

RESOURCE RECOVERY FACILITY EXPANSION

LOT 16 DP 717203 16 KERR ROAD, INGLEBURN

PREPARED FOR: KDC PTY LTD

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TRAFFIC IMPACT ASSESSMENT

RESOURCE RECOVERY FACILITY LOT 16 DP 717203 16 KERR ROAD, INGLEBURN KDC PTY LTD

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1. INTRODUCTION

Intersect Traffic Pty Ltd has been engaged by KDC Pty Ltd to undertake a traffic impact assessment for an expansion of an existing resource recovery facility on Lot 16 DP 717203, 16 Kerr Road, Ingleburn. The existing resource recovery facility includes a concrete batching plant and is located within the existing Ingleburn Industrial area.

This traffic assessment is required to support a development application to the NSW Department of Planning and Environment and allow the Department, Campbelltown City Council and NSW Roads and Maritime Services (NSW RMS) officers to assess the traffic related impacts associated with the development.

This report presents the findings of the traffic impact assessment and includes the following:

- An outline of the existing situation near the site.
- An assessment of the traffic impacts of the proposed development including the predicted traffic generation and its impact on existing road and intersection capacities.
- Reviews the on-site parking provided within the proposed development and assesses it against Council and Australian Standards requirements.
- Presentation of conclusions and recommendations.

This assessment has been undertaken with reference to the RTA's Guide to Traffic Generating Developments (2002), Austroads Guide to Road Design – Part 4A Unsignalised and signalised intersections (2010), latest Australian Standards AS2890.1 & 2 – Parking Facilities – Part 1 – Off street car parking and Part 2 – Commercial vehicle facilities and Campbelltown City Council requirements.

In respect of the SEARS issued for this project dated 27th September 2017 the following traffic and transport measures are addressed as follows;

- 1. Traffic generated by the development **Section 2.5**;
- 2. Traffic Impacts including Sidra Intersection modelling Section 3;
- 3. Road Upgrades / New Infrastructure **Section 3** none required;
- 4. Road Pavement Impacts Visual Inspection / Assessment only Section 2.3; and
- 5. Public Transport Accessibility Section 3.5.



2. DEVELOPMENT PROPOSAL

2.1 Site Location

Kerr Road is an industrial standard cul-de-sac within the Ingleburn Industrial area located approximately 1.2 km's east of the Hume Motorway and 9 km's north-east of the Campbelltown CBD area. Access to and from the Hume Highway for origin / destinations to the north is via Brooks Road, Williamson Road, Henderson Road, Lancaster Street and Aero Road to Kerr Road while access for origins to the south would be via Campbelltown Road, Williamson Road, Henderson Road, Lancaster Street and Aero Road to Kerr Road. *Figure 1* below shows the site location while *Photograph 1* shows the existing development on the site.

The surrounding area is made of up industrial standard roads with kerb and gutter and longitudinal drainage constructed to a suitable standard for heavy vehicle use. High standard intersection control in the form of roundabout controls all the existing intersections on the likely haulage routes to the site except at the Aero Road / Kerr Road intersection which is a give way-controlled priority T-intersection. *Photograph 2* below shows the roundabout at the Henderson Road / Lancaster Road intersection which provides the main connection to the local collector road network from the site.



Figure 1 – Site Location

The site is titled Lot 16 in DP 717203 and addressed as 16 Kerr Road, Ingleburn. It has a total area of approximately 12,849 m² and is zoned IN1 – General Industrial pursuant to the requirements of the Campbelltown LEP (2015).





Photograph 1 – Existing site development and vehicular access.



Photograph 2 – Henderson Road / Lancaster Road roundabout.



2.2 Development Proposal

The proposed development concept involves the following;

- Expansion of the existing Waste Management Facility / Resource Recovery Facility on the site with a capacity to cater for 225,000 tonnes per annum of waste and potentially provide for 90,000 tonnes of waste on the site at any time.
- An upgraded concrete batching plant with an annual capacity of 50,000 tonnes per annum.

It is understood no additional site infrastructure is proposed and the development seeks approval for additional waste to be processed and recycled on site only.

2.3 Existing Road Network

2.3.1 Campbelltown Road

Campbelltown Road under a functional road hierarchy is a sub-arterial road that not only connects the Campbelltown area to the Liverpool area but also connects the Ingleburn Industrial area to the arterial road network (Hume Motorway) for traffic with an origin / destination to the south. Near the site it is a high standard two-lane two-way sealed rural road with 3 to 3.5 metre lane widths and variable width sealed shoulders (up to 4.5 metres) wide which are also line marked as on-road cycleways. It is under the care and control of NSW RMS and a 70 km/h speed zone exists through the area. At the time of inspection, Campbelltown Road was found to be in good condition.

2.3.2 Brooks Road

Brooks Road under a functional road hierarchy is a local collector road that connects the Ingleburn Industrial area to the arterial road network (Hume Motorway) for traffic with an origin / destination to the north. Brooks Road operates as the on and off-ramp for the Hume Motorway and near the site it is generally a four-lane two-way sealed urban road with kerb and gutter and additional turning lanes near intersections. Lane widths are in the order of 3.5 metres and on inspection Brooks Road was found to be in good condition as evidenced in **Photograph 3** below. It is under the care and control of Campbelltown City Council and a 60 km/h speed zone exists through the area.

2.3.3 Williamson Road

Williamson Road under a functional road hierarchy performs the function of a local collector road and the main collector road through the Ingleburn Industrial area. It is a dual carriageway sealed urban road with kerb and gutter and a raised and vegetated wide central median and two travel lanes in each direction. Indented parking areas are provided within the central median with no parking evidenced in the outer lanes allowing two travel lanes per direction. Lane widths were found to be in the order of 3.1 to 3.5 metres wide and a 50 km/hr speed zoning would apply to the road. The road would also be under the care and control of Campbelltown City Council and at the time of inspection Williamson Road was found to be in good condition as evidenced in **Photograph 4** below. Williamson Road connects to Brooks Road via a 2-lane roundabout.

2.3.4 Henderson Road

Henderson Road under a functional road hierarchy performs the function of a local collector road in the Ingleburn Industrial area. It is a four lane two way sealed urban road with kerb and gutter and a raised concrete central median. With no parking evidenced in the outer lanes the road contained two travel lanes per direction. Lane widths were found to be in the order of 3.1 to 3.5 metres wide and a 50 km/hr speed zoning would apply to the road. The road would be under the care and control of Campbelltown City Council and at the time of inspection Henderson Road was found to be in good condition as evidenced in **Photograph 5** below. Henderson Road connects to Williamson Road via a two-lane roundabout.





Photograph 3 – Brooks Road near Williamson Road



Photograph 4 – Williamson Road.





Photograph 5 – Henderson Road.

2.3.5 Lancaster Street

Lancaster Street under a functional road hierarchy is a local industrial road within the Ingleburn Industrial area primarily providing vehicular access to properties along its length. Near the site it is a two-lane two-way sealed urban road (12.5 metre carriageway width) with kerb and gutter and onstreet parking lanes. Lane widths are in the order of 3 to 3.5 metres and on inspection Lancaster Street was found to be in good condition as evidenced in **Photograph 6** below. It is under the care and control of Campbelltown City Council and a 50 km/h speed zone exists through the area. Lancaster Street connects to Henderson Road via a two-lane roundabout.

2.3.3 Aero Road

Aero Road under a functional road hierarchy is a local industrial road within the Ingleburn Industrial area providing vehicular access to properties along its length. Near the site it is a two-lane two-way sealed urban road (12 metre carriageway width) with kerb and gutter and on-street parking lanes. Lane widths are in the order of 3 to 3.5 metres and on inspection Aero Road was found to be in fair condition as evidenced in *Photograph 7* below. It is under the care and control of Campbelltown City Council and a 50 km/h speed zone exists through the area. Aero Road connects to Lancaster Street via a single lane roundabout.

2.3.4 Kerr Road

Kerr Road under a functional road hierarchy is a local industrial cul-de-sac road within the Ingleburn Industrial area providing vehicular access to properties along its length. Near the site it is a two-lane two-way sealed urban road (11 metre carriageway width) with kerb and gutter and onstreet parking lanes with a 25-metre radius turning area which includes a central vegetated island. This turning area is suitably for convenient use by all sizes of heavy vehicles. Lane widths are in the order of 3 to 3.5 metres and on inspection Kerr Road was found to be in good condition as evidenced in *Photograph 8* below. It is under the care and control of Campbelltown City Council and a 50 km/h speed zone exists through the area. Kerr Road connects to Aero Road via a give way-controlled T-intersection.





Photograph 6 – Lancaster Street near site.



Photograph 7 – Aero Road near site.





Photograph 8 – Kerr Road near site.

2.4 Alternative Transport Modes

Public transport (buses) in the area are provided by Interline Bus Services with service route 869 Ingleburn to Liverpool via Edmondson Park running past the site along Henderson Street. This route connects Ingleburn Railway Station to Edmondson Park Railway Station and Liverpool Railway Station. Other bus and rail connections at these locations provides access to all the major residential, commercial, retail, health and educational areas near the site. The nearest bus stops to the site are located on Henderson Road near the Lancaster Road roundabout about 200 to 350 metres north west of the site. A bus route extract for Route 869 is provided below in *Figure 2*.

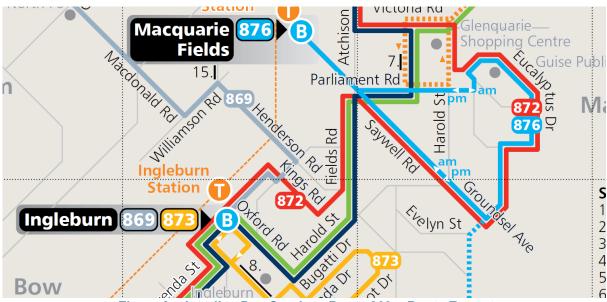


Figure 2 – Interline Bus Services Route 869 – Route Extract



The site is within 900 metres of Ingleburn Railway Station which lies on Sydney Trains Airport and South Line (T8). This is approximately a 20-minute walk from the site and provides access to the Sydney Trains and Regional rail networks.

A suitable concrete pedestrian footpath network exists along the major roads in the area connecting to Ingleburn Railway Station and local bus stops. Near the site a shared pathway exists along Henderson Road while pedestrian footpaths are provided along Lancaster Road to Aero Road and Aero Road from Kerr Road to Ingleburn Railway Station. The only gap in the pedestrian footpath network near the site is along Kerr Road itself where pedestrians are required to use the grass verges or parking lanes for trip making purposes. Photograph 9 below shows the existing concrete footpath in Henderson Road near the site.



Photograph 9 – Lancaster Road footpath near site.

The only observed cycle way near the site is in the form of an off-road shared pathway on Henderson Road from Lancaster Road to Williamson Road as shown below in *Photograph 10*.

This provides only a short section of benefit for cyclists in the area though does provide safe passage through a difficult and dangerous section of the road network for cyclists. In all other area's cyclists are required to share the outside travel lanes with other vehicles. This situation is only suitable for experienced cyclists.





Photograph 10 – Henderson Road off-road shared pathway near site

2.5 Traffic Generation

Traffic generation data for this assessment report has been determined from the operational details provided by KDC Pty Ltd and assumptions made in relation to operating hours of the facility and truck sizes. The key data used for the traffic generation calculations are;

- Waste delivery is 225,000 tonnes per annum;
- Waste removal based on 90,000 tonnes of storage on site i.e. 160,000 tonnes per annum.
- Each vehicle load (delivery and removal) represents an inbound and outbound trip that will
 occur in the same hour.
- Operating Hours 10 hours per day weekdays and 5 hours on Saturdays.
- Facility is open 50 weeks of the year (Closed Christmas, New Year & Easter)
- Waste delivery provided in many different sized trucks with an average haulage load of 20 tonnes.
- Waste removal undertaken using semi-trailers and B-Doubles with an average haulage load of 24 tonnes operated by contractors.
- Staff numbers assumed to be 15 staff including drivers.
- Concrete Agi-trucks carry 15 tonnes of concrete per load (6 m³ capacity).

Note: - Existing traffic is not included in this assessment but has been picked up in the traffic counts carried out for this assessment. The traffic generation assessment determines the additional traffic generated by the site from the facility expansion.

Therefore, the traffic generation calculations are;

- 1. Waste delivery 225,000 tonnes per annum / 50 weeks per annum / 65 hours per week / 20 tonnes per vehicle x 2 trips per vehicle = approximately 8 vehicle trips per hour.
- 2. Waste removal 225,000 tonnes per annum / 50 weeks per annum / 65 hours per week / 24 tonnes per vehicle x 2 trips per vehicle = approximately 6 vehicle trips per hour.



- 3. Staff trips Peak Hour considered to be arrival at work (AM) all inbound trips 15 vtph and departure from work (PM) all outbound trips 15 vtph.
- 4. Concrete trucks Peak hour 50000 tonnes/year/50 weeks per year/ 5.5 days per week / 10 hrs per day/15 tonne per load = 2 deliveries per hour maximum i.e. 2 inbound and 2 outbound trip. Assume maximum material delivery of 1 per day maximum in non-peak periods.

Therefore, Peak Hour and Daily Trips can be calculated as follows;

Weekday Daily Vehicle Trips = $8 \times 10 + 6 \times 10 + 15 \times 2 + 42$ (concrete batching plant) = **212 vtpd**. AM Peak hour = 7 inbound trips + 7 outbound trips + 15 inbound + 2 inbound and 2 outbound = 33 vtph (24 inbound and 9 outbound).

PM Peak hour = 7 inbound trips + 7 outbound trips + 15 outbound trips + 2 inbound + 2 outbound = 31 vtph (9 inbound and 24 outbound).

2.6 Trip Distribution

In determining the trip distribution for the site, it has been assumed that during the AM and PM peak traffic periods in terms of origin / destination approximately 50 % of trips will have an origin / destination to the north via the Hume Motorway, 40 % of trips will have an origin / destination to the south via Campbelltown Road and 10% of trips will have an origin destination to the east via Henderson Road. The resultant trip distribution on the local road network is therefore as shown in *Figure 3* below.

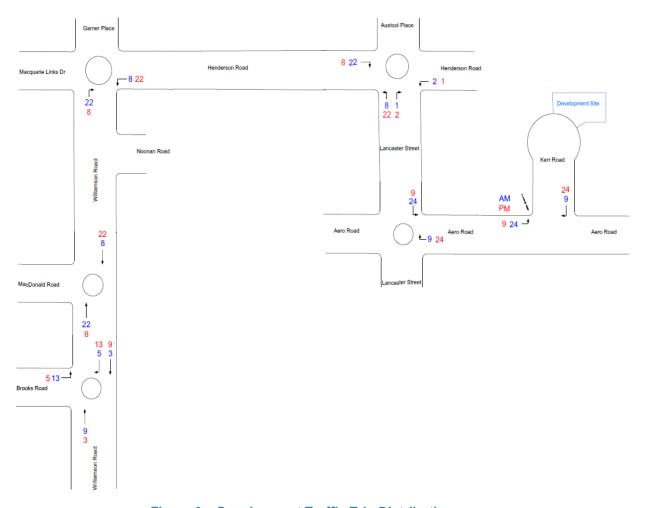


Figure 3 – Development Traffic Trip Distribution



3. TRAFFIC IMPACTS AND CONSIDERATIONS

3.1 Mid-block Road Network Capacity

Table 4.4 of the RMS publication "RTA's Guide to Traffic Generating Developments" provides some guidance on likely levels of service being experienced on two lane two-way urban roads though the capacity of urban roads is generally determined by intersection capacity. This table is reproduced below.

Table 4.4
Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
А	200	900
В	380	1400
С	600	1800
D	900	2200
Е	1400	2800

Source: - RTA's Guide to Traffic Generating Developments 2002

In determining the capacity of the road network from this table the following has been considered;

- All roads are two-lane two-way roads except Williamson Road and Henderson Road which effectively operate as four lane two-way roads:
- A LoS C is considered the acceptable level of service for these roads given their function within a functional road hierarchy.

On this basis the likely mid-block two-way road capacity for Brooks Road, Williamson Road and Henderson Road is 4,400 vtph (i.e. $2 \times 2,200$ vtph) and for Lancaster Street and Aero Road is 1,800 vtph (i.e. 2×900 vtph) noting a LoS C exists until the LoS D threshold is reached therefore the LoS D threshold is the lane capacity for a LoS C.

Roar Data on behalf of Intersect Traffic undertook traffic counts at the following intersections during the AM and PM peak periods during November 2017;

- Brooks Road / Williamson Road roundabout;
- Williamson Road / MacDonald Road roundabout;
- Williamson Road / Henderson Road roundabout;
- Henderson Road / Lancaster Street roundabout; and
- Lancaster Street / Aero Road roundabout.

This data indicates the peak hour traffic volumes on the local road network affected by the development are currently as follows;

- Brooks Road 2,052 vtph in the AM peak and 2,188 vtph in the PM peak.
- Williamson Road 2,045 vtph in the AM peak and 2,183 vtph in the PM peak.
- ◆ Henderson Road 2,486 vtph in the AM peak and 2,604 vtph in the PM peak
- Lancaster Street 1,097 vtph in the AM peak and 1,188 vtph in the PM peak; and
- Aero Road 328 vtph in the AM peak and 339 vtph in the PM peak.

The additional traffic from the proposed development would increase these traffic volumes (see *Figure 2*) as follows;



- Brooks Road 16 vtph in both the AM and PM peak hour;
- Williamson Road 28 vtph in both the AM and PM peak hour;
- Henderson Road 28 vtph in both the AM and PM peak hour
- Lancaster Street 31 vtph in both the AM and PM peak hour; and
- Aero Road 31 vtph in both the AM and PM peak hour.

Therefore, in terms of mid-block road network capacity the following assessment as shown in *Table 1* below has been determined by adopting a background traffic growth of 2 % per annum for the next 10 years.

Table 1 – Two-way mid-block capacity assessment

Road	Section	2017		2027		Road	Developme	ent Traffic
		AM (vtph)	PM (vtph)	AM (vtph)	PM (vtph)	Capacity	AM	PM
Brooks Road	West of Williamson Road	2070	2206	2519	2685	4400	18	18
Williamson Road	North of Brooks Road	2075	2213	2523	2691	4400	30	30
Henderson Road	east of Williamson Road	2516	2634	3060	3204	4400	30	30
Lancaster Street	south of Henderson Road	1130	1221	1370	1481	1800	33	33
Aero Road	west of Kerr Road	361	372	433	446	1800	33	33

Therefore, as these values are below the mid-block two-way road capacity for the road network of 4,400 vtph and 1,800 vtph as relevant it is reasonable to conclude that the existing road network has sufficient two-way mid-block capacity to cater for the proposed development.

3.2 Intersection Capacity

To determine the impact of the development on intersection capacity all the roundabout intersections for which traffic volume data was collected have been modelled for the AM and PM peak traffic periods using the Sidra Intersection modelling program. This software package predicts likely delays, queue lengths and thus levels of service that will occur at intersections. Assessment is then based on the level of service requirements of the RMS shown below:

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
А	< 14	Good operation	Good operation
В	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
С	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays	At capacity, requires other control mode
		Roundabouts require other control mode	

Source: - RTA's Guide to Traffic Generating Developments (2002).



Assumptions made in this modelling are:

- The intersection layout will remain as per current conditions.
- Traffic volumes used in the modelling are as collected by Roar Data on Wednesday 1st November 2017.
- Traffic generated by the development is distributed as per Figure 3.
- Future 2028 traffic growth predicted using a 2.0 % per annum background traffic growth rate.

The results of the modelling are summarised in *Tables 2 - 6* below for 'all vehicles'. The Sidra Movement Summary Tables are provided in *Attachment B.*

Table 2 – Brooks Road / Williamson Road roundabout - Sidra Modelling Results Summary

Model	Deg. Stan (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018 AM + development	0.777	9.6	Α	9.2
2018 PM + development	0.650	11.0	А	7.5
2028 AM + development	0.889	11.9	Α	15.3
2028 PM + development	0.768	14.2	Α	11.6

Table 3 – Williamson Road / MacDonald Road roundabout - Sidra Modelling Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018 AM + development	0.577	7.5	Α	5.1
2018 PM + development	0.515	7.2	Α	4.6
2028 AM + development	0.729	8.7	А	7.1
2028 PM + development	0.618	7.9	А	5.8

Table 4 – Williamson Road / Henderson Road roundabout - Sidra Modelling Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018 AM + development	0.640	7.6	А	6.9
2018 PM + development	0.735	6.9	А	9.6
2028 AM + development	0.714	7.9	А	8.6
2028 PM + development	0.814	7.1	Α	13.3

Table 5 – Henderson Road / Lancaster Street roundabout - Sidra Modelling Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018 AM + development	0.539	6.7	А	4.2
2018 PM + development	0.585	8.0	A	4.9
2028 AM + development	0.599	7.2	A	5.2
2028 PM + development	0.669	8.9	А	6.8

Table 6 – Lancaster Street / Aero Road roundabout - Sidra Modelling Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018AM + development	0.403	6.1	А	2.9
2018 PM + development	0.415	7.3	А	2.9
2028 AM + development	0.441	6.2	Α	3.4
2028 PM + development	0.468	7.6	А	3.4



This modelling shows the development has little impact on the operation of the major intersections in the adjoining road network with all intersections continuing to operate satisfactorily post development through to at least 2028. Average delays, LoS and queue lengths remain within the acceptable criteria set by NSW RMS. Therefore, the development does not adversely impact on the efficiency and effectiveness of the local road network.

It should also be noted this assessment is likely to be very conservative as it has not allowed for existing traffic generated by the development. It would be appropriate to discount the additional traffic generated by the new development by the existing traffic generated by the site however ignoring existing traffic results in a robust traffic impact assessment.

3.3 Site Access / Road Upgrading

Post development the site access will service more than 25 car spaces but less than 100 car parks. Under Table 3.1 of Australian Standard *AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking* a car park with between 25 to 100 car parking spaces accessed via a local road providing long term employee parking (Class 1) is required to have a Category 2 access facility. A Category 2 access facility is combined entry / exit access 6 m to 9 metres wide. It is noted the existing access is approximately 10 metres wide therefore compliant with AS2890.1-2004. However, for the type of vehicle using the site the access width will be determined by the swept path analysis for entry and exit to and from the site by B-Double vehicles. Having observed the existing site access, it is considered suitable for the proposed development and will not require upgrading.

Part 6.3 of the Campbelltown (Sustainable City) Development Control Plan (2015) which details car parking and access requirements for Industrial development in the Campbelltown LGA identifies that each industrial site can have only one heavy vehicle entry / exit and may have a second light vehicle entry / exit and must be designed in accordance with Australian Standard AS2890.1-2004 Parking facilities — Part 1 - Off-street car parking and Australian Standard AS2890.2-2002 Parking facilities — Part 2 - Off-street commercial vehicle facilities. The proposed development complies with these requirements.

It is noted from the RMS restricted vehicle access maps that Campbelltown Road, Williamson Road, Brooks Road, Henderson Road and Lancaster Street are already B-Double approved routes while Aero Road and Kerr Road are approved routes with travel conditions while the Lancaster Street / Aero Road roundabout is a restricted intersection with conditional approval for B-Doubles. It is likely that these conditional approvals already apply to the existing site operations and similar conditions are likely to be placed on the expanded development. Therefore, no nexus would exist for any additional road upgrading conditions to be required by Council for the proposed development

3.4 On-site parking and driveway

On-site parking requirements for development in the Campbelltown City Council LGA are contained within the Campbelltown (Sustainable City) Development Control Plan (2015). Part 6 deals with Industrial Development and Section 6.3 details the requirements for car parking and access.

Relevant to the site the requirements for car parking are;

For offices / lunch rooms / storage – 1 space per 35 m²; For other areas - minimum of 2 spaces per unit;

> 1 space per 100 m² GFA up to 2,000 m²; 1 space per 250 m² GFA above 2,000 m²; plus 1 space per 300 m² outdoor storage area.

Insufficient information has been provided to undertake a detailed car parking requirement calculation for the site however based on an aerial photograph assessment showing a roof area of



 $5,800 \text{ m}^2$ GFA and approximately $1,500 \text{ m}^2$ of outdoor storage a car parking requirement for the site is likely to be approximately = 20 + 16 + 5 = 41 car parking spaces. The site is large enough to provide more than 41 car parking spaces therefore sufficient car parking compliant with AS2890.1-2004 Parking facilities – Part 1 Off-street car parking could be provided on-site.

Overall it is concluded sufficient and suitable on-site car parking can be provided on-site to meet the requirements of the Campbelltown (Sustainable City) Development Control Plan (2015). It is also noted that as the proposal does not increase the exiting GFA or storage areas on site there is no nexus to apply any increase in on-site car parking on the site.

3.5 Alternative Transport Modes

The proposed development will not increase use of the existing public transport service significantly therefore there would be no nexus from this development for the provision of additional infrastructure or changes to the existing service resulting from this development.

Similarly, the development is unlikely to significantly increase pedestrian and cycle traffic on the local road network therefore no nexus exists for the provision of additional external pedestrian or cycle way infrastructure.





4. CONCLUSIONS

This traffic impact assessment for the expansion of an existing resource recovery facility on Lot 16 DP 717203, 16 Kerr Road, Ingleburn has concluded;

- The proposed development is likely to generate in the order of an additional 33 vtph during the AM and PM peak hour traffic periods.
- There is sufficient two-way mid-block capacity within the local road network to cater for the additional traffic generated by this development.
- SIDRA INTERSECTION modelling has shown that all the major intersections along the likely haulage routes to the Hume Motorway and local areas have sufficient spare capacity to cater for the proposal noting they will continue to operate satisfactorily post development through to at least 2027. Therefore, the development will not adversely impact on the local road network and no road upgrading is considered warranted.
- ◆ The existing vehicular access is satisfactory for the proposed development and would be compliant with Australian Standard AS2890.1-2004 Parking facilities Part 1 Off-street car parking and Australian Standard AS2890.2-2002 Parking facilities Part 2 Off-street commercial vehicle facilities. The access would also comply with the Campbelltown (Sustainable City) Development Control Plan (2015)
- It is noted from the RMS restricted vehicle access maps that the haulage routes to the site are already approved for 25/B26 metre B-Double heavy vehicles though Aero Road and Kerr Road are approved routes with travel conditions while the Lancaster Street / Aero Road roundabout is a restricted intersection with conditional approval for B-Doubles. If the site was to generate B-Double vehicle movements, future consultation with Campbelltown City Council's Traffic Committee will be required.
- Overall it is concluded that the local road network has sufficient spare capacity to cater for the development and the proposal will not adversely impact on the local and state road network.
- Sufficient and suitable on-site car parking can be provided on-site to meet the requirements of the Campbelltown (Sustainable City) Development Control Plan (2015). It is also noted that as the proposal does not increase the exiting GFA or storage areas on site there is no nexus to apply any increase in on-site car parking on the site.
- The proposed development will not increase use of the existing public transport service significantly therefore there would be no nexus from this development for the provision of additional infrastructure or changes to the existing service resulting from this development.
- The development is unlikely to significantly increase pedestrian and cycle traffic on the local road network therefore no nexus exists for the provision of additional external pedestrian or cycle way infrastructure.

5. RECOMMENDATION

Having carried out this traffic impact assessment for the proposed expansion of an existing resource recovery facility on Lot 16 DP 717203, 16 Kerr Road, Ingleburn it is recommended that the proposal can be supported from a traffic perspective as it will not adversely impact on the local and state road network and generally complies with the requirements of Campbelltown City Council, Australian Standards and NSW Roads and Maritime Services.

JR Garry BE (Civil), Masters of Traffic

Director

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Intersect Traffic Pty Ltd



ATTACHMENT A TRAFFIC COUNT DATA



Job No/Name: 6643 INGLEBURN Traffic Counts

: InTersect Traffic

Client

R.O.A.R. DATA Reliable, Original & Authentic Results Ph.88196847, Mob.0418-239019

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R.O.A.R. DATA Reliable, Original & Authentic Results Ph.88196847, Mob.0418-239019

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: InTersect Traffic : 6643 INGLEBURN Traffic Counts : Wednesday 29th November 2017 Client Job No/Name Day/Date

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office			Lancaster St Aero PI	LTR	3 6 3 6	2 1 1 14	4 5 1 25	0 4 2 25	3 3 2 24	4 2 1 18	1 0 2 14	2 5 4 18	19 26 16 144	ŀ	Lancaster S Aero H	LIB	9 16 7 70	141 9 13 6 88	149 11 14 6 92	10 10 9 74	9 13 6 88			Lancaster St Aero PI	R L I B	3 8 3 9	2 2 1 16	4 5 1 26	1 4 2 27	4 4 2 25	8 2 1 18	
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R.O.A.R. DATA Reliable, Original & Authentic Results Ph.88196847, Mob.0418-239019

: 6643 INGLEBURN Traffic Counts : Wednesday 29th November 2017 :InTersect Traffic Job No/Name Day/Date

10 123 69 **4** 5 2 7 EAST Aero Pi UNCLASSIFIED œ Aero PI Aero Pi EAST EAST 0 0 Lancaster St UNCLA SSIFIED 0 Lancaster St Lancaster St SOUTH SOUTH 8 ţ, <u></u> 0 0 0 0 0 0 0 00 Q Aero PI WEST Aero PI Aero Pi 0 0 0 0 0 0 Lancaster St Lancaster St Lancaster St NORTH 33 2 6 4 œ 1515 - 1530 1530 - 1545 1615 - 1630 1630 - 1645 1645 - 1700 PEAK HOUR 1600 - 1615 1545 - 1645 1545 - 1600 1530 - 1630 1500 - 1515 Heavies Heavies Peds 253 240 316 242 10 1010 90 1049 10 20371088 1027 281 251 183 349 8 39 28 47 160 8 198 189 32 Aero PI Aero PI Aero Pi EAST EAST EAST 32 20 9 23 9 9 Lancaster St Lancaster St Lancaster St SOUTH SOUTH SOUTH 13 189 360 372 37 369 83 322 99 8 86 74 382 Ø 25 8 55 ę WEST Aero PI AGOR 0 0 190 107 38 32 8 20 Š 22 8 Lancaster St Lancaster 9 ancaster 224 2 194 224 18 ďδ 88 改 S) ş 88 221 53 9 69 92 1630 - 1645 PEAK HOUP Combined 515-1530 530 - 1545 1545 - 1600 1600 - 1615 545 - 1645 615-1630 530 - 1630 Lights



ATTACHMENT B SIDRA MOVEMENT SUMMARY TABLE



MOVEMENT SUMMARY

♥ Site: 101 [2018AM + dev]

Brooks Road / Williamson Road, Ingleburn Site Category: (None)

Roundabout

Move	ment Pe	erformanc	e - Veh	icles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	
South	: Williams	son										
1	L2	364	20.1	0.436	7.1	LOS A	3.4	27.2	0.74	0.73	0.74	51.6
2	T1	468	6.4	0.436	7.1	LOS A	3.4	27.2	0.75	0.71	0.75	50.8
3u	U	1	0.0	0.436	13.7	LOS A	3.3	24.1	0.75	0.71	0.75	54.2
Appro	ach	833	12.4	0.436	7.1	LOS A	3.4	27.2	0.75	0.72	0.75	51.2
North:	Williams	on										
8	T1	384	5.7	0.438	7.6	LOS A	3.5	26.0	0.78	0.76	0.78	51.0
9	R2	428	8.4	0.438	11.7	LOS A	3.5	26.0	0.78	0.79	0.78	47.6
9u	U	1	0.0	0.438	13.5	LOS A	3.5	26.0	0.78	0.79	0.78	46.1
Appro	ach	813	7.1	0.438	9.7	LOS A	3.5	26.0	0.78	0.78	0.78	49.2
West:	Brooks											
10	L2	791	5.6	0.777	10.0	LOS A	9.2	67.6	0.88	1.00	1.16	47.2
12	R2	483	10.8	0.598	13.3	LOS A	4.6	35.1	0.75	0.94	0.88	49.4
12u	U	1	0.0	0.598	14.9	LOS B	4.6	35.1	0.75	0.94	0.88	50.2
Appro	ach	1275	7.5	0.777	11.3	LOS A	9.2	67.6	0.83	0.97	1.05	48.2
All Vel	hicles	2921	8.8	0.777	9.6	LOSA	9.2	67.6	0.79	0.85	0.89	49.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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Project: C:\Work Documents\Projects\2017\17.164 - Kerr Road Ingleburn - Resource Recovery Expansion\Sidra\Brooks_Williamson

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MOVEMENT SUMMARY

∀ Site: 101 [2028AM + dev]

Brooks Road / Williamson Road, Ingleburn

Site Category: (None)

Roundabout

Move	ment F	Performan	ce - Ve	hicles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South	: William	nson										
1	L2	400	20.0	0.508	7.9	LOSA	4.4	35.5	0.82	0.80	0.86	51.3
2	T1	514	6.2	0.508	8.1	LOS A	4.4	35.5	0.82	0.82	0.88	50.4
3u	U	1	0.0	0.508	14.8	LOS B	4.3	31.8	0.82	0.82	0.88	53.9
Appro	ach	915	12.2	0.508	8.0	LOSA	4.4	35.5	0.82	0.81	0.87	50.8
North:	William	son										
8	T1	422	5.7	0.516	9.1	LOSA	4.7	35.2	0.86	0.88	0.95	50.5
9	R2	471	8.3	0.516	12.8	LOS A	4.7	35.2	0.86	0.86	0.92	47.0
9u	U	1	0.0	0.516	14.6	LOS B	4.7	35.2	0.86	0.86	0.92	45.4
Appro	ach	894	7.0	0.516	11.1	LOSA	4.7	35.2	0.86	0.87	0.93	48.7
West:	Brooks											
10	L2	869	5.4	0.889	15.1	LOS B	15.3	112.3	1.00	1.25	1.67	43.2
12	R2	531	10.7	0.689	14.9	LOS B	6.2	47.2	0.83	1.04	1.07	48.3
12u	U	1	0.0	0.689	16.5	LOS B	6.2	47.2	0.83	1.04	1.07	49.0
Appro	ach	1401	7.4	0.889	15.0	LOS B	15.3	112.3	0.94	1.17	1.44	45.4
All Vel	hicles	3210	8.7	0.889	11.9	LOSA	15.3	112.3	0.88	0.98	1.14	47.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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



MOVEMENT SUMMARY

₩ Site: 101 [2018PM + dev]

Brooks Road / Williamson Road, Ingleburn Site Category: (None)

Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South:	William	son										
1	L2	400	9.0	0.536	9.6	LOS A	5.2	39.4	0.94	0.93	1.05	50.4
2	T1	413	4.1	0.536	10.7	LOS A	5.2	39.4	0.93	0.96	1.07	49.1
3u	U	1	0.0	0.536	17.3	LOS B	4.9	35.6	0.93	0.97	1.07	52.5
Approach		814	6.5	0.536	10.2	LOS A	5.2	39.4	0.93	0.95	1.06	49.8
North:	Williams	son										
8	T1	506	5.3	0.626	10.9	LOS A	6.5	47.5	0.90	0.96	1.11	49.2
9	R2	637	7.1	0.650	14.6	LOS B	7.5	55.7	0.92	0.95	1.11	45.5
9u	U	1	0.0	0.650	16.5	LOS B	7.5	55.7	0.92	0.95	1.11	43.4
Approach		1144	6.3	0.650	13.0	LOS A	7.5	55.7	0.91	0.96	1.11	47.1
West:	Brooks											
10	L2	653	7.4	0.641	7.6	LOS A	5.8	43.1	0.76	0.83	0.87	49.2
12	R2	512	12.7	0.591	12.5	LOSA	4.7	36.5	0.74	0.89	0.84	49.9
12u	U	1	0.0	0.591	14.2	LOS A	4.7	36.5	0.74	0.89	0.84	50.8
Approach		1166	9.7	0.641	9.8	LOS A	5.8	43.1	0.75	0.86	0.86	49.5
All Vehicles		3124	7.6	0.650	11.0	LOSA	7.5	55.7	0.86	0.92	1.00	48.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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₩ Site: 101 [2028PM + dev]

Brooks Road / Williamson Road, Ingleburn Site Category: (None) Roundabout

Move	ment F	Performan	ce - Vel	hicles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South:	William	nson										
1	L2	440	9.1	0.661	13.3	LOSA	8.0	59.9	1.00	1.07	1.30	47.8
2	T1	454	4.0	0.661	14.8	LOS B	8.0	59.9	1.00	1.11	1.33	45.8
3u	U	1	0.0	0.661	21.5	LOS B	7.3	52.7	1.00	1.12	1.33	49.6
Appro	ach	895	6.5	0.661	14.1	LOSA	8.0	59.9	1.00	1.09	1.31	46.9
North:	William	ison										
8	T1	556	5.2	0.745	15.2	LOS B	9.8	71.7	1.00	1.15	1.44	45.7
9	R2	700	7.0	0.768	18.8	LOS B	11.6	86.1	1.00	1.11	1.44	42.5
9u	U	111	0.0	0.768	20.7	LOS B	11.6	86.1	1.00	1.11	1.44	39.8
Appro	ach	1257	6.2	0.768	17.2	LOS B	11.6	86.1	1.00	1.13	1.44	43.9
West:	Brooks											
10	L2	718	7.2	0.732	9.1	LOSA	7.9	59.0	0.86	0.94	1.07	47.8
12	R2	563	12.8	0.679	14.0	LOSA	6.3	49.0	0.83	0.98	1.01	48.9
12u	U	1	0.0	0.679	15.6	LOS B	6.3	49.0	0.83	0.98	1.01	49.7
Appro	ach	1282	9.7	0.732	11.3	LOSA	7.9	59.0	0.85	0.96	1.04	48.4
All Vel	nicles	3434	7.6	0.768	14.2	LOSA	11.6	86.1	0.94	1.05	1.26	46.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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\Brooks_Williamson.sip8



∀ Site: 101 [2018AM + dev]

Williamson Road / MacDonald Road, Ingleburn Site Category: (None) Roundabout

Move	ement P	erforman	ice - Ve	hicles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South	: William	son										
1	L2	110	12.7	0.577	7.1	LOSA	5.1	38.1	0.72	0.70	0.75	49.5
2	T1	1137	5.4	0.577	7.3	LOSA	5.1	38.1	0.73	0.72	0.78	51.5
3	R2	20	10.0	0.577	12.5	LOSA	5.1	37.6	0.74	0.75	0.81	32.6
3u	U	1	0.0	0.577	14.3	LOSA	5.1	37.6	0.74	0.75	0.81	49.7
Appro	ach	1268	6.1	0.577	7.4	LOSA	5.1	38.1	0.73	0.72	0.78	51.1
East:	Private a	ccess										
4	L2	10	50.0	0.030	6.8	LOSA	0.1	1.0	0.65	0.77	0.65	
5	T1	1	0.0	0.030	5.5	LOSA	0.1	1.0	0.65	0.77	0.65	49.3
6	R2	2	0.0	0.030	9.5	LOSA	0.1	1.0	0.65	0.77	0.65	49.3
6u	U	1	0.0	0.030	11.5	LOSA	0.1	1.0	0.65	0.77	0.65	11.4
Appro	ach	14	35.7	0.030	7.4	LOSA	0.1	1.0	0.65	0.77	0.65	35.4
North	: William	son Road										
7	L2	6	0.0	0.411	4.9	LOSA	3.2	23.6	0.44	0.48	0.44	40.3
8	T1	735	6.0	0.411	5.0	LOSA	3.2	23.6	0.44	0.51	0.44	52.0
9	R2	358	3.1	0.411	9.7	LOSA	3.1	22.6	0.46	0.61	0.46	52.6
9u	U	1	0.0	0.411	11.8	LOSA	3.1	22.6	0.46	0.61	0.46	53.7
Appro	ach	1100	5.0	0.411	6.5	LOSA	3.2	23.6	0.45	0.54	0.45	52.2
West:	MacDor	nald Road										
10	L2	394	3.0	0.554	8.9	LOSA	3.5	25.4	0.83	0.97	1.00	51.6
11	T1	5	0.0	0.283	8.9	LOSA	1.2	9.2	0.74	0.91	0.75	37.2
12	R2	116	10.3	0.283	14.1	LOSA	1.2	9.2	0.74	0.91	0.75	46.1
12u	U	1	0.0	0.283	15.6	LOS B	1.2	9.2	0.74	0.91	0.75	50.6
Appro	ach	516	4.7	0.554	10.1	LOSA	3.5	25.4	0.80	0.96	0.94	50.4
All Ve	hicles	2898	5.6	0.577	7.5	LOSA	5.1	38.1	0.64	0.69	0.68	51.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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∀ Site: 101 [2028AM + dev]

Williamson Road / MacDonald Road, Ingleburn Site Category: (None) Roundabout

Move	ment Po	erformanc	e - Veh	icles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South	: Williams	son										
1	L2	121	12.4	0.650	8.4	LOS A	7.1	52.0	0.81	0.79	0.92	49.0
2	T1	1239	4.4	0.650	8.7	LOS A	7.1	52.0	0.82	0.82	0.95	50.9
3	R2	22	9.1	0.650	14.1	LOS A	6.9	50.3	0.83	0.85	0.98	31.9
3u	U	1	0.0	0.650	15.8	LOS B	6.9	50.3	0.83	0.85	0.98	48.8
Appro	ach	1383	5.2	0.650	8.8	LOS A	7.1	52.0	0.82	0.82	0.94	50.5
East: I	Private a	ccess										
4	L2	11	45.5	0.034	7.2	LOS A	0.1	1.2	0.68	0.80	0.68	32.4
5	T1	1	0.0	0.034	6.0	LOS A	0.1	1.2	0.68	0.80	0.68	48.9
6	R2	2	0.0	0.034	9.9	LOS A	0.1	1.2	0.68	0.80	0.68	48.9
6u	U	1	0.0	0.034	12.0	LOS A	0.1	1.2	0.68	0.80	0.68	11.0
Appro	ach	15	33.3	0.034	7.8	LOS A	0.1	1.2	0.68	0.80	0.68	35.3
North:	Williams	on Road										
7	L2	7	0.0	0.464	5.1	LOS A	3.9	28.3	0.50	0.51	0.50	40.0
8	T1	808	5.8	0.464	5.2	LOS A	3.9	28.3	0.51	0.53	0.51	51.7
9	R2	394	3.0	0.464	10.0	LOS A	3.7	27.1	0.53	0.63	0.53	52.4
9u	U	1	0.0	0.464	12.0	LOS A	3.7	27.1	0.53	0.63	0.53	53.5
Appro	ach	1210	4.9	0.464	6.8	LOS A	3.9	28.3	0.51	0.56	0.51	51.9
West:	MacDon	ald Road										
10	L2	473	2.7	0.729	11.8	LOS A	5.7	40.8	0.91	1.08	1.29	49.6
11	T1	6	0.0	0.368	9.9	LOS A	1.7	13.0	0.78	0.95	0.87	36.5
12	R2	139	9.4	0.368	15.2	LOS B	1.7	13.0	0.78	0.95	0.87	45.5
12u	U	1	0.0	0.368	16.7	LOS B	1.7	13.0	0.78	0.95	0.87	49.9
Appro	ach	619	4.2	0.729	12.5	LOS A	5.7	40.8	0.88	1.05	1.19	48.7
All Vel	hicles	3227	5.0	0.729	8.7	LOSA	7.1	52.0	0.72	0.77	0.83	50.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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 Site: 101 [2018PM + dev]

Williamson Road / MacDonald Road, Ingleburn

Site Category: (None) Roundabout

			e - Veh									
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South	: Williams	son										
1	L2	82	2.4	0.515	6.9	LOS A	4.2	30.5	0.73	0.70	0.75	49.9
2	T1	972	6.1	0.515	7.5	LOS A	4.2	30.5	0.74	0.73	0.77	51.4
3	R2	5	20.0	0.515	13.1	LOS A	4.1	30.3	0.75	0.77	0.80	32.6
3u	U	1	0.0	0.515	14.4	LOS A	4.1	30.3	0.75	0.77	0.80	49.8
Appro	ach	1060	5.8	0.515	7.4	LOS A	4.2	30.5	0.74	0.73	0.77	51.3
East: I	Private a	ccess										
4	L2	9	0.0	0.022	5.8	LOS A	0.1	0.6	0.68	0.76	0.68	42.
5	T1	1	0.0	0.022	6.4	LOS A	0.1	0.6	0.68	0.76	0.68	50.
6	R2	1	0.0	0.022	10.3	LOS A	0.1	0.6	0.68	0.76	0.68	50.
6u	U	1	0.0	0.022	12.3	LOS A	0.1	0.6	0.68	0.76	0.68	11.
Appro	ach	12	0.0	0.022	6.8	LOS A	0.1	0.6	0.68	0.76	0.68	42.
North:	Williams	on Road										
7	L2	6	0.0	0.506	4.7	LOS A	4.6	33.5	0.42	0.45	0.42	40.
8	T1	991	5.1	0.506	4.8	LOS A	4.6	33.5	0.42	0.48	0.42	52.
9	R2	433	3.0	0.506	9.5	LOS A	4.5	32.5	0.44	0.58	0.44	52.
9u	U	1	0.0	0.506	11.6	LOS A	4.5	32.5	0.44	0.58	0.44	53.
Appro	ach	1431	4.5	0.506	6.3	LOS A	4.6	33.5	0.43	0.51	0.43	52.4
West:	MacDon	ald Road										
10	L2	407	2.2	0.515	8.0	LOS A	3.2	22.8	0.78	0.93	0.91	52.3
11	T1	2	0.0	0.220	8.7	LOS A	0.9	6.8	0.70	0.89	0.70	37.3
12	R2	93	9.7	0.220	13.9	LOS A	0.9	6.8	0.70	0.89	0.70	46.3
12u	U	1	0.0	0.220	15.4	LOS B	0.9	6.8	0.70	0.89	0.70	50.
Appro	ach	503	3.6	0.515	9.1	LOS A	3.2	22.8	0.76	0.93	0.87	51.
All Vel	hicles	3006	4.8	0.515	7.2	LOSA	4.6	33.5	0.60	0.66	0.62	51.

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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₩ Site: 101 [2028PM + dev]

Williamson Road / MacDonald Road, Ingleburn

Site Category: (None)

Roundabout

Move	ment P	erforman	ce - Vel	hicles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South	: William	ison										
1	L2	90	2.2	0.591	8.3	LOSA	5.8	42.5	0.81	0.82	0.92	49.4
2	T1	1068	5.9	0.591	8.9	LOSA	5.8	42.5	0.82	0.84	0.94	50.8
3	R2	6	16.7	0.591	14.6	LOS B	5.6	41.2	0.83	0.87	0.97	31.7
3u	U	1	0.0	0.591	16.0	LOS B	5.6	41.2	0.83	0.87	0.97	48.6
Appro	ach	1165	5.7	0.591	8.9	LOSA	5.8	42.5	0.82	0.84	0.94	50.6
East:	Private a	access										
4	L2	10	0.0	0.026	6.4	LOSA	0.1	0.8	0.72	0.79	0.72	41.3
5	T1	1	0.0	0.026	6.9	LOSA	0.1	0.8	0.72	0.79	0.72	50.1
6	R2	1	0.0	0.026	10.8	LOSA	0.1	0.8	0.72	0.79	0.72	50.2
6u	U	1	0.0	0.026	12.9	LOSA	0.1	0.8	0.72	0.79	0.72	10.7
Appro	ach	13	0.0	0.026	7.3	LOSA	0.1	8.0	0.72	0.79	0.72	41.4
North:	William	son Road										
7	L2	7	0.0	0.561	4.9	LOSA	5.5	40.1	0.47	0.47	0.47	40.1
8	T1	1087	4.9	0.561	5.0	LOSA	5.5	40.1	0.48	0.50	0.48	51.9
9	R2	476	2.9	0.561	9.7	LOSA	5.4	38.8	0.50	0.58	0.50	52.6
9u	U	1	0.0	0.561	11.8	LOSA	5.4	38.8	0.50	0.58	0.50	53.8
Appro	ach	1571	4.3	0.561	6.4	LOSA	5.5	40.1	0.49	0.52	0.49	52.1
West:	MacDor	nald Road										
10	L2	448	2.2	0.618	9.3	LOSA	4.3	30.8	0.85	1.00	1.07	51.4
11	T1	2	0.0	0.262	9.0	LOSA	1.1	8.4	0.73	0.91	0.73	37.0
12	R2	102	9.8	0.262	14.3	LOSA	1.1	8.4	0.73	0.91	0.73	46.0
12u	U	1	0.0	0.262	15.7	LOS B	1.1	8.4	0.73	0.91	0.73	50.4
Appro	ach	553	3.6	0.618	10.2	LOSA	4.3	30.8	0.83	0.98	1.01	50.4
All Ve	hicles	3302	4.6	0.618	7.9	LOSA	5.8	42.5	0.66	0.71	0.73	51.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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∀ Site: 101 [2018AM + dev]

Williamson Road / Henderson Road / Macquarie Links Road / Garner Place Site Category: (None) Roundabout

Move	ement P	erforman	ce - Ve	hicles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate		Average Speed km/h
South	ı: William	son Road										
1	L2	41	4.9	0.441	3.7	LOSA	3.5	25.0	0.23	0.58	0.23	51.5
2	T1	6	0.0	0.441	3.7	LOSA	3.5	25.0	0.23	0.58	0.23	52.6
3	R2	1353	4.2	0.441	9.4	LOSA	3.5	25.0	0.24	0.58	0.24	53.2
3u	U	1	0.0	0.441	11.8	LOSA	3.4	24.9	0.26	0.59	0.26	54.6
Appro	ach	1401	4.2	0.441	9.3	LOSA	3.5	25.0	0.24	0.58	0.24	53.2
East:	Henders	on Road										
4	L2	993	3.9	0.640	4.3	LOSA	6.9	49.8	0.57	0.51	0.57	54.6
5	T1	38	2.6	0.032	3.4	LOSA	0.2	1.3	0.32	0.43	0.32	56.1
6	R2	10	0.0	0.032	9.6	LOSA	0.2	1.3	0.32	0.43	0.32	56.2
6u	U	1	0.0	0.032	11.9	LOSA	0.2	1.3	0.32	0.43	0.32	57.9
Appro	ach	1042	3.8	0.640	4.3	LOS A	6.9	49.8	0.56	0.51	0.56	54.7
North	: Garner	Place										
7	L2	8	25.0	0.041	9.7	LOSA	0.2	1.3	0.68	0.78	0.68	50.3
8	T1	12	8.3	0.041	8.7	LOSA	0.2	1.3	0.68	0.78	0.68	52.5
9	R2	1	0.0	0.041	14.0	LOSA	0.2	1.3	0.68	0.78	0.68	52.9
9u	U	1	0.0	0.041	16.4	LOS B	0.2	1.3	0.68	0.78	0.68	53.8
Appro	ach	22	13.6	0.041	9.6	LOSA	0.2	1.3	0.68	0.78	0.68	51.7
West:	Macqua	rie Links Di	rive									
10	L2	2	0.0	0.389	9.0	LOSA	1.9	13.4	0.73	0.92	0.84	48.9
11	T1	110	1.8	0.389	9.2	LOSA	1.9	13.4	0.73	0.92	0.84	51.2
12	R2	142	0.7	0.389	14.5	LOS B	1.9	13.4	0.73	0.92	0.84	51.5
12u	U	1	0.0	0.389	16.9	LOS B	1.9	13.4	0.73	0.92	0.84	52.7
Appro	ach	255	1.2	0.389	12.2	LOSA	1.9	13.4	0.73	0.92	0.84	51.4
All Ve	hicles	2720	3.9	0.640	7.6	LOSA	6.9	49.8	0.41	0.59	0.42	53.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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 Site: 101 [2028AM + dev]

Williamson Road / Henderson Road / Macquarie Links Road / Garner Place Site Category: (None) Roundabout

Move	ement Pe	erformanc	e - Veh	icles								
Mov	Turn	Demand		Deg.	Average	Level of	95% Back		Prop.	Effective	Aver. No.	
ID		Total veh/h	HV %	Satn v/c	Delay sec	Service	Vehicles veh	Distance m	Queued	Stop Rate	Cycles	Speed km/h
South	ı: Williams		70	V/0	300		VC11					KIII/II
1	L2	45	4.4	0.487	3.8	LOS A	4.1	29.5	0.26	0.58	0.26	51.4
2	T1	7	0.0	0.487	3.7	LOS A	4.1	29.5	0.26	0.58	0.26	52.5
3	R2	1486	4.0	0.487	9.5	LOS A	4.1	29.5	0.27	0.58	0.27	53.1
3u	U	1	0.0	0.487	11.9	LOS A	4.0	29.3	0.29	0.58	0.29	54.4
Appro	ach	1539	4.0	0.487	9.3	LOS A	4.1	29.5	0.27	0.58	0.27	53.1
East:	Henderso	n Road										
4	L2	1092	3.8	0.714	4.5	LOS A	8.6	61.9	0.67	0.54	0.67	54.3
5	T1	42	2.4	0.036	3.5	LOS A	0.2	1.5	0.34	0.43	0.34	56.1
6	R2	11	0.0	0.036	9.7	LOS A	0.2	1.5	0.34	0.43	0.34	56.1
6u	U	1	0.0	0.036	12.0	LOS A	0.2	1.5	0.34	0.43	0.34	57.9
Appro	oach	1146	3.8	0.714	4.5	LOS A	8.6	61.9	0.65	0.54	0.65	54.4
North	: Garner F	Place										
7	L2	9	22.2	0.048	10.5	LOS A	0.2	1.6	0.72	0.81	0.72	49.8
8	T1	13	7.7	0.048	9.5	LOS A	0.2	1.6	0.72	0.81	0.72	51.8
9	R2	1	0.0	0.048	14.9	LOS B	0.2	1.6	0.72	0.81	0.72	52.2
9u	U	1	0.0	0.048	17.2	LOS B	0.2	1.6	0.72	0.81	0.72	53.0
Appro	oach	24	12.5	0.048	10.4	LOS A	0.2	1.6	0.72	0.81	0.72	51.1
West:	Macquar	ie Links Dri	ve									
10	L2	2	0.0	0.459	10.3	LOS A	2.4	17.2	0.77	0.96	0.97	47.9
11	T1	121	1.7	0.459	10.6	LOS A	2.4	17.2	0.77	0.96	0.97	50.2
12	R2	156	0.6	0.459	15.9	LOS B	2.4	17.2	0.77	0.96	0.97	50.6
12u	U	1	0.0	0.459	18.2	LOS B	2.4	17.2	0.77	0.96	0.97	51.7
Appro	ach	280	1.1	0.459	13.6	LOS A	2.4	17.2	0.77	0.96	0.97	50.4
All Ve	hicles	2989	3.7	0.714	7.9	LOSA	8.6	61.9	0.47	0.60	0.49	53.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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₩ Site: 101 [2018PM + dev]

Williamson Road / Henderson Road / Macquarie Links Road / Garner Place Site Category: (None)

Roundabout

Mov	Turn	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID		Total	HV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Cycles	Speed
0	. \ACII:	veh/h	%	v/c	sec		veh	m				km/l
		son Road		0.440				0.4.0		0.50		- 4
1	L2	91	0.0	0.443	3.8	LOS A	3.3	24.2	0.30	0.58	0.30	51.
2	T1	11	9.1	0.443	3.9	LOS A	3.3	24.2	0.30	0.58	0.30	52.
3	R2	1257	4.2	0.443	9.6	LOS A	3.3	24.2	0.31	0.59	0.31	53.
3u	U	1	0.0	0.443	12.0	LOS A	3.3	24.1	0.33	0.60	0.33	54.
Appro	ach	1360	4.0	0.443	9.2	LOS A	3.3	24.2	0.31	0.59	0.31	53.
East:	Henders	on Road										
4	L2	1217	4.3	0.735	4.1	LOS A	9.6	69.4	0.51	0.46	0.51	54.
5	T1	70	1.4	0.052	3.3	LOS A	0.3	2.0	0.24	0.39	0.24	56.
6	R2	12	8.3	0.052	9.6	LOS A	0.3	2.0	0.24	0.39	0.24	56.
6u	U	1	0.0	0.052	11.8	LOS A	0.3	2.0	0.24	0.39	0.24	58.
Appro	ach	1300	4.2	0.735	4.1	LOS A	9.6	69.4	0.50	0.45	0.50	55.
North:	Garner l	Place										
7	L2	24	4.2	0.105	7.7	LOS A	0.4	3.1	0.66	0.78	0.66	52.
8	T1	40	5.0	0.105	7.5	LOS A	0.4	3.1	0.66	0.78	0.66	54.
9	R2	1	0.0	0.105	13.1	LOS A	0.4	3.1	0.66	0.78	0.66	54.
9u	U	1	0.0	0.105	15.4	LOS B	0.4	3.1	0.66	0.78	0.66	55.
Appro	ach	66	4.5	0.105	7.8	LOS A	0.4	3.1	0.66	0.78	0.66	53.
West:	Macquai	rie Links Dri	ve									
10	L2	1	0.0	0.150	7.3	LOS A	0.6	4.4	0.66	0.84	0.66	49.
11	T1	41	2.4	0.150	7.6	LOS A	0.6	4.4	0.66	0.84	0.66	52.
12	R2	56	1.8	0.150	12.9	LOS A	0.6	4.4	0.66	0.84	0.66	52.
12u	U	1	0.0	0.150	15.2	LOS B	0.6	4.4	0.66	0.84	0.66	53.
Appro	ach	99	2.0	0.150	10.7	LOS A	0.6	4.4	0.66	0.84	0.66	52
All Ve	hicles	2825	4.0	0.735	6.9	LOS A	9.6	69.4	0.42	0.54	0.42	53.

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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Project: C:\Work Documents\Projects\2017\17.164 - Kerr Road Ingleburn - Resource Recovery Expansion\Sidra\Williamson_Henderson

\Williamson_Henderson.sip8



₩ Site: 101 [2028PM + dev]

Williamson Road / Henderson Road / Macquarie Links Road / Garner Place

Site Category: (None)

Roundabout

Move	ment P	erformand	e - Vel	hicles								
Mov ID	Turn	Demand I Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South	: William	son Road										
1	L2	100	0.0	0.491	3.9	LOS A	3.9	28.5	0.33	0.58	0.33	51.6
2	T1	12	8.3	0.491	4.0	LOS A	3.9	28.5	0.33	0.58	0.33	52.5
3	R2	1382	4.1	0.491	9.7	LOS A	3.9	28.5	0.35	0.59	0.35	53.0
3u	U	1	0.0	0.491	12.1	LOSA	3.9	28.3	0.37	0.60	0.37	54.1
Appro	ach	1495	3.9	0.491	9.3	LOSA	3.9	28.5	0.35	0.59	0.35	52.9
East:	Henders	on Road										
4	L2	1337	4.1	0.814	4.4	LOSA	13.3	96.5	0.64	0.48	0.64	54.4
5	T1	77	1.3	0.057	3.3	LOSA	0.3	2.2	0.25	0.39	0.25	56.9
6	R2	13	7.7	0.057	9.6	LOSA	0.3	2.2	0.25	0.39	0.25	56.6
6u	U	1	0.0	0.057	11.8	LOSA	0.3	2.2	0.25	0.39	0.25	58.7
Appro	ach	1428	4.0	0.814	4.4	LOSA	13.3	96.5	0.61	0.48	0.61	54.6
North:	Garner	Place										
7	L2	26	3.8	0.123	8.2	LOSA	0.5	3.7	0.69	0.81	0.69	51.9
8	T1	44	4.5	0.123	8.0	LOSA	0.5	3.7	0.69	0.81	0.69	53.7
9	R2	1	0.0	0.123	13.6	LOS A	0.5	3.7	0.69	0.81	0.69	54.0
9u	U	1	0.0	0.123	15.9	LOS B	0.5	3.7	0.69	0.81	0.69	55.1
Appro	ach	72	4.2	0.123	8.3	LOSA	0.5	3.7	0.69	0.81	0.69	53.0
West:	Macqua	rie Links Dr	ive									
10	L2	1	0.0	0.177	7.8	LOSA	0.7	5.3	0.69	0.86	0.69	49.6
11	T1	45	2.2	0.177	8.1	LOSA	0.7	5.3	0.69	0.86	0.69	51.9
12	R2	62	1.6	0.177	13.4	LOSA	0.7	5.3	0.69	0.86	0.69	52.2
12u	U	1	0.0	0.177	15.7	LOS B	0.7	5.3	0.69	0.86	0.69	53.5
Appro	ach	109	1.8	0.177	11.2	LOSA	0.7	5.3	0.69	0.86	0.69	52.1
All Ve	hicles	3104	3.9	0.814	7.1	LOSA	13.3	96.5	0.49	0.55	0.49	53.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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₩ Site: 101 [2018AM + dev]

Henderson Road / Lancaster Street / Austool Place, Ingleburn

Site Category: (None)

Roundabout

Move	ement P	erforman	ce - Ve	hicles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South	: Lancas	ter Street										
1	L2	207	14.0	0.259	7.0	LOSA	1.2	9.8	0.66	0.80	0.66	48.2
2	T1	13	15.4	0.186	7.7	LOSA	8.0	6.1	0.64	0.86	0.64	49.0
3	R2	109	6.4	0.186	12.1	LOSA	8.0	6.1	0.64	0.86	0.64	50.3
3u	U	1	0.0	0.186	13.9	LOSA	0.8	6.1	0.64	0.86	0.64	50.7
Appro	ach	330	11.5	0.259	8.7	LOSA	1.2	9.8	0.65	0.82	0.65	49.1
East:	Henders	on Road										
4	L2	225	2.7	0.503	6.5	LOSA	3.4	23.8	0.63	0.67	0.65	52.0
5	T1	814	0.9	0.503	6.6	LOSA	3.4	23.8	0.63	0.68	0.66	52.4
6	R2	9	0.0	0.503	11.4	LOSA	3.3	23.5	0.64	0.68	0.67	53.1
6u	U	1	0.0	0.503	13.5	LOSA	3.3	23.5	0.64	0.68	0.67	54.9
Appro	ach	1049	1.2	0.503	6.6	LOSA	3.4	23.8	0.63	0.67	0.66	52.3
North:	: Austool	Place										
7	L2	4	0.0	0.031	8.6	LOSA	0.1	1.0	0.68	0.77	0.68	50.6
8	T1	11	18.2	0.031	9.4	LOSA	0.1	1.0	0.68	0.77	0.68	50.9
9	R2	26	11.5	0.040	12.5	LOSA	0.2	1.3	0.68	0.81	0.68	45.5
9u	U	1	0.0	0.040	14.2	LOSA	0.2	1.3	0.68	0.81	0.68	49.5
Appro	ach	42	11.9	0.040	11.3	LOSA	0.2	1.3	0.68	0.80	0.68	47.6
West:	Henders	son Road										
10	L2	97	3.1	0.539	4.9	LOSA	4.2	30.1	0.43	0.49	0.43	50.4
11	T1	941	1.7	0.539	5.0	LOSA	4.2	30.1	0.44	0.52	0.44	53.0
12	R2	363	9.9	0.539	9.8	LOSA	4.1	30.6	0.45	0.59	0.45	50.3
12u	U	1	0.0	0.539	11.8	LOSA	4.1	30.6	0.45	0.59	0.45	50.7
Appro	ach	1402	3.9	0.539	6.2	LOSA	4.2	30.6	0.44	0.54	0.44	52.2
All Ve	hicles	2823	3.9	0.539	6.7	LOSA	4.2	30.6	0.54	0.62	0.55	51.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement. Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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♥ Site: 101 [2028AM + dev]

Henderson Road / Lancaster Street / Austool Place, Ingleburn Site Category: (None)

Roundabout

Move	ement Pe	erformand	e - Veh	icles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued		Aver. No. Cycles	Average Speed km/h
South	: Lancast	er Street										
1	L2	227	13.7	0.302	7.3	LOS A	1.5	11.9	0.70	0.84	0.70	48.1
2	T1	14	14.3	0.220	8.1	LOS A	1.0	7.5	0.68	0.88	0.68	48.7
3	R2	120	6.7	0.220	12.4	LOS A	1.0	7.5	0.68	0.88	0.68	50.1
3u	U	1	0.0	0.220	14.3	LOS A	1.0	7.5	0.68	0.88	0.68	50.4
Appro	ach	362	11.3	0.302	9.0	LOS A	1.5	11.9	0.70	0.85	0.70	48.9
East:	Henderso	n Road										
4	L2	247	2.4	0.572	7.3	LOS A	4.5	31.9	0.70	0.77	0.78	51.7
5	T1	895	0.9	0.572	7.5	LOS A	4.5	31.9	0.71	0.78	0.79	52.0
6	R2	10	0.0	0.572	12.3	LOS A	4.4	31.3	0.71	0.80	0.80	52.7
6u	U	1	0.0	0.572	14.5	LOS A	4.4	31.3	0.71	0.80	0.80	54.5
Appro	ach	1153	1.2	0.572	7.5	LOS A	4.5	31.9	0.71	0.78	0.79	51.9
North	: Austool I	Place										
7	L2	4	0.0	0.037	9.2	LOS A	0.2	1.2	0.72	0.80	0.72	50.1
8	T1	12	16.7	0.037	10.1	LOS A	0.2	1.2	0.72	0.80	0.72	50.3
9	R2	29	10.3	0.048	12.9	LOS A	0.2	1.7	0.72	0.84	0.72	45.3
9u	U	1	0.0	0.048	14.7	LOS B	0.2	1.7	0.72	0.84	0.72	49.1
Appro	ach	46	10.9	0.048	11.9	LOS A	0.2	1.7	0.72	0.83	0.72	47.2
West:	Henders	on Road										
10	L2	107	2.8	0.599	5.1	LOS A	5.2	36.7	0.50	0.50	0.50	50.0
11	T1	1035	1.7	0.599	5.1	LOS A	5.2	36.7	0.50	0.53	0.50	52.7
12	R2	397	9.6	0.599	10.0	LOS A	5.0	37.1	0.52	0.60	0.52	50.0
12u	U	1	0.0	0.599	12.0	LOS A	5.0	37.1	0.52	0.60	0.52	50.3
Appro	ach	1540	3.8	0.599	6.4	LOS A	5.2	37.1	0.51	0.55	0.51	51.9
All Ve	hicles	3101	3.8	0.599	7.2	LOSA	5.2	37.1	0.61	0.68	0.64	51.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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₩ Site: 101 [2018PM + dev]

Henderson Road / Lancaster Street / Austool Place, Ingleburn Site Category: (None) Roundabout

veh/h % v/c sec veh South: Lancaster Street 1 L2 524 7.6 0.584 8.5 LOS A 4.0 2 T1 14 7.1 0.458 8.4 LOS A 2.5 3 R2 338 1.2 0.458 12.8 LOS A 2.5 3u U 1 0.0 0.458 14.8 LOS B 2.5 Approach 877 5.1 0.584 10.2 LOS A 4.0 East: Henderson Road 4 L2 141 2.1 0.367 5.4 LOS A 2.1 5 T1 689 1.3 0.367 5.5 LOS A 2.1 6 R2 4 0.0 0.367 10.2 LOS A 2.0 6u U 1 0.0 0.367 12.3 LOS A 2.0	Queue Prop. Effective Aver. No. Average tance Queued Stop Rate Cycles Speed m km/h
veh/h % v/c sec veh South: Lancaster Street 1 L2 524 7.6 0.584 8.5 LOS A 4.0 2 T1 14 7.1 0.458 8.4 LOS A 2.5 3 R2 338 1.2 0.458 12.8 LOS A 2.5 3u U 1 0.0 0.458 14.8 LOS B 2.5 Approach 877 5.1 0.584 10.2 LOS A 4.0 East: Henderson Road 4 L2 141 2.1 0.367 5.4 LOS A 2.1 5 T1 689 1.3 0.367 5.5 LOS A 2.1 6 R2 4 0.0 0.367 10.2 LOS A 2.0 6u U 1 0.0 0.367 12.3 LOS A 2.0	m km/h
South: Lancaster Street 1 L2 524 7.6 0.584 8.5 LOS A 4.0 2 T1 14 7.1 0.458 8.4 LOS A 2.5 3 R2 338 1.2 0.458 12.8 LOS A 2.5 3u U 1 0.0 0.458 14.8 LOS B 2.5 Approach 877 5.1 0.584 10.2 LOS A 4.0 East: Henderson Road 4 L2 141 2.1 0.367 5.4 LOS A 2.1 5 T1 689 1.3 0.367 5.5 LOS A 2.1 6 R2 4 0.0 0.367 10.2 LOS A 2.0 6u U 1 0.0 0.367 12.3 LOS A 2.0	
2 T1 14 7.1 0.458 8.4 LOS A 2.5 3 R2 338 1.2 0.458 12.8 LOS A 2.5 3u U 1 0.0 0.458 14.8 LOS B 2.5 Approach 877 5.1 0.584 10.2 LOS A 4.0 East: Henderson Road 4 L2 141 2.1 0.367 5.4 LOS A 2.1 5 T1 689 1.3 0.367 5.5 LOS A 2.1 6 R2 4 0.0 0.367 10.2 LOS A 2.0 6u U 1 0.0 0.367 12.3 LOS A 2.0	29.9 0.74 0.93 0.91 47.8
3 R2 338 1.2 0.458 12.8 LOS A 2.5 3u U 1 0.0 0.458 14.8 LOS B 2.5 Approach 877 5.1 0.584 10.2 LOS A 4.0 East: Henderson Road 4 L2 141 2.1 0.367 5.4 LOS A 2.1 5 T1 689 1.3 0.367 5.5 LOS A 2.1 6 R2 4 0.0 0.367 10.2 LOS A 2.0 6u U 1 0.0 0.367 12.3 LOS A 2.0	
3u U 1 0.0 0.458 14.8 LOS B 2.5 Approach 877 5.1 0.584 10.2 LOS A 4.0 East: Henderson Road 4 L2 141 2.1 0.367 5.4 LOS A 2.1 5 T1 689 1.3 0.367 5.5 LOS A 2.1 6 R2 4 0.0 0.367 10.2 LOS A 2.0 6u U 1 0.0 0.367 12.3 LOS A 2.0	18.0 0.69 0.93 0.79 48.5
Approach 877 5.1 0.584 10.2 LOS A 4.0 East: Henderson Road 4 L2 141 2.1 0.367 5.4 LOS A 2.1 5 T1 689 1.3 0.367 5.5 LOS A 2.1 6 R2 4 0.0 0.367 10.2 LOS A 2.0 6u U 1 0.0 0.367 12.3 LOS A 2.0	18.0 0.69 0.93 0.79 49.8
East: Henderson Road 4	18.0 0.69 0.93 0.79 50.0
4 L2 141 2.1 0.367 5.4 LOS A 2.1 5 T1 689 1.3 0.367 5.5 LOS A 2.1 6 R2 4 0.0 0.367 10.2 LOS A 2.0 6u U 1 0.0 0.367 12.3 LOS A 2.0	29.9 0.72 0.93 0.86 48.7
5 T1 689 1.3 0.367 5.5 LOS A 2.1 6 R2 4 0.0 0.367 10.2 LOS A 2.0 6u U 1 0.0 0.367 12.3 LOS A 2.0	
6 R2 4 0.0 0.367 10.2 LOS A 2.0 6u U 1 0.0 0.367 12.3 LOS A 2.0	14.6 0.48 0.56 0.48 52.7
6u U 1 0.0 0.367 12.3 LOS A 2.0	14.6 0.48 0.55 0.48 53.2
	14.4 0.49 0.55 0.49 53.9
	14.4 0.49 0.55 0.49 55.7
Approach 835 1.4 0.367 5.5 LOS A 2.1	14.6 0.48 0.55 0.48 53.1
North: Austool Place	
7 L2 18 0.0 0.098 9.7 LOS A 0.4	3.1 0.76 0.86 0.76 50.1
8 T1 26 0.0 0.098 9.8 LOS A 0.4	3.1 0.76 0.86 0.76 50.7
9 R2 80 1.3 0.132 13.1 LOS A 0.7	4.7 0.78 0.91 0.78 46.3
9u U 1 0.0 0.132 15.2 LOSB 0.7	4.7 0.78 0.91 0.78 48.9
Approach 125 0.8 0.132 11.9 LOS A 0.7	4.7 0.77 0.90 0.77 47.9
West: Henderson Road	
10 L2 25 28.0 0.585 7.4 LOS A 4.9	35.3 0.70 0.68 0.74 47.8
11 T1 1013 1.5 0.585 6.9 LOS A 4.9	35.3 0.70 0.72 0.75 51.7
12 R2 174 18.4 0.585 12.3 LOS A 4.9	36.0 0.71 0.77 0.77 49.2
12u U 1 0.0 0.585 13.9 LOS A 4.9	36.0 0.71 0.77 0.77 49.9
Approach 1213 4.5 0.585 7.7 LOS A 4.9	36.0 0.70 0.72 0.75 51.3
All Vehicles 3050 3.7 0.585 8.0 LOS A 4.9	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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♥ Site: 101 [2028PM + dev]

Henderson Road / Lancaster Street / Austool Place, Ingleburn Site Category: (None) Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South	: Lancas	ter Street										
1	L2	575	7.3	0.669	9.9	LOS A	5.3	39.2	0.81	1.01	1.09	46.6
2	T1	15	6.7	0.531	9.4	LOS A	3.3	23.0	0.75	0.97	0.91	47.7
3	R2	372	1.1	0.531	13.8	LOS A	3.3	23.0	0.75	0.97	0.91	49.1
3u	U	1	0.0	0.531	15.8	LOS B	3.3	23.0	0.75	0.97	0.91	49.2
Appro	ach	963	4.9	0.669	11.4	LOS A	5.3	39.2	0.78	0.99	1.02	47.8
East:	Henders	on Road										
4	L2	155	1.9	0.414	5.6	LOS A	2.5	17.4	0.53	0.58	0.53	52.5
5	T1	758	1.3	0.414	5.7	LOS A	2.5	17.4	0.53	0.57	0.53	52.9
6	R2	4	0.0	0.414	10.4	LOS A	2.4	17.0	0.54	0.57	0.54	53.6
6u	U	1	0.0	0.414	12.5	LOS A	2.4	17.0	0.54	0.57	0.54	55.4
Appro	ach	918	1.4	0.414	5.7	LOS A	2.5	17.4	0.53	0.57	0.53	52.8
North	: Austool	Place										
7	L2	20	0.0	0.125	10.8	LOS A	0.6	4.1	0.80	0.89	0.80	49.3
8	T1	29	0.0	0.125	10.8	LOS A	0.6	4.1	0.80	0.89	0.80	49.8
9	R2	88	1.1	0.165	13.9	LOS A	0.9	6.2	0.83	0.94	0.83	45.7
9u	U	1	0.0	0.165	16.0	LOS B	0.9	6.2	0.83	0.94	0.83	48.3
Appro	ach	138	0.7	0.165	12.8	LOS A	0.9	6.2	0.82	0.92	0.82	47.2
West:	Henders	on Road										
10	L2	28	28.6	0.666	8.8	LOS A	6.8	48.9	0.79	0.81	0.91	47.2
11	T1	1114	1.5	0.666	8.2	LOS A	6.8	48.9	0.80	0.83	0.92	51.1
12	R2	191	17.8	0.666	13.8	LOS A	6.7	49.2	0.80	0.86	0.94	48.5
12u	U	1	0.0	0.666	15.3	LOS B	6.7	49.2	0.80	0.86	0.94	48.9
Appro	ach	1334	4.4	0.666	9.0	LOS A	6.8	49.2	0.80	0.83	0.92	50.7
All Ve	hicles	3353	3.6	0.669	8.9	LOSA	6.8	49.2	0.72	0.81	0.84	50.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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∀ Site: 101 [2018AM + dev]

Lancaster Street / Aero Road, Ingleburn Site Category: (None) Roundabout

	ment F	erforman	ce - ve	hicles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South:	Lancas	ter Street										
1	L2	32	9.4	0.195	5.5	LOSA	1.1	8.4	0.43	0.55	0.43	49.4
2	T1	160	11.9	0.195	5.8	LOSA	1.1	8.4	0.43	0.55	0.43	53.
3	R2	11	18.2	0.195	10.0	LOSA	1.1	8.4	0.43	0.55	0.43	52.
3u	U	1	0.0	0.195	11.4	LOSA	1.1	8.4	0.43	0.55	0.43	54.
Approa	ach	204	11.8	0.195	6.0	LOSA	1.1	8.4	0.43	0.55	0.43	52.
East: A	Aero Roa	ad										
4	L2	15	13.3	0.139	6.7	LOSA	0.7	5.7	0.54	0.71	0.54	49.
5	T1	6	0.0	0.139	6.6	LOSA	0.7	5.7	0.54	0.71	0.54	47.
6	R2	101	15.8	0.139	11.0	LOSA	0.7	5.7	0.54	0.71	0.54	49.
6u	U	1	0.0	0.139	12.4	LOSA	0.7	5.7	0.54	0.71	0.54	50.
Approa	ach	123	14.6	0.139	10.3	LOSA	0.7	5.7	0.54	0.71	0.54	49.
North:	Lancas	ter Street										
7	L2	222	10.4	0.403	4.4	LOSA	2.9	21.7	0.18	0.48	0.18	52.
8	T1	287	3.5	0.403	4.6	LOSA	2.9	21.7	0.18	0.48	0.18	54.
9	R2	92	3.3	0.403	8.6	LOSA	2.9	21.7	0.18	0.48	0.18	51.
9u	U	1	0.0	0.403	10.4	LOSA	2.9	21.7	0.18	0.48	0.18	54.
Approa	ach	602	6.0	0.403	5.2	LOSA	2.9	21.7	0.18	0.48	0.18	53.
West:	Aero Ro	ad										
10	L2	38	5.3	0.054	5.7	LOSA	0.3	2.1	0.44	0.59	0.44	48.
11	T1	2	0.0	0.054	5.8	LOSA	0.3	2.1	0.44	0.59	0.44	50.
12	R2	12	33.3	0.054	10.6	LOSA	0.3	2.1	0.44	0.59	0.44	49.
12u	U	1	0.0	0.054	11.7	LOSA	0.3	2.1	0.44	0.59	0.44	47.
Approa	ach	53	11.3	0.054	6.9	LOSA	0.3	2.1	0.44	0.59	0.44	48.
All Veh	nicles	982	8.6	0.403	6.1	LOSA	2.9	21.7	0.29	0.53	0.29	52.

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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\Lancaster_Aero.sip8



∀ Site: 101 [2028AM + dev]

Lancaster Street / Aero Road, Ingleburn Site Category: (None) Roundabout

Move	ement P	erformanc	e - Veh	icles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued		Aver. No. Cycles	Average Speed km/h
South	: Lancast	ter Street										
1	L2	35	8.6	0.219	5.7	LOS A	1.2	9.6	0.45	0.56	0.45	49.3
2	T1	176	11.9	0.219	6.0	LOS A	1.2	9.6	0.45	0.56	0.45	53.1
3	R2	12	16.7	0.219	10.1	LOS A	1.2	9.6	0.45	0.56	0.45	52.4
3u	U	1	0.0	0.219	11.6	LOS A	1.2	9.6	0.45	0.56	0.45	54.6
Appro		224	11.6	0.219	6.2	LOS A	1.2	9.6	0.45	0.56	0.45	52.5
East:	Aero Roa											
4	L2	17	11.8	0.158	7.0	LOS A	0.8	6.6	0.57	0.73	0.57	49.2
5	T1	7	0.0	0.158	6.9	LOS A	0.8	6.6	0.57	0.73	0.57	46.7
6	R2	110	15.5	0.158	11.3	LOS A	0.8	6.6	0.57	0.73	0.57	48.9
6u	U	1	0.0	0.158	12.7	LOS A	0.8	6.6	0.57	0.73	0.57	50.4
Appro	ach	135	14.1	0.158	10.6	LOS A	0.8	6.6	0.57	0.73	0.57	48.8
North:	Lancast	er Street										
7	L2	242	9.5	0.441	4.5	LOS A	3.4	25.1	0.19	0.48	0.19	52.0
8	T1	316	3.5	0.441	4.6	LOS A	3.4	25.1	0.19	0.48	0.19	54.3
9	R2	101	3.0	0.441	8.6	LOS A	3.4	25.1	0.19	0.48	0.19	51.0
9u	U	1	0.0	0.441	10.5	LOS A	3.4	25.1	0.19	0.48	0.19	54.5
Appro	ach	660	5.6	0.441	5.2	LOS A	3.4	25.1	0.19	0.48	0.19	53.1
West:	Aero Ro	ad										
10	L2	42	4.8	0.061	5.8	LOS A	0.3	2.3	0.47	0.60	0.47	48.5
11	T1	2	0.0	0.061	6.0	LOS A	0.3	2.3	0.47	0.60	0.47	50.4
12	R2	13	30.8	0.061	10.8	LOS A	0.3	2.3	0.47	0.60	0.47	49.6
12u	U	1	0.0	0.061	11.8	LOS A	0.3	2.3	0.47	0.60	0.47	46.8
Appro	ach	58	10.3	0.061	7.0	LOS A	0.3	2.3	0.47	0.60	0.47	48.8
All Ve	hicles	1077	8.2	0.441	6.2	LOSA	3.4	25.1	0.31	0.54	0.31	52.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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\Lancaster Aero.sip8



∀ Site: 101 [2018PM + dev]

Lancaster Street / Aero Road, Ingleburn Site Category: (None) Roundabout

Mov ID Turn Veh/h Demand Flows Veh/h Deg. Sath Veh/c Average Sath Veh/c Level of Service 1 L2 9 0.0 0.415 6.2 Los A 2 T1 387 4.7 0.415 6.6 Los A 3 R2 19 15.8 0.415 10.9 Los A 3u U 1 0.0 0.415 12.3 Los A Approach 416 5.0 0.415 6.8 Los A East: Aero Road 4 L2 35 11.4 0.276 6.6 Los A 5 T1 6 16.7 0.276 7.0 Los A 6 R2 213 13.1 0.276 10.9 Los A 6u U 1 0.0 0.276 12.4 Los A Approach 255 12.9 0.276 10.2 Los A	95% Back of Queue Prop. Effective Aver. No. Aver
1 L2 9 0.0 0.415 6.2 LOS A 2 T1 387 4.7 0.415 6.6 LOS A 3 R2 19 15.8 0.415 10.9 LOS A 3u U 1 0.0 0.415 12.3 LOS A Approach 416 5.0 0.415 6.8 LOS A East: Aero Road 4 L2 35 11.4 0.276 6.6 LOS A 5 T1 6 16.7 0.276 7.0 LOS A 6 R2 213 13.1 0.276 10.9 LOS A 6u U 1 0.0 0.276 12.4 LOS A	Vehicles Distance Queued Stop Rate Cycles Spe veh m k
2 T1 387 4.7 0.415 6.6 LOS A 3 R2 19 15.8 0.415 10.9 LOS A 3u U 1 0.0 0.415 12.3 LOS A Approach 416 5.0 0.415 6.8 LOS A East: Aero Road 4 L2 35 11.4 0.276 6.6 LOS A 5 T1 6 16.7 0.276 7.0 LOS A 6 R2 213 13.1 0.276 10.9 LOS A 6u U 1 0.0 0.276 12.4 LOS A	
3 R2 19 15.8 0.415 10.9 LOS A 3u U 1 0.0 0.415 12.3 LOS A Approach 416 5.0 0.415 6.8 LOS A East: Aero Road 4 L2 35 11.4 0.276 6.6 LOS A 5 T1 6 16.7 0.276 7.0 LOS A 6 R2 213 13.1 0.276 10.9 LOS A 6u U 1 0.0 0.276 12.4 LOS A	2.9 20.8 0.60 0.64 0.60
3u U 1 0.0 0.415 12.3 LOS A Approach 416 5.0 0.415 6.8 LOS A East: Aero Road 4 L2 35 11.4 0.276 6.6 LOS A 5 T1 6 16.7 0.276 7.0 LOS A 6 R2 213 13.1 0.276 10.9 LOS A 6u U 1 0.0 0.276 12.4 LOS A	2.9 20.8 0.60 0.64 0.60
Approach 416 5.0 0.415 6.8 LOS A East: Aero Road 4 L2 35 11.4 0.276 6.6 LOS A 5 T1 6 16.7 0.276 7.0 LOS A 6 R2 213 13.1 0.276 10.9 LOS A 6u U 1 0.0 0.276 12.4 LOS A	2.9 20.8 0.60 0.64 0.60
East: Aero Road 4	2.9 20.8 0.60 0.64 0.60
4 L2 35 11.4 0.276 6.6 LOS A 5 T1 6 16.7 0.276 7.0 LOS A 6 R2 213 13.1 0.276 10.9 LOS A 6u U 1 0.0 0.276 12.4 LOS A	2.9 20.8 0.60 0.64 0.60
5 T1 6 16.7 0.276 7.0 LOS A 6 R2 213 13.1 0.276 10.9 LOS A 6u U 1 0.0 0.276 12.4 LOS A	
6 R2 213 13.1 0.276 10.9 LOS A 6u U 1 0.0 0.276 12.4 LOS A	1.6 12.4 0.56 0.72 0.56
6u U 1 0.0 0.276 12.4 LOS A	1.6 12.4 0.56 0.72 0.56
	1.6 12.4 0.56 0.72 0.56
Approach 255 12.9 0.276 10.2 LOS A	1.6 12.4 0.56 0.72 0.56
Approach 250 12.0 0.270 10.2 EOOA	1.6 12.4 0.56 0.72 0.56
North: Lancaster Street	
7 L2 93 19.4 0.296 4.7 LOSA	2.0 15.0 0.23 0.48 0.23
8 T1 245 8.6 0.296 4.8 LOS A	2.0 15.0 0.23 0.48 0.23
9 R2 61 4.9 0.296 8.7 LOS A	2.0 15.0 0.23 0.48 0.23
9u U 1 0.0 0.296 10.5 LOS A	2.0 15.0 0.23 0.48 0.23
Approach 400 10.5 0.296 5.4 LOS A	2.0 15.0 0.23 0.48 0.23
West: Aero Road	
10 L2 92 2.2 0.163 8.2 LOS A	1.0 7.0 0.70 0.76 0.70
11 T1 2 0.0 0.163 8.3 LOSA	1.0 7.0 0.70 0.76 0.70
12 R2 27 7.4 0.163 12.6 LOS A	1.0 7.0 0.70 0.76 0.70
12u U 1 0.0 0.163 14.2 LOS A	1.0 7.0 0.70 0.76 0.70
Approach 122 3.3 0.163 9.2 LOS A	1.0 7.0 0.70 0.76 0.70
All Vehicles 1193 8.4 0.415 7.3 LOS A	2.9 20.8 0.48 0.62 0.48

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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\Lancaster_Aero.sip8



♥ Site: 101 [2028PM + dev]

Lancaster Street / Aero Road, Ingleburn Site Category: (None) Roundabout

Move	ement Pe	erformand	e - Veh	icles								
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South	: Lancast	er Street										
1	L2	10	0.0	0.468	6.5	LOS A	3.4	24.6	0.66	0.68	0.66	48.9
2	T1	426	4.7	0.468	6.9	LOS A	3.4	24.6	0.66	0.68	0.66	52.3
3	R2	21	14.3	0.468	11.2	LOS A	3.4	24.6	0.66	0.68	0.66	51.6
3u	U	1	0.0	0.468	12.6	LOS A	3.4	24.6	0.66	0.68	0.66	53.6
Appro	ach	458	5.0	0.468	7.1	LOS A	3.4	24.6	0.66	0.68	0.66	52.2
East:	Aero Roa	d										
4	L2	39	10.3	0.310	6.9	LOS A	1.8	14.2	0.59	0.74	0.59	49.3
5	T1	7	14.3	0.310	7.3	LOS A	1.8	14.2	0.59	0.74	0.59	45.5
6	R2	232	12.5	0.310	11.2	LOS A	1.8	14.2	0.59	0.74	0.59	49.0
6u	U	1	0.0	0.310	12.7	LOS A	1.8	14.2	0.59	0.74	0.59	50.4
Appro	ach	279	12.2	0.310	10.5	LOS A	1.8	14.2	0.59	0.74	0.59	49.0
North:	Lancaste	er Street										
7	L2	92	20.7	0.321	4.7	LOS A	2.2	16.7	0.25	0.48	0.25	51.2
8	T1	270	8.5	0.321	4.8	LOS A	2.2	16.7	0.25	0.48	0.25	53.8
9	R2	67	4.5	0.321	8.8	LOS A	2.2	16.7	0.25	0.48	0.25	50.4
9u	U	1	0.0	0.321	10.6	LOS A	2.2	16.7	0.25	0.48	0.25	54.1
Appro	ach	430	10.5	0.321	5.4	LOS A	2.2	16.7	0.25	0.48	0.25	52.8
West:	Aero Roa	ad										
10	L2	102	2.0	0.193	8.8	LOS A	1.2	8.5	0.74	0.80	0.74	45.5
11	T1	2	0.0	0.193	9.0	LOS A	1.2	8.5	0.74	0.80	0.74	47.1
12	R2	30	6.7	0.193	13.3	LOS A	1.2	8.5	0.74	0.80	0.74	48.0
12u	U	1	0.0	0.193	14.9	LOS B	1.2	8.5	0.74	0.80	0.74	42.3
Appro	ach	135	3.0	0.193	9.9	LOS A	1.2	8.5	0.74	0.80	0.74	46.1
All Vel	hicles	1302	8.1	0.468	7.6	LOSA	3.4	24.6	0.52	0.64	0.52	51.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

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