ttpp

transport planning

Our Ref: 17322

27 May 2019

Department of Planning & Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Mr Bruce Zhang

Dear Bruce,

**RE: CHESTER HILL MATERIALS RECYCLING FACILITY MP 06_0052 MOD 3
RESPONSE TO CANTERBURY BANKSTOWN COUNCIL ADDITIONAL SUBMISSION**

The Transport Planning Partnership (TTPP) prepares this letter in response to additional (May 2019) comments made by Canterbury Bankstown Council (CBC) in relation to the above development application.

The additional comments from CBC and TTPP's response to each item are presented in Table 1 below.

Table 1: Response to Council's Comments

Council's May 2019 Comments	TTPP's Response
1. Whilst the applicant has provided a summary results of SIDRA modelling, a detailed SIDRA Output and Movement Summary is missing for all three nearby intersections (Miller-Hume Hwy, Miller Rd- Site access, and Miller Rd- Christina Rd).	Detailed Movement Summary output from SIDRA for all three assessed intersections are provided in Attachment One of this letter.
Council seeks confirmation on whether the existing and the proposed peak period trip generation takes considerations of all existing users at 191 Miller Road.	The traffic assessment included traffic generation surveys (as reported in TTPP's DA traffic assessment report) of the existing site access capturing all existing uses. Surveyed traffic volumes have been carried across into the future case SIDRA models.
2. There is a discrepancy in traffic volumes, for example: • Figure 2.2 it shows that 7 vehicles are entering during the AM peak in 2017. • Figure 4.3 shows 5 vehicles entering during the AM peak in 2027. The growth factors do not appear to have been used. Figure 4.4 it shows the post development traffic generation as 86 vehicles are entering and 44 vehicles are exiting the site during the AM peak and 40 vehicles are entering and 89 vehicles are exiting during the PM peak. In other words 130 vehicles and 129 vehicles are generated during the AM and PM peak hour.	The discrepancy is due to a typo in the figures where the right turn entering volume has been incorrectly shown. Notwithstanding this, all traffic volumes for all movements at all intersections for all scenarios including the future case scenarios have been entered correctly into the relevant SIDRA models. TTPP confirms the volumes reported in Figure 4.4 are correct. They are higher than the traffic generation discussed in Section 4.1 of the DA traffic report due the inclusion of passenger car unit (PCU) factors to better account for the effects of heavy vehicles in our SIDRA models.

Council's May 2019 Comments	TTPP's Response
	In developing the SIDRA models, TTPP has adopted PCU factors of 1, 3 and 5 for staff vehicles, 12.5m heavy rigid vehicles and 19m articulated vehicles respectively. The PCU factors in our opinion are very conservative. In this regard, it is noted the US Highway Capacity Manual (HCM) recommended a PCU factor of 2.0 for trucks as per the extract from HCM below.

Step 2: Adjust Flow Rates for Heavy Vehicles

The flow rate for each movement may be adjusted to account for vehicle stream characteristics by using factors given in Exhibit 22-11.

Vehicle Type	Passenger Car Equivalent, E_T
Passenger car	1.0
Heavy vehicle	2.0

The calculation to incorporate these values is given in Equation 22-9 and Equation 22-10.

$$v_{i.pce} = \frac{v_i}{f_{HV}}$$

$$f_{HV} = \frac{1}{1 + P_T(E_T - 1)}$$

where

$v_{i,pce}$ = demand flow rate for movement i (pc/h),

v_i = demand flow rate for movement i (veh/h),

f_{HV} = heavy-vehicle adjustment factor,

P_T = proportion of demand volume that consists of heavy vehicles, and

E_T = passenger car equivalent for heavy vehicles.

Effectively, in TTPP's assessment a heavy rigid vehicle has three times the impact of a passenger vehicle. Similarly, a 19m articulated vehicles have five times the impact of a passenger vehicle.

The morning peak volumes in Figure 4.4 have been calculated as follow:

- staff vehicles 40 vph (x1 PCU) = 40 pcu/hr
- heavy rigid trucks 16 vph (x3 PCU) = 48 pcu/hr
- articulated vehicles 6 vph (x5 PCU) = 30 pcu/hr
- total traffic generation 62 vph = 118 pcu/hr
- existing site traffic 9 vph = 12 pcu/hr
- total intersection traffic 71 vph = 130 puc/hr

The evening peak volumes have calculated in a similar manner.

Council's May 2019 Comments	TTPP's Response
3. Confirm the calculation undertaken includes a gross weight of the nominated trucks. If so, the number of truck movements proposed could be higher than what is currently being proposed. Please advise a tentative timeframe to receive ESA calculation	A review of the gate receipts for loads received and leaving the facility in preceding years found that trucks carrying waste to the facility carried on average 12.5 tonnes of waste each. Based on a proposed maximum capacity of 910 tonnes per day for the facility, this translates to 73 trucks per day or 146 trucks movements (two-way) per day or 15 movements (two-way) per hour based on a 10-hour working day. It is noted that the DA traffic report assumes 16 truck movements (two-way) per hour which is higher than the above estimate. This is what has been modelled in SIDRA. In addition, as noted above a PCU factor of 3.0 has been assumed which is conservative given that the HCM recommended a factor of 2.0 for all trucks. Similarly for product delivery vehicles, the review found that trucks carried an average 30 tonnes of product. This translates to 30 trucks per day or 61 truck movements (two-way) per day or 6 truck movements (two-way) per hour.

Council's May 2019 Comments	TTPP's Response
	The DA traffic report and the underlying SIDRA modelling also assumes 6 truck movements (two-way) per hour together with a PCU of 5.0 which is conservative.
	On this basis, the SIDRA modelling undertaken as part of the DA traffic assessment remains valid and will continue to provide robust assessment of the future operation of the assessed intersections. As such, the SIDRA models and its intersection performance detailed in the DA traffic report do not require any amendments.
	ESA calculation will be undertaken by another consultant and will be provided under a separate cover.
4. • Gurney Road and Miller Road north of Christina Road have a 3T load limit and these roads must not be used by trucks. • Miller Road south of the site has traffic devices which has been designed for vehicles up to 12.5 metre long. The 12.5 m HRV may travel south to the Hume Hwy using Miller Rd, but the 19 m AV should access the State road network via northbound on Miller Rd and Christina Rd.	This could be addressed by way of a consent condition requiring a traffic management plan to be prepared prior to occupation of the proposed development. The traffic management plan is to be distributed to all service providers and their drivers accessing the site. Drivers are required to abide by the rules and conditions contained in the traffic management plan when accessing the site. The traffic management plan will include a condition reflecting Council's intended truck routes for the site.
5. In considering applicant's submission, Council notes TIA has not responded to a vehicular conflict at the entry of the site between the outgoing trucks and the vehicles intending to access staff car park.	This situation also occurs under existing arrangements. It is understood that this arrangement operates without any issues including when the subject site was previously operating at full capacity. It is further noted that a weigh bridge will continue to be provided for outgoing trucks just before the staff car park access. As such, outgoing trucks will be stopped at the weigh bridge and/or travel at a low speed as it approaches the staff car park access point as it leaves the weigh bridge. In addition, as vehicles enter the staff car park, they would do so at a slow speed as they turn in from Miller Street. Therefore, both the trucks and staff vehicles would proceed at a slow speed. The vehicles will be able to stop and yield to the opposing vehicles when and as required. In addition, a review of the aerial imagery of the area in question does not appear to suggest there is any sight distance issues. As such, this situation could continue to be self managed without any issues.

We trust the above is to your satisfaction. Should you have any queries regarding the above or require further information, please do not hesitate to contact the undersigned on 8437 7800.

Yours sincerely,

Michael Lee
Director

Attachment One

Detailed SIDRA Output

MOVEMENT SUMMARY

🚦 Site: 101 [EX_AM_Miller Road_Hume Highway]

Miller Road_Hume Highway
Signals - Fixed Time Coordinated   Cycle Time = 150 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Hume Highway (East Arm)											
5	T1	1444	6.9	0.492	5.8	LOS A	17.9	132.5	0.38	0.35	62.4
6	R2	452	5.1	0.652	44.7	LOS D	11.7	85.2	0.98	0.82	30.2
Approach		1896	6.4	0.652	15.1	LOS B	17.9	132.5	0.52	0.46	51.6
North: Miller Road											
7	L2	416	13.4	0.612	45.9	LOS D	18.4	143.8	0.83	0.81	28.5
9	R2	95	13.3	0.612	69.2	LOS E	11.6	90.5	0.98	0.82	24.3
Approach		511	13.4	0.612	50.2	LOS D	18.4	143.8	0.86	0.81	27.5
West: Hume Highway (West Arm)											
10	L2	68	10.8	0.470	24.9	LOS B	17.7	131.4	0.50	0.49	43.5
11	T1	1552	6.1	0.470	18.3	LOS B	18.0	132.9	0.50	0.46	50.5
Approach		1620	6.3	0.470	18.6	LOS B	18.0	132.9	0.50	0.46	50.2
All Vehicles		4026	7.3	0.652	21.0	LOS B	18.4	143.8	0.56	0.51	46.7

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		105	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

▽ Site: 102 [EX_AM_Miller Road_Site Access]

Miller Road_Site Access
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Miller Road (South Arm)											
2	T1	518	6.3	0.288	0.1	LOS A	0.2	1.3	0.04	0.01	59.6
3	R2	12	0.0	0.288	9.0	LOS A	0.2	1.3	0.04	0.01	30.5
Approach		529	6.2	0.288	0.3	NA	0.2	1.3	0.04	0.01	58.1
East: Site Access											
4	L2	11	0.0	0.015	2.3	LOS A	0.1	0.4	0.52	0.39	28.7
6	R2	1	0.0	0.015	8.4	LOS A	0.1	0.4	0.52	0.39	25.2
Approach		12	0.0	0.015	2.8	LOS A	0.1	0.4	0.52	0.39	28.4
North: Miller Road (North Arm)											
7	L2	2	0.0	0.302	5.6	LOS A	0.0	0.0	0.00	0.00	57.8
8	T1	544	12.0	0.302	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		546	11.9	0.302	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		1087	9.0	0.302	0.2	NA	0.2	1.3	0.03	0.01	58.2

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.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

MOVEMENT SUMMARY

▽ Site: 103 [EX_AM_Miller Road_Waldron Road_Christina Road]

Miller Road_Waldron Road_Christina Road
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Miller Road (South Arm)											
1	L2	226	10.2	0.339	8.4	LOS A	1.9	14.3	0.74	0.86	50.0
2	T1	240	3.1	0.354	7.6	LOS A	2.1	15.4	0.74	0.77	51.3
3	R2	49	4.3	0.354	12.1	LOS A	2.1	15.4	0.74	0.77	51.1
3u	U	1	0.0	0.354	14.0	LOS A	2.1	15.4	0.74	0.77	50.3
Approach		517	6.3	0.354	8.4	LOS A	2.1	15.4	0.74	0.81	50.7
East: Waldron Road											
4	L2	83	5.1	0.255	9.4	LOS A	1.2	8.4	0.65	0.81	49.5
5	T1	593	1.8	0.689	10.6	LOS A	6.8	48.4	0.83	0.98	51.6
6	R2	60	0.0	0.689	15.0	LOS B	6.8	48.4	0.84	0.99	51.5
6u	U	5	0.0	0.689	17.1	LOS B	6.8	48.4	0.84	0.99	52.4
Approach		741	2.0	0.689	10.8	LOS A	6.8	48.4	0.81	0.96	51.4
North: Miller Road (North Arm)											
7	L2	117	2.7	0.273	9.7	LOS A	1.4	9.9	0.78	0.89	51.0
8	T1	247	3.8	0.490	10.0	LOS A	3.4	25.2	0.85	0.98	49.7
9	R2	95	8.9	0.490	14.7	LOS B	3.4	25.2	0.86	0.99	51.0
9u	U	1	0.0	0.490	16.4	LOS B	3.4	25.2	0.86	0.99	52.3
Approach		460	4.6	0.490	10.9	LOS A	3.4	25.2	0.84	0.96	50.4
West: Christina Road											
10	L2	114	2.8	0.412	7.2	LOS A	2.2	15.8	0.61	0.72	52.5
11	T1	733	3.3	0.811	10.1	LOS A	10.7	80.5	0.81	0.89	51.5
12	R2	216	22.9	0.811	16.1	LOS B	10.7	80.5	0.86	0.95	45.9
12u	U	4	25.0	0.811	18.3	LOS B	10.7	80.5	0.86	0.95	50.8
Approach		1066	7.3	0.811	11.0	LOS A	10.7	80.5	0.80	0.89	50.6
All Vehicles		2784	5.3	0.811	10.5	LOS A	10.7	80.5	0.80	0.90	50.8

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 [EX_PM_Miller Road_Hume Highway]

Miller Road_Hume Highway
Signals - Fixed Time Coordinated   Cycle Time = 110 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Hume Highway (East Arm)											
5	T1	1874	5.1	0.875	9.2	LOS A	20.8	151.8	0.34	0.37	58.8
6	R2	456	8.5	1.001	102.0	LOS F	17.6	132.6	1.00	1.12	18.1
Approach		2329	5.7	1.001	27.3	LOS B	20.8	151.8	0.47	0.52	43.3
North: Miller Road											
7	L2	521	7.3	0.769	42.4	LOS C	19.4	144.3	0.91	0.87	30.1
9	R2	165	10.2	0.769	53.7	LOS D	14.7	111.2	1.00	0.89	28.2
Approach		686	8.0	0.769	45.1	LOS D	19.4	144.3	0.93	0.87	29.6
West: Hume Highway (West Arm)											
10	L2	46	6.8	0.672	26.1	LOS B	26.3	189.1	0.78	0.72	43.4
11	T1	2015	3.0	0.672	19.7	LOS B	26.5	190.5	0.78	0.71	49.6
Approach		2061	3.1	0.672	19.8	LOS B	26.5	190.5	0.78	0.71	49.5
All Vehicles		5077	5.0	1.001	26.7	LOS B	26.5	190.5	0.66	0.65	43.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		105	49.3	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

▽ Site: 102 [EX_PM_Miller Road_Site Access]

Miller Road_Site Access
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Miller Road (South Arm)											
2	T1	547	5.8	0.293	0.0	LOS A	0.0	0.2	0.00	0.00	59.9
3	R2	1	0.0	0.293	11.1	LOS A	0.0	0.2	0.00	0.00	30.6
Approach		548	5.8	0.293	0.0	NA	0.0	0.2	0.00	0.00	59.8
East: Site Access											
4	L2	8	0.0	0.022	3.6	LOS A	0.1	0.5	0.67	0.61	28.0
6	R2	3	0.0	0.022	12.7	LOS A	0.1	0.5	0.67	0.61	24.5
Approach		12	0.0	0.022	6.1	LOS A	0.1	0.5	0.67	0.61	27.1
North: Miller Road (North Arm)											
7	L2	1	0.0	0.392	5.6	LOS A	0.0	0.0	0.00	0.00	57.8
8	T1	738	5.1	0.392	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		739	5.1	0.392	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		1299	5.3	0.392	0.1	NA	0.1	0.5	0.01	0.01	59.1

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

MOVEMENT SUMMARY

▽ Site: 103 [EX_PM_Miller Road_Waldron Road_Christina Road]

Miller Road_Waldron Road_Christina Road
Roundabout

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
Movement Performance - Vehicles											
South: Miller Road (South Arm)											
1	L2	301	8.0	0.422	8.3	LOS A	2.5	19.0	0.79	0.92	50.2
2	T1	212	3.5	0.436	9.1	LOS A	2.5	18.4	0.79	0.93	50.7
3	R2	55	7.7	0.436	13.7	LOS A	2.5	18.4	0.79	0.93	50.4
3u	U	2	0.0	0.436	15.4	LOS B	2.5	18.4	0.79	0.93	49.6
Approach		569	6.3	0.436	9.1	LOS A	2.5	19.0	0.79	0.92	50.4
East: Waldron Road											
4	L2	92	4.6	0.584	11.3	LOS A	4.5	31.7	0.82	0.98	48.0
5	T1	824	1.4	0.730	12.3	LOS A	7.7	54.6	0.88	1.06	50.4
6	R2	55	1.9	0.730	17.5	LOS B	7.7	54.6	0.91	1.11	49.8
6u	U	11	10.0	0.730	19.9	LOS B	7.7	54.6	0.91	1.11	50.3
Approach		981	1.8	0.730	12.6	LOS A	7.7	54.6	0.87	1.06	50.2
North: Miller Road (North Arm)											
7	L2	72	1.5	0.231	9.9	LOS A	1.2	8.3	0.78	0.88	50.9
8	T1	221	2.4	0.415	9.6	LOS A	2.7	19.5	0.84	0.95	50.1
9	R2	81	6.5	0.415	14.1	LOS A	2.7	19.5	0.85	0.96	51.4
9u	U	1	0.0	0.415	15.9	LOS B	2.7	19.5	0.85	0.96	52.6
Approach		375	3.1	0.415	10.7	LOS A	2.7	19.5	0.83	0.94	50.6
West: Christina Road											
10	L2	92	5.7	0.441	7.4	LOS A	2.3	16.3	0.61	0.71	52.4
11	T1	601	2.5	0.869	10.9	LOS A	13.0	94.2	0.79	0.91	50.5
12	R2	417	6.6	0.869	17.2	LOS B	13.0	94.2	0.87	1.00	46.1
12u	U	5	0.0	0.869	19.1	LOS B	13.0	94.2	0.87	1.00	49.8
Approach		1115	4.2	0.869	13.0	LOS A	13.0	94.2	0.80	0.93	49.1
All Vehicles		3040	3.7	0.869	11.9	LOS A	13.0	94.2	0.83	0.97	49.9

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.

MOVEMENT SUMMARY

🚦 Site: 101 [FU_AM_Miller Road_Hume Highway]

Miller Road_Hume Highway
Signals - Fixed Time Coordinated   Cycle Time = 150 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Hume Highway (East Arm)											
5	T1	1686	5.9	0.784	6.5	LOS A	23.2	170.8	0.42	0.39	61.7
6	R2	533	4.3	0.765	48.6	LOS D	14.6	105.8	1.00	0.87	28.9
Approach		2219	5.5	0.784	16.6	LOS B	23.2	170.8	0.56	0.50	50.4
North: Miller Road											
7	L2	464	12.0	0.704	47.3	LOS D	20.6	158.9	0.85	0.82	28.1
9	R2	107	11.8	0.704	71.2	LOS F	14.0	108.0	1.00	0.85	24.0
Approach		572	12.0	0.704	51.8	LOS D	20.6	158.9	0.88	0.83	27.2
West: Hume Highway (West Arm)											
10	L2	74	10.0	0.504	25.3	LOS B	19.8	145.8	0.52	0.50	43.3
11	T1	1668	5.7	0.504	18.8	LOS B	20.1	147.5	0.52	0.48	50.2
Approach		1742	5.9	0.504	19.1	LOS B	20.1	147.5	0.52	0.48	49.9
All Vehicles		4533	6.5	0.784	22.0	LOS B	23.2	170.8	0.59	0.54	46.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		105	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

▽ Site: 102 [FU_AM_Miller Road_Site Access]

Miller Road_Site Access
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Miller Road (South Arm)											
2	T1	572	5.7	0.317	0.2	LOS A	0.2	1.6	0.04	0.01	59.5
3	R2	12	0.0	0.317	9.8	LOS A	0.2	1.6	0.04	0.01	30.5
Approach		583	5.6	0.317	0.4	NA	0.2	1.6	0.04	0.01	58.2
East: Site Access											
4	L2	11	0.0	0.016	2.7	LOS A	0.1	0.4	0.55	0.44	28.6
6	R2	1	0.0	0.016	10.5	LOS A	0.1	0.4	0.55	0.44	25.1
Approach		12	0.0	0.016	3.4	LOS A	0.1	0.4	0.55	0.44	28.3
North: Miller Road (North Arm)											
7	L2	2	0.0	0.337	5.6	LOS A	0.0	0.0	0.00	0.00	57.8
8	T1	612	10.7	0.337	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		614	10.6	0.337	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		1208	8.1	0.337	0.2	NA	0.2	1.6	0.03	0.01	58.3

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.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

MOVEMENT SUMMARY

▽ Site: 103 [FU_AM_Miller Road_Waldron Road_Christina Road]

Miller Road_Waldron Road_Christina Road
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m		per veh	km/h
South: Miller Road (South Arm)											
1	L2	248	9.3	0.408	9.6	LOS A	2.5	19.1	0.80	0.92	49.0
2	T1	265	2.8	0.426	8.6	LOS A	2.9	20.7	0.81	0.87	50.9
3	R2	55	3.8	0.426	13.1	LOS A	2.9	20.7	0.81	0.87	50.7
3u	U	1	0.0	0.426	15.0	LOS B	2.9	20.7	0.81	0.87	49.8
Approach		569	5.7	0.426	9.5	LOS A	2.9	20.7	0.81	0.90	50.0
East: Waldron Road											
4	L2	91	4.7	0.298	10.0	LOS A	1.4	10.2	0.70	0.84	48.9
5	T1	651	1.6	0.805	14.4	LOS A	10.5	74.4	0.94	1.17	49.0
6	R2	66	0.0	0.805	19.2	LOS B	10.5	74.4	0.96	1.19	48.7
6u	U	6	0.0	0.805	21.3	LOS B	10.5	74.4	0.96	1.19	49.5
Approach		814	1.8	0.805	14.4	LOS A	10.5	74.4	0.91	1.13	49.0
North: Miller Road (North Arm)											
7	L2	134	2.4	0.354	11.1	LOS A	2.0	14.0	0.84	0.94	50.0
8	T1	283	3.3	0.635	13.2	LOS A	5.4	39.0	0.94	1.08	47.2
9	R2	107	7.8	0.635	18.0	LOS B	5.4	39.0	0.95	1.09	48.9
9u	U	1	0.0	0.635	19.7	LOS B	5.4	39.0	0.95	1.09	50.0
Approach		525	4.0	0.635	13.7	LOS A	5.4	39.0	0.92	1.05	48.4
West: Christina Road											
10	L2	125	2.5	0.466	8.1	LOS A	2.8	19.8	0.67	0.78	52.2
11	T1	803	3.0	0.918	16.0	LOS B	19.0	142.0	0.92	1.14	47.6
12	R2	233	21.3	0.918	23.6	LOS B	19.0	142.0	1.00	1.24	41.4
12u	U	4	25.0	0.918	25.8	LOS B	19.0	142.0	1.00	1.24	46.1
Approach		1165	6.7	0.918	16.7	LOS B	19.0	142.0	0.91	1.12	46.9
All Vehicles		3074	4.8	0.918	14.2	LOS A	19.0	142.0	0.89	1.07	48.2

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.

MOVEMENT SUMMARY

🚦 **Site: 101 [FU_PM_Miller Road_Hume Highway]**

Miller Road_Hume Highway
Signals - Fixed Time Coordinated   Cycle Time = 110 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Hume Highway (East Arm)											
5	T1	2069	4.6	0.939	22.0	LOS B	33.9	246.5	0.37	0.49	48.0
6	R2	501	7.8	0.791	58.8	LOS E	13.9	104.0	1.00	0.89	25.9
Approach		2571	5.2	0.939	29.2	LOS C	33.9	246.5	0.49	0.57	42.3
North: Miller Road											
7	L2	562	6.4	0.858	48.3	LOS D	24.4	180.0	0.91	0.92	28.2
9	R2	179	9.4	0.858	61.7	LOS E	16.3	122.5	1.00	0.96	26.2
Approach		741	7.1	0.858	51.6	LOS D	24.4	180.0	0.93	0.93	27.7
West: Hume Highway (West Arm)											
10	L2	52	6.1	0.795	30.6	LOS C	34.0	244.1	0.89	0.82	40.7
11	T1	2268	2.7	0.795	24.1	LOS B	34.3	245.5	0.89	0.82	46.6
Approach		2320	2.8	0.795	24.3	LOS B	34.3	245.5	0.89	0.82	46.4
All Vehicles		5632	4.4	0.939	30.1	LOS C	34.3	246.5	0.72	0.72	41.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		105	49.3	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

▽ **Site: 102 [FU_PM_Miller Road_Site Access]**

Miller Road_Site Access
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Miller Road (South Arm)											
2	T1	568	5.6	0.304	0.0	LOS A	0.0	0.2	0.01	0.00	59.9
3	R2	1	0.0	0.304	13.4	LOS A	0.0	0.2	0.01	0.00	30.6
Approach		569	5.5	0.304	0.1	NA	0.0	0.2	0.01	0.00	59.8
East: Site Access											
4	L2	8	0.0	0.029	5.0	LOS A	0.1	0.7	0.75	0.72	27.5
6	R2	3	0.0	0.029	17.7	LOS B	0.1	0.7	0.75	0.72	24.1
Approach		12	0.0	0.029	8.5	LOS A	0.1	0.7	0.75	0.72	26.6
North: Miller Road (North Arm)											
7	L2	1	0.0	0.456	5.6	LOS A	0.0	0.0	0.00	0.00	57.8
8	T1	864	4.4	0.456	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		865	4.4	0.456	0.0	NA	0.0	0.0	0.00	0.00	59.8
All Vehicles		1446	4.8	0.456	0.1	NA	0.1	0.7	0.01	0.01	59.1

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

MOVEMENT SUMMARY

▽ Site: 103 [FU_PM_Miller Road_Waldron Road_Christina Road]

Miller Road_Waldron Road_Christina Road
Roundabout

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Miller Road (South Arm)											
1	L2	312	7.8	0.519	10.1	LOS A	3.5	26.2	0.88	1.00	48.7
2	T1	220	3.3	0.552	11.6	LOS A	3.6	26.1	0.88	1.01	48.7
3	R2	57	7.4	0.552	16.2	LOS B	3.6	26.1	0.88	1.01	48.3
3u	U	2	0.0	0.552	17.9	LOS B	3.6	26.1	0.88	1.01	47.0
Approach		591	6.1	0.552	11.3	LOS A	3.6	26.2	0.88	1.00	48.6
East: Waldron Road											
4	L2	109	3.8	0.733	15.3	LOS B	7.2	51.1	0.92	1.12	45.1
5	T1	986	1.2	0.916	22.1	LOS B	17.5	124.2	0.97	1.37	44.5
6	R2	65	1.6	0.916	30.6	LOS C	17.5	124.2	1.00	1.51	42.4
6u	U	13	8.3	0.916	33.1	LOS C	17.5	124.2	1.00	1.51	42.8
Approach		1174	1.5	0.916	22.1	LOS B	17.5	124.2	0.97	1.35	44.4
North: Miller Road (North Arm)											
7	L2	80	1.3	0.275	10.3	LOS A	1.4	10.2	0.81	0.90	50.6
8	T1	247	2.1	0.495	10.8	LOS A	3.6	25.5	0.88	0.99	49.2
9	R2	91	5.8	0.495	15.4	LOS B	3.6	25.5	0.90	1.01	50.5
9u	U	1	0.0	0.495	17.3	LOS B	3.6	25.5	0.90	1.01	51.6
Approach		419	2.8	0.495	11.7	LOS A	3.6	25.5	0.87	0.98	49.8
West: Christina Road											
10	L2	95	5.6	0.469	7.9	LOS A	2.6	18.5	0.64	0.75	52.2
11	T1	624	2.4	0.924	14.6	LOS B	18.2	132.1	0.85	1.05	48.2
12	R2	433	6.3	0.924	22.3	LOS B	18.2	132.1	0.95	1.19	42.8
12u	U	5	0.0	0.924	24.2	LOS B	18.2	132.1	0.95	1.19	46.7
Approach		1157	4.1	0.924	17.0	LOS B	18.2	132.1	0.87	1.08	46.6
All Vehicles		3340	3.4	0.924	17.1	LOS B	18.2	132.1	0.91	1.15	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.

MOVEMENT SUMMARY

🚦 **Site: 101 [DV_AM_Miller Road_Hume Highway]**

Miller Road_Hume Highway
Signals - Fixed Time Coordinated   Cycle Time = 150 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Hume Highway (East Arm)											
5	T1	1686	5.9	0.784	6.5	LOS A	23.2	170.8	0.42	0.39	61.7
6	R2	567	4.1	0.813	53.1	LOS D	16.0	116.2	1.00	0.90	27.6
Approach		2254	5.4	0.813	18.2	LOS B	23.2	170.8	0.57	0.52	49.1
North: Miller Road											
7	L2	474	11.8	0.721	47.7	LOS D	21.0	161.9	0.85	0.83	28.0
9	R2	109	11.5	0.721	71.8	LOS F	14.5	111.7	1.00	0.85	23.9
Approach		583	11.7	0.721	52.2	LOS D	21.0	161.9	0.88	0.83	27.1
West: Hume Highway (West Arm)											
10	L2	82	9.0	0.507	25.3	LOS B	19.9	146.7	0.52	0.51	43.4
11	T1	1668	5.7	0.507	18.8	LOS B	20.3	148.7	0.52	0.48	50.1
Approach		1751	5.8	0.507	19.1	LOS B	20.3	148.7	0.52	0.48	49.8
All Vehicles		4587	6.4	0.813	22.9	LOS B	23.2	170.8	0.59	0.54	45.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
P3	North Full Crossing	53	69.3	LOS F	0.2	0.2	0.96	0.96
All Pedestrians		105	69.3	LOS F			0.96	0.96

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

MOVEMENT SUMMARY

▽ Site: 102 [DV_AM_Miller Road_Site Access]

Miller Road_Site Access
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Miller Road (South Arm)											
2	T1	572	5.7	0.367	0.9	LOS A	1.1	8.3	0.19	0.06	57.9
3	R2	53	0.0	0.367	10.6	LOS A	1.1	8.3	0.19	0.06	30.2
Approach		624	5.2	0.367	1.8	NA	1.1	8.3	0.19	0.06	52.8
East: Site Access											
4	L2	32	0.0	0.115	2.9	LOS A	0.4	2.6	0.67	0.66	27.9
6	R2	21	0.0	0.115	12.4	LOS A	0.4	2.6	0.67	0.66	24.4
Approach		53	0.0	0.115	6.7	LOS A	0.4	2.6	0.67	0.66	26.6
North: Miller Road (North Arm)											
7	L2	43	0.0	0.359	5.6	LOS A	0.0	0.0	0.00	0.04	57.4
8	T1	612	10.7	0.359	0.0	LOS A	0.0	0.0	0.00	0.04	59.4
Approach		655	10.0	0.359	0.4	NA	0.0	0.0	0.00	0.04	59.3
All Vehicles		1332	7.4	0.367	1.3	NA	1.1	8.3	0.11	0.07	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.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

MOVEMENT SUMMARY

▽ Site: 103 [DV_AM_Miller Road_Waldron Road_Christina Road]

Miller Road_Waldron Road_Christina Road
Roundabout

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Miller Road (South Arm)											
1	L2	259	8.9	0.426	9.8	LOS A	2.7	20.4	0.81	0.94	48.9
2	T1	276	2.7	0.442	8.8	LOS A	3.1	22.1	0.82	0.90	50.8
3	R2	55	3.8	0.442	13.3	LOS A	3.1	22.1	0.82	0.90	50.6
3u	U	1	0.0	0.442	15.2	LOS B	3.1	22.1	0.82	0.90	49.7
Approach		591	5.5	0.442	9.7	LOS A	3.1	22.1	0.82	0.91	49.9
East: Waldron Road											
4	L2	95	4.4	0.306	10.3	LOS A	1.5	10.5	0.71	0.84	48.7
5	T1	651	1.6	0.827	15.9	LOS B	11.4	80.9	0.96	1.21	48.1
6	R2	66	0.0	0.827	20.7	LOS B	11.4	80.9	0.98	1.24	47.7
6u	U	6	0.0	0.827	22.8	LOS B	11.4	80.9	0.98	1.24	48.5
Approach		818	1.8	0.827	15.7	LOS B	11.4	80.9	0.93	1.17	48.1
North: Miller Road (North Arm)											
7	L2	134	2.4	0.372	11.5	LOS A	2.1	15.0	0.85	0.95	49.8
8	T1	303	3.1	0.668	14.1	LOS A	5.9	42.7	0.95	1.10	46.6
9	R2	107	7.8	0.668	19.0	LOS B	5.9	42.7	0.96	1.11	48.3
9u	U	1	0.0	0.668	20.7	LOS B	5.9	42.7	0.96	1.11	49.4
Approach		545	3.9	0.668	14.4	LOS A	5.9	42.7	0.93	1.07	47.8
West: Christina Road											
10	L2	125	2.5	0.477	8.3	LOS A	2.9	20.8	0.68	0.79	52.1
11	T1	803	3.0	0.939	18.6	LOS B	22.0	164.5	0.93	1.22	46.1
12	R2	249	19.8	0.939	26.9	LOS B	22.0	164.5	1.00	1.35	39.7
12u	U	4	25.0	0.939	29.2	LOS C	22.0	164.5	1.00	1.35	44.3
Approach		1182	6.6	0.939	19.3	LOS B	22.0	164.5	0.92	1.20	45.4
All Vehicles		3136	4.7	0.939	15.7	LOS B	22.0	164.5	0.90	1.12	47.2

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.

MOVEMENT SUMMARY

🚦 **Site: 101 [DV_PM_Miller Road_Hume Highway]**

Miller Road_Hume Highway
Signals - Fixed Time Coordinated   Cycle Time = 110 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Hume Highway (East Arm)											
5	T1	2069	4.6	0.939	22.0	LOS B	33.9	246.5	0.37	0.49	48.0
6	R2	517	7.5	0.815	60.0	LOS E	14.6	109.0	1.00	0.90	25.6
Approach		2586	5.2	0.939	29.6	LOS C	33.9	246.5	0.50	0.57	42.0
North: Miller Road											
7	L2	614	6.2	0.929	63.5	LOS E	31.6	233.3	0.93	1.01	24.3
9	R2	192	8.8	0.929	73.6	LOS F	20.0	149.3	1.00	1.04	23.7
Approach		805	6.8	0.929	65.9	LOS E	31.6	233.3	0.95	1.01	24.1
West: Hume Highway (West Arm)											
10	L2	57	5.6	0.797	30.8	LOS C	34.2	245.5	0.89	0.83	40.6
11	T1	2268	2.7	0.797	24.3	LOS B	34.5	247.1	0.89	0.82	46.5
Approach		2325	2.8	0.797	24.4	LOS B	34.5	247.1	0.89	0.82	46.3
All Vehicles		5717	4.4	0.939	32.6	LOS C	34.5	247.1	0.72	0.74	40.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	53	49.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		105	49.3	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

▽ **Site: 102 [DV_PM_Miller Road_Site Access]**

Miller Road_Site Access
Giveway / Yield (Two-Way)

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Miller Road (South Arm)											
2	T1	568	5.6	0.340	0.8	LOS A	0.7	5.4	0.12	0.03	58.4
3	R2	22	0.0	0.340	14.0	LOS A	0.7	5.4	0.12	0.03	30.3
Approach		591	5.3	0.340	1.3	NA	0.7	5.4	0.12	0.03	55.9
East: Site Access											
4	L2	51	0.0	0.312	7.2	LOS A	1.2	8.1	0.84	0.96	26.3
6	R2	44	0.0	0.312	22.6	LOS B	1.2	8.1	0.84	0.96	22.9
Approach		95	0.0	0.312	14.4	LOS A	1.2	8.1	0.84	0.96	24.8
North: Miller Road (North Arm)											
7	L2	20	0.0	0.467	5.6	LOS A	0.0	0.0	0.00	0.01	57.7
8	T1	864	4.4	0.467	0.0	LOS A	0.0	0.0	0.00	0.01	59.7
Approach		884	4.3	0.467	0.2	NA	0.0	0.0	0.00	0.01	59.6
All Vehicles		1569	4.4	0.467	1.5	NA	1.2	8.1	0.10	0.08	53.2

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.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

MOVEMENT SUMMARY

▽ Site: 103 [DV_PM_Miller Road_Waldron Road_Christina Road]

Miller Road_Waldron Road_Christina Road
Roundabout

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Miller Road (South Arm)											
1	L2	334	7.3	0.555	10.6	LOS A	3.9	29.1	0.89	1.01	48.3
2	T1	238	3.1	0.592	12.2	LOS A	4.0	29.1	0.89	1.03	48.2
3	R2	59	7.1	0.592	16.8	LOS B	4.0	29.1	0.89	1.03	47.9
3u	U	2	0.0	0.592	18.6	LOS B	4.0	29.1	0.89	1.03	46.4
Approach		633	5.7	0.592	11.8	LOS A	4.0	29.1	0.89	1.02	48.2
East: Waldron Road											
4	L2	109	3.8	0.757	16.7	LOS B	7.7	54.7	0.93	1.16	44.2
5	T1	986	1.2	0.946	26.8	LOS B	21.1	149.2	0.98	1.48	42.2
6	R2	65	1.6	0.946	37.2	LOS C	21.1	149.2	1.00	1.67	39.4
6u	U	13	8.3	0.946	39.7	LOS C	21.1	149.2	1.00	1.67	39.8
Approach		1174	1.5	0.946	26.6	LOS B	21.1	149.2	0.97	1.46	42.1
North: Miller Road (North Arm)											
7	L2	80	1.3	0.302	10.5	LOS A	1.6	11.4	0.83	0.91	50.5
8	T1	268	5.9	0.542	11.7	LOS A	4.1	29.9	0.90	1.01	48.5
9	R2	91	5.8	0.542	16.3	LOS B	4.1	29.9	0.92	1.04	49.9
9u	U	1	0.0	0.542	18.1	LOS B	4.1	29.9	0.92	1.04	51.0
Approach		440	5.0	0.542	12.4	LOS A	4.1	29.9	0.89	1.00	49.2
West: Christina Road											
10	L2	95	5.6	0.483	8.3	LOS A	2.7	19.7	0.66	0.78	52.1
11	T1	624	2.4	0.951	18.1	LOS B	22.5	163.0	0.88	1.17	46.1
12	R2	443	6.2	0.951	27.5	LOS B	22.5	163.0	0.99	1.36	39.8
12u	U	5	0.0	0.951	29.3	LOS C	22.5	163.0	0.99	1.36	43.8
Approach		1167	4.1	0.951	20.9	LOS B	22.5	163.0	0.91	1.21	44.2
All Vehicles		3414	3.6	0.951	20.1	LOS B	22.5	163.0	0.92	1.23	44.6

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.