TRAFFIC IMPACT ASSESSMENT

Proposed Mixed Use Development – Planning Proposal
45 McLaren Street, North Sydney

Reference: 20.270r01v10
Date: November 2021

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1. INTRODUCTION

TRAFFIX has been commissioned by 45 McLaren Pty Limited Ltd to undertake a traffic impact assessment (TIA) in support of the amended Planning Proposal (November 2021) for the proposed mixed-use development at 45 McLaren Street, North Sydney, comprising 82 residential units with 2,091m² of retail/commercial Gross Floor Area (GFA) (including a Gym) on the ground and podium levels. Approval is sought for a change of land zoning from R4-High Density Residential (existing) to B4-Mixed Use (proposed), in accordance with Council's Local Environmental Plan (LEP). The development is located within the North Sydney Council Local Government Area (LGA) and has been assessed under that Council's controls.

This report documents the findings of our investigations and should be read in the context of the Amended Planning Proposal Report and Urban Design Report prepared separately. The development is classified as a minor development and does not require referral to the RMS under the provisions of SEPP (Infrastructure) 2007.

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic condition
- Section 4: Provides a strategic context
- Section 5: Describes the proposed development
- Section 6: Assesses the parking requirements
- Section 7: Assesses traffic impacts
- Section 8: Discusses access and internal design aspects
- Section 9: Presents the overall study conclusions

2. LOCATION AND SITE

The subject site is located at 45 McLaren Street, North Sydney and is legally described as Lot DP of SP14598. It is located within the North Sydney CBD (within the Ward Street Precinct Masterplan) on the southwestern corner of the intersection of McLaren Street and Walker Street, approximately 620 metres north of North Sydney Railway Station and 3.7 kilometres north of the Sydney Central Business District (CBD).

The subject site has a total site area of 1,792m^2. It is rectangular in configuration and has a northern frontage of 30 metres to McLaren Street, an eastern frontage of 48 metres to Walker Street, a western frontage of 48 metres to Harnett Street and a southern boundary of 30 metres with an adjacent residential development.

Vehicular access to the site is currently provided via Walker Street located at the south-eastern corner of the subject site.

A Location Plan is presented in Figure 1, with a Site Plan presented in Figure 2. Reference should also be made to the Photographic Record presented in Appendix A which provides an appreciation of the general character of roads and other key attributes in proximity to the site.

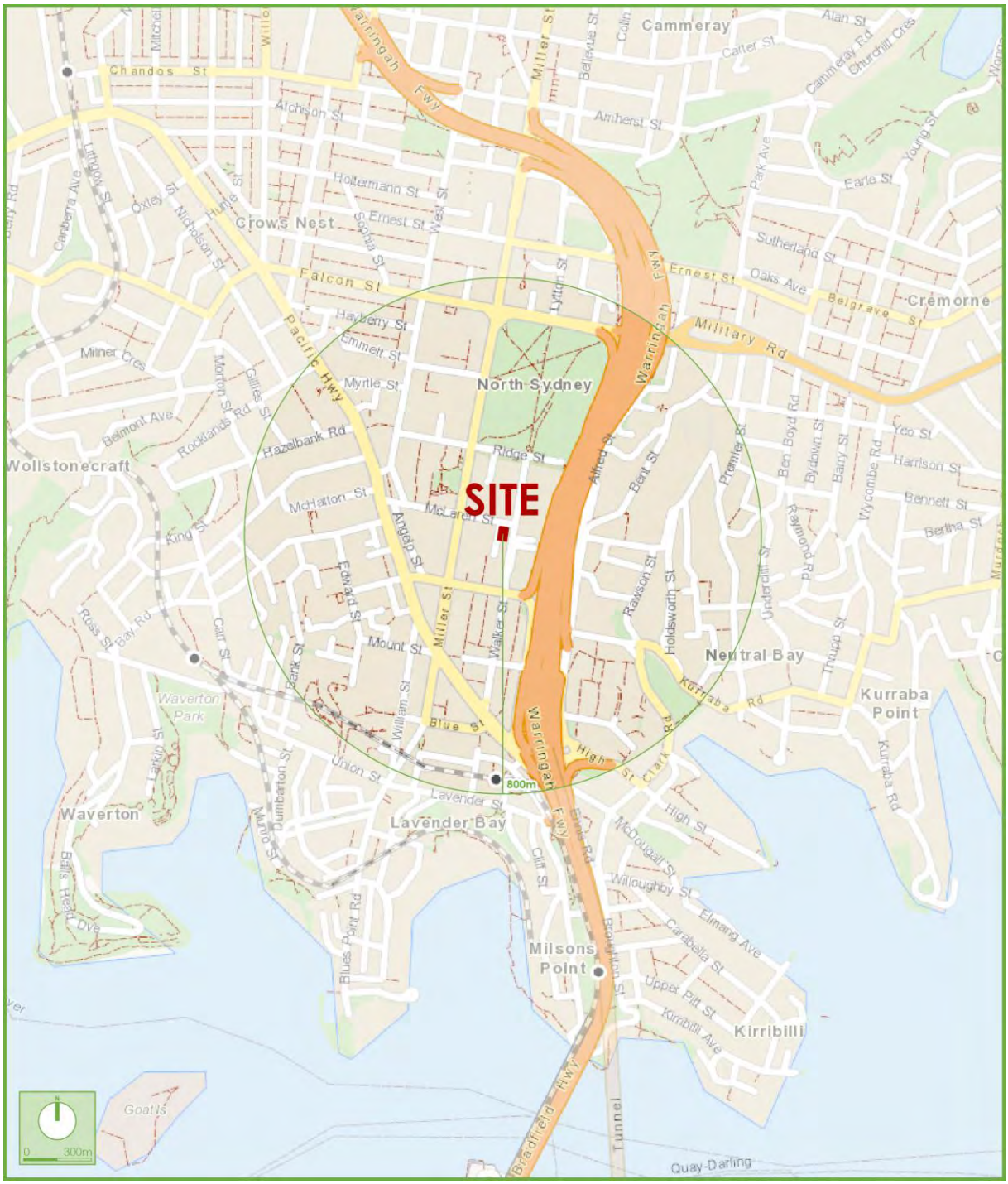


Figure 1: Location Plan

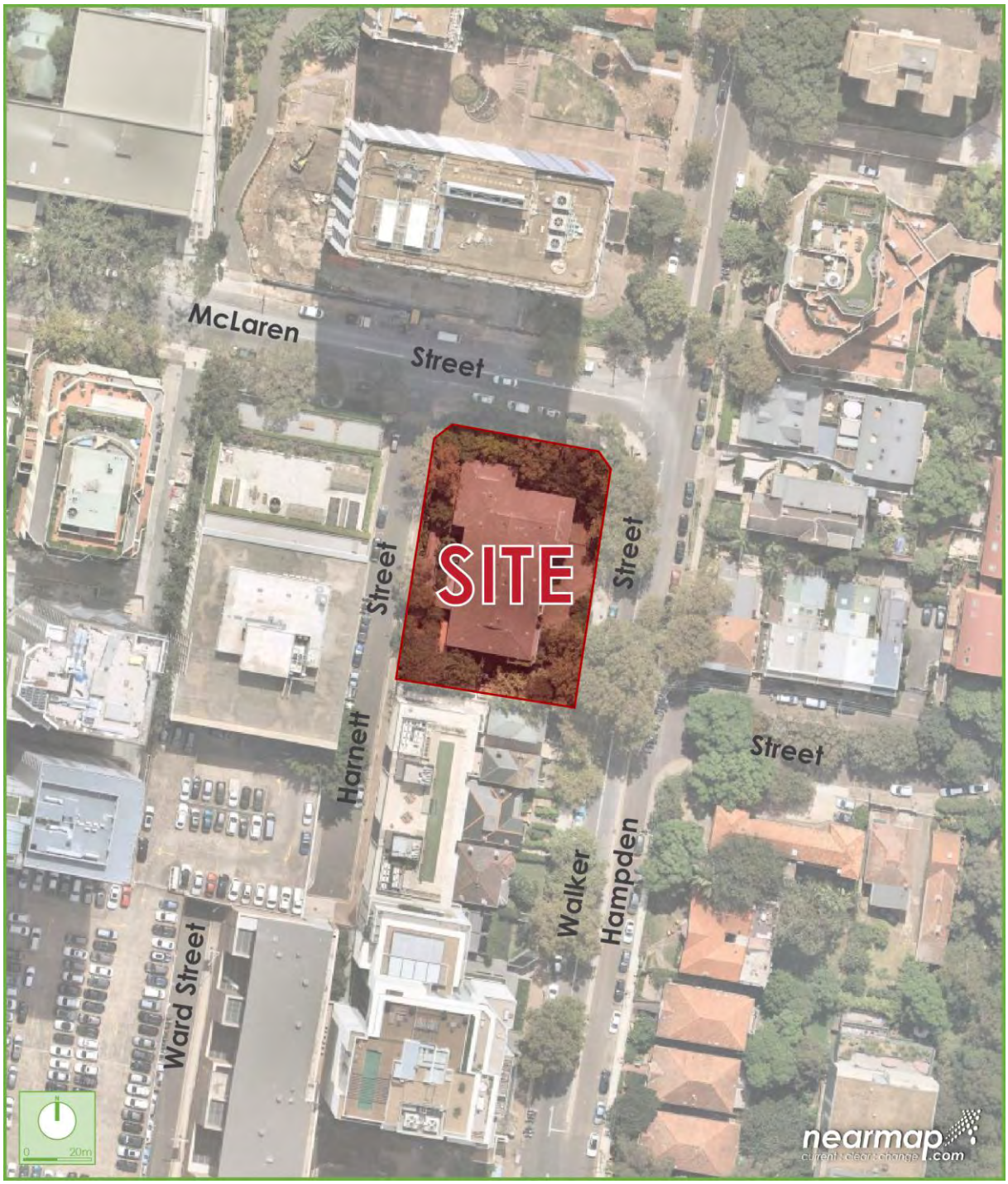


Figure 2: Site Plan

3. EXISTING TRAFFIC CONDITIONS

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in Figure 3 with the following roads of particular interest:

- Warringah Freeway: an RMS Classified Main Road (F1) and major arterial corridor that generally runs in a north-south direction connecting the Gore Hill Freeway in the north with the Bradfield Highway and Cahill Expressway in the south. The Warringah Freeway accommodates multiple lanes of traffic in either direction within multiple divided carriageways. It is subject to an 80km/h speed zoning and parking is not permitted along its length.
- Pacific Highway: an RMS Highway (HW 10) that generally runs in a north-south direction for a length of 790 kilometres between The Gold Coast Highway, Queensland in the north and the Warringah Freeway, New South Wales in the south forming part of the national highway network. The Pacific Highway accommodates three (3) lanes of traffic in each direction within a divided carriageway in the vicinity of the site. It is subject to a 60km/h speed zoning and 40km/h school zoning (between 8:00am-9:30am and 2:30pm-4:00pm on school days). Kerbside parking is not permitted along either side of the Pacific Highway in the vicinity of the site.
- Miller Street: a local collector road that runs in a north-south direction between Calbina Road in the north and Blue Street in the south. Miller Street accommodates two (2) lanes of traffic in each direction which are subject to tidal clearway restrictions. A 40km/h High Pedestrian Activity Area (HPAA) zoning and 40km/h school zoning (between 8:00am-9:30am and 2:30pm-4:00pm on school days) operates in the vicinity of the site. Metred kerbside parking is permitted along both sides of Miller Street.
- Walker Street: a local collector road that runs in a north-south direction between Ridge Street in the north and Blue Street in the south.

Walker Street accommodates a single lane of traffic in each direction within an undivided carriageway and is subject to 40km HPAA zoning and 40km/h school zoning (between 8:00am-9:30am and 2:30pm-4:00pm on school days). Metred parking is permitted along both sides of Walker Street.

- McLaren Street: a local collector road that runs in an east-west direction between Walker Street in the east and Pacific Highway in the west. McLaren Street accommodates a single lane of traffic in each direction within an undivided carriageway and is subject to 40km/h HPAA zoning. Metred kerbside parking is permitted along both sides of McLaren Street.
- Harnett Street: a local road that runs in a north-south direction between McLaren Street in the north and a cul-de-sac in the south. Harnett Street accommodates two-way traffic flow within an undivided carriageway and is subject to 40km/h HPAA speed zoning. Metred kerbside parking is permitted along the western side of Harnett Street and parking is not permitted along its western side.

It can be seen from Figure 3 that the site is conveniently located with respect to the arterial and local road network serving the region with access to the north and south via the Warrinagh Freeway and Pacific Highway using McLaren Street, Walker Street and Berry Street which also provide connections to the east and west of the subject site. It is therefore able to effectively distribute traffic onto the wider local road and highway network, thereby minimising local traffic impacts.

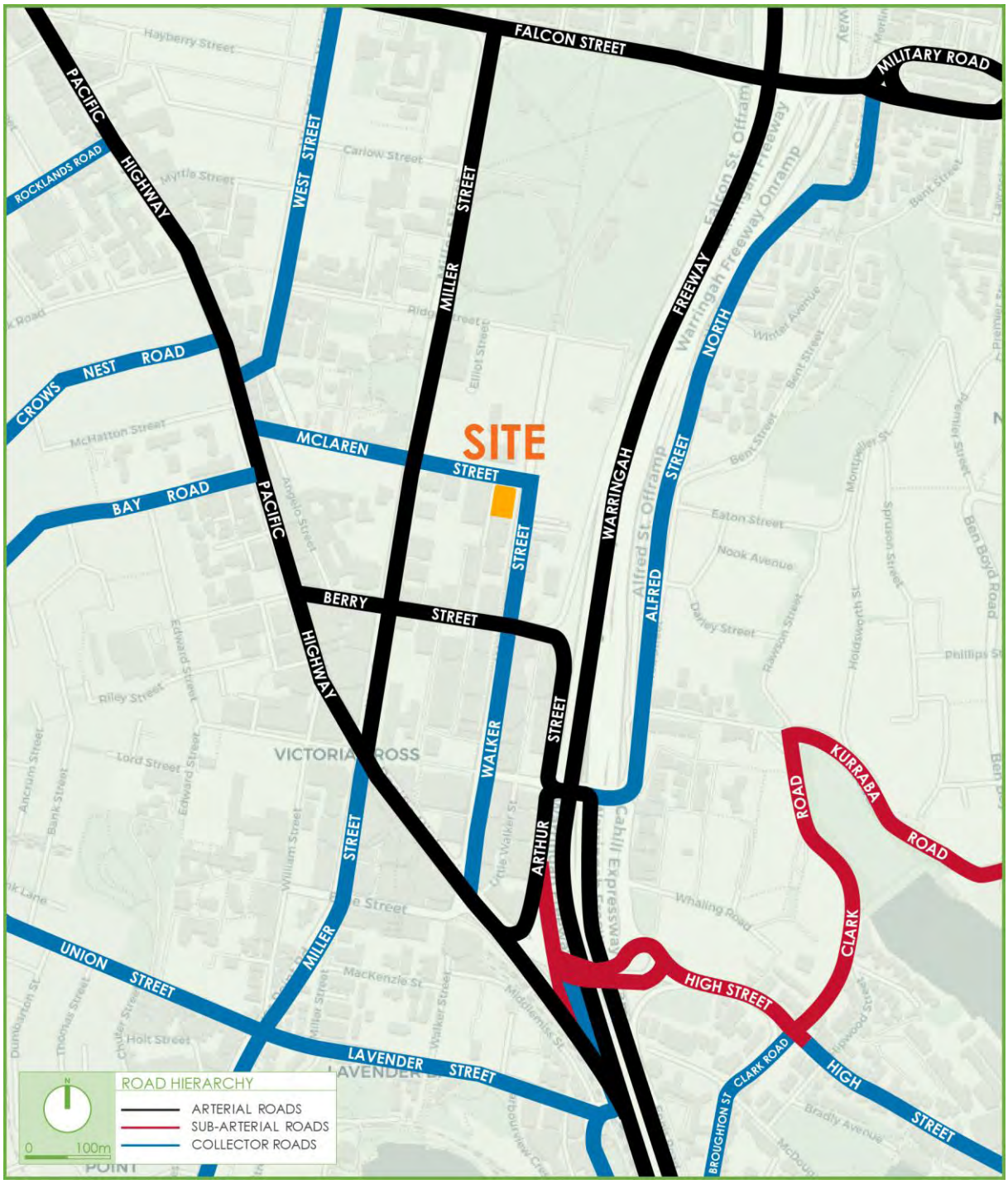


Figure 3: Road Hierarchy

3.2 Public Transport

3.2.1 Bus

The subject site is within optimal walking distance (400 metres) of numerous bus services operating in the locality, with the closest bus stops located along Miler Street, approximately 160 metres walking distance west of the subject site. A map of the available bus services in the locality is presented in Figure 4 for reference.

3.2.2 Rail

The *Integrated Public Transport Service Planning Guidelines*, Sydney Metropolitan Area (TfNSW, December 2013) states that a walking catchment is generally within 800 metres of a station for train services. The subject site is located approximately 620 metres north of North Sydney Railway Station and is therefore considered to be within optimal walking distance. North Sydney Railway Station provides services to the City, North Shore, Parramatta, and Western Sydney on the following lines:

- T1 – North Shore and Western Line
- T9 – Northern Line

The above rail services directly connects the subject site with key town centres located within metropolitan and Greater Sydney including but not limited to the Sydney CBD, Parramatta, Hornsby, Pennant Hills, Epping, Eastwood, West Ryde, Westmead, Granville, Blacktown, Strathfield, Burwood, Waitara, Redfern and Central Station which connects with the wider metropolitan, regional and national rail networks and Sydney Airport.

3.2.3 Pedestrian and Cycling

The site is conveniently located to take advantage of the excellent pedestrian and bicycle infrastructure available in the locality, encouraging residents, visitors and employees to take advantage of sustainable and active modes of transport, thereby promoting healthy lifestyles. Footpaths are provided on both sides of surrounding streets and signalised pedestrian crossings are provided across all legs of nearby intersections safely connecting the site with nearby schools, shops, commercial office buildings and nearby public transport infrastructure along pedestrian desire lines.

The subject site is located within proximity of a formal bicycle network which includes a combination of on and off-road cycle routes connecting the site with surrounding local centres such as Neutral Bay, Lane Cove and the Sydney CBD. Reference should be made to Figure 5 which shows the available cycle routes located within the vicinity of the site.

An analysis of the local cycling network, including treatments outlined in the North Sydney CBD Transport Masterplan and PDS will be included in a future DA. This will also be in conjunction with any DCP requirements, with regard for the location and quantity of on-site cycling parking and associated cycling facilities to be provided.

3.2.4 Summary

It is evident the subject site is well serviced by numerous modes of public transport and active travel infrastructure, providing an integrated public and active transport network, thereby minimising reliance on private vehicle use and encouraging travel to and from the site by more sustainable modes of transport. Therefore, the subject site will benefit from a green travel plan to further encourage trips to and from the site by more sustainable modes of transport. This can be addressed in more detail during a later stage.

The existing public transport and active travel infrastructure network will be enhanced by the construction of Victoria Cross Metro Station as discussed in Section 4.2 below. Additional and up-to-date information concerning service frequencies for all bus and train services throughout the week may be obtained by visiting the Transport for NSW website: https://transportnsw.info/.

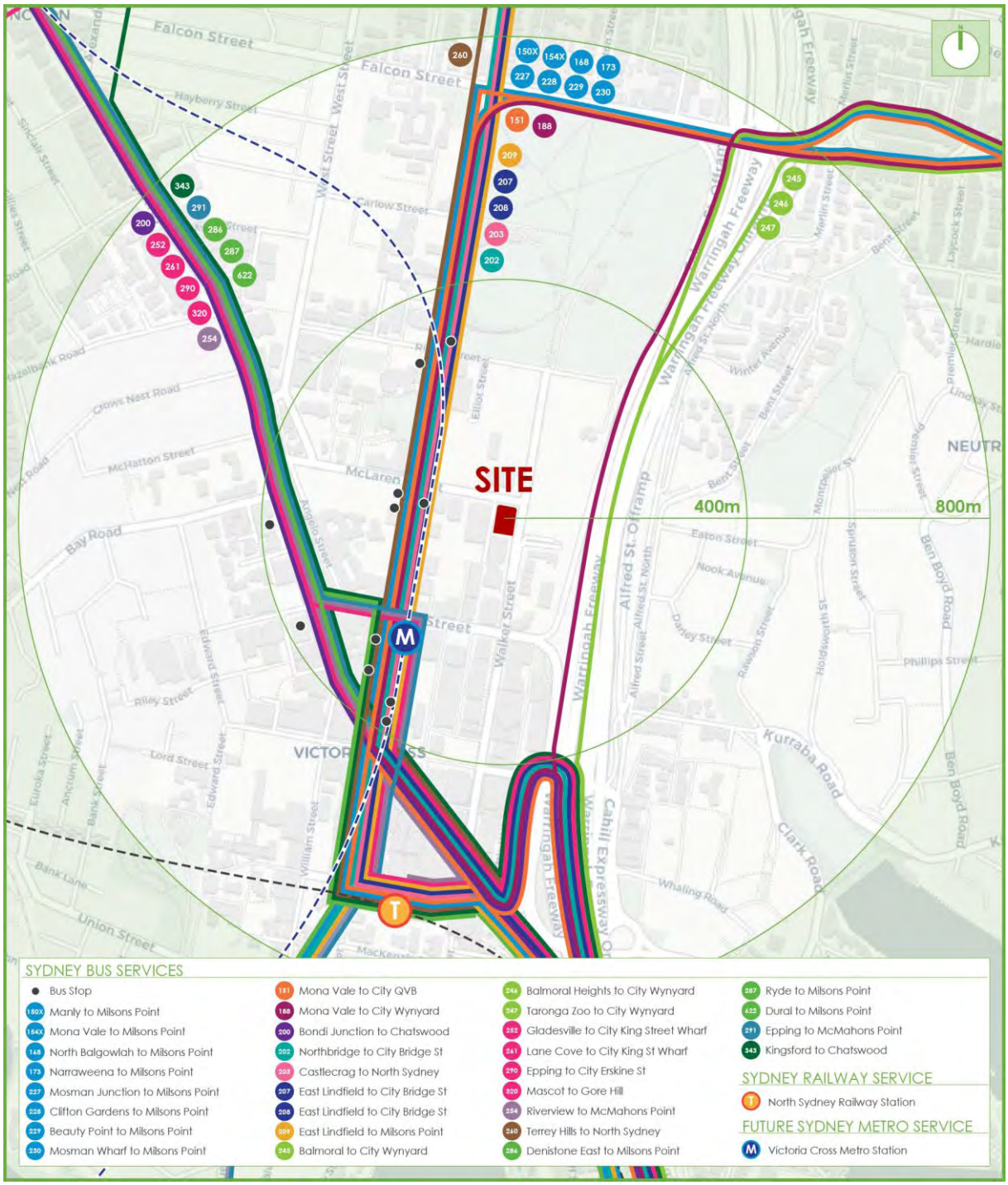


Figure 4: Public Transport

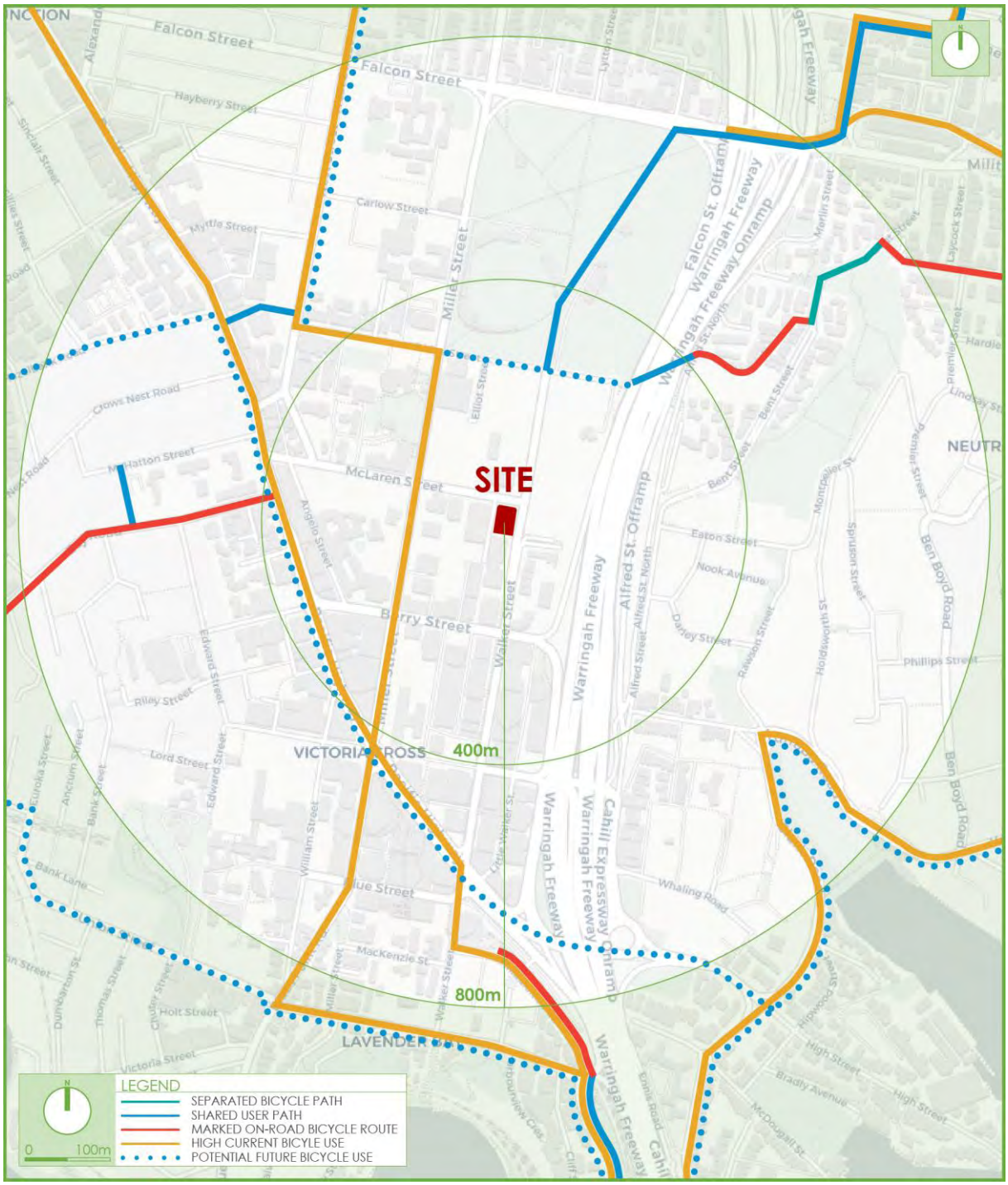


Figure 5: Bicycle Network

4. STRATEGIC CONTEXT

4.1 Ward Street Precinct Master Plan

The Ward Street Precinct Masterplan is a public domain and amenity improvements project within the North Sydney CBD bounded by the Miller Street, McLaren Street, Walker Street and Berry Street as shown Figure 6 below.

The subject development is located within the north-east corner of this precinct. The Masterplan aims to deliver public domain and amenity improvements to the North Sydney CBD and identify commercial growth opportunities as a result of the planned Victoria Cross Metro Station, strong development interest, the return of the Ward Street car park to Council control in 2020, the opportunity to set the direction for contemporary best practice planning and the activation of the North Sydney CBD. The Ward Street Precinct Masterplan will deliver 5,000 additional jobs, a new knowledge and cultural hub as well as fine grain "eat streets".

The subject development is advantageously located to contribute to the activation of the Ward Street Precinct in line with the masterplan given the excellent active transport infrastructure already available in the locality as discussed in Section 3.2.3 above.

Figure 6: Ward Street Precinct

4.2 Future Metro Services

Sydney Metro comprises the Sydney Metro Northwest project opened on 26 May 2019 and is currently operational and the Sydney Metro City and Southwest project, scheduled for completion in 2024. Once completed, Sydney Metro will connect Sydney's North West region, North Sydney, Sydney CBD and Sydney's South West region, comprising a 66-kilometre standalone metro railway system servicing 31 metro railway stations. A map showing the future Sydney Metro network is provided in Figure 7 below. It is expected the Sydney Metro will have a target capacity of about 40,000 customers per hour, in comparison with Sydney's current suburban rail system which can reliably carry 24,000 people per hour per line.

The Sydney Metro City and Southwest Project involves the construction and operation of a new metro rail line from Chatswood under Sydney Harbour and through Sydney's CBD to Sydenham, spanning some 15.5 kilometres. The Chatswood to Sydenham project was approved on 10th January 2017 and tunnelling finished in early 2020. The project is scheduled for completion in late 2024.

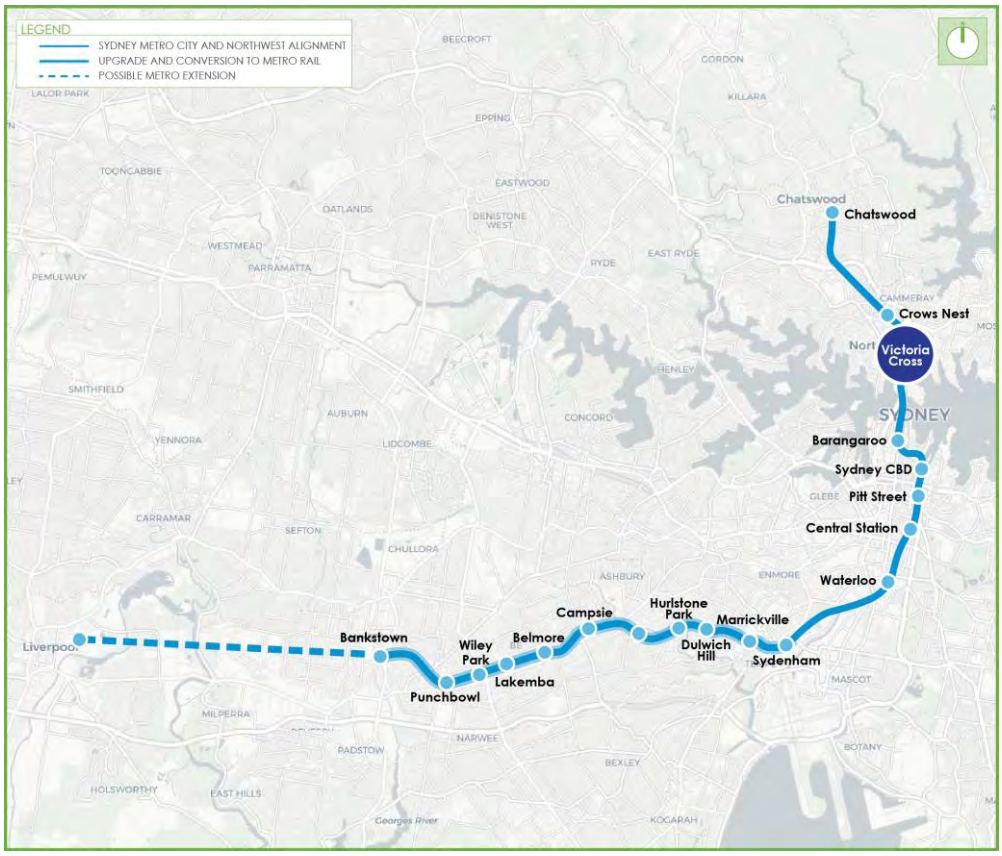


Figure 7: Future Sydney Metro Service Map

4.3 Victoria Cross Metro Station

Victoria Cross Metro Station is a future metro station which is part of the Sydney Metro City and Southwest project currently under construction and scheduled to open in 2024. The Station will form part of the wider Sydney Metro network providing services to the North West, Macquarie Park, Martin Place, Barangaroo, Central Station, Sydenham and Bankstown among others on the following lines:

- M – Metro North West Line (operational)
- M – Metro City and Southwest Line (under construction)

Victoria Cross Metro Station (Northern Site) will be located on the north-eastern corner of the intersection of McLaren Street and Miller Street, approximately 100 metres west of the subject site (1-minute walk). Victoria Cross Metro Station (Southern Site) will be located on the south-eastern corner of the intersection of Berry Street and Miller Street, approximately 210 metres southwest of the subject site and within 400 metres walking distance (6-minute walk). Victoria Cross Metro Station will provide new bicycle parking, kiss and ride bays, a taxi zone along McLaren Street and an enhancement of pedestrian infrastructure surrounding the station, thereby integrating existing public and active transport infrastructure with future metro services.

5. DESCRIPTION OF PROPOSED DEVELOPMENT

A detailed description of the changes sought to the North Sydney Local Environmental Plan 2013 is provided in the Planning Proposal Report and Urban Design Report, prepared as part of the Amend Planning Proposal for proposed mixed-use development.

For the purpose of assessment, a concept development scheme for a 10-14-storey mixed-use development has been envisaged, which is representative of the full development potential of the site under the Planning Proposal. The proposed development comprises the following:

- 82 residential units in total, containing:
  - 25 x 1-bedroom
  - 38 x 2-bedroom
  - 17 x 3-bedroom
  - 2 x Penthouse apartments
- 2,091m^2 of retail GFA which includes 592m^2 of Gym GFA.
- A carpark comprising loading and waste collection bays on Level 00 Lower and three (3) x basement levels containing:
  - 70-80 car parking spaces, and
  - 7-8 motorcycle spaces
  - 3 loading bays
- Vehicular access via Walker Street

The parking and traffic impacts arising from the development are discussed in Section 6 and Section 7. Reference should be made to the plans submitted separately to Council which are presented at reduced scale in Appendix B.

6. PARKING REQUIREMENTS

6.1 Car Parking

6.1.1 Residential

North Sydney Development Control Plan (DCP) Section 10.2 Table B-10.1 provides maximum parking rates for residential flat buildings in accordance with rates shown in Table 1 below.

Table 1: Council Maximum Residential Parking Rates

Type	Zone	Location	Maximum Parking Rate
Residential Flat Buildings/Shop Top Housing	B4-Mixed Use	All except in St Leonards Precincts 2 & 3	0.5 spaces per studio & 1-bedroom dwelling
			1 space per & 2-or more bedroom dwellings

6.1.2 Retail

The North Sydney DCP Section 10.2 Table B-10.2 provides maximum parking rates for non-residential development yields in accordance with the rates shown in Table 2 below:

Table 2: Council Maximum Non-Residential Parking Rates

Type	Maximum Parking Rate
Retail*	1 space / 400m^2 non-residential GFA

**All uses not listed in Table B-10.3 – Specific Uses of Council's DCP.*

6.1.3 Gym

A gymnasium is defined as an indoor recreational facility in accordance with the North Sydney LEP 2013. The North Sydney DCP 2013 Section 10.2 Table B-10.3 provides maximum car parking rates for recreation centres as summarised in Table 3 below.

Table 3: Council Maximum Parking Rates – Recreational Facility (Gym)

Type	Maximum Parking Rate
Recreational facility (gym)	1 space per 100m^2 GFA

6.1.4 Overall Car Parking Requirement and Provision

In summary the maximum car parking allowance and provision for the mixed-use development is outlined in Table 4 below.

Table 4: Overall Parking Requirement and Provision

Type	Units[1]/GFA/GLFA	Parking Rate	Maximum Spaces Permitted
Residential Component (maximum)			
Studio & 1 Bed	25 units	0.5 spaces per dwelling	12.5 (13)
2+ Bed	57 units	1 space per dwelling	57
Retail (maximum)			
Retail	1,499m² GFA	1 space / 400m² non-residential GFA	3.7 (4)
Recreational Facility (Gym) (maximum)			
Gym	592m² GFA	1 space per 100m²	5.92 (6)
TOTAL			80

[1]Yeilds are indicative and are subject to change at a later DA stage.

It can be seen from Table 4 that the development is permitted to provide a maximum of 80 parking spaces comprising 70 residential and visitor spaces, four (4) retail spaces and six (6) gym spaces. In response, the subject development will provide approximately 70-80 spaces in compliance with the maximum spaces permitted under Council's DCP, thus ensuring that all parking requirements will be accommodated onsite. It is therefore concluded that the site is sufficiently large enough to accommodate the required parking provision for any future development permissible under the Planning Proposal.

6.1.5 **Response to Council's Comments**

TRAFFIX acknowledges the following comments made by Council in relation to traffic impacts attributed to increased traffic generation as referenced in the letter from Council dated 1st February 2021:

"The planning proposal includes parking for 160-170 vehicles. This is based on the parking rates for residential flat buildings other than B4 Mixed Use and RMS parking rates. Given that the proposal is actually for a mixed-use development and is located within 200 metres of the future

Victoria Cross Metro Station (currently under construction), the parking rates for B4 mixed use zoned sites would be more appropriate to use for this proposal. Application of B4 mixed use zoning produces a maximum parking provision of 102 spaces as outlined in the table below":

Component	**NSC DCP 2013 Parking Rate**	**Maximum Parking Provision**
Residential (Shop-top housing – Zone B4 Mixed Use) 17 x 1-bedroom unit 65 x 2-bedroom unit 18 x 3-bedroom unit	 0.5 spaces/ unit 1 space/ unit 1 space/ unit 1 carwash bay	 93
Gym – 537m^2 GFA	1 space / 100m^2 GFA	5
Retail – 1631m^2 GFA	1 space / 400m2 GFA	4
Total car parking		**102**
Motorbike Parking	1 space per 10 car spaces	10

TRAFFIX Response:

The parking provision has been reduced from 160-170 parking spaces to a maximum of 80 parking spaces, based on the revised development yield in compliance with Council's parking rates applicable to B4-mixed use zoning developments.

TRAFFIX acknowledges the following comments made by Council in relation to traffic impacts attributed to increased traffic generation as referenced in the letter from Council dated 24th November 2020:

"Council notes there has been no change to the approach to address parking provision on the subject site since it raised concerns at its pre-PP meeting of 10 August 2020. In particular, it was requested that consideration be given to utilising the parking rates for St Leonards due to the site's proximity to the future Metro Station entry.

If the site is rezoned to B4 Mixed Use as recommended at Issue 1, then the maximum base parking rates are automatically changed, effectively reducing the quantum of parking required. These parking rates are further reduced if the maximum base parking rates for St Leonards are adopted as recommended to ensure a modal shift away from private transportation use in close proximity to mass public transport, consistent with Council's Transport Strategy.

Further, pursuing the delivery of parking at the maximum rates for a traditional residential flat building and non-residential purposes in a residential zone as suggested is contrary to the concept proposal's intent to deliver a carbon neutral development, through excessive.

excavation, increased ventilation requirements and ongoing use of private internal combustion vehicles over and above that currently provided on site.

To this end the Traffic Impact Assessment requires revision to address these matters."

TRAFFIX Response:

The parking requirements have been assessed based on the revised development yield in accordance with Council's parking rates applicable to B4-mixed use zoned developments. TRAFFIX notes that the subject site is not located within the St Leonard Precinct and is therefore subject to the generic B4 Mixed Use parking rates outlined in Table 10.1 – Residential Parking Rates of Section 10.2 of Council's DCP. Notwithstanding, application of the B4-Mixed Use parking rates will ensure that all parking requirements are accommodated onsite whilst balancing Council's objective to achieve a sustainable transport outcome.

6.2 Motorcycle Parking

Council's DCP states that motorcycle parking is to be provided at the following minimum rate:

- 1 x motorcycle parking space per 10 car spaces or part thereof.

With the provision of 70-80 car parking spaces, the development will be required to provide 7-8 motorcycle parking spaces. It is envisaged that this requirement can be readily accommodated onsite within the basement levels and this will be detailed further at DA Stage.

6.3 Refuse Collection and Servicing

6.3.1 Waste Collection

All waste collection is proposed to be conducted via Walker Street as presently occurs given that North Sydney Council does not permit onsite waste collection within its Local Government Area. This arrangement is considered acceptable and specific waste collection arrangements can be dealt with by the appointed waste consultant in more detail during the DA stage, as required.

6.3.2 Retail

Council's DCP states that: "*Off-street loading and unloading facilities should be provided for all commercial (including retail) and industrial premises as required by Council. The requirement for, number and size of loading bays will be determined by Council having regard to the:*

(a) Intended use of the premises;

(b) Frequency of deliveries / collections;

(c) Size and bulk of goods to be delivered / collected;

(d) Size of vehicles to be used;

(e) Practicality of accommodating delivery and service vehicles on site; and

(f) Likely impacts on traffic safety and efficiency on adjoining roads."

It is noteworthy that the retail component will primarily require onsite servicing to be conducted using small delivery vehicles up to a 6.4m Small Rigid Vehicle (SRV) given the intended use of the premises as a specialty retail – fresh food outlet and is considered acceptable based on expected servicing requirements as advised by the client. The expected level of servicing (frequency) is to be confirmed and dealt with during DA stage.

6.3.3 Residential Component

Council's DCP states that: "*Developments containing more than 60 dwellings must provide at least 1 service delivery space, capable of accommodating at least:*

(a) 1 Heavy Rigid Vehicle (HRV); or

(b) 2 Medium Rigid Vehicle (MRV)s."

The subject development aims to provide 82 dwellings and is therefore required to provide delivery spaces in accordance with the above rates in strict accordance with Council's DCP. However, it is not possible to accommodate an MRV or HRV onsite given site constraints. Alternatively, servicing is proposed using 6.4m Small Rigid Vehicles in accordance with the strategy outlined in Section 6.3.4 below.

6.3.4 Total Provision

It is proposed that all servicing will be undertaken within the development using three (3) Small Rigid Vehicle (SRV) loading spaces provided within the Basement Level. It is proposed that these loading spaces will be shared between the residential and retail components and will be managed through the implementation of a Loading Dock Management Plan (LDMP) to be prepared at a later stage, in order to optimise the available loading area. These arrangements will ensure that all servicing requirements will be accommodated onsite, thereby minimising impacts to the surrounding local road networks, and is considered acceptable in this regard.

6.3.5 Response to Council's Comments

TRAFFIX acknowledges the following comments made by Council in relation to traffic impacts attributed to increased traffic generation as referenced in the letter from Council dated 1st February 2021:

"*An issue of serious concern with regards to this proposal is the proposed loading dock (3 x 6.4m small rigid vehicles) which does not adequately provide for furniture removalist vans and delivery vehicles.*

A development of this size with 100 apartments and 1631 m2 of retail space requires provision for at least either a heavy rigid truck (12.5m long and 4.5m high) or two medium rigid trucks (8.8m long and 4.5m high) as per Australian Standard 2890.2.

The population of North Sydney is highly mobile. Nearly half of all residents rent and, over a five-year period, over 60% move to a new address. This is particularly the case for apartments, and particularly for the smaller apartments included in the proposed development. Smaller apartments are more likely to be utilised by renters, who move in and out more readily. Given that this development is for 100 residential apartments, it could be assumed that there will be a substantial number of residents moving in and out of the building on a weekly basis."

TRAFFIX Response:

As discussed in Section 6.3.3, it is not possible to accommodate an MRV or HRV onsite given site constraints. However, the provision of 3 x 6.4m SRV service bays is considered sufficient to accommodate all serving needs given the initiative to introduce a Loading Dock Management Plan (LDMP) and booking system will streamline the utilisation of these bays to effectively

manage all servicing requirements onsite. As Council have stated, the apartments are predominately small apartments (1 and 2-bedrrom apartments), and it is reasonable to expect that 6.4m SRV's are capable of accommodating the transportation of bulky furniture items in relation to these small apartments. In summary, it is expected the provision of a LDMP and booking system will assist in effectively managing all servicing requirements onsite.

6.4 Other Parking Requirements

The subsequent development application/s would need to consider the additional parking requirements which may include the following:

- Accessible parking;
- Bicycle parking;
- Car Share; and
- Car wash bays.

It is expected the subject development would fully comply with the above parking requirements, as required.

7. TRAFFIC AND TRANSPORT IMPACTS

7.1 Existing Site Generation

The subject site currently accommodates 18 (medium density) residential units. The RMS Guide to Traffic Generating Developments (2002) provides traffic generation rates for medium density residential flat buildings (up to 2 bedrooms in order to provide a conservative assessment) as follows during the critical morning and evening peak periods:

- 0.5 vehicle trips per dwelling during the AM peak
- 0.5 vehicle trips per dwelling during the PM peak

As such, the existing residential units on the site are expected to generate the following, assuming an 80,20 split:

- 9 vehicle trips per hour in the AM peak period (2 in, 7 out); and
- 9 vehicle trips per hour in the PM peak period (7 in, 2 out).

7.2 Development Trip Generation

The impacts of the proposed development on the external road network have been assessed having regard for the indicative yield scenarios as summarised in Section 4 above. This assessment has been undertaken in accordance with the requirements of the RMS Guideline to Traffic Generating Developments (2002) and as such, the traffic generation rates published in the RMS Guide have been adopted for each individual land use. The result of this assessment is summarised below.

7.2.1 Residential

In August 2013, RMS released Technical Direction TDT 2013/04a, which provides revised trip generation advice for a number of land uses based on survey data obtained since 2009. One of the land uses covered by TDT 2013/04a is high density residential development. The average Sydney weekday trip rates provided by TDT 2013/04a have been adopted for assessing the traffic generating potential of the subject development. The relevant trip rates are as follows:

- 0.19 vehicle trips per unit during the AM peak hour; and
- 0.15 vehicle trips per unit during the PM peak hour.

Application of these trip rates to the 82 residential units proposed, and adopting an 80:20 split, results in the following predicted trip generation volumes:

- 16 vehicle trips per hour in the AM peak period (3 in, 13 out); and
- 13 vehicle trips per hour in the PM peak period (10 in, 3 out).

7.2.2 Retail

As discussed, the subject development does not provide onsite car parking spaces for retail customers. Therefore, all traffic generated by the retail component is in relation to the four (4) staff parking spaces provided onsite staff. As such, the retail component will generate the following trips during the morning and evening peaks, related to staff arrivals and departures:

- 4 vehicle trips per hour in the AM peak period (4 in, 0 out)
- 4 vehicle trips per hour in the PM peak period (0 in, 4 out)

7.2.3 Combined Generation

The combined generation of the residential and commercial components can be summarised as follows:

- 20 vehicle trips per hour in the AM peak period (7 in, 13 out); and
- 17 vehicle trips per hour in the PM peak period (10 in, 7 out).

7.3 Net Traffic Impacts

The above development trip generation does not include trips generated by the existing development and is therefore not a net increase above existing levels. When accounting for existing trips, the subject development will generate the following trips:

- +11 vehicle trips per hour in the AM peak period (+5 in, +6 out); and
- +8 vehicle trips per hour in the PM peak period (+3 in, +5 out).

In order to determine the impact of these additional trips on the surrounding road network, the below critical intersections have been assessed:

- Miller Road / McLaren Street
- Walker Street / Berry Street
- Walker Street / McLaren Street

Impacts to the above key intersections as a result of the proposed development are discussed below.

7.4 Traffic Distributions

In order to determine the distribution of traffic to and from the proposed development, percentage splits have been adopted. The following trip distributions have been assumed, having regard for the surveyed traffic volumes of the key intersections and access routes to/from nearby major arterial roads of Warringah Freeway and Pacific Highway.

- Morning Trips: 50% north along Walker Street, 50% south along Walker Street.
- Afternoon trips: 63% north along Walker Street, 37 % south along Walker Street.

The majority of morning trips relate to staff arrivals to the site and resident departures from the site and therefore trips are evenly distributed north and south along Walker Street. Conversely, the majority of trips in the afternoon peak will be local trips associated with the retail component and therefore more trips have been allocated north along Walker Street, to and from local residential catchments areas. Reference should be made to the network diagrams presented in Appendix C for reference.

The impacts of the additional traffic generated by the proposed development to the operation of the abovementioned critical intersections is discussed in more detail below.

7.5 Peak Period Intersection Performance

In order to assess the potential traffic impacts of the proposed development, the following scenarios were identified:

- Base Case; and
- Base Case + Development.

Traffic surveys were undertaken of the intersections mentioned above, which are considered to be most critical in relation to the site. These counts were undertaken on different weekdays between 7:00am-9:00am and 4:00am-6:00pm, prior to February 2020 due to impacts on traffic volumes as a result of the COVID-19 pandemic.

The traffic volumes in these surveys formed the base case volumes for software modelling undertaken to assess intersection performance characteristics under existing traffic conditions. The SIDRA Intersection 8 model produces a range of outputs, the most useful of which are the Degree of Saturation (DoS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LoS) criteria. These performance measures can be interpreted using the following explanations:

DoS - the DoS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DoS approaches 1, it is usual to attempt to keep DoS to less than 0.9. When DoS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DoS of 0.8 or less.

AVD - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LoS - this is a comparative measure which provides an indication of the operating performance of an intersection.

Table 5: Intersection Performance Indicators (RMS)

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode or major treatment

The traffic impacts arising from the proposed development during the morning and evening peak period have been assessed by loading the distributed traffic volumes into the SIDRA Intersection model. The results of this software modelling are summarised in Table 6 below, with detailed outputs provided in Appendix D for individual lanes and approaches.

Table 6: Existing and Proposed Intersection Performance

Intersection	Control	Scenario	Period	Degree of Saturation (DoS)	Average Delay	Level of Service*
McLaren Street / Miller Street	Signals	Base Case	AM	0.517	25	B
			PM	0.502	26.6	B
		Base Case + Development	AM	0.536	25.7	B
			PM	0.512	27.3	B
Berry Street / Walker Street	Signals	Base Case	AM	0.785	23.3	C
			PM	0.857	30.3	C
		Base Case + Development	AM	0.799	23.4	C
			PM	0.857	30.4	C
McLaren Street / Walker Street*	Give Way	Base Case	AM	0.177	8.7	A
			PM	0.251	8.1	A
		Base Case + Development	AM	0.218	8.7	A
			PM	0.251	8.1	A

* LoS for priority intersections based on the worst performing movement in accordance with RMS Guide to Traffic Generating Development.

It can be seen from Table 6 that the signalised intersection of McLaren Street / Miller Street recorded a minimal change to average delay of less than 0.7 seconds in the morning and evening peaks. The intersection remains at a level of service 'B' during both peaks during the base case plus development scenario.

The signalised intersection of Berry Street / Walker Street will continue to operate at a level of service 'C' in both the morning and evening peak period. The intersection recorded less than a 0.1 second increase in average delay during the morning and evening peaks.

The priority-controlled intersection of McLaren Street / Walker Street will continue to operate at a level of service 'A' in both the morning and evening peak period with insignificant changes to the Average Delay or Degree of Saturation during both peaks.

In summary, the surrounding road network will experience minimal (if any) increases to average delays during the peak periods, which are considered acceptable within no intersection upgrades considered necessary. In addition, there are no changes in the Level of Service of each intersection, respectively.

It is acknowledged that Council requested a cumulative impact assessment be undertaken in accordance with Council's pre lodgement minutes dated 10th August 2020. It is noted that the EP&A Act and RMS Guidelines require a nexus to be established between a development's impacts and any infrastructure improvements that may be required. The subject development generates negligible impacts on the road network and proportionally would contribute negligibly to external network improvements. Hence, any impacts associated with the suggested cumulative impact assessment would not, with respect, advance the assessment process and this aspect has been tested in previous Court proceedings. In particular, the need to include developments that have been submitted and not determined is quite concerning, as development impacts can only be based on what can be termed 'planning certainty', as generally held by the NSW Land and Environment Court. This includes the nearby sites which are yet to be determined.

TRAFFIX acknowledges the following comments made by Council in relation to traffic impacts attributed to increased traffic generation as reference in the letter from Council dated 1 February 2021:

"Traffic generation:

The net increase in traffic expected to be generated by the proposed development is 18 vehicles per hour in the AM peak, 82 vehicles per hour in the PM peak.

The definition of the impact on residential/environmental amenity by varying levels of traffic flow is extremely complex. Perceptions of impact vary greatly from person to person. Traffic flows that one person may find perfectly acceptable may be considered excessive by another. Impact is affected by the nature of the street and the area in which it is located, its width, building setbacks, grades, etc. as well as by the speed of traffic and the mix of cars and heavy vehicles.

The functional classification of the street is important when determining the impact on residential/environmental amenity. The RMS Guide to Traffic Generating Developments states that the environmental capacity performance for a local road is a goal of 200 vehicles per hour and a maximum of 300 vehicles per hour. For a collector road the environmental capacity performance is a goal of 300 vehicles per hour and a maximum of 500 vehicles per hour.

Walker Street and McLaren Street have peak hourly volume in the order of 700 vehicles. A 10% increase in traffic on these streets as a result of one development is likely to be felt by residents."

TRAFFIX Response:

The subject development is likely to generate significantly less vehicle trips compared with the vehicle trips outlined in this updated report for the following reasons:

- 82 out of the 88 vehicle trips generated during the critical evening weekday peak (93% of all vehicle trips) were attributed to retail visitor trips based on the RMS Guide and are applicable to the previous design which proposed 55 retail car parking spaces. The RMS retail trip rates were used to assess the impact of the subject development on the operation of nearby intersections as a worst-case scenario when 55 retail parking spaces were proposed. However, the revised development yield which forms the basis of this updated report comprises only four (4) retail parking spaces which are to be allocated to staff parking. Therefore, retail trips are more likely to be in the order of four (4) vehicle trips per hour during the morning and evening network peaks respectively, attributed to staff arrivals and departures during these periods.
- The provision of only four (4) retail staff parking spaces is consistent with Council's maximum parking rates which seek to limit parking within the North Sydney precinct, given the excellent public and alternative transport options available within the vicinity of the subject site as discussed in Section 4.
- The retail component comprises a café, gym and boutique retail stores which are considered ancillary to the subject development and not a primary traffic generator such as a supermarket or shopping centre containing specialty retail stores. That is, the retail components will primarily serve nearby residents and pedestrians within the vicinity of the site, thereby generating minimal (if any) additional vehicle trips.

Therefore, the subject development is more likely to generate in the order of 11 additional vehicle trips per hour during the morning peak period and an additional 8 vehicle trips per hour during the evening peak, as discussed. which represents a less than 2% increase in traffic volumes along Walker Street and McLaren Street with respect to existing traffic volumes, based on the reduced retail parking provision. This increase is considered negligible and well within background fluctuations of traffic volumes and will have minimal (if any) impacts to environmental capacity along these streets in accordance with RMS Guidelines.

8. ACCESS AND INTERNAL DESIGN ASPECTS

8.1 Site Vehicular Access

The development proposes a maximum of 80 parking spaces with access via Walker Street, a local road. It will therefore require a Category 2 driveway under AS 2890.1 (2004), being a combined entry and exit width of 6.0 to 9.0 metres. The access driveway will also accommodate SRV vehicles at the ground floor. The proposed access driveway can be optimised further during later DA stage/s.

Access via Walker Street is supportable from a traffic engineering perspective, and it is confirmed that a safe and efficient access driveway can be achieved via Walker Street in accordance with the requirements of AS2890, accordingly. Site specific access via Harnett Street was considered, however the topography of the site has significant impacts for service vehicle access, vehicle circulation and architectural layout. Additionally, there may be congestion and access impacts as a result of the overutilisation of Harnett Street as a broader access corridor to 45 McLaren Street and surrounding developments.

8.2 Internal Design

The internal car park should comply with the requirements of AS 2890.1 (2004), AS 2890.2 (2018) and AS 2890.6 (2009), and the following characteristics are noteworthy:

8.2.1 Parking Modules

- All residential/employee car parking spaces are to be designed in accordance with User Class 1A. These spaces are provided with a minimum space length of 5.4m, a minimum width of 2.4m and a minimum aisle width of 5.8m.
- All accessible parking spaces are to be designed in accordance with AS 2890.6 (2009), being 2.4m wide, 5.4m long and located adjacent to a dedicated shared area of the same dimensions.
- All spaces located adjacent to obstructions of greater than 150mm in height are to be provided with an additional width of 300mm and all columns are to be located outside of the parking space design envelope shown in Figure 5.2 of AS 2890.1 (2004).

- Dead-end aisles are to be provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS 2890.1 (2004).

8.2.2 Ramps

- All vehicle ramps accessed by retail visitors to have a maximum gradient of 20% (1 in 5) for up to 20 metres long, with a minimum 2.0 metre long transition at 12.5% (1 in 8), in accordance with the public car park requirements of AS 2890.1 (2004).
- All vehicle ramps accessed by residents/employees to have a maximum gradient of 25% (1 in 4) for up to 20 metres long, with a minimum 2.0 metre long transition at 12.5% (1 in 8), in accordance with the residential car park requirements of AS 2890.1 (2004).
- The access driveway is to have a maximum gradient of 1:20 (5%) extending from the property boundary line for at least 6.0m in accordance with AS 2890.2 (2018).

8.2.3 Clear Head Heights

- A minimum clear head height of 2.2m is provided for all areas within the basement car park as required by AS 2890.1 (2004).
- A minimum clear head height of 2.5m is to be provided above all accessible spaces in accordance with AS 2890.6 (2009).
- Head height clearances for roadways/loading docks accessed by service vehicles are to be provided in accordance with Table 2.1 of AS 2890.2 (2018).

8.2.4 Loading/Service Bays

- All loading bays are to be designed to accommodate the largest vehicle in accordance with AS 2890.2 (2018).
- Roadways/ramps accessed by waste/service vehicles are to be designed in accordance with Table 3.2 of AS 2890.2 (2018).
- The maximum gradient for any part of the service bay shall be 1:25 (4%) measured in any direction including directions oblique to the bay centre-line as required by AS 2890.2 (2018).

8.2.5 Other Considerations

- Visual splays are to be provided at the access driveway in accordance with Figure 3.3 of AS 2890.1 (2004).

8.3 Summary

In summary, the internal configuration of the car park should be designed in accordance with AS 2890.1 (2004), AS 2890.2 (2018) and AS 2890.6 (2009). The car parking and service bay arrangements can be further optimised during future DA stage/s.

9. CONCLUSIONS

The following matters are noteworthy:

- The amended Planning Proposal seeks approval to construct a 10-14-storey mixed use development at 45 McLaren Street in North Sydney containing 82 apartments, 2,091m^2 of retail GFA which includes 592m^2 of Gym GFA and three (3) levels of basement car parking accommodating 70-80 spaces. Loading, waste collection and servicing will be undertaken within three (3) designated loading bays provided on Level 00 Lower.
- The subject site is well connected to the public and active transport network with reliable access to regular bus, rail services and future metro services. These, along with existing pedestrian and cycle links, ensure the site is ideally situated for retail development as it provides a good opportunity to encourage future tenants / visitors to use sustainable transport modes.
- All normal parking demands will be readily accommodated on-site.
- The traffic generation arising from the development has been assessed as a net change over existing conditions and equates to an additional 11 vehicle trips per hour during the morning peak and an additional 8 vehicle trips the evening peak. SIDRA intersection modelling undertaken for the site indicated that no external improvements are required to facilitate the proposed development. The traffic impacts of the development are therefore considered acceptable.
- The basement car park will comply with the requirements of AS 2890.1 (2004), AS 2890.2 (2002) and AS2890.6 (2009) and the detailed carpark operation can be dealt with during the DA Stage.
- The traffic items outlined in Council's Pre lodgement meeting minutes are primarily in relation to detailed design aspects and travel planning requirements which are to be addressed in subsequent stages of the development approval process, accordingly.
- TRAFFIX has responded to each of Councils' comments in relation to the letters dated 24th November 2020 and 1st February 2021 in Sections 6 and 7.

This traffic impact assessment therefore demonstrates that the Amended Planning Proposal is supportable on traffic planning grounds. TRAFFIX anticipates an ongoing involvement during the development approval process.

APPENDIX A

Photographic Record

View looking west across Walker Street towards the subject development

View looking southwest across Walker Street towards the subject site

View looking south along Walker Street across its intersection with McLaren Street

View looking south along Walker Street showing the subject site to the right

View looking east along McLaren Street across its intersection with Harnett Street

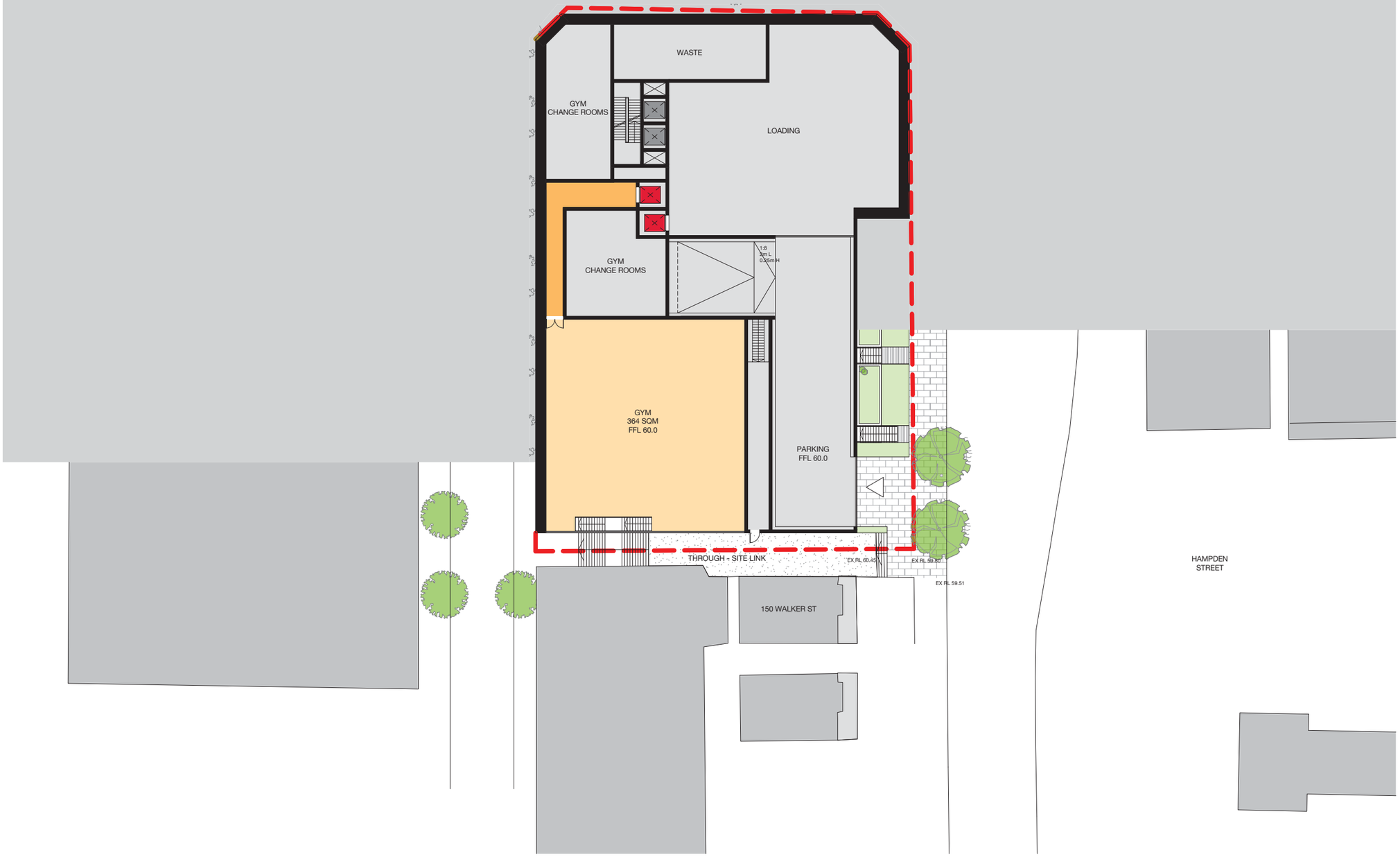
View looking east along McLaren Street towards its intersection with Walker Street

View looking south along Miller Street towards its intersection with McLaren Street

View looking east along Berry Street towards its intersection with Walker Street

APPENDIX B

Reduced Plans



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6	08.11.21	Issue for Information	MD	MD
5	05.11.21	Issue for Information	MD	MD
4	08.06.21	Issue for Information	MD	MD
3	07.09.20	Issue for Information	MD	MD
2	21.08.20	Issue for Information	MD	MD
1	19.08.20	Issue for Information	MD	MD
0	10.08.20	Issue for Information	MD	MD

S12400
45 McLaren Street

A02
Level 00 Lower

Status	Planning Proposal		
Scale	1:200 @ A1		
Drawn	ELH	Checked	MD
Project No.	S12400		
Plot Date	5/11/2021 5:49:34 PM		
BIM	MCLARENST_BS_ARCH_R2020		

Drawing no. A02.00L

Revision 6

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Bates Smart Pty Ltd ABN 70 004 999 400

BATESSMART

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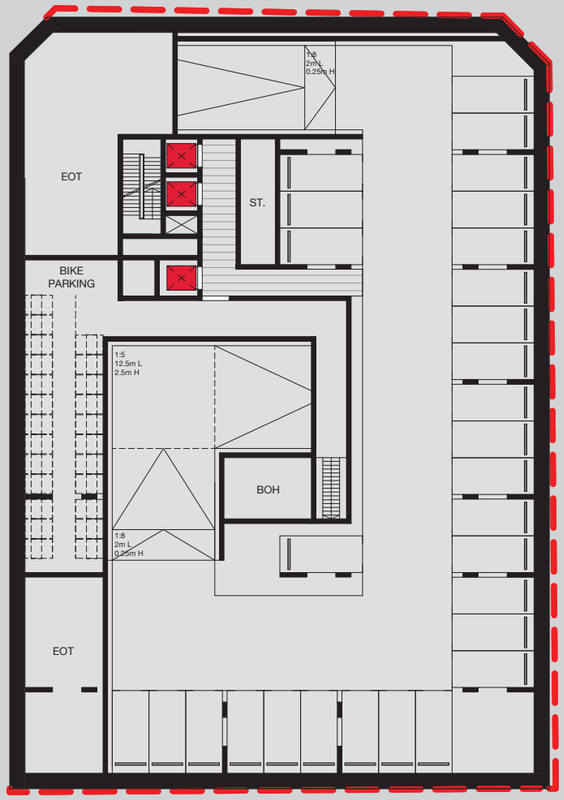

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4	08.06.21	Issue for Information	MD	MD
3	07.09.20	Issue for Information	MD	MD
2	21.08.20	Issue for Information	MD	MD
1	19.08.20	Issue for Information	MD	MD
0	10.08.20	Issue for Information	MD	MD

S12400
45 McLaren Street

A02
Basement 01

Status	Planning Proposal		
Scale	1:200 @ A1		
Drawn	ELH	Checked	MD
Project No.	S12400		
Plot Date	26/10/2021 5:00:53 PM		
BIM	MCLARENST_BS_ARCH_R2020		
Drawing no.	A02.B01	Revision	5

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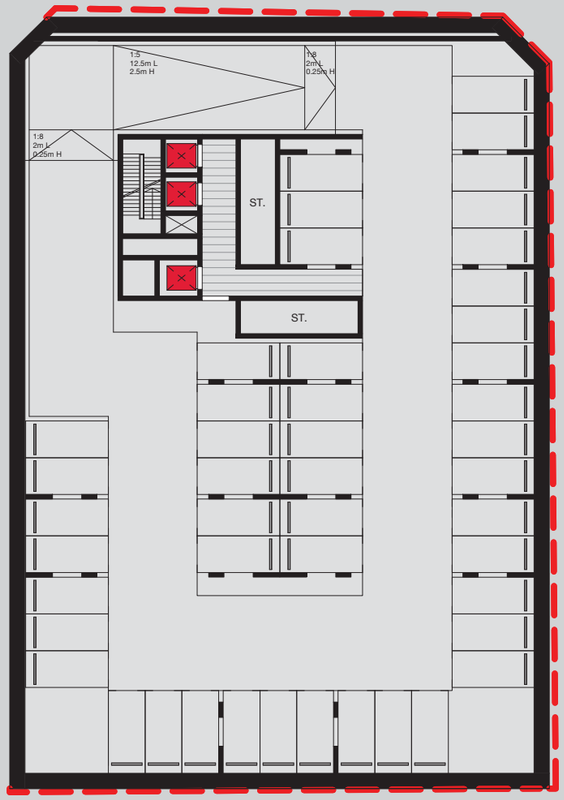

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1	08.06.21	Issue for Information	MD	MD
0	07.09.20	Issue for Information	MD	MD

S12400
45 McLaren Street

Basement 02-03

Status	Planning Proposal		
Scale	1:200 @ A1		
Drawn	ELH	Checked	MD
Project No.	S12400		
Plot Date	26/10/2021 5:00:55 PM		
BIM	MCLARENST_BS_ARCH_R2020		

Drawing no. A02.B02

Revision 2

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APPENDIX C

Network Diagrams

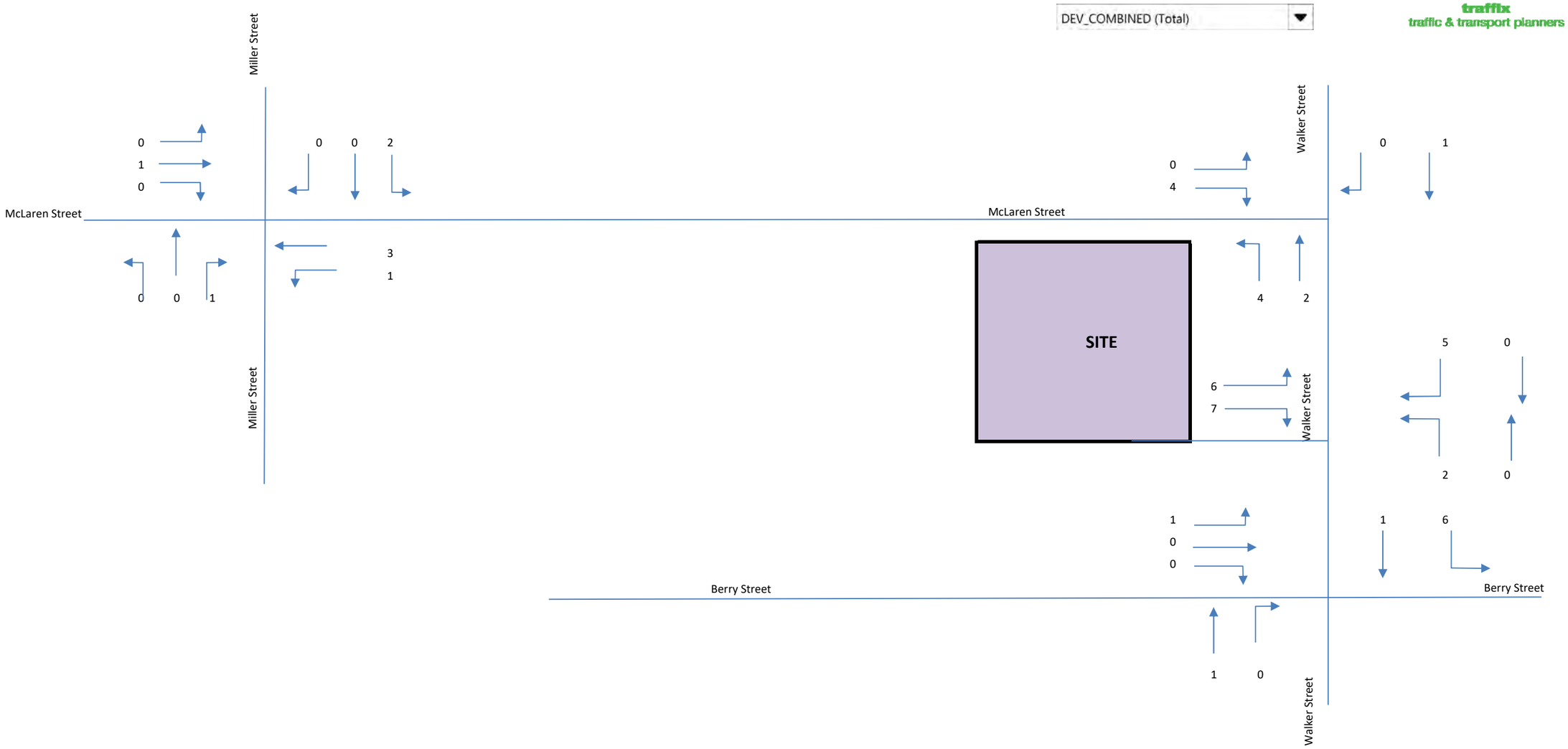
PERIOD:

Morning Peak

SCENARIO:

DEV_COMBINED (Total)

traffix
traffic & transport planners



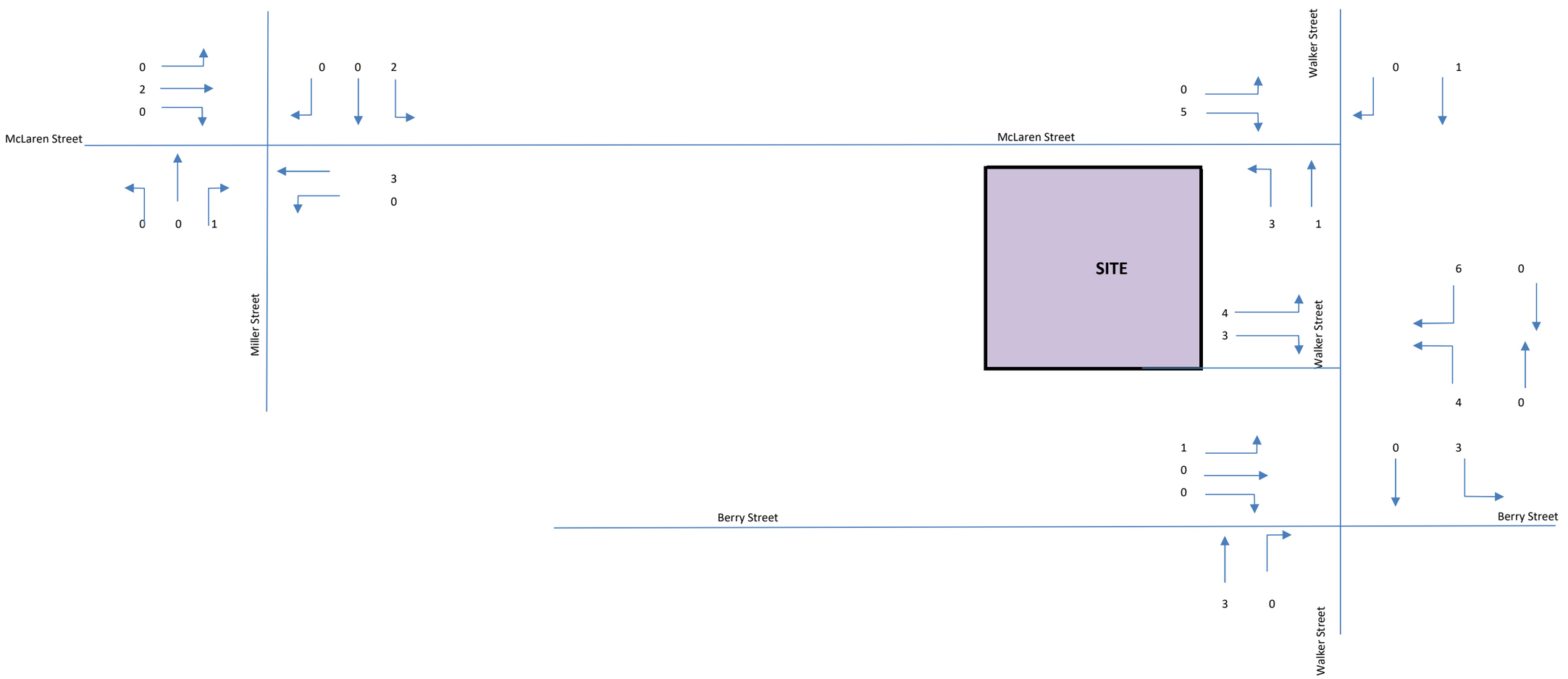
PERIOD:

Evening Peak

SCENARIO:

DEV_COMBINED (Total)

traffix
traffic & transport planners



APPENDIX D

SIDRA Results

USER REPORT FOR SITE

Project: Miller x McLaren

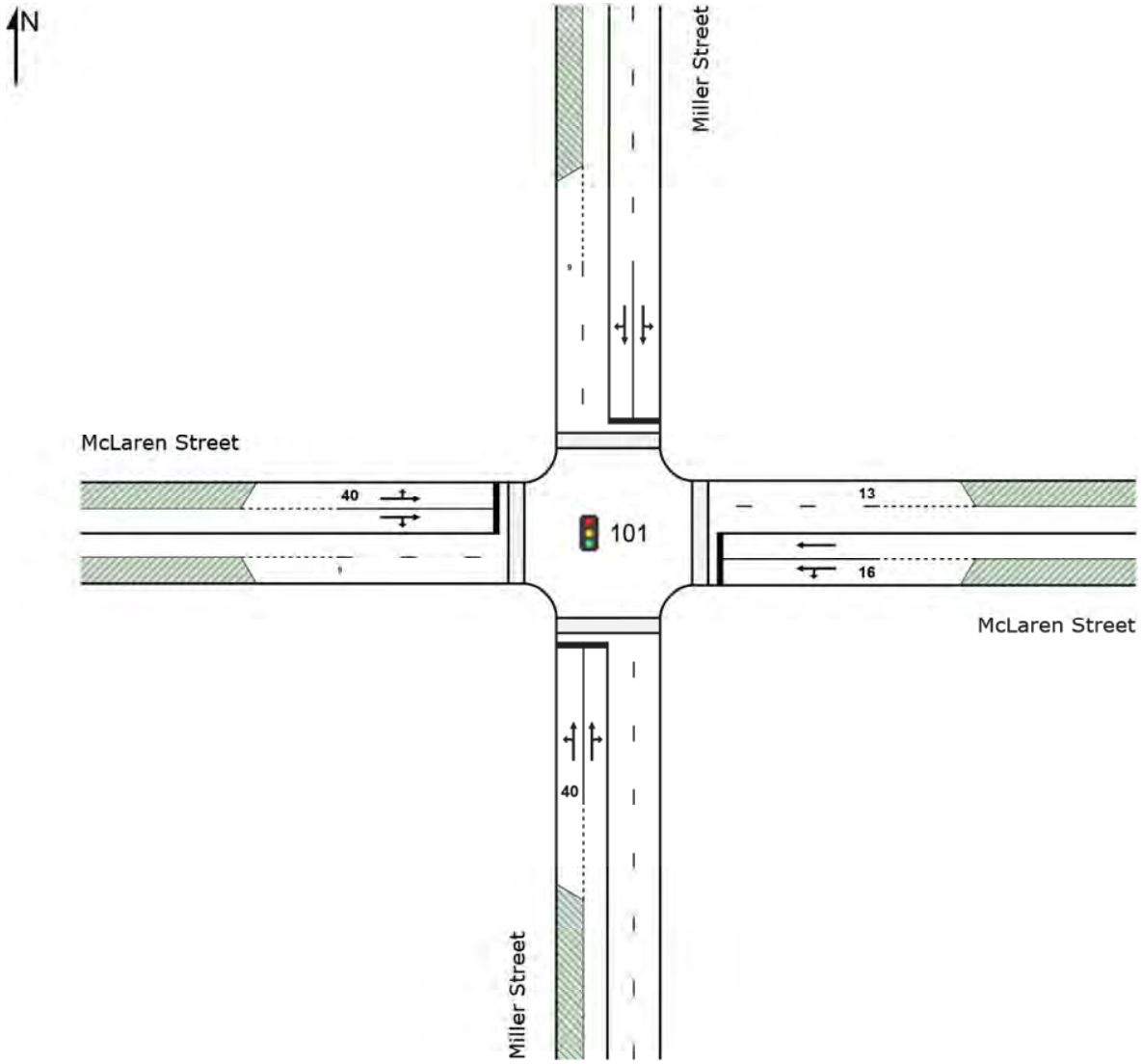
Template: Layout and Movement Summary

Site: 101 [Miller St/McLaren St - AM Existing Scenario]

Miller St/McLaren St - AM Existing Scenario
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Miller Street												
1	L2	93	2.3	0.071	14.4	LOS A	2.3	16.7	0.45	0.61	0.45	29.9
2	T1	287	10.3	0.357	16.4	LOS B	10.0	75.7	0.60	0.54	0.60	28.0
3	R2	21	5.0	0.357	19.9	LOS B	10.0	75.7	0.60	0.54	0.60	27.3
Approach		401	8.1	0.357	16.2	LOS B	10.0	75.7	0.57	0.56	0.57	28.4
East: McLaren Street												
4	L2	60	12.3	0.411	61.5	LOS E	3.5	26.9	0.98	0.76	0.98	14.6
5	T1	107	2.9	0.517	52.7	LOS D	5.9	42.4	0.96	0.76	0.96	16.9
Approach		167	6.3	0.517	55.8	LOS D	5.9	42.4	0.97	0.76	0.97	16.0
North: Miller Street												
7	L2	56	9.4	0.511	18.7	LOS B	18.2	140.6	0.63	0.59	0.63	28.0
8	T1	607	12.1	0.511	16.9	LOS B	18.2	140.6	0.65	0.61	0.65	27.5
9	R2	168	1.9	0.511	27.0	LOS B	11.9	87.4	0.74	0.72	0.74	24.9
Approach		832	9.9	0.511	19.1	LOS B	18.2	140.6	0.67	0.63	0.67	26.9
West: McLaren Street												
10	L2	67	1.6	0.129	37.6	LOS C	2.9	20.7	0.78	0.71	0.78	21.2
11	T1	104	3.0	0.360	40.6	LOS C	7.7	54.9	0.88	0.72	0.88	19.1
12	R2	48	2.2	0.360	44.0	LOS D	7.7	54.9	0.88	0.72	0.88	20.0
Approach		220	2.4	0.360	40.4	LOS C	7.7	54.9	0.85	0.71	0.85	19.9
All Vehicles		1620	8.1	0.517	25.0	LOS B	18.2	140.6	0.70	0.64	0.70	24.4

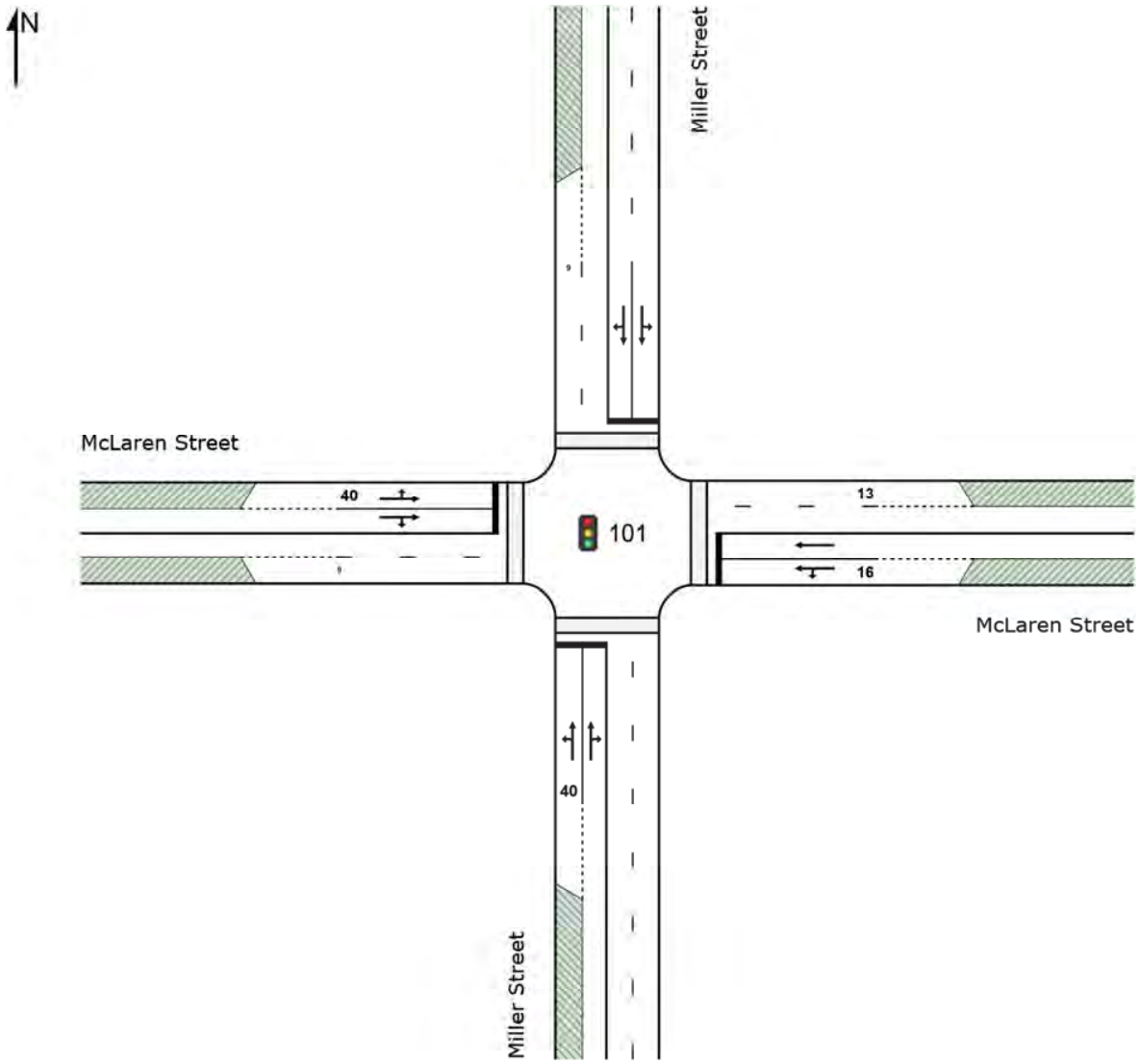
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard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

Site: 101 [Miller St/McLaren St - AM Future Scenario]

Miller St/McLaren St - AM Existing Scenario
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout



MOVEMENT SUMMARY

Site: 101 [Miller St/McLaren St - AM Future Scenario (Site Folder: General)]

Miller St/McLaren St - AM Existing Scenario
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Miller Street														
1	L2	88	2	93	2.3	0.073	15.4	LOS B	2.4	17.5	0.46	0.61	0.46	29.7
2	T1	273	28	287	10.3	0.367	17.7	LOS B	10.3	78.3	0.62	0.56	0.62	27.4
3	R2	21	1	22	4.8	0.367	21.3	LOS B	10.3	78.3	0.63	0.56	0.63	26.7
Approach		382	31	402	8.1	0.367	17.3	LOS B	10.3	78.3	0.59	0.57	0.59	27.9
East: McLaren Street														
4	L2	58	7	61	12.1	0.418	61.6	LOS E	3.5	27.4	0.98	0.76	0.98	14.6
5	T1	105	3	111	2.9	* 0.536	52.8	LOS D	6.1	43.7	0.96	0.76	0.96	16.9
Approach		163	10	172	6.1	0.536	55.9	LOS D	6.1	43.7	0.97	0.76	0.97	16.1
North: Miller Street														
7	L2	55	5	58	9.1	* 0.521	19.6	LOS B	18.7	144.4	0.65	0.60	0.65	27.8
8	T1	577	70	607	12.1	0.521	17.6	LOS B	18.7	144.4	0.67	0.62	0.67	27.2
9	R2	160	3	168	1.9	0.521	27.8	LOS B	12.0	88.8	0.75	0.73	0.75	24.6
Approach		792	78	834	9.8	0.521	19.8	LOS B	18.7	144.4	0.68	0.64	0.68	26.6
West: McLaren Street														
10	L2	64	1	67	1.6	0.125	37.3	LOS C	2.9	20.4	0.77	0.71	0.77	21.4
11	T1	100	3	105	3.0	0.350	39.7	LOS C	7.6	54.6	0.87	0.71	0.87	19.4
12	R2	46	1	48	2.2	* 0.350	43.2	LOS D	7.6	54.6	0.87	0.71	0.87	20.2
Approach		210	5	221	2.4	0.350	39.7	LOS C	7.6	54.6	0.84	0.71	0.84	20.2
All Vehicles		1547	124	1628	8.0	0.536	25.7	LOS B	18.7	144.4	0.71	0.65	0.71	24.2

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Miller Street												
P1	Full	512	539	55.4	LOS E	1.8	1.8	0.97	0.97	82.3	35.0	0.43
East: McLaren Street												
P2	Full	378	398	55.1	LOS E	1.3	1.3	0.97	0.97	82.1	35.2	0.43
North: Miller Street												

P3	Full	72	76	54.3	LOS E	0.2	0.2	0.95	0.95	81.2	35.0	0.43
West: McLaren Street												
P4	Full	250	263	54.8	LOS E	0.9	0.9	0.96	0.96	81.5	34.8	0.43
All Pedestrians		1212	1276	55.1	LOS E	1.8	1.8	0.97	0.97	82.0	35.0	0.43

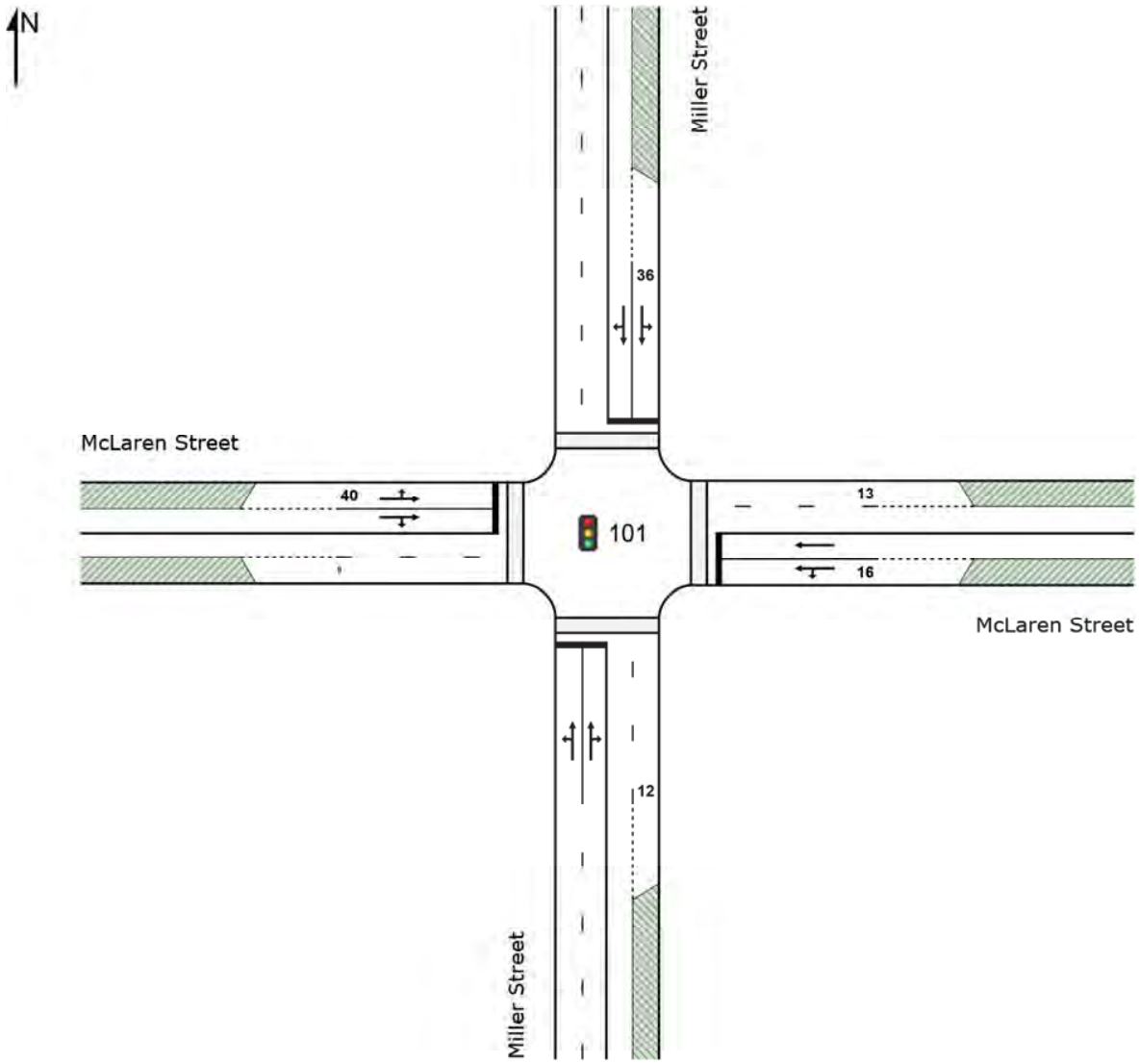
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Site: 101 [Miller St/McLaren St - PM Existing Scenario]

Miller St/McLaren St - PM Existing Scenario
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Miller Street												
1	L2	127	0.8	0.308	21.4	LOS B	9.4	69.5	0.62	0.61	0.62	27.3
2	T1	371	11.6	0.308	19.5	LOS B	9.4	69.5	0.64	0.59	0.64	26.2
3	R2	25	4.2	0.308	24.1	LOS B	8.5	65.4	0.66	0.58	0.66	25.2
Approach		523	8.7	0.308	20.2	LOS B	9.4	69.5	0.63	0.60	0.63	26.4
East: McLaren Street												
4	L2	60	0.0	0.189	48.5	LOS D	3.0	21.0	0.88	0.73	0.88	16.9
5	T1	171	9.9	0.502	43.1	LOS D	8.6	65.3	0.90	0.74	0.90	18.8
Approach		231	7.3	0.502	44.5	LOS D	8.6	65.3	0.90	0.74	0.90	18.3
North: Miller Street												
7	L2	34	0.0	0.099	20.6	LOS B	2.7	20.2	0.56	0.53	0.56	26.5
8	T1	323	9.8	0.497	22.2	LOS B	12.8	96.2	0.70	0.63	0.70	25.1
9	R2	57	1.9	0.497	26.7	LOS B	12.8	96.2	0.73	0.66	0.73	25.6
Approach		414	7.9	0.497	22.7	LOS B	12.8	96.2	0.69	0.63	0.69	25.3
West: McLaren Street												
10	L2	43	0.0	0.063	29.5	LOS C	1.6	11.3	0.68	0.66	0.68	23.6
11	T1	82	0.0	0.241	31.2	LOS C	5.6	38.9	0.78	0.66	0.78	21.6
12	R2	47	0.0	0.241	34.6	LOS C	5.6	38.9	0.78	0.66	0.78	22.5
Approach		173	0.0	0.241	31.7	LOS C	5.6	38.9	0.76	0.66	0.76	22.4
All Vehicles		1340	7.1	0.502	26.6	LOS B	12.8	96.2	0.71	0.64	0.71	23.8

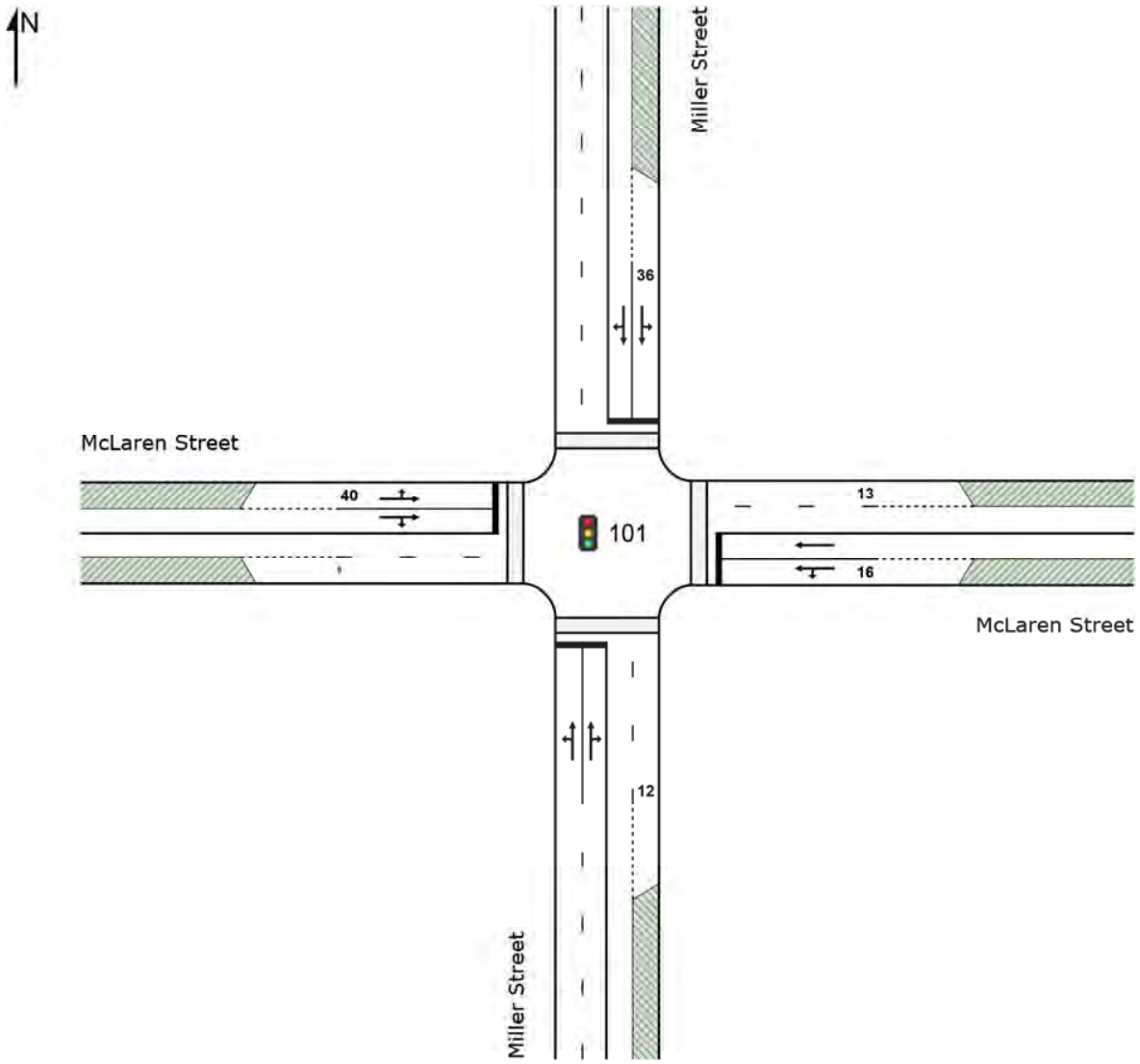
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard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

Site: 101 [Miller St/McLaren St - PM Future Scenario]

Miller St/McLaren St - PM Existing Scenario
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Variable Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout



MOVEMENT SUMMARY

Site: 101 [Miller St/McLaren St - PM Future Scenario (Site Folder: General)]

Miller St/McLaren St - PM Existing Scenario
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Miller Street														
1	L2	121	1	127	0.8	0.314	21.9	LOS B	9.6	71.1	0.62	0.61	0.62	27.3
2	T1	352	41	371	11.6	0.314	20.2	LOS B	9.6	71.1	0.65	0.60	0.65	25.9
3	R2	25	1	26	4.0	0.314	25.5	LOS B	8.6	66.1	0.67	0.59	0.67	24.7
Approach		498	43	524	8.6	0.314	20.9	LOS B	9.6	71.1	0.64	0.60	0.64	26.2
East: McLaren Street														
4	L2	57	0	60	0.0	0.189	49.1	LOS D	3.0	21.0	0.88	0.73	0.88	16.9
5	T1	165	16	174	9.7	* 0.511	43.2	LOS D	8.8	66.5	0.90	0.74	0.90	18.9
Approach		222	16	234	7.2	0.511	44.7	LOS D	8.8	66.5	0.90	0.74	0.90	18.4
North: Miller Street														
7	L2	34	0	36	0.0	0.102	20.9	LOS B	2.8	20.8	0.56	0.53	0.56	26.7
8	T1	307	30	323	9.8	* 0.512	23.5	LOS B	13.2	98.7	0.71	0.65	0.71	24.7
9	R2	54	1	57	1.9	0.512	28.1	LOS B	13.2	98.7	0.75	0.67	0.75	25.1
Approach		395	31	416	7.8	0.512	23.9	LOS B	13.2	98.7	0.71	0.64	0.71	24.9
West: McLaren Street														
10	L2	41	0	43	0.0	0.063	29.5	LOS C	1.6	11.3	0.68	0.66	0.68	23.6
11	T1	80	0	84	0.0	0.245	31.3	LOS C	5.7	39.6	0.78	0.66	0.78	21.7
12	R2	45	0	47	0.0	* 0.245	34.7	LOS C	5.7	39.6	0.78	0.66	0.78	22.5
Approach		166	0	175	0.0	0.245	31.8	LOS C	5.7	39.6	0.76	0.66	0.76	22.4
All Vehicles		1281	90	1348	7.0	0.512	27.3	LOS B	13.2	98.7	0.72	0.65	0.72	23.6

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Miller Street												
P1	Full	271	285	54.8	LOS E	0.9	0.9	0.96	0.96	81.7	35.0	0.43
East: McLaren Street												
P2	Full	294	309	54.9	LOS E	1.0	1.0	0.96	0.96	81.9	35.2	0.43
North: Miller Street												

P3	Full	74	78	54.3	LOS E	0.3	0.3	0.95	0.95	81.2	35.0	0.43
West: McLaren Street												
P4	Full	281	296	54.8	LOS E	1.0	1.0	0.96	0.96	81.6	34.8	0.43
All Pedestrians		920	968	54.8	LOS E	1.0	1.0	0.96	0.96	81.7	35.0	0.43

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

USER REPORT FOR SITE

Project: 20.270m01v02

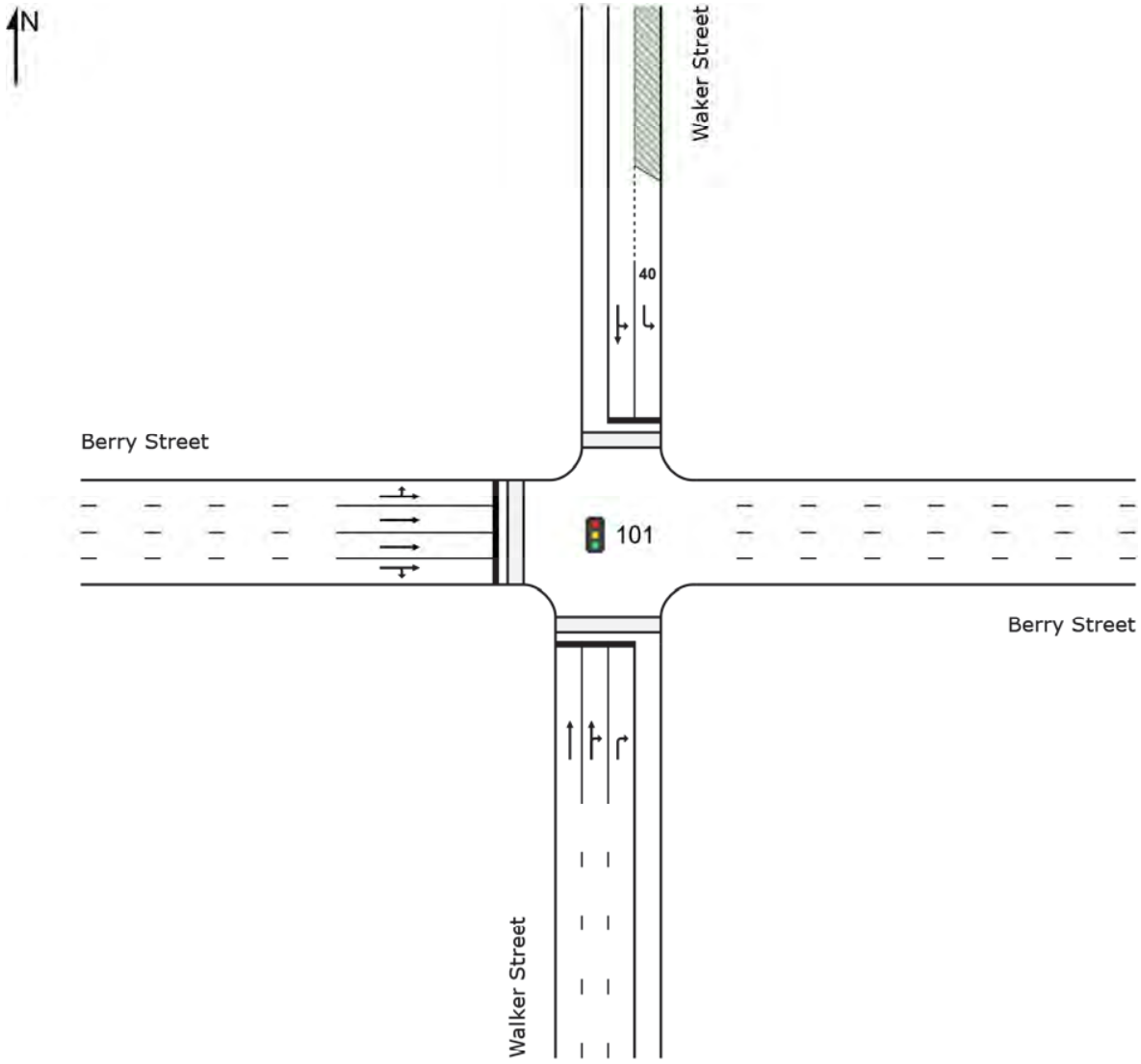
Template: Layout and Movement Summary

Site: 101 [Berry Street / Walker Street AM Existing Scenario]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Walker Street												
2	T1	273	1.2	0.762	12.2	LOS B	10.2	75.7	0.71	0.64	0.78	32.5
3	R2	665	8.5	0.762	24.8	LOS C	10.2	75.7	0.97	0.93	1.15	30.9
Approach		938	6.4	0.762	21.2	LOS C	10.2	75.7	0.89	0.85	1.05	31.2
North: Waker Street												
7	L2	343	1.5	0.785	30.4	LOS C	5.6	40.0	1.00	1.00	1.34	27.4
8	T1	62	5.1	0.785	27.0	LOS C	5.6	40.0	1.00	1.00	1.34	26.6
Approach		405	2.1	0.785	29.9	LOS C	5.6	40.0	1.00	1.00	1.34	27.3
West: Berry Street												
10	L2	55	11.5	0.733	25.9	LOS C	7.7	55.8	0.98	0.94	1.15	24.1
11	T1	1117	2.4	0.733	22.4	LOS C	7.9	56.1	0.98	0.94	1.15	29.2
12	R2	57	5.6	0.733	25.9	LOS C	7.8	55.7	0.98	0.94	1.15	28.3
Approach		1228	2.9	0.733	22.7	LOS C	7.9	56.1	0.98	0.94	1.15	29.0
All Vehicles		2572	4.1	0.785	23.3	LOS C	10.2	75.7	0.95	0.92	1.14	29.6

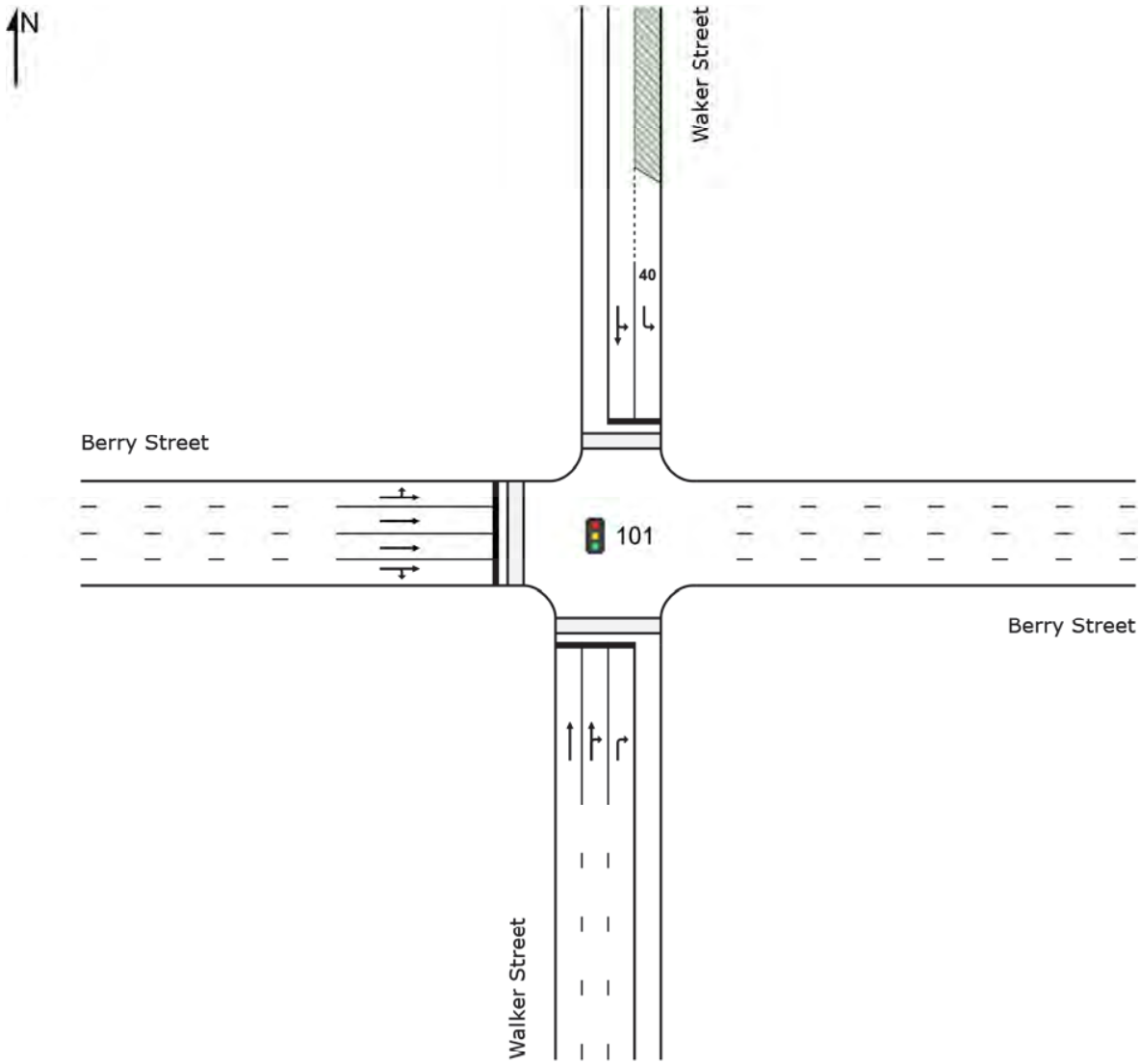
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay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

Site: 101 [Berry Street / Walker Street PM Existing Scenario]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout



Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Walker Street												
2	T1	312	1.4	0.848	15.8	LOS B	17.2	121.7	0.72	0.68	0.84	30.9
3	R2	881	1.2	0.848	31.7	LOS C	17.2	121.7	1.00	1.01	1.28	29.0
Approach		1193	1.2	0.848	27.6	LOS C	17.2	121.7	0.92	0.92	1.16	29.4
North: Waker Street												
7	L2	314	0.7	0.752	34.4	LOS C	6.0	42.1	1.00	0.95	1.24	26.3
8	T1	60	0.0	0.752	31.0	LOS C	6.0	42.1	1.00	0.95	1.24	25.4
Approach		374	0.6	0.752	33.9	LOS C	6.0	42.1	1.00	0.95	1.24	26.2
West: Berry Street												
10	L2	74	0.0	0.857	34.4	LOS C	14.0	98.8	1.00	1.11	1.34	20.9
11	T1	1455	0.7	0.857	31.0	LOS C	14.1	99.6	1.00	1.12	1.34	26.5
12	R2	126	0.0	0.857	34.5	LOS C	14.0	98.2	1.00	1.10	1.35	25.3
Approach		1655	0.6	0.857	31.4	LOS C	14.1	99.6	1.00	1.11	1.34	26.2
All Vehicles		3221	0.8	0.857	30.3	LOS C	17.2	121.7	0.97	1.02	1.26	27.5

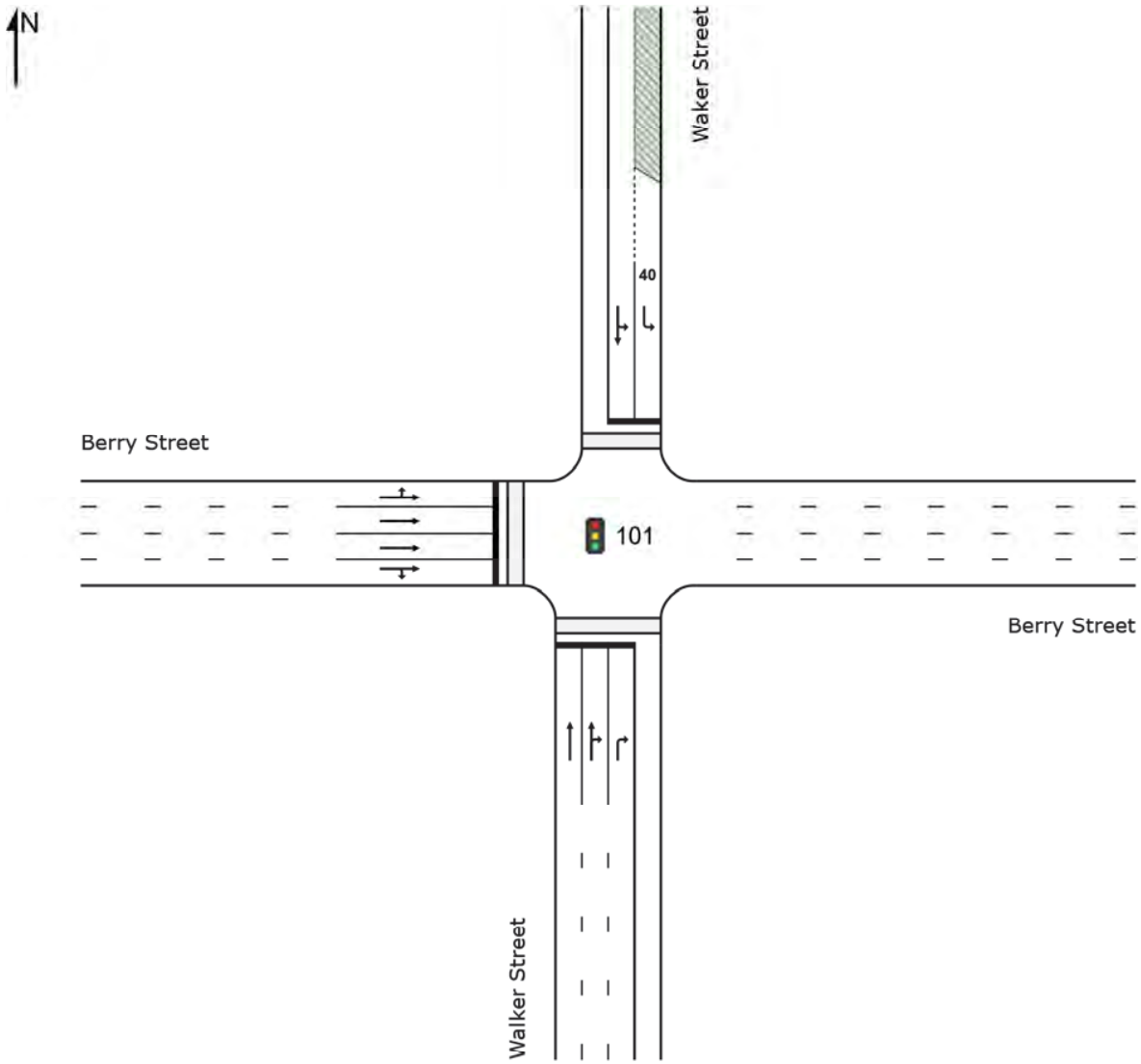
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay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

Site: 101 [Berry Street / Walker Street AM Existing+Development Scenario]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout



MOVEMENT SUMMARY

Site: 101 [Berry Street / Walker Street AM Existing+Development Scenario]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 50 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Walker Street												
2	T1	275	1.1	0.763	12.2	LOS B	10.3	76.0	0.71	0.65	0.79	32.6
3	R2	665	8.5	0.763	24.9	LOS C	10.3	76.0	0.97	0.94	1.16	30.9
Approach		940	6.4	0.763	21.2	LOS C	10.3	76.0	0.89	0.85	1.05	31.2
North: Waker Street												
7	L2	349	1.5	0.799	30.9	LOS C	5.8	41.2	1.00	1.02	1.38	27.3
8	T1	63	5.0	0.799	27.4	LOS C	5.8	41.2	1.00	1.02	1.38	26.6
Approach		413	2.0	0.799	30.4	LOS C	5.8	41.2	1.00	1.02	1.38	27.2
West: Berry Street												
10	L2	56	11.3	0.734	25.9	LOS C	7.7	55.9	0.98	0.94	1.16	24.1
11	T1	1117	2.4	0.734	22.4	LOS C	7.9	56.2	0.98	0.94	1.15	29.2
12	R2	57	5.6	0.734	25.9	LOS C	7.8	55.8	0.98	0.94	1.15	28.3
Approach		1229	2.9	0.734	22.7	LOS C	7.9	56.2	0.98	0.94	1.15	29.0
All Vehicles		2582	4.0	0.799	23.4	LOS C	10.3	76.0	0.95	0.92	1.15	29.6

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	19.4	LOS B	0.1	0.1	0.88	0.88
P3	North Full Crossing	53	19.4	LOS B	0.1	0.1	0.88	0.88
P4	West Full Crossing	53	19.4	LOS B	0.1	0.1	0.88	0.88
All Pedestrians		158	19.4	LOS B			0.88	0.88

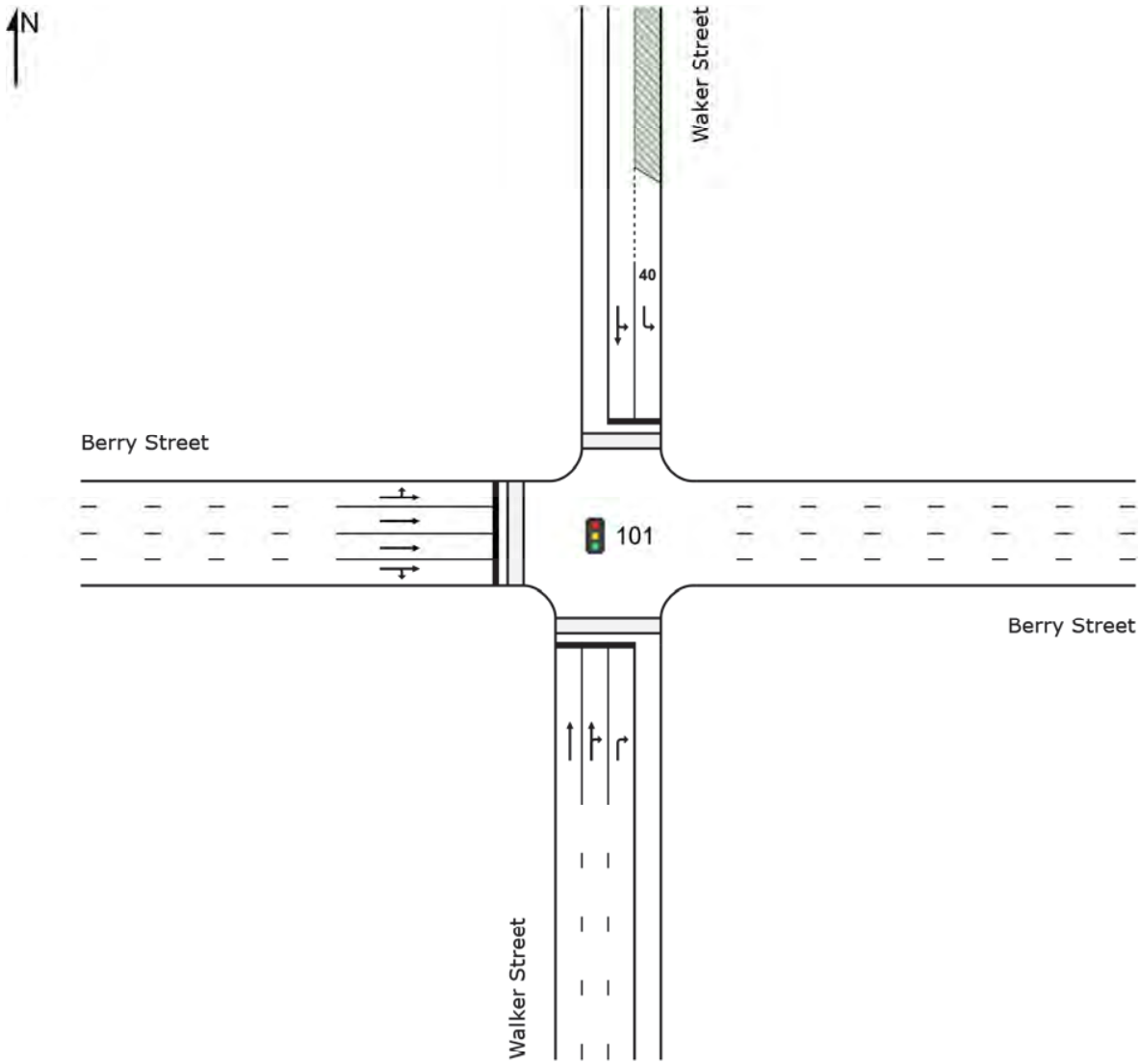
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Site: 101 [Berry Street / Walker Street PM Existing+Development Scenario]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Two-Phase
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Site Layout



MOVEMENT SUMMARY

Site: 101 [Berry Street / Walker Street PM Existing +Development Scenario (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Walker Street														
2	T1	299	4	315	1.3	* 0.850	15.9	LOS B	17.3	122.5	0.72	0.69	0.84	31.0
3	R2	837	10	881	1.2	0.850	31.9	LOS C	17.3	122.5	1.00	1.01	1.28	29.0
Approach		1136	14	1196	1.2	0.850	27.7	LOS C	17.3	122.5	0.92	0.93	1.17	29.4
North: Waker Street														
7	L2	301	2	317	0.7	0.758	34.6	LOS C	6.1	42.6	1.00	0.95	1.25	26.3
8	T1	57	0	60	0.0	0.758	31.1	LOS C	6.1	42.6	1.00	0.95	1.25	25.4
Approach		358	2	377	0.6	0.758	34.0	LOS C	6.1	42.6	1.00	0.95	1.25	26.2
West: Berry Street														
10	L2	71	0	75	0.0	0.857	34.5	LOS C	14.1	99.0	1.00	1.11	1.35	20.9
11	T1	1382	9	1455	0.7	* 0.857	31.1	LOS C	14.2	99.8	1.00	1.12	1.34	26.5
12	R2	120	0	126	0.0	0.857	34.6	LOS C	14.0	98.4	1.00	1.10	1.35	25.3
Approach		1573	9	1656	0.6	0.857	31.5	LOS C	14.2	99.8	1.00	1.12	1.34	26.2
All Vehicles		3067	25	3228	0.8	0.857	30.4	LOS C	17.3	122.5	0.97	1.03	1.27	27.5

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Walker Street												
P1	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	51.4	35.2	0.68
North: Waker Street												
P3	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	48.9	31.9	0.65
West: Berry Street												
P4	Full	50	53	24.4	LOS C	0.1	0.1	0.90	0.90	51.4	35.2	0.68
All Pedestrians		150	158	24.4	LOS C	0.1	0.1	0.90	0.90	50.6	34.1	0.67

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

USER REPORT FOR SITE

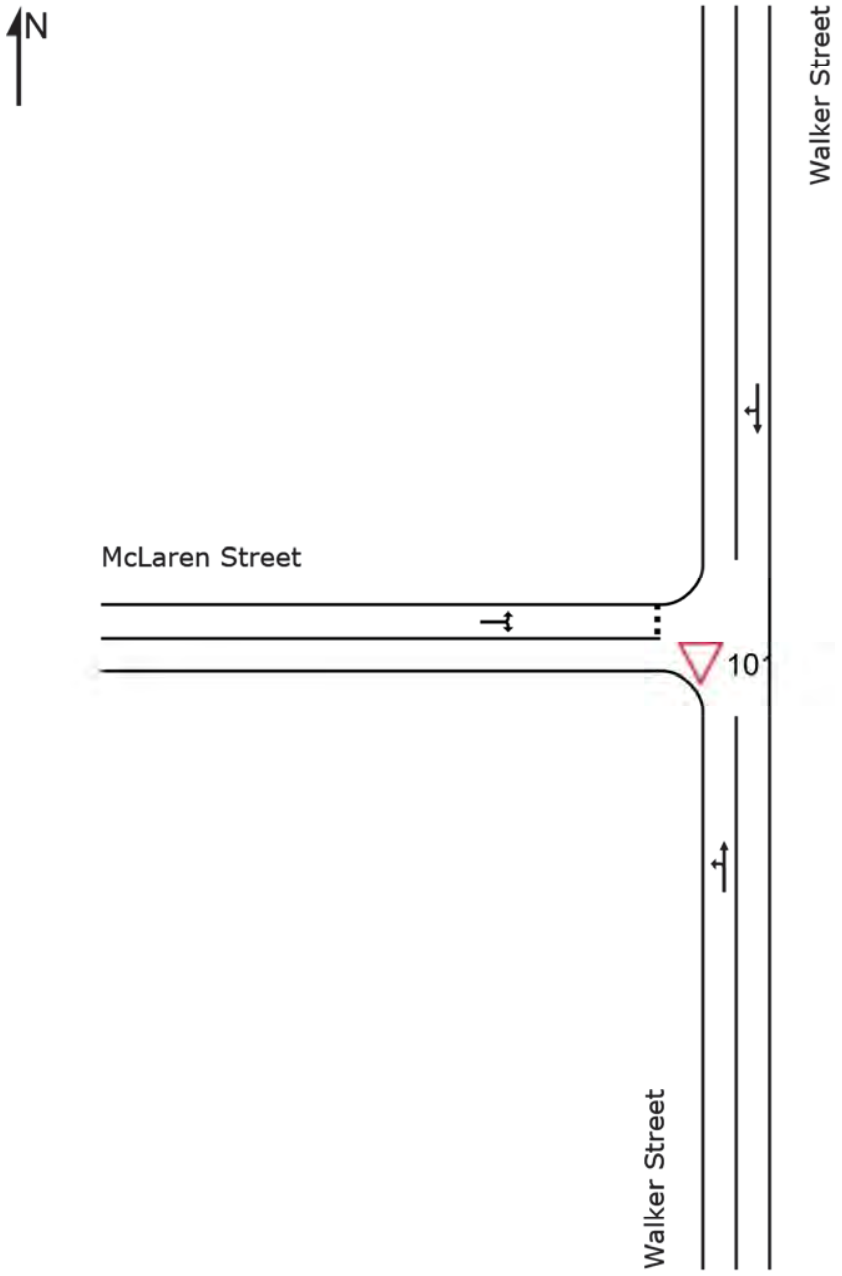
Project: 20.270m01v02

Template: Layout and Movement Summary

Site: 101 [Walker Street / McLaren Street - AM Existing Scenario]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Site Layout



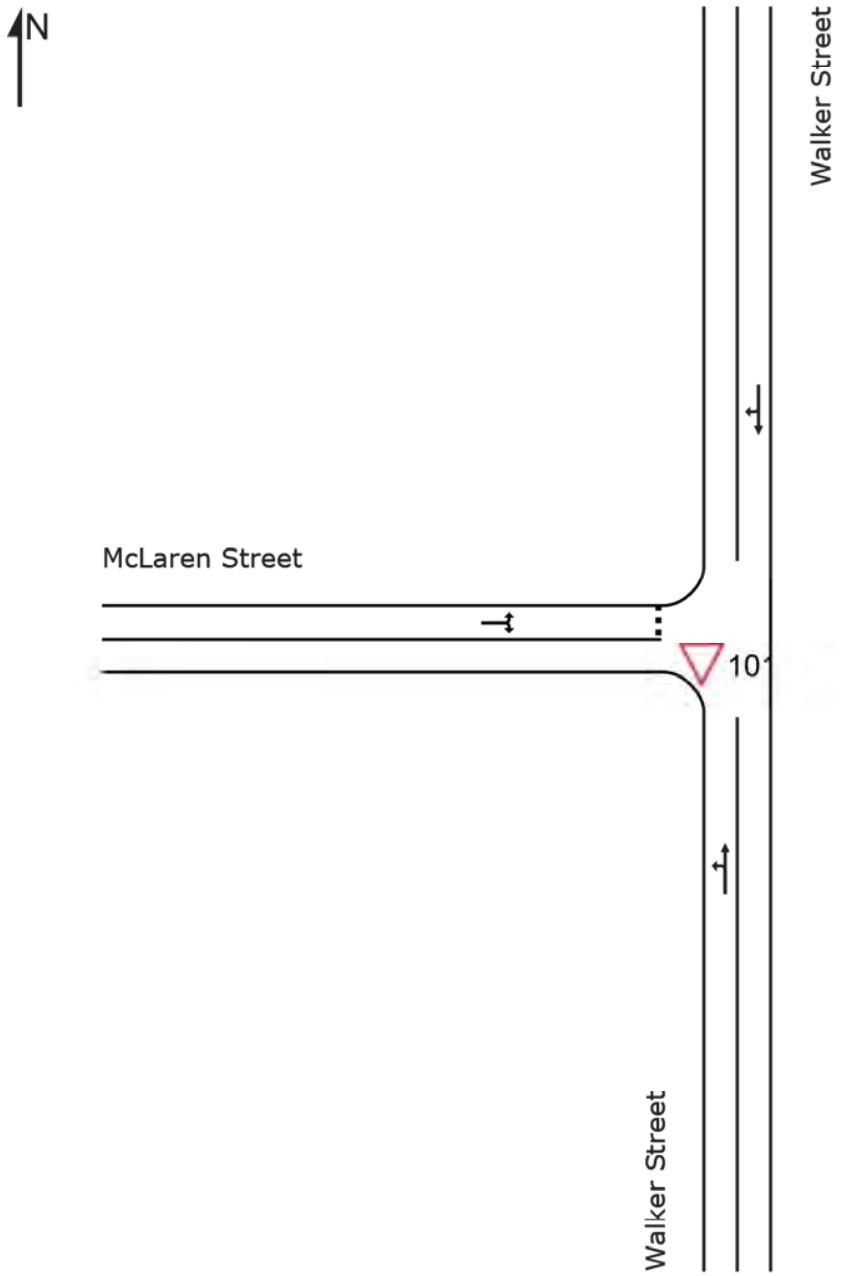
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Walker Street												
1	L2	256	1.0	0.203	5.6	LOS A	0.0	0.0	0.00	0.39	0.00	48.2
2	T1	125	1.0	0.203	0.0	LOS A	0.0	0.0	0.00	0.39	0.00	52.3
Approach		381	1.0	0.203	3.7	NA	0.0	0.0	0.00	0.39	0.00	49.6
North: Walker Street												
8	T1	275	0.0	0.218	0.7	LOS A	0.8	5.9	0.29	0.17	0.29	54.4
9	R2	94	0.0	0.218	7.1	LOS A	0.8	5.9	0.29	0.17	0.29	49.3
Approach		368	0.0	0.218	2.3	NA	0.8	5.9	0.29	0.17	0.29	53.1
West: McLaren Street												
10	L2	55	0.0	0.177	5.9	LOS A	0.6	4.5	0.32	0.67	0.32	42.5
12	R2	98	0.0	0.177	8.7	LOS A	0.6	4.5	0.32	0.67	0.32	41.3
Approach		153	0.0	0.177	7.7	LOS A	0.6	4.5	0.32	0.67	0.32	41.7
All Vehicles		902	0.4	0.218	3.8	NA	0.8	5.9	0.17	0.35	0.17	49.5

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

Site: 101 [Walker Street / McLaren Street - PM Existing Scenario]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Site Layout



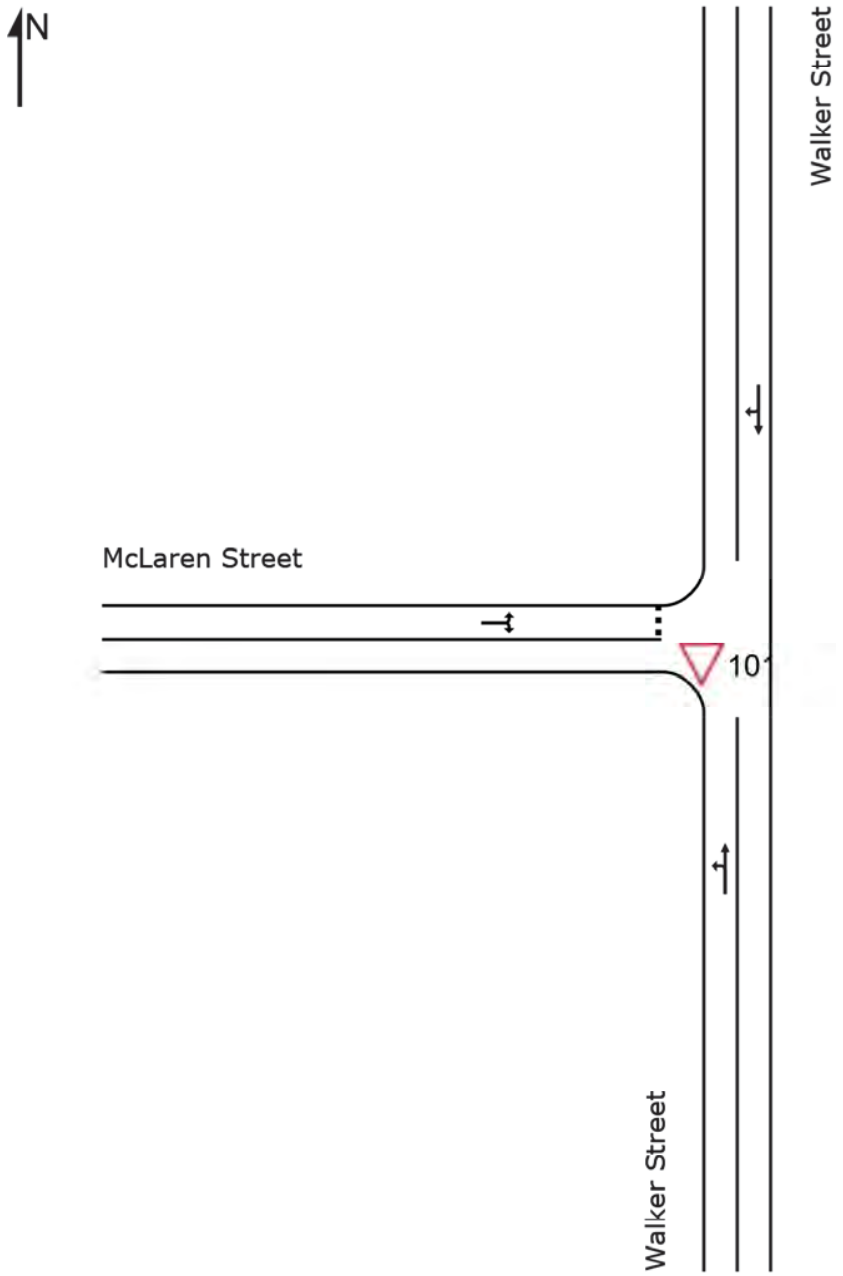
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Walker Street												
1	L2	246	1.0	0.237	5.6	LOS A	0.0	0.0	0.00	0.32	0.00	49.3
2	T1	201	1.0	0.237	0.0	LOS A	0.0	0.0	0.00	0.32	0.00	53.5
Approach		447	1.0	0.237	3.1	NA	0.0	0.0	0.00	0.32	0.00	51.3
North: Walker Street												
8	T1	148	0.0	0.100	0.5	LOS A	0.2	1.7	0.18	0.10	0.18	56.4
9	R2	26	0.0	0.100	7.3	LOS A	0.2	1.7	0.18	0.10	0.18	51.0
Approach		175	0.0	0.100	1.5	NA	0.2	1.7	0.18	0.10	0.18	55.6
West: McLaren Street												
10	L2	60	0.0	0.251	6.3	LOS A	1.0	6.7	0.42	0.71	0.42	42.7
12	R2	166	0.0	0.251	8.1	LOS A	1.0	6.7	0.42	0.71	0.42	41.5
Approach		226	0.0	0.251	7.6	LOS A	1.0	6.7	0.42	0.71	0.42	41.8
All Vehicles		848	0.5	0.251	4.0	NA	1.0	6.7	0.15	0.38	0.15	49.2

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

Site: 101 [Walker Street / McLaren Street - AM Existing+Development Scenario]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Site Layout



MOVEMENT SUMMARY

Site: 101 [Walker Street / McLaren Street - AM Existing +Development Scenario (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

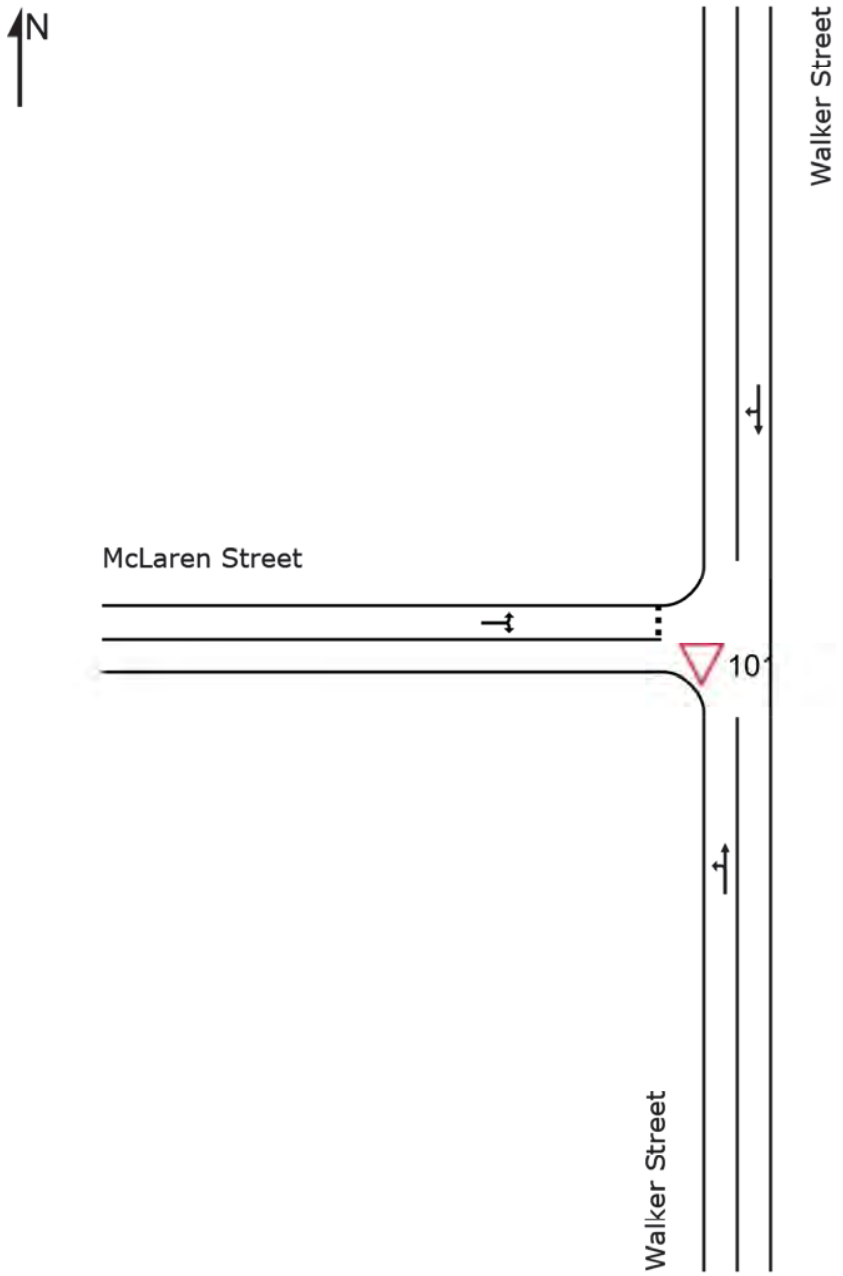
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Walker Street														
1	L2	243	2	256	1.0	0.203	5.6	LOS A	0.0	0.0	0.00	0.39	0.00	48.1
2	T1	119	1	125	1.0	0.203	0.0	LOS A	0.0	0.0	0.00	0.39	0.00	52.3
Approach		362	4	381	1.0	0.203	3.7	NA	0.0	0.0	0.00	0.39	0.00	49.5
North: Walker Street														
8	T1	261	0	275	0.0	0.218	0.7	LOS A	0.8	5.9	0.29	0.17	0.29	54.4
9	R2	89	0	94	0.0	0.218	7.1	LOS A	0.8	5.9	0.29	0.17	0.29	49.3
Approach		350	0	368	0.0	0.218	2.3	NA	0.8	5.9	0.29	0.17	0.29	53.1
West: McLaren Street														
10	L2	52	0	55	0.0	0.177	5.9	LOS A	0.6	4.5	0.32	0.67	0.32	42.5
12	R2	93	0	98	0.0	0.177	8.7	LOS A	0.6	4.5	0.32	0.67	0.32	41.3
Approach		145	0	153	0.0	0.177	7.7	LOS A	0.6	4.5	0.32	0.67	0.32	41.7
All Vehicles		857	4	902	0.4	0.218	3.9	NA	0.8	5.9	0.17	0.35	0.17	49.4

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

Site: 101 [Walker Street / McLaren Street - PM Existing+Development Scenario]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Site Layout



MOVEMENT SUMMARY

Site: 101 [Walker Street / McLaren Street - PM Existing +Development Scenario (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Walker Street														
1	L2	234	2	246	1.0	0.237	5.6	LOS A	0.0	0.0	0.00	0.32	0.00	49.3
2	T1	191	2	201	1.0	0.237	0.0	LOS A	0.0	0.0	0.00	0.32	0.00	53.5
Approach		425	4	447	1.0	0.237	3.1	NA	0.0	0.0	0.00	0.32	0.00	51.2
North: Walker Street														
8	T1	141	0	148	0.0	0.100	0.5	LOS A	0.2	1.7	0.18	0.10	0.18	56.4
9	R2	25	0	26	0.0	0.100	7.3	LOS A	0.2	1.7	0.18	0.10	0.18	51.0
Approach		166	0	175	0.0	0.100	1.5	NA	0.2	1.7	0.18	0.10	0.18	55.6
West: McLaren Street														
10	L2	57	0	60	0.0	0.251	6.3	LOS A	1.0	6.7	0.42	0.71	0.42	42.7
12	R2	158	0	166	0.0	0.251	8.1	LOS A	1.0	6.7	0.42	0.71	0.42	41.5
Approach		215	0	226	0.0	0.251	7.6	LOS A	1.0	6.7	0.42	0.71	0.42	41.8
All Vehicles		806	4	848	0.5	0.251	4.0	NA	1.0	6.7	0.15	0.38	0.15	49.2

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