

Transport Assessment

Proposed Residential Development

Precinct 3, Edmondson Park

Ref: P1321r01v3 18/08/2023



info@asongroup.com.au +61 2 9083 6601 Suite 17.02, Level 17, 1 Castlereagh Street, Sydney, NSW 2000

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Glossary

Acronym	Description
CC	Construction Certificate
Council	Liverpool City Council
DA	Development Application
DCP	Development Control Plan
DoS	Degree of Saturation
DPE	Department of Planning and Environment
EPS	Edmondson Park South
GFA	Gross Floor Area
HRV	Heavy Rigid Vehicle (as defined by AS2890.2:2018)
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
MOD	Section 4.55 Modification (also referred as a S4.55)
RMS Guide	Transport for NSW (formerly Roads and Traffic Authority), Guide to Traffic Generating Developments, 2002
TDT 2013/04a	TfNSW Technical Direction, Guide to Traffic Generating Developments – Updated traffic surveys, August 2013
TfNSW	Transport for New South Wales
ТА	Transport Assessment
veh/hr	Vehicle movements per hour (1 vehicle in & out = 2 movements)



1 Introduction

1.1 Overview

Ason Group has been commissioned by Landcom to prepare a Transport Assessment (TA) in support of a Development Application (DA) for construction of 250 residential dwellings within Precinct 3, Edmondson Park South (the Site). This TA provides an assessment of the access, traffic, and parking implications of the Proposal.

For context, the Site is located within the Edmondson Park South Concept Plan area, approved under Section 75W of the Environmental Planning and Assessment Act (MP10_0118¹). That Concept Plan envisaged a dwelling yield of 270 dwellings within area "4", now referred to as Landcom's "Precinct 3".

Having regard for the above, the broader traffic impacts of the development – which is consistent with the above dwelling targets – has been considered in the development of previous modelling to identify necessary precinct-wide infrastructure. Indeed, broader traffic impacts of the development associated with the latest Modification 12 (MOD 12²) to the Concept Plan has considered.

The Concept Plan and supporting studies envisage a signalised connection to MacDonald Road to the east of the site, notwithstanding further review and considerations have been outlined below in **Section 6.4**. A new connection to Zouch Road is also proposed which results in a minor change to access strategy contemplated by MOD 12. Therefore, additional SIDRA modelling has been undertaken to identify any impacts to the surrounding key intersections.

The Site is located at Lot 3 & Lot 5 DP1272931 and on land zoned as R1 – General Residential & RE1 – Public Recreation, as shown in **Figure 1** below.



Figure 1: Site Location



¹ http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3970

² <u>http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=10705</u>

1.2 Project History

The Edmondson Park South (EPS) Concept Plan was originally approved on 18 August 2011, followed by several subsequent modifications. A summary of those modifications is provided in **Table 1**.

TABLE 1: EPS CONCEPT PLAN (MP 10_0118) – MODIFICATION HISTORY			
Modifications	Descriptions	Traffic / Transport Related	Status
MOD 1	Amend the timing for approval of a vegetation rehabilitation plan associated with remediation works.	No	Approved
MOD 2	Modification in relation to the sales and information centre within Edmondson Park	No	Approved
MOD 3	Modification in relation to Sewerage Treatment Plan, Decommissioning and Remediation	No	Approved
MOD 4	Modifications in relation to maximum Gross Floor Area (GFA), maximum building height, number of dwellings, maximum parking rates etc.	Yes	Approved
MOD 5	Revision to the Concept Plan boundary to include land owned by Landcom and the Office of Strategic Lands (OSL) and other modifications relating to school zone, road layout, dwelling yield, and mix, building height and bushfire asset protection zones.	Yes	More information required
MOD 6	Redistribute GFA within the Town Centre Core to reflect the further design development that has occurred since the original indicative scheme was developed. It will NOT result in any increase in the total GFA, height or number of dwellings for the Frasers Town Centre.	No	Approved
MOD 7	Modification to include a high school in the Edmondson Park Town Centre	Yes	Withdrawn
MOD 8	Amendment to the Edmondson Park Frasers Town Centre Guidelines to reduce the car park rate for 2- bedroom dwellings in the Town Centre Core	Yes	Approved
MOD 9	Modification to amend the Edmondson Park Frasers Town Centre Guidelines to reduce the car parking rate for two-bedroom dwellings within residential flat buildings in the Town Centre Core from 1.2 spaces per dwelling to 1 space per dwelling.	Yes	Withdrawn
MOD 10	Modification to the Concept Plan, as it relates to Precinct 3 to increase dwelling numbers by 350 to a maximum of 600 (a total of 4,852 dwellings across the Concept Plan) and alter the road network hierarchy.	Yes	Withdrawn
MOD 11	Modification to the approved Design Guidelines to allow additional attached dwelling typologies with Residential Precincts 2 and 3.	No	Approved





MOD 12	Modification to allow school lot within the town centre and relocate residential flat buildings from the town centre into Residential Precinct 3.	Yes	Proponent Reviewing Submissions
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It is noted that MOD 12 is the most recent modification of relevance to traffic and transport considerations. As such, the proposed implications have been assessed against the 'benchmark' conditions detailed in the MOD 12 traffic and transport study. MOD 12 references approved MOD 4 vehicular trip generation rates which have been inherently considered and validated by the key consent authorities, including the Department of Planning and Environment (DPE) and Transport for NSW (TfNSW). It is assumed that MOD 12 will be approved, and this TA aims to show that that the Proposal is largely consistent with the modelling included in MOD 12.

MOD 10 has direct impacts on the subject Precinct. However, for the purposes of this DA, those changes are not relied upon.

1.3 Response to TfNSW Modelling Comments

TfNSW Operational Transport Forecasting Team has provided comments on 13 June 2023 which relates to the traffic model of this TA. The comments and corresponding responses are outlined in **Table 2**.

IADLE 2:	TABLE 2: MODELLING COMMENTS AND RESPONSES (15 JUNE 2023)		
Item No.	Comment	AG Response	
1	Campbelltown Rd should have 70km/hr as post speed limit, Macdonald Rd should have 60km/hr as post speed limit, and General Blvd should have 50km/hr as post speed limit The speed coding in the model is incorrect.	Noted. Updated the model to ensure all roads have the correct speed limits.	
2	No calibrations were found for existing base model. Existing base model should be carefully calibrated according to the available queue length data.	Noted. Site inspections were undertaken on 22 August 2022 and during the Surveyed Period being 6 September 2022, where queue lengths and general congestion were observed for each of the 3x existing intersections within the model. A third site inspection was undertaken on 8 August 2023 to observe and confirm the queue lengths. The resulting queue lengths reported by the model were generally consistent with the queues and general congestion patterns observed on site, indicating that the model did not require any additional amendments to the code within the model. Notwithstanding, the model has been updated per the comments in this document.	
3	Queue in output should use 95th percentile queue under Network Data-Override Site	Noted.	



	Data. SIDRA model was not consistent with it. For example, Existing 2022 AM peak was using Average. Please note, this comment applies to all network & individual SIDRA models.	Network results have been changed to show the 95th percentile rather than showing the average queue.
4	The walking speed (average) parameter was left as the default 1.3m/s. Section 14.2.7 of TfNSW's Traffic Modelling Guidelines recommends to lower this to 1.2m/s for pedestrian modelling in NSW.	Noted. The pedestrian movement speed has been updated to 1.2m/s.
5	Passenger Car Unit value for heavy vehicles should be adjusted to 2.0 PCU	Noted. Passenger Car Unit value for heavy vehicles has been updated to 2.0 PCU.
6	It is noticed the intersection of Zouch Road / Existing Access was coded as Stop sign control type, however, the intersection shows as Give Way control which needs to be corrected.	Noted. It is noted that the access to Zouch Road from the existing property on the existing western leg has a stop sign, then the access from the Site access will be give way. Therefore, it would be incorrect in either scenario. Regardless, the intersection control type has been updated as requested.
7	It is noticed the intersection of Zouch Road / Campbelltown Rd is not standard 90-degree intersection for all approaches, instead, it is Northeast / Southwest for Campbelltown Rd, and North / South for Zouch Rd.	Noted. The intersection of Zouch Road / Campbelltown Road has been updated to Northeast / Southwest for Campbelltown Road. (Refer to Figure 19)
8	The westbound merging on Campbelltown Rd to the west of the intersection of Campbelltown Rd & MacDonald Rd should be zipper merge instead of give way merge.	Noted. Updated to Zipper Merge.
9	The northern approach of MacDonald Rd & General Blvd intersection should have median.	Noted. Updated to include a median. (Refer to Figure 21)
10	Existing base model should use user-given phase time instead of user-given cycle time	Noted. Existing base model has been updated to user-given phase time. The demand inputs are derived from survey data, and user-given phase time selected and confirmed from site observations made during an additional site inspection on 8 August 2023. The resulting queue lengths reported by the model are in line with queues and general congestion patterns observed, site, indicating that the signal operation is being modelled effectively.
11	The priorities are not adequately defined to ensure that vehicles yield to pedestrians. For instance, in Phase A of Intersection	Noted. Priorities have been updated.



Campbelltown Rd & MacDonald Rd, there is a conflict between the east & west left turn and the pedestrian movement on north & south approach.	
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1.4 Key References

In preparing this TA, Ason Group has referenced the following key planning documents. These include:

- Edmondson Park South Development Control Plan, Nov 2012 (EPS DCP 2012);
- Edmondson Park South MOD 12 Transport Assessment, dated 17 November 2021, prepared by Ason Group (referred as 'MOD 12 TA Report');
- Transport Assessment Report Edmondson Park South MOD 12, dated 17 November 2021, prepared by Ason Group (MOD 12 TA Report);
- Option Assessment Report Ed. Square MOD 12, dated 30 September 2021, prepared by Ason Group (MOD 12 OAR Report);
- Traffic Impact Assessment Report Edmondson Park Frasers Town Centre Section 75W Modification, dated 05 February 2017, prepared by Ason Group (MOD 4 RtS TIA Report).

This TA also references general access, traffic and parking guidelines, including:

- Australian Standards, AS 2890.1: 2004 Parking Facilities Off-Street Car Parking (AS 2890.1);
- Australian Standards, AS 2890.2:2018 Parking Facilities Off-Street Commercial Vehicle Facilities (AS 2890.2);
- Australian Standards, AS 2890.3: 2015 Parking Facilities Bicycle Parking (AS 2890.3);
- Australian Standards, AS 2890.6: 2022 Parking Facilities Off-Street Parking for People with Disabilities (AS 2890.6);
- Roads and Maritime Services, Guide to Traffic Generating Developments, v2.02, 2002 (RMS Guide)
- Roads and Maritime Services, Technical Direction TDT 2013/04a, Guide to Traffic Generating Developments – Updated Traffic Surveys (Updated RMS Guide)
- National Construction Code 2019 Volume One (NCC 2019).



2 Description of the Proposal

2.1 Subdivision Concept Plan

The Proposal seeks approval for the subdivision of the site including precinct access, internal roads, and other supporting infrastructure. A reduced copy of the subdivision concept plan is provided below.



Figure 2: Precinct 3 Subdivision Plan (Source: Urbanco)

2.2 Development Yield

The Proposal seeks approval for 250 residential dwellings, comprised of:

- 90 terraces
- 4 small and duplex sites, and
- 156 residential lots



3 Existing Conditions

3.1 Site Context

Edmondson Park is approximately 8 kilometres southwest from the Liverpool CBD and approximately 34 kilometres from the Sydney CBD. The overall EPS Concept Plan area is located within both Liverpool Council and Campbelltown Council LGAs.

The Site subject to this application is located within Edmondson Park South, as shown in Figure 3 below within the suburb of Edmondson Park. It lies solely within the Liverpool Council LGA and is approximately 550m south-west of the Edmondson Park Railway Station



Figure 3: Edmondson Park South (Source: MOD 4 Final Determination Report)

3.2 Road Hierarchy

The existing road network in the vicinity of the Site is shown in **Figure 4** while key roads are further detailed below.



TABLE 3: ROAD HIERARCHY

Road	Description
Campbelltown Road	Campbelltown Road is a classified arterial road that traverses in an east-west direction to the south of the Site. It currently carries an annual average daily traffic (AADT) in the order of 15,350 vehicles per day (two-way). Traffic volumes during the weekday morning and evening peak periods are in the order 1,450 and 1,475 vehicles per hour (veh/hr), respectively.
MacDonald Road (previously Bernera Rd)	MacDonald Road is a north-south vehicular connector road to the east of the Site. It currently does not connect to Buchan Ave but will once built. MacDonald Rd has two-lanes in each direction and has a posted speed limit of 50km/hr. There is no parking on either side of the road.
Soldiers Parade	Soldiers Parade is a secondary north-south connection to the east of the Site. It currently forms a signalised intersection with Henderson Parade and an unsignalised intersection with Campbelltown Road to the south. Near the Site, Soldiers Pde is a single lane in each direction and has a posted speed limit of 50km/hr. Unrestricted parking is available on both sides of the road
Zouch Road	Zouch Road is a north-south local road located to the west of the Site with a sign posted speed limit of 60 km/h. Zouch Road generally provides a single lane of traffic on either direction with no parking on both sides. The southern end of Zouch Road connects to Campbelltown Road at a priority-controlled intersection.





Figure 4: Existing Road Network



3.3 Public Transport

3.3.1 Train Services

The Edmondson Park Train Station is located approximately 600 metres to the north-east of the Site, providing access to the broader metropolitan area. It is within the comfortable walking catchment based on the Integrated Public Transport Service Planning Guidelines (IPT Guidelines).

3.3.2 Bus Services

The closest bus stops servicing the existing Transport for NSW bus routes are located 350 metres from the Site. Available bus routes and their service frequencies are summarised below.

TABLE 4: BUS FREQUENCY	
Routes	Peak Frequency
859 Carnes Hill to Edmondson Park Station	11 services during the AM Peak and 12 services during the PM Peak
869 Ingleburn to Liverpool via Edmondson Park & Prestons	5 services during AM Peak and 12 services during the PM Peak
868 Edmondson Park Station	4 services during AM Peak and 3 services during the PM Peak
N31 Leppington to Liverpool (Night Service)	Does not run during AM and PM Peak Periods. 1 service per hour during night time operations





Figure 5: Public and Active Transport Near the Site



3.4 Active Transport

3.4.1 Pedestrian Routes

Currently, the Site has a 3.0-metre-wide shared path at its southern frontage which runs 200 metres west along Campbelltown Road from the MacDonald Road / Campbelltown Road intersection. There is also a 2.5-metre-wide shared path at its eastern frontage along MacDonald Road which is of good quality and enables pedestrian access to public transport services via pedestrian crossings. The shared paths also allow access to local roads from the Site.

3.4.2 Bicycle Routes

The closest bicycle route to the Site is along Campbelltown Road via a shared footpath on the northern side of the road. The bicycle route is connected to Hume Motorway. Bicycle routes are shown in more detail below.



Figure 6: Active Transport Network (Source: MOD 4 2016)



4 Future Context

4.1 Concept Plan Road Network

The original Edmondson Park South (EPS) Concept Plan was approved in 2011 by the Planning Assessment Commission (PAC).



Figure 7: Original Concept Plan (MP10_0118)

All access to Precinct 3 was proposed via Macdonald Road to the east and Campbelltown Road to the south.

It is noted that subsequent Modifications to the Concept Plan has sought changes to the broader road network. The latest approved road network being proposed under MOD 4 is shown below. This includes:

- Removal of right-turn bans previously envisaged at the Soldiers Parade / Campbelltown Road signals.
- New signalised intersection at MacDonald Road / General Boulevarde
- Retention of the existing roundabout at MacDonald Road / Henderson Road (previously noted as "Potential Traffic Signals")
- Other local road changes within the Edmondson Park Frasers Town Centre (Ed.Square)





Figure 8: Concept Plan Road Network & Hierarchy (MOD 4 - APPROVED)

MOD 12 – being the latest Modification to the Concept Plan – envisages further changes to the external road network, including:

• Further local road changes within the Edmondson Park Frasers Town Centre (Ed.Square), including associated access intersections to MacDonald Road.

However, MOD 12 does not material impact the local road within Precinct 3 of relevance to this DA.





Figure 9: Concept Plan Road Network & Hierarchy (MOD 12)

4.2 Approved Trip Generation Rates

With reference to the MOD 5 TA report, the following peak hour trip generation rates were adopted and approved (as shown in **Table 5**). It is noted that these trip rates have already been approved as part of MOD 4.

TABLE 5: MOD 5 APPROVED PEAK HOUR TRIP GENERATION RATES						
Land Use	AM Peak	PM Peak	Source			
Residential ¹	Medium Density: 0.62	trips / hour / dwelling	Concept Plan TMAP			

Note: 1) First principal assessment based on mode split assumptions.





4.3 MOD 12 Summary

MOD 12 seeks approval for the school lot to be within the town centre and the relocation of residential flat buildings from the town centre into Residential Precinct 3.

It is noted that MOD 12 also adopts the approved MOD 4 vehicular trip generation rates, and the modelling assumes a yield of 270 medium density units based on the MOD 12 OAR Report for Precinct 3. Therefore, the approved forecast peak hour traffic generation is 167 vehicle trips / hour.



5 Parking Requirements

5.1 Car Parking

5.1.1 Car Parking Requirements

This DA seeks to construct a residential precinct consisting of 250 medium density dwellings. Car parking rates have been adopted from Section 6.9 of the Edmondson Park South DCP (EPS DCP 2012). Rates that are considered applicable to the Proposal are outlined below.

TABLE 6: EPS DCP 2012 CAR PARKING RATES (MAXIMUM)

Land Use	Parking Rate
Dwelling	1 space ¹ per dwelling (minimum) A maximum of 2x spaces per dwelling permissible

Notes: 1) This space must be provided behind the frontage building line as per Section 6.9 of the <u>EPS DCP 2012</u>.

5.1.2 Car Parking Assessment

The application of the above rates results in the parking requirements below.

TABLE 7: CAR PARKING ASSESSMENT

Land Use	Yield	Requirement
Dwalling	250 dwallings	Minimum: 250 spaces ¹
Dweining	250 dweilings	Maximum: 500 spaces ²

Notes: 1) Based on a minimum of 1x space per dwelling

2) Based on the maximum of 2x spaces per dwelling

As such, it is expected that future built form (subject to separate approvals) will provide between 250 to 500 spaces across the Site to meet EPS DCP 2012 requirements as part of the post DA or pre-CC documentation.

5.1.3 Visitor Parking

The provision of visitor spaces will be provided via on-street public parking, in accordance with Section 3.1 of the EPS DCP and is expected to be sufficient to accommodate the demands arising from the Site. On-street parking should be consistent with the street sections shown in **Section 6.2**. Based on a high-level review of the plan, there are many on-street parking opportunities on the Urban Street, Minor Roads, and Minor Roads (Edge) to meet visitor parking demands.



6 Design Commentary

The relevant design commentary is explained in the following sections.

6.1 On Lot Design Standards

Site access (into the garage), garages shall be designed with reference to the following Australian Standards:

• AS2890.1:2004 for car parking areas, and

It is expected that any detailed construction drawings in relation to any on-street car parking spaces and loading areas would comply with these Standards. Furthermore, compliance with the above Standards would be expected to form a standard Condition of Consent prior to any development approval.

No direct access to MacDonald Road, Campbelltown Road or Zouch Road is proposed, other than the future public road intersections. All garage access shall be provided from internal local roads and laneways.

6.2 Road Design

The proposed road typologies are consistent with the EPS DCP 2012 as shown in the figures below. However, the proposal seeks approval for a connection to Zouch Road which differs from the road connections from Campbelltown Road shown within the EPS DCP 2012. Nonetheless, the modelling results within this TA demonstrate that the proposed connection is supportable and modelled intersections under the sensitivity scenario can readily accommodate development traffic from the Site.

Below is an indicative layout plan of the proposal.



Figure 10: Indicative Road Design



The proposed internal road network design is discussed in the following:

- It is noted that there are 2 sets of staggered T-intersections along the Urban Street. It is proposed to
 mitigate these 2 staggered intersections through a series of Local Area Traffic Management solutions
 such as a median island along the Urban Street to restrict both intersections to left-in-left-out only.
 Detailed plans can be finalised as part of the CC process.
- Sight distance has been assessed in accordance with Austroads Guide to Road Design Part 4A and AS2890.1: 2004. The intersection configurations are generally acceptable, with minor adjustments possible to be made during the CC stage.
- The cul-de-sac on the Laneway closest to Campbelltown Road is smaller than a standard cul-de-sac. Hence, it is suggested that this laneway is signposted with for No Access (Residents Excepted) to reduce traffic accessing the smaller cul-de-sac.
- Where possible, garage access should be provided from lower order roads and laneways.
- Section 2.6 of AS2890.1 outlines that the minimum width of domestic driveways shall be 3.0 m.
- Further to the above, Figure 5.4 of AS2890.1 outlines that a distance between a garage and the opposite kerb must be a minimum of 5.6 7.0m depending on the size of the garage door. As such, further consideration should be given to widening the laneway to 5.6m to ensure that the standard has been met.

The following figures provide context to the indicative road layout for each road typology.



Figure 11: Typical Urban Street Section





Figure 12: Typical Urban Street Plan



Figure 13: Typical Minor Road Edge





Figure 14: Typical Minor Road Section



Figure 15: Typical Laneway Section





Figure 16: Typical Laneway Plan

6.3 Design Vehicles

Garages will be designed to accommodate movements of an 85th percentile car (B85), in line with AS2890.1:2004.

The road network is expected to be designed to accommodate movements for vehicles up to 12.5m Heavy Rigid Vehicles (HRV's), consistent with the road function and occasional removalist / waste collection vehicles.

6.4 Access Design

Primary access to the Site is provided via a sing-controlled connection at MacDonald Road x General Boulevard. Section 6.4.1 outlines further the intersection design and considerations. This intersection is slightly offset to reduce impacts within the C1 (Conservation) zoned land.

The Proposal includes a secondary connection via Zouch Road to provide vehicles access from the western side of the Site.

All public road connections shall be designed for vehicles up to 12.5m Heavy Rigid Vehicle (HRV). Swept paths will be undertaken by the project civil engineer to ensure the indicative concept design can accommodate a 12.5m HRV.



With consideration for the Indicative intersection at MacDonald Road x General Boulevard, it is anticipated that pedestrian and vehicular movements will significantly increase once the Site and broader Edmondson Park Town Centre is developed.

The intersection has been designated as a signalised intersection from MOD 4 onwards to MOD 12, therefore can be considered to have in principle approval. Notwithstanding, as with all new signalised intersections, a warrant assessment must be undertaken and met prior to ultimate approval and installation.

The below table demonstrates a warrant assessment against TfNSW Traffic Signal Design, Section 2, Warrants (Version 1.4, Dec 2010) based on forecast traffic and pedestrian conditions of the proposed crossing locations.

TABLE 8: SIGNALISED INTERSECTIONS – VEHICLE CONSIDERATIONS

	Traffic Demand		Continuous Traffic			Crashes		
Location	Major Road >600 veh/hr	Minor Road >200 veh/hr	Major Road >900 veh/hr	Minor Road >100 veh/hr	Speed/ Sight Hazards	No Other Access	Crashes =+ 3	Volumes 80%
MacDonal d Road x General Boulevard	N	М	N	М	N	N	N	N

Note: 1) "M", or orange scores indicate that warrants are not met for the "Existing 2022 Survey" scenario but could be met for the "2022 Survey + Development" scenario.

2) All criteria are required to be addressed prior to the warrant being met.

TABLE 9: SIGNALISED INTERSECTIONS – PEDESTRIAN CONSIDERATIONS

	Pedestrian Safety		Pedestrian Safety – High Speed Road		
Location	Ped >150 peds/hr	Major Road >600 veh/hr	Ped >150 peds/hr	Major Road >450 veh/hr	Speed >75km/hr
MacDonald Road x General Boulevard	N	N	N	N	N

Note: 1) "M", or orange scores indicate that warrants are not met for the "Existing 2022 Survey" scenario but could be met for the "2022 Survey + Development" scenario.

2) All criteria are required to be addressed prior to the warrant being met.

Based on the above, it would suggest that the warrant would not be met following the construction of the development. Therefore, a sign-controlled intersection would be acceptable, until such a time where one (or more) of the warrants are met.



As discussed earlier in Section 6.4, the Proposal to provide a secondary connection via Zouch Road to provide vehicles access from the western side of the Site. Section 7 (and in particular Section 0) outlines that changes are required to obtain acceptable level of services.

These changes would consist of restriction in the northern and southern approaches of Zouch Road to leftin-left-out only. Figure 19 provides an illustration of the changes.

6.5 On-street Parking Design

Visitor parking shall be provided on-street and shall comply with AS2890.5:2020. Review of a signage plan prepared by the civil engineer will be undertaken to confirm the locations of on-street parking.

6.6 Waste Collection

All garbage collection is to be via a laneway or secondary streets where applicable as per Table 9 of the EPS DCP 2012. In this regard, bins will be transferred by residents to and from the kerbside for collection.

Waste collection is expected to be serviced by council's 10m Garbage Truck.



7 Traffic Assessment

7.1 Traffic Modelling Study Area & Scope

As previously mentioned in **Section 1.1**, the proposed development has generally been considered by preceding transport studies to identify broader transport infrastructure requirements.

However, the proposed new connection to Zouch Road could create a change to network. As such, additional SIDRA modelling of localised intersections has been undertaken to investigate any impacts to key intersections immediately surrounding the Site that may be affected by this Proposal. Intersections to be modelled are outlined below.



Figure 17: Modelled Intersections

The modelled scenarios are shown in **Table 10**. This includes a 'sensitivity' scenario to assess the potential impact associated with redistribution of background traffic heading east from Zouch Road using the new internal roads to connect to MacDonald Road (and subsequent signalised connections), in lieu of the priority-controlled intersection at Zouch Road / Campbelltown Road.

TABLE 10: MODELLED SCENARIOS						
Scenario No.	Scenario	Description				
1	Existing 2022 Baseline	2022 Surveyed volumes				
2	Existing 2022 + Development	2022 Survey volumes + development traffic				
3	Sensitivity 2022 + Development	2022 Survey volumes (redistributed) + development traffic				





Scenario 2 and Scenario 3 assumes a 4-leg MacDonald Road x General Boulevard sign-controlled intersection, a 4-leg Zouch Road x Existing Access sign-controlled intersection. Scenario 3 has modelled a turning movement of Zouch Road to left-in, left-out (LILO) only at Zouch Road x Campbelltown Road. Reduced copies of the modelled geometry for each intersection are shown in the figures below and the network layout of these intersections is shown in **Appendix A**.



Figure 18: Zouch Road x Site Access



Figure 19: Zouch Road x Campbelltown Road





Figure 20: MacDonald Road x Campbelltown Road



Figure 21: MacDonald Road x General Boulevard



It is noted that the Upgraded intersection at General Boulevard similar with that modelled as part of the transport assessments for MOD 4 and is consistent with MOD 12.

7.2 Existing Baseline Traffic (2022)

The Site is currently vacant, hence, there is no traffic generation to/from the Site.

Traffic surveys have been undertaken for each intersection outlined in **Figure 17** on 6 September 2022 to establish baseline traffic volumes. A network diagram has been created and a reduced copy shown within **Appendix A**. The modelling results for the existing baseline scenario is shown **Table 11**.

TABLE 11: EXISTING BASELINE RESULTS					
Intersection	Peak	DoS	Average Delay (s)	LoS	
Zouch Road x	AM	0.173	9.6	А	
Existing Access Driveway	PM	0.062	9.1	А	
Zouch Road x	AM	1.046	282.7	F	
Campbelltown Road	PM	0.630	167.7	F	
Campbelltown Road x	AM	0.945	36.7	С	
MacDonald Road	PM	0.801	37.3	С	
MacDonald Road x	AM	0.099	14.6	В	
General Boulevard	PM	0.108	16.3	В	

7.3 Proposed Development Traffic

7.3.1 Project Traffic Generation

The adopted MOD 12 traffic generation rates remain unchanged to the approved rates within MOD 4 (and MOD 5). Application of these adopted trip rates to this DA are summarised in **Table 12**.

TABLE 12: PROPOSED TRAFFIC GENERATION

	Yield	AM Peak		PM Peak	
Land Use		Trip Rate	Movements (vehicles/hr)	Trip Rate	Movements (vehicles/hr)
Single Dwelling Houses	250	0.62 trips per dwelling	155	0.62 trips per dwelling	155

The application of the approved rates to the development results in a forecast traffic generation of 155 vehicular movements per hour during the AM and PM peak periods.



Notwithstanding, for the purpose of this report, a higher peak hourly traffic generation has been adopted to allow for some sensitivity and to ensure the robustness of the proposal. As such a proposed yield of 270 units has been adopted which results in a peak of 167 veh/hr.

All modelling below has adopted the higher rate.

7.3.2 Traffic Distribution & Assignment

The adopted trip distribution for the Site has been based on those outlined within the MOD 12 submission, as follows.

TABLE 13: IN/OUT TRAFFIC DISTRIBUTION						
Land Llas	AM		РМ			
Land Use	In	Out	In	Out		
Dwelling	25%	75%	80%	20%		

Directional assignment assumptions during AM and PM peaks are summarised in the figures below which detail the assumed routes for the Site's traffic distribution. Assumed inbound / outbound routes for each direction are as follows.

- North: Vehicles travelling to and from the north are expected to travel along the northern leg or eastern leg of the MacDonald Road x General Boulevard intersection.
- East: Vehicles travelling to and from the east would travel along MacDonald Road and Campbelltown Road.
- South: Vehicles travelling to and from the south would travel along General Boulevard, Soldiers Parade and Campbelltown Road. An alternative route consists of travelling along General Boulevard, Soldiers Parade and Ray Simpson Avenue.
- West: Vehicles going to and from the Site would use the proposed connection via Zouch Road.

It is noted that the percentages for inbound and outbound do not sum up to exactly 100% due to rounding. However, the percentages have been derived from MOD 12's directional assignment assumptions.





Figure 22: Development Traffic Distribution AM



Figure 23: Development Traffic Distribution PM


7.4 Network Performance with Development

7.4.1 Standard Assessment

Based on the above distribution assumptions, the Site's 167 vehicular trips have been distributed onto the existing network for both AM and PM peak hours. The resulting network diagrams have been provided within **Appendix A**, with the subsequent modelling results outlined in the table below.

TABLE 14: EXISTING BASELINE + DEVELOPMENT RESULTS

Intersection	Peak	DoS	Average Delay (s)	LoS
Zouch Road x	AM	0.178	10.3	А
Existing Access Driveway	PM	0.063	9.1	А
Zouch Road x	AM	1.182	267.2	F
Campbelltown Road	PM	0.631	161.5	F
Campbelltown Road x	AM	0.731	47.2	D
MacDonald Road	PM	0.814	52.7	D
MacDonald Road x	AM	0.424	25.2	В
General Boulevard	PM	0.125	23.5	В

The above demonstrates that all intersections are operating at a LOS D or above during AM and PM peak periods, except for Zouch Road x Campbelltown Road which results in a LOS F. However, that is an existing issue and not materially impacted by the development itself.

TABLE 15: COMPARISON BETWEEN BASE AND PROJECT CASE SCENARIOS

			Base Case			Project Case	9
Intersection	Peak	DoS	Average Delay (s)	LoS	DoS	Average Delay (s)	LoS
Zouch Road x	AM	0.173	9.6	А	0.178	10.3 (+7.2%)	А
Driveway	PM	0.062	9.1	А	0.063	9.1 (0%)	A
Zouch Road x	AM	1.046	282.7	F	1.182	267.2 (-5.5%)	F
Road	PM	0.630	167.7	F	0.631	161.5 (-3.7%)	F
Campbelltown	AM	0.945	36.7	С	0.731	47.2 (+28.6%)	D
MacDonald Road	PM	0.801	37.3	С	0.814	52.7 (+41.3%)	D
MacDonald Road x	AM	0.099	14.6	В	0.424	25.2 (+72.6%)	В
General Boulevard	PM	0.108	16.3	В	0.125	23.5 (+44.2%)	В



Having regard for the negligible impact to key intersections, the proposal is deemed acceptable.

7.4.2 Sensitivity Testing

Recognising that route choice is dynamic in nature, it could be expected that the routes chosen of background traffic may change with the introduction of the proposed connection between Zouch Road and MacDonald Road, and with changes made to the intersection of Zouch Road and Campbelltown Road (LILO). Therefore, sensitivity analysis has been conducted to assess network performance if traffic from the northern approach of Zouch Road x Campbelltown Road is redirected to Campbelltown Road x MacDonald Road.

This sensitivity scenario assumes that 50% of the existing traffic travelling south along Zouch Road and heading towards Campbelltown Road would instead travel through the Site and utilise the signalised of Campbelltown Road via MacDonald Road. This rerouted movement was based on the following assumptions:

- The signalised intersection of Campbelltown Road x MacDonald Road provides a safer movement for all motorists when compared to the sign-controlled intersection of Zouch Road x Campbelltown Road
- Motorists heading to the Town Centre, Train Station or travelling north towards Edmondson Park and Liverpool would have a reduced travel distance, and
- The proposed upgrades to Campbelltown Road restrict the turning movements of Zouch Road to left-in, left-out only.

The network diagrams are shown in Appendix A, while modelling results for this sensitivity scenario are shown in the table below.

Intersection	Peak	DoS	Average Delay (s)	LoS
Zouch Road x	AM	0.171	17.7	В
Existing Access Driveway	PM	0.102	8.2	А
Zouch Road x	AM	0.622	24.0	В
Campbelltown Road	PM	0.525	12.2	А
Campbelltown Road x	AM	0.766	51.0	D
MacDonald Road	PM	0.860	56.0	D
MacDonald Road x	AM	0.724	37.1	С
General Boulevard	PM	0.487	33.5	С

TABLE 16: SENSITIVITY TESTING RESULTS

Based on the results shown above, it is evident that the remaining intersections have sufficient capacity to accommodate all background traffic from Zouch Road and can operate at LOS D or above during AM and PM peak periods.



7.5 Traffic Impact Summary

The northern approach of Zouch Road x Campbelltown Road already fails under existing conditions (surveyed 2022 volumes). Project-related demands will have minimal impact on this intersection, with all other key intersection operating acceptably (LoS D or better) during both peak periods.

This proposal offers an alternate route for vehicles travelling along Zouch Road to safely access Campbelltown Road. In this regard, it is expected that background network users would prefer to utilise the Site to access Campbelltown Road x MacDonald Road. Further sensitivity analysis of this scenario illustrates that there is sufficient capacity to accommodate the redirected background traffic, with all intersections operating at LOS D or better.

As such, the proposed traffic generated by the Site, and subsequent redistribution of background traffic is supportable based on the modelling undertaken as part of this DA. Further, the traffic modelling aligns with the broader Concept Plan modelling with respect to traffic generation, distribution, and intersection layouts.



8 Summary & Conclusion

8.1 Introduction & Development Summary

- Ason Group has been engaged by Landcom to prepare a TA report to support the proposed civil and builtform Development Applications (DAs) for Precinct 3 within Edmondson Park South (as identified within the Edmondson Park South Concept Plan (MP 10_0118)).
- A summary of the proposed yields is provided below:
 - The Site would provide a residential development, which comprises:
 - 90 terraces
 - 4 small and duplex sites, and
 - 156 residential lots

8.2 Key Findings

The key findings of this TA are:

- It is expected that between 250-500 car spaces will be provided to meet EPS DCP 2012 requirements. The provision of residential car parking spaces is expected to readily comply with the requirements.
- Trip generation rates adopted for this assessment are consistent with the traffic assessment undertaken in the approved MOD 4 RtS TIA Report and subsequent MOD 12 TA which adopted 0.62 vehicle trips per hour per dwelling, resulting in 155 vehicle movements per hour (veh/hr).
- However, a peak hourly traffic generation of 167 veh/hr has been adopted for modelling purposes to provide a conservative analysis, consistent with the potential for up to 270 dwellings previously contemplated.
- The Existing 2022 scenario and Existing 2022 + Development scenario both show Zouch Road x Campbelltown Road will operate at LOS F. All other intersections operate at LoS D or better during both peak periods.
- Sensitivity analysis has been undertaken noting that this DA proposes a new connection between Zouch Road and MacDonald Road which provides traffic an alternative route to access Campbelltown Road.
- Recognising that route choice is dynamic in nature, it is expected that redirected background traffic may access Campbelltown Road via MacDonald Road when the proposed connection is constructed. Results show that the network performance at the other three intersections can still operate at LOS D or better.
- Design of the access (to the garages), the garages themselves, and the on-street car parking areas shall be designed with reference to the Australian Standards. It is anticipated that the full design compliance with the relevant Australian Standards would form a standard Condition of Consent further to the approval, which will also provide for any design changes if required.
- The road network is expected to be designed to accommodate movements for vehicles up to 12.5m Heavy Rigid Vehicles (HRV's) to cater for occasional removalist vehicles and waste collection trucks; likely serviced by Council's 10m Garbage Truck.

8.3 Conclusion

In summary, the Proposal is supportable on traffic planning grounds and will not result in any adverse impacts on the surrounding road network. Indeed, the new connection proposed will help to mitigate existing network delays and provide overall network safety benefits to the community.



Appendix A. Network Diagrams



Figure 24: Existing Baseline Traffic (2022) AM



Figure 25: Existing Baseline Traffic (2022) PM





Figure 26: Existing Baseline (2022) + Development AM



Figure 27: Existing Baseline (2022) + Development PM





Figure 28: Sensitivity Scenario (2022) + Development AM



Figure 29: Sensitivity Scenario (2022) + Development PM



Appendix B. SIDRA Results





 Site: 1v [1. Zouch Road x Existing Access Driveway - 2022 -AM - Import (Site Folder: Existing Base (2022))]
 Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [Existing 2022 AM Peak (Network Folder: Existing 2022 Network)]

Zouch Road x Existing Access Driveway - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Derr Fl	nand lows	Ar Fl	rival ows	Deg. Satn	Aver. Delay	Level of Service	95% Bacł	c Of Queue	e Prop. Que	Eff. Stop	Aver. No. of	Aver. Speed
			[Total	HV]	[Total veb/b	HV]	vic	202		[Veh.	Dist]		Rate	Cycles	km/h
South: Zouch Road (355 m)											_	_	_	KIII/II	
1	L2	All MCs	12	9.1	12	9.1	0.018	5.6	LOS A	0.0	0.0	0.00	0.20	0.00	25.0
2	T1	All MCs	22	4.8	22	4.8	0.018	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	57.9
Appro	ach		34	6.3	34	6.3	0.018	1.9	NA	0.0	0.0	0.00	0.20	0.00	46.0
North: Zouch Road			500 m)												
8	T1	All MCs	329	0.6	329	0.6	0.173	0.0	LOS A	0.1	0.8	0.01	0.03	0.01	59.4
9	R2	All MCs	16	0.0	16	0.0	0.173	5.5	LOS A	0.1	0.8	0.01	0.03	0.01	34.7
Appro	ach		345	0.6	345	0.6	0.173	0.3	NA	0.1	0.8	0.01	0.03	0.01	57.4
West:	Existi	ing Acces	s Drive	way ((41 m)										
10	L2	All MCs	2	0.0	2	0.0	0.005	5.9	LOS A	0.0	0.1	0.16	0.94	0.16	46.6
12	R2	All MCs	2	50.0	2	50.0	0.005	9.6	LOS A	0.0	0.1	0.16	0.94	0.16	19.3
Appro	ach		4	25.0	4 2	25.0	0.005	7.8	LOS A	0.0	0.1	0.16	0.94	0.16	41.3
All Ve	hicles		383	1.4	383	1.4	0.173	0.5	NA	0.1	0.8	0.01	0.05	0.01	55.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Organisation: ASON GROUP PTY LTD | Licence: NETWORK / 1PC | Processed: Monday, 14 August 2023 9:06:22 AM Project: C:\Users\Emily Duan\Desktop\WORK\p1321 TA Ed park residential\2023.0714 Modelling comments from TfNSW + amend\03 Revised

Model/P1321m02_Precinct 3 (Resi), Edmondson Park (No Signals at General Blvd) - test with user-given phase time - Copy2023.8.9.sip9

V Site: 2 [2. Zouch Road x Campbelltown Road - 2022 -AM -Import (Site Folder: Existing Base (2022))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Existing 2022 AM Peak (Network Folder: Existing 2022 Network)]

Zouch Road x Campbelltown Road - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov	Turn	Mov	Dem F	nand	Ar	rival	Deg. Sata	Aver.	Level of	95% Bacł	COf Queue	e Prop.	Eff. Stop	Aver.	Aver.
		01833	[Total	HV 1	[Total	HV 1	Jaur	Delay	Ocivice	[Veh.	Dist 1	Que	Rate	Cvcles	Opeeu
			veh/h	%	veh/h	%	v/c	sec		veh	m			- 7	km/h
South	: Zouo	ch Road (215 m)												
1b	L3	All MCs	102	1.0	102	1.0	0.116	8.2	LOS A	0.5	3.3	0.55	0.74	0.55	48.5
2	T1	All MCs	2	0.0	2	0.0	0.177	62.8	LOS E	0.4	3.1	0.97	0.99	1.00	7.2
3a	R1	All MCs	4	0.0	4	0.0	0.177	114.4	LOS F	0.4	3.1	0.97	0.99	1.00	7.2
Appro	ach		108	1.0	108	1.0	0.177	13.4	LOS A	0.5	3.3	0.57	0.76	0.57	43.8
North	East:	Campbell	town R	oad ((680 m)									
24a	L1	All MCs	8	0.0	8	0.0	0.499	8.9	LOS A	4.1	30.0	0.30	0.35	0.52	53.3
25	T1	All MCs	600	6.0	600	6.0	0.499	3.4	LOS A	4.1	30.0	0.30	0.35	0.52	61.5
26b	R3	All MCs	53	4.0	53	4.0	0.499	66.8	LOS E	4.1	30.0	0.30	0.35	0.52	56.5
Appro	ach		661	5.7	661	5.7	0.499	8.5	NA	4.1	30.0	0.30	0.35	0.52	61.1
North	Zouc	h Road (355 m)												
7b	L3	All MCs	300	0.7	300	0.7	0.877	37.7	LOS C	6.7	47.0	0.97	1.49	2.92	22.6
8	T1	All MCs	9	0.0	9	0.0	1.046	210.9	LOS F	2.6	20.7	1.00	1.23	2.00	7.3
9a	R1	All MCs	12	27.3	12	27.3	1.046	282.7	LOS F	2.6	20.7	1.00	1.23	2.00	10.1
Appro	ach		321	1.6	321	1.6	1.046	51.7	LOS D	6.7	47.0	0.97	1.47	2.86	19.0
South	West:	Campbe	lltown F	Road	(500 m	n)									
30a	L1	All MCs	18	23.5	18	23.5	0.668	6.7	LOS A	3.3	23.7	0.13	0.18	0.31	64.6
31	T1	All MCs	1083	4.4	1083	4.4	0.668	0.9	LOS A	3.3	23.7	0.13	0.18	0.31	64.6
32b	R3	All MCs	68	4.6	68	4.6	0.668	22.5	LOS B	3.3	23.7	0.13	0.18	0.31	56.6
Appro	ach		1169	4.7	1169	4.7	0.668	2.2	NA	3.3	23.7	0.13	0.18	0.31	63.8
All Ve	hicles		2260	4.4	2260	4.4	1.046	11.6	NA	6.7	47.0	0.32	0.44	0.74	51.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 3 [3. Campbelltown Road x MacDonald Road - 2022 -AM -Import (Site Folder: Existing Base (2022))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Existing 2022 AM Peak (Network Folder: Existing 2022 Network)]

Campbelltown Road x MacDonald Road, 2026

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	95% Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ט ו		Class	FI Total	IOWS	FI [Total	IOWS	Sath	Delay	Service	[\/eh	Dist 1	Que	Stop Rate	NO. OT Cycles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		rtato	Cycles	km/h
South	Mac	Donald R	oad (36	60m)											
1	L2	All MCs	127	12.4	127	12.4	0.228	36.1	LOS C	5.3	41.0	0.75	0.76	0.75	23.2
2	T1	All MCs	246	3.0	246	3.0	*0.650	49.5	LOS D	13.5	96.6	0.97	0.82	0.97	19.2
3	R2	All MCs	309	8.2	309	8.2	*0.904	65.4	LOS E	17.8	133.6	1.00	1.12	1.30	23.3
Appro	ach		683	7.1	683	7.1	0.904	54.2	LOS D	17.8	133.6	0.95	0.95	1.08	22.0
East: (Camp	belltown	Road (320m	ı)										
4	L2	All MCs	259	7.3	259	7.3	0.406	27.2	LOS B	12.4	92.1	0.70	0.76	0.70	36.1
5	T1	All MCs	448	4.7	448	4.7	*0.482	27.3	LOS B	16.0	116.5	0.76	0.69	0.76	27.7
6	R2	All MCs	5	0.0	5	0.0	0.340	84.1	LOS F	0.4	2.6	1.00	0.63	1.00	12.2
Appro	ach		713	5.6	713	5.6	0.482	27.7	LOS B	16.0	116.5	0.74	0.71	0.74	31.5
North:	Macl	Donald Ro	oad (19	0m)											
7	L2	All MCs	28	0.0	28	0.0	0.080	32.6	LOS C	1.0	7.3	0.85	0.70	0.85	28.1
8	T1	All MCs	125	0.8	125	0.8	0.324	45.0	LOS D	6.3	44.6	0.90	0.72	0.90	25.4
9	R2	All MCs	85	1.2	85	1.2	0.558	64.3	LOS E	5.0	35.7	1.00	0.78	1.00	9.8
Appro	ach		239	0.9	239	0.9	0.558	50.4	LOS D	6.3	44.6	0.93	0.74	0.93	20.1
West:	Cam	obelltown	Road ((680n	n)										
10	L2	All MCs	187	0.6	187	0.6	*0.613	20.0	LOS B	19.4	139.2	0.76	0.81	0.76	43.0
11	T1	All MCs	1004	4.0	1004	4.0	0.613	21.4	LOS B	20.1	145.8	0.75	0.77	0.75	50.0
12	R2	All MCs	196	4.3	196	4.3	0.945	85.4	LOS F	14.1	102.7	1.00	1.06	1.48	26.4
Appro	ach		1387	3.6	1387	3.6	0.945	30.3	LOS C	20.1	145.8	0.79	0.82	0.86	43.4
All Vel	nicles		3022	4.6	3022	4.6	0.945	36.7	LOS C	20.1	145.8	0.83	0.82	0.89	34.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Peo	Pedestrian Movement Performance														
Mo		Dem.	Aver.	Level of	AVERAGE	BACK OF	Prop.	Eff.	Travel	Travel	Aver.				
ID	Crossing	Flow	Delay	Service	QUE	UE	Que	Stop	Time	Dist.	Speed				
					[Ped	Dist]		Rate							
		ped/h	sec		ped	m			sec	m	m/sec				
Sou	th: MacDonal	d Road ((360m)												
P1	Full	53	29.5	LOS C	0.1	0.1	0.70	0.70	46.1	20.0	0.43				

East: Campbelltow	n Road	(320m)											
P2 Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	70.9	20.0	0.28			
North: MacDonald Road (190m)													
P3 Full	53	16.2	LOS B	0.1	0.1	0.66	0.66	32.9	20.0	0.61			
West: Campbelltow	vn Roac	l (680m))										
P4 Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	70.9	20.0	0.28			
All Pedestrians	211	38.6	LOS D	0.2	0.2	0.82	0.82	55.2	20.0	0.36			

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

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Site: 4 [4. MacDonald Road x General Boulevard - 2022 -AM -Import (Site Folder: Existing Base (2022))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Existing 2022 AM Peak (Network Folder: Existing 2022 Network)]

MacDonald Road x General Boulevard - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Den F	nand lows	Ar Fl	rival lows	Deg. Satn	Aver. Delay	Level of Service	95% Back	Of Queue	e Prop. Que	Eff. Stop	Aver. No. of	Aver. Speed
			[Total veh/h	HV] %	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m		Rate	Cycles	km/h
South: MacDonald Road (190 m)															
2	T1	All MCs	379	2.2	379	2.2	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	60	0.0	60	0.0	0.051	6.4	LOS A	0.2	1.2	0.22	0.57	0.22	45.3
Appro	ach		439	1.9	439	1.9	0.099	0.9	NA	0.2	1.2	0.03	0.08	0.03	57.4
East:	Gene	ral Boule	vard (26	60m)											
4	L2	All MCs	60	1.8	60	1.8	0.054	8.4	LOS A	0.2	1.4	0.17	0.90	0.17	40.4
6	R2	All MCs	12	0.0	12	0.0	0.030	14.6	LOS B	0.1	0.7	0.56	0.93	0.56	40.2
Appro	ach		72	1.5	72	1.5	0.054	9.4	LOS A	0.2	1.4	0.24	0.90	0.24	40.4
North:	Mac	Donald R	oad (26	i0 m)											
7	L2	All MCs	27	0.0	27	0.0	0.054	5.5	LOS A	0.0	0.0	0.00	0.16	0.00	53.1
8	T1	All MCs	179	0.6	179	0.6	0.054	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	57.8
Appro	ach		206	0.5	206	0.5	0.054	0.7	NA	0.0	0.0	0.00	0.08	0.00	56.7
All Ve	hicles		717	1.5	717	1.5	0.099	1.7	NA	0.2	1.4	0.04	0.16	0.04	55.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Organisation: ASON GROUP PTY LTD | Licence: NETWORK / 1PC | Processed: Monday, 14 August 2023 9:06:22 AM Project: C:\Users\Emily Duan\Desktop\WORK\p1321 TA Ed park residential\2023.0714 Modelling comments from TfNSW + amend\03 Revised

 Site: 1v [1. Zouch Road x Existing Access Driveway - 2022 -PM - Import (Site Folder: Existing Base (2022))]
 Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [Existing 2022 PM Peak (Network Folder: Existing 2022 Network)]

Zouch Road x Existing Access Driveway - 2022 - PM

Assumptions: 2022 Survey Site Category: (None) Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Dem F [Total	nand lows HV]	Ar Fl [Total	rival lows HV]	Deg. Satn	Aver. Delay	Level of Service	95% Bac [Veh.	k Of Queue Dist]	e Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
South	: Zoud	ch Road ((355 m)	70	ven/n	70	V/C	Sec	_	ven	111	_	_	_	KIII/11
1	L2	All MCs	1	0.0	1	0.0	0.062	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	25.8
2	T1	All MCs	123	0.9	123	0.9	0.062	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Appro	ach		124	0.8	124	0.8	0.062	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
North:	Zouc	h Road (500 m)												
8	T1	All MCs	42	2.5	42	2.5	0.022	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	59.6
9	R2	All MCs	1	0.0	1	0.0	0.022	5.7	LOS A	0.0	0.0	0.01	0.02	0.01	34.8
Appro	ach		43	2.4	43	2.4	0.022	0.1	NA	0.0	0.0	0.01	0.02	0.01	58.5
West:	Existi	ng Acces	s Drive	way	(41 m)										
10	L2	All MCs	1	100. 0	1	100. 0	0.008	9.1	LOS A	0.0	0.2	0.25	0.89	0.25	42.1
12	R2	All MCs	6	0.0	6	0.0	0.008	6.1	LOS A	0.0	0.2	0.25	0.89	0.25	20.9
Appro	ach		7	14.3	7	14.3	0.008	6.5	LOS A	0.0	0.2	0.25	0.89	0.25	30.7
All Ve	hicles		175	1.8	175	1.8	0.062	0.3	NA	0.0	0.2	0.01	0.05	0.01	59.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 2 [2. Zouch Road x Campbelltown Road - 2022 -PM -Import (Site Folder: Existing Base (2022))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [Existing 2022 PM Peak (Network Folder: Existing 2022 Network)]

Zouch Road x Campbelltown Road - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov	Turn	Mov	Derr ⊑	nand	Ar FI	rival	Deg. Sata	Aver.	Level of	95% Back	Of Queue	e Prop.	Eff. Stop	Aver.	Aver.
		Class	[Total	HV 1	Total	HV 1	Jain	Delay	Service	[Veh	Dist 1	Que	Rate	Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			0,000	km/h
South	: Zoud	ch Road ((215 m)												
1b	L3	All MCs	63	0.0	63	0.0	0.122	11.8	LOS A	0.4	3.1	0.71	0.88	0.71	45.7
2	T1	All MCs	2	0.0	2	0.0	0.132	38.5	LOS C	0.2	2.1	0.96	0.98	0.97	6.8
3a	R1	All MCs	2	50.0	2	50.0	0.132	167.7	LOS F	0.2	2.1	0.96	0.98	0.97	6.8
Appro	ach		67	1.6	67	1.6	0.132	17.5	LOS B	0.4	3.1	0.73	0.88	0.73	41.1
North	East: (Campbel	ltown R	oad ((680 m))									
24a	L1	All MCs	16	0.0	16	0.0	0.630	6.3	LOS A	3.2	22.4	0.19	0.26	0.36	58.9
25	T1	All MCs	974	1.8	974	1.8	0.630	0.8	LOS A	3.2	22.4	0.19	0.26	0.36	67.1
26b	R3	All MCs	102	0.0	102	0.0	0.630	19.8	LOS B	3.2	22.4	0.19	0.26	0.36	65.1
Appro	ach		1092	1.6	1092	1.6	0.630	2.6	NA	3.2	22.4	0.19	0.26	0.36	66.9
North	: Zouc	h Road (355 m)												
7b	L3	All MCs	64	1.6	64	1.6	0.074	9.2	LOS A	0.3	1.9	0.53	0.75	0.53	42.8
8	T1	All MCs	3	0.0	3	0.0	0.131	38.9	LOS C	0.4	2.5	0.94	0.97	0.94	24.7
9a	R1	All MCs	7	0.0	7	0.0	0.131	49.2	LOS D	0.4	2.5	0.94	0.97	0.94	32.4
Appro	ach		75	1.4	75	1.4	0.131	14.4	LOS A	0.4	2.5	0.58	0.78	0.58	38.7
South	West:	Campbe	lltown I	Road	(500 m	ו)									
30a	L1	All MCs	16	0.0	16	0.0	0.430	6.4	LOS A	2.4	17.3	0.26	0.31	0.36	60.3
31	T1	All MCs	594	1.8	594	1.8	0.430	0.9	LOS A	2.4	17.3	0.26	0.31	0.36	60.3
32b	R3	All MCs	57	1.9	57	1.9	0.430	38.5	LOS C	2.4	17.3	0.26	0.31	0.36	54.3
Appro	ach		666	1.7	666	1.7	0.430	4.3	NA	2.4	17.3	0.26	0.31	0.36	59.5
All Ve	hicles		1900	1.7	1900	1.7	0.630	4.2	NA	3.2	22.4	0.25	0.32	0.38	63.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 3 [3. Campbelltown Road x MacDonald Road - 2022 -PM -Import (Site Folder: Existing Base (2022))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [Existing 2022 PM Peak (Network Folder: Existing 2022 Network)]

Campbelltown Road x MacDonald Road, 2026

Site Category: (None) Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Vehicle Movement Performance Level of 95% Back Of Queue Prop. Mov Turn Mov Demand Arrival Deg. Aver. Aver. Aver ID Class Satn Delay Service Speed Flows Que [Total HV] [Total HV] Cycles [Veh. Dist] Rate km/h /eh/h veh/h sec veh South: MacDonald Road (360m) 1 L2 All MCs 0.276 38.1 LOS C 7.0 50.1 0.78 0.77 0.78 22.5 163 1.9 163 1.9 2 T1 All MCs 199 4.8 199 4.8 *0.611 51.5 LOS D 11.0 79.9 0.98 0.81 0.98 18.7 3 R2 All MCs 311 4.1 311 4.1 *0.801 44.9 LOS D 15.7 114.0 0.98 0.90 1.10 28.9 Approach 673 3.8 673 3.8 0.801 45.2 LOS D 15.7 114.0 0.93 0.84 0.99 24.8 East: Campbelltown Road (320m) 4 12 All MCs 253 4.2 253 4.2 0.614 26.6 LOS B 21.3 153.2 0.83 0.79 0.83 34.3 5 All MCs 803 18 803 18 *0.728 36.0 LOS C 28.3 201.1 0.88 0.80 0.88 25.1 T1 ₁ 100. ₁ 100. R2 All MCs 6 0.071 86.7 LOS F 0.1 0.9 1.00 0.59 1.00 12.4 0 0 Approach 1057 2.5 1057 2.5 0.728 33.8 LOS C 28.3 201.1 0.87 0.80 0.87 28.0 North: MacDonald Road (190m) L2 All MCs LOS D 3.2 22.5 0.85 0.85 23.5 7 67 0.0 67 0.0 0.167 45.8 0.74 8 T1 All MCs 155 0.7 155 0.7 0.457 48.9 LOS D 8.2 58.1 0.94 0.77 0.94 24.2 9 R2 All MCs 126 0.0 126 0.0 0.510 58.1 LOS E 7.1 49.5 0.98 0.79 0.98 10.6 0.94 Approach 348 0.3 348 0.3 0.510 51.6 LOS D 8.2 58.1 0.94 0.77 19.6 West: Campbelltown Road (680m) 10 49.0 L2 All MCs 118 1.8 118 1.8 0.231 13.8 LOS A 6.9 0.52 0.59 0.52 48.2 50.9 0.53 11 T1 All MCs 380 1.1 380 1.1 0.231 15.3 LOS B 7.2 0.53 0.50 54.8 70.2 12 R2 All MCs 162 3.9 162 3.9 *0.728 64.7 LOS E 9.7 1.00 0.86 1.10 30.7 Approach 660 1.9 660 1.9 0.728 27.2 LOS B 9.7 70.2 0.64 0.61 0.67 44.6 All Vehicles 2738 2.4 2738 2.4 0.801 37.3 LOS C 28.3 201.1 0.84 0.76 0.86 30.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Peo	destrian Mov	vement	Perform	nance							
Mov ID	/ Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped Dist]		Prop. Que	Eff. Stop	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m		Rate	sec	m	m/sec
Sou	th: MacDonal	d Road ((360m)								
P1	Full	53	30.2	LOS D	0.1	0.1	0.71	0.71	46.8	20.0	0.43

East: Campbelltow	n Road	(320m)								
P2 Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	70.9	20.0	0.28
North: MacDonald	Road (1	l90m)								
P3 Full	53	18.2	LOS B	0.1	0.1	0.55	0.55	34.9	20.0	0.57
West: Campbelltow	vn Roac	l (680m))							
P4 Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	70.9	20.0	0.28
All Pedestrians	211	39.2	LOS D	0.2	0.2	0.79	0.79	55.9	20.0	0.36

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

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Site: 4 [4. MacDonald Road x General Boulevard - 2022 -PM -Import (Site Folder: Existing Base (2022))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Existing 2022 PM Peak (Network Folder: Existing 2022 Network)]

MacDonald Road x General Boulevard - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Dem Fl [Total	nand Iows HV]	Ar Fl [Total]	rival ows HV]	Deg. Satn	Aver. Delay	Level of Service	95% Back [Veh.	Of Queue Dist]	e Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
South	Mac	Donald F	veh/h load (19	% 90 m)	veh/h	%	V/C	sec	_	veh	m	-			km/h
2	Т1		263	4.8	263	48	0.071	0.0		0.0	0.0	0.00	0.00	0.00	60.0
2	 ₽2		66	0.0	66	0.0	0.071	7.4		0.0	1.6	0.00	0.00	0.00	44.2
0	1\2	All MCS	00	0.0	00	0.0	0.070	1.4		0.2	1.0	0.30	0.04	0.00	44.2
Appro	acn		329	3.8	329	3.8	0.071	1.5	NA	0.2	1.6	0.07	0.13	0.07	55.9
East:	Gener	al Boule	vard (26	60 m))										
4	L2	All MCs	43	2.4	43	2.4	0.040	8.6	LOS A	0.1	1.0	0.20	0.89	0.20	40.4
6	R2	All MCs	5	0.0	5	0.0	0.016	16.3	LOS B	0.1	0.4	0.63	0.91	0.63	39.0
Appro	ach		48	2.2	48	2.2	0.040	9.4	LOS A	0.1	1.0	0.24	0.89	0.24	40.1
North:	Mac	Donald R	oad (26	60 m)											
7	L2	All MCs	109	1.0	109	1.0	0.108	5.6	LOS A	0.0	0.0	0.00	0.32	0.00	50.9
8	T1	All MCs	305	0.0	305	0.0	0.108	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	56.8
Appro	ach		415	0.3	415	0.3	0.108	1.5	NA	0.0	0.0	0.00	0.16	0.00	54.2
All Vel	nicles		793	1.9	793	1.9	0.108	2.0	NA	0.2	1.6	0.04	0.19	0.04	54.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Model/P1321m02_Precinct 3 (Resi), Edmondson Park (No Signals at General Blvd) - test with user-given phase time - Copy2023.8.9.sip9

46 | P1321r01v3 DA TA_Precinct 3 (Residential), Edmondson Park



Site: 1v [1. Zouch Road x Existing Access Driveway -Existing + Development -AM (Site Folder: Existing Base (2022) + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Existing 2022 + Development AM Peak (Network Folder: Existing 2022 + Development Network)]

Zouch Road x Existing Access Driveway - 2022 - AM

Assumptions: Existing Base (2022) + Development Site Category: (None) Stop (Two-Way)

Vehic	le M	ovement	Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	95% Back	COf Queue	Prop.	Eff.	Aver.	Aver.
U		Class	H Total]	IOWS H\/1	l-l I Total	IOWS H\/ 1	Satn	Delay	Service	[\/eh	Diet 1	Que	Stop Rate	No. of	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		rtato	Cycleo	km/h
South	: Zoud	ch Road (355 m)												
1	L2	All MCs	12	9.1	12	9.1	0.019	5.6	LOS A	0.0	0.1	0.04	0.23	0.04	24.9
2	T1	All MCs	22	4.8	22	4.8	0.019	0.0	LOS A	0.0	0.1	0.04	0.23	0.04	57.6
3	R2	All MCs	1	0.0	1	0.0	0.019	9.1	LOS A	0.0	0.1	0.04	0.23	0.04	52.2
Appro	ach		35	6.1	35	6.1	0.019	2.2	NA	0.0	0.1	0.04	0.23	0.04	45.9
East:	Site A	ccess													
4	L2	All MCs	1	0.0	1	0.0	0.003	6.6	LOS A	0.0	0.1	0.39	0.56	0.39	39.5
5	T1	All MCs	1	0.0	1	0.0	0.003	5.8	LOS A	0.0	0.1	0.39	0.56	0.39	19.0
6	R2	All MCs	1	0.0	1	0.0	0.003	7.4	LOS A	0.0	0.1	0.39	0.56	0.39	49.1
Appro	ach		3	0.0	3	0.0	0.003	6.6	LOS A	0.0	0.1	0.39	0.56	0.39	35.4
North:	Zouc	h Road (5	500 m)												
7	L2	All MCs	1	0.0	1	0.0	0.178	5.5	LOS A	0.1	0.8	0.01	0.03	0.01	56.1
8	T1	All MCs	329	0.6	329	0.6	0.178	0.0	LOS A	0.1	0.8	0.01	0.03	0.01	59.4
9	R2	All MCs	16	0.0	16	0.0	0.178	5.5	LOS A	0.1	0.8	0.01	0.03	0.01	46.7
Appro	ach		346	0.6	346	0.6	0.178	0.3	NA	0.1	0.8	0.01	0.03	0.01	58.6
West:	Existi	ng Acces	s Drive	way ((41 m)										
10	L2	All MCs	2	0.0	2	0.0	0.007	5.9	LOS A	0.0	0.2	0.19	0.96	0.19	46.4
11	T1	All MCs	2	50.0	2	50.0	0.007	10.3	LOS A	0.0	0.2	0.19	0.96	0.19	29.5
12	R2	All MCs	1	0.0	1	0.0	0.007	7.8	LOS A	0.0	0.2	0.19	0.96	0.19	18.8
Appro	ach		5	20.0	5	20.0	0.007	8.1	LOS A	0.0	0.2	0.19	0.96	0.19	37.9
All Ve	hicles		389	1.4	389	1.4	0.178	0.6	NA	0.1	0.8	0.02	0.06	0.02	56.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 2 [2. Zouch Road x Campbelltown Road - Existing + Development - AM (Site Folder: Existing Base (2022) + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Existing 2022 + Development AM Peak (Network Folder: Existing 2022 + Development Network)]

Zouch Road x Campbelltown Road - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehic	le M	ovement	Perfc	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	95% Bacł	c Of Queue	Prop.	Eff.	Aver.	Aver.
ID		Class		OWS 山い1	- Total]	OWS 山\/1	Satn	Delay	Service	[\/ob	Diet 1	Que	Stop	No. of	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		Tate	Cycles	km/h
South	Zou	ch Road (215 m)												
1b	L3	All MCs	102	1.0	102	1.0	0.116	8.2	LOS A	0.5	3.3	0.55	0.74	0.55	48.5
2	T1	All MCs	2	0.0	2	0.0	0.202	65.0	LOS E	0.5	3.5	0.98	1.00	1.01	6.4
3a	R1	All MCs	4	0.0	4	0.0	0.202	136.5	LOS F	0.5	3.5	0.98	1.00	1.01	6.4
Appro	ach		108	1.0	108	1.0	0.202	14.3	LOS A	0.5	3.5	0.57	0.75	0.57	43.1
North	East:	Campbell	town R	oad ((680 m))									
24a	L1	All MCs	8	0.0	8	0.0	0.502	8.8	LOS A	4.1	29.9	0.30	0.35	0.51	53.3
25	T1	All MCs	604	5.9	604	5.9	0.502	3.3	LOS A	4.1	29.9	0.30	0.35	0.51	61.5
26b	R3	All MCs	53	4.0	53	4.0	0.502	67.0	LOS E	4.1	29.9	0.30	0.35	0.51	56.6
Appro	ach		665	5.7	665	5.7	0.502	8.4	NA	4.1	29.9	0.30	0.35	0.51	61.2
North:	Zouc	h Road (3	355 m)												
7b	L3	All MCs	405	0.5	405	0.5	1.182	197.2	LOS F	45.7	321.5	1.00	3.95	12.47	6.2
8	T1	All MCs	9	0.0	9	0.0	1.003	189.8	LOS F	2.4	18.6	1.00	1.19	1.84	7.7
9a	R1	All MCs	12	27.3	12	27.3	1.003	267.2	LOS F	2.4	18.6	1.00	1.19	1.84	10.7
Appro	ach		426	1.2	426	1.2	1.182	198.9	LOS F	45.7	321.5	1.00	3.81	11.95	6.4
South	West:	Campbel	lltown F	Road	(500 m	ו)									
30a	L1	All MCs	18	23.5	18	23.5	0.668	6.7	LOS A	3.3	24.3	0.13	0.18	0.31	64.5
31	T1	All MCs	1084	4.4	1084	4.4	0.668	0.9	LOS A	3.3	24.3	0.13	0.18	0.31	64.5
32b	R3	All MCs	68	4.6	68	4.6	0.668	22.7	LOS B	3.3	24.3	0.13	0.18	0.31	56.6
Appro	ach		1171	4.7	1171	4.7	0.668	2.3	NA	3.3	24.3	0.13	0.18	0.31	63.8
All Vel	nicles	i.	2371	4.2	2371	4.2	1.182	39.9	NA	45.7	321.5	0.35	0.91	2.47	32.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 3 [3. Campbelltown Road x MacDonald Road - Existing + Development - AM (Site Folder: Existing Base (2022) + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

 Network: N101 [Existing 2022 + Development AM Peak (Network Folder: Existing 2022 + Development Network)]

Campbelltown Road x MacDonald Road, 2026 Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehic	le M	ovement	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	95% Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ID		Class	FI Total	lows HV 1	H Total]	lows HV 1	Satn	Delay	Service	[Veh	Dist 1	Que	Stop Rate	No. of Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South	: Mac	Donald R	oad (36	60m)											
1	L2	All MCs	127	12.4	127	12.4	0.181	32.1	LOS C	5.3	41.1	0.66	0.74	0.66	24.9
2	T1	All MCs	247	3.0	247	3.0	0.538	51.0	LOS D	14.7	105.7	0.93	0.80	0.93	18.8
3	R2	All MCs	309	8.2	309	8.2	*0.725	58.3	LOS E	19.6	147.2	0.98	0.86	0.99	24.9
Appro	ach		684	7.1	684	7.1	0.725	50.8	LOS D	19.6	147.2	0.90	0.81	0.90	22.9
East:	Camp	belltown l	Road (320m	ı)										
4	L2	All MCs	259	7.3	259	7.3	0.558	36.7	LOS C	18.2	134.4	0.87	0.82	0.87	28.8
5	T1	All MCs	448	4.7	448	4.7	0.662	50.4	LOS D	22.4	163.2	0.92	0.81	0.92	19.6
6	R2	All MCs	27	0.0	27	0.0	*0.344	81.4	LOS F	1.9	13.6	1.00	0.72	1.00	12.6
Appro	ach		735	5.4	735	5.4	0.662	46.7	LOS D	22.4	163.2	0.91	0.81	0.91	23.1
North:	Mac	Donald Ro	oad(19	0m)											
7	L2	All MCs	126	0.0	126	0.0	0.366	58.5	LOS E	7.6	53.1	0.92	0.78	0.92	20.3
8	T1	All MCs	129	0.8	129	0.8	*0.586	65.4	LOS E	8.6	60.7	1.00	0.80	1.00	20.3
9	R2	All MCs	89	1.2	89	1.2	0.402	67.0	LOS E	5.8	40.8	0.97	0.77	0.97	9.5
Appro	ach		345	0.6	345	0.6	0.586	63.3	LOS E	8.6	60.7	0.96	0.79	0.96	17.8
West:	Cam	pbelltown	Road ((680n	n)										
10	L2	All MCs	188	0.6	<mark>180</mark>	0.6	0.731	30.7	LOS C	32.0	229.6	0.90	0.83	0.90	34.0
11	T1	All MCs	1004	4.0	<mark>963</mark>	4.1	*0.731	38.2	LOS C	32.6	236.1	0.90	0.82	0.90	41.1
12	R2	All MCs	196	4.3	<mark>188</mark>	4.5	0.674	68.1	LOS E	12.4	90.1	1.00	0.83	1.01	29.9
Appro	ach		1388	3.6	<mark>1331</mark>	3.7	0.731	41.4	LOS C	32.6	236.1	0.91	0.82	0.92	38.2
All Ve	hicles		3153	4.4	<mark>3095</mark>	4.5	0.731	47.2	LOS D	32.6	236.1	0.91	0.81	0.92	29.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestriar	n Movement	Perform	nance							
Mov ID Crossir	Dem. ng Flow	Aver. Delay	Level of Service	AVERAGE QUE	BACK OF	Prop. Que	Eff. Stop	Travel Time	Travel Dist.	Aver. Speed
	nod/b			[Ped	Dist]		Rate		~	mlaaa
South: Macl	Donald Road	(360m)	_	peu		_	_	Sec		m/sec
P1 Full	53	44.9	LOS E	0.2	0.2	0.80	0.80	61.6	20.0	0.32

East: Campbelltow	n Road	(320m)								
P2 Full	53	64.3	LOS F	0.2	0.2	0.96	0.96	80.9	20.0	0.25
North: MacDonald	Road(1	90m)								
P3 Full	53	32.3	LOS D	0.1	0.1	0.68	0.68	49.0	20.0	0.41
West: Campbelltov	vn Road	l (680m))							
P4 Full	53	56.8	LOS E	0.2	0.2	0.90	0.90	73.5	20.0	0.27
All Pedestrians	211	49.6	LOS E	0.2	0.2	0.84	0.84	66.2	20.0	0.30

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

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Site: 4 [4. MacDonald x General Boulevard - Existing + Development - AM (Site Folder: Existing Base (2022) + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Existing 2022 + Development AM Peak (Network Folder: Existing 2022 + Development Network)]

MacDonald x General Boulevard - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Stop (Two-Way)

Vehic	le M	ovement	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	95% Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ID		Class	H Intel I	lows 山\/ 1	 Total	OWS H\/1	Satn	Delay	Service	[\/eh	Diet 1	Que	Stop Rate	No. of	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		Tale	Cycles	km/h
South	Mac	Donald R	oad (19	90 m)											
1	L2	All MCs	25	0.0	25	0.0	0.102	5.5	LOS A	0.0	0.0	0.00	0.08	0.00	51.8
2	T1	All MCs	371	2.3	<mark>364</mark>	2.3	0.102	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.2
3	R2	All MCs	60	0.0	<mark>59</mark>	0.0	0.050	6.4	LOS A	0.2	1.2	0.22	0.57	0.22	45.4
Appro	ach		456	1.8	<mark>448</mark>	1.9	0.102	1.2	NA	0.2	1.2	0.03	0.11	0.03	56.6
East:	Gene	ral Boulev	/ard (26	60 m)											
4	L2	All MCs	60	1.8	60	1.8	0.084	8.4	LOS A	0.3	2.2	0.24	0.87	0.24	38.6
5	T1	All MCs	9	0.0	9	0.0	0.084	18.0	LOS B	0.3	2.2	0.24	0.87	0.24	41.0
6	R2	All MCs	12	0.0	12	0.0	0.043	18.4	LOS B	0.1	1.0	0.64	0.98	0.64	37.3
Appro	ach		81	1.3	81	1.3	0.084	11.0	LOS A	0.3	2.2	0.30	0.89	0.30	38.6
North:	Macl	Donald Ro	oad (26	60 m)											
7	L2	All MCs	27	0.0	27	0.0	0.054	5.5	LOS A	0.0	0.0	0.00	0.16	0.00	53.1
8	T1	All MCs	179	0.6	179	0.6	0.054	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	57.8
9	R2	All MCs	9	0.0	9	0.0	0.009	6.8	LOS A	0.0	0.3	0.39	0.56	0.39	43.4
Appro	ach		216	0.5	216	0.5	0.054	1.0	NA	0.0	0.3	0.02	0.10	0.02	55.6
West:	Site A	Access (E	ast)												
10	L2	All MCs	14	0.0	14	0.0	0.056	8.8	LOS A	0.2	1.5	0.47	0.83	0.47	38.0
11	T1	All MCs	14	0.0	14	0.0	0.056	17.6	LOS B	0.2	1.5	0.47	0.83	0.47	38.0
12	R2	All MCs	105	0.0	105	0.0	0.424	25.2	LOS B	1.9	13.4	0.77	1.08	1.06	18.0
Appro	ach		133	0.0	133	0.0	0.424	22.7	LOS B	1.9	13.4	0.71	1.03	0.94	22.8
All Vel	nicles		885	1.2	<mark>877</mark>	1.2	0.424	5.3	NA	1.9	13.4	0.15	0.32	0.19	48.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 1v [1. Zouch Road x Existing Access Driveway -Existing + Development -PM (Site Folder: Existing Base (2022) + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Existing 2022 + Development PM Peak (Network Folder: Existing 2022 + Development Network)]

Zouch Road x Existing Access Driveway - 2022 - PM

Assumptions: Existing Base (2022) + Development Site Category: (None) Stop (Two-Way)

Vehic	le M	ovement	Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	95% Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ט ו		Class	F Total]	IOWS HV 1	ا⊦ Total]	lows HV 1	Sath	Delay	Service	[Veh	Dist 1	Que	Stop Rate	NO. OT Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South	: Zouo	ch Road (355 m)												
1	L2	All MCs	1	0.0	1	0.0	0.063	5.5	LOS A	0.0	0.1	0.00	0.01	0.00	25.8
2	T1	All MCs	123	0.9	123	0.9	0.063	0.0	LOS A	0.0	0.1	0.00	0.01	0.00	59.9
3	R2	All MCs	1	0.0	1	0.0	0.063	5.5	LOS A	0.0	0.1	0.00	0.01	0.00	55.1
Appro	ach		125	0.8	125	0.8	0.063	0.1	NA	0.0	0.1	0.00	0.01	0.00	59.5
East:	Site A	ccess													
4	L2	All MCs	1	0.0	1	0.0	0.003	5.6	LOS A	0.0	0.1	0.18	0.52	0.18	41.3
5	T1	All MCs	1	0.0	1	0.0	0.003	4.8	LOS A	0.0	0.1	0.18	0.52	0.18	19.3
6	R2	All MCs	1	0.0	1	0.0	0.003	6.2	LOS A	0.0	0.1	0.18	0.52	0.18	49.9
Appro	ach		3	0.0	3	0.0	0.003	5.6	LOS A	0.0	0.1	0.18	0.52	0.18	36.2
North:	Zouc	h Road (500 m)												
7	L2	All MCs	1	0.0	1	0.0	0.023	5.5	LOS A	0.0	0.1	0.02	0.03	0.02	56.1
8	T1	All MCs	42	2.5	42	2.5	0.023	0.0	LOS A	0.0	0.1	0.02	0.03	0.02	59.3
9	R2	All MCs	1	0.0	1	0.0	0.023	5.8	LOS A	0.0	0.1	0.02	0.03	0.02	46.7
Appro	ach		44	2.4	44	2.4	0.023	0.3	NA	0.0	0.1	0.02	0.03	0.02	58.8
West:	Exist	ing Acces	s Drive	way ((41 m)										
10	L2	All MCs	1	100.	1	100.	0.009	9.1	LOS A	0.0	0.2	0.27	0.90	0.27	42.2
				0		0									
11	T1	All MCs	6	0.0	6	0.0	0.009	6.2	LOS A	0.0	0.2	0.27	0.90	0.27	38.4
12	R2	All MCs	1	0.0	1	0.0	0.009	6.3	LOS A	0.0	0.2	0.27	0.90	0.27	21.0
Appro	ach		8	12.5	8	12.5	0.009	6.5	LOS A	0.0	0.2	0.27	0.90	0.27	38.5
All Ve	hicles		181	1.7	181	1.7	0.063	0.5	NA	0.0	0.2	0.02	0.07	0.02	58.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Organisation: ASON GROUP PTY LTD | Licence: NETWORK / 1PC | Processed: Monday, 14 August 2023 9:06:18 AM Project: C:\Users\Emily Duan\Desktop\WORK\p1321 TA Ed park residential\2023.0714 Modelling comments from TfNSW + amend\03 Revised Model\P1321m02_Precinct 3 (Resi), Edmondson Park (No Signals at General Blvd) - test with user-given phase time - Copy2023.8.9.sip9

V Site: 2 [2. Zouch Road x Campbelltown Road - Existing + Development - PM (Site Folder: Existing Base (2022) + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Existing 2022 + Development PM Peak (Network Folder: Existing 2022 + Development Network)]

Zouch Road x Campbelltown Road - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehic	le M	ovement	Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	95% Back	Of Queue	Prop.	Eff.	Aver.	Aver.
טו		Class	F Total]	lows HV 1	Fl [Total	lows HV/1	Satn	Delay	Service	[Veh	Dist 1	Que	Stop Rate	No. of Cycles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South	: Zouo	ch Road (2	215 m)												
1b	L3	All MCs	63	0.0	63	0.0	0.121	11.8	LOS A	0.4	3.1	0.71	0.87	0.71	45.8
2	T1	All MCs	2	0.0	2	0.0	0.127	37.5	LOS C	0.2	2.1	0.96	0.98	0.97	7.1
3a	R1	All MCs	2	50.0	2	50.0	0.127	161.5	LOS F	0.2	2.1	0.96	0.98	0.97	7.1
Appro	ach		67	1.6	67	1.6	0.127	17.3	LOS B	0.4	3.1	0.72	0.88	0.72	41.2
North	East:	Campbellt	town R	oad ((680 m))									
24a	L1	All MCs	16	0.0	16	0.0	0.631	6.3	LOS A	3.1	22.2	0.19	0.26	0.36	58.9
25	T1	All MCs	975	1.8	975	1.8	0.631	0.8	LOS A	3.1	22.2	0.19	0.26	0.36	67.1
26b	R3	All MCs	102	0.0	102	0.0	0.631	19.9	LOS B	3.1	22.2	0.19	0.26	0.36	65.1
Appro	ach		1093	1.6	1093	1.6	0.631	2.6	NA	3.1	22.2	0.19	0.26	0.36	66.9
North:	Zouc	h Road (3	355 m)												
7b	L3	All MCs	64	1.6	64	1.6	0.075	9.2	LOS A	0.3	1.9	0.53	0.75	0.53	42.8
8	T1	All MCs	3	0.0	3	0.0	0.129	38.3	LOS C	0.3	2.4	0.94	0.97	0.94	25.0
9a	R1	All MCs	7	0.0	7	0.0	0.129	48.2	LOS D	0.3	2.4	0.94	0.97	0.94	32.6
Appro	ach		75	1.4	75	1.4	0.129	14.3	LOS A	0.3	2.4	0.59	0.78	0.59	38.8
South	West:	Campbel	lltown I	Road	(500 m	ו)									
30a	L1	All MCs	16	0.0	16	0.0	0.429	6.4	LOS A	2.4	17.2	0.25	0.31	0.36	60.4
31	T1	All MCs	596	1.8	596	1.8	0.429	0.9	LOS A	2.4	17.2	0.25	0.31	0.36	60.4
32b	R3	All MCs	57	1.9	57	1.9	0.429	38.4	LOS C	2.4	17.2	0.25	0.31	0.36	54.3
Appro	ach		668	1.7	668	1.7	0.429	4.2	NA	2.4	17.2	0.25	0.31	0.36	59.6
All Ve	hicles		1903	1.7	1903	1.7	0.631	4.2	NA	3.1	22.2	0.25	0.32	0.38	63.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Organisation: ASON GROUP PTY LTD | Licence: NETWORK / 1PC | Processed: Monday, 14 August 2023 9:06:18 AM

Site: 3 [3. Campbelltown Road x MacDonald Road - Existing + Development -PM (Site Folder: Existing Base (2022) + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [Existing 2022 + Development PM Peak (Network Folder: Existing 2022 + Development Network)]

Campbelltown Road x MacDonald Road, 2026 Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehic	le M	ovement	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	95% Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ID		Class	H Total	lows HV 1	H Total آ	ows HV/1	Satn	Delay	Service	[Veh	Dist 1	Que	Stop Rate	No. of Cycles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		Rate	- Cycles	km/h
South	Mac	Donald R	oad (36	60m)											
1	L2	All MCs	163	1.9	163	1.9	0.262	41.3	LOS C	8.0	56.6	0.76	0.77	0.76	21.3
2	T1	All MCs	201	4.7	201	4.7	0.540	55.8	LOS D	12.4	90.3	0.95	0.80	0.95	17.7
3	R2	All MCs	311	4.1	311	4.1	*0.814	67.0	LOS E	21.5	155.8	1.00	0.92	1.10	23.1
Appro	ach		675	3.7	675	3.7	0.814	57.4	LOS E	21.5	155.8	0.93	0.85	0.98	21.4
East: (Camp	belltown	Road (320m	ı)										
4	L2	All MCs	253	4.2	253	4.2	0.687	28.5	LOS C	27.2	195.6	0.89	0.83	0.89	30.3
5	T1	All MCs	803	1.8	803	1.8	*0.814	54.4	LOS D	35.7	253.9	0.94	0.87	0.96	20.4
6	R2	All MCs	107	1.0	107	1.0	0.511	81.8	LOS F	7.1	50.0	0.99	0.79	0.99	14.0
Appro	ach		1163	2.3	1163	2.3	0.814	51.3	LOS D	35.7	253.9	0.94	0.85	0.95	22.3
North:	Macl	Donald Ro	oad (19	0m)											
7	L2	All MCs	91	0.0	91	0.0	0.190	48.0	LOS D	4.8	33.6	0.82	0.75	0.82	22.9
8	T1	All MCs	156	0.7	156	0.7	*0.704	67.5	LOS E	10.7	75.2	1.00	0.86	1.06	19.9
9	R2	All MCs	127	0.0	127	0.0	0.533	67.4	LOS E	8.3	58.3	0.98	0.80	0.98	9.4
Appro	ach		374	0.3	374	0.3	0.704	62.7	LOS E	10.7	75.2	0.95	0.81	0.98	17.3
West:	Cam	obelltown	Road ((680n	n)										
10	L2	All MCs	120	1.8	120	1.8	0.343	30.2	LOS C	11.7	82.8	0.75	0.72	0.75	35.3
11	T1	All MCs	380	1.1	380	1.1	0.343	35.0	LOS C	12.2	85.9	0.75	0.67	0.75	42.8
12	R2	All MCs	162	3.9	162	3.9	*0.796	77.6	LOS F	11.6	84.0	1.00	0.90	1.16	27.9
Appro	ach		662	1.9	662	1.9	0.796	44.5	LOS D	12.2	85.9	0.81	0.73	0.85	36.5
All Vel	nicles		2874	2.3	2874	2.3	0.814	52.7	LOS D	35.7	253.9	0.91	0.82	0.94	25.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pe	destrian Mov	vement	Perform	nance							
Мо	/	Dem.	Aver.	Level of	AVERAGE	BACK OF	Prop.	Eff.	Travel	Travel	Aver.
ID	Crossing	Flow	Delay	Service	QUE	UE	Que	Stop	Time	Dist.	Speed
					[Ped	Dist]		Rate			
		ped/h	sec		ped	m			sec	m	m/sec
Sou	ith: MacDonal	d Road ((360m)								
P1	Full	53	36.5	LOS D	0.2	0.2	0.72	0.72	53.2	20.0	0.38

East: Campbelltown Road (320m)														
P2 Full	53	64.3	LOS F	0.2	0.2	0.96	0.96	80.9	20.0	0.25				
North: MacDonald Road (190m)														
P3 Full	53	35.8	LOS D	0.1	0.1	0.72	0.72	52.5	20.0	0.38				
West: Campbelltov	vn Roac	l (680m))											
P4 Full	53	62.4	LOS F	0.2	0.2	0.94	0.94	79.0	20.0	0.25				
All Pedestrians	211	49.7	LOS E	0.2	0.2	0.84	0.84	66.4	20.0	0.30				

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

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Site: 4 [4. MacDonald Road x General Boulevard - Existing + Development -PM (Site Folder: Existing Base (2022) + Development)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Existing 2022 + Development PM Peak (Network Folder: Existing 2022 + Development Network)]

MacDonald Road x General Boulevard - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Stop (Two-Way)

Vehic	le Mo	ovemen	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	hand	Ar	rival	Deg.	Aver.	Level of	95% Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ט ו		Class	Fi [Total	IOWS HV 1	۲۱ Total آ	ows HV 1	Sath	Delay	Service	[Veh.	Dist 1	Que	Stop Rate	NO. OT Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			- ,	km/h
South	Mac	Donald R	oad (19	90 m))										
1	L2	All MCs	99	0.0	99	0.0	0.097	5.5	LOS A	0.0	0.0	0.00	0.32	0.00	52.8
2	T1	All MCs	263	4.8	263	4.8	0.097	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	57.9
3	R2	All MCs	66	0.0	66	0.0	0.070	7.4	LOS A	0.2	1.6	0.36	0.64	0.36	44.2
Appro	ach		428	2.9	428	2.9	0.097	2.4	NA	0.2	1.6	0.06	0.23	0.06	54.0
East: (Gene	ral Boule	/ard (26	60 m))										
4	L2	All MCs	43	2.4	43	2.4	0.125	8.6	LOS A	0.5	3.3	0.42	0.83	0.42	34.4
5	T1	All MCs	20	0.0	20	0.0	0.125	23.5	LOS B	0.5	3.3	0.42	0.83	0.42	45.4
6	R2	All MCs	5	0.0	5	0.0	0.024	21.1	LOS B	0.1	0.5	0.70	0.97	0.70	35.6
Appro	ach		68	1.5	68	1.5	0.125	13.9	LOS A	0.5	3.3	0.44	0.84	0.44	39.4
North:	Mac	Donald R	oad (26	60 m)											
7	L2	All MCs	109	1.0	109	1.0	0.108	5.6	LOS A	0.0	0.0	0.00	0.32	0.00	50.9
8	T1	All MCs	305	0.0	305	0.0	0.108	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	56.8
9	R2	All MCs	20	0.0	20	0.0	0.019	6.8	LOS A	0.1	0.5	0.38	0.57	0.38	49.6
Appro	ach		435	0.2	435	0.2	0.108	1.7	NA	0.1	0.5	0.02	0.17	0.02	53.7
West:	Site A	Access (E	ast)												
10	L2	All MCs	5	0.0	5	0.0	0.028	8.4	LOS A	0.1	0.7	0.45	0.77	0.45	44.0
11	T1	All MCs	5	0.0	5	0.0	0.028	22.3	LOS B	0.1	0.7	0.45	0.77	0.45	44.0
12	R2	All MCs	25	0.0	25	0.0	0.123	23.4	LOS B	0.4	2.8	0.74	1.00	0.74	35.2
Appro	ach		36	0.0	36	0.0	0.123	21.0	LOS B	0.4	2.8	0.66	0.93	0.66	38.1
All Vel	nicles		967	1.5	967	1.5	0.125	3.6	NA	0.5	3.3	0.09	0.28	0.09	51.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 1v [1. Zouch Road x Existing Access Driveway -Sensiivity Base (2022) + Development (LILO @ Zouch) -AM (Site Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [Sensivity Base (2022) + Development (LILO @ Zouch) AM Peak (Network Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))]

Zouch Road x Existing Access Driveway - 2022 - AM

Assumptions: Existing Base (2022) + Development Site Category: (None) Stop (Two-Way)

Vehic	le M	ovemen	t Perfo	orma	nce										
Mov	Turn	Mov	Den	hand	Ari	rival	Deg.	Aver.	Level of	95% Bac	ck Of Queue	Prop.	Eff.	Aver.	Aver.
ט ו		Class	٦ Total]	iows HV]	۱۱ Total I]	ows HV 1	Sam	Delay	Service	[Veh.	Dist]	Que	Rate	Cycles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			, in the second	km/h
South	Zou	ch Road ((355 m))											
1	L2	All MCs	12	9.1	12	9.1	0.022	5.6	LOS A	0.1	0.4	0.14	0.28	0.14	24.6
2	T1	All MCs	22	4.8	22	4.8	0.022	0.0	LOS A	0.1	0.4	0.14	0.28	0.14	56.9
3	R2	All MCs	2	100. 0	2 1	100. 0	0.022	17.7	LOS B	0.1	0.4	0.14	0.28	0.14	44.9
Appro	ach		36	11.8	36 ⁻	11.8	0.022	2.9	NA	0.1	0.4	0.14	0.28	0.14	45.2
East:	Site A	ccess													
4	L2	All MCs	1	0.0	1	0.0	0.077	6.0	LOS A	0.3	1.9	0.36	0.64	0.36	38.6
5	T1	All MCs	1	0.0	1	0.0	0.077	5.5	LOS A	0.3	1.9	0.36	0.64	0.36	24.6
6	R2	All MCs	61	3.4	61	3.4	0.077	7.1	LOS A	0.3	1.9	0.36	0.64	0.36	48.5
Appro	ach		63	3.3	63	3.3	0.077	7.1	LOS A	0.3	1.9	0.36	0.64	0.36	48.1
North:	Zouc	h Road (500 m)												
7	L2	All MCs	154	1.4	154	1.4	0.171	5.6	LOS A	0.1	1.0	0.02	0.30	0.02	53.0
8	T1	All MCs	164	0.0	164	0.0	0.171	0.0	LOS A	0.1	1.0	0.02	0.30	0.02	54.9
9	R2	All MCs	16	0.0	16	0.0	0.171	5.5	LOS A	0.1	1.0	0.02	0.30	0.02	44.1
Appro	ach		334	0.6	334	0.6	0.171	2.8	NA	0.1	1.0	0.02	0.30	0.02	53.3
West:	Exist	ing Acces	s Drive	way (41 m)										
10	L2	All MCs	2	0.0	2	0.0	0.007	5.9	LOS A	0.0	0.2	0.18	0.97	0.18	46.7
11	T1	All MCs	2	50.0	25	50.0	0.007	10.2	LOS A	0.0	0.2	0.18	0.97	0.18	29.7
12	R2	All MCs	1	0.0	1	0.0	0.007	6.6	LOS A	0.0	0.2	0.18	0.97	0.18	19.4
Appro	ach		5	20.0	52	20.0	0.007	7.8	LOS A	0.0	0.2	0.18	0.97	0.18	38.3
All Ve	nicles		438	2.2	438	2.2	0.171	3.5	NA	0.3	1.9	0.08	0.35	0.08	51.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 2 [2. Zouch Road x Campbelltown Road - Sensiivity Base (2022) + Development (LILO @ Zouch) -AM (Site Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [Sensivity Base (2022) + Development (LILO @ Zouch) AM Peak (Network Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))]

Zouch Road x Campbelltown Road - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehic	le M	ovement	Perfo	orma	nce										
Mov ID	Turn	Mov Class	Dem F [Total]	nand Iows HV 1	Ar Fl [Total	rival lows HV]	Deg. Satn	Aver. Delay	Level of Service	95% Back [Veh.	Of Queue Dist]	e Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			-)	km/h
South: Zouch Road (215 m)															
1b	L3	All MCs	102	1.0	102	1.0	0.131	9.0	LOS A	0.5	3.7	0.59	0.79	0.59	47.8
Appro	ach		102	1.0	102	1.0	0.131	9.0	LOS A	0.5	3.7	0.59	0.79	0.59	47.8
NorthEast: Campbelltown Road (680 m)															
24a	L1	All MCs	9	0.0	9	0.0	0.382	5.9	LOS A	0.0	0.0	0.00	0.01	0.00	64.7
25	T1	All MCs	704	5.4	704	5.4	0.382	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	69.6
Appro	ach		714	5.3	714	5.3	0.382	0.2	NA	0.0	0.0	0.00	0.01	0.00	69.6
North:	Zoud	h Road (3	355 m)												
7b	L3	All MCs	152	0.0	152	0.0	0.523	24.0	LOS B	2.1	14.7	0.91	1.06	1.30	29.2
Appro	ach		152	0.0	152	0.0	0.523	24.0	LOS B	2.1	14.7	0.91	1.06	1.30	29.2
South	West	Campbel	lltown I	Road	(500 m	ר)									
30a	L1	All MCs	18	23.5	18	23.5	0.622	6.4	LOS A	0.0	0.0	0.00	0.01	0.00	69.0
31	T1	All MCs	1153	4.4	1153	4.4	0.622	0.3	LOS A	0.0	0.0	0.00	0.01	0.00	69.0
Appro	ach		1171	4.7	1171	4.7	0.622	0.4	NA	0.0	0.0	0.00	0.01	0.00	69.0
All Vel	nicles		2138	4.4	2138	4.4	0.622	2.4	NA	2.1	14.7	0.09	0.12	0.12	64.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 3 [3. Campbelltown Road x MacDonald Road - Sensiivity Base (2022) + Development (LILO @ Zouch) -AM (Site Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Sensivity Base (2022) + Development (LILO @ Zouch) AM Peak (Network Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))]

Campbelltown Road x MacDonald Road, 2026 Site Category: (None) Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehic	Vehicle Movement Performance														
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	95% Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ID		Class	Fi Total	IOWS HV 1	۲۱ Total آ	ows HV 1	Sath	Delay	Service	[Veh.	Dist 1	Que	Stop Rate	NO. OT Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			- ,	km/h
South	: Mac	Donald R	oad (36	60m)											
1	L2	All MCs	127	12.4	127	12.4	0.173	30.2	LOS C	5.1	39.5	0.63	0.73	0.63	25.8
2	T1	All MCs	278	3.0	278	3.0	0.587	51.0	LOS D	16.7	119.9	0.94	0.81	0.94	18.8
3	R2	All MCs	309	8.2	309	8.2	*0.746	60.1	LOS E	20.1	150.2	0.99	0.87	1.02	24.4
Appro	ach		715	6.9	715	6.9	0.746	51.2	LOS D	20.1	150.2	0.90	0.82	0.92	22.7
East:	Camp	belltown	Road (320m	ı)										
4	L2	All MCs	259	7.3	259	7.3	0.646	42.4	LOS C	19.6	145.1	0.93	0.84	0.93	27.1
5	T1	All MCs	448	4.7	448	4.7	0.766	57.6	LOS E	24.2	176.5	0.98	0.87	1.00	17.6
6	R2	All MCs	58	1.8	58	1.8	*0.742	85.3	LOS F	4.3	30.5	1.00	0.83	1.20	12.1
Appro	ach		765	5.4	765	5.4	0.766	54.5	LOS D	24.2	176.5	0.96	0.86	0.99	20.8
North:	McD	onald Roa	ad (190)m)											
7	L2	All MCs	144	0.0	144	0.0	0.351	54.1	LOS D	8.3	58.3	0.89	0.78	0.89	21.3
8	T1	All MCs	212	2.0	212	2.0	*0.738	64.5	LOS E	14.4	102.2	1.00	0.88	1.06	20.5
9	R2	All MCs	146	2.9	146	2.9	0.569	66.0	LOS E	9.5	68.2	0.98	0.80	0.98	9.6
Appro	ach		502	1.7	502	1.7	0.738	61.9	LOS E	14.4	102.2	0.96	0.83	0.99	17.9
West:	Cam	pbelltown	Road ((680r	n)										
10	L2	All MCs	147	0.7	147	0.7	0.745	30.8	LOS C	31.3	224.7	0.92	0.84	0.92	32.9
11	T1	All MCs	939	4.0	939	4.0	*0.745	41.2	LOS C	31.8	230.6	0.92	0.83	0.92	39.9
12	R2	All MCs	222	5.2	222	5.2	0.737	68.5	LOS E	14.9	109.3	1.00	0.86	1.06	29.8
Appro	ach		1308	3.9	1308	3.9	0.745	44.6	LOS D	31.8	230.6	0.94	0.84	0.95	37.0
All Ve	hicles		3291	4.5	3291	4.5	0.766	51.0	LOS D	31.8	230.6	0.94	0.84	0.96	27.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance													
Mov ID Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE QUE	BACK OF	Prop. Que	Eff. Stop	Travel Time	Travel Dist.	Aver. Speed			
	ped/h	sec		[Ped ped	Dist] m		Rate	sec	m	m/sec			

South: MacDonald Road (360m)													
P1 Full	53	49.8	LOS E	0.2	0.2	0.84	0.84	66.5	20.0	0.30			
East: Campbelltown Road (320m)													
P2 Full	53	64.3	LOS F	0.2	0.2	0.96	0.96	80.9	20.0	0.25			
North: McDonald Road (190m)													
P3 Full	53	35.1	LOS D	0.1	0.1	0.71	0.71	51.7	20.0	0.39			
West: Campbelltow	/n Road	(680m)	1										
P4 Full	53	55.9	LOS E	0.2	0.2	0.89	0.89	72.6	20.0	0.28			
All Pedestrians	211	51.3	LOS E	0.2	0.2	0.85	0.85	67.9	20.0	0.29			

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

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MOVEMENT SUMMARY

Site: 4 [4. MacDonald Road x General Boulevard- Sensiivity Base (2022) + Development (LILO @ Zouch) -AM (Site Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Sensivity Base (2022) + Development (LILO @ Zouch) AM Peak (Network Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))]

MacDonald Road x General Boulevard - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Stop (Two-Way)

Vehicle Movement Performance															
Mov	Turn	Mov	Dem	hand	Ar	rival	Deg.	Aver.	Level of	95% Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ט ו		Class	۲۱ Total آ	IOWS HV 1	ا۲ Total آ	iows HV 1	Sath	Delay	Service	[Veh.	Dist 1	Que	Stop Rate	NO. OT Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			- ,	km/h
South	Mac	Donald R	oad (19	90 m))										
1	L2	All MCs	87	2.4	87	2.4	0.114	5.6	LOS A	0.0	0.0	0.00	0.24	0.00	48.4
2	T1	All MCs	343	2.5	343	2.5	0.114	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	58.2
3	R2	All MCs	55	0.0	55	0.0	0.046	6.4	LOS A	0.2	1.1	0.22	0.57	0.22	45.4
Appro	ach		485	2.2	485	2.2	0.114	1.7	NA	0.2	1.1	0.02	0.17	0.02	54.8
East: 0	Gene	ral Boulev	vard (26	60 m)											
4	L2	All MCs	60	1.8	60	1.8	0.089	8.5	LOS A	0.3	2.3	0.25	0.87	0.25	38.2
5	T1	All MCs	11	0.0	11	0.0	0.089	18.9	LOS B	0.3	2.3	0.25	0.87	0.25	40.7
6	R2	All MCs	12	0.0	12	0.0	0.049	20.6	LOS B	0.2	1.1	0.69	1.00	0.69	35.9
Appro	ach		82	1.3	82	1.3	0.089	11.5	LOS A	0.3	2.3	0.31	0.89	0.31	38.1
North:	Macl	Donald Ro	oad (26	i0 m)											
7	L2	All MCs	27	0.0	27	0.0	0.054	5.5	LOS A	0.0	0.0	0.00	0.16	0.00	53.2
8	T1	All MCs	180	0.6	180	0.6	0.054	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	57.8
9	R2	All MCs	11	0.0	11	0.0	0.010	7.0	LOS A	0.0	0.3	0.41	0.57	0.41	43.3
Appro	ach		218	0.5	218	0.5	0.054	1.0	NA	0.0	0.3	0.02	0.10	0.02	55.5
West:	Site A	Access (E	ast)												
10	L2	All MCs	91	0.0	91	0.0	0.132	8.6	LOS A	0.6	4.0	0.31	0.85	0.31	40.8
11	T1	All MCs	15	0.0	15	0.0	0.132	18.9	LOS B	0.6	4.0	0.31	0.85	0.31	40.7
12	R2	All MCs	167	3.1	167	3.1	0.724	37.1	LOS C	4.7	33.7	0.88	1.27	1.84	13.3
Appro	ach		273	1.9	273	1.9	0.724	26.7	LOS B	4.7	33.7	0.66	1.11	1.25	22.8
All Vel	nicles		1058	1.7	1058	1.7	0.724	8.8	NA	4.7	33.7	0.21	0.45	0.36	42.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: C:\Users\Emily Duan\Desktop\WORK\p1321 TA Ed park residential\2023.0714 Modelling comments from TfNSW + amend\03 Revised Model\P1321m02_Precinct 3 (Resi), Edmondson Park (No Signals at General Blvd) - test with user-given phase time - Copy2023.8.9.sip9

MOVEMENT SUMMARY

Site: 1v [1. Zouch Road x Existing Access Driveway -Sensivity Base (2022) + Development (LILO @ Zouch) -PM (Site Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Sensivity Base (2022) + Development (LILO @ Zouch) PM Peak (Network Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))]

Zouch Road x Existing Access Driveway - 2022 - PM

Assumptions: Existing Base (2022) + Development Site Category: (None) Stop (Two-Way)

Vehicle Movement Performance															
Mov	Turn	Mov	Der	hand	Ar	rival	Deg.	Aver.	Level of	95% Back	COf Queue	Prop.	Eff.	Aver.	Aver.
שו		Class	٦ Total آ	iows HV 1	۲ Total آ	iows HV 1	Sath	Delay	Service	[Veh.	Dist 1	Que	Stop Rate	NO. OT Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			-,	km/h
South	: Zouo	ch Road (355 m)												
1	L2	All MCs	1	0.0	1	0.0	0.024	5.5	LOS A	0.1	0.8	0.12	0.37	0.12	24.2
2	T1	All MCs	16	0.0	16	0.0	0.024	0.0	LOS A	0.1	0.8	0.12	0.37	0.12	55.8
3	R2	All MCs	26	0.0	26	0.0	0.024	5.7	LOS A	0.1	0.8	0.12	0.37	0.12	49.9
Appro	ach		43	0.0	43	0.0	0.024	3.6	NA	0.1	0.8	0.12	0.37	0.12	51.7
East:	Site A	ccess													
4	L2	All MCs	1	0.0	1	0.0	0.102	5.6	LOS A	0.4	2.5	0.18	0.57	0.18	40.5
5	T1	All MCs	1	0.0	1	0.0	0.102	4.5	LOS A	0.4	2.5	0.18	0.57	0.18	19.1
6	R2	All MCs	104	0.0	104	0.0	0.102	5.9	LOS A	0.4	2.5	0.18	0.57	0.18	49.5
Appro	ach		106	0.0	106	0.0	0.102	5.9	LOS A	0.4	2.5	0.18	0.57	0.18	49.2
North:	Zouc	h Road (500 m)												
7	L2	All MCs	22	4.8	22	4.8	0.024	5.6	LOS A	0.0	0.1	0.01	0.30	0.01	52.6
8	T1	All MCs	22	0.0	22	0.0	0.024	0.0	LOS A	0.0	0.1	0.01	0.30	0.01	55.0
9	R2	All MCs	1	0.0	1	0.0	0.024	5.5	LOS A	0.0	0.1	0.01	0.30	0.01	44.2
Appro	ach		45	2.3	45	2.3	0.024	2.9	NA	0.0	0.1	0.01	0.30	0.01	53.4
West:	Existi	ing Acces	s Drive	way	(41 m)										
10	L2	All MCs	1	100.	1	100.	0.008	8.2	LOS A	0.0	0.2	0.14	0.94	0.14	42.3
				0		0									
11	T1	All MCs	6	0.0	6	0.0	0.008	5.8	LOS A	0.0	0.2	0.14	0.94	0.14	38.6
12	R2	All MCs	1	0.0	1	0.0	0.008	5.7	LOS A	0.0	0.2	0.14	0.94	0.14	21.4
Appro	ach		8	12.5	8	12.5	0.008	6.1	LOS A	0.0	0.2	0.14	0.94	0.14	38.7
All Ve	hicles		203	1.0	203	1.0	0.102	4.7	NA	0.4	2.5	0.13	0.48	0.13	50.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

V Site: 2 [2. Zouch Road x Campbelltown Road - Sensivity Base (2022) + Development (LILO @ Zouch) -PM (Site Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [Sensivity Base (2022) + Development (LILO @ Zouch) PM Peak (Network Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))]

Zouch Road x Campbelltown Road - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Dem Fl [Total	nand lows HV]_	Ar Fl [Total	rival lows HV]_	Deg. Satn	Aver. Delay	Level of Service	95% Back [Veh	Of Queue Dist]	e Prop. Que	Eff. Stop Rate	Aver. No. of Cycle <u>s</u>	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			·	km/h
South	Zou	ch Road (2	215 m)												
1b	L3	All MCs	63	0.0	63	0.0	0.126	12.2	LOS A	0.5	3.2	0.72	0.88	0.72	45.5
Appro	ach		63	0.0	63	0.0	0.126	12.2	LOS A	0.5	3.2	0.72	0.88	0.72	45.5
North	East:	Campbellt	town R	oad (680 m)									
24a	L1	All MCs	16	0.0	16	0.0	0.525	6.0	LOS A	0.0	0.0	0.00	0.01	0.00	64.5
25	T1	All MCs	1000	1.8	1000	1.8	0.525	0.3	LOS A	0.0	0.0	0.00	0.01	0.00	69.4
Appro	ach		1016	1.8	1016	1.8	0.525	0.3	NA	0.0	0.0	0.00	0.01	0.00	69.3
North:	Zouc	h Road (3	355 m)												
7b	L3	All MCs	21	0.0	21	0.0	0.026	9.3	LOS A	0.1	0.6	0.54	0.72	0.54	42.5
Appro	ach		21	0.0	21	0.0	0.026	9.3	LOS A	0.1	0.6	0.54	0.72	0.54	42.5
South	West:	Campbel	lltown F	Road	(500 n	1)									
30a	L1	All MCs	16	0.0	16	0.0	0.345	5.9	LOS A	0.0	0.0	0.00	0.01	0.00	69.4
31	T1	All MCs	653	1.8	653	1.8	0.345	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	69.4
Appro	ach		668	1.7	668	1.7	0.345	0.2	NA	0.0	0.0	0.00	0.01	0.00	69.4
All Vel	nicles		1768	1.7	1768	1.7	0.525	0.8	NA	0.5	3.2	0.03	0.05	0.03	68.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: C:\Users\Emily Duan\Desktop\WORK\p1321 TA Ed park residential\2023.0714 Modelling comments from TfNSW + amend\03 Revised Model\P1321m02_Precinct 3 (Resi), Edmondson Park (No Signals at General Blvd) - test with user-given phase time - Copy2023.8.9.sip9

MOVEMENT SUMMARY

Site: 3 [3. Campbelltown Road x MacDonald Road - Sensivity Base (2022) + Development (LILO @ Zouch) -PM (Site Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Sensivity Base (2022) + Development (LILO @ Zouch) PM Peak (Network Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))]

Campbelltown Road x MacDonald Road, 2026 Site Category: (None) Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance															
Mov	Turn	Mov	Den	nand	Ar	rival	Deg.	Aver.	Level of	95% Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ID		Class	⊣ [Total]	lows HV 1	FI [Total	ows HV 1	Satn	Delay	Service	[Veh	Dist 1	Que	Stop Rate	No. of Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South	: Mac	Donald R	oad (36	60m)											
1	L2	All MCs	160	2.0	160	2.0	0.246	39.7	LOS C	7.6	54.1	0.75	0.77	0.75	21.9
2	T1	All MCs	244	3.9	244	3.9	0.675	58.3	LOS E	15.6	113.1	0.98	0.83	0.98	17.1
3	R2	All MCs	298	4.2	298	4.2	*0.839	70.5	LOS F	21.2	154.0	1.00	0.94	1.14	22.4
Appro	ach		702	3.6	702	3.6	0.839	59.2	LOS E	21.2	154.0	0.94	0.86	1.00	20.7
East:	Camp	belltown	Road (320m	ו)										
4	L2	All MCs	253	4.2	253	4.2	0.708	30.5	LOS C	28.0	201.4	0.91	0.84	0.91	30.0
5	T1	All MCs	803	1.8	803	1.8	*0.840	57.1	LOS E	37.0	263.0	0.96	0.90	1.00	19.5
6	R2	All MCs	160	0.7	160	0.7	0.639	80.7	LOS F	10.6	74.5	1.00	0.82	1.00	14.2
Appro	ach		1216	2.2	1216	2.2	0.840	54.7	LOS D	37.0	263.0	0.95	0.87	0.98	21.3
North:	Mac	Donald Ro	oad (19	0m)											
7	L2	All MCs	105	0.0	105	0.0	0.203	45.8	LOS D	5.5	38.2	0.81	0.75	0.81	23.5
8	T1	All MCs	189	1.1	189	1.1	*0.860	75.1	LOS F	14.0	99.2	1.00	1.00	1.23	18.6
9	R2	All MCs	154	0.0	154	0.0	0.681	70.4	LOS E	10.4	73.0	1.00	0.84	1.04	9.1
Appro	ach		448	0.5	448	0.5	0.860	66.6	LOS E	14.0	99.2	0.95	0.89	1.07	16.6
West:	Cam	pbelltown	Road	(680r	n)										
10	L2	All MCs	109	1.9	109	1.9	0.317	31.1	LOS C	10.6	74.9	0.75	0.71	0.75	35.1
11	T1	All MCs	343	1.2	343	1.2	0.317	35.1	LOS C	11.0	77.6	0.75	0.66	0.75	42.7
12	R2	All MCs	203	3.6	203	3.6	*0.838	77.9	LOS F	14.8	106.8	1.00	0.93	1.19	27.8
Appro	ach		656	2.1	656	2.1	0.838	47.7	LOS D	14.8	106.8	0.83	0.75	0.89	35.4
All Ve	hicles	i	3022	2.2	3022	2.2	0.860	56.0	LOS D	37.0	263.0	0.92	0.85	0.98	23.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE QUE	BACK OF	Prop. Que	Eff. Stop	Travel Time	Travel Dist.	Aver. Speed	
	ped/h	sec		[Ped ped	Dist] m		Rate	sec	m	m/sec	

South: MacDonald Road (360m)										
P1 Full	53	37.2	LOS D	0.2	0.2	0.73	0.73	53.9	20.0	0.37
East: Campbelltow	n Road	(320m)								
P2 Full	53	64.3	LOS F	0.2	0.2	0.96	0.96	80.9	20.0	0.25
North: MacDonald	Road (1	90m)								
P3 Full	53	36.5	LOS D	0.2	0.2	0.72	0.72	53.2	20.0	0.38
West: Campbelltow	n Road	(680m)								
P4 Full	53	63.3	LOS F	0.2	0.2	0.95	0.95	80.0	20.0	0.25
All Pedestrians	211	50.3	LOS E	0.2	0.2	0.84	0.84	67.0	20.0	0.30

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

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MOVEMENT SUMMARY

Site: 4 [4. MacDonald Road x General Boulevard - Sensivity Base (2022) + Development (LILO @ Zouch) -PM (Site Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))] Output produced by SIDRA INTERSECTION Version: 9.1.3.210

■ Network: N101 [Sensivity Base (2022) + Development (LILO @ Zouch) PM Peak (Network Folder: Sensiivity Base (2022) + Development (LILO @ Zouch))]

MacDonald Road x General Boulevard - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Stop (Two-Way)

Vehicle Movement Performance															
Mov	Turn	Mov	Dem	hand	Ar	rival	Deg.	Aver.	Level of	95% Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ט ו		Class	اح Total آ	HV 1	اح Total آ	ows HV 1	Sain	Delay	Service	[Veh.	Dist 1	Que	Rate	Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			,	km/h
South:	Mac	Donald R	oad (19	90 m)	1										
1	L2	All MCs	204	0.0	204	0.0	0.124	5.5	LOS A	0.0	0.0	0.00	0.52	0.00	50.8
2	T1	All MCs	255	5.0	255	5.0	0.124	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	58.9
3	R2	All MCs	65	0.0	65	0.0	0.069	7.4	LOS A	0.2	1.6	0.36	0.63	0.36	44.2
Appro	ach		524	2.4	524	2.4	0.124	3.1	NA	0.2	1.6	0.04	0.31	0.04	52.9
East: (Gene	ral Boulev	vard (26	60m)											
4	L2	All MCs	43	2.4	43	2.4	0.144	8.6	LOS A	0.5	3.7	0.46	0.81	0.46	33.1
5	T1	All MCs	21	0.0	21	0.0	0.144	26.7	LOS B	0.5	3.7	0.46	0.81	0.46	44.6
6	R2	All MCs	5	0.0	5	0.0	0.024	21.1	LOS B	0.1	0.5	0.70	0.97	0.70	35.6
Appro	ach		69	1.5	69	1.5	0.144	15.0	LOS B	0.5	3.7	0.48	0.82	0.48	38.6
North:	Macl	Donald Ro	oad (26	i0 m)											
7	L2	All MCs	109	1.0	109	1.0	0.108	5.6	LOS A	0.0	0.0	0.00	0.32	0.00	50.9
8	T1	All MCs	306	0.0	306	0.0	0.108	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	56.8
9	R2	All MCs	21	0.0	21	0.0	0.021	7.2	LOS A	0.1	0.6	0.43	0.59	0.43	49.5
Appro	ach		437	0.2	437	0.2	0.108	1.7	NA	0.1	0.6	0.02	0.18	0.02	53.7
West:	Site A	Access (E	ast)												
10	L2	All MCs	9	0.0	9	0.0	0.038	8.1	LOS A	0.1	0.9	0.24	0.83	0.24	44.3
11	T1	All MCs	6	0.0	6	0.0	0.038	23.8	LOS B	0.1	0.9	0.24	0.83	0.24	44.3
12	R2	All MCs	91	1.2	91	1.2	0.487	33.5	LOS C	2.1	14.8	0.85	1.10	1.22	29.7
Appro	ach		106	1.0	106	1.0	0.487	30.7	LOS C	2.1	14.8	0.76	1.06	1.08	31.9
All Vel	nicles		1137	1.4	1137	1.4	0.487	5.9	NA	2.1	14.8	0.13	0.36	0.16	48.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Transport Assessment Proposed Residential Development

Precinct 3, Edmondson Park

Ref: P1321r01v2 20/01/2023



info@asongroup.com.au +61 2 9083 6601 Suite 17.02, Level 17, 1 Castlereagh Street, Sydney, NSW 2000

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-	10/11/2022	Draft	J. Wong	J. Laidler
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02	20/01/2023	Issue II	E. Duan	J. Laidler

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APPENDICES

Appendix A. Network Diagrams

Appendix B. SIDRA Results



Glossary

Acronym	Description
CC	Construction Certificate
Council	Liverpool City Council
DA	Development Application
DCP	Development Control Plan
DPE	Department of Planning and Environment
EPS	Edmondson Park South
GFA	Gross Floor Area
HRV	Heavy Rigid Vehicle (as defined by AS2890.2:2018)
LEP	Local Environmental Plan
LGA	Local Government Area
MOD	Section 4.55 Modification (also referred as a S4.55)
RMS Guide	Transport for NSW (formerly Roads and Traffic Authority), Guide to Traffic Generating Developments, 2002
TDT 2013/04a	TfNSW Technical Direction, Guide to Traffic Generating Developments – Updated traffic surveys, August 2013
TfNSW	Transport for New South Wales
ТА	Transport Assessment
veh/hr	Vehicle movements per hour (1 vehicle in & out = 2 movements)



1 Introduction

1.1 Overview

Ason Group has been commissioned by Landcom to prepare a Transport Assessment (TA) in support of a Development Application (DA) for construction of 250 residential dwellings within Precinct 3, Edmondson Park South (the Site). This TA provides an assessment of the access, traffic, and parking implications of the Proposal.

For context, the Site is located within the Edmondson Park South Concept Plan area, approved under Section 75W of the Environmental Planning and Assessment Act (MP10_0118¹). That Concept Plan envisaged a dwelling yield of 270 dwellings within area "4", now referred to as Landcom's "Precinct 3".

Having regard for the above, the broader traffic impacts of the development – which is consistent with the above dwelling targets – has been considered in the development of previous modelling to identify necessary precinct-wide infrastructure. Indeed, broader traffic impacts of the development associated with the latest Modification 12 (MOD 12²) to the Concept Plan has considered.

The Concept Plan and supporting studies envisage a signalised connection to MacDonald Road to the east of the site, notwithstanding further review and considerations have been outlined below in **Section 6.4**. A new connection to Zouch Road is also proposed which results in a minor change to access strategy contemplated by MOD 12. Therefore, additional SIDRA modelling has been undertaken to identify any impacts to the surrounding key intersections.

The Site is located at Lot 3 & Lot 5 DP1272931 and on land zoned as R1 – General Residential & RE1 – Public Recreation, as shown in **Figure 1** below.



Figure 1: Site Location



¹ <u>http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3970</u>

² <u>http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=10705</u>

1.2 Project History

The Edmondson Park South (EPS) Concept Plan was originally approved on 18 August 2011, followed by several subsequent modifications. A summary of those modifications is provided in **Table 1**.

TABLE 1: EF	PS CONCEPT PLAN (MP 10_0118) – MODIFICA	TION HISTORY	
Modifications	Descriptions	Traffic / Transport Related	Status
MOD 1	Amend the timing for approval of a vegetation rehabilitation plan associated with remediation works.	No	Approved
MOD 2	Modification in relation to the sales and information centre within Edmondson Park	No	Approved
MOD 3	Modification in relation to Sewerage Treatment Plan, Decommissioning and Remediation	No	Approved
MOD 4	Modifications in relation to maximum Gross Floor Area (GFA), maximum building height, number of dwellings, maximum parking rates etc.	Yes	Approved
MOD 5	Revision to the Concept Plan boundary to include land owned by Landcom and the Office of Strategic Lands (OSL) and other modifications relating to school zone, road layout, dwelling yield, and mix, building height and bushfire asset protection zones.	Yes	More information required
MOD 6	Redistribute GFA within the Town Centre Core to reflect the further design development that has occurred since the original indicative scheme was developed. It will NOT result in any increase in the total GFA, height or number of dwellings for the Frasers Town Centre.	No	Approved
MOD 7	Modification to include a high school in the Edmondson Park Town Centre	Yes	Withdrawn
MOD 8	Amendment to the Edmondson Park Frasers Town Centre Guidelines to reduce the car park rate for 2- bedroom dwellings in the Town Centre Core	Yes	Approved
MOD 9	Modification to amend the Edmondson Park Frasers Town Centre Guidelines to reduce the car parking rate for two-bedroom dwellings within residential flat buildings in the Town Centre Core from 1.2 spaces per dwelling to 1 space per dwelling.	Yes	Withdrawn
MOD 10	Modification to the Concept Plan, as it relates to Precinct 3 to increase dwelling numbers by 350 to a maximum of 600 (a total of 4,852 dwellings across the Concept Plan) and alter the road network hierarchy.	Yes	SEARs Issued
MOD 11	Modification to the approved Design Guidelines to allow additional attached dwelling typologies with Residential Precincts 2 and 3.	No	Approved



MOD 12	Modification to allow school lot within the town centre and relocate residential flat buildings from the town centre into Residential Precinct 3.	Yes	Proponent Reviewing Submissions
--------	---	-----	---------------------------------------

It is noted that MOD 12 is the most recent modification of relevance to traffic and transport considerations. As such, the proposed implications have been assessed against the 'benchmark' conditions detailed in the MOD 12 traffic and transport study. MOD 12 references approved MOD 4 vehicular trip generation rates which have been inherently considered and validated by the key consent authorities, including the Department of Planning and Environment (DPE) and Transport for NSW (TfNSW). It is assumed that MOD 12 will be approved, and this TA aims to show that the Proposal is largely consistent with the modelling included in MOD 12.

MOD 10 has direct impacts on the subject Precinct. However, for the purposes of this DA, those changes are not relied upon.

1.3 Key References

In preparing this TA, Ason Group has referenced the following key planning documents. These include:

- Edmondson Park South Development Control Plan, Nov 2012 (EPS DCP 2012);
- Edmondson Park South MOD 12 Transport Assessment, dated 17 November 2021, prepared by Ason Group (referred as 'MOD 12 TA Report');
- Transport Assessment Report Edmondson Park South MOD 12, dated 17 November 2021, prepared by Ason Group (MOD 12 TA Report);
- Option Assessment Report Ed. Square MOD 12, dated 30 September 2021, prepared by Ason Group (MOD 12 OAR Report);
- Traffic Impact Assessment Report Edmondson Park Frasers Town Centre Section 75W Modification, dated 05 February 2017, prepared by Ason Group (MOD 4 RtS TIA Report).

This TA also references general access, traffic and parking guidelines, including:

- Australian Standards, AS 2890.1: 2004 Parking Facilities Off-Street Car Parking (AS 2890.1);
- Australian Standards, AS 2890.2:2018 Parking Facilities Off-Street Commercial Vehicle Facilities (AS 2890.2);
- Australian Standards, AS 2890.3: 2015 Parking Facilities Bicycle Parking (AS 2890.3);
- Australian Standards, AS 2890.6: 2022 Parking Facilities Off-Street Parking for People with Disabilities (AS 2890.6);
- Roads and Maritime Services, Guide to Traffic Generating Developments, v2.02, 2002 (RMS Guide)
- Roads and Maritime Services, Technical Direction TDT 2013/04a, Guide to Traffic Generating Developments – Updated Traffic Surveys (Updated RMS Guide)
- National Construction Code 2019 Volume One (NCC 2019).



2 Description of the Proposal

2.1 Subdivision Concept Plan

The Proposal seeks approval for the subdivision of the site including precinct access, internal roads, and other supporting infrastructure. A reduced copy of the subdivision concept plan is provided below.



Figure 2: Precinct 3 Subdivision Plan (Source: Urbanco)

2.2 Development Yield

The Proposal seeks approval for 250 residential dwellings, comprised of:

- 90 terraces
- 4 small and duplex sites, and
- 156 residential lots



3 Existing Conditions

3.1 Site Context

Edmondson Park is approximately 8 kilometres southwest from the Liverpool CBD and approximately 34 kilometres from the Sydney CBD. The overall EPS Concept Plan area is located within both Liverpool Council and Campbelltown Council LGAs.

The Site subject to this application is located within Edmondson Park South, as shown in Figure 3 below within the suburb of Edmondson Park. It lies solely within the Liverpool Council LGA and is approximately 550m south-west of the Edmondson Park Railway Station



Figure 3: Edmondson Park South (Source: MOD 4 Final Determination Report)

3.2 Road Hierarchy

The existing road network in the vicinity of the Site is shown in **Figure 4** while key roads are further detailed below.



TABLE 2: ROAD HIERARCHY

Road	Description
Campbelltown Road	Campbelltown Road is a classified arterial road that traverses in an east-west direction to the south of the Site. It currently carries an annual average daily traffic (AADT) in the order of 15,350 vehicles per day (two-way). Traffic volumes during the weekday morning and evening peak periods are in the order 1,450 and 1,475 vehicles per hour (veh/hr), respectively.
MacDonald Road (previously Bernera Rd)	MacDonald Road is a north-south vehicular connector road to the east of the Site. It currently does not connect to Buchan Ave but will once built. MacDonald Rd has two-lanes in each direction and has a posted speed limit of 50km/hr. There is no parking on either side of the road.
Soldiers Parade	Soldiers Parade is a secondary north-south connection to the east of the Site. It currently forms a signalised intersection with Henderson Parade and an unsignalised intersection with Campbelltown Road to the south. Near the Site, Soldiers Pde is a single lane in each direction and has a posted speed limit of 50km/hr. Unrestricted parking is available on both sides of the road
Zouch Road	Zouch Road is a north-south local road located to the west of the Site with a sign posted speed limit of 60 km/h. Zouch Road generally provides a single lane of traffic on either direction with no parking on both sides. The southern end of Zouch Road connects to Campbelltown Road at a priority-controlled intersection.





Figure 4: Existing Road Network



3.3 Public Transport

3.3.1 Train Services

The Edmondson Park Train Station is located approximately 600 metres to the north-east of the Site, providing access to the broader metropolitan area. It is within the comfortable walking catchment based on the Integrated Public Transport Service Planning Guidelines (IPT Guidelines).

3.3.2 Bus Services

The closest bus stops servicing the existing Transport for NSW bus routes are located 350 metres from the Site. Available bus routes and their service frequencies are summarised below.

TABLE 3: BUS FREQUENCY	
Routes	Peak Frequency
859 Carnes Hill to Edmondson Park Station	11 services during the AM Peak and 12 services during the PM Peak
869 Ingleburn to Liverpool via Edmondson Park & Prestons	5 services during AM Peak and 12 services during the PM Peak
868 Edmondson Park Station	4 services during AM Peak and 3 services during the PM Peak
N31 Leppington to Liverpool (Night Service)	Does not run during AM and PM Peak Periods. 1 service per hour during night time operations





Figure 5: Public and Active Transport Near the Site



3.4 Active Transport

3.4.1 Pedestrian Routes

Currently, the Site has a 3.0-metre-wide shared path at its southern frontage which runs 200 metres west along Campbelltown Road from the MacDonald Road / Campbelltown Road intersection. There is also a 2.5-metre-wide shared path at its eastern frontage along MacDonald Road which is of good quality and enables pedestrian access to public transport services via pedestrian crossings. The shared paths also allow access to local roads from the Site.

3.4.2 Bicycle Routes

The closest bicycle route to the Site is along Campbelltown Road via a shared footpath on the northern side of the road. The bicycle route is connected to Hume Motorway. Bicycle routes are shown in more detail below.



Figure 6: Active Transport Network (Source: MOD 4 2016)



4 Future Context

4.1 Concept Plan Road Network

The original Edmondson Park South (EPS) Concept Plan was approved in 2011 by the Planning Assessment Commission (PAC).



Figure 7: Original Concept Plan (MP10_0118)

All access to Precinct 3 was proposed via Macdonald Road to the east and Campbelltown Road to the south.

It is noted that subsequent Modifications to the Concept Plan has sought changes to the broader road network. The latest approved road network being proposed under MOD 4 is shown below. This includes:

- Removal of right-turn bans previously envisaged at the Soldiers Parade / Campbelltown Road signals
- New signalised intersection at MacDonald Road / General Boulevarde
- Retention of the existing roundabout at MacDonald Road / Henderson Road (previously noted as "Potential Traffic Signals")
- Other local road changes within the Edmondson Park Frasers Town Centre (Ed.Square)





Figure 8: Concept Plan Road Network & Hierarchy (MOD 4 - APPROVED)

MOD 12 – being the latest Modification to the Concept Plan – envisages further changes to the external road network, including:

• Further local road changes within the Edmondson Park Frasers Town Centre (Ed.Square), including associated access intersections to MacDonald Road.

However, MOD 12 does not material impact the local road within Precinct 3 of relevance to this DA.





Figure 9: Concept Plan Road Network & Hierarchy (MOD 12)

4.2 Approved Trip Generation Rates

With reference to the MOD 5 TA report, the following peak hour trip generation rates were adopted and approved (as shown in **Table 4**). It is noted that these trip rates have already been approved as part of MOD 4.

Land Use AM Peak PM Peak Source					
Land Use AM Peak PM Peak Source					
Residential ¹ Medium Density: 0.62 trips / hour / dwelling Concept TMAN	Plan P				

Note: 1) *First principal assessment based on mode split assumptions.*





4.3 MOD 12 Summary

MOD 12 seeks approval for the school lot to be within the town centre and the relocation of residential flat buildings from the town centre into Residential Precinct 3.

It is noted that MOD 12 also adopts the approved MOD 4 vehicular trip generation rates, and the modelling assumes a yield of 270 medium density units based on the MOD 12 OAR Report for Precinct 3. Therefore, the approved forecast peak hour traffic generation is 167 vehicle trips / hour.



5 Parking Requirements

5.1 Car Parking

5.1.1 Car Parking Requirements

This DA seeks to construct a residential precinct consisting of 250 medium density dwellings. Car parking rates have been adopted from Section 6.9 of the Edmondson Park South DCP (EPS DCP 2012). Rates that are considered applicable to the Proposal are outlined below.

TABLE 5: EPS DCP 2012 CAR PARKING RATES (MAXIMUM)

Land Use	Parking Rate
Dwelling	1 space ¹ per dwelling (minimum) A maximum of 2x spaces per dwelling permissible

Notes: 1) This space must be provided behind the frontage building line as per Section 6.9 of the <u>EPS DCP 2012</u>.

5.1.2 Car Parking Assessment

The application of the above rates results in the parking requirements below.

TABLE 6: CAR PARKING ASSESSMENT			
Land Use	Yield	Requirement	
Dwelling	250 dwollingo	Minimum: 250 spaces ¹	
	250 dwellings	Maximum: 500 spaces ²	

Notes: 1) Based on a minimum of 1x space per dwelling

2) Based on the maximum of 2x spaces per dwelling

As such, it is expected that future built-form (subject to separate approvals) will provide between 250 to 500 spaces across the Site to meet EPS DCP 2012 requirements as part of the post DA or pre-CC documentation.

5.1.3 Visitor Parking

The provision of visitor spaces will be provided via on-street public parking, in accordance with Section 3.1 of the EPS DCP and is expected to be sufficient to accommodate the demands arising from the Site. On-street parking should be consistent with the street sections shown in **Section 6.2**. Based on a high-level review of the plan, there are many on-street parking opportunities on the Urban Street, Minor Roads, and Minor Roads (Edge) to meet visitor parking demands.



6 Design Commentary

The relevant design commentary is explained in the following sections.

6.1 On Lot Design Standards

Site access (into the garage), garages shall be designed with reference to the following Australian Standards:

• AS2890.1:2004 for car parking areas, and

It is expected that any detailed construction drawings in relation to any on-street car parking spaces and loading areas would comply with these Standards. Furthermore, compliance with the above Standards would be expected to form a standard Condition of Consent prior to any development approval.

No direct access to MacDonald Road, Campbelltown Road or Zouch Road is proposed, other than the future public road intersections. All garage access shall be provided from internal local roads and laneways.

6.2 Road Design

The proposed road typologies are consistent with the EPS DCP 2012 as shown in the figures below. However, the proposal seeks approval for a connection to Zouch Road which differs from the road connections from Campbelltown Road shown within the EPS DCP 2012. Nonetheless, the modelling results within this TA demonstrate that the proposed connection is supportable and modelled intersections under the sensitivity scenario can readily accommodate development traffic from the Site.

Below is an indicative layout plan of the proposal.



Figure 10: Indicative Road Design



The proposed internal road network design is discussed in the following:

- It is noted that there are 2 sets of staggered T-intersections along the Urban Street. It is proposed to
 mitigate these 2 staggered intersections through a series of Local Area Traffic Management solutions
 such as a median island along the Urban Street to restrict both intersections to left-in-left-out only.
 Detailed plans can be finalised as part of the CC process.
- Sight distance has been assessed in accordance with Austroads Guide to Road Design Part 4A and AS2890.1: 2004. The intersection configurations are generally acceptable, with minor adjustments possible to be made during the CC stage.
- The cul-de-sac on the Laneway closest to Campbelltown Road is smaller than a standard cul-de-sac. Hence, it is suggested that this laneway is signposted with for No Access (Residents Excepted) to reduce traffic accessing the smaller cul-de-sac.
- Where possible, garage access should be provided from lower order roads and laneways.
- Section 2.6 of AS2890.1 outlines that the minimum width of domestic driveways shall be 3.0 m.
- Further to the above, Figure 5.4 of AS2890.1 outlines that a distance between a garage and the opposite kerb must be a minimum of 5.6 7.0m depending on the size of the garage door. As such, further consideration should be given to widening the laneway to 5.6m to ensure that the standard has been met.

The following figures provide context to the indicative road layout for each road typology.



Figure 11: Typical Urban Street Section





Figure 12: Typical Urban Street Plan



Figure 13: Typical Minor Road Edge





Figure 14: Typical Minor Road Section



Figure 15: Typical Laneway Section





Figure 16: Typical Laneway Plan

6.3 Design Vehicles

Garages will be designed to accommodate movements of an 85th percentile car (B85), in line with AS2890.1:2004.

The road network is expected to be designed to accommodate movements for vehicles up to 12.5m Heavy Rigid Vehicles (HRV's), consistent with the road function and occasional removalist / waste collection vehicles.

6.4 Access Design

Primary access to the Site is provided via a sing-controlled connection at MacDonald Road x General Boulevard. Section 6.4.1 outlines further the intersection design and considerations. This intersection is slightly offset to reduce impacts within the C1 (Conservation) zoned land.

The Proposal includes a secondary connection via Zouch Road to provide vehicles access from the western side of the Site.

All public road connections shall be designed for vehicles up to 12.5m Heavy Rigid Vehicle (HRV). Swept paths will be undertaken by the project civil engineer to ensure the indicative concept design can accommodate a 12.5m HRV.



With consideration for the Indicative intersection at MacDonald Road x General Boulevard, it is anticipated that pedestrian and vehicular movements will significantly increase once the Site and broader Edmondson Park Town Centre is developed.

The intersection has been designated as a signalised intersection from MOD 4 onwards to MOD 12, therefore can be considered to have in principle approval. Notwithstanding, as with all new signalised intersections, a warrant assessment must be undertaken and met prior to ultimate approval and installation.

The below table demonstrates a warrant assessment against TfNSW Traffic Signal Design, Section 2, Warrants (Version 1.4, Dec 2010) based on forecast traffic and pedestrian conditions of the proposed crossing locations.

TABLE 7: SIGNALISED INTERSECTIONS – VEHICLE CONSIDERATIONS

	Traffic De	emand	Со	ntinuous Tra	affic		Crashes	
Location	Major Road >600 veh/hr	Minor Road >200 veh/hr	Major Road >900 veh/hr	Minor Road >100 veh/hr	Speed/ Sight Hazards	No Other Access	Crashes =+ 3	Volumes 80%
MacDonal d Road x General Boulevard	N	М	N	Μ	N	N	N	N

Note: 1) "M", or orange scores indicate that warrants are not met for the "Existing 2022 Survey" scenario, but could be met for the "2022 Survey + Development" scenario.

2) All criteria are required to be addressed prior to the warrant being met.

TABLE 8: SIGNALISED INTERSECTIONS - PEDESTRIAN CONSIDERATIONS

	Pedestri	an Safety	Pedestrian Safety – High Speed Road		
Location	Ped >150 peds/hr	Major Road >600 veh/hr	Ped >150 peds/hr	Major Road >450 veh/hr	Speed >75km/hr
MacDonald Road x General Boulevard	N	N	N	N	N

Note: 1) "M", or orange scores indicate that warrants are not met for the "Existing 2022 Survey" scenario but could be met for the "2022 Survey + Development" scenario.

2) All criteria are required to be addressed prior to the warrant being met.

Based on the above, it would suggest that the warrant would not be met following the construction of the development. Therefore, a sign-controlled intersection would be acceptable, until such a time where one (or more) of the warrants are met.



As discussed earlier in Section 6.4, the Proposal to provide a secondary connection via Zouch Road to provide vehicles access from the western side of the Site. Section 7 (and in particular Section 7.4) outlines that changes are required to obtain acceptable level of services.

These changes would consist of restriction in the northern and southern approaches of Zouch Road to leftin-left-out only. Figure 19 provides an illustration of the changes.

6.5 On-street Parking Design

Visitor parking shall be provided on-street and shall comply with AS2890.5:2020. Review of a signage plan prepared by the civil engineer will be undertaken to confirm the locations of on-street parking.

6.6 Waste Collection

All garbage collection is to be via a laneway or secondary streets where applicable as per Table 9 of the EPS DCP 2012. In this regard, bins will be transferred by residents to and from the kerbside for collection.

Waste collection is expected to be serviced by council's 10m Garbage Truck.



7 Traffic Assessment7.1 Traffic Modelling Study Area & Scope

As previously mentioned in **Section 1.1**, the proposed development has generally been considered by preceding transport studies to identify broader transport infrastructure requirements.

However, the proposed new connection to Zouch Road could create a change to network. As such, additional SIDRA modelling of localised intersections has been undertaken to investigate any impacts to key intersections immediately surrounding the Site that may be affected by this Proposal. Intersections to be modelled are outlined below.



Figure 17: Modelled Intersections

The modelled scenarios are shown in **Table 9**. This includes a 'sensitivity' scenario to assess the potential impact associated with redistribution of background traffic heading east from Zouch Road using the new internal roads to connect to MacDonald Road (and subsequent signalised connections), in lieu of the priority-controlled intersection at Zouch Road / Campbelltown Road.

TABLE 9: MODELLED SCENARIOS				
Scenario No.	Scenario	Description		
1	Existing 2022 Baseline	2022 Surveyed volumes		
2	Existing 2022 + Development	2022 Survey volumes + development traffic		
3	Sensitivity 2022 + Development	2022 Survey volumes (redistributed) + development traffic		





Scenario 2 and Scenario 3 assumes a 4-leg MacDonald Road x General Boulevard sign-controlled intersection, a 4-leg Zouch Road x Existing Access sign-controlled intersection, and a LILO at Zouch Road x Campbelltown Road. Reduced copies of the modelled geometry for each intersection are shown in the figures below and the network layout of these intersections is shown in **Appendix A**.



Figure 18: Zouch Road x Site Access



Figure 19: Zouch Road x Campbelltown Road






Figure 20: MacDonald Road x Campbelltown Road





It is noted that the Upgraded intersection at General Boulevard similar with that modelled as part of the transport assessments for MOD 4 and is consistent with MOD 12.



7.2 Existing Baseline Traffic (2022)

The Site is currently vacant, hence, there is no traffic generation to/from the Site.

Traffic surveys have been undertaken for each intersection outlined in **Figure 17** on 6 September 2022 to establish baseline traffic volumes. A network diagram has been created and a reduced copy shown within **Appendix A**. The modelling results for the existing baseline scenario is shown Table 10.

TABLE 10: EXISTING BASELINE RESULTS

Intersection	Peak	Degree of Saturation	Average Delay (seconds)	Level of Service
Zouch Road x	AM	0.173	9.6	А
Existing Access Driveway	PM	0.062	9.1	A
Zouch Road x	AM	1.005	267.9	F
Campbelltown Road	PM	0.620	159.5	F
Campbelltown Road x	AM	0.729	45.2	D
MacDonald Road	PM	0.897	43.4	D
MacDonald Road x	AM	0.423	24.5	В
General Boulevard	PM	0.108	15.9	В

7.3 Proposed Development Traffic

7.3.1 Project Traffic Generation

The adopted MOD 12 traffic generation rates remain unchanged to the approved rates within MOD 4 (and MOD 5). Application of these adopted trip rates to this DA are summarised in **Table 11**.

TABLE 11: PROPOSED TRAFFIC GENERATION												
AM Peak PM Peak												
Land Use	Yield	Trip Rate	Movements (vehicles/hr)	Trip Rate	Movements (vehicles/hr)							
Single Dwelling Houses	250	0.62 trips per dwelling	155	0.62 trips per dwelling	155							

The application of the approved rates to the development results in a forecast traffic generation of 155 vehicular movements per hour during the AM and PM peak periods.

Notwithstanding, for the purpose of this report, a higher peak hourly traffic generation has been adopted to allow for some sensitivity and to ensure the robustness of the proposal. As such a proposed yield of 270 units has been adopted which results in a peak of 167 veh/hr.

All modelling below has adopted the higher rate.



7.3.2 Traffic Distribution & Assignment

The adopted trip distribution for the Site has been based on those outlined within the MOD 12 submission, as follows.

TABLE 12: IN/OUT TRAFFIC DISTRIBUTION											
Land Use											
Land Use	In	Out	In	Out							
Dwelling	25%	75%	80%	20%							

Directional assignment assumptions during AM and PM peaks are summarised in the figures below which detail the assumed routes for the Site's traffic distribution. Assumed inbound / outbound routes for each direction are as follows.

- North: Vehicles travelling to and from the north are expected to travel along the northern leg or eastern leg of the MacDonald Road x General Boulevard intersection.
- East: Vehicles travelling to and from the east would travel along MacDonald Road and Campbelltown Road.
- South: Vehicles travelling to and from the south would travel along General Boulevard, Soldiers Parade and Campbelltown Road. An alternative route consists of travelling along General Boulevard, Soldiers Parade and Ray Simpson Avenue.
- West: Vehicles going to and from the Site would use the proposed connection via Zouch Road.

It is noted that the percentages for inbound and outbound do not sum up to exactly 100% due to rounding. However, the percentages have been derived from MOD 12's directional assignment assumptions





Figure 22: Development Traffic Distribution AM



Figure 23: Development Traffic Distribution PM



7.4 Network Performance with Development

7.4.1 Standard Assessment

Based on the above distribution assumptions, the Site's 167 vehicular trips have been distributed onto the existing network for both AM and PM peak hours. The resulting network diagrams have been provided within **Appendix A**, with the subsequent modelling results outlined in the table below.

TABLE 13: EXISTING BASELINE + DEVELOPMENT RESULTS

Intersection	Peak	Degree of Saturation	Average Delay (seconds)	Level of Service
Zouch Road x	AM	0.177	10.3	А
Existing Access Driveway	PM	0.062	9.1	А
Zouch Road x	AM	1.000	267.6	F
Campbelltown Road	PM	0.621	161.1	F
Campbelltown Road x	AM	0.882	41.9	С
MacDonald Road	PM	0.897	44.4	D
MacDonald Road x	AM	0.272	24.5	В
General Boulevard	PM	0.126	22.9	В

The above demonstrates that all intersections are operating at a LOS D or above during AM and PM peak periods, except for Zouch Road x Campbelltown Road which results in a LOS F. However, that is an existing issue and not materially impacted by the development itself.

TABLE 14: COMPARISON BETWEEN BASE AND PROJECT CASE SCENARIOS

Interception	Dook		Base Case		Project Case			
Intersection	reak	DoS	Delay	LoS	DoS	Delay	LoS	
Zouch Road x	AM	0.173	9.6	А	0.177	10.3 (+7.2%)	А	
Existing Access Driveway	PM	0.062	9.1	А	0.062	9.1 (0%)	А	
Zouch Road x	AM	1.005	267.9	F	1.000	267.6 (-0.01%)	F	
Road	PM	0.620	159.5	F	0.621	161.1 (+0.01%)	F	
Campbelltown Road x	AM	0.729	45.2	D	0.882	41.9 (-0.07%)	С	
MacDonald Road	PM	0.897	43.4	D	0.897	44.4 (+0.2%)	D	
MacDonald Road x	AM	0.423	24.5	A	0.272	24.5 (0%)	В	
General Boulevard	PM	0.108	15.9	В	0.126	22.9 (+47%)	В	



Having regard for the negligible impact to key intersections, the proposal is deemed acceptable.

7.4.2 Sensitivity Testing

Recognising that route choice is dynamic in nature, it could be expected that the routes chosen of background traffic may change with the introduction of the proposed connection between Zouch Road and MacDonald Road, and with changes made to the intersection of Zouch Road and Campbelltown Road (LILO). Therefore, sensitivity analysis has been conducted to assess network performance if traffic from the northern approach of Zouch Road x Campbelltown Road is redirected to Campbelltown Rd x MacDonald Rd.

This sensitivity scenario assumes that 50% of the existing traffic travelling south along Zouch Rd and heading towards Campbelltown Road would instead travel through the Site and utilise the signalised of Campbelltown Road via MacDonald Road. This rerouted movement was based on the following assumptions:

- The signalised intersection of Campbelltown Rd x MacDonald Rd provides a safer movement for all motorists when compared to the sign-controlled intersection of Zouch Rd x Campbelltown Rd
- Motorists heading to the Town Centre, Train Station or travelling north towards Edmondson Park and Liverpool would have a reduced travel distance, and
- The proposed upgrades to Campbelltown Rd restrict the turning movements of Zouch Rd to left-in, leftout only.

The network diagrams are shown in Appendix A, while modelling results for this sensitivity scenario are shown in the table below.

Intersection	Peak	Degree of Saturation	Average Delay (seconds)	Level of Service
Zouch Road x	AM	0.171	17.9	В
Existing Access Driveway	PM	0.102	8.2	А
Zouch Road x	AM	0.613	23.0	В
Campbelltown Road	PM	0.522	11.4	A
Campbelltown Road x	AM	0.745	50.0	D
MacDonald Road	PM	0.827	52.6	D
MacDonald Road x	AM	0.725	36.7	С
General Boulevard	PM	0.488	33.1	С

TABLE 15: SENSITIVITY TESTING RESULTS

Based on the results shown above, it is evident that the remaining intersections have sufficient capacity to accommodate all background traffic from Zouch Road and can operate at LOS D or above during AM and PM peak periods.



7.5 Traffic Impact Summary

The northern approach of Zouch Road x Campbelltown Road already fails under existing conditions (surveyed 2022 volumes). Project-related demands will have minimal impact on this intersection, with all other key intersection operating acceptably (LoS D or better) during both peak periods.

This proposal offers an alternate route for vehicles travelling along Zouch Road to safely access Campbelltown Road. In this regard, it is expected that background network users would prefer to utilise the Site to access Campbelltown Road x MacDonald Road. Further sensitivity analysis of this scenario illustrates that there is sufficient capacity to accommodate the redirected background traffic, with all intersections operating at LOS D or better.

As such, the proposed traffic generated by the Site, and subsequent redistribution of background traffic is supportable based on the modelling undertaken as part of this DA. Further, the traffic modelling aligns with the broader Concept Plan modelling with respect to traffic generation, distribution, and intersection layouts.



8 Summary & Conclusion

8.1 Introduction & Development Summary

- Ason Group has been engaged by Landcom to prepare a Traffic Assessment (TA) report to support the proposed civil and built-form Development Applications (DAs) for Precinct 3 within Edmondson Park South (as identified within the Edmondson Park South Concept Plan (MP 10_0118)).
- A summary of the proposed yields is provided below:
 - The Site would provide a residential development, which comprises:
 - 90 terraces
 - 4 small and duplex sites, and
 - 156 residential lots

8.2 Key Findings

The key findings of this Traffic Assessment (TA) are:

- It is expected that between 250-500 car spaces will be provided to meet EPS DCP 2012 requirements. The provision of residential car parking spaces is expected to readily comply with the requirements.
- Trip generation rates adopted for this assessment are consistent with the traffic assessment undertaken in the approved MOD 4 RtS TIA Report and subsequent MOD 12 TA which adopted 0.62 vehicle trips per hour per dwelling, resulting in 155 vehicle movements per hour (veh/hr).
- However, a peak hourly traffic generation of 167 veh/hr has been adopted for modelling purposes to provide a conservative analysis, consistent with the potential for up to 270 dwellings previously contemplated.
- The Existing 2022 scenario and Existing 2022 + Development scenario both show Zouch Road x Campbelltown Road will operate at LOS F. All other intersections operate at LoS D or better during both peak periods.
- Sensitivity analysis has been undertaken noting that this DA proposes a new connection between Zouch Road and MacDonald Road which provides traffic an alternative route to access Campbelltown Road.
- Recognising that route choice is dynamic in nature, it is expected that redirected background traffic may
 access Campbelltown Road via MacDonald Road when the proposed connection is constructed. Results
 show that the network performance at the other three intersections can still operate at LOS D or better.
- Design of the access (to the garages), the garages themselves, and the on-street car parking areas shall be designed with reference to the Australian Standards. It is anticipated that the full design compliance with the relevant Australian Standards would form a standard Condition of Consent further to the approval, which will also provide for any design changes if required.
- The road network is expected to be designed to accommodate movements for vehicles up to 12.5m Heavy Rigid Vehicles (HRV's) to cater for occasional removalist vehicles and waste collection trucks; likely serviced by Council's 10m Garbage Truck.

8.3 Conclusion

In summary, the Proposal is supportable on traffic planning grounds and will not result in any adverse impacts on the surrounding road network. Indeed, the new connection proposed will help to mitigate existing network delays and provide overall network safety benefits to the community.



Appendix A. Network Diagrams



Figure 24: Existing Baseline Traffic (2022) AM



Figure 25: Existing Baseline Traffic (2022) PM





Figure 26: Existing Baseline (2022) + Development AM



Figure 27: Existing Baseline (2022) + Development PM







Figure 28: Sensitivity Scenario (2022) + Development AM



Figure 29: Sensitivity Scenario (2022) + Development PM







V Site: 1 [1. Zouch Road x Existing Access Driveway - 2022 -AM (Site Folder: Existing 2022 Baseline AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N1 [Existing 2022 Baseline AM (Network Folder: Existing 2022 AM PM)]

Zouch Road x Existing Access Driveway - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Dem Fl	and ows	Ar Fl	rival ows	Deg. Satn	Aver. Delay	Level of Service	Aver. Bac	k Of Queu	e Prop. Que	Eff. Stop	Aver. No. of	Aver. Speed
			[Total	HV]	[Total	HV]				[Veh.	Dist]		Rate	Cycles	' //m
South	: Zoud	ch Rd (35	5 m)	70	ven/n	70	V/C	Sec		ven		_	_	_	KIII/11
1	L2	All MCs	12	9.1	12	9.1	0.018	5.6	LOS A	0.0	0.0	0.00	0.20	0.00	25.0
2	T1	All MCs	22	4.8	22	4.8	0.018	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	57.9
Appro	ach		34	6.3	34	6.3	0.018	1.9	NA	0.0	0.0	0.00	0.20	0.00	46.0
North:	Zouc	h Rd (50	0 m)												
8	T1	All MCs	329	0.6	329	0.6	0.173	0.0	LOS A	0.0	0.3	0.01	0.03	0.01	59.4
9	R2	All MCs	16	0.0	16	0.0	0.173	5.5	LOS A	0.0	0.3	0.01	0.03	0.01	34.7
Appro	ach		345	0.6	345	0.6	0.173	0.3	NA	0.0	0.3	0.01	0.03	0.01	57.4
West:	Existi	ng Acces	s Drive	way	(41 m)										
10	L2	All MCs	2	0.0	2	0.0	0.005	5.9	LOS A	0.0	0.1	0.16	0.94	0.16	46.6
12	R2	All MCs	2	50.0	2	50.0	0.005	9.6	LOS A	0.0	0.1	0.16	0.94	0.16	19.3
Appro	ach		42	25.0	42	25.0	0.005	7.8	LOS A	0.0	0.1	0.16	0.94	0.16	41.3
All Ve	hicles		383	1.4	383	1.4	0.173	0.5	NA	0.0	0.3	0.01	0.05	0.01	55.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 2 [2. Zouch Rd x Campbelltown - 2022 -AM (Site Folder: Existing 2022 Baseline AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

Zouch Rd x Campbelltown - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov	Turn	Mov	Dem ⊑	nand	Ar	rival	Deg. Sata	Aver.	Level of	Aver. Bac	k Of Queue	e Prop.	Eff. Stop	Aver.	Aver.
		01855	[Total	HV 1	[Total	HV 1	Jairi	Delay	Ocivice	[Veh.	Dist]	Que	Rate	Cycles	Opeeu
			veh/h	%	veh/h	%	v/c	sec		veh	m			,	km/h
South: Zouch Rd (215 m)															
1	L2	All MCs	102	1.0	102	1.0	0.115	7.4	LOS A	0.2	1.3	0.55	0.72	0.55	49.2
2	T1	All MCs	2	0.0	2	0.0	0.172	61.0	LOS E	0.2	1.2	0.97	0.99	0.99	7.3
3	R2	All MCs	4	0.0	4	0.0	0.172	112.2	LOS F	0.2	1.2	0.97	0.99	0.99	7.3
Appro	ach		108	1.0	108	1.0	0.172	12.5	LOS A	0.2	1.3	0.57	0.73	0.57	44.4
East:	Camp	belltown	Rd (68	0 m)											
4	L2	All MCs	8	0.0	8	0.0	0.489	9.4	LOS A	1.6	11.6	0.30	0.35	0.50	53.5
5	T1	All MCs	600	6.0	600	6.0	0.489	3.1	LOS A	1.6	11.6	0.30	0.35	0.50	61.8
6	R2	All MCs	53	4.0	53	4.0	0.489	66.1	LOS E	1.6	11.6	0.30	0.35	0.50	57.0
Appro	ach		661	5.7	661	5.7	0.489	8.2	NA	1.6	11.6	0.30	0.35	0.50	61.4
North	Zouc	h Rd (35	5 m)												
7	L2	All MCs	300	0.7	300	0.7	0.877	36.8	LOS C	2.7	18.9	0.97	1.49	2.92	22.6
8	T1	All MCs	9	0.0	9	0.0	1.005	190.2	LOS F	1.0	7.5	1.00	1.19	1.84	7.7
9	R2	All MCs	12	27.3	12	27.3	1.005	267.9	LOS F	1.0	7.5	1.00	1.19	1.84	10.7
Appro	ach		321	1.6	321	1.6	1.005	49.6	LOS D	2.7	18.9	0.97	1.47	2.85	19.3
West:	Camp	obelltown	Rd (50	00 m)											
10	L2	All MCs	18	23.5	18	23.5	0.653	7.5	LOS A	1.3	9.4	0.13	0.17	0.29	64.8
11	T1	All MCs	1083	4.4	1083	4.4	0.653	0.8	LOS A	1.3	9.4	0.13	0.17	0.29	64.8
12	R2	All MCs	68	4.6	68	4.6	0.653	21.7	LOS B	1.3	9.4	0.13	0.17	0.29	57.0
Appro	ach		1169	4.7	1169	4.7	0.653	2.2	NA	1.3	9.4	0.13	0.17	0.29	64.1
All Ve	hicles		2260	4.4	2260	4.4	1.005	11.2	NA	2.7	18.9	0.32	0.44	0.73	52.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 3 [3. Campbelltown x MacDonald - 2022 -AM (Site Folder: Existing 2022 Baseline AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N1 [Existing 2022 Baseline AM (Network Folder: Existing 2022 AM PM)]

Campbelltown x MacDonald - 2022 -AM

Assumptions: 2022 Survey

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance															
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	Of Queue	e Prop.	Eff.	Aver.	Aver.
ID		Class	FI Tatal	lows	FI Totol		Satn	Delay	Service	[\/ob	Diet 1	Que	Stop	No. of	Speed
			veh/h	пvј %	veh/h	⊓vj %	v/c	sec		veh	m m		Nale	Cycles	km/h
South	Mac	Donald R	d (360r	n)											
1	L2	All MCs	127	12.4	127	12.4	0.158	27.0	LOS B	3.0	23.1	0.60	0.71	0.60	25.1
2	T1	All MCs	246	3.0	246	3.0	0.487	46.7	LOS D	8.7	62.3	0.90	0.76	0.90	18.7
3	R2	All MCs	309	8.2	309	8.2	*0.726	57.8	LOS E	12.1	90.5	0.98	0.86	1.00	23.7
Appro	ach		683	7.1	683	7.1	0.726	48.1	LOS D	12.1	90.5	0.88	0.79	0.89	22.3
East: (Camp	belltown l	Rd (32)	0m)											
4	L2	All MCs	259	7.3	259	7.3	0.646	31.3	LOS C	13.7	101.5	0.90	0.83	0.90	26.9
5	T1	All MCs	448	4.7	448	4.7	0.646	52.6	LOS D	13.7	101.5	0.89	0.78	0.89	19.1
6	R2	All MCs	5	0.0	5	0.0	*0.066	78.1	LOS F	0.2	1.5	0.98	0.65	0.98	12.6
Appro	ach		713	5.6	713	5.6	0.646	45.1	LOS D	13.7	101.5	0.90	0.80	0.90	22.6
North:	Macl	Donald Ro	d (190n	n)											
7	L2	All MCs	28	0.0	28	0.0	0.077	53.2	LOS D	1.0	6.7	0.84	0.71	0.84	21.1
8	T1	All MCs	125	0.8	125	0.8	*0.565	65.1	LOS E	5.1	35.9	0.99	0.79	0.99	19.6
9	R2	All MCs	85	1.2	85	1.2	0.499	72.1	LOS F	3.5	24.9	0.99	0.78	0.99	9.0
Appro	ach		239	0.9	239	0.9	0.565	66.2	LOS E	5.1	35.9	0.98	0.78	0.98	16.4
West:	Cam	obelltown	Rd (68	80 m)											
10	L2	All MCs	187	0.6	187	0.6	0.729	28.8	LOS C	20.4	146.6	0.89	0.82	0.89	32.1
11	T1	All MCs	1004	4.0	1004	4.0	*0.729	37.2	LOS C	20.4	147.8	0.89	0.81	0.89	37.9
12	R2	All MCs	196	4.3	196	4.3	0.661	66.1	LOS E	7.8	56.8	0.99	0.83	1.00	28.3
Appro	ach		1387	3.6	1387	3.6	0.729	40.2	LOS C	20.4	147.8	0.91	0.82	0.91	35.4
All Vel	nicles		3022	4.6	3022	4.6	0.729	45.2	LOS D	20.4	147.8	0.90	0.80	0.91	28.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Mo	Pedestrian Movement Performance														
Mov ID Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE QU [Ped	E BACK OF EUE Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed					
	ped/h	sec		ped	m			sec	m	m/sec					
South: MacDona	ld Rd (36	60m)													

P1 Full	53	44.9	LOS E	0.2	0.2	0.80	0.80	60.3	20.0	0.33
East: Campbelltow	n Rd (3	20m)								
P2 Full	53	64.3	LOS F	0.2	0.2	0.96	0.96	79.7	20.0	0.25
North: MacDonald	Rd (190)m)								
P3 Full	53	32.3	LOS D	0.1	0.1	0.68	0.68	47.7	20.0	0.42
West: Campbelltow	/n Rd (6	680 m)								
P4 Full	53	54.2	LOS E	0.2	0.2	0.88	0.88	69.5	20.0	0.29
All Pedestrians	211	48.9	LOS E	0.2	0.2	0.83	0.83	64.3	20.0	0.31

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

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👼 Site: 4 [4. MacDonald x General Bvd - 2022 -AM (Site Folder: Existing 2022 Baseline AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

► Network: N1 [Existing 2022 **Baseline AM (Network Folder:** Existing 2022 AM PM)]

MacDonald x General Bvd - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Dem F	nand lows	Ar Fl	rival ows	Deg. Satn	Aver. Delav	Level of Service	Aver. Back	Of Queue	e Prop. Que	Eff. Stop	Aver. No. of	Aver. Speed
			[Total	HV]	[Total	HV]	NIC			[Veh.	Dist]		Rate	Cycles	km/b
South	: Mac	Donald F	Rd (190	m)	ven/m	/0	v/C	360	_	Ven	111	_	_	_	KIII/11
2	T1	All MCs	379	2.2	379	2.2	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	60	0.0	60	0.0	0.051	6.4	LOS A	0.1	0.5	0.22	0.57	0.22	42.4
Appro	ach		439	1.9	439	1.9	0.099	0.9	NA	0.1	0.5	0.03	0.08	0.03	57.3
East:	Gene	ral Bvd (*	155 m)												
4	L2	All MCs	60	1.8	60	1.8	0.054	8.4	LOS A	0.1	0.6	0.17	0.90	0.17	33.7
6	R2	All MCs	12	0.0	12	0.0	0.030	14.3	LOS A	0.0	0.3	0.56	0.93	0.56	37.1
Appro	ach		72	1.5	72	1.5	0.054	9.4	LOS A	0.1	0.6	0.24	0.90	0.24	34.7
North:	Mac	Donald R	d (260 i	m)											
7	L2	All MCs	27	0.0	27	0.0	0.053	5.5	LOS A	0.0	0.0	0.00	0.16	0.00	51.7
8	T1	All MCs	179	0.6	179	0.6	0.053	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	57.8
Appro	ach		206	0.5	206	0.5	0.053	0.7	NA	0.0	0.0	0.00	0.08	0.00	56.5
All Ve	hicles		717	1.5	717	1.5	0.099	1.7	NA	0.1	0.6	0.04	0.16	0.04	55.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 1 [1. Zouch Road x Existing Access Driveway - 2022 -PM (Site Folder: Existing 2022 Baseline AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

► Network: N1 [Existing 2022 **Baseline PM (Network Folder:** Existing 2022 AM PM)]

Zouch Road x Existing Access Driveway - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Dem Fl [Total	nand lows HV]	Ar Fl [Total	rival lows HV]	Deg. Satn	Aver. Delay	Level of Service	Aver. Bac [Veh.	k Of Queu Dist]	e Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South	: Zouo	ch Rd (35	55 m)												
1	L2	All MCs	1	0.0	1	0.0	0.062	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	25.8
2	T1	All MCs	123	0.9	123	0.9	0.062	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Appro	ach		124	0.8	124	0.8	0.062	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
North:	Zouc	h Rd (50	0 m)												
8	T1	All MCs	42	2.5	42	2.5	0.022	0.0	LOS A	0.0	0.0	0.01	0.02	0.01	59.6
9	R2	All MCs	1	0.0	1	0.0	0.022	5.7	LOS A	0.0	0.0	0.01	0.02	0.01	34.8
Appro	ach		43	2.4	43	2.4	0.022	0.1	NA	0.0	0.0	0.01	0.02	0.01	58.5
West:	Existi	ng Acces	s Drive	way	(41 m)										
10	L2	All MCs	1	100. 0	1	100. 0	0.008	9.1	LOS A	0.0	0.1	0.25	0.89	0.25	42.1
12	R2	All MCs	6	0.0	6	0.0	0.008	6.1	LOS A	0.0	0.1	0.25	0.89	0.25	20.9
Appro	ach		7	14.3	7	14.3	0.008	6.5	LOS A	0.0	0.1	0.25	0.89	0.25	30.7
All Ve	hicles		175	1.8	175	1.8	0.062	0.3	NA	0.0	0.1	0.01	0.05	0.01	59.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 2 [2. Zouch Rd x Campbelltown - 2022 -PM (Site Folder: Existing 2022 Baseline AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

Network: N1 [Existing 2022 Baseline PM (Network Folder: Existing 2022 AM PM)]

Zouch Rd x Campbelltown - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov	Turn	Mov Class	Dem	and	Ar	rival	Deg. Satn	Aver.	Level of Service	Aver. Back	c Of Queue	Prop.	Eff. Stop	Aver.	Aver.
		01033	[Total	HV]	[Total]	HV]	Jain	Delay	Ocivice	[Veh.	Dist]	Que	Rate	Cycles	Opeeu
			veh/h	%	veh/h	%	v/c	sec		veh	m			·	km/h
South	: Zoud	ch Rd (21	5 m)												
1	L2	All MCs	63	0.0	63	0.0	0.120	10.9	LOS A	0.2	1.2	0.71	0.86	0.71	46.4
2	T1	All MCs	2	0.0	2	0.0	0.125	36.9	LOS C	0.1	0.8	0.96	0.98	0.97	7.1
3	R2	All MCs	2	50.0	2	50.0	0.125	159.5	LOS F	0.1	0.8	0.96	0.98	0.97	7.1
Appro	ach		67	1.6	67	1.6	0.125	16.4	LOS B	0.2	1.2	0.72	0.87	0.72	41.8
East:	Camp	belltown	Rd (68	0 m)											
4	L2	All MCs	16	0.0	16	0.0	0.620	7.1	LOS A	1.2	8.7	0.19	0.25	0.35	58.9
5	T1	All MCs	974	1.8	974	1.8	0.620	0.7	LOS A	1.2	8.7	0.19	0.25	0.35	67.2
6	R2	All MCs	102	0.0	102	0.0	0.620	19.0	LOS B	1.2	8.7	0.19	0.25	0.35	65.3
Appro	ach		1092	1.6	1092	1.6	0.620	2.5	NA	1.2	8.7	0.19	0.25	0.35	67.0
North:	Zouc	h Rd (35	5 m)												
7	L2	All MCs	64	1.6	64	1.6	0.074	8.2	LOS A	0.1	0.8	0.53	0.73	0.53	43.8
8	T1	All MCs	3	0.0	3	0.0	0.127	37.9	LOS C	0.1	1.0	0.94	0.97	0.94	24.8
9	R2	All MCs	7	0.0	7	0.0	0.127	48.7	LOS D	0.1	1.0	0.94	0.97	0.94	32.2
Appro	ach		75	1.4	75	1.4	0.127	13.5	LOS A	0.1	1.0	0.58	0.77	0.58	39.3
West:	Camp	belltown	Rd (50	0 m)											
10	L2	All MCs	16	0.0	16	0.0	0.422	7.1	LOS A	0.9	6.7	0.26	0.31	0.35	60.7
11	T1	All MCs	594	1.8	594	1.8	0.422	0.8	LOS A	0.9	6.7	0.26	0.31	0.35	60.7
12	R2	All MCs	57	1.9	57	1.9	0.422	37.4	LOS C	0.9	6.7	0.26	0.31	0.35	54.8
Appro	ach		666	1.7	666	1.7	0.422	4.1	NA	0.9	6.7	0.26	0.31	0.35	59.9
All Ve	hicles		1900	1.7	1900	1.7	0.620	4.0	NA	1.2	8.7	0.25	0.31	0.37	63.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 3 [3. Campbelltown x MacDonald - 2022 -PM (Site Folder: Existing 2022 Baseline AM PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

Campbelltown x MacDonald - 2022 -PM

Assumptions: 2022 Survey Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

Vehic	le M	ovement	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	Of Queue	e Prop.	Eff.	Aver.	Aver.
ID		Class	FI Tatal	lows	FI Totol		Satn	Delay	Service	[\/ob	Diet 1	Que	Stop	No. of	Speed
			veh/h	пvј %	veh/h	пvј %	v/c	sec		veh	m Dist		Rate	Cycles	km/h
South	: Mac	Donald R	d (360r	n)											
1	L2	All MCs	163	1.9	163	1.9	0.223	27.8	LOS B	3.5	24.9	0.70	0.74	0.70	24.7
2	T1	All MCs	199	4.8	199	4.8	0.429	38.0	LOS C	5.6	40.5	0.89	0.74	0.89	21.2
3	R2	All MCs	311	4.1	311	4.1	0.860	59.2	LOS E	11.2	81.0	1.00	1.00	1.22	23.5
Appro	ach		673	3.8	673	3.8	0.860	45.3	LOS D	11.2	81.0	0.89	0.86	1.00	23.1
East:	Camp	belltown	Rd (32	0m)											
4	L2	All MCs	253	4.2	253	4.2	*0.879	34.1	LOS C	20.3	145.6	1.00	1.00	1.16	26.2
5	T1	All MCs	803	1.8	803	1.8	0.879	46.0	LOS D	20.3	145.6	0.97	0.90	1.04	20.2
6	R2	All MCs	13	8.3	13	8.3	0.132	62.3	LOS E	0.4	3.2	0.98	0.68	0.98	15.0
Appro	ach		1068	2.5	1068	2.5	0.879	43.4	LOS D	20.3	145.6	0.98	0.92	1.07	22.1
North:	Macl	Donald Ro	d (190n	n)											
7	L2	All MCs	67	0.0	67	0.0	0.143	38.7	LOS C	1.7	12.0	0.81	0.73	0.81	25.1
8	T1	All MCs	155	0.7	155	0.7	*0.548	48.6	LOS D	4.9	34.2	0.98	0.79	0.98	23.2
9	R2	All MCs	126	0.0	126	0.0	0.680	60.4	LOS E	4.3	29.9	1.00	0.85	1.08	10.5
Appro	ach		348	0.3	348	0.3	0.680	50.9	LOS D	4.9	34.2	0.95	0.80	0.98	19.3
West:	Cam	obelltown	Rd (68	80 m)											
10	L2	All MCs	118	1.8	118	1.8	0.334	22.9	LOS B	5.7	40.2	0.74	0.70	0.74	36.5
11	T1	All MCs	380	1.1	380	1.1	0.334	27.5	LOS B	5.7	40.4	0.75	0.66	0.75	42.0
12	R2	All MCs	162	3.9	162	3.9	*0.897	71.5	LOS F	6.2	44.7	1.00	1.03	1.41	27.3
Appro	ach		660	1.9	660	1.9	0.897	37.5	LOS C	6.2	44.7	0.81	0.76	0.91	36.1
All Ve	hicles		2749	2.4	2749	2.4	0.897	43.4	LOS D	20.3	145.6	0.91	0.85	1.00	26.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Mo	vement	Perform	nance							
Mov ID Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE QU [Ped	E BACK OF EUE Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
	ped/h	sec		ped	m			sec	m	m/sec
South: MacDona	ld Rd (36	60m)								

P1 Full	53	35.3	LOS D	0.1	0.1	0.80	0.80	50.7	20.0	0.39
East: Campbelltow	n Rd (3	20m)								
P2 Full	53	49.3	LOS E	0.2	0.2	0.95	0.95	64.7	20.0	0.31
North: MacDonald	Rd (190)m)								
P3 Full	53	31.4	LOS D	0.1	0.1	0.76	0.76	46.8	20.0	0.43
West: Campbelltow	/n Rd (6	680 m)								
P4 Full	53	48.3	LOS E	0.2	0.2	0.94	0.94	63.7	20.0	0.31
All Pedestrians	211	41.1	LOS E	0.2	0.2	0.86	0.86	56.4	20.0	0.35

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

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👼 Site: 4 [4. MacDonald x General Bvd - 2022 -PM (Site Folder: Existing 2022 Baseline AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

► Network: N1 [Existing 2022 **Baseline PM (Network Folder:** Existing 2022 AM PM)]

MacDonald x General Bvd - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Dem F	nand lows	Ar Fl	rival lows	Deg. Satn	Aver. Delay	Level of Service	Aver. Back	Of Queue	e Prop. Que	Eff. Stop	Aver. No. of	Aver. Speed
			veh/h	HV J %	veh/h	HV J %	v/c	sec		ر ven. veh	Dist j m		Rate	Cycles	km/h
South	: Mac	Donald F	Rd (190	m)											
2	T1	All MCs	263	4.8	263	4.8	0.070	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	All MCs	66	0.0	66	0.0	0.070	7.4	LOS A	0.1	0.6	0.36	0.63	0.36	41.2
Appro	ach		329	3.8	329	3.8	0.070	1.5	NA	0.1	0.6	0.07	0.13	0.07	55.8
East:	Gene	ral Bvd (′	155 m)												
4	L2	All MCs	43	2.4	43	2.4	0.040	8.6	LOS A	0.1	0.4	0.20	0.89	0.20	33.6
6	R2	All MCs	5	0.0	5	0.0	0.016	15.9	LOS B	0.0	0.1	0.62	0.91	0.62	35.9
Appro	ach		48	2.2	48	2.2	0.040	9.4	LOS A	0.1	0.4	0.24	0.89	0.24	34.1
North:	Macl	Donald R	d (260 i	m)											
7	L2	All MCs	109	1.0	109	1.0	0.108	5.6	LOS A	0.0	0.0	0.00	0.32	0.00	49.2
8	T1	All MCs	305	0.0	305	0.0	0.108	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	56.8
Appro	ach		415	0.3	415	0.3	0.108	1.5	NA	0.0	0.0	0.00	0.16	0.00	53.8
All Ve	hicles		793	1.9	793	1.9	0.108	2.0	NA	0.1	0.6	0.04	0.19	0.04	53.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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43 | P1321r01v2 DA TA_Precinct 3 (Residential), Edmondson Park



V Site: 1 [1. Zouch Road x Existing Access Driveway - 2022 -AM (Site Folder: Existing 2022 Baseline + Dev AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing 2022 Baseline + Dev AM - Copy (Network Folder: Existing 2022 + Dev AM PM - Sign Contolled)]

Zouch Road x Existing Access Driveway - 2026 - AM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehic	le M	ovement	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Bac	k Of Queue	Prop.	Eff.	Aver.	Aver.
ID		Class	FI [Total	lows	FI [Total	lows ⊔\/1	Satn	Delay	Service	[\/ob	Diet 1	Que	Stop	No. of	Speed
			veh/h	· · · · j %	veh/h	%	v/c	sec		veh	m		Tale	Cycles	km/h
South	Zou	ch Rd (35	5 m)												
1	L2	All MCs	12	9.1	12	9.1	0.018	5.6	LOS A	0.0	0.0	0.04	0.23	0.04	24.9
2	T1	All MCs	22	4.8	22	4.8	0.018	0.0	LOS A	0.0	0.0	0.04	0.23	0.04	57.6
3	R2	All MCs	1	0.0	1	0.0	0.018	9.1	LOS A	0.0	0.0	0.04	0.23	0.04	52.2
Appro	ach		35	6.1	35	6.1	0.018	2.2	NA	0.0	0.0	0.04	0.23	0.04	45.9
East:	Site A	ccess (20	00 m)												
4	L2	All MCs	1	0.0	1	0.0	0.003	6.6	LOS A	0.0	0.0	0.39	0.56	0.39	39.5
5	T1	All MCs	1	0.0	1	0.0	0.003	5.8	LOS A	0.0	0.0	0.39	0.56	0.39	19.0
6	R2	All MCs	1	0.0	1	0.0	0.003	7.4	LOS A	0.0	0.0	0.39	0.56	0.39	49.1
Appro	ach		3	0.0	3	0.0	0.003	6.6	LOS A	0.0	0.0	0.39	0.56	0.39	35.4
North:	Zoud	h Rd (500) m)												
7	L2	All MCs	1	0.0	1	0.0	0.177	5.5	LOS A	0.0	0.3	0.01	0.03	0.01	56.1
8	T1	All MCs	329	0.6	329	0.6	0.177	0.0	LOS A	0.0	0.3	0.01	0.03	0.01	59.4
9	R2	All MCs	16	0.0	16	0.0	0.177	5.5	LOS A	0.0	0.3	0.01	0.03	0.01	46.7
Appro	ach		346	0.6	346	0.6	0.177	0.3	NA	0.0	0.3	0.01	0.03	0.01	58.6
West:	Exist	ing Acces	s Drive	way	(41 m)										
10	L2	All MCs	2	0.0	2	0.0	0.007	5.9	LOS A	0.0	0.1	0.19	0.96	0.19	46.4
11	T1	All MCs	2	50.0	2	50.0	0.007	10.3	LOS A	0.0	0.1	0.19	0.96	0.19	29.5
12	R2	All MCs	1	0.0	1	0.0	0.007	7.8	LOS A	0.0	0.1	0.19	0.96	0.19	18.8
Appro	ach		5	20.0	5	20.0	0.007	8.1	LOS A	0.0	0.1	0.19	0.96	0.19	37.9
All Ve	nicles		389	1.4	389	1.4	0.177	0.6	NA	0.0	0.3	0.02	0.06	0.02	56.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 2 [2. Zouch Rd x Campbelltown - 2022 -AM (Site Folder: Existing 2022 Baseline + Dev AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing 2022 Baseline + Dev AM - Copy (Network Folder: Existing 2022 + Dev AM PM - Sign Contolled)]

Zouch Rd x Campbelltown - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehic	le M	ovement	Perfo	orma	nce										
Mov	Turn	Mov	Den	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	< Of Queue	e Prop.	Eff.	Aver.	Aver.
ID		Class	FI [Total]	lows µ\/1	Fl [Total	lows µ\/1	Satn	Delay	Service	[\/eh	Diet 1	Que	Stop Rate	No. of	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		Trate	Cycles	km/h
South	: Zou	ch Rd (21	5 m)												
1	L2	All MCs	102	1.0	102	1.0	0.116	7.4	LOS A	0.2	1.3	0.55	0.72	0.55	49.2
2	T1	All MCs	2	0.0	2	0.0	0.202	65.0	LOS E	0.2	1.4	0.98	1.00	1.01	6.3
3	R2	All MCs	4	0.0	4	0.0	0.202	137.5	LOS F	0.2	1.4	0.98	1.00	1.01	6.3
Appro	ach		108	1.0	108	1.0	0.202	13.6	LOS A	0.2	1.4	0.57	0.73	0.57	43.6
East:	Camp	belltown l	Rd (68	0 m)											
4	L2	All MCs	8	0.0	8	0.0	0.492	9.4	LOS A	1.6	11.7	0.30	0.35	0.50	53.5
5	T1	All MCs	604	5.9	604	5.9	0.492	3.1	LOS A	1.6	11.7	0.30	0.35	0.50	61.8
6	R2	All MCs	53	4.0	53	4.0	0.492	66.5	LOS E	1.6	11.7	0.30	0.35	0.50	57.0
Appro	ach		665	5.7	665	5.7	0.492	8.2	NA	1.6	11.7	0.30	0.35	0.50	61.4
North:	Zoud	ch Rd (358	5 m)												
7	L2	All MCs	405	0.5	405	0.5	1.182	196.2	LOS F	18.4	129.4	1.00	3.95	12.47	6.1
8	T1	All MCs	9	0.0	9	0.0	1.000	188.9	LOS F	0.9	7.5	1.00	1.19	1.83	7.7
9	R2	All MCs	12	27.3	12	27.3	1.000	267.6	LOS F	0.9	7.5	1.00	1.19	1.83	10.7
Appro	ach		426	1.2	426	1.2	1.182	198.0	LOS F	18.4	129.4	1.00	3.81	11.95	6.3
West:	Cam	pbelltown	Rd (50	00 m)											
10	L2	All MCs	18	23.5	18	23.5	0.654	7.6	LOS A	1.3	9.5	0.13	0.17	0.30	64.7
11	T1	All MCs	1084	4.4	1084	4.4	0.654	0.9	LOS A	1.3	9.5	0.13	0.17	0.30	64.7
12	R2	All MCs	68	4.6	68	4.6	0.654	21.9	LOS B	1.3	9.5	0.13	0.17	0.30	57.0
Appro	ach		1171	4.7	1171	4.7	0.654	2.2	NA	1.3	9.5	0.13	0.17	0.30	64.0
All Ve	hicles		2371	4.2	2371	4.2	1.182	39.6	NA	18.4	129.4	0.36	0.90	2.46	32.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 3 [3. Campbelltown x MacDonald - 2022 -AM (Site Folder: Existing 2022 Baseline + Dev AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing 2022 Baseline + Dev AM - Copy (Network Folder: Existing 2022 + Dev AM PM - Sign Contolled)]

Campbelltown x MacDonald - 2022 -AM

Assumptions: 2022 Survey

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network Practical Cycle Time)

Vehic	le M	ovement	Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ID		Class	FI [Total	lows	FI [Total	OWS 山\/1	Satn	Delay	Service	[\/ob	Diet 1	Que	Stop	No. of	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		Trate	Cycles	km/h
South	Mac	Donald R	d (360r	n)											
1	L2	All MCs	127	12.4	127	12.4	0.161	22.8	LOS B	2.4	18.6	0.61	0.71	0.61	27.2
2	T1	All MCs	247	3.0	247	3.0	0.490	37.1	LOS C	6.9	49.7	0.90	0.75	0.90	21.5
3	R2	All MCs	309	8.2	309	8.2	* 0.808	53.7	LOS D	10.5	78.8	1.00	0.94	1.13	24.7
Appro	ach		684	7.1	684	7.1	0.808	42.0	LOS C	10.5	78.8	0.89	0.83	0.95	24.0
East: (Camp	belltown l	Rd (32)	0m)											
4	L2	All MCs	259	7.3	259	7.3	0.715	29.9	LOS C	11.7	86.3	0.95	0.85	0.95	28.4
5	T1	All MCs	448	4.7	448	4.7	0.715	45.4	LOS D	11.7	86.3	0.93	0.81	0.93	20.8
6	R2	All MCs	27	0.0	27	0.0	*0.270	63.0	LOS E	0.9	6.5	0.99	0.71	0.99	14.9
Appro	ach		735	5.4	735	5.4	0.715	40.6	LOS C	11.7	86.3	0.94	0.82	0.94	23.9
North:	Macl	Donald Ro	d (190n	n)											
7	L2	All MCs	126	0.0	126	0.0	0.267	40.0	LOS C	3.3	23.3	0.84	0.76	0.84	24.7
8	T1	All MCs	129	0.8	129	0.8	*0.459	47.8	LOS D	4.0	28.2	0.96	0.77	0.96	23.4
9	R2	All MCs	89	1.2	89	1.2	0.486	57.5	LOS E	2.9	20.6	0.99	0.77	0.99	10.8
Appro	ach		345	0.6	345	0.6	0.486	47.5	LOS D	4.0	28.2	0.93	0.77	0.93	20.9
West:	Cam	obelltown	Rd (68	80 m)											
10	L2	All MCs	188	0.6	<mark>180</mark>	0.6	0.822	31.6	LOS C	18.2	130.9	0.97	0.92	1.04	31.0
11	T1	All MCs	1004	4.0	<mark>963</mark>	4.1	*0.822	39.9	LOS C	18.2	130.9	0.97	0.92	1.05	36.9
12	R2	All MCs	196	4.3	<mark>188</mark>	4.5	0.717	57.3	LOS E	6.2	45.3	1.00	0.86	1.08	30.3
Appro	ach		1388	3.6	<mark>1331</mark>	3.7	0.822	41.2	LOS C	18.2	130.9	0.98	0.91	1.05	35.1
All Vel	nicles		3153	4.4	<mark>3095</mark>	4.5	0.822	41.9	LOS C	18.2	130.9	0.94	0.86	0.99	29.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Mov	vement	Perform	nance							
Mov	Dem.	Aver.	Level of	AVERAGE	BACK OF	Prop.	Eff.	Travel	Travel	Aver.
ID Crossing	Flow	Delay	Service	QUE	UE	Que	Stop	Time	Dist.	Speed
				[Ped	Dist]		Rate			
	ped/h	sec		ped	m			sec	m	m/sec

South: MacDonald	Rd (36	Om)								
P1 Full	53	41.1	LOS E	0.1	0.1	0.87	0.87	56.5	20.0	0.35
East: Campbelltow	n Rd (3	20m)								
P2 Full	53	49.3	LOS E	0.2	0.2	0.95	0.95	64.7	20.0	0.31
North: MacDonald	Rd (190)m)								
P3 Full	53	32.9	LOS D	0.1	0.1	0.77	0.77	48.3	20.0	0.41
West: Campbelltov	vn Rd (6	680 m)								
P4 Full	53	46.5	LOS E	0.2	0.2	0.92	0.92	61.9	20.0	0.32
All Pedestrians	211	42.4	LOS E	0.2	0.2	0.88	0.88	57.8	20.0	0.35

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

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Site: 4v [4. MacDonald x General Bvd - 2022 - AM -Conversion (Site Folder: Existing 2022 Baseline + Dev AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing 2022 Baseline + Dev AM - Copy (Network Folder: Existing 2022 + Dev AM PM - Sign Contolled)]

MacDonald x General Bvd - 2022 - AM

Assumptions: 2022 Survey Site Category: 4 leg Signalised Stop (Two-Way)

Vehic	le M	ovement	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	hand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	Of Queue	Prop.	Eff.	Aver.	Aver.
U		Class	FI [Total	IOWS HV 1	FI [Total	lows HV 1	Sath	Delay	Service	[Veh	Dist 1	Que	Stop Rate	NO. OF Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South	: Mac	Donald R	d (190r	n)											
1	L2	All MCs	25	0.0	25	0.0	0.101	4.6	LOS A	0.0	0.0	0.00	0.26	0.00	43.9
2	T1	All MCs	371	2.3	<mark>364</mark>	2.3	0.101	1.2	LOS A	0.0	0.0	0.00	0.24	0.00	48.0
3	R2	All MCs	60	0.0	<mark>59</mark>	0.0	0.050	5.4	LOS A	0.1	0.5	0.22	0.53	0.22	41.1
Appro	ach		456	1.8	<mark>448</mark>	1.9	0.101	2.0	NA	0.1	0.5	0.03	0.28	0.03	47.0
East:	Gene	ral Bvd (2	60m)												
4	L2	All MCs	60	1.8	60	1.8	0.084	7.9	LOS A	0.1	0.9	0.24	0.87	0.24	34.9
5	T1	All MCs	9	0.0	9	0.0	0.084	17.3	LOS B	0.1	0.9	0.24	0.87	0.24	37.3
6	R2	All MCs	12	0.0	12	0.0	0.043	17.0	LOS B	0.1	0.4	0.64	0.98	0.64	33.8
Appro	ach		81	1.3	81	1.3	0.084	10.3	LOS A	0.1	0.9	0.30	0.89	0.30	34.9
North	McD	onald Rd	(370m))											
7	L2	All MCs	27	0.0	27	0.0	0.053	3.4	LOS A	0.0	0.0	0.00	0.12	0.00	38.7
8	T1	All MCs	179	0.6	179	0.6	0.053	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	39.5
9	R2	All MCs	9	0.0	9	0.0	0.009	4.7	LOS A	0.0	0.1	0.39	0.48	0.39	36.9
Appro	ach		216	0.5	216	0.5	0.053	0.6	NA	0.0	0.1	0.02	0.08	0.02	39.2
West:	Gene	eral Bvd (1	150m)												
10	L2	All MCs	14	0.0	14	0.0	0.056	8.2	LOS A	0.1	0.6	0.47	0.83	0.47	33.4
11	T1	All MCs	14	0.0	14	0.0	0.056	16.9	LOS B	0.1	0.6	0.47	0.83	0.47	34.8
12	R2	All MCs	105	0.0	105	0.0	0.423	24.5	LOS B	0.8	5.4	0.77	1.09	1.05	17.3
Appro	ach		133	0.0	133	0.0	0.423	22.0	LOS B	0.8	5.4	0.71	1.04	0.93	21.9
All Ve	hicles		885	1.2	<mark>877</mark>	1.2	0.423	5.4	NA	0.8	5.4	0.15	0.40	0.19	40.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Organisation: ASON GROUP PTY LTD | Licence: NETWORK / 1PC | Processed: Monday, 9 January 2023 5:09:43 PM Project: C:\Users\James Laidler\Downloads\P1321m01v1-Precinct 3 (Resi), Edmondson Park (No Signals).sip9

V Site: 1 [1. Zouch Road x Existing Access Driveway - 2022 -PM (Site Folder: Existing 2022 Baseline + Dev AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing 2022 Baseline + Dev PM - Copy (Network Folder: Existing 2022 + Dev AM PM - Sign Contolled)]

Zouch Road x Existing Access Driveway - 2026 - AM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance															
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Bac	k Of Queue	Prop.	Eff.	Aver.	Aver.
ID		Class	H Total]	lows H\/ 1	Fl [Total	ows H\/ 1	Satn	Delay	Service	[\/eh	Dist 1	Que	Stop Rate	No. of Cycles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		rtato	Cycleo	km/h
South	: Zouo	ch Rd (35	5 m)												
1	L2	All MCs	1	0.0	1	0.0	0.062	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	25.8
2	T1	All MCs	123	0.9	123	0.9	0.062	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
3	R2	All MCs	1	0.0	1	0.0	0.062	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	55.1
Appro	ach		125	0.8	125	0.8	0.062	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.5
East:	Site A	ccess (20	00 m)												
4	L2	All MCs	1	0.0	1	0.0	0.003	5.6	LOS A	0.0	0.0	0.18	0.52	0.18	41.3
5	T1	All MCs	1	0.0	1	0.0	0.003	4.8	LOS A	0.0	0.0	0.18	0.52	0.18	19.3
6	R2	All MCs	1	0.0	1	0.0	0.003	6.2	LOS A	0.0	0.0	0.18	0.52	0.18	49.9
Appro	ach		3	0.0	3	0.0	0.003	5.6	LOS A	0.0	0.0	0.18	0.52	0.18	36.2
North:	Zouc	h Rd (500) m)												
7	L2	All MCs	1	0.0	1	0.0	0.022	5.5	LOS A	0.0	0.0	0.02	0.03	0.02	56.1
8	T1	All MCs	42	2.5	42	2.5	0.022	0.0	LOS A	0.0	0.0	0.02	0.03	0.02	59.3
9	R2	All MCs	1	0.0	1	0.0	0.022	5.8	LOS A	0.0	0.0	0.02	0.03	0.02	46.7
Appro	ach		44	2.4	44	2.4	0.022	0.3	NA	0.0	0.0	0.02	0.03	0.02	58.8
West:	Existi	ng Acces	s Drive	way	(41 m)										
10	L2	All MCs	1	100.	1	100.	0.009	9.1	LOS A	0.0	0.1	0.27	0.90	0.27	42.2
				0		0									
11	T1	All MCs	6	0.0	6	0.0	0.009	6.2	LOS A	0.0	0.1	0.27	0.90	0.27	38.4
12	R2	All MCs	1	0.0	1	0.0	0.009	6.3	LOS A	0.0	0.1	0.27	0.90	0.27	21.0
Appro	ach		8	12.5	8	12.5	0.009	6.5	LOS A	0.0	0.1	0.27	0.90	0.27	38.5
All Ve	hicles		181	1.7	181	1.7	0.062	0.5	NA	0.0	0.1	0.02	0.07	0.02	58.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 2 [2. Zouch Rd x Campbelltown - 2022 -PM (Site Folder: Existing 2022 Baseline + Dev AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing 2022 Baseline + Dev PM - Copy (Network Folder: Existing 2022 + Dev AM PM - Sign Contolled)]

Zouch Rd x Campbelltown - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance															
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ID		Class	Fl Total	IOWS	Fl [Total	lows H\/ 1	Satn	Delay	Service	[\/eh	Dist 1	Que	Stop Rate	No. of Cycles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		Tuto	0,000	km/h
South	: Zou	ch Rd (21	5 m)												
1	L2	All MCs	63	0.0	63	0.0	0.121	10.9	LOS A	0.2	1.2	0.71	0.86	0.71	46.4
2	T1	All MCs	2	0.0	2	0.0	0.126	37.3	LOS C	0.1	0.8	0.96	0.98	0.97	7.1
3	R2	All MCs	2	50.0	2	50.0	0.126	161.1	LOS F	0.1	0.8	0.96	0.98	0.97	7.1
Appro	ach		67	1.6	67	1.6	0.126	16.4	LOS B	0.2	1.2	0.72	0.87	0.72	41.7
East:	Camp	belltown	Rd (68	0 m)											
4	L2	All MCs	16	0.0	16	0.0	0.621	7.1	LOS A	1.2	8.8	0.19	0.25	0.35	58.9
5	T1	All MCs	975	1.8	975	1.8	0.621	0.7	LOS A	1.2	8.8	0.19	0.25	0.35	67.2
6	R2	All MCs	102	0.0	102	0.0	0.621	19.1	LOS B	1.2	8.8	0.19	0.25	0.35	65.3
Appro	ach		1093	1.6	1093	1.6	0.621	2.5	NA	1.2	8.8	0.19	0.25	0.35	67.0
North:	Zouc	ch Rd (35	5 m)												
7	L2	All MCs	64	1.6	64	1.6	0.075	8.2	LOS A	0.1	0.8	0.53	0.73	0.53	43.8
8	T1	All MCs	3	0.0	3	0.0	0.128	38.1	LOS C	0.1	1.0	0.94	0.97	0.94	24.8
9	R2	All MCs	7	0.0	7	0.0	0.128	49.0	LOS D	0.1	1.0	0.94	0.97	0.94	32.1
Appro	ach		75	1.4	75	1.4	0.128	13.5	LOS A	0.1	1.0	0.59	0.77	0.59	39.2
West:	Cam	pbelltown	Rd (50	0 m)											
10	L2	All MCs	16	0.0	16	0.0	0.423	7.2	LOS A	0.9	6.7	0.25	0.31	0.35	60.7
11	T1	All MCs	596	1.8	596	1.8	0.423	0.8	LOS A	0.9	6.7	0.25	0.31	0.35	60.7
12	R2	All MCs	57	1.9	57	1.9	0.423	37.5	LOS C	0.9	6.7	0.25	0.31	0.35	54.8
Appro	ach		668	1.7	668	1.7	0.423	4.1	NA	0.9	6.7	0.25	0.31	0.35	59.9
All Ve	hicles		1903	1.7	1903	1.7	0.621	4.0	NA	1.2	8.8	0.25	0.31	0.37	63.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 3 [3. Campbelltown x MacDonald - 2022 -PM (Site Folder: Existing 2022 Baseline + Dev AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing 2022 Baseline + Dev PM - Copy (Network Folder: Existing 2022 + Dev AM PM - Sign Contolled)]

Campbelltown x MacDonald - 2022 -PM

Assumptions: 2022 Survey

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network Practical Cycle Time)

Vehic	le M	ovement	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	Of Queue	e Prop.	Eff.	Aver.	Aver.
ID		Class	Fl Total	IOWS	H Total	ows H\/ 1	Satn	Delay	Service	[\/eh	Dist 1	Que	Stop Rate	No. of Cycles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		rtato	Cycles	km/h
South: MacDonald F			d (360r	n)											
1	L2	All MCs	163	1.9	163	1.9	0.223	27.8	LOS B	3.5	24.9	0.70	0.74	0.70	24.7
2	T1	All MCs	201	4.7	201	4.7	0.433	38.0	LOS C	5.6	41.0	0.89	0.74	0.89	21.2
3	R2	All MCs	311	4.1	311	4.1	0.860	59.2	LOS E	11.2	81.0	1.00	1.00	1.22	23.5
Approa	ach		675	3.7	675	3.7	0.860	45.3	LOS D	11.2	81.0	0.90	0.86	1.00	23.1
East: 0	Camp	belltown	Rd (32)	Om)											
4	L2	All MCs	253	4.2	253	4.2	*0.879	34.1	LOS C	20.3	145.6	1.00	1.00	1.16	26.2
5	T1	All MCs	803	1.8	803	1.8	0.879	46.0	LOS D	20.3	145.6	0.97	0.90	1.04	20.2
6	R2	All MCs	107	1.0	107	1.0	0.582	59.0	LOS E	3.5	25.0	1.00	0.79	1.01	15.6
Approa	ach		1163	2.3	1163	2.3	0.879	44.6	LOS D	20.3	145.6	0.98	0.91	1.06	21.5
North:	Macl	Donald Ro	d (190n	n)											
7	L2	All MCs	91	0.0	91	0.0	0.162	34.9	LOS C	2.2	15.3	0.77	0.73	0.77	26.4
8	T1	All MCs	156	0.7	156	0.7	*0.552	48.6	LOS D	4.9	34.4	0.98	0.79	0.98	23.2
9	R2	All MCs	127	0.0	127	0.0	0.686	60.5	LOS E	4.3	30.2	1.00	0.85	1.09	10.4
Approa	ach		374	0.3	374	0.3	0.686	49.3	LOS D	4.9	34.4	0.94	0.80	0.97	19.8
West:	Cam	obelltown	Rd (68	0 m)											
10	L2	All MCs	120	1.8	120	1.8	0.380	26.3	LOS B	6.2	43.7	0.79	0.73	0.79	34.5
11	T1	All MCs	380	1.1	380	1.1	0.380	31.7	LOS C	6.2	43.7	0.80	0.70	0.80	40.2
12	R2	All MCs	162	3.9	162	3.9	*0.897	71.5	LOS F	6.2	44.7	1.00	1.03	1.41	27.3
Approa	ach		662	1.9	662	1.9	0.897	40.5	LOS C	6.2	44.7	0.85	0.79	0.95	35.0
All Vel	nicles		2874	2.3	2874	2.3	0.897	44.4	LOS D	20.3	145.6	0.92	0.86	1.01	25.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance													
Mov	Dem.	Aver.	Level of	AVERAGE	BACK OF	Prop.	Eff.	Travel	Travel	Aver.			
ID Crossing	Flow	Delay	Service	QUE	EUE	Que	Stop	Time	Dist.	Speed			
				[Ped	Dist]		Rate						
	ped/h	sec		ped	m			sec	m	m/sec			

South: MacDonald	South: MacDonald Rd (360m)													
P1 Full	53	35.3	LOS D	0.1	0.1	0.80	0.80	50.7	20.0	0.39				
East: Campbelltow	n Rd (3	20m)												
P2 Full	53	49.3	LOS E	0.2	0.2	0.95	0.95	64.7	20.0	0.31				
North: MacDonald	Rd (190)m)												
P3 Full	53	35.3	LOS D	0.1	0.1	0.80	0.80	50.7	20.0	0.39				
West: Campbelltov	vn Rd (6	680 m)												
P4 Full	53	48.3	LOS E	0.2	0.2	0.94	0.94	63.7	20.0	0.31				
All Pedestrians	211	42.0	LOS E	0.2	0.2	0.87	0.87	57.4	20.0	0.35				

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

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Site: 4v [4. MacDonald x General Bvd - 2022 - PM -Conversion (Site Folder: Existing 2022 Baseline + Dev AM PM)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing 2022 Baseline + Dev PM - Copy (Network Folder: Existing 2022 + Dev AM PM - Sign Contolled)]

MacDonald x General Bvd - 2022 - PM

Assumptions: 2022 Survey Site Category: 4 leg Signalised Stop (Two-Way)

Vehicle Movement Performance															
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	k Of Queue	Prop.	Eff.	Aver.	Aver.
ID		Class	Fl Totol	lows	FI Total		Satn	Delay	Service	[\/ob	Diet 1	Que	Stop	No. of	Speed
			veh/h	пvј %	veh/h	⊓vj %	v/c	sec		ven.	m Dist		Rate	Cycles	km/h
South	: Mac	Donald R	d (190r	n)											
1	L2	All MCs	99	0.0	99	0.0	0.096	4.6	LOS A	0.0	0.0	0.00	0.40	0.00	41.9
2	T1	All MCs	263	4.8	263	4.8	0.096	1.3	LOS A	0.0	0.0	0.00	0.28	0.00	47.6
3	R2	All MCs	66	0.0	66	0.0	0.070	6.4	LOS A	0.1	0.6	0.36	0.60	0.36	40.2
Appro	ach		428	2.9	428	2.9	0.096	2.8	NA	0.1	0.6	0.06	0.35	0.06	45.4
East:	Gene	ral Bvd (2	60m)												
4	L2	All MCs	43	2.4	43	2.4	0.126	8.0	LOS A	0.2	1.3	0.42	0.83	0.42	31.4
5	T1	All MCs	20	0.0	20	0.0	0.126	22.9	LOS B	0.2	1.3	0.42	0.83	0.42	34.6
6	R2	All MCs	5	0.0	5	0.0	0.024	19.7	LOS B	0.0	0.2	0.70	0.97	0.70	32.6
Appro	ach		68	1.5	68	1.5	0.126	13.3	LOS A	0.2	1.3	0.44	0.84	0.44	32.7
North	McD	onald Rd	(370m))											
7	L2	All MCs	109	1.0	109	1.0	0.108	3.4	LOS A	0.0	0.0	0.00	0.25	0.00	38.1
8	T1	All MCs	305	0.0	305	0.0	0.108	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	39.3
9	R2	All MCs	20	0.0	20	0.0	0.019	4.6	LOS A	0.0	0.2	0.38	0.49	0.38	36.9
Appro	ach		435	0.2	435	0.2	0.108	1.1	NA	0.0	0.2	0.02	0.14	0.02	38.7
West:	Gene	eral Bvd (1	50m)												
10	L2	All MCs	5	0.0	5	0.0	0.028	7.8	LOS A	0.0	0.3	0.45	0.77	0.45	32.1
11	T1	All MCs	5	0.0	5	0.0	0.028	21.7	LOS B	0.0	0.3	0.45	0.77	0.45	33.2
12	R2	All MCs	25	0.0	25	0.0	0.123	22.9	LOS B	0.2	1.1	0.74	1.00	0.74	18.1
Appro	ach		36	0.0	36	0.0	0.123	20.5	LOS B	0.2	1.1	0.66	0.93	0.66	23.9
All Ve	hicles		967	1.5	967	1.5	0.126	3.4	NA	0.2	1.3	0.09	0.31	0.09	40.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 1 [1. Zouch Road x Existing Access Driveway - 2022 -AM (LILO @ 50%) (Site Folder: Existing 2022 Sensitivity Baseline + Dev AM (LILO - 50% utilisation))] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing Sensitivity 2022 + Dev AM -LILO (Network Folder: Existing Sensitivity 2022 + Dev AM PM -LILO)]

Zouch Road x Existing Access Driveway - 2026 - AM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance															
Mov	Turn	Mov	Dem	hand	Arri\	al D	eg. Av	er.	Level of	Aver. Bac	k Of Queue	Prop.	Eff.	Aver.	Aver.
שו		Class	Total	HV 1	۲۱۵۱ Filo۱	vs 5 /]	ain Dei	ay	Service	[Veh.	Dist]	Que	Rate	Cycles	Speed
			veh/h	%	veh/h	%	v/c s	ес		veh	m				km/h
South	: Zouo	ch Rd (35	5 m)												
1	L2	All MCs	12	9.1	12 9	0.1 0.0	21 5	5.6	LOS A	0.0	0.2	0.14	0.27	0.14	24.6
2	T1	All MCs	22	4.8	22 4	.8 0.0	21 (0.0	LOS A	0.0	0.2	0.14	0.27	0.14	56.9
3	R2	All MCs	2	100. 0	2 ¹⁰	10. 0.0 0	21 17	' .9	LOS B	0.0	0.2	0.14	0.27	0.14	44.9
Appro	ach		36	11.8	36 11	.8 0.0	21 2	2.9	NA	0.0	0.2	0.14	0.27	0.14	45.2
East:	Site A	ccess (20)0 m)												
4	L2	All MCs	1	0.0	1 C	0.0 0.0	77 6	6.0	LOS A	0.1	0.7	0.36	0.64	0.36	38.6
5	T1	All MCs	1	0.0	1 C	0.0 0.0	77 5	5.5	LOS A	0.1	0.7	0.36	0.64	0.36	24.6
6	R2	All MCs	61	3.4	61 3	.4 0.0	77 7	'.1	LOS A	0.1	0.7	0.36	0.64	0.36	48.5
Appro	ach		63	3.3	63 3	0.3 0.0	77 7	'.1	LOS A	0.1	0.7	0.36	0.64	0.36	48.1
North:	Zouc	h Rd (500) m)												
7	L2	All MCs	154	1.4	154 1	.4 0.1	71 5	5.6	LOS A	0.1	0.4	0.02	0.30	0.02	53.0
8	T1	All MCs	164	0.0	164 C	0.0 0.1	71 (0.0	LOS A	0.1	0.4	0.02	0.30	0.02	54.9
9	R2	All MCs	16	0.0	16 C	0.0 0.1	71 5	5.5	LOS A	0.1	0.4	0.02	0.30	0.02	44.1
Appro	ach		334	0.6	334 C	0.6 0.1	71 2	2.8	NA	0.1	0.4	0.02	0.30	0.02	53.3
West:	Existi	ing Acces	s Drive	way	(41 m)										
10	L2	All MCs	2	0.0	2 0	0.0 0.0	07 5	5.9	LOS A	0.0	0.1	0.18	0.97	0.18	46.7
11	T1	All MCs	2	50.0	2 50	0.0 0.0	07 10).2	LOS A	0.0	0.1	0.18	0.97	0.18	29.7
12	R2	All MCs	1	0.0	1 0	0.0 0.0	07 6	6.6	LOS A	0.0	0.1	0.18	0.97	0.18	19.4
Appro	ach		5	20.0	5 20	0.0 0.0	07 7	' .8	LOS A	0.0	0.1	0.18	0.97	0.18	38.3
All Ve	hicles		438	2.2	438 2	.2 0.1	71 3	8.5	NA	0.1	0.7	0.08	0.35	0.08	51.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 2 [2. Zouch Rd x Campbelltown - 2022 -AM - (LILO @ 50%) (Site Folder: Existing 2022 Sensitivity Baseline + Dev AM (LILO - 50% utilisation))]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing Sensitivity 2022 + Dev AM -LILO (Network Folder: Existing Sensitivity 2022 + Dev AM PM -LILO)]

Zouch Rd x Campbelltown - 2022 - AM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehic	le M	ovement	t Perfo	orma	nce										
Mov ID	Turn	Mov Class	Dem F	nand lows	Ar Fl	rival lows	Deg. Satn	Aver. Delay	Level of Service	Aver. Back	Of Queue	e Prop. Que	Eff. Stop	Aver. No. of	Aver. Speed
			l lotal veh/h	HV J %	l lotal veh/h	HV J %	v/c	sec		Į Veh. veh	Dist J m		Rate	Cycles	km/h
South	: Zou	ch Rd (21	5 m)												
1	L2	All MCs	102	1.0	102	1.0	0.132	8.2	LOS A	0.2	1.5	0.59	0.77	0.59	48.5
Appro	ach		102	1.0	102	1.0	0.132	8.2	LOS A	0.2	1.5	0.59	0.77	0.59	48.5
East:	Camp	belltown	Rd (68) m)											
4	L2	All MCs	9	0.0	9	0.0	0.375	6.5	LOS A	0.0	0.0	0.00	0.01	0.00	64.9
5	T1	All MCs	704	5.4	704	5.4	0.375	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	69.6
Appro	ach		714	5.3	714	5.3	0.375	0.2	NA	0.0	0.0	0.00	0.01	0.00	69.6
North:	Zoud	h Rd (35	5 m)												
7	L2	All MCs	152	0.0	152	0.0	0.523	23.0	LOS B	0.8	5.9	0.91	1.06	1.30	29.5
Appro	ach		152	0.0	152	0.0	0.523	23.0	LOS B	0.8	5.9	0.91	1.06	1.30	29.5
West:	Cam	pbelltown	Rd (50	0 m)											
10	L2	All MCs	18	23.5	18	23.5	0.613	6.9	LOS A	0.0	0.0	0.00	0.01	0.00	69.1
11	T1	All MCs	1153	4.4	1153	4.4	0.613	0.3	LOS A	0.0	0.0	0.00	0.01	0.00	69.1
Appro	ach		1171	4.7	1171	4.7	0.613	0.4	NA	0.0	0.0	0.00	0.01	0.00	69.1
All Ve	hicles		2138	4.4	2138	4.4	0.613	2.3	NA	0.8	5.9	0.09	0.12	0.12	64.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 3 [3. Campbelltown x MacDonald - 2022 -AM (LILO @ 50%) (Site Folder: Existing 2022 Sensitivity Baseline + Dev AM (LILO - 50% utilisation))]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing Sensitivity 2022 + Dev AM -LILO (Network Folder: Existing Sensitivity 2022 + Dev AM PM -LILO)]

Campbelltown x MacDonald - 2022 -AM

Assumptions: 2022 Survey Site Category: (None) Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehic	le M	ovement	Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	Of Queue	Prop.	Eff.	Aver.	Aver.
ט ו		Class	ا-۲ Total آ	lows HV 1	ا۲ Total آ	lows HV 1	Sath	Delay	Service	[Veh.	Dist 1	Que	Stop Rate	NO. OT Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			- ,	km/h
South	Mac	Donald R	d (360r	n)											
1	L2	All MCs	127	12.4	127	12.4	0.161	27.6	LOS B	3.0	23.4	0.61	0.71	0.61	24.8
2	T1	All MCs	278	3.0	278	3.0	0.581	49.6	LOS D	10.2	73.3	0.93	0.79	0.93	18.0
3	R2	All MCs	309	8.2	309	8.2	*0.726	57.8	LOS E	12.1	90.5	0.98	0.86	1.00	23.7
Appro	ach		715	6.9	715	6.9	0.726	49.2	LOS D	12.1	90.5	0.90	0.81	0.90	21.9
East: (Camp	belltown l	Rd (32)	Om)											
4	L2	All MCs	259	7.3	259	7.3	0.745	37.1	LOS C	15.0	110.5	0.97	0.86	0.98	25.0
5	T1	All MCs	448	4.7	448	4.7	0.745	59.5	LOS E	15.0	110.5	0.95	0.82	0.95	17.4
6	R2	All MCs	58	1.8	58	1.8	*0.737	84.2	LOS F	2.6	18.7	1.00	0.84	1.20	11.9
Appro	Approach		765	5.4	765	5.4	0.745	53.8	LOS D	15.0	110.5	0.96	0.84	0.98	20.0
North:	Macl	Donald Ro	d (190n	n)											
7	L2	All MCs	144	0.0	144	0.0	0.329	52.2	LOS D	5.0	35.0	0.87	0.78	0.87	21.3
8	T1	All MCs	212	2.0	212	2.0	*0.733	64.1	LOS E	8.8	62.4	1.00	0.88	1.06	19.8
9	R2	All MCs	146	2.9	146	2.9	0.563	66.3	LOS E	5.8	41.8	0.98	0.80	0.98	9.6
Appro	ach		502	1.7	502	1.7	0.733	61.3	LOS E	8.8	62.4	0.96	0.83	0.98	17.6
West:	Cam	obelltown	Rd (68	0 m)											
10	L2	All MCs	147	0.7	147	0.7	0.726	26.8	LOS B	19.1	137.1	0.91	0.83	0.91	31.0
11	T1	All MCs	939	4.0	939	4.0	*0.726	40.8	LOS C	19.1	138.1	0.91	0.82	0.91	36.7
12	R2	All MCs	222	5.2	222	5.2	0.724	67.3	LOS E	9.1	66.4	1.00	0.86	1.04	28.1
Appro	12 R2 All MC: Approach			3.9	1308	3.9	0.726	43.7	LOS D	19.1	138.1	0.93	0.83	0.93	34.3
All Vel	nicles		3291	4.5	3291	4.5	0.745	50.0	LOS D	19.1	138.1	0.93	0.83	0.95	26.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Mov	vement	Perform	nance							
Mov ID Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE I QUE	BACK OF UE Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed

	ped/h	sec		ped	m			sec	m	m/sec
South: MacDona	ld Rd (360)m)								
P1 Full	53	49.8	LOS E	0.2	0.2	0.84	0.84	65.2	20.0	0.31
East: Campbellto	own Rd (32	20m)								
P2 Full	53	64.3	LOS F	0.2	0.2	0.96	0.96	79.7	20.0	0.25
North: MacDona	ld Rd (190	m)								
P3 Full	53	35.8	LOS D	0.1	0.1	0.72	0.72	51.2	20.0	0.39
West: Campbellt	own Rd (6	80 m)								
P4 Full	53	55.9	LOS E	0.2	0.2	0.89	0.89	71.3	20.0	0.28
All Pedestrians	211	51.5	LOS E	0.2	0.2	0.85	0.85	66.8	20.0	0.30

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

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Site: 4v [4. MacDonald x General Bvd - 2022 - AM - (LILO @ 50%) (Site Folder: Existing 2022 Sensitivity Baseline + Dev AM (LILO - 50% utilisation))]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

■ Network: N101 [Existing Sensitivity 2022 + Dev AM -LILO (Network Folder: Existing Sensitivity 2022 + Dev AM PM -LILO)]

MacDonald x General Bvd - 2022 - AM

Assumptions: 2022 Survey Site Category: 4 leg Signalised Stop (Two-Way)

Vehic	le M	ovement	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	Of Queue	Prop.	Eff.	Aver.	Aver.
U		Class	H Total]	IOWS H\/ 1	Fl [Total]	IOWS H\/ 1	Satn	Delay	Service	[\/eh	Dist 1	Que	Stop Rate	No. of Cycles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		Rate	Cycleo	km/h
South	: Mac	Donald R	d (190r	n)											
1	L2	All MCs	87	2.4	87	2.4	0.113	4.6	LOS A	0.0	0.0	0.00	0.35	0.00	42.3
2	T1	All MCs	343	2.5	343	2.5	0.113	1.2	LOS A	0.0	0.0	0.00	0.27	0.00	47.7
3	R2	All MCs	55	0.0	55	0.0	0.046	5.4	LOS A	0.1	0.4	0.22	0.53	0.22	41.1
Appro	ach		485	2.2	485	2.2	0.113	2.3	NA	0.1	0.4	0.02	0.31	0.02	46.2
East:	Gene	ral Bvd (2	60m)												
4	L2	All MCs	60	1.8	60	1.8	0.089	7.9	LOS A	0.1	0.9	0.25	0.87	0.25	34.6
5	T1	All MCs	11	0.0	11	0.0	0.089	18.3	LOS B	0.1	0.9	0.25	0.87	0.25	37.1
6	R2	All MCs	12	0.0	12	0.0	0.049	19.2	LOS B	0.1	0.5	0.69	1.00	0.69	32.8
Approach			82	1.3	82	1.3	0.089	10.8	LOS A	0.1	0.9	0.31	0.89	0.31	34.5
North:	McD	onald Rd	(370m))											
7	L2	All MCs	27	0.0	27	0.0	0.054	3.4	LOS A	0.0	0.0	0.00	0.12	0.00	38.7
8	T1	All MCs	180	0.6	180	0.6	0.054	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	39.5
9	R2	All MCs	11	0.0	11	0.0	0.010	4.8	LOS A	0.0	0.1	0.41	0.49	0.41	36.8
Appro	ach		218	0.5	218	0.5	0.054	0.7	NA	0.0	0.1	0.02	0.08	0.02	39.2
West:	Gene	eral Bvd (1	l50m)												
10	L2	All MCs	91	0.0	91	0.0	0.132	8.1	LOS A	0.2	1.6	0.31	0.85	0.31	35.0
11	T1	All MCs	15	0.0	15	0.0	0.132	18.3	LOS B	0.2	1.6	0.31	0.85	0.31	37.1
12	R2	All MCs	167	3.1	167	3.1	0.725	36.7	LOS C	1.9	13.6	0.88	1.31	1.84	12.9
Appro	Approach		273	1.9	273	1.9	0.725	26.2	LOS B	1.9	13.6	0.66	1.14	1.25	22.2
All Ve	hicles		1058	1.7	1058	1.7	0.725	8.8	NA	1.9	13.6	0.21	0.52	0.36	36.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 1 [1. Zouch Road x Existing Access Driveway - 2022 -PM (LILO @ 50%) - Copy (Site Folder: Existing 2022 Sensitivity Baseline + Dev PM (LILO - 50% utilisation) - Copy)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

Network: N101 [Existing Sensitivity 2022 + Dev PM -LILO (Network Folder: Existing Sensitivity 2022 + Dev AM PM -LILO)]

Zouch Road x Existing Access Driveway - 2026 -PM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehic	cle M	ovemen	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	COf Queue	e Prop.	Eff.	Aver.	Aver.
שו		Class	FI Total	IOWS HV/1	FI [Total	IOWS H\/ 1	Sath	Delay	Service	[Veh	Dist 1	Que	Stop Rate	NO. Of Cycles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m		11010		km/h
South	: Zou	ch Rd (35	5 m)												
1	L2	All MCs	1	0.0	1	0.0	0.024	5.5	LOS A	0.0	0.3	0.12	0.37	0.12	24.2
2	T1	All MCs	16	0.0	16	0.0	0.024	0.0	LOS A	0.0	0.3	0.12	0.37	0.12	55.8
3	R2	All MCs	26	0.0	26	0.0	0.024	5.7	LOS A	0.0	0.3	0.12	0.37	0.12	49.9
Appro	ach		43	0.0	43	0.0	0.024	3.6	NA	0.0	0.3	0.12	0.37	0.12	51.7
East:	Site A	.ccess (20	00 m)												
4	L2	All MCs	1	0.0	1	0.0	0.102	5.6	LOS A	0.1	1.0	0.18	0.57	0.18	40.5
5	T1	All MCs	1	0.0	1	0.0	0.102	4.5	LOS A	0.1	1.0	0.18	0.57	0.18	19.1
6	R2	All MCs	104	0.0	104	0.0	0.102	5.9	LOS A	0.1	1.0	0.18	0.57	0.18	49.5
Appro	ach		106	0.0	106	0.0	0.102	5.9	LOS A	0.1	1.0	0.18	0.57	0.18	49.2
North	Zouc	h Rd (50	0 m)												
7	L2	All MCs	22	4.8	22	4.8	0.023	5.6	LOS A	0.0	0.0	0.01	0.30	0.01	52.6
8	T1	All MCs	22	0.0	22	0.0	0.023	0.0	LOS A	0.0	0.0	0.01	0.30	0.01	55.0
9	R2	All MCs	1	0.0	1	0.0	0.023	5.5	LOS A	0.0	0.0	0.01	0.30	0.01	44.2
Appro	ach		45	2.3	45	2.3	0.023	2.9	NA	0.0	0.0	0.01	0.30	0.01	53.4
West:	Exist	ing Acces	s Drive	way	(41 m)										
10	L2	All MCs	1	100.	1	100.	0.008	8.2	LOS A	0.0	0.1	0.14	0.94	0.14	42.3
			_	0		0									
11	T1	All MCs	6	0.0	6	0.0	0.008	5.8	LOS A	0.0	0.1	0.14	0.94	0.14	38.6
12	R2	All MCs	1	0.0	1	0.0	0.008	5.7	LOS A	0.0	0.1	0.14	0.94	0.14	21.4
Appro	ach		8	12.5	8	12.5	0.008	6.1	LOS A	0.0	0.1	0.14	0.94	0.14	38.7
All Ve	hicles		203	1.0	203	1.0	0.102	4.7	NA	0.1	1.0	0.13	0.48	0.13	50.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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V Site: 2 [2. Zouch Rd x Campbelltown - 2022 -PM - (LILO @ 50%) - Copy (Site Folder: Existing 2022 Sensitivity Baseline + Dev PM (LILO - 50% utilisation) - Copy)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

 Network: N101 [Existing Sensitivity 2022 + Dev PM LILO (Network Folder: Existing Sensitivity 2022 + Dev AM PM LILO)]

Zouch Rd x Campbelltown - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Give-Way (Two-Way)

Vehic	le M	ovement	Perfo	orma	nce										
Mov ID	Turn	Mov Class	Dem Fl [Total	nand lows HV]	Ar Fl [Total	rival lows HV]	Deg. Satn	Aver. Delay	Level of Service	Aver. Back [Veh.	Of Queue	e Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			-	km/h
South	: Zou	ch Rd (21	5 m)												
1	L2	All MCs	63	0.0	63	0.0	0.127	11.4	LOS A	0.2	1.3	0.72	0.87	0.72	46.1
Appro	ach		63	0.0	63	0.0	0.127	11.4	LOS A	0.2	1.3	0.72	0.87	0.72	46.1
East:	Camp	belltown	Rd (68	0 m)											
4	L2	All MCs	16	0.0	16	0.0	0.522	6.6	LOS A	0.0	0.0	0.00	0.01	0.00	64.7
5	T1	All MCs	1000	1.8	1000	1.8	0.522	0.3	LOS A	0.0	0.0	0.00	0.01	0.00	69.4
Appro	ach		1016	1.8	1016	1.8	0.522	0.4	NA	0.0	0.0	0.00	0.01	0.00	69.3
North	Zouc	ch Rd (35	5 m)												
7	L2	All MCs	21	0.0	21	0.0	0.026	8.4	LOS A	0.0	0.3	0.54	0.71	0.54	43.5
Appro	ach		21	0.0	21	0.0	0.026	8.4	LOS A	0.0	0.3	0.54	0.71	0.54	43.5
West:	Cam	pbelltown	Rd (50	0 m)											
10	L2	All MCs	16	0.0	16	0.0	0.343	6.4	LOS A	0.0	0.0	0.00	0.01	0.00	69.4
11	T1	All MCs	653	1.8	653	1.8	0.343	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	69.4
Appro	ach		668	1.7	668	1.7	0.343	0.2	NA	0.0	0.0	0.00	0.01	0.00	69.4
All Ve	hicles	;	1768	1.7	1768	1.7	0.522	0.8	NA	0.2	1.3	0.03	0.05	0.03	68.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Site: 3 [3. Campbelltown x MacDonald - 2022 -PM (LILO @ 50%) - Copy (Site Folder: Existing 2022 Sensitivity Baseline + Dev PM (LILO - 50% utilisation) - Copy)] Output produced by SIDRA INTERSECTION Version: 9.1.2.202

 Network: N101 [Existing Sensitivity 2022 + Dev PM LILO (Network Folder: Existing Sensitivity 2022 + Dev AM PM LILO)]

Campbelltown x MacDonald - 2022 -PM

Assumptions: 2022 Survey Site Category: (None) Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Cycle Time)

Vehic	le M	ovement	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	Of Queue	e Prop.	Eff.	Aver.	Aver.
ID		Class	FI Total	lows HV 1	FI [Total	lows HV 1	Satn	Delay	Service	[Veh	Dist 1	Que	Stop Rate	No. of Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South	: Mac	Donald R	d (360r	n)											
1	L2	All MCs	160	2.0	160	2.0	0.235	36.7	LOS C	4.5	32.4	0.73	0.75	0.73	21.2
2	T1	All MCs	244	3.9	244	3.9	0.666	56.8	LOS E	9.6	69.1	0.98	0.82	0.98	16.5
3	R2	All MCs	298	4.2	298	4.2	*0.826	68.1	LOS E	12.8	93.2	1.00	0.94	1.12	21.7
Appro	ach		702	3.6	702	3.6	0.826	57.0	LOS E	12.8	93.2	0.93	0.86	0.98	20.0
East:	Camp	belltown	Rd (32	0m)											
4	L2	All MCs	253	4.2	253	4.2	0.811	28.9	LOS C	22.0	158.1	0.96	0.89	0.99	27.0
5	T1	All MCs	803	1.8	803	1.8	*0.811	50.4	LOS D	22.0	158.1	0.93	0.84	0.94	19.7
6	R2	All MCs	160	0.7	160	0.7	0.638	72.0	LOS F	6.5	45.6	1.00	0.81	1.00	14.0
Approach			1216	2.2	1216	2.2	0.811	48.8	LOS D	22.0	158.1	0.94	0.84	0.96	20.7
North:	Mac	Donald Ro	d (190n	n)											
7	L2	All MCs	105	0.0	105	0.0	0.189	43.3	LOS D	3.2	22.6	0.78	0.75	0.78	23.7
8	T1	All MCs	189	1.1	189	1.1	*0.806	70.5	LOS E	8.3	58.5	1.00	0.94	1.15	18.6
9	R2	All MCs	154	0.0	154	0.0	0.644	69.7	LOS E	6.3	43.9	1.00	0.82	1.01	9.3
Appro	ach		448	0.5	448	0.5	0.806	63.8	LOS E	8.3	58.5	0.95	0.85	1.02	16.8
West:	Cam	pbelltown	Rd (68	80 m)											
10	L2	All MCs	109	1.9	109	1.9	0.314	27.4	LOS B	6.5	46.5	0.74	0.70	0.74	32.9
11	T1	All MCs	343	1.2	343	1.2	0.314	36.0	LOS C	6.6	46.8	0.75	0.66	0.75	38.7
12	R2	All MCs	203	3.6	203	3.6	*0.827	76.3	LOS F	9.0	64.9	1.00	0.93	1.17	26.4
Appro	12 R2 All MC: Approach		656	2.1	656	2.1	0.827	47.0	LOS D	9.0	64.9	0.83	0.75	0.88	32.8
All Ve	hicles		3022	2.2	3022	2.2	0.827	52.6	LOS D	22.0	158.1	0.92	0.83	0.96	23.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Mo	vement	Perform	nance							
Mov ID Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE QUE [Ped	BACK OF UE Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed

	ped/h	sec		ped	m			sec	m	m/sec
South: MacDonal	ld Rd (360))								
P1 Full	53	38.0	LOS D	0.2	0.2	0.74	0.74	53.4	20.0	0.37
East: Campbellto	wn Rd (3	20m)								
P2 Full	53	64.3	LOS F	0.2	0.2	0.96	0.96	79.7	20.0	0.25
North: MacDonal	d Rd (190)m)								
P3 Full	53	38.0	LOS D	0.2	0.2	0.74	0.74	53.4	20.0	0.37
West: Campbellto	own Rd (6	680 m)								
P4 Full	53	63.3	LOS F	0.2	0.2	0.95	0.95	78.7	20.0	0.25
All Pedestrians	211	50.9	LOS E	0.2	0.2	0.85	0.85	66.3	20.0	0.30

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

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Site: 4v [4. MacDonald x General Bvd - 2022 - PM - (LILO @ 50%) - Copy (Site Folder: Existing 2022 Sensitivity Baseline + Dev PM (LILO - 50% utilisation) - Copy)]
Output produced by SIDRA INTERSECTION Version: 9.1.2.202

 Network: N101 [Existing Sensitivity 2022 + Dev PM LILO (Network Folder: Existing Sensitivity 2022 + Dev AM PM LILO)]

MacDonald x General Bvd - 2022 - PM

Assumptions: 2022 Survey Site Category: Proposed Design 1 Stop (Two-Way)

Vehic	le M	ovement	t Perfo	orma	nce										
Mov	Turn	Mov	Dem	nand	Ar	rival	Deg.	Aver.	Level of	Aver. Back	c Of Queue	Prop.	Eff.	Aver.	Aver.
UI		Class	FI Total	lows HV 1	FI [Total	lows HV 1	Satn	Delay	Service	[Veh	Dist 1	Que	Stop Rate	No. of Cvcles	Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m			- ,	km/h
South	Mac	Donald R	d (190r	n)											
1	L2	All MCs	204	0.0	204	0.0	0.122	4.6	LOS A	0.0	0.0	0.00	0.50	0.00	40.4
2	T1	All MCs	255	5.0	255	5.0	0.122	1.3	LOS A	0.0	0.0	0.00	0.25	0.00	47.9
3	R2	All MCs	65	0.0	65	0.0	0.069	6.4	LOS A	0.1	0.6	0.36	0.60	0.36	40.2
Appro	ach		524	2.4	524	2.4	0.122	3.2	NA	0.1	0.6	0.04	0.39	0.04	44.5
East:	Gene	ral Bvd (2	60m)												
4	L2	All MCs	43	2.4	43	2.4	0.144	8.0	LOS A	0.2	1.5	0.46	0.81	0.46	30.4
5	T1	All MCs	21	0.0	21	0.0	0.144	26.1	LOS B	0.2	1.5	0.46	0.81	0.46	33.8
6	R2	All MCs	5	0.0	5	0.0	0.024	19.7	LOS B	0.0	0.2	0.70	0.97	0.70	32.6
Approach			69	1.5	69	1.5	0.144	14.4	LOS A	0.2	1.5	0.48	0.82	0.48	31.9
North:	McD	onald Rd	(370m))											
7	L2	All MCs	109	1.0	109	1.0	0.108	3.4	LOS A	0.0	0.0	0.00	0.25	0.00	38.1
8	T1	All MCs	306	0.0	306	0.0	0.108	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	39.3
9	R2	All MCs	21	0.0	21	0.0	0.021	5.0	LOS A	0.0	0.2	0.43	0.52	0.43	36.8
Appro	ach		437	0.2	437	0.2	0.108	1.1	NA	0.0	0.2	0.02	0.14	0.02	38.7
West:	Gene	eral Bvd (1	150m)												
10	L2	All MCs	9	0.0	9	0.0	0.038	7.5	LOS A	0.1	0.4	0.23	0.83	0.23	32.4
11	T1	All MCs	6	0.0	6	0.0	0.038	23.2	LOS B	0.1	0.4	0.23	0.83	0.23	33.5
12	R2	All MCs	91	1.2	91	1.2	0.488	33.1	LOS C	0.8	6.0	0.85	1.12	1.22	14.0
Appro	Approach		106	1.0	106	1.0	0.488	30.2	LOS C	0.8	6.0	0.76	1.07	1.08	17.3
All Vel	nicles		1137	1.4	1137	1.4	0.488	5.6	NA	0.8	6.0	0.13	0.38	0.16	38.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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