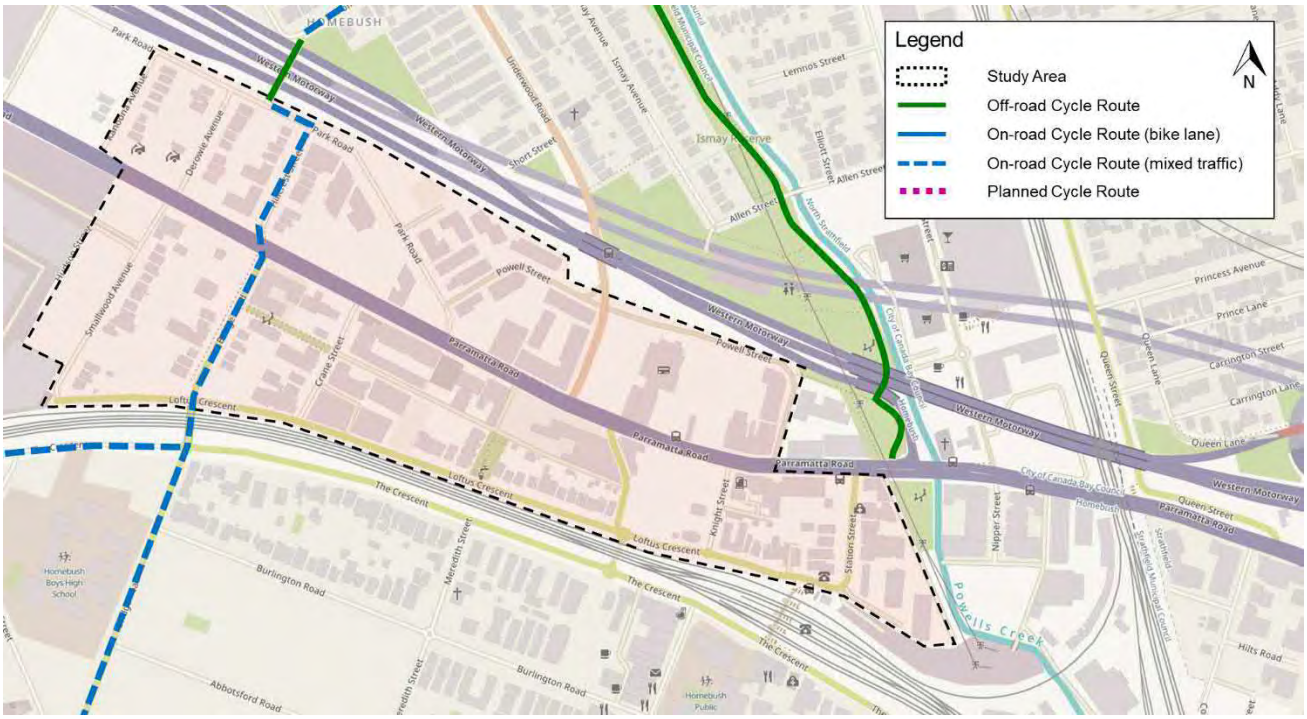


Figure 2-16: Homebush South Precinct Cycle Routes

Challenges and Opportunities Summary

Table 2-5 summarises the challenges and opportunities across the Homebush South precinct.

Table 2-5: Challenges and Opportunities – Homebush North

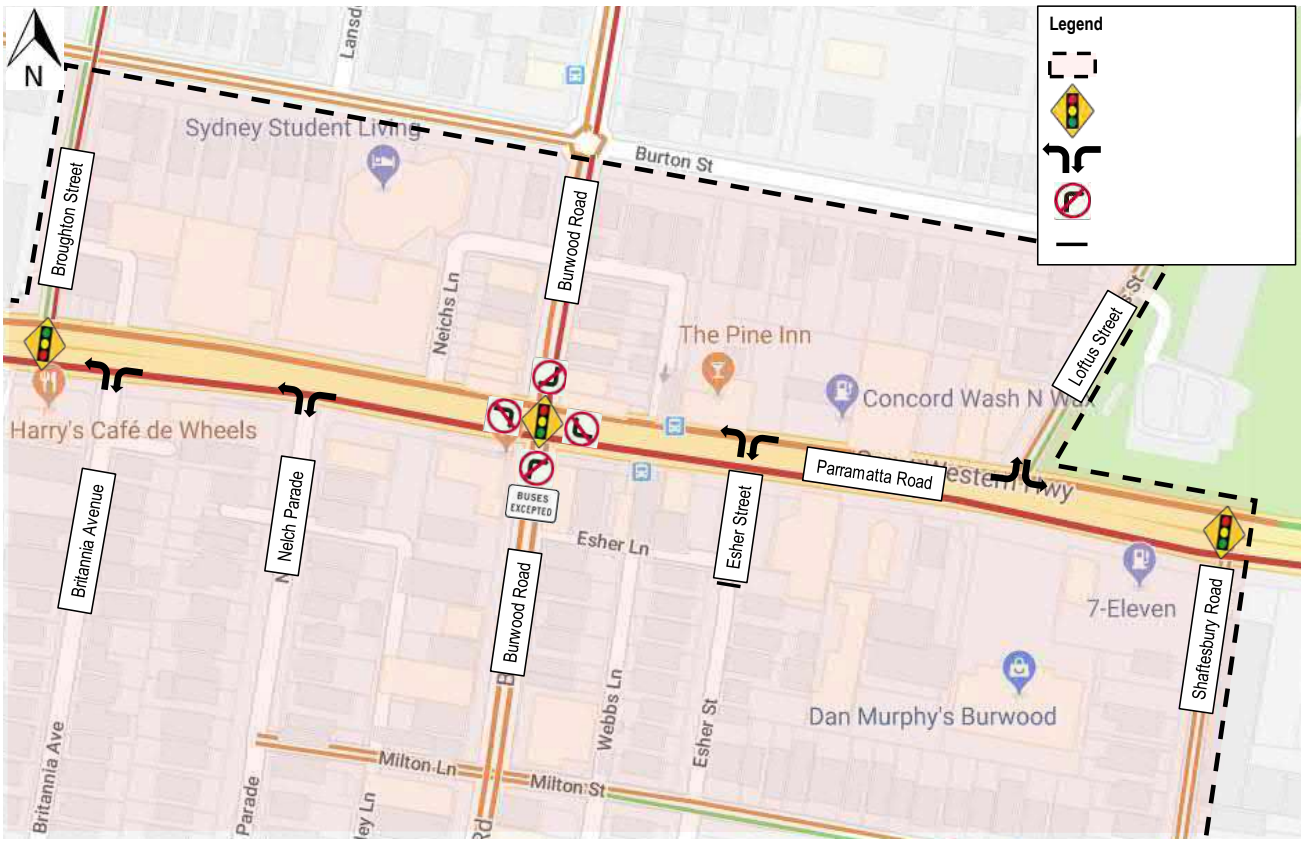
Opportunities	Challenges
▪ Additional bus routes may provide more direct north-south public transport connections and may encourage a mode shift for trips between the precinct and regional centres to the north and south ▪ Additional cycling routes connecting existing routes and Homebush Station and bicycle parking may reduce traffic and parking demand for station commuters.	▪ Traffic performance on Parramatta Road will be dependent on downstream conditions due to proximity to key intersections in the road network like Concord Road. ▪ Additional turning opportunities on Parramatta Road to improve local access opportunities may also attract through traffic which will worsen congestion.

2.8 Challenges and Opportunities: Burwood-Concord

Traffic Accessibility

Existing intersections and turning restrictions linking Parramatta Road with northern and southern areas of the Burwood Precinct are shown below in Figure 2-17. As illustrated in the figure, the busy Parramatta Road / Burwood Road signalised intersection provides the only direct north-south movements between the Burwood Town Centre and suburbs in the north. The intersection attracts over 5,000 vehicles during peak hours despite the right turn restrictions, acting as the main thoroughfare for the Burwood Town Centre.

The only opportunities for drivers travelling eastbound on Parramatta Road to turn right towards the Burwood Town Centre are the Wentworth Road or Shaftesbury Road intersections. The latter intersection was recently upgraded as a part of intersection works undertaken by TfNSW.



Adapted from Google Traffic Data

Figure 2-17: Accessibility to / from Parramatta Road in the Burwood Precinct

Congestion

Heavy congestion has been observed both eastbound and westbound on Parramatta Road in this section during both the AM and PM peak periods.

Queues in the eastbound direction were caused by through traffic turning right into Shaftesbury Road, with queues regularly spilling out of the turn pocket and into through traffic lanes. This occurred in both peak periods as it is one of the few right turn locations along Parramatta Road. This right turn have been recently had a second lane added as a part of the Shaftesbury Road intersection works.

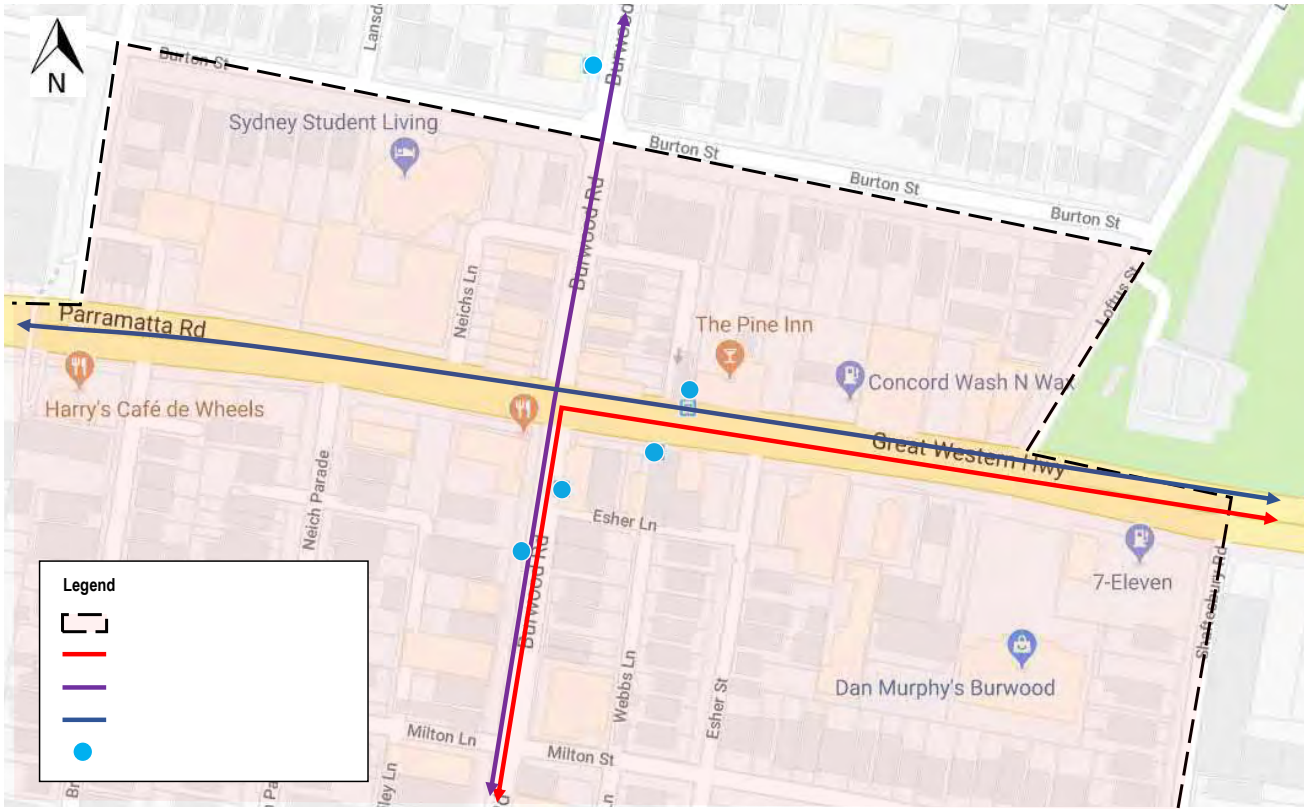
Public Transport

There are two bus stops on Parramatta Road within this precinct's boundaries. These two stops service the following routes, as shown in Figure 2-18:

- 415 – Campsie to Chiswick
- 461N – Burwood to City Hyde Park (late nights and early mornings only)
- 461X – Burwood to City Domain
- 530 – Burwood to Chatswood
- N70 – Penrith to City Town Hall (nightly only)
- N71 – Richmond to City Town Hall (nightly only)
- N80 – Hornsby to City Town Hall (nightly only)
- N81 – Parramatta to City Town Hall (Monday to Saturday nights only).

Excluding the NightRide bus services (N70, N71, N80 and N81), these services only travel along Parramatta Road for a brief period before continuing to other areas of the network away from the Parramatta Road Corridor.

Burwood Train station is located 300m south of the southern edge of the precinct.



Adapted from Google Maps

Figure 2-18: Burwood-Concord Precinct Public Transport

Walkway and Cycleways

As shown in Figure 2-19, the Burwood-Concord Precinct has a cycleway that serves as an east-west link, connecting from Strathfield up to the Cheltenham Road / Parramatta Road intersection. The cycleway also extends from Burwood Park in the south to Broughton Street to the north. The majority of this cycle route is located on local streets with mixed traffic conditions. Shared paths are provided where the route runs along busy Parramatta Road and Shaftesbury Road, and there is a ramped pedestrian bridge over Parramatta Road at Broughton Street.

A shared path on Broughton Street, between Parramatta Road and Burton Street, was opened in 2021. This route continues north as a separated cycleway.

The existing network of narrow streets and footpaths throughout the Burwood Precinct presents a key challenge in retro fitting additional cycleways, particularly along Burwood Road which is a 40km/h high pedestrian activity area south of Milton Street. The 'People Street' and walking/through links along Burwood Road and surrounds proposed by RobertsDay identifies an opportunity to intensify and prioritise pedestrian use and amenity along this major thoroughfare to key attractors such as Westfield Burwood Shopping Centre and Burwood Train Station.

Figure 2-19: Burwood-Concord Precinct Cycle Routes

Challenges and Opportunities Summary

Table 2-6 summarises the challenges and opportunities across the Burwood-Concord precinct.

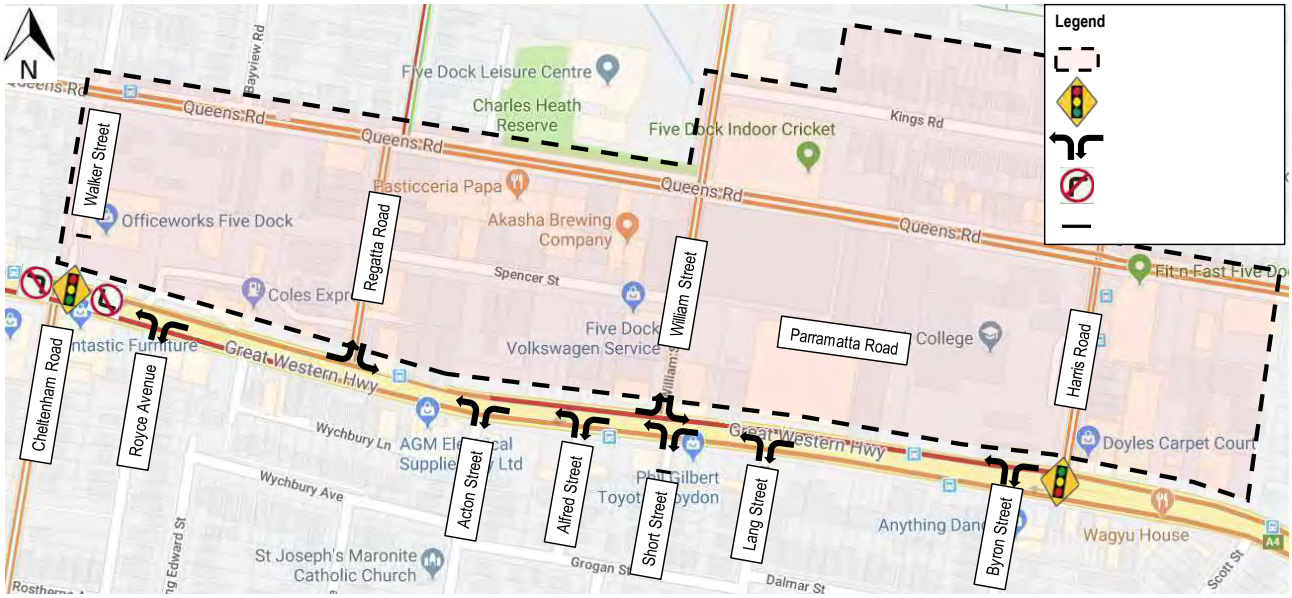
Table 2-6: Challenges and Opportunities – Burwood-Concord

Opportunities	Challenges
▪ New developments may be designed with constrained parking allowances to encourage use of nearby transport facilities such as Burwood Station, the future metro station and the bus routes running through the precinct ▪ Attractiveness of cycling around the precinct may be improved by more direct cycle routes and separation from general traffic ▪ The new Burwood North Metro station is located at the heart of the Burwood-Concord precinct, and provides an opportunity to revitalise the area around the transport core.	▪ Geometric constraints at the intersections along Parramatta Road limiting possibilities for increasing capacity ▪ The Place function of Burwood Road not being compromised to ensure that it remains an attractive, high-amenity place for people. ▪ Cycling connections, particularly for inter-LGA routes, and suitable crossing locations across the busy Parramatta Road.

2.9 Challenges and Opportunities: Kings Bay

Traffic Accessibility

Existing intersections and turning restrictions linking Parramatta Road with northern and southern areas of the Kings Bay Precinct are shown in Figure 2-20.



Adapted from Google Traffic Data Maps

Figure 2-20: Accessibility to / from Parramatta Road in the Kings Bay Precinct

As shown above, there is a four-leg signalised intersection at Parramatta Road / Walker Street / Cheltenham Road; however, Walker Street is a 'No Through Road'. Walker Street is only wide enough for one travel lane in each direction. There is an opportunity to widen Walker Street, as well as upgrade its intersections at Parramatta Road and Queens Road. However, this would increase the traffic pressures on Walker Street, which has a more local road environment bordered by residential dwellings and a school. An alternative option would be to upgrade the Regatta Road intersections at Parramatta Road and Queens Road, given Regatta Road is already a wide road and borders the proposed (B4) Mixed Use zone.

Congestion

During the AM peak period, heavy congestion is observed on the eastbound approach to Harris Road. This is due to slow turning traffic into Harris Road restricting capacity on Parramatta Road eastbound, exacerbated by morning school pick-up and drop-off operations on Harris Road.

During both peak periods, westbound traffic queues downstream from the intersection of Parramatta Road / Burwood Road into the Kings Bay Precinct. There is slow moving traffic in both directions.

Queens Road serves as the parallel 'backbone' to the Kings Bay Precinct and operates at or near capacity with heavy traffic present in both the eastbound and westbound directions during both AM and PM peak periods. Queens Road has a narrow road reserve, with narrow traffic lanes and single-lane approaches to signals.

Public Transport

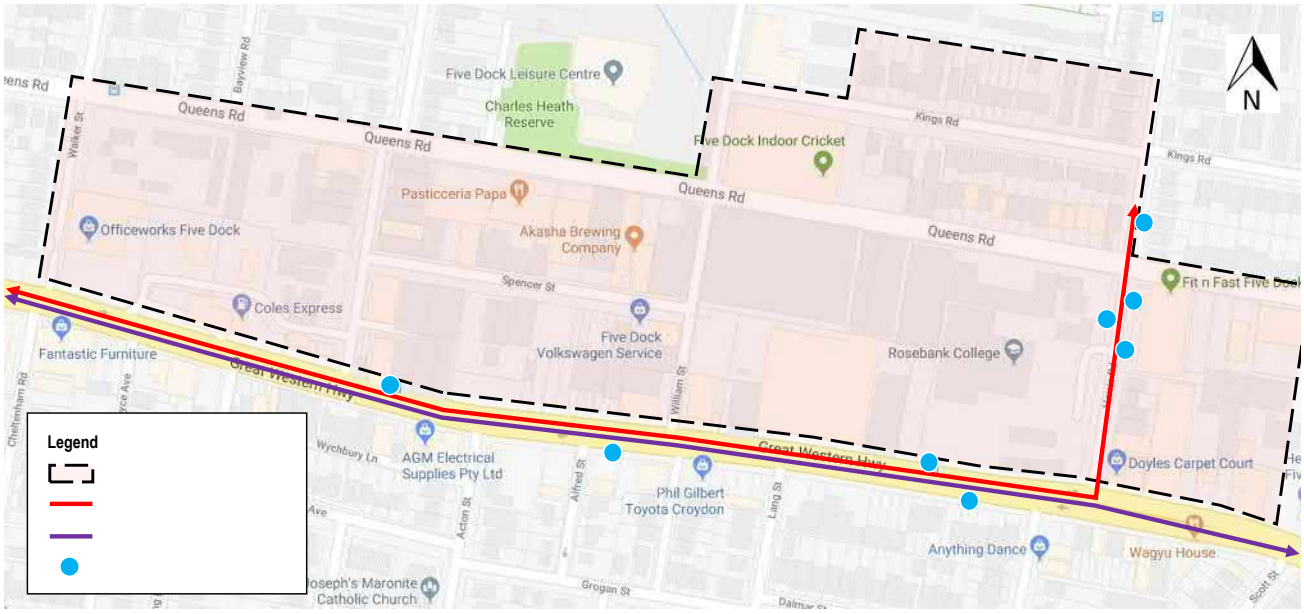
The Kings Bay Precinct does not currently have a train station and bus is the primary mode of public transport to the area. People travelling to Kings Bay have the following bus routes available, as shown in Figure 2-21.

- Route 415 – Chiswick to Campsie
- Route 461N – Burwood to City Hyde Park (late nights and early mornings only)
- Route 461X – Burwood to City Domain
- Route 530 – Burwood to Chatswood.

These services originate from Campsie, Chatswood, Burwood, the Sydney CBD, Mortlake and Five Dock. The spread of route origins means that most parts of the study area have convenient bus access to the Kings Bay Precinct.

Buses travelling to Kings Bay from southern and western areas will either use Parramatta Road or Burwood Road and these trips experience delays due to traffic congestion.

There is an opportunity to add new bus routes and/or update existing routes as the Kings Bay Precinct redevelops.



Adapted from Google Maps

Figure 2-21: Kings Bay Precinct Public Transport

Walkways and Cycleways

While footpaths are provided on both sides of Parramatta Road in the Kings Bay Precinct, there are no pedestrian crossings for almost 800 metres between the Walker Street and Harris Road intersections. The walking link on William Street proposed under the RobertsDay scheme could allow an opportunity for a signalised pedestrian crossing near the future rapid transit stop. Furthermore, the proposed upgraded intersections and walking/through links will improve accessibility between Kings Bay and Parramatta Road.

As shown in Figure 2-22, the cycleways around the Kings Bay Precinct are poorly connected for north-south journeys. The major east-west cycle route along Queens Road is currently unsuitable for inexperienced riders, as the bicycle lanes are inconsistent and traffic volumes are high. Burwood Council has constructed shared paths on a few sections of footpath on the southern side Parramatta Road, but there are no crossings designed for bicycles across the road.

A bicycle route is planned for Walker Street between the existing shared path on Parramatta Road and Renown Street. Walker Street is currently a low-speed environment for bicycles as it is no-through for vehicles between Parramatta Road and Queens Road, but has not been formalised as a cycle route with signage or linemarking.

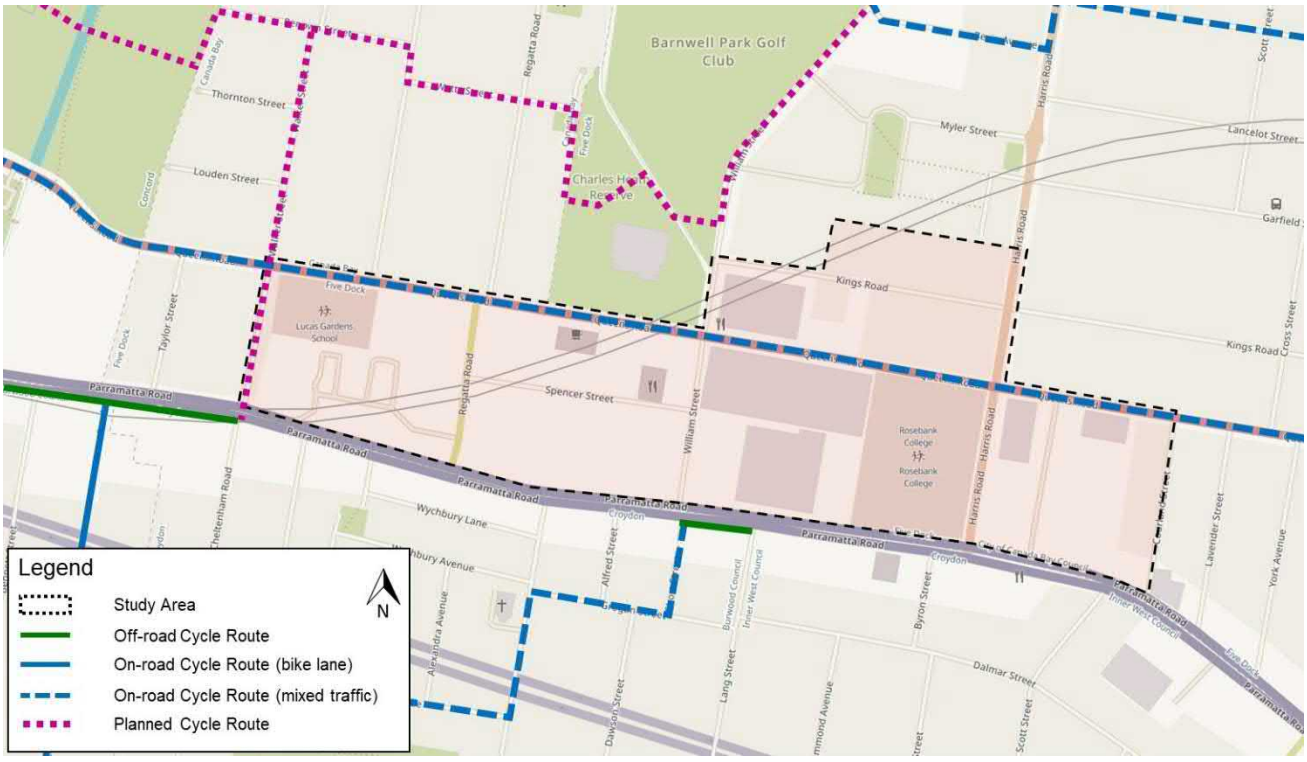


Figure 2-22: Kings Bay Precinct Cycle Routes

Challenges and Opportunities Summary

Table 2-6 summarises the challenges and opportunities across the Kings Bay precinct.

Table 2-7: Challenges and Opportunities – Kings Bay

Opportunities	Challenges
▪ Attractiveness of cycling around the precinct may be improved by more direct cycle routes and separation from general traffic. ▪ Increase turning opportunities on Parramatta Road into and out of the precinct to alleviate pressure on Harris Road ▪ Potential to augment or enhance Queens Road as a strong secondary route of travel.	▪ Geometric constraints at the intersections along Parramatta Road will limit possibilities for increasing road capacity ▪ The precinct is not located near any railway station or future metro station, so walking time and connecting bus services may limit the attractiveness of public transport mode share.

3. VISION AND PLANNING PRINCIPLES

3.1 Integrated Vision

The PRCUTS set the vision for what the Parramatta Road Corridor is expected to look like and how it would function post-WestConnex. With two lanes' worth of through traffic relocating to the M4 East tunnel, an opportunity was identified to reclaim this road space for a rapid bus corridor, essentially using dedicated bus lanes for the entire length of Parramatta Road through the study area. Post-WestConnex traffic growth will present a challenge to introducing bus lanes along Parramatta Road, which would significantly reduce the capacity of the road for general traffic.

With redevelopment of local precincts adjacent to Parramatta Road, there will be more local movements by traffic, service vehicles, pedestrians and cyclists and placing a much greater importance on accessibility to, from and across Parramatta Road than is currently needed. There will essentially be a progressive shift in the function of Parramatta Road from a main road with a high traffic movement function to areas of main streets with a more balanced role catering for turning movements, cross-movements and through movements as well for public transport, walking and cycling.

If the PRCUTS vision were able to be realised, bus lanes, more intersections, more crossing points and a reduced focus on through traffic efficiency would influence how Parramatta Road would look, feel and function. The key challenge however is that traffic modelling suggests that background traffic growth plus local development uplift will increase traffic congestion in 2036 beyond the conditions in 2019. A 'vision and validate' approach will rely on increased investment in active and public transport to support the required mode shift necessary to deliver the PRCUTS vision.

The draft future transport links and land rezoning areas for each precinct are illustrated from Figure 3-2 to Figure 3-8. These draft links have been investigated as part of this report.

The following sections describe the key attributes of these draft precinct plans relevant to traffic and transport.

3.2 Urban Frameworks by Precinct (RobertsDay)

3.2.1 Overview

RobertsDay was commissioned in parallel with this Traffic and Transport Study to undertake built form testing for each of the precincts in the study area. This analysis was used to determine the anticipated yield and distribution of dwellings based on the floor space ratio and building heights contemplated by the Parramatta Road Corridor Urban Design Guideline.

This work was completed in 2019. Urban design frameworks for the Homebush North and Homebush South, Burwood and Kings Bay precincts were prepared. The precinct areas are shown in Figure 3-1. The work also included the creation of maps showing locations of existing land ownership and approvals, recommended on-road and off-road links, rezoning areas, building heights, floor space ratios and proposed character areas.

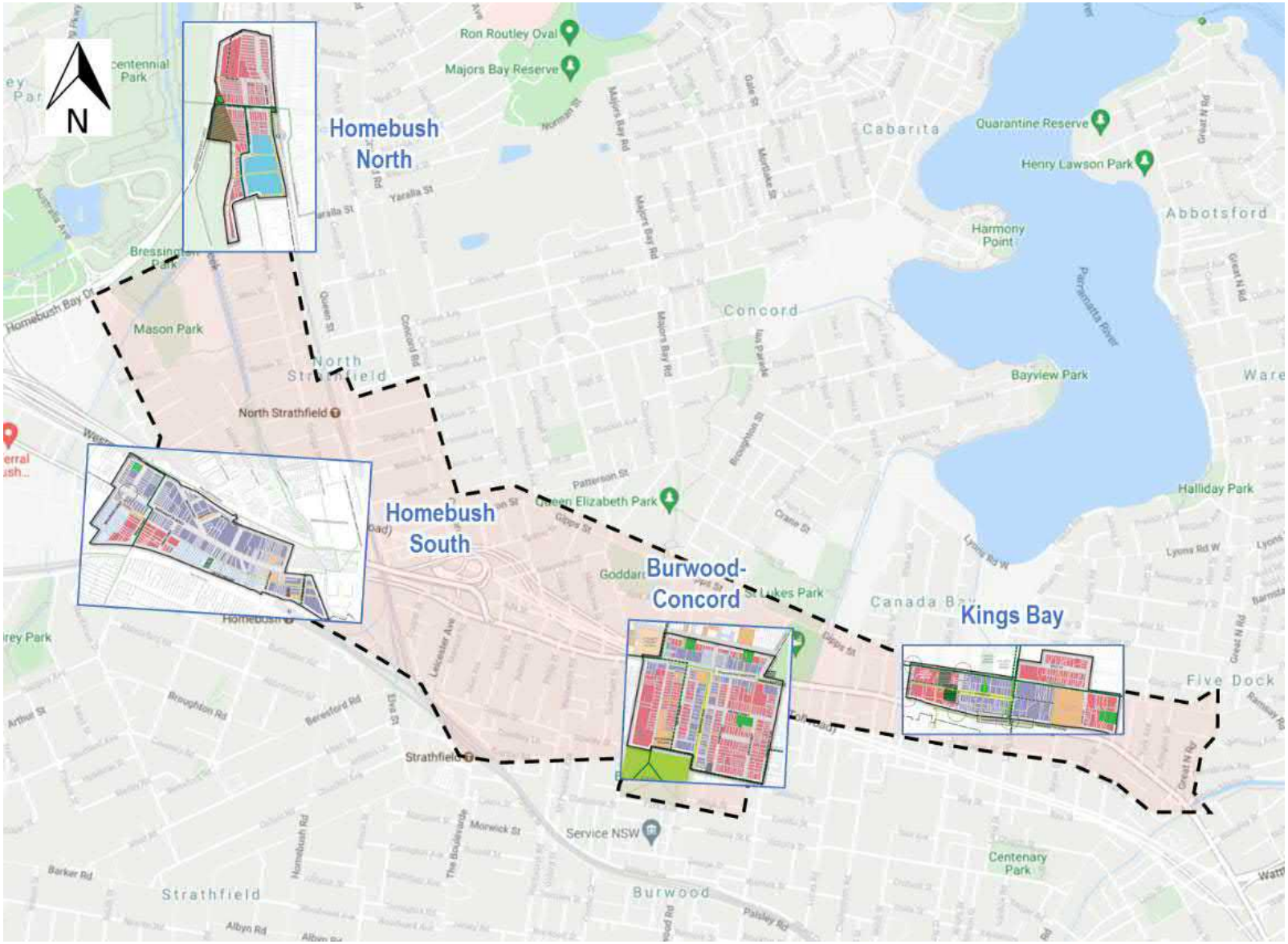
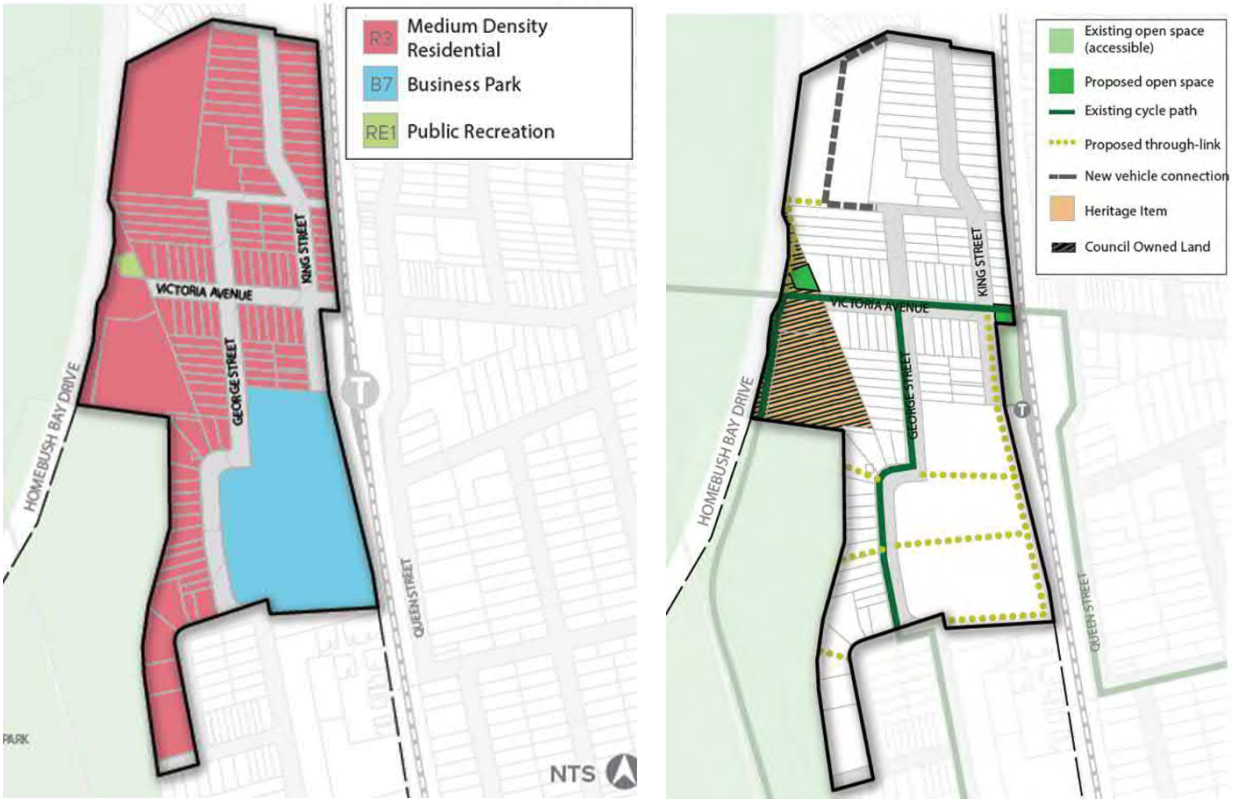


Figure 3-1: Urban Framework Precincts by RobertsDay

3.2.2 Homebush North Precinct

The Homebush North Precinct will remain predominately a residential area with a (B7) Business Park zone. New/additional through road links were proposed in proximity to Concord West Train Station to provide greater permeability for walking and cycling movements near the station whilst also improving traffic accessibility and circulation in the area.

Additional linkages were shown to also improve accessibility to Mason Park and the regional cycle path through it.



Source: Parramatta Road Precincts – A Transformation

Figure 3-2: Homebush North Precinct Rezoning Areas and Future Links

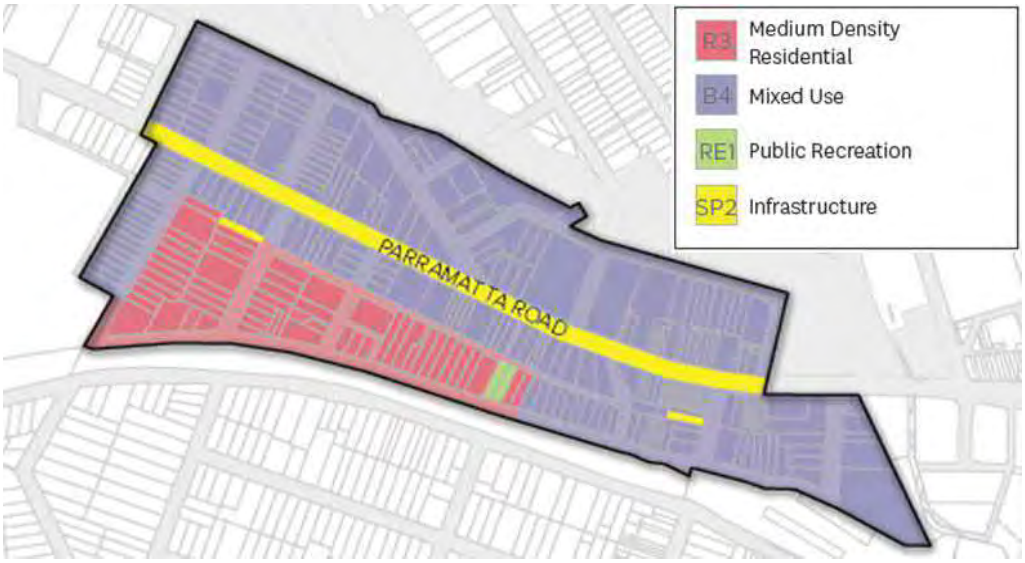
The additional through links proposed by RobertsDay are supported.

3.2.3 Homebush South Precinct

The proposed (B4) Mixed Use zoning within the Homebush South Precinct focuses strategically on the area around Parramatta Road and Homebush Train Station.

Loftus Lane is proposed to be extended to fulfil a 'rear access' function and provide a continuous walking and cycling route. A new four-leg intersection at Underwood Road and Parramatta Road could provide a new local north-south link to connect to Loftus Crescent and break up quite a large 'grid'.

RobertsDay identified there are a number of opportunities available to upgrade / realign intersections along Parramatta Road. The Smallwood Avenue and Derowie Avenue intersections with Parramatta Road were earmarked for this purpose as indicated in Figure 3-4. Furthermore, realigning the existing signalised T-intersection of Bridge Road and Parramatta Road to provide a four-leg intersection with Hillcrest Street was stated to improve connectivity across Parramatta Road for all transport modes. Whilst this may be the case, the 4-leg intersection would need to be large to cater for the turning movements at it, requiring a significant footprint.



Source: Parramatta Road Precincts – A Transformation

Figure 3-3: Homebush South Precinct Rezoning Areas

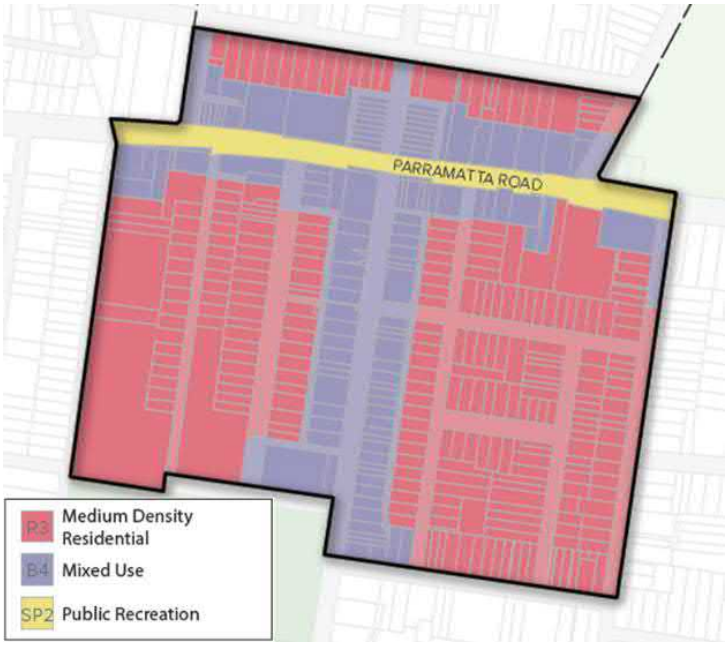
Source: Parramatta Road Precincts – A Transformation

Figure 3-4: Homebush South Precinct Future Links

3.2.4 Burwood Precinct

The proposed (B4) Mixed Use zoning within the Burwood Precinct focuses on the key Parramatta Road / Burwood Road intersection and along Burwood Road to the south. This is highlighted by the proximity to Burwood Town Centre, Burwood Train Station, and the potential rapid transit service along Parramatta Road.

A cycle path was proposed by RobertsDay along Broughton Street, Neich Parade and the southern boundary of the Burwood Precinct, as well as through links providing greater permeability between existing roads. As of December 2021, these cycle paths have been built and are operational, with wide cycle lanes along Neich Parade and a shared path along Broughton Street to the north of Parramatta Road. They identified a number of opportunities available to provide additional links, particularly west of Burwood Road, to improve connections to the future 'People' Street which aims to intensify and prioritise pedestrian use and amenity along Burwood Road. The local links proposed are supported.



Source: Parramatta Road Precincts – A Transformation

Figure 3-5: Burwood Precinct Rezoning Area

Source: Parramatta Road Precincts – A Transformation

Figure 3-6: Burwood Precinct Future Links

3.2.5 Kings Bay Precinct

The proposed B4 Mixed Use zoning around within the Kings Bay precinct focuses on William Street and Spencer Street. Spencer Street was proposed by RobertsDay to be a 'People's Street' with emphasis on active transport. The area is in proximity to the proposed location of the new (proposed) rapid transit service along Parramatta Road. This promotes the most intense travel activity in areas with the greatest transport accessibility to Parramatta Road and surrounding roads, and to amenities within the precinct.

The proposed walking and through links and the intersections earmarked for upgrades were claimed to provide additional and improved north-south and east-west connections in the Kings Bay Precinct and to Parramatta Road. The proposed north-south cycle path along William Street was stated to promote an opportunity for a signalised pedestrian crossing at Parramatta Road, which will also provide an additional crossing point and reduce the current 800-metre crossing gap between the Walker Street and Harris Road intersections. The permeability of the network as proposed by RobertsDay is supported.

Source: Parramatta Road Precincts – A Transformation

Figure 3-7:Kings Bay Precinct Rezoning Area

Source: Parramatta Road Precincts – A Transformation

Figure 3-8:Kings Bay Precinct Future Links

3.3 Key Transport Planning Principles

3.3.1 Overview

A review of the PRCUTS documentation and stakeholder input resulted in the development of five (5) principles relevant to the precinct transport strategy, as detailed in the following sections. They key principles were agreed on workshops with the study stakeholders

3.3.2 Principle 1 – Make the Most of WestConnex

WestConnex provides an alternative route for long-distance east-west traffic and is intended to take a reasonable proportion of these vehicles off Parramatta Road. Reducing through traffic and improving local accessibility are key facilitators of redevelopment in the precincts along Parramatta Road. Timely action is required to maximise the opportunities provided by WestConnex which include shifting the function of Parramatta Road towards local trips, upgrading intersections to improve local access and north-south access, providing bus lanes and improving active transport links to and from the Corridor. Bus lanes should be implemented as soon as possible to avoid the otherwise inevitable take-up of this relieved capacity by traffic from other origin-destination markets. Traffic congestion is rapidly returning to Parramatta Road and the practicality of this principle is diminishing.

Key outcome: *Capitalise on the opening of WestConnex by reorienting the function of Parramatta Road to localised trips and away from through-trips. (This key outcome is unlikely to be realised unless two lanes of through traffic on Parramatta Road are removed and re-purposed for public transport or local traffic accessibility improvements).*

3.3.3 Principle 2 – Localise Parramatta Road

The transfer of long-distance traffic from Parramatta Road onto WestConnex provides the opportunity to reconsider the role of the Corridor. While remaining a primary movement function between centres, it is highly unlikely that Parramatta Road will 'de-congest', particularly if two of its lanes are dedicated to buses. Local traffic movements should be promoted and long distance through traffic usage should be discouraged to reinforce its local accessibility function. Methods of localising the role of Parramatta Road include upgrading existing intersections to cater for new development, providing more/new intersections to reduce traffic circulation distances, and improving and increasing north-south links across Parramatta Road for all modes.

Key outcome: *More signalised intersections, more side streets and more turning opportunities at intersections. (The potential to achieve this now is diminished and will diminish further over time as traffic continues to rapidly grow in the corridor).*

3.3.4 Principle 3 – Maximise Public Transport Efficiency

By removing over 20,000 vehicles per day from Parramatta Road, WestConnex will allow the introduction of dedicated (full-time) bus lanes on Parramatta Road. Dedicated bus lanes will allow rapid bus services to be introduced along with the potential for bus priority measures at intersections. Dedicated lanes will significantly improve bus travel times and reliability elevating the opportunity for buses to capture a larger proportion of more travel markets. Bus lanes on Parramatta Road will not only cater for new Rapid Bus Routes but will also incrementally reduce travel times and improve reliability for the myriad of services which weave their way from north-to-south (and vice versa) using sections of Parramatta Road. Even with Sydney Metro West, there would be a significant role for rapid buses on dedicated bus lanes to feed passengers from the Parramatta Road precincts to adjacent precincts, to Parramatta and to the Sydney CBD.

Key outcome: *Introduce kerbside bus lanes.*

3.3.5 Principle 4 – Improve Walking and Cycling Connectivity

With long blocks fronting Parramatta Road, north-south permeability is currently restricted and there are long distances to walk between parking areas and local businesses in some places. Greater permeability through redevelopment, coupled with wider footpaths and more cross-Parramatta Road linkages will significantly improve the attractiveness of walking to/from precincts.

Cycling routes are disjointed and whilst long-distance cycling conditions along Parramatta Road may not be favourable, alternative parallel routes for casual/recreational cycling will be very important as will north-south linkages to train stations and bus stops.

Key outcome: *More signalised pedestrian crossing points at the additional signalised intersections and wider north-south paths along more street approaches to Paramatta Road. (Could be achieved to some extent with redevelopment).*

3.3.6 Principle 5 – Manage Long-stay Parking

Bus lanes will remove the possibility of reinstating on-street parking in Parramatta Road; however, more closely spaced side streets allow for access to more on-street parking space as well as better access to off-street parking areas. With short stay parking relocating to side streets, timing restrictions may be needed to ensure long-stay parking is discouraged in these areas to allow the short-stay parking to occur. With the rezoning of the four precincts and their proximity to either major public transport routes or major train stations, increasing modal shift away from cars will reduce the need for long-stay parking anyway. Societal trends in reduced car ownership along with increasing usage of rideshare and car-share means less long stay parking as well and this should be encouraged through policies to wind back the amount of all day parking required to be provided for residents in these highly accessible precincts.

Key outcome: *Lower multi-unit residential development parking rates in defined accessible precincts.*

3.4 Future Modal Share Targets

Table 3-1 shows the aspirational modal share targets for each precinct for the year 2023, which were accepted by the Project Working Group in 2018.

Table 3-1: Mode Share Targets

Precinct	Walk	Bicycle	Bus	Train	Car as Driver	Car as Passenger
Homebush	4%	2%	3%	40%	46%	5%
Canada Bay	4%	2%	20%	15%	54%	5%
Strathfield/Burwood	6%	2%	15%	45%	28%	4%

The reason Homebush bus shares are lower than the other precincts reflects current data which shows that most public transport trips to/from this precinct are by heavy rail. This is expected to continue to be the case as heavy rail would be far more competitive than bus even with bus lanes on Parramatta Road.

The summary of the development of these mode share targets is included in **Appendix B**.

It is important to highlight that these targets were established in 2018 prior to confirmation of Sydney Metro West as an approved project and were not used further in the study.

3.5 Tempering the Outcomes

The vision and key principles were established in mid-2018 before WestConnex M4 was open in the study area and the PRCUTS vision was of one lane each way on Parramatta Road being converted into exclusive use for public transport. Since then, the M4 has opened and traffic volumes on Parramatta Road are rising back towards pre-2018 levels with its six-lane configuration.

There is a resulting conflict between Movement and Place functions along the Parramatta Road corridor and surrounding major roads. The vision for new precincts like Homebush South and Kings Bay is to create a number of high amenity ‘urban villages’ and to encourage the Place-based localisation of sections of the corridor. However, the six (traffic) lane configuration of the road corridor reinforces its fundamental Movement function.

This dichotomy in the role of the corridor should be resolved to guide strategic decision making. The balance between Movement and Place by location and by time of day needs to be established once there is an understanding of what ‘whole of corridor’ initiatives are to be introduced. To this end, TfNSW is currently undertaking a strategic business case which considers long-term public transport options along the Parramatta Road corridor

While this would encourage a more localised Parramatta Road with less emphasis on facilitating high volumes of through traffic, the implementation specifics, including timing of these measures is at yet unknown. For the purposes of this study, and with early guidance of key stakeholders, it has been assumed that the Movement role will remain the dominant role of the corridor, with a priority of maintaining a reasonable level of operational traffic performance along the corridor and in the local networks either side of it.

Consequentially, some of the key outcomes agreed in mid-2018 have needed to be tempered in late-2021 and until such time that an alternative balance of Movement and Place for Parramatta is confirmed through specific actions. The revised key outcomes are:

- **Principle 1:** Make the Most of WestConnex.

  Original Key outcome: Don't let relieved capacity created by WestConnex be filled up with other through traffic trips

  Tempered outcome: *Modelling provided by TfNSW shows Parramatta Road carrying even higher traffic demands in 2036 than it did in 2018 (pre M4 East). The scope for changes along Parramatta Road is limited to some potential increases in side street accessibility and turn restrictions to better manage localised congestion as side street demand increases.*

- **Principle 2:** Localise Parramatta Road.

  Key outcome: More signalised intersections, more side streets and more turning opportunities at intersections

  Change: *Since the traffic reduction anticipated by the opening of the M4 WestConnex has been lower than predicted, the scope for changes along Parramatta Road is limited to some potential increases in side street accessibility at existing intersections, and turn restrictions to better manage localised congestion as side street demand increases*

- **Principle 3**: Maximise Public Transport Efficiency.

  Key outcome: Introduce kerbside bus lanes

  Change: *While it is understood that TfNSW is currently preparing a strategic business case for the Parramatta Road corridor which considers options for dedicated bus lanes on Parramatta Road, TfNSW has advised not to include kerbside bus lanes as an assumption for this study. Also, since mid-2018, MetroWest has been confirmed with stations at Burwood North and Strathfield North. Bus service planning is likely to be modified significantly to anchor to with these new stations whilst also servicing the existing train stations and residential areas in the study area*.

- **Principle 4:** Improve Walking and Cycling Connectivity.

  Key outcome: More signalised pedestrian crossing points at the additional signalised intersections and wider north-south paths along more street approaches to Paramatta Road.

  Change: *The role of Parramatta Road seems to have defaulted back from the PRCUTS vision to its existing role and any additional intersections are unlikely to be supported without a shift in role for Parramatta Road. Nevertheless, opportunities to increase the number of pedestrian crossing opportunities, particularly near uplift areas, have been pursued.*

- **Principle 5:** Manage Long-stay Parking

  Key outcome: Lower multi-unit residential development parking rates in defined accessible precincts.

  Change: *No change.*

4. STUDY AREA-WIDE STRATEGIES

4.1 Forecast Corridor Growth

4.1.1 STFM Travel Zones

The Strategic Traffic Forecasting Model (STFM) is a strategic transport model which covers metropolitan Sydney. TfNSW has updated this model and provided outputs from it to ensure consistency of growth assumptions for the length of PRCUTS being investigated. There are 26 STFM travel zones within the study area as shown in Figure 4-1. The zones, and part zones, which contain the redevelopment precincts (or 'uplift areas') are shown in a darker colour.

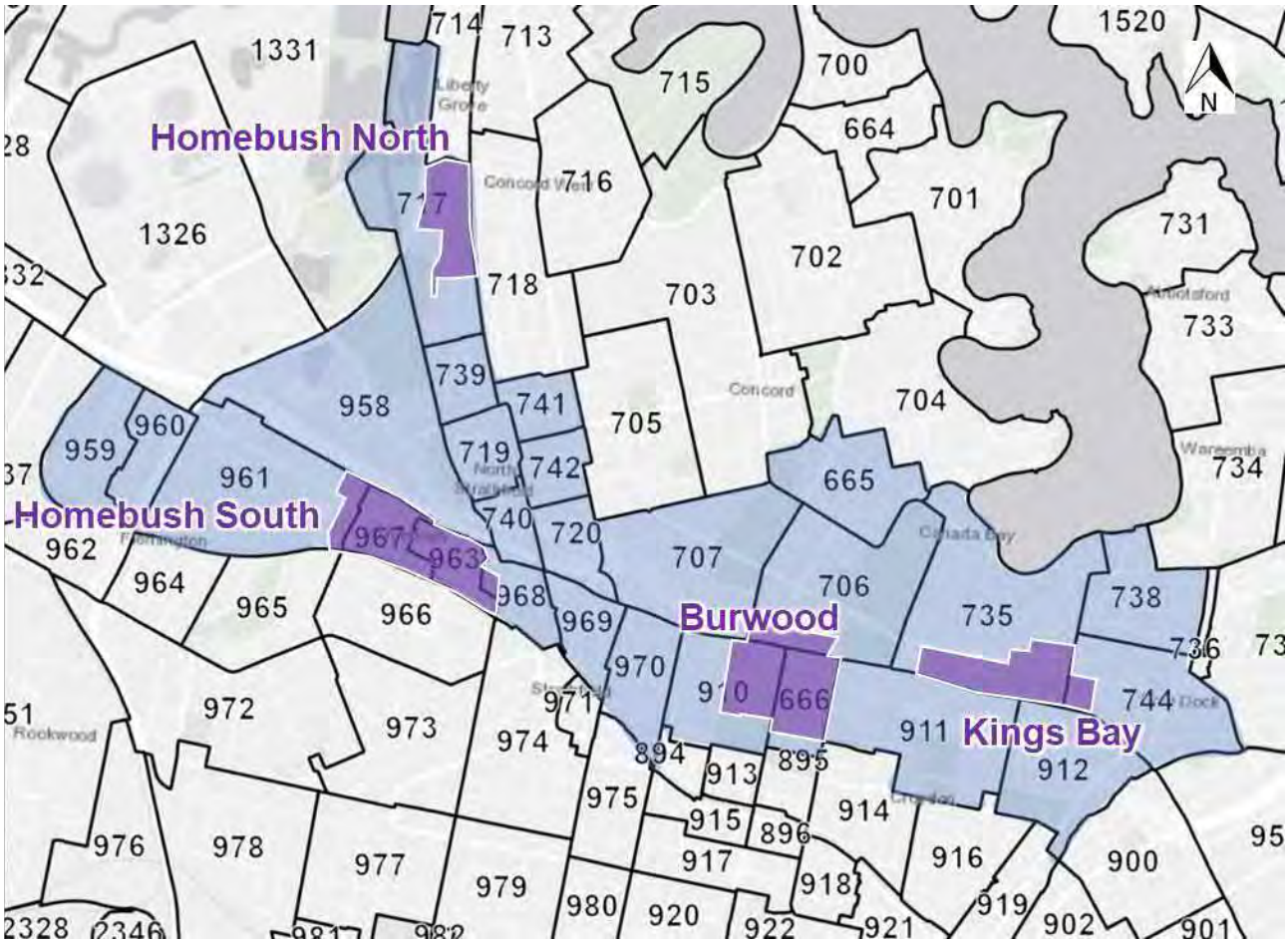


Figure 4-1: STFM Travel Zones in the Study Area (and uplift areas in purple)

4.1.2 Population Growth

For the study area zones, the background population growth and the additional population growth in the proposed uplift areas are shown in Table 4-1.

Table 4-1: Study Area Population Growth from 2016 by Travel Zone

STFM Zone	2016	2016 - 2026 Growth	2016 - 2036 Growth
665	1473	+821	+3263
666	1443	+3468	+3708
706	1380	+770	+3058
707	2056	0	+1697
717	1543	+979	+2677
719	590	0	+1280
720	583	0	+241
735	2690	+6122	+6531
738	1618	+415	+665
739	1355	0	+2935
740	0	0	0
741	538	0	+222
742	666	0	+276
744	2359	+606	+970
910	1343	+3229	+3453
911	1978	0	+1841
912	1531	0	+2205
958	1233	0	+7901
959	2245	0	+283
960	2086	0	+382
961	364	+2244	+4460
963	832	+2031	+2217
967	1167	+2847	+3108
968	895	+2186	+2386
969	2776	0	+1920
970	1626	0	+201
Total	**36369**	**+25,719**	**+57,881**

Accounting for development in the uplift areas, the study area's population will increase from 36,000 in 2016 to 94,000 in 2036. The distribution of this population is shown in Figure 4-2.

The highest population numbers in 2036 are located in the Homebush South (zone 958) and Kings Bay (zone 735) precincts. These areas are also the ones with the greatest population growth between 2016 and 2036 as shown in Figure 4-3.

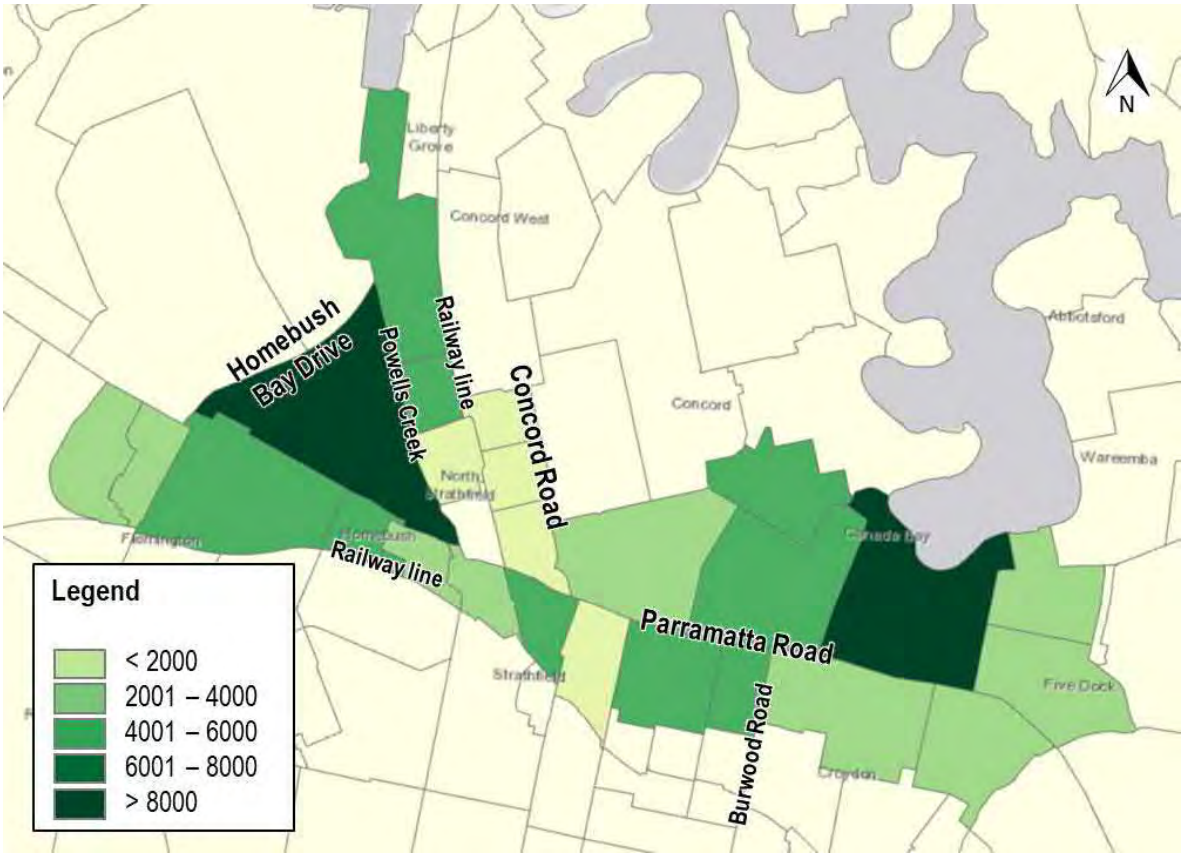


Figure 4-2: **Population in 2036 with Uplift**

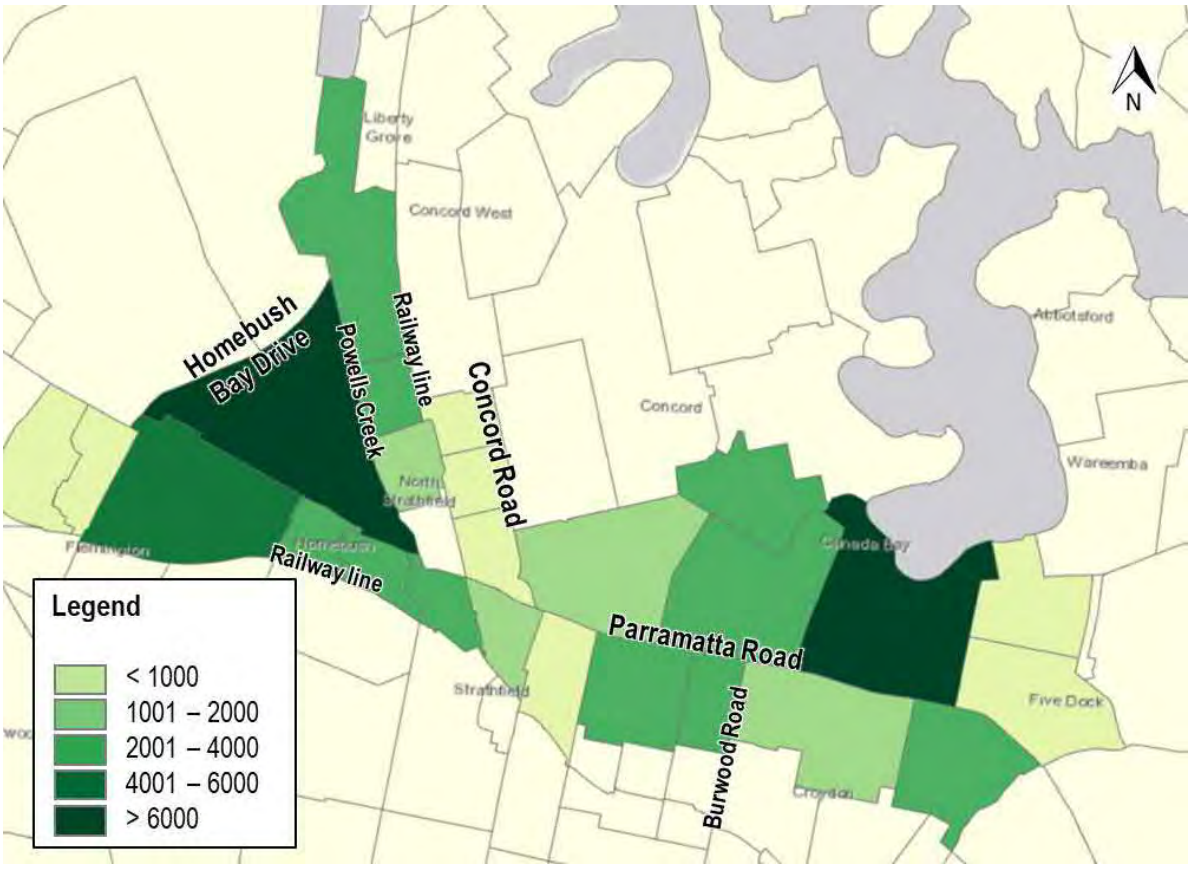


Figure 4-3: **Population Growth between 2016 and 2036 with Uplift**

4.1.3 Employment Growth

Local employment in the study area generates more incoming traffic in the AM peak and more outgoing traffic in the PM peak, to and from other parts of Sydney. The employment growth to 2036 is shown in Table 4-2.

Table 4-2: Study Area Employment Growth from 2016 by Travel Zone

STFM Zone	2016	2016 - 2026 Growth	2016 - 2036 Growth
665	7	+6	+18
666	645	+19	+41
706	800	+668	+1910
707	516	+0	+305
717	1787	+181	+641
719	708	+0	+138
720	195	+0	+59
735	1644	+152	+336
738	798	+3	+71
739	14	+0	+3
740	1302	+0	+252
741	308	+0	+93
742	139	+0	+42
744	1299	+4	+115
910	1604	+47	+101
911	873	+0	+514
912	379	+0	+773
958	2991	+0	+1386
959	1334	+0	-164
960	98	+0	+100
961	3535	+399	+741
963	602	+1012	+1091
967	372	+625	+674
968	340	+571	+615
969	178	+0	+559
970	1120	+0	+30
Total	**23588**	**+3686**	**+10444**

The number of jobs in the study area will increase from 23,588 in 2016 to 34,032 in 2036.

Figure 4-4 shows the distribution of jobs in 2036. The area with the most jobs are in the Homebush South precinct and surrounds (zones 958 and 961), bounded by Homebush Bay Drive, Powells Creek and the Main Suburban railway line. The greatest employment growth is in the Kings Bay precinct (zone 706), followed by the Homebush South precinct (zone 958), as shown in Figure 4-5.

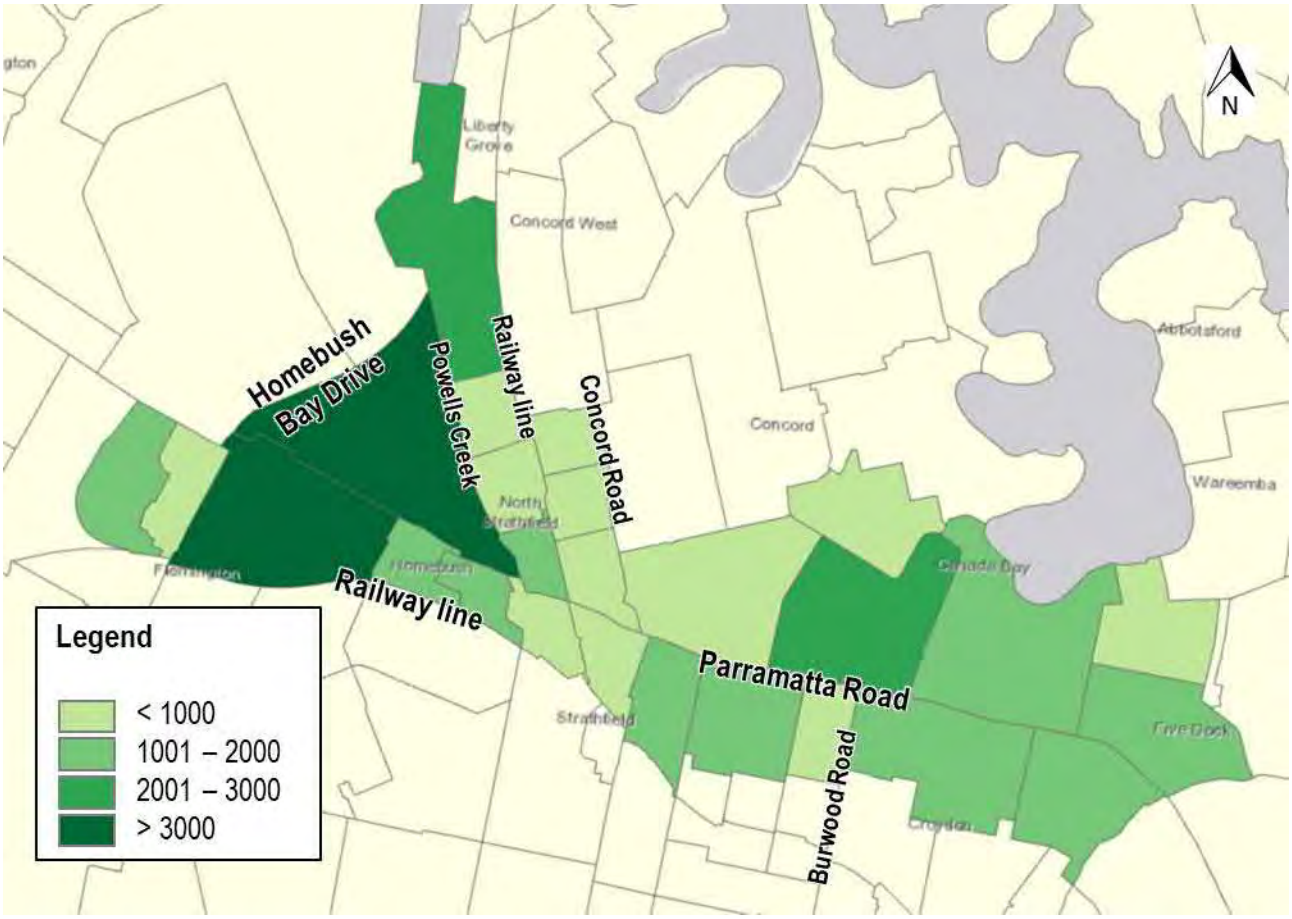


Figure 4-4: Employment in 2036 with Uplift

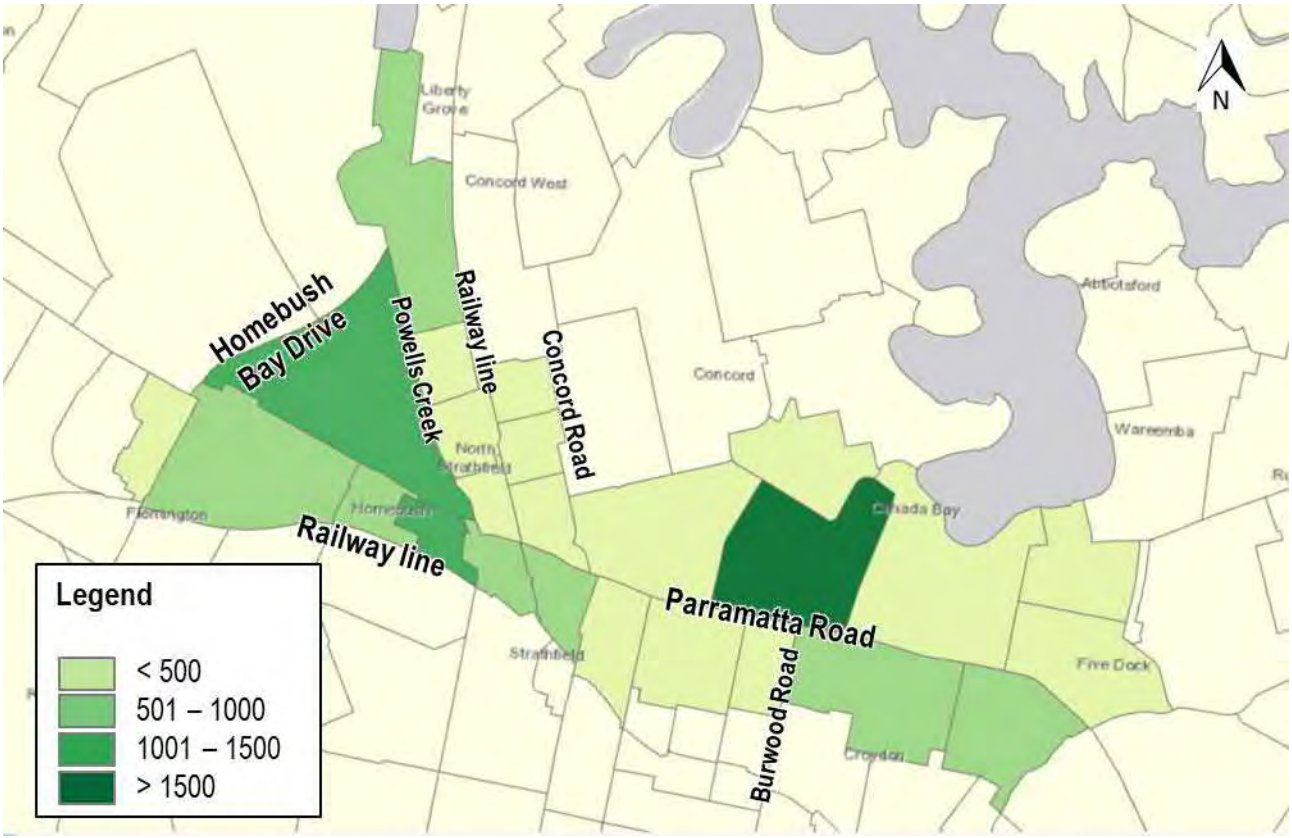


Figure 4-5: Employment Growth between 2016 and 2036 with Uplift

4.1.4 Traffic Growth

Table 4-3 shows the traffic growth from 2019 projected from the STFM for trips to, from, within and through the study area. The majority of the traffic growth in these scenarios is 'external to external'; that is traffic passing through the study area.

Table 4-3: Study Area Traffic Growth from 2019

Scenario	Ext to Ext	Int to Ext	Ext to Int	Int to Int	Total
AM Peak - 2 Hours					
2026 AM Benchmark	+3,826	-474	-719	-70	**+2,563**
2026 AM with Uplift	+5,485	+1,141	+118	+48	**+6,793**
2036 AM Benchmark	+7,223	-311	+167	+132	**+7,210**
2036 AM with Uplift	+10,979	+2,424	+2,150	+552	**+16,106**
PM Peak - 2 Hours					
2026 PM Benchmark	+4,613	-904	-567	-91	**+3,051**
2026 PM with Uplift	+6,707	+168	+1,400	+75	**+8,350**
2036 PM Benchmark	+8,008	+32	-358	+131	**+7,814**
2036 PM with Uplift	+12,267	+2,480	+2,914	+694	**+18,356**

Ext: Means external to the study area.
Int: Means internal to the study area.

The ultimate scenario (2036 with Uplift) shows a total growth in traffic of around 16,000 to 18,000 trips across the two hour peaks. It is important to note that the 'Ext to Ext' traffic includes WestConnex traffic passing through the study area and not using Parramatta Road.

4.1.5 Future Year Traffic Demands

Table 4-4 shows the total traffic demands from STFM within the study area.

Table 4-4: Study Area Traffic

Scenario	Ext to Ext	Int to Ext	Ext to Int	Int to Int	Total
AM Peak 2 Hours					
2019 AM	36,045	4342	5043	270	**45,701**
2026 AM Benchmark	39,871	3868	4324	200	**48,263**
2026 AM with Uplift	41,530	5484	5161	318	**52,493**
2036 AM Benchmark	43,606	4031	5192	402	**53,231**
2036 AM with Uplift	47,024	6767	7193	823	**61,806**
PM Peak 2 Hours					
2019 PM	37,218	6163	4554	339	**48,274**
2026 PM Benchmark	41,831	5258	3987	249	**51,325**
2026 PM with Uplift	43,925	6330	5954	414	**56,624**
2036 PM Benchmark	45,698	6195	4196	471	**56,560**
2036 PM with Uplift	49,832	8643	7469	1033	**66,977**

Ext: Means external to the study area.
Int: Means internal to the study area.

The traffic growth projections for the study area are plotted alongside the population and employment inputs into the strategic modelling in Figure 4-6. The demographic growth is based on 2016 data instead and the traffic growth rates are based on 2019 model outputs. The comparison shows that trip (traffic) growth is well below population in the study area, highlighting an increasing shift to active transport and public transport modal share in the future.

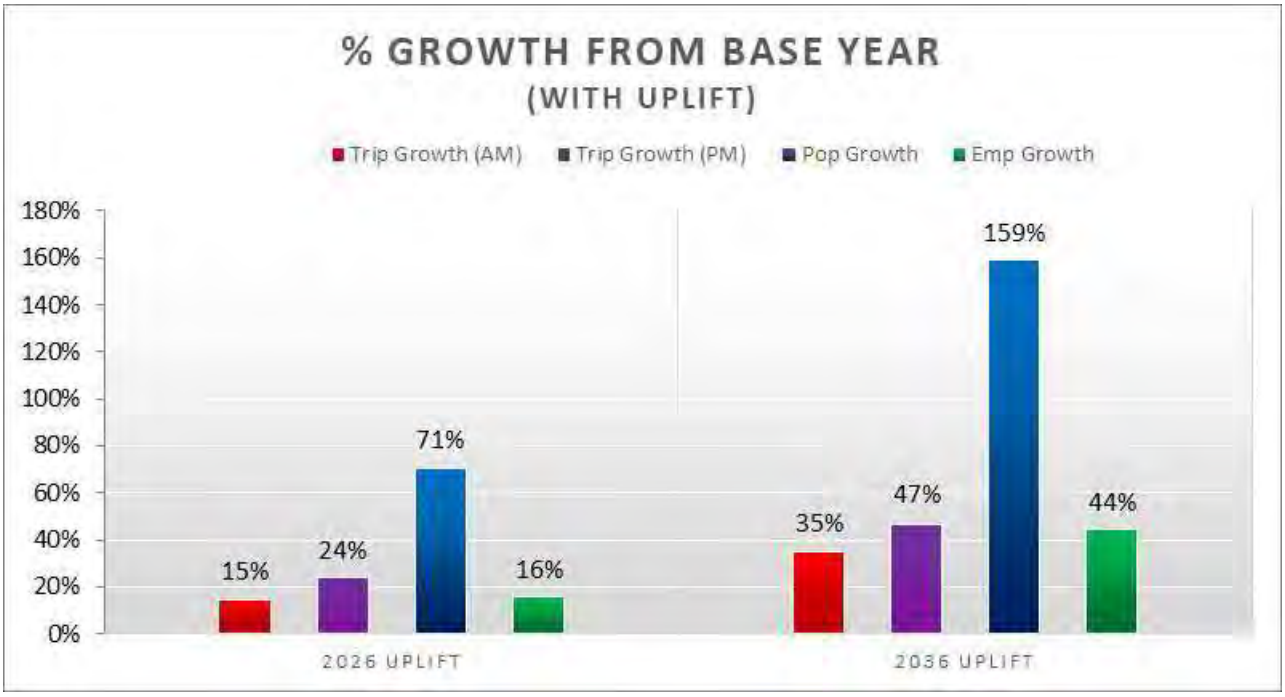


Figure 4-6: Percentage Growth from Base Year – Traffic vs. Population vs. Employment

4.2 Methodologies

4.2.1 Traffic Models Development and Approval Process

Base Model - 2018

A base year AIMSUN microsimulation traffic model was prepared in 2018 for the study area. The model used starting traffic demands from a 'cordon' of the STFM and then calibrated and validated to traffic data. The 2018 base model was deemed fit-for-purpose and approved for use by TfNSW (then Roads and Maritime Services) in late 2018.

Updated Base Model – 2019

The WestConnex M4 tunnel was opened in July 2019 and the 2018 model was updated to create 2019 (post-WestConnex) base traffic demands to account for this major change in traffic patterns.

Cordon matrices were extracted from the STFM for 2019 (post-M4 tunnel) and compared to the 2018 STFM cordon matrices so that the traffic demands changes could be replicated in the study area AIMSUN model. The process used is shown in Figure 4-7.

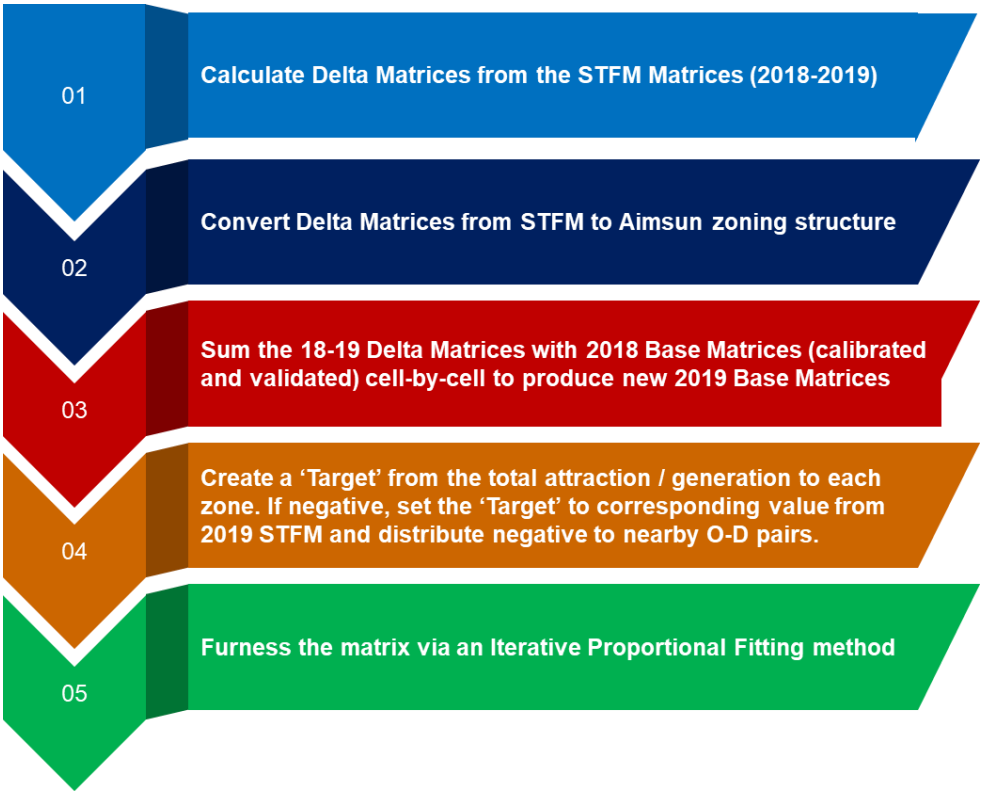


Figure 4-7: 2018 to 2019 Traffic Demand Development Process

These 2019 traffic demands were used only for the development of future year traffic demands (2026 and 2036) and were not modelled in AIMSUN.

Future Year Models – 2026 and 2036

Cordon matrices were extracted from the TfNSW - provided STFM for 2026 and 2036 for two traffic demand scenarios: 'No Uplift' and 'With Uplift'.

The process for the development of the future year traffic demands is summarised in Figure 4-8.

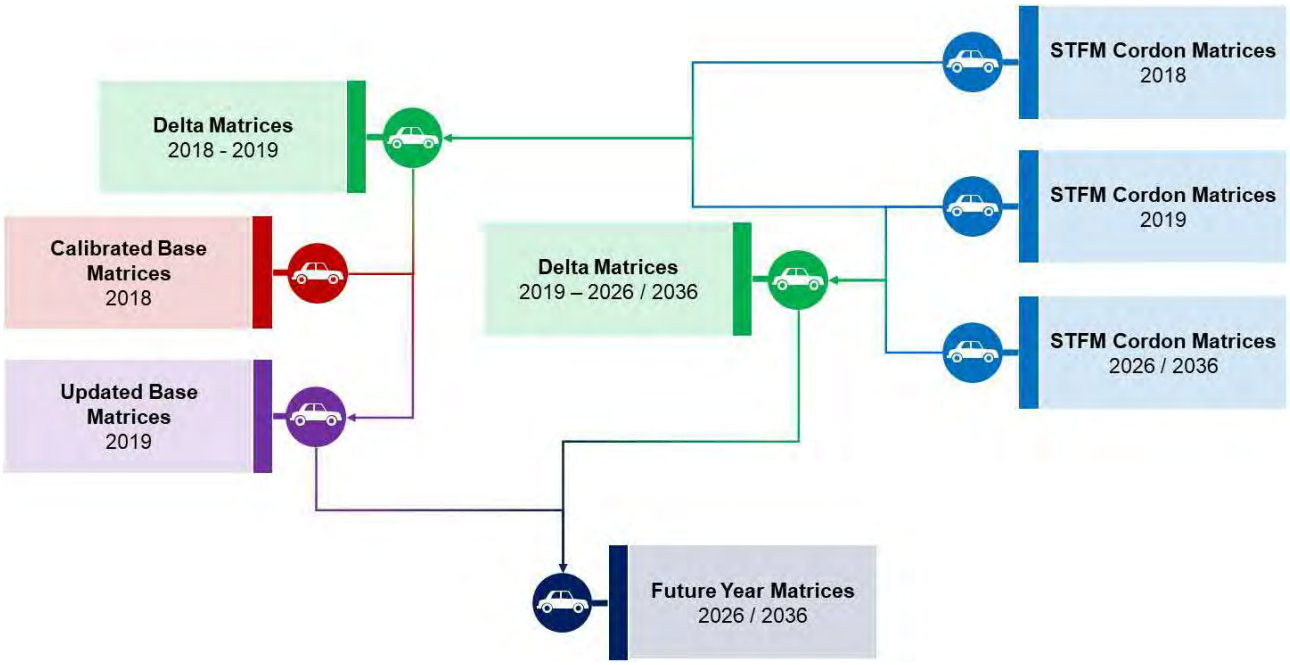


Figure 4-8: Future Year Traffic Demands Calculation Process

Constraining Future Year Growth

Preliminary outputs from the future year models (both with and without Uplift) found that forecast year 2036 traffic demand substantially exceeded the capacity of the road network, with extensive delays and long queues resulting in highly inconsistent modelling results which were unsuitable for providing a detailed assessment of network issues.

This is not an uncommon finding in urban networks where large strategic growth forecasts are added to high base traffic demands. In reality, the network would be upgraded as this growth occurs or the growth may be constrained by the available capacity as people make alternative travel choices. That is, substantial growth in demand and no network upgrades is a hypothetical case.

In order to produce a suitable model with consistent results, future year growth would need to be reduced to a level where the network capacity would not be greatly exceeded. To achieve this, a reduction factor was applied to all external-to-external growth and the growth in the PRCUTS development precincts were unchanged.

Upon further advice from TfNSW in mid-August 2021, the reduction of external-to-external growth was changed from a global reduction to a more targeted approach. The growth reductions were applied to only those network entry points which were affected by capacity constraints. These were identified from preliminary microsimulation model runs and are highlighted in Figure 4-9.

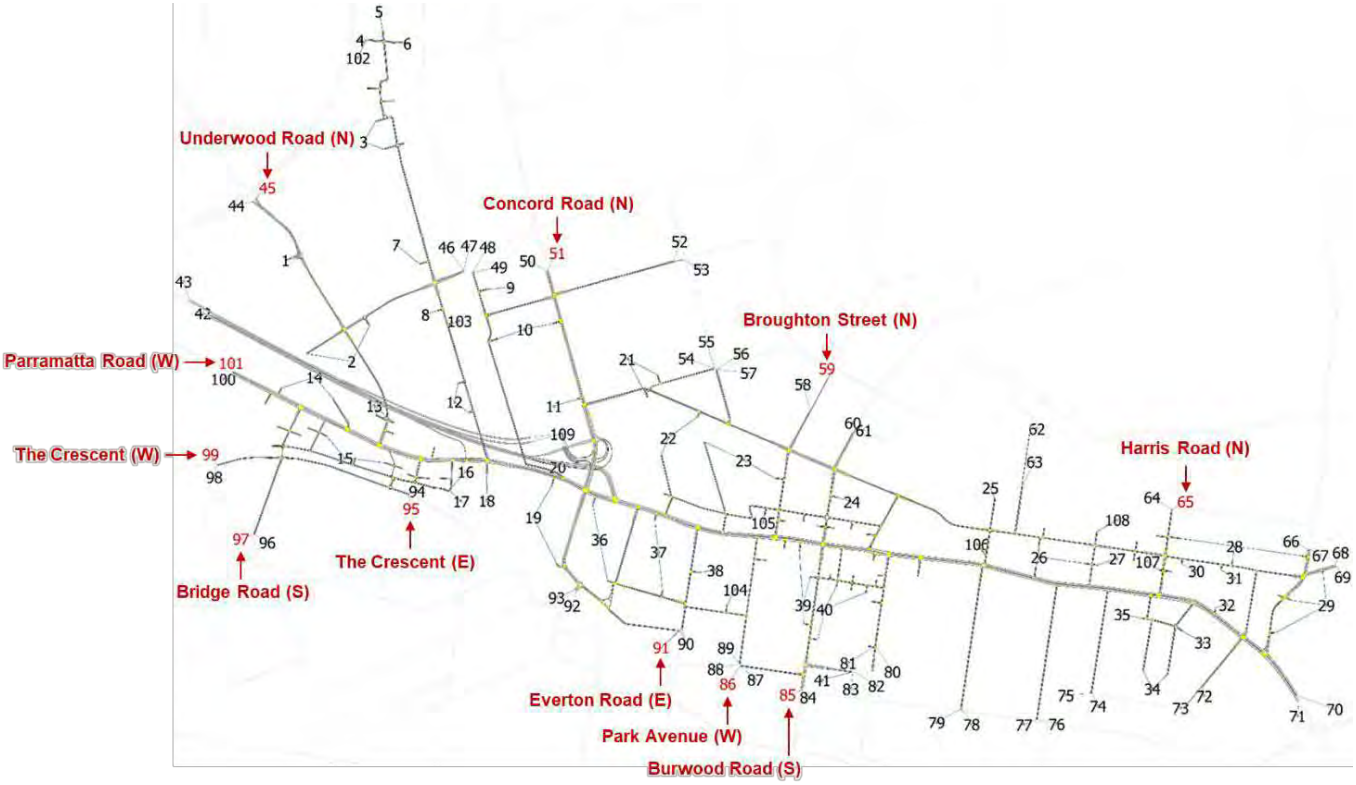


Figure 4-9: Constrained Network Entry Points with Reduced Traffic Growth

The applied factors are summarised in Table 4-5.

Table 4-5: Applied External-to-External Growth Factors

Peak	2026 Benchmark	2026 Uplift	2036 Benchmark	2036 Uplift
AM	1.0	1.0	0.7 (-320 trips)	1.0
PM	1.0	1.0	0.4 (-471 trips)	0.8 (-347 trips)

The lower reductions in the Uplift scenarios compared to the Benchmark scenarios are due to Do Minimum network improvements which were implemented in the Uplift Scenarios for the sole purpose to ensure that the Uplift scenarios models were able to function without 'gridlock' (see Section 4.2.3).

Model Peer Review by PricewaterhouseCoopers (PwC)

In early August 2021, DPIE advised that TfNSW had raised a request for a peer review of the future year AIMSUN traffic model to be undertaken by PwC. The peer review report was received mid-September 2021 and raised a number of comments and recommendations. These issues were addressed to the satisfaction of DPIE and TfNSW, allowing the impact assessment modelling to commence.

4.2.2 Traffic Modelling Scenarios

Three scenarios were prepared for comparison as summarised in Table 4-6.

Table 4-6: Modelling Scenarios

Scenario	Includes			
	Background Traffic Growth	PRCUTS Development Traffic Growth	Do Minimum Upgrades	Upgrades Scheme
Benchmark	☑	☒	☒	☒
Uplift	☑	☑	☑	☒
Uplift (Upgraded)	☑	☑	☑	☑

4.2.3 Traffic Network Upgrades Development

Do Minimum Upgrades

During the iterative testing for future year model convergence, it was necessary to implement 'Do Minimum' upgrades in the Uplift model. The substantial growth in traffic associated with background growth and PRCUTS development resulted in the identification of a series of localised, but significant pinch points in the model. Once the model 'grid-locked', the simulation scenario was no longer capable of providing meaningful outputs to enable identification of what other upgrade works would be needed.

To avoid this, some specific modifications to the road network were made prior to the detailed impact assessment and mitigation modelling. These primarily involved traffic management controls such as new turn restrictions and changes to lane allocations.

Modelling Targets: Uplift verses Benchmark

Following the approved model development methodology, an approach was developed to evaluate the Uplift scenarios and to understand what upgrades were needed to mitigate the impacts of their additional development levels.

A scenario aspirational target was to return the network to Benchmark performance levels (i.e. the network performance without PRCUTS Development traffic) with the Uplift Scenario development traffic levels. These targets as applied to specific network performance indicators are highlighted in Table 4-7.

Table 4-7: Network Performance Indicators

Indicator	Expected change due to Uplift	Desired Outcome Uplift v Benchmark
Total Vehicle Hours Travelled – VHT (hours)	Expected to increase due to more vehicles travelling through the network, and longer travel times due to increased congestion	**No target:** Increases will be inevitable due to higher traffic demands.
Total Vehicle Kilometres Travelled – VKT (kilometres)	Expected to increase due to more vehicles travelling through the network	**No target:** Changes will be inevitable due to higher traffic demands.
VKT/VHT Ratio (km/h)	Expected to decrease due to disproportionate vehicle travel time compared to increases in travelled distance.	**Target:** Uplift VKT/VHT Ratio to get as close to Benchmark values as possible.
Speed (km/h)	Expected to decrease due to increased congestion in the network.	**Target:** Uplift Speed get as close to Benchmark values as possible.
Completed Trips (veh)	Expected to increase due to higher total traffic demands due to development	**No target:** There will be an increase in completed trips in the Uplift scenario, unless the model gridlocks, as there is more demand.
Incomplete Trips (veh)	Expected to increase due to higher total traffic demands due to development and increased congestion.	**No target:** Changes will be inevitable due to higher traffic demands.
Waiting to Enter (veh)	Expected to increase due to higher total traffic demands due to development and increased congestion.	**Target:** Vehicles waiting to enter in Uplift scenario to get as close as possible to Benchmark values.
Average Delay Time (sec/km)	Expected to increase due to increased congestion in network.	**Target:** Average delay time in the Uplift scenario to get as close as possible to Benchmark values.

4.2.4 Public Transport and Active Transport Initiatives

Public transport and active transport initiatives have been primarily considered within and near the Uplift precincts. The process to develop these initiatives included:

- Identify current services levels and gaps
- Consider planned / proposed initiatives by each Council
- Understand desire lines, accessibility constraints and coverage ‘gaps’ using GIS techniques
- Identify new facilities, and facility upgrades in each area based on the above projects.

The consideration of public transport and active transport initiatives has necessarily been focussed at a local scale and are not related to the modelling results. The influences of Sydney Metro West have been taken into account in terms of how additional of rail services will service the corridor and where Metro stations are proposed to be located.

4.2.5 Parking Policies and Strategies

The nomination of parking policies has considered the identification of each uplift precinct’s proximity and quality of access to public transport and nominating development parking rates for inclusion in each LGA’s corresponding Development Control Plan’s (DCPs). Each precinct has been categorised with ‘P1’, ‘P2’ or ‘P3’ according to its proximity and quality of access to nearby public transport services. The nominated categories and rates should be considered preliminary and subject to more detailed investigations specific to each precinct as development details are better understood.

In addition, the future year traffic capacity analyses have revealed additional traffic demands along a number of side roads accessing Parramatta Road during the AM and PM peak hours.

Tidal peak period clearways have been proposed and included in the modelling (both new clearways and extensions to existing clearways) to accommodate these demand changes. The proposed parking policies and strategies are further explained in Section 4.7.

4.2.6 Weekend Traffic Considerations and Modelling Limitations

In addition to the conventional weekday peak periods, the study area was also surveyed for intersection counts, travel times and SCATS signal data for a Saturday midday peak. The base model was also calibrated and validated for Saturday midday peak hours. Table 4-8 summarises a comparison of weekday and Saturday peak traffic volumes at a number of key locations along Parramatta Road.

Table 4-8: Weekday and Saturday 2018 Model Bidirectional Volume Comparisons

Location	Weekday Peak		Saturday Peak (11:00 AM – 12:00 PM)
	AM Peak (8:00 AM – 9:00 PM)	PM Peak (5:00 PM – 6:00 PM)	
East of Underwood Road	2,829 vph	2,393 vph	2,446 vph
East of Burwood Road	3,946 vph	3,900 vph	4,153 vph
East of Harris Road	3,729 vph	3,700 vph	4,137 vph

In the absence of STFM future growth data for Saturday peak hours, a 'synthetic' weekend growth forecast has been created which takes the AM and PM weekday peak growth from the STFM and applies the average of it to the calibrated weekend base year model.

The volume comparison demonstrates that Saturday peak two-way volumes along Parramatta Road are comparable to weekday peak volumes. Given that Saturday flows are less 'tidal' than weekday flows, and that localised congestion on a weekend has lesser economic impacts than during the week (and hence its use as a design case is diminished), it is considered highly unlikely that Saturday modelling results will lead to any modifications to the traffic upgrade items being recommended in this report.

In any case, due to the heavily congested 2036 and 2026 networks based on the forecast traffic growth arising from the STFM, there is limited reliance that can be placed on specific model outputs at an intersection level; the models are therefore being used as a relative guide rather than as an absolute reference for determining traffic upgrade needs.

4.3 Traffic Congestion and Pinch Points

4.3.1 Overview

When developing future year traffic networks, two general approaches are available, namely:

- 'Predict and provide'
- 'Vision and validate'.

This study commenced when 'predict and provide' was the conventional approach. More recently, 'vision and validate' has been an approach increasingly being adopted in congested urban areas like this study area.

The approach used in this study essentially commenced on a 'predict and provide' basis but has since shifted to consider 'vision and validate' principles. Specifically, this means that all of the traffic congestion issues identified in the future are not intended to be 'solved'. Rather, a balanced approach has been taken, blending the interpretation of simulation modelling results with the achievement of broader objectives of more trips being made by walking, cycling and public transport in safer, 'people-friendly' street environments.

4.3.2 Issues Assessment

The future year modelling results show that the Parramatta Road corridor would be heavily congested due to its forecast increase in traffic demand.

Future year traffic congestion issues were classified as either 'Primary Issues' or 'Secondary Issues', with the distinction being:

- **Primary Issues:** Primary issues are typically the fundamental cause of congestion, often being a capacity-constraint at a specific intersection.
- **Secondary issues:** Secondary issues are caused by Primary Issues. For example, queues from a primary constraint might extend to block off a side road, causing secondary queues into the local road network. The need to address these issues is dependent on the response of the network to downstream upgrades.

Figure 4-10 shows the **main** traffic issues identified in the 2036 road network. More details are provided on precinct-by-precinct basis in the following sections.

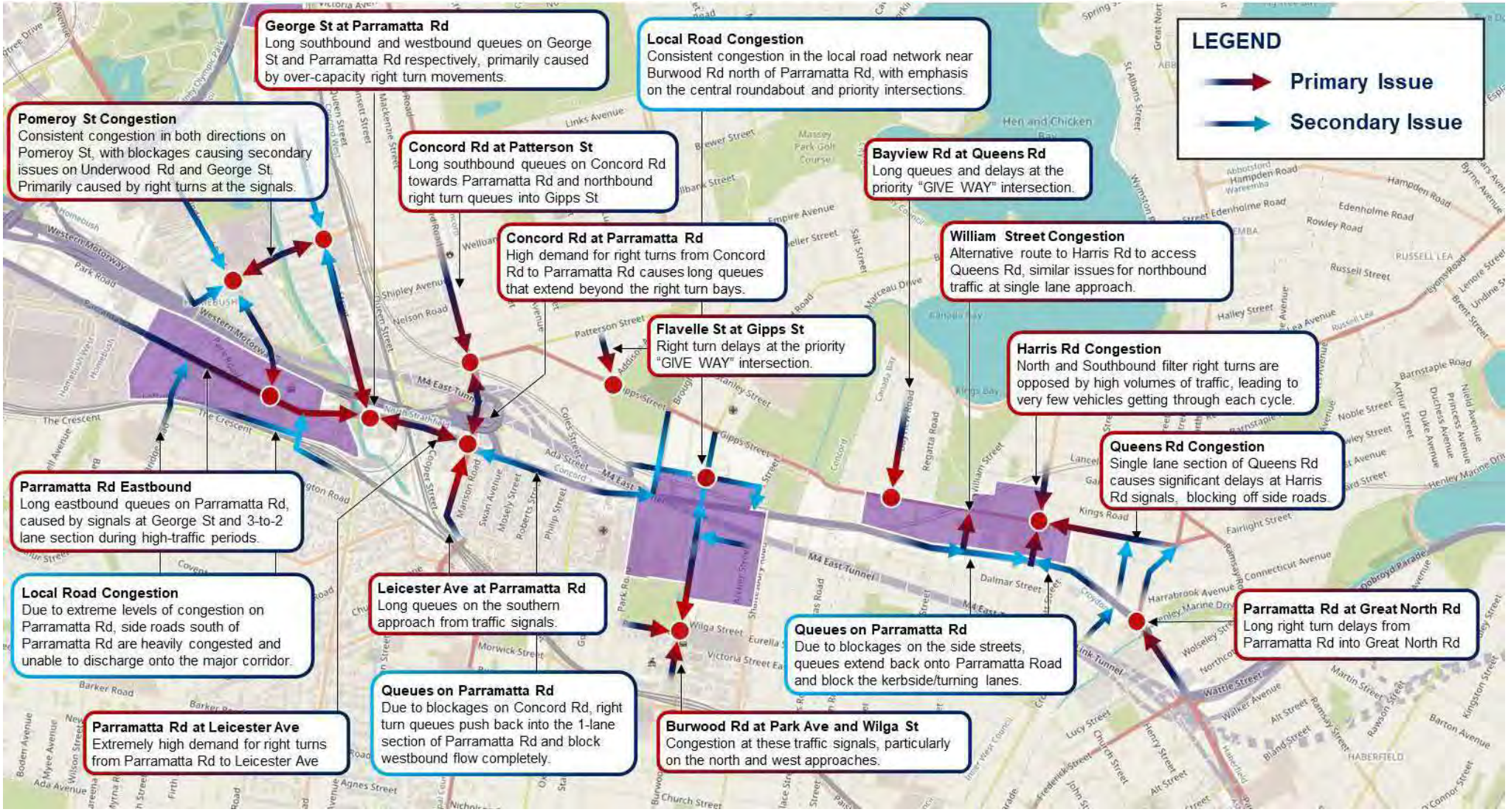


Figure 4-10: Traffic Congestion and Pinch Points Map

4.3.3 'Waiting to Enter' Map

Due to the congestion caused by the Primary and Secondary issues, the initial modelling showed a significant volume of traffic demand 'stuck' outside of the network, unable to enter in the peak periods due to downstream blockages. Without any upgrades, this volume of unreleased traffic steadily increases up to the end of the simulation period.

Figure 4-11 and Figure 4-12 show the locations of vehicles waiting to enter the network at the end of the 2036 AM and PM two-hour peak periods.

Figure 4-11: Waiting to Enter Map – Vehicles Outside (unsatisfied demand) at 9:00 AM

Figure 4-12: Waiting to Enter Map – Vehicles Outside (unsatisfied demand) at 6:00 PM

At the end of the morning peak, there are locations with high volumes of unreleased vehicles on the western entry points to the network, and congestion across the rest of the network, summarised as:

- **Homebush / Strathfield:** extremely high volumes of vehicles waiting outside of the network at key external zones like Parramatta Road, Underwood Road, Pomeroy Street and The Crescent.
- **Burwood:** blockages around Burwood, particularly on Burwood Road and Wentworth Road
- **Canada Bay**: queues outside of the model on Harris Road, Croydon Road and surrounds.

At the end of the afternoon peak, there are unreleased vehicles at the western entry points to the network as well as within Burwood. These can be summarised as:

- **Homebush / Strathfield:** high volumes of vehicles waiting outside of the network at key external zones like Parramatta Road, Underwood Road, Pomeroy Street and The Crescent.
- **Burwood:** significant blockages along Burwood Road, including obstructions to local traffic releases near Burton Street and on Park Avenue.
- **Canada Bay**: minor to moderate volumes of vehicles waiting outside the network near Harris Road.

What these unreleased vehicles demonstrate is that the traffic demand forecast by the strategic modelling cannot be accommodated in the simulation model network within its one hour peak. There would be peak spreading, diversions to other routes, some modal shift and some trip suppression/trip re-distribution because of this but there would also be expected to be significant increases in travel times and delays within the study area.

4.3.4 Homebush North and South

The major intersection pinch points near the Homebush precincts are:

- Parramatta Road / Concord Road / Leicester Avenue
- Parramatta Road / George Street
- Parramatta Road / Underwood Road
- Underwood Road / Pomeroy Street
- George Street / Pomeroy Street.

These pinch points are primarily concentrated near the Homebush South precinct. They are discussed in more detail below.

Parramatta Road / Concord Road / Leicester Avenue

The Parramatta Road / Concord Road / Leicester Avenue intersection is a key intersection in the Parramatta Road corridor, facilitating connections to the M4 Motorway and tunnel, Concord Town Centre to the north and Strathfield to the south.

Due to the heavy conflict for green time at the traffic signals, nearly all approaches show significant delays as follows:

- **From the west:** over 500vph turn right into Leicester Avenue in the PM peak towards Strathfield and Burwood. While there is a very long single lane turning bay for this movement (around 400m), the increase in this demand caused by future growth results in extremely long queues and vehicles blocking the through lane for long periods.
- **From the south:** heavy northbound traffic flows which queue all the way back to the rail crossing tunnel near Strathfield Train Station in the AM peak.
- **From the east:** due to the single lane approach caused by the M4 on-ramp lanes, queues exceeding the available right turn bays have highly detrimental effects on through traffic.
- **From the north:** heavy traffic flows from the northern approach during both peak periods, particularly for the right turn movement, occasionally blocking traffic at the M4 access intersection to the north.

Figure 4-13 shows an example of the queues at this pinch point.

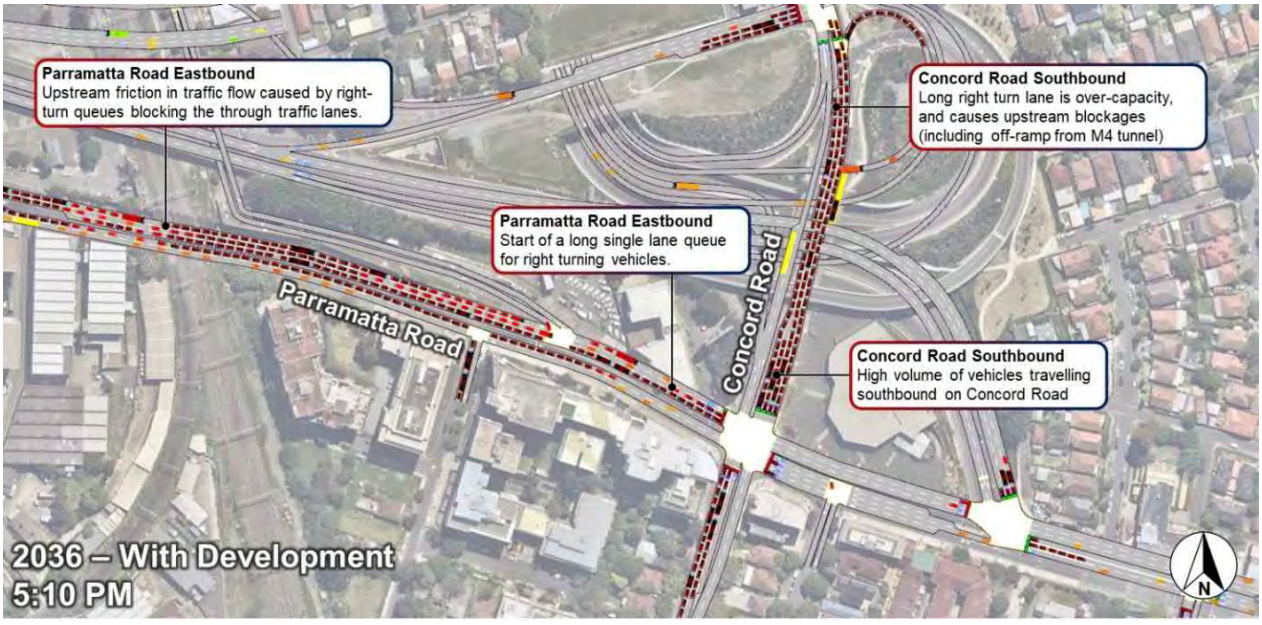


Figure 4-13: Parramatta Road / Concord Road / Leicester Avenue Pinch Point

Parramatta Road / George Street

The Parramatta Road / George Street intersection is another key intersection in the road network near the Homebush precincts. George Street is a vibrant street servicing North Strathfield, with a High Pedestrian Activity Area and cobbled streets passing through the Bakehouse Quarter shopping and dining precinct.

However, despite the elevated levels of 'Place-based' activity like al fresco dining and community spaces, George Street also serves as an important north-south traffic link on the western side of the railway line. George Street provides a critical link to the Homebush North precinct (near Concord West Station) to the north, passing by Pomeroy Street and Bridge Street. Due to this, traffic volumes both into and out of George Street would be relatively high in 2036 and result in delays at the Parramatta Road traffic signals, particularly for the right turn movements.

Eastbound traffic on Parramatta Road is delayed by this intersection. Around 200m to the west of the traffic signals, Parramatta Road eastbound narrows from a 3-lane carriageway to a 2-lane carriageway. Queues from the signals extend back to this narrowing of Parramatta Road, creating a slow moving queue which extends to beyond Bridge Road.

Aside from the southern approach which has a fixed catchment, all approaches to the Parramatta Road / George Street intersection would perform poorly in 2036:

- **From the north:** even with upstream blockages reducing the flow of traffic arriving at the intersection, there would occasionally be queues that extend along George Street in the PM peak back into the pedestrian area near the Bakehouse Quarter
- **From the east:** due to the short right turn bay, right turning vehicles would queue over 200m beyond the turning lane into the through traffic lane, limiting Parramatta Road through traffic to a single lane
- **From the west:** due to the heavy eastbound traffic flows and the nearby 3-to-2 lane merge on Parramatta Road, there would be extremely long queues back from the George Street signals which would create secondary impacts on nearby side streets.

Figure **4-14** shows an example of the queues at this pinch point.

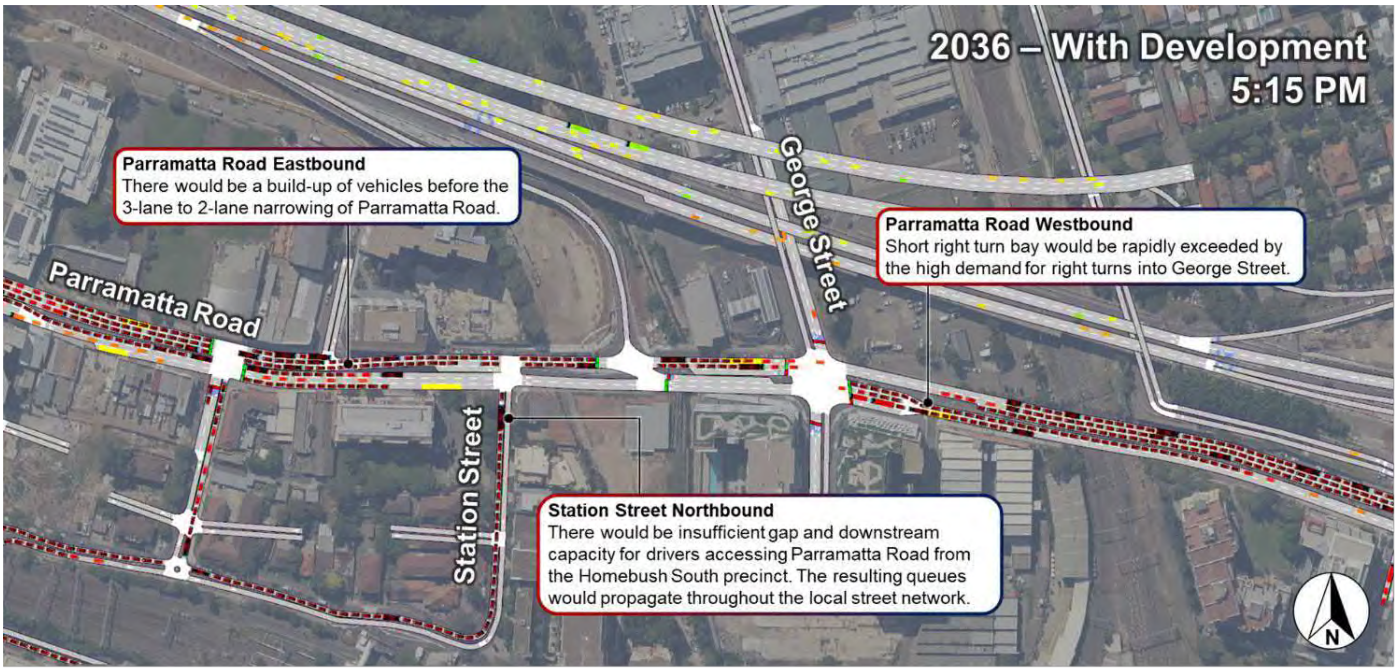


Figure 4-14: Parramatta Road / George Street Pinch Point

Parramatta Road / Underwood Road

The Parramatta Road / Underwood Road intersection is located around 500m west of the Parramatta Road / George Street intersection and serves the North Homebush catchment. Underwood Road and George Street are the only two opportunities to cross the M4 Motorway within the study area, with no other options to the west until Homebush Bay Drive and Birnie Avenue (1.5km and 2.3km away respectively).

At Underwood Road, Parramatta Road has three travel lanes in the eastbound direction, narrowing to two lanes around 250m downstream of the intersection. This, in combination with extensive queueing effects at George Street, would result in congestion which would impact Underwood Road traffic, with vehicles unable to turn out as the eastern departure of the intersection is congested.

The fundamental congestion issue at this location is that traffic from catchments to the north of Parramatta Road would need to use either Underwood Road or George Street to access Parramatta Road.

At a local level, the modelling indicates that there would be an imbalance in the usage of the available lanes. Right-turning vehicles would sometimes prefer to use the kerbside left-right lane instead of the median-side dedicated right lane because much of this traffic then turned left at the next opportunity to access the Homebush South precinct. These issues highlight a need for improved connectivity across Parramatta Road to/from this catchment.

Figure 4-15 shows an example of the queues at this pinch point.

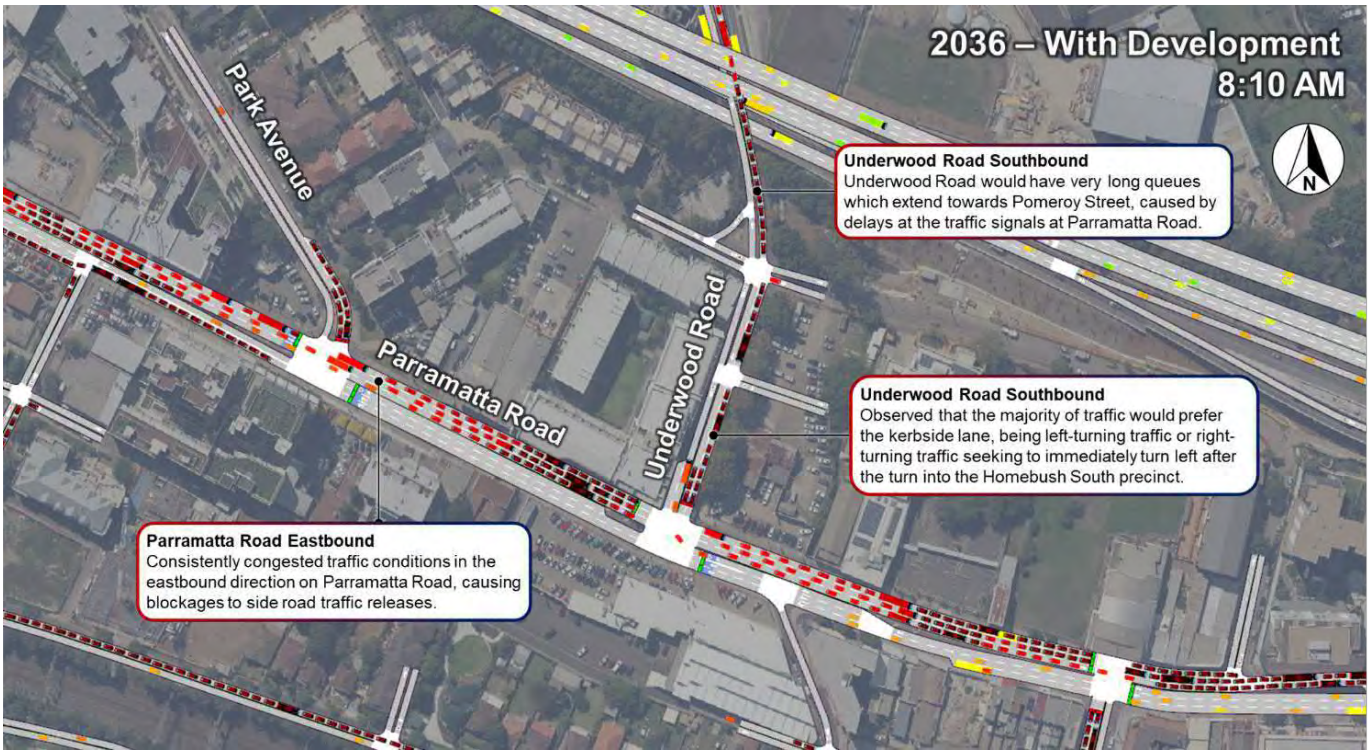


Figure 4-15: Parramatta Road / Underwood Road Pinch Point

Underwood Road / Pomeroy Street

The Underwood Road / Pomeroy Street intersection is around 500m north of Parramatta Road, and not on the main Parramatta Road corridor. However, this intersection is of strategic importance to the surrounding road network, including Parramatta Road. Underwood Road joins Homebush Bay Drive and the Sydney Olympic Park precinct to Parramatta Road, with large-scale facilities like DFO Homebush near the Australia Avenue roundabout. Along with George Street, Underwood Road is one of the few major north-south roads servicing the Homebush area north of Parramatta Road. Pomeroy Street offers one of the only opportunities to cross Powells Creek and is frequently used as a link between Underwood Road and George Street.

All approaches to the intersection would be over-capacity in 2036, with over 500m long queues propagating from this intersection. The volume of traffic passing through the intersection cannot be reasonably accommodated by the traffic signals. Filtering turning traffic has minimal gaps in opposing traffic, and congestion on the departure sides of the intersection due to downstream queues wastes signal green time.

Figure 4-16 shows an example of the queues at this pinch point.

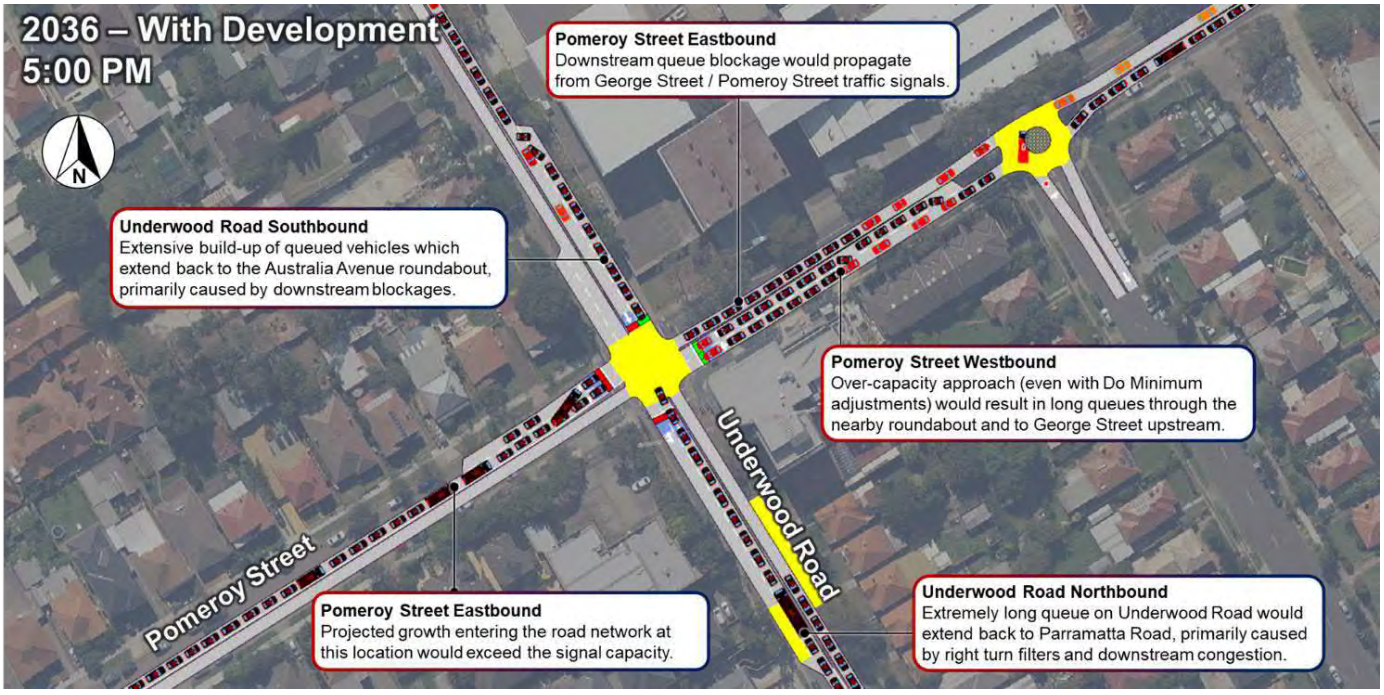


Figure 4-16: Underwood Road / Pomeroy Street Pinch Point

George Street / Pomeroy Street

George Street / Pomeroy Street performs a similar function to Underwood Road / Pomeroy Street on the eastern side of Powells Creek. East of the traffic signals, Pomeroy Street offers the only bridge crossing of the railway line in the area, further elevating the importance of this intersection.

Due to the proximity and connection between this intersection and the Underwood Road / Pomeroy Street intersection, there are significant network implications caused by queues that extend between the two intersections. In 2036, long queues on the western departure on Pomeroy Street are caused by the Underwood Road traffic signals. Due to these, the other approaches waste a significant portion of their signal green time due to blocked downstream locations.

Furthermore, the intersection primarily operates with filtered right turn movements (except for a dedicated right turn phase for the eastern approach). This causes significant delays to the north and west approaches, with only a few vehicles able to turn right each cycle due to high opposing traffic flows. Furthermore, when opposing vehicles are turning right at the same time, they tend to be slowed by due to the 'narrowness' of the intersection.

Figure 4-17 shows an example of the queues at this pinch point.

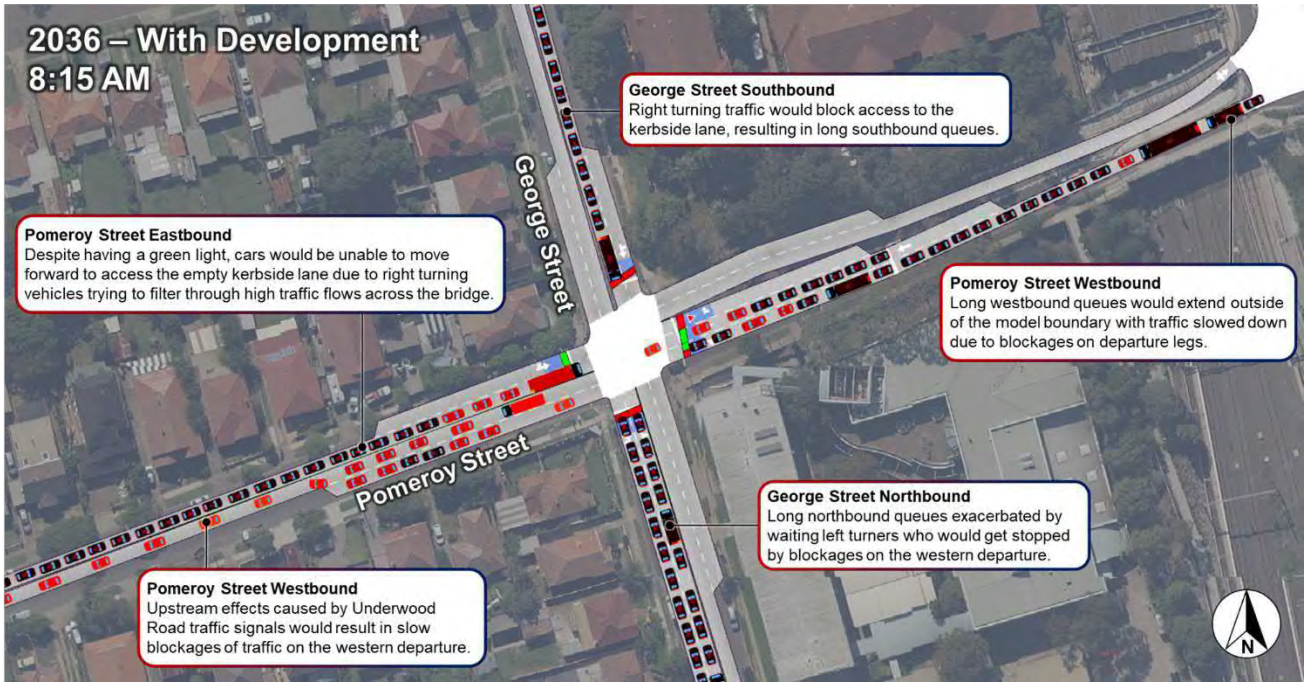


Figure 4-17: George Street / Pomeroy Street Pinch Point

4.3.5 Burwood-Concord

Burwood Road / Park Avenue / Wilga Street

Burwood Road is an important north-south movement corridor, functioning as a Main Street servicing the Burwood town centre south of Parramatta Road. Within the study area, Burwood Road connects Parramatta Road and Burwood Station, and also runs directly to the future Burwood North Metro Station.

The intersection of Burwood Road / Park Avenue / Wilga Street is an offset T-intersection, with around 30 metres between the two side streets. Although Park Avenue and Wilga Street are considered the minor roads to the main Burwood Road corridor, both streets are forecast to experience bidirectional volumes of up to 1000vph in 2036 peak hours.

During the morning peak, there is a demand of around 300 vph for the southbound right turn from Burwood Road into Park Avenue. Due to the signal phasing at the intersection, the majority of traffic is held behind the northern STOP line during filter phases. With the projected increase in traffic by 2036, filter turns would have very limited opportunity to safely cross Burwood Road. This would result in a rapid build-up of right-turning queues which would block access to the kerbside through lane due to short length of parking restrictions.

Figure 4-18 shows an example of the queues at this pinch point.

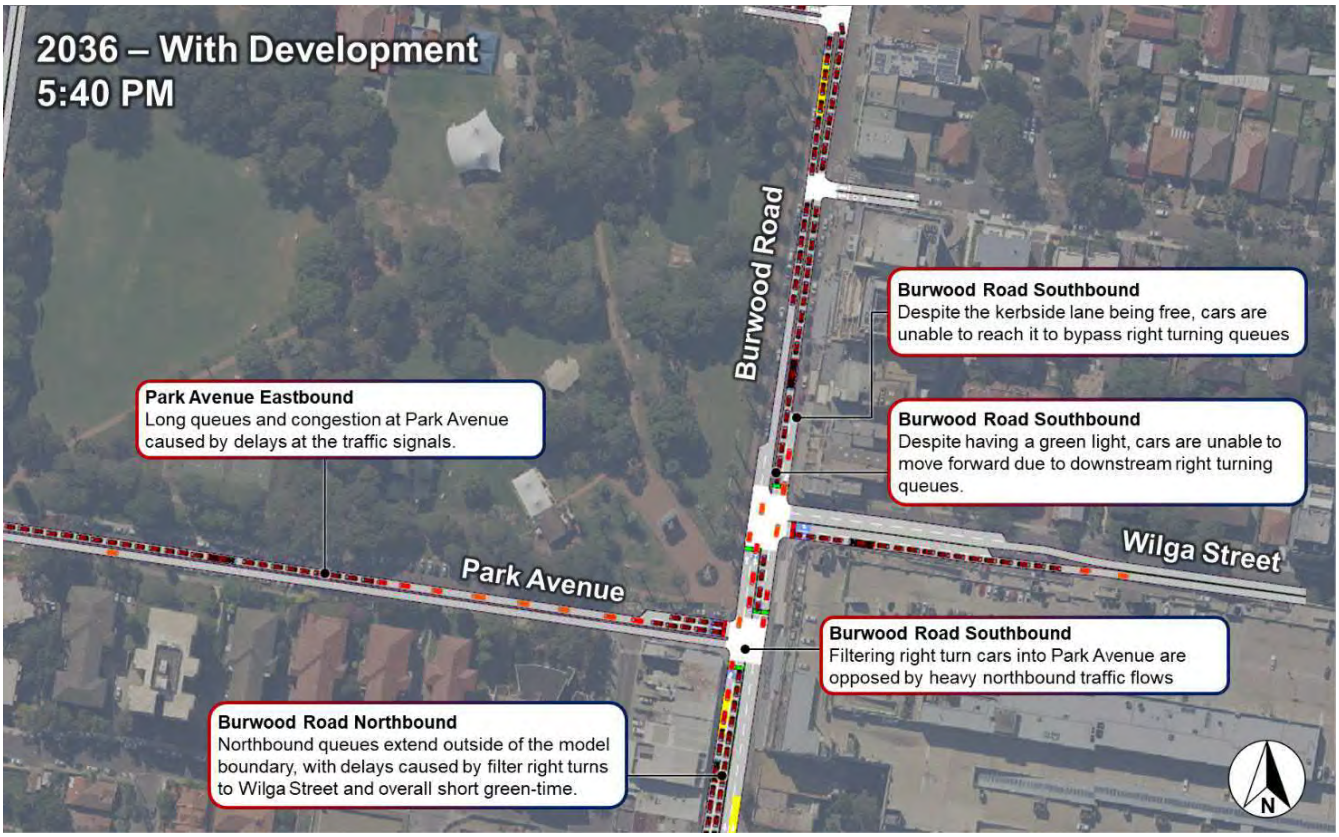


Figure 4-18: Burwood Road / Park Avenue / Wilga Street Pinch Point

Burwood Road / Burton Street

The intersection of Burwood Road / Burton Street is currently a single lane roundabout. The future traffic projections show approach volumes exceeding 300 vph, and up to 1000 vph on the Burwood Road approaches.

The roundabout is a key pinch point in the area and cannot reasonably accommodate the expected future levels of traffic. It also does not facilitate safe pedestrian crossing opportunities near the future Metro station.

There are a number of resulting effects caused by the delays at the roundabout, including diversions through the local road network via Broughton Street and Loftus Street, and consequential effects on both Parramatta Road to the south and Gipps Street to the north. Although there are sections of this road that allow for two travel lanes in either direction (due to peak hour parking restrictions), these are 'pinched' back into a single lane before the roundabout.

Figure 4-19 shows an example of the queues at this pinch point.

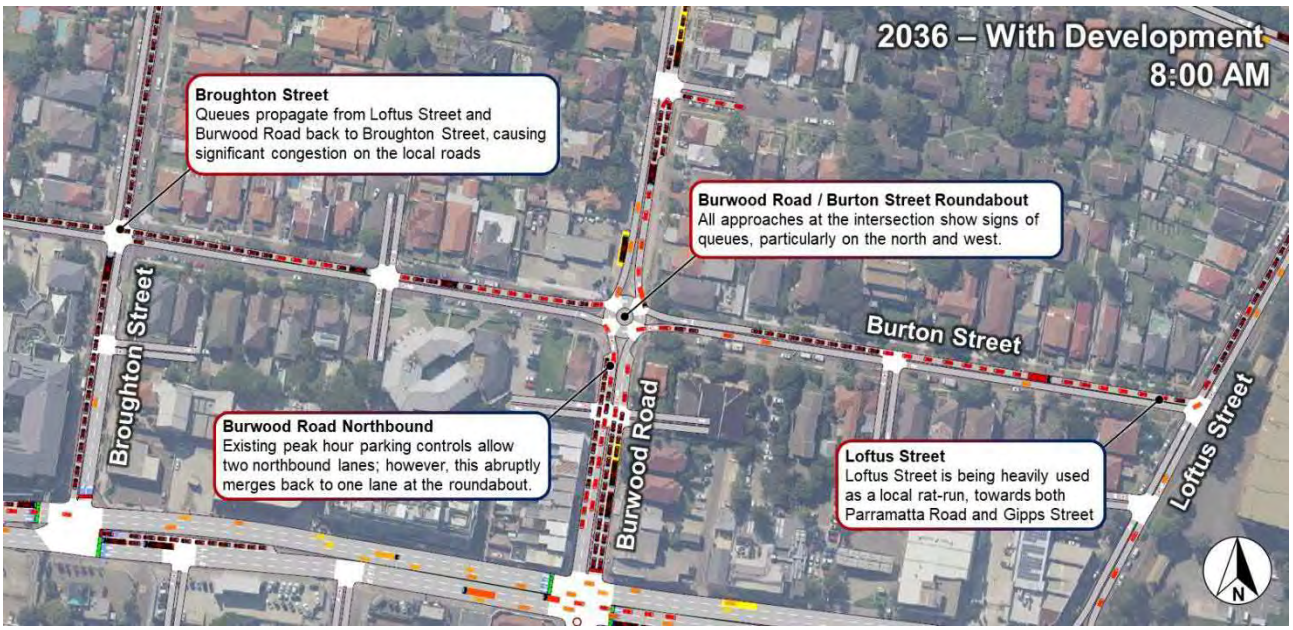


Figure 4-19: Burwood Road / Burton Street Roundabout Pinch Point

4.3.6 Kings Bay

Harris Road / Queens Road

The intersection of Harris Road / Queens Road is around 170m north of Parramatta Road and not located on the main corridor. However, Queens Road and Gipps Street are a part of a parallel corridor to Parramatta Road that provides a secondary route for traffic, particularly to and from Five Dock Town Centre.

The intersection with Harris Road is a key point along this route, with Harris Road being a north-south collector road between Parramatta Road and Lyons Road West. Harris Road is serviced by a number of bus routes and has a high school (Rosebank College) located on the corner with Parramatta Road. The pick-up and drop-off arrangements for Rosebank College are of particular importance, as it occurs on-street and occupies the northbound kerbside lane on Harris Road. There is subsequently a high degree of friction in the traffic stream along Harris Road, between cars moving in and out of the pick-up and drop-off parking spaces, in-lane bus stops, etc.

Figure 4-20 shows an example of the queues at this pinch point.

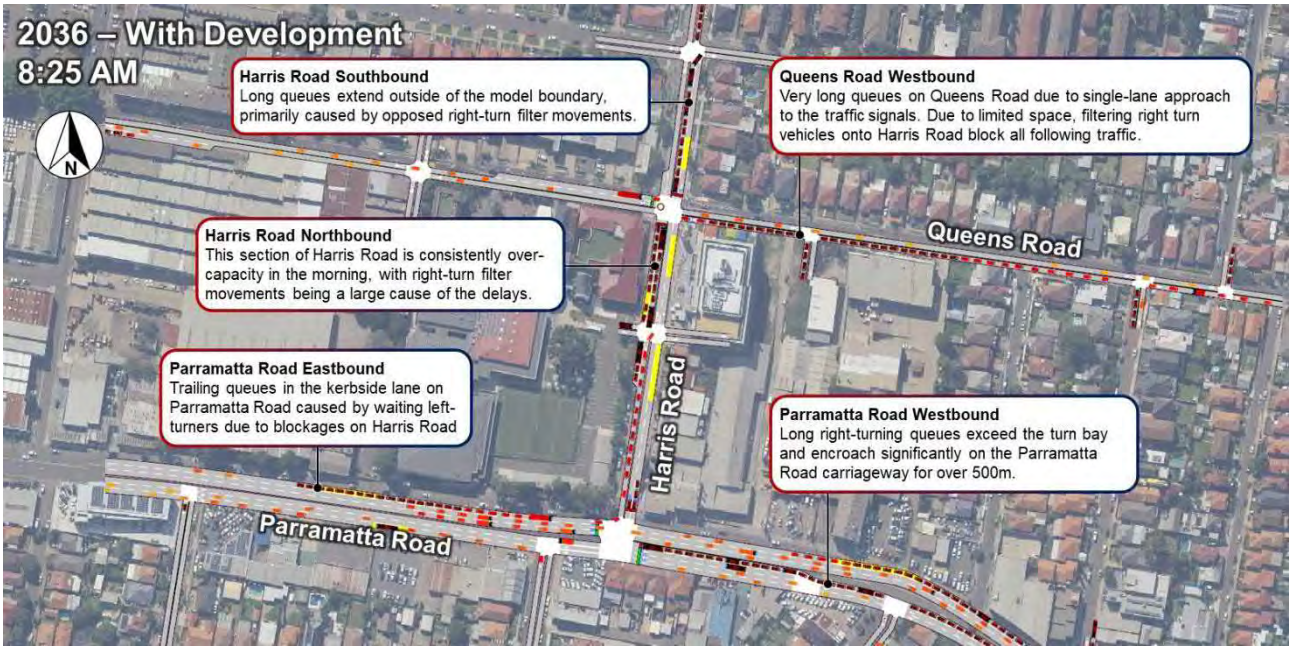


Figure 4-20: Harris Road / Queens Road Pinch Point

Parramatta Road / Great North Road

The intersection of Parramatta Road and Great North Road is affected by the congestion issues at Harris Road / Queens Road. The Great North Road joins Parramatta Road with Five Dock Town Centre, being the main boulevard servicing the lively commercial and retail area. In future, this road will also connect to the Five Dock Metro Station, around 800m north of Parramatta Road.

While Great North Road has a four-lane carriageway, the kerbside lanes are often dedicated to street parking, restricting traffic to a single travel lane. There are peak hour parking restrictions near the intersection with Parramatta Road, which increase the turn capacity at the traffic signals.

It was observed in the models that during the 2036 afternoon peak, delays to right-turning vehicles caused long queues, preventing left turning traffic from entering the kerbside lane. This results in a significant level of wasted intersection capacity, which contributes to the overall poor traffic performance in the Kings Bay area.

Figure 4-21 shows an example of the queues at this pinch point.

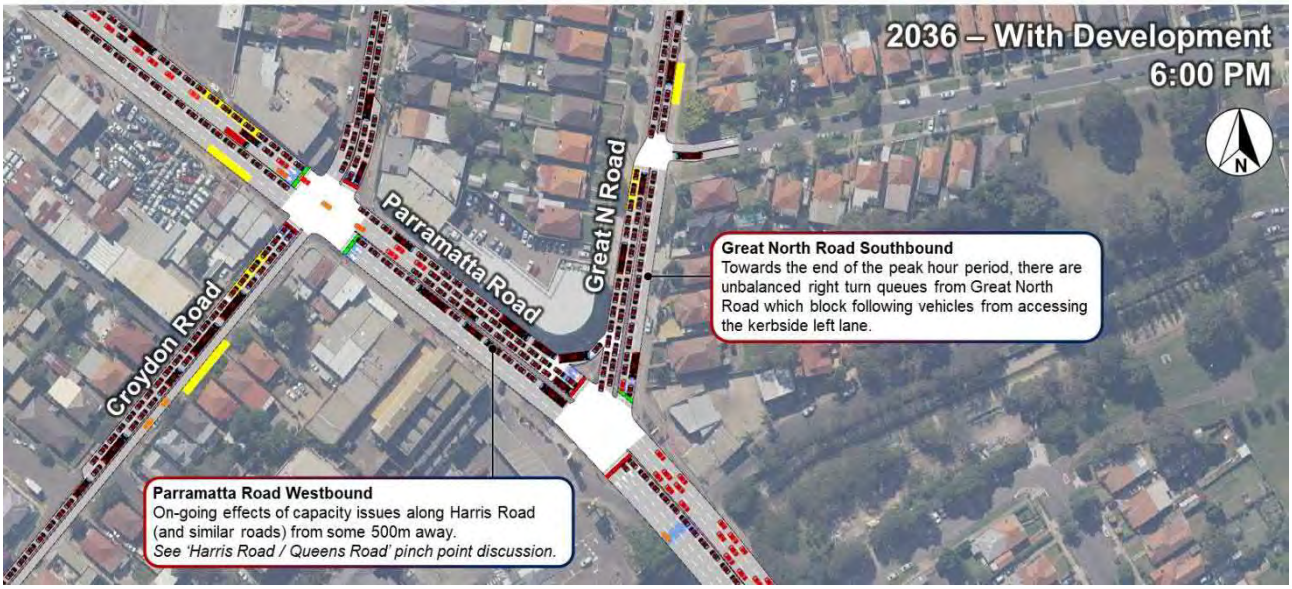


Figure 4-21: Parramatta Road / Great North Road Pinch Point

4.4 Traffic Network Upgrades and Rationale

4.4.1 Do Minimum Changes

The following changes were modelled in a Do Minimum network. These changes are included in all Uplift scenarios to ensure that a minimum baseline operational level of traffic performance was maintained in order to allow meaningful interpretation of the benefits and impacts of other traffic capacity changes:

- **Underwood Road / Pomeroy Street:** No Right Turn from Underwood Road to Pomeroy Street during the AM peak hour period.
- **Underwood Road / Pomeroy Street:** Changed lane allocations on the east approach to permit right turn movements from both lanes.

These are shown in Figure 4-22.

Figure 4-22: Do Minimum Changes – Underwood Road / Pomeroy Street

4.4.2 Proposed Traffic Network Upgrades Summary

The recommended traffic network upgrades can be divided into four main categories:

Road Upgrades

Road upgrades are mostly recommended to facilitate capacity increases and will likely require some civil works (e.g. intersection upgrades, new turning lanes, etc).

Signal Changes

Signal changes are identified as being more significant than changes to phase timings, potentially requiring entirely different phase sequences and ancillary signal lantern infrastructure

Traffic Management

Traffic management policies imply modifications to the road network that do not constitute road upgrades. These include new turn restrictions and/or lane allocation linemarking at existing roads.

Parking Restrictions

Parking restrictions comprise the implementation of new parking plans at key locations to limit parking activity and provide additional road capacity during the key peak hour periods.

The proposed traffic network upgrades are shown in Figure 4-23.

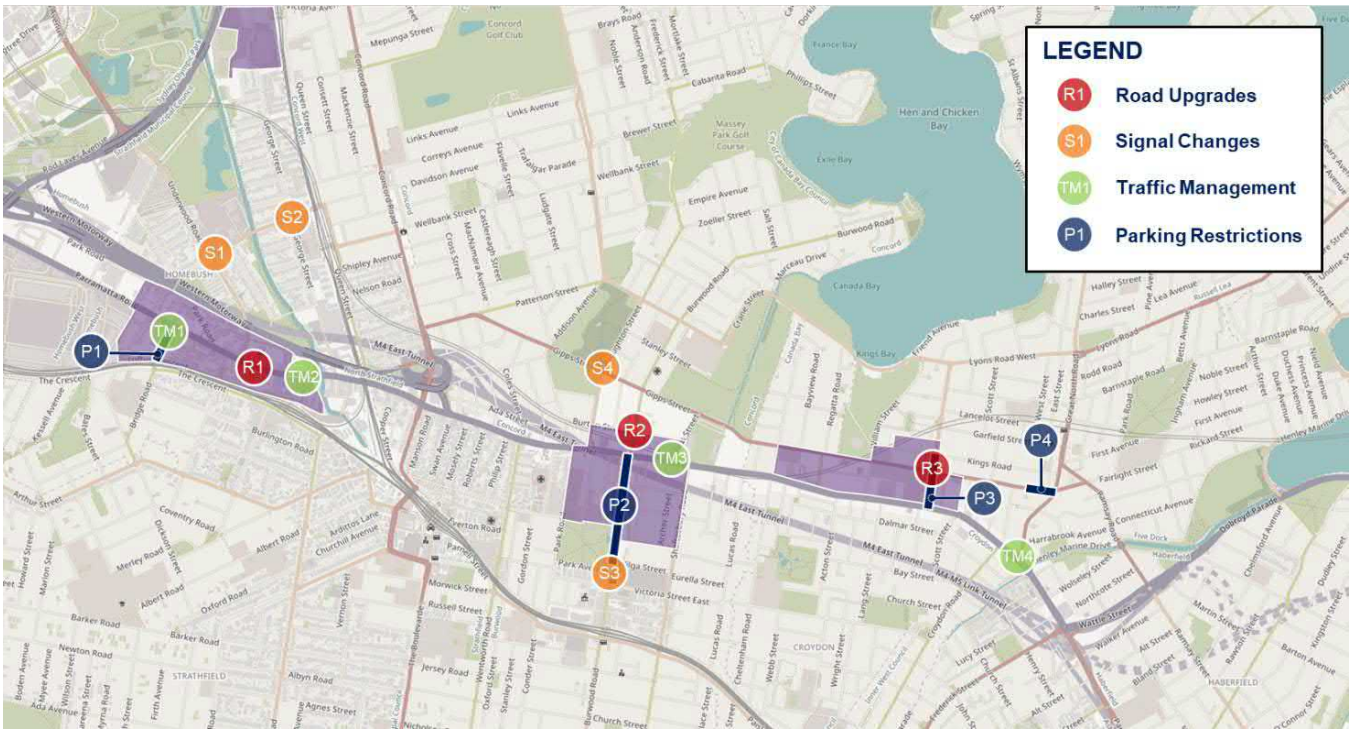


Figure 4-23: Proposed Traffic Network Upgrades – Summary

Each of these items are further described in Figure 4-24.

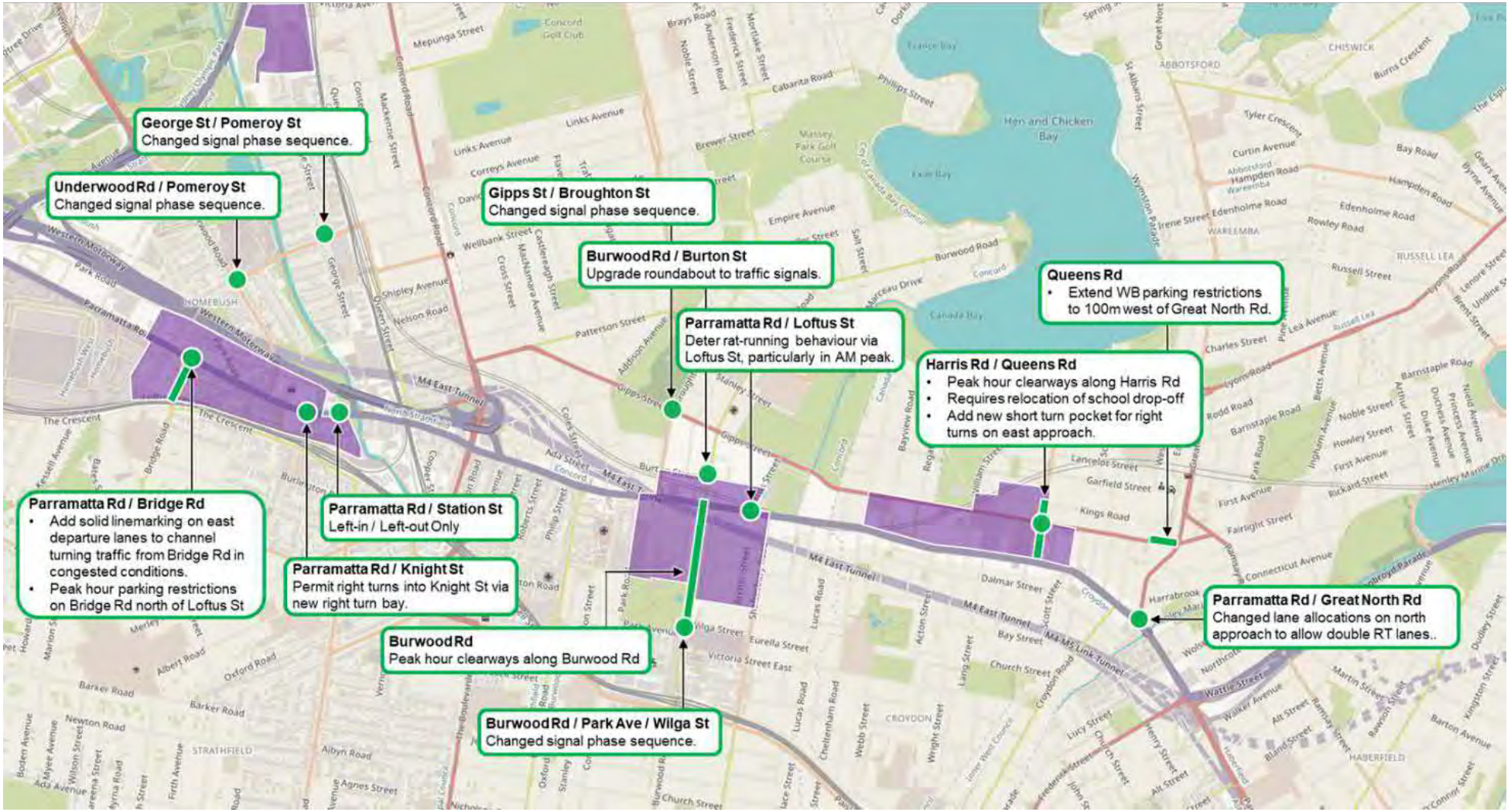


Figure 4-24: Proposed Traffic Network Upgrades – Breakdown

The details around these items are described in greater detail in the Precinct-specific sections in Chapter 5 to Chapter 8.

4.4.3 Traffic Performance Improvements – Network Benefits

Network-wide Performance Statistics Comparison

The following network performance measures were extracted from the model and used as a comparison between modelled scenarios:

- Vehicle Kilometres Travelled (VKT)
- Vehicle Hours Travelled (VHT)
- Ratio of VKT to VHT
- Average Network Speed (km/h)
- Completed Trips at the end of the peak period
- Incomplete Trips at the end of the peak period
- Waiting to Enter Trips at the end of the peak period
- Delay Time (sec/km).

Due to the high volumes of traffic in the model, particularly along Parramatta Road, there were usually vehicles left within the model network at the end of the simulation referred to as 'Incomplete Trips'. Where this was the case, the VKT and VHT outputs were factored to also account for these partial trips.

AM Peak

Table 4-9 summarises the performance outcomes during the AM peak period.

Table 4-9: Traffic Performance Comparison – Network Statistics – AM Peak Period

Performance Indicator	2036 (Benchmark)	2036 (Uplift)	2036 (Uplift with Upgrades)
VHT (hours)	**5,901**	**9,622**	**7,107**
VKT (kilometres)	**96,353**	**94,482**	**101,263**
VKT/VHT Ratio	16.33	9.82	14.25
Speed (km/h)	32	30	30
Completed trips (veh)	45,318	43,323	49,396
Incomplete trips (veh)	3,853	6,821	4,007
Waiting to Enter (veh)	**2,164**	**10,065**	**6,814**
Delay Time (sec/km)	**140**	**219**	**158**

The AM peak network statistics demonstrate that the proposed upgrades would reduce total delays, increase average speeds and reduce the number of incomplete and unreleased trips compared to the Uplift scenario. However, the upgrades would not be enough to restore traffic conditions to the levels of the Benchmark scenario.

Figure 4-25 shows the percentage difference from the Benchmark Scenario (No Uplift).

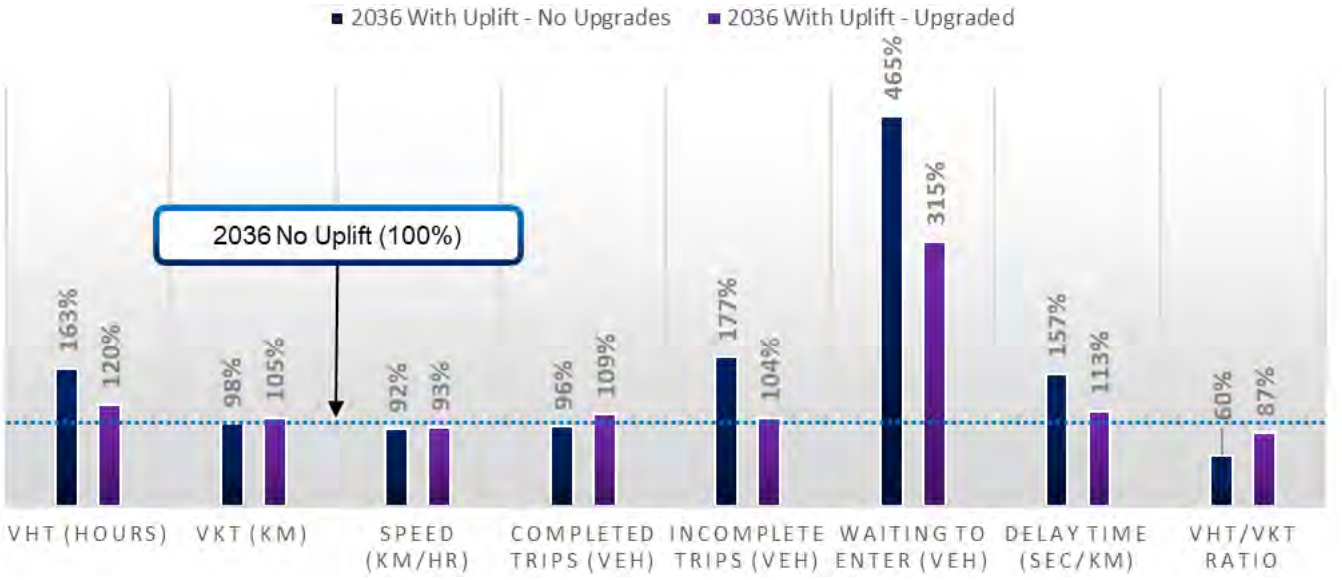


Figure 4-25: Network Statistics Percentage Difference from Benchmark – AM Peak

PM Peak

Table 4-10 summarises the performance outcomes during the PM peak period.

Table 4-10: Traffic Performance Comparison – Network Statistics – PM Peak Period

Performance Indicator	2036 (Benchmark)	2036 (Uplift)	2036 (Uplift with Upgrades)
VHT (hours)	4,763	8,255	6,341
VKT (kilometres)	92,102	95,616	100,877
VKT/VHT Ratio	**19.34**	**11.58**	**15.91**
Speed (km/h)	**36**	**32**	**33**
Completed trips (veh)	44,217	45,594	51,459
Incomplete trips (veh)	4,191	6,378	3,846
Waiting to Enter (veh)	**1,924**	**8,325**	**4,998**
Delay Time (sec/km)	**111**	**190**	**132**

The PM peak network statistics demonstrate that the proposed upgrades would reduce total delays, increase average speeds and reduce the number of incomplete and unreleased trips compared to the Uplift scenario. However, the upgrades would not be enough to restore traffic conditions to the levels of the Benchmark scenario.

Figure 4-26 shows the percentage difference from the Benchmark Scenario (No Uplift).

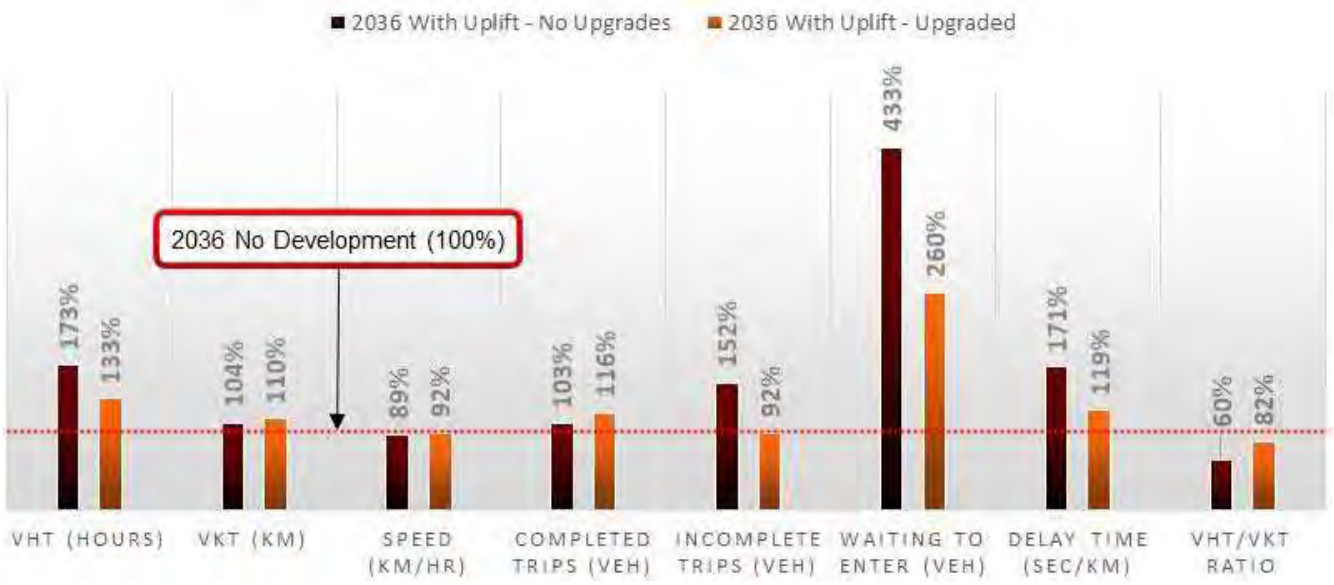


Figure 4-26: Network Statistics Percentage Difference from Benchmark – PM Peak

4.4.4 Traffic Performance Improvements – Route Travel Time

Travel times from the 2036 modelling were compared for the Parramatta Road route shown in Figure 4-27. It is also important to highlight that the travel times are from when a vehicle enters the network, excluding the time it may be queued waiting to enter the network.

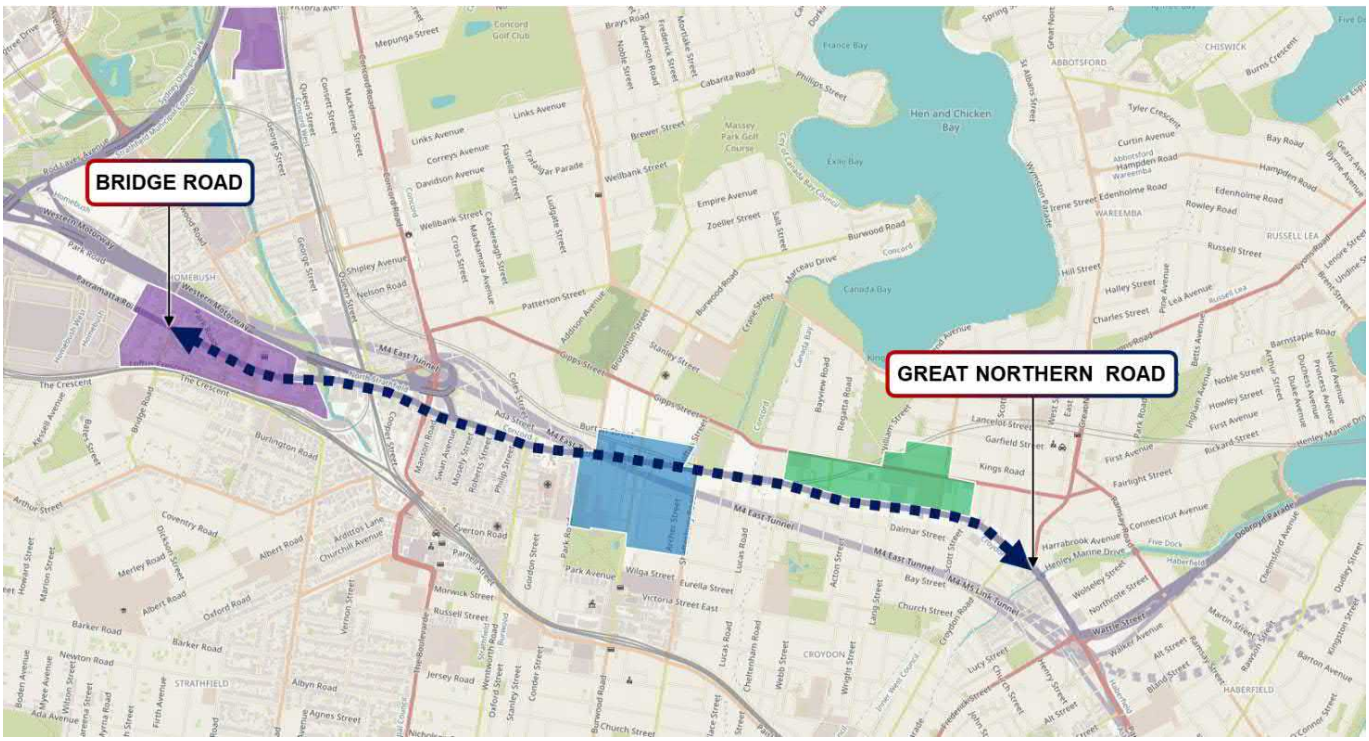


Figure 4-27: Travel Time Route – Parramatta Road

AM Peak

The AM peak travel time comparison between the Uplift (no Upgrades) and Upgrades Uplift Scenarios for the **eastbound** direction on Parramatta Road is shown in Figure 4-28.

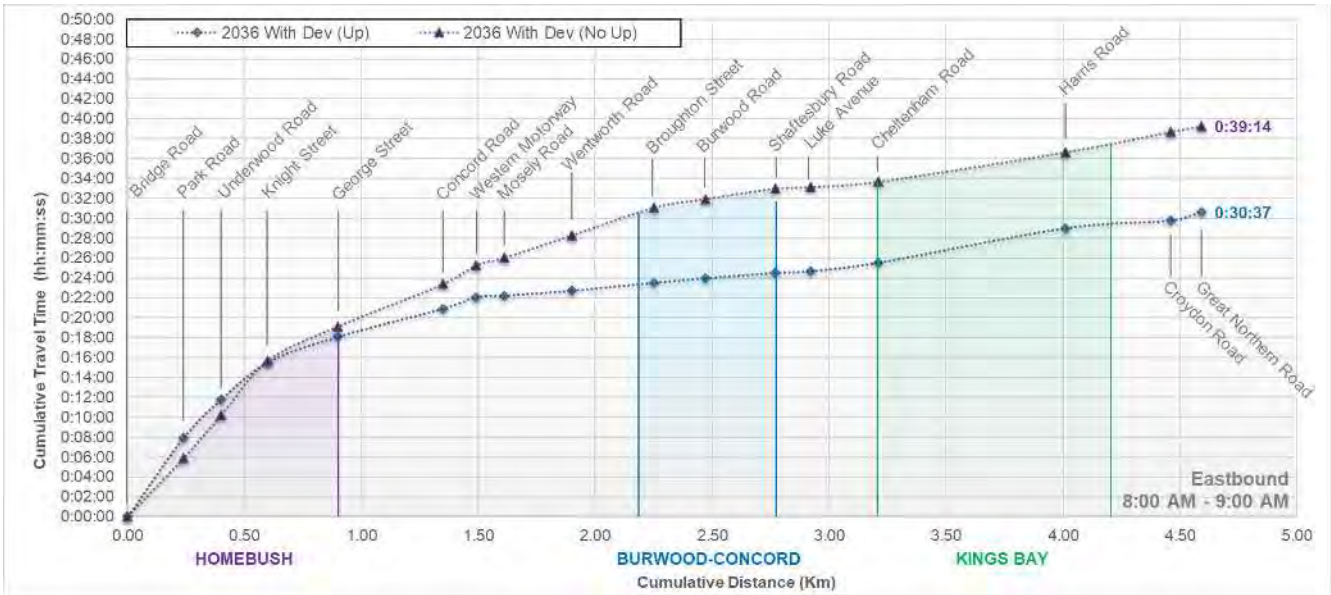


Figure 4-28: Travel Time Comparison – With and Without Upgrades – Eastbound AM Peak

The benchmark comparison for the same peak period and direction is shown in Figure 4-29, highlighting the differences to the 2018 travel time surveys and the 2036 Benchmark Scenario.

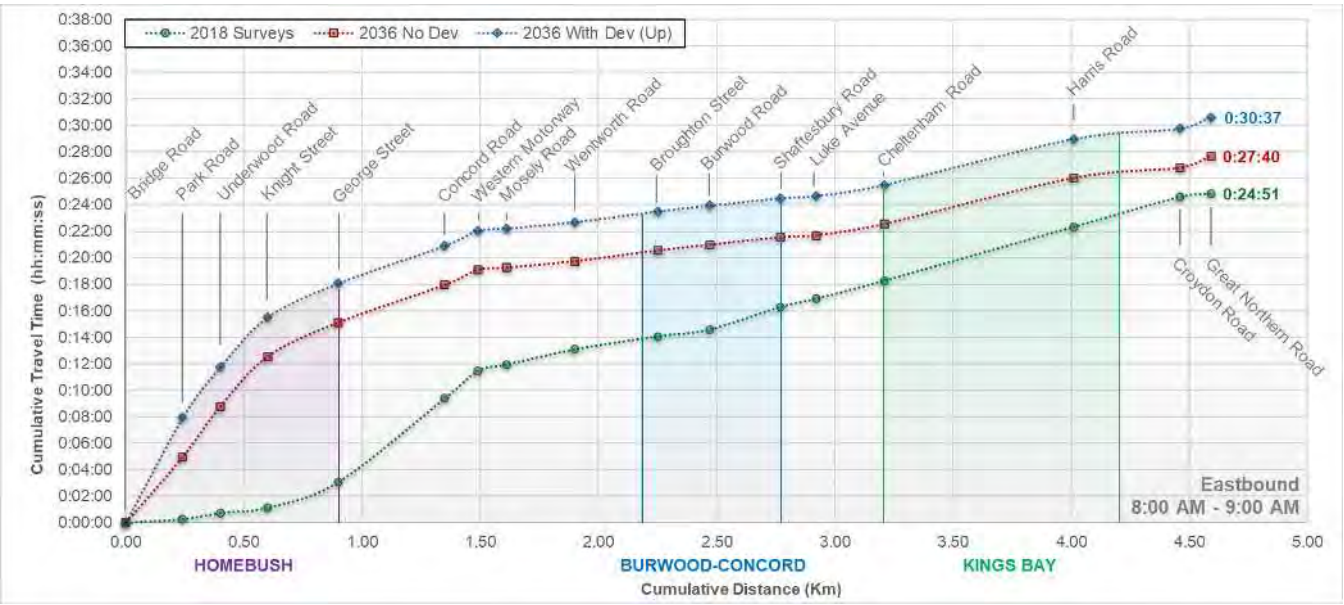


Figure 4-29: Travel Time Comparison to Benchmark Scenarios – Eastbound AM Peak

The AM peak travel time comparison between the Uplift (no Upgrades) and Uplift with Upgrades Scenarios for the **westbound** direction on Parramatta Road is shown in Figure 4-30.

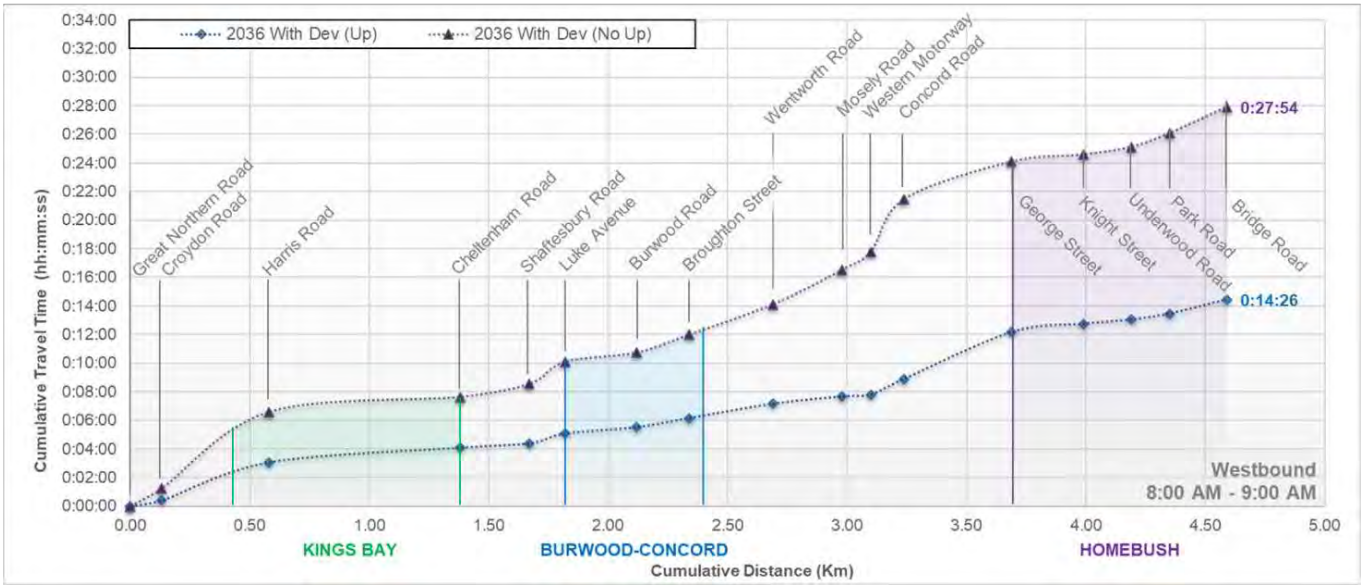


Figure 4-30: Travel Time Comparison – With and Without Upgrades – Westbound AM Peak

The benchmark comparison for the same peak period and direction is shown in Figure 4-31, highlighting the differences to the 2018 travel time surveys and the 2036 Benchmark Scenario.

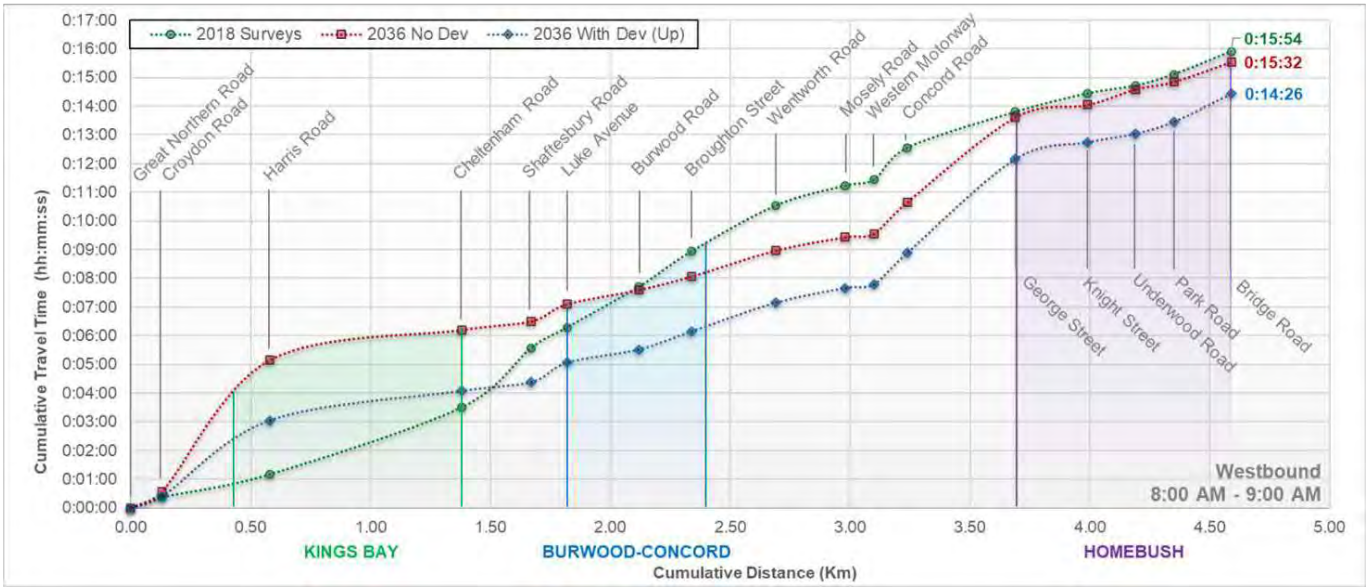


Figure 4-31: Travel Time Comparison to Benchmark Scenarios – Westbound AM Peak

The travel time results indicate that in the AM peak scenario. The proposed upgrades would result in a 22% reduction in eastbound travel times and a 52% reduction in westbound travel times compared to the Uplift scenario.

The proposed upgrades are not expected to reduce travel times to Benchmark scenario levels in the eastbound direction but may be able to reduce travel times in the westbound direction.

PM Peak

The PM peak travel time comparison between the Uplift (no Upgrades) and Uplift with Upgrades Scenarios for the **eastbound** direction on Parramatta Road is shown in Figure 4-32.

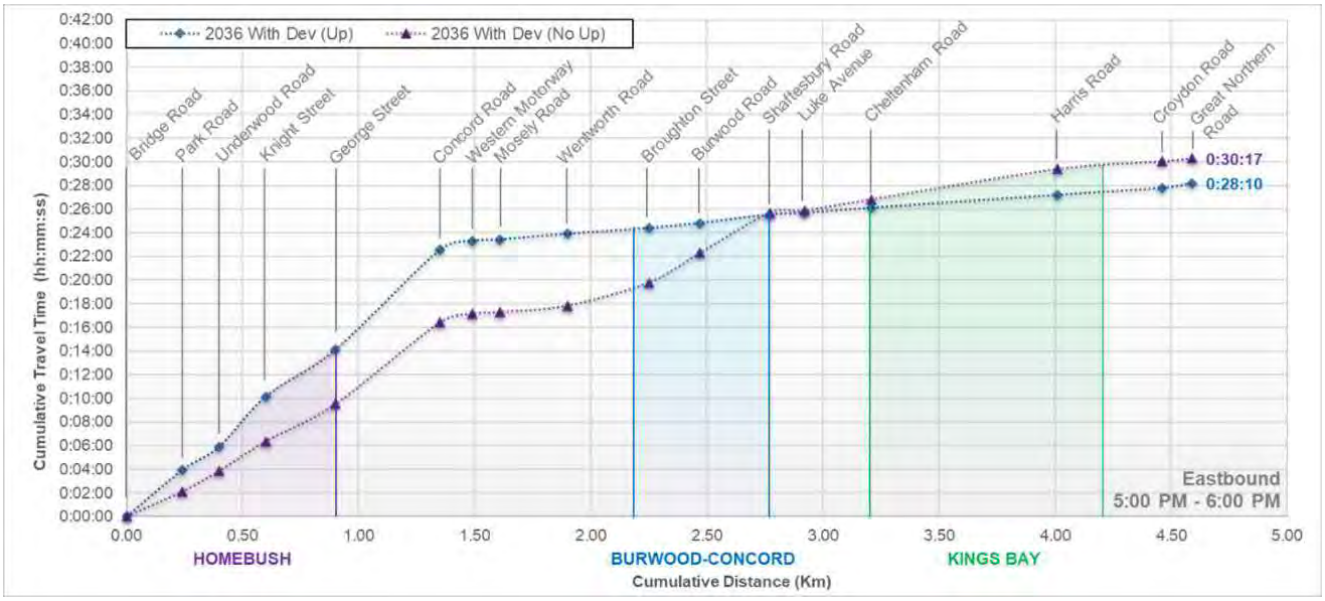


Figure 4-32: Travel Time Comparison – With and Without Upgrades – Eastbound PM Peak

The Benchmark Comparison for the same peak period and direction is shown in Figure 4-33, highlighting the differences to the 2018 travel time surveys and the 2036 Benchmark Scenario.

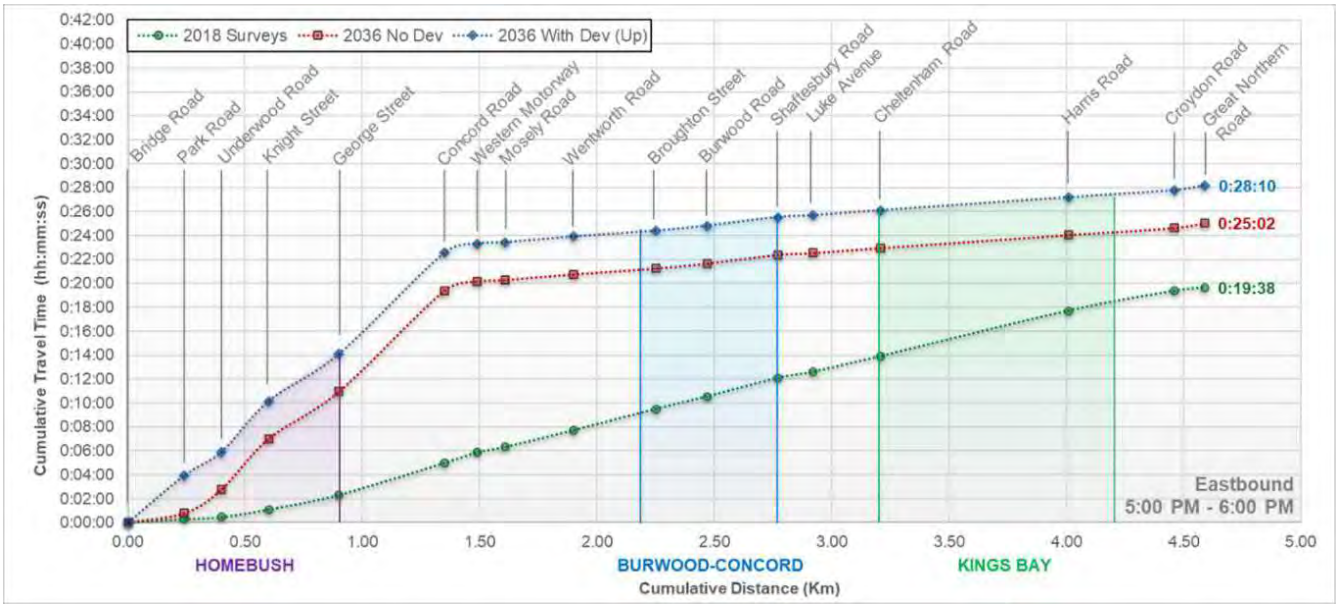


Figure 4-33: Travel Time Comparison to Benchmark Scenarios – Eastbound PM Peak

The PM peak travel time comparison between the Uplift (no Upgrades) and Uplift with Upgrades Scenarios for the **westbound** direction on Parramatta Road is shown in Figure 4-34.

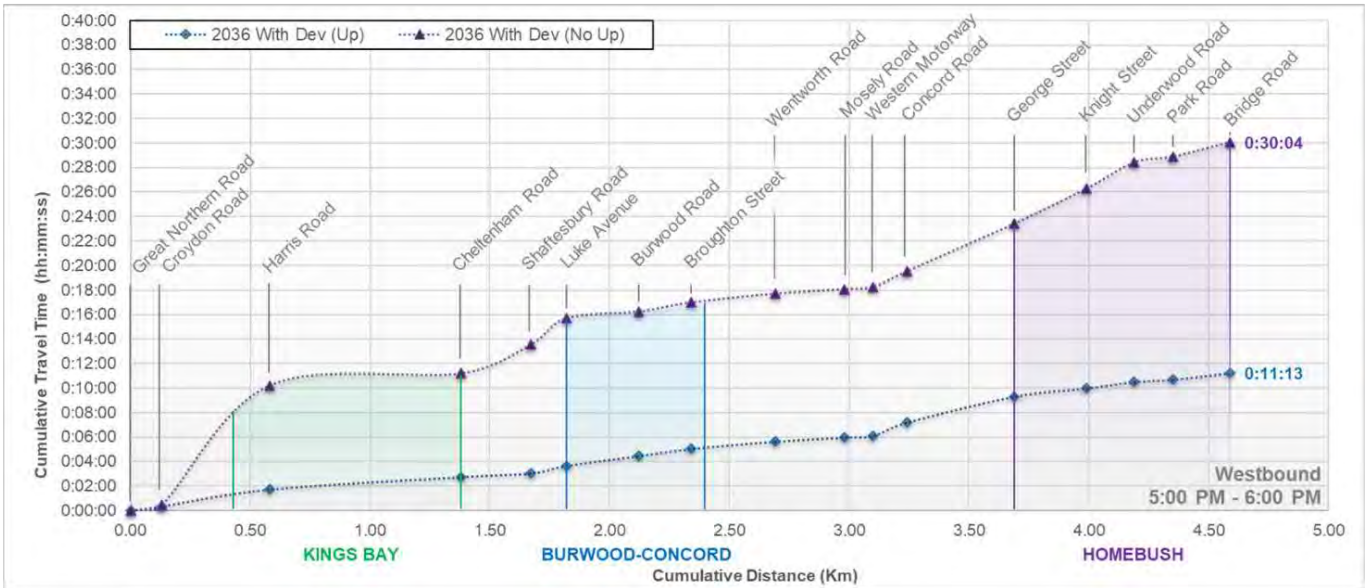


Figure 4-34: Travel Time Comparison – With and Without Upgrades – Westbound PM Peak

The benchmark comparison for the same peak period and direction is shown in Figure 4-35, highlighting the differences with the 2018 travel time surveys and the 2036 Benchmark Scenario.

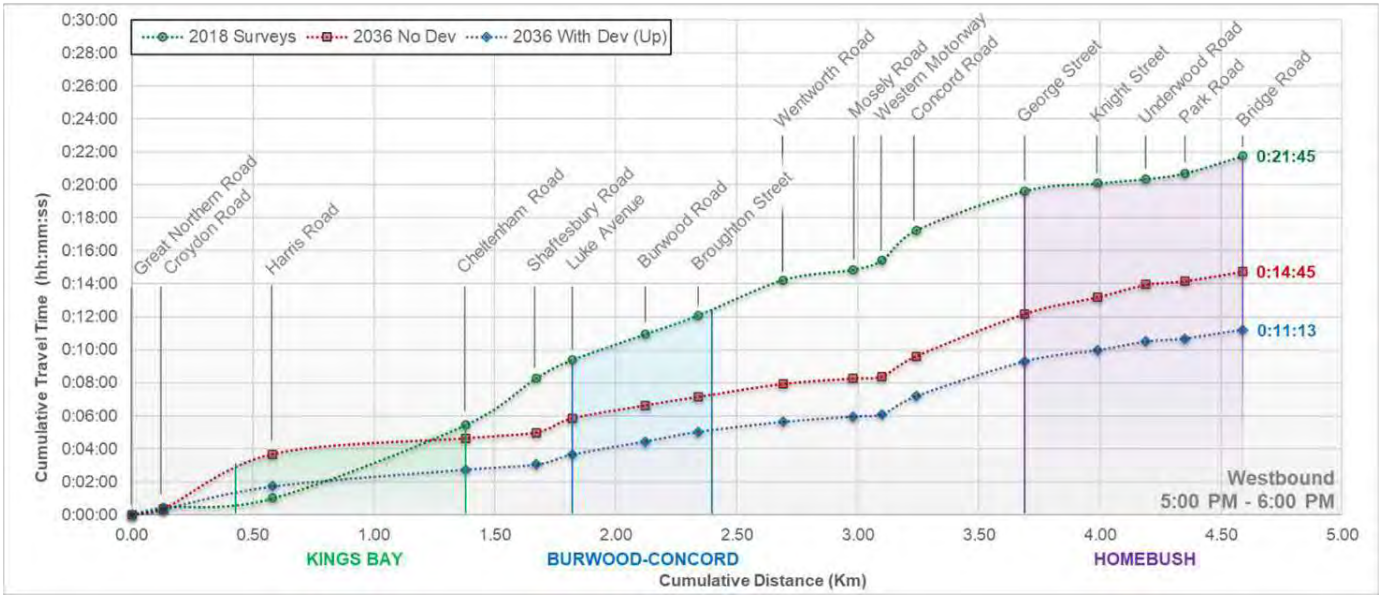


Figure 4-35: Travel Time Comparison to Benchmark Scenarios – Westbound PM Peak

The travel time results indicate that in the PM peak scenario. The proposed upgrades would result in a 7% reduction in eastbound travel times and a 63% reduction in westbound travel times compared to the Uplift scenario.

The proposed upgrades are not expected to reduce travel times to Benchmark scenario levels in the eastbound direction but may be able to reduce travel times in the westbound direction.

4.5 Public Transport

4.5.1 Changes to Public Transport Services

The most recent public transport network changes along the Parramatta Road corridor were implemented in October 2020. The changes were largely timetable improvements instead of changes in route alignment, stop locations or catchment coverage.

There are no daytime bus services between Burwood Road and Concord Road, although a recently implemented on-demand bus service operates in this area. There are no bus stops along this section of Parramatta Road to allow for the safe pick up or drop off on-demand passengers, especially during Clearway hours. Also, limited turn movement access between the northern and southern sides of Parramatta Road would substantially increase travel times for the on-demand service.

Two separate maps have been prepared to identify public transport service coverage gaps for buses and trains. The gaps outside of reasonable walking distance to access each mode are depicted in Figure 4-36 and Figure 4-37. Reasonable walking distances have been defined as 150m for bus services in moderately dense urban areas and 800m for train services. Figure 4-38 overlays the gaps in coverage considering buses and trains together.

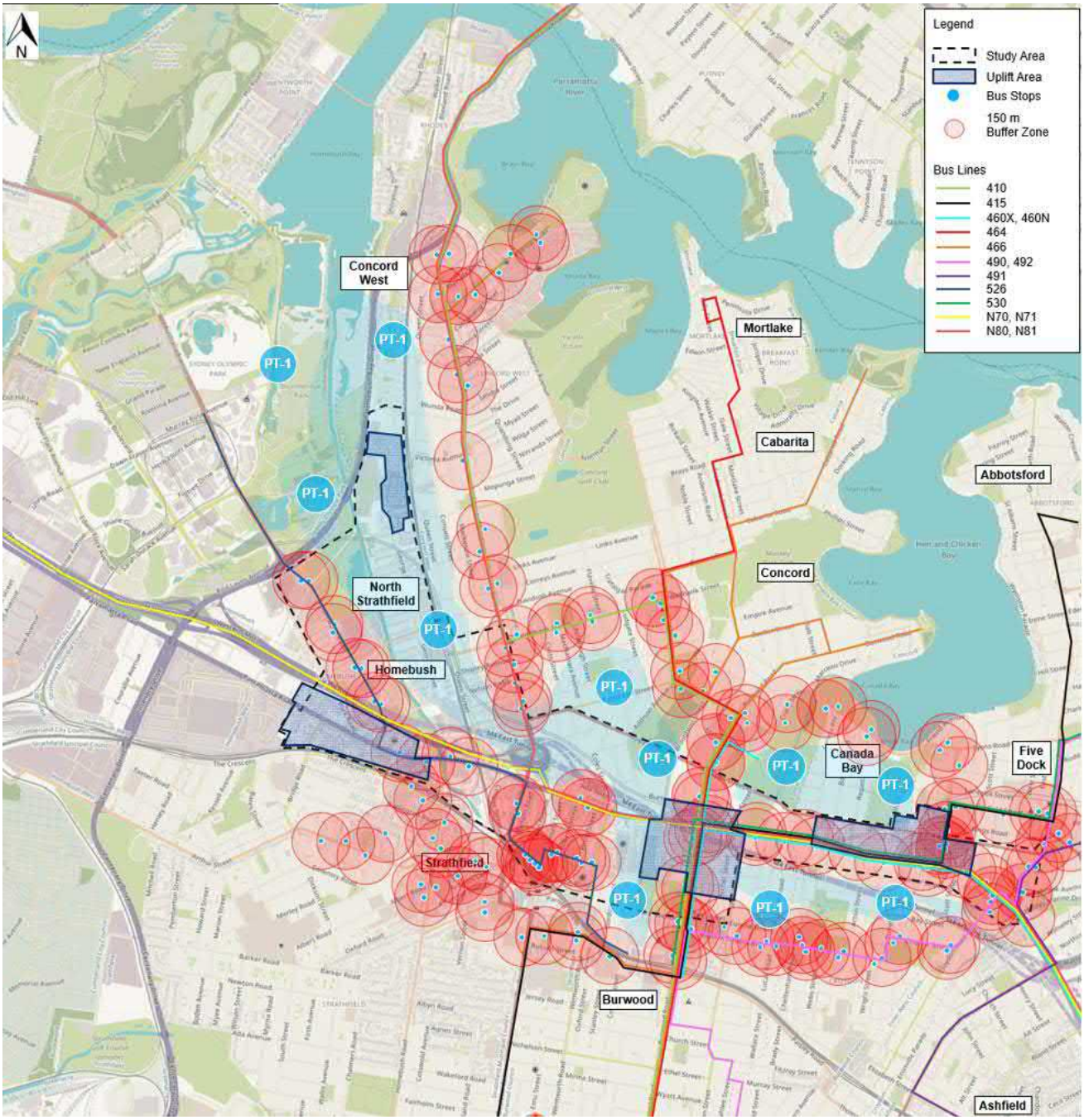


Figure 4-36: Bus Service Stop Coverage Gaps

Figure 4-36 reveals bus coverage gaps within Concord West, North Strathfield, Concord, Canada Bay and Croydon areas. These void clusters are highlighted in light blue in Figure 4-36. Parts of these gaps are within the defined Uplift precincts, particularly in North Strathfield.

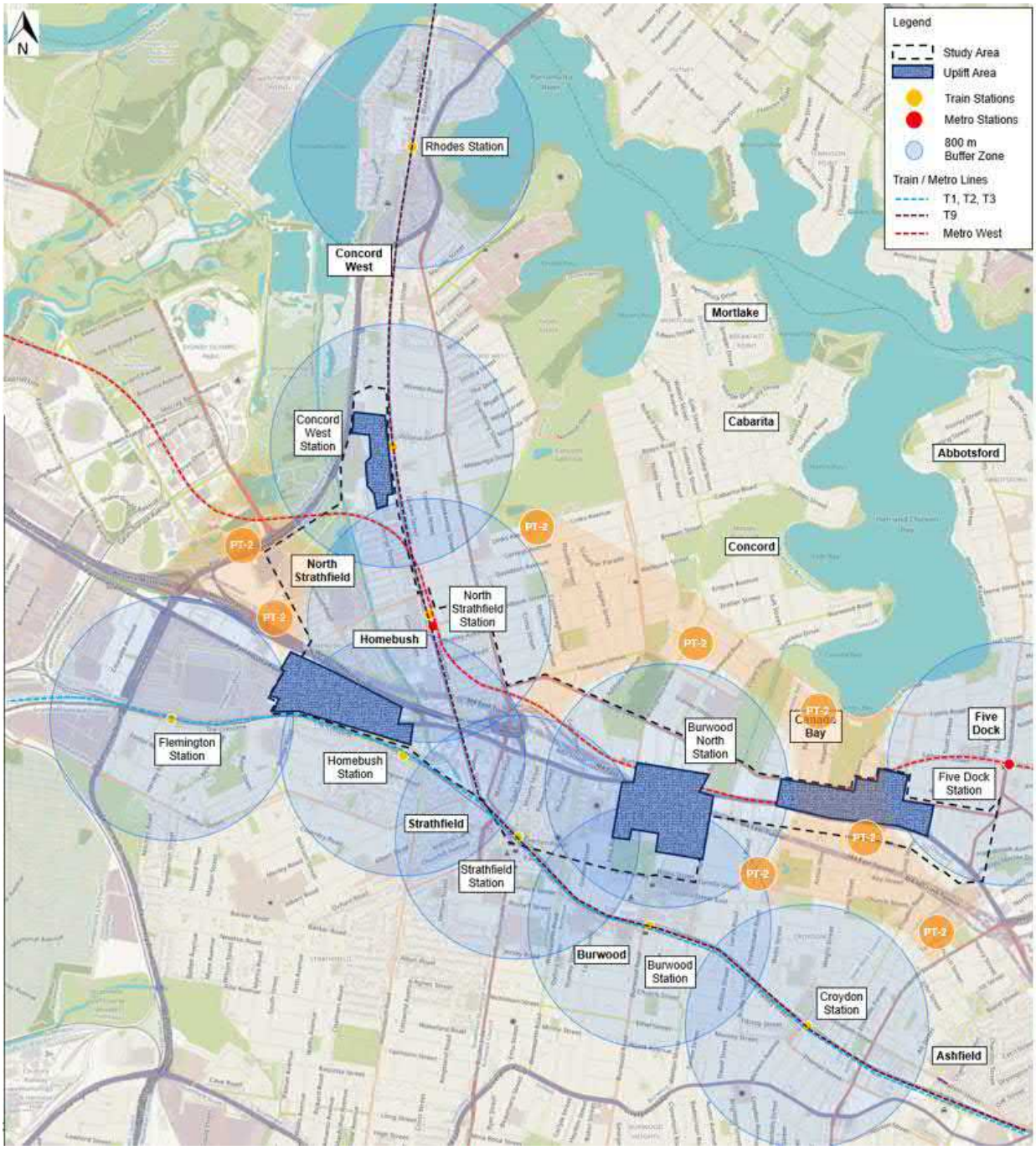


Figure 4-37: Train / Metro Stations Coverage Gaps within the Study Area

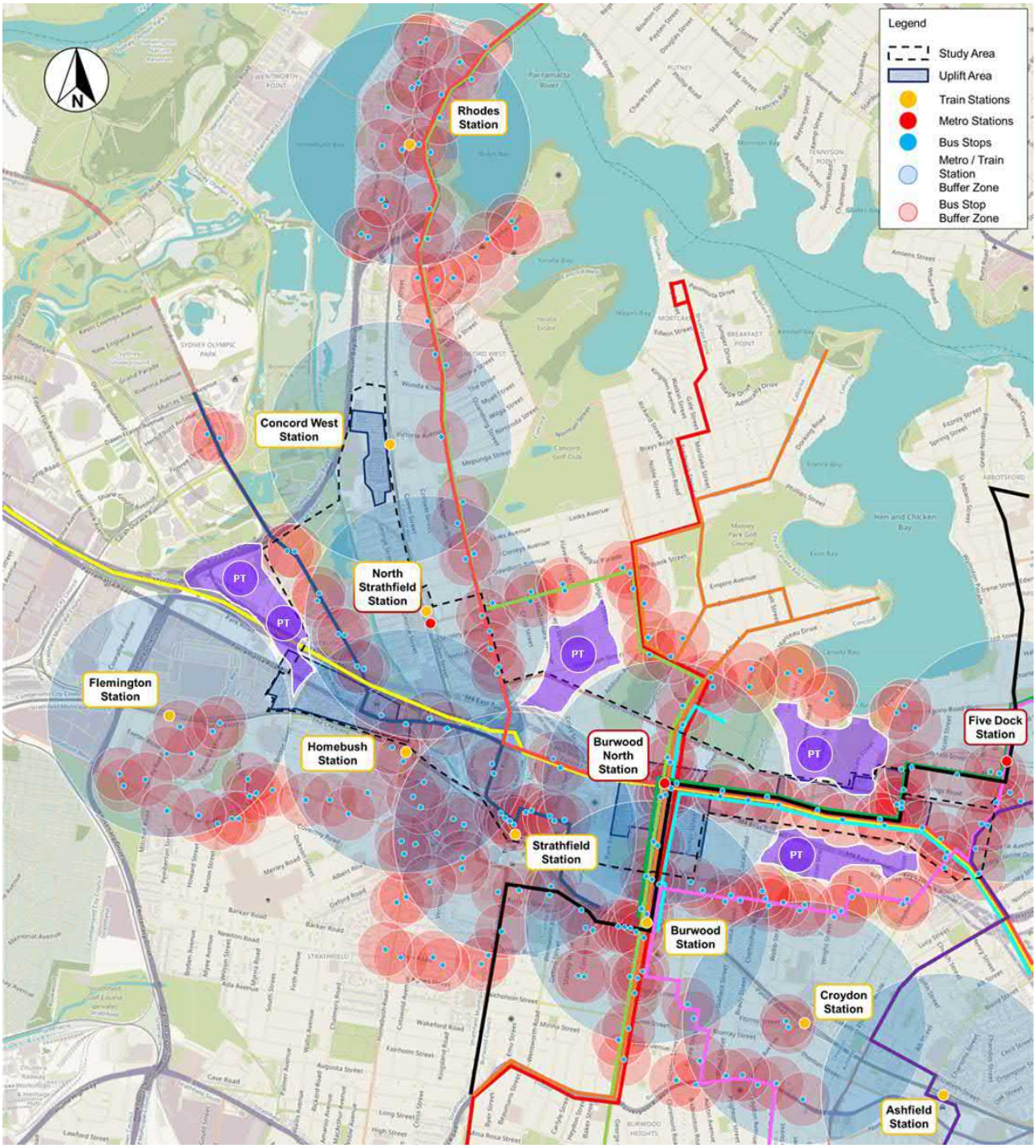


Figure 4-38: Bus and Train / Metro Stations Coverage Gaps

As shown in Figure 4-38, there is no direct bus route between North Strathfield / Homebush West and Sydney CBD. These catchments are some of the most significant in terms of traffic demands onto the Parramatta Road corridor.

Sydney CBD bus routes have a reasonable coverage along Burwood Road and Parramatta Road.

Detailed Public Transport strategies for each precinct are provided in Chapters 5 to 8.

4.5.2 At-grade Rapid Transport Route on Parramatta Road

It is understood that the infrastructure approval for WestConnex conditioned that at least two lanes of Parramatta Road be dedicated for the use of public transport, unless an alternative option with better public transport outcomes is committed to.

The Sydney Metro West project has since been approved, which might be interpreted as meeting the intent of the condition.

However, the future year demand forecasting has demonstrated that this project alone is insufficient to deter traffic from using Parramatta Road and extensive congestion is expected by 2036.

Further investigation of on-road rapid public transport services is warranted to provide alternatives to car travel for residents living and working along the Parramatta Road corridor. It is understood that such a study has been commenced by TfNSW at the time of writing this report.

4.6 Active Transport

4.6.1 Walking Demand and New Links

Existing 'real-time' pedestrian activity was sourced from Global Strava Heatmap, shown Figure 4-39. In the Heatmap, dark areas are categorised as areas with low or no pedestrian activity and lighter areas have high activity. It is noted that Strava data tends to be inherently weighted towards exercise/fitness activity, and therefore may not reflect other types of active transport (e.g. walking to the train station or bus stop, walking to the shops).

The lower levels of relative usage along Parramatta Road highlight the poor connectivity to, from and along this corridor and is a key consideration for improving connections. An overview of the new connections being proposed is also provided in Figure 4-40 with further details provided in Chapter 5 to 8.

4.6.2 Cycling

Figure 4-40 shows the current cycling network and shows how disjointed it is across the study area. An overview of new proposed cycling connections within the Uplift precincts is also shown in Figure 4-40 with further details provided in Chapters 5 to 8.

Source: https://www.strava.com/heatmap#12.62/-208.70684/-33.93341/hot/all

Figure 4-39: Potential Additional Links to the Footpath Network within Uplift Precincts

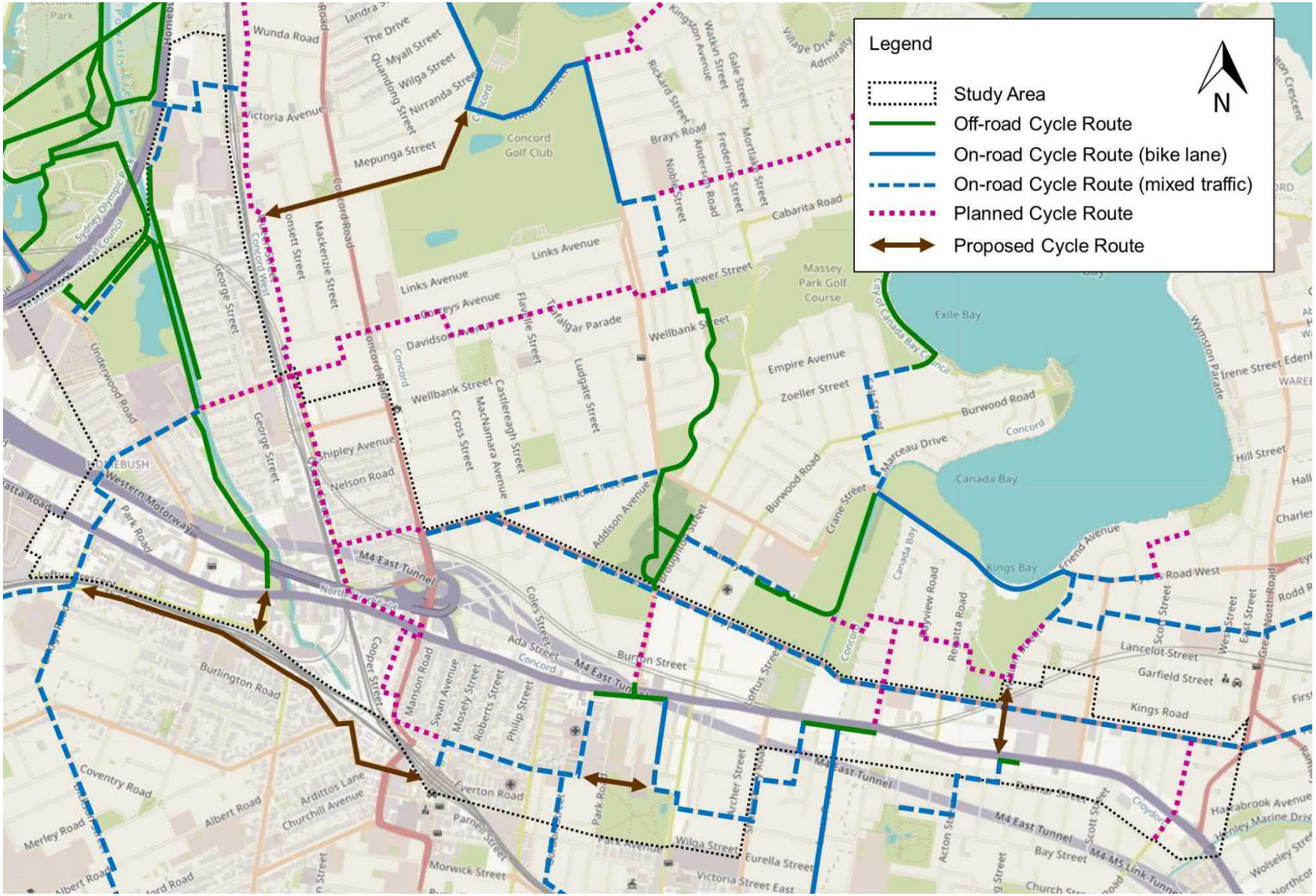


Figure 4-40: Proposed Additional Links for the Cycleways Network within Uplift Precincts

4.7 Parking Policies

4.7.1 General

In redevelopment areas such as the uplift precincts in this study, parking policy can have a significant influence on travel behaviours and traffic demands. For example:

- Lower development parking rates per unit may influence the car ownership characteristics of those who choose to move into the area (knowing there will be restrained on-site parking)
- Managing the supply of parking may compel regular long-stay car parking users to seek alternative modes of transport. This may include constraining off-street parking availability and introducing time restricted / metered on-street parking.

However, an integrated parking policy needs to finely balance the above considerations with what the consequences of restrained supply might be. This is particularly evident in transition areas, like the uplift areas, where the overflow of excess parking demand into adjacent residential areas can be problematic.

For these reasons, a broader parking strategy is preferred to the consideration of the Uplift areas in each LGA in isolation. Notwithstanding these limitations, the two key parking policy measures that have been identified for consideration within the study area are:

- Adjusting parking provision rates in each Councils' Development Control Plans (DCPs), primarily based on the proximity and levels of service of public transport
- Peak period clearways to better cater for future intersection pinch point needs.

Each strategy has been identified and explained in the following sections.

4.7.2 DCP Parking Rate Categories

The proposed uplift precincts have been assessed in terms of proximity and coverage of public transport as the basis for defining the levels of development parking that ought to be considered. The precincts have been categorised into three 'parking transition' types:

- **P1 - Excellent Public Transport Provision:** Adjust parking provision rates to lowest level (e.g. near the proposed Burwood North Metro Station)
- **P2 - Good Public Transport Provisions:** Adjust parking provision rates down to moderately lower rates
- **P3 - Limited-to-or no reliable public transport provision:** Unchanged parking provision rates.

The parking areas were classified based on the density of nearby public transport facilities (and their areas of influence) as well as the hierarchy of services.

Proposed development parking provision rates have been annotated within each uplift precinct in Figure 4-41. The rates in Table 4-11 are proposed for the **P1** areas. **P3** areas are proposed to retain their current rates and **P2** areas are proposed to be the average of P1 and P3 rates.

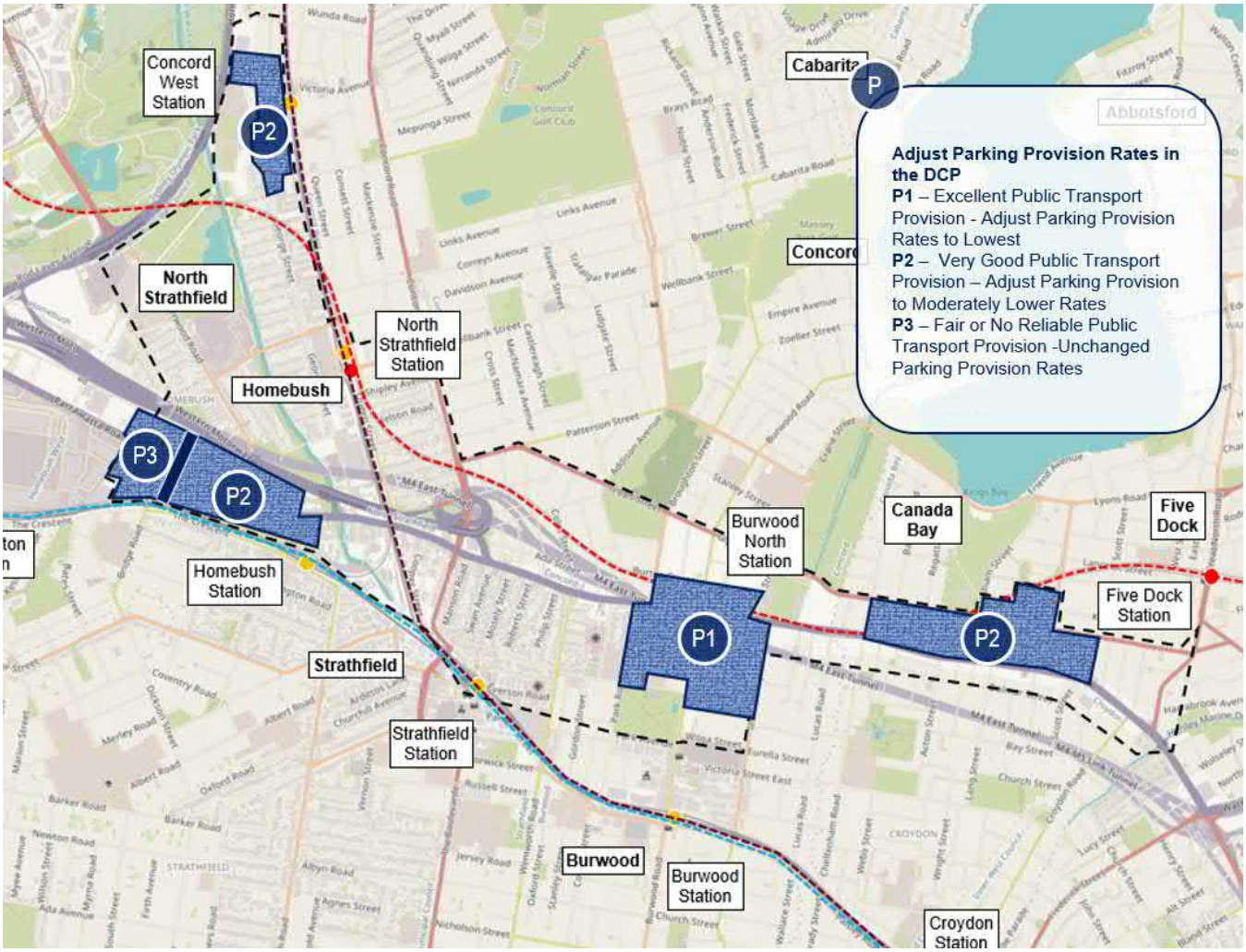


Figure 4-41: Proposed Parking Provision Transition Area

Table 4-11: Parking Rate Comparison for High Density Residential Dwellings *

Bedrooms	Sample P1 Rate*	Canada Bay P3 Rate	Burwood P3 Rate	Strathfield P3 Rate
Rate Type	Maximum	Minimum	Exact	Minimum
Studio	0.3	N/A	0.5	N/A
1	0.5	1	1	1
2	0.9	1.5	1	1
3	1.2	2	2	1.5
Visitor Parking	0.02	0.5	0.2	0.2

**Adapted from Parramatta Council DCP for Epping Town Centre*

Furthermore, 'P1' areas should be defined with maximum parking rates whilst 'P2' and 'P3' should be retained as minimum rates, although Council's would ideally be more flexible to accepting parking relaxations in 'P2' areas.

It is recognised that there is a relationship between allowable development parking supply and property attractiveness and marketability, which can lead to the issue of reduced parking availability being sensitive with the industry. The implementation of any new parking rates should be tested with industry and with the broader community.

Since the proposed uplift is predominately residential development, it is considered appropriate to maintain retail and commercial parking at current rates. The consolidation of retail parking in one area would be beneficial to manage long term parking supply (rather than allowing parking for each development) but would require the construction of a dedicated car park at the same time on-site parking provision was being discouraged. The time-lag between building the centralised facility and restraining site-based parking for individual developments is a key challenge. Alternatively, Councils may allow for shared/discounted parking requirements for mixed-use development and the allowance of unbundled parking for major developments.

4.7.3 Peak Period Clearways

The following local roads in the Uplift precincts are proposed for peak period parking restrictions (or 'clearways') to cater for additional 'inbound' traffic demand (towards Parramatta Road) in the AM peak and more 'outbound' demand in the PM peak. The locations are:

1. (P1) Bridge Road, Homebush between Parramatta Road and Loftus Crescent
2. (P2) Burwood Road, Burwood between Wilga Street to the south and Burton Street north of Parramatta Road
3. (P3) Harris Road, Five Dock between Parramatta Road and Kings Road
4. (P4) Queens Road, Five Dock between Arlington Street and Great North Road.

The proposed parking restrictions would take the form of peak period clearways and parking restrictions would defer to current restrictions during the day and on weekends. The need for the peak period clearways however is aligned with substantial completion of redevelopment of the area.

The proposed clearways are depicted in Figure 4-42.

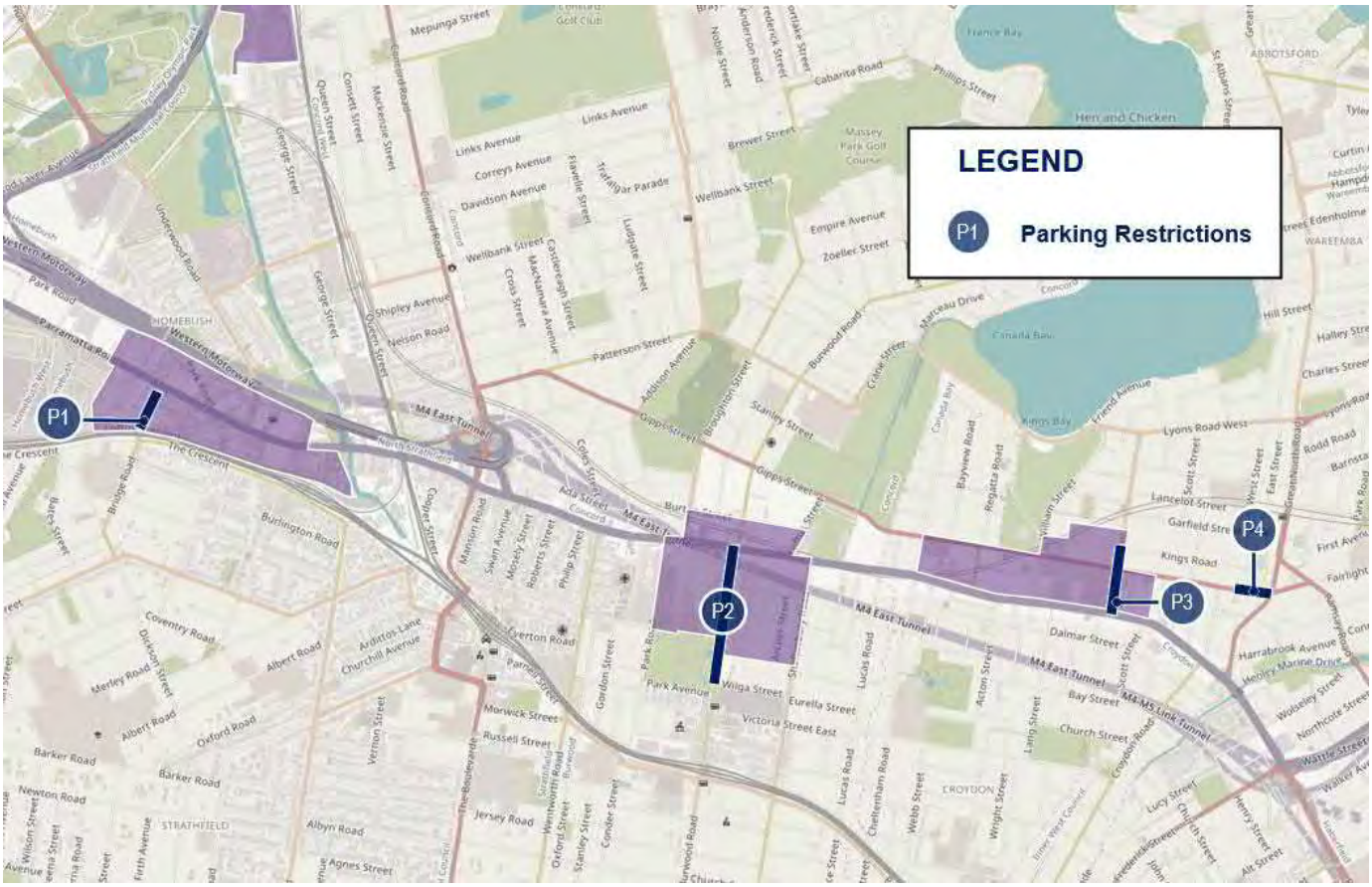


Figure 4-42: Proposed Peak Hour (Tidal) Clearways

4.8 Travel Demand Management Measures

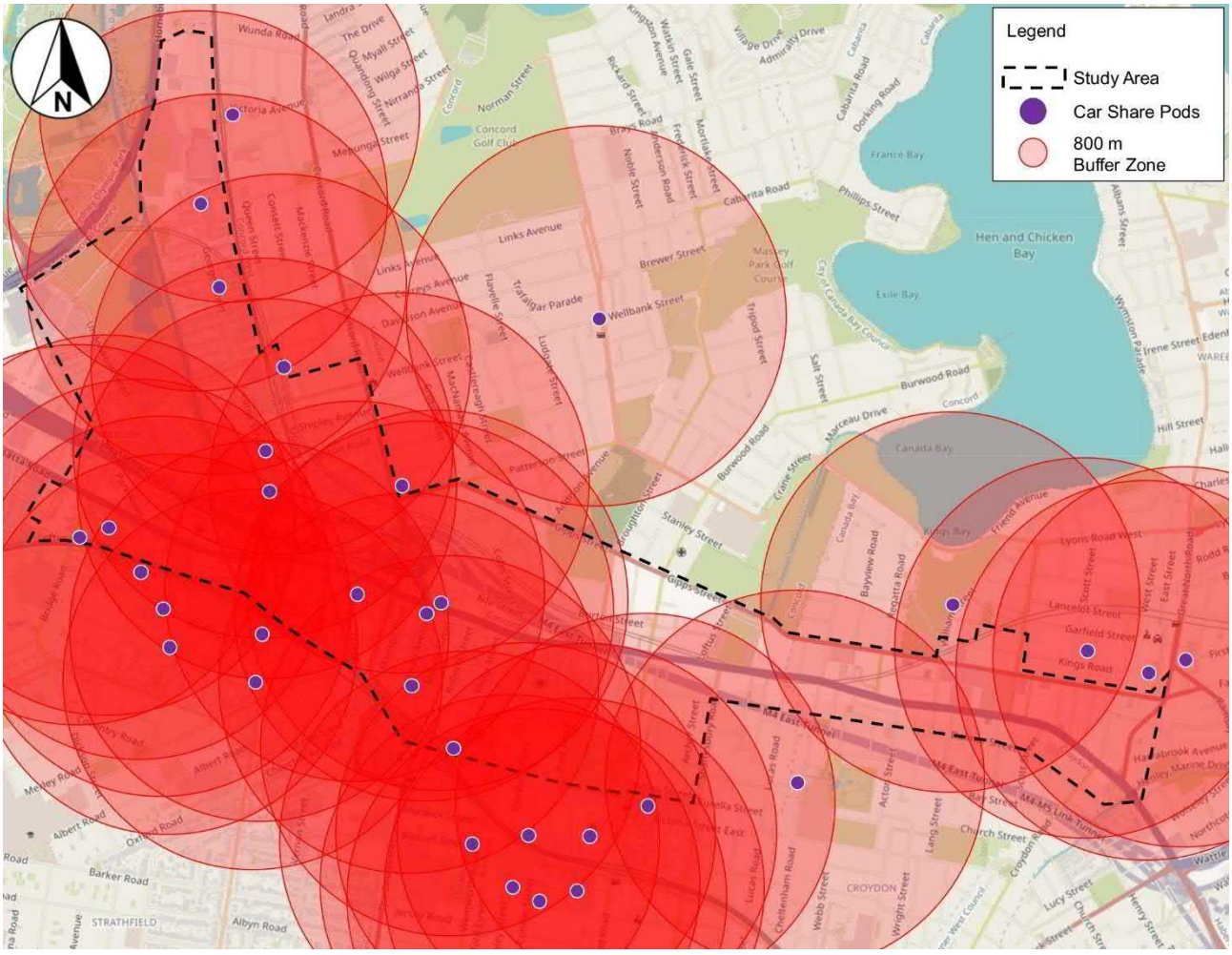
4.8.1 Car Share Strategies

Figure 4-43 shows a map of existing car share parking pods in the study area. 'Go Get' is the current provider in these locations. It can be seen that the GoGet parking pods are mostly near railway stations, and that they are not provided in the Burwood-Concord and Kings Bay precincts.

As the precincts redevelop, with expected increases in population and (potentially) more restrictive development parking rates, the demand for car share facilities will increase, and should be encouraged through development initiatives. The integration of car share as a part of major new developments in the study area could encourage reduced car ownership when moving into the area. It is noted that new car share spaces are continuously being added by Councils and car share companies.

Additional to proposed car share in new developments, car share pods could be provided along:

- Queens Road and its side streets
- Concord Road and its side streets
- Side streets off Burwood Road.



Source: GoGet

Figure 4-43: GoGet Parking Pods in the Study Area with an 800m Walking Radius

4.8.2 Green Travel Plans

The uplift precincts are located in areas of high public transport accessibility. Depending on the scale of each development in each of the precincts, a Green Travel Plan should be prepared to capitalise on walking, cycling and public transport facilities proposed to be introduced into these areas, supported by a finer grained road system. There would be merit in each Council preparing Green Travel Plan templates for major developments to use as a basis for their individual Green Travel Plans.

4.8.3 'Finer Grain' Local Street Networks

Whilst not strictly a TDM measure, there is merit in breaking up the Uplift precincts with laneways and roads to provide greater permeability to and from Parramatta Road for walking and cycling, and to improve traffic circulation opportunities and 'rear access' to developments.

The development layout and street structure principles included in the RobertsDay vision summary completed in August 2017 summary show how these principles could work in each precinct area. This report supports the 'finer grained' road network principles in the vision summary.