JMT CONSULTING

Proposed Development of the Dog on the Tuckerbox Site

Responses to RFI

11 April 2024

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Cootamundra-Gundagai Regional Council

11 April 2024

Dear Sir/Madam

Proposed Development of the Dog on the Tuckerbox Site – Responses to RFI

INTRODUCTION

This document provides responses to feedback provided in relation to DA2023/116 for the proposed mixed use development of the Dog on the Tuckerbox Site. The document provides responses to the traffic and transport matters raised in the correspondence provided by Cootamundra-Gundagai Regional Council ('Council') dated March 2024.

RESPONSES TO MATTERS RAISED

(i) Vehicle access arrangement

In response to feedback from Council the vehicle access arrangement has been revised to provide for a more conventional 'T-Junction' arrangement as indicated in Figure 1 below. The previous u-shaped roundabout formation has been removed in response to Council's concerns this previous arrangement may have led to driver confusion. The revised access arrangement also responds to a comment from Council's engineer in relation to the vehicle swept paths traversing over an island at the entry point to the site.

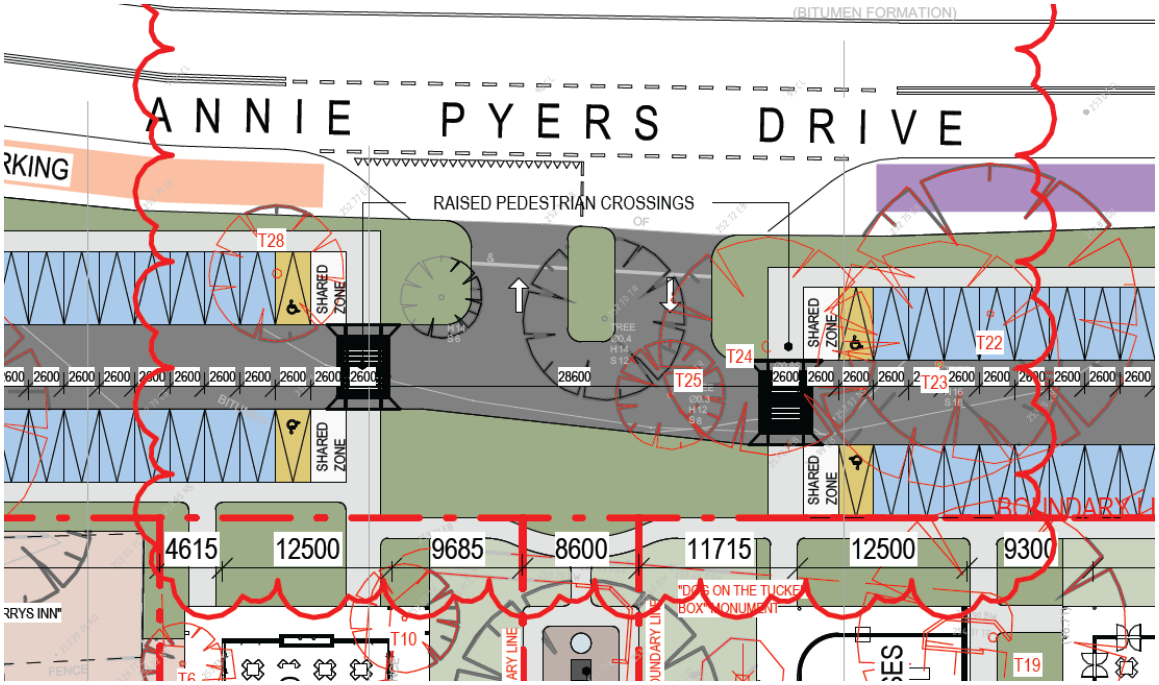

Figure 1 Proposed vehicle access arrangement

(ii) Pedestrian crossing locations

The car parking configuration adjacent to the pedestrian crossings have been amended in response to concerns raised by Council. Vehicles entering or exiting parking spaces will not longer be required to reverse across the pedestrian crossings, with a 'shared zone' next to the disabled parking bays now provided immediately adjacent to the pedestrian crossings. This is indicated in Figure 1 on the previous page of this document.

(iii) Caravan parking / coach parking

In response to Council's feedback the scheme makes allowance for parking for larger vehicles (e.g. caravans and coaches) via a kerbside parking area along Annie Pyers Drive adjacent to the site. This arrangement provides for a more logical and practical approach to parking for larger vehicles, with easy access from this coach parking area through to the site via a future footpath along Annie Pyers Drive

Recognising that these vehicles range in length, from small mini-buses to larger 14.5m coaches, these kerbside parking areas would not be line-marked for individual parking bays. Instead to provide greater flexibility and more efficient use of the area the kerbside zones would be signposted to indicate the relevant parking restrictions.

Both the coach and caravan kerbside zones are approximately 80m in length. Adopting a typical vehicle length of 9m-10m for a caravan and 12.5m-14.5m for a coach, the caravan parking zone may accommodate approximately 7 vehicles while the coach zone may accommodate approximately 5 vehicles. This estimated capacity will however be dependent on the type and size of vehicles utilising the respective zones.

(iv) Transport for NSW matters

Extensive consultation has been undertaken with Transport for NSW (TfNSW) following their correspondence to Council dated 21 February 2024. This has included meetings with relevant TfNSW staff and updated traffic modelling to address concerns raised with the application. Additional analysis has been undertaken to understand expected traffic movements for each stage of the development, with a potential mitigation measure identified to manage traffic movements from the Hume Highway. This mitigation measure would be triggered as part of the Stage 3 development works for the site.

Following the submission of updated documentation to TfNSW, correspondence was provided on 27 March 2024 which noted "*TfNSW notes that the proposal is to be reduced in scale and considers this approach and its assumptions to be appropriate to allow for merit assessment of the application. As Council is the consent authority, the revised documentation is to be submitted to Council. TfNSW will provide its comments to Council when the application is formally referred for comment*."

The updated response to TfNSW matters is provided in Annexure 1 of this document.

Please do not hesitate to contact the undersigned should you require any further information.

Regards

Josh Milston

Director | JMT Consulting

MIEAust CPEng

Annexure 1: TfNSW Response Document

Proposed Development of the Dog on the Tuckerbox Site

Response to TfNSW Submission

15 March 2024

JMT Consulting
PO Box 199
Kingsford NSW 2032
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Transport for NSW

15 March 2024

Dear Sir/Madam

Proposed Development of the Dog on the Tuckerbox Site – Responses to TfNSW Submission

INTRODUCTION

This document provides responses to feedback provided in relation to DA2023/116 for the proposed mixed use development of the Dog on the Tuckerbox Site. The document provides a response to the submission provided by Transport for NSW (TfNSW) dated 21 February 2024.

This document has been prepared following consultation with TfNSW staff to discuss the concerns raised in relation to the proposal, specifically a meeting held via Microsoft Teams on Tuesday 27 February 2024.

RESPONSES TO MATTERS RAISED

(i) Forecast traffic generation

As per advice from TfNSW staff the forecast traffic generation arising from the proposal has been considered in detail and aligned with the overall project staging. These traffic generation assumptions take the following into consideration:

- Net GFA to be added by stage;
- Traffic generation rate of 12.3 vehicles / 100m^2 as per the RTA Guide to Traffic Generating Developments document;
- Application of a 'mixed trips / multi-purpose trips / complementary trips' factor, taking into consideration:
    - Observations by the project team over a period of time indicate that in the order of **70%-85%** of current visitation to the DOTT is subsequent to people already having travelled to the service centre or Olivers
    - The uses proposed, particularly in Stage 3, are complementary (e.g. a retail shop and a food/drink premises, or a food/drink premises and a pub) and therefore people travelling to the site are likely to frequent multiple buildings in the one visit
- Based on discussions with TfNSW staff the allowance for multi-purpose trips was as follows:
    - 50% for Stages 1 & 2
    - 25% for Stage 3

The resultant traffic generation by project stage is summarised in Table 1 on the following page. This demonstrates that Stages 1 & 2 of the development is expected to be less than 30 vehicle movements which would not have any material impact on the road network. Stage 3 is expected to generate higher volumes of traffic and therefore has been considered in further detail as part of the updated traffic modelling.

Table 1 Forecast traffic generation by project stage

Project Stage	New GFA (m^2)	GFA to be removed (m^2)	Net GFA (m^2) by stage	Cumulative GFA (m^2)	Peak hour traffic movements by stage	Cumulative hourly traffic movements	Cumulative hourly traffic movements – standalone to the DOTT
Stage 1	616	300	316	316	29	29	15
Stage 2	278	0	278	594	26	55	28
Stage 3	1330	0	1330	1924	123	178	129

(ii) Traffic modelling scenarios

The following traffic modelling scenarios have been considered:

- Current conditions
- Current conditions + 10 years growth
- Current conditions + 10 years growth + proposal (Stage 1, 2 & 3)
- Current conditions + 10 years growth + proposal (Stage 1, 2 & 3) with mitigation measures

(iii) Traffic model updates

Based on discussions with TfNSW staff the following updates have been made to the SIDRA traffic model:

- Amended all gap acceptance values to align with those recommended in Table 3.5 of Austroads Guide to Road Design, Part4A (Unsignalised and Signalised Intersections)Current conditions + 10 years growth
- Annual growth rate applied to both Hume Highway and Annie Pyers Drive traffic
- Update of pcu/vehicle to 2.5, an increase from the SIDRA default of 1.65, to align with the value adopted for large heavy vehicles such as semi-trailers and B-Doubles. Application of a 'large vehicle' user class in the SIDRA modelling was found to produce unrealistic results that did not reflect current site conditions – for example delays of more than 10 minutes for traffic leaving Annie Pyers Drive back onto the Hume Highway.
- Update of the traffic distribution to reflect observed site traffic movements, with the adopted distribution noted in Table 2.

Table 2 Traffic distribution assumptions (Stages 1, 2 + 3)

Northern Access					Southern Access			
Left in	Left In	Left Out	Right In	Right Out	Left in	Left Out	Right In	Right Out
No. of Vehicles	2	18	7	4	42	21	14	21

SIDRA layouts were developed to reflect existing site conditions, refer to figures below:

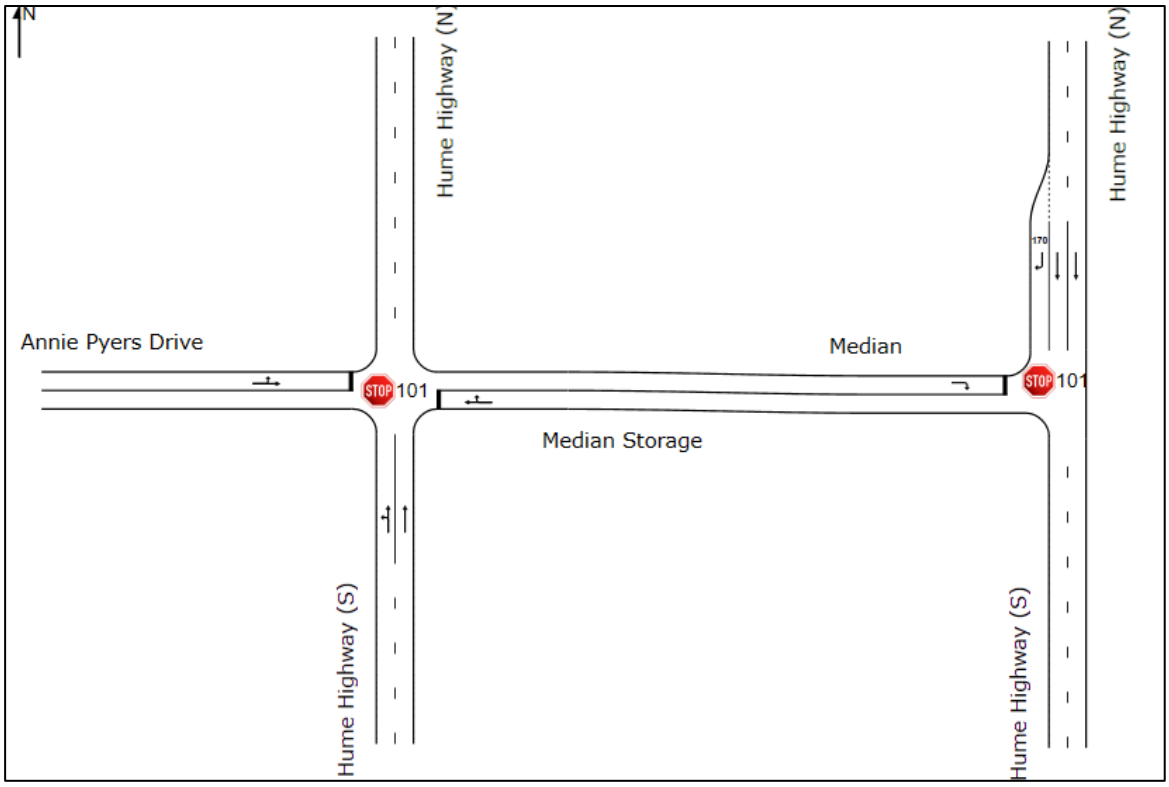

Figure 1 SIDRA layout – northern access point

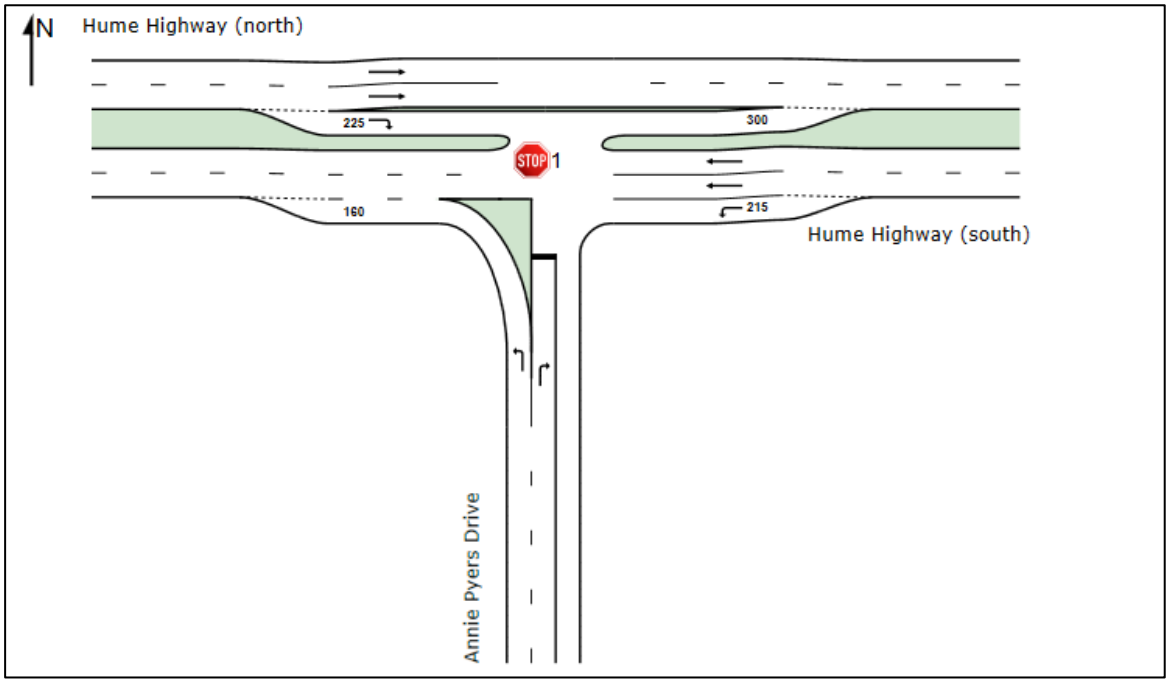

Figure 2 SIDRA layout – southern access point

(iv) Traffic modelling findings

The traffic modelling demonstrates that, even taking into consideration a 5% annual background traffic growth rate over a 10 year period, the two access points adjacent to the site continue to perform at a strong level of service in the peak hour of the day with spare capacity. The proposal is not forecast to result in any queuing on the Hume Highway that would impact regional traffic movements. The modelling outputs are summarised in the table below, with detailed findings provided as an appendix to this document.

Table 3 Traffic modelling results (Stages 1, 2 +3)

Location	Existing Performance			Existing Performance + 10 years growth			Existing Performance + 10 years growth + Proposal		
	AVD (sec)	DOS	LOS*	AVD (sec)	DOS	LOS*	AVD (sec)	DOS	LOS*
Northern intersection (eastern leg)	1	0.15	A	1	0.22	A	1	0.22	A
Northern intersection (western leg)	1	0.16	A	1	0.24	A	2	0.24	A
Southern intersection	2	0.17	B	4	0.51	D	5	0.68	E

AVD – Average vehicle delay (seconds) DOS – Degree of Saturation LOS – Level of Service

* Level of Service reported for worst movement for unsignalised intersections

(v) Potential mitigation measures

It is important to note that the proposal is not predicated or reliant on any upgrades to the existing northern and southern access points from the Hume Highway onto Annie Pyers Drive. As demonstrated in the traffic modelling the additional vehicular traffic generated by the proposal, along with expected levels of traffic growth on the highway, can be accommodated under current design conditions.

In response to concerns raised by TfNSW in their submission of February 2024 a potential mitigation measure has been considered to support the continued safe and efficient operation of the road network. This measure, which would not be triggered until at least prior to the occupation of Stage 3 of the development, would involve modified vehicle access arrangements at the northern and southern intersections on Annie Pyers Drive. The intent of the measure is to reduce points of vehicle conflict by restricting certain right turn movements. The potential arrangement is illustrated in the figures on the following page of this document, and involves:

- Limiting right turns from the Hume Highway (southbound) into Annie Pyers Drive to the northern intersection only; and
- Limiting right turns from Annie Pyers Drive onto the Hume Highway (southbound) to the southern intersection only

Figure 3 Existing vehicle access arrangements

Figure 4 Potential future vehicle access arrangements

The SIDRA modelling was updated to reflect the potential access arrangements, with results presented in Table 4 below. The modelling indicates that the introduction of these revised access arrangements would result in improved intersection performance compared to a 'future base' or 'do nothing' scenario.

Table 4 Traffic modelling results (Stages 1, 2 +3)

Location	Existing Performance + 10 years growth (No Development)			Existing Performance + 10 years growth (With Development)			Existing Performance + 10 years growth (With Development & Changed Access)		
	AVD (sec)	DOS	LOS*	AVD (sec)	DOS	LOS*	AVD (sec)	DOS	LOS*
Northern intersection (eastern leg)	1	0.22	A	1	0.22	A	1	0.22	A
Northern intersection (western leg)	1	0.24	A	2	0.24	A	2	0.24	A
Southern intersection	4	0.51	D	5	0.68	E	3	0.48	C

AVD – Average vehicle delay (seconds) DOS – Degree of Saturation LOS – Level of Service

* Level of Service reported for worst movement for unsignalised intersections

As previously noted, given Stages 1 & 2 of the proposal would result in less than 30 vehicles movements, the modified access arrangements would only need to be considered as part of works to enable Stage 3 of the development. The proposed arrangements would be subject to further investigation by TfNSW in conjunction with Council and consultation with impacted landowners.

Importantly the traffic analysis demonstrates that Stage 1 & 2 of the proposal can proceed immediately without the need for any traffic mitigation works.

Please do not hesitate to contact the undersigned should you require any further information.

Regards

Josh Milston

Director | JMT Consulting

MIEAust CPEng

Appendix A: Traffic Modelling Outputs

MOVEMENT SUMMARY

Site: 101 [Existing Conditions (West Side) (Site Folder: Northern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Existing Conditions (Network Folder: Northern Access Point)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hume Highway (S)															
1	L2	All MCs	4	0.0	4	0.0	0.158	8.2	LOS A	0.0	0.0	0.00	0.01	0.00	61.1
2	T1	All MCs	520	11.9	520	11.9	0.158	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	109.7
Approach			524	11.8	524	11.8	0.158	0.1	NA	0.0	0.0	0.00	0.01	0.00	109.0
East: Median Storage															
5	T1	All MCs	18	0.0	18	0.0	0.020	7.2	LOS A	0.0	0.2	0.48	0.93	0.48	27.2
6	R2	All MCs	1	0.0	1	0.0	0.020	8.7	LOS A	0.0	0.2	0.48	0.93	0.48	27.1
Approach			19	0.0	19	0.0	0.020	7.3	LOS A	0.0	0.2	0.48	0.93	0.48	27.2
West: Annie Pyers Drive															
10	L2	All MCs	51	4.2	51	4.2	0.060	8.8	LOS A	0.1	0.7	0.39	0.89	0.39	48.0
11	T1	All MCs	12	9.1	12	9.1	0.060	8.4	LOS A	0.1	0.7	0.39	0.89	0.39	37.7
Approach			62	5.1	62	5.1	0.060	8.7	LOS A	0.1	0.7	0.39	0.89	0.39	46.7
All Vehicles			605	10.8	605	10.8	0.158	1.2	NA	0.1	0.7	0.06	0.13	0.06	92.5

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [Existing Conditions (East Side) (Site Folder: Northern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Existing Conditions (Network Folder: Northern Access Point)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Hume Highway (N)															
8	T1	All MCs	456	16.9	456	16.9	0.146	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
9	R2	All MCs	18	0.0	18	0.0	0.010	5.7	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach			474	16.2	474	16.2	0.146	0.2	NA	0.0	0.0	0.00	0.02	0.00	107.5
West: Median															
12	R2	All MCs	12	9.1	12	9.1	0.020	8.9	LOS A	0.0	0.2	0.52	0.89	0.52	42.2
Approach			12	9.1	12	9.1	0.020	8.9	LOS A	0.0	0.2	0.52	0.89	0.52	42.2
All Vehicles			485	16.1	485	16.1	0.146	0.4	NA	0.0	0.2	0.01	0.04	0.01	105.4

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [Existing Conditions (West Side) + 10 years growth (Site Folder: Northern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Existing Conditions + growth (Network Folder: Northern Access Point)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hume Highway (S)															
1	L2	All MCs	4	0.0	4	0.0	0.237	8.2	LOS A	0.0	0.0	0.00	0.01	0.00	61.1
2	T1	All MCs	781	12.0	781	12.0	0.237	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.7
Approach			785	11.9	785	11.9	0.237	0.1	NA	0.0	0.0	0.00	0.00	0.00	109.3
East: Median Storage															
5	T1	All MCs	18	0.0	18	0.0	0.028	8.9	LOS A	0.0	0.3	0.58	0.97	0.58	26.6
6	R2	All MCs	1	0.0	1	0.0	0.028	11.9	LOS A	0.0	0.3	0.58	0.97	0.58	26.5
Approach			19	0.0	19	0.0	0.028	9.0	LOS A	0.0	0.3	0.58	0.97	0.58	26.6
West: Annie Pyers Drive															
10	L2	All MCs	51	4.2	51	4.2	0.074	9.7	LOS A	0.1	0.8	0.49	0.92	0.49	50.1
11	T1	All MCs	12	9.1	12	9.1	0.074	12.1	LOS A	0.1	0.8	0.49	0.92	0.49	40.3
Approach			62	5.1	62	5.1	0.074	10.1	LOS A	0.1	0.8	0.49	0.92	0.49	48.9
All Vehicles			866	11.2	866	11.2	0.237	1.0	NA	0.1	0.8	0.05	0.09	0.05	97.7

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [Existing Conditions (East Side) + 10 years growth (Site Folder: Northern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Existing Conditions + growth (Network Folder: Northern Access Point)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Hume Highway (N)															
8	T1	All MCs	684	16.9	684	16.9	0.220	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
9	R2	All MCs	18	0.0	18	0.0	0.010	5.7	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach			702	16.5	702	16.5	0.220	0.2	NA	0.0	0.0	0.00	0.02	0.00	108.3
West: Median															
12	R2	All MCs	12	9.1	12	9.1	0.029	12.3	LOS A	0.0	0.3	0.64	0.95	0.64	39.4
Approach			12	9.1	12	9.1	0.029	12.3	LOS A	0.0	0.3	0.64	0.95	0.64	39.4
All Vehicles			714	16.4	714	16.4	0.220	0.4	NA	0.0	0.3	0.01	0.03	0.01	106.6

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [Existing Conditions (West Side) + 10 years growth + proposal (Site Folder: Northern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Existing Conditions + growth + proposal (Network Folder: Northern Access Point)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hume Highway (S)															
1	L2	All MCs	4	0.0	4	0.0	0.237	8.2	LOS A	0.0	0.0	0.00	0.01	0.00	61.1
2	T1	All MCs	781	12.0	781	12.0	0.237	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.7
Approach			785	11.9	785	11.9	0.237	0.1	NA	0.0	0.0	0.00	0.00	0.00	109.3
East: Median Storage															
5	T1	All MCs	61	0.0	61	0.0	0.088	9.1	LOS A	0.1	0.9	0.59	1.03	0.59	26.6
6	R2	All MCs	1	0.0	1	0.0	0.088	13.1	LOS A	0.1	0.9	0.59	1.03	0.59	26.5
Approach			62	0.0	62	0.0	0.088	9.1	LOS A	0.1	0.9	0.59	1.03	0.59	26.6
West: Annie Pyers Drive															
10	L2	All MCs	94	2.2	94	2.2	0.136	9.7	LOS A	0.2	1.5	0.51	0.93	0.51	50.3
11	T1	All MCs	22	4.8	22	4.8	0.136	11.8	LOS A	0.2	1.5	0.51	0.93	0.51	40.3
Approach			116	2.7	116	2.7	0.136	10.1	LOS A	0.2	1.5	0.51	0.93	0.51	49.0
All Vehicles			963	10.1	963	10.1	0.237	1.8	NA	0.2	1.5	0.10	0.18	0.10	87.4

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [Existing Conditions (East Side) + 10 years growth + proposal (Site Folder: Northern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Existing Conditions + growth + proposal (Network Folder: Northern Access Point)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Hume Highway (N)															
8	T1	All MCs	684	16.9	684	16.9	0.220	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
9	R2	All MCs	61	0.0	61	0.0	0.033	5.7	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach			745	15.5	745	15.5	0.220	0.5	NA	0.0	0.0	0.00	0.05	0.00	104.6
West: Median															
12	R2	All MCs	22	4.8	22	4.8	0.055	12.5	LOS A	0.1	0.6	0.66	0.99	0.66	39.4
Approach			22	4.8	22	4.8	0.055	12.5	LOS A	0.1	0.6	0.66	0.99	0.66	39.4
All Vehicles			767	15.2	767	15.2	0.220	0.8	NA	0.1	0.6	0.02	0.08	0.02	101.9

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [Existing Conditions (West Side) + 10 years growth + proposal + changed access (Site Folder: Northern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Existing Conditions + growth + proposal + changed access (Network Folder: Northern Access Point)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Hume Highway (S)															
1	L2	All MCs	4	0.0	4	0.0	0.237	8.2	LOS A	0.0	0.0	0.00	0.01	0.00	61.1
2	T1	All MCs	781	12.0	781	12.0	0.237	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.7
Approach			785	11.9	785	11.9	0.237	0.1	NA	0.0	0.0	0.00	0.00	0.00	109.3
East: Median Storage															
5	T1	All MCs	128	4.9	128	4.9	0.194	9.9	LOS A	0.3	2.2	0.62	1.06	0.62	26.4
6	R2	All MCs	1	0.0	1	0.0	0.194	13.3	LOS A	0.3	2.2	0.62	1.06	0.62	26.3
Approach			129	4.9	129	4.9	0.194	9.9	LOS A	0.3	2.2	0.62	1.06	0.62	26.4
West: Annie Pyers Drive															
10	L2	All MCs	94	2.2	94	2.2	0.103	9.6	LOS A	0.2	1.2	0.47	0.91	0.47	50.5
Approach			94	2.2	94	2.2	0.103	9.6	LOS A	0.2	1.2	0.47	0.91	0.47	50.5
All Vehicles			1008	10.1	1008	10.1	0.237	2.2	NA	0.3	2.2	0.12	0.22	0.12	81.5

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [Existing Conditions (East Side) + 10 years growth + proposal + changed access (Site Folder: Northern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Network: N101 [Existing Conditions + growth + proposal + changed access (Network Folder: Northern Access Point)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Hume Highway (N)															
8	T1	All MCs	684	16.9	684	16.9	0.220	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
9	R2	All MCs	128	4.9	128	4.9	0.075	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.5
Approach			813	15.0	813	15.0	0.220	0.9	NA	0.0	0.0	0.00	0.10	0.00	99.8
All Vehicles			813	15.0	813	15.0	0.220	0.9	NA	0.0	0.0	0.00	0.10	0.00	99.8

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 1 [Existing Conditions (Site Folder: Southern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Three-way intersection with 5-lane major road (Stop control)
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Annie Pyers Drive															
1	L2	All MCs	56	20.8	56	20.8	0.040	6.4	LOS A	0.0	0.0	0.00	0.52	0.00	52.7
2	R2	All MCs	57	9.3	57	9.3	0.166	18.3	LOS B	0.6	4.4	0.67	1.00	0.67	45.8
Approach			113	15.0	113	15.0	0.166	12.4	LOS A	0.6	4.4	0.34	0.76	0.34	49.0
East: Hume Highway (south)															
3	L2	All MCs	104	13.1	104	13.1	0.068	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	52.3
4	T1	All MCs	520	11.9	520	11.9	0.157	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
Approach			624	12.1	624	12.1	0.157	1.0	NA	0.0	0.0	0.00	0.10	0.00	92.8
West: Hume Highway (north)															
5	T1	All MCs	456	16.9	456	16.9	0.146	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
6	R2	All MCs	35	12.1	35	12.1	0.158	18.7	LOS B	0.4	3.4	0.70	0.86	0.70	44.3
Approach			491	16.5	491	16.5	0.158	1.3	NA	0.4	3.4	0.05	0.06	0.05	99.5
All Vehicles			1227	14.2	1227	14.2	0.166	2.2	NA	0.6	4.4	0.05	0.14	0.05	87.9

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 1 [Existing Conditions + 10 years growth (Site Folder: Southern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Three-way intersection with 5-lane major road (Stop control)
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Annie Pyers Drive															
1	L2	All MCs	84	20.0	84	20.0	0.060	6.8	LOS A	0.0	0.0	0.00	0.52	0.00	52.8
2	R2	All MCs	85	9.9	85	9.9	0.490	38.0	LOS C	1.9	14.5	0.89	1.10	1.26	37.0
Approach			169	14.9	169	14.9	0.490	22.5	LOS B	1.9	14.5	0.45	0.81	0.63	43.5
East: Hume Highway (south)															
3	L2	All MCs	157	13.4	157	13.4	0.103	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	52.3
4	T1	All MCs	781	12.0	781	12.0	0.236	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
Approach			938	12.2	938	12.2	0.236	1.0	NA	0.0	0.0	0.00	0.10	0.00	92.8
West: Hume Highway (north)															
5	T1	All MCs	684	16.9	684	16.9	0.220	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
6	R2	All MCs	53	12.0	53	12.0	0.512	47.9	LOS D	1.5	12.0	0.91	1.05	1.26	32.8
Approach			737	16.6	737	16.6	0.512	3.4	NA	1.5	12.0	0.06	0.07	0.09	94.0
All Vehicles			1844	14.2	1844	14.2	0.512	3.9	NA	1.9	14.5	0.07	0.15	0.09	84.4

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 1 [Existing Conditions + 10 years growth + proposal (Site Folder: Southern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Three-way intersection with 5-lane major road (Stop control)
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Annie Pyers Drive															
1	L2	All MCs	106	15.8	106	15.8	0.072	6.8	LOS A	0.0	0.0	0.00	0.52	0.00	52.9
2	R2	All MCs	107	7.8	107	7.8	0.638	45.0	LOS D	2.8	21.0	0.92	1.17	1.55	34.7
Approach			214	11.8	214	11.8	0.638	25.9	LOS B	2.8	21.0	0.46	0.84	0.78	41.9
East: Hume Highway (south)															
3	L2	All MCs	201	10.5	201	10.5	0.126	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	52.4
4	T1	All MCs	781	12.0	781	12.0	0.236	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
Approach			982	11.7	982	11.7	0.236	1.2	NA	0.0	0.0	0.00	0.12	0.00	89.7
West: Hume Highway (north)															
5	T1	All MCs	684	16.9	684	16.9	0.220	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
6	R2	All MCs	67	9.4	67	9.4	0.682	58.8	LOS E	2.3	17.7	0.94	1.13	1.57	29.9
Approach			752	16.2	752	16.2	0.682	5.3	NA	2.3	17.7	0.08	0.10	0.14	88.6
All Vehicles			1947	13.5	1947	13.5	0.682	5.5	NA	2.8	21.0	0.08	0.19	0.14	79.3

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 1 [Existing Conditions + 10 years growth + proposal + changed access (Site Folder: Southern Access Point)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Three-way intersection with 5-lane major road (Stop control)
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Annie Pyers Drive															
1	L2	All MCs	106	15.8	106	15.8	0.072	6.8	LOS A	0.0	0.0	0.00	0.52	0.00	52.9
2	R2	All MCs	124	7.6	124	7.6	0.484	29.7	LOS C	2.2	16.4	0.86	1.11	1.25	40.4
Approach			231	11.4	231	11.4	0.484	19.1	LOS B	2.2	16.4	0.46	0.84	0.67	45.4
East: Hume Highway (south)															
3	L2	All MCs	201	10.5	201	10.5	0.126	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	52.4
4	T1	All MCs	781	12.0	781	12.0	0.236	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
Approach			982	11.7	982	11.7	0.236	1.2	NA	0.0	0.0	0.00	0.12	0.00	89.7
West: Hume Highway (north)															
5	T1	All MCs	684	16.9	684	16.9	0.220	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	109.9
Approach			684	16.9	684	16.9	0.220	0.0	NA	0.0	0.0	0.00	0.00	0.00	109.9
All Vehicles			1897	13.5	1897	13.5	0.484	2.9	NA	2.2	16.4	0.06	0.16	0.08	85.2

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

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

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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