Marrickville Metro S75W Modification

Traffic Impact Assessment

Prepared for:

AMP Capital Investors

13/10/2017

The Transport Planning Partnership

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Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
Final	13/10/17	Oasika Faiz/ Michael Lee	Michael Lee	Ken Hollyoak	

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The Transport Planning Partnership (TTPP) has prepared this report in accordance with the instructions of AMP Capital Investors for their sole and specific use. Any other persons who use any information contained herein do so at their own risk.

1 Introduction

1.1 Background

This traffic impact assessment has been prepared by The Transport Planning Partnership (TTPP) on behalf of AMP Capital Investors (AMP) in support of a Section 75W Modification Application of the Major Project Approval MP09_0191, for the expansion of the Marrickville Metro Shopping Centre (the Site).

The Major Project was granted Approval by the Minister of Planning on 19th March 2012 for the carrying out of the following development:

- demolition of existing warehouse buildings and associated structures on the Edinburgh Road site;
- refurbishments and construction of a first-floor addition to the existing retail building on the Victoria Road site and the construction of a new building with two levels of retail on Edinburgh Road site comprising:
  - a discount department store (5,000sqm), supermarket (4,500sqm), mini-major (1,791sqm) and speciality retail (4,464sqm) [as amended];
  - an additional 21,780sqm GFA (16,767sqm GLFA) to provide a total of 50,705sqm GFA (39,700sqm GLFA); and
- authorise the use of 1,606 car parking spaces comprising 1,100 existing spaces and 506 additional car parking spaces [as amended].

This report assesses the traffic effects of the proposed expansion. The traffic assessment has been conducted through the use of microsimulation traffic models developed on the VISSIM modelling platform. The microsimulation traffic models include the same nearby intersections that were previously assessed in the 2010 application. TTPP has engaged Bitzios Consulting to develop and operate the VISSIM microsimulation traffic models.

This report also assesses the parking requirements for the proposed expansion including a design review of the car parking spaces for compliance issues against the design requirements set out in the relevant Australian Standard.

The content of this report responds to the Secretary's Environmental Assessment Requirements (SEARs), and is intended to assist with the assessment of the modification proposal against the relevant considerations under of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Table 1.1 summarises the relevant issues (related to transport and traffic) together with descriptions how the issues have been addressed.

Table 1.1: Secretary's Environmental Assessment Requirements (SEARs)

Issues	How Addressed	Report Section
The impact of the proposed modifications (including the proposed extension of hours) on the existing and future traffic performance, public transport and parking demand (including on-street parking) in the surrounding area, and identify any required mitigation measures.	The subject S75W modifications do not propose changes to the approved overall floor area and car parking provision of the Centre, however there would a redistribution of the approved floor area and car parking provision. The S75W modification would distribute parking provision to the Stage 1B site and reconfigure the site accesses on Smidmore Street and Edinburgh Road. The proposed modifications do not require any additional traffic improvement works or mitigation measures other than kerbside parking ban on the eastern side of Edgeware Street between Victoria Road and Alice Street during the Saturday peak period. The proposed extension of the trading hours is not expected to generate any additional traffic and parking impacts.	See Sections 4, 5 and 6.
Review the daily and peak traffic movements resulting from the development having regard to the proposed modification, including consideration of the impacts on intersections and the need/funding for upgrades or road improvement works (where required).	The existing Centre generates around 1,646 vehicles per hour (vph) during the busiest peak period. In the same period, the proposed expansion is expected to generate 2,422 vph (a net increase of 776 vph). Using RMS data, it is estimated that the daily traffic generation of the Centre following the completion of the proposed expansion would be 16,900 trips per day. TTPP engaged Bitzios Consulting to develop and operate a microsimulation model in the Vissim modelling platform to assess the operation of the nearby intersections. The traffic modelling indicates the surrounding intersections have the capacity to accommodate the additional traffic demand. As such road improvements of the nearby intersections are not required to support the proposed expansion other the removal of kerbside parking on Edgeware Street during the Saturday peak period. In addition, it is proposed to provide a new single lane roundabout at the intersection of Edinburgh Street with Sydney Steel Road and the upgrade of the existing roundabout at Edinburgh Road with Railway Parade to facilitate the turning of buses at these intersections.	See Section 6.

Issues	How Addressed	Report Section
Operation and safety of priority controlled right-turn movements into the site from Edinburgh Road having regard for current traffic conditions.	Separate to the Vissim microsimulation modelling, TTPP also conducted detailed intersection modelling of the Edinburgh Road right turn access using SIDRA Intersection modelling tool. The analysis indicates that the traffic queue for the proposed right turn access would be contained within the proposed right turn bay. It would not overflow into the adjacent traffic lane resulting in blockage to the westbound traffic on Edinburgh Road. As such, there would be no safety issues associated with overflow of the right turn queue into the adjacent lane.	See Section 6.7.
Vehicular access arrangements and controls, and consideration of any potential queuing and/or pedestrian/ vehicle conflict.	The design of the proposed driveway into the Stage 1B site has been informed by a queue length assessment. The assessment indicates vehicle queues would be contained within the site.	See Sections 4.3, 4.4 and 5.6.
Any required road/intersection upgrades, such as changes in signage and traffic management controls to accommodate the proposed changes to Smidmore Street.	The proposed modification includes an amended configuration of Smidmore Street to reduce vehicle volumes and improve the public domain space. Measures to reduce traffic and vehicular movements on Smidmore Street would be implemented, with Smidmore Street converted to one-way westbound between Murray Street and the existing site access. To facilitate the arrangement, the existing driveway would be reconfigured to permit left-in and right-out traffic movements to and from the existing car park. The proposed modification would replace the previously conditioned changes to road arrangements on Smidmore Street.	See Section 4.3.
Service vehicle movements, including vehicle type and likely arrival and departure times, and access and loading dock(s) arrangements, such as location and parking.	Several loading docks exist within the Centre. An additional loading dock is proposed with the Stage 1B building, with provision for up to 10 vehicles plus three compactors. A loading dock plan of management would be implemented to ensure the safe and efficient operation of the loading dock.	See Section 5.5
Measures to promote public transport usage and pedestrian and bicycle linkages.	The original measures proposed in the approved Centre will be maintained, including the provision of 142 bicycle parking	See Section 5.3

Issues	How Addressed	Report Section
	spaces, and a new bus stop located on Edinburgh Road fronting the new Stage 1B site.	
Compliance with the requirements of the relevant Australian Standards (i.e. turn paths, sight distance requirements, aisle width, etc.) and relevant parking codes.	The modified car park in Stage 1B has been design in accordance with Australian Standard.	See Section 5.4
Provide a revised assessment of the implications of the proposed modifications for non-car travel models (including public transport, walking and cycling), including further consideration of enhancements to encourage sustainable transport options	The subject modification would not impact on non-car travel modes, with approved measures to be maintained including; provision of 142 bicycle parking spaces, and a new bus stop on Edinburgh Road (which replaces and is an upgrade of the existing stop on Smidmore Street). Additionally, it is noted that the NSW Government's Sydney Metro project will include a new rail line from Epping to Sydenham and an upgraded rail line from Sydenham to Bankstown Station, with improvement to its capacity and frequency. The resulting rail line would likely encourage greater use of public transport as a travel mode to the site.	See Section 5.3 See Section 2.6
Provide an updated construction traffic management plan for all demolition/construction activities, detailing vehicle routes, number of trucks, hours of operation, access arrangements, and traffic control measures, having regard to cumulative impacts of other construction projects in the area.	Construction traffic management plans are typically provided and approved during the construction certificate stage before construction works can commence. It is further noted that the consent conditions from the previous approval requires the construction traffic management plan be submitted during the relevant construction certificate stage. Furthermore, construction details are not available at this stage as a head contractor has not yet been appointed. Notwithstanding the above, a preliminary construction traffic management plan has been prepared and submitted as part of this S75W application.	See separate report prepared by TTPP (Ref: 16065-r02v03_171013_Marrickville CTMP)

The remainder of the report is structured as follows:

- Chapter 2 discusses the existing conditions including a description of the subject site
- Chapter 3 provides a summary of the consultation undertaken with RMS and Inner West Council
- Chapter 4 provides a brief description of the proposed development
- Chapter 5 assesses the proposed on-site parking provision and internal layout
- Chapter 6 examines the traffic generation and its impacts, and
- Chapter 7 presents the conclusions of the assessment.

1.2 References

The following documents have been referenced in the preparation of this traffic assessment:

- Roads and Maritime Service's Guide to Traffic Generating Developments (2002) and Technical Direction TDT2013/04a
- Australian Standard 2890.1 – 2004 Parking Facilities Part 1: Off-street car parking
- Australian Standard 2890.2 – 2002 Parking Facilities Part 2: Off-street commercial vehicle facilities
- Bitzios Consulting, 2017, Marrickville Metro Stage 1B Model and Calibration and Validation Report, Version 2 and VISSIM Model Outputs, and
- Other documents as referenced in the body of this report.

2 Existing Conditions

2.1 Site Description

The Site subject to this modification application comprises three principal land parcels:

- Marrickville Metro Shopping Centre located at 34 Victoria Road, Marrickville. This land has an area of approximately 3.57 hectares (Lot 100 DP 715231).
- 13-55 Edinburgh Road, which has an area of approximately 8,800sqm and is located to the south of Marrickville Metro, with frontage to Smidmore Street, Murray Street and Edinburgh Road. An industrial warehouse development currently occupies this land and this is the site of the approved shopping centre expansion (Lot 1 DP 612551).
- The section of Smidmore Street immediately to the south of Marrickville Metro, between Murray Street to the east and Edinburgh Road to the west. This is located between the existing shopping centre and the expansion site.

Marrickville Metro is a subregional shopping centre, approximately 7km from the Sydney CBD. The shopping centre consists of the major tenants of Kmart, Woolworths and Aldi and a range of speciality stores. The shopping centre is the largest retail shopping centre in the local region and attracts in the order of five million visitations per annum.

The current shopping centre is a substantially enclosed and internalised with pedestrian entries from Victoria Road to the north and Smidmore Street to the south. Pedestrian access is also provided from the rooftop car parking areas down into the centre. Existing open loading dock areas exist along the frontage of Murray Street and from Smidmore Street. Two vehicle access ramps accessed off Smidmore Street and Murray Street provide car access to the roof top parking.

Located on site adjoining the shopping centre is the "Mill House", which is a listed heritage item and currently used as the Centre Management Office. In addition, remnants of the 'Old Vickers Mill' façade remain along the Victoria Road frontage of the site.

The expansion to the shopping centre is consented on the 13-55 Edinburgh Road site, which is located on the opposite side of Smidmore Street to the south. The site is presently occupied by a two-storey factory/warehouse building that is built to the street frontages. Open grade car parking is located on the western side of the site.

An aerial photograph of the site is provided below as Figure 2.1.

Figure 2.1: Aerial Photograph of the Site

Source: Urbis

AMP Capital Investors (AMP) are the managers of the Shopping Centre and 13-55 Edinburgh Road on behalf of the owners Marrickville Metro Pty Ltd.

Smidmore Street which bisects the two AMP owned properties is a public road vested in Inner West Council as the local road authority. The reason that this land forms part of the proposal as there is proposed to be modifications to the road layout and street activation, whilst a new pedestrian bridge is proposed to span the road to connect the two parts of the shopping centre.

At the time of preparing this report, AMP and Inner West Council are in the process of finalising terms associated with the Agreement to Lease/Lease of the proposed bridge stratum.

2.2 Abutting Road Network

It is a common practice to classify roads in accordance to a road hierarchy system, in order to determine their functional role within the road network. Roads are classified according to the role they fulfil and the volume of traffic they should appropriately carry.

The Roads and Maritime Services (RMS) has set down the following guiding principles for the functional classification of roads:

- **Arterial Road** - typically a main road carrying over 15,000 vehicles per day and fulfilling a role as a major inter-regional link (over 1,500 vehicles per hour).
- **Sub-arterial Road** - defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles per day (500 to 2,000 vehicles per hour).
- **Collector Road** - provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles per day (250 to 1,000 vehicles per hour). At volumes greater than 5,000 vehicles per day, residential amenity begins to decline noticeably.
- **Local Road** - provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles per day (250 vehicles per hour).

Those along the site boundaries are collector or local roads which include Victoria Road to the north, Murray Street to the east, Edinburgh Road to the south of the existing site and south of the proposed expansion site, and Smidmore Street to the south of the existing site and north of the proposed expansion site.

A brief description of these roads is described below.

Edinburgh Road

Edinburgh Road is a two-way, local road with typically one lane in each direction with kerbside parking (combined unrestricted and time restricted parking), excepting auxiliary lanes at intersections via "No Stopping" restrictions and turning bays. It is located to the south and south-west of the Edinburgh Road site. It is signposted as 50km/h and carries up to approximately 800 vehicles per hour (vph) during the peak periods.

Victoria Road

Victoria Road, adjacent to the site is a two-way, local road. It aligns in an east-west direction along the northern boundary of the existing site. It is configured with one lane in each direction with kerbside parking (combined unrestricted and time restricted parking). Victoria Road near the western boundary of the existing Centre forms two cul-de-sacs. Only emergency vehicles are permitted to travel through the cul-de-sacs. Victoria Road is 50km/h road.

Murray Street

Murray Street is a local road aligned in a north-south direction and is situated along the eastern boundary of the site. It is a two-way road with kerbside parking (combined unrestricted and time restricted parking). Access into the existing site's car park and loading area is available from Murray Street. Murray Street is a 50km/h road.

Smidmore Street

Smidmore Street is a local road aligned in an east-west direction. It is located between the existing Marrickville Metro site and proposed Stage 1B building. It is configured as a two-way local road with unrestricted kerbside parking. Smidmore Street provides an access into the existing car park. Smidmore Street is a 50km/h road.

2.3 Existing Vehicle Access Arrangements

The existing site's car park has two vehicle access points:

- a two-way access on Smidmore Street, and
- a two-way access on Murray Street.

Vehicle access to loading docks are also located along Murray Street and Smidmore Street including one north of the Murray Street car park access and one east and west of the Smidmore Street car park access.

2.4 Traffic Surveys

Intersection turning movements counts have been conducted at nearby intersections on Thursday 1 June and Saturday 3 June 2017 as follow:

- Car park accesses on Smidmore Street and Murray Street
- Enmore Road-Edgeware Road
- Edinburgh Road-Smidmore Road
- Bedwin Road-May Street
- Victoria Road-Edinburgh Road
- Edgeware Road-Alice Street
- Victoria Road-Sydenham Street
- Enmore Road-Addison Road
- Enmore Road-Llewellyn Street
- Murray Street-Smidmore Street
- Edinburgh Road-Railway Parade
- Murray Street-Edinburgh Road
- Edinburgh Road-Fitzroy Street
- Edinburgh Road-Sydney Steel Street
- Shirlow Street-Sydenham Road
- Fitzroy Street-Sydenham Road
- Victoria Road-Murray Street

- Edgeware Road-Darley Street
- Edgeware Road-Smidmore Street
- Edgeware Road-Wells Street
- Edgeware Road-Victoria Street
- Victoria Road-Mitchell Street
- Victoria Road-Chandler Street
- Victoria Road-Chapel Street
- Cook Road-Victoria Road, and
- Enmore Road-Victoria Road.

2.5 Public Transport

The Centre is within close proximity to frequent bus and train services. A bus stop located at the Centre's doorsteps on Smidmore Street along the southern boundary of the existing site. St Peters Railway Station is located within a 10-minute walk to the east and Sydenham Railway Station which is located within a 15-minute walk to the south.

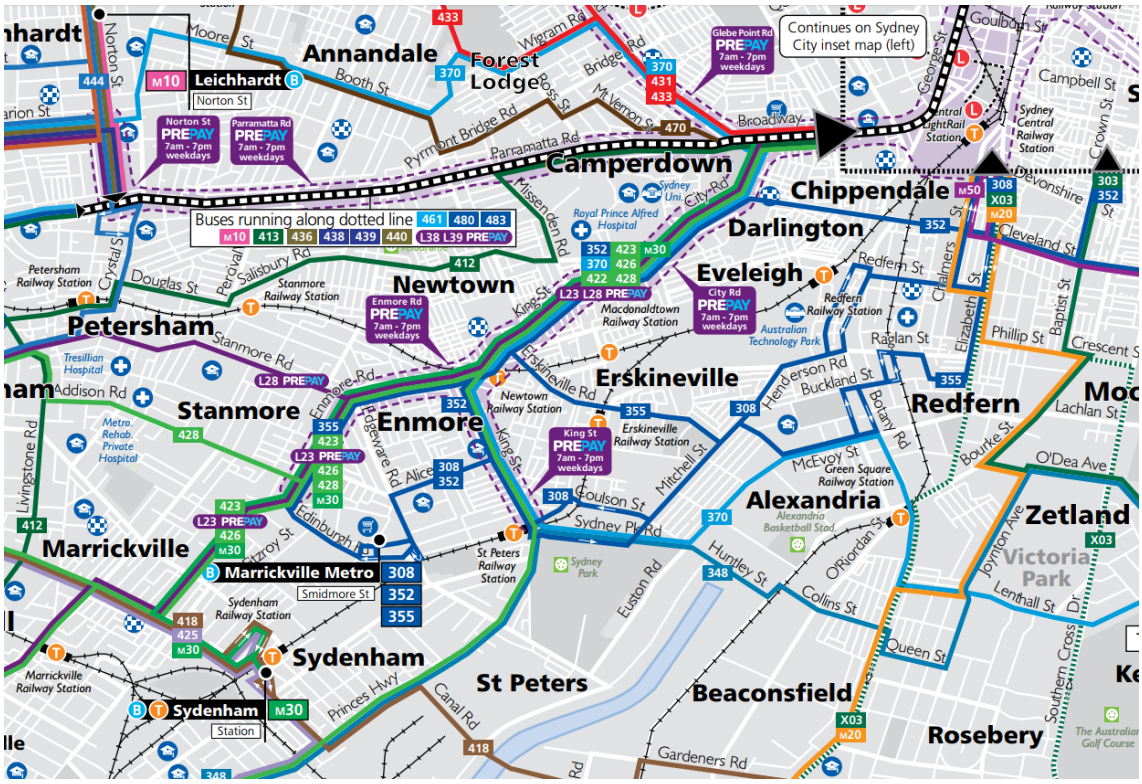
St Peters Railway Station is serviced by the T3 Bankstown Line and provides services every ten to 15-minutes in both directions. Sydenham Railway Station provides services along the T2 Airport, Inner West and South Line, T3 Bankstown Line, and T4 Eastern Suburbs and Illawarra line, with frequencies of five to 15-minutes during the peaks.

The routes serviced by the bus stop on Smidmore Street include:

- 308 Marrickville Metro to City Gresham Street via Redfern
- 352 Marrickville Metro to Bondi Junction via Oxford Street, Crown Street & King Street, and
- 355 Marrickville Metro to Bondi Junction via Moore Park & Erskineville.

These bus services are provided at approximately 15 to 30-minutes intervals. The bus network surrounding the site is shown in Figure 2.2.

Figure 2.2: Bus Network



Source: https://transportnsw.info/document/1694/region-guide-sydney-inner-west-south.pdf, accessed 25/08/17

2.6 Sydney Metro

The NSW Government implementing a new a new standalone, 66-kilometre railway line from Epping to Bankstown via Chatswood. It will include a new line between Epping to Sydenham and will convert the existing railway line between Sydenham and Bankstown to Metro standards. The Metro line will include 31 stations including an upgraded Sydenham Station which is located approximately 1.3-kilometres from the site.

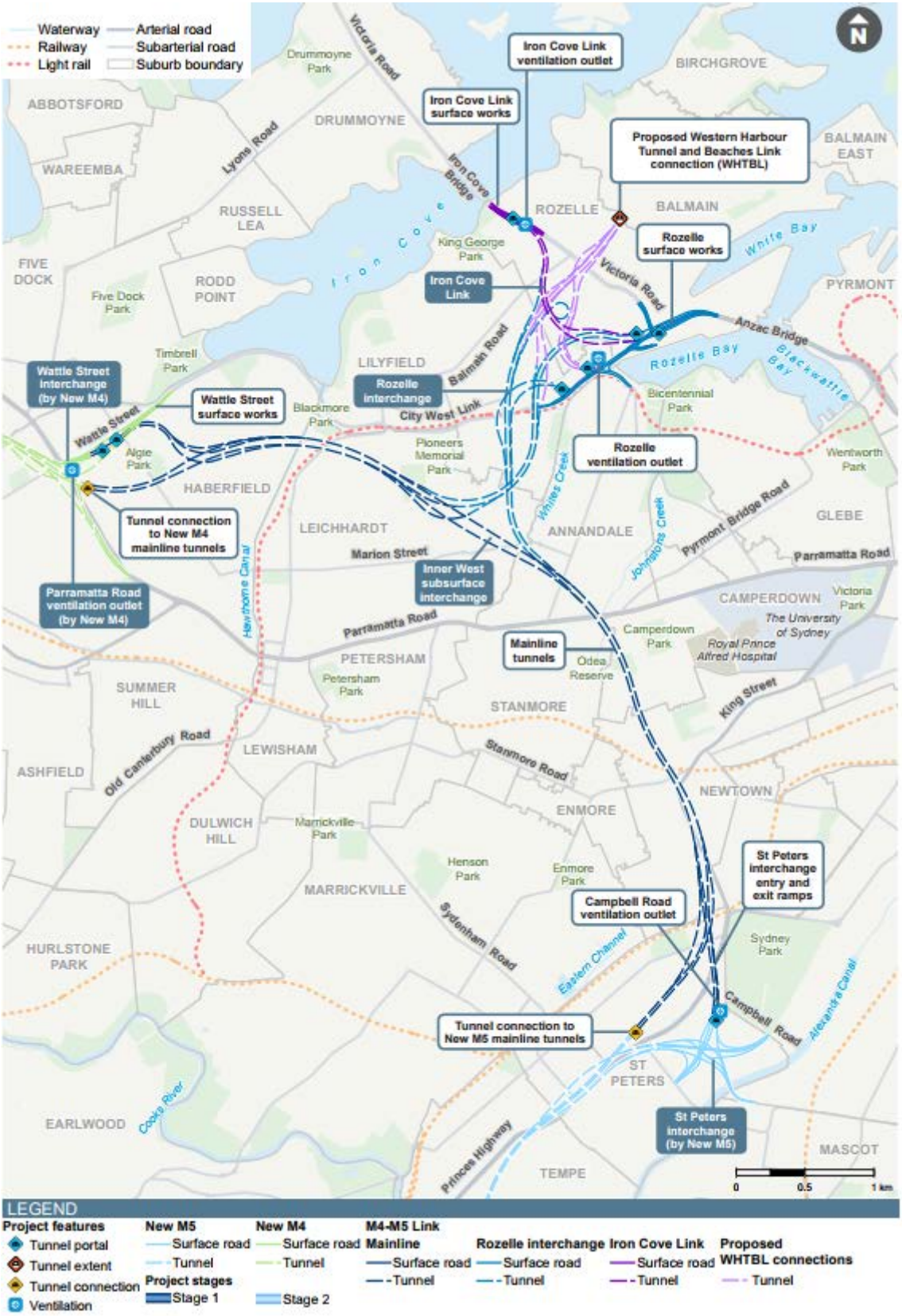
The Metro has an anticipated opening of 2024. Following opening, the Metro is anticipated to provide rail services every four minutes during the peak and 15 minutes off-peak.

2.7 WestConnex

The NSW Government is implementing major motorway network upgrades in Sydney to support future population growth in the city. Known as the WestConnex project, the upgrades include a new link between the M4 and M5 Motorways, which would include a new interchange at St Peters with associated entrance and exit ramps.

The local context of the proposed WestConnex project is shown in Figure 2.3.

Figure 2.3: WestConnex – Local Context and Surrounds



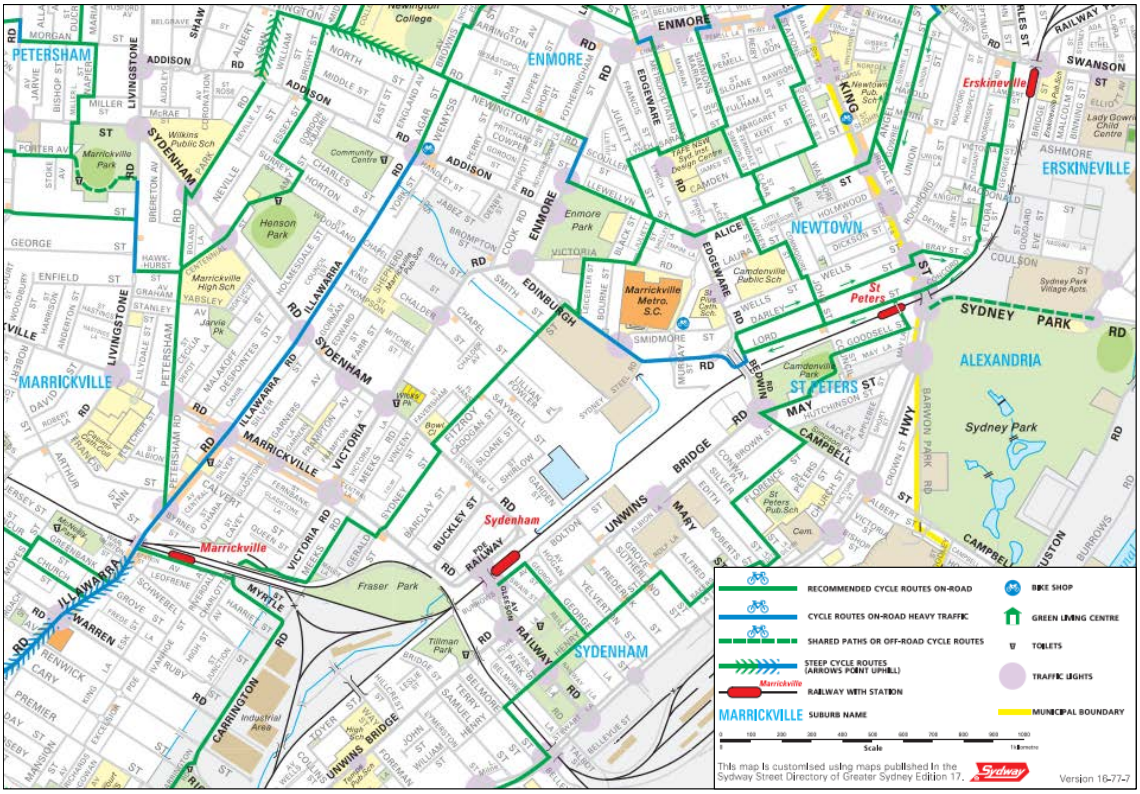
Source: https://www.westconnex.com.au/M4-M5LinkEIS, accessed 11/10/17

2.8 Cycling

Existing cycling facilities around the site includes bicycle parking racks located on Smidmore Road at adjacent to the existing bus stop along Marrickville Metro.

Cycling routes to the site are generally on-road on local roads as shown in Figure 2.4.

Figure 2.4: Cycle Network



Source: https://www.marrickville.nsw.gov.au/en/community/transport-and-infrastructure/cycling/, accessed 04/09/17

3 Authority Consultation

TTPP has consulted the Roads and Maritime Services (RMS) and the Inner West Council. Below is a summary of the consultation process.

Separate meetings were held with representatives from RMS and Inner West Council. In both meetings, RMS/Council were briefed on the history of the previous approval including an overview of the approved development thus far. This was followed by a description of the proposed modifications in the S75W application which are consistent with those outlined in this traffic assessment. In the meetings, TTPP also explained the proposed traffic modelling methodology.

To conclude the meeting, agreement was sought for the proposed traffic assessment methodology and the agreement in principle on the proposed changes to road arrangements on Smidmore Street and Edinburgh Road.

3.1 Roads and Maritime Services

RMS has written back to TTPP confirming that RMS agrees with the scope of the traffic assessment described to them during the meeting. However, RMS raised their concerns in relation to the proposed right turn entry on Edinburgh Road. RMS is concerned that the right turn queue may overflow into the adjacent lane and blocking westbound through traffic.

TTPP agreed with RMS to examine in closer detail of any potential of vehicle queueing blocking through traffic on Edinburgh Road.

This assessment is detailed in Section 6.7 of this report. The results of the assessment suggest that the right turn queue would not have adverse impacts, with the road network continuing to operate satisfactorily.

3.2 Inner West Council

Inner West Council commented that development traffic arising from major infrastructure projects in the area will need to be taken in account. This is discussed further in Section 6.3 of this report.

4 Proposed Development Description

4.1 The Proposed Modifications

The application relates to a Section 75W to modify certain elements of the approval granted in March 2012 for Stage 1B of the proposed development, namely the new retail building on the Edinburgh Road site. The proposed modifications generally relate to refinement and enhancement of the approved design to improve the design quality of the proposed building.

The proposed modifications are illustrated on the Architectural Plans and comprise the followings:

- a revised retail layout within the new shopping centre building proposed under Stage 1B (Edinburgh Road site), including amended travellator locations, new food and beverage uses at ground level, reconfigured shop units and alterations to the upper floor parking layout
- alterations to the building façade on Smidmore Street, amendments to materials used in elevations and minor increase in height of the new shopping centre building to facilitate upper floor parking, along with rooftop plant and equipment
- extending operating hours for a limited number of shops on the ground floor to encourage night time activation for the food and beverage shops
- erection of a new pedestrian bridge linking Level one of the new shopping centre building to the existing shopping centre
- an amended road alignment and modification to the vehicular route on Smidmore Street to implement a new one-way access off Murray Street
- introduction of a right turn entry into the new building from Edinburgh Road
- redistribution of car space provisions across the development without increasing the overall permitted car parking numbers
- introduction of paid parking across the site
- redistribution of the floor area across the site without increasing the overall permitted floor area, and
- introduction of signage/signage zones on the development along with a potential zone for mural(s) on the frontage.

Following the completion of the proposed modifications in this S75W application, the overall Centre will continue to have a total gross leasable floor area (GLFA) of 39,700m^2 (increasing from 22,933m^2 GLFA by 16,767m^2 GLFA) as per the March 2012 approval. Similarly, the overall car parking provision will remain at 1,606 car parking spaces as per the original approval.

However, it is noted that the Stage 1B building will now have approximately 11,100m² GLFA instead of the previous approved floor area which was in the order of 10,000m² GLFA (but the overall additional floor area will continue to be 16,767m² GLFA). The Stage 1B building will also have a corresponding increase in car parking, while maintaining a maximum parking provision of 1,606 spaces.

It is noted that the previous approval includes a condition stipulating a total car parking provision of 1,606 spaces. This S75W seeks to modify the relevant consent condition to prescribe the required 1,606 car parking spaces as being a maximum permissible car parking allowance instead of an exact fixed parking allowance.

4.2 Staging of Development

The MOD2 application which was approved in April 2015 contained an updated development staging programme. As a result of this, the following stages of development are consented.

4.2.1 Stage 1A

The proposed early stage of works or Stage 1A of the development would focus on the Victoria Road entrance and comprise:

- an upgrade to the portion of the existing building façade facing Victoria Road, which will include a minor increase in floor area which occurs with the new alignment of the external walls of the building
- an upgrade to the main entry in the shopping centre
- new paving and landscape treatment to 'Civic Place'
- archival recording of the Mill House [as required by Condition C7 of the original approval]
- preservation of the existing brick footpath [required by Condition E7 of the original approval], and
- traffic management works and with some associated stormwater management works [required by Conditions B15(f), B15(g) and B17].

The above works which formed Stage 1A were completed in March 2017.

4.2.2 Stage 1B

Stage 1B would comprise the new building on the Edinburgh Road site, which will become an extension of the existing Marrickville Metro Shopping Centre, and alterations to the portion of the existing building on or near Smidmore Street, as this area has a physical relationship with and provides the pedestrian connection to the new shopping centre extension.

4.2.3 Stage 2

Stage 2 would continue to be the balance of the work proposed for the redevelopment of the existing shopping centre building, including an additional retail floor at first floor level and additional rooftop car parking.

This S75W modification application principally concerns Stage 1B of the proposed development.

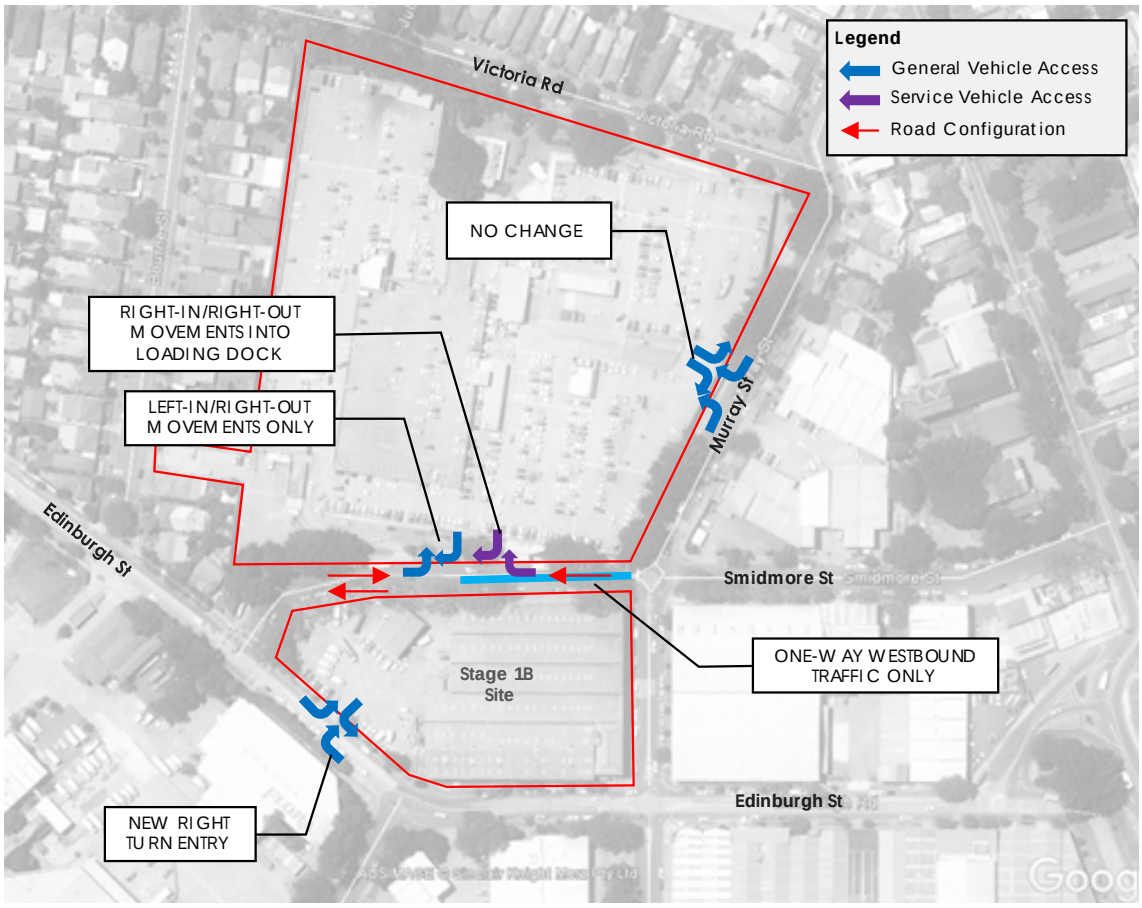
4.2.4 Proposed Modifications Relating to Traffic and Parking

The S75W modification includes the following proposals as relevant in this traffic assessment:

- Smidmore Street is to be converted to one-way between Murray Street and the site access with the Smidmore Street access permitting left in traffic movements from and right out traffic movements to Smidmore Street
- a new right turn entry into the new building on Edinburgh Road (in addition to the approved left-in/left-out configuration), and
- redistribution car parking provision.

The proposed modifications to the site access arrangements and surrounding road network is identified in Figure 4.1. Figure 4.2 and Figure 4.3 provide additional details for the proposed changes to road arrangements on Smidmore Street and Edinburgh Road respectively.

Figure 4.1: Modifications to Vehicle Access



Aerial Source: Land and Property Information

4.3 Smidmore Street Proposed Arrangements

The approved arrangement for Smidmore Street includes a new signalised pedestrian crossing on Smidmore Street between pedestrian entrances into the Centre. The road carriageway of Smidmore Street would otherwise be maintained as existing.

The S75W application seeks approval to amend the Smidmore Street arrangement to improve and enhance pedestrian amenity on Smidmore Street. The proposal seeks to reduce vehicle volumes to facilitate a reinvigorated public domain and pedestrian friendly environment with a new pedestrian crossing on Smidmore Street connecting the new pedestrian entrance to the existing Centre.

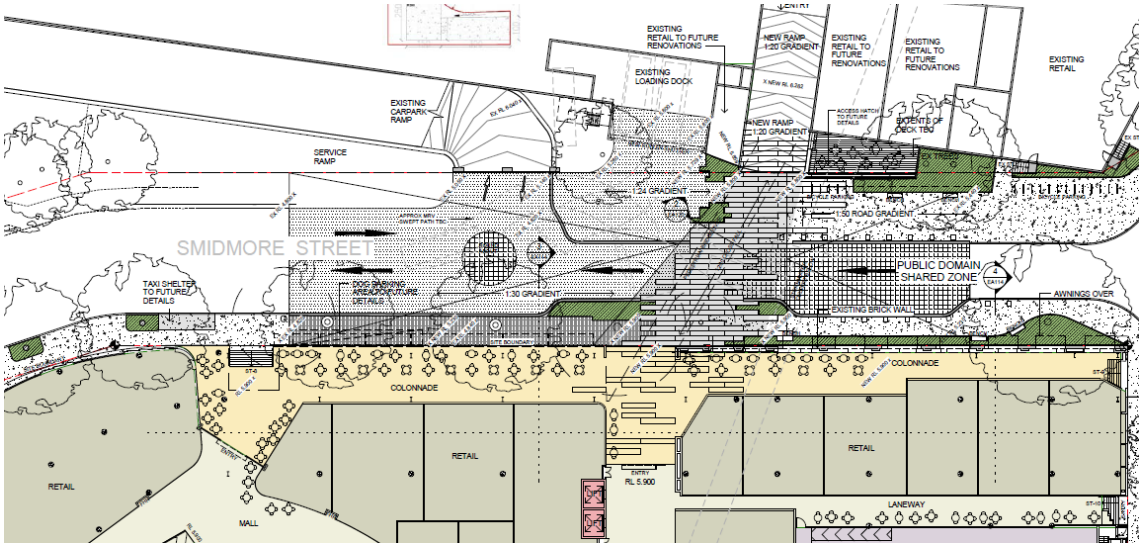
The proposed Smidmore Street arrangement would involve a one-way westbound road between Murray Street and the existing vehicular access. To facilitate the arrangement, the existing driveway would be realigned to prevent a left-turn out of the site. A roundabout is also proposed at the Smidmore Street access driveway.

The one-way operation would also enable widening of the footpaths on Smidmore Street. Access to the adjacent existing loading dock would be maintained, via right-in/ right-out movements.

The proposed modifications to road arrangement on Smidmore Street would replace the conditioned signalised pedestrian crossing and other pedestrian measures in the previous approval.

The proposed layout is shown in Figure 4.2.

Figure 4.2: Smidmore Street Proposed Road Arrangements



Source: Hames Sharley, 11/10/17

4.4 Edinburgh Road Proposed Arrangements

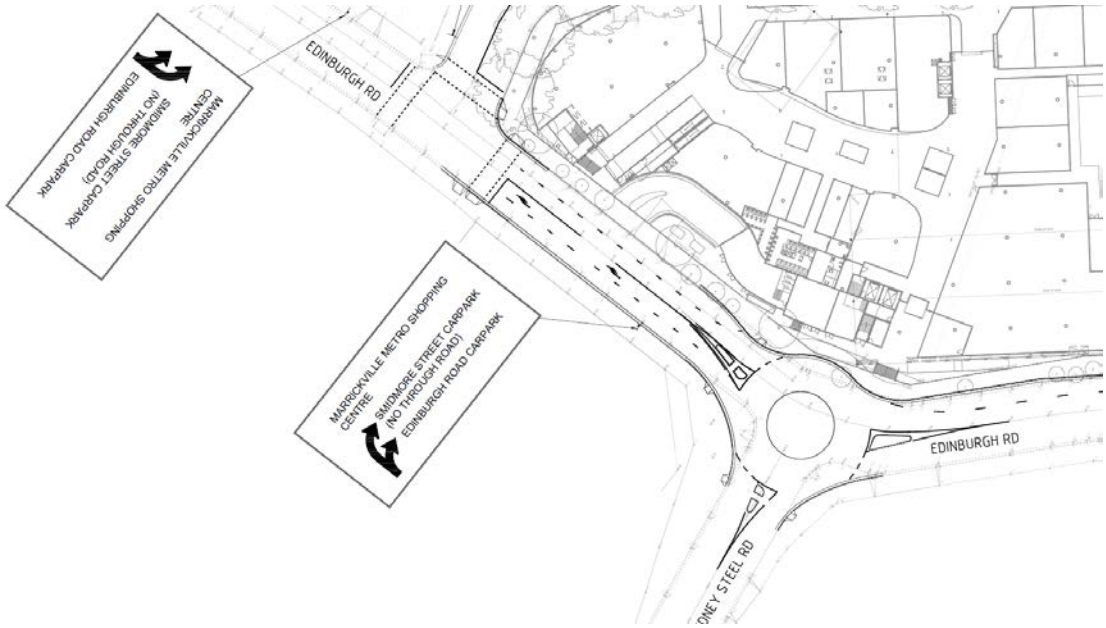
The S75W application seeks approval to modify the approved left-in/left-out access on Edinburgh Road to also permit right turn vehicle movement from Edinburgh Road.

To facilitate the proposed right turn access, it is proposed to remove the kerbside parking lane on the southern side of Edinburgh Road between Smidmore Street and Sydney Steel Road to create two traffic lanes for westbound traffic along Edinburgh Road. The new kerbside lane would become a through traffic lane for westbound traffic, while the second lane would provide two continuous right turn bays providing access to Stage 1B car park and Smidmore Street.

The pedestrian footpath on Edinburgh Road would be retained. The proposed site access on Edinburgh Road is not expected to create any adverse impacts to pedestrian amenity.

The proposed layout is shown in Figure 4.3.

Figure 4.3: Edinburgh Road Proposed Road Arrangements



Source: Cardno (Civil Engineering Assessment)

5 Parking Assessment

5.1 Car Parking

In their assessment of the previous approval, the Department of Planning & Environment (formerly the Department of Planning & Infrastructure) adopted the parking rates from the RMS' *Guide to Traffic Generating Development*. The RMS guidelines recommended a car parking provision rate of 4.1 spaces per 100m^2 of gross leasable floor area (for a 30,000m^2 GLFA or more shopping centre).

On this basis, the Department at the time estimated that the approved development (with a total floor area of 39,700m^2 GLFA) will require a total of 1,628 car parking spaces to be provided. However, the Department also approved at the time a reduction of 22 car parking spaces i.e. the overall approved car parking is 1,606 car parking spaces.

As indicated previously, this S75W application is not proposing to alter the approved floor area and car parking provision. The overall development will continue to have a total of floor area of 39,700m^2 GLFA as per the approval. On this basis, the proposed development continues to propose a total of 1,606 car parking spaces to serve the proposed expanded Marrickville Metro Shopping Centre consistent with the previous approval.

Notwithstanding the above, applying the above parking rate (4.1 spaces per 100m^2) to Stage 1B proposed development with a new floor area of 11,156m^2 GLFA would require a parking provision of 457 car parking spaces.

The S75W proposes to provide a total of 493 car parking spaces within Stage 1B building. Noting that from a recent parking inventory survey, the existing Centre contains 1,018 spaces, therefore when Stage 2 is developed it will provide another 95 car parking spaces to make up the approved 1,606 car parking spaces. As such, following the completion of Stage 1B and Stage 2 development the overall car parking provision would continue to be 1,606 car parking spaces as per the previous approval.

In this regard, the parking provision proposed as part of this application is considered satisfactory.

5.2 Motorcycle Parking

As per the current approval, 42 motorcycle parking spaces are to be provided for the entire development. Of the 42 required motorcycle parking spaces, Stage 1B is required to provide nine motorcycle parking spaces.

This S75W is not proposing to alter this requirement. It will continue to provide nine motorcycle parking spaces in Stage 1B.

5.3 Bicycle Parking

The current approval requires a minimum of 142 secure bicycle parking spaces to be provided for the entire proposed development. Of this, 80 spaces are required to be located within Stage 1B.

This S75W is not proposing to modify this requirement. It will continue to provide 80 bicycle parking spaces.

5.4 Car Parking Layout

The proposed modifications/additions to the car park and associated elements are proposed to comply with design requirements set out in the relevant Australian Standard for car parking facilities, namely AS2890.1:2004 and AS2890.6:2009.

Specifically, AS2890.1:2004 requires retail car parking spaces to have dimensions of 2.6m wide by 5.4m long with an aisle width of 6.6m wide.

Similarly, AS2890.6:2009 which relates to the design of accessible car spaces for people with mobility impairments, requires both the accessible car parking spaces and the adjacent shared area to each have dimensions of 2.4m wide by 5.4m long with an aisle width of 5.8m wide.

The proposed Stage 1B car park has been designed to comply with the above design requirements (from the Australian Standard).

The architectural car park layout plans are provided in Appendix A.

In addition, the car park has been designed to allow the circulation of a 7.45m long trolley truck.

A swept path assessment of the proposed car park is provided in Appendix B.

It is however, envisaged that a condition of consent would be imposed requiring compliance with these standards and as such, any minor amendments can be dealt with prior to the issue of a Construction Certificate.

5.5 Loading Dock Facilities

As per approval, a new loading dock is proposed in the new building (Stage 1B), to be accessed from Murray Street. The new loading dock would have provision for the following:

- four van spaces (5.4m long by 2.6m wide)
- one medium rigid vehicle bays (8.8m long by 3.5m wide)
- three heavy rigid vehicle bays (12.5m long by 3.5m wide)

- one semi-trailer bay (19m long by 3.5m wide), and
- three compactors.

It is noted that the architectural plan of the loading dock in the approved development indicates the following service vehicle bay provision:

- one van space
- three small rigid vehicle bays (6.4m long by 3.5m wide)
- two heavy rigid vehicle bays
- one semi-trailer bay, and
- three compacts.

Deliveries would be made through the day.

From the above, it can be seen that the proposed service vehicle bay provision in this S75W application exceeds the proposed provision in the original approval.

It is proposed to design the loading dock and service vehicle bays to comply with the requirements set out in Australian Standard AS2890.2:2002.

In addition, a plan of management would be prepared and implemented to ensure that the loading dock is operating as efficient and safe as possible. The plan of management would ensure that deliveries to the Centre are spread throughout the day consistent with the available capacity of the loading dock. Measures in the plan of management may include a condition that stipulates deliveries to the site are to be undertaken only during an allocated time slot booked in advance with the dock manager. Each delivery would be restricted to a time interval of 30 minutes or less in which the vehicle would arrive, load/unload and then depart. These measures would be enforced through the drivers reporting to the dock manager on arrival and departure. The dock manager would have the authorities to reject any deliveries if the suppliers/delivery drivers can not comply with the above measures and/or any other additional measures and/conditions imposed to the suppliers by the centre management. The tenants would also need to be made aware and agree to the measures/conditions in relation to the use of the loading dock.

The loading dock is expected to generate the following number of traffic movements per day:

- 19.0m semi-trailer - up to 10 deliveries per day
- 12.5m rigid vehicle - up to 24 deliveries per day
- 8.8m rigid vehicle - say 5 deliveries per day
- vans etc - say 25 deliveries per day, and
- compactors – varies from day to day (up to five per week).

As such, the proposed loading provision is considered to be satisfactory. Appendix B contains swept path diagrams of the loading dock.

5.6 Queue Length Assessment

An assessment of the entry queue lengths and queuing provisions was undertaken to ascertain whether there is suitable queuing capacity at the proposed control gate locations and ensuring queuing would not extend onto the external road system.

It is possible that the proposed car parking areas could be controlled by ways of boom gates with automatic ticket issue machines. However, it is also noted that the development of the project is still ongoing. In addition, technological advance in the area of car park control system and equipment in recent years resulted in more and more car parks being managed using number plate recognition and ticketless technology.

However, as a worst-case scenario, assessment has been conducted to ascertain the potential of vehicle queues associated with the arrival rate of vehicles and the service rate of a manual car park control system where boom gates would be used.

Australia Standard, AS2890.1:2004 states that a single control gate at an access with an automatic ticket issue and boom gate would have a capacity of around 300 vph per lane. This has been adopted as the service rate.

The potential queue lengths arising from a car park control system have been determined using traffic queueing theory based on probability principles for a multi-channel queuing system as described in the Transportation and Traffic Engineering Handbook (ITE), together with the above Australian Standard service rate.

The assessment was undertaken assuming a 6m length for each vehicle within the queuing lane (AS2809.1). The estimated available queuing storage area did not include ramped sections of the queuing lane as a conservative approach.

This way the 50th (average) and 95th percentile queues on the access ramp from Edinburgh Road to the Stage 1B site, have been calculated as follows:

Table 5.1: Estimated Queues at Entry Boom Gates

Entry Location	Peak Hour Flow (vph)§	No. of Boom Gates	Combined Gate Capacity (vph)	Average Queue (Veh)	95th Percentile Queue (Veh)	Available Queue Space (Veh)
Edinburgh Road	331	2	600	2	6	9

§ denotes the maximum of the Thursday and Saturday peak hour flows.

From the analysis, there would be sufficient queue storage space within the car park to accommodate the 50th and 95th percentile queues.

Notwithstanding the above, a ticketless parking control system may be installed at the Centre which would reduce vehicle queues to minimal.

6 Traffic Assessment

6.1 Traffic Generation

RMS *Guide to Traffic Generation Developments* and its recent update in Technical Direction TDT 2013/04a documents extensive survey data at shopping centres across Sydney and NSW. The data indicates that traffic generation is generally relative to a centre's given leasable floor area, i.e. the larger the shopping centre, the lower the traffic generation rate.

The suggested traffic generation rates from the updated traffic generation survey data (in TDT 2013/04a) are shown in Table 6.1. The applicable rates relating to the existing and proposed expanded Centre are shown in italic bold fonts in Table 6.1.

Table 6.1: RMS TDT 2013/04a Traffic Generation Rates

Range in Total Floor Area (GLFA)	RMS Peak Hour Generation Rate (vph per 100m² GLFA)	
	Thursday Evening	Saturday Late Morning/Early Afternoon
0 – 10,000m²	12.3	16.3
10,000 – 20,000m²	6.2 – 7.6	7.5
20,000 – 30,000m²	***5.9 – 6.0***	***7.0 – 7.5***
30,000 – 40,000m²	***4.6***	***6.1***
40,000 – 70,000m²	4.4	5.5
70,000m²+	3.1	3.6

From Table 6.1, the traffic generation rates for a generic shopping centre with a floor area between 20,000m² to 30,000m² are 5.9 to 6.0 and 7.0 to 7.5 vehicle trips per peak hour per 100m² for Thursday and Saturday peak periods respectively. These rates would be applicable to the existing Centre.

For a generic shopping centre with a floor area between 30,000m² to 40,000m², the equivalent Thursday and Saturday traffic generation rates are 4.6 and 6.1 vehicle trips per peak hour per 100m² respectively. These rates would be applicable to the Centre after it is expanded.

To better understand the traffic generating characteristic of the Marrickville Metro Shopping Centre, traffic generation surveys have been conducted at the Centre in June 2017. Based on the traffic generation surveys, the existing Centre traffic generation during the Thursday and Saturday peak periods are summarised in Table 6.2, with their associated trip generation rates.

Table 6.2: 2017 Existing Generated Traffic at Marrickville Metro

	Thursday Peak Hour	Saturday Peak Hour
Traffic Generation (veh/hr)	1,149 vehicles per hour	1,646 vehicles per hour
Trip Rate (veh/hr/100m² GLFA)	5.0 vehicle trips per hour	7.2 vehicle trips per hour

From the traffic generation surveys, the existing Centre has been surveyed to generate approximately 1,149 vph and 1,646 vph during the Thursday evening and Saturday late morning/early afternoon peak periods respectively. These represent trip generation rates of 5.0 and 7.2 trips per hour per 100m² GLFA for the Thursday and Saturday peak periods respectively. It is further noted that the surveyed rate for the Saturday peak is relatively consistent with the RMS traffic generation rates for a generic shopping centre of similar size. On the Thursday peak, the surveyed rate is approximately 84 per cent of the RMS traffic generation rate for a similarly sized shopping centre.

Based on the above comparison, RMS traffic generation rates have been applied to the expanded Centre for the Saturday peak without any adjustments. However, from the above comparison the traffic generation of the existing Centre for Thursday peak period has been surveyed to generating only approximately 84 per cent of the expected traffic generation for a generic centre using RMS traffic generation rate. As such, it is appropriate to apply a factor to the RMS generic traffic generation rates at 30,000m² to 40,000m² to derive an appropriate traffic generation rate for the expanded Centre for the Thursday peak period. This is shown in Table 6.3.

Table 6.3: Trip Generation Comparison (Vehicle Trips per Peak Hour per 100m² GLFA)

	Thursday Peak Period	Saturday Peak Period
Existing Centre (Survey Based) @ 22,900m²	5.0 vehicle trips per hour	7.2 vehicle trips per hour
RMS Generic Centre (20,000 – 30,000m²)	5.9 – 6.0 vehicle trips per hour	7.0 – 7.5 vehicle trips per hour
Surveyed/RMS Rate Factor	0.84	1.0
RMS Generic Centre (30,000 – 40,000m²)	4.6 vehicle trips per hour	6.1 vehicle trips per hour
Post Expansion (Stages 1B + 2 @ 39,700m² (RMS Rates with Factor Applied)	3.8 vehicle trips per hour	6.1 vehicle trips per hour

Table 6.4 summarises the estimated development traffic for the expanded Centre together with the 2017 surveyed traffic generation.

Table 6.4: Estimated Traffic Generation

Stage	Estimated Development Traffic			
	Thursday Evening Period		Saturday Peak Period	
	Traffic Rates	Traffic Flows	Traffic Rates	Traffic Flows
Existing	5.0 per 100m²	1,149 vph	7.2 per 100m²	1,646 vph
Post Expansion (Stages 1B + 2)	3.8 per 100m²	1,527 vph	6.1 per 100m²	2,422 vph
Net Additional Traffic	-	378 vph	-	776 vph

Following the completion of Stage 2 development, the Centre is expected to generate 1,527 vph and 2,422 vph during the Thursday evening peak period and Saturday peak period respectively. Therefore, the net additional traffic is 378 vph and 776 vph during the Thursday and Saturday peak periods respectively.

In terms of the daily traffic generation, the RMS guide provides daily traffic generation rates for Thursdays, and indicates a similar relationship between the daily trip rate and the leasable floor area i.e. the traffic generation rate reduces with an increase of the leasable floor area. The RMS guidelines indicate that a shopping centre of 30,000m^2 to 40,000m^2 GLFA would generate 50 vehicles per day per 100m^2 on a Thursday. On this basis, the Centre following the completion of the proposed expansion would generate 16,700 vehicles per day.

However, it is noted that the greatest effects of the proposed development would be during the Thursday and Saturday peak periods as discussed above. The traffic effects during these peak periods are assessed further in the sections below.

6.2 Distribution of Development Traffic

6.2.1 Directional Distribution

The above estimated development traffic are two-way combined traffic flows. It is expected that the development traffic accessing the Stage 1B development would be distributed between the inbound and outbound directions evenly for both peak periods. For traffic accessing the Centre via the two existing access points, the surveyed distribution would be retained. Table 6.5 presented the distributed traffic flows for the overall Centre.

Table 6.5: Directional Distribution of Estimated Traffic

Stage	Estimated Development Traffic (vph)					
	Thursday Evening Period			Saturday Peak Period		
	In	Out	Two-way	In	Out	Two-way
Post Expansion (Stages 1B + 2)	698	829	1,527	1,231	1,191	2,422

6.2.2 Distribution to the Site Accesses

The development traffic arising from Stages 1B and Stage 2 proposed expansion has been distributed to the three access points of the site, that is, Edinburgh Road access, Smidmore Street access and the Murray Street access.

The distribution of traffic has been firstly based on the proportion of parking provided within the new Stage 1B building and existing building, and secondly based on the existing distribution of traffic between the two existing accesses; Smidmore Street and Murray Street.

The Stage 1B site accommodates approximately 30 per cent of the overall parking provision of the expanded Centre. The 2017 traffic generation survey of the existing Centre indicates that traffic is generally evenly split between the Smidmore Street and Murray Street accesses.

Based on this, 30 per cent of the estimated traffic generation is assumed to utilise the Edinburgh Road access and associated car park, while the remaining would be evenly spread between the two existing access points i.e. 35 per cent at each access point.

The traffic distribution by site access is summarised in Table 6.6.

Table 6.6: Traffic Distribution by Site Access

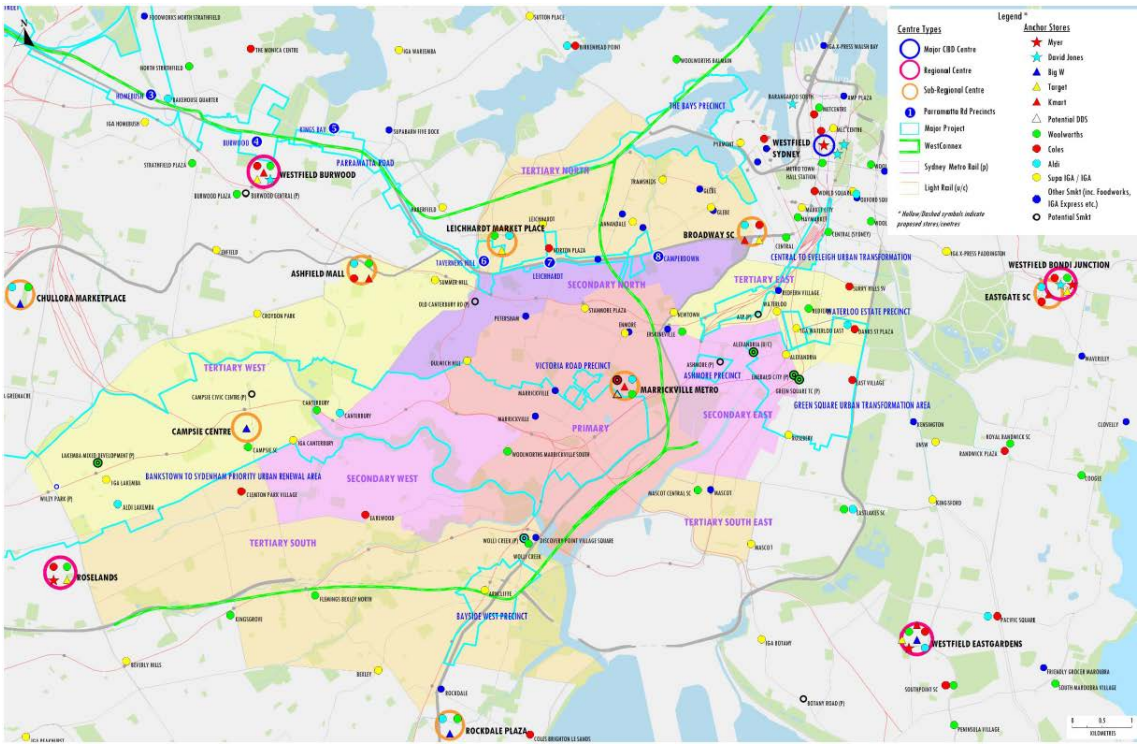
Stage	Thursday Peak Hour (vph)				Saturday Peak Hour (vph)			
	Edinburgh Street	Murray Street	Smidmore Street	Total	Edinburgh Street	Murray Street	Smidmore Street	Total
Existing	-	581	568	1,149	-	850	796	1,646
Post Expansion (Stages 1B + 2)	378	581	568	1,527	662	880	880	2,422

6.2.3 Distribution to the External Road Network

The development traffic arising from Stages 1B and Stage 2 proposed expansion has been distributed to the local road network based on where the retail customers live (catchment areas) and the approach routes for these catchment areas.

AMP has engaged MacroPlan Dimasi to conduct an economic assessment of the Marrickville Metro. This assessment indicates that the Marrickville Metro trade area includes one primary sector, three secondary sectors and five tertiary sectors. These trade areas are depicted in Figure 6.1.

Figure 6.1: Marrickville Metro Trade Areas



Source: MacroPlan Dimasi

The economic assessment also examined the total sales of the expanded centre from each trade area as follow:

- Primary 48.5%
- Secondary North 8.5%
- Secondary East 5.0%
- Secondary West 8.1%
- Tertiary North 2.1%
- Tertiary East 1.4%
- Tertiary South east 5.1%
- Tertiary South 0.1%
- Tertiary West 1.0%, and
- Beyond 20.1%.

Key approach routes to each trade are were then examined to estimate how traffic travelling to/from the trade centre would distribute to the local road network based on the volume of traffic on each route as a proportion of the total traffic on all key routes serving the same catchment/trade area.

The centre sales percentages from above and approach route proportions were then multiplied together to provide traffic distribution factors. The derived distribution factors

are shown in Figure 6.2 and Figure 6.3 respectively for Thursday and Saturday peak periods respectively.

Figure 6.2: Thursday Evening Traffic Distribution Factors

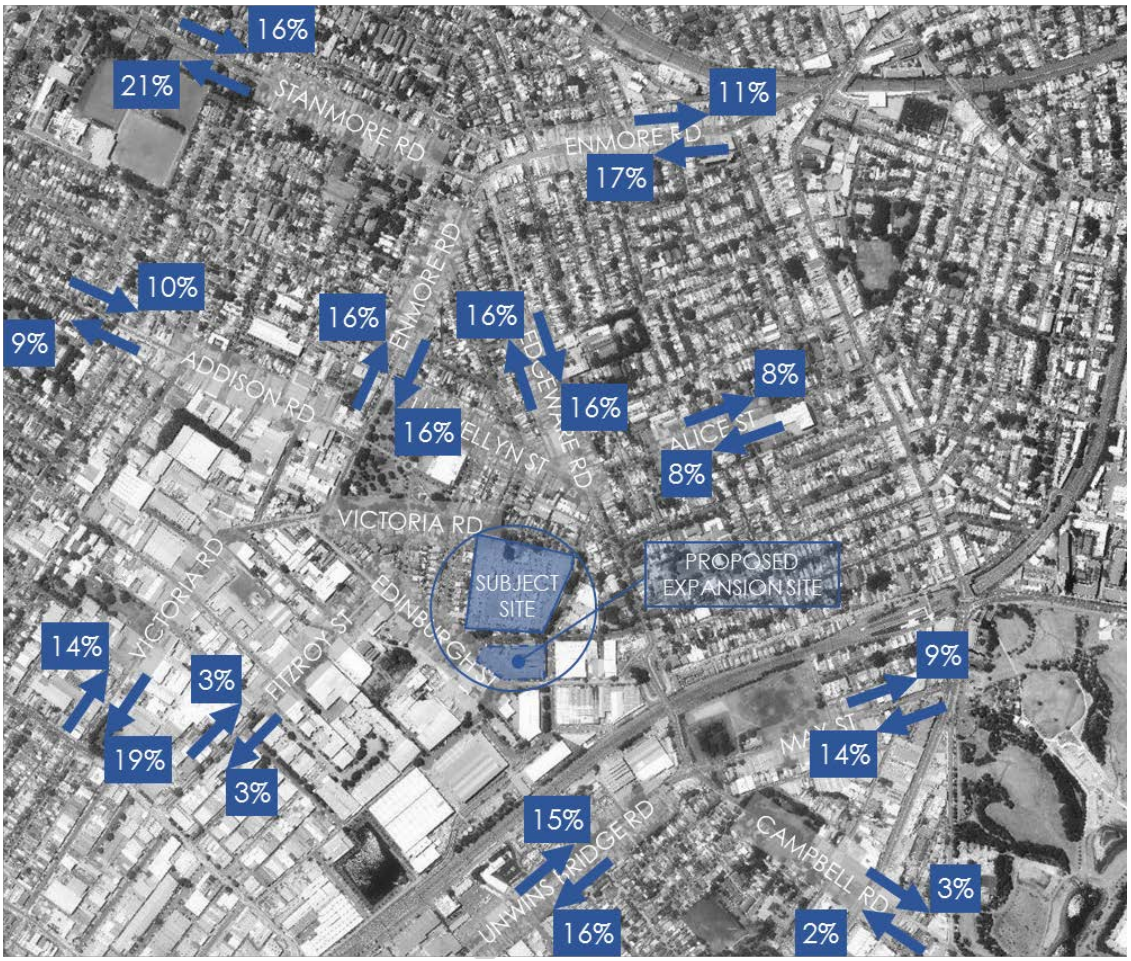
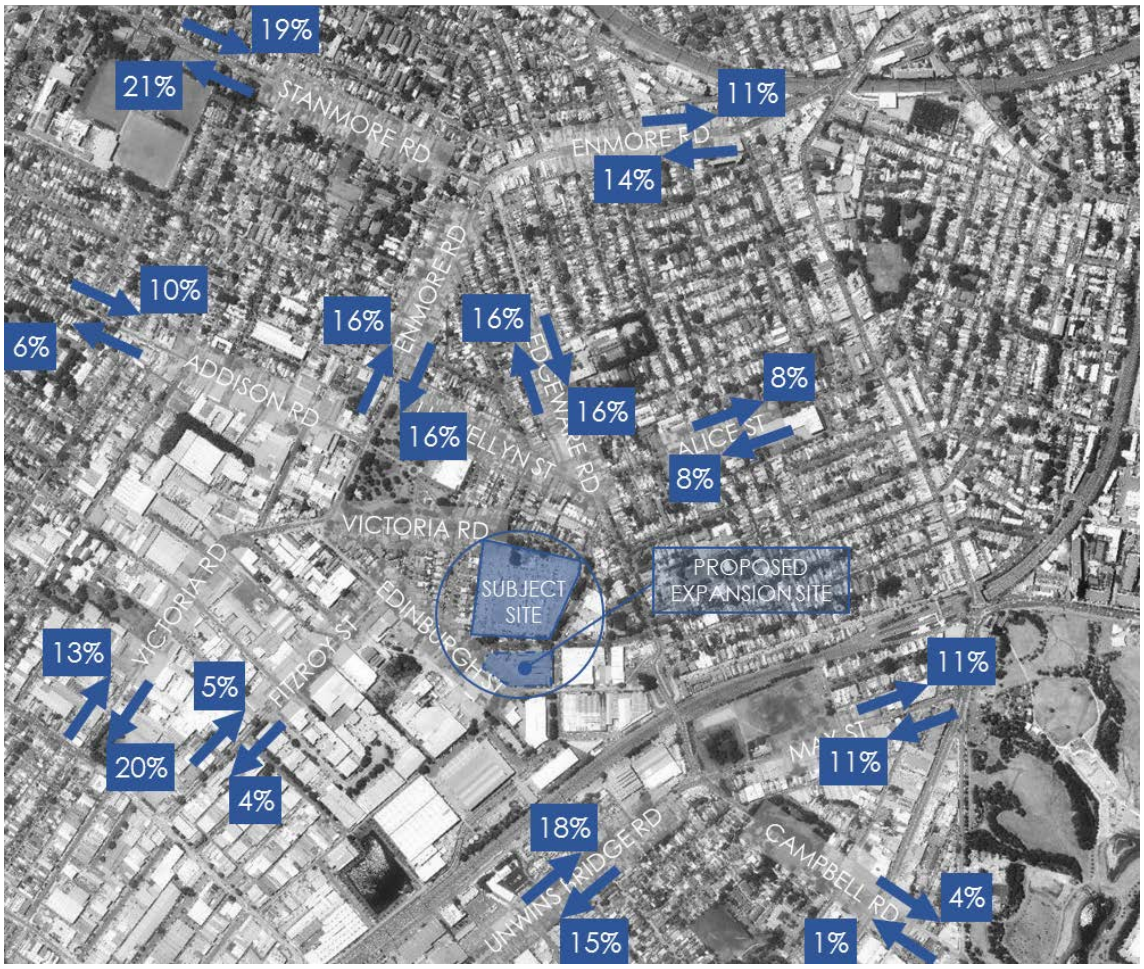


Figure 6.3: Saturday Peak Period Traffic Distribution Factors



6.3 Background Traffic Growth

It is typical to model a 10-year horizon scenario with consideration of the future road network and associated background traffic growth.

Outputs from the 2016 and 2026 strategic traffic models were compared to establish the changes in background traffic growth in the study area. The strategic model includes the traffic effects from the proposed WestConnex Project currently under construction by the NSW State Government.

The WestConnex Project involves the construction of a new motorway in the form of a number of tunnels in the inner west suburbs connecting the existing M5 Motorway to the M4 Motorway.

In the vicinity of the Marrickville Metro Shopping Centre site, the WestConnex Project involves the construction of a new M5 tunnel running between St Peters and Kingsgrove.

The new M5 which duplicates the M5 East from King Georges Road at Kingsgrove to a new interchange at St Peters is expected to open to traffic in 2019. The interchange at St Peters will attract additional traffic into the modelled area.

Future (10 years) traffic volumes with the interchange shows that during the evening peak, traffic volumes between the St Peters Interchange and the study area are expected to increase by 1,170 vph.

Traffic modelling conducted by Bitzios Consulting indicates that the additional traffic arising from the WestConnex Project within the study area would result in extensive vehicle queues and congestion throughout the local area in the vicinity of the Centre. With this additional traffic load from the WestConnex Project, the VISSIM model is forced into 'gridlock'.

It is understood the WestConnex Project does not include any road improvement works within the local road network to service the additional traffic load manifesting itself on the local roads such as Edinburgh Road and Edgeware Street near the Centre. In addition, it is noted that RMS is proposing the intersection upgrade at the Campbell Street intersection with May Street and Bedwin Road which is expected to provide some traffic relief locally. However, the extent of additional traffic arising from the WestConnex Project would require a wholistic area wide approach involving significant road improvement works to service this additional traffic.

The assessment needed to cater for this level of future traffic is significant and would need to nominate new 'base case' projects to enable the model to run. This work is considered to be well outside the reasonable scope of this study for a single standalone private development.

On this basis, and to allow the models to run without 'gridlock' so that a meaningful assessment of the impacts of the development can be revealed by the modelling, it was necessary to exclude any background traffic growth from the future year models. As such, our future model development case relates to existing surveyed traffic plus additional development traffic arising from the proposed expansion.

6.4 Traffic Assessment

The traffic effects of the proposed expansion of the Marrickville Metro Shopping Centre have been assessed through the use of a microsimulation model on the Vissim modelling platform as agreed with RMS. TTPP has engaged Bitzios Consulting to development and operate the Vissim traffic model.

The VISSIM traffic model outputs performance measures for intersections including average delays per vehicle passing through the intersection as well as the levels of service.

Levels of service describe the experience of a driver travelling through the intersection. It is useful in the comparison of the traffic effects for different traffic scenarios, for example before and after development traffic conditions.

Table 6.7 below provides a description of the attributes of different levels of service.

Table 6.7: Level of Service Criteria

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

Source: RMS Traffic Generating Development Guidelines

The level of service ranges from A to F. Levels of service between A and D indicate the intersection is operating within capacity with LoS A providing exceptionally good performance to LoS D indicating satisfactory performance. LoS D is the long term desirable level of service. LoS E and F indicate the intersection is operating at or near capacity and generally would require intersection improvement works to maintain reasonable performance.

6.5 Modelling Scenarios

The traffic effects of the proposed development have been assessed using a microsimulation traffic model developed on the VISSIM platform. Two scenarios have been modelled as follows:

- Scenario 1 – existing case (no development), and
- Scenario 2 – post development case (existing scenario plus development traffic without any changes to existing background traffic nor road improvement works).

The calibration and validation of the existing case traffic model has been prepared and documented by Bitzios Consulting. This report is contained in Appendix C.

6.6 Modelling Results

Following the above, peak hour intersection turning movement volumes for the existing and post development scenarios are contained in Appendix D.

The Vissim modelling results are presented in Table 6.8 and Table 6.9 for the Thursday evening and Saturday peak periods respectively.

The level of service results (worse of either peak period) are also presented in Figure 6.4 and Figure 6.5.

Table 6.8: Modelling Results for Thursday Evening Peak Period

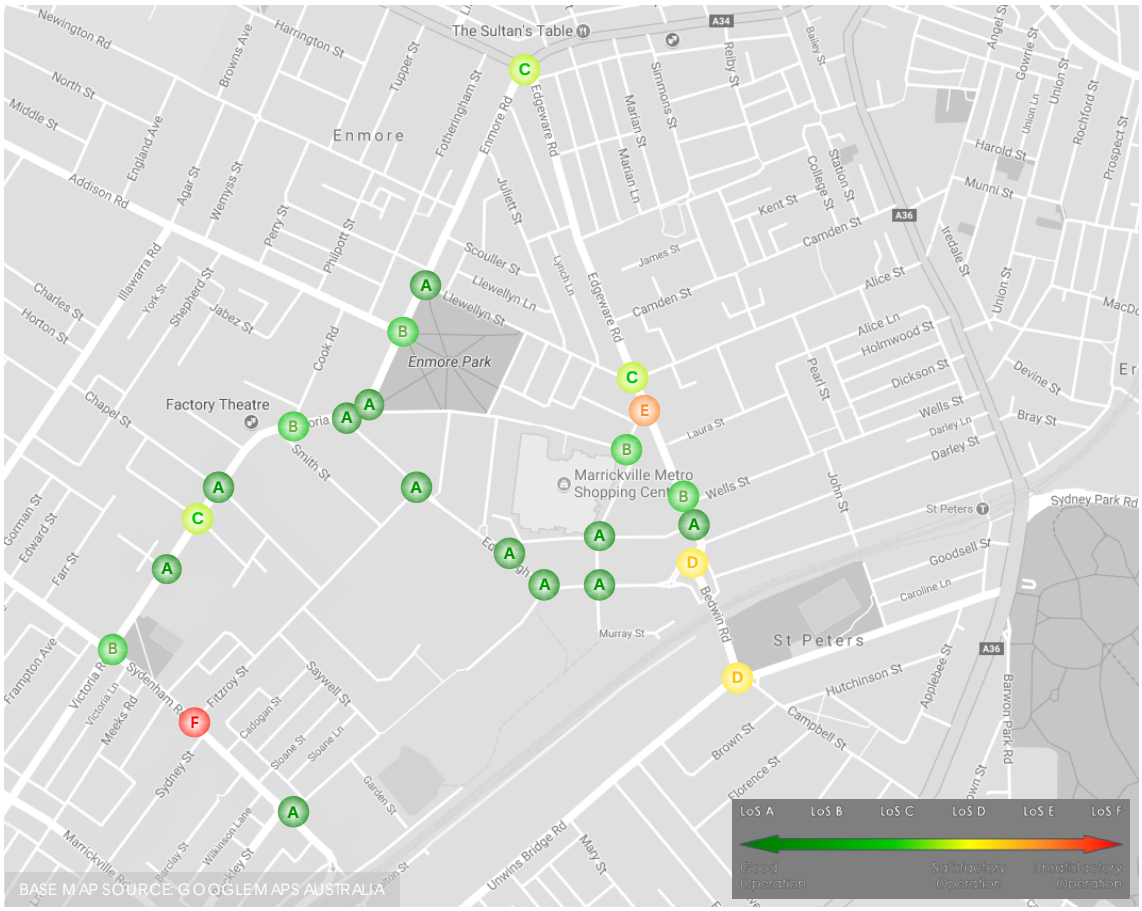
Intersection	Control	Existing Condition		Post Development	
		Delay	LoS	Delay	LoS
Campbell St-Bedwin Rd	Signals	22	B	23	B
Edgeware Rd-Edinburgh Rd	Priority	49	D	65	E
Edgeware Rd-Smidmore St	Priority	5	A	4	A
Edgeware Rd-Wells St	Priority	2	A	5	A
Edgeware Rd-Victoria St	Priority	25	B	35	C
Alice St- Edgeware Rd-Llewellyn St	Signals	30	C	30	C
Enmore Rd- Stanmore Rd	Signals	30	C	30	C
Edinburgh Rd-Railway Parade	Roundabout	6	A	15	B
Victoria Rd-Murray St	Priority	2	A	4	A
Murray St-Edinburgh Rd	Roundabout	5	A	7	A
Murray St-Smidmore St	Roundabout	13	A	3	A
Enmore Rd-Llewellyn St	Signals	13	A	13	A
Enmore Rd-Addison Rd	Signals	20	B	20	B
Edinburgh Rd-Sydney Steel St	Priority	5	A	10	A
Edinburgh Rd-Smidmore Rd	Signals	10	A	12	A
Edinburgh Rd-Fitzroy St	Roundabout	8	A	7	A
Enmore Rd-Victoria Rd	Priority	7	A	8	A
Victoria Rd-Edinburgh Rd	Signals	10	A	11	A
Cook Rd-Victoria Rd	Priority	29	B	23	B
Victoria Rd-Chapel St	Priority	14	A	75	F
Victoria Rd-Chalder St	Priority	29	C	25	B
Victoria Rd-Mitchell St	Priority	0	A	0	A
Victoria Rd-Sydenham Rd	Signals	21	B	21	B
Fitzroy St- Sydenham Rd	Priority	78	F	82	F
Shirlow St-Sydenham Rd	Priority	0	A	0	A
Murray St Car Park Access	Priority	4	A	5	A
Smidmore St Car Park Access	Priority	2	A	2	A
Edinburgh Rd Car Park Access	Priority	NA	NA	4	A

Table 6.9: Modelling Results for Saturday Peak Period

Intersection	Control	Existing Condition		Post Development	
		Delay	LoS	Delay	LoS
Campbell St-Bedwin Rd	Signals	17	D	19	B
Edgeware Rd-Edinburgh Rd	Priority	52	D	62	E
Edgeware Rd-Smidmore St	Priority	5	A	7	A
Edgeware Rd-Wells St	Priority	27	B	24	B
Edgeware Rd-Victoria St	Priority	57	E	47	D
Alice St- Edgeware Rd-Llewellyn St	Signals	29	B	34	C
Enmore Rd- Stanmore Rd	Signals	22	B	34	C
Edinburgh Rd-Railway Parade	Roundabout	8	A	17	B
Victoria Rd-Murray St	Priority	21	B	20	B
Murray St-Edinburgh Rd	Roundabout	8	A	8	A
Murray St-Smidmore St	Roundabout	4	A	4	A
Enmore Rd-Llewellyn St	Signals	13	A	12	A
Enmore Rd-Addison Rd	Signals	20	B	19	B
Edinburgh Rd-Sydney Steel St	Priority	7	A	17	B
Edinburgh Rd-Smidmore Rd	Signals	9	A	21	B
Edinburgh Rd-Fitzroy St	Roundabout	11	A	13	A
Enmore Rd-Victoria Rd	Priority	3	A	5	A
Victoria Rd-Edinburgh Rd	Signals	9	A	15	A
Cook Rd-Victoria Rd	Priority	12	A	19	B
Victoria Rd-Chapel St	Priority	14	A	46	D
Victoria Rd-Chalder St	Priority	14	A	11	A
Victoria Rd-Mitchell St	Priority	2	A	1	A
Victoria Rd-Sydenham Rd	Signals	24	B	26	B
Fitzroy St- Sydenham Rd	Priority	31	C	41	C
Shirlow St-Sydenham Rd	Priority	0	A	0	A
Murray St Car Park Access	Priority	3	A	9	A
Smidmore St Car Park Access	Priority	2	A	20	B
Edinburgh Rd Car Park Access	Priority	NA	NA	8	A

**Weekend parking ban on the southbound Edgware Road between Victoria Road and Alice Street*

Figure 6.4: Existing Condition Modelling Results



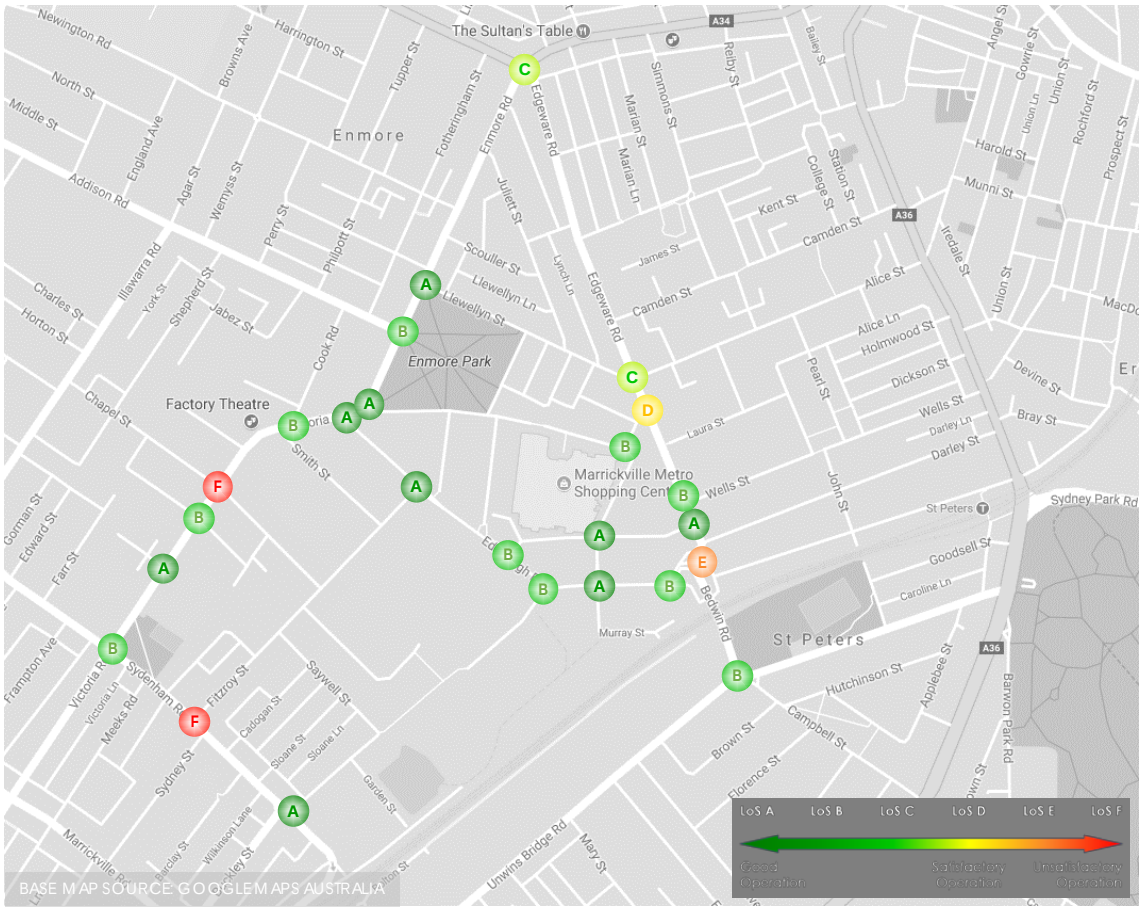
The modelling results indicate that under 2017 existing traffic conditions (Figure 6.4), the majority of assessed intersections operate satisfactorily with LoS D or better in either peak period. The exceptions are at the intersections of Edgeware Road and Victoria Road which operates at LoS E during the Saturday peak period, and Sydenham Road and Fitzroy Road which operates at a LoS F during the Thursday peak period.

A detailed review of the modelling results for these intersections shows that only a single movement is operating above capacity, that is, the right turns from the streets (namely Fitzroy Street and Victoria Road) where vehicles are required to give way to two lanes of traffic on a collector road.

LoS E/F operation indicates the intersection is operating at above capacity. However, it is not unusual for some key intersections in the Sydney road network especially those where a minor approach is required to give way to a key collector road to operate with LoS F.

In relation to the poor performance of the right turn movement from Victoria Road, it is noted that the previous approval conditioned for this right turn to be prohibited (Condition B15 (e)). As such, this movement does not exist in the future.

Figure 6.5: Post Development Modelling Results Post Development Condition



In Scenario 2, under post development traffic conditions, the majority of assessed intersections would continue to operate satisfactorily following the completion of the proposed expansion. The exceptions are at the following three intersections:

- Sydenham Road-Fitzroy Street
- Chapel Street-Victoria Road, and
- Bedwin Road-Edgeware Road-Edinburgh Road.

In relation to the Sydenham Road and Fitzroy Street intersection, it is noted that this intersection would operate with similar performance to existing conditions albeit with an additional four seconds delays. This would only occur in the Thursday peak period.

The Chapel Street and Victoria Road intersection is expected to operate at a LoS F during the Thursday evening peak period. However, assessment of the detailed results indicates that the vehicle movement that is expected to operate at LoS F only contains a volume of one vehicle per hour. The remaining intersection movements are operation at a LoS B or better. In this regard, the operation of Chapel Street and Victoria Road is considered acceptable.

The intersection of Bedwin Road, Edgeware Road and Edinburgh Road is expected to be operating at a LoS E in the post development situation, where it is LoS D in the existing situation. The future intersection is impacted by the right turn from Edinburgh

Road to Bedwin Road, which is expected to increase in delay from 49 seconds to 65 seconds. The remaining approaches are however expected to operate at a LoS A. In addition, it is noted that there is an alternative access route for this movement. Instead of turning right into Bedwin Road from Edgeware Road, it is possible to continue down Railway Parade to travel beneath Bedwin Road and then turn left into Bedwin Road. It is expected that if the right turn movement continue to be delayed traffic would choose the alternative routes to avoid this delay.

In addition, it is noted that the operation of the intersection at Victoria Road with Edgeware Road would require a kerbside parking ban on the eastern side of Edgeware Street between Alice Street and Victoria Road during the Saturday peak period.

It is noted that the modelling of the post development condition does not include road improvement changes conditioned in the previous approval. However, it is proposed to implement the following road improvement works from the previous approval:

- removal of right turn from Victoria Street to Edgeware Road (completed)
- conversion of Edinburgh Road and Sydney Steel Road intersection into a single lane roundabout
- upgrade of the Edinburgh Road and Railway Parade Road intersection to permit buses to conduct u-turn manoeuvres, and
- implementation of 'No Parking' restrictions along the eastern side of Edgeware Road between Alice Street and Victoria Road, during the Saturday peak period.

6.7 Localised Intersection Assessment

A localised assessment has been undertaken of the new access on Edinburgh Road, to understand the impact of the proposed right turn movement into the site from Edinburgh Road. The assessment has been undertaken using the SIDRA Intersection modelling software which was designed specifically to assess the intersection performance under prevailing traffic conditions. The assessment includes the following intersections:

- Edinburgh Road-Smidmore Road
- Edinburgh Road-Proposed site access, and
- Edinburgh Road-Sydney Steel Road.

Both existing case and post development scenarios have been modelled, during the Thursday evening and Saturday midday peak hours. The existing scenario takes into consideration existing road geometries at the signalised intersection of Edinburgh Road and Smidmore Street and the priority T-Intersection of Edinburgh Road with Sydney Steel Road.

Localised intersection modelling was also carried out for the post development case scenario, which will see the implementation of the site access point on Edinburgh Road to include a right turn access from Edinburgh Road and the conversion of the

intersection of Edinburgh Road with Sydney Steel Road, from a priority T-intersection to a priority single lane roundabout.

In addition, the modelling of the post development case includes a 10-year growth of the background traffic which includes outputs from the 2026 strategic models (i.e. the traffic effects from the proposed WestConnex Project).

The modelling results of the existing condition and post development condition for the Thursday evening peak periods are shown in the Table 6.10 below.

Table 6.10: Edinburgh Rd Modelling Results for Thursday Evening Peak Period

Intersection	Control	Existing Condition		Post Development	
		Delay	LoS	Delay	LoS
Edinburgh Rd-Smidmore St	Signals	15	B	29	C
Edinburgh Rd Proposed Access	Priority	-	-	6	A
Edinburgh Rd-Sydney Steel Rd	Priority	10	A	14	A

Table 6.10 demonstrates that there are no existing capacity issues at the assessed Edinburgh Road intersections with the greatest delay for vehicles noted at 15 seconds and intersection level of service not falling below LoS B.

The results in Table 6.10 demonstrate that intersection operation would continue to operate satisfactorily during the Thursday evening peak period following the completion of the proposed expansion. There would be slight increases to intersection delay, in the comparison to the existing scenario, by 14 seconds at the signalised intersection of Smidmore Street with Edinburgh Road and by 4 seconds at the proposed roundabout intersection of Edinburgh Road with Sydney Steel Road. Level of service is also noted to change from a LoS B to C at the signalised Smidmore Street intersection. The modelling results for the proposed site access on Edinburgh Road is noted to operate well with a LoS A and an anticipated vehicle delay of 6 seconds for vehicles queuing to egress the site.

The modelling results for the Saturday peak period are shown in Table 6.11.

Table 6.11: Edinburgh Rd Modelling Results for Saturday Peak

Intersection	Control	Existing Condition		Post Development	
		Delay	LoS	Delay	LoS
Edinburgh Rd-Smidmore St	Signals	17	B	46	D
Edinburgh Rd Proposed Access	Priority	-	-	7	A
Edinburgh Rd-Sydney Steel Rd	Priority	10	A	20	B

The localised intersection modelling results for the existing condition during the Saturday peak demonstrates similar results to the Thursday peak period with the greatest intersection delay being noted as 17 seconds. The existing intersections during the Saturday peak period are noted not to fall below LoS B, with the priority intersection of Edinburgh Road and Sydney Steel Road operating at a LoS A.

It is noted that the existing Smidmore Street access permit vehicle movements in all directions. However, the S75W modifications proposes the conversion of the eastern section of Smidmore Street into a one-way road permitting the traffic movement in the westbound direction only. As such, in the future vehicles exiting the Centre at the Smidmore Street access are only permitted to turn right out into Smidmore Street. However, traffic modelling in assigning development traffic did not make allowance to permit traffic that used to turn left into Smidmore Street to exit the Centre via the Murray Street. The traffic model assumes that this left turning traffic would continue to use Smidmore Street access to exit the Centre and then turn right into Edinburgh Road. But in reality, this left turning traffic would exit the site via the Murray Street access without having the need to negotiate the Smidmore Street intersection with Edinburgh Road.

To account for this, the localised intersection modelling using SIDRA involved a manual re-assignment of this traffic. This involved approximately 20 per cent reduction of the right turn traffic on Smidmore Street approach.

Like the Thursday results, the Saturday post development case demonstrates increases in delay, in comparison to the existing case, with increases of 29 second at the Smidmore Street intersection and 10 seconds at the Sydney Steel Road intersection. Level of services are also noted to change, with the worst level of service anticipated to be satisfactorily (LoS D).

The proposed site access is noted to operate at a LoS A with a worst movement delay of 7 seconds which relates to vehicles queuing to egress the site.

In addition, the 95th percentile queue of the right turn movement accessing the Centre from Edinburgh Road would be less than one vehicle in both the Thursday and Saturday peak periods. It is noted the proposed right turn bay on Edinburgh Road can store up to three vehicles waiting to turn right.

Therefore, the proposed right turn bay would not result in the overflow of queues on to the adjacent traffic lane. As such, the westbound traffic on Edinburgh Road would not be blocked and queues would not form.

It is considered that there would be no significant detrimental impacts to the existing road network, as a result of the proposed right turn access on Edinburgh Road.

6.8 Proposed Extension to Operating Hours

The S75W application also seeks approval to extend the trading hours for a number of shops on the ground floor of the Stage 1B building. These shops are generally related to food and beverage shops.

The existing approval permits the Centre to be opened from 7:00am to 10:00pm. It is proposed to extend the trading hours to 12 midnight.

The proposal to extend the trading hours is not expected to result in any material adverse traffic and parking impacts for the following reasons:

- the extending trading hours would be restricted to a small number of shops only
- the extending trading hours do not coincide with the commuter peak period where the commuter peak period traffic coincide with the development traffic
- during the proposed extended trading hours from 10:00pm to 12 midnight, it is expected both the background and development traffic would be significantly reduced
- this traffic assessment has assessed the effects of peak hour traffic where the development traffic arising from the proposed expansion coincides with the background commuter traffic and it was found that the majority of intersections would continue to operate satisfactorily
- the existing and proposed car parking provisions would be adequate to meet the parking demand arising from limited number of shops opened during the extending trading hour period.

7 Summary and Conclusion

This report examines the transport, traffic and parking implications in relation to a Section 75W modification application for the proposed Stage 1B expansion of the Marrickville Metro Shopping Centre at 34 Victoria Road and 13-55 Edinburgh Road, Marrickville. It is noted that there is an existing major project approval (MP09_0191) for the proposed expansion which was granted in March 2012. The S75W application proposes modifications generally relating to the refinement and enhancement of the approved design of the building. Essentially, the proposed overall floor area and car parking provision in this S75W application will remain at 39,700m^2 GLFA and 1,606 car parking spaces respectively as per the previous approval. In addition, it also seeks approval to modify existing road arrangements on Smidmore Street as well as approval to permit right turn movement from Edinburgh Road into Stage 1B car park.

It is noted that the previous approval conditioned a number of road improvement works to accommodate the traffic demand from the proposed expansion. AMP is committed to implementing the conditioned road improvement works, but the Smidmore Street works would be modified slightly as discussed in the report to improve pedestrian safety and amenity.

The Stage 1B development would add an additional 11,156m^2 GLFA to the Centre. Based on the required car parking provision rate of 4.1 spaces per 100m^2 GLFA, the proposed development would require a total of 457 car parking spaces to be provided.

The S75W proposes to provide a total of 493 car parking spaces in Stage 1B development. While this is an additional 36 spaces, the overall provision for the Centre is to maintain the approved 1,606 spaces.

The proposed development will provide bicycle and motorcycle parking spaces in compliance the previous approval.

In addition, Stage 1B development includes a loading dock with nine service vehicle bays of various services plus three compactors. The proposed number of service vehicle bays exceed the existing approval. As such, the proposed loading facility is considered to be satisfactory.

The car parking and loading areas have designed to comply with the design requirements set out in the Australian Standard for car parking facilities, namely AS2890.1:2004, AS2890.2:2002, AS2890.3:2015 and AS2890.6:2009.

Based on RMS traffic generation rates, the proposed expanded Centre (including expansion on the existing Centre i.e. Stage 2) is expected to generate a total of 1,572 vph and 2,422 vph during the Thursday and Saturday peak periods.

The traffic effects of the proposed expansion (including Stage 2) has been assessed through a microsimulation model development on the Vissim modelling platform.

The modelling indicates that in the future following the completion of the proposed expansion, the majority of the assessed intersections would continue to operate with satisfactory performance. The exceptions are at the Sydenham Road intersection with Fitzroy Street, Chapel Street intersection with Victoria Road, and Bedwin Road with Edgeware Road.

At the Sydenham Road intersection, it is noted that this intersection is currently operating poorly with LoS E performance. In the future, this intersection would continue to operate with similar performance to existing traffic condition, but with an increase of four seconds delay.

The poor performance of the Chapel Street intersection is due to one movement which is expected to have only one vehicle movement per hour, while the other movements are expected to operate with LoS B or better.

At the Bedwin Road intersection, there is an alternative route which traffic could use to avoid the delay at this intersection.

In addition, RMS has raised concerns that traffic queues due to the proposed right turn access on Edinburgh Road would overflow on to the adjacent traffic lane resulting in the westbound traffic on Edinburgh Road being blocked potentially resulting in queues extending past Sydney Steel Road. To address this, detailed intersection modelling has been conducted using SIDRA Intersection. This analysis includes the background traffic (10-year growth) obtained from RMS.

The SIDRA model includes the Smidmore Street signalised intersection, the proposed Edinburgh Road access and the Sydney Steel Road intersection operating as a single lane roundabout.

The modelling results indicate that the proposed right turn access would have a 95th percentile queue of less than one vehicle for both the Thursday and Saturday peak periods. As such, the 95th percentile queue would be contained within the proposed right turn bay.

The traffic modelling results indicate that further road would not be required to support the proposed expansion of the Marrickville Metro Shopping Centre other than the removal of kerbside parking on the eastern side of Edgeware Road between Victoria Road and Alice Street during the Saturday peak period. In addition, it is also proposed provide a new single lane roundabout at the intersection of Edinburgh Road with Sydney Steel Road, and the upgrade of the existing roundabout at the Edinburgh Road intersection with Railway Parade to facilitate buses to conduct u-turn movements.

Overall, the traffic and parking effects of the proposed expansion would be satisfactory.

Appendix A

Architectural Car Park Plans

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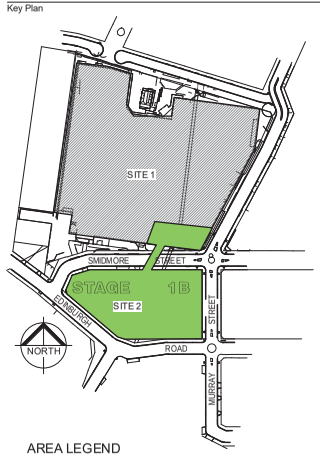
Key Plan



AREA LEGEND

- AMENITIES
- BIKE STORE
- CIRCULATION / PUBLIC
- LOADING DOCK
- MALL
- RETAIL
- RETAIL - F&B
- SERVICES
- STORAGE
- VERTICAL TRANSPORT
- Calcu

LEGEND

- TREE TO REMOVE

SMIDMORE STREET

EDINBURGH ROAD

MURRAY STREET

NEW ENTRY DOORS TO FUTURE DETAIL
EXISTING MALL
MALL ENTRY
EXISTING RETAIL TO FUTURE RENOVATIONS
NEW RAMP 1:20 GRADIENT
EXISTING RETAIL TO FUTURE RENOVATIONS
EXISTING RETAIL TO FUTURE RENOVATIONS
EXISTING RETAIL
EXISTING LOADING DOCK
LIFT
EXISTING CARPARK RAMP
SERVICE RAMP
ACCESS HATCH TO FUTURE DETAILS
OUTDOOR SEATING
NEW RAMP 1:20 GRADIENT
1:24 GRADIENT
1:50 ROAD GRADIENT
BICYCLE PARKING
BENCH
PUBLIC DOMAIN SHARED ZONE
AWNINGS OVER
EXISTING BRICK WALL
TAXI SHELTER TO FUTURE DETAILS
DOG PARKING AREA TO FUTURE DETAILS
1:30 GRADIENT
SITE BOUNDARY
COLONNADE
RETAIL
ENTRY
RL 5.900
LIFT
VOID OVER
MALL
RL 5.900
LANEWAY
LINEMARKING
NOMINAL TRUCK TURNING PATH
TRUCK
LOADING DOCK
RL 4.900
ROLLER SHUTTER
DRIVEWAY CROSSING
EXISTING PEDESTRIAN CROSSING
METAL CLADDING
ACCESS RAMP 1:14
TRAVELATORS
COMMS
CARPARK RAMP
1:6 GRADIENT
SUBSTATION KIOSK
MALE
PARENT
AWC
FEMALE
BIKES
PLANT
FIRE CTR RM
AIRLOCK
BOOSTER VALVES
STORMWATER CULVERT BELOW
KERB RE-ALIGNMENT
ACCESSIBLE RAMP
1:16 GRADIENT
BUS SHELTER TO FUTURE DESIGN (X4)
EXISTING BRICK WALL
CLN
COMPACTOR
SERVICE
WASTE
SUPERMARKET STORE
Room
COLES BOH
SHUTTER
SUBSTATION
CAFE
GAS & METER ROOM
VOID
GOODS LIFT
ST-1
ST-2
ST-3
ST-4
ST-5
ST-6
ST-7
ST-8
ST-9
ST-10

0 2.5 5 12.5 25m

1 GROUND FLOOR PLAN
1 : 250

Rev.	Date	Initial	Description
A	11/10/17	HS	SECTION 75W SUBMISSION

Client

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Project
MARRICKVILLE METRO REDEVELOPMENT
34 VICTORIA ROAD MARRICKVILLE NSW 2204

Drawing Title
GENERAL ARRANGEMENTS
PROPOSED GROUND FLOOR PLAN

Drawn By	Checked By	Scale @ A3	Scale @ A1
HS	HS	1 : 500	1 : 250

Project No.	Drawing No.	Revision
50980	EA106	A

Status
SECTION 75W SUBMISSION
75W

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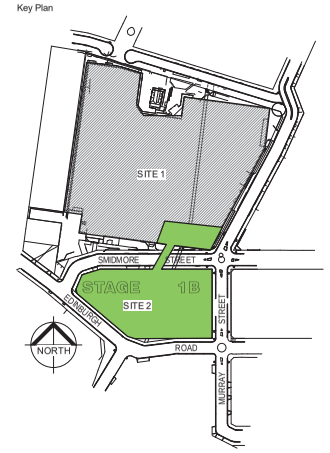
Key Plan



AREA LEGEND

- CIRCULATION / PUBLIC
- RETAIL
- SERVICES
- STORAGE
- VERTICAL TRANSPORT
- Calculating...

164 CARS SPACES
4 ADAPATABLE CAR SPACES
3 MOTORCYCLE SPACES

GALVANISED MILD STEEL WEB FORGE
GALVANISED STANDING SEAM BELOW WEB FORGE
GALVANISED MILD STEEL WEB FORGE
BRIDGE ROOF
3 EA114
4 EA114
1 EA113
2 EA113
RETAIL
RL 16.850
LOBBY
METAL CLADDING
6550
ST
ST-1
LIFT
VOID
PLANT
CARPARK
RL 16.700
TROLLEY BAY
5400
6600
STORAGE
UP
ST-2
5400
VOID
PLANT
GALVANISED EXPANDED MILD STEEL SHEET
6200
METAL PALISADE
LOBBY
GOODS LIFT
BOILER PLANT RM DBL HEIGHT
CHILLER PLANT RM DBL HEIGHT
WATER DETENTION TANK TO FUTURE DETAIL
TROLLEY STORAGE BAY
TROLLEY VEHICLE
1:12 GRADIENT
VEHICLE RAMP 1:6 GRADIENT
VEHICLE RAMP 1:6 GRADIENT
RL 16.700
S'MARKET PICKUP
ST-3
DN
VOID
EXISTING FACADE BELOW
GALVANISED MILD STEEL WEB FORGE
GALVANISED EXPANDED MILD STEEL SHEET

0 2.5 5 12.5 25m

10700 10700 10700 10700 10700 10700 10700 10700 10700 10700 10700 10700 7700

A B C D E F G H J K L M N P

1 5450
2 8700
3 8700
4 8700
5 8700
6 8700
7 8700
8 8700
9 8700
10

Rev.	Date	Initial	Description
A	11/10/17	HS	SECTION 75W SUBMISSION

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34 VICTORIA ROAD MARRICKVILLE NSW 2204

Drawing Title
GENERAL ARRANGEMENTS
PROPOSED LEVEL 2 FLOOR PLAN

Drawn By	Checked By	Scale @ A3	Scale @ A1
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Project No.	Drawing No.	Revision
50980	EA108	A

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75W

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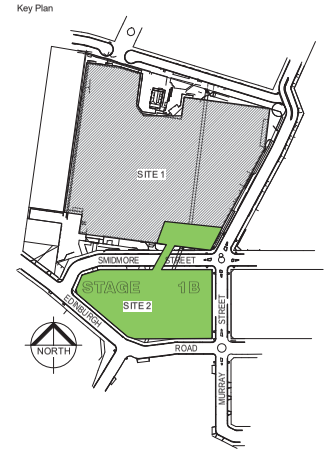

BRIDGE ROOF

BRIDGE LINK BELOW

GALVANISED MILD STEEL WEB FORGE

GALVANISED MILD STEEL WEB FORGE

3 EA114

4 EA114

1 EA113

2 EA113

VOID

TROLLEY BAY

STORAGE

RL 19.650

VOID TO RETAIL BELOW

METAL CLADDING

ST-1

ST

LIFT

VOID

DOUBLE HEIGHT SHOPFRONT

LOBBY

RL 19.500

PLANT

RL 19.500

CARPARK RL 19.500

CARPARK OVER SHOWN DASHED

DET

RL 19.650

ST-2

PLANT

GALVANISED EXPANDED MILD STEEL SHEET

VOID TO PLANT BELOW

6900

6100

6850

RL 19.650

ST-3

GOODS LIFT

STORAGE

LOBBY

VOID TO PLANT BELOW

GALVANISED MILD STEEL WEB FORGE

1:12 GRADIENT

VEHICLE RAMP 1:6 GRADIENT

1:12 GRADIENT

6330

METAL PALISADE

GALVANISED MILD STEEL WEB FORGE

GALVANISED EXPANDED MILD STEEL SHEET

5450
8700
8700
8700
8700
8700
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8700

6550
6600
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5400
5400
5400
6600
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6600
5400
5400
6700
5400

0 2.5 5 12.5 25m

10700 10700 10700 10700 10700 10700 10700 10700 10700 10700 10700 10700 7700

A B C D E F G H J K L M N P

AREA LEGEND

- CIRCULATION / PUBLIC
- SERVICES
- STORAGE
- VERTICAL TRANSPORT
- Calculating...

182 CARS SPACES
8 ADAPATABLE CAR SPACES
3 MOTORCYCLE SPACES

Rev.	Date	Initial	Description
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Drawing Title
GENERAL ARRANGEMENTS
LEVEL 2A FLOOR PLAN

Drawn By	Checked By	Scale @ A3	Scale @ A1
HS	HS	1 : 500	1 : 250

Project No.	Drawing No.	Revision
50980	EA109	A

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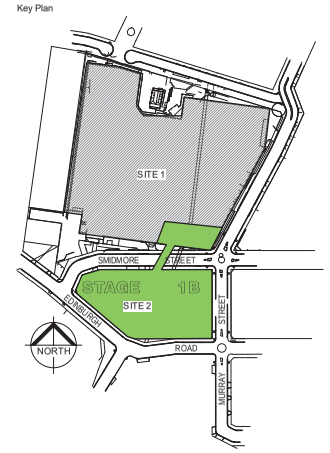

AREA LEGEND

- SERVICES
- VERTICAL TRANSPORT
- Calculating 137 CARS SPACES 3 MOTORCYCLE SPACES

PLANT
PLANT
ROOF BELOW
METAL CLADDING
L2A LOBBY BELOW
LIFT OVERRUN
ROOF
ROOF BELOW
CARPARK BELOW
GALVANISED MILD STEEL WEB FORGE
BRIDGE LINK BELOW
GALVANISED MILD STEEL WEB FORGE
CARPARK BELOW
RL 22.450
CARPARK
RL 22.300
6450
6600
6700
RL 22.450
COOLING TOWERS
CARPARK BELOW RL 19.500
ST-1
6000S LIFT
6000S LIFT
1:12 GRADIENT
VEHICLE RAMP 1:6 GRADIENT
1:12 GRADIENT
RL 22.300
CARPARK BELOW
LIFT OVERRUN
LIFT OVERRUN
GALVANISED MILD STEEL WEB FORGE
GALVANISED EXPANDED MILD STEEL SHEET
GALVANISED MILD STEEL WEB FORGE
GALVANISED EXPANDED MILD STEEL SHEET
FALL
FALL
CARPARK BELOW

1 EA113 · 2 EA113 · 3 EA114 · 4 EA114

1 5450 · 2 8700 · 3 8700 · 4 8700 · 5 8700 · 6 8700 · 7 8700 · 8 8700 · 9 8700 · 10

7900 · 5400 · 5400 · 6700 · 5400 · 5400 · 6700 · 5400

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10700 · 10700 · 10700 · 10700 · 10700 · 10700 · 10700 · 10700 · 10700 · 10700 · 10700 · 10700 · 10700 · 7700

A B C D E F G H J K L M N P

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34 VICTORIA ROAD MARRICKVILLE NSW 2204

Drawing Title
GENERAL ARRANGEMENTS ROOF PLAN

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Project No.	Drawing No.	Revision
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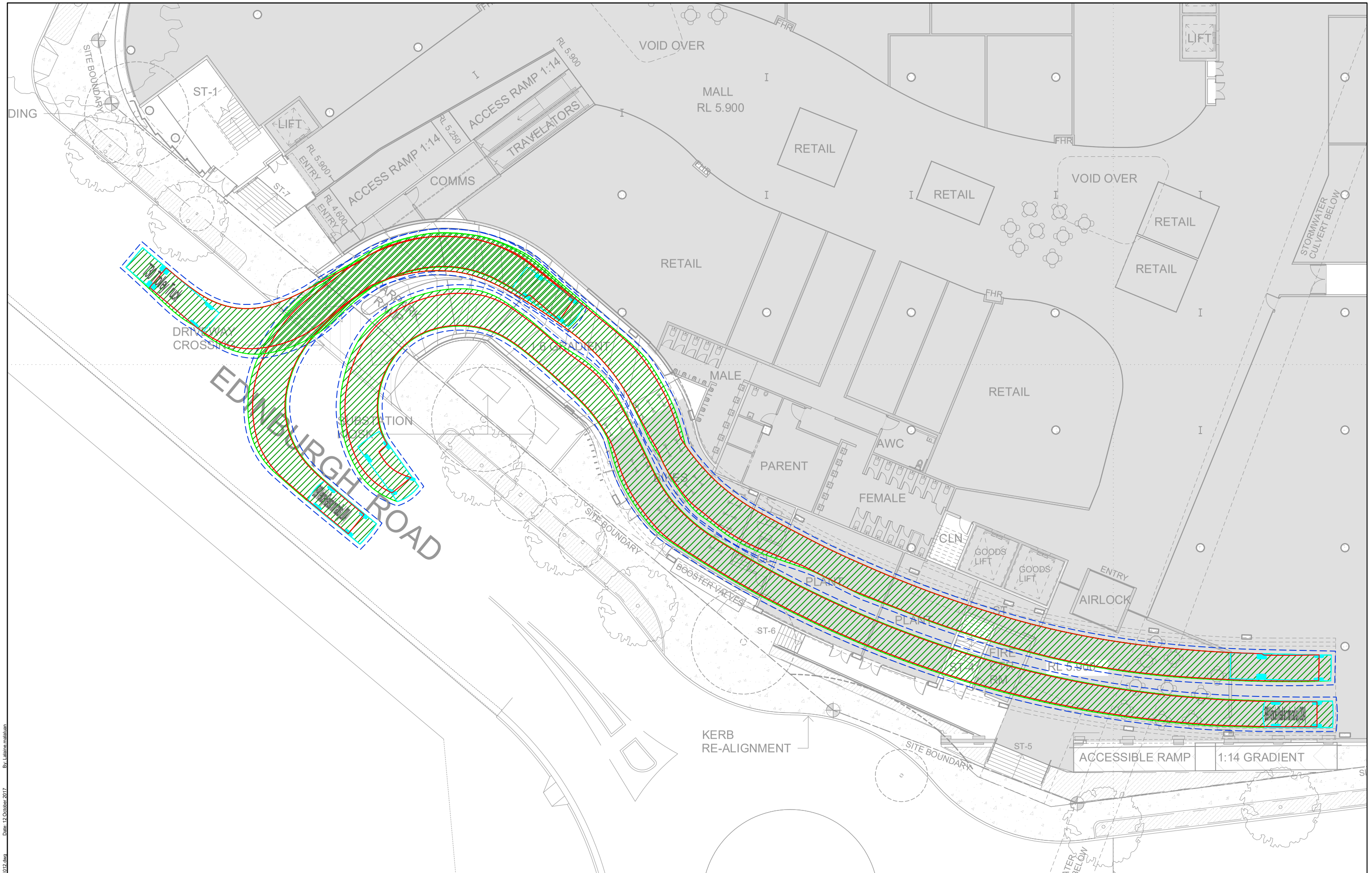
Appendix B

Swept Path Diagrams



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership
Suite 402, 22 Atchison Street
St. Leonards NSW 2065
Tel: 02 8437 7800
Email: info@ttpp.net.au

PROJECT
MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE
CAR PARK RAMP SWEPT PATH ANALYSIS
AS2890.1:2004 B99 VEHICLE

DWG No.
FIGURE 1

DATE STAMP
12 OCTOBER 2017

PROJECT No.	SCALE	REV.
16065	1:250 @A3	A

Filename: 16065CAD12-Swept Path-171012.dwg Date: 12 October 2017 By: Lalaine malalusan

T30 Trolley Truck	
Overall Length	7.450m
Overall Width	1.904m
Overall Body Height	2.091m
Min Body Ground Clearance	0.323m
Track Width	1.904m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.100m

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership
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St. Leonards NSW 2065
Tel: 02 8437 7800
Email: info@ttpp.net.au

PROJECT
MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE
CAR PARK RAMP SWEPT PATH ANALYSIS
T30 LOWRIDER TROLLEY TRUCK

DWG No. FIGURE 2
DATE STAMP 12 OCTOBER 2017
PROJECT No. 16065
SCALE 1:250 @A3
REV. A

Filename: 16065CAD12-Swept Path-171012.dwg Date: 12 October 2017 By: Lalaine malaluan

VEHICLE ENTERING

VEHICLE EXITING

T30 Trolley Truck

TROLLEY BAY

TROLLEY BAY

TROLLEY BAY

TROLLEY BAY

WATER DETENTION TANK TO FUTURE DETAIL

TROLLEY STORAGE BAY

TROLLEY VEHICLE

RL 16.850

RL 16.700

VOID

LIFT

7.45

0.896

4.25

T30 Trolley Truck	
Overall Length	7.450m
Overall Width	1.904m
Overall Body Height	2.091m
Min Body Ground Clearance	0.323m
Track Width	1.904m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.100m

By: Lalaine.malalaan
Date: 12 October 2017
Filename: 16065-CAD12-Swept Path-171012.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership
Suite 402, 22 Atchison Street
St. Leonards NSW 2065
Tel: 02 8437 7800
Email: info@ttpp.net.au

PROJECT: MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE: LEVEL 2 SWEPT PATH ANALYSIS
T30 LOWRIDER TROLLEY TRUCK

DWG No.: FIGURE 3

DATE STAMP: 12 OCTOBER 2017

PROJECT No.: 16065

SCALE: 1:200 @A3

REV.: A

RL 16.700

6600

5400

5400

5400

TROLLEY BAY

TROLLEY BAY

RL 16.850

TROLLEY VEHICLE

BOILER PLANT RM DBL HEIGHT

CHILLER PLANT RM DBL HEIGHT

WATER DETENTION TANK TO FUTURE DETAIL

TROLLEY STORAGE BAY

VEHICLE RAMP 1:6 GRADIENT

RL 16.700

GALVANISED MILD STEEL WEB FORGE

VOID

PLANT

GALVANISED MILD STEEL S

PLANT

VOID

S'MARKET PICKUP

RL 16.850

ST-3

UP

VOID

GOODS LIFT

GOODS LIFT

VOID

GALVANISED MILD STEEL S

By: Lalaine matalusan

Date: 12 October 2017

Filename: 16065-CAD12-Swept Path-171012.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership

Suite 402, 22 Atchison Street
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Tel: 02 8437 7800
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PROJECT

MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE

LEVEL 2 SWEPT PATH ANALYSIS
AS2890.1:2004 5.2M B99 VEHICLE

DWG No. FIGURE 4

DATE STAMP 12 OCTOBER 2017

PROJECT No.	SCALE	REV.
16065	1:200 @A3	A

5400
5400
6600
5400
6900
TROLLEY BAY
TROLLEY BAY
PLANT
VOID TO
PLANT BELOW
VOID
RL 19.650
6100
LOBBY
GOODS
LIFT
GOODS
LIFT
VOID TO
PLANT BELOW
RL 19.650
5400
RL 19.650
6850
RL 19.650
5700
5400
ST-3
VOID
GOODS
LIFT
GOODS
LIFT
VEHICLE RAMP
1:6 GRADIENT
AL PALISADE
GALVANISED MILD
STEEL WEB FORGE

By: Lalaine.malahan
Date: 12 October 2017
Filename: 16065CAD12-Swept Path-171012.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership
Suite 402, 22 Atchison Street
St. Leonards NSW 2065
Tel: 02 8437 7800
Email: info@ttpp.net.au

PROJECT
MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE
LEVEL 2A SWEPT PATH ANALYSIS
AS2890.1:2004 5.2M B99 VEHICLE

DWG No.
FIGURE 5

DATE STAMP
12 OCTOBER 2017

PROJECT No.	SCALE	REV.
16065	1:200 @A3	A

RL 22.300

6450

5400

5400

6700

5400

6600

6700

RL 22.450

COOLING TOWERS

ST-4

GOODS LIFT

GOODS LIFT

CARPARK BELOW
RL 19.500

1:12 GRADIENT

VEHICLE RAMP
1:6 GRADIENT

RL 22.300

CARPARK BELOW

GALVANISED MILD STEEL WEB FORGE

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
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PROJECT
MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE
LEVEL 2B SWEPT PATH ANALYSIS
AS2890.1:2004 5.2M B99 VEHICLE

DWG No.
FIGURE 6

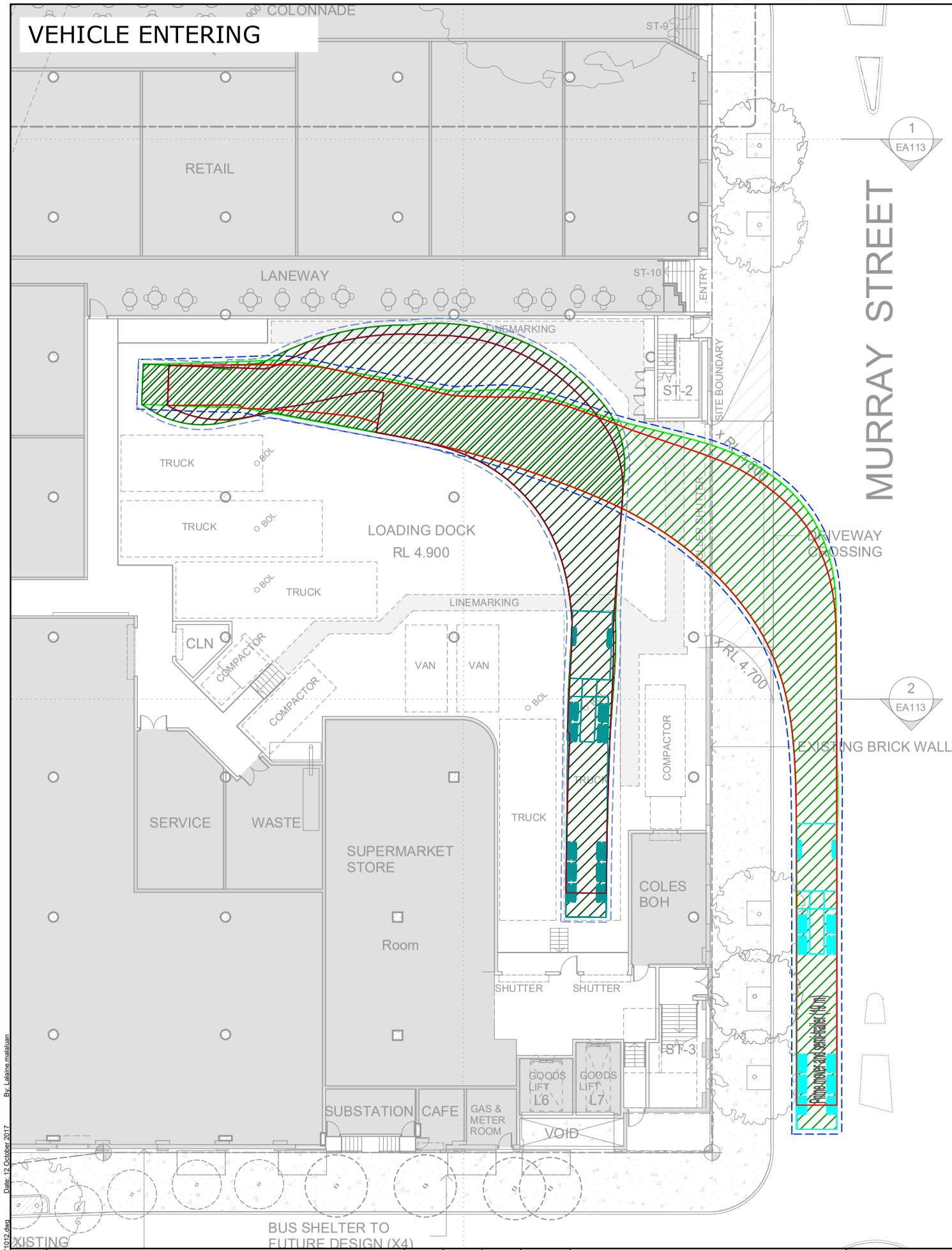
DATE STAMP
12 OCTOBER 2017

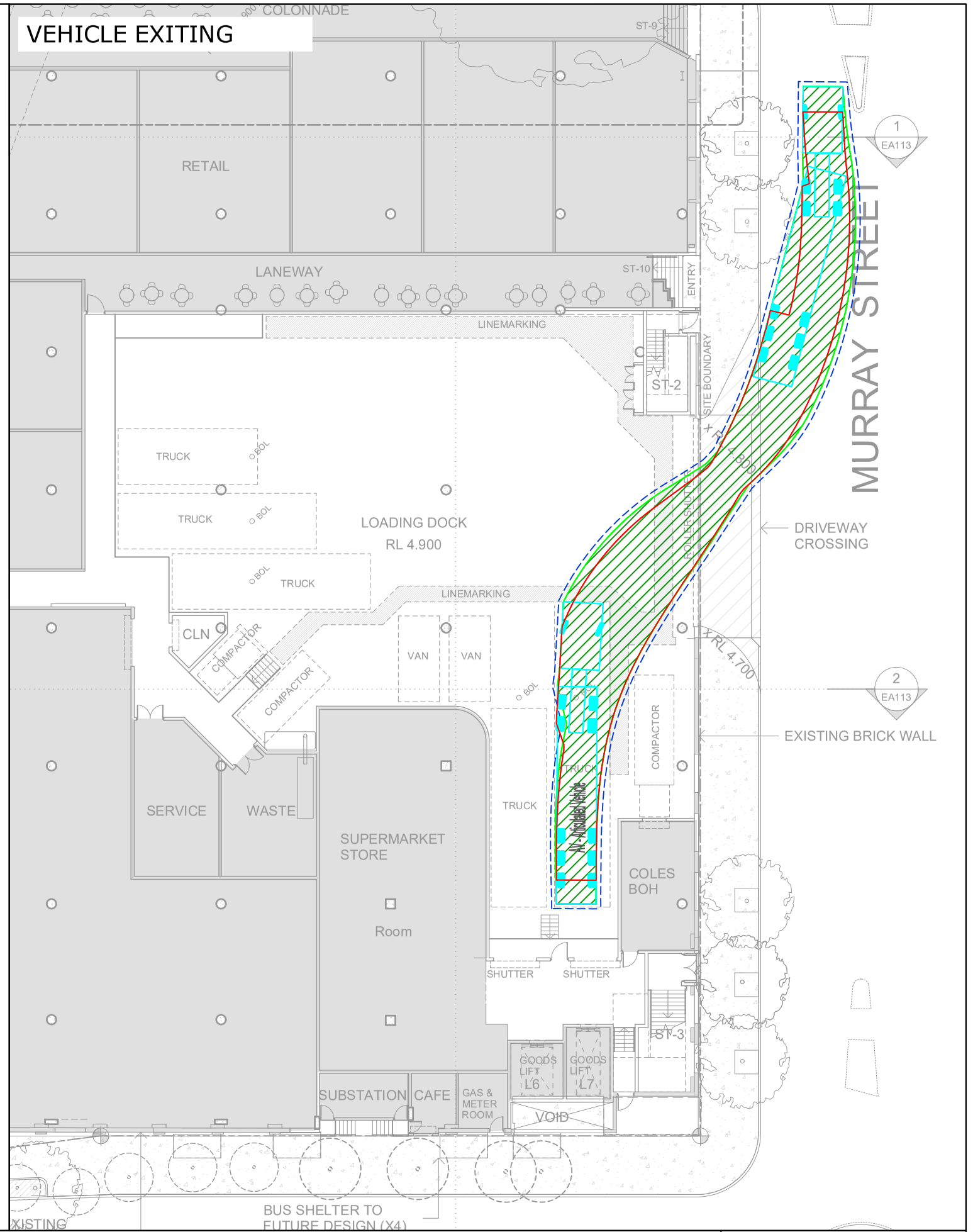
PROJECT No.	SCALE	REV.
16065	1:200 @A3	A

Filename: 16065CAD12-Swept Path-171012.dwg Date: 12 October 2017 By: Lalaine.malalian

VEHICLE ENTERING

VEHICLE EXITING





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
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The Transport Planning Partnership

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PROJECT

MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE

LOADING DOCK SWEPT PATH ANALYSIS
AS2890.2:2002 19m ARTICULATED VEHICLE

DWG No. FIGURE 7

DATE STAMP 12 OCTOBER 2017

PROJECT No.	SCALE	REV.
16065	1:300 @A3	A

Filename: 16065CAD12-Swept Path-171012.dwg Date: 12 October 2017 By: Lalaine malaluan

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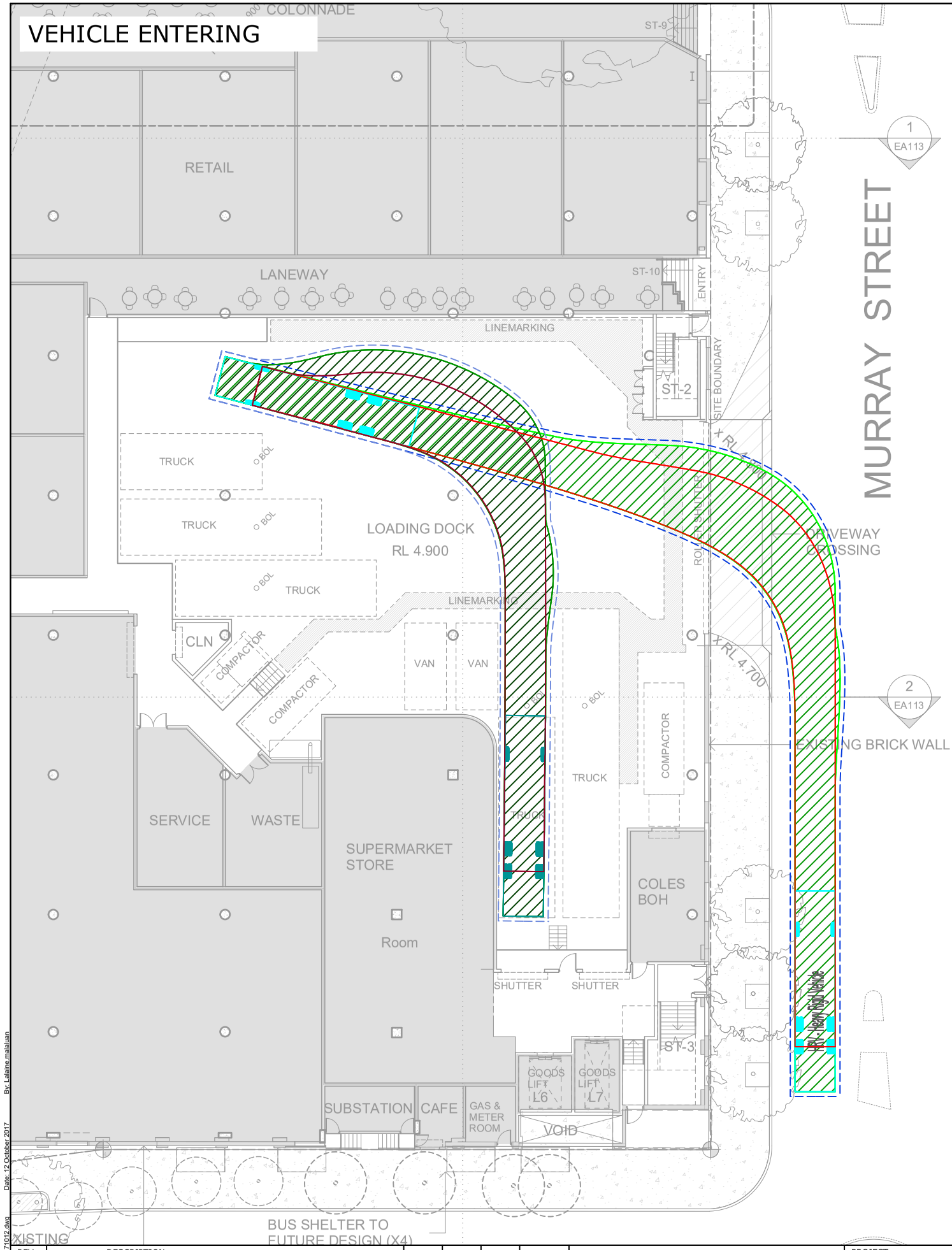
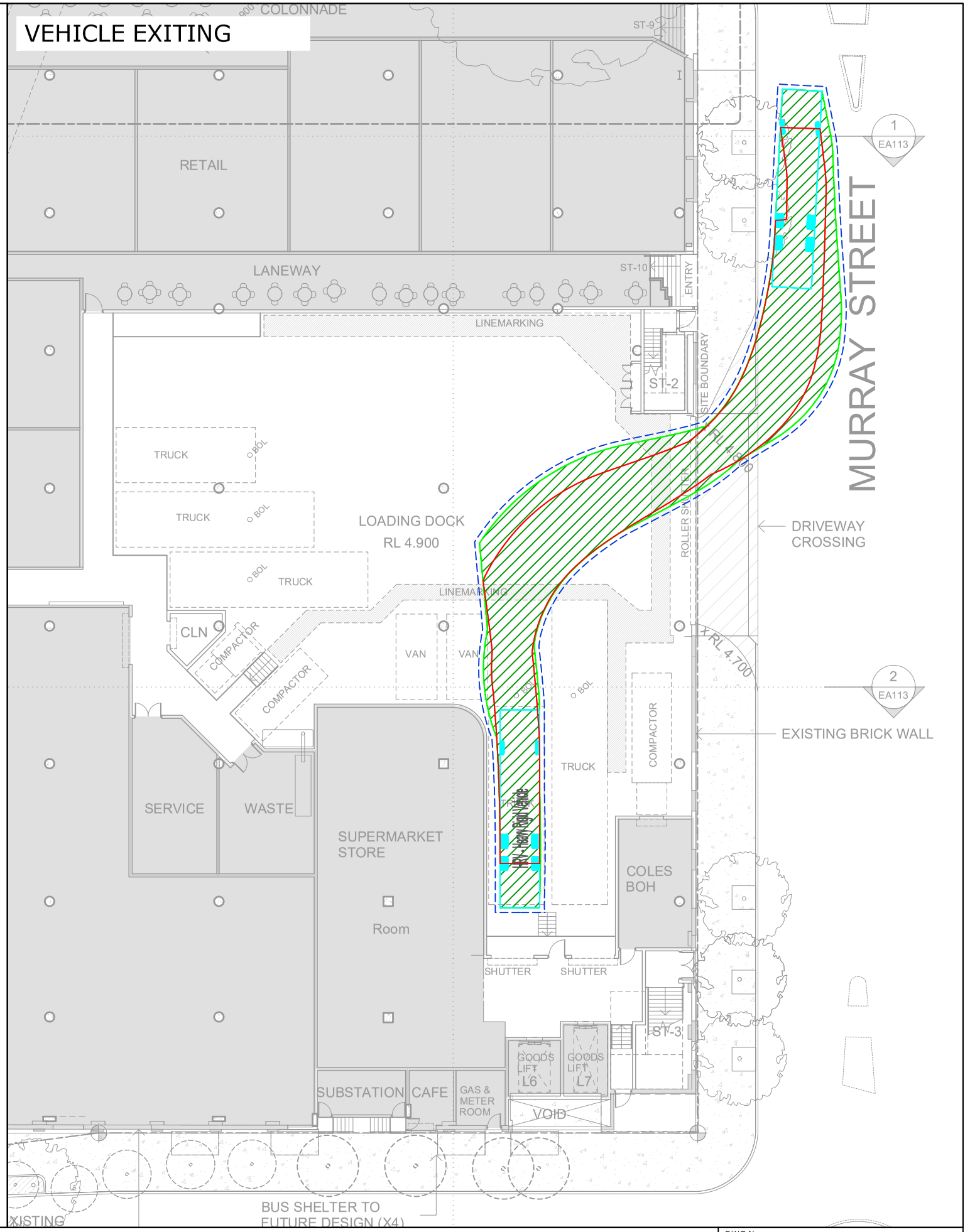


VEHICLE EXITING



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership
Suite 402, 22 Atchison Street
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PROJECT
MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE
LOADING DOCK SWEPT PATH ANALYSIS
AS2890.2: 2002 12.5M HEAVY RIGID VEHICLE

DWG No. FIGURE 8

DATE STAMP 12 OCTOBER 2017

PROJECT No. 16065 | SCALE 1:300 @A3 | REV. A

Filename: 16065CAD12-Swept Path-171012.dwg
Date: 12 October 2017
By: Lalaine malalan

VEHICLE ENTERING

VEHICLE EXITING

RETAIL
COLONNADE
ST-9
ST-10
LANEWAY
ENTRY
LINEMARKING
ST-2
SITE BOUNDARY
ROLLER SHUTTER
MURRAY STREET
1
EA113
2
EA113
X RL 4.700
DRIVEWAY CROSSING
TRUCK
BOL
LOADING DOCK
RL 4.900
HRV - Heavy Rigid Vehicle
CLN
COMPACTOR
VAN
SERVICE
WASTE
SUPERMARKET STORE
Room
COLES BOH
SHUTTER
ST-3
GOODS LIFT L6
GOODS LIFT L7
SUBSTATION
CAFE
GAS & METER ROOM
VOID
EXISTING BRICK WALL
EXISTING
BUS SHELTER TO FUTURE DESIGN (X4)

By: Lalaine malalaan
Date: 12 October 2017
Filename: 16065CAD12-Swept Path-171012.dwg

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership
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PROJECT
MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE
LOADING DOCK SWEPT PATH ANALYSIS
AS2890.2: 2002 12.5M HEAVY RIGID VEHICLE

DWG No. FIGURE 9
DATE STAMP 12 OCTOBER 2017
PROJECT No. 16065
SCALE 1:300 @A3
REV. A

VEHICLE ENTERING

VEHICLE EXITING

COLONNADE
RETAIL
LANEWAY
ST-9
ST-10
ENTRY
LINEMARKING
ST-2
SITE BOUNDARY
ROLLER SHUTTER
X RL 4.900
X RL 4.700
MURRAY STREET
1 EA113
2 EA113
DRIVEWAY CROSSING
EXISTING BRICK WALL
TRUCK
BOL
LOADING DOCK
CLN
COMPACTOR
VAN
SERVICE
WASTE
SUPERMARKET STORE
Room
COLES BOH
SHUTTER
ST-3
GOODS LIFT L6
GOODS LIFT L7
SUBSTATION
CAFE
GAS & METER ROOM
VOID
BUS SHELTER TO FUTURE DESIGN (X4)
EXISTING
HRV - Heavy Rigid Vehicle

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership
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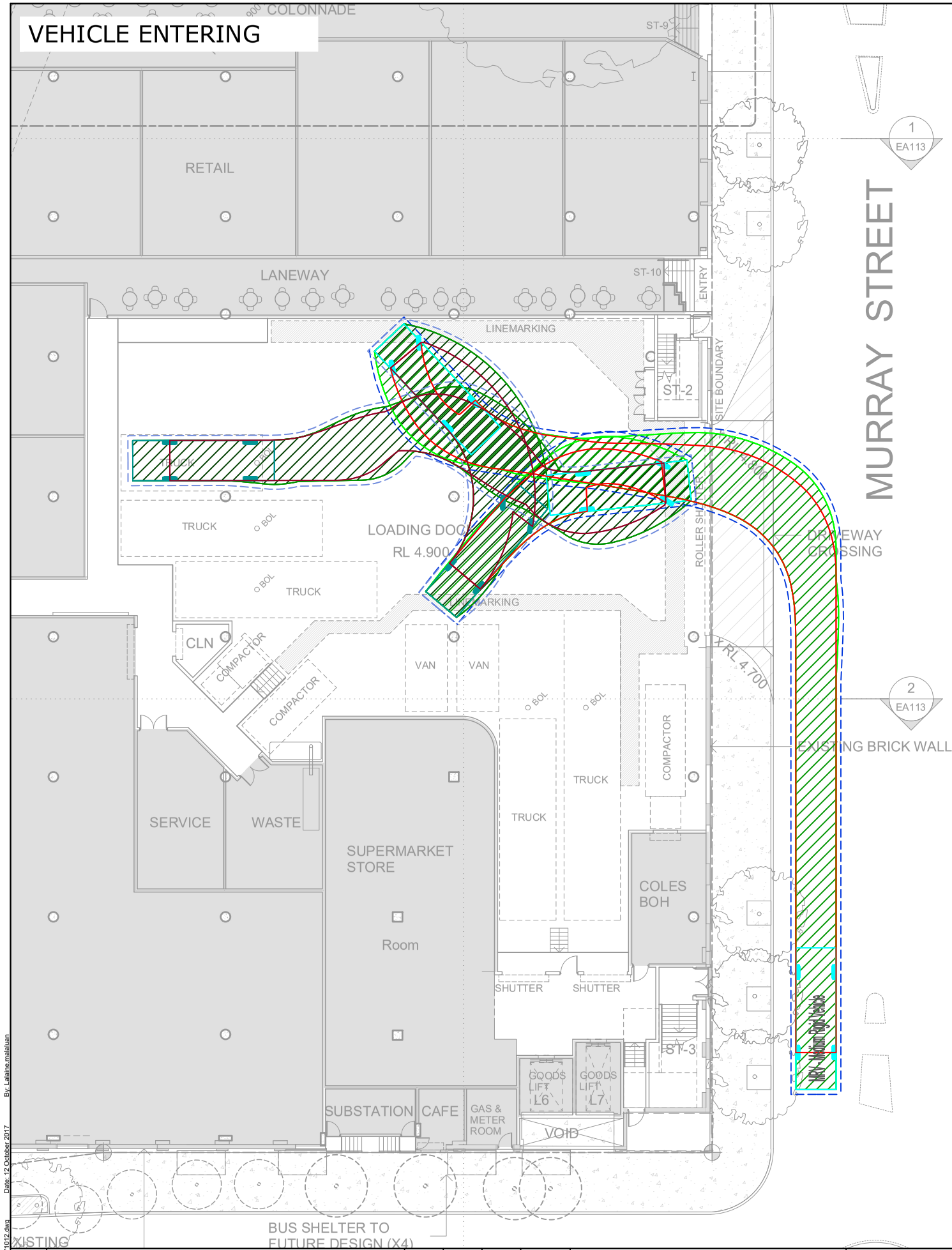
PROJECT
MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE
LOADING DOCK SWEPT PATH ANALYSIS
AS2890.2: 2002 12.5M HEAVY RIGID VEHICLE

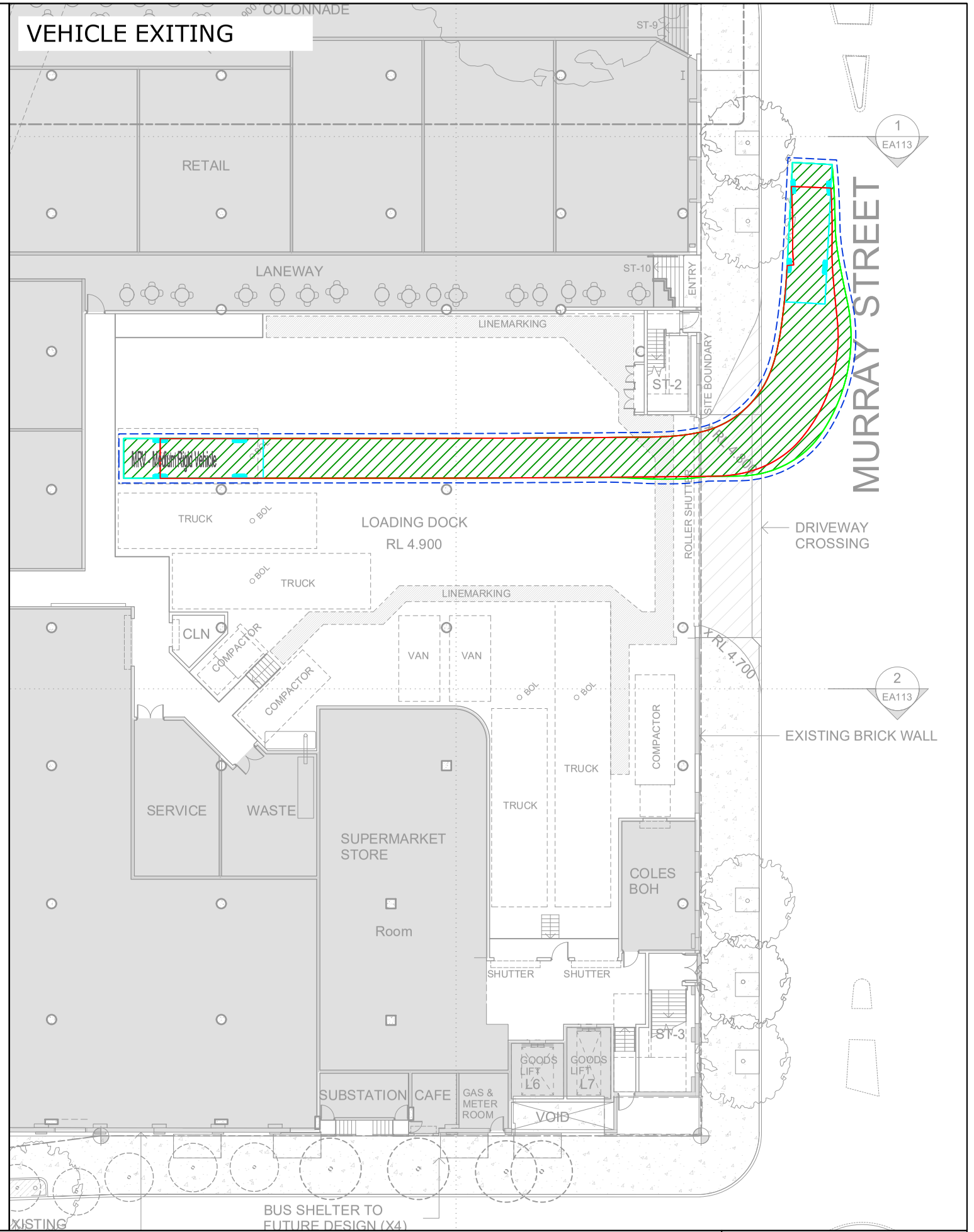
DWG No. FIGURE 10
DATE STAMP 12 OCTOBER 2017
PROJECT No. 16065
SCALE 1:300 @A3
REV. A

Filename: 16065CAD12-Swept Path-171012.dwg
Date: 12 October 2017
By: Lalaine maliatan

VEHICLE ENTERING



VEHICLE EXITING



Filename: 16065CAD12-Swept Path-171012.dwg Date: 12 October 2017 By: Lalaine malaluan

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership
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PROJECT
MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE
LOADING DOCK SWEPT PATH ANALYSIS
AS2890.2: 2002 8.8M MEDIUM RIGID VEHICLE

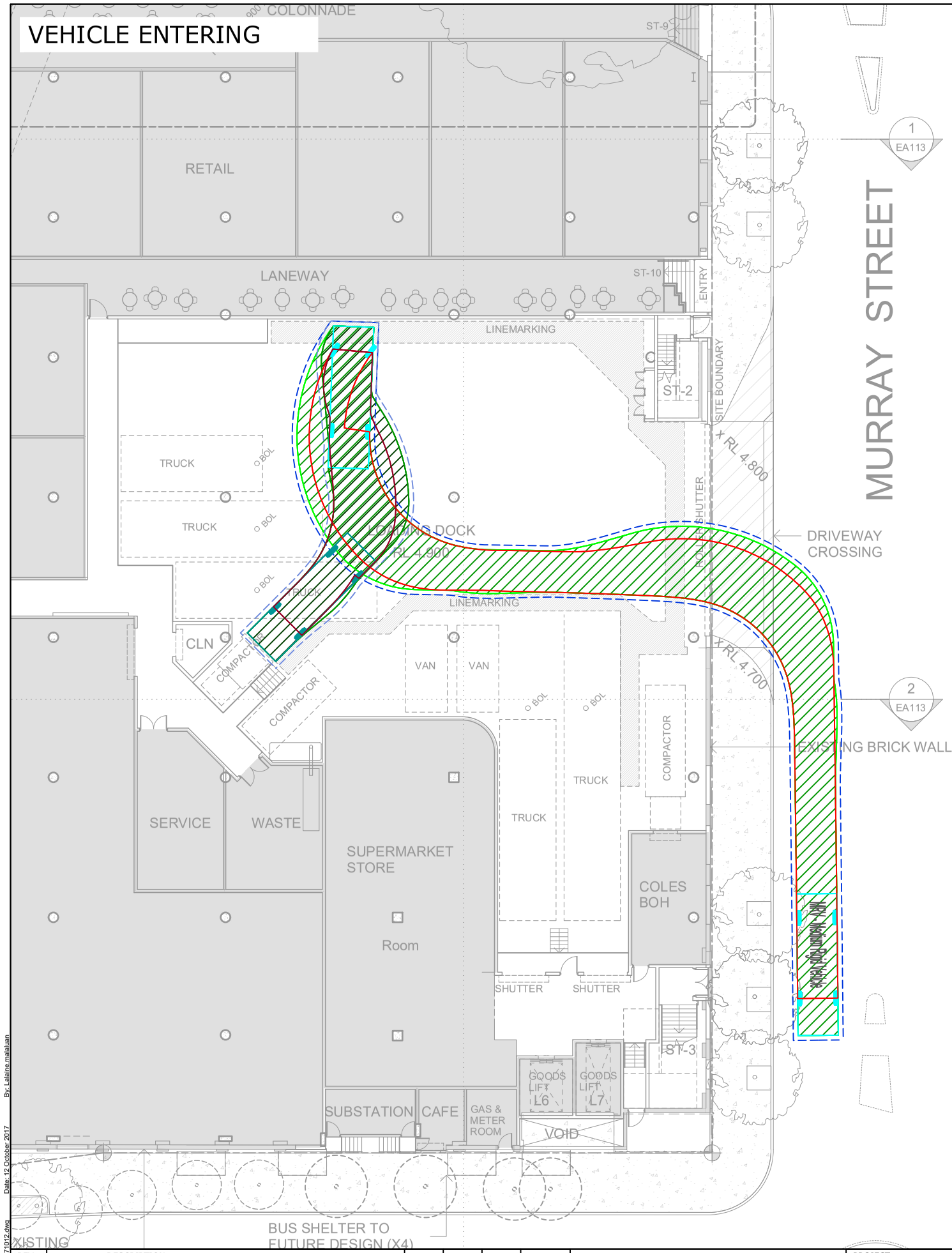
DWG No. FIGURE 11

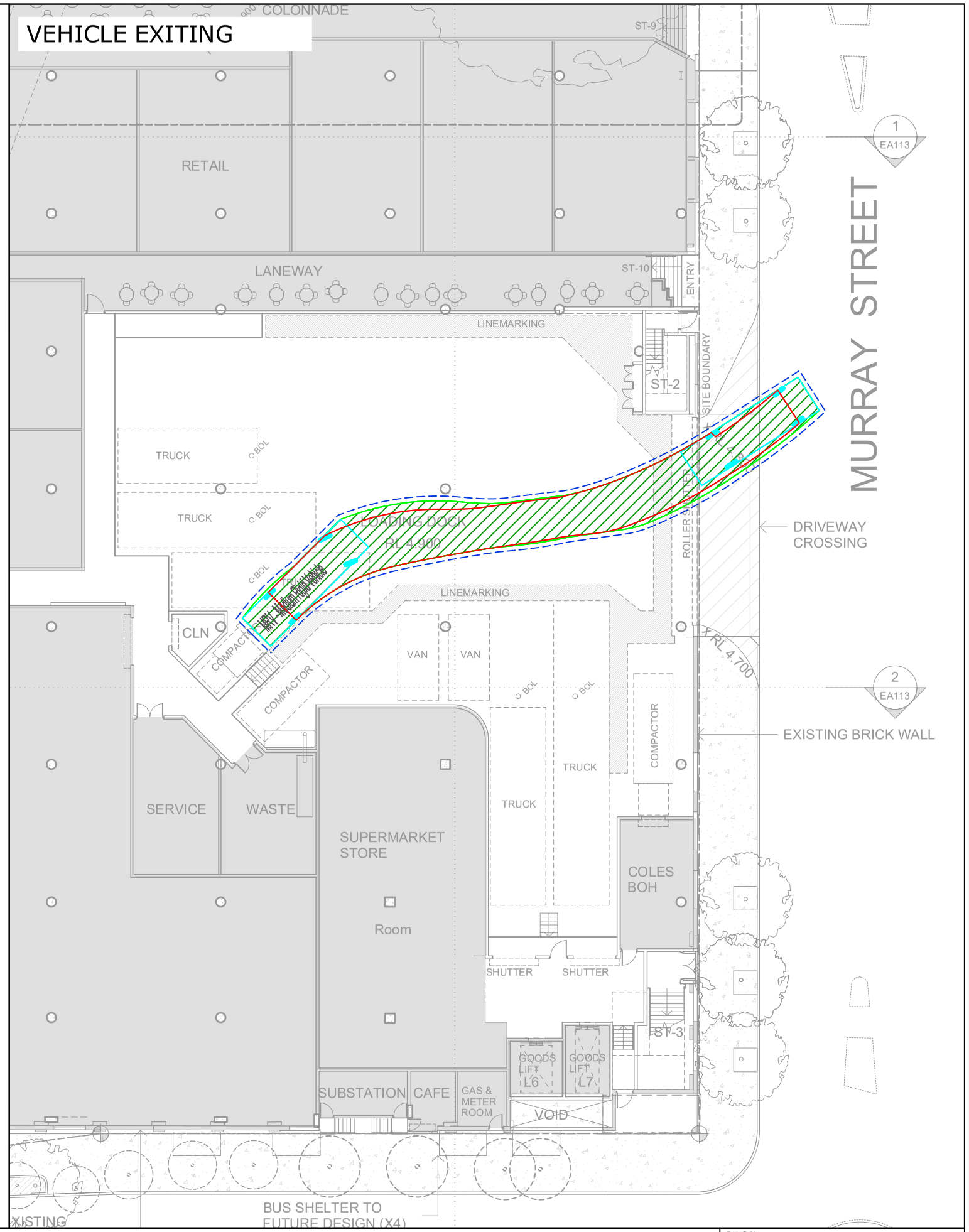
DATE STAMP 12 OCTOBER 2017

PROJECT No.	SCALE	REV.
16065	1:300 @A3	A

VEHICLE ENTERING

VEHICLE EXITING





Filename: 16065CAD12-Swept Path-171012.dwg Date: 12 October 2017 By: Lalaine maliklan

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership

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St. Leonards NSW 2065
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Email: info@ttpp.net.au

PROJECT

MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE

LOADING DOCK SWEPT PATH ANALYSIS
AS2890.2: 2002 8.8M MEDIUM RIGID VEHICLE ACCESSING COMPACTOR #1

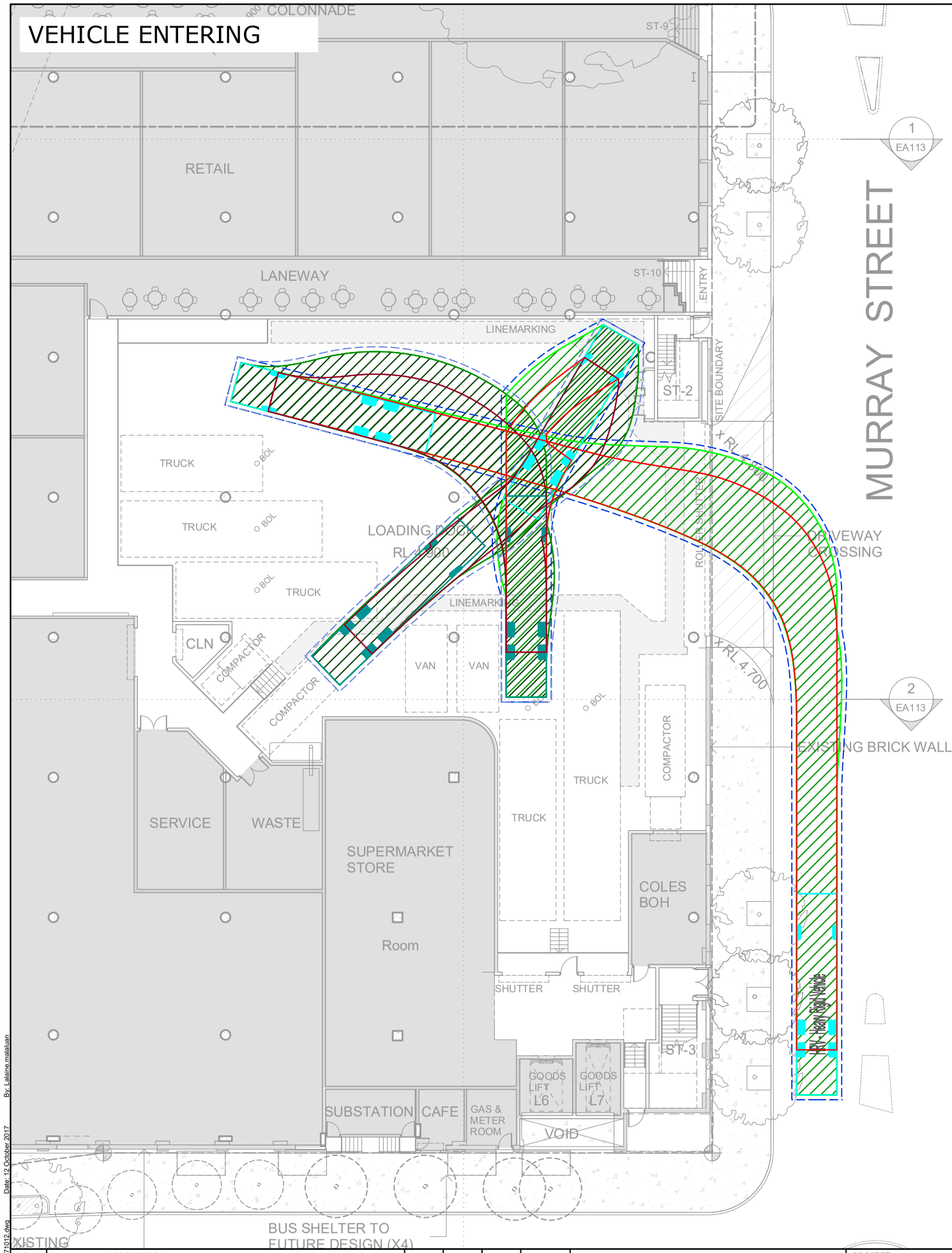
DWG No. FIGURE 12

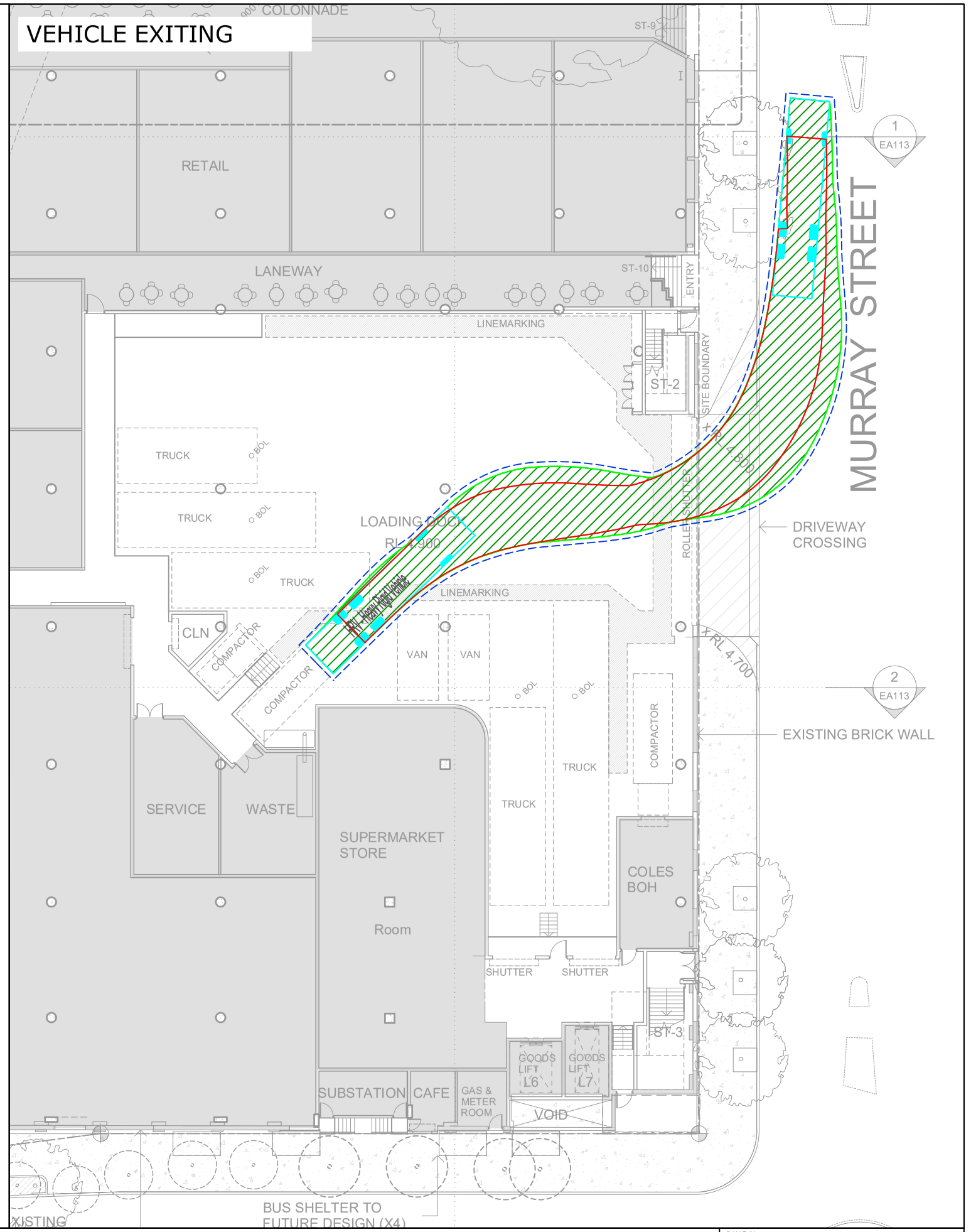
DATE STAMP 12 OCTOBER 2017

PROJECT No.	SCALE	REV.
16065	1:300 @A3	A

VEHICLE ENTERING

VEHICLE EXITING





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
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PROJECT

MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE

LOADING DOCK SWEPT PATH ANALYSIS
AS2890.2: 2002 12.5M HEAVY RIGID VEHICLE ACCESSING COMPACTOR #2

DWG No. FIGURE 13

DATE STAMP 12 OCTOBER 2017

PROJECT No.	SCALE	REV.
16065	1:300 @A3	A

Filename: 16065CAD12-Swept Path-171012.dwg
Date: 12 October 2017
By: Lalaine maliatan

VEHICLE ENTERING

VEHICLE EXITING

RETAIL
LANEWAY
COLONNADE
ST-9
ST-10
ST-2
ST-3
ENTRY
LINEMARKING
SITE BOUNDARY
ROLLER SHUTTER
MURRAY STREET
1 EA113
2 EA113
DRIVEWAY CROSSING
EXISTING BRICK WALL
X RL 4.800
X RL 4.700
LOADING DOCK RL 4.900
TRUCK
BOL
CLN
COMPACTOR
VAN
SERVICE
WASTE
SUPERMARKET STORE
Room
COLES BOH
SHUTTER
GOODS LIFT L6
GOODS LIFT L7
SUBSTATION
CAFE
GAS & METER ROOM
VOID
EXISTING
BUS SHELTER TO FUTURE DESIGN (X4)

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership
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Email: info@ttpp.net.au

PROJECT
MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

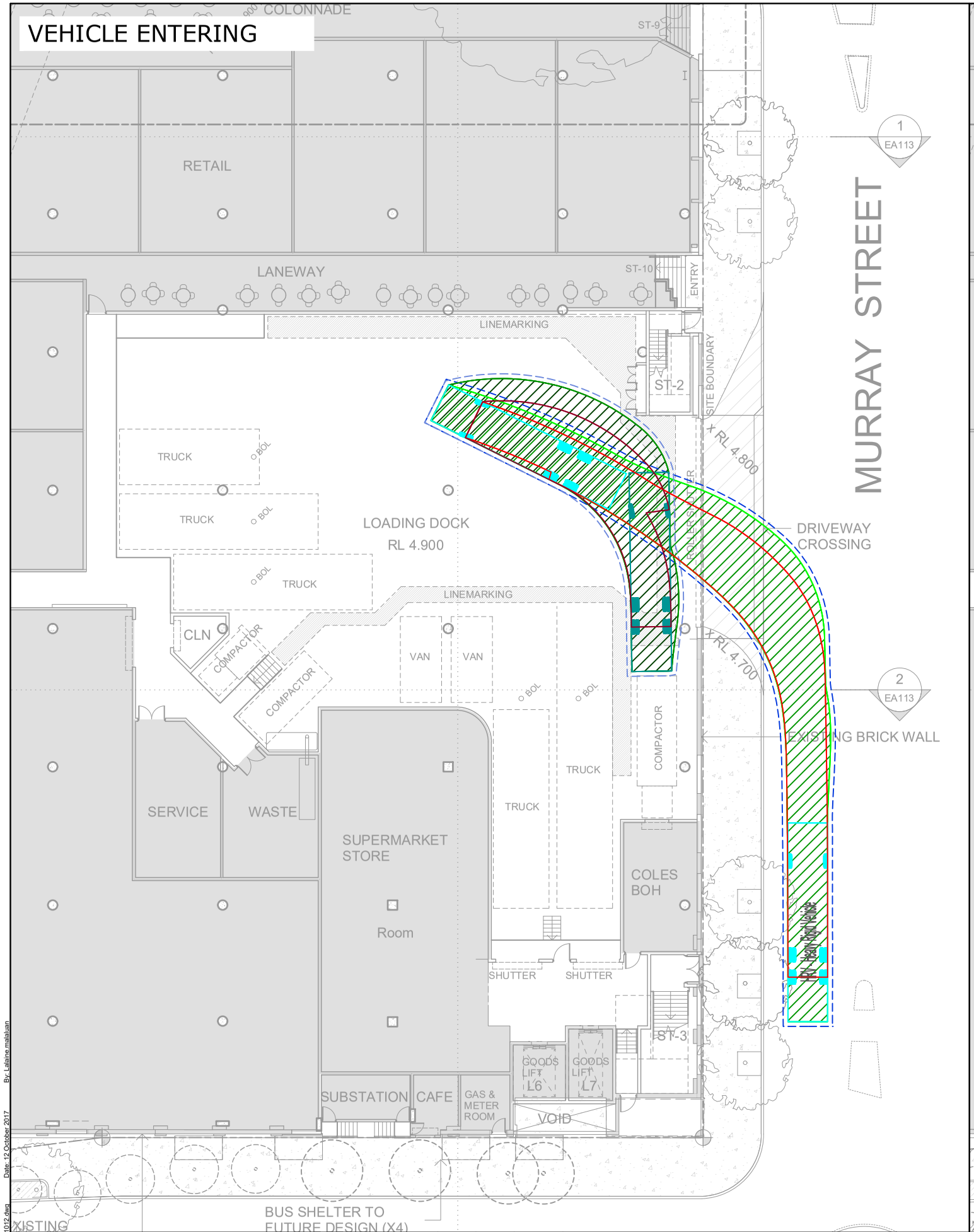
TITLE
LOADING DOCK SWEPT PATH ANALYSIS
AS2890.2:2002 8.8M MEDIUM RIGID VEHICLE ACCESSING COMPACTOR #2

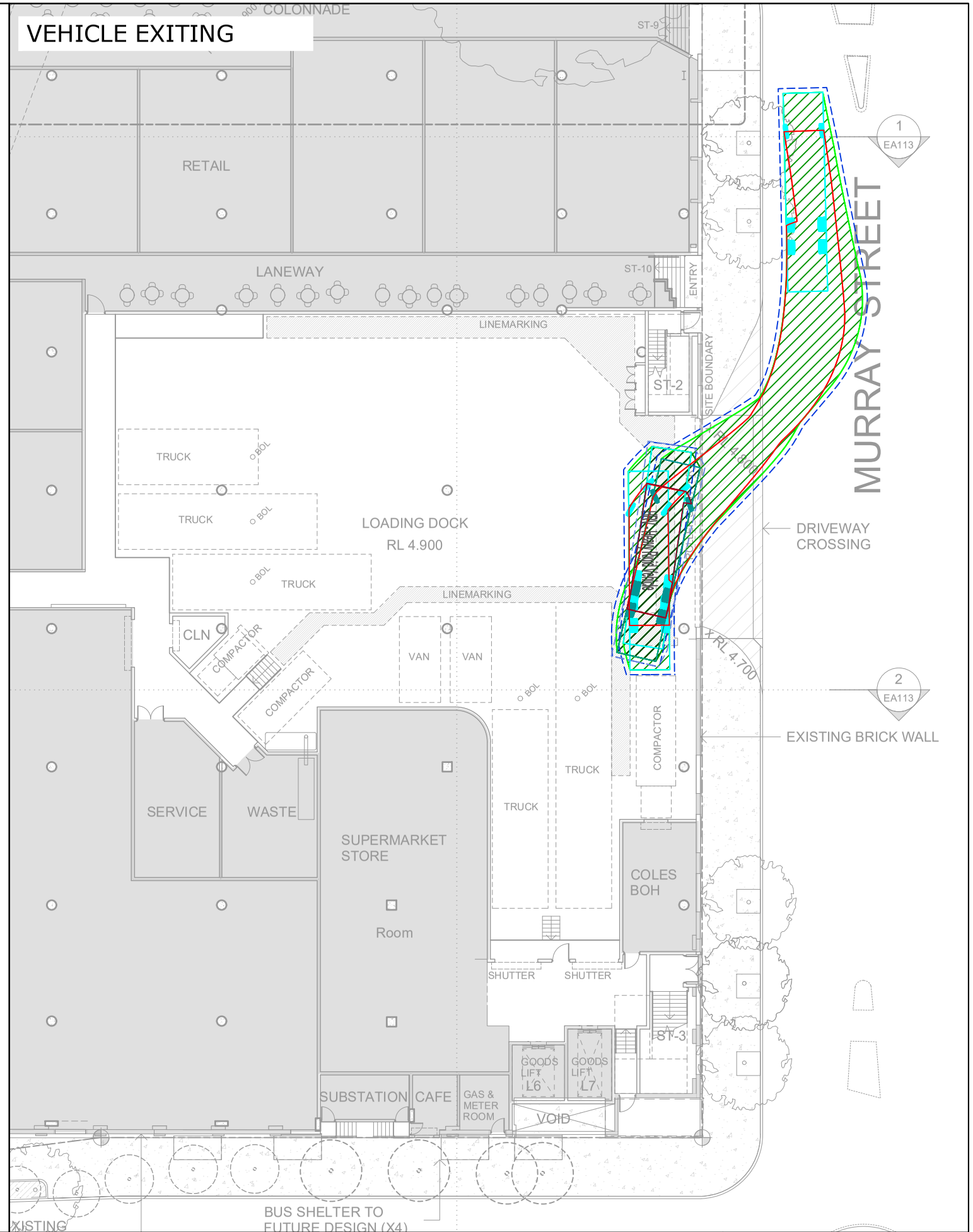
DWG No. FIGURE 14
DATE STAMP 12 OCTOBER 2017
PROJECT No. 16065
SCALE 1:300 @A3
REV. A

Filename: 16065CAD12-Swept Path-171012.dwg
Date: 12 October 2017
By: Lalaine maliatan

VEHICLE ENTERING

VEHICLE EXITING





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership
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Email: info@ttpp.net.au

PROJECT
MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE
LOADING DOCK SWEPT PATH ANALYSIS
AS2890.2: 2002 12.5M HEAVY RIGID VEHICLE ACCESSING COMPACTOR #3

DWG No. FIGURE 15

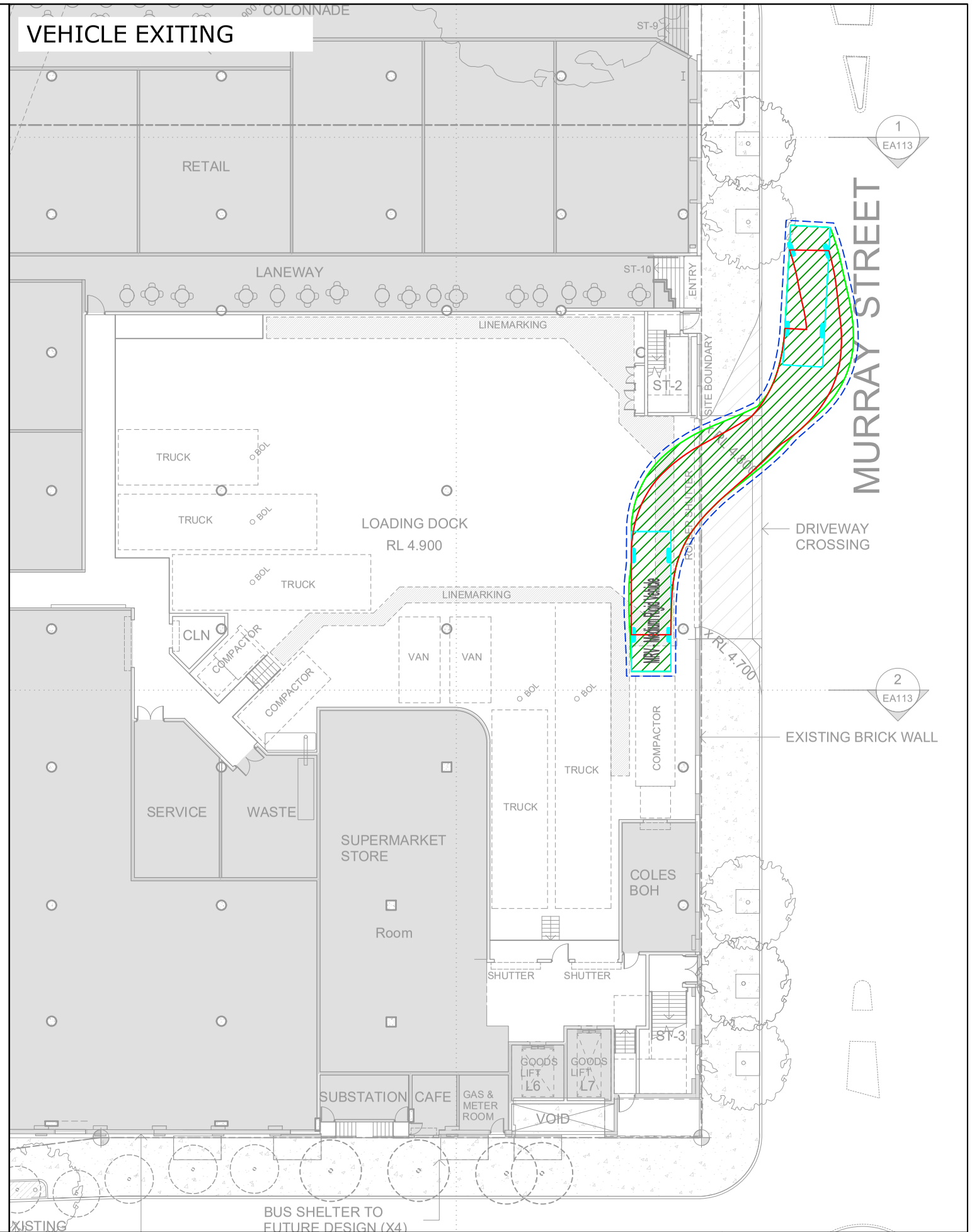
DATE STAMP 12 OCTOBER 2017

PROJECT No. 16065 | SCALE 1:300 @A3 | REV. A

Filename: 16065CAD12-Swept Path-171012.dwg
Date: 12 October 2017
By: Lalaine maliatan

VEHICLE ENTERING

VEHICLE EXITING



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
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PROJECT
MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE
LOADING DOCK SWEPT PATH ANALYSIS
AS2890.2:2002 8.8M MEDIUM RIGID VEHICLE ACCESSING COMPACTOR #3

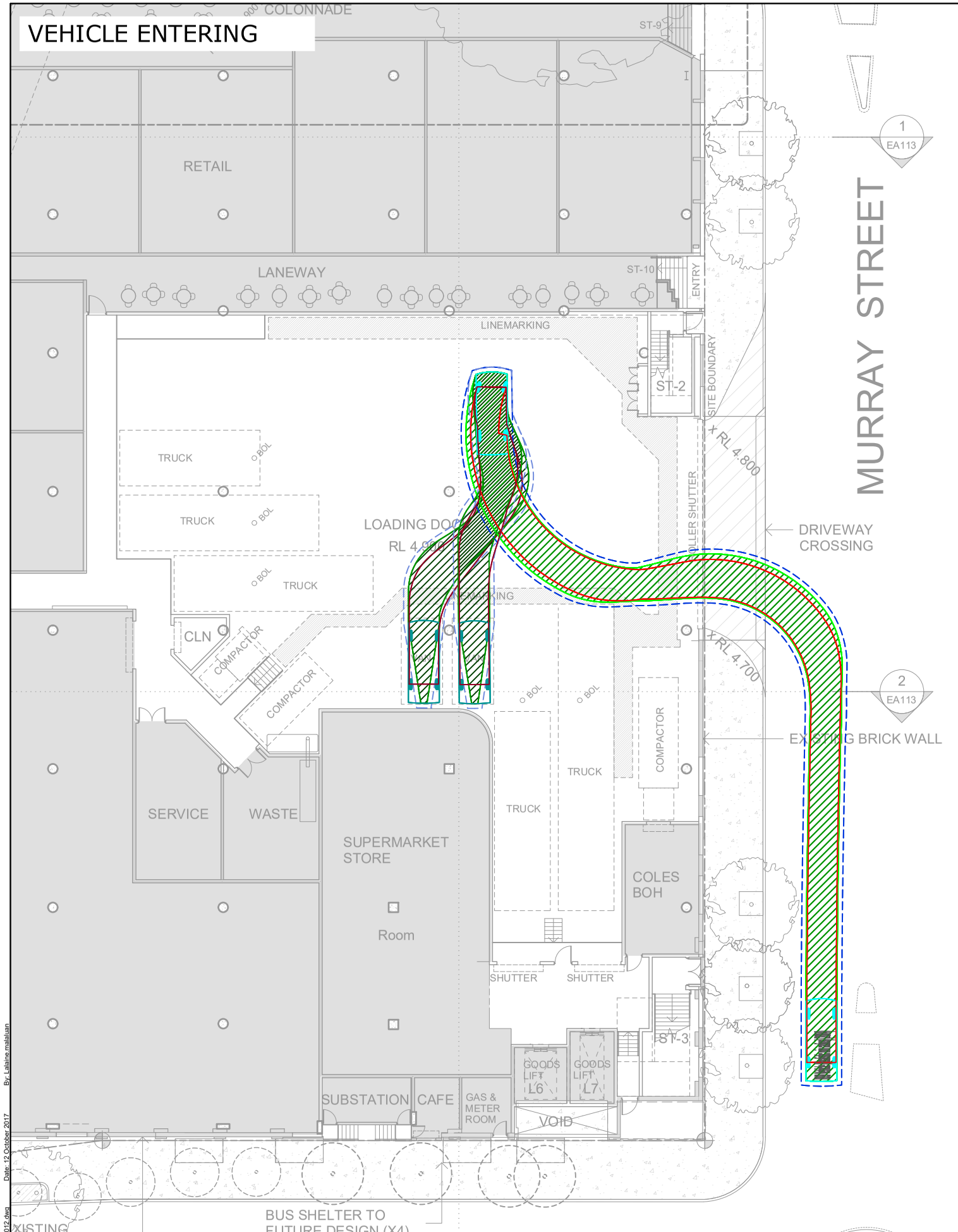
DWG No. FIGURE 16

DATE STAMP 12 OCTOBER 2017

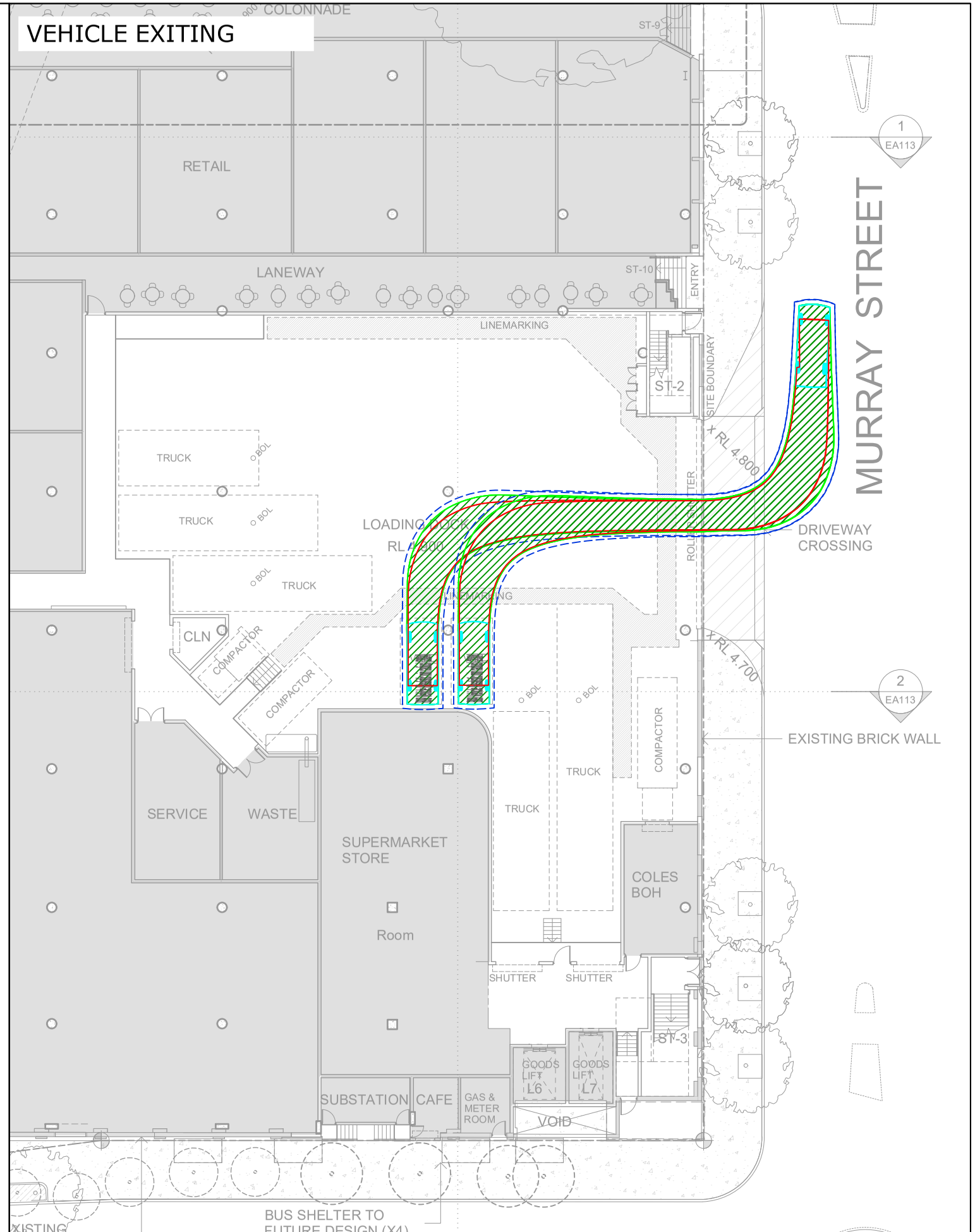
PROJECT No. 16065 | SCALE 1:300 @A3 | REV. A

Filename: 16065CAD12-Swept Path-171012.dwg
Date: 12 October 2017
By: Lalaine maliliian

VEHICLE ENTERING



VEHICLE EXITING



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	OF	ML	12/10/17

The Transport Planning Partnership

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PROJECT

MARRICKVILLE METRO SHOPPING CENTRE REDEVELOPMENT

TITLE

LOADING DOCK SWEPT PATH ANALYSIS
AS2890.1:2004 5.2M B99 VEHICLE

DWG No. FIGURE 17

DATE STAMP 12 OCTOBER 2017

PROJECT No. 16065 | SCALE 1:300 @A3 | REV. A

Filename: 16065CAD12-Swept Path-171012.dwg Date: 12 October 2017 By: Lalaine malalan

Appendix C

Vissim Calibration and Validation Report

Issue History

File Name	Prepared by	Reviewed by	Issued by	Date	Issued to
P3253.001T Marrickville Metro Stage 1B Model Calibration and Validation Report.doc	A Choudhury	A. Ahmed	A. Ahmed	07/09/2017	The Transport Planning Partnership Pty Ltd
P3253.002T Marrickville Metro Stage 1B Model Calibration and Validation Report.doc	A Choudhury	A. Ahmed	A. Ahmed	20/09/2017	The Transport Planning Partnership Pty Ltd

Marrickville Metro Stage 1B Model Calibration and Validation Technical Note

1. INTRODUCTION

1.1 BACKGROUND

Bitzios Consulting has been engaged by The Transport Planning Partnership (TTPP) to develop an existing condition microsimulation model in VISSIM for key road network surrounding the Marrickville Metro Shopping Centre. The model will be used to assess the traffic impacts of the proposed expansion of the Marrickville Metro Shopping centre.

This report documents the data collection, model development process (including all assumptions) as well as the calibration and validation of the model as per the RMS Traffic Modelling Guidelines.

1.2 STUDY AREA

The study area covers the road network around the Marrickville Shopping Centre, and is bounded by Enmore Road and Edgeware Road to the north, May Street to the east, Shirlow Street to the south and the corner of Sydenham Road and Victoria Road to the west. Figure 1.1 below shows the model coverage area.

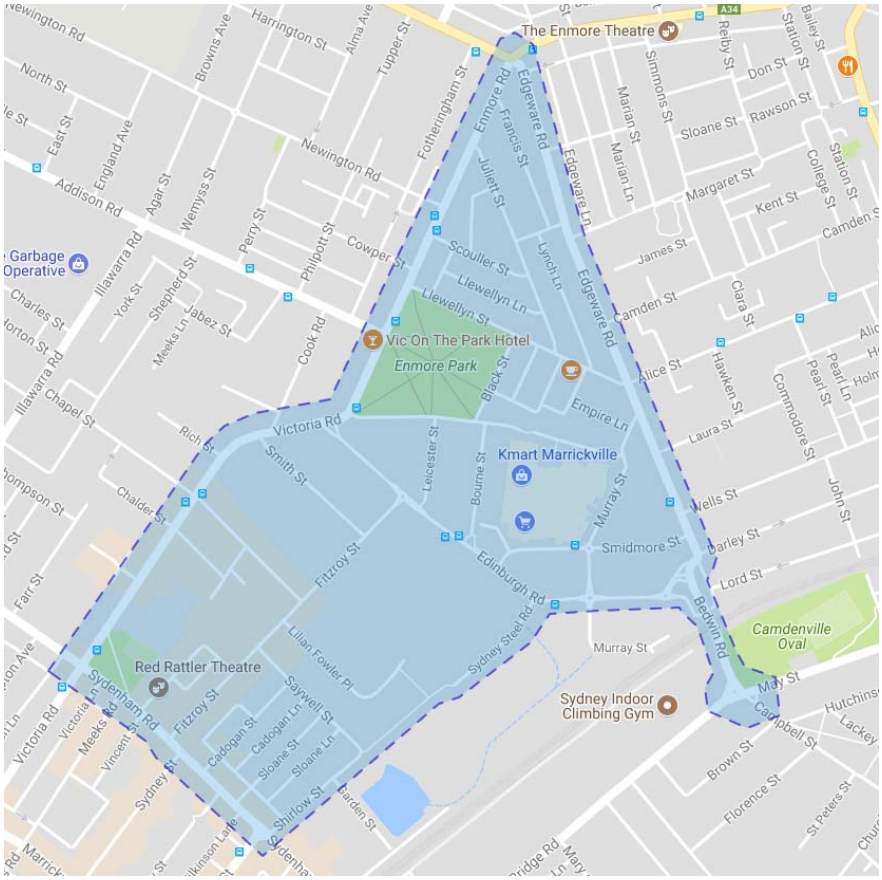


Figure 1.1: The Study Area

The modelled area effectively depicts key road and intersections within the study areas. All key sides roads and pedestrians crossing signals ae included. The modelled roads and intersections are shown in Figure 1.2.

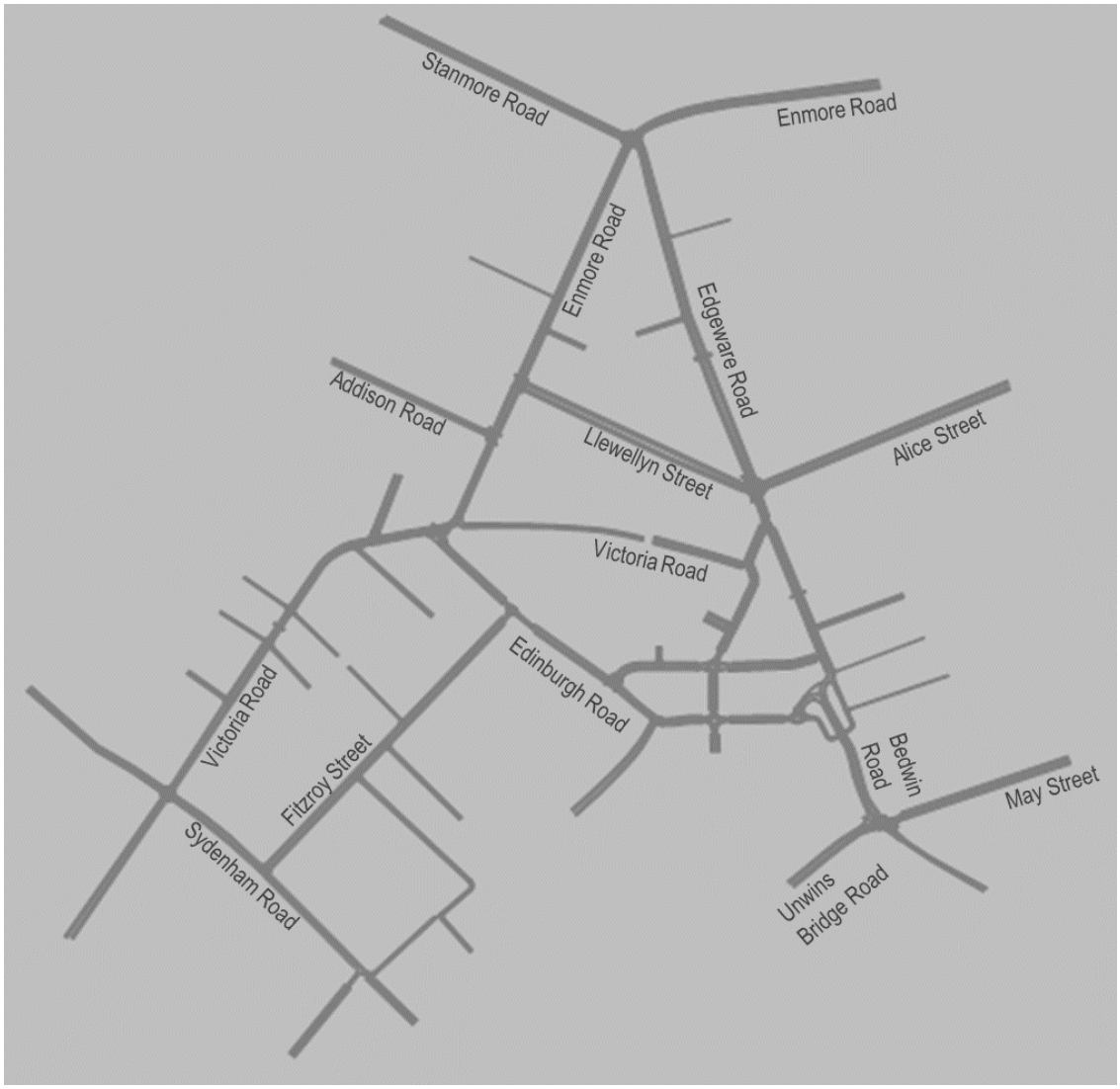


Figure 1.2: Modelled Area

1.3 SITE VISIT

Several site visits were conducted during the model development process. On-site observations were undertaken of queue propagation and the signal operations at various key intersections. Pedestrian behaviour was also observed at marked crossings. Other features such as on-street parking, bus stop locations and a qualitative understanding of vehicle and pedestrian volumes were also gained during the site visit.

2. DATA SOURCES

2.1 KEY DATA SETS

The traffic data used to develop the VISSUM model were compiled from several sources including:

- Intersection count data;
- RMS Sydney Strategic Travel Model (STM) 2016 matrices
- Intersection Diagnostic Monitor (IDM) signal data informing signal phasing; and
- Travel time surveys.

2.2 INTERSECTION COUNTS

Intersection counts were provided by The Transport Planning Partnership and were obtained by BVY Traffic Survey for the Thursday AM Peak (0700-0900), Thursday PM peak (1700-1800) and the Saturday morning peak (1130-1230) at the following intersections:

1. May Street / Campbell Street / Unwins Bridge Road / Bedwin Road;
2. Darley Street / Edgeware Road / Bedwin Road / Edinburgh Road;
3. Edgeware Road / Smidmore Street;
4. Edgeware Road / Wells Street;
5. Edgeware Road / Victoria Road;
6. Alice Street / Edgeware Road / Llewellyn Street;
7. Enmore Road / Edgeware Road / Stanmore Road;
8. Edinburgh Road / Railway Parade;
9. Victoria Road / Murray Street;
10. Murray Street / Edinburgh Road;
11. Murray Street / Smidmore Road;
12. Enmore Road / Llewellyn Street;
13. Enmore Road / Addison Road;
14. Edinburgh Road / Sydney Steel Road;
15. Smidmore Road / Edinburgh Road;
16. Edinburgh Road / Fitzroy Street;
17. Enmore Road / Victoria Road;
18. Victoria Road / Edinburgh Road;
19. Victoria Road / Cook Road;
20. Victoria Road / Chapel Street;
21. Victoria Road / Chalder Street;
22. Victoria Road / Mitchell Street;
23. Victoria Road / Sydenham Road;
24. Fitzroy Street / Sydenham Road;
25. Shirlow Street / Buckley Street.

This data included intersection counts for both light and heavy vehicles. The intersection locations are shown in Figure 2.1.

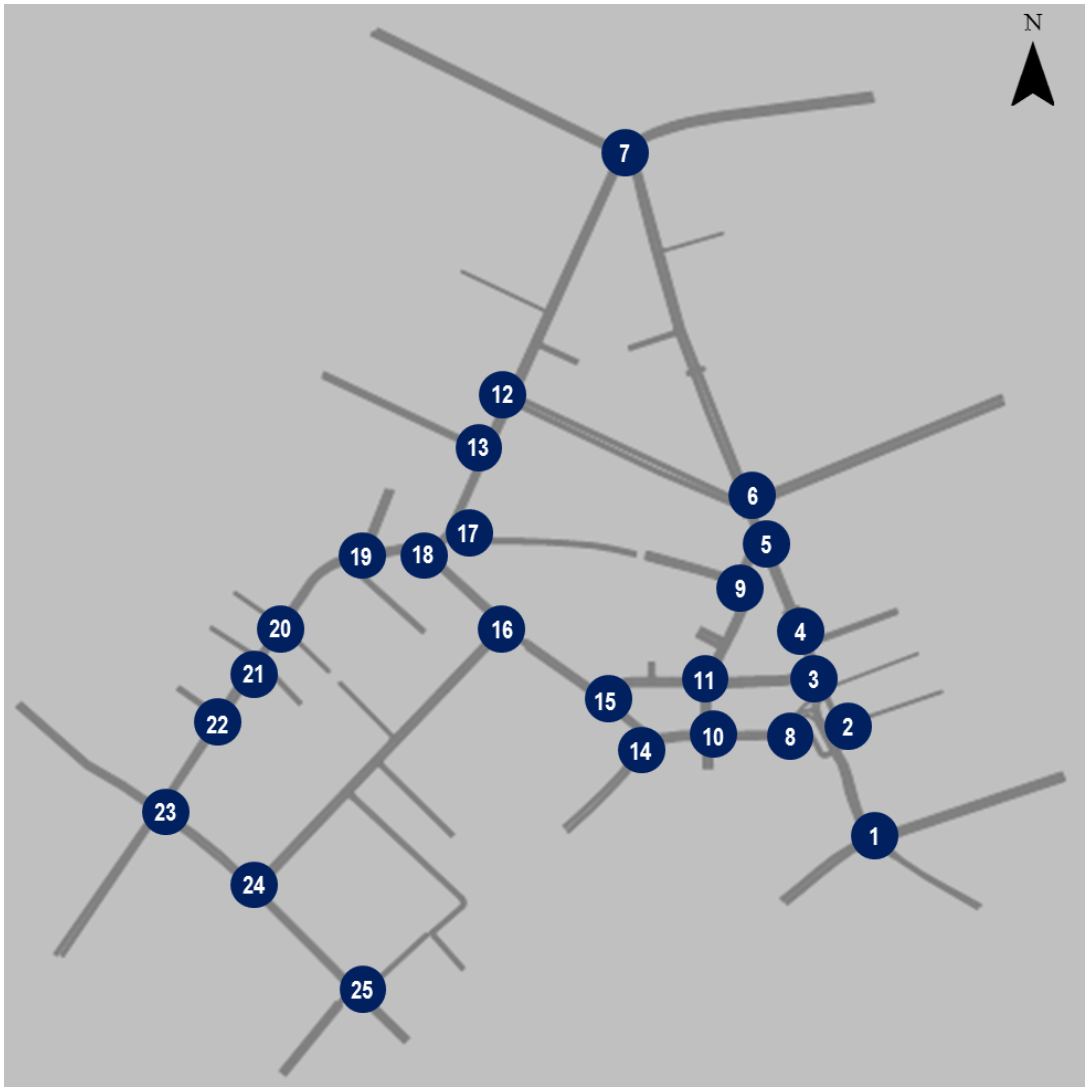


Figure 2.1 Intersection Count Location

2.3 BALANCED TRAFFIC COUNT

Engineering judgement was applied to manually balance the different data sets of traffic counts.

2.4 SCATS DATA

SCATS data was recorded by the Roads and Maritime Services on the 27th of May 2017 (Saturday) and the 1st of June 2017 (Thursday). Data was provided for the full 24-hour period on each day for the following intersections:

- TCS 20 – Enmore Road / Stanmore Road / Edgeware Road;
- TCS 41 – Victoria Road / Sydenham Road;
- TCS 860 – Edgeware Road / Alice Street / Llewellyn Street;
- TCS 917 – Unwins Bridge Road / Campbell Street / May Street;
- TCS 1437 – Victoria Road / Edinburgh Road / Enmore Road;
- TCS 1884 – Enmore Road / Addison Road;
- TCS 1889 – Enmore Road / Llewellyn Street;
- TCS 1992 – Victoria Road / Chapel Street;
- TCS 2025 – Edgeware Road / Wells Street;
- TCS 3769 – Edinburgh Road / Smidmore Street.

2.5 TRAVEL TIME SURVEYS

Traffic surveys were conducted by BVY on Saturday the 27th of May for the AM peak and Thursday the 1st of June 2017 for the PM peak. Three bi-directional routes were chosen within the study area, with travel times between intersections recorded to determine the consistency of the model. The layout of the study routes is shown in Figure 2.2:

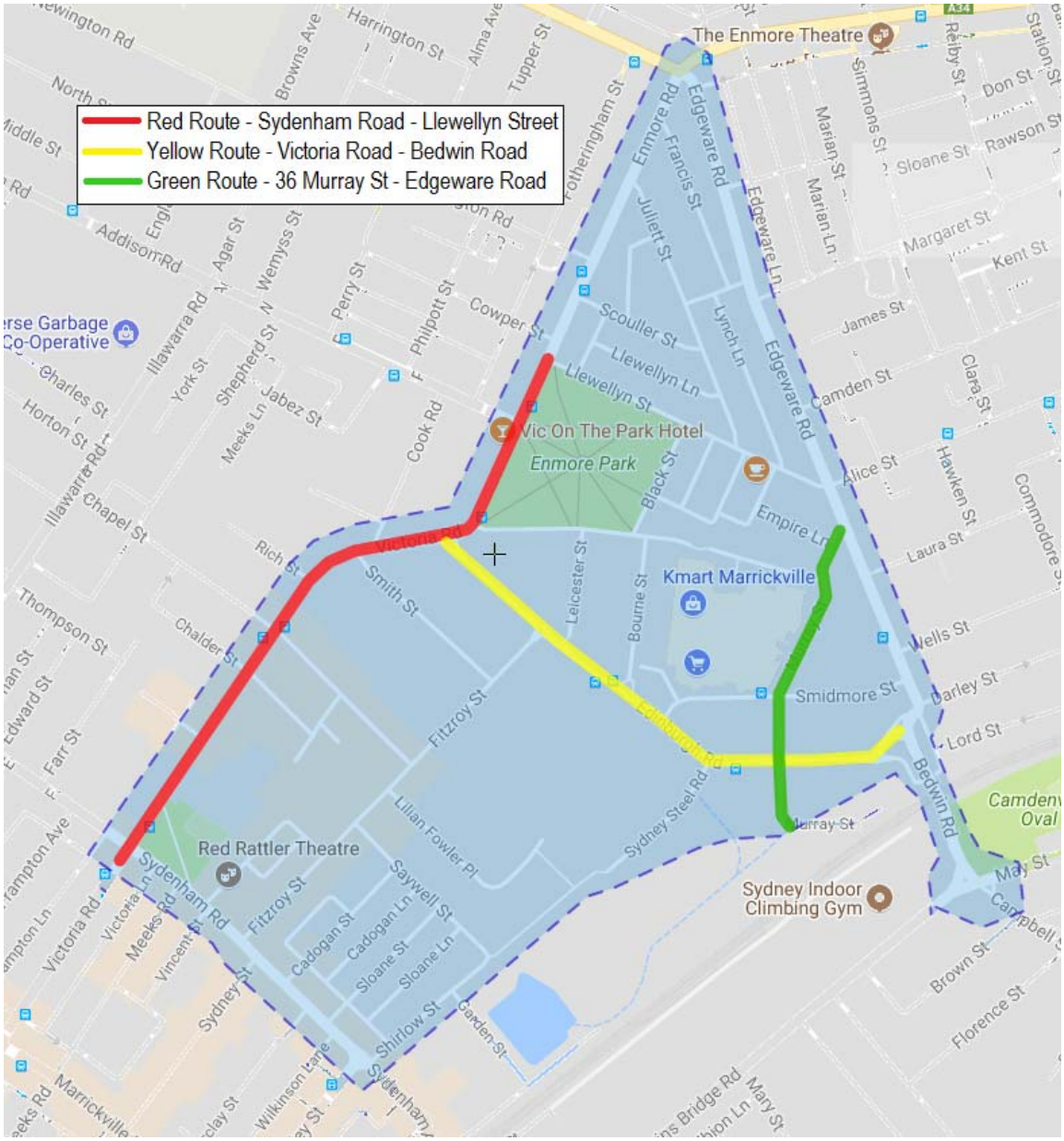


Figure 2.2 Travel Time Routes

2.6 SPEED LIMIT

The maximum speed limit within the study area is 60 km/hr. This is maintained along Enmore Road from the Enmore Road/Stanmore Road intersection and continues along Victoria Road out of the study area. Stanmore Road to Bedwin Road along Edgeware Road also maintain a speed limit of 60km/hr. A school zone is located on Edgeware Road, from Darley Street to surpassing Laura Street. Local roads have a posted speed limit of 50 km/hr, including roads surrounding the Marrickville Metro Shopping Centre. These roads include Edinburgh Road, Murray Street and Victoria Road. The existing speed limits are illustrated in Figure 2.3.

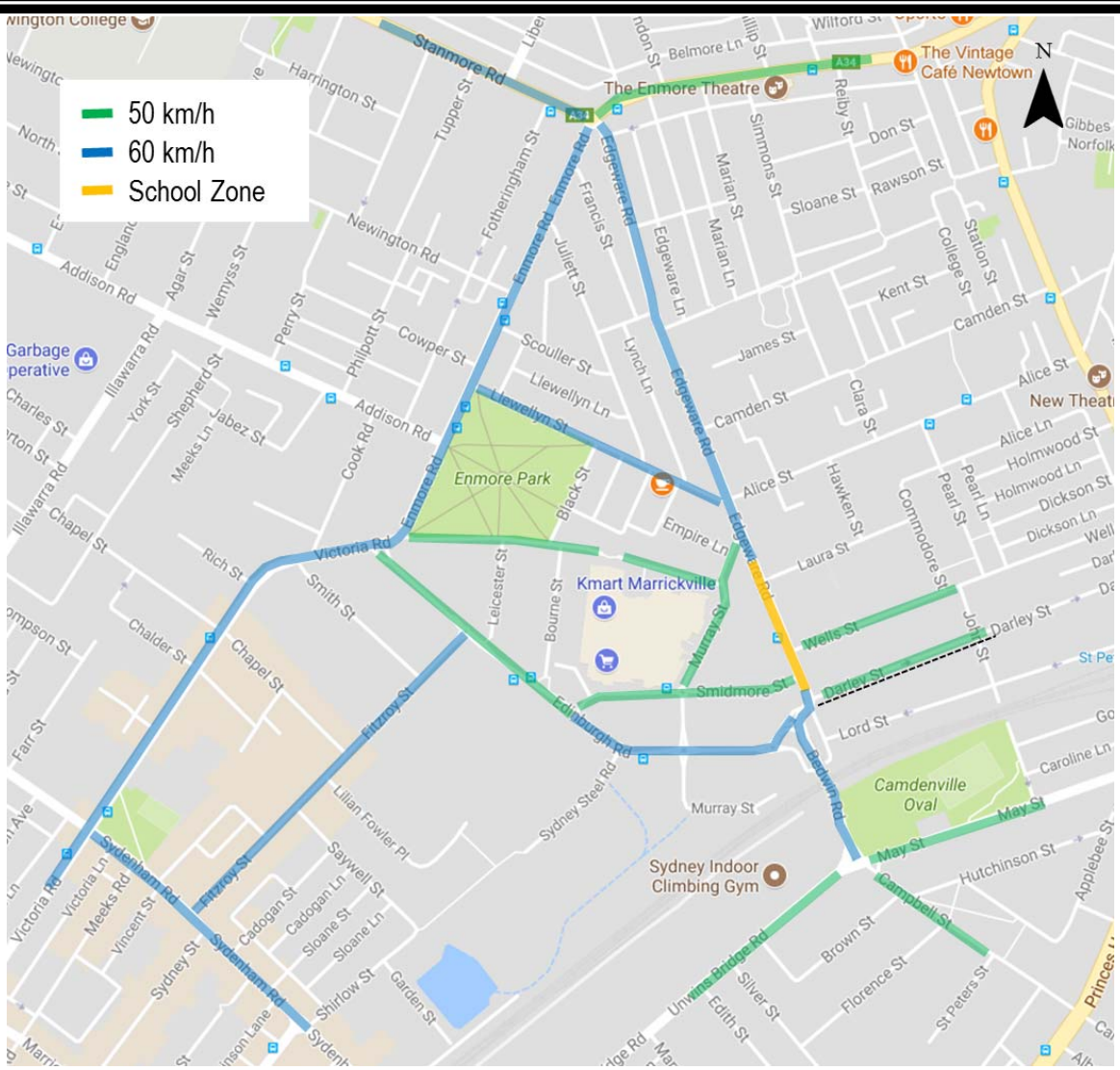


Figure 2.3 Speed limits within the area

3. VISSIM MODEL DEVELOPMENT

3.1 OVERVIEW

The VISSIM model network was developed in VISSIM version 9 software. The network was coded using knowledge obtained from the site visit and latest available aerials. Model parameters were left at the VISSIM defaults. Some of the key features of the model coding that should be noted include:

- Movements within intersections and approaching zebra crossings are controlled by 'Priority Rules' to demonstrate appropriate give-way behaviours;
- reduced speed areas were included in some locations to more accurately reflect vehicle behaviour while completing certain manoeuvres;
- vehicle inputs release vehicles into the models as per the existing posted speed limit;
- kerbside parking spaces were included in the model to simulate the friction caused by the on-street parallel parking.

The following aspects of the model development are more thoroughly explained below:

- public transport services;
- on-street parking restrictions;
- zone system and matrix formulation;
- demand profiling; and
- VisVAP signalling.

3.2 PUBLIC TRANSPORT SERVICES

The Bus Services modelled in the study corresponded to services collated from Transport for NSW and Google Maps and are presented below in Table 3.1 and Figure 3.1.

Table 3.1: Bus Services Within Study Area

Route No	Route Description	Reference to Figure 3.1	Days of Operation
355	Bondi Junction to Marrickville Metro via Moore Park and Erskineville	AF	Operates everyday
	Marrickville Metro to Bondi Junction via Moore Park and Erskineville	FA	Operates everyday
423	City Martin Place to Kingsgrove	AC	Operates everyday
	Kingsgrove to City Martin Place	CA	Operates everyday
426	City Martin Place to Dulwich Hill	AC	Operates everyday
	Dulwich Hill to City Martin Place	CA	Operates everyday
428	City Martin Place to Canterbury	AE	Operates everyday
	Canterbury to City Martin Place	EA	Operates everyday
L23	PrePay only - City Martin Place to Kingsgrove (limited Stops)	AC	Operates weekdays only
	Prepay Only - Kingsgrove to City Martin Place (Limited Stops)	CA	Operates weekdays only and not in PM peak
L28	PrePay Only - City Martin Place to Canterbury (Limited Stops)	AD	Operates weekdays only
	Prepay Only - Canterbury to City Martin Place (Limited Stops)	DA	Operates weekdays only and not in model PM peak
M30	PrePay Only - Spit Junction to Sydenham via City	AC	Operates everyday
	Prepay Only - Sydenham to Spit Junction via City	CA	Operates everyday

	Marrickville Metro to City Gresham St via Redfern	GB	Operates everyday
308	City Gresham St to Marrickville Metro via Redfern	BG	Operates everyday
	Marrickville Metro to Bondi Junction via Oxford St, Crown St and King St	BF	Operates everyday
352	Bondi Junction to Marrickville Metro via Oxford St, Crown St and King St	BF	Operates everyday

The bus stops within the study area are summarised in Table 3.2 below and correspond to Figure 3.1.

Table 3.2 List of Bus Stops

TSN	Bus Stop Location	Reference to Figure 3.1	Bus Routes
Northbound Bus Stops			
204212	Enmore Road at Cambridge Road	N1	355, 423, 426, 428, L23, L28, M30
220438	Enmore Road at Newington Road	N2	355, 423, 426, 428, M30
2204100	Enmore Road after Addison Road	N3	355, 423, 426, 428, L23, M30
220474	Victoria Road at Cook Road	N4	423, 426, M30
220473	Victoria Road at Chapel Street	N5	423, 426, M30
220467	Victoria Road before Sydenham Road	N6	423, 426, M30
204233	Edgeware Road opposite Wells Street	N7	308, 352
Southbound Bus Stops			
204240	Enmore Road at Edgeware Road	S1	355, 423, 426, 428, L23, M30
220440	Enmore Road at Scouller Street	S2	355, 423, 426, 428, M30
220441	Enmore Road at Llewellyn Street	S3	355, 428
220442	Enmore Park, Enmore Road	S4	355, 426, L23, M30
220447	Enmore Road at Victoria Road	S5	355, 423, 426, M30
220448	Vicotria Road at Chapel Street	S6	423, 426, M30
220449	Wicks Park, Victoria Road	S7	423, 426, M30
Westbound Bus Stops			
204263	Stanmore Road at Fotheringham Street	W1	L28
220475	Addison Road at Denby Street	W4	428
2204109	Edinburgh Road opposite Smidmore Street	W2	355
220412	Wedinburgh Road before Sydney Steel Road	W3	308, 352
204232	Alice Street at Pearl Street	W5	308, 352
Eastbound Bus Stops			
220446	Addison Road at Perry Street	E4	428
2204110	Edinburgh Road before Smidmore Street	E1	355
220411	Marrickville Metro Shopping Centre, Smidmore Street	E2	308, 352, 355

204234	Alice Street before Clara Street	E3	308, 352

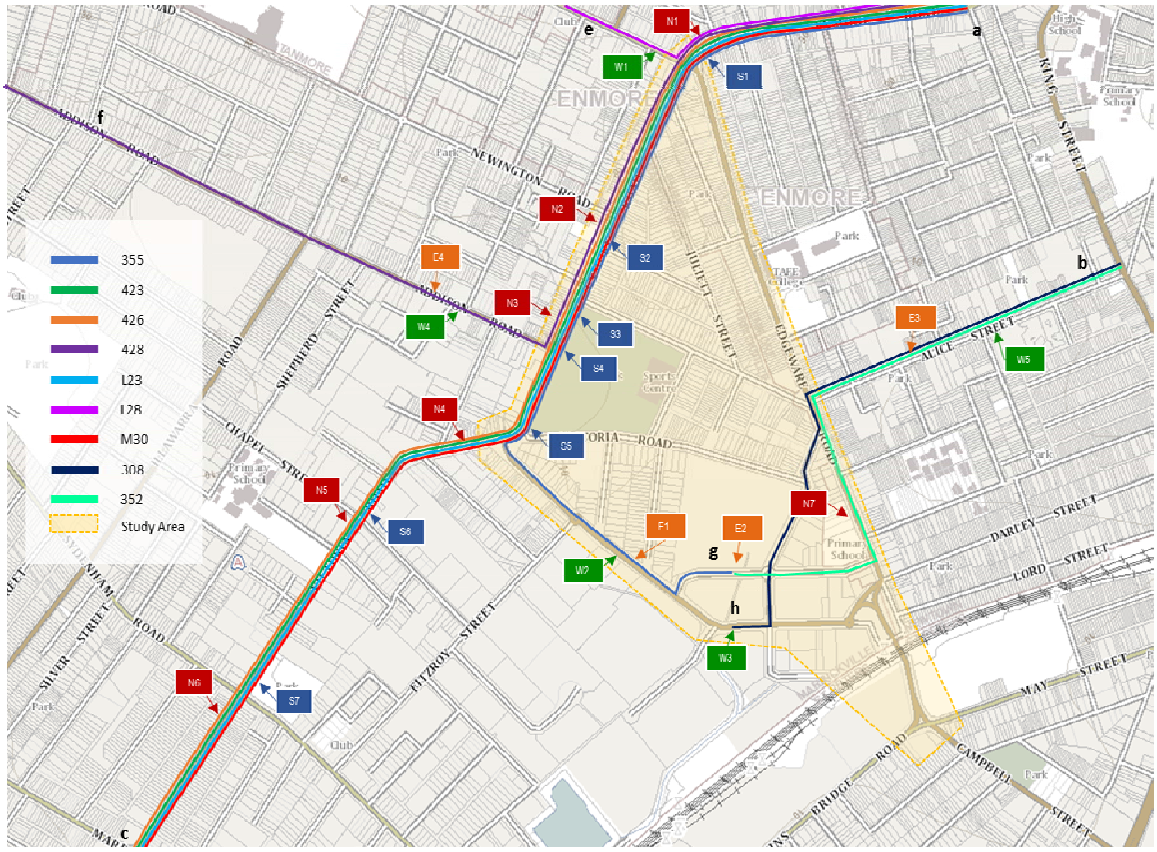


Figure 3.1: Bus Routes Overview Map

Frequencies and times of each bus route during the periods modelled were determined from the Transport for NSW website based on the August 2017 timetable.

3.3 On-Street Parking Restrictions

The study area contains a range of parking restrictions, particularly located north, towards the Enmore Road/Stanmore Road intersection, along Enmore road and Edgeware Road. Most variations relate to the time restrictions for no parking and parking sections. The on-street parking restrictions are displayed in Figure 3.2 and correspond to the following references:

1. Unrestricted;
2. Bus Zone;
3. Mail Zone;
4. No Parking at all times;
5. No Parking 6:30am - 9am, Monday – Friday;
6. No Parking 7am – 9am, Monday – Friday;
7. No Parking 7:30am – 9:30am, 3:30pm – 5:30pm, Monday – Friday;
8. No Parking 7:30am – 9:30am, 4:30pm – 6:30pm, Monday – Friday;
9. No Parking 8:30am – 6pm, Monday – Friday;
10. No Parking 3:30pm – 5:30pm, Monday – Friday;
11. No Parking 3:30pm – 7pm, Monday – Friday;
12. No Parking, 4pm – 6pm, Monday – Friday;
13. No Stopping at all times;

14. No Stopping 6am – 9:30am, Monday – Friday;
15. No Stopping 7am – 9am, 4pm – 6pm, Monday – Friday;
16. Loading Zone 9am – 4pm, Monday – Friday;
17. Loading Zone 12pm – 2pm;
18. P5min 8:30am – 9am, 3pm – 3:30pm, School Days;
19. P15min 7am – 9am, 4pm – 6pm, Monday – Friday;
20. 1P 6pm – 10pm everyday;
21. 2P 8:30am – 6pm, Monday – Friday;
22. 2P 8:30am – 6pm Monday – Friday, 8:30am – 6pm Saturday;
23. PWD Parking at all times; and
24. PWD Parking 8:30am - 9:30am, 2pm – 3:30pm, School Days.

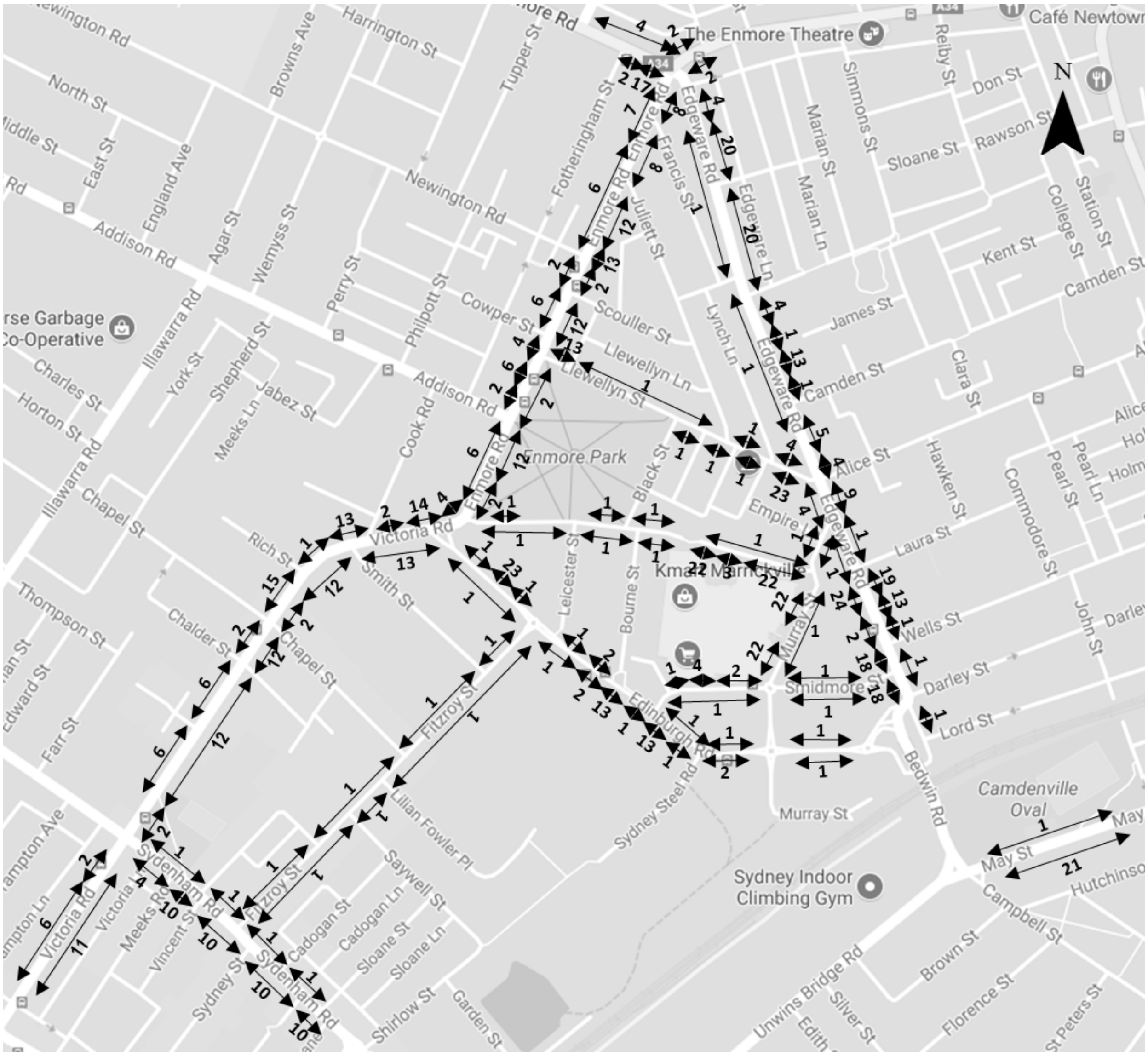


Figure 3.2 Parking restrictions within the study area

3.4 ZONE SYSTEM AND MATRIX FORMULATION

A combination of traffic counts, site observation and cordon matrix from Sydney Strategic Travel Model (STM) for the study area, were used to estimate a "best guess" prior matrix. Each period's matrix was then run through the model with manual adjustments made to satisfactorily represent the base traffic patterns while achieving the model calibration criteria. The travel zones created in the VISSIM model is shown in Figure 3.3 that corresponds to the following road segments:

- Zone 1: Stanmore Road;
- Zone 2: Enmore Road;
- Zone 3: Alice Street;
- Zone 4: Wells Street;
- Zone 5: Darley Street;
- Zone 6: May Street;
- Zone 7: Campbell Street;
- Zone 9: Edgeware Road (removed);
- Zone 10: Railway Parade (removed);
- Zone 11: Murray Street;
- Zone 12: Sydney Steel Road;
- Zone 13: Garden Street;
- Zone 14: Buckley Street;
- Zone 15: Victoria Road;
- Zone 16: Sydenham Road (West);
- Zone 17: Mitchell Street;
- Zone 18: Chalder Street (West);
- Zone 19: Chalder Street (East);
- Zone 20: Chapel Street (West);
- Zone 21: Chapel Street (East)
- Zone 22: Smith Street;
- Zone 23: Cook Road;
- Zone 24: Addison Road;
- Zone 25: Scouller Street;
- Zone 26: Lynch Avenue;
- Zone 27: Victoria Road (East);
- Zone 28: Victoria Road (West);
- Zone 29: Marrickville Metro Shopping Centre Entrance (East);
- Zone 30: Marrickville Metro Shopping Centre Entrance (South);
- Zone 31: Lillian Fowler Place;
- Zone 32: Chapel Street;
- Zone 33: Newington Road;
- Zone 34: Cross Lane;
- Zone 35: Sydenham Road (East); and
- Zone 36: Lord Street.

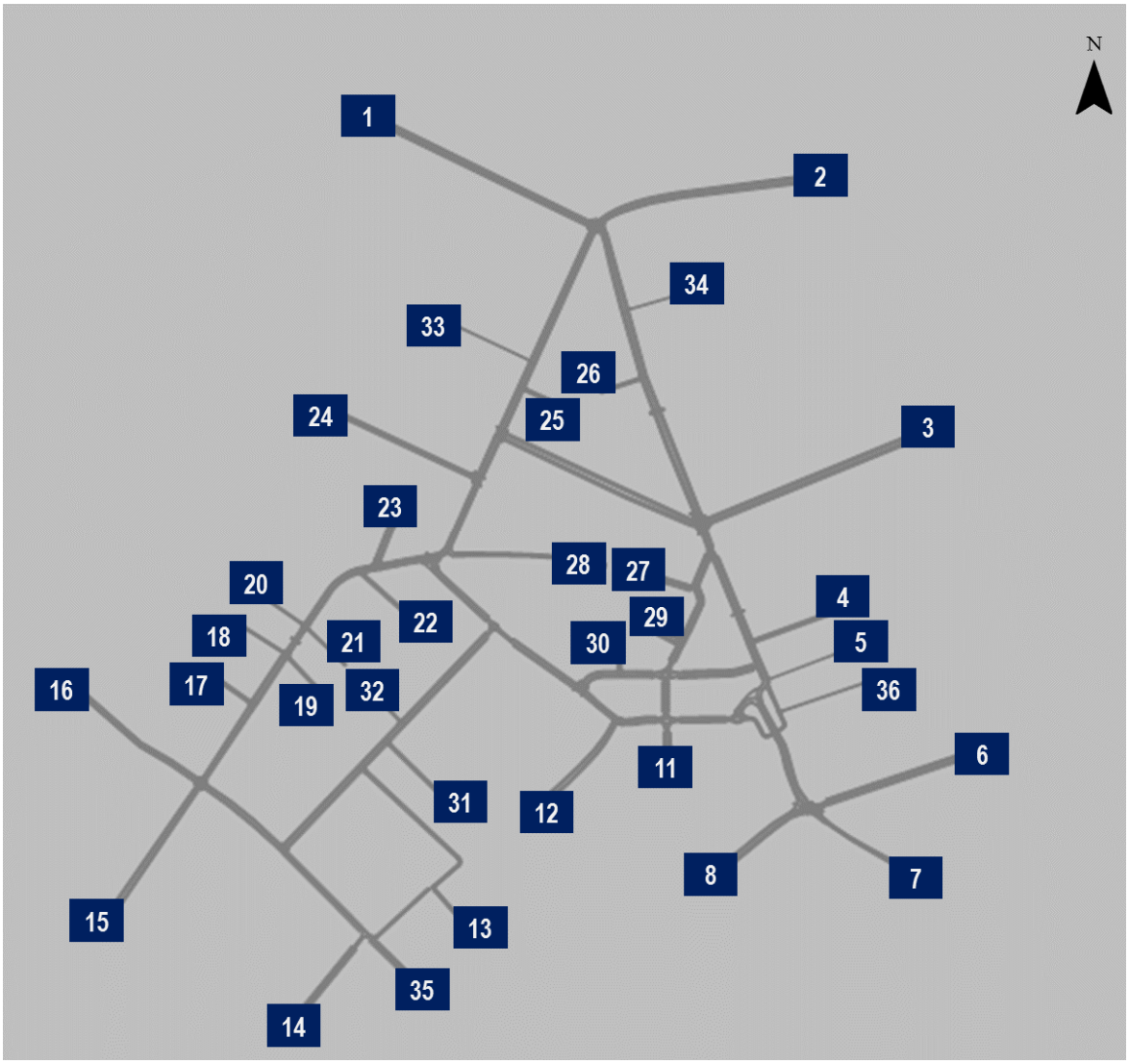


Figure 3.3 Travel zones in the VISSUM model

3.5 TRAFFIC COUNT DATA

The observed counts were combined from various sources and then manually balanced. The Weekday PM peak and Weekend Mid-day peak hour balanced counts are shown in Attachment A.

3.6 TIME PERIODS AND PROFILES

3.6.1 Modelled Periods

The Weekday PM and Weekend Mid-day peak periods were identified based on traffic survey data at all intersections in the study area. The model has been set up to include a 30-minute warm-up period, a 1-hour evaluation period and a 30-minute cool-down period, for both the peak periods. These are outlined in Table 3.3

Table 3.3 Weekday PM and Weekend Mid-day peak periods

Peak Periods	Warm Up	Peak Period	Cool Down
PM	16:30 – 17:00	17:00 - 18:00	18:00 – 18:30
Weekend Mid-day	11:00 – 11:30	11:30- 12:30	12:30 – 13:00

Results have been set up to be recorded in 15-minute intervals, while the majority of model inputs are also entered in 15-minute increments.

3.6.2 Demand Profiling

In order to ensure that the correct number of vehicles are released into the network as per defined time slices, a demand profile was constructed. Temporal traffic profiles were developed for 15 minute periods based on the surveyed traffic data at the key intersection of Enmore Road/ Stanmore Road/ Edgeware Road.

The AM and Weekend Mid-day peak demand profiles are presented in Table 3.4 and Table 3.5 below.

Table 3.4: PM Peak Traffic Demand Profile

Measure	Weekday PM Peak			
	17:00-17:15	17:15-17:30	17:30-17:45	17:45-18:00
Demand Profile	25%	26%	25%	24%

Table 3.5: Weekend Mid-day Peak Traffic Demand Profile

Measure	Weekend Mid-day Peak			
	11:30-11:45	11:45-12:00	12:00-12:15	12:15-12:30
Demand Profile	25%	26%	25%	24%

3.6.3 Traffic Composition

Traffic composition used in the model was based on the analysis of traffic mix at the Enmore Road/ Stanmore Road/ Edgeware Road signalised intersection. The traffic composition used in the model is summarised in Table 3.6.

Table 3.6: AM and PM Traffic Composition

Measure	PM Peak		Weekend Mid-day Peak	
	Light	Heavy	Light	Heavy
Traffic Composition	98.0%	2.0%	95.4%	4.6%

3.6.4 Bus Dwell Time

A normal distribution of the minimum and maximum times has been assumed in VISSIM using the program setting. The maximum and minimum bus dwell times at bus stops is 30 seconds and 2 seconds respectively.

3.6.5 VisVAP Signalling

The signal groups within the model are partially actuated and controlled by VisVAP program, incorporating the signal behaviours reflected in the IDMs. The signal behaviour varies in an-hour blocks, depending on the average, observed phase timing from the IDMs.

SCATS's LX files were interrogated to calculate intersection offsets:

- Progression Plan (PP) and Link Plan (LP) 2 were adopted for the PM peak model; and
- Progression Plan (PP) and Link Plan (LP) 3 were adopted for the Mid-Day Weekend model.

4. CALIBRATION

4.1 CRITERIA

The model was calibrated in accordance with the *RMS Traffic Modelling Guidelines 2013,* which stipulate the requirements for model calibration. Notable key criteria are:

- Satisfactory GEH values for all turn and link volumes;
- Volumes within a "core area" must be satisfactory against specified "tolerance limits"; and
- R^2 Value must be 0.9 throughout the network, and 0.95 within the "core area."

These criteria are elaborated on below. Due to the area under investigation directly relating to the modelled area, the "core area" is the whole model.

4.2 GEH STATISTIC

The Geoffrey E. Havers (GEH) Statistic is an industry standard measure of variance between the observed count and modelled count, expressed by the following:

$$GEH = \sqrt{\frac{2(M-C)^2}{M+C}}$$

Where M is the Modelled Volume and C is Observed Volume.

This expression effectively relates the severity of variance to the size of the observed volume and allows the variance from both large and small volumes to be assessed by the same measure.

The *RMS Traffic Modelling Guidelines 2013* (Table 11.1) uses the GEH Statistic as the main measurement of variance in microsimulation modelling and sets out the following requirements for calibration to turning movement and link volumes:

- 100% of turns and links with a GEH < 10; and
- 85% of turns and links with a GEH < 5.

The GEH results for the AM and PM base model in relation to these criteria are summarised in Table 4.1, while the detailed calculations for each movement are shown in Attachment B.

Table 4.1: AM and PM Base Model Turning Movement GEH Results

Measure	Weekday PM	Weekend Mid-day
% of GEH < 10	100%	100%
% of GEH < 5	86%	91%

As indicated by the results in Table 4.1, the model satisfies the GEH calibration requirements in both peak periods.

4.3 MODEL STABILITY

4.3.1 Stability Testing

Model stability between runs/seed values is particularly important in microsimulation models and is demonstrate using a variety of network performance measures. The following network performance measures have been adopted to demonstrate model stability:

- Total number of vehicles in the model; and
- Cumulative travel time across all vehicles (vehicle-hour travelled).

Model outputs for each of the two measures are presented at 15-minute interval in Figure 4.1 through to Figure 4.4 across the following five seeds modelled:

- Run 1: Seed 5;
- Run 2: Seed 10;
- Run 3: Seed 15;
- Run 4: Seed 20; and
- Run 5: Seed 25

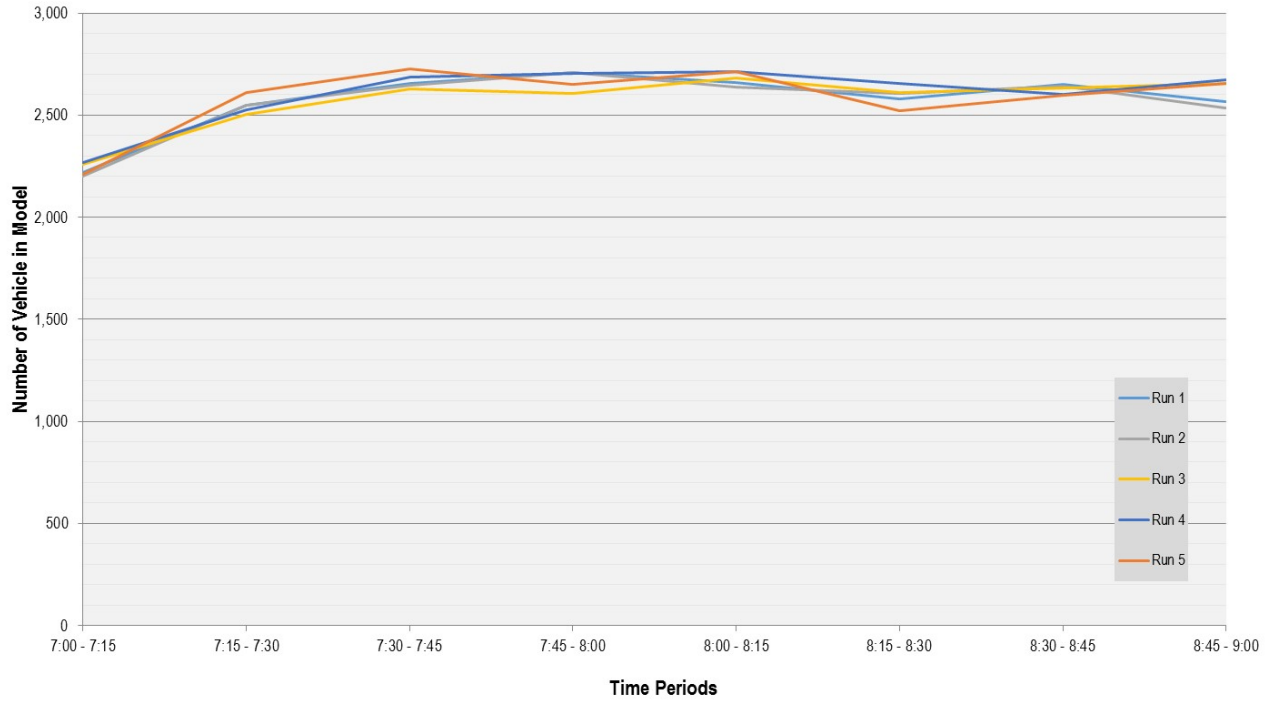


Figure 4.1: Weekday PM Peak Total Number of Vehicles in the Model

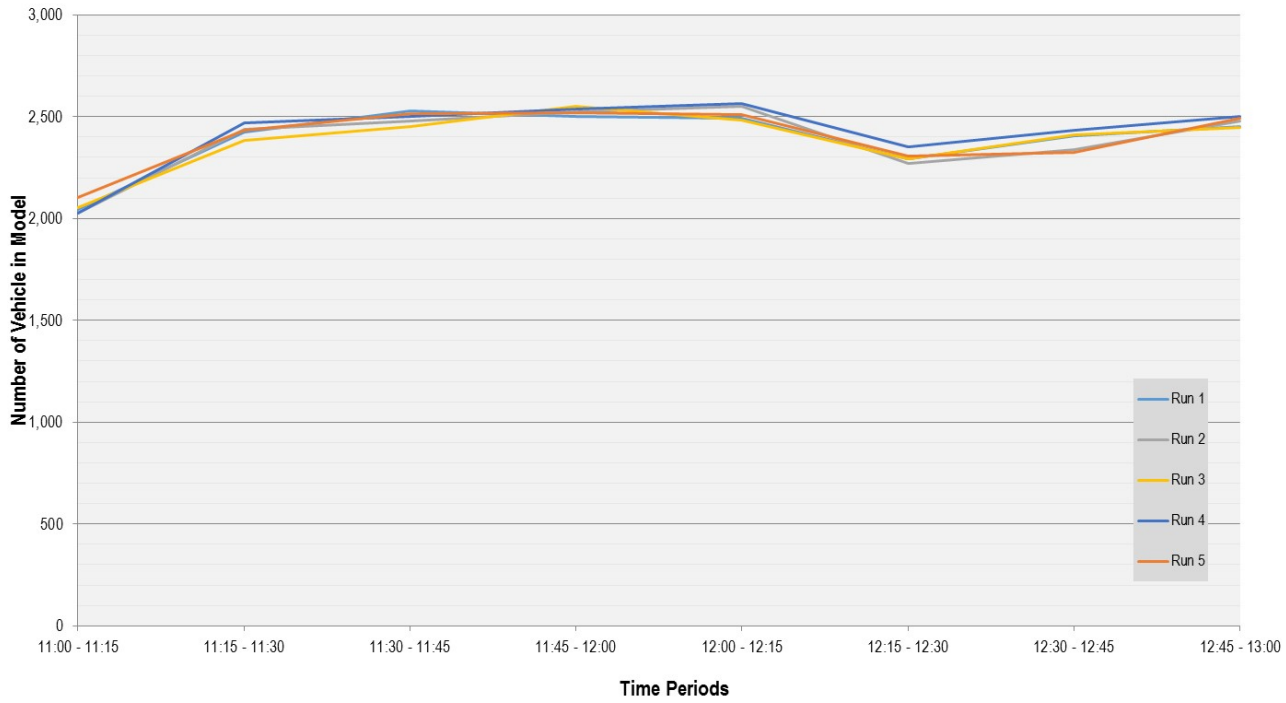


Figure 4.2: Weekend Mid-Day Peak Total Number of Vehicles in the Model

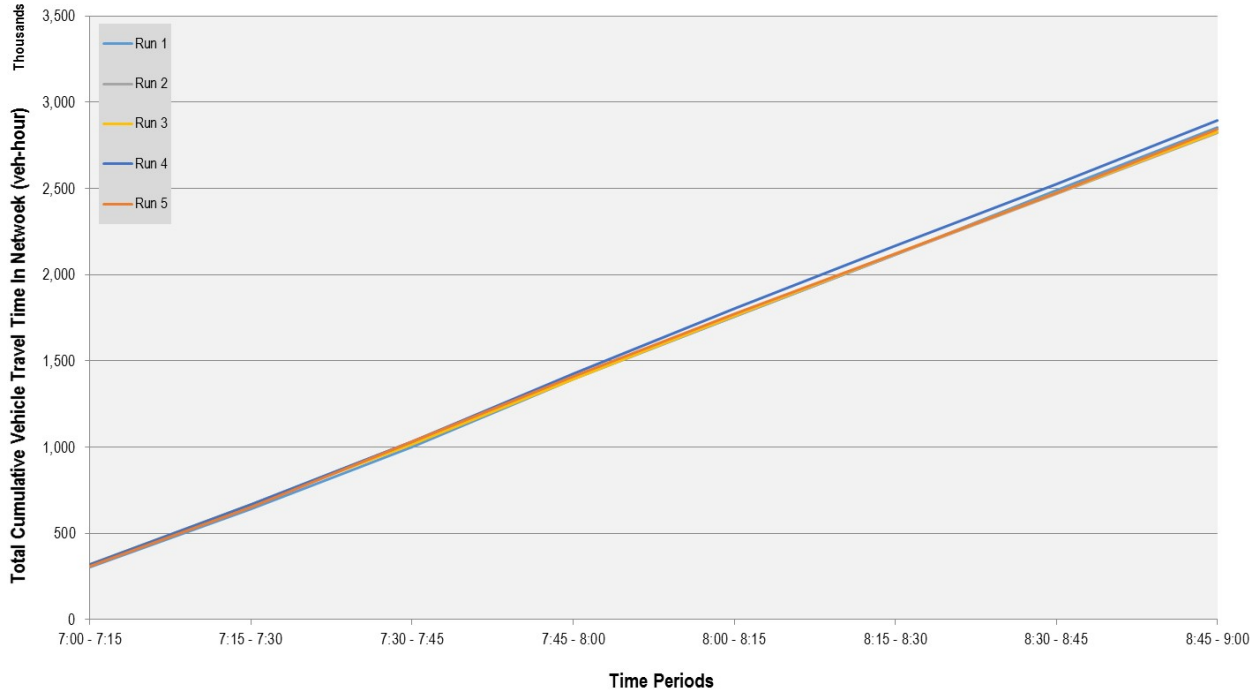


Figure 4.3: Weekday PM Peak Vehicles Hour Travelled

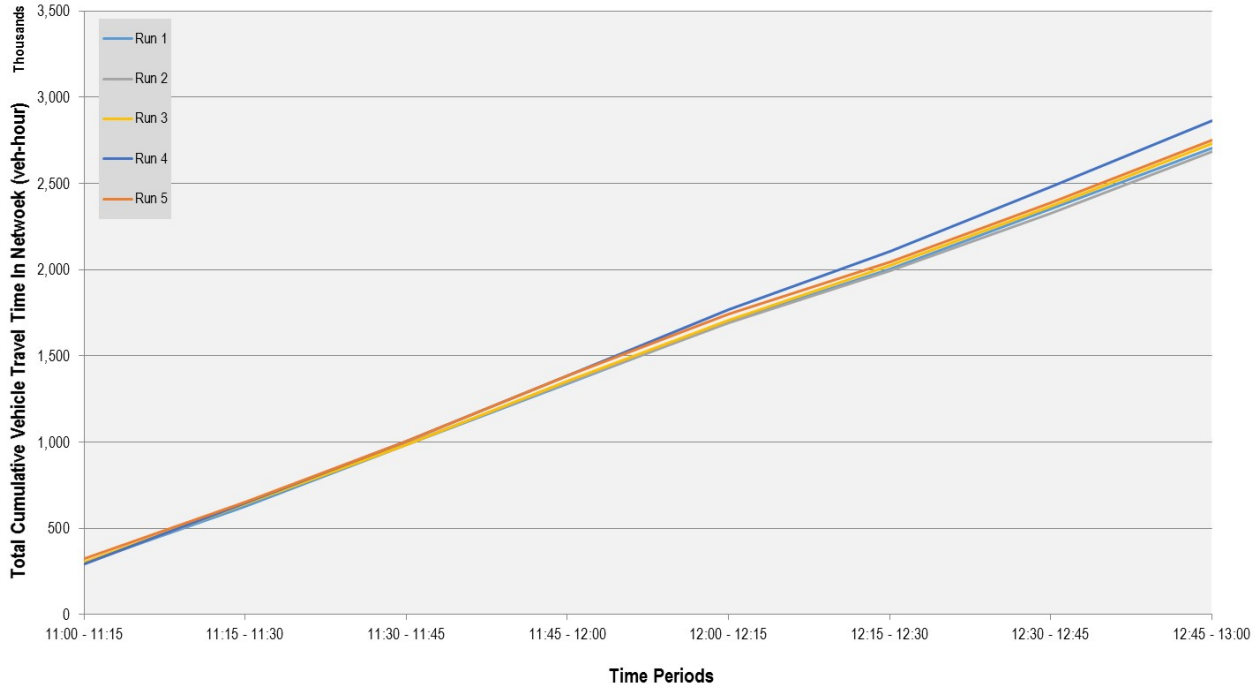


Figure 4.4: Weekend Mid-Day Peak Vehicles Hour Travelled

As evidenced by the above figures, the model behaviour across these two measures is quite consistent between seed runs. The models are therefore considered to be stable.

4.3.2 Median Seed

The median seed for each peak period has been identified by assessing the vehicle hours travelled (VHT) for each of the simulated runs. The weekday PM and weekend Mid-day peak median seeds are:

- Weekday PM Peak: Seed 5; and
- Weekend Mid-Day Peak: Seed 15

All calibration and validation outputs reported are drawn from the median seed run.

5. VALIDATION

Following the calibration of the model to vehicle flows, the model was validated to average vehicle travel time and signal behaviour.

5.1 TRAVEL TIME VALIDATION

The RMS Modelling Guidelines require a comparison between the observed and modelled travel times. Travel time validation was undertaken for the following routes within the study area (as shown in Figure 2.2):

- Red Route: Victoria Road both direction between Llewellyn Street and Sydenham Road;
- Yellow Route: Edinburgh Road both direction between Victoria Road and Bedwin Road; and
- Green Route: Murray Street both direction between Edinburgh Road and Edgeware Road.

The RMS Modelling Guidelines consider the modelled travel time to validate (i.e. sufficiently resemble) the observed travel time when they lie within ±15% of the observed average. This is demonstrated for each route in each peak by the cumulative time vs. distance graphs in Figure 5.1 to Figure 5.12. The modelled travel times sufficiently resemble the observed travel times.

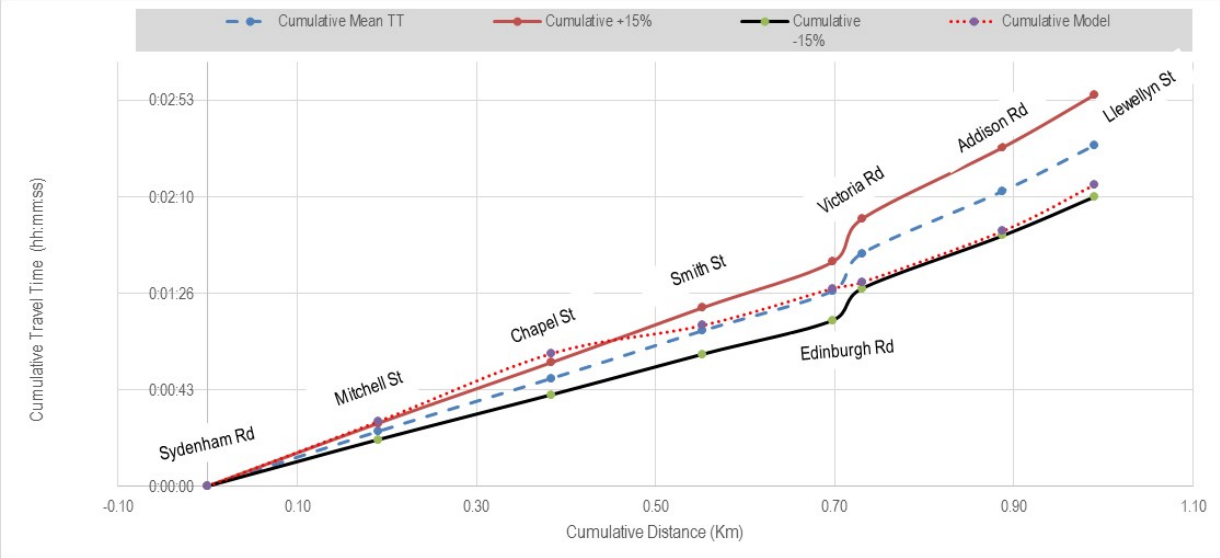


Figure 5.1: Weekday PM Peak Travel Time Validation – Red Route Northbound

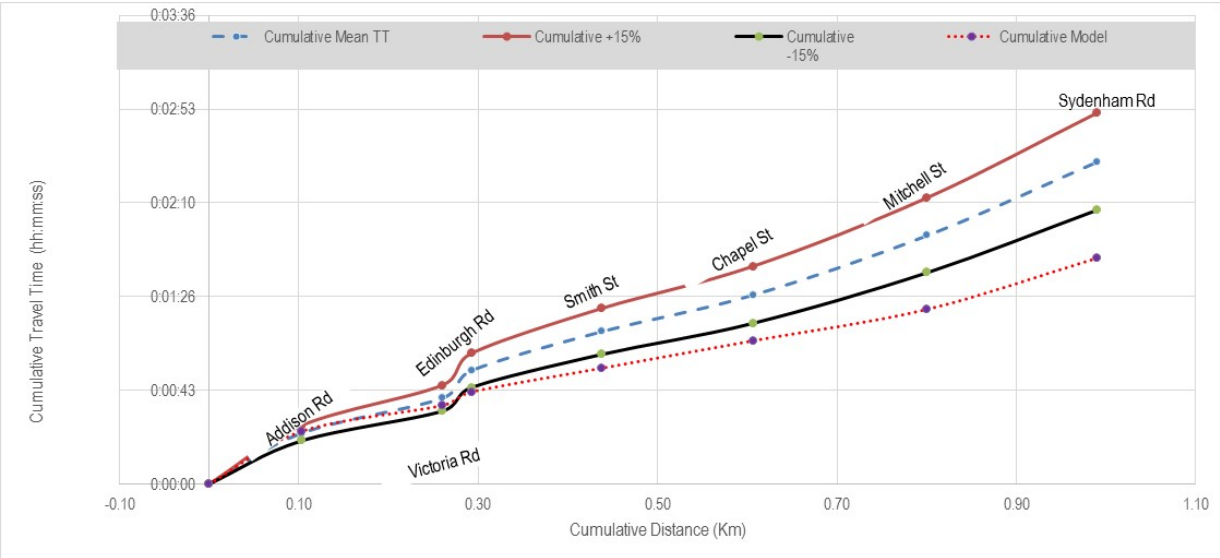


Figure 5.2: Weekday PM Peak Travel Time Validation – Red Route Southbound

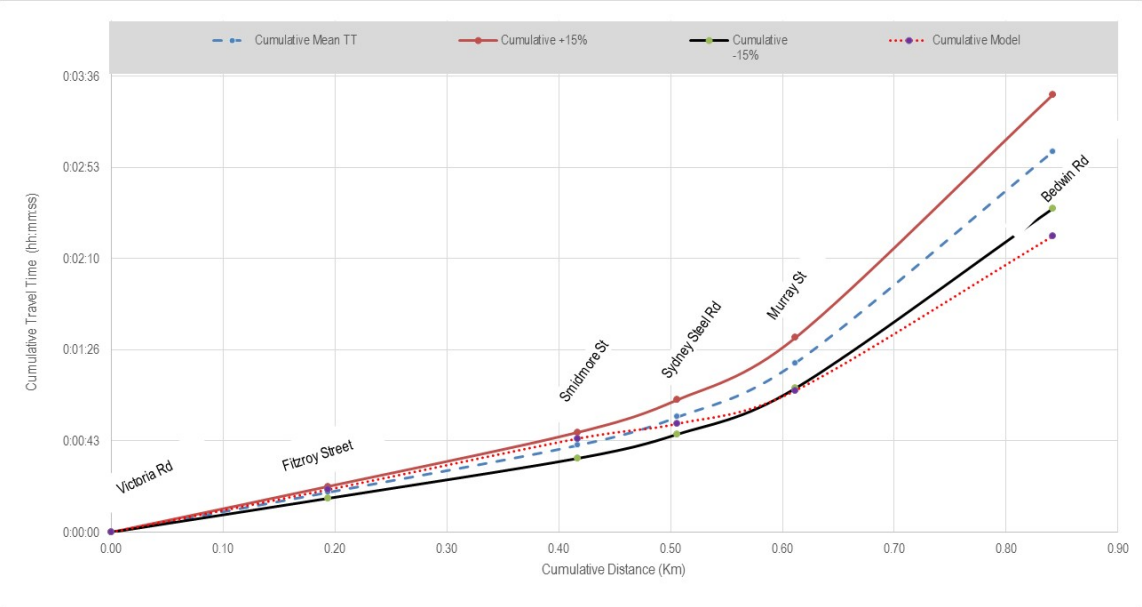


Figure 5.3: Weekday PM Peak Travel Time Validation – Yellow Route Eastbound

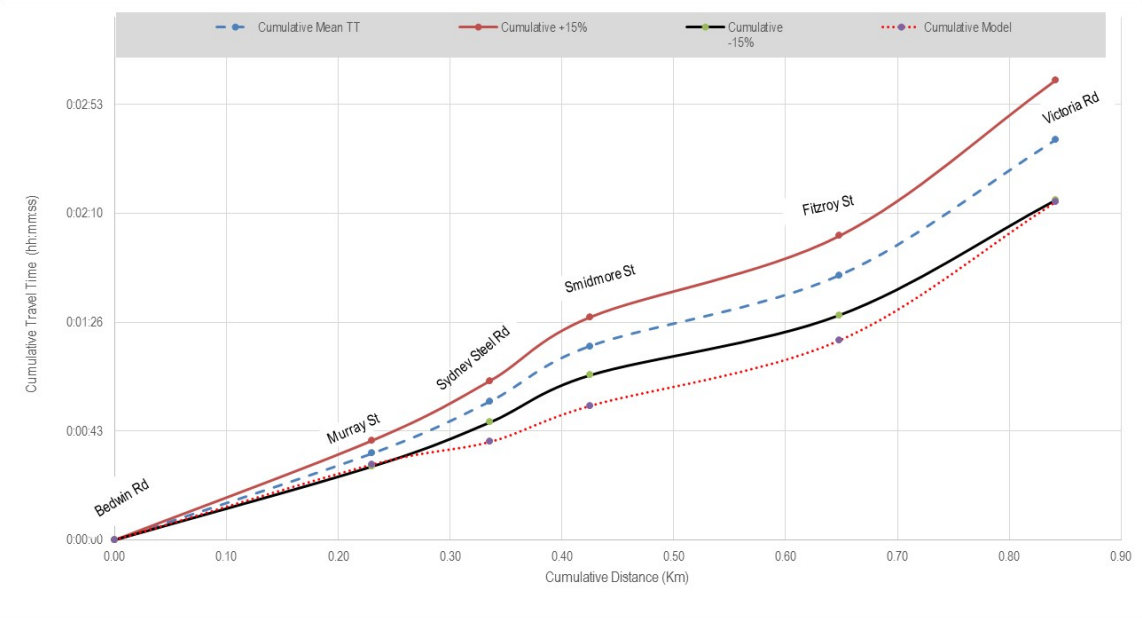


Figure 5.4: Weekday PM Peak Travel Time Validation – Yellow Route Westbound

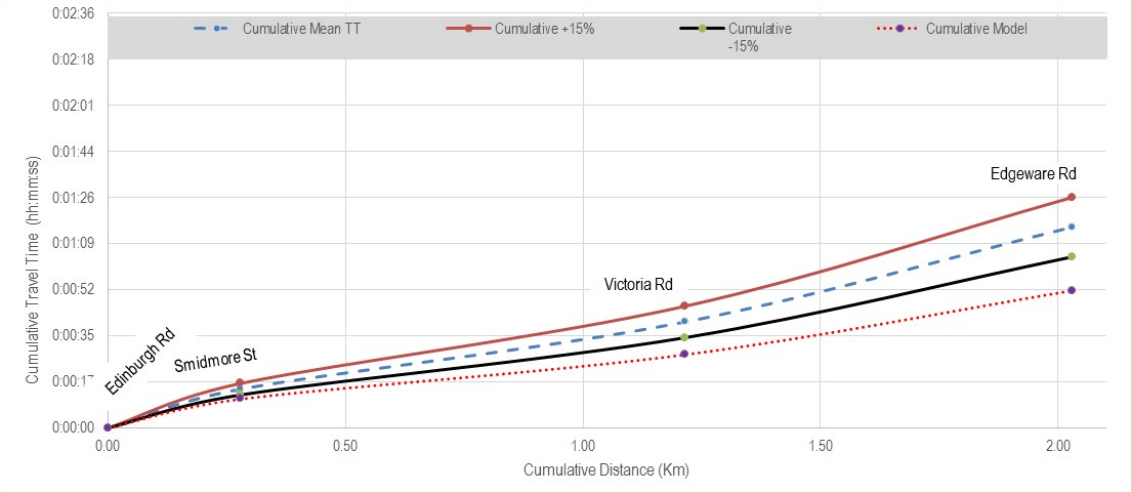


Figure 5.5: Weekday PM Peak Travel Time Validation – Green Route Northbound

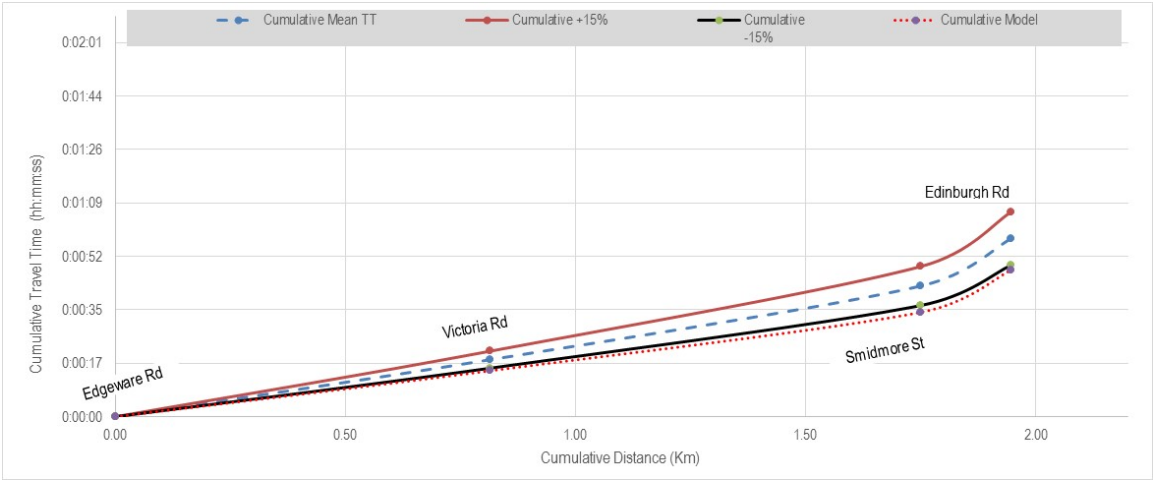


Figure 5.6: Weekday PM Peak Travel Time Validation – Green Route Southbound

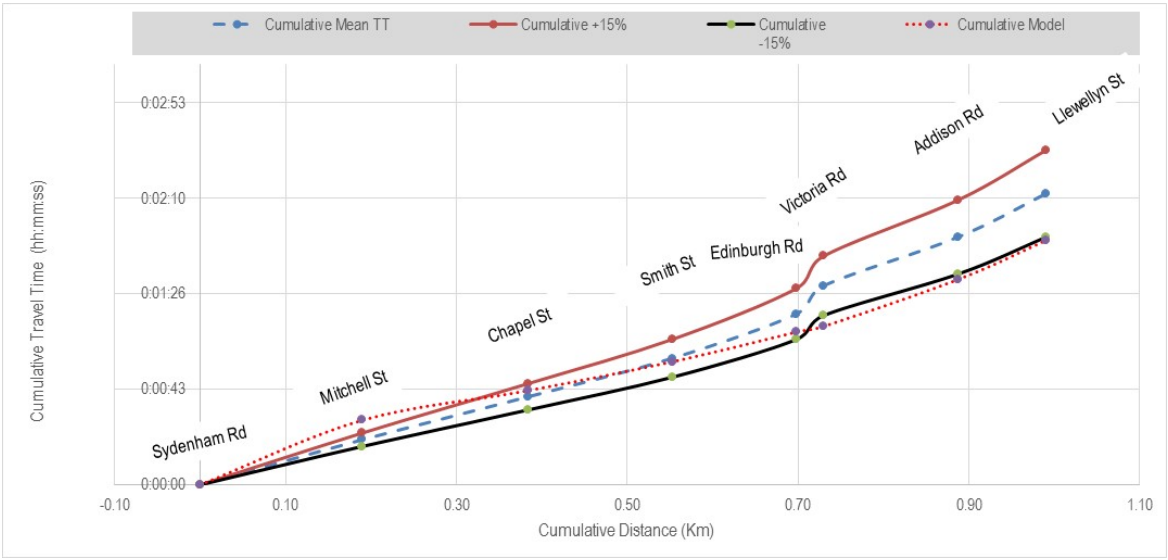


Figure 5.7: Weekend Mid-Day Peak Travel Time Validation – Red Route Northbound

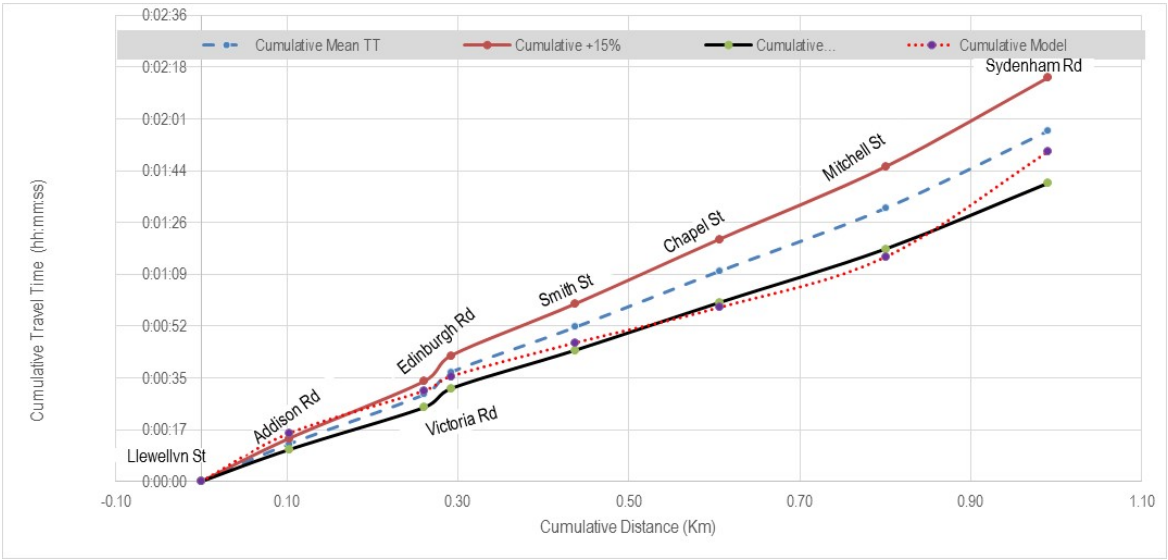


Figure 5.8: Weekend Mid-Day Travel Time Validation – Red Route Southbound

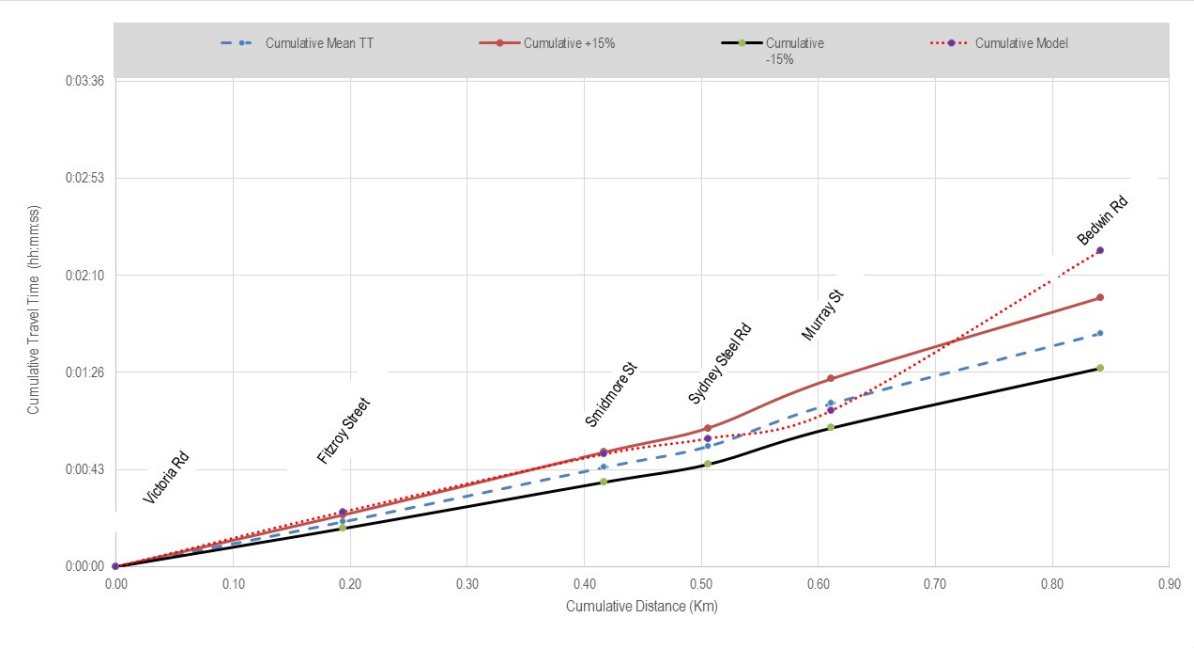


Figure 5.9: Weekend Mid-Day Travel Time Validation – Yellow Route Eastbound

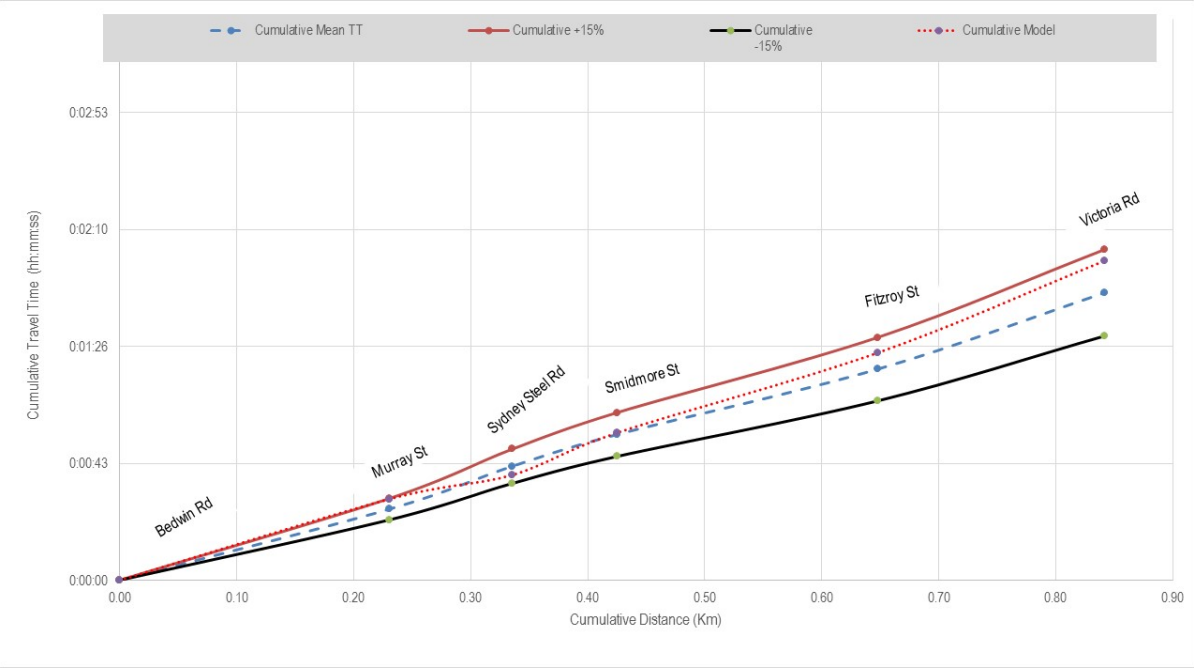


Figure 5.10: Weekend Mid-Day Travel Time Validation – Yellow Route Westbound

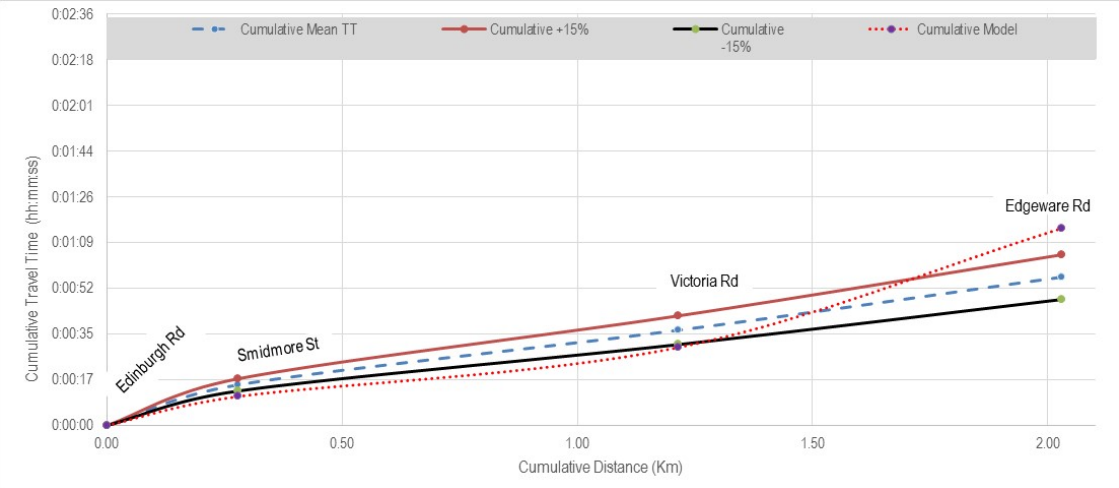


Figure 5.11: Weekend Mid-Day Travel Time Validation – Green Route Northbound

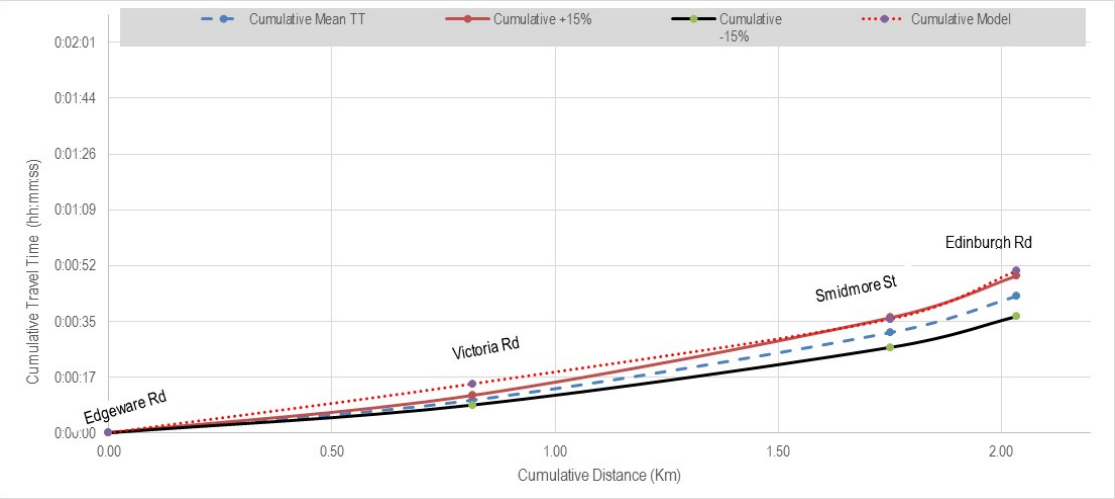


Figure 5.12: Weekend Mid-Day Travel Time Validation – Green Route Southbound

5.2 SIGNAL TIME VALIDATION

5.2.1 Data Comparisons

SCATS data obtained from RMS have been compared with model signal times. As per the RMS Modelling Guidelines the following signal attributes were used in the comparison:

- Cycle Time: average modelled cycle time in one-hour period to be within 10 percent of observed average:
- Green Time: total of green time over each one-hour period to be within 10 percent of observed equivalent for each phase; and
- Call Frequency: call frequency if demand-dependent phases (including pedestrian phase calls) to be compared with observed data to ensure phase activation occurs to a similar level over each hour period.

A detailed comparison of modelled and observed Cycle Time, Phase Time and Offset for each intersection across the Weekday PM and Weekend Mid-day peak is presented in Attachment C.

5.2.2 Cycle Time

All VISSIM cycle times are within 10% of SCATS average cycle time.

5.2.3 Phase Time

Generally, the average phase times are within 10% of SCATS average phase times. There are some exceptions which are clearly identified in Attachment C. The exceptions are mainly either minor or resulting due to differences in cycle time.

5.2.4 Call Frequency

SCATS data was interrogated to find out which phases are called in most of the cycles. In order to simplify the VisVAP signal logic in VISSIM, it has been programmed in such a way that these phases are called in every cycle in VISSIM.

Phases which are not called in most of the cycles, are programmed as demand dependent.

6. CONCLUDING STATEMENT

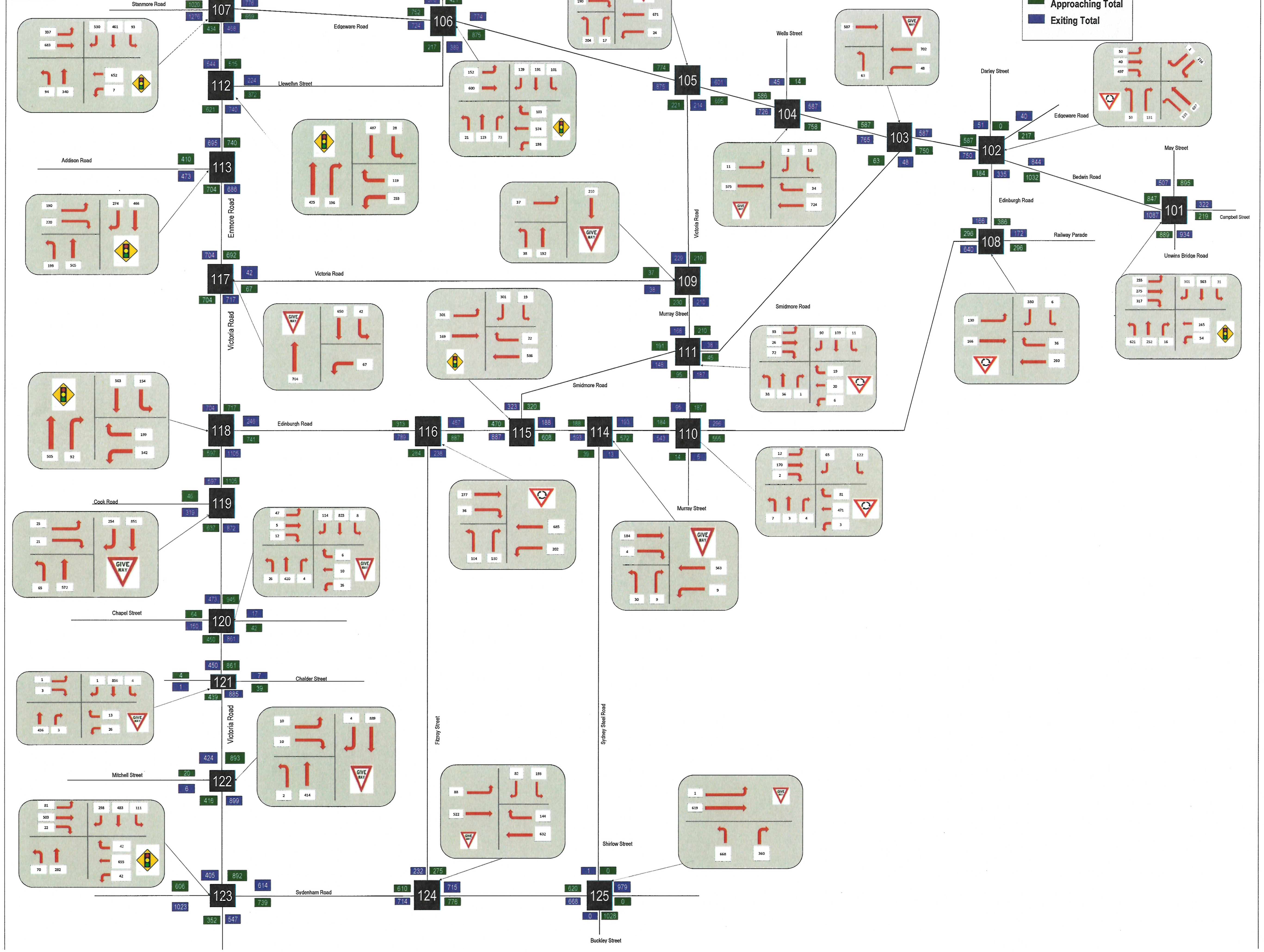
In summary, the VISSIM models are deemed suitably calibrated and validated.

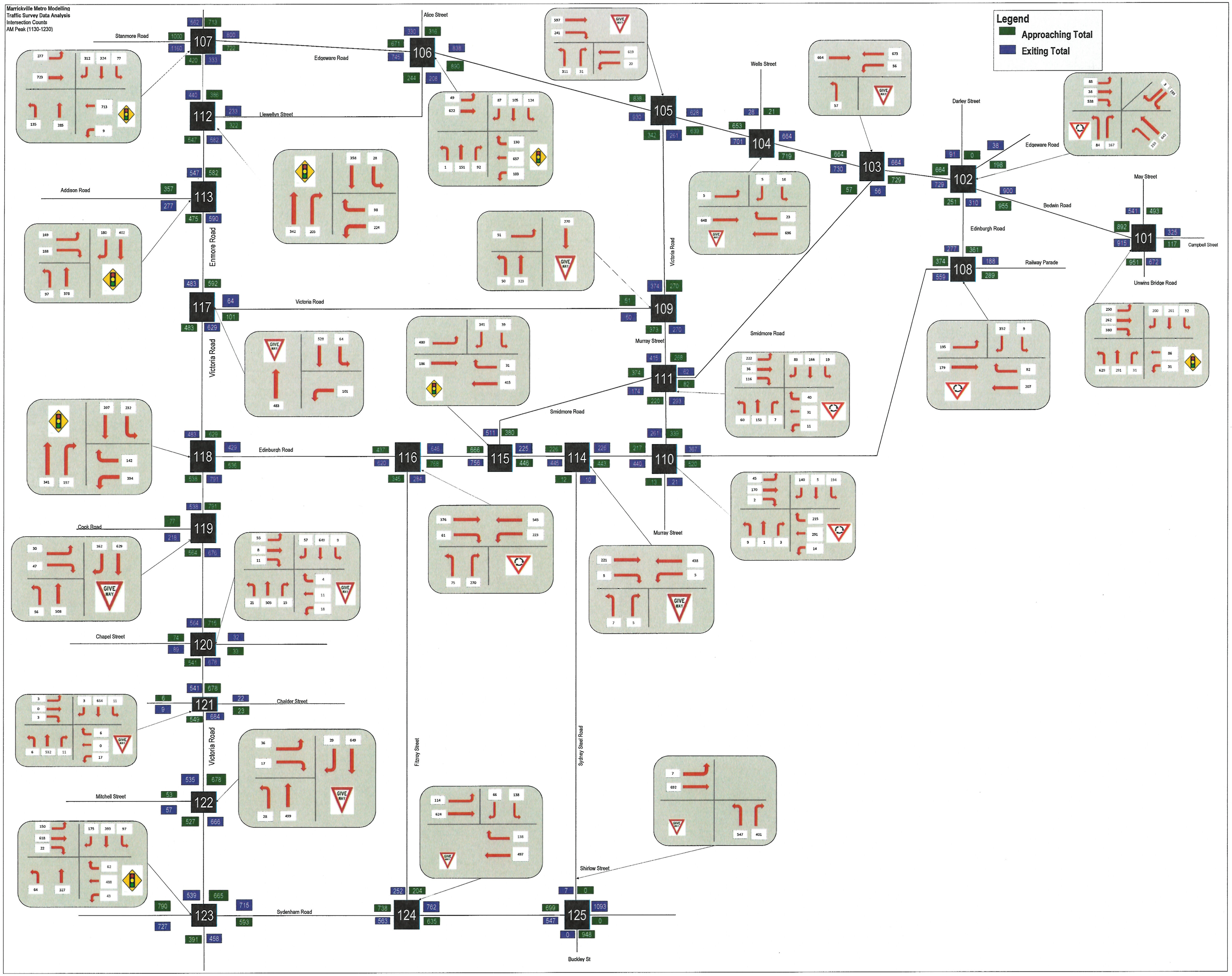
The models are considered fit for purpose of testing the benefits and impacts of the proposed upgrades in future year scenarios.

ATTACHMENT A

BALANCED TRAFFIC COUNT SUMMARY

Marrickville Metro Modelling
Traffic Survey Data Analysis
Intersection Counts
PM Peak (1700-1800)




Marrickville Metro Modelling
Traffic Survey Data Analysis
Intersection Counts
AM Peak (1130-1230)
Legend
Approaching Total
Exiting Total
Stanmore Road
Edgeware Road
Alice Street
Llewellyn Street
Wells Street
Darley Street
Addison Road
Enmore Road
Victoria Road
May Street
Bedwin Road
Edinburgh Road
Campbell Street
Railway Parade
Unwins Bridge Road
Murray Street
Smidmore Road
Cook Road
Chapel Street
Chalder Street
Mitchell Street
Fitzroy Street
Sydney Steel Road
Shirlow Street
Sydenham Road
Buckley St
107
106
105
104
103
102
101
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124
125
GIVE WAY

ATTACHMENT B

CALIBRATION AND VALIDATION SUMMARY

P3253 Marrickville Metro VISSIM Model

VISSIM Data Analysis - Node

PM Peak 1700-1800

1

GEH Turn Summary 1700-1800		
>10	0	0.00%
>5, <=10	25	13.44%
<=5	161	86.56%

Time	ID	Intersection	Aimsun Code	Movement Code	From	To	Turn	Observed	Modelled	Abs. Diff (Mod - Obs)	% Diff (Mod - Obs)	GEH	Accept	Delay (s)	LoS	Queue (m)
1800	101	May Street	9244	101-1	May Street (N)	Bedwin Road (W)	R	301	280	-21	-7.0%	1.2	Y	18.0	B	30.6
		Campbell Street	9243	101-2		Unwins Bridge Road (S)	T	563	552	-11	-2.0%	0.5	Y	16.7	B	30.6
		Unwins Bridge Road	9255	101-3		Campbell Street (E)	L	31	31	0	0.0%	0.0	Y	3.4	A	25.6
		Bedwin Road	9247	101-5	Campbell Street (E)	Bedwin Road (W)	T	165	168	3	1.8%	0.2	Y	35.2	C	7.9
			9246	101-6		Unwins Bridge Road (S)	L	54	53	-1	-1.9%	0.1	Y	36.4	C	7.9
			9238	101-7	Unwins Bridge (S)	Campbell Street (E)	R	16	18	2	12.5%	0.5	Y	27.5	B	3.6
			9239	101-8		May Street (N)	T	252	244	-8	-3.2%	0.5	Y	15.4	B	3.6
			9264	101-9		Bedwin Road (W)	L	621	605	-16	-2.6%	0.6	Y	4.5	A	1.6
			9240	101-10	Bedwin Road (W)	Unwins Bridge Road (S)	R	317	328	11	3.5%	0.6	Y	33.5	C	18.4
			9241	101-11		Campbell Street (E)	T	275	289	14	5.1%	0.8	Y	39.5	C	52.4
			9242	101-12		May Street (N)	L	255	302	47	18.4%	2.8	Y	40.6	C	52.4
					All			2,850	2,870					22.3	B	20.0
	102	Edgeware Road	9219	102-6	Edgeware Road (NE)	Bedwin Road (SE)	L	236	299	63	26.7%	3.9	Y	8.6	A	2.6
		Bedwin Road	9193	102-8	Bedwin Road (SE)	Edgeware Road (W)	T	697	694	-3	-0.4%	0.1	Y	0.9	A	0.0
		Edinburgh Road	9228	102-9		Edinburgh Road (S)	L	335	359	24	7.2%	1.3	Y	0.5	A	0.0
			9191	102-10	Edinburgh Road (S)	Bedwin Road (SE)	R	131	110	-21	-16.0%	1.9	Y	49.1	D	9.6
			4302	102-12		Edgeware Road (W)	L	53	37	-16	-30.2%	2.4	Y	3.6	A	0.1
			9221	102-13	Edgeware Road (W)	Bedwin Road (SE)	R	497	514	17	3.4%	0.8	Y	1.3	A	0.0
			9222	102-14		Edgeware Road (NE)	T	32	10	-22	-68.8%	4.8	Y	0.1	A	0.0
			9223	102-15		Darley Street (N)	L	50	82	32	64.0%	3.9	Y	-0.7	A	0.0
					All			1,452	2,105					49.1	D	2.5
	103	Edgeware Road	4745	103-5	Edgeware Road (E)	Edgeware Road (W)	T	702	617	-85	-12.1%	3.3	Y	0.4	A	0.0
		Smidmore Road	4746	103-6		Smidmore Road (S)	L	48	113	65	135.4%	7.2	N	-0.3	A	0.0
			4748	103-9	Smidmore Road (S)	Edgeware Road (W)	L	63	23	-40	-63.5%	6.1	N	4.7	A	0.1
			4742	103-11	Edgeware Road (W)	Edgeware Road (E)	T	587	606	19	3.2%	0.8	Y	0.9	A	0.0
					All			1400	1,359					4.7	A	0.0
	104	Edgeware Road	4524	104-1	Wells Street (N)	Edgware Road (W)	R	2	0	-2	-100.0%	2.0	Y	0.0	A	0.0
		Wells Street	4522	104-3		Edgeware Road (E)	L	12	4	-8	-66.7%	2.8	Y	2.0	A	0.0
			4527	104-4	Edgeware Road (E)	Wells Street (N)	R	34	23	-11	-32.4%	2.1	Y	1.4	A	0.0
			4528	104-5		Edgeware Road (W)	T	724	617	-107	-14.8%	4.1	Y	0.3	A	0.0
			4526	104-11	Edgeware Road (W)	Edgeware Road (E)	T	575	601	26	4.5%	1.1	Y	0.2	A	0.0
			4525	104-12		Wells Street (N)	L	11	8	-3	-27.3%	1.0	Y	-0.3	A	0.0
								1,358	1,253					2.0	A	0.0
	105	Edgeware Road	4475	105-5	Edgeware Road (E)	Edgeware Road (W)	T	671	606	-65	-9.7%	2.6	Y	2.0	A	1.1
		Victoria Road	4474	105-6		Victoria Road (S)	L	24	0	-24	-100.0%	6.9	N	0.0	A	0.9
			4471	105-7	Victoria Road (S)	Edgeware Road (E)	R	17	57	40	235.3%	6.6	N	24.8	B	2.0
			4469	105-9		Edgeware Road (W)	L	234	307	73	31.2%	4.4	Y	14.2	A	2.0
			4472	105-10	Edgeware Road (W)	Victoria Road (S)	R	190	226	36	18.9%	2.5	Y	3.5	A	5.1
			4473	105-11		Edgeware Road (E)	T	584	555	-29	-5.0%	1.2	Y	1.0	A	4.3
								1,720	2,200					24.8	B	12.6
	106	Alice Street	9340	106-1	Alice Street (N)	Edgeware Road (W)	R	129	110	-19	-14.7%	1.7	Y	41.5	C	17.6
		Edgeware Road	9341	106-2		Llewellyn Street (S)	T	191	151	-40	-20.9%	3.1	Y	37.1	C	17.6
		Llewellyn St	9342	106-3		Edgeware Road (E)	L	101	119	18	17.8%	1.7	Y	42.3	C	17.6
			9349	106-4	Edgeware Road (E)	Alice Street (N)	R	103	152	49	47.6%	4.3	Y	25.6	B	19.9
			9350	106-5		Edgeware Road (W)	T	574	582	8	1.4%	0.3	Y	11.8	A	20.1
			9351	106-6		Llewellyn Street (S)	L	198	173	-25	-12.6%	1.8	Y	12.1	A	20.2
			9348	106-7	Llewellyn Street (S)	Edgeware Road (E)	R	73	46	-27	-37.0%	3.5	Y	48.1	D	5.1
			9346	106-8		Alice Street (N)	T	123	74	-49	-39.8%	4.9	Y	35.0	C	5.6
			9347	106-9		Edgeware Road (W)	L	21	24	3	14.3%	0.6	Y	34.9	C	4.9
			9345	106-11	Edgeware Road (W)	Edgeware Road (E)	T	600	620	20	3.3%	0.8	Y	11.7	A	6.9
			9900	106-12		Alice Street (N)	L	152	149	-3	-2.0%	0.2	Y	10.4	A	6.9
								2,265	3,291					29.9	C	41.4
	107	Enmore Road	9306	107-1	Enmore Road (N)	Stanmore Road (W)	R	530	528	-2	-0.4%	0.1	Y	36.9	C	54.3
		Edgeware Road	9307	107-2		Enmore Road (S)	T	461	464	3	0.7%	0.1	Y	18.8	B	54.3
		Stanmore Road	9305	107-3		Edgeware Road (E)	L	93	113	20	21.5%	2.0	Y	16.6	B	51.0
			9303	107-5	Edgeware Road (E)	Stanmore Road (W)	T	652	669	17	2.6%	0.7	Y	22.5	B	16.9
			9304	107-6		Enmore Road (S)	L	7	36	29	414.3%	6.3	N	29.8	C	16.9
			9312	107-8	Enmore Road (S)	Enmore Road (N)	T	340	365	25	7.4%	1.3	Y	30.4	C	36.4
			9313	107-9		Stanmore Road (W)	L	94	124	30	31.9%	2.9	Y	45.4	D	36.4
			9308	107-11	Stanmore Road (W)	Edgeware Road (E)	T	683	649	-34	-5.0%	1.3	Y	36.7	C	35.3
			9309	107-12		Enmore Road (N)	L	337	343	6	1.8%	0.3	Y	33.7	C	35.3
								3,197	2,200					19.3	B	12.6
	108	Edinburgh Road	9888	108-1	Edinburgh Road (N)	Edinburgh Road (W)	R	380	346	-34	-8.9%	1.8	Y	1.9	A	0.3
		Railway Parade	9887	108-3		Railway Parade (E)	L	6	11	5	83.3%	1.7	Y	1.4	A	0.2
			9889	108-4	Railway Parade (E)	Edinburgh Road (N)	R	36	37	1	2.8%	0.2	Y	5.5	A	2.0
			9890	108-5		Edinburgh Road (W)	T	260	243	-17	-6.5%	1.1	Y	6.4	A	2.0
			9892	108-11	Edinburgh Road (W)	Railway Parade (E)	T	166	102	-64	-38.6%	5.5	N	1.7	A	0.1
			9891	108-12		Edinburgh Road (N)	L	130	112	-18	-13.8%	1.6	Y	4.0	A	0.1
								978	851					6.4	A	0.6
	109	Victoria Road	9452	109-2	Victoria Road (N)	Murray Street (S)	T	210	226	16	7.6%	1.1	Y	0.1	A	0.0
		Murray Street	9450	109-8	Murray Street (S)	Victoria Road (N)	T	192	325	133	69.3%	8.3	N	0.3	A	0.0
			9451	109-9		Victoria Road (W)	L	38	70	32	84.2%	4.4	Y	0.1	A	0.0
			9455	109-12	Victoria Road (W)	Victoria Road (N)	L	37	39	2	5.4%	0.3	Y	1.8	A	0.0
								477	660					1.8	A	0.0
	110	Murray Street	9883	110-1	Murray Street (N)	Edinburgh (W)	R	65	111	46	71.6%	4.9	Y	1.5	A	0.1
		Edinburgh Road	9884	110-2		Murray Street (S)	T	0	3	3	#DIV/0!	2.4	Y	2.4	A	0.1
			???	110-3		Edinburgh (E)	L	122	137	15	12.3%	1.3	Y	1.3	A	0.1
			9882	110-4	Edinburgh (E)	Murray Street (N)	R	81	43	-38	-46.9%	4.8	Y	3.7	A	1.1
			9880	110-5		Edinburgh (W)	T	471	542	71	15.1%	3.2	Y	3.1	A	1.1
			9881	110-6		Murray Street (S)	L	3	3	0	0.0%	0.0	Y	1.8	A	1.1
			9878	110-7	Murray Street (S)	Edinburgh (E)	R	4	0	-4	-100.0%	2.8	Y	0.0	A	0.1
			9879	110-8		Murray Street (N)	T	3	9	7	260.0%	2.7	Y	5.2	A	0.1
			9877	110-9		Edinburgh Street (W)	L	7	10	3	42.9%	1.0	Y	4.5	A	0.1
			9874	110-10	Edinburgh (W)	Murray Street (S)	R	2	0	-2	-100.0%	2.0	Y	0.0	A	0.1
			9875	110-11		Edinburgh Street (E)	T	170	77	-93	-54.7%	8.4	N	0.2	A	0.1
			9876	110-12		Murray Street (N)	L	12	41	30	256.5%	5.8	N	0.3	A	0.1
								939	976					5.2	A	0.3
	111	Murray Street	9870	111-1	Murray Street (N)	Smidmore Road (W)	R	90	62	-28	-31.4%	3.2	Y	2.2	A	0.0
		Smidmore Road	9871	111-2		Murray Road (S)	T	109	132	23	21.5%	2.1	Y	2.4	A	0.0
			9872	111-3		Smidmore Road (E)	L	11	16	5	45.6%	1.4	Y	1.4	A	0.0
			9869	111-4	Smidmore Road (E)	Murray Street (N)	R	19	80	61	321.1%	8.7	N	2.7	A	0.2
			9867	111-5		Smidmore Road (W)	T	20	32	12	60.0%	2.4	Y	2.7	A	0.2
			9868	111-6		Murray Street (S)	L	6	0	-6	-100.0%	3.5	Y	0.0	A	0.1
			9865	111-7	Murray Street (S)	Smidmore Road (E)	R	1	4	3	300.0%	1.9	Y	0.4	A	0.1
			9866	111-8		Murray Street (N)	T	56	58	2	3.6%	0.3	Y	1.9	A	0.1
			9864	111-9		Smidmore Road (W)	L	38	31	-7	-18.4%	1.2	Y	1.8	A	0.1
			9861	111-10	Smidmore Road (W)	Murray Street (S)	R	72	118	46	63.9%	4.7	Y	2.2	A	0.4
			9862	111-11		Smidmore Road (E)	T	26	3	-23	-88.5%	6.0	N	12.9	A	0.4
			9863	111-12		Murray Street (N)	L	133	213	80	60.2%	6.1	N	2.2	A	0.4
								581	749					12.9	A	0.2
	112	Enmore Road	4595	112-2	Enmore Road (N)	Enmore Road (S)	T	487	484	-3	-0.6%	0.1	Y	7.0	A	4.0
		Llewellyn Street	4594	112-3		Llewellyn Street (E)	L	28	9	-19	-67.9%	4.4	Y	7.8	A	4.1
			4591	112-4	Llewellyn Street (E)	Enmore Road (N)	R	119	112	-7	-5.9%	0.7	Y	42.1	C	14.4
			4593	112-6		Enmore Road (S)	L	253	213	-40	-15.8%	2.6	Y	33.2	C	14.4
			4596	112-7	Enmore Road (S)	Llewellyn Street (E)	R	196	132	-64	-32.7%	5.0	Y	12.4	A	8.6
			4597	112-8		Enmore Road (N)	T	425	496	71	16.7%	3.3	Y	4.9	A	8.5
								1,508	1,446					13.3	A	7.9
	113	Enmore Road	4621	113-1	Enmore Road (N)	Addison Road (W)	R	274	261	-13	-4.7%	0.8	Y	29.6	C	14.8
		Addison Road	4622	113-2		Enmore Road (S)	T	466	435	-31	-6.7%	1.5	Y	12.4	A	14.8
			4619	113-8	Enmore Road (S)	Enmore Road (N)	T	505	433	-72	-14.2%	3.3	Y	10.0	A	9.3

			4618	113-9		Addison Road (W)	L	199	229	30	15.0%	2.0	Y	9.8	A	9.1
			4616	113-10	Addison Road (W)	Enmore Road (S)	R	220	191	-29	-13.2%	2.0	Y	47.5	D	19.1
			9383	113-12		Enmore Road (N)	L	190	193	3	1.6%	0.2	Y	27.5	B	17.7
								1,854	1,742					19.6	B	14.0
	114	Edinburgh Road	3775	114-5	Edinburgh Road (E)	Edinburgh Road (W)	T	563	653	90	16.0%	3.6	Y	0.5	A	0.6
		Sydney Steel Road	3773	114-6		Sydney Steel Road (S)	L	9	11	2	22.2%	0.6	Y	0.7	A	0.6
			3776	114-7	Sydney Steel Road (S)	Edinburgh Road (E)	R	9	12	3	33.3%	0.9	Y	5.0	A	0.1
			3777	114-9		Edinburgh Road (W)	L	30	19	-11	-36.7%	2.2	Y	3.1	A	0.1
			3779	114-10	Edinburgh Road (W)	Sydney Steel Road (S)	R	4	17	13	325.0%	4.0	Y	2.9	A	0.1
			3778	114-11		Edinburgh Road (E)	T	184	108	-76	-41.3%	6.3	N	0.3	A	0.0
								799	820					5.0	A	0.2
	115	Smidmore Road	3765	115-1	Smidmore Road (N)	Edinburgh Road (W)	R	301	230	-71	-23.6%	4.4	Y	29.7	C	11.1
		Edinburgh Road	3763	115-3		Edinburn Road (E)	L	19	5	-14	-73.7%	4.0	Y	20.1	B	11.1
			3768	115-4	Edinburgh Road (E)	Smidmore Road (N)	R	22	8	-14	-63.6%	3.6	Y	7.9	A	6.7
			3769	115-5		Edinburgh Road (W)	T	586	664	78	13.3%	3.1	Y	5.5	A	6.7
			3767	115-11	Edinburgh Road (W)	Edinburgh Road (E)	T	169	120	-49	-29.0%	4.1	Y	7.3	A	3.2
			3766	115-12		Smidmore Road (N)	L	301	343	42	14.0%	2.3	Y	5.0	A	3.3
								1,398	1,370					9.7	A	6.1
	116	Edinburgh Road	9899	116-5	Edinburgh Road (E)	Edgeware Road (W)	T	685	608	-77	-11.2%	3.0	Y	5.2	A	6.4
		Fitzroy Road	9898	116-6		Fitzroy Street (S)	L	202	285	83	41.1%	5.3	N	5.3	A	6.4
			9895	116-7	Fitzroy Street (S)	Edinburgh Road (E)	R	180	193	13	7.2%	1.0	Y	5.6	A	1.4
			9894	116-9		Edinburgh Road (W)	L	104	28	-76	-73.1%	9.4	N	7.7	A	1.4
			9896	116-10	Edinburgh Road (W)	Fitzroy Street (S)	R	36	20	-16	-44.4%	3.0	Y	4.8	A	1.1
			9897	116-11		Edinburgh Road (E)	T	277	266	-11	-4.0%	0.7	Y	4.3	A	1.1
								1,484	1,400					7.7	A	3.0
	117	Enmore Road	9370	117-2	Enmore Road (N)	Victoria Road (S)	T	650	601	-49	-7.5%	2.0	Y	3.3	A	2.1
		Victoria Road	9369	117-3		Victoria Road (E)	L	42	27	-15	-35.7%	2.6	Y	1.9	A	2.5
			7201	117-6	Victoria Road (E)	Victoria Road (S)	L	67	71	4	6.0%	0.5	Y	7.1	A	0.4
			7202	117-8	Victoria Road (S)	Enmore Road (N)	T	704	664	-40	-5.7%	1.5	Y	0.3	A	0.0
								1,463	1,363					7.1	A	1.3
	118	Victoria Road	9389	118-2	Victoria Road (N)	Victoria Road (S)	T	563	522	-41	-7.3%	1.8	Y	3.1	A	2.2
		Edinburgh Road	9390	118-3		Edinburgh Road (E)	L	154	153	-1	-0.6%	0.1	Y	1.6	A	2.2
			9388	118-4	Edinburgh Road (E)	Victoria Road (N)	R	199	224	25	12.6%	1.7	Y	38.6	C	14.2
			9289	118-6		Victoria Road (S)	L	542	411	-131	-24.2%	6.0	N	9.9	A	4.7
			9385	118-7	Victoria Road (S)	Edinburgh Road (E)	R	92	135	43	46.7%	4.0	Y	14.4	A	5.0
			9386	118-8		Victoria Road (N)	T	505	439	-66	-13.1%	3.0	Y	5.5	A	5.0
								2,055	1,884					10.0	A	6.6
	119	Victoria Road	9151	119-1	Victoria Road (N)	Cook Road (W)	R	254	256	2	0.8%	0.1	Y	5.0	A	2.0
		Cook Road	9152	119-2		Victoria Road (S)	T	851	677	-174	-20.4%	6.3	N	0.3	A	0.5
			9156	119-8	Victoria Road (S)	Victoria Road (N)	T	572	544	-28	-4.9%	1.2	Y	4.8	A	0.0
			9155	119-9		Cook Road (W)	L	65	53	-12	-18.5%	1.6	Y	0.6	A	0.0
			9154	119-10	Cook Road (W)	Victoria Road (S)	R	21	16	-5	-23.8%	1.2	Y	28.8	B	1.0
			9153	119-12		Victoria Road (N)	L	25	24	-1	-4.0%	0.2	Y	9.9	A	0.6
								1,788	1,570					28.8	B	0.8
	120	Victoria Road	9403	120-1	Victoria Road (N)	Chapel Street (W)	R	114	99	-15	-13.2%	1.5	Y	2.9	A	3.7
		Chapel Street	9402	120-2		Victoria Road (S)	T	823	687	-136	-16.5%	4.9	Y	2.5	A	3.7
			9401	120-3		Chapel Street (E)	L	8	8	0	0.0%	0.0	Y	2.6	A	3.7
			9394	120-4	Chapel Street (E)	Victoria Road (N)	R	6	8	2	33.3%	0.8	Y	0.3	A	0.0
			9393	120-5		Chapel Street (W)	T	10	0	-10	-100.0%	4.5	Y	0.0	A	0.2
			9392	120-6		Victoria Road (S)	L	26	19	-7	-26.9%	1.5	Y	8.7	A	0.2
			9395	120-7	Victoria Road (S)	Chapel Street (E)	R	4	16	12	300.0%	3.8	Y	10.7	A	3.7
			9397	120-8		Victoria Road (N)	T	420	433	13	3.1%	0.6	Y	13.8	A	3.7
			9396	120-9		Chapel Street (W)	L	26	31	5	19.2%	0.9	Y	8.5	A	3.7
			9399	120-10	Chapel Street (W)	Victoria Road (S)	R	12	16	4	33.3%	1.1	Y	0.7	A	0.0
			9398	120-11		Chapel Street (E)	T	5	0	-5	-100.0%	3.2	Y	0.0	A	0.0
			9400	120-12		Victoria Road (N)	L	47	29	-18	-38.3%	2.9	Y	2.2	A	0.0
								1,501	1,346					13.8	A	1.3
	121	Victoria Road	9430	121-1	Victoria Road (N)	Chalder Street (W)	R	1	0	-1	-100.0%	1.4	Y	0.0	A	0.0
		Chalder Street	9428	121-2		Victoria Road (S)	T	856	709	-147	-17.2%	5.3	N	2.9	A	0.0
			9429	121-3		Chalder Street (E)	L	4	12	8	200.0%	2.8	Y	5.4	A	0.0
			9426	121-4	Chalder Street (E)	Victoria Road (N)	R	13	28	15	115.4%	3.3	Y	3.3	A	0.0
			9425	121-6		Victoria Road (S)	L	26	23	-3	-11.5%	0.6	Y	15.0	B	0.4
			9434	121-7	Victoria Road (S)	Chalder Street (E)	R	3	0	-3	-100.0%	2.4	Y	0.0	A	0.0
			9435	121-8		Victoria Road (N)	T	436	451	15	3.4%	0.7	Y	4.6	A	0.0
			9431	121-10	Chalder Street (W)	Victoria Road (S)	R	3	20	17	566.7%	5.0	N	1.8	A	0.0
			9433	121-12		Victoria Road (N)	L	1	1	0	0.0%	0.0	Y	29.2	C	0.0
								1,343	1,244					29.2	C	0.1
	122	Victoria Road	6595	122-1	Victoria Road (N)	Mitchell Street (W)	R	4	20	16	400.0%	4.6	Y	1.5	A	0.0
		Mitchell Street	6594	122-2		Victoria Road (S)	T	889	732	-157	-17.7%	5.5	N	0.1	A	0.0
			6591	122-8	Victoria Road (S)	Victoria Road (N)	T	414	447	33	8.0%	1.6	Y	0.1	A	0.0
			6593	122-9		Mitchell Street (W)	L	2	0	-2	-100.0%	2.0	Y	0.0	A	0.0
			6597	122-10	Mitchell Street (W)	Victoria Street (S)	R	10	20	10	100.0%	2.6	Y	9.4	A	0.2
			6596	122-12		Victoria Street (N)	L	10	8	-2	-20.0%	0.7	Y	8.8	A	0.2
								1,329	1,227					0.3	A	0.1
	123	Victoria Road	4678	123-1	Victoria Road (N)	Sydenham Road (W)	R	298	215	-83	-27.9%	5.2	N	25.7	B	12.4
		Sydenham Road	4679	123-2		Victoria Road (S)	T	483	452	-31	-6.4%	1.4	Y	11.0	A	12.4
			4677	123-3		Sydenham Road (E)	L	111	84	-27	-24.3%	2.7	Y	19.4	B	12.4
			4673	123-4	Sydenham Road (E)	Victoria Road (N)	R	42	7	-35	-83.3%	7.1	N	28.6	B	14.1
			4675	123-5		Sydenham Road (W)	T	655	721	66	10.1%	2.5	Y	11.8	A	14.1
			4676	123-6		Victoria Road (S)	L	42	84	42	100.0%	5.3	N	8.5	A	14.1
			4684	123-8	Victoria Road (S)	Victoria Road (N)	T	282	340	58	20.6%	3.3	Y	40.8	C	15.8
			4685	123-9		Sydenham Road (W)	L	70	69	-1	-1.4%	0.1	Y	36.3	C	15.8
			4682	123-10	Sydenham Road (W)	Victoria Road (S)	R	22	36	14	63.6%	2.6	Y	40.9	C	14.6
			4680	123-11		Sydenham Road (E)	T	503	508	5	1.0%	0.2	Y	23.8	B	14.6
		Victoria Road	4681	123-12		Victoria Road (N)	L	81	100	19	23.5%	2.0	Y	24.6	B	14.6
								2,589	2,616					20.6	B	14.2
	124	Fitzroy Street	7290	124-1	Fitzroy Street (N)	Sydenham Road (W)	R	82	175	93	113.4%	8.2	N	77.5	F	49.4
		Sydenham Road	7288	124-3		Sydenham Road (E)	L	193	130	-63	-32.6%	5.0	Y	44.3	D	49.4
			7293	124-4	Sydenham Road (E)	Fitzroy Street (N)	R	144	118	-26	-18.1%	2.3	Y	3.1	A	0.4
			7294	124-5		Sydenham Road (W)	T	632	638	6	0.9%	0.2	Y	0.1	A	0.0
			7292	124-11	Sydenham Road (W)	Sydenham Road (E)	T	522	500	-22	-4.2%	1.0	Y	0.3	A	0.0
			7291	124-12		Fitzroy Street (N)	L	88	93	5	5.7%	0.5	Y	-0.2	A	0.0
								1,661	1,654					77.5	F	10.0
	125	Shirlow Street	3887	125-7	Buckley Street	Sydenham Road (E)	R	360	348	-12	-3.3%	0.6	Y	0.2	A	0.0
		Sydenham Road	4633	125-9		Sydenham Road (W)	L	668	753	85	12.7%	3.2	Y	0.3	A	0.0
			4634	125-11	Sydenham Road (W)	Sydenham Road (E)	T	619	621	2	0.3%	0.1	Y	0.1	A	0.0
			7426	125-12		Shirlow Street (N)	L	1	7	6	600.0%	3.0	Y	0.2	A	0.0
								1,648	1,729					0.3	A	0.0
	132	Carpark	9669	126-1	Murrary Street (N)	Carpark (W)	R	125	98	-27	-21.6%	2.6	Y	2.4	A	0.0
		Murray Street	9670	126-2		Murrary Street (S)	T	92	126	34	37.0%	3.3	Y	0.6	A	0.0
			9673	126-8	Murrary Street (S)	Murrary Street (N)	T	130	236	106	81.5%	7.8	N	0.3	A	0.0
			9674	126-9		Carpark (W)	L	147	121	-26	-17.7%	2.2	Y	4.0	A	0.4
			9672	126-10	Carpark (W)	Murrary Street (S)	R	95	84	-11	-11.6%	1.2	Y	4.0	A	0.4
			9671	126-12		Murrary Street (N)	L	148	159	11	7.4%	0.9	Y	1.3	A	0.2
								737	824					4.0	A	0.2
	136	Carpark	9698	127-1	Carpark (N)	Smidmore Street (W)	R	162	174	12	7.4%	0.9	Y	4.2	A	1.5
		Smidmore	9697	127-3		Smidmore Street (E)	L	143	131	-12	-8.4%	1.0	Y	1.5	A	0.1
			9699	127-4	Smidmore Street (E)	Carpark (N)	R	51	64	13	25.5%	1.7	Y	1.5	A	0.1
			9700	127-5		Smidmore Street (W)	T	153	60	-93	-60.8%	9.0	N	0.8	A	0.0
			9702	127-11	Smidmore Street (W)	Smidmore Street (E)	T	146	204	58	39.7%	4.4	Y	0.8	A	0.0
			9701	127-12		Carpark (N)	L	180	145	-35	-19.4%	2.7	Y	1.8	A	0.5
								835	778					1.8	A	0.5

P3253 Marrickville Metro VISSIM Model

VISSIM Data Analysis - Node

AM Peak 1130-1230

3

GEH Turn Summary 0745-0845		
>10	0	0.00%
>5, <=10	17	8.72%
<=5	178	91.28%

Time	ID	Intersection	Aimsun Code	Movement Code	From	To	Turn	Observed	Modelled	Abs. Diff (Mod - Obs)	% Diff (Mod - Obs)	GEH	Accept	Delay (s)	LoS	Queue (m)
1800	101	May Street	9244	101-1	May Street (N)	Bedwin Road (W)	R	200	211	11	5.5%	0.8	Y	20.0	B	10.7
		Campbell Street	9243	101-2		Unwins Bridge Road (S)	T	261	262	1	0.4%	0.1	Y	15.1	B	10.7
		Unwins Bridge Road	9255	101-3		Campbell Street (E)	L	32	27	-5	-15.6%	0.9	Y	2.0	A	5.4
		Bedwin Road	9247	101-5	Campbell Street (E)	Bedwin Road (W)	T	86	109	23	26.7%	2.3	Y	33.8	C	5.0
			9246	101-6		Unwins Bridge Road (S)	L	31	32	1	3.2%	0.2	Y	32.7	C	5.0
			9238	101-7	Unwins Bridge (S)	Campbell Street (E)	R	31	31	0	0.0%	0.0	Y	19.1	B	4.5
			9239	101-8		May Street (N)	T	291	281	-10	-3.4%	0.6	Y	16.4	B	4.5
			9264	101-9		Bedwin Road (W)	L	629	636	7	1.1%	0.3	Y	3.0	A	0.7
			9240	101-10	Bedwin Road (W)	Unwins Bridge Road (S)	R	380	383	3	0.8%	0.2	Y	33.6	C	22.4
			9241	101-11		Campbell Street (E)	T	262	265	3	1.1%	0.2	Y	20.5	B	14.3
			9242	101-12		May Street (N)	L	250	177	-73	-29.2%	5.0	Y	19.5	B	14.3
					All			2,453	2,414					17.3	B	9.0
	102	Darley Street	9219	102-6		Bedwin Road (SE)	L	195	184	-11	-5.6%	0.8	Y	6.6	A	0.9
		Edgeware Road	9193	102-8	Bedwin Road (SE)	Edgeware Road (W)	T	645	679	34	5.3%	1.3	Y	1.0	A	0.0
		Bedwin Road	9228	102-9		Edinburgh Road (S)	L	310	281	-29	-9.4%	1.7	Y	0.5	A	0.0
		Edinburgh Road	9191	102-10	Edinburgh Road (S)	Bedwin Road (SE)	R	167	155	-12	-7.2%	0.9	Y	52.4	D	17.8
			4302	102-12		Edgeware Road (W)	L	84	79	-5	-6.0%	0.6	Y	8.2	A	0.8
			9221	102-13	Edgeware Road (W)	Bedwin Road (SE)	R	538	482	-56	-10.4%	2.5	Y	0.9	A	0.0
			9222	102-14		Edgeware Road (NE)	T	38	44	6	15.8%	0.9	Y	0.1	A	0.0
			9223	102-15		Darley Street (N)	L	88	69	-19	-21.6%	2.1	Y	-0.8	A	0.0
					All			1,401	1,973					52.4	D	3.9
	103	Edgeware Road	4745	103-5	Edgeware Road (E)	Edgeware Road (W)	T	673	690	17	2.5%	0.7	Y	0.6	A	0.0
		Smidmore Road	4746	103-6		Smidmore Road (S)	L	56	69	13	23.2%	1.6	Y	-0.2	A	0.0
			4748	103-9	Smidmore Road (S)	Edgeware Road (W)	L	57	59	2	3.5%	0.3	Y	5.0	A	0.3
			4742	103-11	Edgeware Road (W)	Edgeware Road (E)	T	664	595	-69	-10.4%	2.8	Y	0.6	A	0.0
					All			1450	1,413					5.0	A	0.1
	104	Edgeware Road	4524	104-1	Wells Street (N)	Edgware Road (W)	R	5	9	4	80.0%	1.5	Y	27.3	B	0.4
		Wells Street	4522	104-3		Edgeware Road (E)	L	16	11	-5	-31.3%	1.4	Y	6.4	A	0.1
			4527	104-4	Edgeware Road (E)	Wells Street (N)	R	23	37	14	60.9%	2.6	Y	4.0	A	0.4
			4528	104-5		Edgeware Road (W)	T	696	710	14	2.0%	0.5	Y	0.9	A	0.2
			4526	104-11	Edgeware Road (W)	Edgeware Road (E)	T	648	584	-64	-9.9%	2.6	Y	0.3	A	0.0
			4525	104-12		Wells Street (N)	L	5	24	19	380.0%	5.0	Y	-0.2	A	0.0
								1,393	1,375					27.3	B	0.2
	105	Edgeware Road	4475	105-5	Edgeware Road (E)	Edgeware Road (W)	T	619	721	102	16.5%	3.9	Y	3.7	A	5.9
		Victoria Road	4474	105-6		Victoria Road (S)	L	20	1	-19	-95.0%	5.9	N	0.4	A	5.6
			4471	105-7	Victoria Road (S)	Edgeware Road (E)	R	61	66	5	8.2%	0.6	Y	57.4	E	15.6
			4469	105-9		Edgeware Road (W)	L	311	320	9	2.9%	0.5	Y	32.5	C	15.6
			4472	105-10	Edgeware Road (W)	Victoria Road (S)	R	241	278	37	15.4%	2.3	Y	3.6	A	9.3
			4473	105-11		Edgeware Road (E)	T	597	542	-55	-9.2%	2.3	Y	1.3	A	7.8
								1,849	2,193					57.4	E	15.6
	106	Alice Street	9340	106-1	Alice Street (N)	Edgeware Road (W)	R	87	50	-37	-42.5%	4.5	Y	48.1	D	11.3
		Edgeware Road	9341	106-2		Llewellyn Street (S)	T	105	98	-7	-6.7%	0.7	Y	34.7	C	11.3
		Llewellyn St	9342	106-3		Edgeware Road (E)	L	124	144	20	16.1%	1.7	Y	31.4	C	11.3
			9349	106-4	Edgeware Road (E)	Alice Street (N)	R	130	185	55	42.3%	4.4	Y	23.7	B	23.0
			9350	106-5		Edgeware Road (W)	T	657	669	12	1.8%	0.5	Y	11.1	A	23.2
			9351	106-6		Llewellyn Street (S)	L	103	187	84	81.6%	7.0	N	10.4	A	23.3
			9348	106-7	Llewellyn Street (S)	Edgeware Road (E)	R	92	30	-62	-67.4%	7.9	N	67.1	E	5.8
			9346	106-8		Alice Street (N)	T	151	98	-53	-35.1%	4.7	Y	33.9	C	6.1
			9347	106-9		Edgeware Road (W)	L	1	4	3	300.0%	1.9	Y	30.8	C	5.6
			9345	106-11	Edgeware Road (W)	Edgeware Road (E)	T	622	649	27	4.3%	1.1	Y	24.1	B	26.8
			9900	106-12		Alice Street (N)	L	49	79	30	61.2%	3.8	Y	29.1	C	26.8
								2,121	2,884					28.9	B	25.7
	107	Enmore Road	9306	107-1	Enmore Road (N)	Stanmore Road (W)	R	312	309	-3	-1.0%	0.2	Y	32.5	C	21.8
		Edgeware Road	9307	107-2		Enmore Road (S)	T	324	342	18	5.6%	1.0	Y	13.9	A	21.7
		Stanmore Road	9305	107-3		Edgeware Road (E)	L	77	64	-13	-16.9%	1.5	Y	11.1	A	18.9
			9303	107-5	Edgeware Road (E)	Stanmore Road (W)	T	713	733	20	2.8%	0.7	Y	18.8	B	25.3
			9304	107-6		Enmore Road (S)	L	9	18	9	100.0%	2.4	Y	27.3	B	25.3
			9312	107-8	Enmore Road (S)	Enmore Road (N)	T	285	306	21	7.4%	1.2	Y	32.5	C	27.1
			9313	107-9		Stanmore Road (W)	L	135	117	-18	-13.3%	1.6	Y	37.7	C	27.1
			9308	107-11	Stanmore Road (W)	Edgeware Road (E)	T	723	719	-4	-0.6%	0.1	Y	40.5	C	39.3
			9309	107-12		Enmore Road (N)	L	277	276	-1	-0.4%	0.1	Y	36.0	C	39.3
								2,855	2,193					21.7	B	15.6
	108	Edinburgh Road	9888	108-1	Edinburgh Road (N)	Edinburgh Road (W)	R	352	280	-72	-20.5%	4.1	Y	1.3	A	0.1
		Railway Parade	9887	108-3		Railway Parade (E)	L	9	0	-9	-100.0%	4.2	Y	0.0	A	0.1
			9889	108-4	Railway Parade (E)	Edinburgh Road (N)	R	82	75	-7	-8.5%	0.8	Y	8.3	A	2.2
			9890	108-5		Edinburgh Road (W)	T	207	244	37	17.9%	2.5	Y	5.5	A	2.2
			9892	108-11	Edinburgh Road (W)	Railway Parade (E)	T	179	120	-59	-33.0%	4.8	Y	3.1	A	0.7
			9891	108-12		Edinburgh Road (N)	L	195	158	-37	-19.0%	2.8	Y	7.2	A	0.7
								1,024	877					8.3	A	0.8
	109	Victoria Road	9452	109-2	Victoria Road (N)	Murray Street (S)	T	270	278	8	3.0%	0.5	Y	0.2	A	0.0
		Murray Street	9450	109-8	Murray Street (S)	Victoria Road (N)	T	323	331	8	2.5%	0.4	Y	6.0	A	1.3
			9451	109-9		Victoria Road (W)	L	50	78	28	56.0%	3.5	Y	5.3	A	1.3
			9455	109-12	Victoria Road (W)	Victoria Road (N)	L	51	53	2	3.9%	0.3	Y	21.1	B	1.4
								694	740					21.1	B	0.9
	110	Murray Street	9883	110-1	Murray Street (N)	Edinburgh (W)	R	140	136	-4	-2.9%	0.3	Y	2.8	A	0.5
		Edinburgh Road	9884	110-2		Murray Street (S)	T	5	8	3	60.0%	1.2	Y	1.2	A	0.5
			???	110-3		Edinburgh (E)	L	194	138	-56	-28.9%	4.3	Y	2.2	A	0.5
			9882	110-4	Edinburgh (E)	Murray Street (N)	R	215	167	-48	-22.3%	3.5	Y	3.9	A	1.6
			9880	110-5		Edinburgh (W)	T	291	353	62	21.3%	3.5	Y	3.7	A	1.6
			9881	110-6		Murray Street (S)	L	14	4	-10	-71.4%	3.3	Y	1.8	A	1.6
			9878	110-7	Murray Street (S)	Edinburgh (E)	R	3	0	-3	-100.0%	2.4	Y	0.0	A	0.0
			9879	110-8		Murray Street (N)	T	1	1	0	0.0%	0.0	Y	8.0	A	0.0
			9877	110-9		Edinburgh Street (W)	L	9	10	1	11.1%	0.3	Y	3.2	A	0.0
			9874	110-10	Edinburgh (W)	Murray Street (S)	R	2	0	-2	-100.0%	2.0	Y	0.0	A	0.2
			9875	110-11		Edinburgh Street (E)	T	170	140	-30	-17.6%	2.4	Y	1.4	A	0.2
			9876	110-12		Murray Street (N)	L	45	38	-7	-15.6%	1.1	Y	1.4	A	0.2
								1,089	995					8.0	A	0.6
	111	Murray Street	9870	111-1	Murray Street (N)	Smidmore Road (W)	R	83	70	-13	-15.7%	1.5	Y	1.5	A	0.0
		Smidmore Road	9871	111-2		Murray Road (S)	T	166	150	-16	-9.6%	1.3	Y	2.7	A	0.0
			9872	111-3		Smidmore Road (E)	L	19	34	15	78.9%	2.9	Y	2.1	A	0.0
			9869	111-4	Smidmore Road (E)	Murray Street (N)	R	40	28	-12	-30.0%	2.1	Y	3.7	A	0.2
			9867	111-5		Smidmore Road (W)	T	31	41	10	32.3%	1.7	Y	2.8	A	0.2
			9868	111-6		Murray Street (S)	L	11	0	-11	-100.0%	4.7	Y	0.0	A	0.1
			9865	111-7	Murray Street (S)	Smidmore Road (E)	R	7	4	-3	-42.9%	1.3	Y	1.5	A	0.2
			9866	111-8		Murray Street (N)	T	153	172	19	12.4%	1.5	Y	2.4	A	0.2
			9864	111-9		Smidmore Road (W)	L	60	31	-29	-48.3%	4.3	Y	1.6	A	0.2
			9861	111-10	Smidmore Road (W)	Murray Street (S)	R	116	133	17	14.7%	1.5	Y	2.9	A	1.1
			9862	111-11		Smidmore Road (E)	T	36	22	-14	-38.9%	2.6	Y	4.4	A	1.1
			9863	111-12		Murray Street (N)	L	222	260	38	17.1%	2.4	Y	4.0	A	1.1
								944	945					4.4	A	0.4
	112	Enmore Road	4595	112-2	Enmore Road (N)	Enmore Road (S)	T	358	357	-1	-0.3%	0.1	Y	5.5	A	3.6
		Llewellyn Street	4594	112-3		Llewellyn Street (E)	L	28	15	-13	-46.4%	2.8	Y	6.4	A	3.7
			4591	112-4	Llewellyn Street (E)	Enmore Road (N)	R	98	79	-19	-19.4%	2.0	Y	42.1	C	12.9
			4593	112-6		Enmore Road (S)	L	224	203	-21	-9.4%	1.4	Y	37.6	C	12.9
			4596	112-7	Enmore Road (S)	Llewellyn Street (E)	R	205	112	-93	-45.4%	7.4	N	8.3	A	2.5
			4597	112-8		Enmore Road (N)	T	342	388	46	13.5%	2.4	Y	3.9	A	2.5
								1,255	1,154					13.4	A	5.0
	113	Enmore Road	4621	113-1	Enmore Road (N)	Addison Road (W)	R	180	218	38	21.1%	2.7	Y	21.7	B	8.0

		Addison Road	4622	113-2		Enmore Road (S)	T	402	342	-60	-14.9%	3.1	Y	10.7	A	8.0
			4619	113-8	Enmore Road (S)	Enmore Road (N)	T	378	317	-61	-16.1%	3.3	Y	9.7	A	5.7
			4618	113-9		Addison Road (W)	L	97	148	51	52.6%	4.6	Y	10.5	A	5.1
			4616	113-10	Addison Road (W)	Enmore Road (S)	R	188	166	-22	-11.7%	1.7	Y	44.6	D	20.6
			9383	113-12		Enmore Road (N)	L	169	185	16	9.5%	1.2	Y	36.3	C	19.8
								1,414	1,376					19.7	B	11.8
	114	Edinburgh Road	3775	114-5	Edinburgh Road (E)	Edinburgh Road (W)	T	438	496	58	13.2%	2.7	Y	0.3	A	0.4
		Sydney Steel Road	3773	114-6		Sydney Steel Road (S)	L	5	4	-1	-20.0%	0.5	Y	0.4	A	0.4
			3776	114-7	Sydney Steel Road (S)	Edinburgh Road (E)	R	5	14	9	180.0%	2.9	Y	6.8	A	0.1
			3777	114-9		Edinburgh Road (W)	L	7	16	9	128.6%	2.7	Y	5.5	A	0.1
			3779	114-10	Edinburgh Road (W)	Sydney Steel Road (S)	R	5	16	11	220.0%	3.4	Y	0.5	A	0.0
			3778	114-11		Edinburgh Road (E)	T	221	163	-58	-26.2%	4.2	Y	0.3	A	0.0
								681	709					6.8	A	0.2
	115	Smidmore Road	3765	115-1	Smidmore Road (N)	Edinburgh Road (W)	R	261	241	-20	-7.7%	1.3	Y	27.2	B	11.3
		Edinburgh Road	3763	115-3		Edinburn Road (E)	L	39	9	-30	-76.9%	6.1	N	28.0	B	11.3
			3768	115-4	Edinburgh Road (E)	Smidmore Road (N)	R	31	21	-10	-32.3%	2.0	Y	6.2	A	5.7
			3769	115-5		Edinburgh Road (W)	T	415	493	78	18.8%	3.7	Y	6.9	A	5.7
			3767	115-11	Edinburgh Road (W)	Edinburgh Road (E)	T	186	167	-19	-10.2%	1.4	Y	7.7	A	5.5
			3766	115-12		Smidmore Road (N)	L	480	514	34	7.1%	1.5	Y	3.5	A	5.6
								1,412	1,445					9.3	A	7.0
	116	Edinburgh Road	9899	116-5	Edinburgh Road (E)	Edgeware Road (W)	T	545	453	-92	-16.9%	4.1	Y	7.1	A	11.8
		Fitzroy Road	9898	116-6		Fitzroy Street (S)	L	223	285	62	27.8%	3.9	Y	7.2	A	11.8
			9895	116-7	Fitzroy Street (S)	Edinburgh Road (E)	R	270	297	27	10.0%	1.6	Y	9.0	A	5.0
			9894	116-9		Edinburgh Road (W)	L	75	68	-7	-9.3%	0.8	Y	10.7	A	5.0
			9896	116-10	Edinburgh Road (W)	Fitzroy Street (S)	R	61	35	-26	-42.6%	3.8	Y	7.2	A	5.4
			9897	116-11		Edinburgh Road (E)	T	376	381	5	1.3%	0.3	Y	8.6	A	5.4
								1,550	1,519					10.7	A	7.4
	117	Enmore Road	9370	117-2	Enmore Road (N)	Victoria Road (S)	T	528	436	-92	-17.4%	4.2	Y	2.1	A	0.6
		Victoria Road	9369	117-3		Victoria Road (E)	L	64	76	12	18.8%	1.4	Y	1.7	A	0.7
			7201	117-6	Victoria Road (E)	Victoria Road (S)	L	101	105	4	4.0%	0.4	Y	3.0	A	0.2
			7202	117-8	Victoria Road (S)	Enmore Road (N)	T	483	465	-18	-3.7%	0.8	Y	0.6	A	0.0
								1,176	1,082					3.0	A	0.4
	118	Victoria Road	9389	118-2	Victoria Road (N)	Victoria Road (S)	T	397	339	-58	-14.6%	3.0	Y	2.7	A	2.2
		Edinburgh Road	9390	118-3		Edinburgh Road (E)	L	232	202	-30	-12.9%	2.0	Y	3.1	A	2.2
			9388	118-4	Edinburgh Road (E)	Victoria Road (N)	R	142	143	1	0.7%	0.1	Y	49.2	D	15.7
			9289	118-6		Victoria Road (S)	L	394	382	-12	-3.0%	0.6	Y	10.2	A	3.7
			9385	118-7	Victoria Road (S)	Edinburgh Road (E)	R	197	216	19	9.6%	1.3	Y	5.8	A	2.1
			9386	118-8		Victoria Road (N)	T	341	322	-19	-5.6%	1.0	Y	3.6	A	2.1
								1,703	1,604					9.3	A	5.9
	119	Victoria Road	9151	119-1	Victoria Road (N)	Cook Road (W)	R	162	157	-5	-3.1%	0.4	Y	6.6	A	1.6
		Cook Road	9152	119-2		Victoria Road (S)	T	629	565	-64	-10.2%	2.6	Y	0.4	A	0.3
			9156	119-8	Victoria Road (S)	Victoria Road (N)	T	508	508	0	0.0%	0.0	Y	0.7	A	0.0
			9155	119-9		Cook Road (W)	L	56	29	-27	-48.2%	4.1	Y	0.6	A	0.0
			9154	119-10	Cook Road (W)	Victoria Road (S)	R	47	45	-2	-4.3%	0.3	Y	12.3	A	0.6
			9153	119-12		Victoria Road (N)	L	30	31	1	3.3%	0.2	Y	7.4	A	0.3
								1,432	1,335					12.3	A	0.6
	120	Victoria Road	9403	120-1	Victoria Road (N)	Chapel Street (W)	R	57	36	-21	-36.8%	3.1	Y	3.5	A	1.8
		Chapel Street	9402	120-2		Victoria Road (S)	T	649	593	-56	-8.6%	2.2	Y	1.6	A	1.8
			9401	120-3		Chapel Street (E)	L	9	3	-6	-66.7%	2.4	Y	0.4	A	1.8
			9394	120-4	Chapel Street (E)	Victoria Road (N)	R	4	4	0	0.0%	0.0	Y	0.7	A	0.0
			9393	120-5		Chapel Street (W)	T	11	4	-7	-63.6%	2.6	Y	13.6	A	0.3
			9392	120-6		Victoria Road (S)	L	18	26	8	44.4%	1.7	Y	5.7	A	0.3
			9395	120-7	Victoria Road (S)	Chapel Street (E)	R	15	25	10	66.7%	2.2	Y	6.2	A	1.0
			9397	120-8		Victoria Road (N)	T	505	511	6	1.2%	0.3	Y	2.3	A	1.0
			9396	120-9		Chapel Street (W)	L	21	0	-21	-100.0%	6.5	N	0.0	A	1.0
			9399	120-10	Chapel Street (W)	Victoria Road (S)	R	11	36	25	227.3%	5.2	N	1.7	A	0.0
			9398	120-11		Chapel Street (E)	T	8	0	-8	-100.0%	4.0	Y	0.0	A	0.0
			9400	120-12		Victoria Road (N)	L	55	5	-50	-90.9%	9.1	N	6.0	A	0.0
								1,363	1,243					13.6	A	0.5
	121	Victoria Road	9430	121-1	Victoria Road (N)	Chalder Street (W)	R	3	43	40	1333.3%	8.3	N	8.8	A	0.2
		Chalder Street	9428	121-2		Victoria Road (S)	T	664	609	-55	-8.3%	2.2	Y	3.5	A	0.1
			9429	121-3		Chalder Street (E)	L	11	1	-10	-90.9%	4.1	Y	0.3	A	0.1
			9426	121-4	Chalder Street (E)	Victoria Road (N)	R	6	13	7	116.7%	2.3	Y	1.4	A	0.1
			9425	121-6		Victoria Road (S)	L	17	27	10	58.8%	2.1	Y	13.8	A	0.5
			9434	121-7	Victoria Road (S)	Chalder Street (E)	R	11	0	-11	-100.0%	4.7	Y	0.0	A	0.0
			9435	121-8		Victoria Road (N)	T	532	525	-7	-1.3%	0.3	Y	0.2	A	0.0
			9431	121-10	Chalder Street (W)	Victoria Road (S)	R	3	16	13	433.3%	4.2	Y	1.8	A	0.0
			9433	121-12		Victoria Road (N)	L	3	0	-3	-100.0%	2.4	Y	0.0	A	0.0
								1,250	1,236					13.8	A	0.1
	122	Victoria Road	6595	122-1	Victoria Road (N)	Mitchell Street (W)	R	29	23	-6	-20.7%	1.2	Y	5.0	A	0.2
		Mitchell Street	6594	122-2		Victoria Road (S)	T	649	629	-20	-3.1%	0.8	Y	0.6	A	0.0
			6591	122-8	Victoria Road (S)	Victoria Road (N)	T	499	499	0	0.0%	0.0	Y	0.1	A	0.0
			6593	122-9		Mitchell Street (W)	L	28	11	-17	-60.7%	3.8	Y	-0.1	A	0.0
			6597	122-10	Mitchell Street (W)	Victoria Street (S)	R	17	27	10	58.8%	2.1	Y	28.3	B	1.9
			6596	122-12		Victoria Street (N)	L	36	27	-9	-25.0%	1.6	Y	23.5	B	1.9
								1,258	1,216					1.6	A	0.4
	123	Victoria Road	4678	123-1	Victoria Road (N)	Sydenham Road (W)	R	175	187	12	6.9%	0.9	Y	28.2	B	18.6
		Sydenham Road	4679	123-2		Victoria Road (S)	T	393	369	-24	-6.1%	1.2	Y	18.0	B	18.6
			4677	123-3		Sydenham Road (E)	L	97	100	3	3.1%	0.3	Y	20.6	B	18.6
			4673	123-4	Sydenham Road (E)	Victoria Road (N)	R	62	23	-39	-62.9%	6.0	N	41.4	C	8.9
			4675	123-5		Sydenham Road (W)	T	488	499	11	2.3%	0.5	Y	17.2	B	8.9
			4676	123-6		Victoria Road (S)	L	43	99	56	130.2%	6.6	N	14.4	A	8.9
			4684	123-8	Victoria Road (S)	Victoria Road (N)	T	327	352	25	7.6%	1.4	Y	40.1	C	15.9
			4685	123-9		Sydenham Road (W)	L	64	63	-1	-1.6%	0.1	Y	32.3	C	15.9
			4682	123-10	Sydenham Road (W)	Victoria Road (S)	R	22	24	2	9.1%	0.4	Y	30.8	C	26.3
			4680	123-11		Sydenham Road (E)	T	618	713	95	15.4%	3.7	Y	22.7	B	26.3
		Victoria Road	4681	123-12		Victoria Road (N)	L	150	130	-20	-13.3%	1.7	Y	27.1	B	26.3
								2,439	2,559					24.1	B	17.4
	124	Fitzroy Street	7290	124-1	Fitzroy Street (N)	Sydenham Road (W)	R	66	110	44	66.7%	4.7	Y	30.6	C	0.9
		Sydenham Road	7288	124-3		Sydenham Road (E)	L	138	100	-38	-27.5%	3.5	Y	8.1	A	0.9
			7293	124-4	Sydenham Road (E)	Fitzroy Street (N)	R	138	119	-19	-13.8%	1.7	Y	4.4	A	0.7
			7294	124-5		Sydenham Road (W)	T	497	506	9	1.8%	0.4	Y	0.5	A	0.0
			7292	124-11	Sydenham Road (W)	Sydenham Road (E)	T	624	605	-19	-3.0%	0.8	Y	0.4	A	0.0
			7291	124-12		Fitzroy Street (N)	L	114	201	87	76.3%	6.9	N	-0.3	A	0.0
								1,577	1,641					30.6	C	0.3
	125	Shirlow Street	3887	125-7	Buckley Street	Sydenham Road (E)	R	401	390	-11	-2.7%	0.6	Y	0.2	A	0.0
		Sydenham Road	4633	125-9		Sydenham Road (W)	L	547	620	73	13.3%	3.0	Y	0.3	A	0.0
			4634	125-11	Sydenham Road (W)	Sydenham Road (E)	T	692	704	12	1.7%	0.5	Y	0.1	A	0.0
			7426	125-12		Shirlow Street (N)	L	7	3	-4	-57.1%	1.8	Y	0.2	A	0.0
								1,647	1,717					0.3	A	0.0
	132	Carpark	9669	126-1	Murrary Street (N)	Carpark (W)	R	187	133	-54	-28.9%	4.3	Y	302.9%	A	0.04897
		Murray Street	9670	126-2		Murrary Street (S)	T	83	145	62	74.7%	5.8	N	64.9%	A	0.04897
			9673	126-8	Murrary Street (S)	Murrary Street (N)	T	186	177	-9	-4.8%	0.7	Y	35.2%	A	0
			9674	126-9		Carpark (W)	L	278	288	10	3.6%	0.6	Y	311.5%	A	0.30849
			9672	126-10	Carpark (W)	Murrary Street (S)	R	193	107	-86	-44.6%	7.0	N	311.5%	A	0.30849
			9671	126-12		Murrary Street (N)	L	193	233	40	20.7%	2.7	Y	127.9%	A	0.17463
								1,120	808					311.5%	A	0.17463
	136	Carpark	9698	127-1	Carpark (N)	Smidmore Street (W)	R	221	209	-12	-5.4%	0.8	Y	375.6%	A	1.34296
		Smidmore	9697	127-3		Smidmore Street (E)	L	225	157	-68	-30.2%	4.9	Y	170.4%	A	0.0627
			9699	127-4	Smidmore Street (E)	Carpark (N)	R	59	107	48	81.4%	5.3	N	170.4%	A	0.0627
			9700	127-5		Smidmore Street (W)	T	78	37	-41	-52.6%	5.4	N	79.6%	A	0
			9702	127-11	Smidmore Street (W)	Smidmore Street (E)	T	180	258	78	43.3%	5.3	N	79.6%	A	0
			9701	127-12		Carpark (N)	L	294	277	-17	-5.8%	1.0	Y	155.0%	A	0.4325
								1,057	761					170.4%	A	0.4325

ATTACHMENT C

TRAFFIC SIGNAL VALIDATION SUMMARY

Marrickville Metro Study
Signal Time Comparison

PM Peak (1700-180)

Intersection (TCS)	Cycle / Phase	PM				
		IDM			VISSIM	Within 10%?
		Avg.	10%	-10%		
TCS 20 – Enmore Road / Stanmore Road / Edgeware Road Artarmon Road / Small Street	CT*	113	124	102	110	✓
	A	31	34	28	34	✓
	B	38	42	34	37	✓
	C	44	48	40	39	✗
TCS 41 – Victoria Road / Sydenham Road	CT*	100	110	90	100	✓
	A	24	26	22	28	✗
	B	26	29	23	27	✓
	C	50	55	45	45	✓
TCS 860 – Edgeware Road / Alice Street / Llewellyn Street;	CT*	100	110	90	100	✓
	A	52	57	47	52	✓
	B	12	13	11	12	✓
	C	36	40	32	36	✓
TCS 917 – Unwins Bridge Road / Campbell Street / May Street	CT*	96	106	86	100	✓
	A	52	57	47	48	✓
	B	20	22	18	26	✗
	C	24	26	22	26	✓
TCS 1437 – Victoria Road / Edinburgh Road / Enmore Road	CT*	97	107	87	100	✓
	A	69	76	62	60	✗
	B	6	7	5	12	✗
	C	22	24	20	28	✗
TCS 1884 – Enmore Road / Addison Road	CT*	104	114	94	100	✓
	A	59	65	53	53	✓
	B	19	21	17	19	✓
	C	26	29	23	28	✓
TCS 1889 – Enmore Road / Llewellyn Street	CT*	100	110	90	100	✓
	A	30	33	27	30	✓
	B	35	39	32	35	✓
	C	35	39	32	35	✓
TCS 3769 – Edinburgh Road / Smidmore Street	CT*	58	64	52	60	✓
	A	21	23	19	22	✓
	B	15	17	14	15	✓
	C	22	24	20	23	✓
TCS 1992 – Victoria Road / Chapel Street	CT*	158	174	142	100	✗
	A	138	152	124	79	✗
	B	20	22	18	21	✓
TCS 2025 – Edgeware Road / Wells Street	CT*	197	217	177	110	✗
	A	178	196	160	91	✗
	B	19	21	17	19	✓
TCS 2126 – Edgeware Road Pedestrian Crossing	CT*	110	121	99	110	✓
	A	91	100	82	91	✓
	B	19	21	17	19	✓

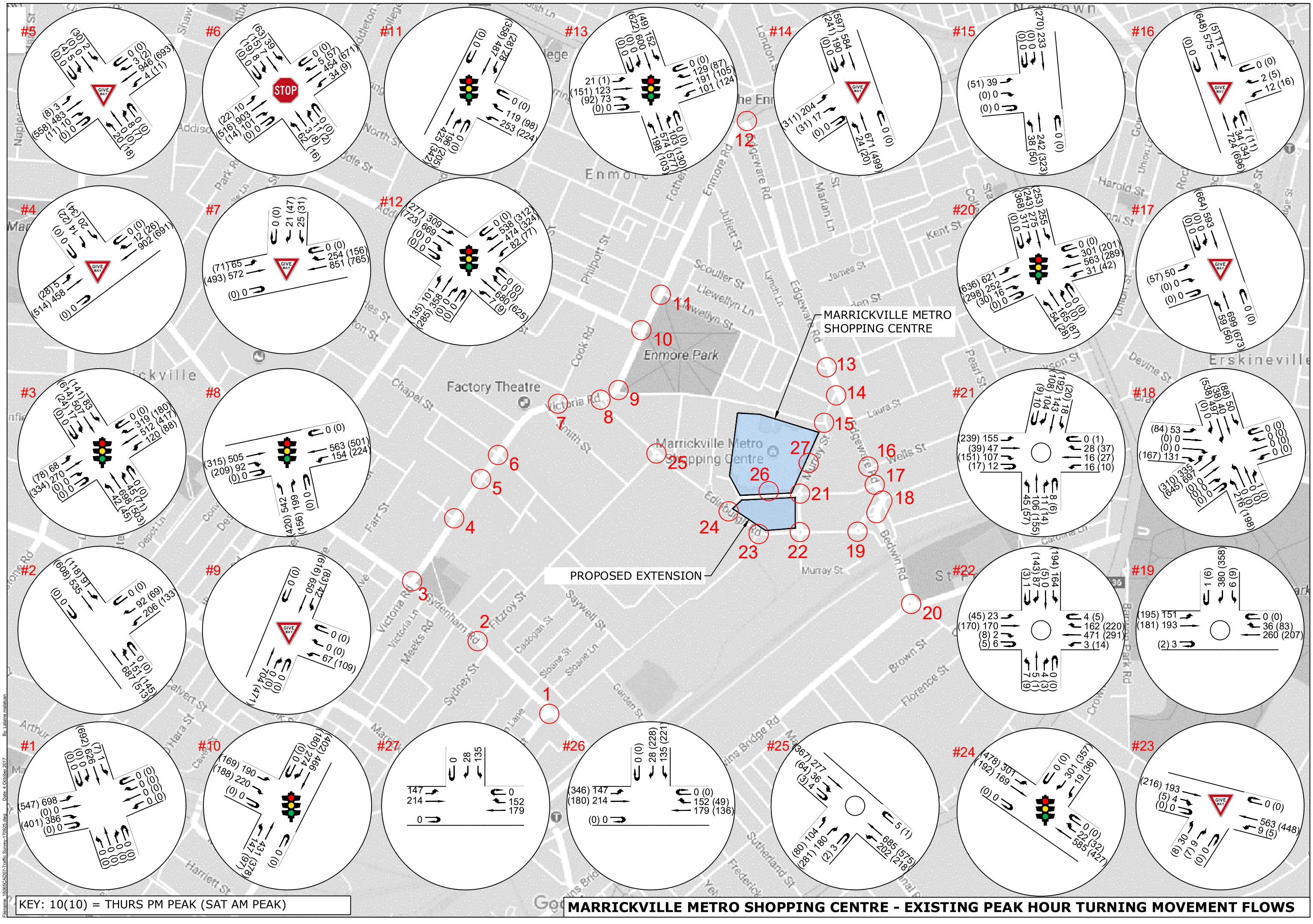
Marrickville Metro Study
Signal Time Comparison

Weekend Mid-day Peak (1130-1230)

Intersection (TCS)	Cycle / Phase	Weekend				
		IDM			VISSIM	Within 10%?
		Avg.	10%	-10%		
TCS 20 – Enmore Road / Stanmore Road / Edgeware Road Artarmon Road / Small Street	CT*	108	119	97	110	✓
	A	35	39	32	35	✓
	B	33	36	30	35	✓
	C	40	44	36	40	✓
TCS 41 – Victoria Road / Sydenham Road	CT*	103	113	93	100	✓
	A	26	29	23	23	✓
	B	23	25	21	26	✗
	C	54	59	49	51	✓
TCS 860 – Edgeware Road / Alice Street / Llewellyn Street;	CT*	109	120	98	110	✓
	A	57	63	51	55	✓
	B	18	20	16	21	✗
	C	34	37	31	34	✓
TCS 917 – Unwins Bridge Road / Campbell Street / May Street	CT*	76	84	68	80	✓
	A	42	46	38	44	✓
	B	17	19	15	18	✓
	C	17	19	15	18	✓
TCS 1437 – Victoria Road / Edinburgh Road / Enmore Road	CT*	95	105	86	100	✓
	A	61	67	55	65	✓
	B	14	15	13	14	✓
	C	20	22	18	21	✓
TCS 1884 – Enmore Road / Addison Road	CT*	99	109	89	100	✓
	A	50	55	45	50	✓
	B	21	23	19	22	✓
	C	28	31	25	28	✓
TCS 1889 – Enmore Road / Llewellyn Street	CT*	100	110	90	100	✓
	A	30	33	27	30	✓
	B	35	39	32	35	✓
	C	35	39	32	35	✓
TCS 3769 – Edinburgh Road / Smidmore Street	CT*	58	64	52	60	✓
	A	22	24	20	23	✓
	B	13	14	12	13	✓
	C	23	25	21	24	✓
TCS 1992 – Victoria Road / Chapel Street	CT*	158	174	142	100	✗
	A	138	152	124	79	✗
	B	20	22	18	21	✓
TCS 2025 – Edgeware Road / Wells Street	CT*	197	217	177	110	✗
	A	178	196	160	91	✗
	B	19	21	17	19	✓
TCS 2126 – Edgeware Road Pedestrian Crossing	CT*	110	121	99	110	✓
	A	91	100	82	91	✓
	B	19	21	17	19	✓

Appendix D

Existing and Future Intersection Volumes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MARRICKVILLE METRO SHOPPING CENTRE
PROPOSED EXTENSION
Marrickville Metro Shopping Centre
Enmore Park
Factory Theatre
Enmore
Erskineville
Newtown
Marrickville
Victoria Rd
Enmore Rd
Edgeware Rd
Cook Rd
Chapel St
Fitzroy St
Sydney St
Meeks Rd
Murray St
Wells St
Bedwin Rd
Brown St
Florence St
Sutherland St
Frederick St
Garden St
Sloane St
Cadogan St
Saywell St
Llewellyn St
Juliett St
Philport St
Scouller St
Lynch Ln
Marian Ln
Pearl St
Laura St
Harold St
Kent St
Devine St
Byrnes St
Bridge Rd
Barwon Park Rd
Illawarra Rd
Addison Rd
Smith St
Victoria Ln
Sloane Ln
Garden Lane
Carolina Ln
Depot Ln
Harriett St
Arthur St
O'Hara St
Calvert St
Farr St
North St
Park Rd
Shaw St
Union St
Jamee St
Ann St
Victoria Rd
Sydenham Rd
Fotheringham St
Addison St
Napier St
Marrickville Rd
Illawarra Rd
Stanmore Rd
Parramatta Rd
Edinburgh Rd
Murray St
Wells St
Bedwin Rd
Brown St
Florence St
Sutherland St
Frederick St
Garden St
Sloane St
Cadogan St
Saywell St
Llewellyn St
Juliett St
Philport St
Scouller St
Lynch Ln
Marian Ln
Pearl St
Laura St
Harold St
Kent St
Devine St
Byrnes St
Bridge Rd
Barwon Park Rd
Illawarra Rd
Addison Rd
Smith St
Victoria Rd
Victoria Ln
Sloane Ln
Garden Lane
Carolina Ln
Depot Ln
Harriett St
Arthur St
O'Hara St
Calvert St
Farr St
North St
Park Rd
Shaw St
Union St
Jamee St
Ann St
Victoria Rd
Sydenham Rd
Fotheringham St
Addison St
Napier St
Marrickville Rd
Illawarra Rd
Stanmore Rd
Parramatta Rd
Edinburgh Rd
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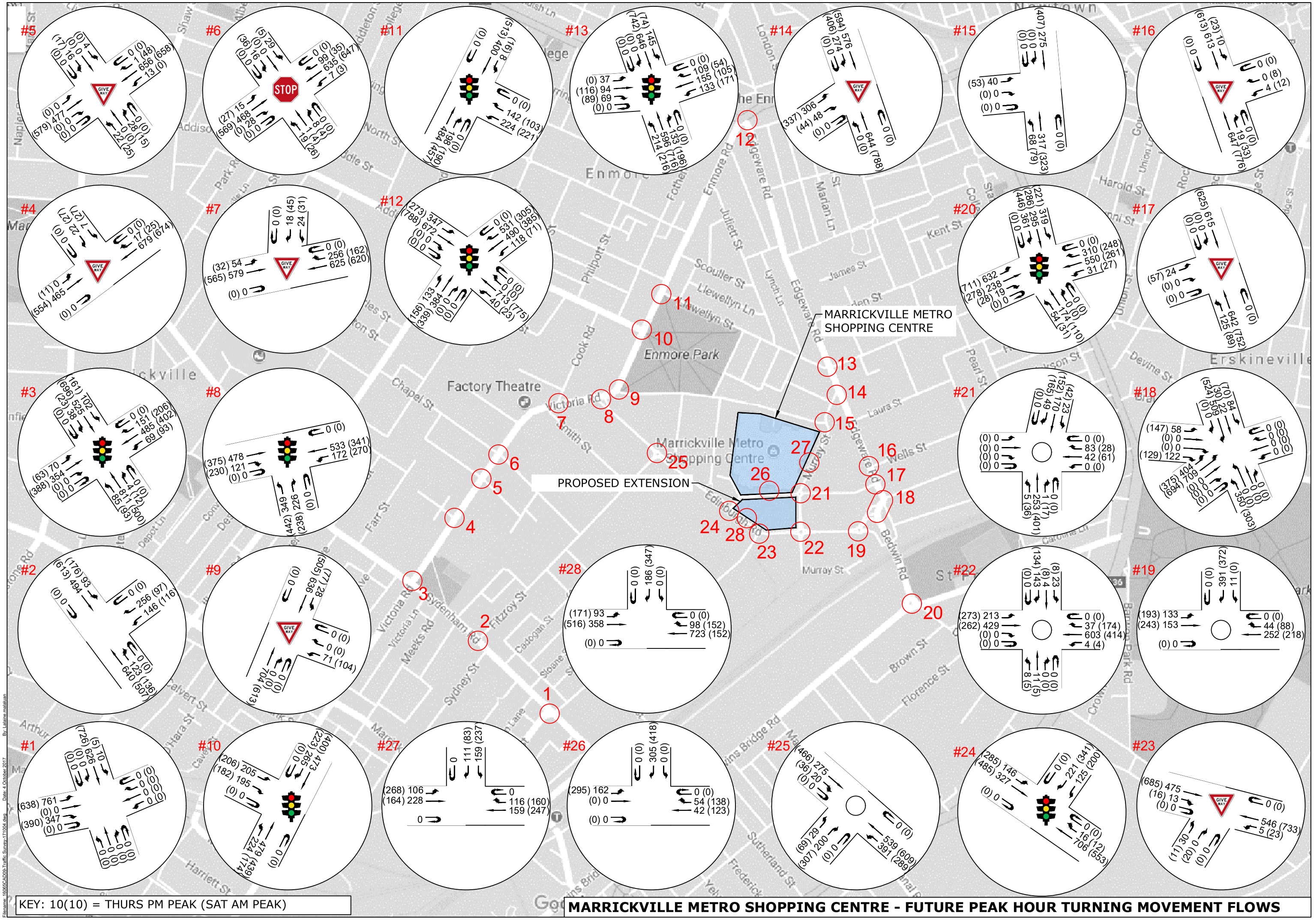
KEY: 10(10) = THURS PM PEAK (SAT AM PEAK)
MARRICKVILLE METRO SHOPPING CENTRE - EXISTING PEAK HOUR TURNING MOVEMENT FLOWS
By: Lalaine.matalauan
Date: 4 October 2017
Filename: 180655AD07-Traffic Surveys-170925.dwg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MARRICKVILLE METRO SHOPPING CENTRE
PROPOSED EXTENSION
Marrickville Metro Shopping Centre
Enmore Park
Factory Theatre
Enmore
Marrickville
Erskineville
STOP
GIVE WAY
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
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KEY: 10(10) = THURS PM PEAK (SAT AM PEAK)
MARRICKVILLE METRO SHOPPING CENTRE - FUTURE PEAK HOUR TURNING MOVEMENT FLOWS
Filename: 160652AD09-Traffic Surveys-171004.dwg
Date: 4 October 2017
By: Lalaine.matalusan

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