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30 March 2020

Katelyn Symington
Senior Environmental Assessment Officer
Department of Planning, Industry and Environment
4 Parramatta Square, 12 Darcy Street
Parramatta NSW 2124

Re: SSD 7733 Penrith Resource Recovery Facility - Response to Matters Raised by Penrith Council

Dear Katelyn,

This letter provides a response to the matters raised by Penrith City Council (Council) in their letter dated 2 March 2020 from (Their Ref: ECM: 9030810) in relation to the subject application.

The Council raises concerns in relation to contamination assessment and remediation requirements; and traffic management and local road conditions.

The Council concerns (in italics) and responses are provided below.

1 Contamination assessment and remediation requirements

Council maintains concerns that the investigations carried out to date are insufficient to establish if the site suitable having regard to SEPP 55 and SREP 20 in combination.

In the absence of a sufficient site investigation, it is also then difficult to ascertain if SREP 20 applies (in terms of whether the level of impact is a trigger that would warrant formal development consent for remediation works).

Though additional sampling is proposed through the Remediation Management Plan, this would be carried out post-determination. This is not considered appropriate as SREP 20 requires consent to be obtained for any remediation works, which means that the identification of required remediation works must be done as part of the development application assessment, coupled with a remediation action plan that forms part of the formal determination documentation. Essentially the additional sampling should be done as part of the current application and not deferred until post determination.

It is also noted in the Remediation Management Plan, that where soils are above limits, then these soils are to be removed or remediated on-site. These works would constitute remediation works, and development consent would be required to be obtained as outlined above. It is also noted that this document is not a referenced document within either SEPP 55 or the EPA Guidelines.

If there was a suggestion to condition an 'unexpected finds' approach, then all works would need to cease if contamination is identified. This cessation would need to be in place until such time as a development application for remediation is lodged, assessed, favourably determined and the works subject of that consent are undertaken and validated. This requirement would need to be captured in consent conditions if the application is determined without the above recommended site investigations being done, and / or inclusion of remediation as part of the works seeking development consent.

It is however reiterated that the Department is the relevant consent authority, and the Department must be be satisfied that the site is suitable or can be made suitable as per SEPP 55 noting the implications of the consent requirements contained within SREP 20.

Response

Clause 114 of the *Sydney Regional Environmental Plan No 2-Hawkesbury-Neapean River* (SREP 20) defines remediation of contaminated land as (emphasis added):

> Removing soil or other deposits from, or otherwise remediating, contaminated land. For the purposes of this definition, contaminated land means land on which hazardous substances occur at concentration levels above background levels, **where an assessment (carried out in accordance with guidelines circulated to councils by the Department) has indicated the substances pose, or are likely to pose, an immediate or long-term hazard to human health or to the environment.**

Neither the preliminary contamination assessment (PCA) submitted with the original environmental impact statement (EIS) or the remediation management plan submitted with the response to submissions (RTS) found it likely that any substance would pose an immediate or long-term hazard to human health or to the environment. Therefore, it is considered that SREP 20 does not apply to the current application. Notwithstanding, it is acknowledged that, if any remediation works are required in the future, then development consent for those works would be required.

2 Traffic Management and Local Road Conditions

Council maintains its position that the driveway must be widened to satisfactorily facilitate truck turning swept paths clear of parking lanes, and clear of oncoming vehicles in opposing travel lanes. Amended plans reflecting this requirement should be submitted that demonstrate compliance with this requirement.

The application appears to now indicate that no formalised truck parking is line marked to be provided. It must be demonstrated that sufficient space on the site is available to accommodate sufficient on-site truck parking. It is not sufficient to remove indications of parking without demonstrating that parking is available, without reliance on the local road network.

The primary remaining concern that is yet to be resolved is the Level of Service (LOS) F that has been identified in the application for the western leg of the intersection of Peachtree Road with Castlereagh Road. If the Department is of a mind to support the application, this support should be predicated on traffic infrastructure works that sufficiently resolve queue lengths and time delays as identified in the traffic modelling submitted. The RMS commentary will relate to the classified roads under their care and control, whereas Council must separately ensure that our local road network is not further compromised or impacted by the proposal on this site, in this location.

The applicant's response to date is that it is considered accepted practice to only look at overall intersection performance (rather than individual legs) in terms of Level of Service. This is not considered to be an adequate response and does not resolve or address the concerns raised by Council. It is recommended that the Department ensure that the failure of the western leg of the intersection is sufficiently addressed and measures included within this application, or as conditions of consent, that ensure that the existing volumes / local road function are not worsened as a result of this intensified development. If such measures are not proposed or included, the question of suitability of the site to accommodate this scale and nature of development comes into question, being a key consideration within Section 4.15 of the Environmental Planning and Assessment Act, 1979.

Response

A memorandum from EMM's Traffic and Transport Team addressing the adequacy of the driveway width, truck parking and intersection performance is attached.

Should you have any further queries please do not hesitate to contact the undersigned.

Yours sincerely

John Arnold
Associate
jarnold@emmconsulting.com.au

Memorandum

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30 March 2020

To: John Arnold (EMM Associate Environmental Planner)
From: Abdullah Uddin (EMM Associate Transport Engineer)
Subject: Penrith Resource Recovery Facility – Response to Traffic Matters Raised by Penrith City Council

Dear John,

This letter addresses the traffic related matters raised by Penrith City Council (Council) in its letter to NSW Department of Planning Industry & Environment (DPIE) dated 2 March 2020 in regard to the proposed Penrith Resource Recovery Facility at 46 Peachtree Road in Penrith. The traffic matters and EMM's responses are provided below:

Matter 1

Council comment:

> *"Council maintains its position that the driveway must be widened to satisfactorily facilitate truck turning swept paths clear of parking lanes, and clear of oncoming vehicles in opposing travel lanes. Amended plans reflecting this requirement should be submitted that demonstrate compliance with this requirement."*

EMM response:

A swept path assessment has been undertaken (refer Appendix A) demonstrating truck manoeuvres can be appropriately accommodated without encroachment onto the opposing lane.

Matter 2

Council comment:

> *"The application appears to now indicate that no formalised truck parking is line marked to be provided. It must be demonstrated that sufficient space on the site is available to accommodate sufficient on-site truck parking. It is not sufficient to remove indications of parking without demonstrating that parking available, without reliance on the local road network."*

EMM response:

Formalised truck parking spaces have been provided near the stockpiles area in accordance with AS2890.2 and are shown in the swept path assessment (Appendix A). The assessment demonstrates adequate manoeuvrability of these spaces for 19 m articulated vehicles.

Matter 3

Council comment:

> *"The primary remaining concern that is yet to be resolved is the Level of Service (LOS) F that has been identified in the application for the western leg of the intersection of Peachtree Road with Castlereagh Road. If the Department is of a mind to support the application, this support should be predicated on traffic infrastructure works that sufficiently resolve queue lengths and time delays as identified in the traffic modelling submitted. The RMS commentary will relate to the classified roads under their care and control, whereas Council must separately ensure that our local road network is not further compromised or impacted by the proposal on this site, in this location.*
>
> *The applicant's response to date is that it is considered accepted practice to only look at overall intersection performance (rather than individual legs) in terms of Level of Service. This is not considered to be an adequate response and does not resolve or address the concerns raised by Council. It is recommended that the Department ensure that the failure of the western leg of the intersection is sufficiently addressed and measures included within this application, or as conditions of consent, that ensure that the existing volumes/local road function are not worsened as a result of this intensified development. If such measures are not proposed or included, the question of suitability of the site to accommodate this scale and nature of development comes into question, being a key consideration within Section 4.15 of the Environmental Planning and Assessment Act, 1979."*

EMM response:

Traffic analysis has been undertaken for the following periods:

- AM Peak 8am to 9am
- Midday Peak 1pm to 2pm
- PM Peak 4pm to 5pm

The SIDRA model has been updated to include both Castlereagh Road/Peachtree Road/Thornton Drive and Castlereagh Road/Mullins Road/Coreen Avenue intersections as a network model, rather than two individual models. In addition, in accordance with Transport for NSW (TfNSW) requirements, the maximum cycle time has been limited to 120 seconds at this signalised intersection.

For clarity, the existing traffic, additional traffic and development traffic detailed in the Traffic Impact Assessment (TIA) (prepared by EMM Consulting in May 2017 to accompany the Penrith Waste Recycling and Transfer Facility Environmental Impact Statement) are presented in Figure 1, Figure 2 and Figure 3 respectively. The development traffic is obtained by summing the existing traffic and additional traffic. The numbers unbracketed represent light vehicle volumes in the respective peak hours while the numbers inside the brackets represent heavy vehicle volumes.

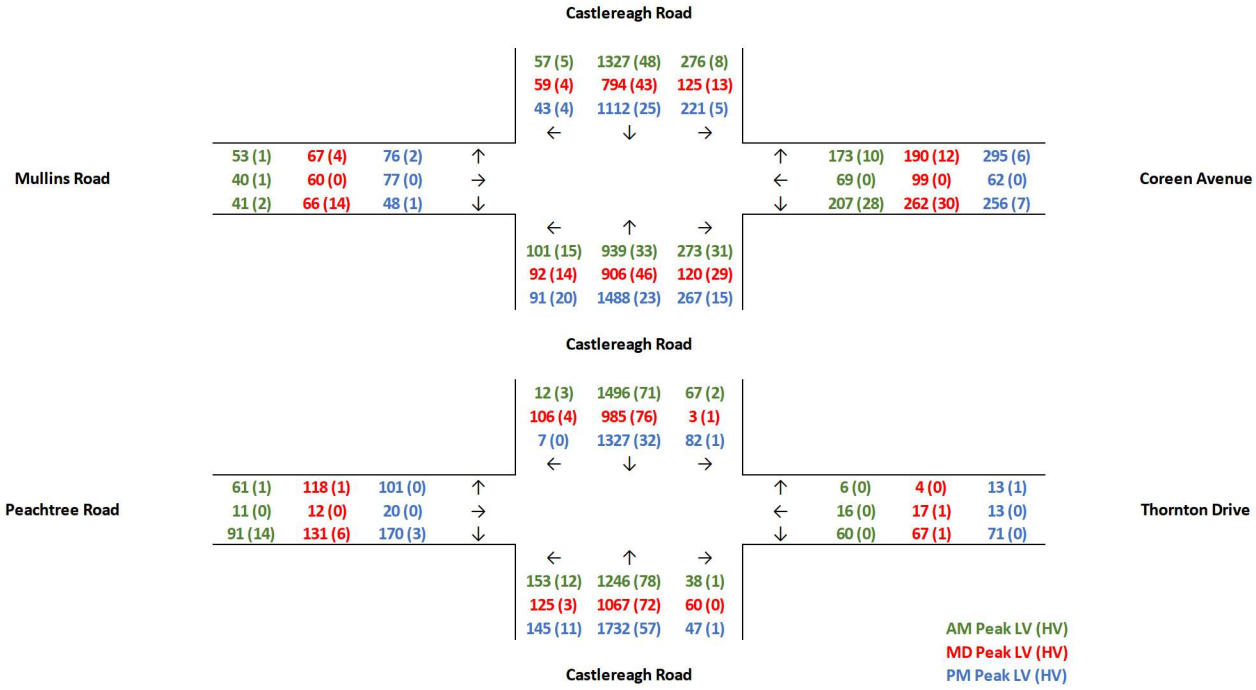


Figure 1 Existing traffic volumes

As a sensitivity testing, the TIA also explored the option of extended operations, which has the following shifts:

- 6am to 3pm
- 3pm to 10pm

The extended operations would have reduced employee traffic movements during the PM peak (4pm and 5pm). Deliveries are assumed to remain the same, as extended hours would be used to service customers that are unlikely to schedule deliveries in the peak hour.

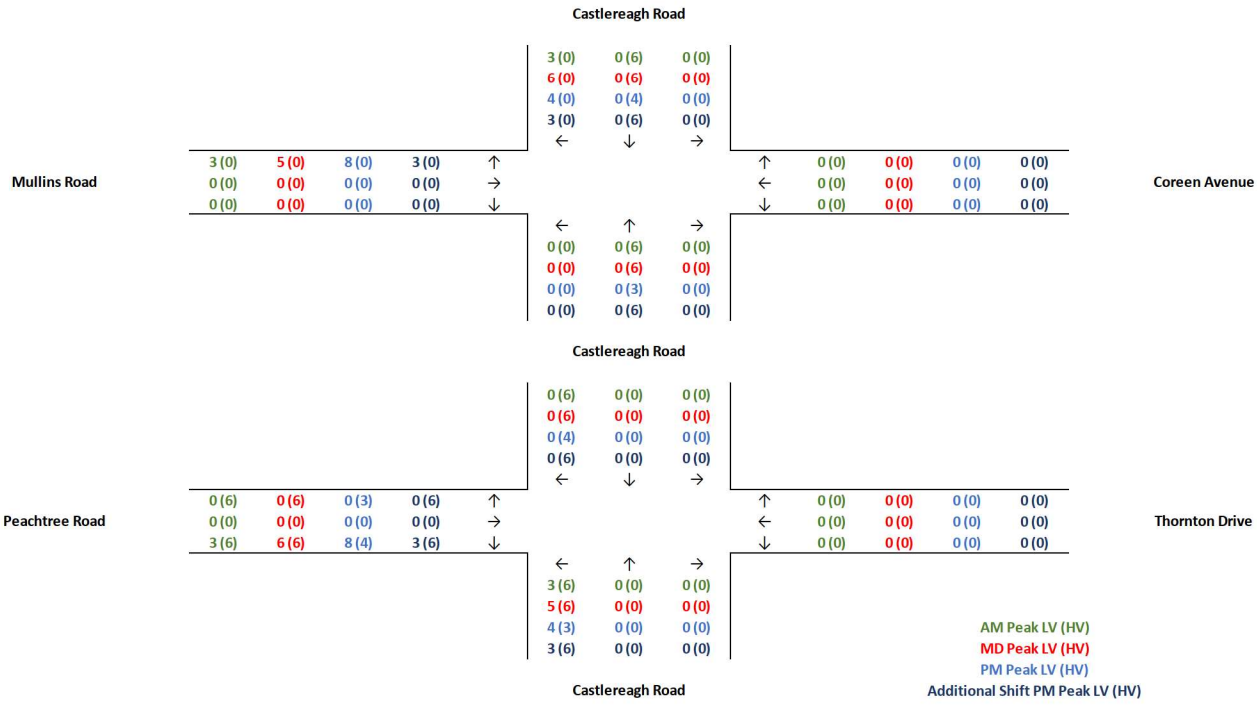


Figure 2 Additional traffic

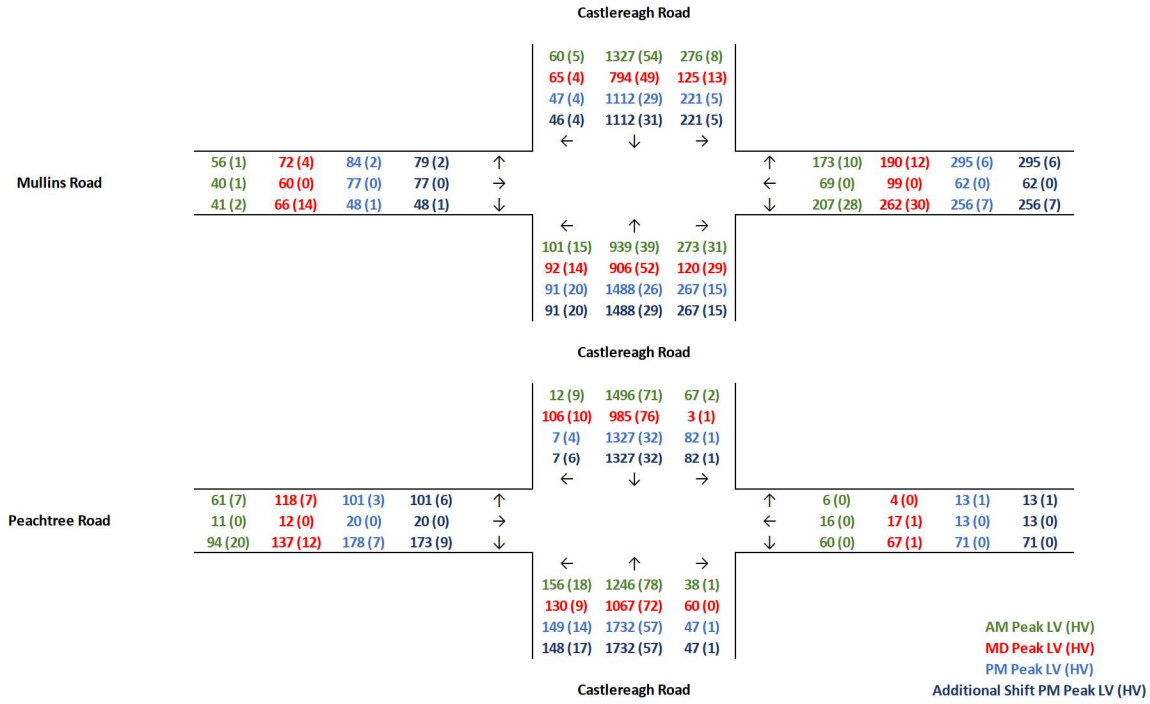


Figure 3 Development traffic volume

The SIDRA results for the two intersections are presented in Table 1. It is noted that these results capture the overall intersection performance which is the general practice for roundabouts and signalised intersections.

Table 1 SIDRA results (overall intersection performance)

Intersection	Peak Period	DOS		LOS		DEL		Q95	
		Existing	Development	Existing	Development	Existing	Development	Existing	Development
Castlereagh Road/ Peachtree Road traffic lights	AM	0.680	0.707	A	A	13.0	13.6	181.3	184.8
	MD	0.708	0.759	B	B	15.2	15.6	113.9	116.7
	PM (standard hours)	0.842	0.859	B	B	17.0	18.6	335.0 (southern approach)	359.4
	PM (additional shift)		0.861		B		18.9		364.1
Castlereagh Road/ Mullins Road roundabout	AM	0.834	0.838	A	A	10.9	11.1	103.7	107.8
	MD	0.593	0.600	A	A	7.3	7.3	33.5	34.6
	PM (standard hours)	0.959	0.965	B	B	15.5	16.1	188.2 (southern approach)	197.0
	PM (additional shift)		0.966		B		16.3		200.2

The SIDRA results in the above table shows that overall, both the intersections will operate at LOS A or B with reasonable spare capacity. SIDRA results are attached in Appendix B.

However, to address Council's concerns, the performance of the western approach of the Castlereagh Road/ Peachtree Road intersection, particularly the right turn approach, is presented in Table 2.

Table 2 SIDRA results (right turn movement from Peachtree Road to Castlereagh Road)

Intersection	Peak Period	DOS		LOS		DEL		Q95	
		Existing	Development	Existing	Development	Existing	Development	Existing	Development
Castlereagh Road/ Peachtree Road (western approach)	AM	0.569	0.546	D	D	54.0	44.0	46.7	43.0
	MD	0.441	0.489	B	B	24.1	24.4	25.6	29.0
	PM (standard hours)	0.742	0.774	D	D	53.9	54.2	71.5	78.5
	PM (additional shift)		0.763		D		53.9		77.6

It should be noted that with more traffic, SIDRA allocates more time to the phase with the subject movement and this reduces the minor road traffic delay. It is also noted with the revised traffic model, that the right turn movement from Peachtree Road to Castlereagh Road has a LOS D in its existing configuration. The improvement of the SIDRA intersection model results with the new intersection configuration has been attributed to the following reasons:

- adjustment of the intersection layout based on the latest aerial view (eg Eagleview image);
- adjustment of the phasing based on the TfNSW TCS plan; and
- application of the maximum cycle time to 120 seconds as required by TfNSW.

As the development right turn movement from Peachtree Street is LOS D or better for all the traffic peak periods considered, no intersection upgrade work is required as a result of the proposed development.

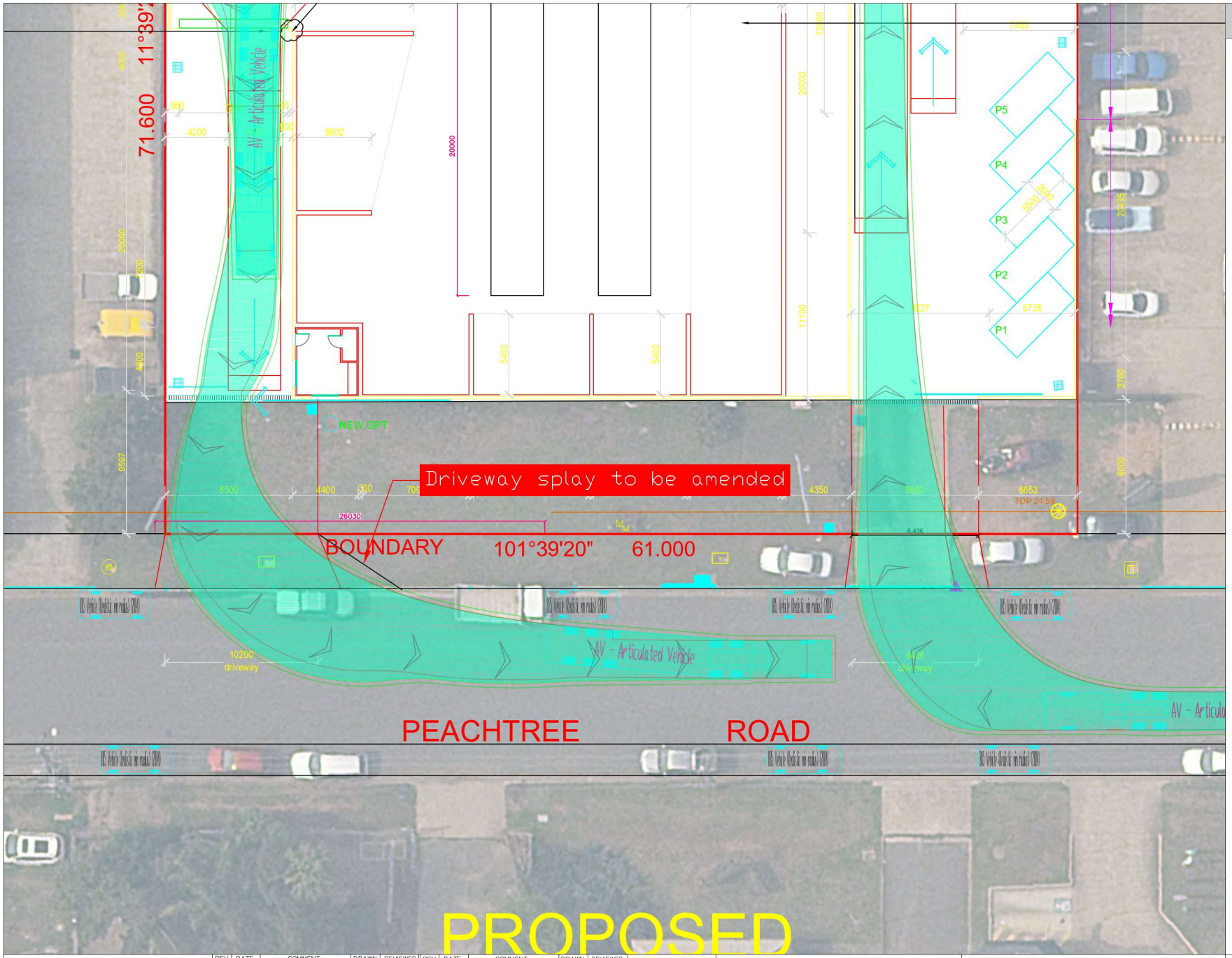
We trust this letter satisfies Council's traffic related matters, however, if you have any further questions, please contact the undersigned.

Yours sincerely

Abdullah Uddin
Associate Traffic Engineer
auddin@emmconsulting.com.au

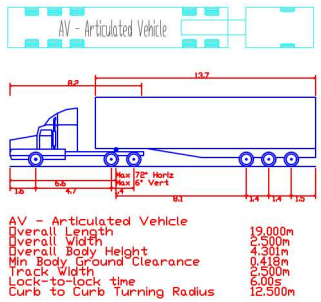
Appendix A

Swept paths



COMMENTS

A3



Loss of on-street parking
26m @ 6m each = 5 spaces

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REV	DATE	COMMENT	DRAWN	REVIEWED
1	26/03/20	FOR INFORMATION	EL	AU

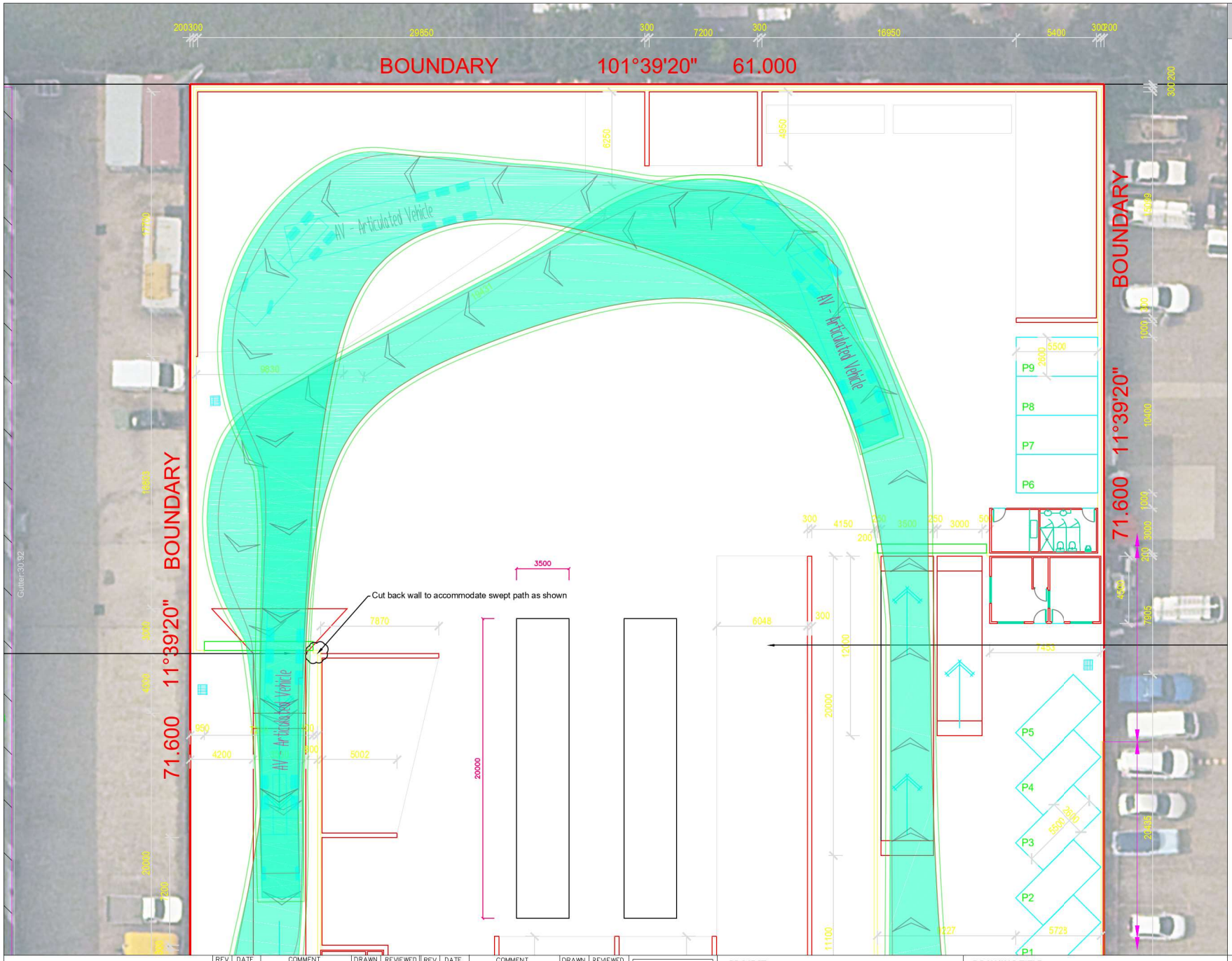
PROJECT:
Penrith Waste Recycling and Transfer Facility

DRAWING TITLE:
19m AV Manoeuvrability

Site Access

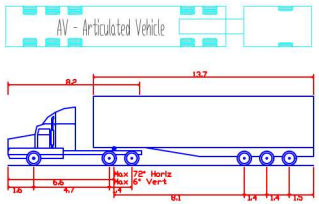
CLIENT:	Benedict Recycling Pty Ltd
DRG. #:	EMM-001
PROJECT #:	J16099
SCALE:	1:250

REV: 1



COMMENTS

A3



AV - Articulated Vehicle

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

REV	DATE	COMMENT	DRAWN	REVIEWED
1	26/03/20	FOR INFORMATION	EL	AU

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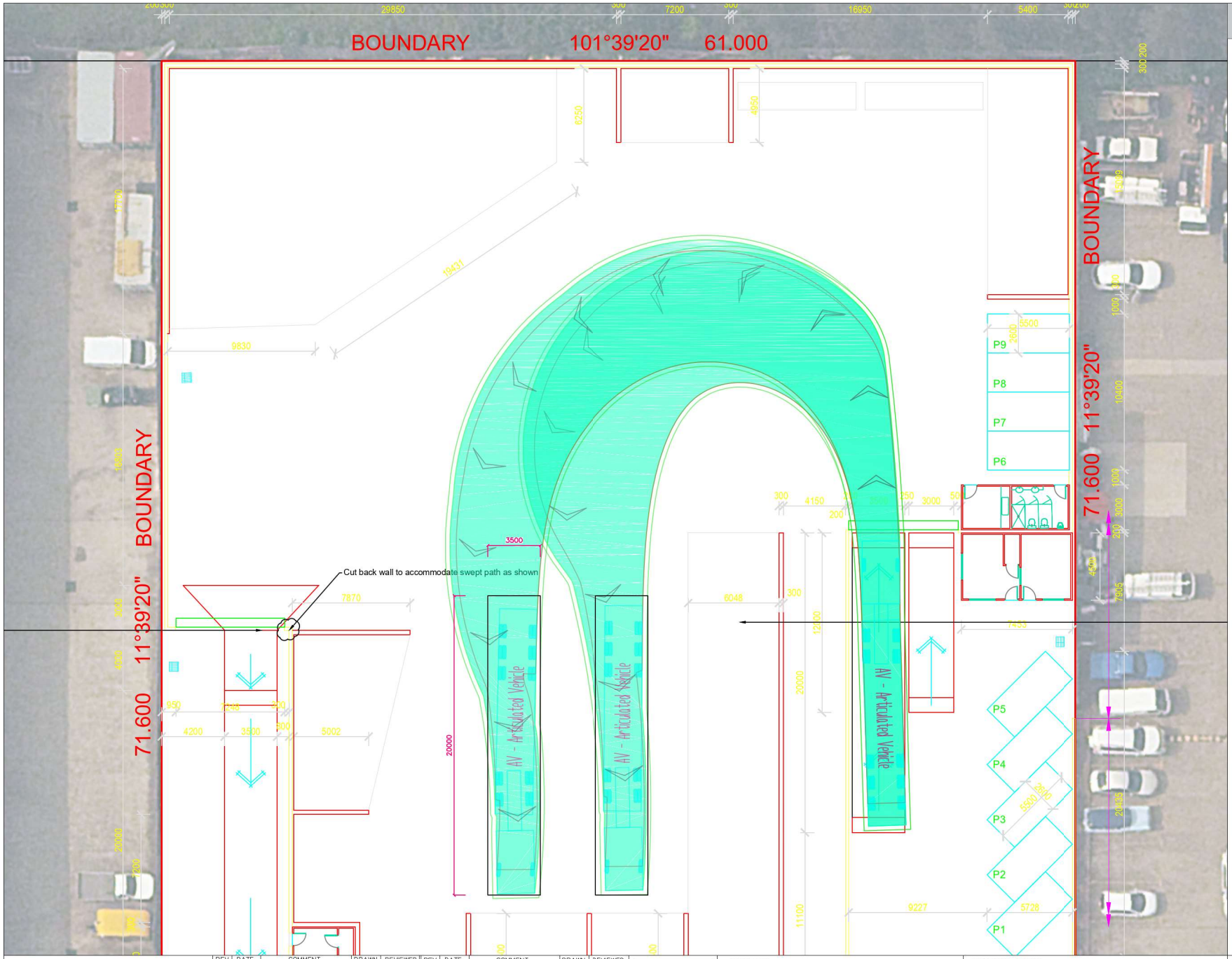
PROJECT:
Penrith Waste Recycling and Transfer Facility

DRAWING TITLE:
19m AV Manoeuvrability

Truck Tipping

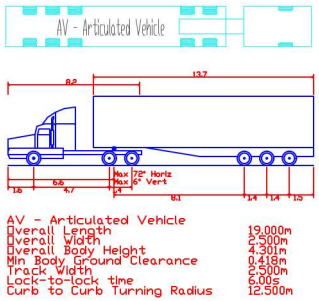
CLIENT:	Benedict Recycling Pty Ltd
DRG. #:	EMM-002
PROJECT #:	J16099
SCALE:	1:250

REV: 1



COMMENTS

A3



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REV	DATE	COMMENT	DRAWN	REVIEWED
1	26/03/20	FOR INFORMATION	EL	AU

REV	DATE	COMMENT	DRAWN	REVIEWED

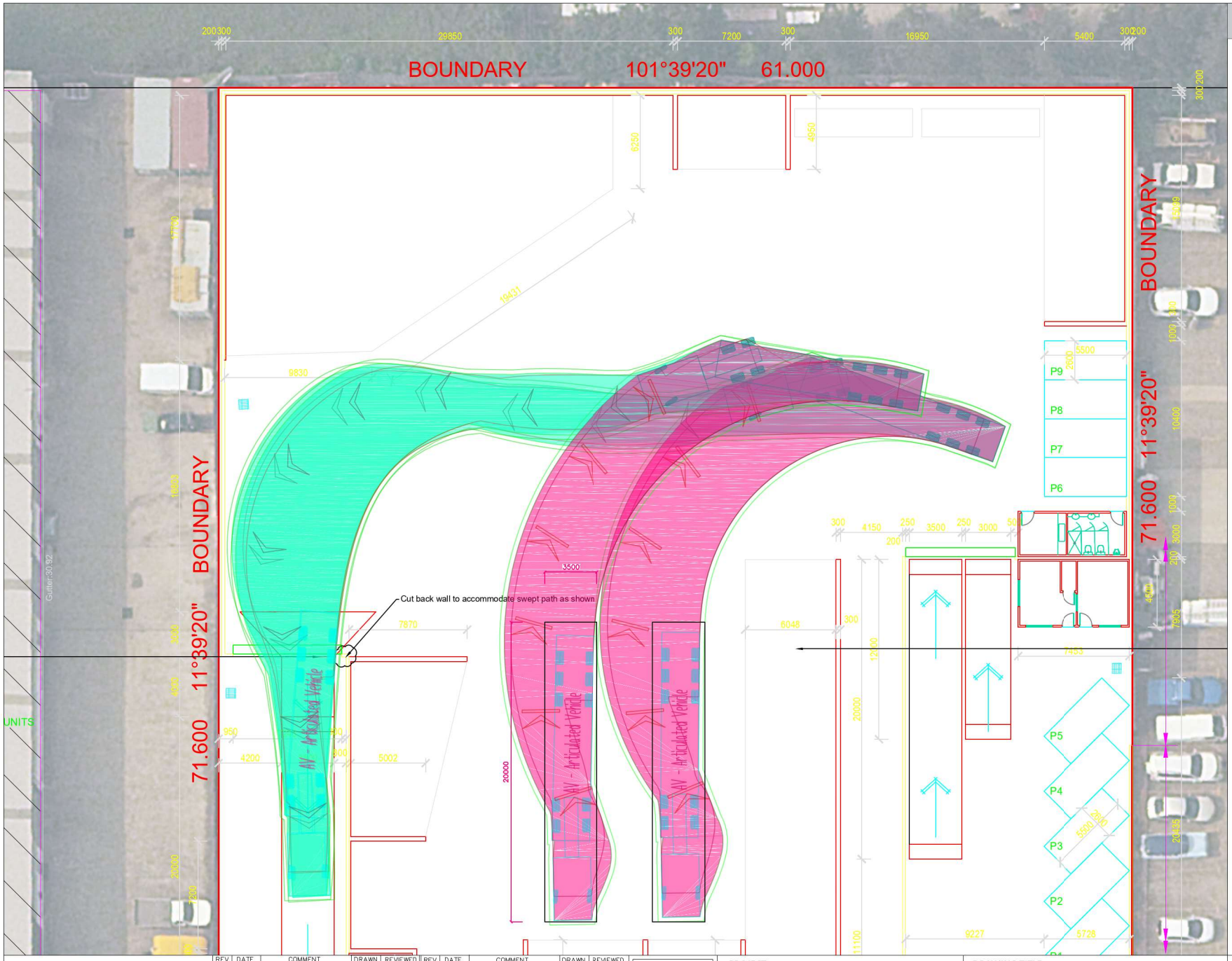
PROJECT:
Penrith Waste Recycling and Transfer Facility

DRAWING TITLE:
19m AV Manoeuvrability

Truck Loading/Parking Area Inbound

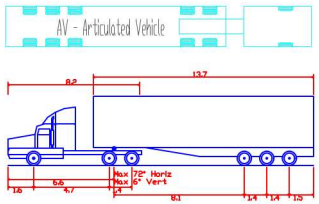
CLIENT:	Benedict Recycling Pty Ltd
DRG. #:	EMM-003
PROJECT #:	J16099
SCALE:	1:250

REV: 1



COMMENTS

A3



AV - Articulated Vehicle

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

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REV	DATE	COMMENT	DRAWN	REVIEWED
1	26/03/20	FOR INFORMATION	EL	AU

PROJECT:
Penrith Waste Recycling and Transfer Facility

DRAWING TITLE:
19m AV Manoeuvrability

Truck Loading/Parking Area Outbound

CLIENT:	Benedict Recycling Pty Ltd
DRG. #:	EMM-004
PROJECT #:	J16099
SCALE:	1:250

REV: 1

Appendix B

SIDRA results

MOVEMENT SUMMARY

Site: 101 [Ex Castlereagh Rd/Mullins Rd AM Peak]

Network: N101 [Ex AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	122	12.9	122	12.9	0.654	6.5	LOS A	5.9	43.0	0.62	0.64	0.67	46.9
2	T1	1023	3.4	1023	3.4	0.654	6.4	LOS A	5.9	43.0	0.63	0.68	0.69	52.3
3	R2	320	10.2	320	10.2	0.654	12.5	LOS A	5.7	42.0	0.64	0.75	0.71	50.4
Approach		1465	5.7	1465	5.7	0.654	7.8	LOS A	5.9	43.0	0.63	0.69	0.69	51.4
East: Coreen Avenue														
4	L2	247	11.9	247	11.9	0.675	16.5	LOS B	4.4	34.2	0.92	1.07	1.27	36.9
5	T1	73	0.0	73	0.0	0.484	10.2	LOS A	3.3	23.7	0.93	1.02	1.06	46.4
6	R2	193	5.5	193	5.5	0.484	15.9	LOS B	3.3	23.7	0.93	1.02	1.06	49.4
Approach		513	7.8	513	7.8	0.675	15.4	LOS B	4.4	34.2	0.93	1.04	1.16	44.4
North: Castlereagh Road														
7	L2	299	2.8	299	2.8	0.834	11.5	LOS A	14.4	103.7	0.95	0.99	1.31	49.5
8	T1	1447	3.5	1447	3.5	0.834	12.2	LOS A	14.4	103.7	0.96	1.02	1.35	42.8
9	R2	65	8.1	65	8.1	0.834	18.5	LOS B	13.9	100.3	0.97	1.05	1.38	47.8
Approach		1812	3.5	1812	3.5	0.834	12.3	LOS A	14.4	103.7	0.96	1.02	1.34	44.6
West: Mullins Road														
10	L2	57	1.9	57	1.9	0.111	7.7	LOS A	0.6	3.9	0.78	0.84	0.78	48.3
11	T1	43	2.4	43	2.4	0.127	6.1	LOS A	0.7	5.2	0.80	0.79	0.80	48.2
12	R2	45	4.7	45	4.7	0.127	11.4	LOS A	0.7	5.2	0.80	0.79	0.80	40.5
Approach		145	2.9	145	2.9	0.127	8.4	LOS A	0.7	5.2	0.79	0.81	0.79	46.5
All Vehicles		3935	4.9	3935	4.9	0.834	10.9	LOS A	14.4	103.7	0.83	0.89	1.06	47.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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 Castlereagh Rd/Peachtree Rd AM Peak]

Network: N101 [Ex AM]

Existing Intersection
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	174	7.3	174	7.3	0.584	13.9	LOS A	21.4	157.6	0.52	0.54	0.52	42.5
2	T1	1394	5.9	1394	5.9	0.584	8.6	LOS A	22.0	161.8	0.52	0.51	0.52	31.4
3	R2	41	2.6	41	2.6	0.344	27.4	LOS B	1.6	11.4	0.65	0.74	0.65	30.2
Approach		1608	6.0	1608	6.0	0.584	9.6	LOS A	22.0	161.8	0.53	0.52	0.53	34.1
East: Thornton Drive														
4	L2	63	0.0	63	0.0	0.680	70.7	LOS F	4.0	27.8	1.00	0.82	1.15	17.8
5	T1	17	0.0	17	0.0	0.173	62.2	LOS E	1.0	7.0	0.99	0.68	0.99	25.6
6	R2	6	0.0	6	0.0	0.064	65.6	LOS E	0.4	2.6	0.98	0.65	0.98	15.3
Approach		86	0.0	86	0.0	0.680	68.6	LOS E	4.0	27.8	1.00	0.78	1.11	19.4
North: Castlereagh Road														
7	L2	73	2.9	73	2.9	0.056	10.8	LOS A	1.2	8.7	0.31	0.65	0.31	42.1
8	T1	1649	4.5	1649	4.5	0.647	9.0	LOS A	24.9	181.3	0.55	0.50	0.55	43.8
9	R2	16	20.0	16	20.0	0.143	23.3	LOS B	0.5	4.3	0.55	0.69	0.55	35.9
Approach		1738	4.6	1738	4.6	0.647	9.2	LOS A	24.9	181.3	0.54	0.51	0.54	43.5
West: Peachtree Road														
10	L2	65	1.6	65	1.6	0.226	49.9	LOS D	3.9	27.4	0.89	0.75	0.89	21.5
11	T1	12	0.0	12	0.0	0.226	45.4	LOS D	3.9	27.4	0.89	0.75	0.89	28.4
12	R2	111	13.3	111	13.3	0.569	54.0	LOS D	6.0	46.7	1.00	0.78	1.00	23.3
Approach		187	8.4	187	8.4	0.569	52.1	LOS D	6.0	46.7	0.96	0.77	0.96	23.1
All Vehicles		3620	5.3	3620	5.3	0.680	13.0	LOS A	24.9	181.3	0.56	0.54	0.57	35.8

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P2	East Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P3	North Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P4	West Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		21	54.2	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: 101 [Ex Castlereagh Rd/Mullins Rd MD Peak]

Network: N101 [Ex MD]

Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	112	13.2	112	13.2	0.593	6.5	LOS A	4.5	33.5	0.53	0.62	0.56	47.3
2	T1	1002	4.8	1002	4.8	0.593	6.5	LOS A	4.5	33.5	0.53	0.65	0.58	53.1
3	R2	157	19.5	157	19.5	0.593	12.7	LOS A	4.4	32.9	0.54	0.70	0.60	51.4
Approach		1271	7.4	1271	7.4	0.593	7.2	LOS A	4.5	33.5	0.53	0.66	0.58	52.3
East: Coreen Avenue														
4	L2	307	10.3	307	10.3	0.455	8.5	LOS A	2.5	19.2	0.75	0.91	0.88	45.4
5	T1	104	0.0	104	0.0	0.354	6.3	LOS A	1.9	13.6	0.71	0.82	0.73	48.6
6	R2	213	5.9	213	5.9	0.354	12.0	LOS A	1.9	13.6	0.71	0.82	0.73	52.0
Approach		624	7.1	624	7.1	0.455	9.3	LOS A	2.5	19.2	0.73	0.86	0.80	49.0
North: Castlereagh Road														
7	L2	145	9.4	145	9.4	0.469	5.5	LOS A	3.3	24.5	0.57	0.54	0.57	52.7
8	T1	881	5.1	881	5.1	0.469	5.5	LOS A	3.3	24.5	0.57	0.56	0.57	48.3
9	R2	66	6.3	66	6.3	0.469	11.1	LOS A	3.2	23.4	0.58	0.58	0.58	51.4
Approach		1093	5.8	1093	5.8	0.469	5.8	LOS A	3.3	24.5	0.57	0.56	0.57	49.4
West: Mullins Road														
10	L2	75	5.6	75	5.6	0.128	7.5	LOS A	0.7	5.0	0.76	0.80	0.76	48.4
11	T1	63	0.0	63	0.0	0.192	6.0	LOS A	1.2	9.0	0.79	0.80	0.79	48.2
12	R2	84	17.5	84	17.5	0.192	11.8	LOS A	1.2	9.0	0.79	0.80	0.79	40.4
Approach		222	8.5	222	8.5	0.192	8.7	LOS A	1.2	9.0	0.78	0.80	0.78	46.0
All Vehicles		3209	6.9	3209	6.9	0.593	7.3	LOS A	4.5	33.5	0.60	0.67	0.63	50.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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 Castlereagh Rd/Peachtree Rd MD Peak]

Network: N101 [Ex MD]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 60 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	135	2.3	135	2.3	0.708	17.9	LOS B	15.3	112.5	0.82	0.76	0.83	39.8
2	T1	1199	6.3	1199	6.3	0.708	12.7	LOS A	15.4	113.9	0.83	0.76	0.84	25.8
3	R2	63	0.0	63	0.0	0.294	24.4	LOS B	1.5	10.8	0.81	0.75	0.81	31.6
Approach		1397	5.7	1397	5.7	0.708	13.7	LOS A	15.4	113.9	0.82	0.76	0.84	29.3
East: Thornton Drive														
4	L2	72	1.5	72	1.5	0.389	34.0	LOS C	2.1	15.1	0.97	0.75	0.97	26.7
5	T1	19	5.6	19	5.6	0.101	28.0	LOS B	0.5	3.9	0.94	0.66	0.94	34.9
6	R2	4	0.0	4	0.0	0.022	31.8	LOS C	0.1	0.8	0.92	0.63	0.92	23.8
Approach		95	2.2	95	2.2	0.389	32.7	LOS C	2.1	15.1	0.97	0.73	0.97	28.6
North: Castlereagh Road														
7	L2	4	25.0	4	25.0	0.005	13.8	LOS A	0.1	0.5	0.52	0.62	0.52	39.7
8	T1	1117	7.2	1117	7.2	0.599	11.7	LOS A	11.8	87.8	0.77	0.68	0.77	40.5
9	R2	116	3.6	116	3.6	0.691	33.4	LOS C	3.7	26.6	0.96	0.90	1.21	31.8
Approach		1237	6.9	1237	6.9	0.691	13.7	LOS A	11.8	87.8	0.78	0.70	0.81	38.8
West: Peachtree Road														
10	L2	125	0.8	125	0.8	0.248	22.1	LOS B	3.1	22.0	0.80	0.74	0.80	31.6
11	T1	13	0.0	13	0.0	0.248	17.5	LOS B	3.1	22.0	0.80	0.74	0.80	37.4
12	R2	144	4.4	144	4.4	0.441	24.1	LOS B	3.5	25.6	0.95	0.77	0.95	33.1
Approach		282	2.6	282	2.6	0.441	22.9	LOS B	3.5	25.6	0.87	0.76	0.87	32.8
All Vehicles		3011	5.8	3011	5.8	0.708	15.2	LOS B	15.4	113.9	0.82	0.73	0.83	33.9

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	5	24.3	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	5	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	5	24.3	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	5	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		21	24.3	LOS C			0.90	0.90

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: 101 [Ex Castlereagh Rd/Mullins Rd PM Peak]

Network: N101 [Ex PM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	117	18.0	117	18.0	0.959	20.6	LOS B	26.1	188.2	0.92	1.26	1.83	38.8
2	T1	1591	1.5	1591	1.5	0.959	20.9	LOS B	26.1	188.2	0.93	1.29	1.87	41.7
3	R2	297	5.3	297	5.3	0.959	28.1	LOS B	24.5	175.2	0.93	1.34	1.94	39.4
Approach		2004	3.0	2004	3.0	0.959	22.0	LOS B	26.1	188.2	0.93	1.30	1.88	41.2
East: Coreen Avenue														
4	L2	277	2.7	277	2.7	0.526	10.1	LOS A	3.2	22.8	0.85	0.98	1.04	43.4
5	T1	65	0.0	65	0.0	0.534	8.4	LOS A	3.7	26.1	0.87	0.99	1.04	47.1
6	R2	317	2.0	317	2.0	0.534	13.9	LOS A	3.7	26.1	0.87	0.99	1.04	50.3
Approach		659	2.1	659	2.1	0.534	11.8	LOS A	3.7	26.1	0.87	0.99	1.04	48.0
North: Castlereagh Road														
7	L2	238	2.2	238	2.2	0.702	8.1	LOS A	8.1	57.5	0.83	0.84	0.99	51.5
8	T1	1197	2.2	1197	2.2	0.702	8.5	LOS A	8.1	57.5	0.84	0.86	1.01	46.2
9	R2	49	8.5	49	8.5	0.702	14.6	LOS B	7.8	55.6	0.84	0.89	1.03	50.2
Approach		1484	2.4	1484	2.4	0.702	8.7	LOS A	8.1	57.5	0.84	0.86	1.01	47.7
West: Mullins Road														
10	L2	82	2.6	82	2.6	0.309	14.4	LOS A	1.7	12.3	0.92	0.97	0.97	44.3
11	T1	81	0.0	81	0.0	0.325	10.6	LOS A	2.2	15.4	0.98	1.00	1.00	46.2
12	R2	52	2.0	52	2.0	0.325	16.0	LOS B	2.2	15.4	0.98	1.00	1.00	38.0
Approach		215	1.5	215	1.5	0.325	13.4	LOS A	2.2	15.4	0.96	0.98	0.98	43.9
All Vehicles		4362	2.6	4362	2.6	0.959	15.5	LOS B	26.1	188.2	0.89	1.09	1.41	44.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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 Castlereagh Rd/Peachtree Rd PM Peak]

Network: N101 [Ex PM]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	164	7.1	164	7.1	0.842	19.5	LOS B	46.4	335.0	0.80	0.77	0.80	39.0
2	T1	1883	3.2	1883	3.2	0.842	13.7	LOS A	46.4	335.0	0.73	0.70	0.74	24.9
3	R2	51	2.1	51	2.1	0.326	25.5	LOS B	1.9	13.2	0.62	0.73	0.62	31.0
Approach		2098	3.5	2098	3.5	0.842	14.4	LOS A	46.4	335.0	0.73	0.70	0.74	27.6
East: Thornton Drive														
4	L2	75	0.0	75	0.0	0.805	73.3	LOS F	4.8	33.9	1.00	0.90	1.33	17.4
5	T1	14	0.0	14	0.0	0.140	61.9	LOS E	0.8	5.7	0.98	0.67	0.98	25.6
6	R2	15	7.1	15	7.1	0.157	66.8	LOS E	0.9	6.5	0.99	0.69	0.99	15.1
Approach		103	1.0	103	1.0	0.805	70.9	LOS F	4.8	33.9	1.00	0.84	1.23	18.3
North: Castlereagh Road														
7	L2	87	1.2	87	1.2	0.069	11.8	LOS A	1.6	11.4	0.34	0.66	0.34	41.4
8	T1	1431	2.4	1431	2.4	0.562	9.6	LOS A	20.5	146.6	0.53	0.49	0.53	43.0
9	R2	7	0.0	7	0.0	0.099	44.5	LOS D	0.4	2.5	0.78	0.70	0.78	28.1
Approach		1525	2.3	1525	2.3	0.562	9.9	LOS A	20.5	146.6	0.52	0.50	0.52	42.7
West: Peachtree Road														
10	L2	106	0.0	106	0.0	0.327	48.3	LOS D	6.4	44.7	0.89	0.77	0.89	21.9
11	T1	21	0.0	21	0.0	0.327	43.8	LOS D	6.4	44.7	0.89	0.77	0.89	28.8
12	R2	182	1.7	182	1.7	0.742	53.9	LOS D	10.1	71.5	1.00	0.86	1.11	23.5
Approach		309	1.0	309	1.0	0.742	51.3	LOS D	10.1	71.5	0.96	0.82	1.02	23.5
All Vehicles		4036	2.8	4036	2.8	0.842	17.0	LOS B	46.4	335.0	0.68	0.64	0.69	31.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P2	East Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P3	North Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P4	West Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		21	54.2	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: 101 [Dev Castlereagh Rd/Mullins Rd AM Peak]

Network: N101 [Dev AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	122	12.9	122	12.9	0.660	6.6	LOS A	6.0	44.0	0.60	0.65	0.66	46.9
2	T1	1029	4.0	1029	4.0	0.660	6.5	LOS A	6.0	44.0	0.61	0.69	0.67	52.4
3	R2	320	10.2	320	10.2	0.660	12.6	LOS A	5.8	42.9	0.62	0.75	0.70	50.4
Approach		1472	6.1	1472	6.1	0.660	7.8	LOS A	6.0	44.0	0.61	0.70	0.68	51.5
East: Coreen Avenue														
4	L2	247	11.9	247	11.9	0.687	17.2	LOS B	4.5	35.0	0.93	1.08	1.29	36.4
5	T1	73	0.0	73	0.0	0.491	10.4	LOS A	3.3	24.2	0.93	1.02	1.07	46.3
6	R2	193	5.5	193	5.5	0.491	16.1	LOS B	3.3	24.2	0.93	1.02	1.07	49.2
Approach		513	7.8	513	7.8	0.687	15.8	LOS B	4.5	35.0	0.93	1.05	1.18	44.0
North: Castlereagh Road														
7	L2	299	2.8	299	2.8	0.838	11.8	LOS A	14.9	107.8	0.96	0.99	1.33	49.2
8	T1	1454	3.9	1454	3.9	0.838	12.5	LOS A	14.9	107.8	0.97	1.03	1.37	42.5
9	R2	68	7.7	68	7.7	0.838	18.8	LOS B	14.4	104.2	0.98	1.06	1.40	47.6
Approach		1821	3.9	1821	3.9	0.838	12.6	LOS A	14.9	107.8	0.97	1.02	1.36	44.3
West: Mullins Road														
10	L2	60	1.8	60	1.8	0.115	7.8	LOS A	0.6	4.2	0.78	0.84	0.78	48.3
11	T1	43	2.4	43	2.4	0.125	6.2	LOS A	0.7	5.3	0.81	0.79	0.81	48.2
12	R2	45	4.7	45	4.7	0.125	11.6	LOS A	0.7	5.3	0.81	0.79	0.81	40.4
Approach		148	2.8	148	2.8	0.125	8.5	LOS A	0.7	5.3	0.80	0.81	0.80	46.4
All Vehicles		3954	5.2	3954	5.2	0.838	11.1	LOS A	14.9	107.8	0.83	0.90	1.06	47.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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 [Dev Castlereagh Rd/Peachtree Rd AM Peak]

Network: N101 [Dev AM]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	183	10.3	183	10.3	0.630	15.2	LOS B	21.1	156.8	0.61	0.61	0.61	41.6
2	T1	1394	5.9	1394	5.9	0.630	9.8	LOS A	21.8	160.3	0.61	0.59	0.61	29.5
3	R2	41	2.6	41	2.6	0.342	30.2	LOS C	1.5	10.9	0.73	0.75	0.73	28.9
Approach		1618	6.3	1618	6.3	0.630	10.9	LOS A	21.8	160.3	0.62	0.59	0.62	32.5
East: Thornton Drive														
4	L2	63	0.0	63	0.0	0.567	57.9	LOS E	3.3	22.8	1.00	0.77	1.05	20.2
5	T1	17	0.0	17	0.0	0.144	50.7	LOS D	0.8	5.8	0.98	0.68	0.98	28.1
6	R2	6	0.0	6	0.0	0.054	54.4	LOS D	0.3	2.1	0.97	0.65	0.97	17.4
Approach		86	0.0	86	0.0	0.567	56.3	LOS D	3.3	22.8	0.99	0.75	1.03	21.8
North: Castlereagh Road														
7	L2	73	2.9	73	2.9	0.060	11.5	LOS A	1.2	8.5	0.36	0.66	0.36	41.6
8	T1	1649	4.5	1649	4.5	0.707	10.3	LOS A	25.4	184.8	0.64	0.58	0.64	42.2
9	R2	22	42.9	22	42.9	0.231	27.6	LOS B	0.8	7.3	0.66	0.72	0.66	33.9
Approach		1744	4.9	1744	4.9	0.707	10.6	LOS A	25.4	184.8	0.63	0.59	0.63	41.9
West: Peachtree Road														
10	L2	72	10.3	72	10.3	0.225	40.4	LOS C	3.4	25.7	0.87	0.74	0.87	24.2
11	T1	12	0.0	12	0.0	0.225	35.8	LOS C	3.4	25.7	0.87	0.74	0.87	31.0
12	R2	120	17.5	120	17.5	0.546	44.0	LOS D	5.3	43.0	0.99	0.79	0.99	25.7
Approach		203	14.0	203	14.0	0.546	42.3	LOS C	5.3	43.0	0.94	0.77	0.94	25.6
All Vehicles		3652	5.9	3652	5.9	0.707	13.6	LOS A	25.4	184.8	0.65	0.60	0.65	35.4

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	5	44.2	LOS E	0.0	0.0	0.94	0.94
P2	East Full Crossing	5	44.2	LOS E	0.0	0.0	0.94	0.94
P3	North Full Crossing	5	44.2	LOS E	0.0	0.0	0.94	0.94
P4	West Full Crossing	5	44.2	LOS E	0.0	0.0	0.94	0.94
All Pedestrians		21	44.2	LOS E			0.94	0.94

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: 101 [Dev Castlereagh Rd/Mullins Rd MD Peak]

Network: N101 [Dev MD]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Castlereagh Road														
1	L2	112	13.2	112	13.2	0.600	6.6	LOS A	4.7	34.6	0.53	0.63	0.57	47.3
2	T1	1008	5.4	1008	5.4	0.600	6.6	LOS A	4.7	34.6	0.54	0.66	0.59	53.0
3	R2	157	19.5	157	19.5	0.600	12.9	LOS A	4.5	33.9	0.55	0.71	0.61	51.3
Approach		1277	7.8	1277	7.8	0.600	7.4	LOS A	4.7	34.6	0.54	0.67	0.59	52.3
East: Coreen Avenue														
4	L2	307	10.3	307	10.3	0.460	8.7	LOS A	2.6	19.5	0.76	0.91	0.89	45.3
5	T1	104	0.0	104	0.0	0.357	6.4	LOS A	1.9	13.8	0.72	0.83	0.73	48.6
6	R2	213	5.9	213	5.9	0.357	12.0	LOS A	1.9	13.8	0.72	0.83	0.73	52.0
Approach		624	7.1	624	7.1	0.460	9.4	LOS A	2.6	19.5	0.74	0.87	0.81	49.0
North: Castlereagh Road														
7	L2	145	9.4	145	9.4	0.476	5.5	LOS A	3.4	25.1	0.57	0.54	0.57	52.7
8	T1	887	5.8	887	5.8	0.476	5.5	LOS A	3.4	25.1	0.58	0.56	0.58	48.2
9	R2	73	5.8	73	5.8	0.476	11.1	LOS A	3.3	24.0	0.58	0.58	0.58	51.3
Approach		1105	6.3	1105	6.3	0.476	5.9	LOS A	3.4	25.1	0.58	0.56	0.58	49.4
West: Mullins Road														
10	L2	80	5.3	80	5.3	0.137	7.6	LOS A	0.7	5.4	0.76	0.80	0.76	48.4
11	T1	63	0.0	63	0.0	0.193	6.0	LOS A	1.2	9.1	0.79	0.80	0.79	48.2
12	R2	84	17.5	84	17.5	0.193	11.8	LOS A	1.2	9.1	0.79	0.80	0.79	40.4
Approach		227	8.3	227	8.3	0.193	8.7	LOS A	1.2	9.1	0.78	0.80	0.78	46.0
All Vehicles		3234	7.2	3234	7.2	0.600	7.3	LOS A	4.7	34.6	0.61	0.68	0.64	50.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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 [Dev Castlereagh Rd/Peachtree Rd MD Peak]

Network: N101 [Dev MD]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 60 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	146	6.5	146	6.5	0.716	18.2	LOS B	15.7	115.7	0.83	0.77	0.84	39.5
2	T1	1199	6.3	1199	6.3	0.716	13.0	LOS A	15.8	116.7	0.83	0.77	0.85	25.5
3	R2	63	0.0	63	0.0	0.294	24.4	LOS B	1.5	10.8	0.81	0.75	0.81	31.6
Approach		1408	6.1	1408	6.1	0.716	14.0	LOS A	15.8	116.7	0.83	0.77	0.85	29.1
East: Thornton Drive														
4	L2	72	1.5	72	1.5	0.389	34.0	LOS C	2.1	15.1	0.97	0.75	0.97	26.7
5	T1	19	5.6	19	5.6	0.101	28.0	LOS B	0.5	3.9	0.94	0.66	0.94	34.9
6	R2	4	0.0	4	0.0	0.022	31.8	LOS C	0.1	0.8	0.92	0.63	0.92	23.8
Approach		95	2.2	95	2.2	0.389	32.7	LOS C	2.1	15.1	0.97	0.73	0.97	28.6
North: Castlereagh Road														
7	L2	4	25.0	4	25.0	0.005	13.8	LOS A	0.1	0.5	0.52	0.62	0.52	39.7
8	T1	1117	7.2	1117	7.2	0.599	11.7	LOS A	11.8	87.8	0.77	0.68	0.77	40.5
9	R2	122	8.6	122	8.6	0.759	36.8	LOS C	4.1	31.1	0.99	0.96	1.37	30.5
Approach		1243	7.4	1243	7.4	0.759	14.2	LOS A	11.8	87.8	0.79	0.70	0.82	38.4
West: Peachtree Road														
10	L2	132	5.6	132	5.6	0.267	22.2	LOS B	3.3	24.1	0.80	0.74	0.80	31.5
11	T1	13	0.0	13	0.0	0.267	17.6	LOS B	3.3	24.1	0.80	0.74	0.80	37.4
12	R2	157	8.1	157	8.1	0.489	24.4	LOS B	3.9	29.0	0.96	0.78	0.96	32.9
Approach		301	6.6	301	6.6	0.489	23.2	LOS B	3.9	29.0	0.88	0.76	0.88	32.6
All Vehicles		3047	6.5	3047	6.5	0.759	15.6	LOS B	15.8	116.7	0.82	0.74	0.85	33.7

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	5	24.3	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	5	24.3	LOS C	0.0	0.0	0.90	0.90
P3	North Full Crossing	5	24.3	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	5	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		21	24.3	LOS C			0.90	0.90

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: 101 [Dev Castlereagh Rd/Mullins Rd PM Peak]

Network: N101 [Dev PM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	117	18.0	117	18.0	0.965	21.8	LOS B	27.3	197.0	0.93	1.31	1.92	38.2
2	T1	1594	1.7	1594	1.7	0.965	22.2	LOS B	27.3	197.0	0.94	1.34	1.96	40.9
3	R2	297	5.3	297	5.3	0.965	29.4	LOS C	25.5	183.0	0.94	1.38	2.02	38.6
Approach		2007	3.2	2007	3.2	0.965	23.2	LOS B	27.3	197.0	0.94	1.34	1.97	40.4
East: Coreen Avenue														
4	L2	277	2.7	277	2.7	0.531	10.2	LOS A	3.2	23.2	0.86	0.98	1.05	43.2
5	T1	65	0.0	65	0.0	0.539	8.5	LOS A	3.7	26.5	0.88	1.00	1.05	47.0
6	R2	317	2.0	317	2.0	0.539	14.0	LOS A	3.7	26.5	0.88	1.00	1.05	50.2
Approach		659	2.1	659	2.1	0.539	11.9	LOS A	3.7	26.5	0.87	0.99	1.05	47.9
North: Castlereagh Road														
7	L2	238	2.2	238	2.2	0.707	8.2	LOS A	8.2	58.8	0.84	0.84	1.00	51.5
8	T1	1201	2.5	1201	2.5	0.707	8.6	LOS A	8.2	58.8	0.84	0.87	1.02	46.2
9	R2	54	7.8	54	7.8	0.707	14.7	LOS B	7.9	56.9	0.85	0.89	1.04	50.2
Approach		1493	2.7	1493	2.7	0.707	8.8	LOS A	8.2	58.8	0.84	0.87	1.02	47.6
West: Mullins Road														
10	L2	91	2.3	91	2.3	0.349	15.6	LOS B	2.0	14.1	0.93	0.99	1.02	43.7
11	T1	81	0.0	81	0.0	0.329	10.8	LOS A	2.2	15.6	0.98	1.00	1.00	46.1
12	R2	52	2.0	52	2.0	0.329	16.2	LOS B	2.2	15.6	0.98	1.00	1.00	37.8
Approach		223	1.4	223	1.4	0.349	14.0	LOS A	2.2	15.6	0.96	0.99	1.01	43.6
All Vehicles		4382	2.8	4382	2.8	0.965	16.1	LOS B	27.3	197.0	0.90	1.11	1.46	43.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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 [Dev Castlereagh Rd/Peachtree Rd PM Peak]

Network: N101 [Dev PM]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	172	8.6	172	8.6	0.859	21.6	LOS B	49.6	359.4	0.83	0.80	0.84	37.7
2	T1	1883	3.2	1883	3.2	0.859	16.2	LOS B	49.6	359.4	0.76	0.73	0.78	22.5
3	R2	51	2.1	51	2.1	0.334	26.9	LOS B	1.9	13.7	0.64	0.74	0.64	30.4
Approach		2105	3.6	2105	3.6	0.859	16.9	LOS B	49.6	359.4	0.76	0.74	0.78	25.5
East: Thornton Drive														
4	L2	75	0.0	75	0.0	0.805	73.3	LOS F	4.8	33.9	1.00	0.90	1.33	17.4
5	T1	14	0.0	14	0.0	0.140	61.9	LOS E	0.8	5.7	0.98	0.67	0.98	25.6
6	R2	15	7.1	15	7.1	0.157	66.8	LOS E	0.9	6.5	0.99	0.69	0.99	15.1
Approach		103	1.0	103	1.0	0.805	70.9	LOS F	4.8	33.9	1.00	0.84	1.23	18.3
North: Castlereagh Road														
7	L2	87	1.2	87	1.2	0.069	12.2	LOS A	1.7	11.7	0.35	0.66	0.35	41.1
8	T1	1431	2.4	1431	2.4	0.580	10.1	LOS A	21.6	154.3	0.55	0.50	0.55	42.4
9	R2	12	36.4	12	36.4	0.187	50.3	LOS D	0.6	5.6	0.83	0.73	0.83	26.4
Approach		1529	2.5	1529	2.5	0.580	10.5	LOS A	21.6	154.3	0.54	0.51	0.54	41.9
West: Peachtree Road														
10	L2	109	2.9	109	2.9	0.327	47.6	LOS D	6.5	46.4	0.89	0.77	0.89	22.2
11	T1	21	0.0	21	0.0	0.327	43.0	LOS D	6.5	46.4	0.89	0.77	0.89	29.0
12	R2	195	3.8	195	3.8	0.774	54.2	LOS D	10.9	78.5	1.00	0.88	1.14	23.4
Approach		325	3.2	325	3.2	0.774	51.3	LOS D	10.9	78.5	0.96	0.84	1.04	23.4
All Vehicles		4063	3.1	4063	3.1	0.859	18.6	LOS B	49.6	359.4	0.70	0.66	0.72	30.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P2	East Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P3	North Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P4	West Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		21	54.2	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: 101 [Dev Castlereagh Rd/Mullins Rd PM Peak Additional Shift]

Network: N101 [Dev PM Additional shift]

Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	117	18.0	117	18.0	0.966	22.2	LOS B	27.7	200.2	0.94	1.32	1.94	38.0
2	T1	1597	1.9	1597	1.9	0.966	22.6	LOS B	27.7	200.2	0.94	1.35	1.98	40.7
3	R2	297	5.3	297	5.3	0.966	29.8	LOS C	25.9	185.8	0.94	1.39	2.05	38.4
Approach		2011	3.4	2011	3.4	0.966	23.6	LOS B	27.7	200.2	0.94	1.35	1.99	40.2
East: Coreen Avenue														
4	L2	277	2.7	277	2.7	0.532	10.3	LOS A	3.2	23.2	0.86	0.98	1.05	43.2
5	T1	65	0.0	65	0.0	0.540	8.5	LOS A	3.7	26.6	0.88	1.00	1.05	47.0
6	R2	317	2.0	317	2.0	0.540	14.1	LOS A	3.7	26.6	0.88	1.00	1.05	50.2
Approach		659	2.1	659	2.1	0.540	11.9	LOS A	3.7	26.6	0.87	0.99	1.05	47.9
North: Castlereagh Road														
7	L2	238	2.2	238	2.2	0.709	8.2	LOS A	8.3	59.1	0.84	0.85	1.00	51.5
8	T1	1203	2.7	1203	2.7	0.709	8.7	LOS A	8.3	59.1	0.84	0.87	1.02	46.1
9	R2	53	8.0	53	8.0	0.709	14.7	LOS B	8.0	57.2	0.85	0.90	1.05	50.2
Approach		1494	2.8	1494	2.8	0.709	8.8	LOS A	8.3	59.1	0.84	0.87	1.02	47.6
West: Mullins Road														
10	L2	85	2.5	85	2.5	0.329	15.1	LOS B	1.8	13.2	0.92	0.98	0.99	43.9
11	T1	81	0.0	81	0.0	0.331	10.9	LOS A	2.2	15.7	0.99	1.00	1.01	46.0
12	R2	52	2.0	52	2.0	0.331	16.3	LOS B	2.2	15.7	0.99	1.00	1.01	37.8
Approach		218	1.4	218	1.4	0.331	13.8	LOS A	2.2	15.7	0.96	0.99	1.00	43.7
All Vehicles		4381	2.9	4381	2.9	0.966	16.3	LOS B	27.7	200.2	0.90	1.11	1.47	43.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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 [Dev Castlereagh Rd/Peachtree Rd PM Peak Additional Shift]

Network: N101 [Dev PM Additional shift]

Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Castlereagh Road														
1	L2	174	10.3	174	10.3	0.861	22.0	LOS B	50.2	364.1	0.83	0.81	0.85	37.4
2	T1	1883	3.2	1883	3.2	0.861	16.6	LOS B	50.2	364.1	0.76	0.74	0.78	22.2
3	R2	51	2.1	51	2.1	0.336	26.9	LOS B	1.9	13.7	0.64	0.74	0.64	30.4
Approach		2107	3.7	2107	3.7	0.861	17.3	LOS B	50.2	364.1	0.76	0.74	0.79	25.2
East: Thornton Drive														
4	L2	75	0.0	75	0.0	0.805	73.3	LOS F	4.8	33.9	1.00	0.90	1.33	17.4
5	T1	14	0.0	14	0.0	0.140	61.9	LOS E	0.8	5.7	0.98	0.67	0.98	25.6
6	R2	15	7.1	15	7.1	0.157	66.8	LOS E	0.9	6.5	0.99	0.69	0.99	15.1
Approach		103	1.0	103	1.0	0.805	70.9	LOS F	4.8	33.9	1.00	0.84	1.23	18.3
North: Castlereagh Road														
7	L2	87	1.2	87	1.2	0.069	12.2	LOS A	1.7	11.7	0.35	0.66	0.35	41.1
8	T1	1431	2.4	1431	2.4	0.585	10.1	LOS A	21.9	156.5	0.55	0.50	0.55	42.3
9	R2	14	46.2	14	46.2	0.228	51.2	LOS D	0.7	7.1	0.84	0.73	0.84	26.1
Approach		1532	2.7	1532	2.7	0.585	10.6	LOS A	21.9	156.5	0.54	0.51	0.54	41.8
West: Peachtree Road														
10	L2	113	5.6	113	5.6	0.341	47.8	LOS D	6.7	48.6	0.89	0.77	0.89	22.1
11	T1	21	0.0	21	0.0	0.341	43.1	LOS D	6.7	48.6	0.89	0.77	0.89	29.0
12	R2	192	4.9	192	4.9	0.763	53.9	LOS D	10.6	77.6	1.00	0.87	1.13	23.4
Approach		325	4.9	325	4.9	0.763	51.1	LOS D	10.6	77.6	0.96	0.83	1.03	23.5
All Vehicles		4067	3.4	4067	3.4	0.861	18.9	LOS B	50.2	364.1	0.70	0.67	0.72	30.0

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P2	East Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P3	North Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
P4	West Full Crossing	5	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		21	54.2	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.