

27 February 2026

TfNSW  
6 Stewart Avenue  
Newcastle West NSW 2302

## **HUNTLEE STAGE 2 DA, SSD 70748466, Intersection A-11 Sensitivity Modelling**

In response to correspondence received from TfNSW on 4 December 2025, additional SIDRA modelling has been undertaken for the purposes of a sensitivity test to review the Level of Service (LoS) for Intersection A-11 for consideration by TfNSW and DPHI.

This review responds to Recommendation 1 and 2 of the TfNSW letter through sensitivity testing of Intersection A-11 as well as a review of a new development threshold specifically for this intersection that will achieve a Level of Service C or D instead of the Level of Service E reported within the Arcadis Traffic Modelling Report (June 2024).

This additional modelling work and letter report is provided to assist in further refining the proposed DA Conditions, it is not intended to replace or supersede the previously submitted Arcadis work submitted and reviewed by TfNSW.

## **1 Background/Modelling Methodology**

Arcadis prepared the original traffic modelling using SIDRA 9 as part of the original DA submission in June 2024 which was subsequently updated in July 2025 to conclude all other outstanding comments received from TfNSW.

In order to respond to the remaining comments from TfNSW on intersection A-11, an additional SIDRA model has been prepared using the same parameters previously presented to TfNSW, including amendments previously requested by TfNSW. This model has been prepared using SIDRA 10 which will in effect add another sensitivity test to the previous work undertaken by Arcadis as this was prepared using the preceding SIDRA version.

It is noted that the modelling prepared by Arcadis included a partial network model to coordinate the signalised intersections A-1 (WCD/Tollbar), A-3 (Empire St/WCD) and A-5 (WCD/Bakehouse/Triton), it is noted that A-6 was not included in this network for coordination.

For the purposes of this sensitivity test, a standalone model for intersection A-11 is believed to be sufficient and a comparison of results of this model against the Arcadis work is presented in the following section to ensure similar base line results are achieved.

## 2 SIDRA Model Setup and Verification

As outlined in the previous section, a standalone intersection model for A-11 has been prepared using SIDRA 10. Prior to reviewing any potential new scenarios for the purposes of the sensitivity testing, the results of the new base A-11 model have been compared to the work undertaken by Arcadis which was previously submitted to and reviewed by TfNSW. This comparison is important to ensure that the base model produces similar results to align with the Arcadis work prior to undertaking any sensitivity test. As outlined in the previous section, for the preparation of the base SIDRA model the same parameters were used as contained in the last iteration of SIDRA models submitted to TfNSW in November 2024.

It is noted that in this sensitivity review of A-11, only the PM peak has been assessed as this is the key peak period of concern affecting Level of Service for the overall intersection.

The results of the SIDRA model prepared for A-11 as part of this report are compared to the results previously reported by Arcadis in Table 1 below.

**TABLE 1 – Intersection A-11 SIDRA Results Comparison, 2036 PM Peak, Base Development Case**

Intersection / Approach	Arrival Flows		Deg Satn v/c Arcadis Model	Deg Satn v/c	Average Delay (seconds) Arcadis Model	Average Delay (seconds)	LoS Arcadis Model	LoS	95% Queue Length (m) Arcadis Model	95% Queue Length (m)
	Total Veh/hr	Total Veh/hr								
	Arcadis Model									
A-11	4461	4463	1.05	1.05 <sup>2</sup>	63 <sup>1</sup>	62.8 <sup>2</sup>	E <sup>1</sup>	E <sup>2</sup>	348 <sup>2</sup>	347 <sup>2</sup>
New England Hwy Approach	1126	1126	1.05	1.05	66.1	62.8	E	E	348	347
Wine Country Drive Approach	1332	1332	0.46	0.46	10.4	6.6	A	A	27	27
HEX Westbound	1257	1258	0.65	0.66	5.4	3.1	A	A	9	9
HEX Eastbound	746	747	0.52	0.52	13.3	9.5	A	A	23	23

NOTE; (1) Result taken from Arcadis Report dated June 2024 (2) Overall intersection delay/LoS and 95% queue length for intersection reported as the worst approach result per TfNSW requirements.(3) Arcadis model results for individual approaches are from a SIDRA 10 run of the previously submitted Arcadis model issued November 2024

The comparison of results in the above table confirms that the models are calculating similar results and that the New England Highway approach is the approach of concern. Both models indicate oversaturated operation (DoS > 1.0) on the subject approach, and the operational assessment is unchanged.

The SIDRA result summary for this base model is included with this letter as Attachment (i).

### 3 Intersection A-11 Review

As outlined in previous sections, given the modelling approved to date by TfNSW, the sensitivity testing of A-11 did not review the majority of the modelling setup such as roundabout geometry, the review focussed on reducing the number of dwellings but did also include a consideration of the Environment Factor that was used in the Arcadis SIDRA Model. A review of the Environment Factor (EF) was included given the parameter within the Arcadis model was not the SIDRA default setting, hence it was considered prudent to include this within this sensitivity modelling. The following summarises the individual model scenarios tested, with results and discussion presented in the following sections;

- 1) Reduction of EF from 1.20 to 1.15 (5000dw, 20Ha mixed use base model)
- 2) Reduction of EF from 1.20 to 1.10 (5000dw, 20Ha mixed use base model)
- 3) Development threshold of 4500 dwellings, 20Ha commercial/mixed use (EF1.20)
- 4) Development threshold of 4500 dwellings, 20Ha commercial/mixed use (EF1.15)
- 5) Development threshold of 4500 dwellings, 20Ha commercial/mixed use (EF1.10)

#### 3.1 Environment Factor Sensitivity

The Arcadis SIDRA model adopted an Environment Factor of 1.20 for A-11 on all approaches which is within the general range accepted within SIDRA, with the default SIDRA value being 1.0. There was no specific discussion within the Arcadis report as to the reasoning for the selection of this value.

The Environment Factor is a model calibration factor within SIDRA to allow for the effect of different driver behaviour (aggressiveness/alertness) and general characteristics of the roundabout environment in terms of the roundabout design type, visibility, grades, operating speeds and predominant size of vehicle. Capacity increases with decreasing value with default values being 1.0 for the standard SIDRA New South Wales software setup (SIDRA Intersection 10 User Guide Section 2.6.2).

Given the regional interchange context, period of time that the roundabout has already been operating and the long term nature of the forward looking modelling being undertaken, sensitivity testing was undertaken at Environment Factors of 1.15 and 1.10 to assess the robustness of the operational outcomes to environmental assumptions. The approaches to the roundabout have limited if any pedestrians/cyclists and no parking areas which are considerations when selecting an Environment Factor. For the purposes of the sensitivity testing, two scenarios have been reviewed which are a reduction in the EF to 1.15 and 1.10. The results are presented in the following tables.

**TABLE 2 – A-11 SIDRA Results, Scenario 1, 2036 PM Peak 5000Dw 20Ha & EF 1.15**

Intersection / Approach	Total Veh/hr	Deg Satn v/c	Average Delay (sec)	Level of Service (LoS)	95% Queue Length (m)
A-11	4463	0.98 <sup>1</sup>	31.4 <sup>1</sup>	C <sup>1</sup>	194 <sup>1</sup>
New England Hwy Approach	1126	0.98	31.4	C	194
Wine Country Drive Approach (HEX Link Rd)	1332	0.44	6.4	A	26
HEX Westbound	1258	0.66	3.1	A	8
HEX Eastbound	747	0.50	8.9	A	21

*NOTE; (1) Overall intersection delay/LoS and 95% queue length for intersection reported as the worst approach result per TfNSW requirements.*

**TABLE 3 – A-11, SIDRA Results Scenario 2, 2036 PM Peak 5000Dw 20Ha & EF 1.10**

Intersection / Approach	Total Veh/hr	Deg Satn v/c	Average Delay (sec)	Level of Service (LoS)	95% Queue Length (m)
A-11	4463	0.90 <sup>1</sup>	18.5 <sup>1</sup>	B <sup>1</sup>	118 <sup>1</sup>
New England Hwy Approach	1126	0.90	18.5	A	118
Wine Country Drive Approach (HEX Link Rd)	1332	0.42	6.3	A	24
HEX Westbound	1258	0.66	3.0	A	8
HEX Eastbound	747	0.47	8.4	A	19

NOTE; (1) Overall intersection delay/LoS and 95% queue length for intersection reported as the worst approach result per TfNSW requirements.

The results outlined above in Tables 2 and 3 show that the model is sensitive to the Environment Factor selected, particularly on the New England Highway approach which is the critical leg of the roundabout affecting the overall intersection Level of Service. This is not unexpected given that the EF parameter changes the follow-up headway and critical gap acceptance numbers used within SIDRA, directly impacting the capacity of the approach as previously discussed.

It is suggested that future modelling associated with further Huntlee development applications (ie Village 3) should look at this parameter more closely as the development progresses and observations of the HEX interchange under additional development traffic can be undertaken.

### 3.2 Reduced Residential Development Threshold

The Arcadis Stage 2 DA Traffic Report identified the required network upgrades required for the Stage 2 DA on the basis of a total cumulative development of 5000 dwellings and 20Ha of commercial/mixed use GFA, which includes the approved Stage 1 Development area. This was based on a timeframe of 10 years and expected development rollout within this period up to the modelled year being 2036.

In response to TfNSW comments in relation to the Level of Service and queue lengths noted in the Arcadis Report for intersection A-11, it is proposed to assess intersection A-11 at a reduced overall development threshold of 4,500 dwellings and 20Ha of commercial /mixed use GFA. The Huntlee Project is expected to have completed approximately 2,200 dwelling lots by the middle of 2026, as such this proposed lower threshold still provides a significant future development capacity to cover the next 8-10 years, assuming 225-250 dwelling lots are completed by Huntlee each year. This lower threshold will also be sufficient to cover the initial release of lots within the Huntlee Stage 2 Detailed DA footprint, Village 2 Central and South precincts which totals approximately 1720 residential lots which will accommodate up to 1,855 residential dwellings.

In order to model this reduced threshold as a sensitivity analysis on A-11, the trip generation rates and trip distribution parameters from the Stage 2 Traffic & Transport Impact Assessment Report (Arcadis, June 2024, Section as 3.4 & 3.5) will be used to identify the reduced number of trips and relevant turning movements at A-11. This has been reviewed by determining the number of trips from 500 dwellings that would be removed from A-11 in the PM peak using the Arcadis Trip generation rates outlined in Table 4 below, as well as trip distribution parameters in Table 5.

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**TABLE 4 – TRIP GENERATION PARAMETERS**

	AM Peak	PM Peak
Single dwelling trip generation	0.78	0.71
Self containment	25%	25%
Outbound	80%	20%
Inbound	20%	80%

Source: Huntlee Stage 2 Traffic & Transport Impact Assessment Report (June 2024), Section 3.4

**TABLE 5 – TRIP DISTRIBUTION PARAMETERS (Relevant to HEX Roundabout)**

	% of Total Trips
WCD (immediately south-west of HEX Rdbt)	67%
New England Highway (north of HEX Rdbt)	18%
Hunter Expressway (east of HEX Rdbt)	38%
Hunter Expressway (west of HEX Rdbt)	11%

Source: Huntlee Stage 2 Traffic & Transport Impact Assessment Report (June 2024), Section 3.5

Table 6 below summarises the resulting reduction in trips and approach flows to intersection A-11 using the parameters from Table 4 and 5 above which were sourced from the original Arcadis Stage 2 DA traffic report. As outlined below, a reduction of 500 dwellings within the Huntlee Project results in 266 less trips during a PM peak hour, and most relevantly in relation to vehicle movements at A-11 in the PM peak, a reduction of 178 trips.

**TABLE 6 – APPROACH FLOW REDUCTION FOR 4500 DWELLING SCENARIO (PM)**

	PARAMETERS	TRIP & APPROACH FLOW REDUCTIONS
		PM Peak (500 Dwelling Reduction)
Single Dwelling Trip Generation (PM peak)	0.71	355
Self Containment	25%	89
Total Trips Considering Self Containment	-	266
WCD (immediately south-west of HEX Rdbt)	67%	178
New England Highway (north of HEX Rdbt)	18%	48
Hunter Expressway (east of HEX Rdbt)	38%	101
Hunter Expressway (west of HEX Rdbt)	11%	29

Table 7 below further breaks down the reduction in approach flows applicable to intersection A-11 into reductions on individual turning movements at each of the roundabout approaches in the PM peak.

**TABLE 7 – A-11 TURNING MOVEMENT REDUCTIONS FOR 4500 DWELLING SCENARIO (PM)**

	<b>Movement Ratio</b> (from Trip Distribution assumptions)	<b>Turning Movement Reduction</b> (500 dwelling reduction)
<b>Wine Country Drive Approach</b>		
<i>Left turn onto HEX Westbound</i>	11% of outbound trips (2.2% of total trips)	6
<i>Straight to NEH</i>	18% of outbound trips (3.6% of total trips)	10
<i>Right turn onto HEX Eastbound</i>	38% of outbound trips (7.6% of total trips)	20
<b>HEX Eastbound Approach</b>		
<i>Left turn onto NEH</i>	Nil Huntlee Generated Trips	0
<i>Straight onto HEX Eastbound</i>	Nil Huntlee Generated Trips	0
<i>Right turn onto WCD</i>	11% of inbound trips (8.8% of total trips)	23
<b>HEX Westbound Approach</b>		
<i>Left turn onto WCD</i>	38% of inbound trips (30.4% of total trips)	81
<i>Straight onto HEX Westbound</i>	Nil Huntlee Generated Trips	0
<i>Right Turn onto NEH</i>	Nil Huntlee Generated Trips	0
<b>New England Highway Approach</b>		
<i>Left turn onto HEX Eastbound</i>	Nil Huntlee Generated Trips	0
<i>Straight onto WCD</i>	18% of inbound trips (14.4% of total trips)	38
<i>Right turn onto HEX Westbound</i>	Nil Huntlee Generated Trips	0
<b>TOTAL</b>		<b>178</b>

The turning movement reductions outlined above in Table 7 were applied to the 2036 PM turning movements outlined in Appendix B of the Stage 2 Traffic & Transport Impact Assessment Report (Arcadis, June 2024), with the final resulting turning movements to be modelled as outlined below in Table 8.

**TABLE 8 – A-11 TURNING MOVEMENTS COMPARISON (2036 PM, 5000Dw BASE VS 4500Dw)**

	Turning Movements (Arcadis 2036 PM)	Turning Movements (500 dwelling reduction)
<b>Wine Country Drive Approach</b>		
<i>Left turn onto HEX Westbound</i>	275	269
<i>Straight to NEH</i>	408	398
<i>Right turn onto HEX Eastbound</i>	582	562
<b>HEX Eastbound Approach</b>		
<i>Left turn onto NEH</i>	309	309
<i>Straight onto HEX Eastbound</i>	1	1
<i>Right turn onto WCD</i>	399	376
<b>HEX Westbound Approach</b>		
<i>Left turn onto WCD</i>	1031	950
<i>Straight onto HEX Westbound</i>	1	1
<i>Right Turn onto NEH</i>	162	162
<b>New England Highway Approach</b>		
<i>Left turn onto HEX Eastbound</i>	187	187
<i>Straight onto WCD</i>	598	560
<i>Right turn onto HEX Westbound</i>	285	285
<b>TOTAL</b>	<b>4238</b>	<b>4058</b>

The results of the SIDRA model analysis using the reduced turning movements are shown in Table 9.

**TABLE 9 – A-11 SIDRA Results, Scenario 3 – 2036 PM Peak, 4500 DW 20Ha GFA & EF 1.20**

Intersection / Approach	Total Veh/hr	Deg Satn v/c	Average Delay (sec)	Level of Service (LoS)	95% Queue Length (m)
A-11	4276	0.97 <sup>1</sup>	30.7 <sup>1</sup>	C <sup>1</sup>	183 <sup>1</sup>
New England Hwy Approach	1086	0.97	30.7	C	183
Wine Country Drive Approach (HEX Link Rd)	1294	0.45	6.5	A	26
HEX Westbound	1173	0.60	3.1	A	8
HEX Eastbound	723	0.51	9.1	A	21

NOTE; (1) Overall intersection delay/LoS and 95% queue length for intersection reported as the worst approach result per TfNSW requirements. (2) Total veh/hr greater than Table 8 due to Peak Flow Factor of 95% used within SIDRA Model.

The above results indicate that the proposed reduced development threshold of 4,500 dwellings and 20Ha mixed use/commercial GFA can be accommodated on intersection A-11 with the proposed

upgrades outlined in Section 8.1 of the Stage 2 Traffic & Transport Impact Report (Arcadis June 2024), whilst also maintaining the level of service required by TfNSW.

In addition to the above scenario, additional sensitivity model runs were undertaken for the reduced development threshold on A-11 with two different EF parameter scenarios of 1.15 and 1.10 to determine if the intersection remained sensitive to this calibration factor. The results are shown below in Table 10 and 11.

**TABLE 10 – A-11 SIDRA Results, Scenario 4 – 2036 PM Peak, 4500 DW 20Ha GFA & EF1.15**

Intersection / Approach	Total Veh/hr	Deg Satn v/c	Average Delay (sec)	Level of Service (LoS)	95% Queue Length (m)
A-11	4276	0.90 <sup>1</sup>	18.7 <sup>1</sup>	B <sup>1</sup>	115 <sup>1</sup>
New England Hwy Approach	1086	0.90	18.7	B	115
Wine Country Drive Approach (HEX Link Rd)	1294	0.43	6.4	A	24
HEX Westbound	1173	0.60	3.1	A	8
HEX Eastbound	723	0.49	8.6	A	20

NOTE; (1) Overall intersection delay/LoS and 95% queue length for intersection reported as the worst approach result per TfNSW requirements.

**TABLE 11 – A-11 SIDRA Results, Scenario 5 – 2036 PM Peak, 4500 DW 20Ha GFA & EF1.10**

Intersection / Approach	Total Veh/hr	Deg Satn v/c	Average Delay (sec)	Level of Service (LoS)	95% Queue Length (m)
A-11	4276	0.84 <sup>1</sup>	13.8 <sup>1</sup>	A <sup>1</sup>	84 <sup>1</sup>
New England Hwy Approach	1086	0.84	13.8	A	84
Wine Country Drive Approach (HEX Link Rd)	1294	0.41	6.2	A	23
HEX Westbound	1173	0.60	3.0	A	7
HEX Eastbound	723	0.46	8.2	A	19

NOTE; (1) Overall intersection delay/LoS and 95% queue length for intersection reported as the worst approach result per TfNSW requirements.

The results of the additional scenarios summarised above in Table 10 and 11 show that at the lower development yield of 4500 dwellings the SIDRA Model is less sensitive to the Environment Factor, maintaining the same Level of Service with marginal decreases in queue length and delays.

## 4 Sensitivity Test Conclusions

The results of the sensitivity tests (summarised below in Table 12) have identified a reduced dwelling threshold (4500 dwellings for Stage 1 & 2) that will achieve TfNSW's desired Level of Service for intersection A-11. The review also indicates that A-11 is sensitive to the Environment Factor selected in the SIDRA modelling as the New England Highway leg of the roundabout approaches its theoretical capacity.

**TABLE 12 – Intersection A-11 Sensitivity Modelling Results (PM)**

	Level of Service (LoS)	95% Queue Length (m)
Base Scenario (5000dw, 20Ha GFA, EF1.20)	E	347
Scenario 1 (5000dw, 20Ha GFA, EF1.15)	C	194
Scenario 2 (5000dw, 20Ha GFA, EF1.10)	B	118
Scenario 3 (4500dw, 20Ha GFA, EF1.20)	C	183
Scenario 4 (4500dw, 20Ha GFA, EF1.15)	B	115
Scenario 5 (4500dw, 20Ha GFA, EF1.10)	A	84

The results outlined above in Table 12 have been used as the basis of the response to the TfNSW request which is outlined in the Section 5 below.

## 5 TfNSW Recommendation Response

Following completion of the sensitivity modelling outlined in this letter, responses to the TfNSW recommendations of 4 December 2025 are provided below;

### TfNSW Recommendations & Response

- 1. Sensitivity testing of the modelling be undertaken to identify the number of lots that could be released prior to unacceptable impact on the intersection (Los C or D as minimum), which could then be conditioned, and/or***

The sensitivity testing as summarised in Section 4 of this letter has shown that a Level of Service B for intersection A-11 can be achieved by reducing the proposed number of dwellings able to be developed to 4,500. It is therefore proposed that the DA Condition relevant to intersection A-11 should consider a maximum development yield of 4,500 dwellings and 20Ha of mixed use/commercial in lieu of 5,000 dwellings and 20Ha of mixed use/commercial nominated in the Arcadis report dated July 2024.

- 2. An appropriate upgrade solution be determined for the total number of lots so that it may be conditioned, with a view to providing flexibility in the condition for further modelling to inform an alternative upgrade solution, if appropriate to the satisfaction of TfNSW.***

The Huntlee Stage 2 DA submission is seeking approval for the following;

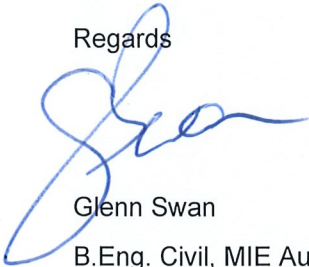
- Detailed DA approval for 1,855 residential dwellings
- Concept DA approval for 2,067 residential dwellings (requires future detailed subdivision DA to DPHI)

The current Huntlee Stage 1 Development Consent issued by DPHI allows for a total of 2,631 residential dwellings. Assuming the current Stage 2 DA is approved without further amendment, only a total of 4,486 residential dwellings would then be permitted for construction. The concept DA areas will require future Detailed DA submissions which would require further separate consideration of traffic modelling and impacts for review by TfNSW and DPHI.

On the basis of the above, it is suggested that the current Stage 2 DA framework of Detailed and Concept areas provides the necessary flexibility for TfNSW and DPHI, requiring further traffic modelling and investigations for any additional future detailed subdivision DA's over and above the total 4,486 dwellings that would be approved following the issue of a Consent for Huntlee Stage 2.

Should you wish to discuss the above, please contact the undersigned.

Regards



Glenn Swan

B.Eng. Civil, MIE Aust

[glenn@swanprojects.com.au](mailto:glenn@swanprojects.com.au)

Attachments

- (i) A-11 Base Scenario (5000dw, 20Ha) SIDRA Movement Summary & Approach Display Results
- (ii) A-11 Reduced Dwelling Threshold (Scenario 3 - 4500dw, 20Ha) Movement Summary & Approach Display Results
- (iii) A-11 Reduced Dwelling Threshold (Scenario 4 - 4500dw, 20Ha, EF1.15) Movement Summary & Approach Display Results
- (iv) SIDRA 10 Model File /Huntlee Stage 2\_DA Feb 2026 A\_11 Review SPA.sipx

# MOVEMENT SUMMARY

 Site: [1] A-11 Branxton Interchange 2036 PM (Huntlee 5000dw  
20Ha A11 BASE MODEL)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site  
Site Category: (None)  
Roundabout  
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Total HV ]	[ Total HV ]	v/c	sec		[ Veh. ]	[ Dist ]				km/h
			veh/h	%	veh/h	%				veh	m				
South: HEX Link Road															
1b	L3	All MCs	289	2.5	289	2.5	0.178	1.6	LOS A	0.0	0.0	0.00	0.22	0.00	58.0
2	T1	All MCs	429	1.2	429	1.2	0.464	4.4	LOS A	3.8	26.8	0.72	0.52	0.72	52.4
3a	R1	All MCs	613	3.1	613	3.1	0.464	10.4	LOS A	3.8	26.8	0.74	0.63	0.74	50.6
Approach			1332	2.4	1332	2.4	0.464	6.6	LOS A	3.8	26.8	0.57	0.50	0.57	52.5
SouthEast: HEX off ramp WB															
21b	L3	All MCs	1085	1.5	1085	1.5	0.650	1.9	LOS A	0.0	0.0	0.00	0.21	0.00	57.5
21	L2	All MCs	1	0.0	1	0.0	0.227	4.7	LOS A	1.2	8.7	0.77	0.72	0.77	50.9
23a	R1	All MCs	171	3.7	171	3.7	0.227	10.9	LOS A	1.2	8.7	0.77	0.72	0.77	50.6
23	R2	All MCs	1	0.0	1	0.0	0.227	11.7	LOS A	1.2	8.7	0.77	0.72	0.77	50.6
Approach			1258	1.8	1258	1.8	0.650	3.1	LOS A	1.2	8.7	0.11	0.28	0.11	56.2
North: NEH															
7b	L3	All MCs	197	4.8	197	4.8	1.054	79.7	LOS F	48.8	347.5	1.00	2.89	6.11	26.4
8	T1	All MCs	629	1.2	629	1.2	1.054	79.8	LOS F	48.8	347.5	1.00	2.89	6.11	24.9
9a	R1	All MCs	300	1.1	300	1.1	0.547	16.1	LOS B	3.6	25.6	0.83	0.94	1.09	48.8
Approach			1126	1.8	1126	1.8	1.054	62.8	LOS E	48.8	347.5	0.96	2.37	4.77	29.7
NorthWest: HEX off ramp EB															
27b	L3	All MCs	325	3.2	325	3.2	0.523	7.2	LOS A	3.1	22.1	0.81	0.87	0.99	53.5
27	L2	All MCs	1	0.0	1	0.0	0.523	7.4	LOS A	3.1	22.1	0.81	0.87	0.99	53.5
29a	R1	All MCs	420	2.3	420	2.3	0.497	11.3	LOS A	3.2	22.6	0.80	0.83	0.93	49.2
29	R2	All MCs	1	0.0	1	0.0	0.497	12.5	LOS A	3.2	22.6	0.80	0.83	0.93	50.0
Approach			747	2.7	747	2.7	0.523	9.5	LOS A	3.2	22.6	0.81	0.85	0.96	50.9
All Vehicles			4463	2.1	4463	2.1	1.054	20.3	LOS B	48.8	347.5	0.58	0.97	1.56	44.3

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

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

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

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

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

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

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Project: C:\Users\gswan\Desktop\OneDrive\Documents\SWAN PROJECT ADVISORY\Projects\Huntlee\Traffic Modelling\Stage 2 DA\Feb 2026 A\_11 Sensitivity Review\Huntlee Stage 2\_DA Feb 2026 A\_11 Review SPA.sipx

# LEVEL OF SERVICE

Approach Level of Service

Site: [1] A-11 Branxton Interchange 2036 PM (Huntlee 5000dw  
20Ha A11 BASE MODEL)

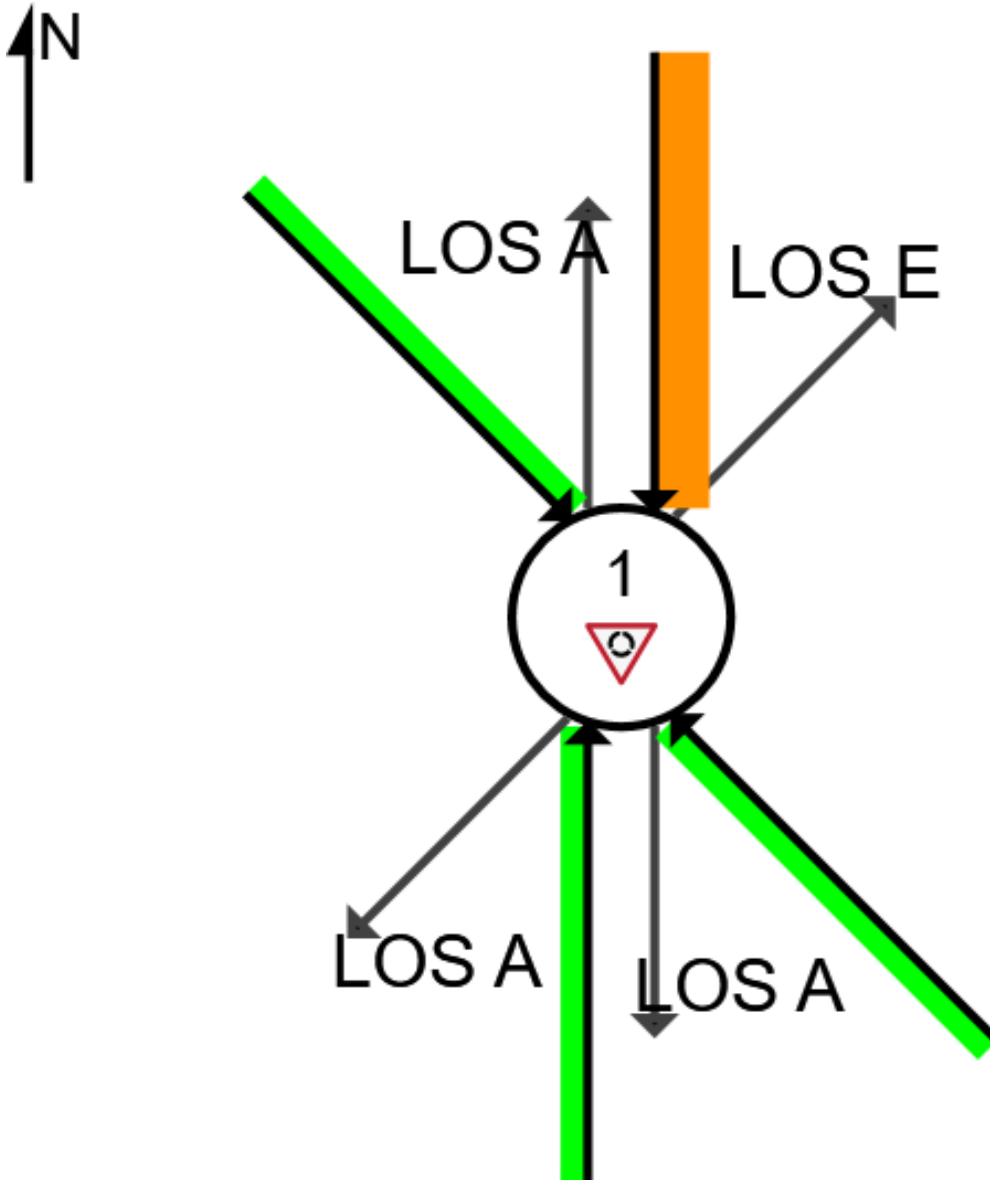
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes



Colour code based on Level of Service



Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

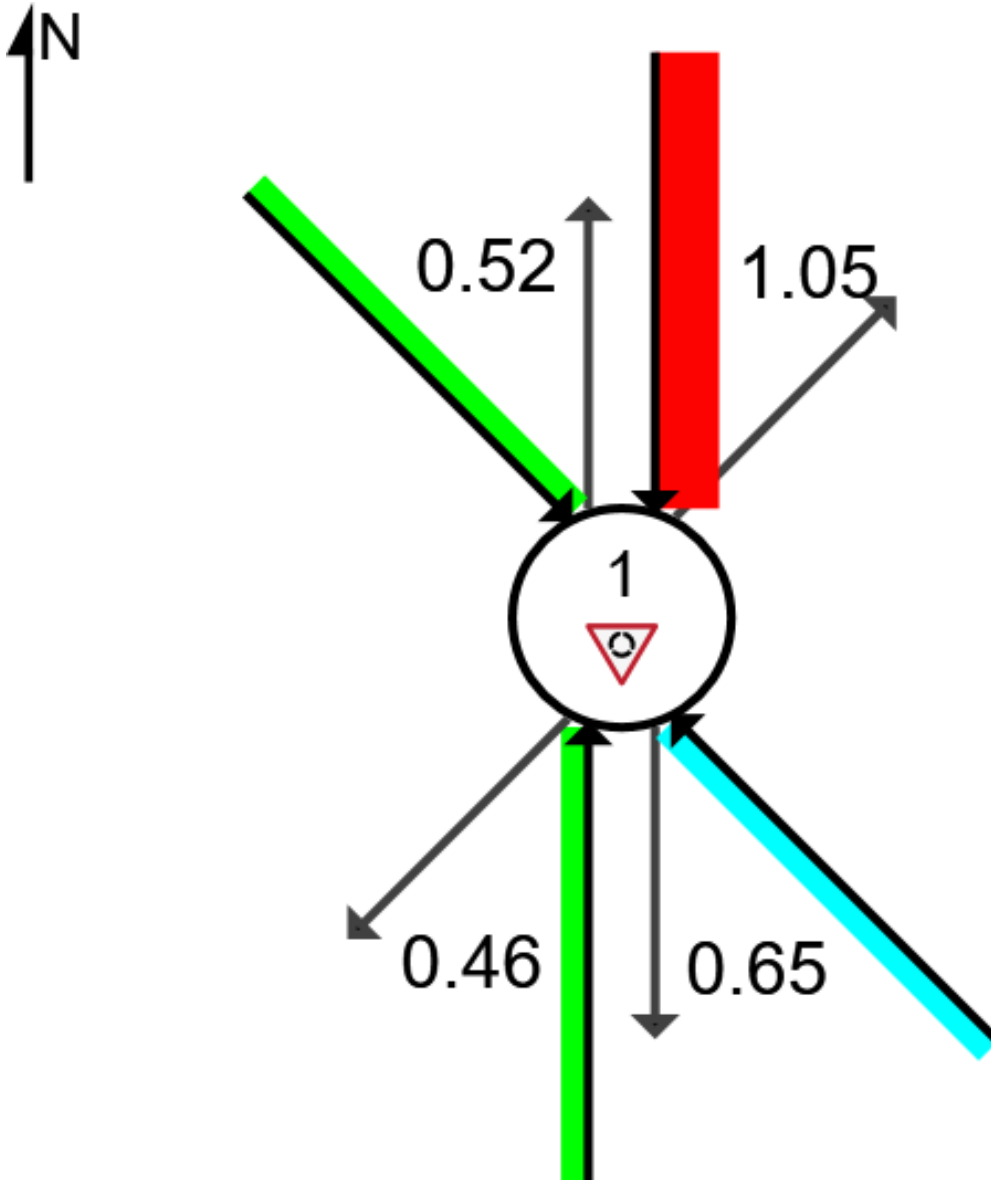
# DEGREE OF SATURATION

Ratio of Arrival Flow to Capacity, v/c ratio (worst lane for the approach)

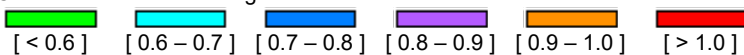
Site: [1] A-11 Branxton Interchange 2036 PM (Huntlee 5000dw  
20Ha A11 BASE MODEL)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site  
Site Category: (None)  
Roundabout  
Site Scenario: 1 | Local Volumes



Colour code based on Degree of Saturation



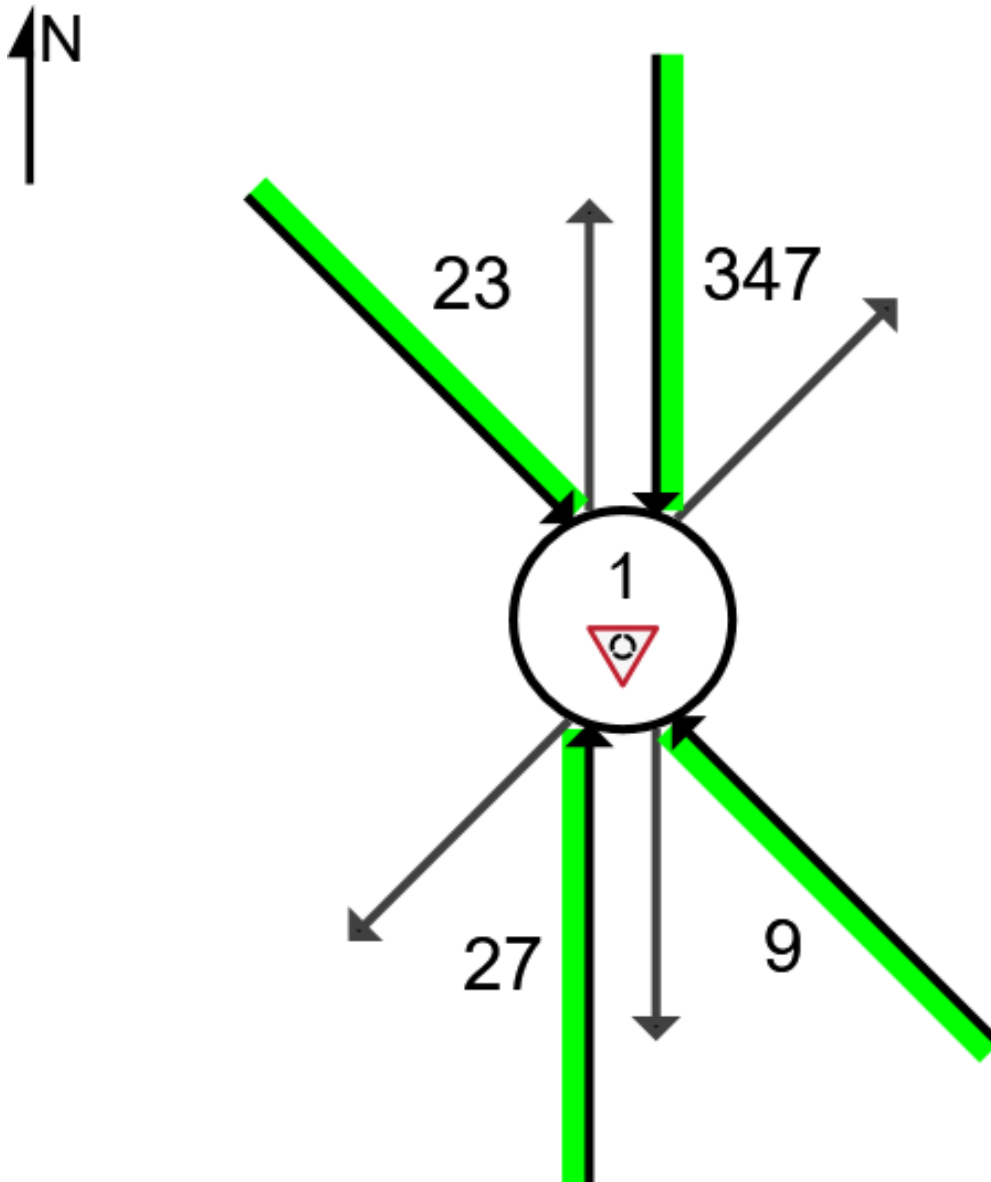
# QUEUE DISTANCE (PERCENTILE)

Largest 95% Back of Queue Distance for any lane on the approach (metres)

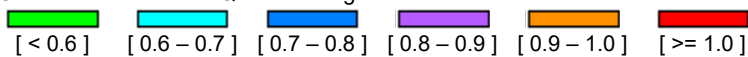
Site: [1] A-11 Branxton Interchange 2036 PM (Huntlee 5000dw  
20Ha A11 BASE MODEL)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site  
Site Category: (None)  
Roundabout  
Site Scenario: 1 | Local Volumes



Colour code based on Queue Storage Ratio



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

# MOVEMENT SUMMARY

**Site: [1 (6)] A-11 Branxton Interchange 4500dw 2036 PM**  
 (Huntlee 4500dw 20Ha A11 BASE MODEL)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Total HV ]	[ Total HV ]	v/c	sec		[ Veh. ]	[ Dist ]				km/h
			veh/h	%	veh/h	%				veh	m				
South: HEX Link Road															
1b	L3	All MCs	283	2.6	283	2.6	0.174	1.6	LOS A	0.0	0.0	0.00	0.22	0.00	58.0
2	T1	All MCs	419	1.3	419	1.3	0.449	4.4	LOS A	3.6	25.6	0.72	0.51	0.72	52.5
3a	R1	All MCs	592	3.2	592	3.2	0.449	10.3	LOS A	3.6	25.6	0.73	0.62	0.73	50.6
Approach			1294	2.4	1294	2.4	0.449	6.5	LOS A	3.6	25.6	0.56	0.50	0.56	52.5
SouthEast: HEX off ramp WB															
21b	L3	All MCs	1000	1.6	1000	1.6	0.600	1.8	LOS A	0.0	0.0	0.00	0.22	0.00	57.6
21	L2	All MCs	1	0.0	1	0.0	0.222	4.6	LOS A	1.2	8.5	0.76	0.71	0.76	50.9
23a	R1	All MCs	171	3.7	171	3.7	0.222	10.7	LOS A	1.2	8.5	0.76	0.71	0.76	50.6
23	R2	All MCs	1	0.0	1	0.0	0.222	11.6	LOS A	1.2	8.5	0.76	0.71	0.76	50.7
Approach			1173	1.9	1173	1.9	0.600	3.1	LOS A	1.2	8.5	0.11	0.29	0.11	56.2
North: NEH															
7b	L3	All MCs	197	4.8	197	4.8	0.974	36.5	LOS C	25.7	183.3	1.00	1.88	3.41	37.5
8	T1	All MCs	589	1.3	589	1.3	0.974	36.7	LOS C	25.7	183.3	1.00	1.88	3.41	36.1
9a	R1	All MCs	300	1.1	300	1.1	0.523	15.2	LOS B	3.4	23.9	0.81	0.91	1.03	49.3
Approach			1086	1.8	1086	1.8	0.974	30.7	LOS C	25.7	183.3	0.95	1.61	2.76	39.8
NorthWest: HEX off ramp EB															
27b	L3	All MCs	325	3.2	325	3.2	0.510	7.0	LOS A	3.0	21.4	0.80	0.86	0.96	53.6
27	L2	All MCs	1	0.0	1	0.0	0.510	7.1	LOS A	3.0	21.4	0.80	0.86	0.96	53.7
29a	R1	All MCs	396	2.4	396	2.4	0.461	10.9	LOS A	2.8	20.1	0.78	0.80	0.88	49.8
29	R2	All MCs	1	0.0	1	0.0	0.461	12.2	LOS A	2.8	20.1	0.78	0.80	0.88	50.5
Approach			723	2.8	723	2.8	0.510	9.1	LOS A	3.0	21.4	0.79	0.83	0.92	51.4
All Vehicles			4276	2.2	4276	2.2	0.974	12.2	LOS A	25.7	183.3	0.58	0.78	1.06	49.1

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

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

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

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

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

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

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Project: C:\Users\gswan\Desktop\OneDrive\Documents\SWAN PROJECT ADVISORY\Projects\Huntlee\Traffic Modelling\Stage 2 DA\Feb 2026 A\_11 Sensitivity Review\Huntlee Stage 2\_DA Feb 2026 A\_11 Review SPA.sipx

# LEVEL OF SERVICE

Approach Level of Service

Site: [1 (6)] A-11 Branxton Interchange 4500dw 2036 PM  
(Huntlee 4500dw 20Ha A11 BASE MODEL)

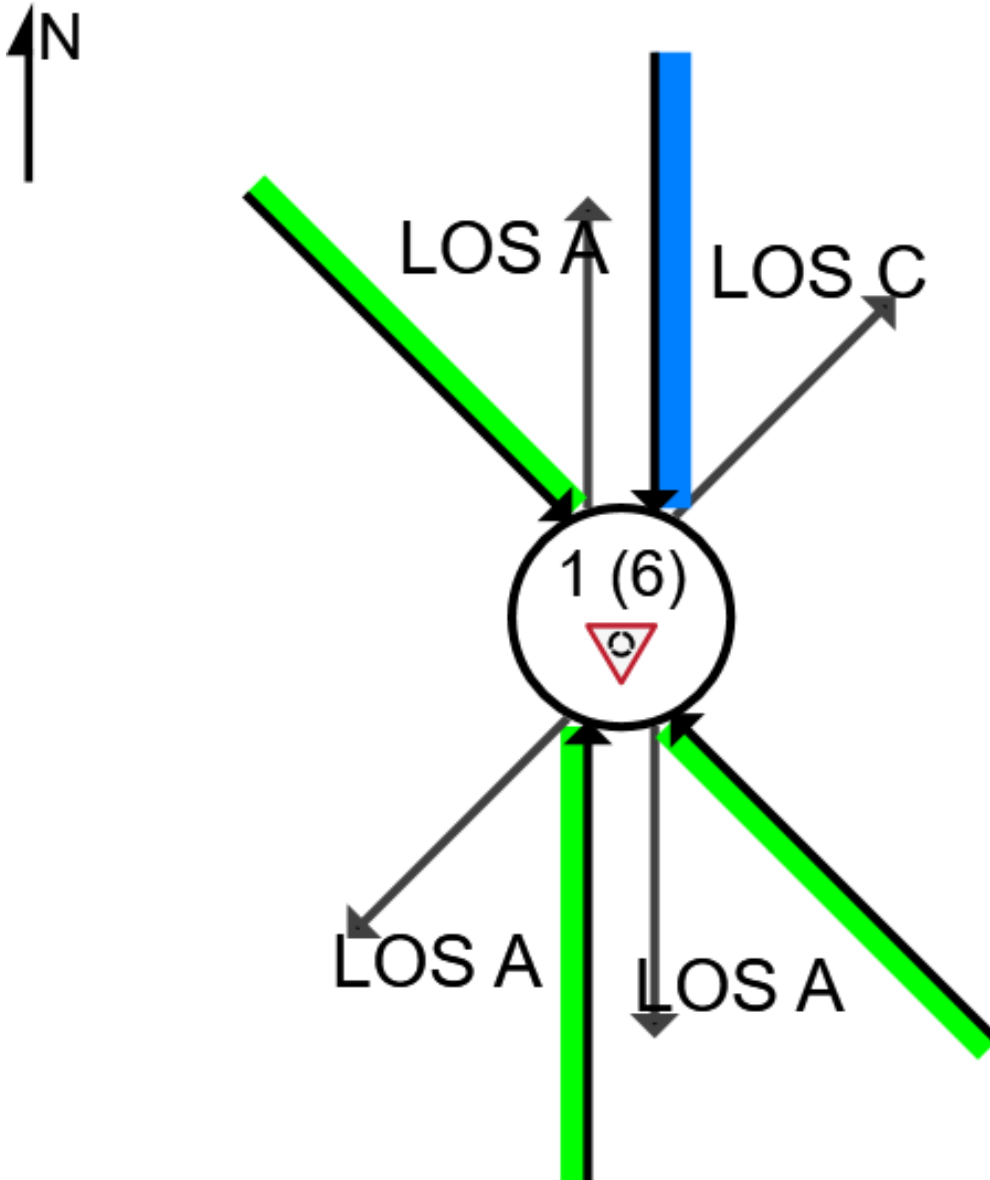
Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes



Colour code based on Level of Service



Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

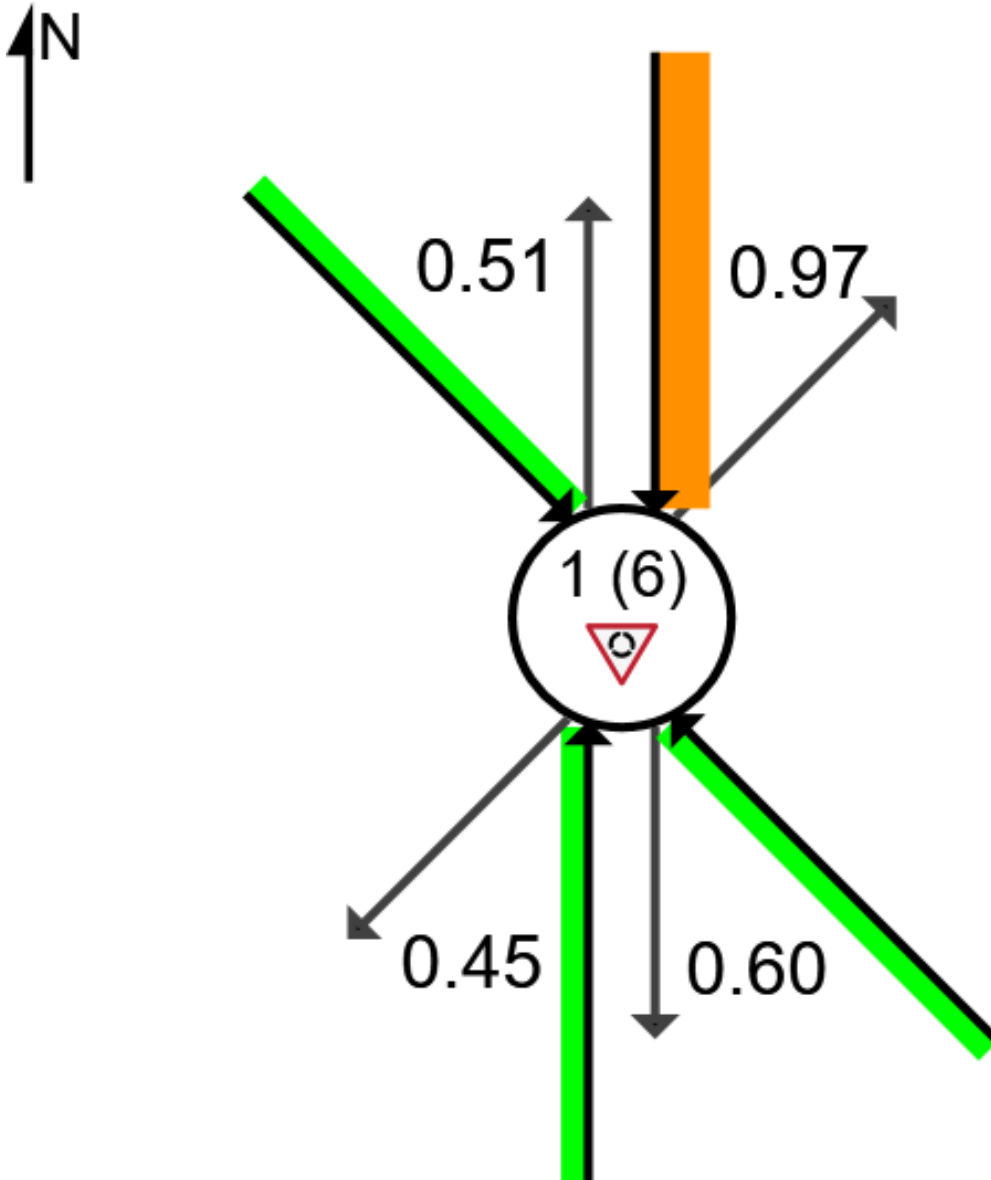
# DEGREE OF SATURATION

Ratio of Arrival Flow to Capacity, v/c ratio (worst lane for the approach)

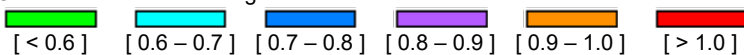
Site: [1 (6)] A-11 Branxton Interchange 4500dw 2036 PM  
(Huntlee 4500dw 20Ha A11 BASE MODEL)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site  
Site Category: (None)  
Roundabout  
Site Scenario: 1 | Local Volumes



Colour code based on Degree of Saturation



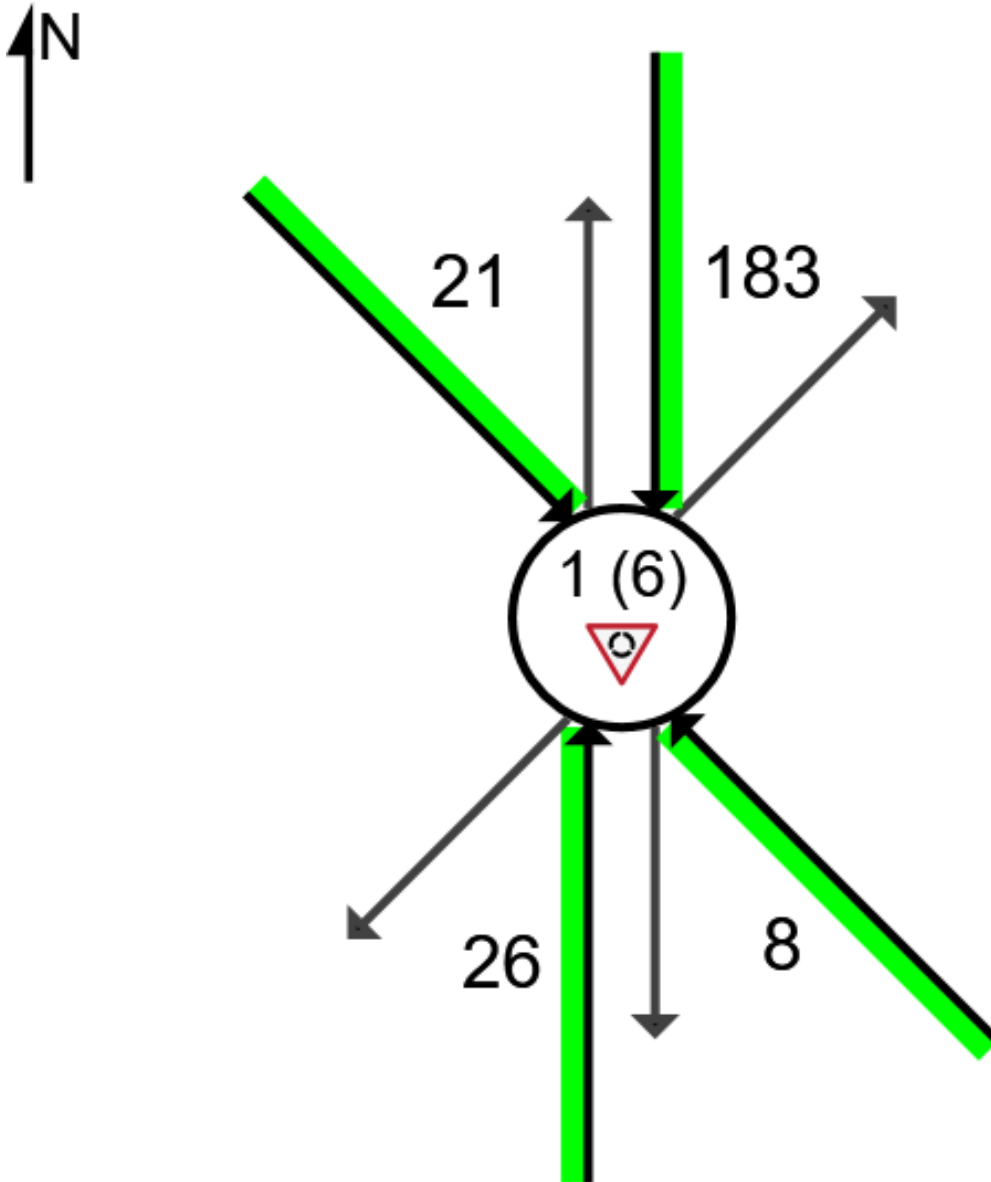
# QUEUE DISTANCE (PERCENTILE)

Largest 95% Back of Queue Distance for any lane on the approach (metres)

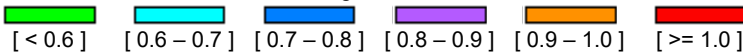
Site: [1 (6)] A-11 Branxton Interchange 4500dw 2036 PM  
(Huntlee 4500dw 20Ha A11 BASE MODEL)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site  
Site Category: (None)  
Roundabout  
Site Scenario: 1 | Local Volumes



Colour code based on Queue Storage Ratio



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

# MOVEMENT SUMMARY

 Site: [1 (7)] A-11 Branxton Interchange 4500dw 2036 PM  
EF1.15 (Huntlee 4500dw 20Ha A11 EF 1.15)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[ Total HV ]	[ Total HV ]	[ Total HV ]	[ Total HV ]	v/c	sec		[ Veh. ]	[ Dist ]				km/h
			veh/h	%	veh/h	%				veh	m				
South: HEX Link Road															
1b	L3	All MCs	283	2.6	283	2.6	0.174	1.6	LOS A	0.0	0.0	0.00	0.22	0.00	58.0
2	T1	All MCs	419	1.3	419	1.3	0.428	4.2	LOS A	3.4	24.4	0.70	0.50	0.70	52.5
3a	R1	All MCs	592	3.2	592	3.2	0.428	10.2	LOS A	3.4	24.4	0.71	0.61	0.71	50.7
Approach			1294	2.4	1294	2.4	0.428	6.4	LOS A	3.4	24.4	0.55	0.49	0.55	52.6
SouthEast: HEX off ramp WB															
21b	L3	All MCs	1000	1.6	1000	1.6	0.600	1.8	LOS A	0.0	0.0	0.00	0.22	0.00	57.6
21	L2	All MCs	1	0.0	1	0.0	0.204	4.3	LOS A	1.1	8.0	0.75	0.70	0.75	50.9
23a	R1	All MCs	171	3.7	171	3.7	0.204	10.5	LOS A	1.1	8.0	0.75	0.70	0.75	50.7
23	R2	All MCs	1	0.0	1	0.0	0.204	11.4	LOS A	1.1	8.0	0.75	0.70	0.75	50.7
Approach			1173	1.9	1173	1.9	0.600	3.1	LOS A	1.1	8.0	0.11	0.29	0.11	56.2
North: NEH															
7b	L3	All MCs	197	4.8	197	4.8	0.904	20.4	LOS B	16.2	115.1	1.00	1.40	2.27	44.3
8	T1	All MCs	589	1.3	589	1.3	0.904	20.6	LOS B	16.2	115.1	1.00	1.40	2.27	43.2
9a	R1	All MCs	300	1.1	300	1.1	0.481	14.0	LOS A	3.0	21.3	0.80	0.88	0.96	49.8
Approach			1086	1.8	1086	1.8	0.904	18.7	LOS B	16.2	115.1	0.94	1.26	1.91	45.3
NorthWest: HEX off ramp EB															
27b	L3	All MCs	325	3.2	325	3.2	0.486	6.5	LOS A	2.8	20.0	0.79	0.84	0.93	53.9
27	L2	All MCs	1	0.0	1	0.0	0.486	6.6	LOS A	2.8	20.0	0.79	0.84	0.93	53.9
29a	R1	All MCs	396	2.4	396	2.4	0.424	10.4	LOS A	2.5	18.1	0.77	0.75	0.83	49.8
29	R2	All MCs	1	0.0	1	0.0	0.424	11.7	LOS A	2.5	18.1	0.77	0.75	0.83	50.6
Approach			723	2.8	723	2.8	0.486	8.6	LOS A	2.8	20.0	0.78	0.79	0.88	51.5
All Vehicles			4276	2.2	4276	2.2	0.904	9.0	LOS A	16.2	115.1	0.57	0.68	0.83	51.1

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

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

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

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

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

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

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Project: C:\Users\gswan\Desktop\OneDrive\Documents\SWAN PROJECT ADVISORY\Projects\Huntlee\Traffic Modelling\Stage 2 DA\Feb 2026 A\_11 Sensitivity Review\Huntlee Stage 2\_DA Feb 2026 A\_11 Review SPA.sipx

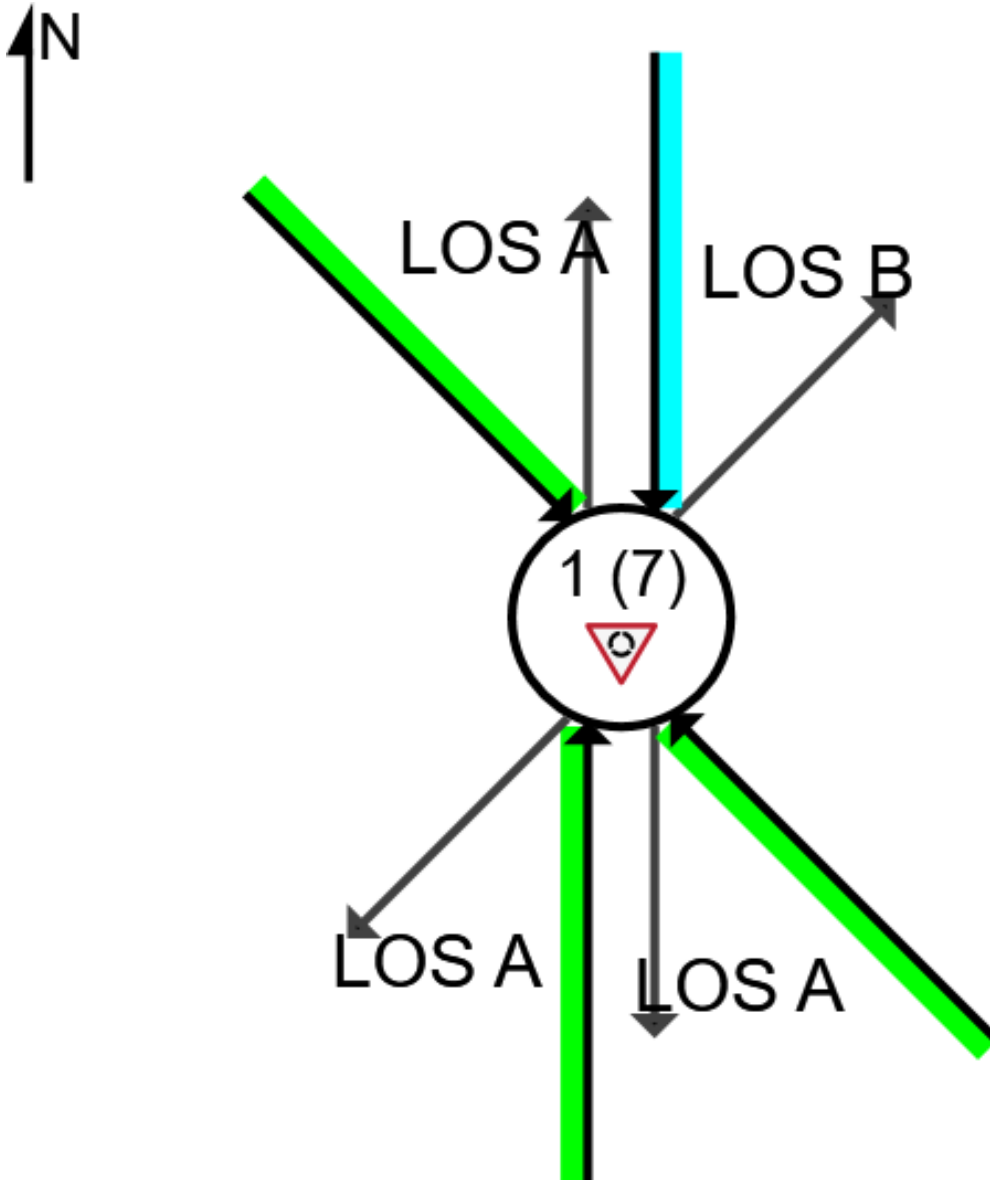
# LEVEL OF SERVICE

Approach Level of Service

Site: [1 (7)] A-11 Branxton Interchange 4500dw 2036 PM  
EF1.15 (Huntlee 4500dw 20Ha A11 EF 1.15)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site  
Site Category: (None)  
Roundabout  
Site Scenario: 1 | Local Volumes



Colour code based on Level of Service



Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).  
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

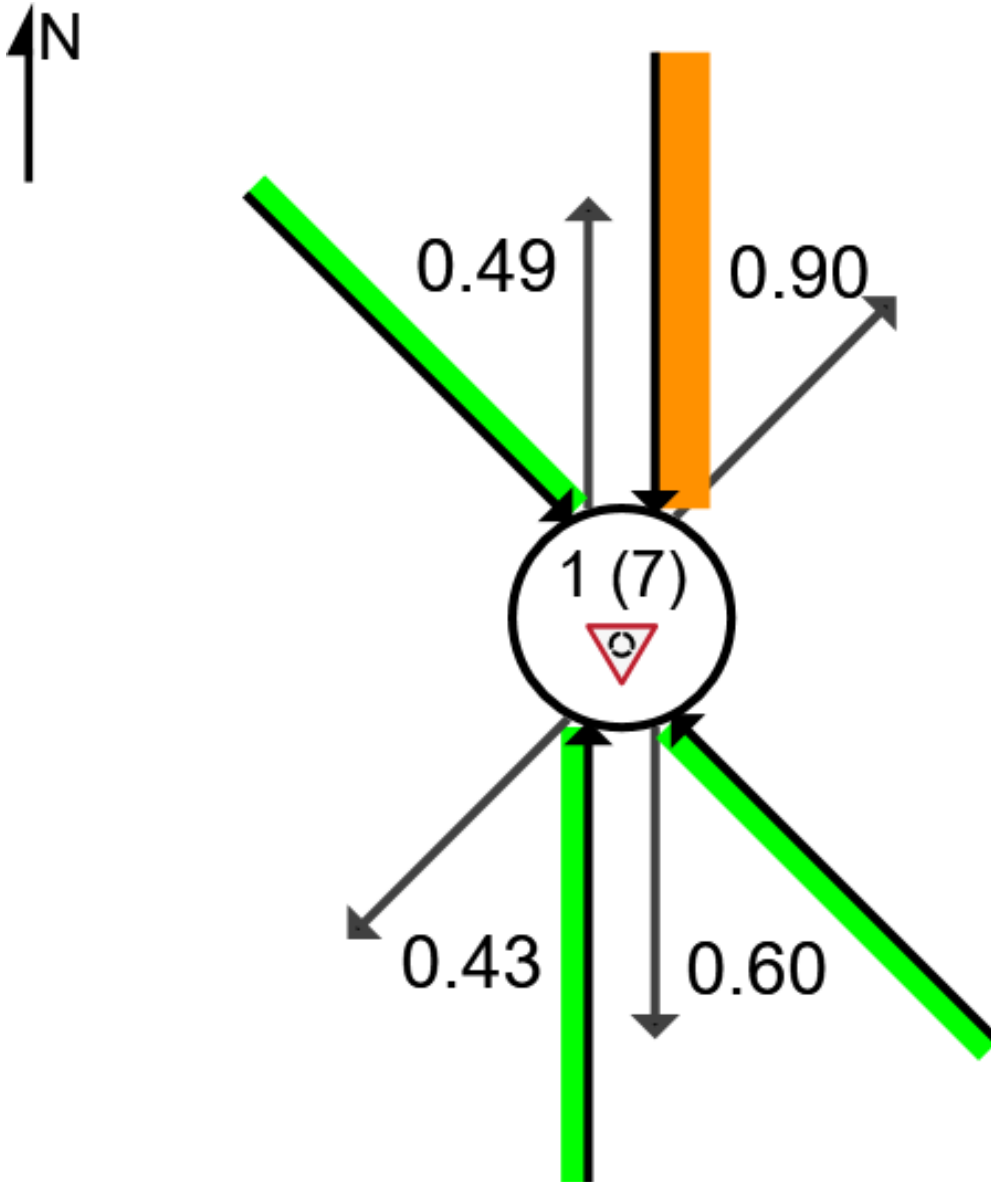
# DEGREE OF SATURATION

Ratio of Arrival Flow to Capacity, v/c ratio (worst lane for the approach)

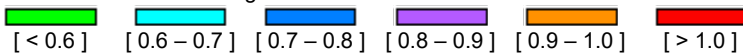
Site: [1 (7)] A-11 Branxton Interchange 4500dw 2036 PM  
EF1.15 (Huntlee 4500dw 20Ha A11 EF 1.15)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site  
Site Category: (None)  
Roundabout  
Site Scenario: 1 | Local Volumes



Colour code based on Degree of Saturation



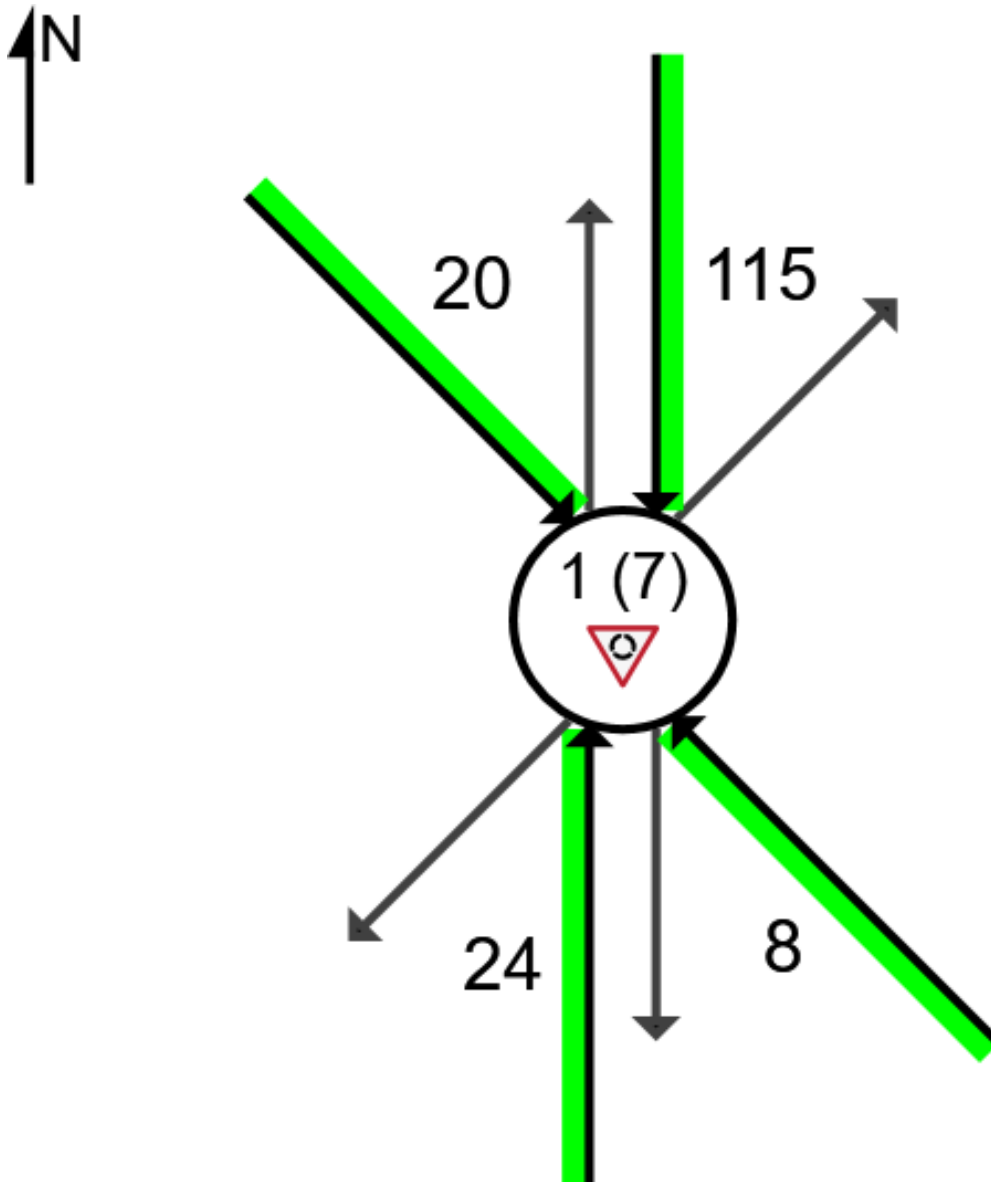
# QUEUE DISTANCE (PERCENTILE)

Largest 95% Back of Queue Distance for any lane on the approach (metres)

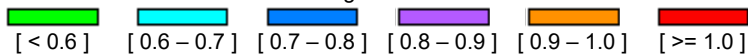
Site: [1 (7)] A-11 Branxton Interchange 4500dw 2036 PM  
EF1.15 (Huntlee 4500dw 20Ha A11 EF 1.15)

Output produced by SIDRA INTERSECTION Version: 10.0.8.241

New Site  
Site Category: (None)  
Roundabout  
Site Scenario: 1 | Local Volumes



Colour code based on Queue Storage Ratio



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