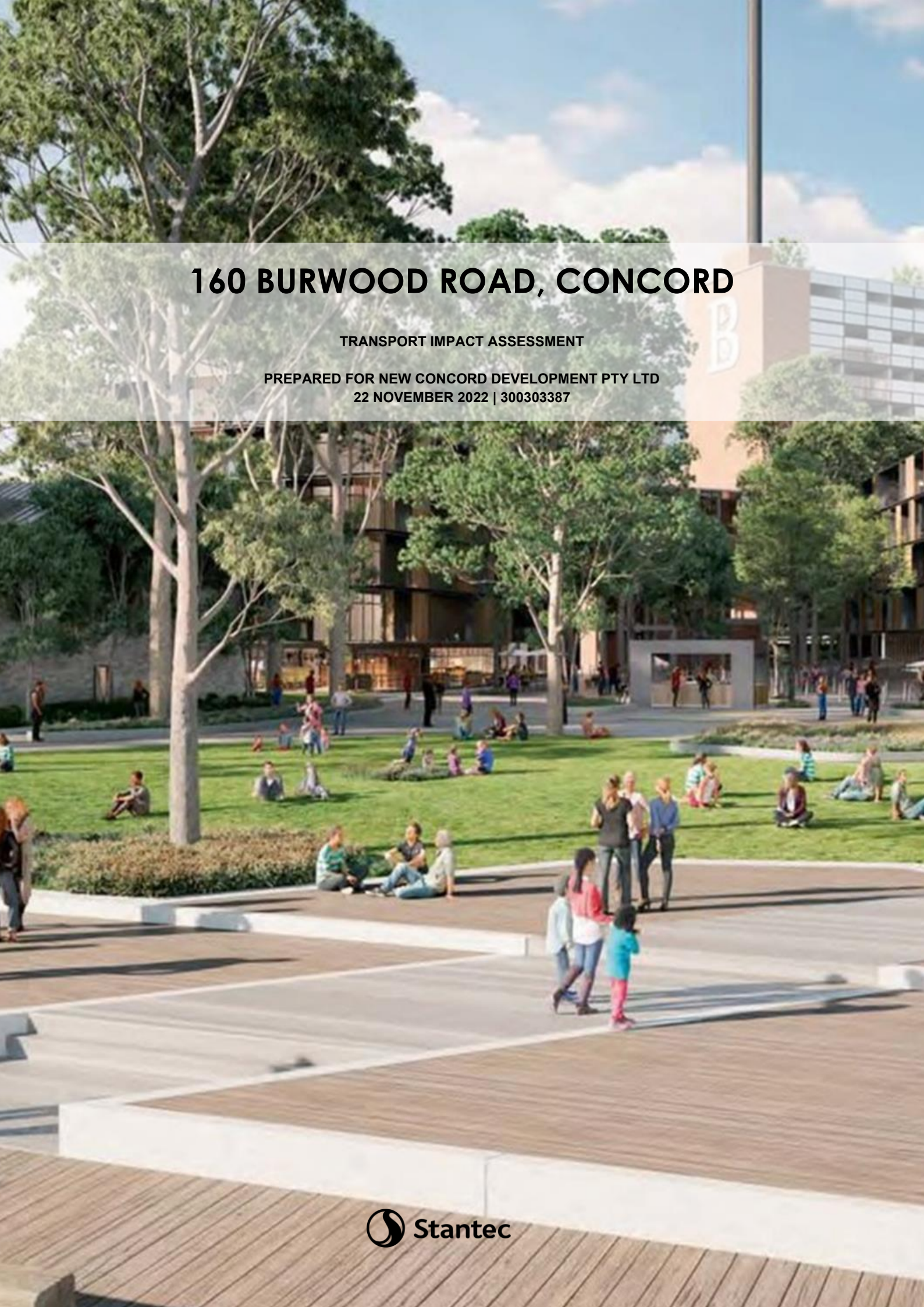

160 BURWOOD ROAD, CONCORD

TRANSPORT IMPACT ASSESSMENT

PREPARED FOR NEW CONCORD DEVELOPMENT PTY LTD
22 NOVEMBER 2022 | 300303387

Stantec

Revision	Date	Description	Author	Quality Check	Approver
A	29/04/2022	Final	Mackenzie Brinums	Brett Maynard	Brett Maynard
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C	10/11/2022	Updated to address additional Council comments	Mackenzie Brinums	Rhys Hazell	Brett Maynard
D	22/11/2022	Minor updates	Mackenzie Brinums	Rhys Hazell	Brett Maynard

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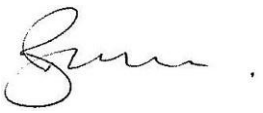
Reviewed by: 

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Executive Summary

A planning proposal has been lodged with City of Canada Bay Council for a mixed-use redevelopment of the Bushells factory site located at 160 Burwood Road in Concord.

The planning proposal seeks to facilitate the urban renewal of the subject site from an industrial site into a mixed-use, riverside village offering a mix of land uses that are complimentary to the existing surrounding residential area. It provides approximately 400 new dwellings (including 10 per cent as affordable housing), comprising a mix of shop top housing and residential flat buildings up to six storeys and terrace housing up to three storeys. A maximum 7,000 square metres of retail/ commercial uses will be provided (including a 1,000-square-metre small-format supermarket), together with a minimum 3,000 square metres of light industry/ urban services uses that will be primarily located in the Bushells Factory building, which is proposed for heritage listing and adaptive re-use. The 10,000 square metres of non-residential uses will create approximately 281 new jobs. The proposed uses will be supported by 5,900 square metres of new public open space, including a new plaza and foreshore park to Exile Bay, and publicly accessible internal streets including a vehicular connection between Burwood Road and Zoeller Street.

It should be noted that the evolution and assessment of the proposal itself has occurred over several years and has incorporated feedback from several of the transport stakeholders including Council and Transport for NSW. During the course of design development and Council consultation for the project, Stantec has formally assessed a range of yield options from 360-680 apartments and 4,000 to 8,000 square metres of non-residential uses, in addition to community facilities. Accordingly, this transport impact assessment has been updated to reflect the current scheme as approved by the City of Canada Bay Local Planning Panel to proceed to public exhibition.

The strategic value of the site is a unique large waterfront landholding offering transport accessibility from both the water and a direct road connection (Burwood Road) to the arterial road network (Parramatta Road). While the site is not located within the various centres and precincts that have been identified, it is in a high residential amenity location and a comprehensive transport strategy has been identified including:

- Easy access to existing bus services (Route 466 in particular adjacent to the site providing connection between Cabarita and Burwood at up to five services per hour, which operates between Ashfield and Cabarita Park via Burwood Road).
- On-site car share pod with a minimum of 10 car share vehicles up completion of the full redevelopment.
- Fleet of e-bikes (or best available technology at the time) for fast and easy connection to local destinations including the future Metro West station.
- Travel demand management for existing and future local residents through the provision of new on-site facilities and services as part of the proposal.
- Integrated walking and cycling links within the public domain and open space, improving local walking and cycling connectivity.

- Series of minor and realistic road network improvement measures to address both existing and future traffic conditions.

A peer review of the proposal completed by Jacobs concluded that current regular route bus services along Burwood Road should be sufficient to meet the demands of the site.

Staging of the development is expected to align with surrounding public infrastructure projects such as Sydney Metro West, considering the required timeframe for the rezoning itself, concept master plan approval, staged development applications and construction.

Detailed traffic analysis (using recent 2022 survey data as agreed with Council) at a suitable level of detail for the Planning Proposal stage has been prepared noting that there will be ongoing changes in local and regional traffic patterns in the coming years due to significant public infrastructure works including WestConnex, Parramatta Road Urban Transformation Corridor and Sydney Metro West.

Specifically, it is noted that:

- Conservatively high residential trip generation rates have been used to ensure appropriate sensitivity testing of the surrounding road network. Retail traffic generation rates are based on Stantec's experience with local retail in a mixed-use development environment, noting that a major supermarket would not be provided (something that is an anchor characteristic of local/ smaller shopping centres that exhibit higher traffic generation rates).
- Reduced car travel throughout the day/ week can be expected from the surrounding existing local area for convenience retail and food/ beverage related trips as a result of the proposed commercial/ retail uses, which will benefit the broader area.
- To address select local traffic constraints, a series of improvement opportunities have been identified which can all be accommodated within the existing road alignments. The modifications are also limited to the loss of some existing on-street parking and only during peak periods.
- With the potential mitigation measures identified, the assessed key intersections surrounding the site are expected to continue operating satisfactorily.
- A green travel plan should be implemented for the proposed development, consistent with current best practice, in order to reduce road network peak period wherever possible.

The TIA recommends that car parking for the future land uses be provided in accordance with the requirements of the City of Canada Bay DCP, while noting that there may be an opportunity to share (part of) the residential visitor parking provision with the retail parking, as well as reducing the overall visitor parking provision to be more consistent with typical high-density developments. On-street parking restrictions (resident parking scheme and/or short-term parking to be developed with Council at the DA stage) are proposed to manage the potential demand for all-day parking, noting that short-term use of on-street parking along the site frontage is appropriate and consistent with local area traffic management principles. There is no reason to expect a detrimental impact on local resident parking on this basis, noting that most local residents have off-street parking for more than one vehicle.

In summary, the proposal has the potential to make a positive contribution to the surrounding area by way of a new retail precinct, with cafes, restaurants and cultural spaces. Appropriate traffic solutions are available to manage future background traffic growth along with the proposal.

1 Introduction

1.1 Background and Proposal

It is understood that a Planning Proposal has been lodged with City of Canada Bay Council to amend the current planning controls for the current Bushells factory site located at 160 Burwood Road in Concord. The Proposal seeks to amend the planning controls in the Canada Bay Local Environment Plan 2013 from IN1 (Industrial) to B4 (Residential – Mixed Use) as delineated in the Canada Bay Local Environmental Plan 2013. In rezoning the site, the proposal seeks to increase the permissible height limit and introduce a site-specific floor-space ratio.

An indicative development yield for the site comprises some 384 residential apartments set above 6,747 square metres gross floor area (GFA) of lower level non-residential land uses.

Stantec was engaged by New Concord Development Pty Ltd to undertake a transport impact assessment for the proposed development. This transport impact assessment has been updated from the Planning Proposal submission to reflect the scheme as approved by the City of Canada Bay Local Planning Panel to proceed to public exhibition.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

- existing traffic and parking conditions surrounding the site
- suitability of the proposed parking in terms of supply (quantum) and layout
- service vehicle requirements
- pedestrian and bicycle requirements
- the traffic generating characteristics of the proposed development
- suitability of the proposed access arrangements for the site
- the transport impacts of the development proposal on the surrounding road network.

1.3 References

In preparation of this assessment and report references have been made to the following:

- an inspection of the site and its surrounds
- traffic surveys completed in October 2022 as referenced in the context of this report
- Canada Bay Local Environmental Plan (LEP) 2013
- The City of Canada Bay Development Control Plan (DCP) 2020
- Transport for NSW Guide to Traffic Generating Developments 2002
- other documents and data as referenced in this report.

2 Strategic Context

2.1 Overview

The following key strategies and plans have influenced development opportunities in local and regional area, together with real effects on future travel demand and mode splits.

A trigger for significant change in the inner west is the implementation of WestConnex and Sydney Metro West. WestConnex assists in reducing demand and improving travel times for vehicles along Parramatta Road and other east-west roads near the site, while Sydney Metro West will improve travel time, reliability and reduce costs compared a range of other travel modes and reinforce the link to key employment areas including Sydney CBD and Parramatta. The service will also alleviate some of the demand on the existing T1 Western Line.

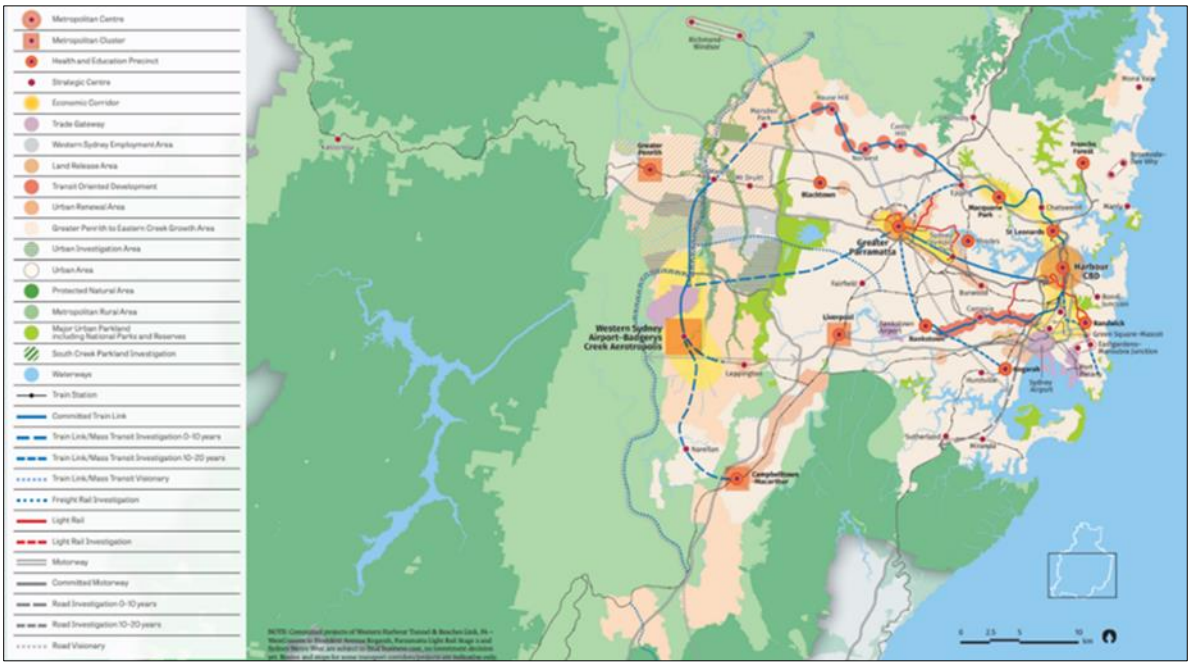
2.2 The Greater Sydney Region Plan 2018

The Greater Sydney Commission (GSC) is an independent organisation that leads metropolitan planning for Greater Sydney. It has prepared the Greater Sydney Region Plan which outlines how Greater Sydney will manage growth and guide infrastructure delivery. The plan has been prepared in conjunction with the NSW Government's Future Transport 2056 Strategy and informs Infrastructure NSW's State Infrastructure Strategy.

The GSC's vision is to create three connected cities; a Western Parkland City west of the M7, a Central River City with Greater Parramatta at its heart and an Eastern Harbour City. By integrating land use, transport links and infrastructure across the three cities, more people will have access within 30-minutes to jobs, schools, hospitals and services.

The Greater Sydney Region Plan is a 20-year plan with a 40-year vision and has four key focuses; infrastructure and collaboration, liveability, productivity and sustainability. The Greater Sydney Structure Plan 2056 is shown indicatively in Figure 1.

Figure 1: Greater Sydney Structure Plan 2056 – The Three Cities



Source: Greater Sydney Commission

2.3 Future Transport 2056

Future Transport 2056 provides a 40-year strategy for how transport will be planned, amended and forecasted within NSW, both regional and metropolitan, for the expected 12 million residents within the state. Future Transport 2056 follows from the 2012 Long Term Transport Master Plan which listed over 700 transport projects, the majority of which are completed or in progress. It also ties in with Greater Sydney Region Plan and the subsequent district plans to support the three cities metropolis vision.

Future Transport 2056 is supported by two key documents, Greater Sydney Services and Infrastructure Plan and Regional NSW Services and Infrastructure Plan, which provide guidance and planning for these areas.

From a metropolitan view, Future Transport 2056 and associated plans include the 30-minute city where jobs and services are within 30 minutes of residents with Greater Sydney. Strategic transport corridors to move people and goods are outlined between metropolitan and strategic centres, clusters and surrounds. The Movement and Place framework is also emphasised to support liveability, productivity and sustainability.

The plan introduces several initiatives that relate to the road hierarchy and transport network within the site:

- New Infrastructure:
    - WestConnex
    - Parramatta Light Rail
    - Long Term Future Mass Transit Link from Macquarie Park to Hurstville via Rhodes.

- The Parramatta Road public transport upgrade
- The Parramatta River Ferries upgrade project
- Priority Cycleway links in inner Sydney.

2.4 The Eastern City District Plan

The Eastern City District Plan follows from the Metropolis of Three Cities article with a focus on the Eastern District of Sydney which contains the site. It presents a 20-year plan to manage growth in the context of economic, social and environmental matters to achieve the 40-year plan outlined both in Future Transport and Metropolis of Three Cities. The article serves as a bridge between regional and local planning.

The Plan introduces several planning priorities, including:

- E3: Providing services and social infrastructure to meet peoples' chancing needs
- E5: Providing housing supply, choice and affordability with access to jobs, services and public transport
- E10: Planning for integrated land use and transport planning, whereby an indicator is a maximum 30-minute access to a metropolitan centre/cluster. The relevant cluster for the site is the Sydney CBD.

2.5 WestConnex

The WestConnex project comprises of approximately 33km of new and expanded toll roads which will provide high quality connections between Sydney's west, CBD, south and airport. Currently the largest transport project in Australia, WestConnex is a priority strategic project for Sydney that aims to ease congestion, create jobs and connect communities. The project is being delivered in stages due for completion in 2023, some elements of the WestConnex project are described as follows:

- Stage 1 (M4 Widening and M4 East Extension): as part of this stage, the M4 was widened to four lanes in each direction between Parramatta and Homebush. The M4 East component of Stage 1 involved the construction of a new 5km twin tunnel along the Parramatta Road corridor between the M4 at North Strathfield and City West Link at Haberfield → opened July 2019.
- Stage 2 (New M8): this stage involved the duplication of the M5 East, creating new twin tunnels with three lanes in each direction between Beverly Hills to St Peters → opened July 2020.
- Stage 3 (M4 – M5 Link): this stage of WestConnex will connect the M4 with the M5 through a new tunnel comprising three lanes in each direction → due to open in 2023.
- Stage 4 (Rozelle Interchange): this stage involves a new interchange, largely underground, connection the M4 – M5 Link to the Anzac and Iron Cove Bridges and the future Western Harbour Tunnel and Beaches Link → due to open in 2023.

The WestConnex project will:

- Provide quicker, more reliable trips between Western Sydney and the Port Botany/ Sydney Airport precinct to support Sydney's urban freight task.

- Help distribute traffic across the wider road network, removing bottlenecks and relieving congestion for local trips.
- Provide better connections along the M4 Western Motorway and M5 corridors to cater for the forecast growth in employment and population along these routes.
- Allow urban revitalisation and increase opportunities for active and public transport along and across Parramatta Road.

The WestConnex project has and will continue to increase capacity along M4 Western Motorway and Parramatta Road corridor. It is anticipated that through traffic currently using Parramatta Road will be re-assigned to the new WestConnex link, increasing capacity for Parramatta Road. In addition, it is likely that additional capacity will be generated for parallel east-west routes such as Gipps Street and Crane Street.

An overview of the WestConnex project is illustrated in Figure 2.

Figure 2: WestConnex overview

Base image source: https://www.westconnex.com.au/explore-westconnex/interactive-map/ accessed February 2022

2.6 Sydney Metro West

The NSW Government has committed to building a new metro railway line from Sydney CBD to Greater Parramatta via the Bays Precinct in Rozelle and Sydney Olympic Park. The project will focus on the corridor between the Parramatta River and existing T1 Western Line, servicing key existing centres and growth areas. Stage 1 (Northwest) of Sydney Metro commenced operations in May 2019, with Stage 2 (City and Southwest) under construction and due for completion in 2024. Sydney Metro West will likely service five key precincts:

- Westmead – which is becoming one of the largest health, education, research and training precincts in Australia

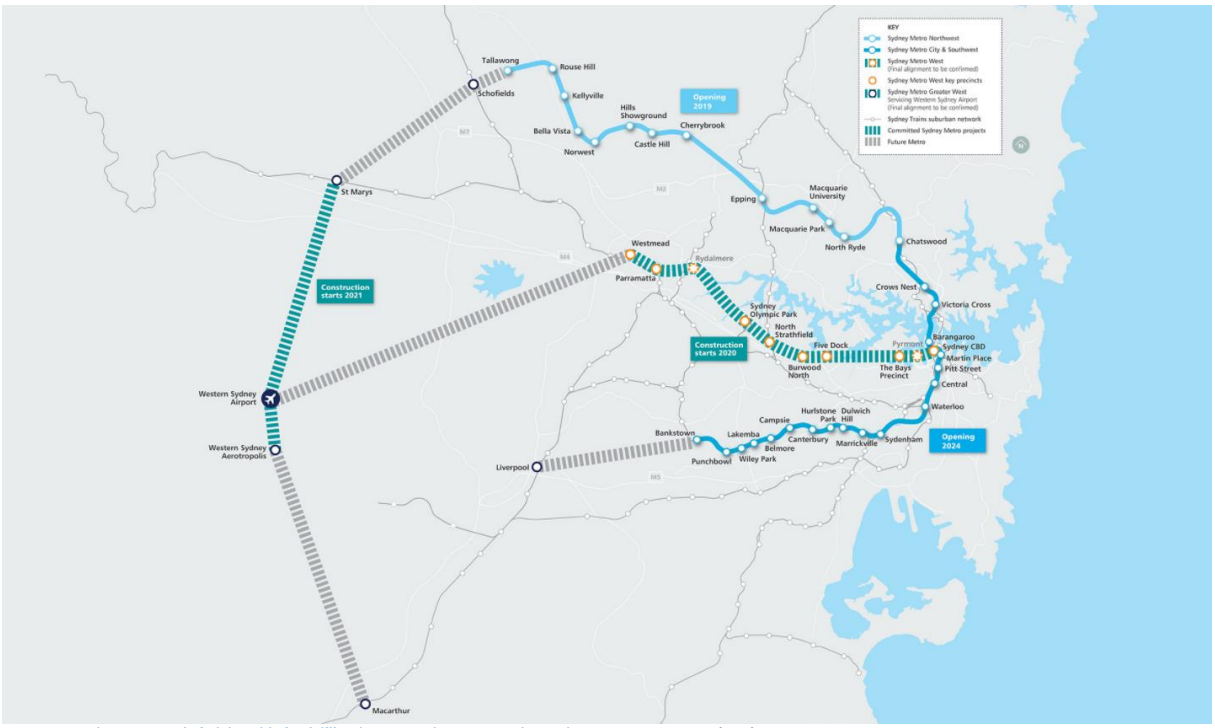
- Parramatta – where the number of jobs is expected to double over the next 20 years to 100,000
- Sydney Olympic Park – where 34,000 jobs and more than 23,000 residents will be located by 2030
- The Bays Precinct – Sydney's new innovation hub where 95 hectares of land is being regenerated
- The Sydney CBD – allowing easy access to the existing public transport network and Sydney Metro Northwest and Sydney Metro City and Southwest.

The NSW Government anticipated the new railway line would be completed and operational in the second half of the 2020's. It will directly benefit the future residents and employees of the surrounding Parramatta area. The NSW Transport Minister confirmed that Sydney West Metro must be built before 2031 to alleviate the severe overcrowding on the existing T1 Western Line which is already operating at 135 per cent seating capacity during peak periods.

Near the site, a new intermediate station at North Burwood is proposed on the corner of Burwood Road and Parramatta Road, with entrances on both the north and south sides of Parramatta Road.

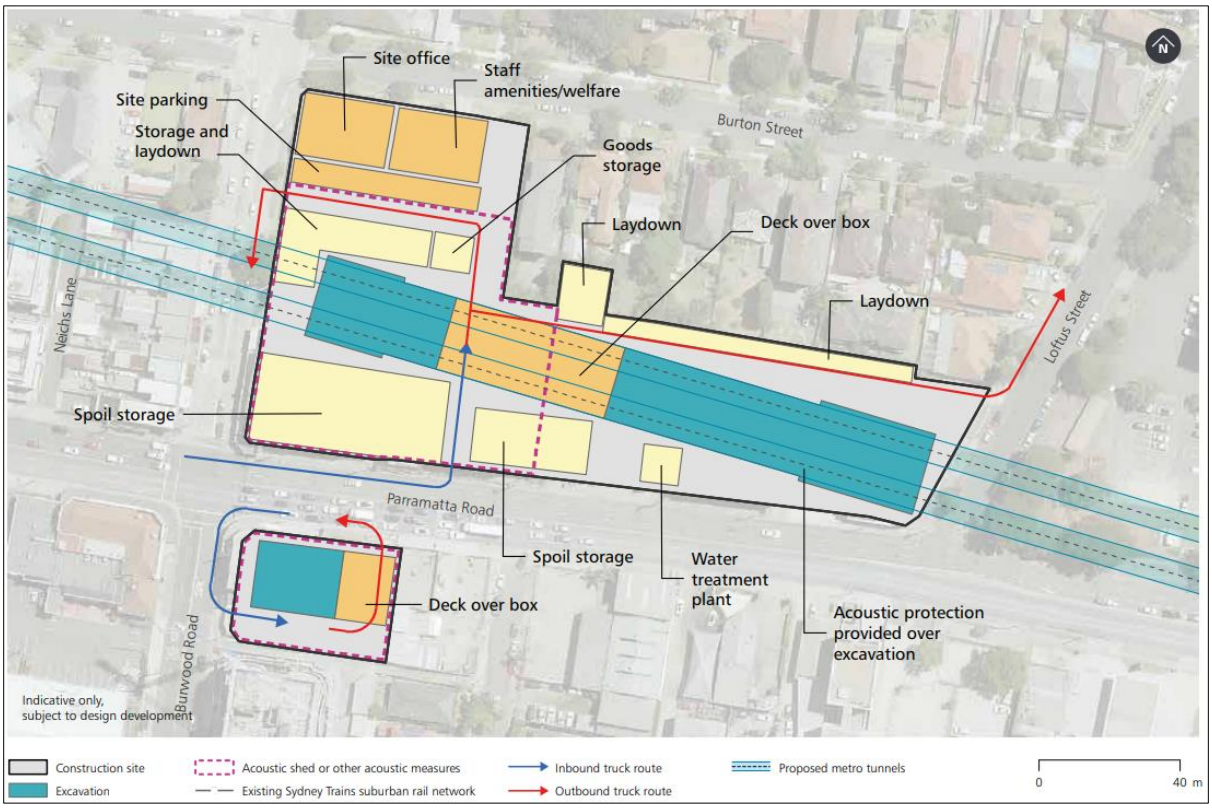
The Sydney Metro West study area is shown in Figure 3, while the construction plan for the North Burwood metro station is shown in Figure 4.

Figure 3: Sydney Metro West study area



Source: sydneymetro.info/sites/default/files/2021-09/Westmead_to_the_Bays accessed February 2022

Figure 4: North Burwood metro station location and construction plan



Source: https://www.sydneymetro.info/sites/default/files/2021-09/Westmead_to_the_Bays_and_Sydney_CBD_Environmental_Impact_Statement_summary_final_1.pdf accessed February 2022

3 Existing Conditions

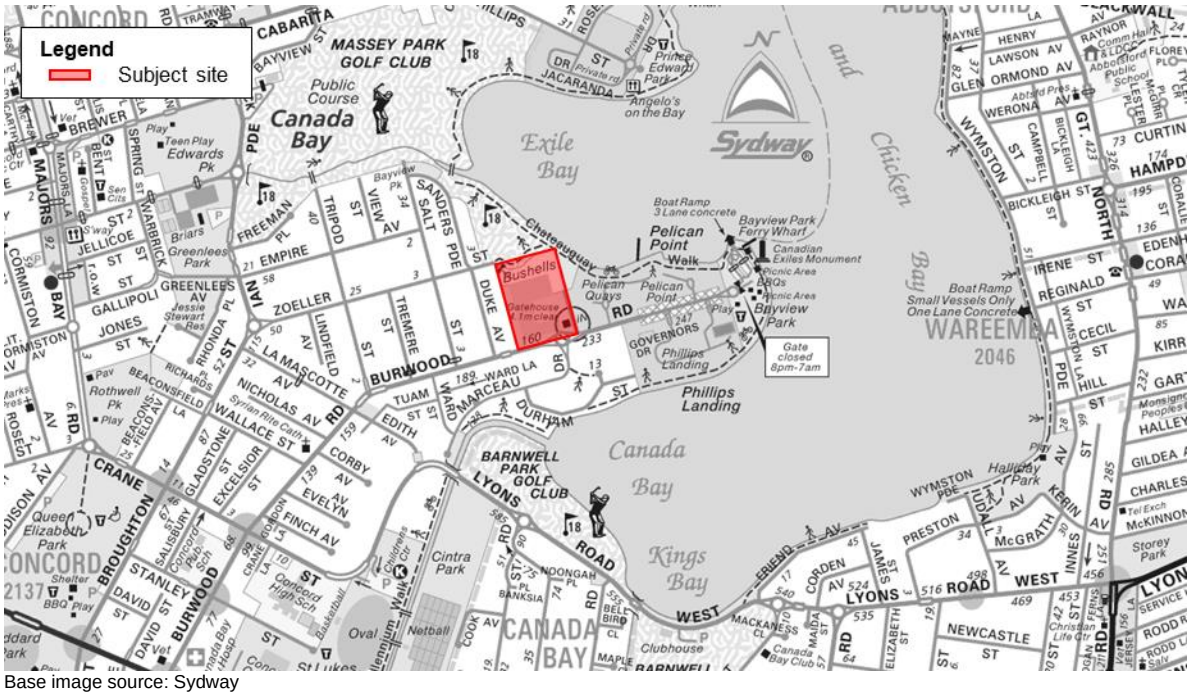
3.1 Location

The subject site is located at 160 Burwood Road, Concord and is Lot 5 of DP129325. The site of approximately four hectares in area has a southern frontage of 170 metres to Burwood Road and a northern frontage of 10 metres to Zoeller Street. The site also has a boundary to Exile Bay in the north-east.

The site is currently classified as IN1 – General Industrial under the City of Canada Bay LEP 2013. The site is currently occupied by factory premises (in existence for a significant period of time). The surrounding properties predominantly include low and medium density residential uses. Exile Bay is located to the north-east of the site and Bayview Park and Ferry Wharf are located on the point to the east.

It is understood that the current factory site is coming to the end of its economic life. The site's peninsula location, limited road access for heavy vehicles and proximity to adjoining residential areas, represent significant constraints for the operation of ongoing industrial activity. The location of the subject site and its surrounding environs is shown in Figure 5.

Figure 5: Site location and environs



Base image source: Sydway

3.2 Surrounding Road Network

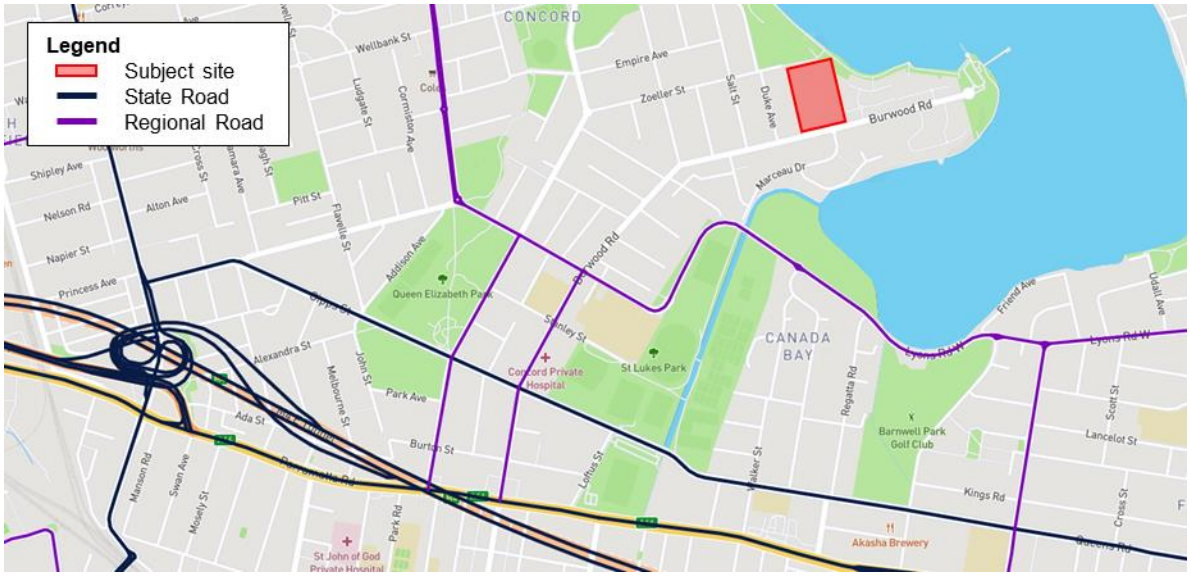
The surrounding road network has been outlined in Table 1 and shown in Figure 6.

Table 1: Road network outline

Road name	Classification	Properties
Parramatta Road	State Road	• East-west alignment

Road name	Classification	Properties
		• 16.4m road width • 23.0m road reserve • Three lanes either direction • 60km/h speed zoning • Parking is not permitted on either side of the road
Gipps Street	State Road	• East-west alignment • 12.4m road width • 18.3m road reserve • One lane in either direction • 60km/h speed zoning • Parking is permitted either side of the road
Burwood Road	Mainly a local road, however between Crane Street and Parramatta Road is a Regional Road	• North-south alignment • 12.8m road width • 19.9m road reserve • One to two lanes of traffic in either direction • 50km/h speed zoning, with a section subject to 40km/h school zoning • Parking is subject to zone and time either side of the road
Broughton Street/ Ian Parade	Mainly a local road, however Broughton Street between Crane Street and Parramatta Road is a Regional Road	• North-south alignment • 12.1m road width • 19.4m road reserve • One lane of traffic in either direction • 50km/h speed zoning • Parking is permitted either side of the road
Crane Street	Regional Road	• East-west alignment • 12.6m road width • 19.0m road reserve • Two lanes of traffic in either direction • 50km/h speed zoning • Parking is primarily not permitted on either side of the road
Zoeller Street	Local road	• East-west from the Ian Parade/ Broughton Street/ Zoeller Street roundabout to cul-de-sac 590m to the west • 12.7m road width • 19.7m road reserve • One lane of traffic in either direction • 50km/h speed zoning • Parking is permitted either side of the road

Figure 6: Road network diagram



Base image source: https://roads-waterways.transport.nsw.gov.au/classification/map/cartomap accessed 2 February 2022

3.3 Traffic Volumes

Traffic movement counts at the following key intersections were completed on a typical weekday and Saturday in October 2022:

1. Burwood Road/ Crane Street
2. Burwood Road/ Gipps Street
3. Burwood Road/ Parramatta Road
4. Broughton Street/ Zoeller Street/ Ian Parade
5. Broughton Street/ Crane Street
6. Broughton Street/ Gipps Street
7. Broughton Street/ Parramatta Road.

The weekday AM and PM peak hours were found to occur from 8:00am to 9:00am and 5:15pm to 6:15pm respectively with the Saturday peak being 12:00pm to 1:00pm. A summary of the existing traffic volumes during the respective peak hours is included in Appendix A.

It is noted that several iterations of traffic surveys have been completed at the key intersections near the site, with the previous most recent being in 2019. By way of comparison, the 2022 data indicates there has been an increase in traffic volumes of between zero and five per cent at Intersections 2 to 4 since 2019. Traffic volumes at Intersections 1 and 5 along Crane Street have reduced over the same period. Intersections 6 and 7 were not included as part of the 2019 survey scope with no comparison possible.

3.4 Intersection Operation

The operation of the key intersections within the study area have been assessed using SIDRA Intersection (SIDRA), a computer-based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the Transport for NSW, is vehicle delay. SIDRA determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 2 shows the criteria that SIDRA adopts in assessing the level of service.

Table 2: SIDRA level of service criteria

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

Intersections were modelled as a network within SIDRA, with the models calibrated based on SCATS phasing data and on-site observations of queues and delay during the weekday and Saturday peak hours. Table 3 presents a summary of the existing operation of the key study intersections.

Table 3: 2022 intersection operating conditions

Intersection	Peak	Degree of saturation (DOS)	Average delay (sec)	Average queue (m)	Level of service (LOS)
Broughton Street/ Zoeller Street/ Ian Parade	AM	0.27	19	5	B
	PM	0.17	11	3	A
	Saturday	0.20	12	3	A
Broughton Street/ Crane Street	AM	0.57	25	56	B
	PM	0.73	28	77	B
	Saturday	0.74	28	78	B
Burwood Road/ Crane Street	AM	0.60	34	66	C
	PM	0.68	34	79	C
	Saturday	0.74	36	83	C
Burwood Road/ Gipps Street	AM	0.75	30	79	C
	PM	0.82	28	91	B
	Saturday	0.59	24	67	B
Burwood Road/ Parramatta Road	AM	0.61	17	88	B
	PM	0.60	16	94	B
	Saturday	0.58	15	87	B
Broughton Street/ Gipps Street	AM	0.86	26	85	B
	PM	0.67	26	78	B
	Saturday	0.72	29	77	C
Boughton Street/ Parramatta Road	AM	0.71	14	119	A
	PM	0.70	15	115	B
	Saturday	0.74	20	142	B

The results presented in Table 3 indicate that all intersections currently operate well within the weekday and Saturday peak hours at a LOS C or better. Average queues are generally manageable and do not impact the operations of the upstream or downstream intersections, noting again that the SIDRA model considers the intersections as a network and therefore also analyses the interaction between the study intersections.

3.5 Car Parking

Unrestricted kerbside parking is permitted on all roads in the vicinity of the site. There is a considerable on-street parking supply located on surrounding roads including Burwood Road, which provides parallel parking near the site and some 45-degree angle parking to the east. During the weekday afternoon peak, the car parking demand is low to moderate with demand increasing throughout the afternoon, typically associated with residents returning home.

3.6 Sustainable Transport

3.6.1 PUBLIC TRANSPORT

The site is well serviced by the surrounding bus network, with the 466 and 502 bus routes stopping adjacent to the site on Burwood Road, while several other services are within a short walk further south along Burwood Road or northwest on Ian Parade. A summary of the available bus stops near the site is provided in Table 4.

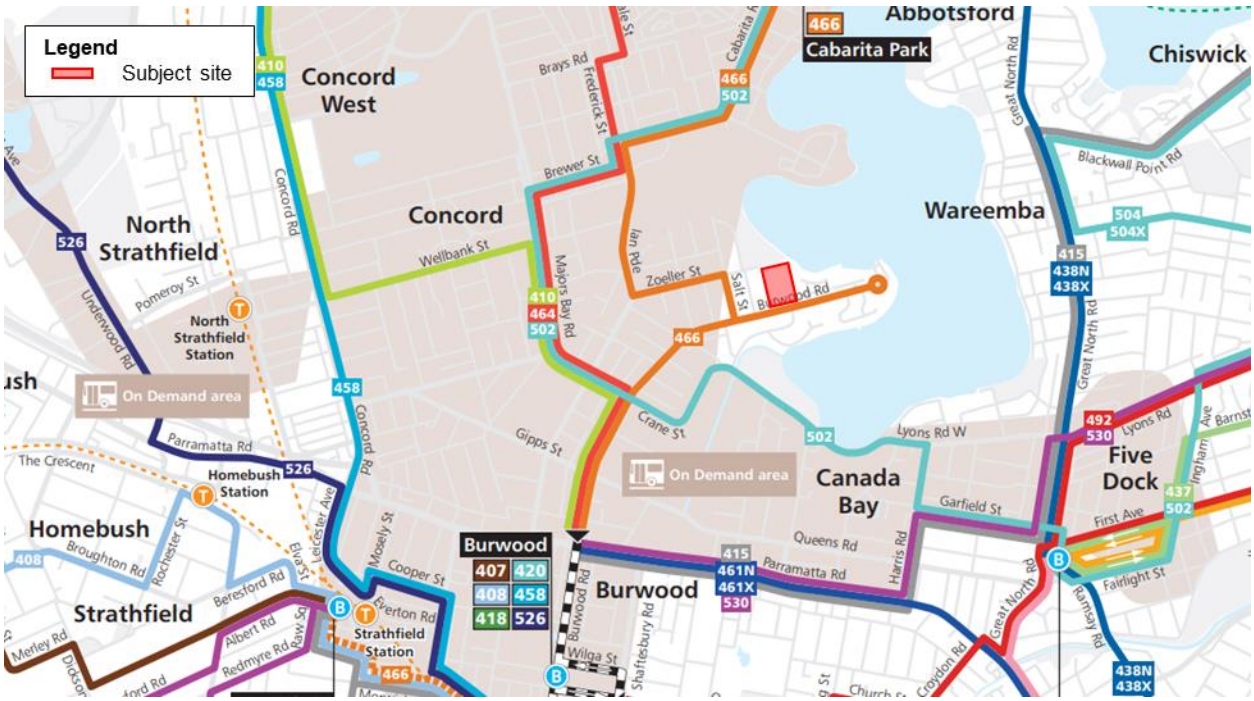
Table 4: Schedule of bus network

Route number	Route description	Location of nearest bus stop	Distance to nearest bus stop	Frequency (peak / off-peak)
410	Macquarie Park to Hurstville	Burwood Road and Crane Street	800m	10 mins/ 15 mins
464	Mortlake to Ashfield	Outside site on Burwood Road	800m	15 mins peak and off peak
466	Cabarita to Burwood	Burwood Road and Crane Street	0m	20 mins peak only
502	Cabarita Wharf to Drummoyne and City Town Hall	Burwood Road and Crane Street	800m	10 mins/ 30 mins

Services to the closest train station (Burwood Station) take approximately 11 minutes from the Marceau Drive/ Burwood Road bus stop via the 466 bus route. This service runs approximately every 20 minutes during peak time.

The surrounding bus network is shown in Figure 7.

Figure 7: Surrounding bus network



Base image source: https://transportnsw.info/document/5670/21569_ts_r6_network_map_20211205.pdf accessed February 2022

The site is also located adjacent to the Transport for NSW On Demand public transport service area (see Figure 7), which allow users to book a vehicle and be picked up from either home or a convenient nearby location, and dropped off at a local transport hub or point of interest. It is easy to book using an app, online or by phone. In future, there is potential for coverage to expand to cover the site as demand for the service increases.

Burwood Station is located approximately 2.3 kilometres south of the site and services the T2 Inner West and Leppington Line and T9 Northern Line. The station provides frequent heavy rail services during peak and off-peak periods.

The Bayview Park Wharf is located to the east of the site. This terminal was removed from Sydney Ferries timetables in 2013 due to low patronage.

3.6.2 ACTIVE TRANSPORT

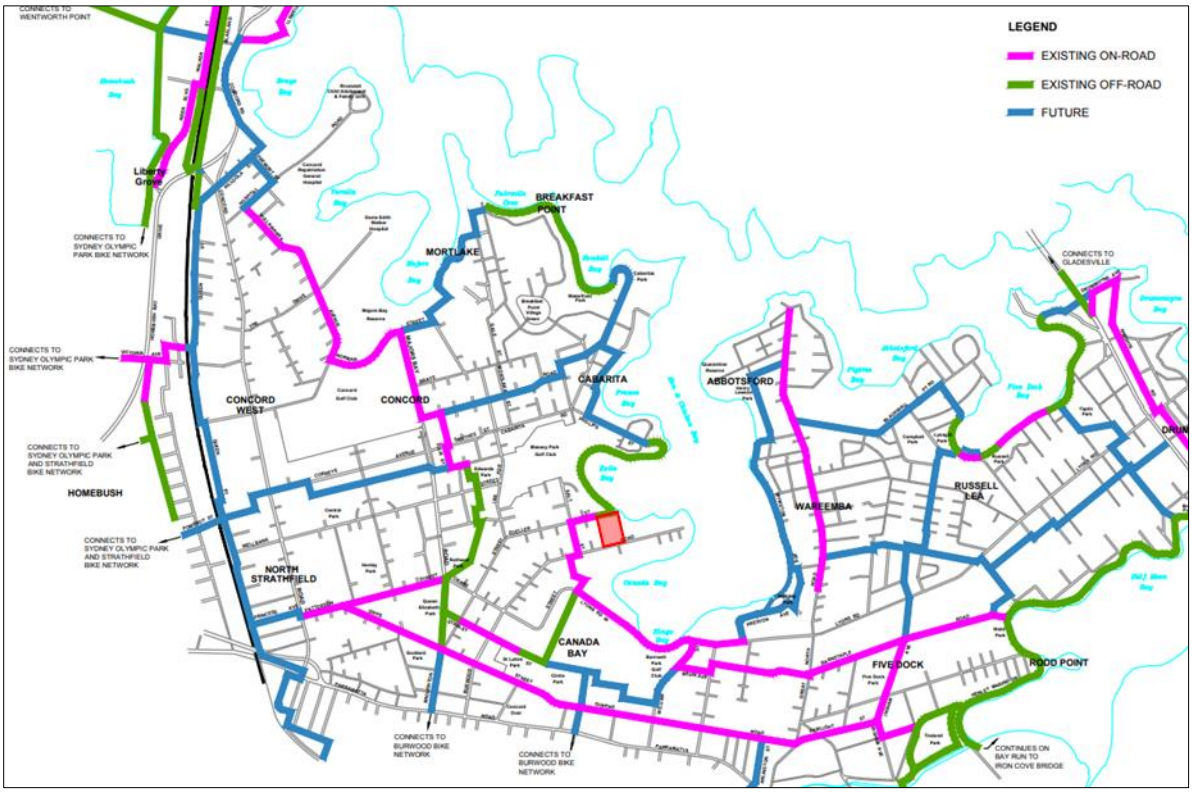
Pedestrian paths are located on all major roads within the immediate road network, providing good pedestrian connectivity. Pedestrian crossings are available at all signalised intersections along Burwood Road in the vicinity of the site. The available pedestrian paths provide good access to local parks and shops, with the relatively flat topography in the immediate vicinity of the site providing good walking and cycling conditions.

The City of Canada Bay prepared the Interim Bike Network Map, detailing on and off-road cycling routes in the local area.

The site is well located in the local cycling network, although there are no formal bicycle routes on Burwood Road. An on-road bike lane on Queens Road/ Gipps Street connects Concord with suburbs to the east. This route is accessed from off-road routes located within a short distance to the south of the site. A cycle route also connects Concord with Homebush Bay to the northwest through a number of on-street cycle paths. This route can be accessed from Salt Street located in close proximity to the west of the site.

The City of Canada Bay existing and planned future bike network map is shown in Figure 8.

Figure 8: City of Canada Bay existing bike network map



Base image source: City of Canada Bay Interim Bike Network Map, dated 8 January 2019

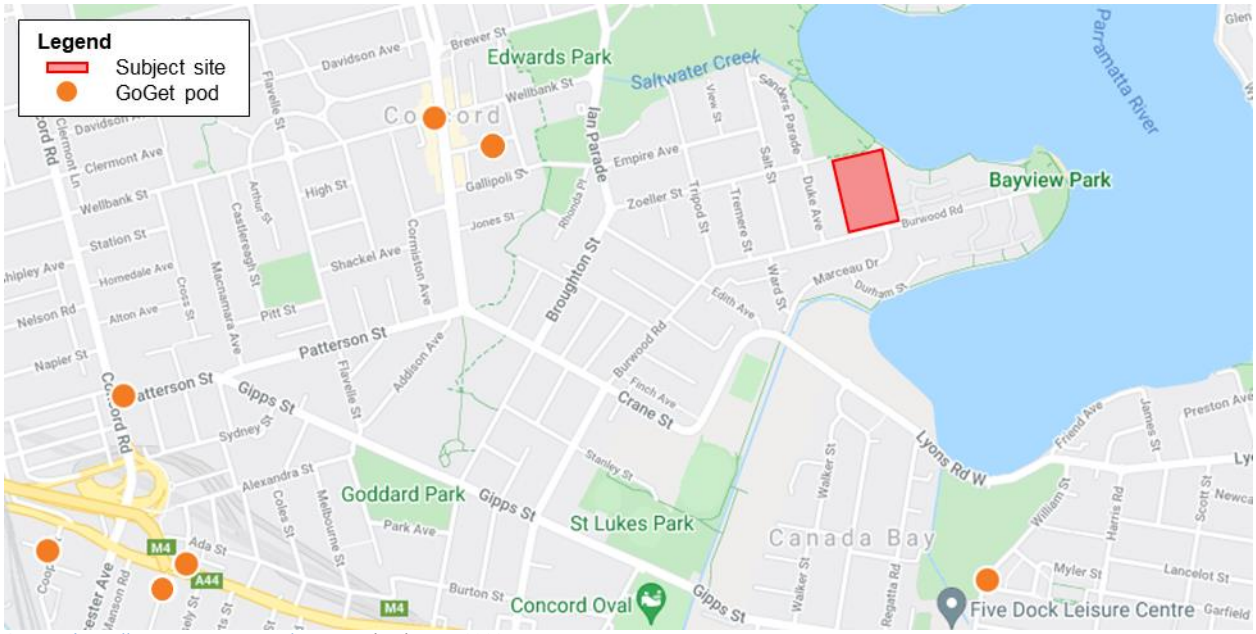
3.7 Local Car Share Initiatives

GoGet (along with other car share providers) has become increasingly common throughout Sydney and is now recognised as a viable transport option for drivers throughout Sydney. They are now a well-utilised service especially in the inner suburbs due to limited parking availability and the expense involved in parking close to the Sydney CBD. GoGet offer a viable alternative to the private car for trips where distances are short and are likely to be of benefit to future tenants and commercial residents of the proposed development.

Research suggests that a single car share vehicle can replace at least 10 private vehicles and (on average) services 23 members. On this basis, the provision of car share vehicles on-site has the potential to significantly reduce private car ownership and/or usage.

GoGet car share pods located close to the site are shown in Figure 9, with the closest pods located near Majors Bay Road to the west of the site. The existing local area has limited demand for car share given the lower residential density and availability of off-street car parking. However, car share pods within a higher density residential development could be a catalyst for car share usage in the area.

Figure 9: Surrounding GoGet pods



Source: https://www.goget.com.au/ accessed February 2022

3.8 Existing Travel Behaviour

The 2016 Australian Bureau of Statistics journey to work data for the existing residents in the local area surrounding the site is provided in Table 5. The results for the surrounding travel zone have been benchmarked against Sydney Greater Metropolitan Region (GMR).

Table 5: ABS journey to work data – Concord

Mode of travel	Surrounding Concord area mode share	GMR mode share
Car, driver	73%	61%
Car, passenger	4%	5%
Train	8%	19%
Bus	10%	7%
Ferry	1%	1%
Walk	2%	5%
Bicycle	1%	1%
Motorcycle	1%	1%
Total	**100%**	**100%**

Note: Includes SA1:12001138327

Table 5 indicates that despite the relatively close proximity of the site to the Sydney CBD, the existing residents surrounding the site have a higher private vehicle mode share (73 per cent) compared with the average for the wider Sydney GMR (61 per cent). Public transport uptake is slightly lower than the wider Sydney GMR noting the surrounding area is limited to bus services unless connecting at Burwood or Strathfield stations. Active travel modes such as walking and cycling is similar to the wider Sydney GMR at around five per cent.

4 Development Proposal

4.1 Land Uses

The proposal incorporates a new mixed-use development along with new internal roads and open space. The proposed future development indicatively includes:

- Retention of the iconic Bushells building including 'B' signage and chimney stack, together with key elements of the existing industrial building fabric.
- 384 apartments, with 10 per cent of the development (approximately 40 apartments) proposed for affordable housing.
- Retention of sight lines to the iconic Bushells building.
- Significant areas of public open space, including through-site access to a new waterfront public park and beach access to Exile Bay.
- A range of cultural and community infrastructure and recreational facilities.
- Approximately 6,700 square metres of retail hub with a mix of convenience shopping, specialty food, cafes and dining for residents and nearby locals.

A summary of the proposed land uses is shown in Figure 6.

Table 6: Indicative development schedule

Land use	Description	Size
Residential	Affordable (mix)	40 dwellings
	1-bedroom	69 dwellings
	2-bedroom	206 dwellings
	3-bedroom	69 dwellings
	Subtotal	**384 dwellings**
Non-residential	Retail and restaurant	6,747m^2 GFA
	Urban services	3,531m^2 GFA
	Subtotal	**10,278m^2 GFA**

4.2 Vehicle Access

Vehicle access to the site is proposed via access points on Burwood Road and Zoeller Street.

The access point to Burwood Road would form a fourth leg (northern approach) to the existing Burwood Road/ Marceau Drive roundabout. The site access to Zoeller Street would form a standard unsignalised access point. A new internal road link is proposed to run parallel to Duke Street (50 metres to the east) and would form unsignalised intersections at each end with Burwood Road and Zoeller Street.

Further detail on the design of the access points will be provided as part of future Development Application(s) for the site.

4.3 Car Parking

It is proposed to provide four separate basement car parks corresponding to the west, east and central (north and south) precincts of the site. There is potential for extra car parking spaces to be provided as indented parking on the new internal access roads which would likely serve the retail and recreational facilities.

Further car parking layout details would be provided as part of any future Development Application.

4.4 Other Considerations

4.4.1 PEDESTRIAN FACILITIES

Pedestrian paths will be provided throughout the site and will link key destinations within the site to the external road network and public realm. A shared pedestrian and vehicle zone is proposed to the south of the existing Bushells building, with pedestrian paths to be provided along both sides of the internal road network. Retail and community spaces are proposed to be located to activate street frontages. The main pedestrian entrances to the village centre will be located along Burwood Road.

4.4.2 BICYCLE FACILITIES

The development plans do not yet show bicycle end-of-trip facilities. Notwithstanding, it is intended that appropriate bicycle facilities will be provided on-site to encourage cycling as a viable mode of transport.

4.4.3 LOADING AREAS

Further design of on-site loading and servicing facilities dock will be considered as part of any future Development Application however it is anticipated that much of the loading activity would occur on-street in loading zones on the proposed internal roads.

4.4.4 MODE SHARE TARGETS

As previously mentioned in Section 3.8, the most recently available Journey to Work data for existing residents surrounding the site shows that residents have a higher private vehicle mode share than the wider Sydney GMR, while public transport and active transport is similar or lower than the wider Sydney GMR.

With the development of the site improving convenient links with the existing walking and cycling network, and potential improvements to the public transport network in the area (particularly with onset of Sydney Metro West services), it is anticipated that there will be less reliance on private vehicles and a higher uptake of sustainable travels modes. This is due to residents and staff associated of the proposed development generating more demand, potentially modified services and improved facilities which in-turn organically increases the potential uptake of these transport modes. Facilitating through site links will also improve connections and permeability for the surrounding area, with existing residents afforded shorter walking routes between Burwood Road and Zoeller Street in particular

On this basis, target travel mode shares for the site have been developed and shown in Table 7.

Table 7: Future mode share targets for the site and relevant travel zones

Travel mode	Existing mode share	Short term future mode share targets	Long term future mode share targets
Vehicle (as driver or passenger)	78%	70%	60%
Public Transport (train, metro, bus and ferry)	19%	25%	30%
Walk or Cycle	3%	5%	10%
Total	**100%**	**100%**	**100%**

It is noted that the above mode share targets are considered indicative initial guides, with achievable mode shares identified for the short turn and more aggressive long term mode shift targets able to be investigated as part of future sustainable travel planning for the site. Longer term mode share targets would be reliant on implementation of targeted green travel initiatives for future residents and staff.

The following potential measures and initiatives could be investigated to encourage more sustainable travel modes:

1. Developing a Travel Access Guide (TAG) for all residents and staff and made publicly available to all visitors. The document would be based on facilities available at the site and include details on the surrounding public transport services and active transport initiatives. The TAG would be updated as the surrounding transport environment changes.

2. Providing public transport information boards/ apps to inform residents, staff and visitors of alternative transport options (the format of such information/ communication strategy would be based on the TAG).

3. Providing car share pods on-site or on-street nearby and promoting the availability of such facilities for trips that require the use of private vehicles.

4. Providing quality bicycle facilities including secure bicycle parking for staff, bicycle racks/ rails for visitors and shower and change room facilities.

5. Encouraging staff that drive to work and park on surrounding roads to carpool through creation of a carpooling club or registry/ forum.

6. Regularly promoting ride/ walk to work days.

7. Providing a regular newsletter to all residents and staff bringing the latest news on sustainable travel initiatives in the area.

Again, it is highlighted these mode share targets are initial guides only to provide an estimate on the mode shifts that could be achieved as part of future sustainable travel planning for the site. Future sustainable travel planning is typically completed during the Development Application stage, or post development approval prior to occupation once tenant and resident requirements are known.

5 Car Parking Assessment

5.1 Car Parking Requirements

The car parking requirements for different development types are set out in the City of Canada Bay DCP 2020. For the purpose of the planning proposal, it has been assumed that all affordable housing units are single bedroom units.

A review of the car parking requirements for the proposed yields is provided in Table 8.

Table 8: Car parking requirements

Land use	Description	Size	Car parking rate	Car parking requirement
Residential	1-bedroom	109 dwellings	1 space per dwelling	109
	2-bedroom	206 dwellings	1 spaces per dwelling	206
	3-bedroom	69 dwellings	1.5 spaces per dwelling	104
	Visitors	384 dwellings	0.2 spaces per dwelling	77
Non-residential [1]	Retail shops, cafés and restaurant	6,747m^2 GFA	1 space per 40m^2 GLFA for shops 1 space per 6m^2 of service area or 1 space per 4 seats (whichever is greater) for restaurants, cafes, take-away food & drink premises	169[2]
Total				**665**

[1] It is assumed that the proposed recreational facilities would largely service residents of the development and/or the local area and therefore no specific parking demand has been assigned. Any minor demand could be accommodated by retail parking.
[2] At this stage all non-residential facilities have been assessed as retail shop land uses and it has conservatively been assumed GLFA is equal to GFA.

Based on the above, the proposed development is required to provide a minimum of 665 car parking spaces. Parking associated with the non-residential uses can be refined as part of any future Development Application, once the likely non-residential tenants and/or operation of the floor space is known. Notwithstanding, parking will be provided in-line with the requirements of the City of Canada Bay DCP.

It is also noted that there may be an opportunity to provide a shared car parking pool for the retail, other non-residential and residential visitor parking demands. In this regard, it is noted that residential visitor demands typically peak in the evening, whilst retail demands typically peak during the day. More specifically, it is commonly accepted that daytime residential visitor demands are 50 per cent of the evening demands.

Therefore, it could be appropriate that a reduction (based on a temporal profile of car parking demand) in residential visitor parking could be applied. Moreover, visitor parking is typically provided at a rate of one space per five to seven apartments for high density developments (Transport for

NSW, 2002), noting that this typically represents an over-supply for larger developments with integrated basements and further justifying a reduction in visitor parking.

Future Development Application(s) for the site would need to justify any proposed visitor parking reduction.

5.2 Retail/ Restaurant Demand

Given the desirable location and scale of the development, there is potential for the retail or restaurant uses (depending on the tenant(s) secured) to become a regionally significant site that may attract a large number of patrons at key times of the day/ week. If this were to occur, there are a number of measures outlined below that could be implemented to aid efficient use of the on-site car parking and to ensure the impact to existing on-street car parking demand is minimal. The surrounding road network provides appropriate regional road connections to the east, west and south in particular, supporting any regional demand generated.

5.2.1 ON-STREET RESIDENT PARKING SCHEME

As previously mentioned, there is a large supply of on-street unrestricted car parking spaces in the vicinity of the development. To protect the amenity of the surrounding area, the introduction of timed parking in conjunction with a resident parking scheme should be investigated. This could be restricted to one side of the road, or implemented on both sides, depending on the residential and visitor demand.

It is understood that Council may not be supportive of such parking restrictions, however they may be necessary to protect the amenity of local residents and should be considered further during future Development Application(s) for the site, noting that typical resident parking permit policies may need to be adjusted to suit local neighbourhood characteristics.

5.2.2 CAR PARK SUPPORTING TECHNOLOGY

For a development of this size, there are other measures that can be undertaken to improve the efficiency and utilisation of the car spaces, particularly for visitors to the site. A parking guidance system with dynamic signage may be appropriate to aid drivers to find a vacant car space, with the option of individual bays having car parking sensors, or areas/ levels having sensors.

5.2.3 PAID PARKING/ TIME RESTRICTIONS

The implementation of paid parking and/ or time restricted parking could also be considered as a car parking demand management tool, as regularly implemented in public car park facilities and shopping centres. Entrance treatments should be designed to meet requirements for card consoles. Any such parking management would also need to consider on-street parking in the immediate local area.

6 Sustainable Transport

6.1 Bicycle End of Trip Facilities

6.1.1 REQUIREMENTS

Bicycle parking for the site should be provided in accordance with the requirements of the City of Canada Bay DCP 2020, as summarised in Table 9. Bicycle parking provisions would be refined as part of any future Development Application.

Table 9: Bicycle parking requirements

Use	Size/ No.	DCP bicycle parking/ storage rate	Bicycle requirements
Residential	384 dwellings	1 bicycle storage space/ dwelling	384 storage spaces
		1 bicycle parking space/ 12 dwellings	32 parking spaces
Non-residential	6,747m^2 GFA	1 bicycle storage space/ 300m^2	22 storage spaces
		1 bicycle parking space/ 500m^2	13 parking spaces
		Total	**406 bicycle storage spaces and 45 bicycle parking spaces**

[1] At this stage all non-residential facilities have been assumed as retail land use.

Table 9 indicates that based on the indicative yield, any future development at the site should provide 406 bicycle storage spaces and 45 visitor bicycle parking spaces.

6.1.2 CYCLIST AND PEDESTRIAN ACCESS

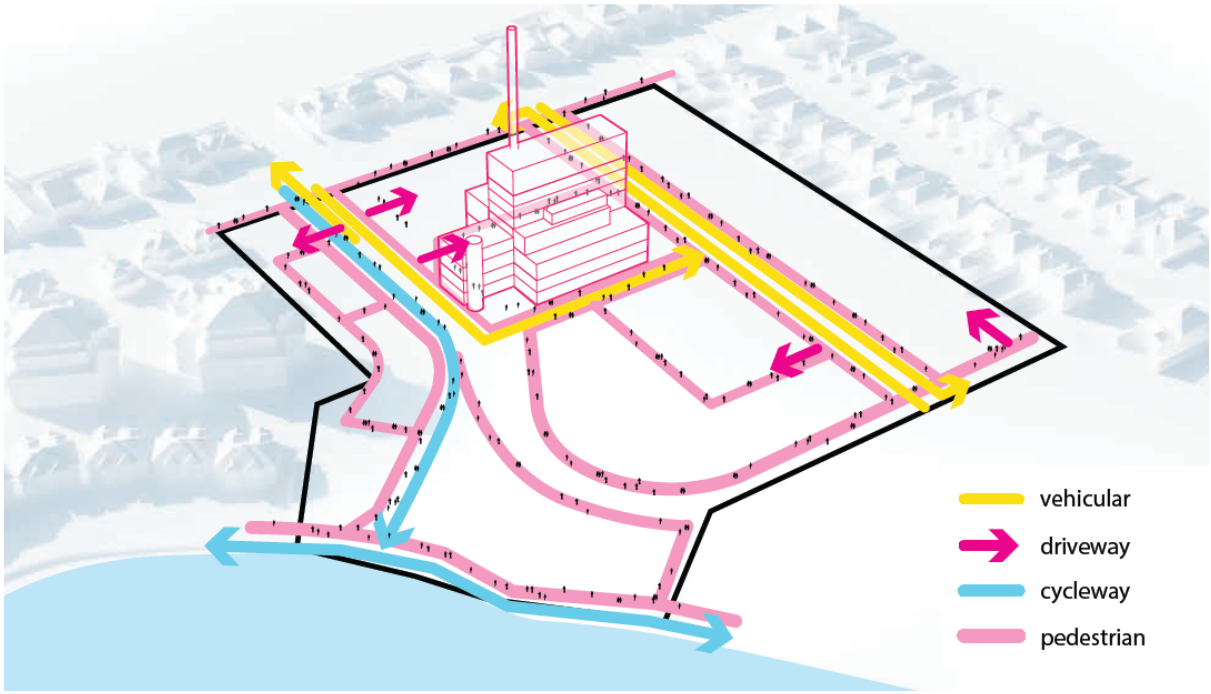
Cyclist and pedestrian access to the new uses would be provided from the future internal road network as well as from the surrounding road network, including Burwood Road, Zoeller Street and to the existing foreshore walkway.

The form of the potential active transport corridor has not yet been determined but could include continuation of the existing footpath by way an on-road mixed traffic bicycle facility or separated cycleway or similar. The make-up of the future facility would need to be determined in consultation with Council, TfNSW and local residents as part of any future Development Application, with consideration to TfNSW Cycleway Design Toolbox requirements. It should be noted that the proposed through site link to the south of the Bushells building would also provide an east-west link for pedestrians and/ or cyclists.

The facility would contribute to encouraging residents, customers and staff of the development to walk or cycle between the site and nearby transport nodes.

A summary of the proposed walking and cycling connections through the site are shown indicatively in Figure 10, again noting that the form and design of the cycling connections will be developed further in consultation with Council and TfNSW as part of future Development Application(s) on the site.

Figure 10: Movement and access summary



Source: Hatch RobertsDay, Bushells 3.0, Amended Planning Proposal in Response to the Gateway Determination Report dated April 2022

6.1.3 FUTURE BICYCLE ROUTE FACILITIES

It is understood from consultation with Transport for NSW that the Parramatta Road Urban Transformation has an associated proposed cycleway along Patterson Street, Gipps Street and Queens Road. The cycleway is included in the Urban Amenity Improvement Plan and is currently in planning and could involve significant changes to intersection arrangements.

A shared bicycle and pedestrian path facility would be constructed along Burwood Road between Gipps Street and Bayview Park to provide a high-quality connection to this proposed facility.

While this route is still to be implemented, The River Run off-road walking and cycling path under the City of Canada Interim Bike Network Map, as detailed in Section 3.6.2, will allow for a complete foreshore connection linking the site between Breakfast Point, Cabarita and Abbotsford. Once complete, the site will have a good active transport connection and would help to achieve an increase in active transport uptake.

6.1.4 ELECTRIC BICYCLES

There is potential to provide a fleet of electric bicycles (or the best available technology at the time) as part of the development for use by residents. Electric bicycles can offer a quick, convenient and inexpensive self-operated ride to a train station, a bus stop or a specific destination. The benefit of providing electric alternatives is they require little or no physical effort and can be used by nearly anyone. Provision of a number of electric bicycles would allow residents to utilise the existing and planned future cycling paths to connect with surrounding railways stations, as well as the future Sydney Metro West station which could potentially be located at North Burwood. This will in turn reduce any unnecessary vehicle trips associated with first and last kilometre of residents' journeys.

6.2 Car Share Vehicles

As discussed in Section 3.7, research suggests that a single car share vehicle can replace at least 10 private vehicles and (on average) services 23 car share members. On this basis, the provision of car share vehicles on-site has the potential to significantly reduce private car ownership and/or usage, along with the corresponding reduction in road network peak period travel.

The Green Building Council of Australia recommends one car share vehicle per 70 residents. At an average of (say) two residents per dwelling, this would represent a potential future supply of 11 car share vehicles for 384 dwellings. It is recommended that as part of the likely staged development construction, an initial pod of two vehicles is provided, with additional vehicles added in response to the occupation of subsequent development stages and/or in response to demand. A suitable objective would be to provide a minimum of 10 car share vehicles up completion of the full redevelopment.

6.3 Public Transport

6.3.1 REGULAR ROUTE BUS SERVICES

Direct and convenient pedestrian links from the development to the existing bus stops on Burwood Road and Zoeller Street would be provided as part of the development. As previously mentioned, while there are several bus stops within close proximity to the site, the frequency of buses servicing the site and variety of routes from the site could provide a greater level of service.

The main local destinations for public transport patrons from the site are likely to be Burwood Railway Station and the Majors Bay Road shopping precinct, as well as connections to the east including Victoria Road. For residents of the new development travelling to the Burwood Station, the 466 bus from the bus stop adjacent to the site which provides a 15 to 30-minute frequency service. With the development potentially accommodating around 1,000 residents living on the site, the demand on the bus service is likely to increase, resulting in a demand for greater frequency of service in the peak hour to encourage public transport use.

Residents wanting to travel to the Majors Bay Road shopping strip via public transport can catch the 466 bus and connect with a second bus connecting with the shopping strip, or alternatively walk around 10 minutes to the Crane Street bus stop and catch the 502 bus.

As discussed, the 466 bus provides a connection to Burwood Station where commuters can transfer to the T9 Northern Line or T2 Inner West Line and Leppington Line, providing connections to other parts of Sydney including the CBD.

The utilisation of the 466 bus should be monitored to assess whether the frequency of this service needs to be increased and extended into off-peak periods.

6.3.2 FERRY

Historically, Sydney Ferries serviced the Bayview Park Wharf as part of the Parramatta River services. The Bayview Park wharf is located between the Abbotsford and Cabarita Wharves. The Bayview Park wharf was previously serviced by two weekday morning and two afternoon services.

The Sydney's Ferry Future document was released in May 2013 and outlines a 20-year plan for the ferry network. The document identifies a number of initiatives to improve the operation and capacity of the ferry network.

The document includes a review of 30 potential new locations that could be served by the ferry network, including the Bayview Park Wharf.

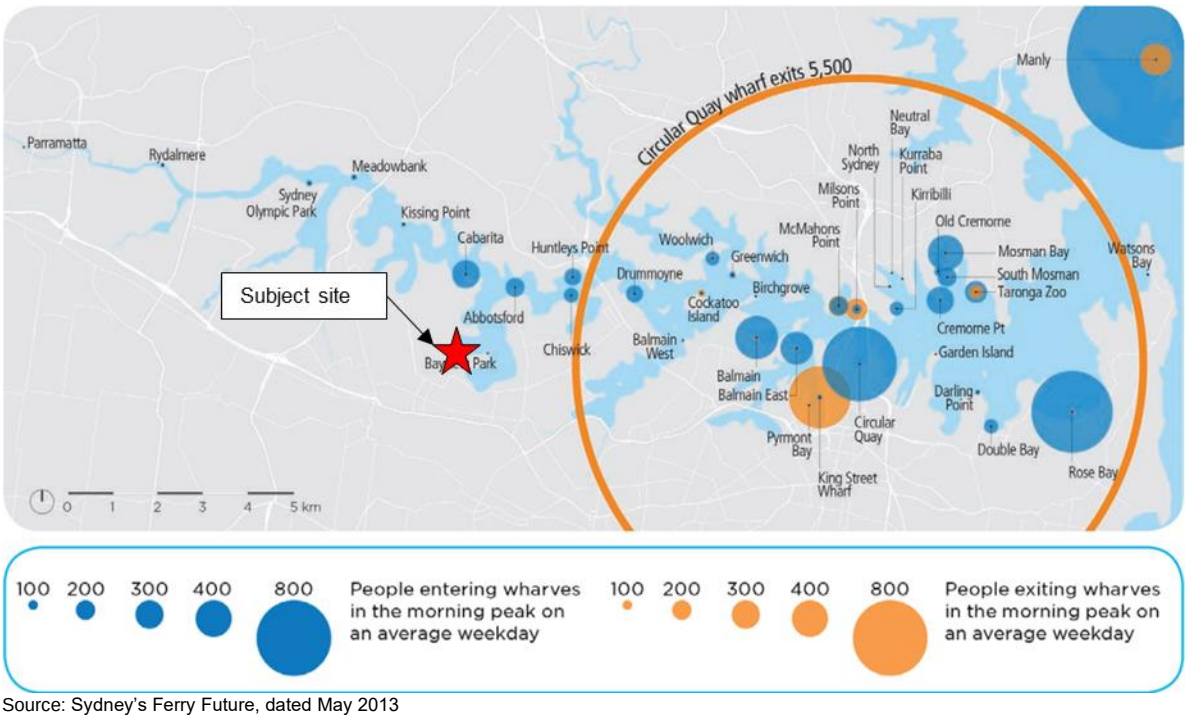
Each of the locations was assessed against the following:

- current and future demand with a focus on population, employment and attractions within the walking catchment of the wharf
- directness of the ferry route relative to the road alternative
- the costs of new infrastructure
- the frequency, cost, travel time and catchment of other modes compared to ferries.

Five new potential ferry wharves were identified on this basis. As part of the review, the Bayview Park and Balmain West Wharves were identified as being poorly patronised and recommended for services to be ceased to these wharves.

An overview of the ferry patronage (2012) is provided in Figure 3 of the Sydney's Ferry Future document reproduced in Figure 11.

Figure 11: Sydney Ferries patronage overview



Source: Sydney's Ferry Future, dated May 2013

Specifically, it is noted that the Bayview Park Wharf was observed to carry 28 passengers in the AM peak period compared to 880 at Cabarita Wharf and 690 at Abbotsford Wharf (the two adjacent wharves) for the same time period.

Reference is made to the NSW Bureau of Transport Statistics (BTS) Journey to Work data which was collected in 2011. The data provides a mode share breakdown by travel zone for residents' journey to work. The data has been analysed to assess the ferry patronage for surrounding suburbs (with ferry wharves) and including the development site, as shown in Table 10.

Table 10: BTS travel to work data – ferry travel

Suburb	Travel zone number	Number of workers living in suburb	Number of workers travel on ferry	Percentage of workers travel on ferry
Abbotsford	731	1,067	54	5%
Wareemba	733	1,532	78	5%
Wareemba South	734	1,504	23	2%
Cabarita	738	1,309	99	8%
Breakfast Point	701	1,593	105	7%
Canada Bay	735	1,342	9	1%
Five Dock	738	1,741	25	1%
Concord (development site)	704	933	25	3%

The BTS data shows that 54 workers in Abbotsford and 99 workers in Cabarita travelled to work by ferry. This is in comparison to the observed ferry numbers provided in the Sydney's Ferry Future document of 690 people at Abbotsford Wharf and 880 people at Cabarita Wharf. This shows that both the Abbotsford Wharf and Cabarita Wharf serve a wider catchment than their own suburb.

Comparing the BTS data to the Sydney's Ferry Future observations for the Bayview Park Wharf shows 25 workers travel to work by ferry, and 28 people were observed at the wharf. This implies that historically the Bayview Park Wharf only served the immediate local catchment.

Ferry services to Bayview Park have now ceased operation. Improved efficiencies along all wharves along the Parramatta River were cited as reasons for the cessation of services to Bayview Park Wharf. It is also noted that ferry trips to Bayview Park require the ferry to deviate significantly from Parramatta River (i.e. resulting in a diverted ferry trip rather than a passing trip).

Consideration is given to the potential demand by residents of the new development for the Bayview Park Wharf should the ferry services be resumed. Assuming each dwelling of the development has (on average) one worker, there would be around 400 additional workers at the site. Referring to the BTS data, the highest percentage of workers travelling on the ferry is in Cabarita at eight per cent. Applying this high rate of eight per cent to the development site would result in around 40 workers travelling to work on the ferry.

Assuming the 25 commuters recorded in the BTS data would resume using the ferry service, a total of at least 65 commuters could be expected to use the Bayview Park Wharf if the services were to be resumed. Noting that there would likely need to be a regeneration of the overall precinct rather than just this site in isolation in order to justify resumption of a ferry service, the reinstatement of the ferry service would align with the GSC vision of the adjacent Central River City.

7 Traffic Impact Assessment

7.1 Traffic Generation – Proposed Development

7.1.1 RESIDENTIAL USES

Traffic generation estimates for the residential use have been sourced from the Transport for NSW Guide to Traffic Generating Developments 2002 (the Guide) and Updated Traffic Surveys Technical Direction (TDT 2013/ 04a). Having regard for the proximity of the site to existing and future public transport services, employment and large-scale retail opportunities, a rate of 0.3 trips per dwelling in the weekday and Saturday peak hours is considered appropriate for the site.

This rate is approximately 60 to 100 per cent higher than the average weekday and Saturday peak hour traffic generation rates as recommended in TDT 2013/ 04a for high density residential dwellings to appropriately consider the level of existing public transport accessibility in the local area. This rate has also been supported in Jacobs' peer review where it was suggested that higher density residential sites that are more than one kilometre from a train station and within 10km of Sydney CBD indicate traffic rates closer to 0.30 vehicle trips per dwelling in the peak hours.

On this basis and given the proposed 384 apartments, it is anticipated the residential component of the development would generate around 115 vehicle trips in any peak hour.

7.1.2 NON-RESIDENTIAL USES

There are several non-residential land uses envisaged as part of the proposed development. These include retail, restaurant, club, market and gallery uses with the breakdown of these uses only indicative at this stage of planning and hence may be subject to some change.

In this instance a retail traffic generation rate has been adopted for each of the non-residential uses. Specifically, the Guide recommends a peak weekday rate of 5.6 vehicle trips per 100 square metres for specialty retail, which has been applied to the weekday PM peak hour. The AM peak hour rate has been adopted to reflect a lower rate of 50 per cent of the PM peak hour rate. This approach is common and broadly accepted transport engineering practice. The Guide also recommends a rate of 10.7 vehicle trips per 100 square metres during the Saturday peak hour. Adopting these rates is considered conservatively high, particularly noting that restaurant uses have a substantially lower traffic generation rate of five movements per 100 square metres (as per the Guide). On this basis, the resultant non-residential traffic generation can be viewed as conservative and an upper limit at this stage of planning.

A 25 per cent reduction has also been applied to consider internal trips from residents of the development itself. This is appropriate given that the proposed non-residential uses are of a neighbourhood scale (i.e., small footprint stores) and largely reliant on the local (walk-up) residential catchment.

Overall, it is estimated that the proposed 6,747 square metres of non-residential floor area would generate 142, 283 and 541 vehicle trips in the weekday AM, PM and Saturday peak periods respectively.

7.1.3 SUMMARY

A summary of the anticipated development traffic generation is provided in Table 11 noting that the split of in and out traffic movements has been developed by adopting standard proportional splits as per relevant guidelines. This generally includes an 80:20 residential land use split and 50:50 retail split in the relevant peak hours.

Table 11: Summary of traffic generation

Use	AM peak hour			PM peak hour			Saturday peak hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Residential	23	92	115	81	34	115	58	57	115
Non-residential	112	28	142	141	142	283	270	271	541
Total	**135**	**120**	**257**	**222**	**176**	**398**	**328**	**328**	**656**

Table 11 indicates that the proposed development is estimated to generate 398 vehicle trips in the weekday PM peak and 656 vehicle trips on Saturdays. Less traffic would be generated in the weekday AM peak, estimated at 257 vehicle trips per hour.

It should be noted that the non-residential traffic generation associated with the proposal is greater than the residential component, hence the traffic analysis is less sensitive to changes the residential yield. However, the non-residential component of the development is also providing a broader public benefit and some of the above traffic generation will be from the local area/ residents. It is recommended that this is given due consideration when considering the acceptability of traffic impacts and any modifications to the proposal.

7.2 Traffic Generation – Existing Use

The existing site is zoned IN1 – General Industrial and occupied by factory premises. The site is operational and currently generating traffic volumes that are distributed across the surrounding road network. Traffic counts of the existing vehicle access points servicing the site indicate that the site currently generates the following peak hour trips:

- AM peak hour: 27 vehicle trips
- PM peak hour: 19 vehicle trips.

It is understood that in recent years production at the site and in-turn persons employed at the site has reduced. As such, it is anticipated that historically the site would have generated additional traffic beyond its current levels.

In this regard, an assessment of the site's current traffic generation potential could be made by applying the Guide traffic generation rate for industrial uses to the existing floor area. Such an assessment is presented in Table 12 (the existing floor area has been adopted from the existing site-specific planning controls).

Table 12: Estimated traffic generation – existing industrial land use

Use	Size[1]	Traffic generation rates (trips/ hour)			Traffic generation trips (trips/ hour)		
		AM	PM	Saturday	AM	PM	Saturday
Industrial	40,000 sqm	0.52 per 100m^2	0.56 per 100m^2	Negligible	208	224	0

[1] Based on an overall site area of 4ha (40,000sqm) and a maximum floor space ratio of 1:1.

When adopting the current planning controls, the existing site has the potential to generate some 220 peak hour vehicle trips. This is significantly more than the traffic currently being generated by the site (given reduced production).

The proposed development seeks to increase the traffic generation of the site when considering in light of the potential traffic associated with the existing land use. This includes a negligible change in the weekday AM, less than double in the weekday PM and up to three times on Saturdays.

7.3 Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, including the:

- configuration of the arterial road network in the immediate vicinity of the site
- existing operation of intersections providing access between the local and arterial road network
- surrounding employment centres, retail centres and schools in relation to the site
- configuration of access points to the site.

Traffic accessing the site would generally do so via Burwood Road and Zoeller Street which connects the site to the broader arterial/ higher order road network. Traffic would gradually disperse (east and west) from these corridors when moving further south at Crane Street, Gipps Street and Parramatta Road.

Having consideration for the above and for the purposes of estimating vehicle movements, Appendix A provides a summary of the assumed directional distributions for development traffic. This is based on the existing turning movement counts at the key surveyed intersections.

Overall, the traffic modelling has been completed for the following scenarios:

- 2022 without development (refer to Section 3.4)
- 2022 with development
- 2036 without development
- 2036 with development.

For the purposes of estimating future background traffic volumes, growth factors have been sourced from TfNSW STFM and applied to existing traffic volumes to estimate 2036 traffic volumes.

7.4 Traffic Impact

7.4.1 2022 WITH DEVELOPMENT

The impact of the development traffic on the surrounding intersections has been assessed using SIDRA. Based on the traffic generation estimates and distribution presented above, Table 13 presents a summary of the intersection operation of the key surveyed intersections following full development of the site.

Table 13: 2022 intersection operation with development traffic

Intersection	Peak	Degree of saturation (DOS)	Average delay (sec)	Average queue (m)	Level of service (LOS)
Broughton Street/ Zoeller Street/ Ian Parade	AM	0.35	19	7	B
	PM	0.27	12	5	A
	Saturday	0.41	13	8	A
Broughton Street/ Crane Street	AM	0.59	25	59	B
	PM	0.75	29	85	C
	Saturday	0.76	28	82	B
Burwood Road/ Crane Street	AM	0.64	35	71	C
	PM	0.75	37	91	C
	Saturday	0.88	43	103	D
Burwood Road/ Gipps Street	AM	0.77	31	85	C
	PM	0.76	26	83	B
	Saturday	0.64	26	70	B
Burwood Road/ Parramatta Road	AM	0.62	17	91	B
	PM	0.61	16	100	B
	Saturday	0.60	16	94	B
Broughton Street/ Gipps Street	AM	0.87	26	86	B
	PM	0.69	27	81	B
	Saturday	0.74	30	80	C
Boughton Street/ Parramatta Road	AM	0.73	15	122	B
	PM	0.69	18	129	B
	Saturday	0.77	21	151	B

Table 13 indicates that all key intersections are expected to continue operating satisfactorily overall (generally defined as LOS D or better), with similar delays and queuing to existing conditions. It is noted that the results indicate that the average delay for the Burwood Road/ Gipps Street intersection actually decreases by two seconds from existing conditions, however this is due to SIDRA adjusting the phase times slightly to optimise the delay across the intersection based on the distribution of development traffic at this intersection.

7.4.2 2036 WITHOUT DEVELOPMENT

Table 14 presents a summary of the intersection operation of the key surveyed intersection in 2036 without development traffic.

Table 14: 2036 intersection operation without development traffic

Intersection	Peak	Degree of saturation (DOS)	Average delay (sec)	Average queue (m)	Level of service (LOS)
Broughton Street/ Zoeller Street/ Ian Parade	AM	0.32	21	6	B
	PM	0.20	12	3	A
	Saturday	0.24	14	4	A
Broughton Street/ Crane Street	AM	0.66	26	64	B
	PM	0.83	31	97	C
	Saturday	0.85	32	112	C
Burwood Road/ Crane Street	AM	0.64	34	74	C
	PM	0.74	35	90	C
	Saturday	0.79	38	100	C
Burwood Road/ Gipps Street	AM	1.05	42	133	C
	PM	0.94	39	131	C
	Saturday	0.74	28	78	B
Burwood Road/ Parramatta Road	AM	0.62	18	88	B
	PM	0.58	19	88	B
	Saturday	0.57	17	81	B
Broughton Street/ Gipps Street	AM	1.08	44	120	D
	PM	0.82	32	81	C
	Saturday	0.74	31	78	C
Boughton Street/ Parramatta Road	AM	0.60	17	110	B
	PM	0.63	17	94	B
	Saturday	0.74	19	109	B

Table 14 indicates most of the key intersections are expected to operate satisfactorily in 2036, with the exception of the Broughton Street/ Gipps Street and Burwood Road/ Gipps Street intersections which are expected to operate overcapacity as indicated by the DOS over 1.00 in the weekday AM peak hour, despite the satisfactory overall LOS.

The deterioration of the operation of these intersections is attributed to high traffic growth as indicated in the STFM data, particularly for the south approach to the Broughton Street/ Gipps Street intersection despite the STFM data indicating a reduction in volumes further south along Parramatta Road. Should this level of traffic growth be realised in the future, mitigation measures would likely be necessary to increase capacity.

At the Burwood Road/ Gipps Street intersection, one potential mitigation measure has been identified which includes lengthening the short approach lane for the east approach from around 65 metres to

100 metres. At the Broughton Street/ Gipps Street intersection, the identified potential mitigation measures include:

- lengthening the short north approach lane from around 25 metres to 100 metres
- marginally lengthening the short north approach lane from around 90 metres to 100 metres.

These measures are shown indicatively in Figure 12 and Figure 13, with a summary of the modelling results and the proposed mitigation measures in place provided in Table 15.

It is noted that the identified mitigation measures are all able to be accommodated within the existing road configuration with some minor removal of existing on-street parking. Given that these measures are only required to address 2036 weekday AM intersection operation, these measures could be implemented by restricting parking during peak periods only, allowing existing kerbside parking to be retained outside the impacted hours. This is similar to what currently occurs on Burwood Road south of Gipps Street, where “No Parking” restrictions are currently in place during the weekday AM and PM peak periods on the eastern side of the road.

These identified upgrades do not impact the Broughton Street cycleway project. It is noted that the Parramatta Road Corridor Traffic and Transport Study and Action Plan (Bitzios, October 2022) also identified capacity constraints at the Broughton Street/ Gipps Street intersection in the 2036 future horizon year, with potential measures identified involving turn bans at this intersection, subject to further detailed assessment of the diverted traffic as a result of the turn bans.

The mitigation measures identified in this assessment involving minor changes to parking during peak periods is considered a more desirable measure than turn bans at this intersection and as such, this assessment does not propose imposing turn bans at this intersection. Notwithstanding the above, the identified potential mitigation measures do not physically prevent right turn bans being implemented by others in the future as part of the Parramatta Road Urban Transformation project, if deemed necessary.

Figure 12: Burwood Road/ Gipps Street potential mitigation measure

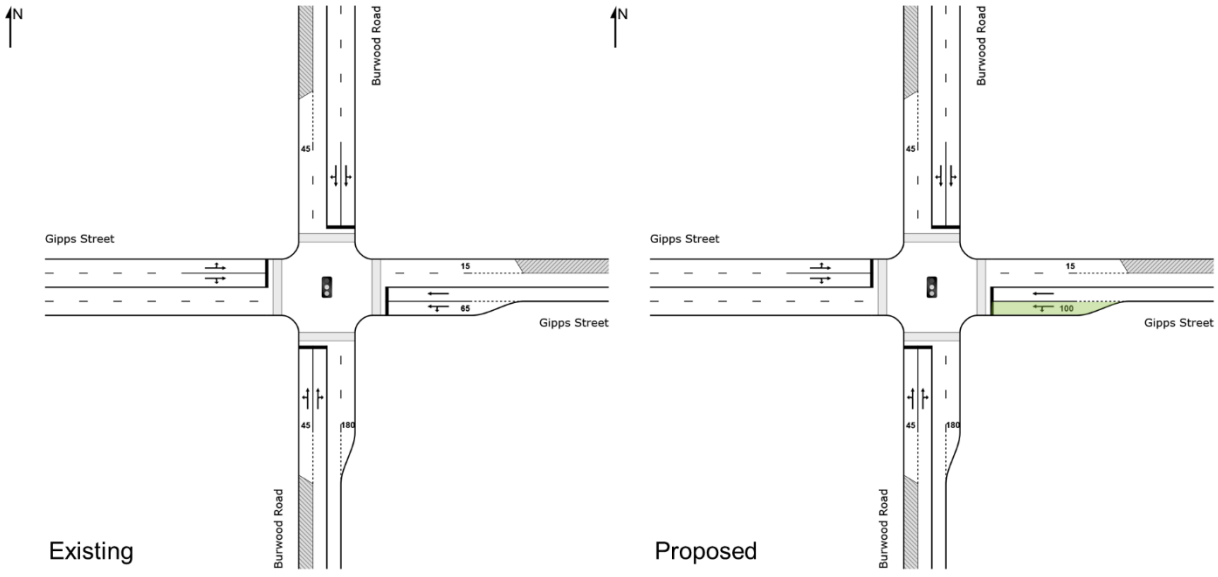


Figure 13: Broughton Street/ Gipps Street potential mitigation measure

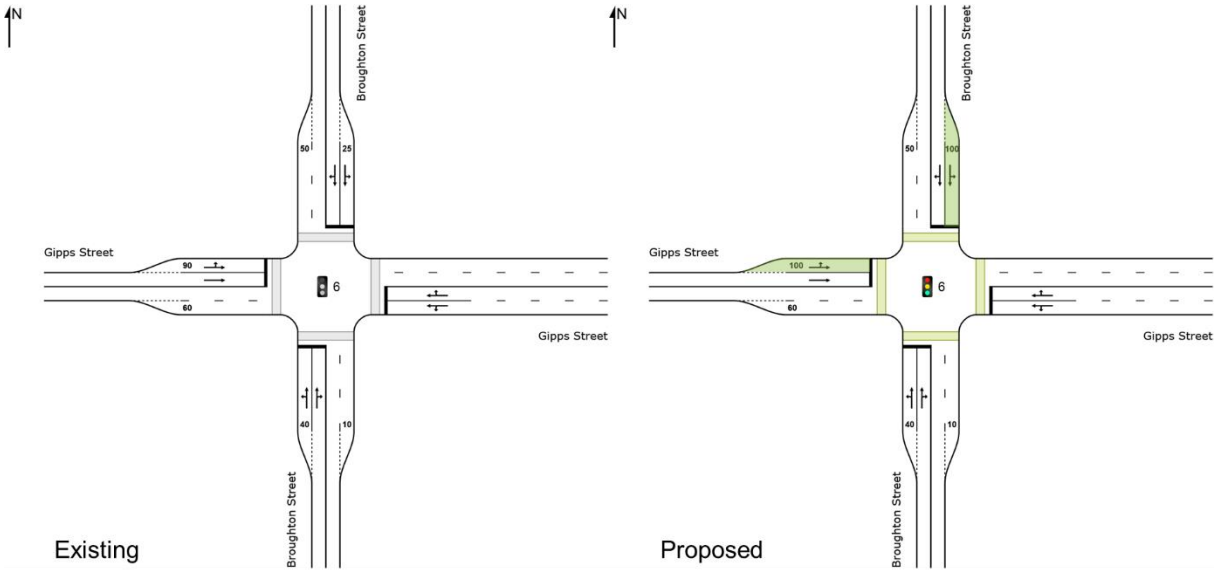


Table 15: 2036 AM intersection operation without development traffic with mitigation measures

Intersection	Peak	Degree of saturation (DOS)	Average delay (sec)	Average queue (m)	Level of service (LOS)
Broughton St/ Zoeller St/ Ian Pde	AM	0.32	21	6	B
Broughton Street/ Crane Street		0.66	26	64	B
Burwood Road/ Crane Street		0.64	34	74	C
Burwood Road/ Gipps Street		0.76	37	116	C
Burwood Road/ Parramatta Rd		0.62	18	88	B
Broughton Street/ Gipps Street		0.99	52	162	D
Boughton Street/ Parramatta Rd		0.60	17	110	B

Table 15 confirms that with implementation of the identified potential mitigation measures, all intersections would return to a satisfactory LOS D or better overall. It is however also noted that the Broughton Street/ Gipps Street intersection would effectively be at capacity, as indicated by the DOS of around 1.00.

7.4.3 2036 WITH DEVELOPMENT

Table 16 presents a summary of the intersection operation of the key surveyed intersections in 2036 following full development of the site, with the potential mitigation measures identified in Section 7.4.2 above applied to the AM peak hour scenario.

Table 16: 2036 intersection operation with development traffic and AM mitigation measures

Intersection	Peak	Degree of saturation (DOS)	Average delay (sec)	Average queue (m)	Level of service (LOS)
Broughton Street/ Zoeller Street/ Ian Parade	AM	0.42	22	9	B
	PM	0.31	13	6	A
	Saturday	0.50	16	12	B
Broughton Street/ Crane Street	AM	0.66	26	65	B
	PM	0.86	32	109	C
	Saturday	0.90	34	134	C
Burwood Road/ Crane Street	AM	0.70	36	81	C
	PM	0.82	39	106	C
	Saturday	0.91	47	126	D
Burwood Road/ Gipps Street	AM	0.80	32	107	C
	PM	0.97	41	134	C
	Saturday	0.80	31	84	C
Burwood Road/ Parramatta Road	AM	0.63	18	91	B
	PM	0.60	19	92	B
	Saturday	0.59	17	87	B
Broughton Street/ Gipps Street	AM	1.00	55	163	D
	PM	0.84	34	87	C
	Saturday	1.15	84	196	F
Boughton Street/ Parramatta Road	AM	0.64	18	119	B
	PM	0.67	18	98	B
	Saturday	0.70	22	125	B

Table 16 indicates most intersections are expected to continue operating similar to the 2036 without development scenario, with the exception of the Broughton Street/ Gipps Street intersection during the Saturday peak hour which is expected to reduce to a LOS F. The average delay at the Broughton Street/ Gipps Street is expected to increase by just three seconds with average queues expected to remain similar overall despite this intersection effectively being at capacity in the 2036 without development scenario. This highlights the minor impact the proposed development is anticipated to have on the study intersections, and at this intersection in particular.

To resolve the capacity constraints at the Broughton Street/ Gipps Street intersection during the Saturday peak hour, the same mitigation measures proposed at the Burwood Road/ Gipps Street intersection in the weekday AM peak hour have been applied to the Saturday peak hour (i.e., increasing the length of the short lane on the east approach from 65 metres to 100 metres). A summary of the anticipated intersection operation with these mitigation measures in place is presented in Table 17.

Table 17: 2036 Saturday intersection operation with development traffic + mitigation measures

Intersection	Peak	Degree of saturation (DOS)	Average delay (sec)	Average queue (m)	Level of service (LOS)
Broughton St/ Zoeller St/ Ian Pde	Saturday	0.50	16	12	B
Broughton Street/ Crane Street		0.93	35	135	C
Burwood Road/ Crane Street		0.91	47	126	D
Burwood Road/ Gipps Street		0.78	32	86	C
Burwood Road/ Parramatta Rd		0.59	18	87	B
Broughton Street/ Gipps Street		0.77	32	81	C
Boughton Street/ Parramatta Rd		0.72	23	127	B

Table 17 indicates that with the potential mitigation measures applied in the Saturday peak hour, all intersections would return to a satisfactory LOS overall.

Average queue lengths for all peak hours are also considered acceptable, with the network modelling confirming queues would not extend back nor impact other key intersections.

7.5 Summary

Against existing traffic volumes in the vicinity of the site, the additional traffic generated by the proposed development could not be expected to compromise the safety or materially impact the function of the surrounding road network. Traffic modelling indicates some constraints on the surrounding local road network, specifically along Gipps Street based on 2036 background traffic growth without proposed development traffic included. Potential minor mitigation measures have been identified to resolve these capacity constraints should this traffic growth be realised, with the identified measures able to be delivered within the existing road configuration and limited to some adjustments to kerbside parking restrictions during peak periods. With the potential mitigation measures, all intersections are expected to continue operating at an overall satisfactory LOS in 2036, with similar delays and queues to without the proposed development.

A summary of the anticipated minor change in traffic volumes as a result of the proposed development in comparison to the existing and 2036 background traffic growth forecasts is included in Table 18 and Table 19 respectively.

Further to this, the proposed development will also provide a variety of local and speciality shops in which will directly service the immediate surrounding residential catchment. Currently, the nearest local shops are located on Majors Bay Road. The proposed commercial and retail offering will ultimately reduce the number of local trips surrounding residents take to get to get to their local shops by providing daily needs within an easy walk of people.

Table 18: 2022 traffic volume comparison

Intersection	Existing			With development					
	AM	PM	Saturday	AM	Difference	PM	Difference	Saturday	Difference
Broughton St/ Zoeller St/ Ian Pde	1,575	1,495	1,491	1,695	8%	1,683	13%	1,795	20%
Broughton Street/ Crane Street	1,612	2,004	2,050	1,645	2%	2,056	3%	2,131	4%
Burwood Road/ Crane Street	1,465	1,745	1,780	1,608	10%	1,966	13%	2,149	21%
Burwood Road/ Gipps Street	2,412	2,368	2,070	2,467	2%	2,452	4%	2,213	7%
Burwood Road/ Parramatta Road	4,416	4,346	4,418	4,474	1%	4,437	2%	4,565	3%
Broughton Street/ Gipps Street	2,658	2,624	2,399	2,684	1%	2,665	2%	2,462	3%
Broughton Street/ Parramatta Road	3,961	3,898	4,135	3,983	1%	3,934	1%	4,190	1%

Table 19: 2036 traffic volume comparison

Intersection	2036 background growth			With development					
	AM	PM	Saturday	AM	Difference	PM	Difference	Saturday	Difference
Broughton St/ Zoeller St/ Ian Pde	1,852	1,703	1,733	1,972	6%	1,890	11%	2,037	18%
Broughton Street/ Crane Street	1,899	2,300	2,411	1,932	2%	2,352	2%	2,492	3%
Burwood Road/ Crane Street	1,587	1,908	1,931	1,730	9%	2,129	12%	2,300	19%
Burwood Road/ Gipps Street	2,724	2,548	2,267	2,779	2%	2,632	3%	2,410	6%
Burwood Road/ Parramatta Road	4,126	3,960	4,038	4,184	1%	4,051	2%	4,185	4%
Broughton Street/ Gipps Street	3,188	2,868	2,764	3,214	1%	2,909	1%	2,828	2%
Broughton Street/ Parramatta Road	3,501	3,418	3,671	3,524	1%	3,454	1%	3,726	1%

8 Other Considerations

8.1 Car Share

As previously mentioned, there are no car sharing facilities within close proximity of the site. As part of the development, car share spaces could be provided on-site to provide residents an alternative to owning their own car. The benefits of car share can be:

- Reduced car usage – research shows that people drive on average 20 per cent less when using car share.
- Fewer cars – Industry evidence suggests a single car share space can replace the need for around five parking spaces for residents and/or visitors.
- Promotes and maintains liveable communities – encourages public and active transport use, facilitating interactions which creates cohesive residential communities.
- Provides economic benefit – can be cheaper alternate to owning a car for infrequent drivers.
- Cleaner Air – more fuel-efficient cars result in less pollution.

The inclusion of car sharing facilities on-site may support a dispensation in car parking provision should a reduction from the required rates outlined in the DCP be sought.

8.2 Autonomous Vehicles

With continuing technological advancements, research and development into autonomous vehicles, there is the potential for significant impacts to the automotive industry which will in turn alter the way in which we plan and design cities. While is it unlikely that fully autonomous vehicles will be available in the short term, research suggests that there is potential for the technology and associated enabling legislation to be available within the next 25 years. In this regard, the potential impacts of autonomous vehicles on the proposed development are considered.

One of the main considerations regarding this development is the reduction in car parking space required for autonomous vehicles. Self-parking vehicles would not require open-door space for drivers and passengers to enter and exit the car when parking. Drivers and passengers could be dropped off prior to parking, and the vehicle could then park itself. Research suggests the parking space itself could require 15 per cent less space.

In addition to this, the whole concept of car ownership could alter, further reducing car parking requirements. Instead of individual car ownership, car sharing may become more popular with the ability for individuals to request a vehicle pick them up and drop them off without the need for the vehicle to park at either the origin or the destination. While this may have a positive impact in the reduction of car parking space required, it has the potential to increase traffic volumes with unoccupied vehicle trips.

Given the long-term outlook for the implementation of fully autonomous vehicles, no immediate impact is considered for the development. However, given the long-term potential for a reduction in car parking demand, consideration should be given to the ability to retrofit alternative use(s) into basement car parking. Possible design considerations include providing car spaces with increased height clearance to accommodate the height requirements of commercial floor space.

8.3 Development Staging

As discussed in Section 2.6, the NSW Government has indicated plans to deliver Sydney Metro West in the late 2020s. In addition, the next stage of WestConnex near Iron Cove and Rozelle is expected to open in 2023, potentially having further benefit to reducing traffic volumes along Parramatta Road and nearby east-west links.

When considering the timeframes related to gaining approval for the proposed rezoning, concept master plan, staged development applications and construction itself, it is expected that the development will align well with the implementation of these infrastructure projects, which will likely further assist in reducing the travel demand of the site, as well as alleviate demand for key roads surrounding the site.

9 Conclusion

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

1. It is proposed to rezone the subject site to a B4 Mixed Use zone, increase the permissible height limit and introduce a site-specific floor space ratio.

2. The indicative development yield is around 400 apartments, a maximum 7,000 square metres GFA of retail/ commercial uses and a minimum 3,000 square metres of light industry/ urban services.

3. The proposed development is anticipated to generate in the order of 257 vehicle trips in the weekday AM peak hour, 398 trips in the weekday PM and 656 trips on Saturdays.

4. It is recommended that car parking for the future land uses be provided in accordance with the requirements of the City of Canada Bay DCP. There may be an opportunity to share (part of) the residential visitor parking provision with the retail parking, as well as reducing the overall visitor parking provision to be more consistent with typical high-density developments.

5. It is recommended that bicycle parking for the future land uses be provided in accordance with the requirements of the City of Canada Bay DCP.

6. There is generally adequate capacity in the surrounding road network to cater for the traffic generated by the proposed development, in addition to projected future background traffic increases/ decreases, following implementation of select agreed road network improvements.

7. The project team would work with Transport for NSW and Council to agree operational and physical improvements to affected intersections, particularly the Broughton Street/ Gipps Street and Burwood Road/ Gipps Street intersections. Potential measures have been identified which can be accommodated within the existing road configuration, subject to some minor removal of existing on-street parking during peak periods. With these mitigation measures, the key intersections surrounding the site are expected to operate satisfactorily in the weekday and Saturday peak periods in the assessed 2036 future year scenario.

8. There is potential of electric bicycles to be provided to residents of the development to complete the first and last kilometre of their journey to surrounding transport interchanges such as Burwood and Strathfield Stations, as well as the future Sydney Metro West Burwood North Station.

9. An on-site car share pod of minimum 10 vehicles is recommended to assist with managing car ownership and travel demand, with incremental implementation.

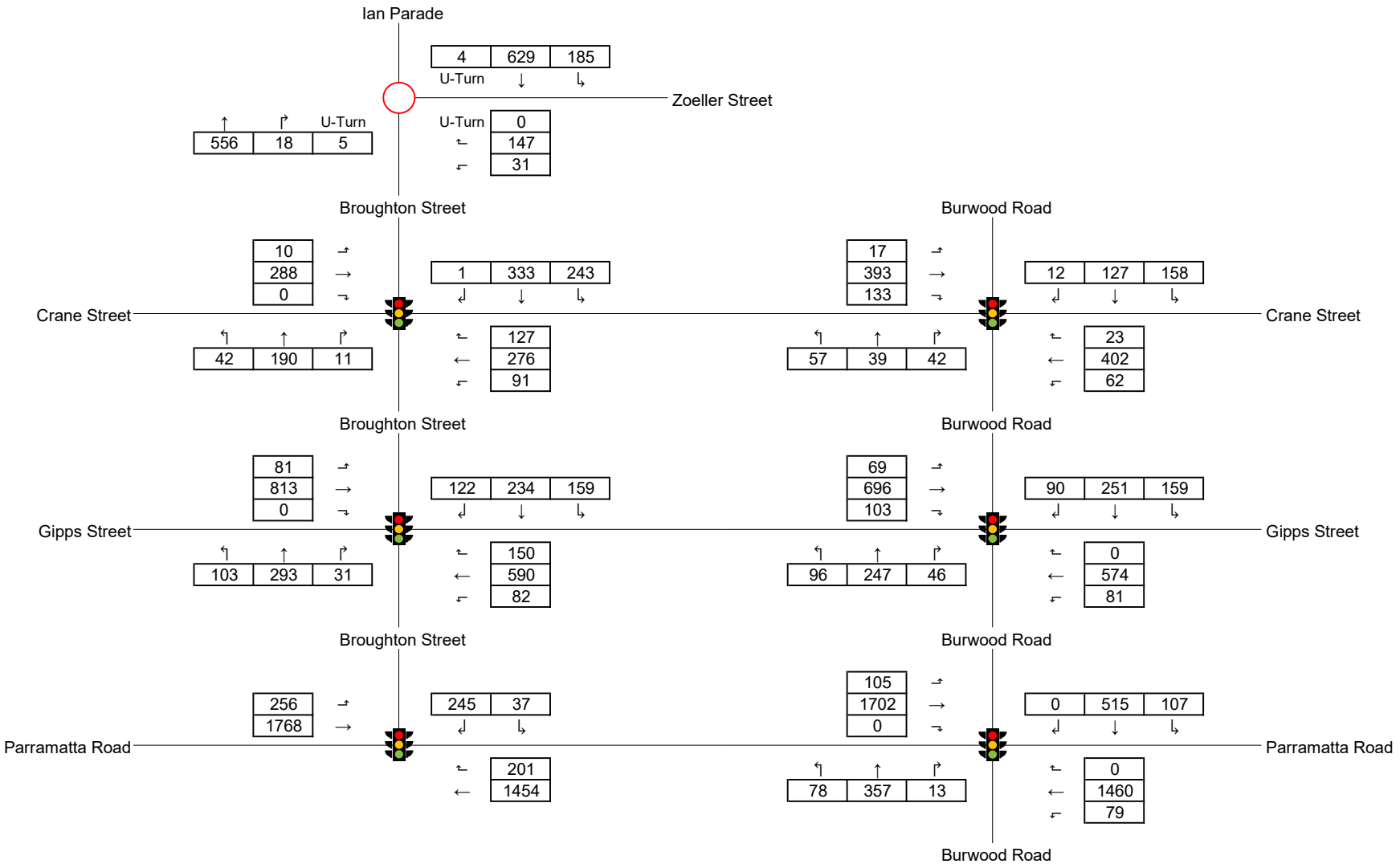
10. Given the proposed retail and commercial uses, it is likely the proposed development will result in a reduction in local vehicle trips of the surrounding area by providing daily needs within an easy walk.

11. Staging of the development will also align with surrounding infrastructure projects such as Sydney Metro West, considering the required timeframe for the rezoning itself, concept master plan approval, staged development applications and construction.

12. Future development has the potential to make a positive contribution to the surrounding area by providing a new retail precinct, with cafes, restaurants and cultural space.

APPENDICES

Appendix A Turning Movement Diagrams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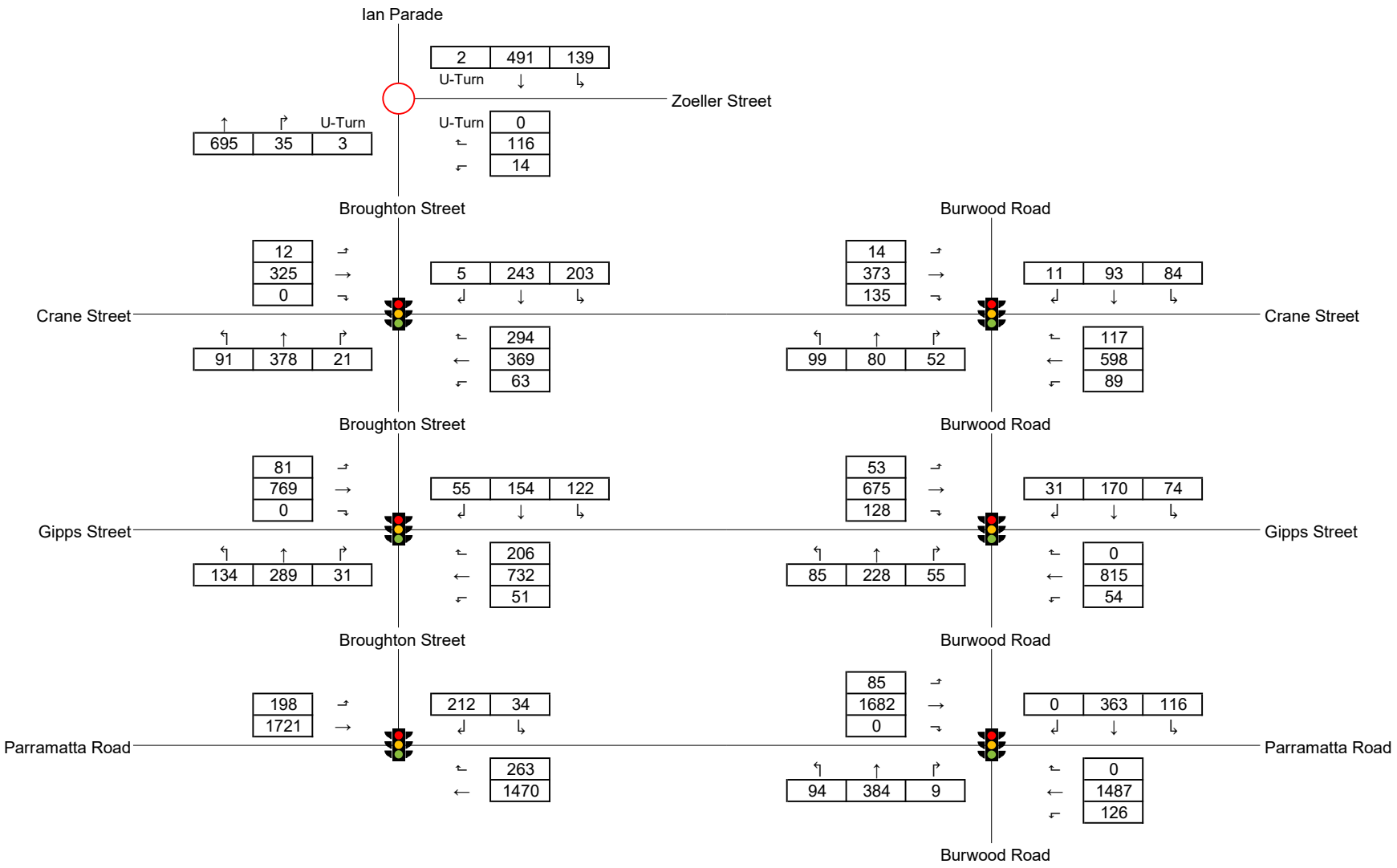
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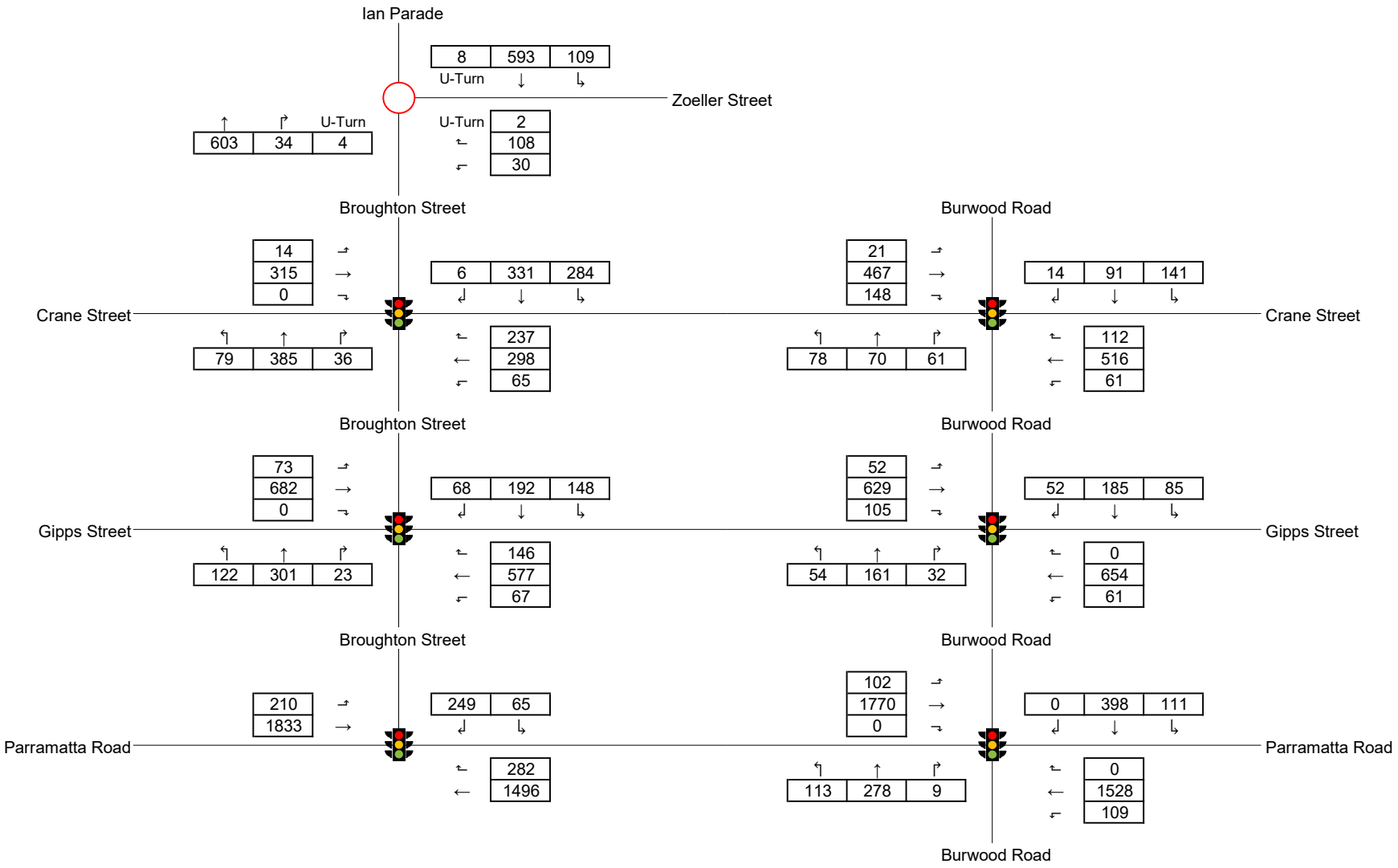
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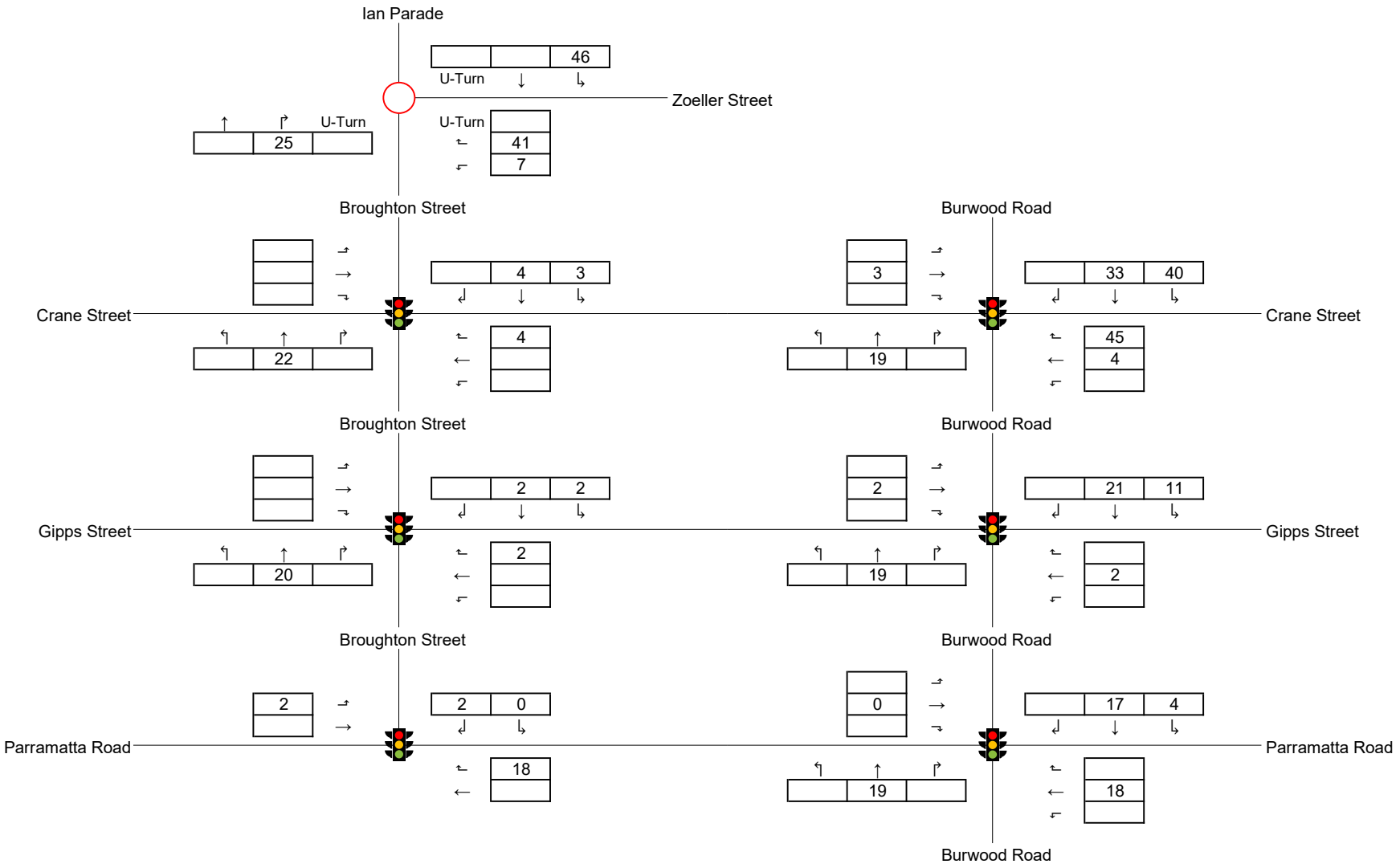
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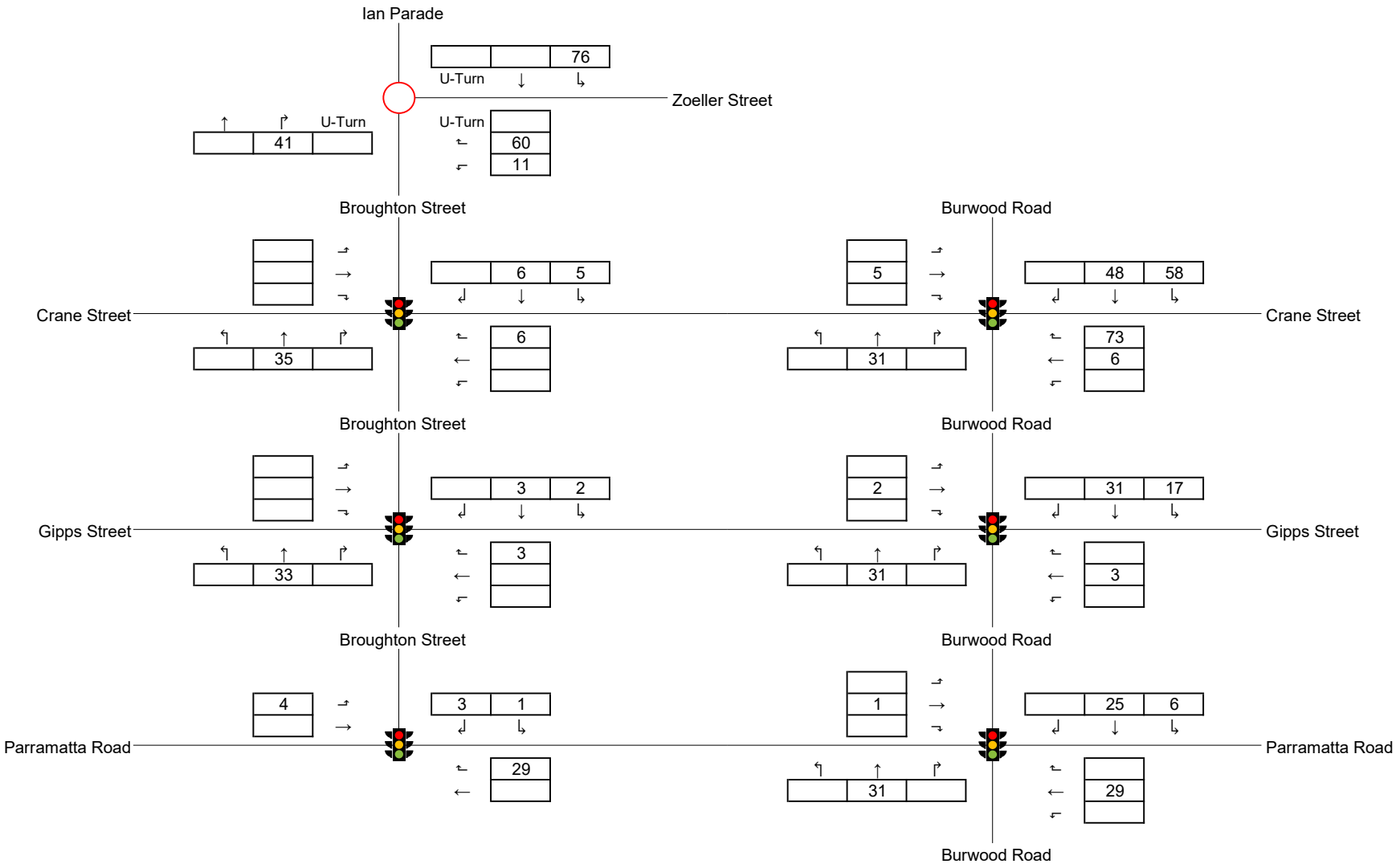
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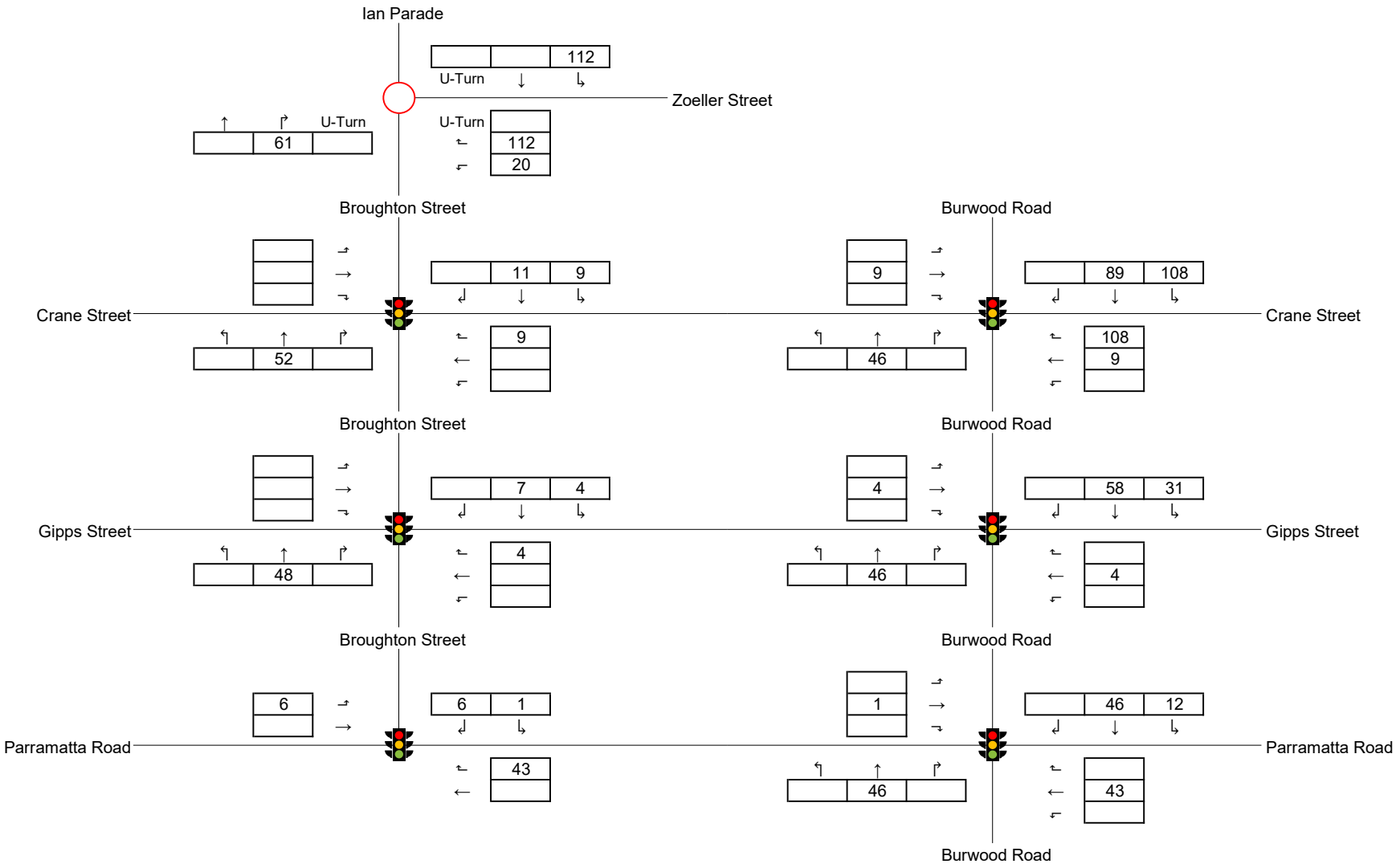
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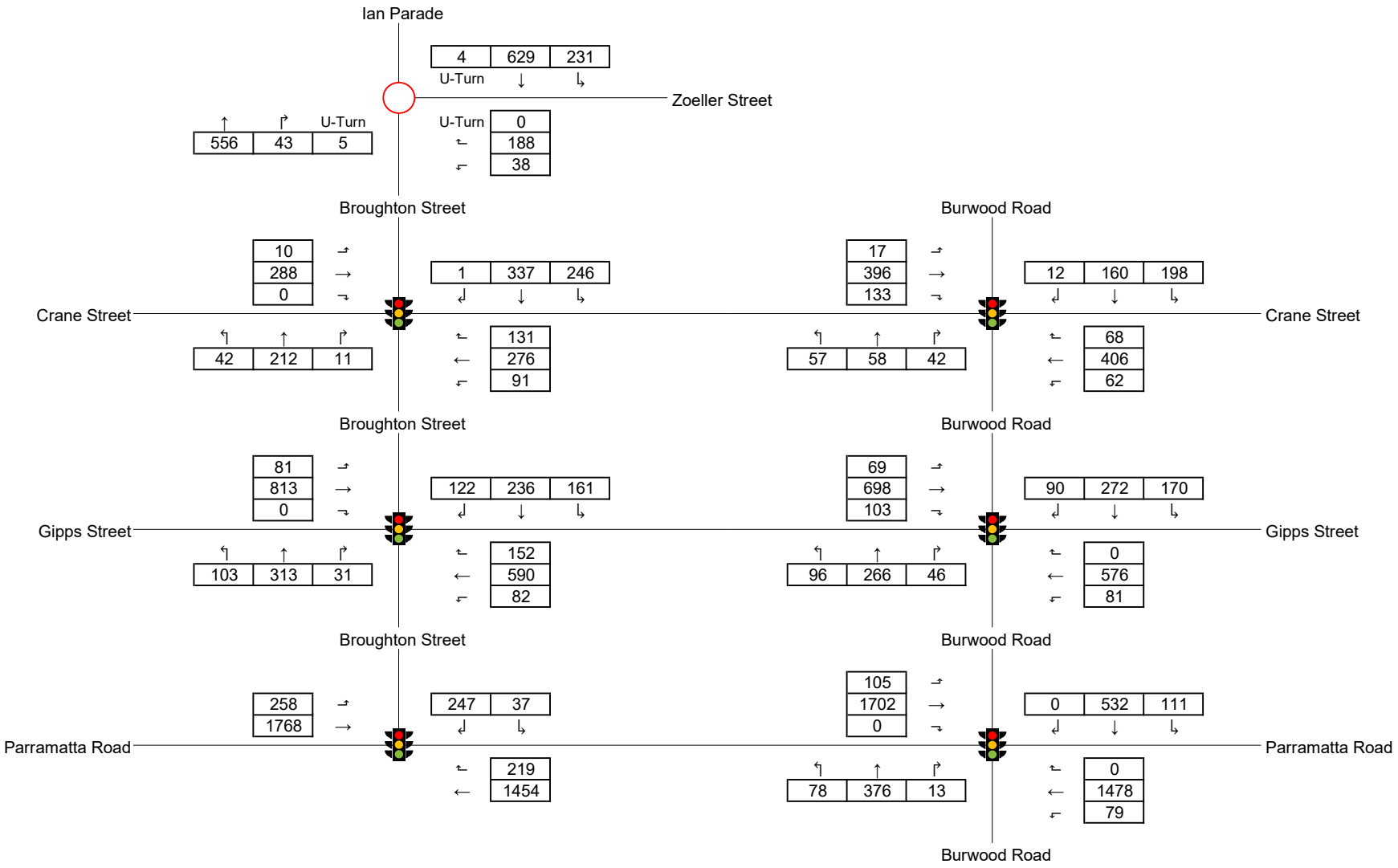
Burwood Road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Crane Street
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Broughton Street
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Gipps Street
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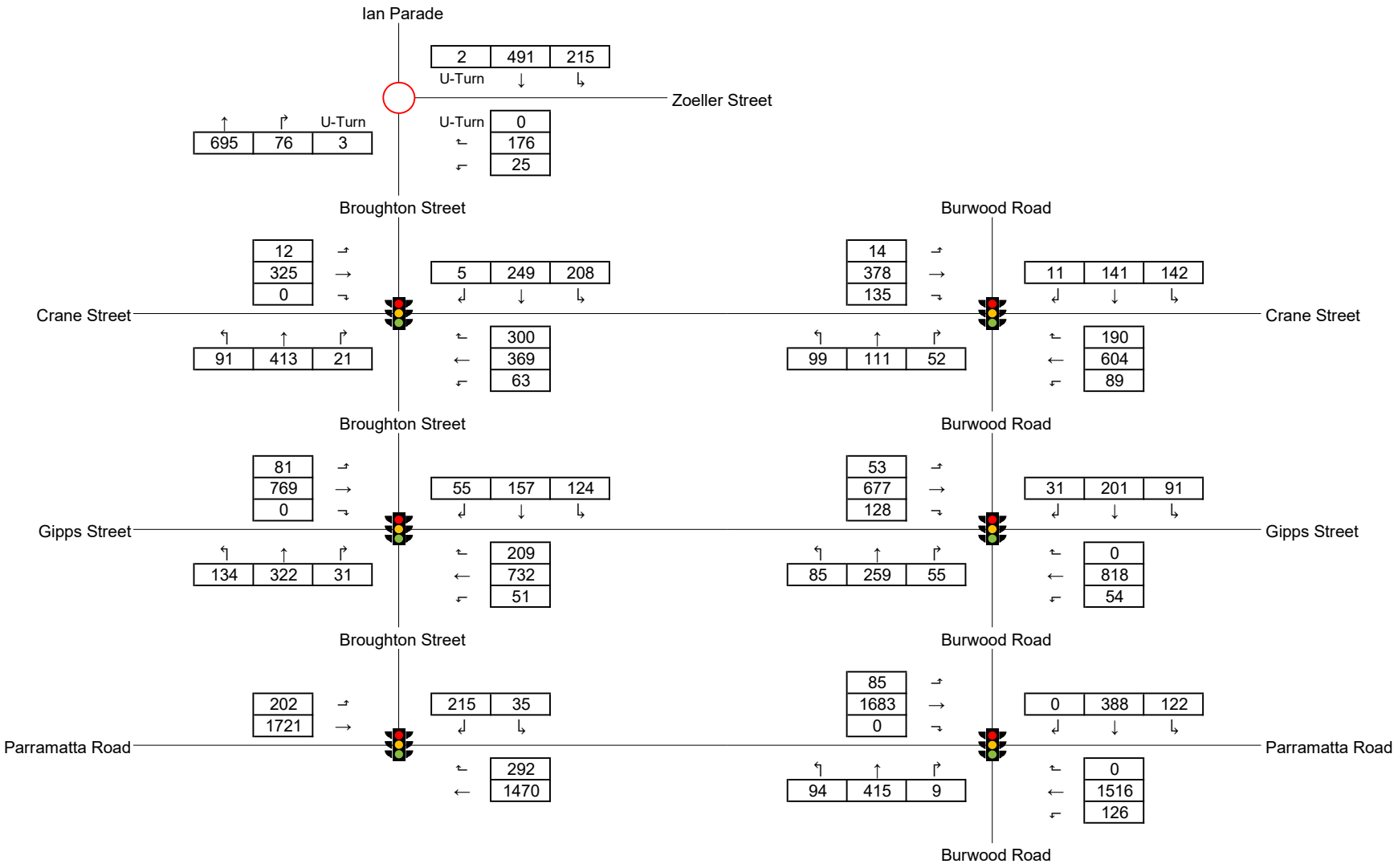
79
Burwood Road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249
208
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141
142
Crane Street
Crane Street
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413
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300
369
63
99
111
52
190
604
89
Broughton Street
Burwood Road
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157
124
53
677
128
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201
91
Gipps Street
Gipps Street
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Burwood Road
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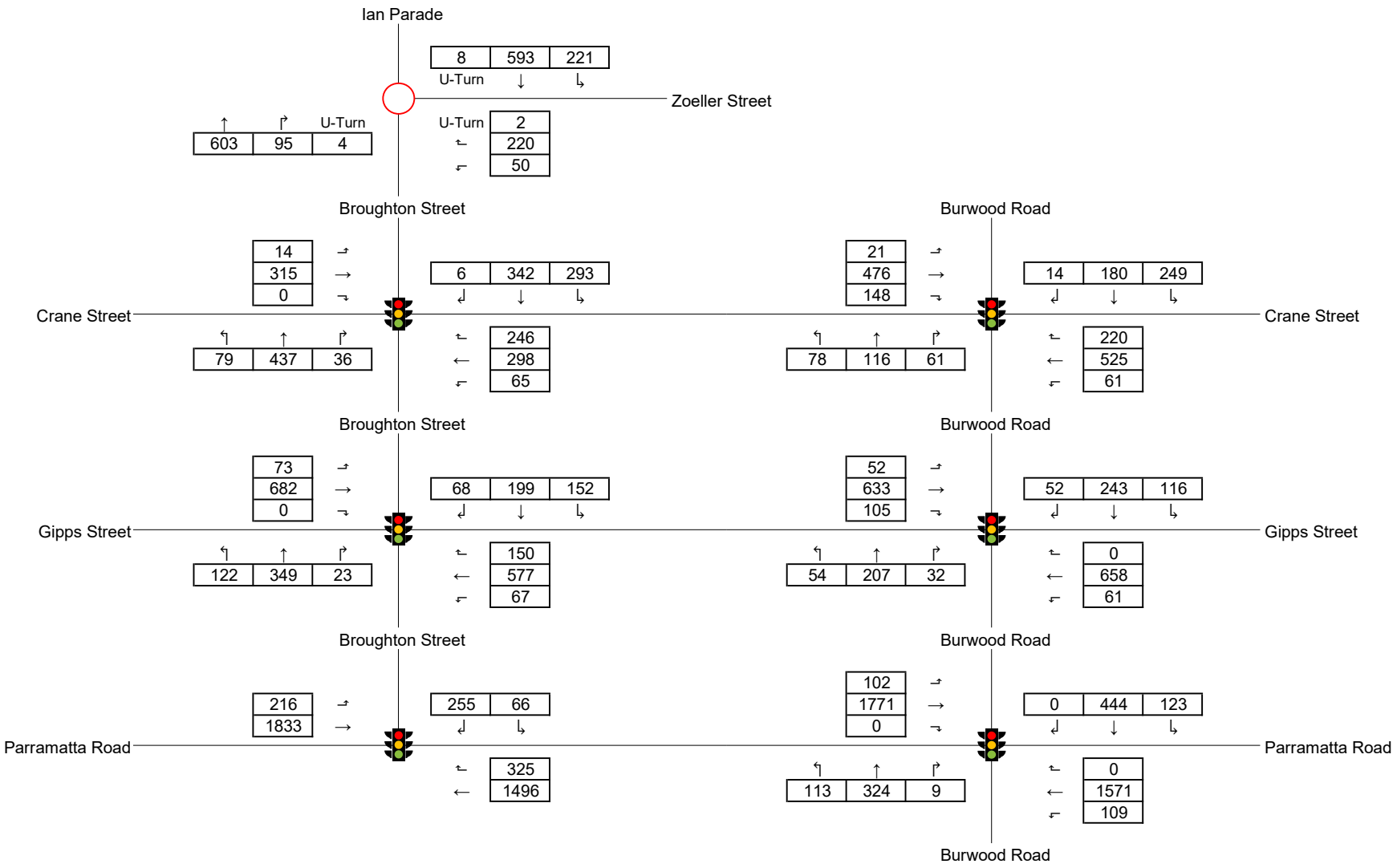
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249
Crane Street
Crane Street
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Burwood Road
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633
105
52
243
116
Gipps Street
Gipps Street
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577
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349
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Broughton Street
Burwood Road
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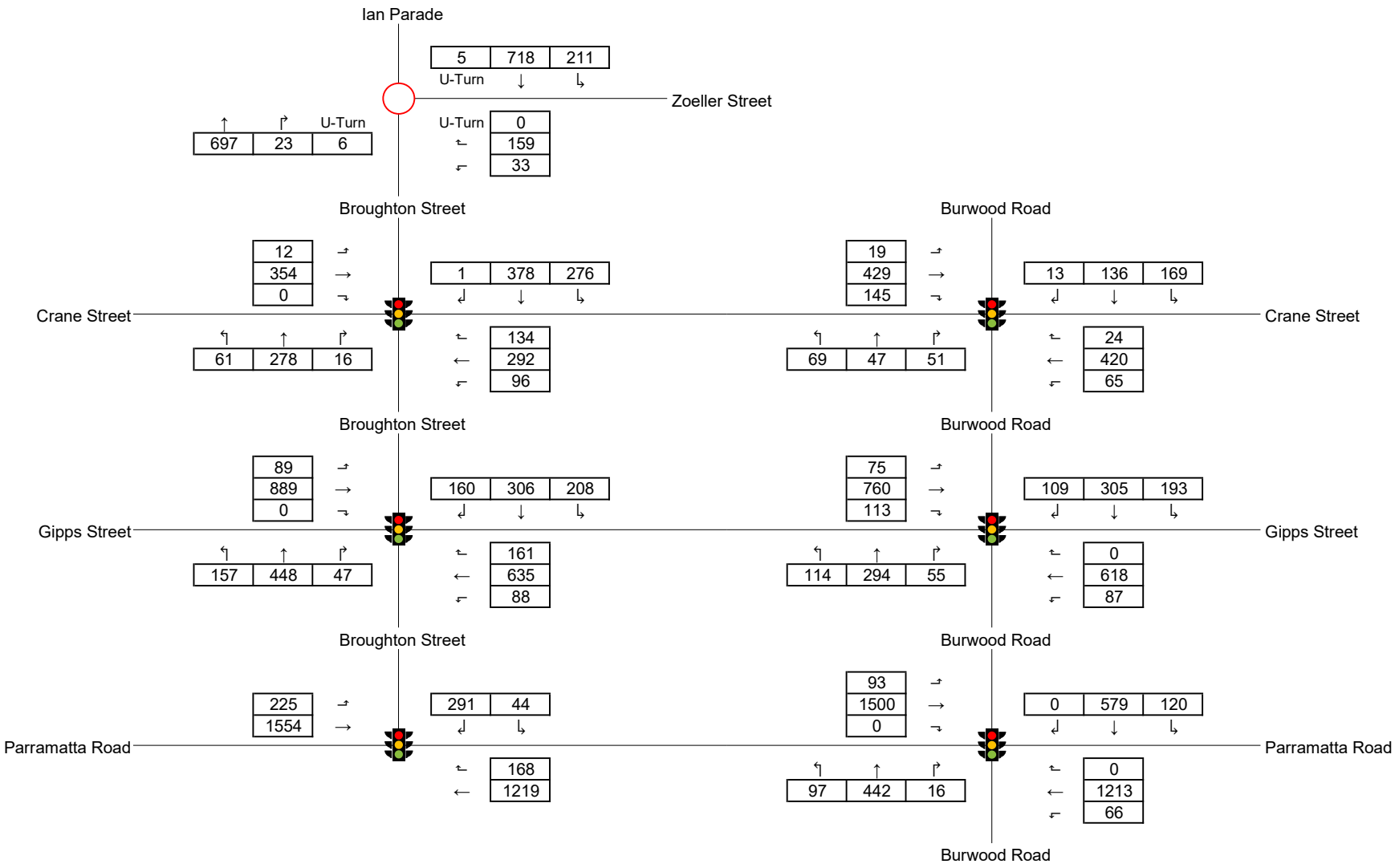
Burwood Road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697 23 U-Turn 6
Broughton Street
Burwood Road
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Crane Street
Crane Street
19
429
145
13 136 169
61 278 16
134
292
96
69 47 51
24
420
65
Broughton Street
Burwood Road
89
889
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160 306 208
Gipps Street
Gipps Street
75
760
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109 305 193
157 448 47
161
635
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114 294 55
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87
Broughton Street
Burwood Road
225
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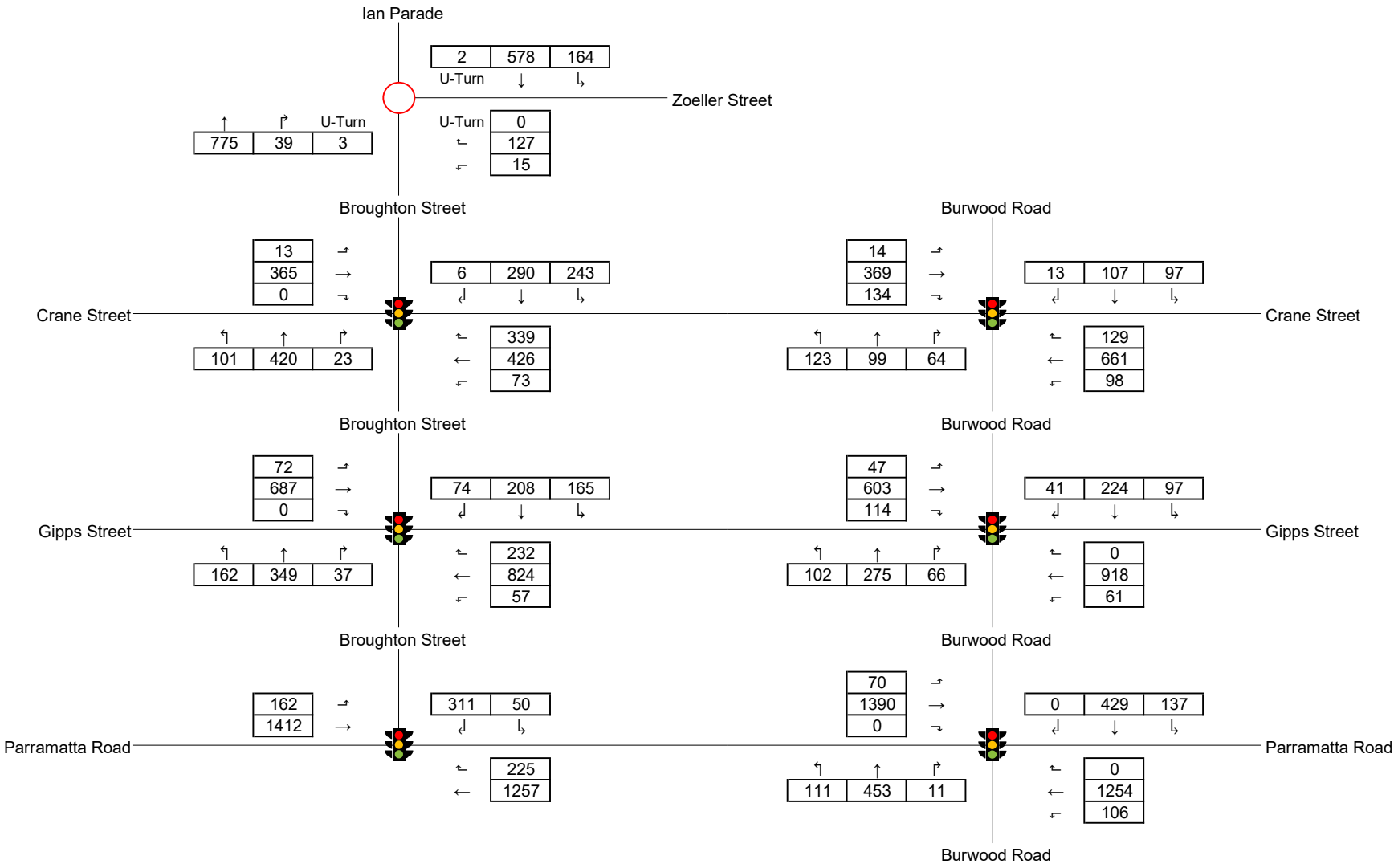
Burwood Road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Crane Street
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Broughton Street
Burwood Road
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Gipps Street
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Broughton Street
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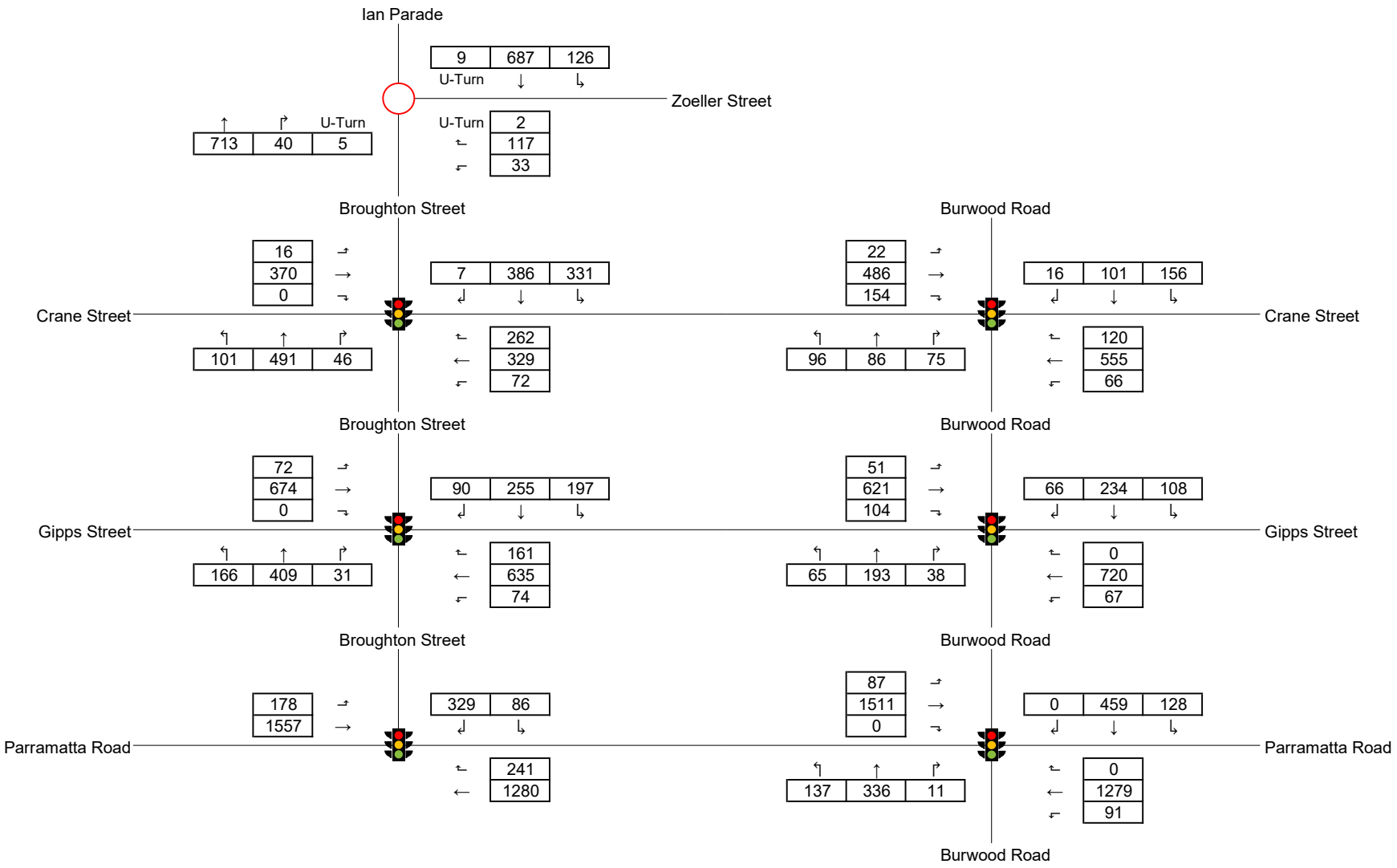
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Crane Street
Crane Street
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Broughton Street
Burwood Road
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Gipps Street
Gipps Street
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Broughton Street
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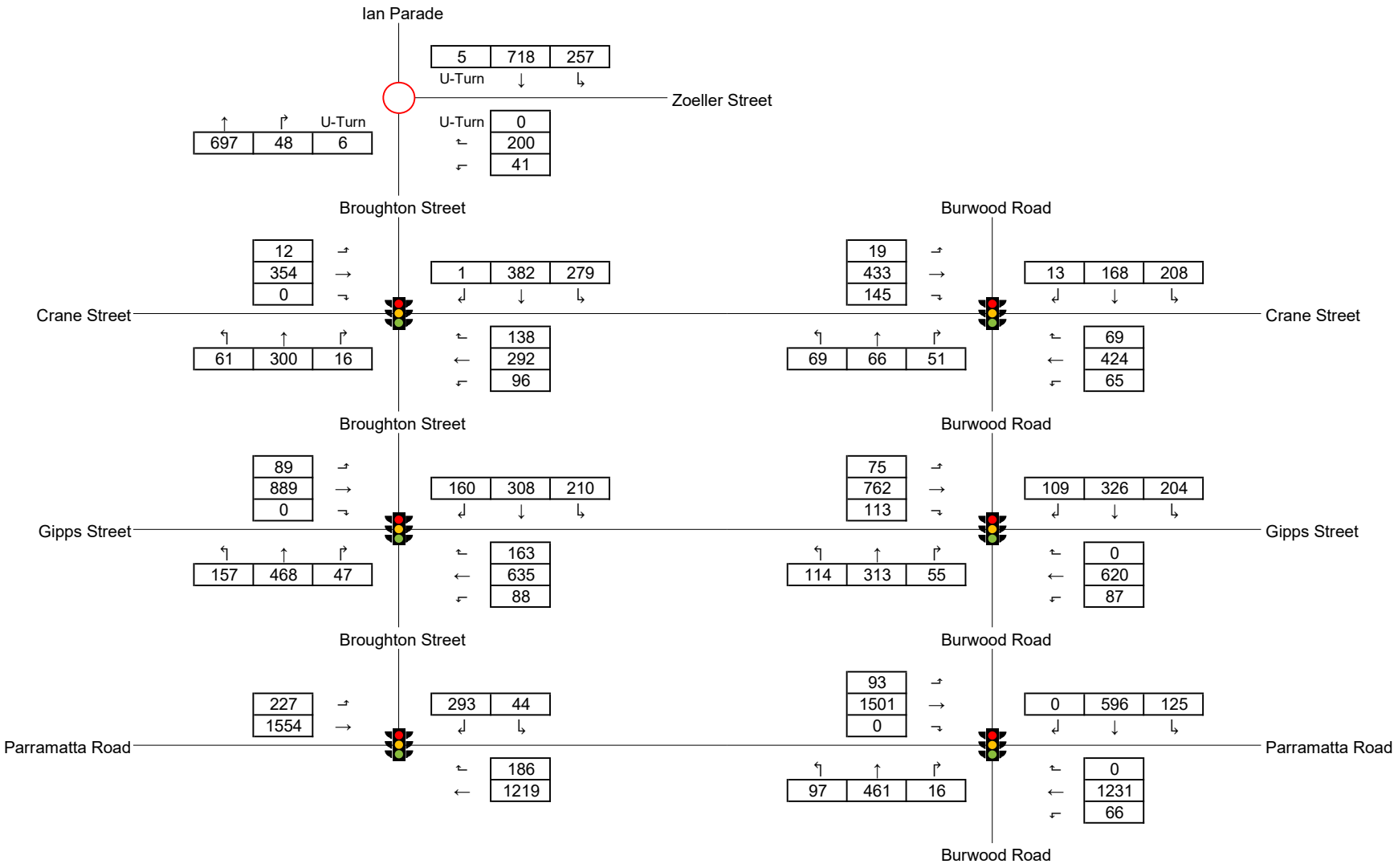
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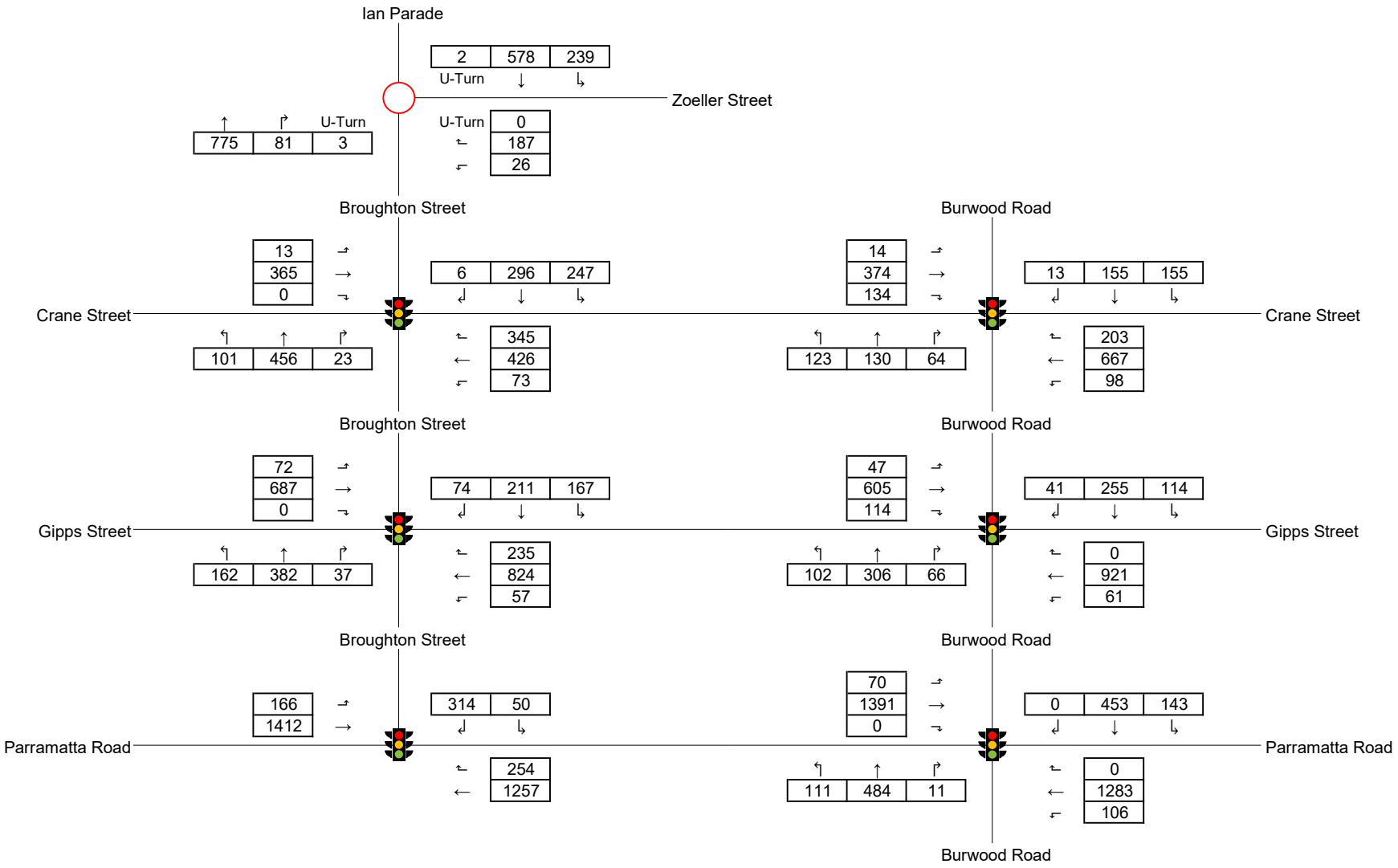
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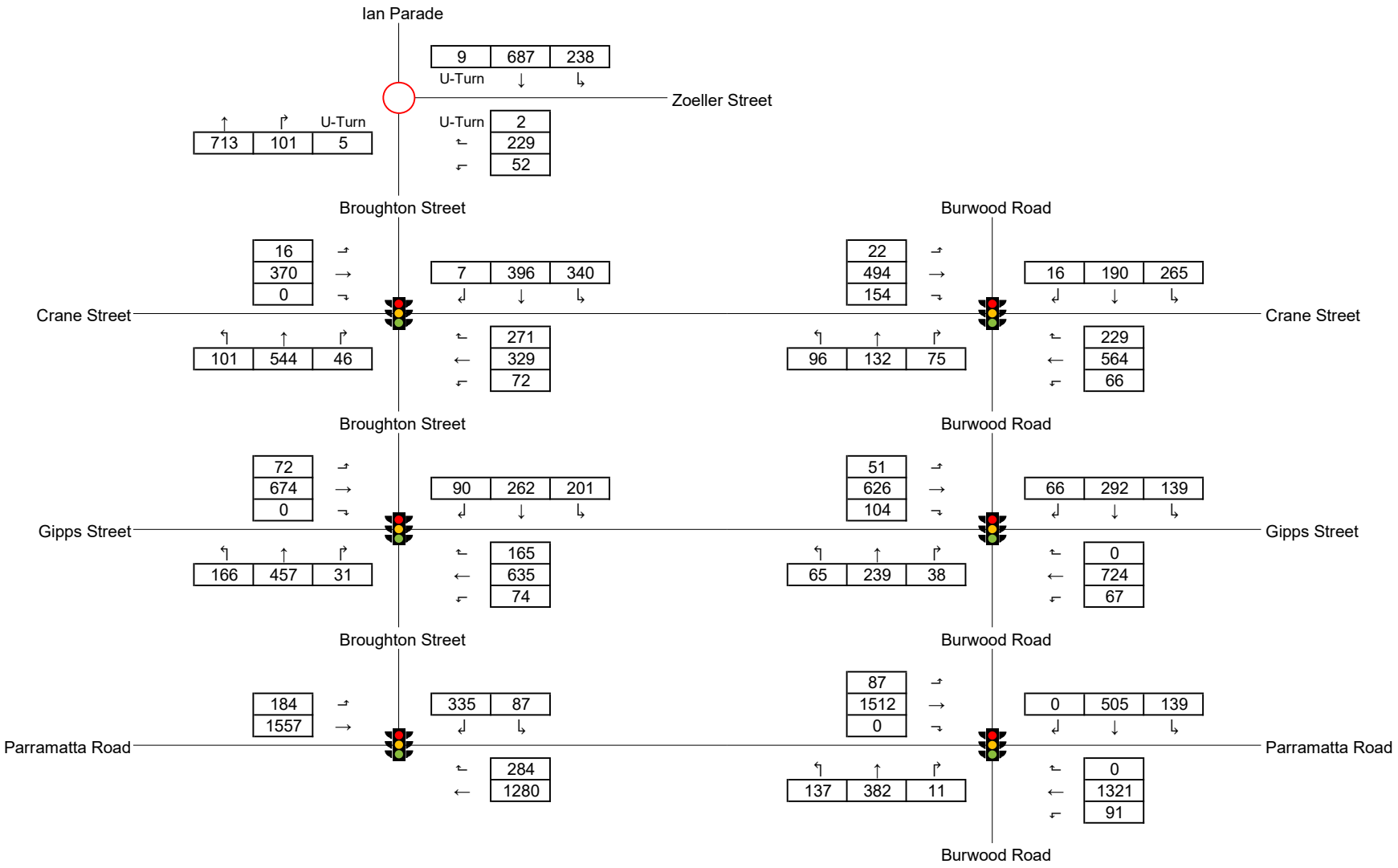
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