245 Marion Street, Leichhardt

Traffic and Parking Impact Assessment

Prepared for:

P&C Consulting

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1 Introduction

The Transport Planning Partnership (TTPP) Pty Ltd has prepared this traffic and parking impact assessment report on behalf of P&C Consulting Pty Ltd to accompany a Planning Proposal to be lodged with Inner West Council.

The Planning Proposal seeks approval to allow additional permitted uses on the site at 245 Marion Street Leichardt to allow mixed-use development to occur on the site. The proposal would allow both employment and residential uses to occur on the site.

The site is currently occupied by light industrial automotive repair uses. The existing site use would be compatible with the proposed complimentary employment and residential uses.

The indicative architectural scheme (see Appendix A) prepared for the purpose of the planning proposal comprises the following uses:

- Automotive services (light industrial)
- Urban services (light industrial)
- Office premises
- Ancillary retail (restaurants / café)
- Residential

The indicative architectural scheme has been utilised in the traffic and parking assessment presented herein. The report assesses the traffic implications associated with the proposed development.

The remainder of the report is set out as follows:

- Chapter 2 discusses the existing conditions including a description of the subject site
- Chapter 3 provides a brief description of the proposed development
- Chapter 4 assesses the traffic and transport implications of the planning proposal
- Chapter 5 provides the assessments conclusions and recommendations.

2 Existing Condition Assessment

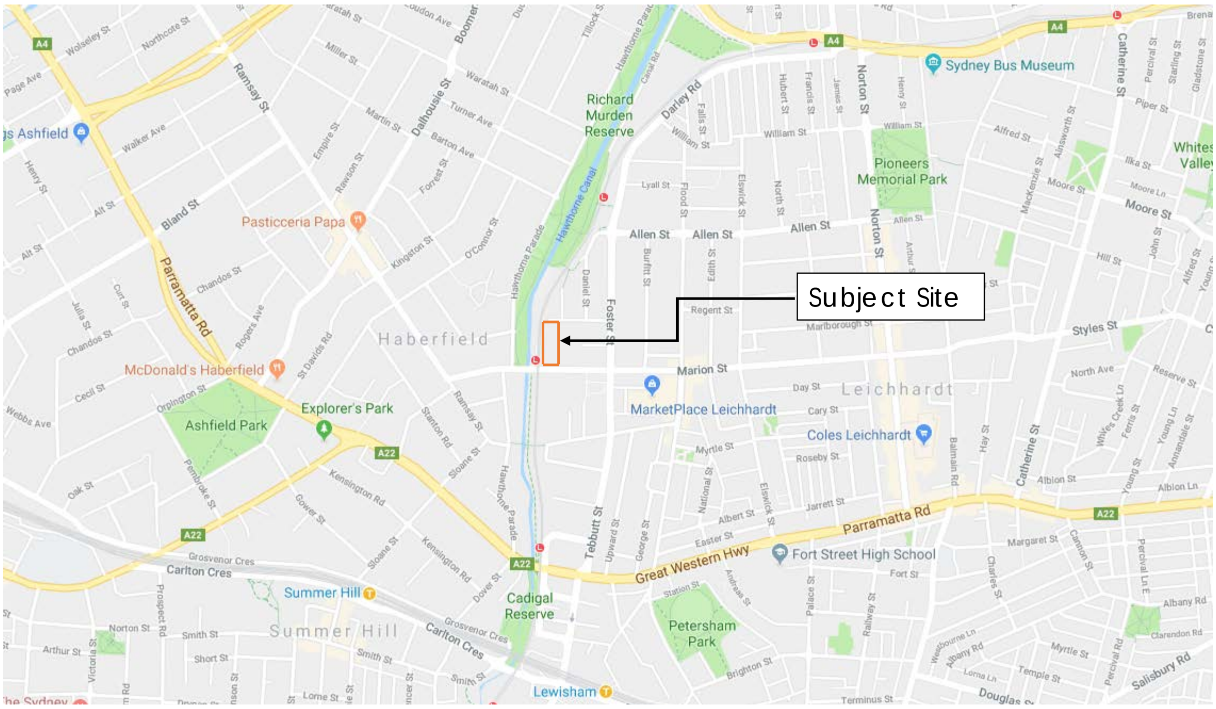
2.1 Site Description

The subject site is located at 245 Marion Street. The site has two road frontages, one to Marion Street and a rear site frontage to Walter Street.

The site falls within the local government area of Inner West Council.

A locality map of the subject site is shown in Figure 2.1.

Figure 2.1: Site Locality



Source: Google Maps

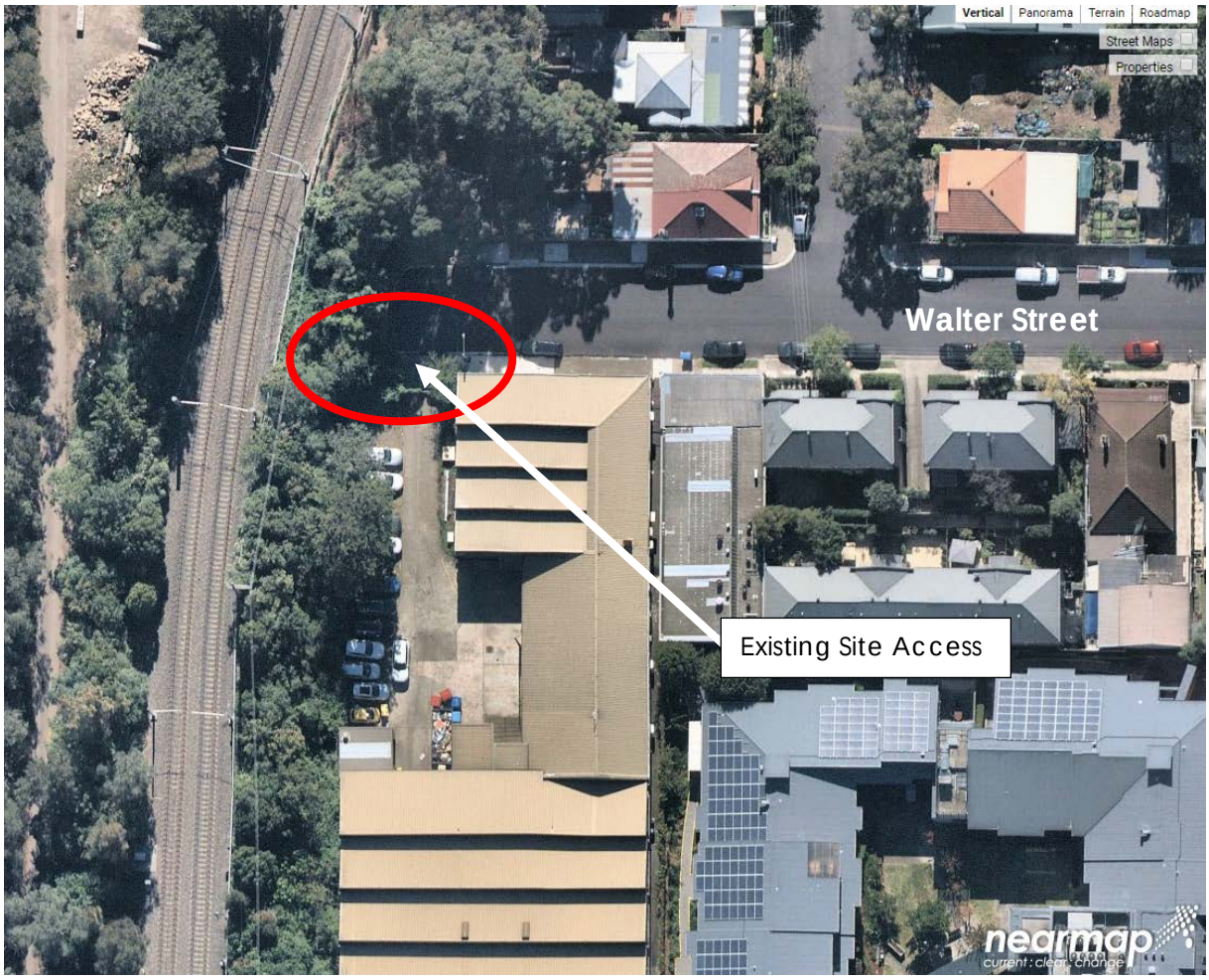
The site is currently in use as an automotive repair and service centre.

Vehicle access to / from the site is provided by:

- Marion Street - 25 metre wide driveway with entry and exit lanes to the building and 90 degree parking spaces as shown in Figure 2.2; and
- Walter Street - combined entry / exit driveway as shown in Figure 2.3.

Figure 2.2: Existing Marion Street Site Frontage with Access Driveway

Figure 2.3: Existing Walter Street Site Frontage with Access Driveway



Land uses surrounding the site are predominantly low density residential housing. In addition there is:

- an aged care facility immediately east of the site;
- a light railway station immediately to the west; and
- a recreational sports facility opposite the site's frontage.

Other nearby facilities include:

- Kegworth Primary School; and
- Leichhardt Market Place shopping centre;

2.2 Abutting Road Network

The subject site fronts Marion Street which if a designated Regional Road. Other streets within the vicinity of the site include Foster Street to the east and Hawthorne Parade to the west.

Figure 2.4 displays the road classifications for streets near the site, and a brief description of these roads is provided below.

Figure 2.4: Abutting Road Network

Source: Roads and Maritime Services Roads Classification Review – Sydney Overview

2.2.1 Marion Street

Marion Street is a two-way, two-lane regional road aligned in an east-west direction between Leichhardt and Haberfield and is the principal point of access to the subject site. Marion Street is generally 12.5 metres in width and accommodates on-street parking on both sides of the road (outside of peak periods). The road has a posted speed limit of 50 km/hr and intersects Foster Street to the east via a four-way traffic signal-controlled intersection.

2.2.2 Walter Street

Walter Street is a two-way local road, which provides the secondary point of access to the subject site. The street is aligned in an east-west direction and is generally 10 metres in width. Walter Street has a 50 km/hr posted speed limit and unrestricted kerbside parking is generally accommodated on both sides of the carriageway.

2.2.3 Foster Street

Foster Street functions as a two-way, two-lane state road aligned in a north-south direction between Darley Street and Tebbutt Street. The street offers good accessibility to the wider arterial road network, including the City West Link via Darley Road to the north and Paramatta Road via Tebbutt Street to the south.

Foster Street is generally 12.5 metres in width and generally accommodates kerbside parallel parking on both sides of the road. The road has a posted speed limit of 50 km/hr, with 40 km/hr school zone restrictions applicable during school hours within the immediate vicinity of Kegworth Public School.

2.2.4 Hawthorne Parade

Hawthorne Parade is a two-way, two-lane local road aligned a north-south direction, intersecting Marion Street via a priority junction. North of the Marion Street intersection, Hawthorne Parade has a posted speed limit of 15 km/hr, assisted by a speed bump 10 metres north of the junction. To the south, Hawthorne Parade is a 50 km/hr area with a 3 tonne gross load limit restriction.

2.3 Existing Vehicle Access

As indicated previously, vehicle access to the existing site is provided by two separate driveways to two separate car parking areas. The principle site access is taken to the south of the site via Marion Street and is approximately 25 metres wide, leading to the principal on-site car park.

A second site access is located to the north of the site via Walter Street, providing access to the second on-site car park and is approximately 4 metres wide.

2.4 Pedestrian Infrastructure

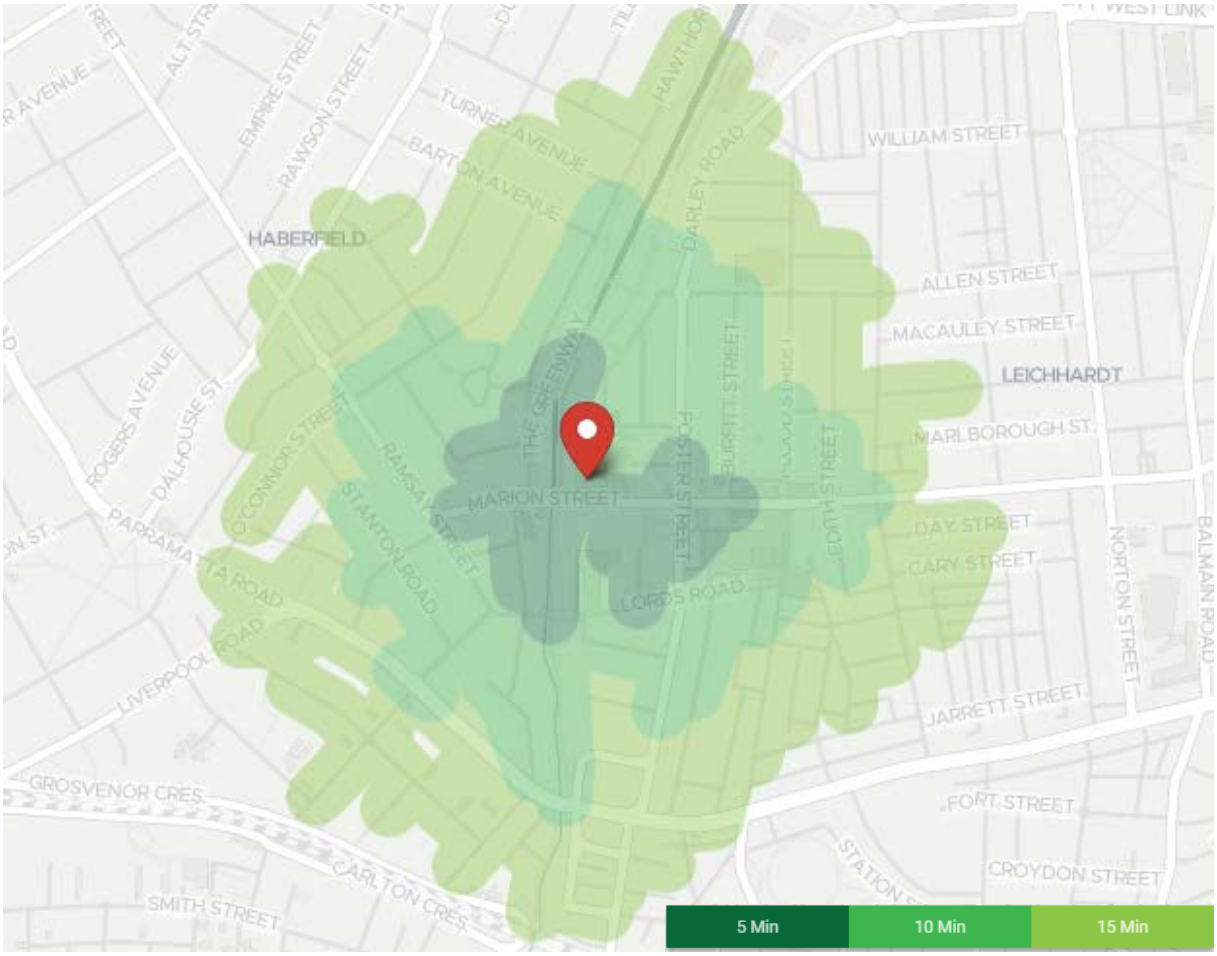
Pedestrian access to / from the site is provided via the footpath on the north side of Marion Street that leads through the principal vehicle access. Pedestrian access is also possible via the secondary vehicle access on Walter Street.

There are several well-established pedestrian facilities within the vicinity of the site that provide good access to the surrounding residential areas and public transport. All the surrounding streets are provided with paved pedestrian footpaths on both sides of the road, and a signalised pedestrian crossing is located at the Marion Street / Foster Street

intersection. Approximately 160 metres west of the site, there is also a pedestrian crossing area featuring a refuge island enabling pedestrians to cross Marion Street safely.

The pedestrian catchment within a 15-minute walking distance from the site is shown in Figure 2.5. It is noted that several bus, light rail and railway stations are located within or on the periphery of a 15-minute walking distance catchment. These will be discussed in greater depth later in the report.

Figure 2.5: Pedestrian Catchment Surrounding Site (15-minute walking distance)



Source: www.app.targomo.com/demo

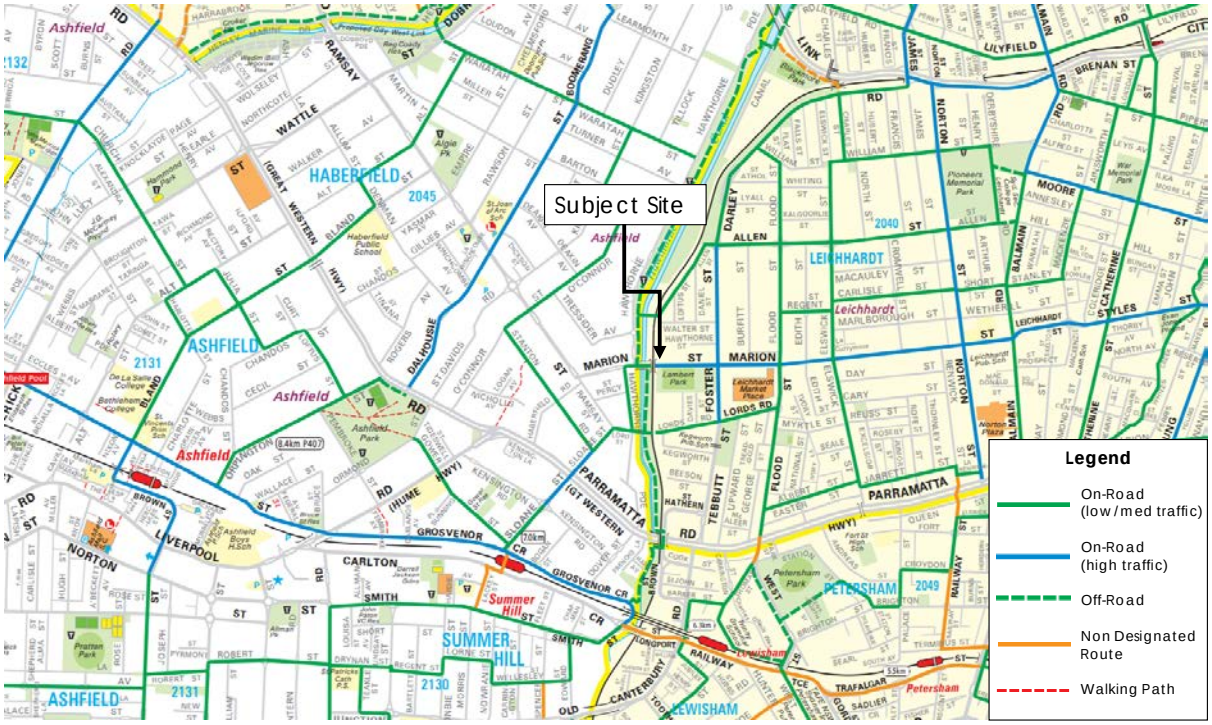
2.5 Cycle Infrastructure

The site benefits from several established on and off-road bicycle routes. On-street markings are provided on Marion Street to indicate that the street is a shared facility for motor vehicles and cyclists.

There are similar indicators provided on Hawthorne Parade to the south of the Marion Street junction, as well of the provision of signages that indicate the distance to various destinations. There is also an off-road dedicated cycle path aligned in a north-south direction that runs parallel to Hawthorne Parade between Sydney Harbour and Lewisham.

The bicycle network map for the vicinity of the site is provided in Figure 2.6.

Figure 2.6: Bicycle Network Map

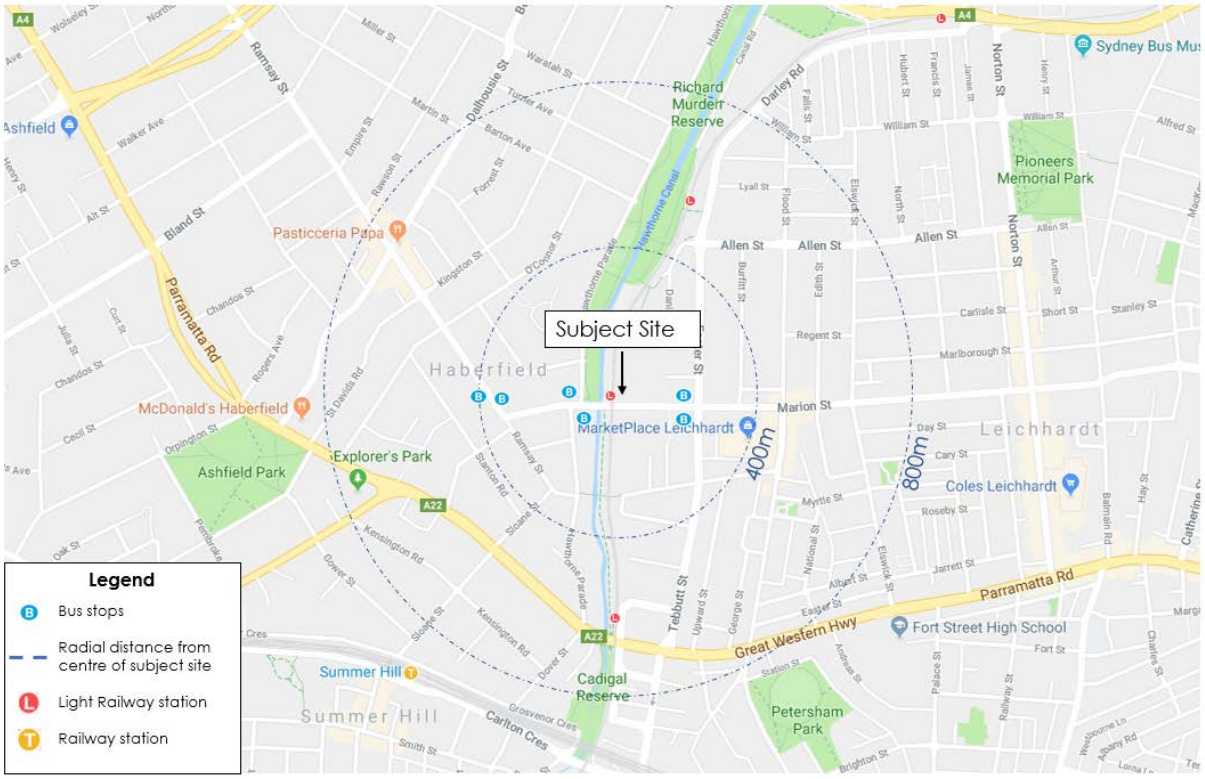


Source: Inner West Council, Ashfield Cycling Map

2.6 Public Transport Facilities

The site benefits from very good accessibility by public transport. The location of bus stops falling within a 400 metre catchment area radius of the subject site are indicated in Figure 2.7, as well as the location of rail and light rail stations in the area.

Figure 2.7: Public Transport Access Nodes in the Catchment Area



Source: Google Maps

2.6.1 Bus Services

A summary of the existing bus services provided close to or within a 400 metre walking distance catchment radius of the site is provided in Table 2.1.

A map displaying the regional bus network is shown in Figure 2.8.

2.6.2 Light Rail Services

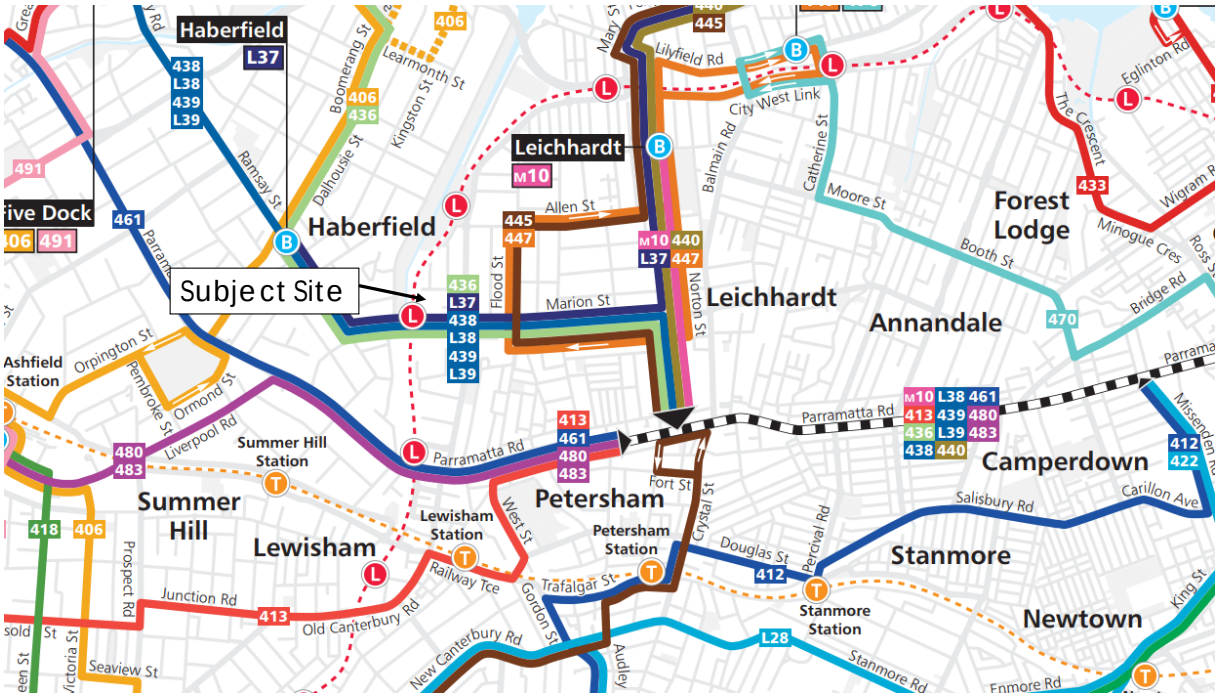
The site is adjacent to Marion Light Railway Station, which is located on the L1 Dulwich Hill line. The L1 route provides connection between Dulwich Hill and Central via several Inner West stations including Lilyfield, Rozelle Bay and Leichhardt North. These services typically operate every 10-15 minutes throughout the day.

A map of the L1 Dulwich Hill light rail route is shown in Figure 2.9.

Table 2.1: Existing Bus Services

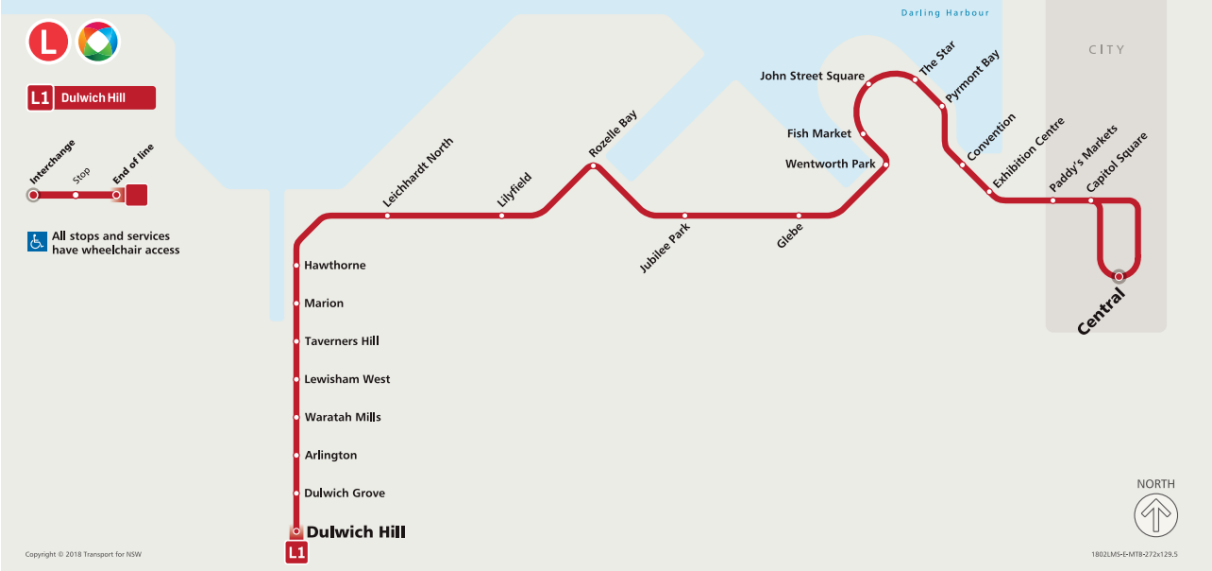
Service No.	Route Description	Bus Stop Location ID	Approximate Site Proximity	Approximate Frequency	
				Peak	Off-peak
436	Central Station Belmore Park – Rodd Point and Chiswick	204549 / 204550	130 metres	Every 16-20 minutes	Every 30 minutes
438	City Martin Place			Every 7-15 minutes	Every 15 minutes
439	City Martin Place – Mortlake			N/A	Every 30 minutes
L38	City Martin Place – Abbotsford			4 every hour	N/A
L39	City Martin Place – Mortlake			4 every hour	N/A
445	Balmain to Campsie	204041 / 204033	410 metres	4 every hour	4 every hour
447	Lilyfield to Leichhardt Marketplace (Loop Service)			Every hour	Every hour
370	Coogee to Leichhardt Marketplace	204037	440 metres	Every 10 minutes	Every 15 minutes

Figure 2.8: Regional Bus Network



Source: Sydney Buses

Figure 2.9: L1 Dulwich Hill Light Rail Route



Source: Transport for NSW

2.6.3 Rail Services

Summer Hill Railway Station is approximately 910 metres south-west of the site. Summer Hill is served by the T2 Inner West & Leppington line as well as the T3 Bankstown line, which provide services between Sydney City and the Inner West suburbs of Parramatta, Leppington and Liverpool.

A summary of the existing train services and their associated peak hour frequencies are provided in Table 2.2.

Table 2.2: Summary of Existing Train Services and Frequencies

Rail Line	Route	AM Peak 7am-9am (no. of services)	PM Peak 4pm-6pm (no. of services)
T2 Inner West & Leppington	City Circle via Town Centre	18	8
	Paramatta	7	8
	Ashfield Only	1	-
	Leppington via Granville	-	9
T3 Bankstown	Liverpool via Regents Park	1	-

2.7 Car Sharing Pods

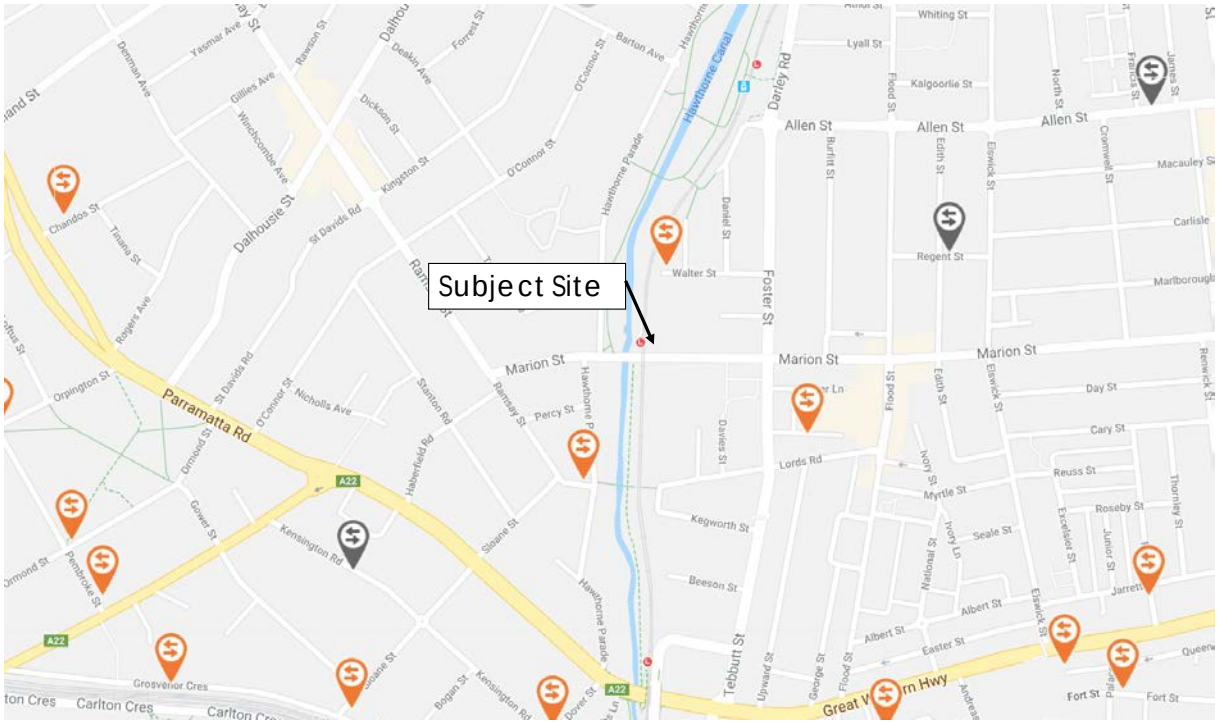
Car sharing is a flexible, cost-effective alternative to car ownership and is a convenient and reliable way for residents to use a car when they need one.

GoGet and Flexicar are car share companies operating in Australia, with a number of vehicles positioned within the area. Car share is a concept by which members join a car ownership club, choose a rate plan and pay an annual fee. The fees cover fuel, insurance, maintenance and cleaning.

The vehicles are mostly sedans, but also include SUVs, station wagons and vans. Each vehicle has a home location, referred to as a "pod", either in a parking lot or on a street, typically in a densely-populated urban neighbourhood. Members reserve a car by web, telephone and use a key card to access the vehicle.

The locations of GoGet car sharing pods in the vicinity of the site are shown in Figure 2.10.

Figure 2.10: GoGet Car Sharing Vehicles



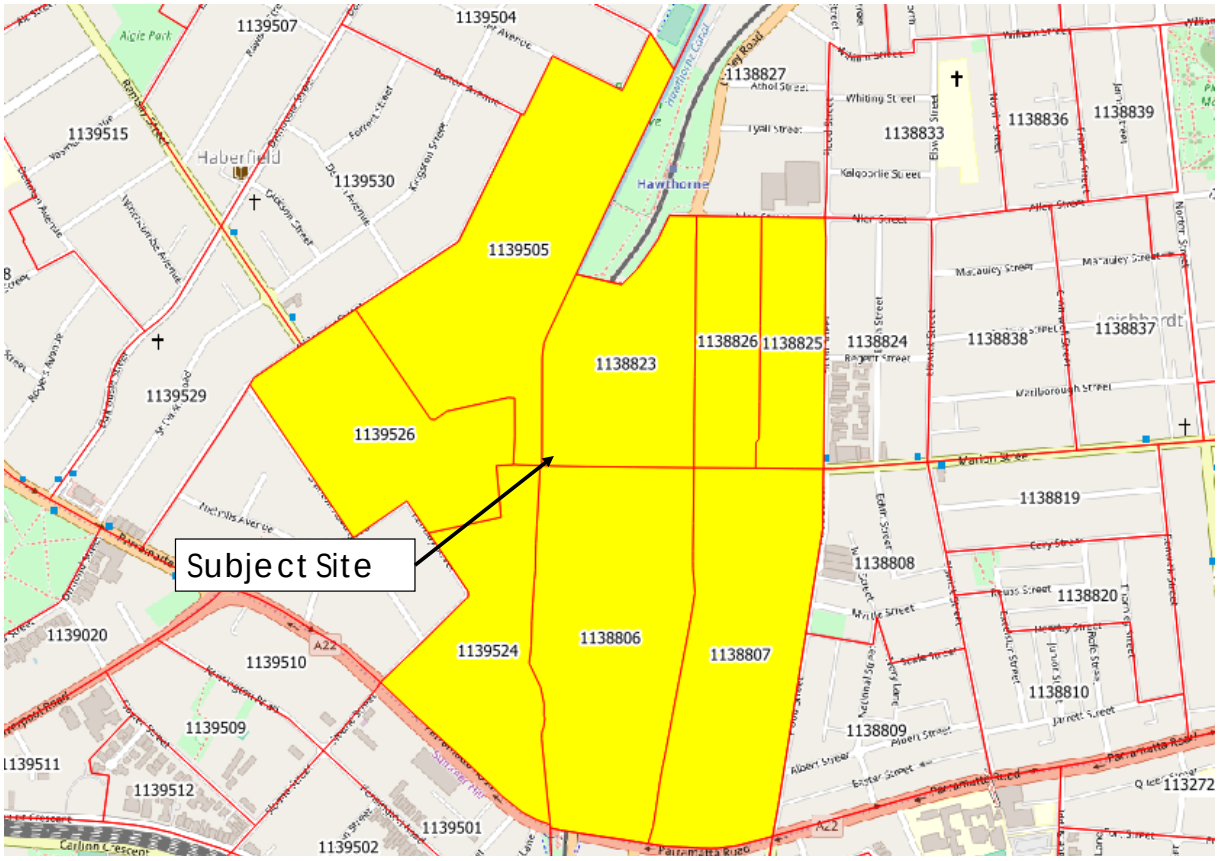
Source: www.goget.com.au

2.8 Travel Behaviour Data

2.8.1 Method of Travel to Work Data

Method of Travel to Work (MTW) using 2016 census data from the Australian Bureau of Statistics has been obtained in order to understand the existing travel behaviour of residents living in the area surrounding the subject site. Eight level one statistical areas have been selected surrounding the site, as shown in Figure 2.11.

Figure 2.11: Selected SA1 Areas Surrounding the Subject Area



Source: QGIS

An analysis of the data indicates that the predominant mode of travel among residents living in the selected level one statistical areas is car (44 per cent) followed by both bus (12 per cent) and train (12 per cent), although a further 14 per cent either worked at home or did not go to work.

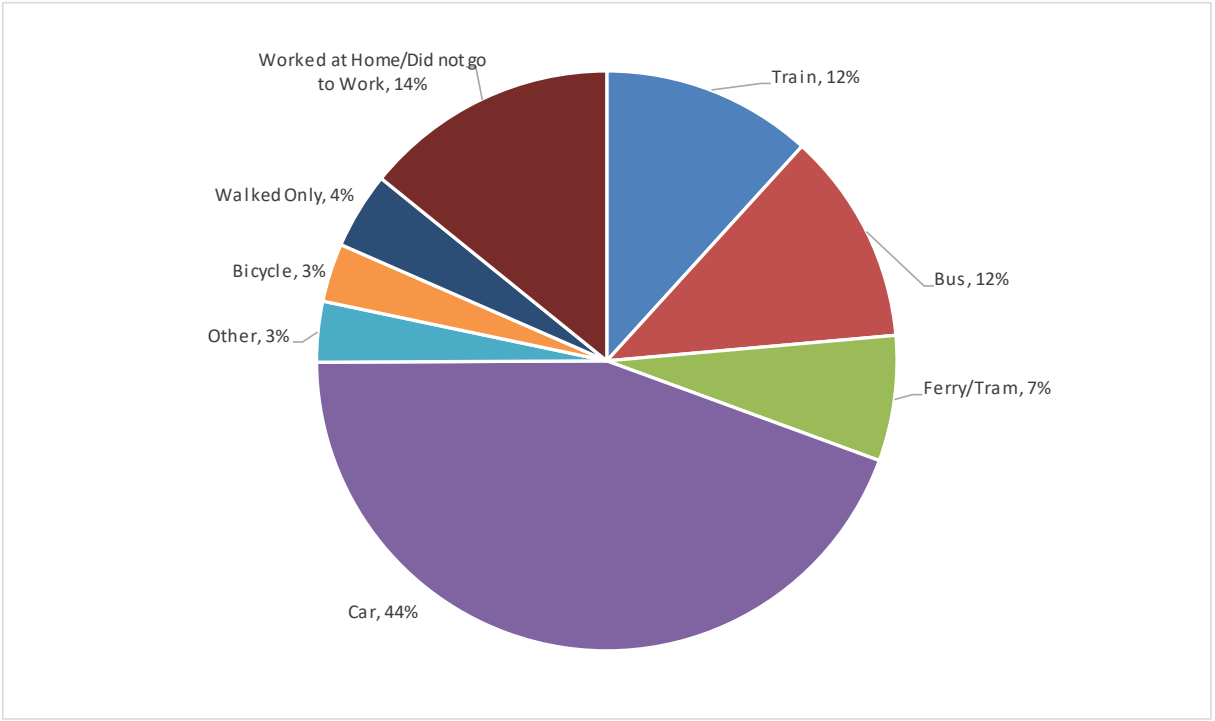
A full breakdown is provided in Figure 2.12.

Given the introduction of the new Marion Light Rail stop in 2014 and current journey to work trip patterns in the area, the site is considered to be well serviced by public transport facilities

and shows the potential to generate a modal shift away from car modes to more sustainable transport.

As such, it is proposed to provide a green travel plan as part of the proposed development, with green travel plan initiatives intended to be provided prior to the occupation of the site. As part of the planning proposal submission a Green Travel Plan has been prepared for the site. This Green Travel Plan is provided in Appendix B.

Figure 2.12: Travel to Work Mode Share for Residents near the Subject Site



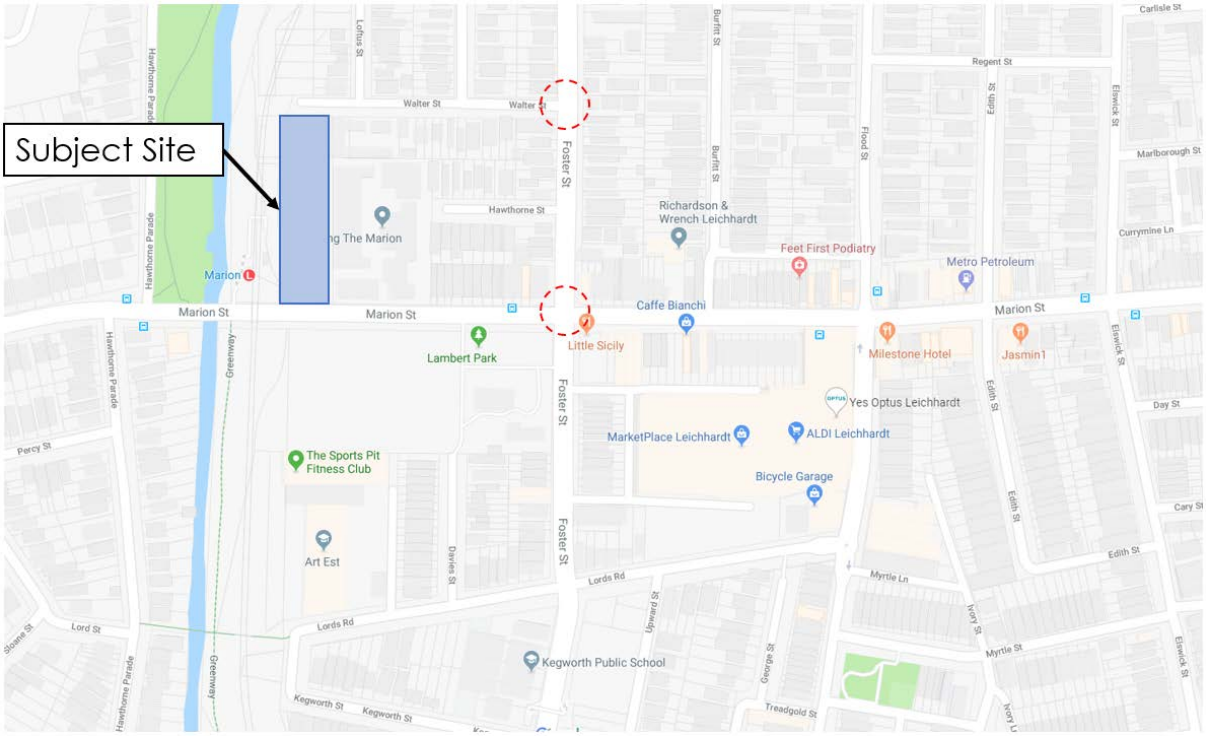
2.9 Traffic Volumes

Traffic surveys have been conducted at the following key nominated intersections:

- Foster Street-Walter Street (priority intersection)
- Foster Street-Marion Street (signalised intersection)

The nominated key intersections are outlined in red in Figure 2.13. A summary of the surveyed flows is presented in Figure 2.14. The detailed survey results are provided in Appendix C.

Figure 2.13: Key Nominated Intersections



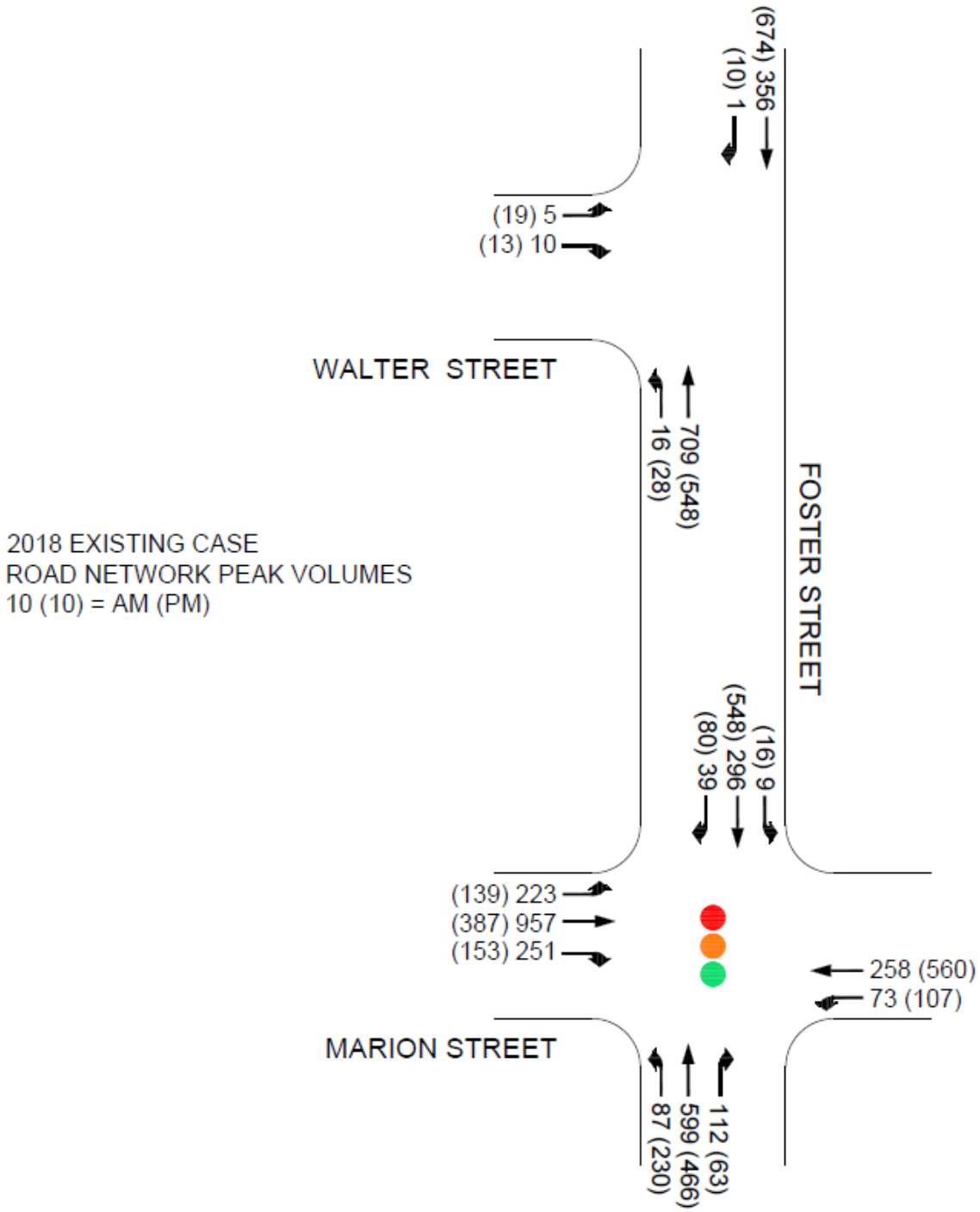
Source: Google Maps

The surveyed traffic flows include traffic generated by the existing automotive repair and service facility on the site. TTPP's observations of the existing site conditions have indicated that the existing facilities can accommodate between 50 – 80 vehicle services per day with additional vehicle movements parts deliveries etc.

Customer arrival and departure of vehicles to the existing automotive service facility are undertaken via the Marion Street driveways. This represents the bulk of the vehicle movements to and from the site.

Service and staff related vehicle movements are typically undertaken via the rear driveway at Walter Street.

Figure 2.14: Existing (2018) Traffic Flows



3 Public Transport Capacity

This section contains a review of historical data of existing occupancy figures on public transport facilities, including light rail, bus and ferry services, and household travel survey information obtained from Transport for NSW's Open Data website.

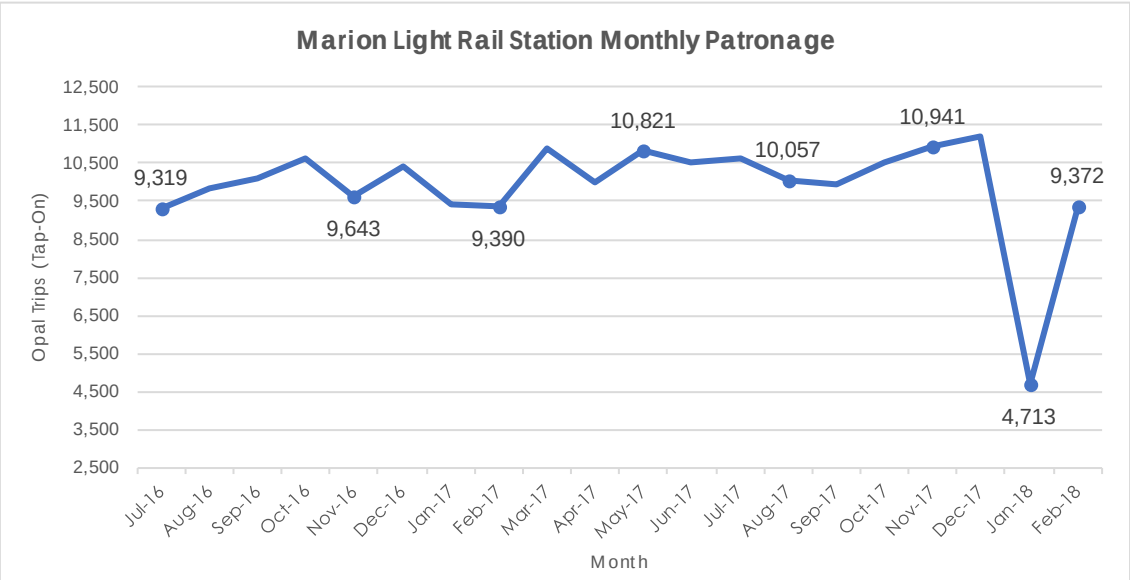
3.1 Light Rail Patronage

The Marion Light Rail station was opened in 2014 and provides good public transport connectivity between Dulwich Hill and Central. The Marion Light Rail station currently services some 10,000 patrons per month and is set to increase in the future based on future development in the area and the future connection to the CBD and South East Light Rail link.

A summary of the existing monthly patronage at the Marion Light Rail station is shown in Figure 3.1.

It is noted that Transport for NSW regularly reviews patronage, demand and anticipated growth for light rail services. Since opening it is understood that some 220 additional services have been added to the peak, inter peak and weekend periods thus reflecting the provision of services to adequately meet travel demands for light rail from the proposed development at 245 Marion Street and other development proposals.

Figure 3.1: Marion Light Rail Monthly Patronage (July 2016 to February 2018)



Note. A significant portion of the Light Rail line was closed during the month of January to allow for construction work as part of the CBD and South East Light Rail project, resulting in lower number of trips in January.

3.2 Bus Patronage

Bus patronage surveys on Thursday, 24 November 2017 have been obtained to understand existing bus services, frequencies and capacity within the immediate vicinity of the site along the Marion Street corridor.

The bus patronage surveys have been derived from the following three main sources:

- PTIPS – Public Transport Information and Prioritisation System
- Opal
- Bus Fleet Capacity

A summary of the existing bus frequencies at the nearest bus stops located on Marion Street, near Lambert Park is summarised in Table 3.1.

Table 3.1: Summary of Bus Frequencies near the Site

Cordon	AM Period		PM Period	
	7am-8am	8am-9am	4pm-5pm	5pm-6pm
To City	7	12	8	7
From City	6	8	9	10

The above data excludes any other bus stops located on Parramatta Road, which service bus routes 461, 480 and 484 to the City The Domain and Central station suburbs.

Existing bus services along the Marion Road corridor can currently accommodate a total capacity of some 62-112 bus patrons (people) per bus. Based on the bus patronage surveys, existing bus loads within the immediate vicinity of the site currently operate below their capacity, generally with many seats available during peak times.

The bus patronage surveys provide the following bus capacity classifications:

- **MANY_SEATS_AVAILABLE**

  If occupancy on the bus is less than 50% of the seating capacity (e.g. less than or equal 22 bus patrons)

- **FEW_SEATS_AVAILABLE**

  If occupancy on the bus is more than 50% of the seating capacity (e.g. more than 22 bus patrons)

- **STANDING_ROOM_ONLY**

  If occupancy on the bus is more than the seating capacity of the bus (e.g. more than 45 bus patrons)

With the above in mind, the existing bus loadings/capacities at the selected bus stops on Marion Street, near Lambert Park during the AM and PM peak periods are summarised in Figure 3.2 and Figure 3.3.

The following graphs show how many buses currently operate during the peak periods and their associated bus capacity classification.

Figure 3.2: Existing Peak Bus Capacities (Bus Stop 204080) – To City

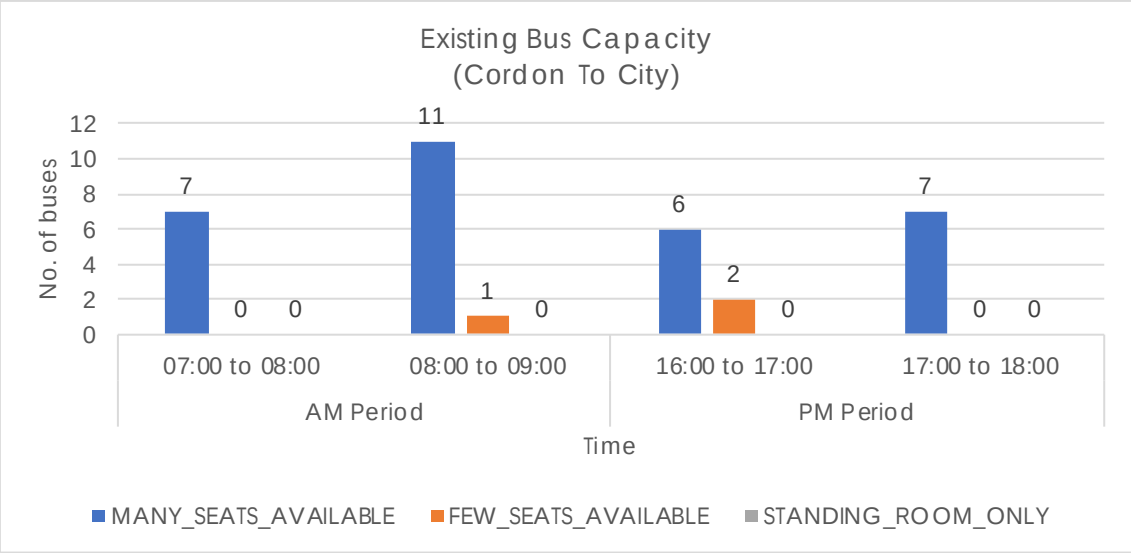
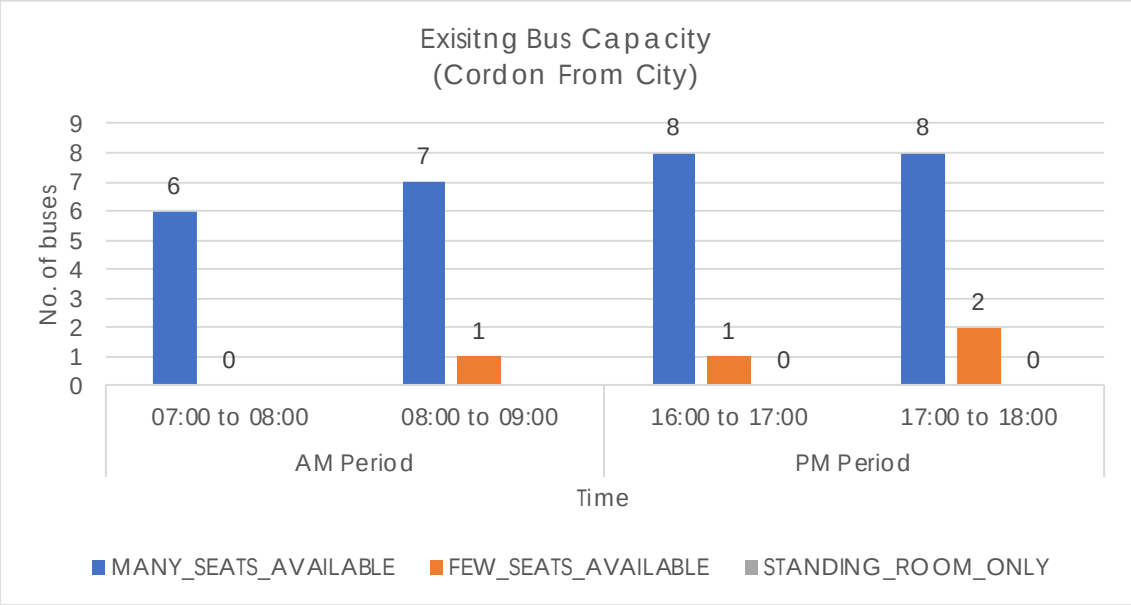


Figure 3.3: Existing Peak Bus Capacities (Bus Stop 204082) – From City



As such, the existing bus facilities within the immediate vicinity of the site currently operate well below its capacity, with spare capacity for any additional bus trips generated by the proposed development site (e.g. residents, visitors, staff etc.).

4 Overview of Planning Proposal

The proposed development involves the construction of a mixed-use development at 245 Marion Street, Leichhardt.

As noted previously, this planning proposal seeks approval to allow additional site-specific uses on the site.

An indicative masterplan (see Appendix A) has been prepared by Figgis & Jefferson Tepa Architects for traffic analysis purposes, with the following indicative mix:

- 97 residential units
    - 2 x studio units
    - 22 x 1-bedroom units
    - 56 x 2-bedroom units
    - 17 x 3-bedroom+ units
- 3,200m2 (minimum) of urban services and light industry
- 2,000m2 (maximum) commercial (business and office premises, health service facilities or child care)
- 250m2 ancillary retail.
- Basement car parking facilities (indicatively 146 spaces over 3 levels of basement)

The master plan proposal seeks to retain the primary vehicle access via Marion Street with a single two way vehicle driveway. A single vehicle driveway (exit only) is proposed to be retained at Walter Street.

In addition to this, as part of the proposed development, there will be opportunities to create a through site pedestrian / cycle link between Marion Street and Walter Street. Such a link will improve access to the Marion Street light rail station for existing residential properties to the north of the site.

5 Assessment of Planning Proposal

5.1 Car Parking Provisions

The car parking requirements for the proposed development has been assessed with reference to the following three documents:

- Leichhardt Development Control Plan (DCP) 2013; and
- Roads and Maritime Services guidelines

The car parking assessment for the proposed development is detailed below.

5.1.1 Leichhardt DCP 2013

The car parking requirement for various development land uses within the old Leichardt Council area of the new Inner West Local Government Area are is set out in the Leichhardt DCP 2013.

The car parking requirements are set out within *Part C1.11 – Parking in* the DCP. A summary of the indicative car parking requirements arising from the proposal is summarised in Table 5.1.

Table 5.1: Leichhardt DCP 2013 Car Parking Requirements (Indicative)

Land use		Size	DCP Parking Rates (Min – Max)	DCP Parking Requirement (Min – Max)
Residential	Studio	2	0 to 0.5 spaces per dwelling	0 - 1 spaces
	1-bed	22	0.333 to 0.5 spaces per dwelling	7 - 11 spaces
	2-bed	56	0.5 to 1 space per dwelling	28 - 56 spaces
	3-bed+	17	1 to 1.2 spaces per dwelling	17 - 20 spaces
	Visitors		0.09 to 0.125 spaces per dwelling	9 - 12 spaces
	Sub-Total	*97*	-	*61 - 100 spaces*
Light Industrial		3,160m2	1/250m2 – 1/150m2	13 - 21
Office		1,800m2	1/100m2 - 1/80m2	18 – 23
Retail		250m2	1/50m2 – 1/50m2	5
Total				**97 - 149 spaces**

Based on the proposed development yields set out in the planning proposal, Table 5.1 indicates that the proposed development would be required to provide between 97-149 on site car spaces to service the proposed uses.

5.1.2 Roads and Maritime Guidelines

For the purpose of estimating the parking requirements arising from the proposed development under RMS guidelines, the following parking rates have been adopted using the Roads and Maritime Traffic Generation guidelines:

- residential (sub-metropolitan)
  - 0.6 spaces per 1-bedroom unit
  - 0.9 spaces per 2-bedroom unit
  - 1.4 spaces per 3-bedroom unit
  - 1 space per 5-units (visitor parking)
- commercial/community use:
  - 2.41 spaces per 100m2

Using the above metrics, the proposed development would require some 226 car parking spaces, with the following car parking breakdown:

- 107 residential spaces; and
- 119 non-residential spaces.

Notably, this car parking requirement of the RMS is higher than that assessed using the DCP rates.

TTPP notes that the future vision for the area will lead to higher levels of local employment, as well as better access to public transport infrastructure and facilities. As such, there may be an opportunity to reduce the car parking rates as set out using the Roads and Maritime rates.

In this regard, it is the intention to satisfy Council's DCP car parking rates for the proposal, which represents a less onerous car parking provision compared to the Roads and Maritime rates. Council's DCP car parking rates are also considered more appropriate to cater for anticipated market and demand of the proposed development uses (i.e. residential and commercial/employment uses).

[1] *This car parking rate is the average maximum parking demand derived from the Roads and Maritime's Trip Generation and Parking Generation Surveys (Office Blocks) Analysis report 2010.*

5.1.3 Summary of Car Parking Assessment

Based on the above car parking assessment and parking codes (DCP) a car parking provision of 97 – 149 car spaces would be appropriate to serve the proposed development.

At this stage, it is envisaged that some 146 car parking spaces can be accommodated within the basement car parking levels. This car parking provision is considered satisfactory to serve the proposed development based on the above car parking assessment.

Further to this, car share spaces, accessible parking, motorcycle and bicycle parking spaces would also need to be considered and provided in accordance with Council's DCP requirements as part of a future development application (DA) for the site.

The car park and associated elements are proposed to be designed in accordance with the design requirements set out in the relevant Australian Standards for car parking facilities.

5.2 Public Transport and Sustainable Travel Modes

As noted in Section 2 and Section 3 of this report, the proposed redevelopment site is well placed within close proximity to a range of public transport services and community facilities.

This proximity to public transport and community facilities provides a realistic opportunity to better manage travel demand generated by the site and in particular promote more sustainable modes of transport and better management of car use.

Notwithstanding the above, the implementation of site specific as part of a "Green Travel Plan" (GTP) will further encourage and maintain use of sustainable travel modes to and from the site.

A GTP is a package of coordinated strategies and measures to promote and encourage sustainable travel, such as walking, cycling and public transport etc. Such plans aim to influence the way people move to/from a business, residential complex or any other organisation to deliver better environmental outcomes and a range of travel choices, whilst also reducing the reliance on private car usage, particularly single occupancy car trips.

A GTP is proposed to be implemented as part of any development approval for the site, with green travel plan initiatives intended to be provided prior to the occupation of the site.

These green travel plan initiatives would promote the use of more sustainable modes of travel (i.e. walking, cycling, car share and public transport) and subsequently, reduce vehicle trips to/from the area.

An initial GTP has been prepared for the site and is provided in Appendix B. This initial GTP would guide a future GTP to be prepared as part of a future DA and implemented for site operation.

GTP measures may include (but not limited to):

- Appointment of a Travel Plan Co-ordinator to ensure the ongoing monitoring and evaluation of the plan
- provision of reduced car parking within the site for commercial (destination based land use) to limit attractiveness of the site for private vehicle trips for the journey to work travel
- creation of high quality pedestrian/shared environments and cycling facilities to encourage cycling and walking
- provide car sharing facilities and promote the availability of such car sharing pods to reduce private car ownership
- provide free opal cards to all residents upon occupation with pre-loaded credit so that travel patterns can be influenced from Day 1
- provision of public transport noticeboards to notify all residents/occupants of the alternate transport options available and a transport access guide for all new occupants
- provision of high quality telecommunication points to reduce the need for travel off-site
- a half yearly newsletter for every resident after occupation to outline the latest news on sustainable travel initiatives in the area.

These and other measures are set out in the GTP for the site contained in Appendix B.

In fact, such GTP initiatives (e.g. provided residents/occupants pre-loaded Opal cards from Day 1 and a welcome pack with public transport information) have been put in place in other similar developments, including Mirvac's Harold Park development, which has resulted in car traffic generation rates being some 50% lower than predicted in the original traffic impact assessment.

This site is considered comparable with the Harold Park site due to its proximity to high frequency public transport facilities. The site is located approximately 100m south from the Marion light rail stop, whilst the Harold Park site is located about 400m south from the Jubilee Park light rail stop. Both light rail stops (Marion and Jubilee) services the L1 Dulwich Hill line.

Following the occupation of the Harold Park site with the green travel initiatives in place, the peak hour traffic generation per unit was recorded as being 0.1-0.12 trips per unit based on surveys conducted 3-month post occupation in 2015 and recent surveys conducted this year (2018).

Thus, it is envisaged that the implementation of a GTP could reduce trips generated by the development, particularly to target residents and staff within the proposed development site.

5.3 Traffic Generation Assessment

5.3.1 Estimated Additional Traffic Generation Potential

As indicated previously, the existing site is currently occupied by an automotive repair and service facility with a floor area of over 3,000m2.

The existing traffic generation of the site has been included in the existing surveyed traffic flows as presented in Section 2 of this report.

It is proposed that the future use of the site will retain approximately 3,200m2 of 'light industrial' floor area for the use of automotive services. Essentially the existing automotive uses will be retained on the site under the proposed development.

Thus, with regard to potential traffic implications of the proposal, it is the nett additional traffic generation associated with the 'office' and 'residential' uses that need to be considered.

For the purpose of assessing the traffic generation potential of the proposed additional site uses, the Roads and Maritime suggested traffic generation rates for commercial and residential uses have been adopted as follows:

- residential: 0.19 trips per unit (AM Peak); 0.15 trips per unit (PM Peak)
- commercia/community use: 1.69 trips per 100m2 (AM Peak); 1.2 trips per 100m2 (PM Peak)

The application of these rates has been applied to the additional uses on the site in Table 5.2.

Table 5.2: Estimate Net Additional Site Traffic Generation

Scenario	AM Peak Hour	PM Peak Hour
Automotive Services	No additional traffic	No additional traffic
Office (commercial) GFA RMS Traffic Generation Rate Traffic Generation	 1800m2 1.69 vph / 100m2 + 30 vph	 1800m2 1.2 vph / 100m2 +22 vph
Residential No. of Apartments RMS Traffic Generation Rate Traffic Generation	 97 0.19 vph / apartment + 18 vph	 97 0.15 vph / apartment + 15 vph
Total Additional Peak Hour Traffic	+ 48 vph	+37 vph

As shown above, the planning proposal could be expected to generate an additional 37- 48 vehicle trips during the AM and PM Peak respectively.

For the additional traffic potential the following proportions of inbound and outbound trips have been assumed in the surrounding road network assessment:

- residential: 20% inbound / 80% outbound (AM Peak); 80% inbound / 20% outbound (PM Peak)
- commercial/community use: 80% inbound / 20% outbound (AM Peak); 20% inbound / 80% outbound (PM Peak)

5.3.2 Intersection Operation Analysis

Based on the above, the potential additional traffic flows associated with the planning proposal development have been assigned to the surrounding road network and the operation of adjacent key intersections assessed using SIDRA modelling software to ascertain the intersection performance at the key nominated intersections surrounding the site.

Roads and Maritime uses the performance measure level of service to define how efficient an intersection is operating under given prevailing traffic conditions. Level of service is directly related to the delays experienced by traffic travelling the intersection. Level of service ranges from LoS A to LoS F. LoS A indicates the intersection is operating with spare capacity, while LoS F indicates the intersection is operating above capacity. LoS D is the long term desirable level of service.

Table 5.3 shows the criteria that SIDRA Intersection adopts in assessing the level of service.

Table 5.3: Level of Service Criteria for Intersection Operation

Level of Service	Average Delay (seconds per vehicle)	Traffic Signals, Roundabout	Give Way and Stop Signs
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	operating near capacity	near capacity and 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 71	unsatisfactory with excessive queuing	unsatisfactory with excessive queuing; requires other control mode

Source: Roads and Maritime Guide to Traffic Generating Developments, 2002

The SIDRA modelling results for the existing (2018) and with development scenarios are presented in Table 5.4.

The full movement summaries of the SIDRA modelling results are provided in Appendix D.

Table 5.4: Intersection Operation with Additional Traffic Generated by Site Development

Intersection	Existing (2018)		With Development	
	Ave. Delay (s)	LOS	Ave. Delay (s)	LOS
Marion St-Foster St				
AM Peak	62	E	65	E
PM Peak	60	E	57	E
Foster St-Walter St				
AM Peak	12	A	12	A
PM Peak	15	B	15	B

Under the above traffic assessment, the proposed development is expected to result in a slight increase in the delays experienced at the Marion Street / Foster Street intersection during both the AM and PM peak periods.

It is pertinent to note that the Marion Street / Foster Street intersection currently experiences poor levels of service intersection and that the proposed development would not significantly exacerbate this existing condition.

Notwithstanding the above, the site's close proximity to high quality public transport services will offer residents and workers at the site realistic alternatives to private vehicle use. Traffic congestion during peak periods will be another factor influencing mode choice in favour of public transport. The implementation of a green travel plan (as appended to this report) is considered to be a critical factor in encouraging the mode shifts away from private motor vehicle use for future residents and workers of the site.

5.4 Site Access Arrangements

As described in Section 2, the site currently benefits from wide driveways at Marion Street and a rear site driveway at Walter Street.

As shown in the ground floor plan of the architectural drawings for the planning proposal, it is intended to consolidate the existing driveways at Marion Street to a single entry / exit driveway and retain a single driveway at Walter Street.

To limit the volume of traffic utilising Walter Street while maintaining flexibility for vehicle movements within the site, it is intended that the Walter Street driveway be provided as a one way access. TTPP's recommendations during the concept design is that the Walter Street access should be provided as a one way exit driveway.

The provision of a ground level through site link will facility efficient service vehicle movements through the site. It will also allow cars accessing the site to avoid the need to travel through the congested Marion Street / Foster Street intersection.

The through site link will also facilitate pedestrian and cycle movement through the site and improve the walking / cycling connections to the Marion Street Light Rail station and Marion Street bus stops.

It is noted that the proposed site access arrangements are consistent with the adjacent Uniting aged care facility which provides its primary access at Marion Street while also facilitating vehicle exit movements via the rear of the site at Hawthorne Street.

6 Conclusions

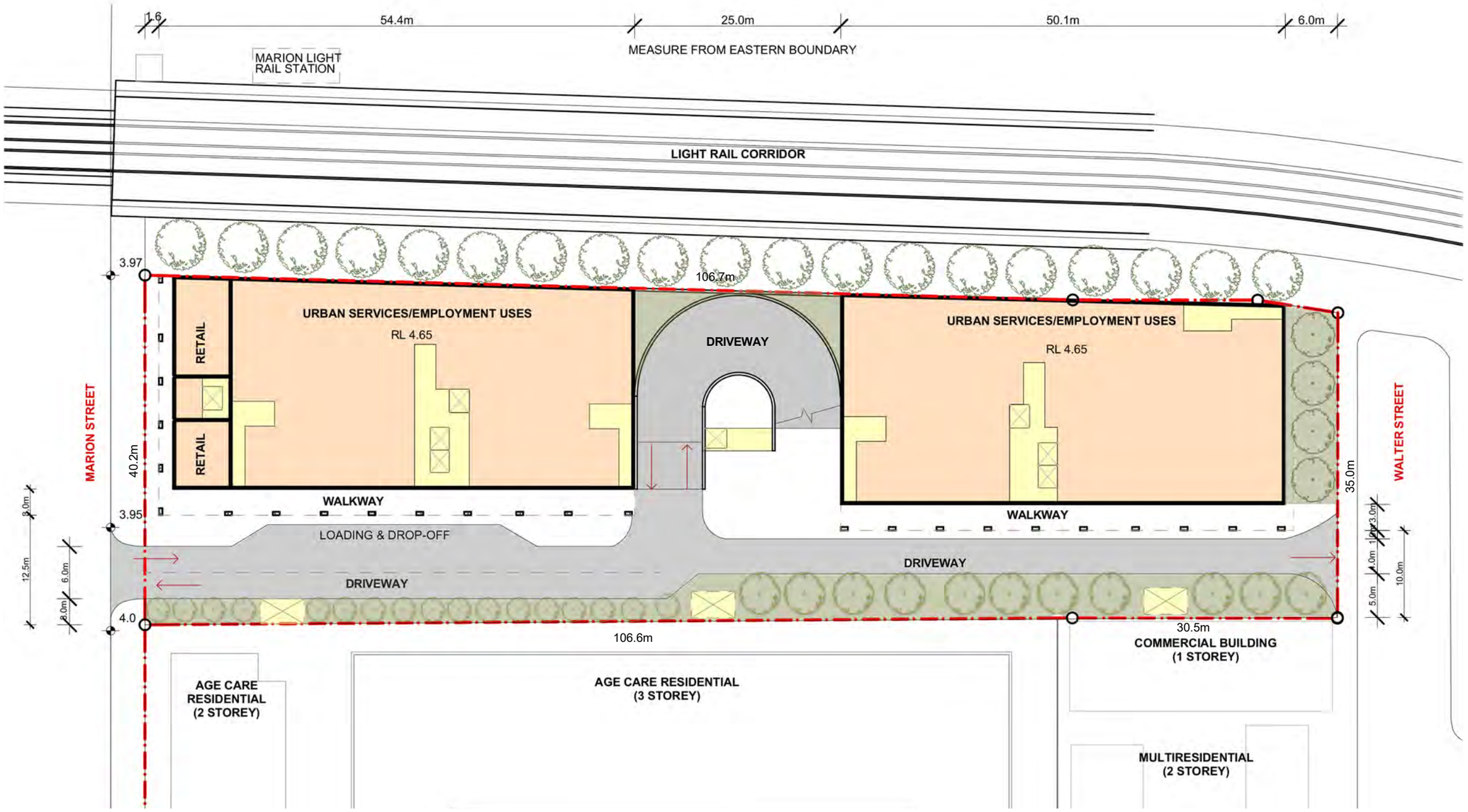
This report examines the traffic and parking implications of the planning proposal development at 245 Marion Street, Leichhardt. The key findings of this report are presented below.

- The planning proposal seeks approval to allow additional permitted uses on the site at 245 Marion Street Leichardt to allow mixed-use development to occur on the site. The proposal would allow both employment and residential uses to occur on the site.
- The site is currently occupied by automotive service uses. It is intended that this use will remain on site as part of the proposed development.
- The additional uses of the site would indicatively include:
    - Residential apartments (97 apartments)
    - Office / commercial (1,800m2)
    - Ancillary retail (eg. café)
- The proposed architectural plans indicate that on site car parking provision can be provided in accordance with the relevant parking controls/guidelines, with appropriate allocation provided for bicycle and motorcycle spaces.
- The proposal is expected to generate an additional 37-48 vehicles per hour in the peak periods.
- The proposed development is not expected to change the overall level of service at key nominated intersections within the vicinity.
- However, traffic modelling indicates that the Marion Street-Foster Street intersection is forecasted to continue to function at its operational capacity at LoS E in the future, irrespective of the development traffic arising from the proposed site.
- Notwithstanding the above, the site's close proximity to high quality public transport services will provide a realistic and attractive travel mode alternative to private vehicle travel.
- The proposed vehicle access arrangements and provision of a through site link will facilitate improved access to the Marion Street Light Rail Station and Marion Street bus stops for the site and its neighbours.
- A green travel plan should be implemented as part of the proposed development to facilitate a modal shift towards public transport usage as opposed to car usage, particularly for single-occupancy car trips. This is likely to further reduce traffic generated by the proposal.

Overall, it is concluded that the traffic and parking aspects of the proposed development would be satisfactory.

Appendix A

Planning Proposal Architectural Plans



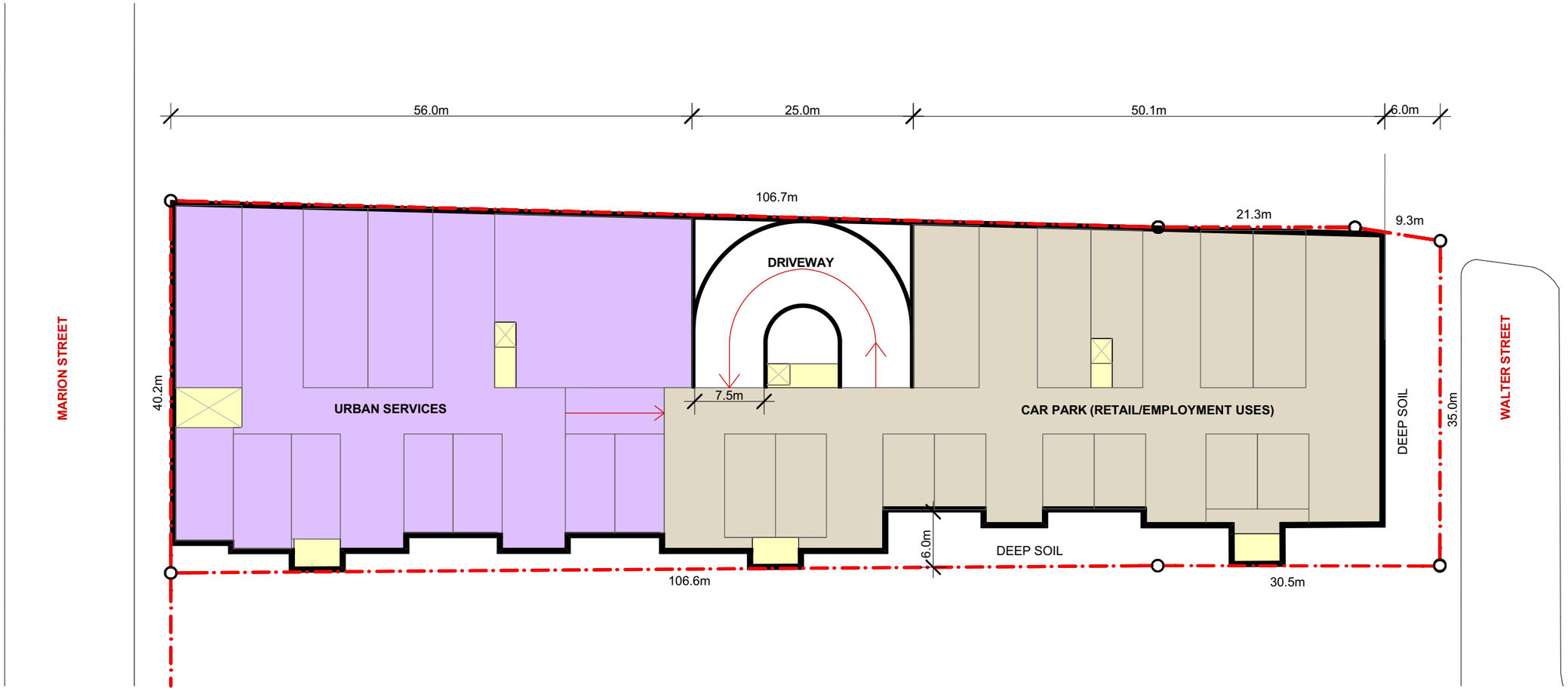
LEVEL 1- GROUND FLOOR

TRUE NORTH

SCALE 0m 5m 10m 15m 20m 25m

FIGGIS + JEFFERSON TEPA

REDEVELOPMENT OF 245 MARION STREET, LEICHHARDT - PLANNING PROPOSAL



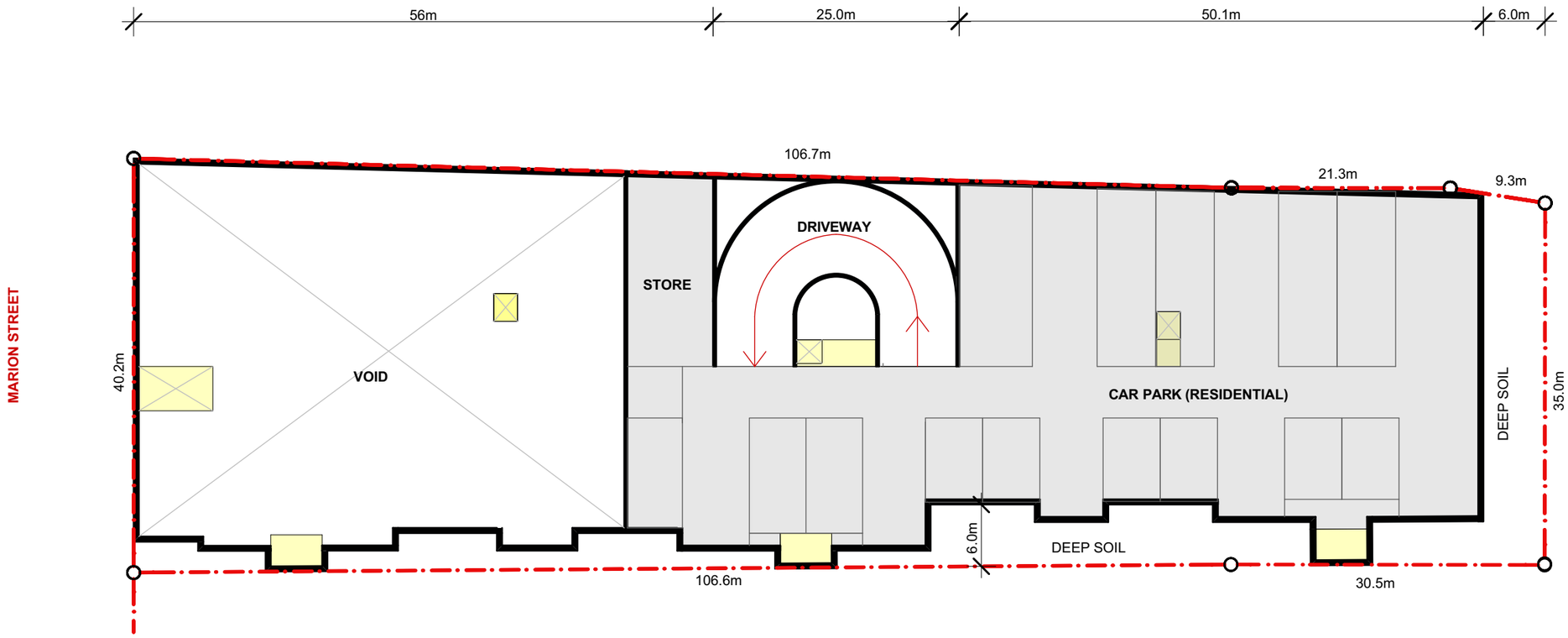
BASEMENT 1

TRUE NORTH

SCALE 0m 5m 10m 15m 20m 25m

FIGGIS + JEFFERSON TEPA

REDEVELOPMENT OF 245 MARION STREET, LEICHHARDT - PLANNING PROPOSAL



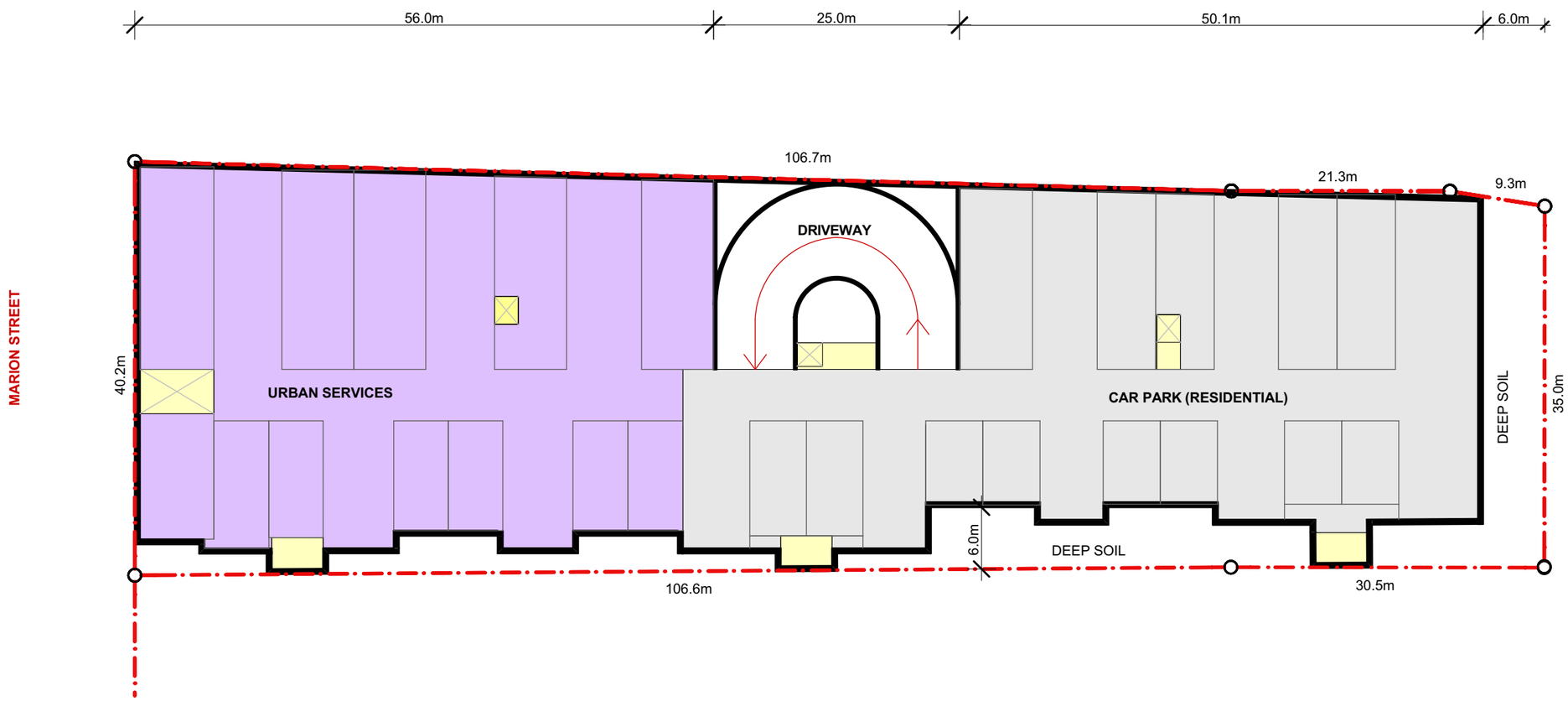
BASEMENT 2

TRUE NORTH

SCALE 0m 5m 10m 15m 20m 25m

FIGGIS + JEFFERSON TEPA

REDEVELOPMENT OF 245 MARION STREET, LEICHHARDT - PLANNING PROPOSAL



BASEMENT 3

TRUE NORTH

SCALE 0m 5m 10m 15m 20m 25m

FIGGIS + JEFFERSON TEPA

REDEVELOPMENT OF 245 MARION STREET, LEICHHARDT - PLANNING PROPOSAL

Appendix B

Indicative Green Travel Plan

245 Marion Street, Leichhardt
Green Travel Plan

Prepared for:

P&C Consulting Pty Ltd

12 June 2019

The Transport Planning Partnership

245 Marion Street, Leichhardt

Green Travel Plan

Client: P&C Consulting Pty Ltd

Version: V01

Date: 12 June 2019

TTPP Reference: 18256

Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
V01	12/06/19	Jessica Ng	Jason Rudd	Jason Rudd	

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APPENDICES

1 Introduction

1.1 Preamble

TTPP has been appointed to provide a Green Travel Plan (GTP) for the subject site to assist in the management of travel demand at the proposed rezoning site at 245 Marion Street Leichhardt.

This GTP has been prepared to outline how travel demand of the future site development can be managed in a manner which encourages greater use of sustainable, public and active travel modes, along with reducing trip lengths and the need for trips.

This GTP is considered to be a live document that will evolve over time to reflect the changing demand of the site's population and its surrounds.

1.2 The Role of Travel Plans

The purpose of a Green Travel Plan (GTP) is to encapsulate a strategy for managing travel demand that embraces the principles of sustainable transport. In its simplest form, this GTP encourages use of transport modes that have a low environmental impact, such as active transport modes – walking, cycling, public transport, and better management of car use.

Active transport presents a number of interrelated benefits including:

- improved health benefits
- reduced traffic congestion, noise and air pollution caused by cars
- greater social connections within communities
- cost savings to the economy and individual.

A GTP is a package of coordinated strategies and measures to promote and encourage active/sustainable travel. This GTP aims to influence the way people move to/from the proposed development site to deliver better environmental outcomes and provide a range of travel choices, whilst also reducing the reliance on private car usage, particularly single occupancy car trips.

The planning of the new development would need to accommodate innovative ideas to better manage the transport demand of the project. It will be necessary to introduce

new measures to ensure that trips generated by the proposed development are not solely private car based, particularly single occupancy trips.

Key drivers for the GTP are detailed in Section 1.3.

In order to ensure that the GTP meets its intended objectives, a review of the 2012 GTP against '*best practice'* guidelines such as the City of Sydney '*Guide to Travel Plans*' and '*The Essential Guide to Travel Planning'* prepared by the United Kingdom Department of Transport, has been undertaken.

The key themes applicable to the GTP include:

- **Site audit and data collection:** A desktop audit has been undertaken in order to identify and document the existing issues and opportunities relevant to site and its accessibility particularly by non-car modes. Opportunities to improve amenity, incentivise non-car travel and remove barriers to use of sustainable transport modes are then dealt with under the Site-Specific Measures.
- **Audit of Policies:** An audit of key policy documents has been undertaken to assist define the direction and purpose of the GTP, aligned with the key targets and objectives from a local and regional perspective.
- **Bicycle parking and car parking management:** This GTP provides a strategy for management of both bicycle parking and car parking moving forward, and how they interact with travel choices.
- **Local alliances:** The development of relationships between the Proponent and various stakeholders (such as the Inner West Council, the Roads and Maritime Services and Transport for New South Wales) will assist the Proponent in delivering improved transport options.

1.3 Travel Plan Pyramid

The GTP will need to be tailored to the proposed development site to ensure appropriate measures are in place for the different land uses to promote a modal shift away from car usage.

The key elements of the GTP are shown in the Travel Plan Pyramid in Figure 1.1.

Figure 1.1: Travel Plan Pyramid

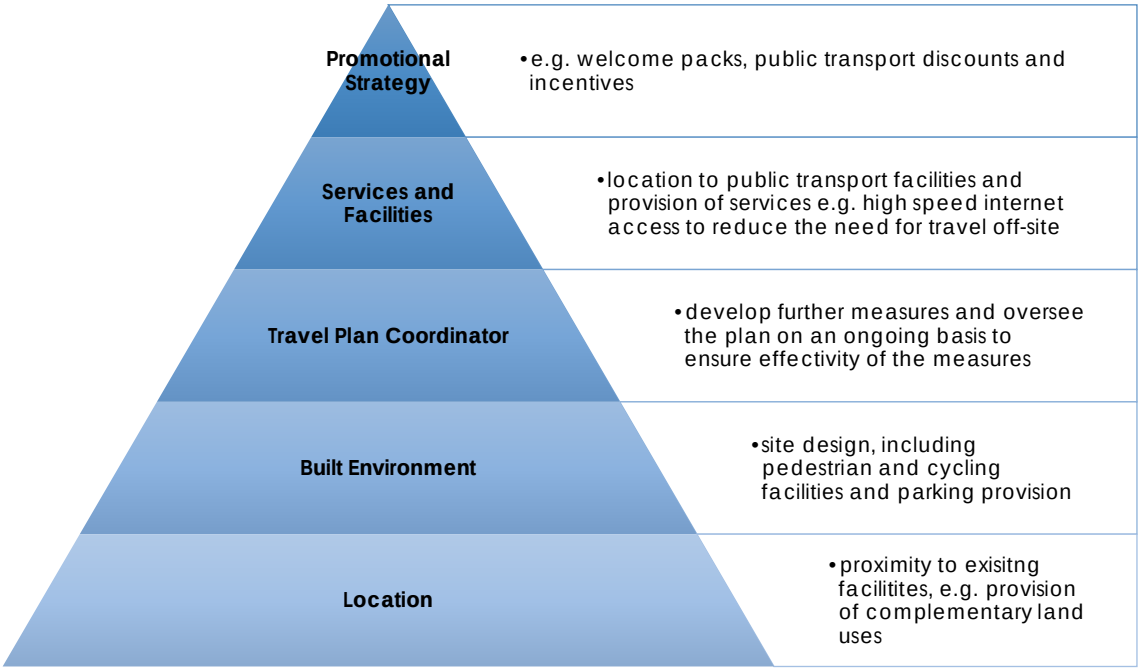


Figure 1.1 demonstrates that the key foundations to ensure the success of a GTP are:

1. **Location** – i.e. proximity to existing public transport services and proximity to mixed land uses, e.g. shops and services, such that walking or cycling becomes the natural choice
2. **Built Environment** – i.e. provision of high quality pedestrian and cycling facilities, end-of-trip facilities and reduced car parking provision to encourage sustainable transport choices.

1.4 Drivers of the Travel Plan

Further to the above, there are a number of social, environmental and economic drivers for developing and implementing a GTP for the proposed development site as detailed below.

1.4.1.1 Car Parking

Car parks utilise valuable land resources and impact amenity. If the area continues to grow and there is no modal shift towards non-car transport modes, the car parking demand could increase significantly. As such, the provision of car parking must reflect the site's proximity to public transport to influence a modal shift to sustainable transport modes. As the site is located within close proximity to high frequency public transport facilities with direct access to the Sydney CBD, there is strong justification to provide

reduced car parking compared to the maximum car parking rates as set out in Council's Development Control Plan.

Further to this, the cost of building underground parking is significant and therefore, there is strong economic imperative to reduce parking demand through supporting modal shift to sustainable transport modes (Poinsatte and Toor 1999).

1.4.1.2 Environmental Impacts

The transport sector amounts to 13.5% of greenhouse gas emissions (**GHG**) in Australia (Department of Sustainability, Environment, Water, Population and Communities 2011). Mitigating this impact is a key driver of the GTP. Within Australia, GHG emissions in the transport sector have risen by 30% in the last 20 years with the greatest emissions growth coming from the use of private vehicles (Department of Climate Change and Energy Efficiency, 2011). In comparison, travel modes such as walking and cycling have the lowest emissions while public transportation has far less impact than the private car (Dave 2011).

1.4.1.3 Health Benefits

The use of sustainable transport modes can have wide-ranging health benefits across the population (World Health Organisation, 2009). High levels of car-use and long commuting times are also associated with decreased physical activity and sedentary lifestyle diseases such as obesity, heart disease and type-2 diabetes (Wen et al.2006). Medibank Private (2007) estimates the cost of physical inactivity to the health care system to be $1.5 billion per year. Active transport modes (including public transport) also provide more sustained health benefits because physical activity becomes part of everyday routine. Sustainable transport modes also improve air quality by lowering air pollution and reducing exposure to particulates, sulphates and atmospheric ozone. A Bureau of Transport and Regional Economics (2007) report estimates that between 900 and 2,000 early deaths are caused by motor vehicle pollution in Australia each year. Reducing pollution has both environmental and health benefits.

1.4.1.4 Social Inclusion

Transport has a fundamental role in supporting social equity through providing access to essential amenities, employment opportunities and social and recreational goods (Lucas and Currie, 2011). Greater levels of walking and cycling hold significant benefits in terms of equity and community cohesion (Hart 2008). Car dependency accentuates inequalities of access amongst certain groups who are less likely to drive including the unemployed, persons on low incomes, children and young people, the aged, and persons with disabilities (Sustainable Development Commission, 2011). As such, sustainable transport modes can provide a more affordable alternative to car use.

1.4.1.5 Resident and Staff Attraction

Ease of access has a significant impact on choices of work and living. Negative experiences and costs associated with travel can reduce the competitiveness of a residential, commercial or retail precinct. High quality and efficient transport systems are key to attracting and retaining staff, visitors and residential tenants. Support for active transport modes is also highly desired by employers and employees, because it improves health and productivity (Colliers International 2011).

1.5 Case Study – Harold Park Green Travel Plan

In 2011, TTPP staff were commissioned by Mirvac to complete the transport assessment for the Harold Park Masterplan comprising 1,250 residential apartments, 7,300m^2 of retail floor area and 3,850m^2 of commercial floor area.

As part of the proposed Harold Park Masterplan, a Green Travel Plan was prepared to encourage and promote the future use of transport by residents in a sustainable and environmentally friendly manner. In fact, the following Green Travel Plan initiatives were implemented as part of the proposed development:

- compliance with the stringent parking controls applicable to the site
- creation of street networks and associated cycleways, footpaths and links to encourage cycling and walking
- provision of a TAG given to every new occupant of the dwelling
- public transport noticeboards within the development to notify all residents and visitors of the alternate transport options available
- provision of free yearly GoOccasional, car share membership for the initial occupation of dwellings to allow two drivers registered per membership
- provision of free weekly light rail and travel ten bus tickets for the initial occupation (N.B. this was updated to pre-loaded Opal cards for Precincts completed post-2015)
- provision of high quality telecommunication points
- provision of bicycle parking spaces for both residents and visitors in accordance with City of Sydney requirements.
- a half yearly newsletter for every household after occupation to outline the latest news on sustainable travel initiatives in the area.

The above listed measures were in place from 'Day One' to establish better transport habits at the start of occupation.

Following this, TTPP staff were appointed as the Travel Plan Co-Ordinator for the Harold Park to develop, implement and monitor the effectiveness of the GTP. Surveys have since been conducted to understand the effectiveness of the Green Travel Plan initiatives.

A summary of the survey data is shown in Table 1.1.

Table 1.1: Summary of Harold Park Post-Occupation Surveys

	Initial Traffic Assessment Report Estimate (2011)	Roads and Maritime Guide TDT2013/04a	3-month Post-Occupation Survey (2015)	Latest Post-Occupation Survey (2018)
Trip Rate	0.29 trips per unit	0.19 trips per unit	0.10 trips per unit	0.12 trips per unit

Table 1.1 indicates that the Harold Park site generates a peak traffic generation rate of 0.12 trips per unit based recent post-occupation surveys. Comparably, this is more than 50% less than what was initially envisaged for the site and 40% less than current suggested traffic generation rates in the Roads and Maritime latest technical direction for Guide to Traffic Generating Developments.

Taking the above into consideration, TTPP notes that there is strong supporting evidence to suggest the effectiveness of Green Travel Plan initiatives to reduce vehicle trips from a development site. However, that being said, it should be noted that the Harold Park site is supported by high frequency public transport facilities and located near key employment areas. On this basis, a site's proximity to public transport facilities and key employment areas/attractions is considered a critical component to assess the effectiveness of Green Travel Plan initiatives.

2 Existing Transport Policy Context

2.1 Summary of Key Policy Directions

The review of existing relevant policy clearly illustrates a number of themes that should inform the approach to ongoing management of transport demand, and investment in the transport network. These themes include:

- Provision of high quality local transport infrastructure and improved bike paths and networks and improving accessibly and connectivity
- Address car parking issues in key locations, including residential and business districts and encouraging active transport
- Create connected, liveable communities where people can walk, cycle and use public transport to promote healthier, active communities.

A summary of the existing policy framework documents is provided in Table 2.1.

Table 2.1: Summary of Policy Framework

Policy/Strategy	Key Aims/Objectives/Goals
Inner West Council	
Leichardt 2025+ Community Strategy Plan	Leichhardt 2025+ is the strategic plan for the Leichhardt Local Government Area that identifies the community's main priorities and aspirations for the future and guides the delivery of Council services over the next ten years. The key goals are to create: ▪ a community that is equitable, cohesive, connected, caring, diverse, healthy, safe culturally active, creative and innovative and has a strong sense of belong and place ▪ a liveable community – socially, environmentally and economically ▪ thriving business and vibrant community ▪ accountable civic leadership that delivers services and assets to support the community and future growth.
Statement of Vision and Priorities Engagement Report	▪ Delivering the GreenWay ▪ Managing traffic congestion ▪ Provision and maintenance of local transport infrastructure e.g. roads, footpaths ▪ Improving bike paths and networks ▪ Improving accessibility and connectivity ▪ Addressing car parking issues in key locations, including residential and business districts ▪ Encouraging active transport

Policy/Strategy	Key Aims/Objectives/Goals
NSW State Government	
Parramatta Road Corridor Urban Transport Strategy	The purpose of the Strategy is to facilitate the coordinated transformation of Parramatta Road and its adjoining lands by integrated land use and development with transport initiatives and public domain improvements. The key objectives for the Corridor include to: ▪ make it easier to move to, through and within the Corridor ▪ support walking and/or cycling for local trips, bus and/or light rail for intermediate trips, rail and/or car for regional trips ▪ realise and support urban transformation and transit-oriented development ▪ facilitate additional east-west and north-south movements ▪ enhance existing or create new desirable and affordable mixed-use environments ▪ optimise the Corridor's inherent social, economic and environmental resources, including freight generating precincts ▪ utilise excess road and rail capacity and non-infrastructure initiatives and optimise public investment in transport ▪ contribute to regional resilience and sustainable communities.
New South Wales Long Term Transport Masterplan (NSW State Government, 2012)	The NSW Long Term Transport Masterplan guide the NSW Government's transport funding priorities over the next 20 years. As part of this Plan, the Inner West Light Rail extension was completed in 2014, which involved the introduction of nine new stations from Lilyfield to Dulwich Hill, including Marion Light Rail station. This light rail route has provided good connectivity to shopping and entertainment districts and better transport integration by allowing passengers to transfer between rail, bus, bike and heavy rail services.
Future Transport Strategy 2056	The Strategy aims to increase the mode share of public transport services and reduce the use of single occupant vehicles. The Proposal will look to reduce private vehicle travel and aligning with the objectives of the Strategy.
Greater Sydney Region Plan: A Metropolis of Three Cities – Connecting People	The Site is ideally located to contribute towards creating a 30-minute city. The mix of uses means residents/employees can access easily access shops and the community facilities within the immediate vicinity. The Site's links with public transport means there are numerous facilities including jobs, schools and hospitals, within a 30-minute travel time for future residents and the Site is within a 30-minute travel time for visitors. The Site thus aligns with the objects of the Plan.
Sydney's Cycling Future, Cycling for Everyday Transport (NSW State Government, 2013)	The Three Pillars of Sydney's Cycling Future: ▪ investing in separated cycleways ▪ providing connected bicycle networks to major centres and transport interchanges promoting better use of our existing network; and, ▪ engaging with our partners across government, councils, developers and bicycle users.

2.1.1 Greater Sydney Region Plans: 30-minute City

As indicated above, the Greater Sydney Commission's Greater Sydney Region Plan, the key purpose of the plan is to deliver a 30-minute city where jobs, services and quality public transport spaces are in easy reach of people's home. The Eastern City District Plan has been produced so that the Region Plan can be implemented at a district level.

However, a recent study conducted by Deloitte Access Economics found that only 75 of the 313 Sydney neighbourhoods could currently be deemed to have easy access to

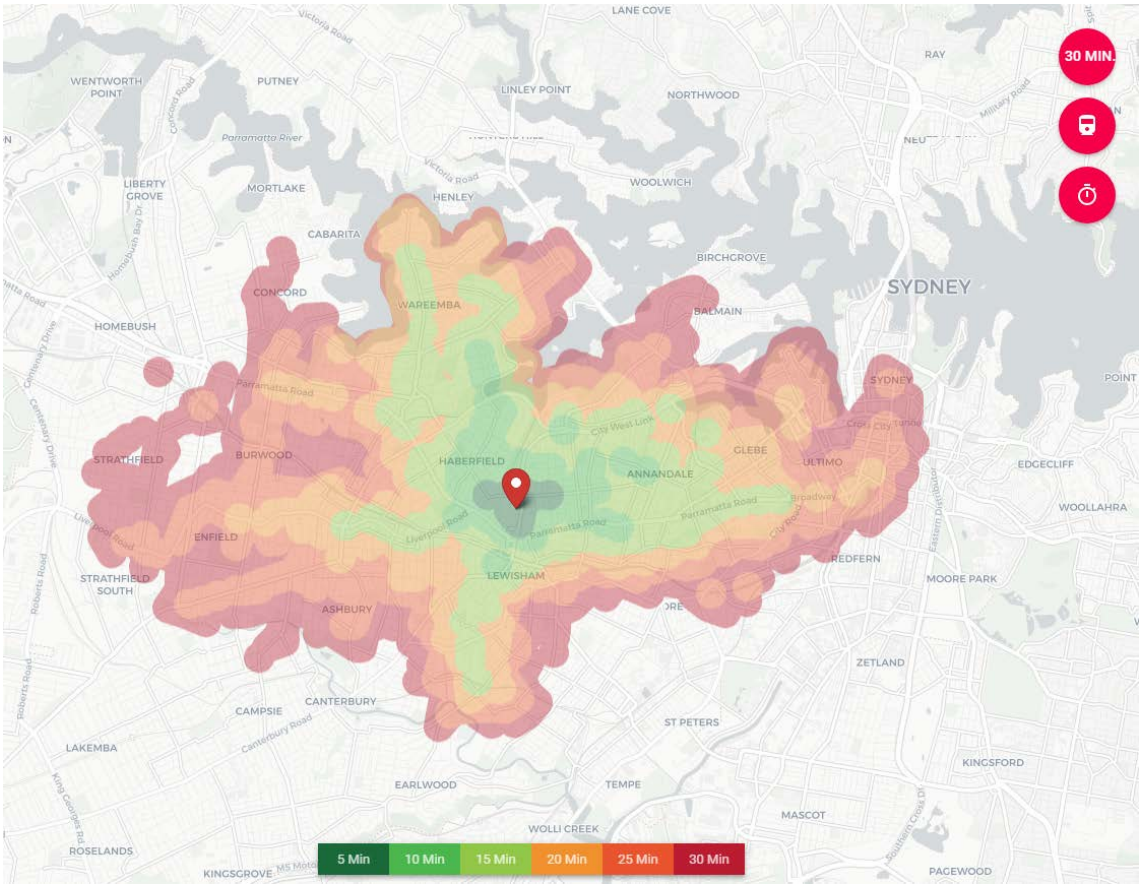
major job hubs and other key services within half an hour. Based on the findings of the Deloitte study and work undertaken by Arup, a number of key performance criteria have been identified in order to achieve a 30-minute city:

- **Access to healthcare** – hospitals provide an important facility to many people and play a role for employment, education and training facilities. Parking is often limited at hospitals and as such, access via a variety of transport modes are required.
- **Access to retail services** – access to all forms of retail (supermarkets and specialist stores) is essential to achieve a 30-minute city. There has already been an increase in the number of mixed-use developments within Sydney to create micro-communities, which provide mixed retail services, residential, commercial and community facility uses.
- **Access to schools** – access to good schools relies on housing affordability, which also shape where teachers live. In particular, many students have good access to local schools, however some have to travel outside their catchment areas for specialist and selective schools. As such, it is important to create strong transport link are required to provide good access to local schools and connect teachers with their place of residents and work.
- **Access to further education facilities** – public transport links for TAFE and universities are vital as students and teachers often travel out of the local catchment to the educational facility as they are often located in areas with high property prices.
- **Quality of public transport facilities** –Whilst Sydney is a liveable city; it is often constrained by transport issues. As such, the provision of good quality, reliable public transport facilities are essential to achieve a 30-minute city.
- **Access to jobs** – people being able to live close to their jobs is fundamental to delivering a 30-minute city. The current Sydney CBD has the highest concentration of jobs but as found by the Deloitte study, the average one-way commute for those travelling into the CBD from outside the city is 63- minutes. The locations with the best access to jobs currently are located near to railway stations, or close to major employment centres such as the Sydney CBD.
- **Access to residents** – a way of minimising travel needs is to locate jobs and services close to where residents live.

As an indication, the site's proximity to surrounding suburbs within a 30-minute commute by transit is shown in Figure 2.1.

Figure 2.1 indicates that the site is located within a 30-minute commute to the Sydney CBD by transit (e.g. Ultimo, Haymarket, Pyrmont, Sydney suburbs). Based on this, the site is considered well located to key employment hubs with good public transport connectivity and as such, is considered to align with the key objectives of the Sydney Greater Region Plan by contributing towards the creation of a 30-minute city.

Figure 2.1: 30-minute Catchment by Transit



Source: Route360 (accessed on 8/06/18)

3 Existing Transport Conditions

3.1 Rail Services

3.1.1 Train

Train services are available at Summer Hill and Lewisham Stations, which are located approximately 900m south of the site. The T2 Inner West & Leppington line and T3 Bankstown line service both these train stations. A summary of the existing train services and their associated frequencies are provided in Table 3.1.

Table 3.1: Summary of Existing Train Services and Frequencies

Rail Line	Route	AM Peak 7am-9am (no. of services)	PM Peak 4pm-6pm (no. of services)
T2 Inner West & Leppington	City Circle via Town Centre	18	8
	Parramatta	7	8
	Ashfield Only	1	-
	Leppington via Granville	-	6
T3 Bankstown	Liverpool via Regents Park	1	-

The T2 and T3 route is shown in Figure 3.1 and Figure 3.2 respectively.

Figure 3.1: T2 Route

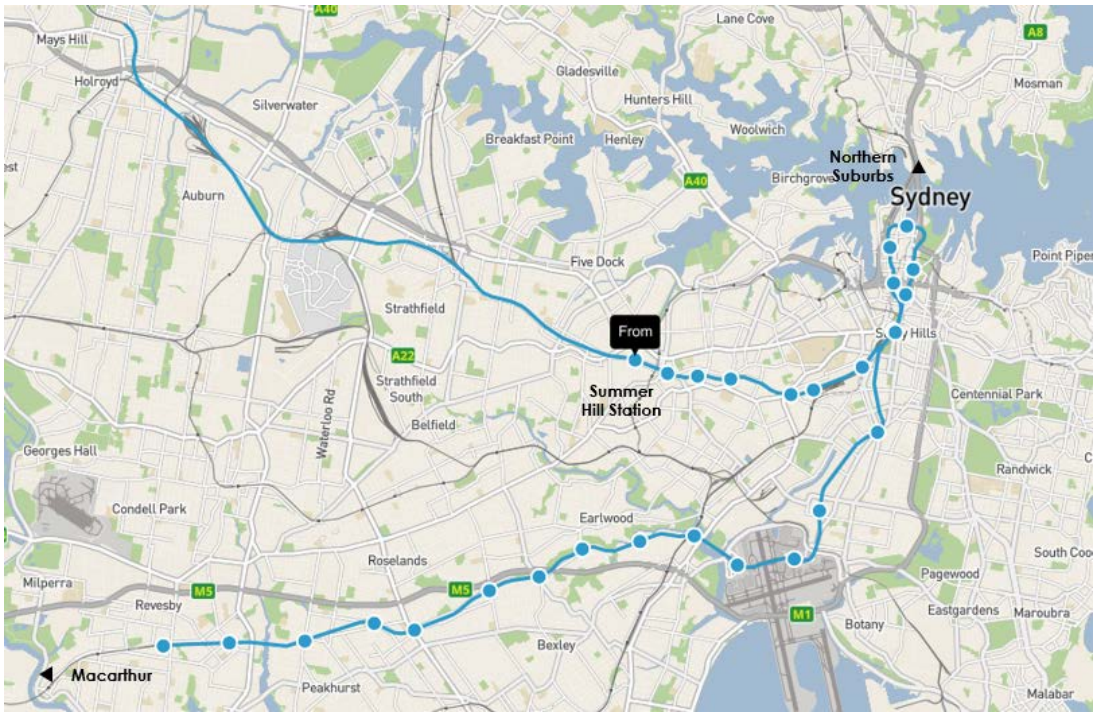
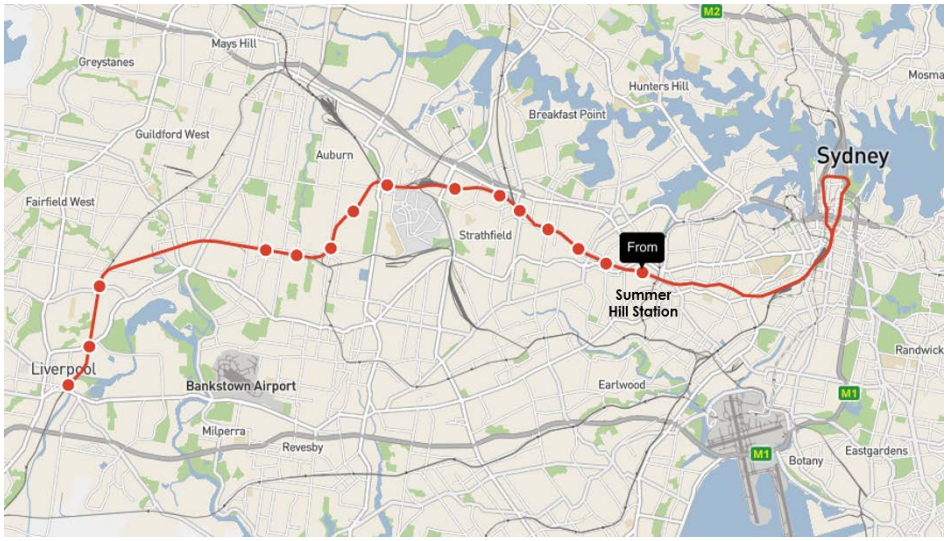


Figure 3.2: T3 Route

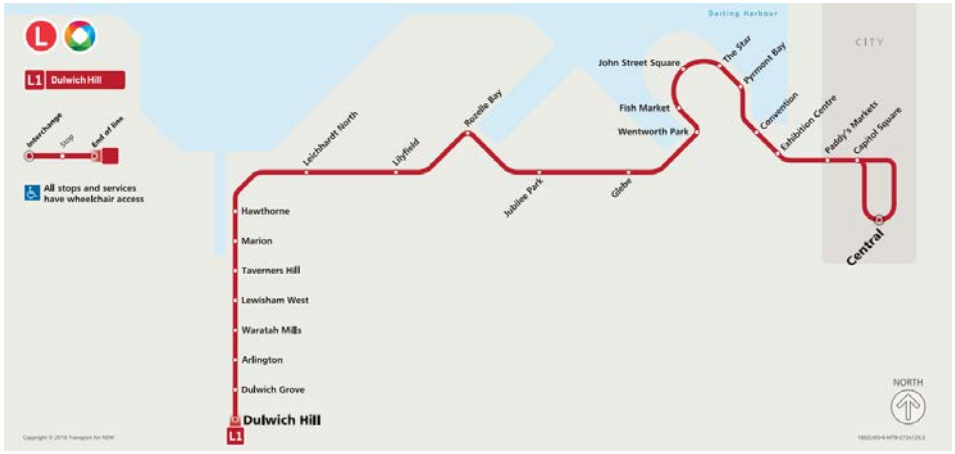


3.1.2 Light Rail

The L1 Dulwich Hill light rail runs from Dulwich Hill to Central via Rozelle Bay, Lilyfield, Leichhardt North, Hawthorne and Marion light rail stops. Services operate every 10-15 minutes between 6am and 11pm, Sunday to Thursday, and until midnight on Friday and Saturday. Bicycles are allowed on light rail spaces for free when space permits.

Further to this, advice provided from TfNSW on 9 July 2018 regarding the potential uplift in light rail demand from the proposal, notes that "TfNSW constantly review the patronage for the inner west light rail services and would increase the services if required". As such, it is envisaged that adequate public transport connections and services would be provided to cater the proposal, plus other developments within the Taverners Hill Precinct.

Figure 3.3: L1 Dulwich Hill Light Rail Route



Source: Transport for NSW https://transportnsw.info/documents/timetables/93-L1-Dulwich-Hill-Line-20170828.pdf (accessed on 15/06/18)

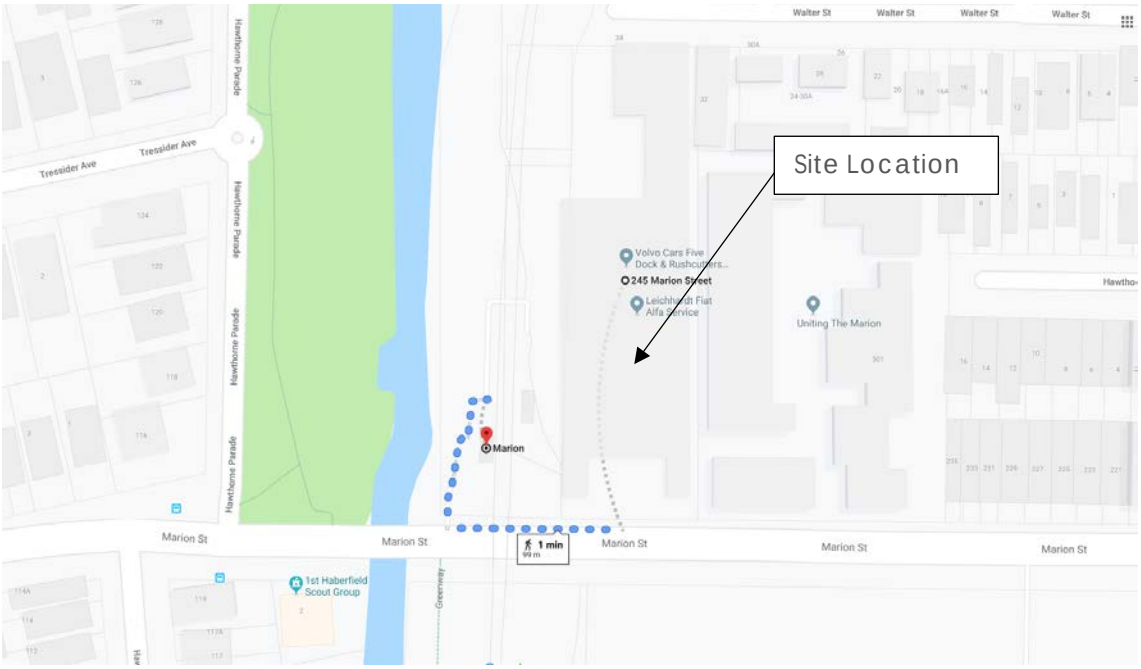
The Marion Light Rail station is located immediately adjacent to the site (1 minute walk – less than 100m) and operates daily, every 7-8 minutes during peak periods in either direction. A picture of this station is shown in Figure 3.4.

The walk travel times and routes to the Marion Light Rail station are shown in Figure 3.5

Figure 3.4: Marion Light Rail Station

Source: Google Images (Jensathit, T Feb 2018)

Figure 3.5: Walking Route to the Marion Light Rail Station



Source: Google Maps Australia (accessed on 08/06/18)

3.2 Existing Bus Services

The Integrated Public Transport Service Planning Guidelines state that bus services influence the travel mode choices of sites within 400 metres (approximately 5 minutes) of a bus stop.

However, more recent data collected by TfNSW Transport Performance and Analytics from 2014/15 household travel surveys suggest that walking trips to a bus stop extend further than the traditional 400m distance to a bus stop, as shown in Table 3.2.

Table 3.2: Population of Walkers to a Bus Stop (Weekday Trips)

Walking Distance	Population	Percentage of Population
Up to 400m	155,948	49%
401m to 800m	91,077	28%
801m and greater	73,632	23%
Total	320,657	100%

Data Source: TfNSW Transport Performance and Analytics Household Travel Surveys 2014/2015

Notably, there are a number of bus stops located within a 400m catchment radius of the site on Marion Street, which provide good public transport access to a myriad of locations across Sydney. The existing bus network map surrounding the site is shown in Figure 3.6.

3.3 Existing Pedestrian Infrastructure

Well-established pedestrian facilities are provided within the vicinity of the site. Sealed pedestrian paths are provided on either side of Lords Road, which provide good pedestrian access to the properties along Lords Road and retail shops on Flood Street, including MarketPlace Leichhardt.

In addition to this, within the immediate vicinity of the site, signalised pedestrian crossings are provided across Lords Road-Foster Street with zebra pedestrian crossings provided at the Lords Road-Flood Street intersection.

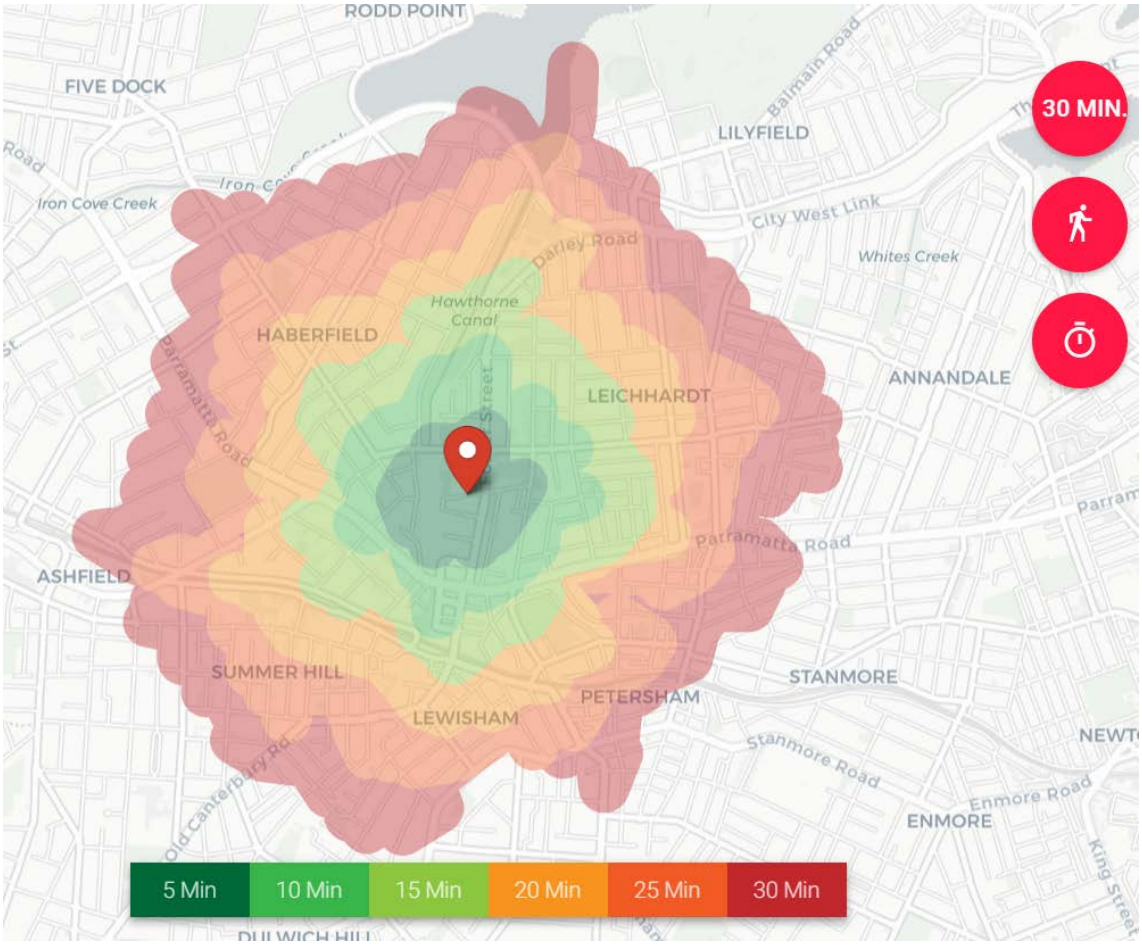
The site is located within a 30-minute walk distance to key destinations and attractions in the area, including MarketPlace Leichhardt, child care centres, local café and restaurants and various recreational facilities and parks.

The pedestrian catchment within a 30-minute walk distance from the site is graphically shown in Figure 3.7.

Figure 3.6: Existing Bus Network Map

Basemap Source: State Transit Inner West Network Map (accessed on 15/06/18)
<http://www.sydneybuses.info/>

Figure 3.7: Existing Pedestrian Catchment (30-minute walk)

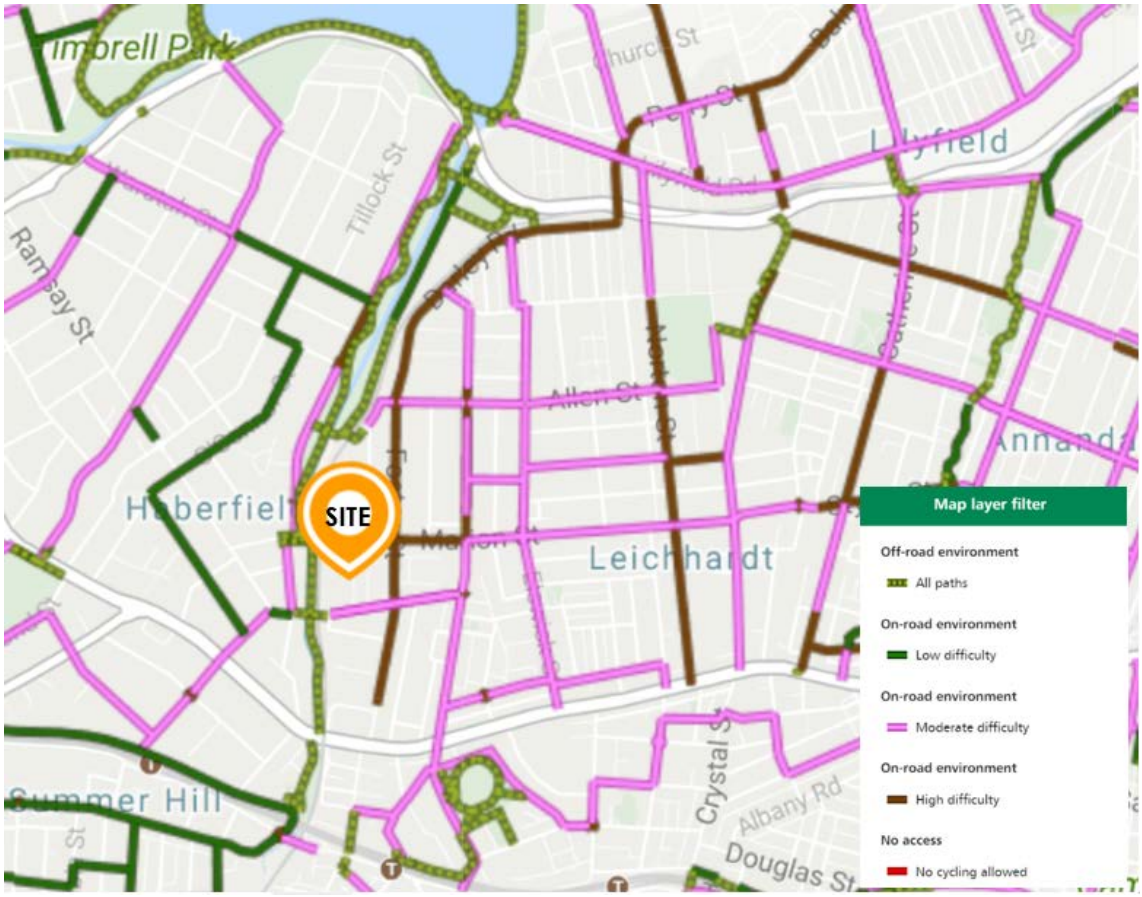


Source: Route360 (accessed on 15/06/18)

3.4 Existing Cycling Infrastructure

A number of on-road and off-road bicycle routes are provided within the immediate vicinity of the site. The existing bicycle route map surrounding the site is presented in Figure 3.8.

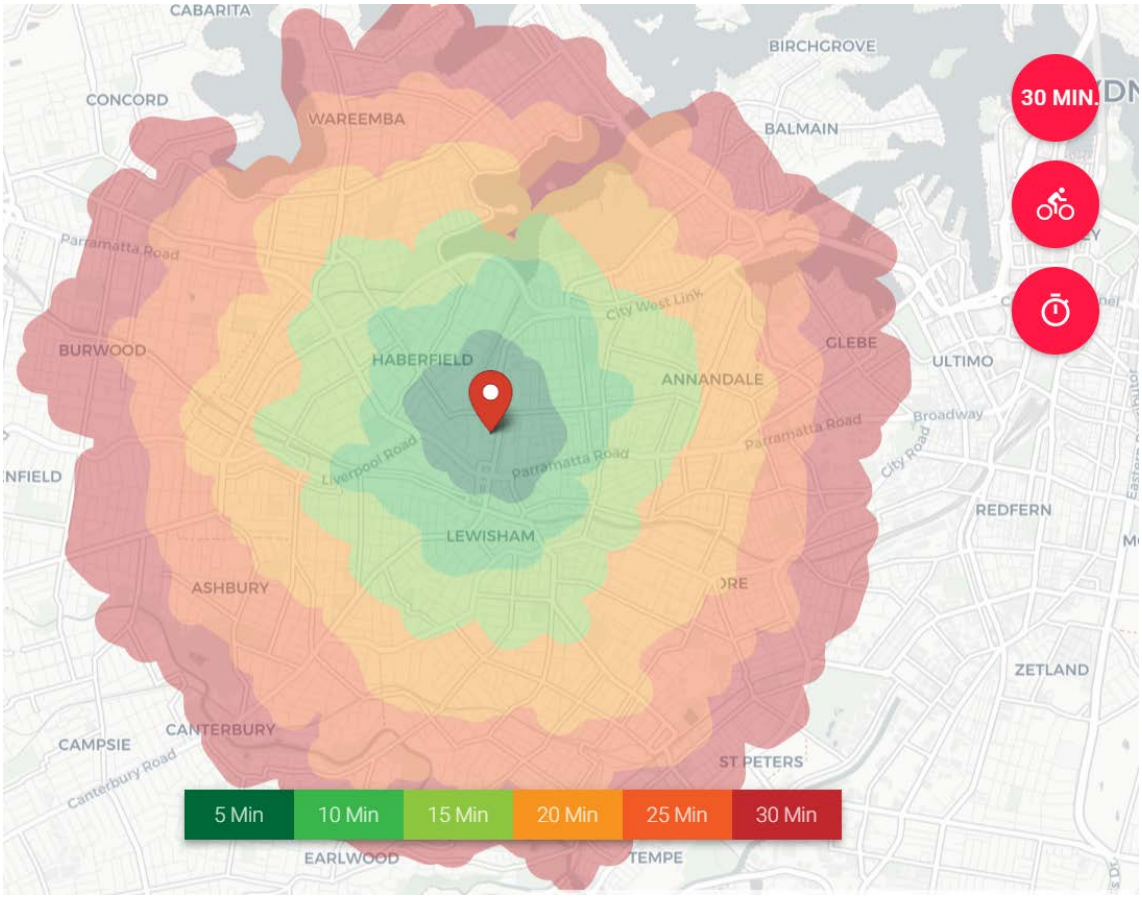
Figure 3.8: Existing Bicycle Route Map



Source: Roads and Maritime Cycleway Finder (accessed on 15/06/18)

Notably, travelling to Marrickville/Newtown suburbs by bike would take about 20 to 30 minutes from the site via existing bicycle routes. As an indication, the cycling catchment area within a 30-minute bike ride from the site is shown in Figure 3.9.

Figure 3.9: Existing Bicycle Catchment (30-minutes)



Source: Route360 (accessed on 15/06/18)

3.5 Car Share

Car sharing is a flexible, cost effective alternative to car ownership and is a convenient and reliable way for residents to use a car when they need one. GoGet is a car share company operated in Australia, with a number of vehicles positioned within the area.

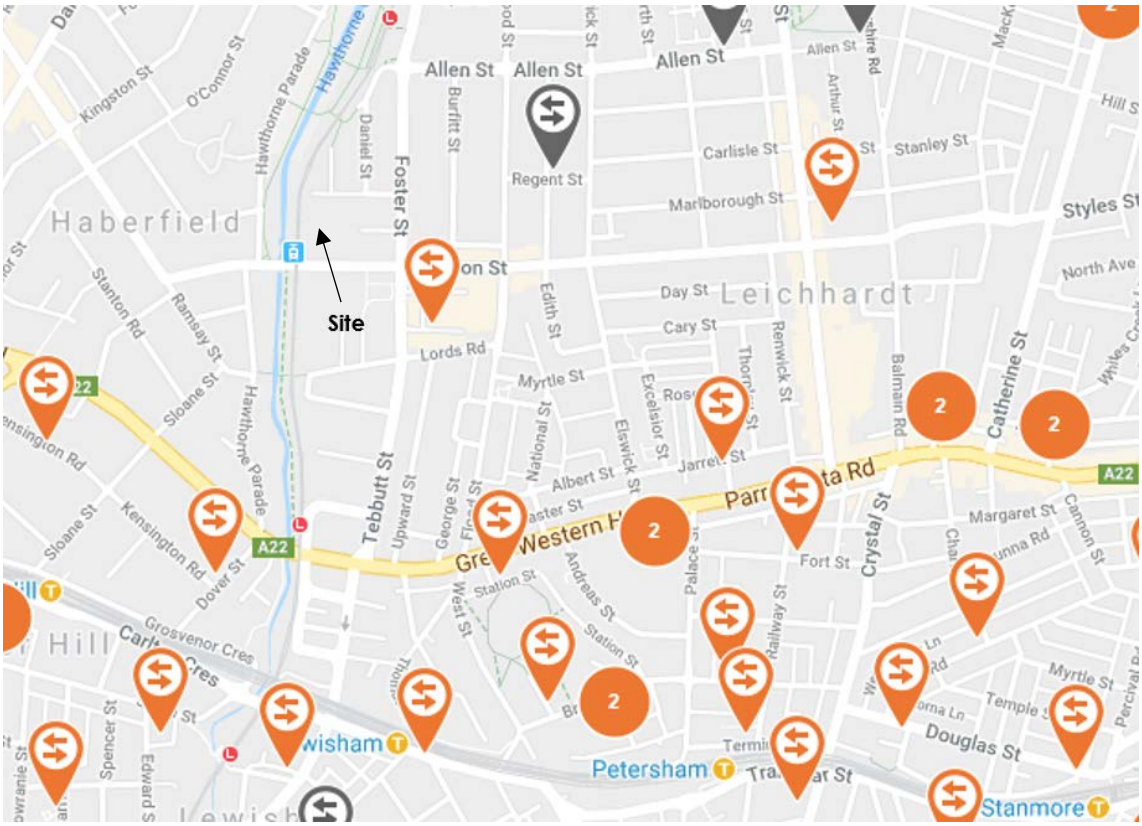
Car share is a concept by which members join a car ownership club, choose a rate plan and pay an annual fee. The fees cover fuel, insurance, maintenance, and cleaning. The vehicles are mostly sedans, but also include SUVs and station wagons. Each vehicle has a home location, referred to as a "pod", either in a parking lot or on a street, typically in a highly-populated urban neighbourhood. Members reserve a car by web or telephone and use a key card to access the vehicle.

Notably, the City of Sydney Council has reported that *"a single car share vehicle can replace up to 12 private vehicles that would otherwise compete for local parking"*.

As such, the provision of car sharing facilities should be able to reduce both the parking demand for the site and the traffic generated by it.

Figure 3.10 shows the location of the existing GoGet vehicles within the immediate vicinity of the site.

Figure 3.10: Location of Existing GoGet Vehicles



Source: GoGet Australia (accessed on14/06/18: https://www.goget.com.au/find-cars/)

In addition to those identified above, the development would consider the provision of car share spaces. This would benefit not only the occupants/residents at the site but also other employees and residents in the vicinity.

3.6 Traffic Surveys and Modal Split

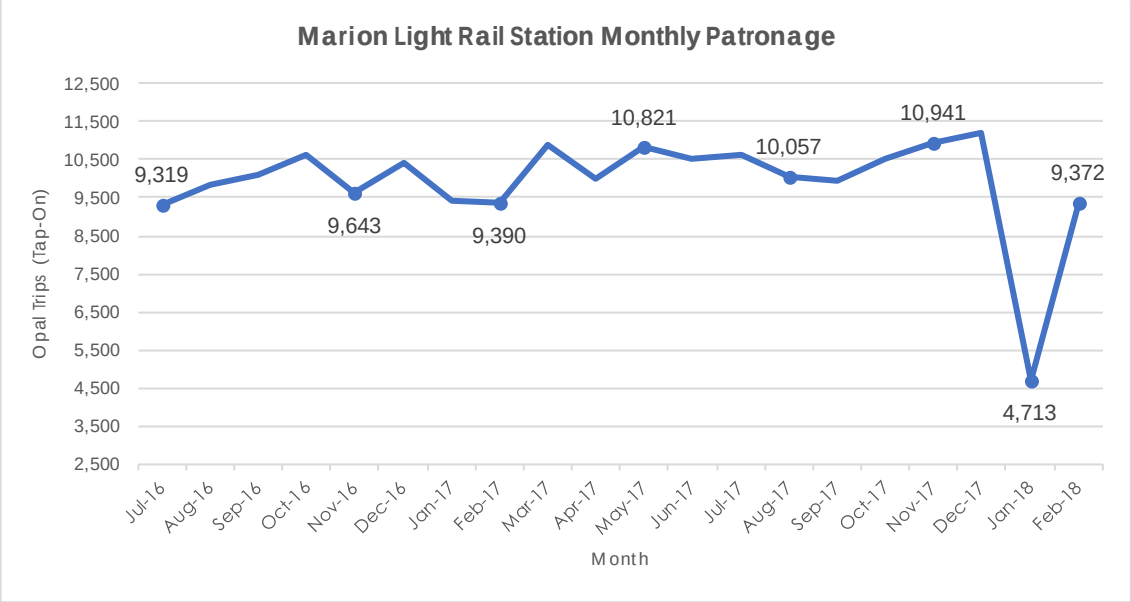
This section contains a review of historical data of existing occupancy figures on public transport facilities, including light rail, bus and ferry services, and household travel survey information obtained from Transport for NSW's Open Data website.

3.6.1 Light Rail Patronage

The Marion Light Rail station was opened in 2014 and provides good public transport connectivity between Dulwich Hill and Central. The Marion Light Rail station currently services some 10,000 patrons per month and is set to increase in the future based on future development in the area and the future connection to the CBD and South East Light Rail link.

A summary of the existing monthly patronage at the Marion Light Rail station is shown in Figure 3.11.

Figure 3.11: Marion Light Rail Monthly Patronage (July 2016 to February 2018)



Note. A significant portion of the Light Rail line was closed during the month of January to allow for construction work as part of the CBD and South East Light Rail project, resulting in lower number of trips in January.

3.6.2 Bus Patronage

Bus patronage surveys on Thursday, 24 November 2017 have been obtained to understand existing bus services, frequencies and capacity within the immediate vicinity of the site along the Marion Street corridor.

The bus patronage surveys have been derived from the following three main sources:

- PTIPS – Public Transport Information and Prioritisation System
- Opal
- Bus Fleet Capacity

A summary of the existing bus frequencies at the nearest bus stops located on Marion Street, near Lambert Park is summarised in Table 3.3.

Table 3.3: Summary of Bus Frequencies near the Site

Cordon	AM Period		PM Period	
	7am-8am	8am-9am	4pm-5pm	5pm-6pm
To City	7	12	8	7
From City	6	8	9	10

The above data excludes any other bus stops located on Parramatta Road, which service bus routes 461, 480 and 484 to the City The Domain and Central station suburbs.

Existing bus services along the Marion Road corridor can currently accommodate a total capacity of some 62-112 bus patrons (people) per bus. Based on the bus patronage surveys, existing bus loads within the immediate vicinity of the site currently operate below its capacity, generally with many seats available during peak times.

The bus patronage surveys provide the following bus capacity classifications:

- **MANY_SEATS_AVAILABLE**
  - If occupancy on the bus is less than 50% of the seating capacity (e.g. less than or equal 22 bus patrons)
- **FEW_SEATS_AVAILABLE**
  - If occupancy on the bus is more than 50% of the seating capacity (e.g. more than 22 bus patrons)
- **STANDING_ROOM_ONLY**
  - If occupancy on the bus is more than the seating capacity of the bus (e.g. more than 45 bus patrons)

With the above in mind, the existing bus loadings/capacities at the selected bus stops on Marion Street, near Lambert Park during the AM and PM peak periods are summarised in Figure 3.12 and Figure 3.13.

The following graphs show how many buses currently operate during the peak periods and their associated bus capacity classification.

Figure 3.12: Existing Peak Bus Capacities (Bus Stop 204080) – To City

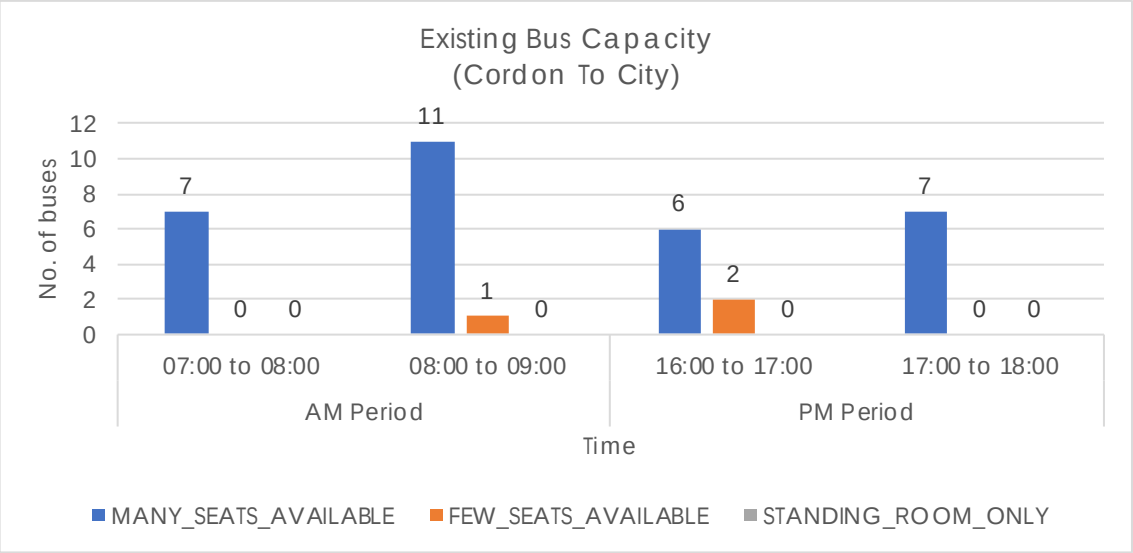
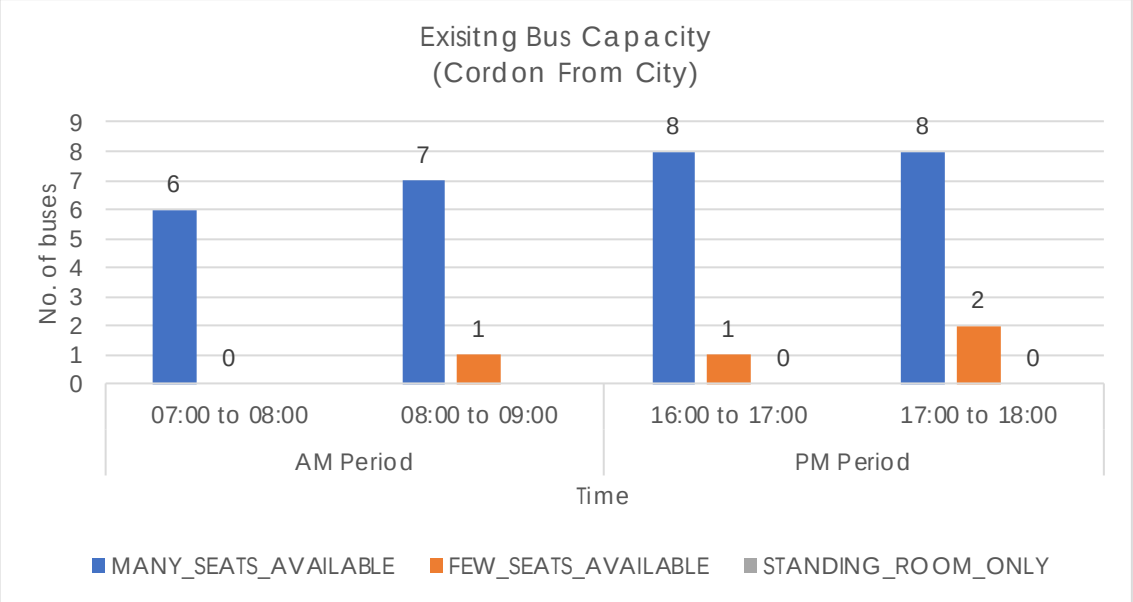


Figure 3.13: Existing Peak Bus Capacities (Bus Stop 204082) – From City



As such, the existing bus facilities within the immediate vicinity of the site currently operate well below its capacity, with spare capacity for any additional bus trips generated by the proposed development site (e.g. residents, visitors, staff etc.).

3.6.3 Existing Modal Split

2016 Census data has been obtained to understand existing journey to work trips in the Leichhardt area. Based on this data, 77.5% of working residents travel outside of the area to work, with the majority of residents working in the Sydney CBD or within the Inner West local government area (outside of Leichhardt).

A summary of the existing modal splits in the Leichhardt area is shown in Table 3.4. As a benchmark, the modal splits in the Greater Sydney Region have also been presented in Table 3.4.

Table 3.4: Journey to Work Modal Splits (2016 Census)

Main Method of Travel	Proportion (%)	
	Leichhardt	Greater Sydney Region Benchmark
Train	12%	19%
Bus	22%	7%
Tram or Ferry	5%	0%
Car Driver	48%	62%
Car Passenger	3%	5%
Motorbike / Scooter	2%	1%
Bicycle	3%	1%
Walk	5%	5%
Total	**100%**	**100%**

Table 3.4 indicates that 39% of working residents travel to work via bus, train or tram, with 51% travelling by car (car driver and car passengers). Comparably, within the Greater Sydney region, a total of 67% of working residents travel to work by car.

Given the recent introduction of the new Marion Light Rail stop in 2014 and current journey to work trip patterns in the area, the site is considered to be well serviced by public transport facilities and shows the potential to generate a modal shift away from car modes to more sustainable transport.

4 Objectives and Targets

4.1 Future Population and Projected Mode Splits

The proposed development is envisaged to generate a net additional 48 and 37 vehicle trips during the AM and PM peaks respectively. Based on this metric, the projected modal splits for the development are shown in Table 4.1.

Table 4.1: Projected Journey to Work Modal Splits

Main method of Travel	Leichhardt (Proportion %)	Net Proposed Development Trips (No. of Trips)	
		AM Peak	PM Peak
Train	12%	11	9
Bus	22%	21	16
Tram or Ferry	5%	5	4
Car Driver	48%	48	37
Car Passenger	3%		
Motorbike / Scooter	2%	2	1
Bicycle	3%	3	2
Walk	5%	5	4
Total	**100%**	**95**	**73**

Based on this, the proposed development is expected to generate a net additional 16-21 bus trips, 4-5 ferry trips, 9-11 train trips and 5-9 walking or cycling trips during peak periods.

4.2 Objectives

The following objectives have been identified in order to achieve the vision of the GTP.

Objective 1: Facilitate a shift towards more sustainable transport modes

- Improve access, safety, amenity and convenience of sustainable transport modes for travel to and from the site
- Provide incentives for sustainable travel and establish a culture of active and public transport use.
- Continue to encourage non-car based modes by limiting the convenience of car access to the site.

Objectives 2: Make the site a great place to live, work and visit

- Improve access and mobility and enhance the sense of place.
- Reduce the need to travel by co-locating of complementary land uses.

4.3 Mode Share Targets

As indicated previously, the aim of the GTP is to encourage modal shift away from cars by implementing measures that influence the travel patterns of residents, visitors and staff. To ensure that the GTP is having the desired effect, the implementation of the GTP would be regularly monitored. The success of the GTP is measured by setting modal share targets and identifying the measures and actions that have the greatest impact.

The results of the 2016 Census surveys indicate that car driver mode share is 51% in the area. Noting that a modal shift of between 3-5% would be considered to be a significant achievement (as stated by the experts in the LEC), it is considered that the mode share target for car driver should be **46%,** which represents around a 5% modal shift. On this basis, the proposed development would need to influence a modal shift for about 4-7 people per hour to achieve a modal shift of 5%.

Table 4.2: Projected Journey to Work Modal Splits

Main method of Travel	Existing Modal Split	Proposed Modal Split
Train	12%	12%
Bus	22%	22%
Tram or Ferry	5%	10%
Car Driver	48%	43%
Car Passenger	3%	3%
Motorbike / Scooter	2%	2%
Bicycle	3%	3%
Walk	5%	5%
Total	**100%**	**100%**

5 Methods of Encouraging Modal Shift

To achieve the objectives of the GTP, measures will be put in place to influence the travel patterns to/from the site, with a view to encouraging modal shift away from cars.

5.1 Site Specific Measures

The Proponent will implement the following measures to encourage more sustainable travel use.

5.1.1 Walking

Staff employed at the site will be encouraged to walk by implementing a'*10,000 steps per day initiative'*. This involves the provision of high quality pedestrian facilities, including pedestrian paths to/from key public transport hubs and bus stops. Staff members who have achieved the 10,000-step goal over a set period could be rewarded.

5.1.2 Cycling

Provision of high quality cycling infrastructure with end-of-trip facilities will be provided to encourage people to arrive by bicycle. Further to this, all staff, residents and visitors will be encouraged to travel to the site by bike through word of mouth and bicycle maps and routes posted on all noticeboards, newsletters, websites etc, to promote awareness. It is also noted that end of trip facilities are being provided in basement car park.

5.1.3 Public Transport

Public transport noticeboards will be provided in all commercial residential and retail facilities to make staff, residents and visitors more aware of the alternative transport options available. The format of the noticeboards will be based upon the travel access guide.

In addition to this, staff at the site and the initial residents would be provided with pre-loaded Opal cards during either their staff induction or when a resident occupies the site so that travel patterns can be influenced from Day 1.

5.1.4 Travel Share

There will be provision of car sharing facilities at or near the site for use by residents, visitors and staff members. The initiative is aimed at residents and staff members who drive to the site to reduce car ownership and single occupancy car trips.

In addition to this, a carpooling forum will be developed to encourage residents and/or staff to travel in groups. The forum would provide a platform for people travelling on the same route to find each other and form groups. The forum will be posted on noticeboards and in newsletters.

5.1.5 Off-site Measures

The Proponent will consult with Council with a view to implementing several off-site measures to improve the transport connections to and from the site including:

- Investigations with Council to accommodate cycle facilities within or adjacent to the proposed development site, including opportunities to enhance the through site pedestrian / cycle link created between Marion Street and Walter Street.
- Improved signage and way finding from key public transport hubs, to improve the walking and cycling experience. Signage would include wayfinding for cyclists to direct them to the best and safest route to the site and other key destinations.
- Investigations will be carried out to introduce parking stickers or other car park management solutions for residents, staff and visitors as a means of ensuring that the car parks are not utilised by external commuters for 'park and ride'.
- Compliance with the stringent parking controls applicable to the site.
- Investigations with Council to facilitate additional car sharing facilities.
- Introduction of flexible working hours in the commercial facilities to allow staff to commute out of typical peak times to reduce overall congestion and travel time.
- Provision of high quality telecommunication services (internet, phone) to enable residents to work from home, rather than travelling off-site to work.

5.2 GTP Information

The information provided within the GTP will be provided to staff, residents and visitors in the form of a package of easy to understand travel information known as a Travel Access Guide (TAG).

This will be included in the information pack provided to residents and staff on day one.

TAGs provide customised travel information for people travelling to and from a particular site using sustainable forms of transport – walking, cycling and public transport. It provides a simple quick visual look at a location making it easy to see the relationship of site to train stations, light rail stations, bus stops and walking and cycling routes.

Such TAGs encourage the use of non-vehicle mode transport and can reduce associated greenhouse gas emissions and traffic congestion while improving health through active transport choices.

They can take many forms from a map printed on the back of business cards or brochures. Best practice suggests that the information should be as concise, simple and site centred as possible and where possible provided on a single side/sheet. If instructions are too complex, people are likely to ignore them.

This TAG should be available for pick up at various locations at the site such as, at front entrances and noticeboards.

An indicative TAG for the proposed rezoning site is provided in Appendix A.

5.3 Information and Communication

Several opportunities exist to provide staff, residents and visitors with information about nearby transport options. Connecting staff, residents and visitors with information would help to facilitate journey planning and increase their awareness of convenient and inexpensive transport options which support change in travel behaviour.

Transport NSW info

- Bus, train and ferry routes, timetables and journey planning are provided by Transport for New South Wales through their Transport Info website: http://www.transportnsw.info/

Sydney Cycleways

- City of Sydney provides a number of services and a range of information to encourage people of all levels of experience to travel by bicycle. http://sydneycycleways.net/

Similarly such phone apps as TripView display Sydney public transport timetable data and shows a summary view showing current and subsequent services, as well as a full timetable viewer. This timetable data is stored on the phone, so it can be used offline.

Connecting staff, residents and visitors via social media may provide a platform to informally pilot new programs or create travel-buddy networks and communication.

The above web links and any social media platforms may be included within the GTP/TAG.

5.4 Actions

A summary of the key strategy and framework action table is shown in Table 5.1. It should be noted that this framework action table will be updated as required. However, it is stressed that the availability of the suggested strategies on opening is a key factor in influencing travel patterns.

Table 5.1: Framework Action Table

Strategy	Action	Targeted Audience	Timeline	Responsibility
Managing Car Use				
Car Sharing	Provide car sharing facilities to reduce car occupancy	Residents, staff and visitors	Prior Occupation	Proponent
Car Pooling	Establish a car pooling system to reduce single car occupancy and promote social interaction	Residents, staff and visitors	Upon Occupation	Building Manager/Travel Plan Coordinator
Promoting Public Transport				
Travel Pass	Provide a subsided Opal pass	Residents, staff and visitors	Upon Occupation	Building Manager/Travel Plan Coordinator
Promoting Cycling and Walking				
Provision of End-of-Trip Facilities	Provide bicycle parking, showers, lockers and change rooms	Residents, staff and visitors	Prior to Occupation	Proponent
Other				
Green Travel Plan	Provide residents, staff and visitors with the Green Travel Plan to encourage active travel	Residents, staff and visitors	Upon Occupation	Building Manager/Travel Plan Coordinator
Transport Access Guide	Provide residents, staff and visitors with a TAG on day one of occupation/induction and post the TAG on noticeboards, front entrances, Club's online website, etc.	Residents, staff and visitors	Upon Occupation	Building Manager/Travel Plan Coordinator
Ongoing Review	Ongoing review of the GTP to introduce additional measures as required	-	Ongoing	Travel Plan Coordinator

6 Management and Monitoring of the Plan

6.1 Management

There is no standard methodology for the implementation and management of a GTP. However, the GTP will be monitored to ensure that it is achieving the desired benefits. The mode share targets set out in Section 4.3 are used in this regard to ensure there is an overall goal in the management of the GTP.

The monitoring of the GTP would require travel surveys to be undertaken with a focus to establish travel patterns including mode share of trips to and from the Site.

The implementation of the GTP will need a formal Travel Plan Co-ordinator (**TPC**), who will have responsibility for developing, implementing and monitoring the GTP. The TPC will be an appointed staff member of the Club or an independent expert.

It will also be necessary to provide feedback to staff, residents and visitors to ensure that they can see the benefits of sustainable transport.

Indeed, there are several keys to the development and implementation of a successful GTP. These include:

- Communications – Good communications are an essential part of the GTP. It will be necessary to explain the reason for adopting the plan, promote the benefits available and provide information about the alternatives to driving alone.
- Commitment – GTPs involve changing established habits or providing the impetus for people in new developments to choose a travel mode other than private car use. To achieve co-operation, it is essential to promote positively the wider objectives and benefits of the plan. This commitment includes the provision of the necessary resources to implement the plan, beginning with the introduction of the *'carrots'* or incentives for changing travel modes upon occupation.
- Building Consensus – It will be necessary to obtain broad support for the introduction of the plan from the residents, staff and visitors.

Once the plan has been adopted, it is essential to maintain interest in the scheme. Each new initiative in the plan will need to be publicised and marketing of the project as a whole will be important.

6.2 Remedial Actions

A continuous review will take place to identify remedial actions should the modal share targets not be achieved. However, the following measures are proposed both as discrete measures (e.g. car share) and those being proposed as part of the proposed development masterplan:

- Increased cycle parking
- Increased / improved changing facilities /lockers
- Increase in shuttle bus frequency
- Increase use of car share (e.g. GoGet for staff).

Alternatively, the TPC could work with council to see how the measures might be aligned with those identified in councils Active Travel study.

6.3 Consultation

The results of the Green Travel Plan will be communicated with Council, staff, resident, visitors and to the wider community via the noticeboard and/or newsletters.

As such, it is recommended that a summary letter is produced presenting the results of the survey within one month of the undertaking of the travel surveys (say 3-months post-occupation). The letter/report may be also appended to the GTP and submitted to Council for comment. Subsequent surveys would be undertaken after 1, 3 and 5 years.

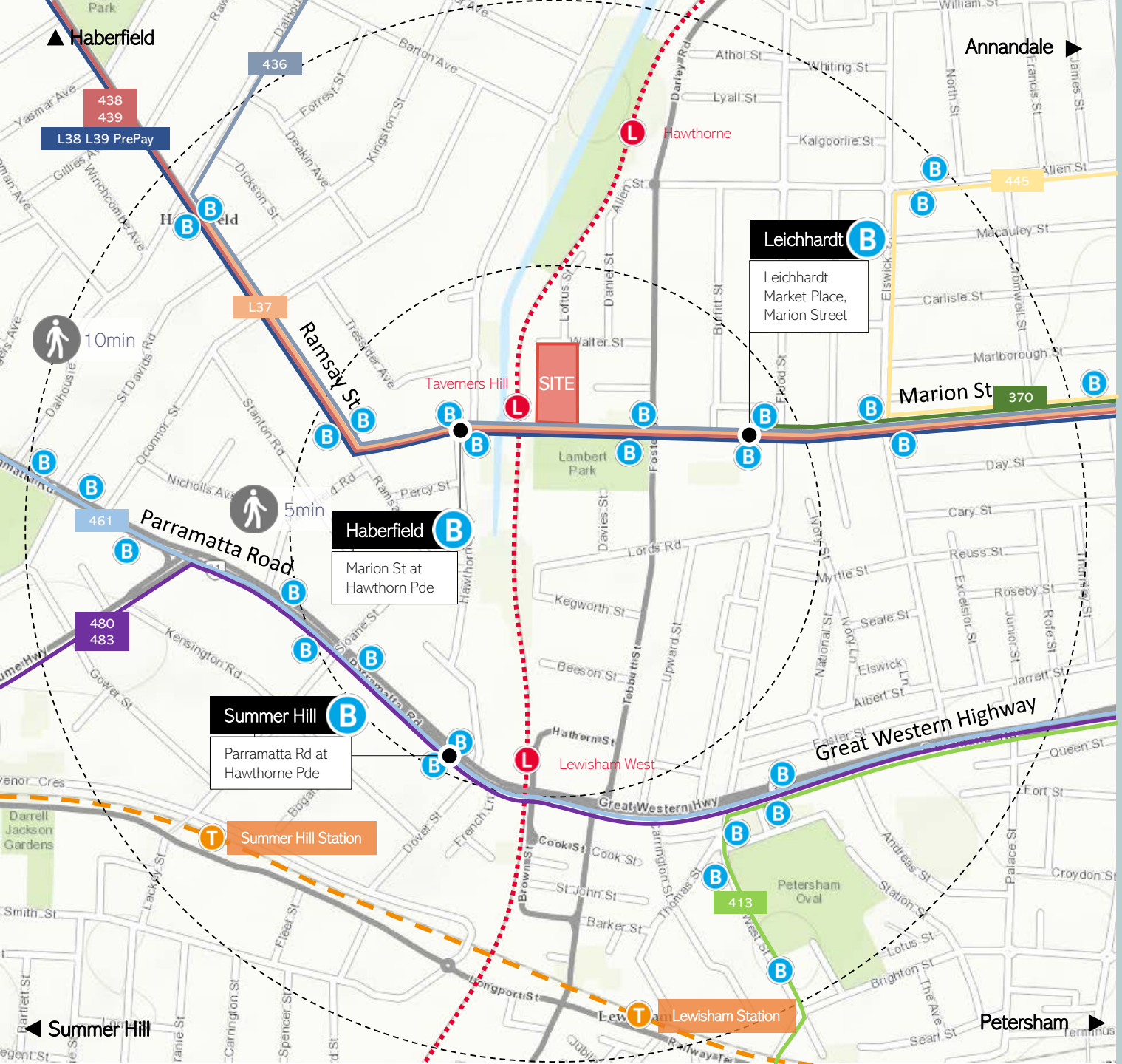
Communication to staff, residents, visitors and the wider community may be carried out in a similar form by public display of the GTP on noticeboards. Alternatively, a news article on the matter could be included on newsletters and/or an online website.

6.4 Conclusion

It is recommended that travel surveys be undertaken 3-months post-occupation of the site, with this draft GTP updated accordingly to suit the site's existing modal splits and findings of the travel surveys, including opportunities and constraints to influence a modal shift away from car usage. Subsequent surveys should be undertaken after 1, 3 and 5 years.

Appendix A

Transport Access Guide



Transport Access Guide

Use active transport and get your daily physical activity while you travel

245 Marion Street, Leichhardt

Proposed Rezoning

Getting Here

Train

Summer Hill Station (1.0km away)

Service Line	T2 Inner West Line
Distance	13 minute walk away
Average Frequency	Every 15 minutes
Journey Time	6 minutes to Burwood 9 minutes to Strathfield 15 minutes to Central

Lewisham Station (1.2km away)

Service Line	T2 Inner West Line
Distance	15 minute walk away
Average Frequency	Every 15 minutes
Journey Time	8 minutes to Burwood 11 minutes to Strathfield 13 minutes to Central

Adult Opal card holders get a $2 discount for every transfer between train, ferry, bus or light rail as part of one journey

Start walking today to achieve a goal of 10,000 steps per day!

Bus

Frequent bus services are available on Marion Road and Paramatta Road located within 10 minute walk from the site.

Route	Description
438	Abbotsford - City Martin Place
439	Mortlake - City Martin Place
L38 L39	PrePay Only Abbotsford - City Martin Place (Limited Stops) Mortlake - City Martin Place (Limited Stops)
436	Chiswick - Central Pitt St
L37	Haberfield - City Town Hall Limited Stop
445	Campsie - Balmain East Wharf via Leichhardt Marketplace
370	Leichhardt Marketplace - Coogee
480	Strathfield - Central Pitt St via Homebush Rd
483	Strathfield - Central Pitt St via South Strathfield
461	Burwood - City Domain
413	Campsie - City Martin Place

Public Transport Information

For detailed route maps, departure and arrival times and service information, please contact Transport Info on 131 500 or visit **transportnsw.info**

Light Rail

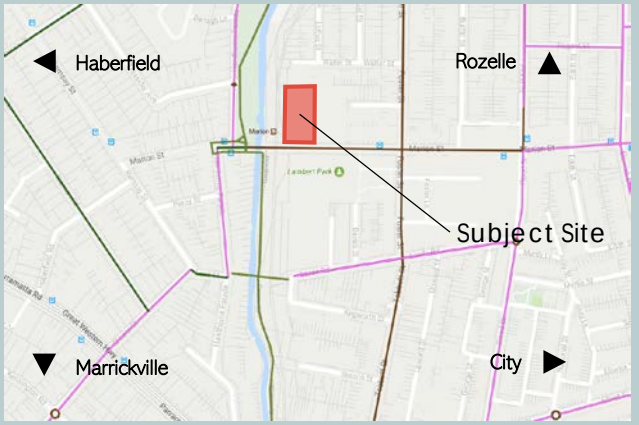
Marion Light Rail Station (100m away)

Average Frequency	Every 12 minutes
Journey Time	31 minutes to Central

Cycle

There are many cycleways of low (green), moderate (pink) and high (brown) difficulty in the proximity of the site, providing connectivity to the City, Rozelle, Haberfield and Marrickville in the east, north, west and south respectively.

Routes

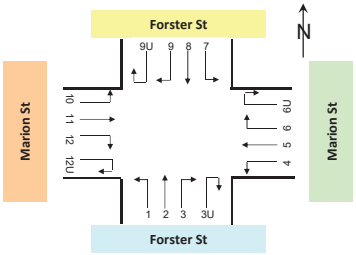


Appendix C

Traffic Survey Results

Job No.	: N4293
Client	: TTPP
Suburb	: Leichardt
Location	: 1. Forster St / Marion St
Day/Date	: Wed, 20th June 2018
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	**Class 1**	**Class 2**
	Lights	Heavies



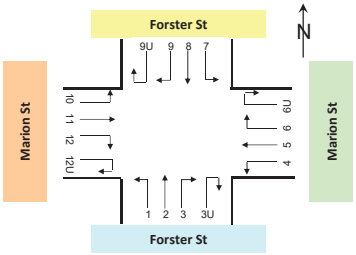
MATRIX Traffic and Transport Data

Approach	**Forster St**												**Marion St**											
Direction	**Direction 1 (Left Turn)**			**Direction 2 (Through)**			**Direction 3 (Right Turn)**			**Direction 3U (U Turn)**			**Direction 4 (Left Turn)**			**Direction 5 (Through)**			**Direction 6 (Right Turn)**			**Direction 6U (U Turn)**		
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
6:30 to 6:45	16	0	**16**	136	2	**138**	23	0	**23**	0	0	**0**	6	2	**8**	33	1	**34**	1	0	**1**	0	0	**0**
6:45 to 7:00	19	0	**19**	113	3	**116**	21	1	**22**	0	0	**0**	7	1	**8**	46	0	**46**	0	0	**0**	0	0	**0**
7:00 to 7:15	23	0	**23**	127	0	**127**	30	0	**30**	0	0	**0**	6	0	**6**	43	1	**44**	0	0	**0**	0	0	**0**
7:15 to 7:30	16	1	**17**	134	4	**138**	27	0	**27**	0	0	**0**	14	2	**16**	63	1	**64**	0	0	**0**	0	0	**0**
7:30 to 7:45	18	0	**18**	129	1	**130**	33	0	**33**	0	0	**0**	10	1	**11**	56	4	**60**	0	0	**0**	0	0	**0**
7:45 to 8:00	16	0	**16**	110	0	**110**	17	0	**17**	0	0	**0**	15	0	**15**	50	2	**52**	0	0	**0**	0	0	**0**
8:00 to 8:15	34	2	**36**	219	2	**221**	35	0	**35**	0	0	**0**	29	2	**31**	81	1	**82**	0	0	**0**	0	0	**0**
8:15 to 8:30	23	2	**25**	114	4	**118**	22	0	**22**	0	0	**0**	10	1	**11**	54	2	**56**	0	0	**0**	0	0	**0**
8:30 to 8:45	11	0	**11**	135	1	**136**	21	1	**22**	0	0	**0**	10	1	**11**	66	2	**68**	0	0	**0**	0	0	**0**
8:45 to 9:00	28	0	**28**	99	1	**100**	19	0	**19**	0	0	**0**	10	0	**10**	52	0	**52**	0	0	**0**	0	0	**0**
9:00 to 9:15	19	1	**20**	146	1	**147**	32	0	**32**	0	0	**0**	15	2	**17**	73	3	**76**	0	0	**0**	0	0	**0**
9:15 to 9:30	28	0	**28**	143	0	**143**	32	0	**32**	0	0	**0**	27	1	**28**	62	2	**64**	0	0	**0**	0	0	**0**
AM Totals	**251**	**6**	**257**	**1,605**	**19**	**1,624**	**312**	**2**	**314**	**0**	**0**	**0**	**159**	**13**	**172**	**679**	**19**	**698**	**1**	**0**	**1**	**0**	**0**	**0**
15:30 to 15:45	50	1	**51**	109	1	**110**	3	0	**3**	0	0	**0**	29	1	**30**	90	2	**92**	0	0	**0**	0	0	**0**
15:45 to 16:00	48	2	**50**	102	2	**104**	14	0	**14**	0	0	**0**	17	1	**18**	105	4	**109**	0	0	**0**	0	0	**0**
16:00 to 16:15	46	1	**47**	83	5	**88**	9	0	**9**	0	0	**0**	28	2	**30**	113	2	**115**	0	0	**0**	0	0	**0**
16:15 to 16:30	42	0	**42**	95	0	**95**	10	0	**10**	0	0	**0**	26	1	**27**	137	3	**140**	0	0	**0**	0	0	**0**
16:30 to 16:45	44	0	**44**	112	3	**115**	22	0	**22**	0	0	**0**	26	2	**28**	114	3	**117**	0	0	**0**	0	0	**0**
16:45 to 17:00	45	0	**45**	82	1	**83**	19	0	**19**	0	0	**0**	29	1	**30**	132	3	**135**	0	0	**0**	0	0	**0**
17:00 to 17:15	59	0	**59**	115	2	**117**	14	0	**14**	0	0	**0**	24	1	**25**	134	3	**137**	0	0	**0**	0	0	**0**
17:15 to 17:30	39	0	**39**	111	0	**111**	23	0	**23**	0	0	**0**	24	1	**25**	138	5	**143**	0	0	**0**	0	0	**0**
17:30 to 17:45	61	0	**61**	118	1	**119**	11	0	**11**	0	0	**0**	30	1	**31**	122	4	**126**	0	0	**0**	0	0	**0**
17:45 to 18:00	71	0	**71**	119	0	**119**	15	0	**15**	0	0	**0**	26	0	**26**	149	5	**154**	0	0	**0**	0	0	**0**
18:00 to 18:15	42	0	**42**	86	0	**86**	20	0	**20**	0	0	**0**	32	2	**34**	129	8	**137**	0	0	**0**	0	0	**0**
18:15 to 18:30	52	0	**52**	91	0	**91**	13	0	**13**	0	0	**0**	29	2	**31**	105	4	**109**	0	0	**0**	0	0	**0**
PM Totals	**599**	**4**	**603**	**1,223**	**15**	**1,238**	**173**	**0**	**173**	**0**	**0**	**0**	**320**	**15**	**335**	**1,468**	**46**	**1,514**	**0**	**0**	**0**	**0**	**0**	**0**

Approach	**Forster St**												**Marion St**											
Direction	**Direction 7 (Left Turn)**			**Direction 8 (Through)**			**Direction 9 (Right Turn)**			**Direction 9U (U Turn)**			**Direction 10 (Left Turn)**			**Direction 11 (Through)**			**Direction 12 (Right Turn)**			**Direction 12U (U Turn)**		
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
6:30 to 6:45	0	1	**1**	47	0	**47**	16	0	**16**	0	0	**0**	28	0	**28**	139	0	**139**	23	1	**24**	0	0	**0**
6:45 to 7:00	2	0	**2**	61	1	**62**	9	0	**9**	0	0	**0**	46	0	**46**	204	4	**208**	27	0	**27**	0	0	**0**
7:00 to 7:15	2	0	**2**	56	1	**57**	15	0	**15**	0	0	**0**	36	0	**36**	205	5	**210**	51	0	**51**	0	0	**0**
7:15 to 7:30	4	0	**4**	59	1	**60**	6	1	**7**	0	0	**0**	60	0	**60**	208	7	**215**	54	1	**55**	0	0	**0**
7:30 to 7:45	1	0	**1**	74	1	**75**	7	0	**7**	0	0	**0**	46	0	**46**	252	5	**257**	55	0	**55**	0	0	**0**
7:45 to 8:00	2	0	**2**	79	1	**80**	18	0	**18**	0	0	**0**	53	0	**53**	264	6	**270**	71	0	**71**	0	0	**0**
8:00 to 8:15	2	0	**2**	79	2	**81**	7	0	**7**	0	0	**0**	64	0	**64**	208	7	**215**	68	2	**70**	0	0	**0**
8:15 to 8:30	3	0	**3**	67	0	**67**	16	0	**16**	0	0	**0**	55	0	**55**	217	6	**223**	72	1	**73**	0	0	**0**
8:30 to 8:45	4	0	**4**	71	3	**74**	6	0	**6**	0	0	**0**	46	0	**46**	236	3	**239**	67	0	**67**	0	0	**0**
8:45 to 9:00	7	1	**8**	65	0	**65**	11	0	**11**	0	0	**0**	42	0	**42**	195	7	**202**	66	0	**66**	0	0	**0**
9:00 to 9:15	3	0	**3**	93	1	**94**	5	0	**5**	0	0	**0**	32	0	**32**	160	3	**163**	54	0	**54**	0	0	**0**
9:15 to 9:30	5	0	**5**	84	1	**85**	12	0	**12**	0	0	**0**	54	0	**54**	173	5	**178**	54	0	**54**	0	0	**0**
AM Totals	**35**	**2**	**37**	**835**	**12**	**847**	**128**	**1**	**129**	**0**	**0**	**0**	**562**	**0**	**562**	**2,461**	**58**	**2,519**	**662**	**5**	**667**	**0**	**0**	**0**
15:30 to 15:45	7	0	**7**	137	2	**139**	25	0	**25**	0	0	**0**	31	0	**31**	67	2	**69**	52	0	**52**	0	0	**0**
15:45 to 16:00	2	0	**2**	164	0	**164**	22	0	**22**	0	0	**0**	25	3	**28**	68	5	**73**	41	0	**41**	0	0	**0**
16:00 to 16:15	8	0	**8**	164	0	**164**	33	0	**33**	0	0	**0**	37	0	**37**	58	4	**62**	33	0	**33**	0	0	**0**
16:15 to 16:30	2	0	**2**	160	1	**161**	14	0	**14**	0	0	**0**	29	0	**29**	79	2	**81**	38	0	**38**	0	0	**0**
16:30 to 16:45	6	0	**6**	158	0	**158**	19	0	**19**	0	0	**0**	36	0	**36**	83	2	**85**	46	0	**46**	0	0	**0**
16:45 to 17:00	2	0	**2**	121	1	**122**	25	0	**25**	0	0	**0**	32	0	**32**	75	3	**78**	34	0	**34**	0	0	**0**
17:00 to 17:15	4	0	**4**	157	0	**157**	18	0	**18**	0	0	**0**	38	0	**38**	93	1	**94**	34	0	**34**	0	0	**0**
17:15 to 17:30	2	0	**2**	135	0	**135**	15	0	**15**	0	0	**0**	35	0	**35**	103	2	**105**	50	0	**50**	0	0	**0**
17:30 to 17:45	4	0	**4**	133	1	**134**	16	0	**16**	0	0	**0**	37	0	**37**	104	1	**105**	37	0	**37**	0	0	**0**
17:45 to 18:00	6	0	**6**	122	0	**122**	31	0	**31**	0	0	**0**	29	0	**29**	81	2	**83**	32	0	**32**	0	0	**0**
18:00 to 18:15	2	0	**2**	144	0	**144**	24	0	**24**	0	0	**0**	29	0	**29**	89	3	**92**	28	0	**28**	0	0	**0**
18:15 to 18:30	2	0	**2**	134	0	**134**	22	0	**22**	0	0	**0**	26	0	**26**	73	2	**75**	26	0	**26**	0	0	**0**
PM Totals	**47**	**0**	**47**	**1,729**	**5**	**1,734**	**264**	**0**	**264**	**0**	**0**	**0**	**384**	**3**	**387**	**973**	**29**	**1,002**	**451**	**0**	**451**	**0**	**0**	**0**

Job No. : N4293
Client : TTPP
Suburb : Leichardt
Location : 1. Forster St / Marion St

Day/Date : Wed, 20th June 2018
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



MATRIX Traffic and Transport Data

Approach	Forster St												Marion St											
Direction	Direction 1 (Left Turn)			Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)			Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
6:30 to 7:30	74	1	**75**	510	9	**519**	101	1	**102**	0	0	**0**	33	5	**38**	185	3	**188**	1	0	**1**	0	0	**0**
6:45 to 7:45	76	1	**77**	503	8	**511**	111	1	**112**	0	0	**0**	37	4	**41**	208	6	**214**	0	0	**0**	0	0	**0**
7:00 to 8:00	73	1	**74**	500	5	**505**	107	0	**107**	0	0	**0**	45	3	**48**	212	8	**220**	0	0	**0**	0	0	**0**
7:15 to 8:15	84	3	**87**	592	7	**599**	112	0	**112**	0	0	**0**	68	5	**73**	250	8	**258**	0	0	**0**	0	0	**0**
7:30 to 8:30	91	4	**95**	572	7	**579**	107	0	**107**	0	0	**0**	64	4	**68**	241	9	**250**	0	0	**0**	0	0	**0**
7:45 to 8:45	84	4	**88**	578	7	**585**	95	1	**96**	0	0	**0**	64	4	**68**	251	7	**258**	0	0	**0**	0	0	**0**
8:00 to 9:00	96	4	**100**	567	8	**575**	97	1	**98**	0	0	**0**	59	4	**63**	253	5	**258**	0	0	**0**	0	0	**0**
8:15 to 9:15	81	3	**84**	494	7	**501**	94	1	**95**	0	0	**0**	45	4	**49**	245	7	**252**	0	0	**0**	0	0	**0**
8:30 to 9:30	86	1	**87**	523	3	**526**	104	1	**105**	0	0	**0**	62	4	**66**	253	7	**260**	0	0	**0**	0	0	**0**
AM Totals	**251**	**6**	**257**	**1,605**	**19**	**1,624**	**312**	**2**	**314**	**0**	**0**	**0**	**159**	**13**	**172**	**679**	**19**	**698**	**1**	**0**	**1**	**0**	**0**	**0**
15:30 to 16:30	186	4	**190**	389	8	**397**	36	0	**36**	0	0	**0**	100	5	**105**	445	11	**456**	0	0	**0**	0	0	**0**
15:45 to 16:45	180	3	**183**	392	10	**402**	55	0	**55**	0	0	**0**	97	6	**103**	469	12	**481**	0	0	**0**	0	0	**0**
16:00 to 17:00	177	1	**178**	372	9	**381**	60	0	**60**	0	0	**0**	109	6	**115**	496	11	**507**	0	0	**0**	0	0	**0**
16:15 to 17:15	190	0	**190**	404	6	**410**	65	0	**65**	0	0	**0**	105	5	**110**	517	12	**529**	0	0	**0**	0	0	**0**
16:30 to 17:30	187	0	**187**	420	6	**426**	78	0	**78**	0	0	**0**	103	5	**108**	518	14	**532**	0	0	**0**	0	0	**0**
16:45 to 17:45	204	0	**204**	426	4	**430**	67	0	**67**	0	0	**0**	107	4	**111**	526	15	**541**	0	0	**0**	0	0	**0**
17:00 to 18:00	230	0	**230**	463	3	**466**	63	0	**63**	0	0	**0**	104	3	**107**	543	17	**560**	0	0	**0**	0	0	**0**
17:15 to 18:15	213	0	**213**	434	1	**435**	69	0	**69**	0	0	**0**	112	4	**116**	538	22	**560**	0	0	**0**	0	0	**0**
17:30 to 18:30	226	0	**226**	414	1	**415**	59	0	**59**	0	0	**0**	117	5	**122**	505	21	**526**	0	0	**0**	0	0	**0**
PM Totals	**599**	**4**	**603**	**1,223**	**15**	**1,238**	**173**	**0**	**173**	**0**	**0**	**0**	**320**	**15**	**335**	**1,468**	**46**	**1,514**	**0**	**0**	**0**	**0**	**0**	**0**

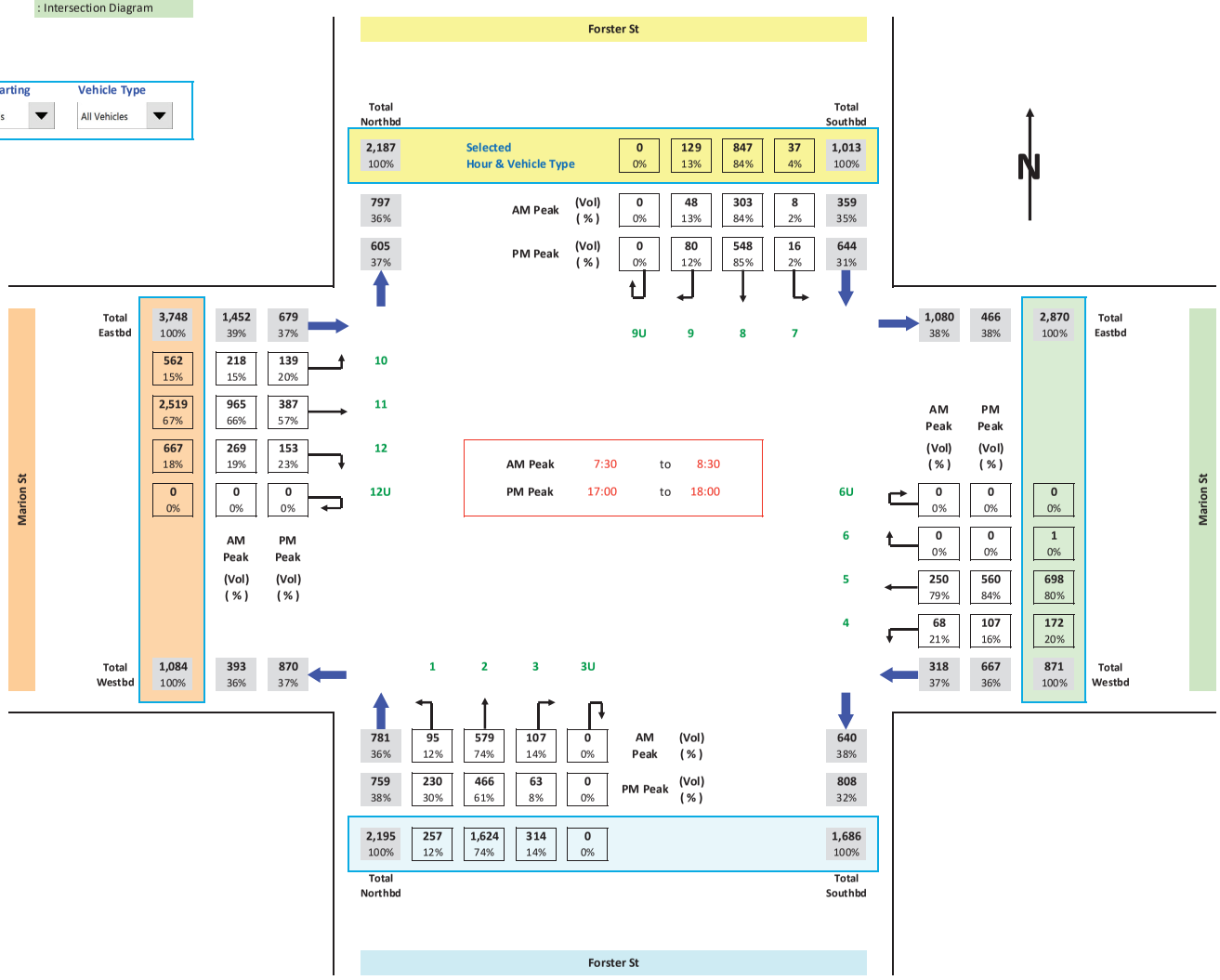
Approach	Forster St												Marion St											
Direction	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
6:30 to 7:30	8	1	**9**	223	3	**226**	46	1	**47**	0	0	**0**	170	0	**170**	756	16	**772**	155	2	**157**	0	0	**0**
6:45 to 7:45	9	0	**9**	250	4	**254**	37	1	**38**	0	0	**0**	188	0	**188**	869	21	**890**	187	1	**188**	0	0	**0**
7:00 to 8:00	9	0	**9**	268	4	**272**	46	1	**47**	0	0	**0**	195	0	**195**	929	23	**952**	231	1	**232**	0	0	**0**
7:15 to 8:15	9	0	**9**	291	5	**296**	38	1	**39**	0	0	**0**	223	0	**223**	932	25	**957**	248	3	**251**	0	0	**0**
7:30 to 8:30	8	0	**8**	299	4	**303**	48	0	**48**	0	0	**0**	218	0	**218**	941	24	**965**	266	3	**269**	0	0	**0**
7:45 to 8:45	11	0	**11**	296	6	**302**	47	0	**47**	0	0	**0**	218	0	**218**	925	22	**947**	278	3	**281**	0	0	**0**
8:00 to 9:00	16	1	**17**	282	5	**287**	40	0	**40**	0	0	**0**	207	0	**207**	856	23	**879**	273	3	**276**	0	0	**0**
8:15 to 9:15	17	1	**18**	296	4	**300**	38	0	**38**	0	0	**0**	175	0	**175**	808	19	**827**	259	1	**260**	0	0	**0**
8:30 to 9:30	19	1	**20**	313	5	**318**	34	0	**34**	0	0	**0**	174	0	**174**	764	18	**782**	241	0	**241**	0	0	**0**
AM Totals	**35**	**2**	**37**	**835**	**12**	**847**	**128**	**1**	**129**	**0**	**0**	**0**	**562**	**0**	**562**	**2,461**	**58**	**2,519**	**662**	**5**	**667**	**0**	**0**	**0**
15:30 to 16:30	19	0	**19**	625	3	**628**	94	0	**94**	0	0	**0**	122	3	**125**	272	13	**285**	164	0	**164**	0	0	**0**
15:45 to 16:45	18	0	**18**	646	1	**647**	88	0	**88**	0	0	**0**	127	3	**130**	288	13	**301**	158	0	**158**	0	0	**0**
16:00 to 17:00	18	0	**18**	603	2	**605**	91	0	**91**	0	0	**0**	134	0	**134**	295	11	**306**	151	0	**151**	0	0	**0**
16:15 to 17:15	14	0	**14**	596	2	**598**	76	0	**76**	0	0	**0**	135	0	**135**	330	8	**338**	152	0	**152**	0	0	**0**
16:30 to 17:30	14	0	**14**	571	1	**572**	77	0	**77**	0	0	**0**	141	0	**141**	354	8	**362**	164	0	**164**	0	0	**0**
16:45 to 17:45	12	0	**12**	546	2	**548**	74	0	**74**	0	0	**0**	142	0	**142**	375	7	**382**	155	0	**155**	0	0	**0**
17:00 to 18:00	16	0	**16**	547	1	**548**	80	0	**80**	0	0	**0**	139	0	**139**	381	6	**387**	153	0	**153**	0	0	**0**
17:15 to 18:15	14	0	**14**	534	1	**535**	86	0	**86**	0	0	**0**	130	0	**130**	377	8	**385**	147	0	**147**	0	0	**0**
17:30 to 18:30	14	0	**14**	533	1	**534**	93	0	**93**	0	0	**0**	121	0	**121**	347	8	**355**	123	0	**123**	0	0	**0**
PM Totals	**47**	**0**	**47**	**1,729**	**5**	**1,734**	**264**	**0**	**264**	**0**	**0**	**0**	**384**	**3**	**387**	**973**	**29**	**1,002**	**451**	**0**	**451**	**0**	**0**	**0**

Job No. : N4293
Client : TTPP
Suburb : Leichardt
Location : 1. Forster St / Marion St

Day/Date : Wed, 20th June 2018
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting: AM Totals | Vehicle Type: All Vehicles



TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Walter St and Foster St, Leichart

GPS *-33.882781, 151.147616*

Date:	Thu 13/09/18
Weather:	Overcast
Suburban:	Leichart
Customer:	TTPP

North:	Foster St
East:	N/A
South:	Foster St
West:	Walter St

Survey Period	AM:	7:00 AM-10:00 AM
	PM:	2:30 PM-6:00 PM
Traffic Peak	AM:	7:30 AM-8:30 AM
	PM:	4:45 PM-5:45 PM

All Vehicles

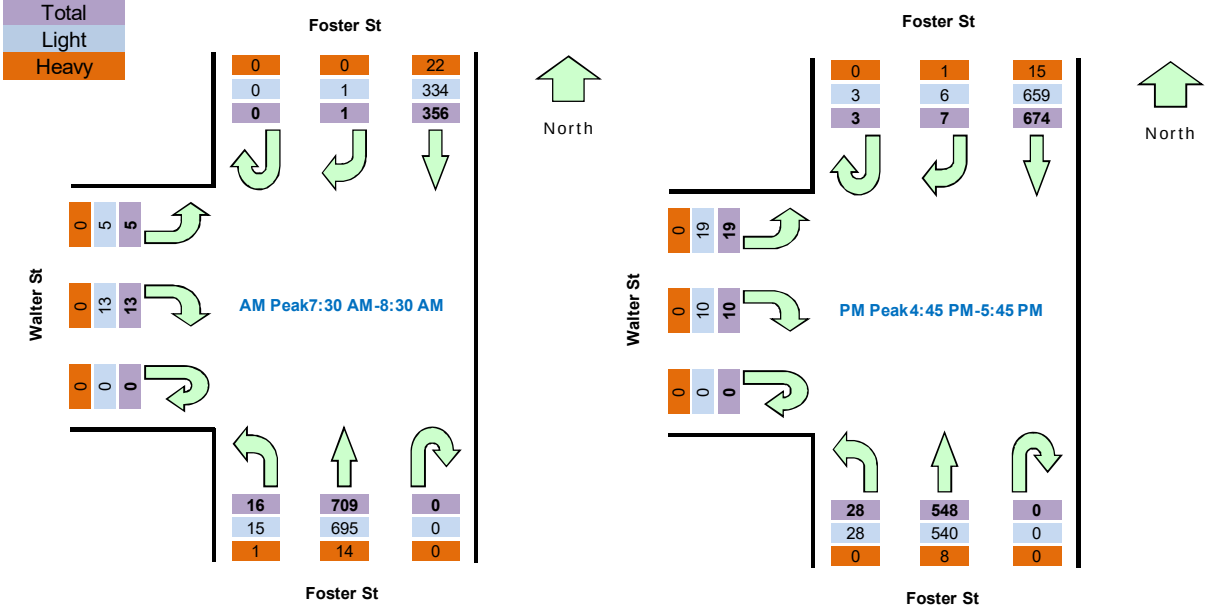
Time		North Approach Foster St			South Approach Foster St			West Approach Walter St			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
7:00	7:15	0	3	64	0	161	4	0	4	3	1062	
7:15	7:30	0	1	88	0	166	1	0	3	0	1079	
7:30	7:45	0	0	80	0	203	4	0	1	1	1100	Peak
7:45	8:00	0	0	110	0	156	6	0	2	1	1085	
8:00	8:15	0	0	78	0	167	3	0	6	2	1076	
8:15	8:30	0	1	88	0	183	3	0	4	1	1077	
8:30	8:45	0	1	82	0	182	5	0	3	1	1060	
8:45	9:00	1	1	117	0	140	3	0	3	1	1067	
9:00	9:15	0	1	72	0	176	5	0	2	1	1024	
9:15	9:30	0	0	84	0	169	4	0	5	1		
9:30	9:45	1	1	95	0	179	2	0	2	1		
9:45	10:00	0	0	84	0	135	1	0	1	2		
14:30	14:45	0	1	143	0	114	2	0	6	2	1125	
14:45	15:00	0	2	142	0	134	2	0	3	3	1164	
15:00	15:15	0	3	134	0	97	3	0	6	3	1169	
15:15	15:30	0	2	167	0	147	3	0	4	2	1240	
15:30	15:45	0	4	174	0	120	2	0	5	2	1224	
15:45	16:00	0	2	154	0	127	2	0	2	4	1206	
16:00	16:15	0	0	163	0	144	4	0	4	2	1225	
16:15	16:30	0	1	186	0	112	3	0	3	4	1233	
16:30	16:45	0	1	162	0	121	4	0	0	1	1248	
16:45	17:00	0	2	169	0	129	6	0	1	3	1289	Peak
17:00	17:15	1	2	166	0	139	5	0	6	6	1287	
17:15	17:30	1	0	169	0	139	8	0	2	5		
17:30	17:45	1	3	170	0	141	9	0	1	5		
17:45	18:00	1	1	160	1	131	5	0	5	4		

Peak Time		North Approach Foster St			South Approach Foster St			West Approach Walter St			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	
7:30	8:30	0	1	356	0	709	16	0	13	5	1100
16:45	17:45	3	7	674	0	548	28	0	10	19	1289

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Foster St			South Approach Foster St			West Approach Walter St		
Period Start	**Period End**	U	R	SB	U	NB	L	U	R	L
7:00	7:15	0	3	61	0	156	4	0	4	2
7:15	7:30	0	0	82	0	158	1	0	3	0
7:30	7:45	0	0	71	0	196	3	0	1	1
7:45	8:00	0	0	105	0	156	6	0	2	1
8:00	8:15	0	0	72	0	162	3	0	6	2
8:15	8:30	0	1	86	0	181	3	0	4	1
8:30	8:45	0	1	79	0	178	5	0	3	1
8:45	9:00	1	1	110	0	139	2	0	3	1
9:00	9:15	0	1	68	0	171	5	0	2	1
9:15	9:30	0	0	84	0	163	4	0	5	1
9:30	9:45	1	1	90	0	173	2	0	2	1
9:45	10:00	0	0	80	0	135	1	0	1	2
14:30	14:45	0	1	138	0	112	2	0	5	2
14:45	15:00	0	2	138	0	129	2	0	3	3
15:00	15:15	0	3	126	0	96	3	0	6	3
15:15	15:30	0	2	158	0	144	3	0	4	2
15:30	15:45	0	4	169	0	119	2	0	3	2
15:45	16:00	0	2	149	0	125	2	0	2	4
16:00	16:15	0	0	161	0	137	4	0	4	2
16:15	16:30	0	1	179	0	107	3	0	3	4
16:30	16:45	0	1	156	0	119	4	0	0	1
16:45	17:00	0	2	163	0	129	6	0	1	3
17:00	17:15	1	1	162	0	135	5	0	6	6
17:15	17:30	1	0	166	0	138	8	0	2	5
17:30	17:45	1	3	168	0	138	9	0	1	5
17:45	18:00	1	1	159	1	126	5	0	5	4

Peak Time		North Approach Foster St			South Approach Foster St			West Approach Walter St			Peak
Period Start	**Period End**	U	R	SB	U	NB	L	U	R	L	**total**
7:30	8:30	0	1	334	0	695	15	0	13	5	1063
16:45	17:45	3	6	659	0	540	28	0	10	19	1265

Heavy Vehicles

Time		North Approach Foster St			South Approach Foster St			West Approach Walter St		
Period Start	**Period End**	U	R	SB	U	NB	L	U	R	L
7:00	7:15	0	0	3	0	5	0	0	0	1
7:15	7:30	0	1	6	0	8	0	0	0	0
7:30	7:45	0	0	7	0	6	1	0	0	0
7:45	8:00	0	0	3	0	0	0	0	0	0
8:00	8:15	0	0	3	0	4	0	0	0	0
8:15	8:30	0	0	1	0	2	0	0	0	0
8:30	8:45	0	0	2	0	4	0	0	0	0
8:45	9:00	0	0	5	0	1	1	0	0	0
9:00	9:15	0	0	2	0	5	0	0	0	0
9:15	9:30	0	0	0	0	6	0	0	0	0
9:30	9:45	0	0	5	0	6	0	0	0	0
9:45	10:00	0	0	4	0	0	0	0	0	0
14:30	14:45	0	0	4	0	2	0	0	1	0
14:45	15:00	0	0	3	0	2	0	0	0	0
15:00	15:15	0	0	6	0	1	0	0	0	0
15:15	15:30	0	0	3	0	3	0	0	0	0
15:30	15:45	0	0	5	0	1	0	0	2	0
15:45	16:00	0	0	5	0	2	0	0	0	0
16:00	16:15	0	0	2	0	3	0	0	0	0
16:15	16:30	0	0	6	0	0	0	0	0	0
16:30	16:45	0	0	4	0	2	0	0	0	0
16:45	17:00	0	0	3	0	0	0	0	0	0
17:00	17:15	0	1	3	0	1	0	0	0	0
17:15	17:30	0	0	3	0	1	0	0	0	0
17:30	17:45	0	0	2	0	1	0	0	0	0
17:45	18:00	0	0	1	0	3	0	0	0	0

Peak Time		North Approach Foster St			South Approach Foster St			West Approach Walter St			Peak
Period Start	**Period End**	U	R	SB	U	NB	L	U	R	L	**total**
7:30	8:30	0	0	22	0	14	1	0	0	0	37
16:45	17:45	0	1	15	0	8	0	0	0	0	24

Bus

Time		North Approach Foster St			South Approach Foster St			West Approach Walter St		
Period Start	**Period End**	U	R	SB	U	NB	L	U	R	L
7:00	7:15	0	0	0	0	0	0	0	0	0
7:15	7:30	0	0	0	0	0	0	0	0	0
7:30	7:45	0	0	2	0	1	0	0	0	0
7:45	8:00	0	0	2	0	0	0	0	0	0
8:00	8:15	0	0	3	0	1	0	0	0	0
8:15	8:30	0	0	1	0	0	0	0	0	0
8:30	8:45	0	0	1	0	0	0	0	0	0
8:45	9:00	0	0	2	0	0	0	0	0	0
9:00	9:15	0	0	2	0	0	0	0	0	0
9:15	9:30	0	0	0	0	0	0	0	0	0
9:30	9:45	0	0	0	0	0	0	0	0	0
9:45	10:00	0	0	0	0	0	0	0	0	0
14:30	14:45	0	0	1	0	0	0	0	0	0
14:45	15:00	0	0	1	0	3	0	0	0	0
15:00	15:15	0	0	2	0	0	0	0	0	0
15:15	15:30	0	0	6	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	4	0	0	0	0
16:15	16:30	0	0	1	0	5	0	0	0	0
16:30	16:45	0	0	2	0	0	0	0	0	0
16:45	17:00	0	0	3	0	0	0	0	0	0
17:00	17:15	0	0	1	0	3	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	2	0	0	0	0
17:45	18:00	0	0	0	0	2	0	0	0	0

Peak Time		North Approach Foster St			South Approach Foster St			West Approach Walter St			Peak
Period Start	**Period End**	U	R	SB	U	NB	L	U	R	L	**total**
7:30	8:30	0	0	8	0	2	0	0	0	0	10
16:45	17:45	0	0	4	0	5	0	0	0	0	9

Appendix D

Intersection Operation Modelling Results

MOVEMENT SUMMARY

Site: 101v [1. Foster St/ Walter St EX AM]

18256 245 Marion Street Leichhardt
Site Category: 2018 Existing Base
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Foster Street												
1	L2	17	2.0	0.397	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	48.2
2	T1	746	2.0	0.397	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.8
Approach		763	2.0	0.397	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.7
North: Foster Street												
8	T1	375	6.0	0.201	0.0	LOS A	0.0	0.2	0.01	0.00	0.01	49.9
9	R2	1	6.0	0.201	9.8	LOS A	0.0	0.2	0.01	0.00	0.01	48.1
Approach		376	6.0	0.201	0.1	NA	0.0	0.2	0.01	0.00	0.01	49.9
West: Walter Street												
10	L2	5	0.0	0.007	7.9	LOS A	0.0	0.2	0.57	0.63	0.57	39.6
12	R2	14	0.0	0.036	12.2	LOS A	0.1	0.8	0.71	0.87	0.71	31.8
Approach		19	0.0	0.036	11.0	LOS A	0.1	0.8	0.67	0.80	0.67	34.1
All Vehicles		1158	3.3	0.397	0.3	NA	0.1	0.8	0.01	0.02	0.01	49.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [1. Marion St/Foster St EX AM]

18256 245 Marion Street Leichhardt
Site Category: 2018 Existing Base
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Foster Street												
1	L2	92	3.4	0.973	71.0	LOS F	45.5	322.3	0.96	1.23	1.45	15.1
2	T1	631	1.2	0.973	67.5	LOS E	45.5	322.3	0.96	1.23	1.48	13.1
3	R2	118	0.0	0.973	85.5	LOS F	11.2	78.4	1.00	1.23	1.81	12.6
Approach		840	1.3	0.973	70.4	LOS E	45.5	322.3	0.97	1.23	1.52	13.2
East: Marion Street												
4	L2	77	6.8	0.117	26.8	LOS B	2.5	18.2	0.69	0.71	0.69	25.4
5	T1	272	3.1	0.376	20.2	LOS B	8.7	62.8	0.71	0.60	0.71	30.1
Approach		348	3.9	0.376	21.7	LOS B	8.7	62.8	0.70	0.63	0.70	29.0
North: Foster Street												
7	L2	9	0.0	0.204	24.2	LOS B	5.0	35.2	0.67	0.57	0.67	27.7
8	T1	312	1.7	0.712	32.8	LOS C	9.9	70.1	0.84	0.73	0.88	21.0
9	R2	41	2.6	0.712	49.9	LOS D	9.9	70.1	1.00	0.88	1.09	18.0
Approach		362	1.7	0.712	34.5	LOS C	9.9	70.1	0.85	0.74	0.90	20.7
West: Marion Street												
10	L2	235	0.0	1.003	71.1	LOS F	68.8	489.4	1.00	1.27	1.49	13.9
11	T1	1007	2.6	1.003	70.1	LOS E	68.8	489.4	1.00	1.28	1.54	14.7
12	R2	264	1.2	1.003	82.4	LOS F	43.8	311.9	1.00	1.30	1.64	12.7
Approach		1506	2.0	1.003	72.4	LOS F	68.8	489.4	1.00	1.28	1.55	14.2
All Vehicles		3057	2.0	1.003	61.6	LOS E	68.8	489.4	0.94	1.13	1.37	15.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	44.3	LOS E	0.1	0.1	0.94	0.94
P2	East Full Crossing	53	44.3	LOS E	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	44.3	LOS E	0.1	0.1	0.94	0.94
P4	West Full Crossing	53	44.3	LOS E	0.1	0.1	0.94	0.94
All Pedestrians		211	44.3	LOS E			0.94	0.94

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

MOVEMENT SUMMARY

Site: 101v [2. Foster St/ Walter St EX PM]

18256 245 Marion Street Leichhardt
Site Category: 2018 Existing Base
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Foster Street												
1	L2	29	1.0	0.314	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	48.0
2	T1	577	1.0	0.314	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.6
Approach		606	1.0	0.314	0.2	NA	0.0	0.0	0.00	0.03	0.00	49.5
North: Foster Street												
8	T1	709	2.0	0.380	0.1	LOS A	0.2	1.8	0.03	0.01	0.04	49.5
9	R2	11	2.0	0.380	9.0	LOS A	0.2	1.8	0.03	0.01	0.04	48.0
Approach		720	2.0	0.380	0.3	NA	0.2	1.8	0.03	0.01	0.04	49.5
West: Walter Street												
10	L2	20	0.0	0.021	6.8	LOS A	0.1	0.6	0.51	0.61	0.51	40.6
12	R2	11	0.0	0.036	14.9	LOS B	0.1	0.7	0.78	0.90	0.78	29.6
Approach		31	0.0	0.036	9.6	LOS A	0.1	0.7	0.60	0.71	0.60	36.9
All Vehicles		1357	1.5	0.380	0.5	NA	0.2	1.8	0.03	0.03	0.04	49.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4 [2. Marion St/Foster St EX PM]

18256 245 Marion Street Leichhardt
Site Category: 2018 Existing Base
Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Foster Street												
1	L2	242	0.0	0.983	69.9	LOS E	43.0	301.9	0.90	1.12	1.33	15.1
2	T1	491	0.6	0.983	69.4	LOS E	43.0	301.9	0.92	1.13	1.40	12.7
3	R2	66	0.0	0.983	91.6	LOS F	11.7	82.0	1.00	1.19	1.73	12.1
Approach		799	0.4	0.983	71.4	LOS F	43.0	301.9	0.92	1.13	1.41	13.3
East: Marion Street												
4	L2	113	2.8	0.545	37.2	LOS C	14.6	105.1	0.87	0.77	0.87	22.5
5	T1	589	3.0	0.545	31.3	LOS C	15.8	113.7	0.86	0.75	0.86	24.5
Approach		702	3.0	0.545	32.3	LOS C	15.8	113.7	0.86	0.76	0.86	24.2
North: Foster Street												
7	L2	17	0.0	0.920	56.0	LOS D	36.2	253.6	0.95	1.06	1.23	16.5
8	T1	577	0.2	0.920	51.5	LOS D	36.2	253.6	0.95	1.06	1.23	16.0
9	R2	84	0.0	0.920	78.7	LOS F	5.7	39.9	1.00	1.07	1.68	12.4
Approach		678	0.2	0.920	55.0	LOS D	36.2	253.6	0.95	1.06	1.29	15.4
West: Marion Street												
10	L2	146	0.0	0.207	23.8	LOS B	5.5	38.8	0.64	0.69	0.64	26.3
11	T1	407	1.6	1.034	91.9	LOS F	46.3	327.4	0.98	1.37	1.72	10.9
12	R2	161	0.0	1.034	101.6	LOS F	46.3	327.4	1.00	1.42	1.79	10.0
Approach		715	0.9	1.034	80.2	LOS F	46.3	327.4	0.91	1.24	1.51	12.0
All Vehicles		2894	1.1	1.034	60.2	LOS E	46.3	327.4	0.91	1.05	1.27	15.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
P2	East Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		211	49.3	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: 101v [1. Foster St/ Walter St Future AM]

18256 245 Marion Street Leichhardt
Site Category: Future Case
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Foster Street												
1	L2	17	2.0	0.397	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	48.2
2	T1	746	2.0	0.397	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.8
Approach		763	2.0	0.397	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.7
North: Foster Street												
8	T1	377	6.0	0.202	0.0	LOS A	0.0	0.2	0.01	0.00	0.01	49.9
9	R2	1	6.0	0.202	9.8	LOS A	0.0	0.2	0.01	0.00	0.01	48.1
Approach		378	6.0	0.202	0.1	NA	0.0	0.2	0.01	0.00	0.01	49.9
West: Walter Street												
10	L2	9	0.0	0.012	8.0	LOS A	0.0	0.3	0.57	0.65	0.57	39.5
12	R2	14	0.0	0.036	12.3	LOS A	0.1	0.8	0.71	0.87	0.71	31.7
Approach		23	0.0	0.036	10.5	LOS A	0.1	0.8	0.66	0.78	0.66	35.1
All Vehicles		1164	3.3	0.397	0.3	NA	0.1	0.8	0.02	0.02	0.02	49.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [1. Marion St/Foster St Future AM]

18256 245 Marion Street Leichhardt
Site Category: Future Case
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Foster Street												
1	L2	95	3.3	0.979	73.5	LOS F	47.1	333.5	0.97	1.26	1.48	14.7
2	T1	631	1.2	0.979	69.8	LOS E	47.1	333.5	0.97	1.26	1.50	12.8
3	R2	118	0.0	0.979	87.3	LOS F	10.8	76.1	1.00	1.23	1.84	12.4
Approach		843	1.2	0.979	72.7	LOS F	47.1	333.5	0.97	1.25	1.55	12.9
East: Marion Street												
4	L2	77	6.8	0.117	26.8	LOS B	2.5	18.2	0.69	0.71	0.69	25.4
5	T1	281	3.0	0.390	20.4	LOS B	9.1	65.3	0.71	0.61	0.71	30.1
Approach		358	3.8	0.390	21.7	LOS B	9.1	65.3	0.71	0.63	0.71	29.0
North: Foster Street												
7	L2	9	0.0	0.206	24.2	LOS B	5.0	35.6	0.67	0.57	0.67	27.7
8	T1	312	1.7	0.719	32.7	LOS C	9.9	70.3	0.84	0.73	0.89	21.0
9	R2	43	2.4	0.719	50.1	LOS D	9.9	70.3	1.00	0.89	1.10	17.9
Approach		364	1.7	0.719	34.5	LOS C	9.9	70.3	0.85	0.74	0.91	20.7
West: Marion Street												
10	L2	235	0.0	1.011	76.1	LOS F	71.5	508.6	1.00	1.30	1.54	13.2
11	T1	1013	2.6	1.011	75.1	LOS F	71.5	508.6	1.00	1.31	1.58	14.0
12	R2	265	1.2	1.011	87.6	LOS F	45.0	320.1	1.00	1.33	1.68	12.1
Approach		1513	1.9	1.011	77.5	LOS F	71.5	508.6	1.00	1.31	1.59	13.5
All Vehicles		3078	1.9	1.011	64.6	LOS E	71.5	508.6	0.94	1.15	1.40	14.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	44.3	LOS E	0.1	0.1	0.94	0.94
P2	East Full Crossing	53	44.3	LOS E	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	44.3	LOS E	0.1	0.1	0.94	0.94
P4	West Full Crossing	53	44.3	LOS E	0.1	0.1	0.94	0.94
All Pedestrians		211	44.3	LOS E			0.94	0.94

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

MOVEMENT SUMMARY

Site: 101v [2. Foster St/ Walter St Future PM]

18256 245 Marion Street Leichhardt
Site Category: Future Case
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Foster Street												
1	L2	29	1.0	0.314	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	48.0
2	T1	577	1.0	0.314	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.6
Approach		606	1.0	0.314	0.2	NA	0.0	0.0	0.00	0.03	0.00	49.5
North: Foster Street												
8	T1	712	2.0	0.381	0.1	LOS A	0.2	1.8	0.03	0.01	0.04	49.5
9	R2	11	2.0	0.381	9.0	LOS A	0.2	1.8	0.03	0.01	0.04	48.0
Approach		722	2.0	0.381	0.3	NA	0.2	1.8	0.03	0.01	0.04	49.5
West: Walter Street												
10	L2	24	0.0	0.025	6.8	LOS A	0.1	0.7	0.51	0.62	0.51	40.6
12	R2	11	0.0	0.036	15.0	LOS B	0.1	0.7	0.78	0.90	0.78	29.6
Approach		35	0.0	0.036	9.3	LOS A	0.1	0.7	0.59	0.71	0.59	37.3
All Vehicles		1363	1.5	0.381	0.5	NA	0.2	1.8	0.03	0.03	0.04	49.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4 [2. Marion St/Foster St Future PM]

18256 245 Marion Street Leichhardt
Site Category: Future Case
Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Foster Street												
1	L2	244	0.0	0.934	51.1	LOS D	32.9	230.8	0.84	0.96	1.11	18.7
2	T1	491	0.6	0.934	53.2	LOS D	32.9	230.8	0.89	1.01	1.22	15.3
3	R2	66	0.0	0.934	73.7	LOS F	13.7	96.5	1.00	1.12	1.48	14.3
Approach		801	0.4	0.934	54.2	LOS D	32.9	230.8	0.88	1.00	1.21	16.2
East: Marion Street												
4	L2	113	2.8	0.549	37.3	LOS C	14.8	106.1	0.87	0.78	0.87	22.4
5	T1	595	3.0	0.549	31.4	LOS C	16.0	114.7	0.86	0.75	0.86	24.5
Approach		707	3.0	0.549	32.3	LOS C	16.0	114.7	0.86	0.76	0.86	24.2
North: Foster Street												
7	L2	17	0.0	0.914	54.2	LOS D	34.2	239.6	0.93	1.04	1.20	16.8
8	T1	577	0.2	0.914	50.5	LOS D	34.2	239.6	0.93	1.04	1.22	16.2
9	R2	86	0.0	0.914	77.5	LOS F	7.1	50.0	1.00	1.09	1.63	12.7
Approach		680	0.2	0.914	54.0	LOS D	34.2	239.6	0.94	1.05	1.27	15.6
West: Marion Street												
10	L2	146	0.0	0.209	23.8	LOS B	5.6	39.4	0.64	0.69	0.64	26.3
11	T1	413	1.5	1.047	99.5	LOS F	48.6	343.6	0.97	1.41	1.77	10.4
12	R2	163	0.0	1.047	110.2	LOS F	48.6	343.6	1.00	1.46	1.86	9.5
Approach		722	0.9	1.047	86.6	LOS F	48.6	343.6	0.91	1.27	1.56	11.4
All Vehicles		2911	1.1	1.047	56.9	LOS E	48.6	343.6	0.90	1.02	1.23	15.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
P2	East Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		211	49.3	LOS E			0.95	0.95

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

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