Appendix J

Traffic Impact Assessment

David Pavey Pty Ltd trading as

Pavey Consulting Services

Specialising in

- Traffic Studies and Transportation Planning
- Road Safety Reviews
- Civil and Structural Design
- Project Management and Contract Administration
- Mediation and Government Relations

Traffic Impact Assessment

Greenspot Hunter Valley Nutrient Recycling Facility Lot 10 DP1204457, 74 Lemington Road, Ravensworth, NSW

12 March 2019 Rev 0

Contact Details
David Pavey
Pavey Consulting Services
Email; paveyconsulting@iinet.net.au
Phone: 0419696212

Prepared By

David Pavey
Director
B.E (Civil) Grad Dip LGE. LGE Cert. MAIPM, MAICD, MAITPM

David Pavey Pty Ltd
23 Stanley Street
Merewether
NSW 2291
ABN 12 150 774 413
ACN 150 774 413

Table of Contents

1. Introduction

Bettergrow, trading as 'Greenspot Hunter Valley' (the Applicant), is proposing to undertake the expansion and operation of an existing nutrient recycling facility (the Proposal) on Lot 10 DP1204457, 74 Lemington Road, Ravensworth, NSW (the site)

Current composting operations at the site are approved by DA140/2016 to receive up to 76,000 tonnes per annum (tpa) of biosolids and garden organics. The Applicant for DA140/2016 was Bettergrow Pty Ltd who are contracted by AGL Macquarie (the Land Owner) to supply manufactured soil ameliorant and rehabilitation products for use, in part, for approved rehabilitation works at the Ravensworth No. 2 mine and Ravensworth South mine.

The subject application seeks to authorise the receipt of up to 200,000tpa of organic materials, including new feed sources of food waste, to facilitate the sale of a portion of the composted material to third parties.

Pavey Consulting Services has been commissioned by Bettergrow to assess the following traffic and transport implications:

- Details of all traffic types and volumes likely to be generated during construction and operation, including a description of haul routes. Traffic flows are to be shown diagrammatically to a level of detail sufficient for easy interpretation.
- Plans demonstrating how all vehicles likely to be generated during construction and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network.
- An assessment of the predicated impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model.
- Plans of any proposed road upgrades, infrastructure works or new roads required for the development.

The results of the above analyses are outlined in the following sections.

2. Limits of Report

This report takes into account the particular instructions and requirements of the client. Pavey Consulting has taken care in the preparation of this report, however it neither accepts liability nor responsibility whatsoever in respect of:

- Any use of this report by any third party;
- Any third party whose interests may be affected by any decision made regarding the contents of this report; and/or
- Any conclusion drawn resulting from omission or lack of full disclosure by the client, or the clients' consultants.

3. Site Location

The site is located at Ravensworth No. 2 mine and is formally described as Lot 10 DP1204457 at 74 Lemington Road, Ravensworth, NSW. The site is cleared of native vegetation and is located on part of a capped open cut mining void which has been filled with ash from the AGL Bayswater Power Station.

Access to the facility is provided via an internal access road off Lemington Road which connects to the New England Highway. The site location is shown on Figure 1 and 2. The existing composting

facility is located on a graded hardstand area, surrounded by perimeter bunding.

The key roads that provide access to the site are the New England Highway and Lemington Road. The New England Highway is part of the national highway linking Sydney to Brisbane and is an alternative route to the Pacific Highway. In the vicinity of the site the highway has a speed limit of 100km/h on an undivided carriageway with overtaking lanes.

The most recent traffic volume data from the Roads and Martime Services count station (ID 6156) north of Singleton indicates the average daily traffic volumes are 13984 vehicles per day (two way).

Lemington Road is a rural two-way two-lane road that predominantly provides access to the various coal mines in the area. It has a speed limit of 100km/h and provides links between The Golden Highway and the New England Highway.

4. Proposal

Site Access

An internal haul road, with access from Lemington Road, currently exists on the site. Prior to the commencement of the existing composting operations the haul road was widened to accommodate incoming and outgoing heavy vehicle movement, the road surface was also upgraded to allow all-weather access, and surface water drainage was installed to divert stormwater away from the roadway onto suitably stable areas.

No additional works are proposed on internal access roads.

Traffic Generation

As a result of the expansion of the facility, the quantities of organic materials received and dispatched from the site will increase. Accordingly, truck movements to and from the site will also increase. However, not all finished compost will be exported from the Ravensworth site as a portion will be utilised across the Ravensworth rehabilitation areas.

The projected outgoing traffic volumes below assume all finished compost will leave the site via Lemington road, hence these figures are regarded as worst-case scenario.

Based on the increased annual production amount of 200,000 tpa, the following traffic volumes are anticipated:

- Peak truck movements maximum of 108 per day; and
- Peak light vehicles movements maximum of 38 per day.

On the basis that all deliveries and compost transfers will require in-bound and out-bound movements, the worst-case traffic movements generated from the increased operations would be up to 146 movements per day (73 in-bound and 73 out-bound). The actual traffic movements will be less than this due to the use of as many inbound trucks as possible to also take out finished product for delivery to sites.

The additional traffic movements on these routes would pass through the intersection of New England Highway and Lemington Road.

As shown in Figure 4.1 and Figure 4.2, this intersection is a seagull intersection, which minimizes the impacts of the right-turn traffic movements on the through traffic flows on New England Highway and allows vehicles turning right out of Lemington Road to do so in two stages.

It is assumed that heavy vehicles movements will be distributed evenly throughout the day across the 12-hour operation period from 6 am to 6 pm.

It is assumed that light vehicle movements will be distributed evenly across the two hours at the start and end of the day.

The additional vehicle movements added into the intersection during morning and evening peak hour would likely be:

108 heavy vehicles per day distributed as follows:

- 80% to and from the north to other AGL rehabilitation projects accessed via the Bayswater Power Station and Liddell Power Station).
- 20% from the south from Singleton and Newcastle.

38 light vehicles per day distributed as follows:

- 20% to and from the north to other AGL rehabilitation projects accessed via the Bayswater Power Station and Liddell Power Station).
- 80% from the south from Singleton and Newcastle.

The project site and surrounding area have no public transport facilities and minimal active transport activities. Therefore, the project would likely have no impacts on public transport and active transport.

Proposed Haulage Routes

The proposed truck routes are shown in Figure 4.1 and Figure 4.2.

Figure 4.1

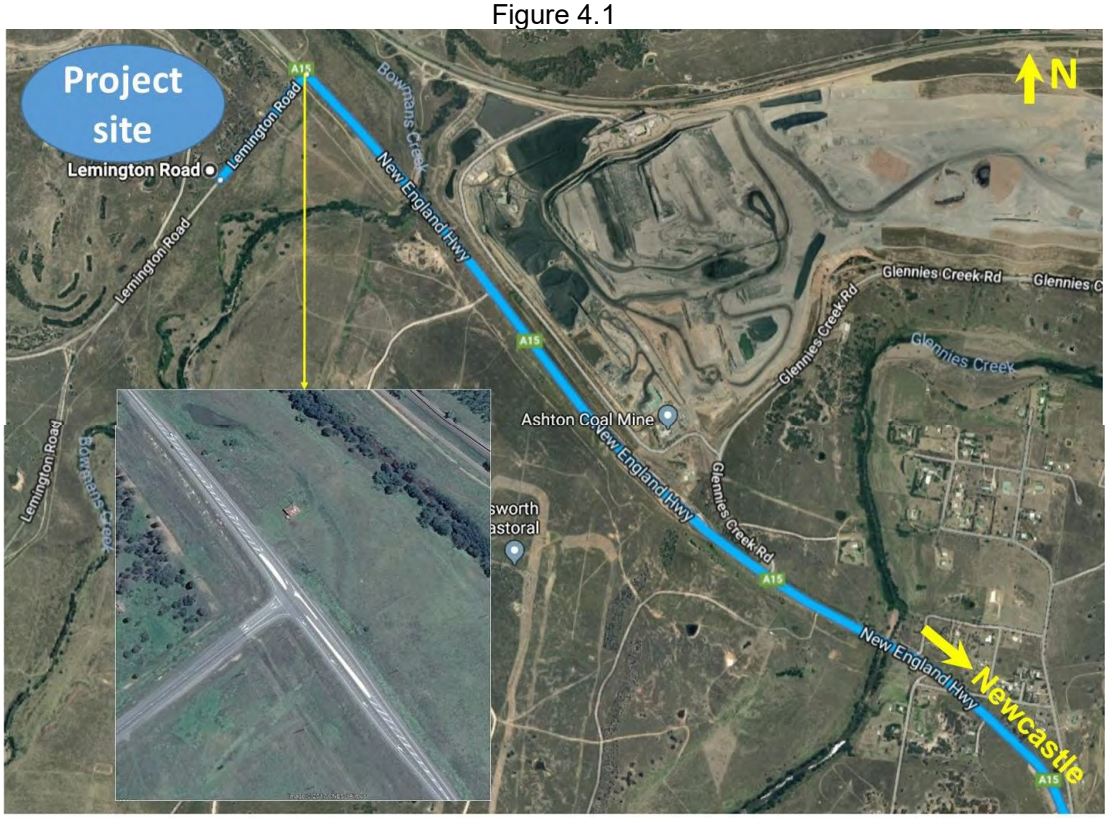
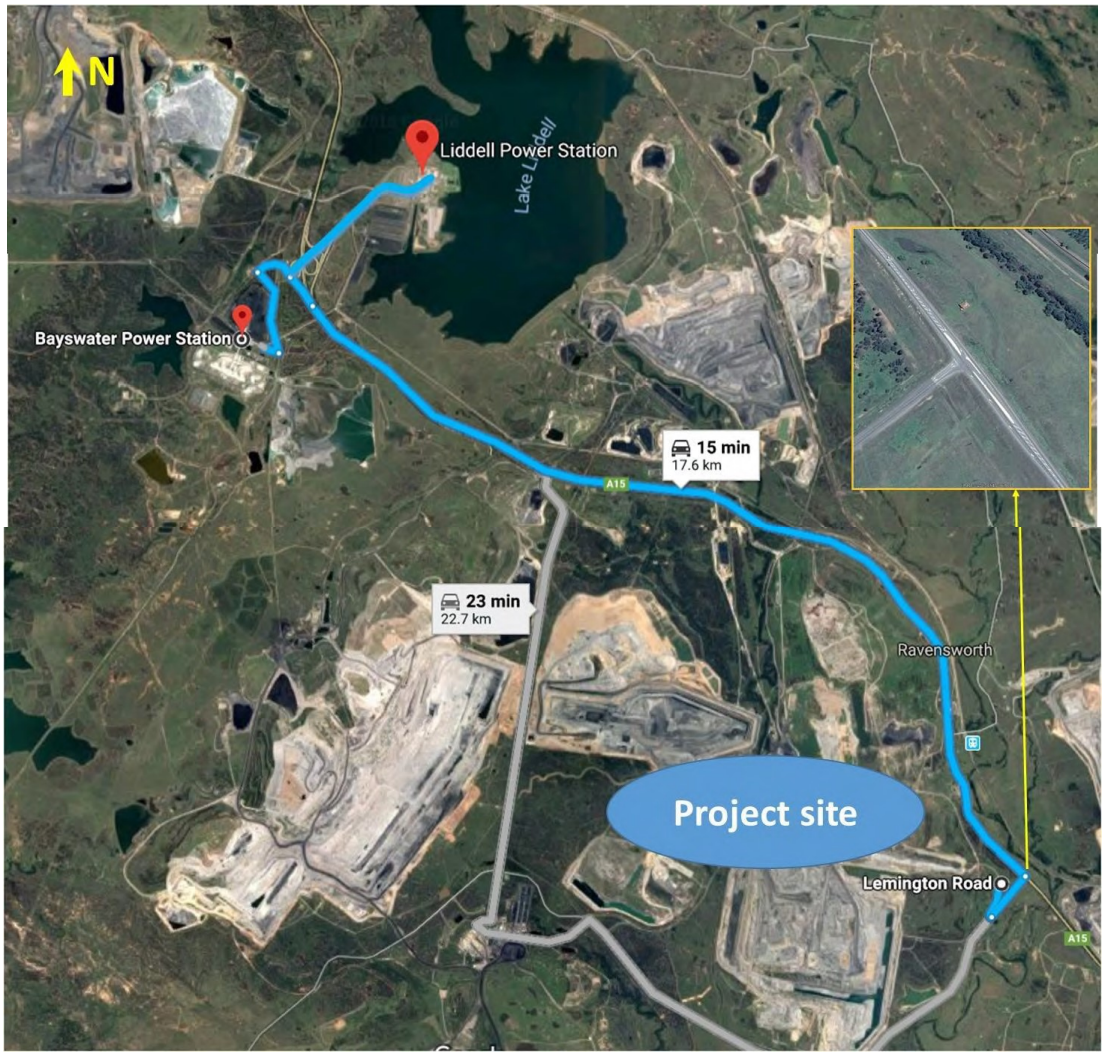


Figure 4.2



Hours of Operation

Hours of operation are expected to be from 6 am to 6 pm, Monday to Saturday.

5. On-site Parking Provisions

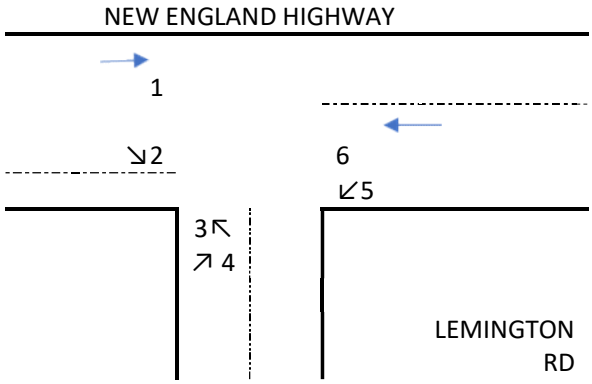
All staff and contractor light vehicles will be parked within the site adjacent to the site office. Similarly, heavy vehicles and plant will be parked and stored within the site.

6. Effect on adjacent Roadway

Establishment of current traffic volumes

A traffic count was carried out on the 10/2/19 between the hours of 6:30 am and 8:30 am to determine all traffic movements at the intersection

In summary the following Peak hour movements were determined as shown below:



Path	Total 6:30 am to 7:30	Total 7:30 am to 8:30 am
1 - LV	229	464
1 - HV	54	111
2 - LV	8	9
2 - HV	4	5
3 - LV	17	4
3 - HV	5	5
4 - LV	33	15
4 - HV	4	5
5 - LV	33	29
5 - HV	8	5
6 - LV	371	290
6 - HV	62	75

Based on the most recent Traffic volume data from the Roads and Martime Services count station (ID 6156) north of Singleton indicates the average growth rate is as follows:

Year	Direction	Classification	Daily	Total	Increase in 3 yrs	Ave Yearly Increase	Ave Annual Growth
2015	Northbound	All Vehicles	6617				
2015	Southbound	All Vehicles	6630				
				13247			
2018	Southbound	All Vehicles	7095				
2018	Northbound	All Vehicles	6889				
				13984	737	246	1.80%

Effect on Intersection Performance

New England Highway and Lemington Rd

To determine if the proposed movements would have an effect on the operations of the existing intersection a SIDRA analysis was carried out.

Full details of the outputs are found in Appendix B, however a summary of this analysis is provided below.

Traffic Modelling Assumption

- Analysis was carried out for AM peak periods only as this is worst case scenario for traffic.
- Existing intersection geometry, including lane lengths and widths were measured using aerial images on the NSW Government's Six Maps.
- SIDRA default values were adopted.
- Level of Services Method is set to RTA NSW.

Intersection Operation

How adequate the capacity of an intersection performs is judged by whether it can physically and operationally cater for the traffic using it.

The performances of the intersections relevant to the proposal have been assessed using the intersection modelling SIDRA software. The model provides parameters of the performance of an intersection including the Degree of Saturation (DoS) and the average delay per vehicle. It provides an accurate and consistent guide to the performance of an intersection under the different traffic flow scenarios. The recommended criteria for evaluating capacity of intersections are shown in Table 3.1.

Table 1 Criteria for Evaluating Capacity of Intersection

Level of Service	Degree of Saturation (DoS)	Ave. Delay/ Veh. (Secs)
A/B good operation	less than 0.80	Less than 28
C satisfactory	0.80 to 0.85	29-42
D poor but manageable	0.85 to 0.90	43-56
E at capacity	0.90 to 1.0	57-70
F unsatisfactory, extra capacity required	Over 1.0	Over 70

Table 2 Intersection Performance (AM Peak) Through Movements

Criteria	**Base**	**Base with Develop**	**Base with 10 years growth)**	**10 Years growth With Develop**
South Bound New England Highway				
Av. Delay (sec)	0.0	0.0	0.0	0.0
Level of Service	A	A	A	A
North Bound New England Highway				
Av. Delay (sec)	0.0	0.0	0.0	0.0
Level of Service	A	A	A	A

Table 3 Intersection Performance (AM Peak Right Turn into Lemington Rd)

Criteria	**Base**	**Base with Develop**	**Base with 10 years growth)**	**10 Years growth With Develop**
Av. Delay (sec)	9.5	10.4	11.8	10.7
Level of Service	A	A	A	A
Q. Length- (m)	20	20	20	20

Key:; Q=Queue

Table 4 Intersection Performance (AM peak Right turn out of Lemington Rd)

Criteria	Base	Base with Devel	Base with 10 years growth)	10 Years growth With Develop
Av. Delay (sec)	26.5	27.8	40.9	37.3
Level of Service	B	B	C	C
Q. Length- (m)	20	20	20	20

Table 5 Intersection Performance (AM peak Left turn into Lemington Rd)

Criteria	Base	Base with Devel	Base with 10 years growth)	10 Years growth With Develop
Av. Delay (sec)	5.8	5.8	5.8	5.8
Level of Service	A	A	A	A
Q. Length- (m)	0	0	0	20

Table 5 Intersection Performance (AM peak Left turn out of Lemington Road)

Criteria	Base	Base with Develop	Base with 10 years growth)	10 Years growth With Develop
Av. Delay (sec)	15.8	16.2	18	17.5
Level of Service	B	B	B	B
Q. Length- (m)	20	20	20	20

The modelling outputs as shown in Table 2 through 6 illustrate that there is no deterioration of Av Delay, Level of Service, or Que length when development traffic is added to either of the 2018 or 2028 simulations of the intersection.

In 2028 (in either scenarios) the intersection operates at Level of Service of C or above on all legs and turn movements in the morning peak hour.

Further the que length for the right turn into Lemington Road under the development scenario in 10 years of 20 m does not exceed the 200 m available for storage of the current road layout.

The relatively low number of additional traffic movements generated by the modification would be within the normal day to day variation of traffic volumes and would have minimal impacts on this intersection.

Lemington Road and Private Access Road

The relatively low number of additional traffic movements generated by the modification would be within the normal day to day variation of traffic volumes and would have minimal impacts on this intersection.

7. Conclusions

It is proposed to increase the capacity of the Ravensworth Composting Facility from 76,000 tonnes per year to 200,000 tonnes per year and transport composted materials to wholesale markets and the Bayswater and Liddell power stations for use in rehabilitation activities.

The proposal expansion would generate 108 heavy vehicle movements per day and 38 light vehicle movements per day.

Given the efficient operation of seagull intersections and its existing performance, the impact of the proposal on the intersection would be minimal as no deterioration on level of service is evident from the SIDRA modelling.

Based on the above assessment, I consider that that this development will have no unacceptable traffic implications on the operation of:

- Intersection of New England Highway and Lemington Road,
- Intersection of Lemington Road and Private Access Road, or
- the surrounding area.

Based on the findings of this report, Pavey Consulting Services is of the opinion that there are no traffic engineering related matters that should preclude approval of this development application.

Prepared by:
David Pavey
B.E (Civil) Grad Dip LGE. LGE Cert MAICD, MAIPM
Director,
David Pavey Pty Ltd

Appendix A
SIDRA OUTPUTS

INPUT VOLUMES

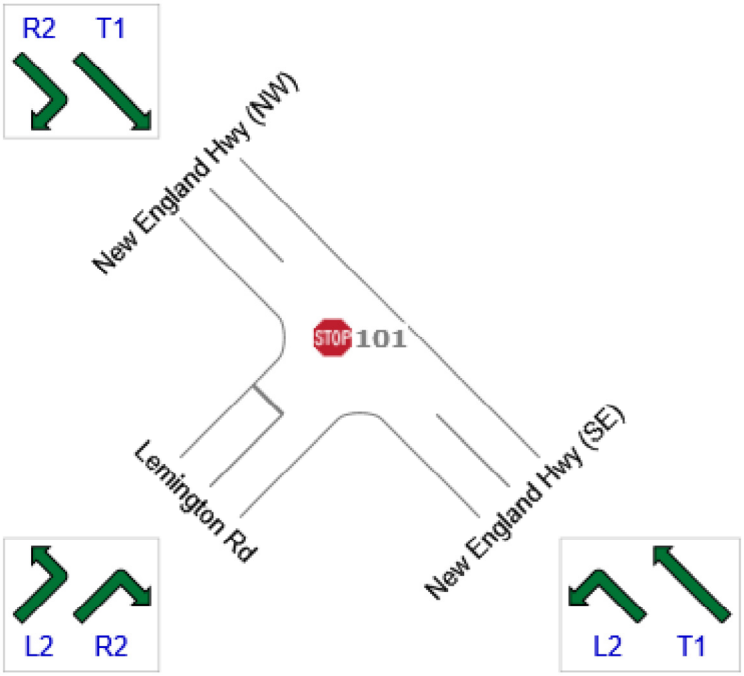
Vehicles and pedestrians per 60 minutes

Site: 101 [New England Hwy-Lemington Rd_2018_AM]

New England Hwy/Lemington Rd
2018 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

Volume Display Method: Separate

	R2	T1
Tot	15	293
LV	10	239
HV	5	54



	L2	R2
Tot	12	25
LV	5	19
HV	7	6

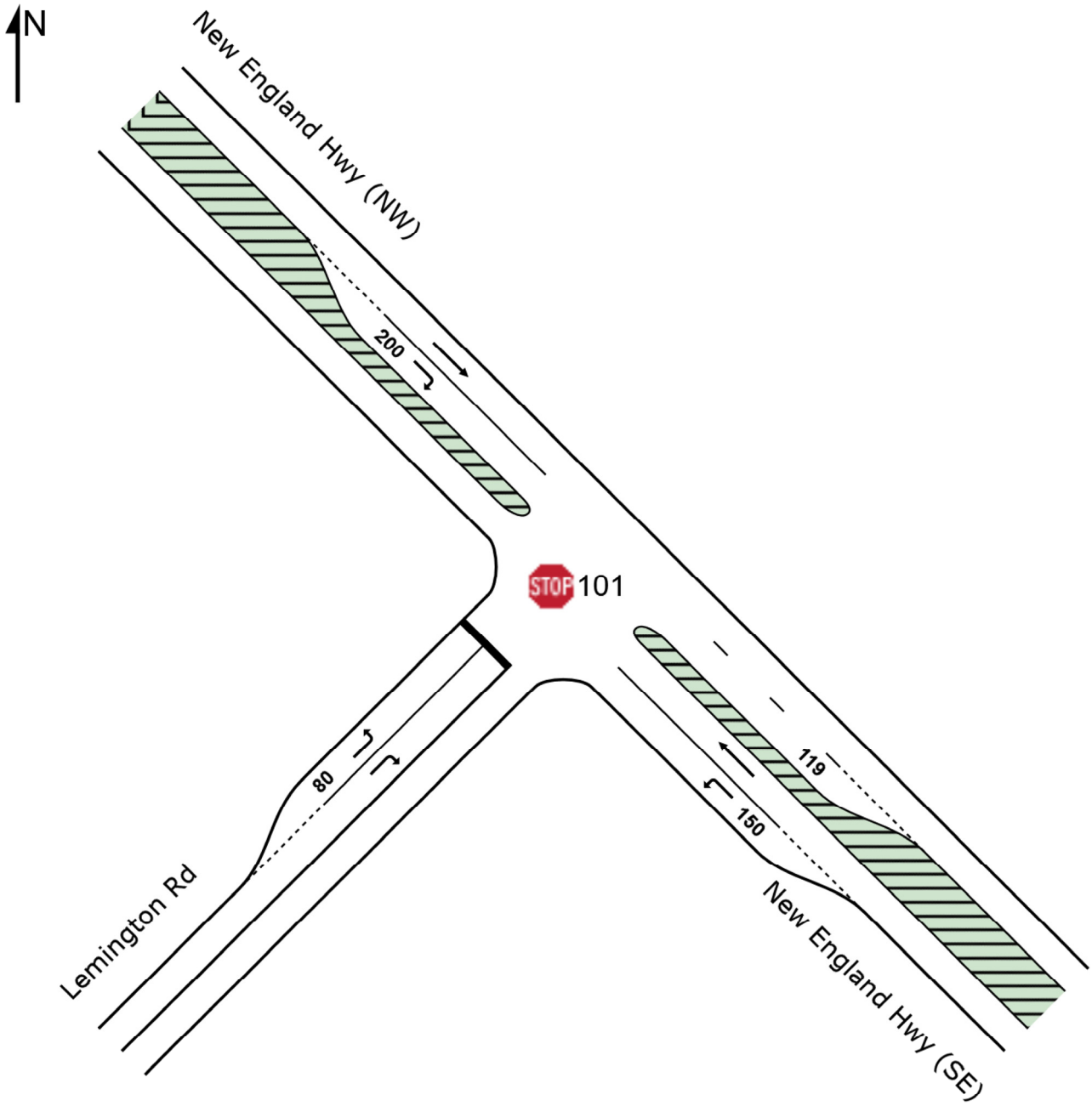
	L2	T1
Tot	42	412
LV	32	341
HV	10	71

	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
SE: New England Hwy (SE)	454	373	81
NW: New England Hwy (NW)	308	249	59
SW: Lemington Rd	37	24	13
Total	799	646	153

SITE LAYOUT

Site: 101 [New England Hwy-Lemington Rd_2018_AM]

New England Hwy/Lemington Rd
2018 AM 0800-0900
Site Category: (None)
Stop (Two-Way)



MOVEMENT SUMMARY

Site: 101 [New England Hwy-Lemington Rd_2018_AM]

New England Hwy/Lemington Rd
2018 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: New England Hwy (SE)												
21	L2	44	23.8	0.028	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.6
22	T1	434	17.2	0.247	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		478	17.8	0.247	0.6	NA	0.0	0.0	0.00	0.05	0.00	59.2
NorthWest: New England Hwy (NW)												
28	T1	308	18.4	0.177	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
29	R2	16	33.3	0.025	9.5	LOS A	0.1	0.8	0.53	0.70	0.53	49.4
Approach		324	19.2	0.177	0.5	NA	0.1	0.8	0.03	0.03	0.03	59.3
SouthWest: Lemington Rd												
30	L2	13	58.3	0.029	15.8	LOS B	0.1	1.0	0.54	0.96	0.54	46.8
32	R2	26	24.0	0.135	26.5	LOS B	0.4	3.8	0.81	1.01	0.81	41.4
Approach		39	35.1	0.135	23.0	LOS B	0.4	3.8	0.72	0.99	0.72	43.0
All Vehicles		841	19.1	0.247	1.6	NA	0.4	3.8	0.04	0.09	0.04	58.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

QUEUE DISTANCE (%ILE)

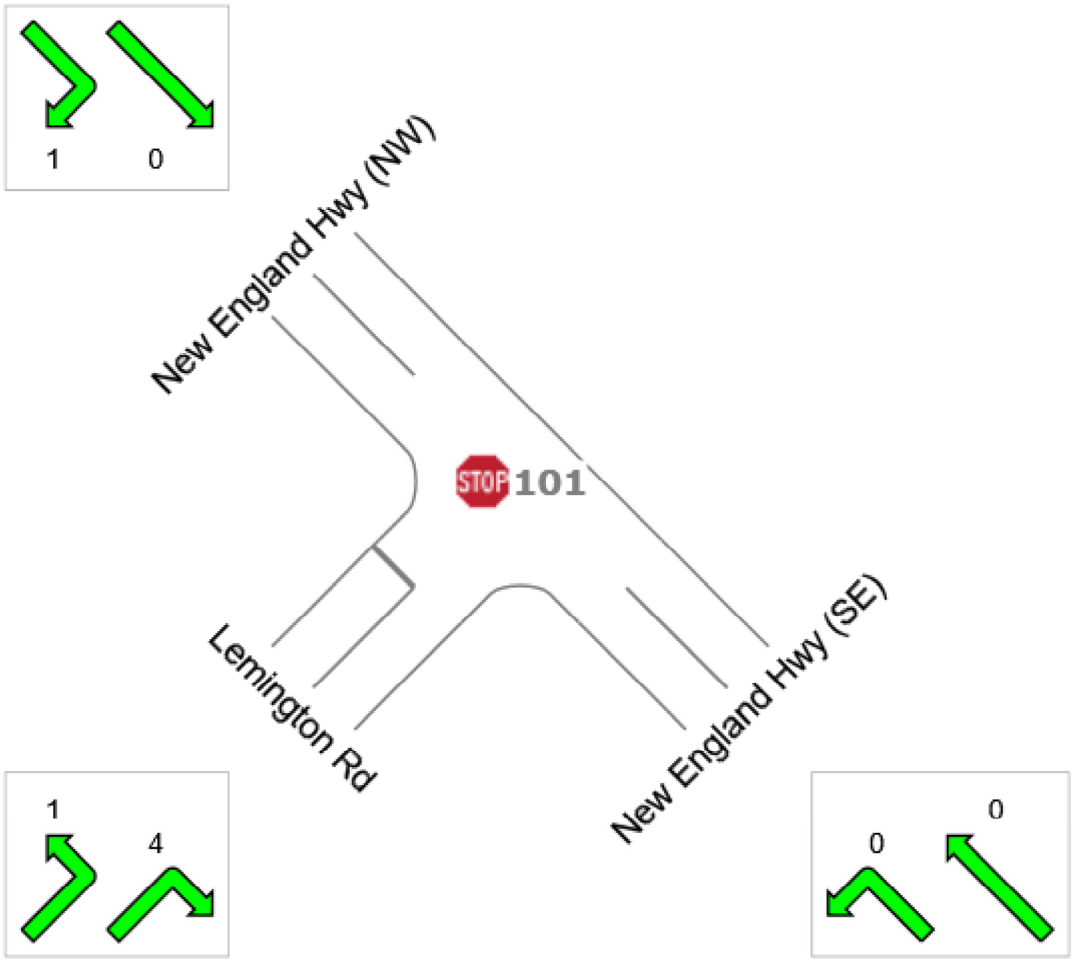
Largest 95% Back of Queue Distance for any lane used by vehicle movement (metres)

Site: 101 [New England Hwy-Lemington Rd_2018_AM]

New England Hwy/Lemington Rd
2018 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

All Movement Classes

	Approaches			Intersection
	Southeast	Northwest	Southwest	
Vehicle Queue (%ile)	0	1	4	4



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

QUEUE DISTANCE (AVER)

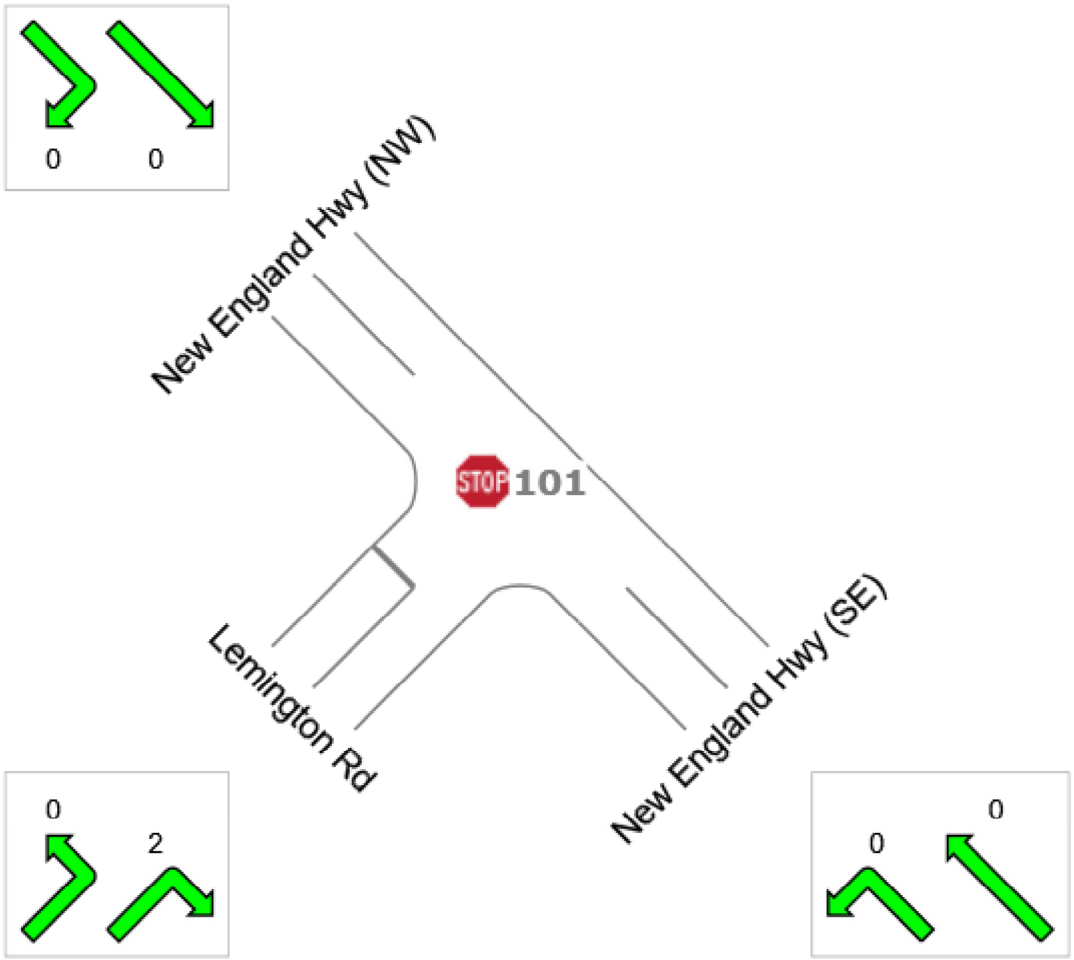
Average Back of Queue Distance for any lane used by vehicle movement (metres)

Site: 101 [New England Hwy-Lemington Rd_2018_AM]

New England Hwy/Lemington Rd
2018 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

All Movement Classes

	Approaches			Intersection
	Southeast	Northwest	Southwest	
Queue Distance (Aver)	0	0	2	2



Colour code based on Queue Storage Ratio

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INPUT VOLUMES

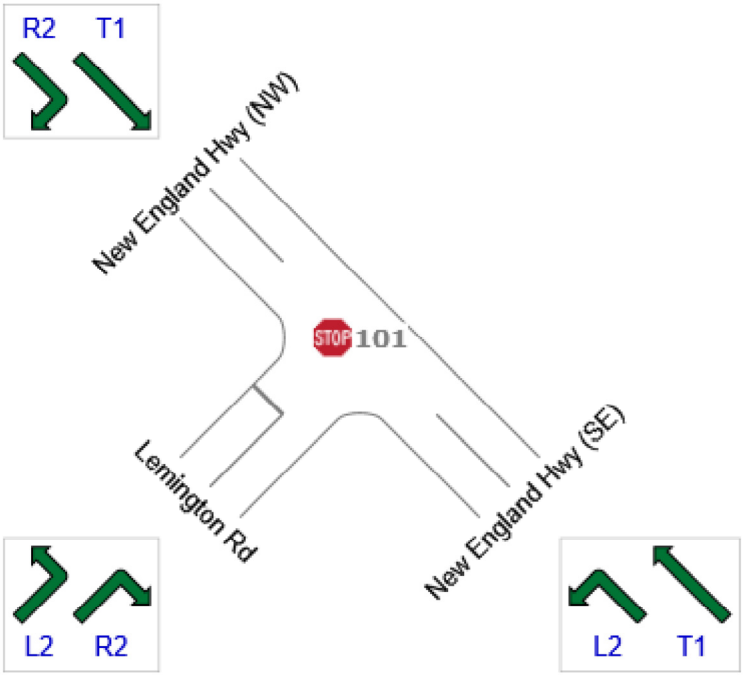
Vehicles and pedestrians per 60 minutes

Site: 101 [New England Hwy-Lemington Rd_2018_AM_withDev]

New England Hwy/Lemington Rd
2018 AM 0800-0900 (with Development)
Site Category: (None)
Stop (Two-Way)

Volume Display Method: Separate

	R2	T1
Tot	26	293
LV	14	239
HV	12	54



	L2	R2
Tot	23	39
LV	9	31
HV	14	8

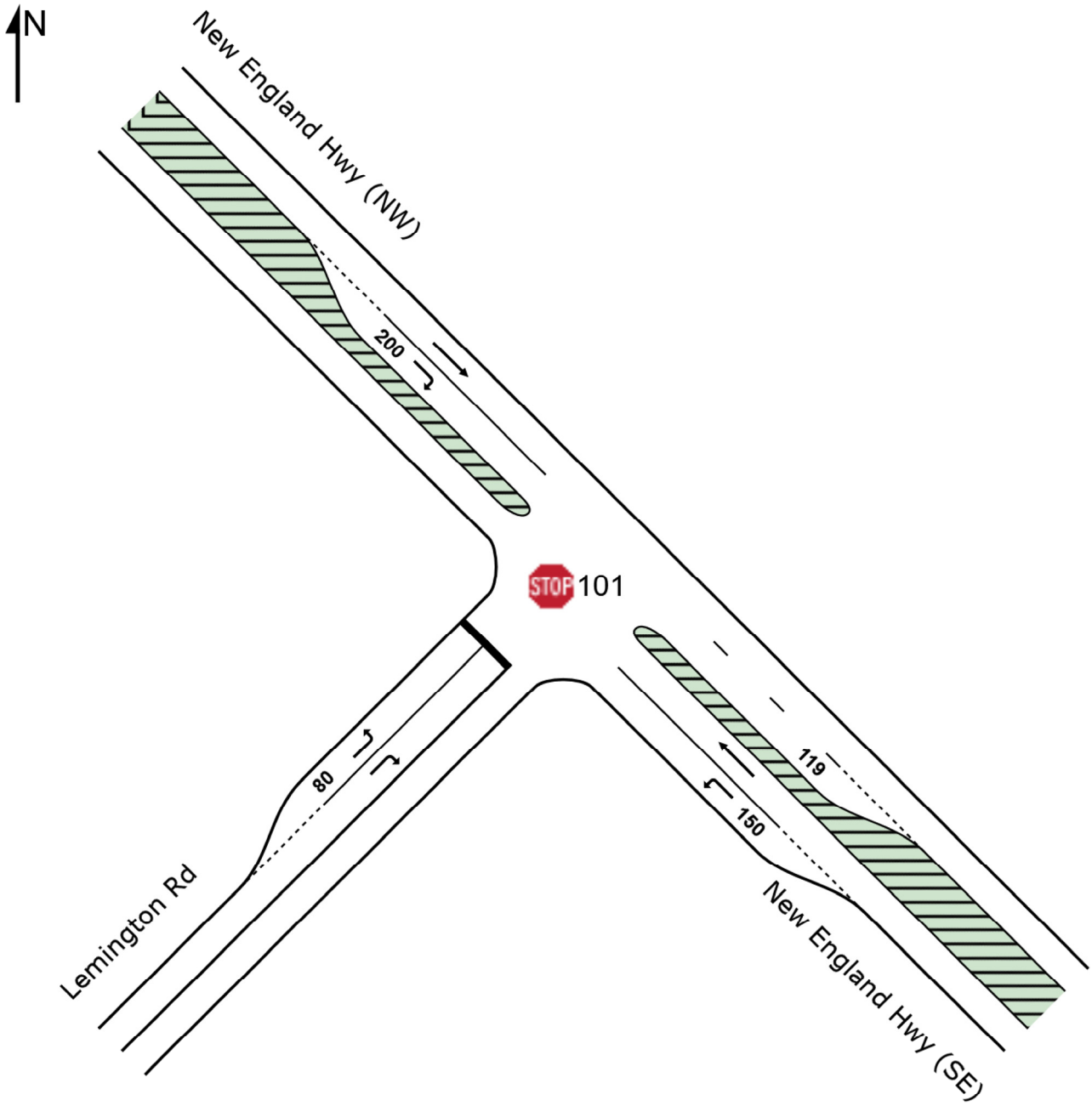
	L2	T1
Tot	56	412
LV	44	341
HV	12	71

	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
SE: New England Hwy (SE)	468	385	83
NW: New England Hwy (NW)	319	253	66
SW: Lemington Rd	62	40	22
Total	849	678	171

SITE LAYOUT

Site: 101 [New England Hwy-Lemington Rd_2018_AM_withDev]

New England Hwy/Lemington Rd
2018 AM 0800-0900 (with Development)
Site Category: (None)
Stop (Two-Way)



MOVEMENT SUMMARY

Site: 101 [New England Hwy-Lemington Rd_2018_AM_withDev]

New England Hwy/Lemington Rd
2018 AM 0800-0900 (with Development)
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: New England Hwy (SE)												
21	L2	59	21.4	0.037	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.7
22	T1	434	17.2	0.247	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		493	17.7	0.247	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.0
NorthWest: New England Hwy (NW)												
28	T1	308	18.4	0.177	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
29	R2	27	46.2	0.049	10.4	LOS A	0.2	1.7	0.56	0.74	0.56	48.4
Approach		336	20.7	0.177	0.9	NA	0.2	1.7	0.05	0.06	0.05	58.8
SouthWest: Lemington Rd												
30	L2	24	60.9	0.056	16.2	LOS B	0.2	2.0	0.55	1.00	0.55	46.6
32	R2	41	20.5	0.212	27.8	LOS B	0.7	6.1	0.82	1.02	0.88	40.9
Approach		65	35.5	0.212	23.5	LOS B	0.7	6.1	0.72	1.01	0.75	42.8
All Vehicles		894	20.1	0.247	2.4	NA	0.7	6.1	0.07	0.13	0.07	57.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

QUEUE DISTANCE (%ILE)

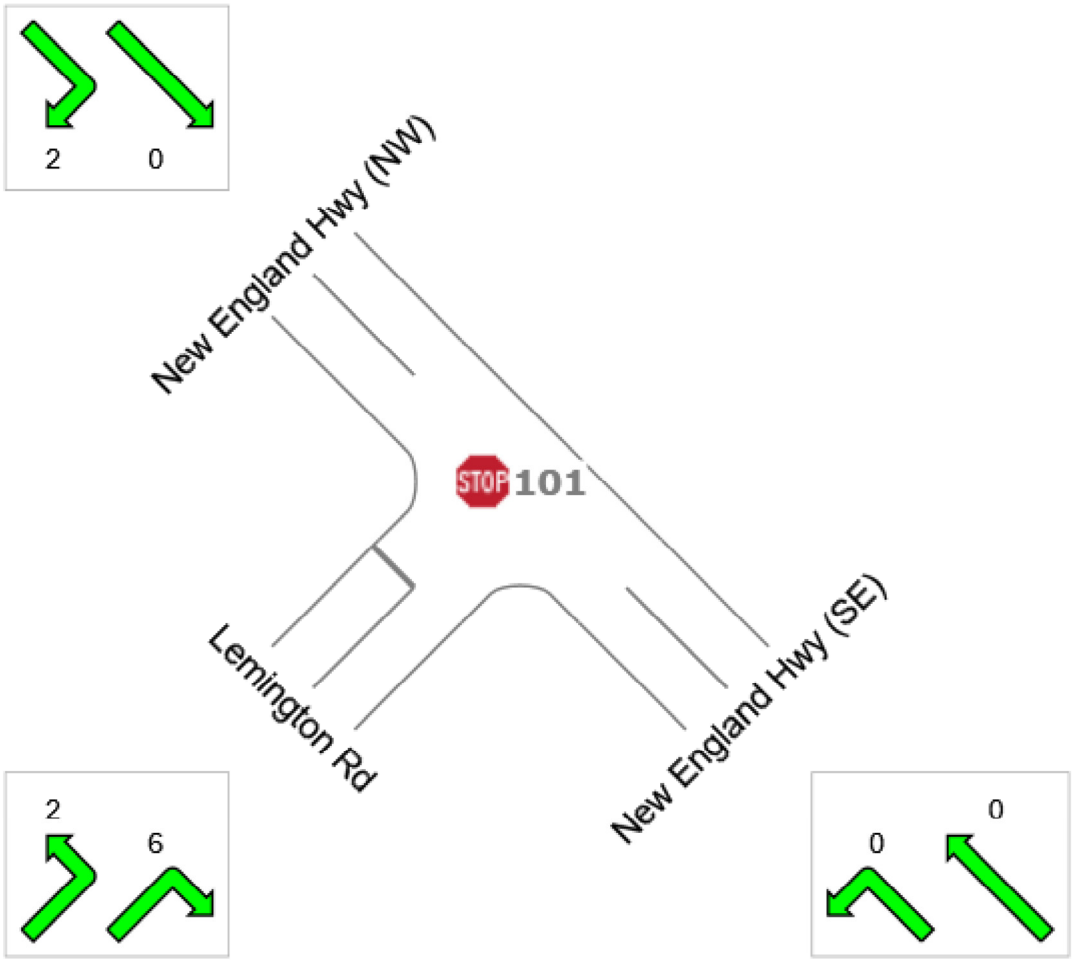
Largest 95% Back of Queue Distance for any lane used by vehicle movement (metres)

Site: 101 [New England Hwy-Lemington Rd_2018_AM_withDev]

New England Hwy/Lemington Rd
2018 AM 0800-0900 (with Development)
Site Category: (None)
Stop (Two-Way)

All Movement Classes

	Approaches			Intersection
	Southeast	Northwest	Southwest	
Vehicle Queue (%ile)	0	2	6	6



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

QUEUE DISTANCE (AVER)

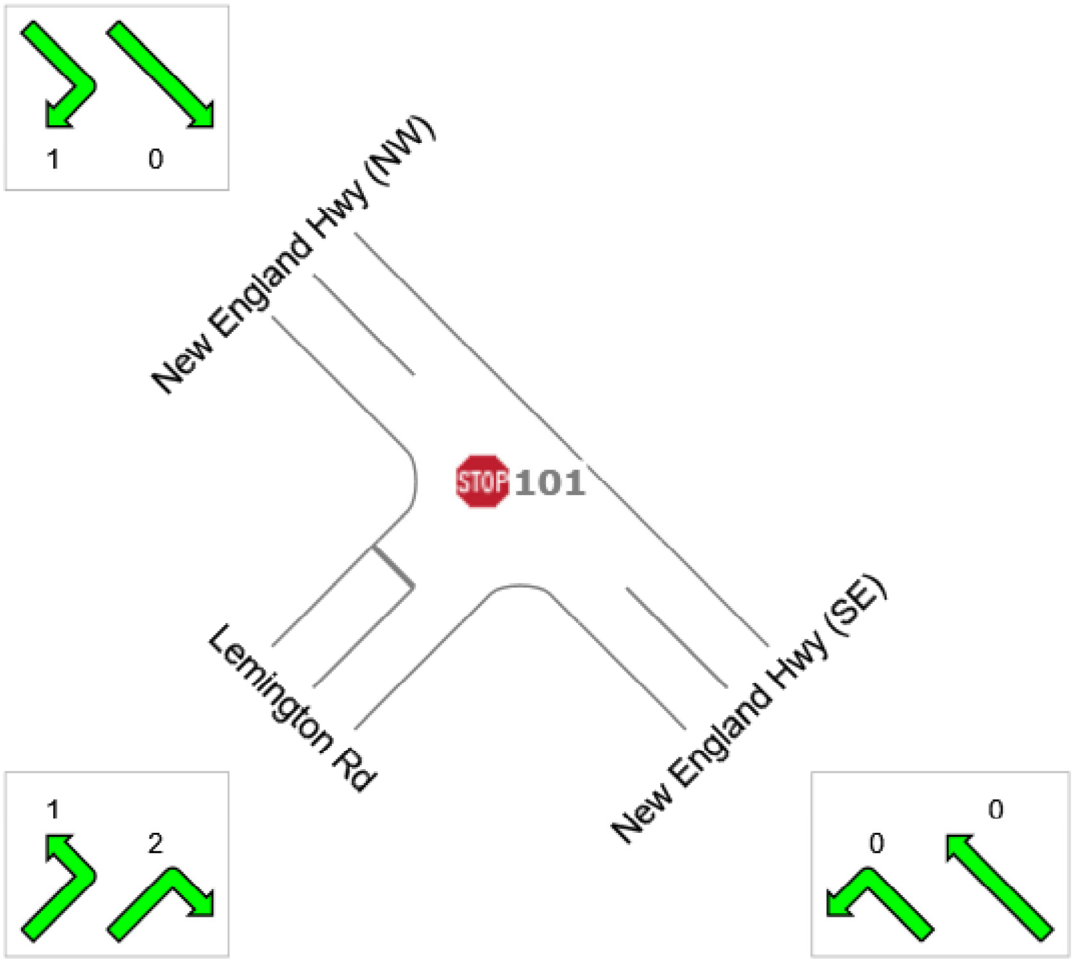
Average Back of Queue Distance for any lane used by vehicle movement (metres)

Site: 101 [New England Hwy-Lemington Rd_2018_AM_withDev]

New England Hwy/Lemington Rd
2018 AM 0800-0900 (with Development)
Site Category: (None)
Stop (Two-Way)

All Movement Classes

	Approaches			Intersection
	Southeast	Northwest	Southwest	
Queue Distance (Aver)	0	1	2	2



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[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

INPUT VOLUMES

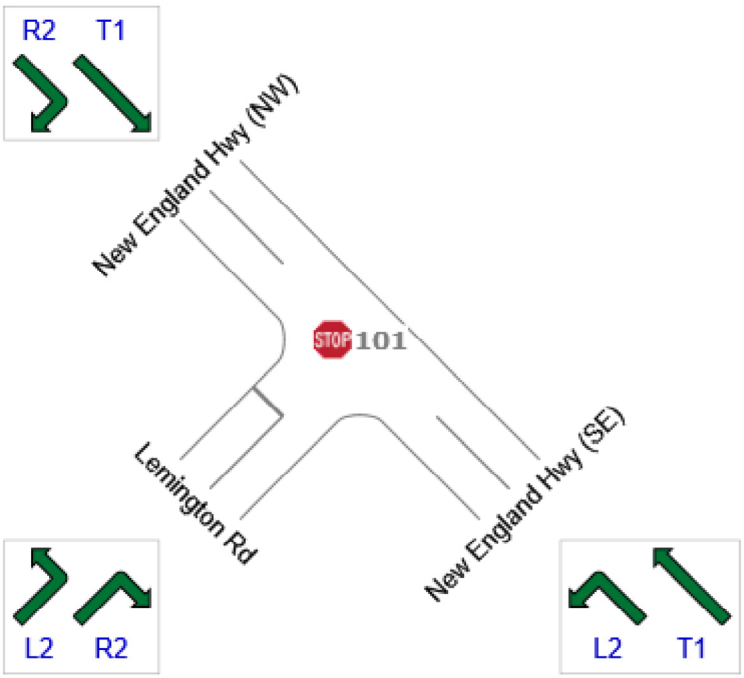
Vehicles and pedestrians per 60 minutes

Site: 101 [New England Hwy-Lemington Rd_2028_AM]

New England Hwy/Lemington Rd
2028 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

Volume Display Method: Separate

	R2	T1
Tot	18	346
LV	12	282
HV	6	64



	L2	R2
Tot	14	29
LV	6	22
HV	8	7

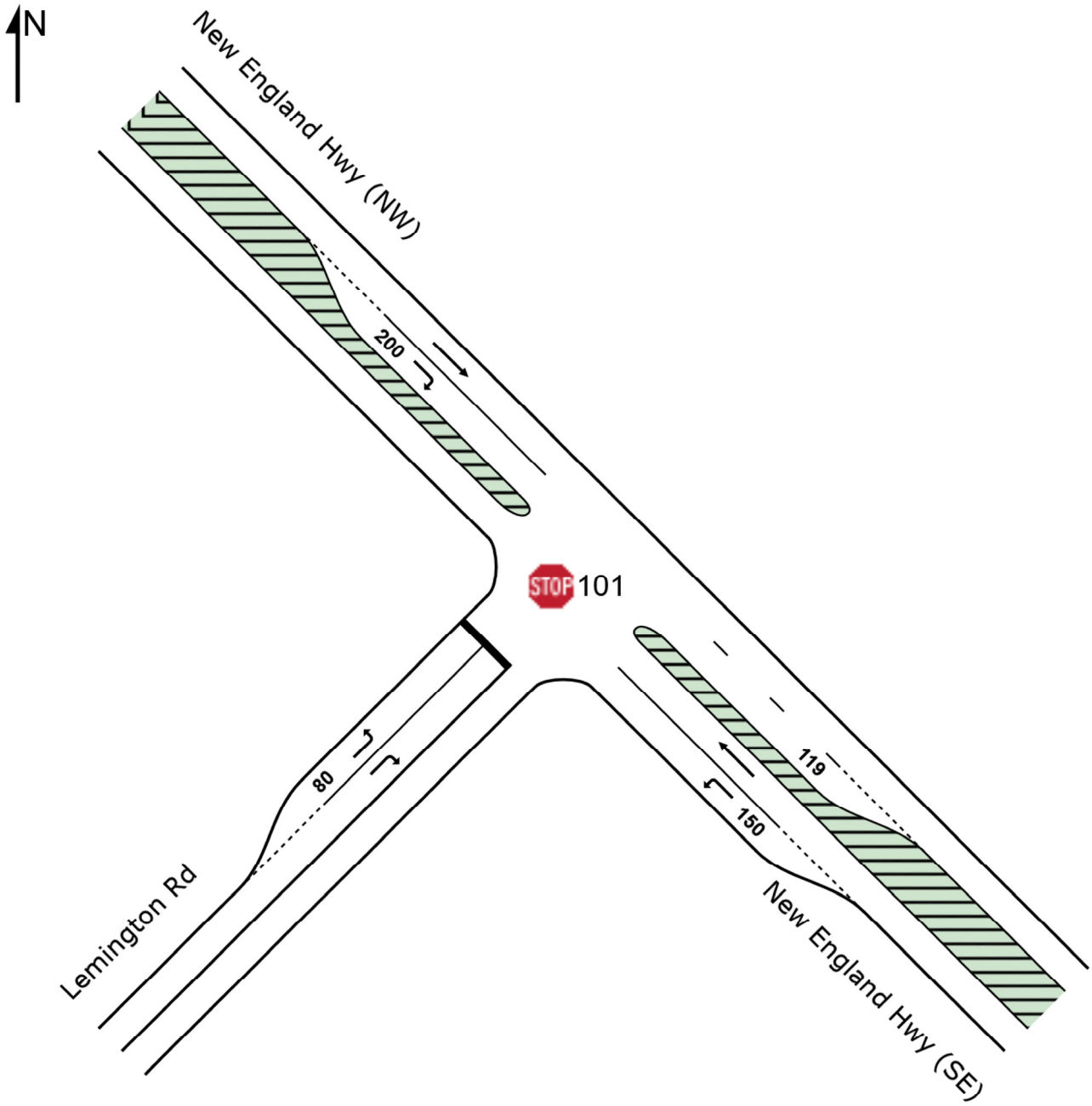
	L2	T1
Tot	50	486
LV	38	402
HV	12	84

	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
SE: New England Hwy (SE)	536	440	96
NW: New England Hwy (NW)	364	294	70
SW: Lemington Rd	43	28	15
Total	943	762	181

SITE LAYOUT

Site: 101 [New England Hwy-Lemington Rd_2028_AM]

New England Hwy/Lemington Rd
2028 AM 0800-0900
Site Category: (None)
Stop (Two-Way)



MOVEMENT SUMMARY

Site: 101 [New England Hwy-Lemington Rd_2028_AM]

New England Hwy/Lemington Rd
2028 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: New England Hwy (SE)												
21	L2	53	24.0	0.033	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.6
22	T1	512	17.3	0.292	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		564	17.9	0.292	0.6	NA	0.0	0.0	0.00	0.05	0.00	59.2
NorthWest: New England Hwy (NW)												
28	T1	364	18.5	0.209	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
29	R2	19	33.3	0.035	10.7	LOS A	0.1	1.1	0.57	0.75	0.57	48.7
Approach		383	19.2	0.209	0.6	NA	0.1	1.1	0.03	0.04	0.03	59.3
SouthWest: Lemington Rd												
30	L2	15	57.1	0.040	17.5	LOS B	0.1	1.4	0.61	1.00	0.61	45.9
32	R2	31	24.1	0.225	37.3	LOS C	0.7	6.3	0.88	1.02	0.95	37.0
Approach		45	34.9	0.225	30.8	LOS C	0.7	6.3	0.79	1.02	0.84	39.5
All Vehicles		993	19.2	0.292	1.9	NA	0.7	6.3	0.05	0.09	0.05	57.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

QUEUE DISTANCE (%ILE)

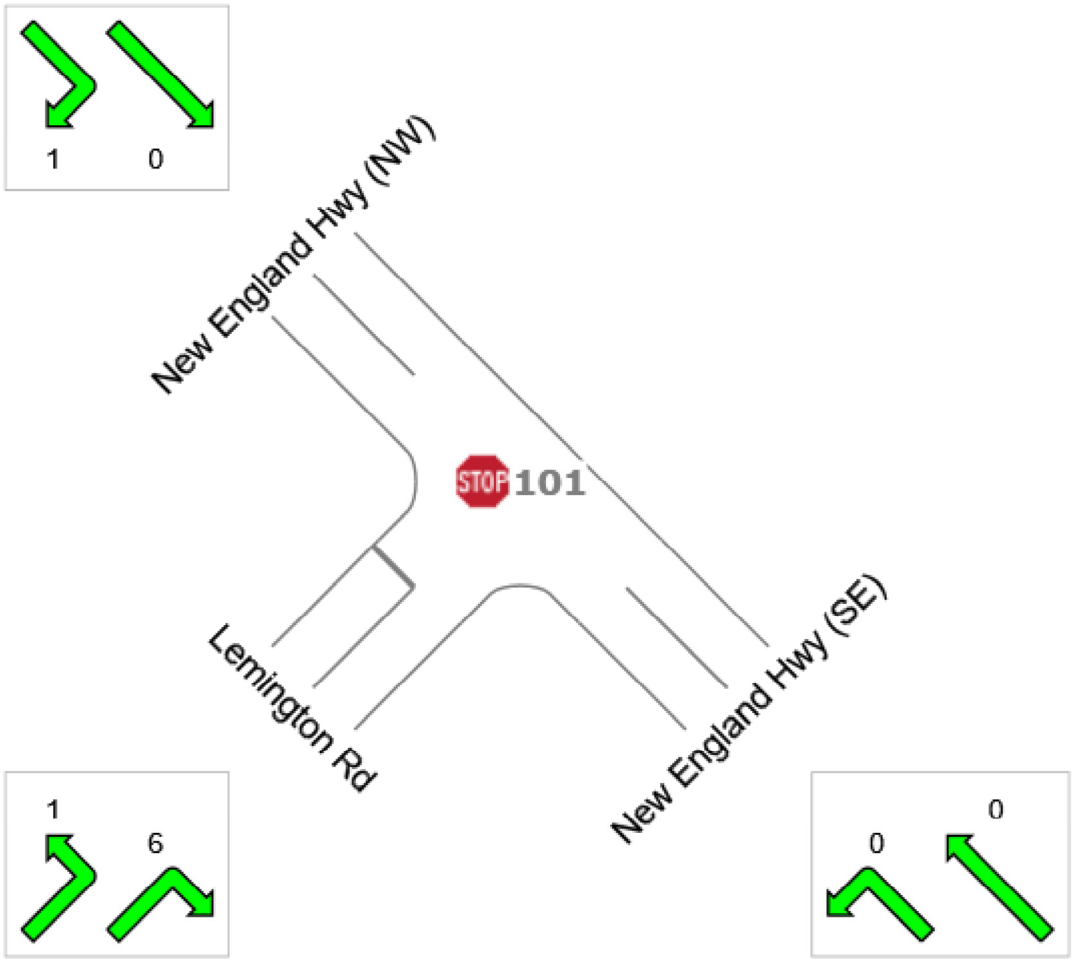
Largest 95% Back of Queue Distance for any lane used by vehicle movement (metres)

Site: 101 [New England Hwy-Lemington Rd_2028_AM]

New England Hwy/Lemington Rd
2028 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

All Movement Classes

	Approaches			Intersection
	Southeast	Northwest	Southwest	
Vehicle Queue (%ile)	0	1	6	6



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

QUEUE DISTANCE (AVER)

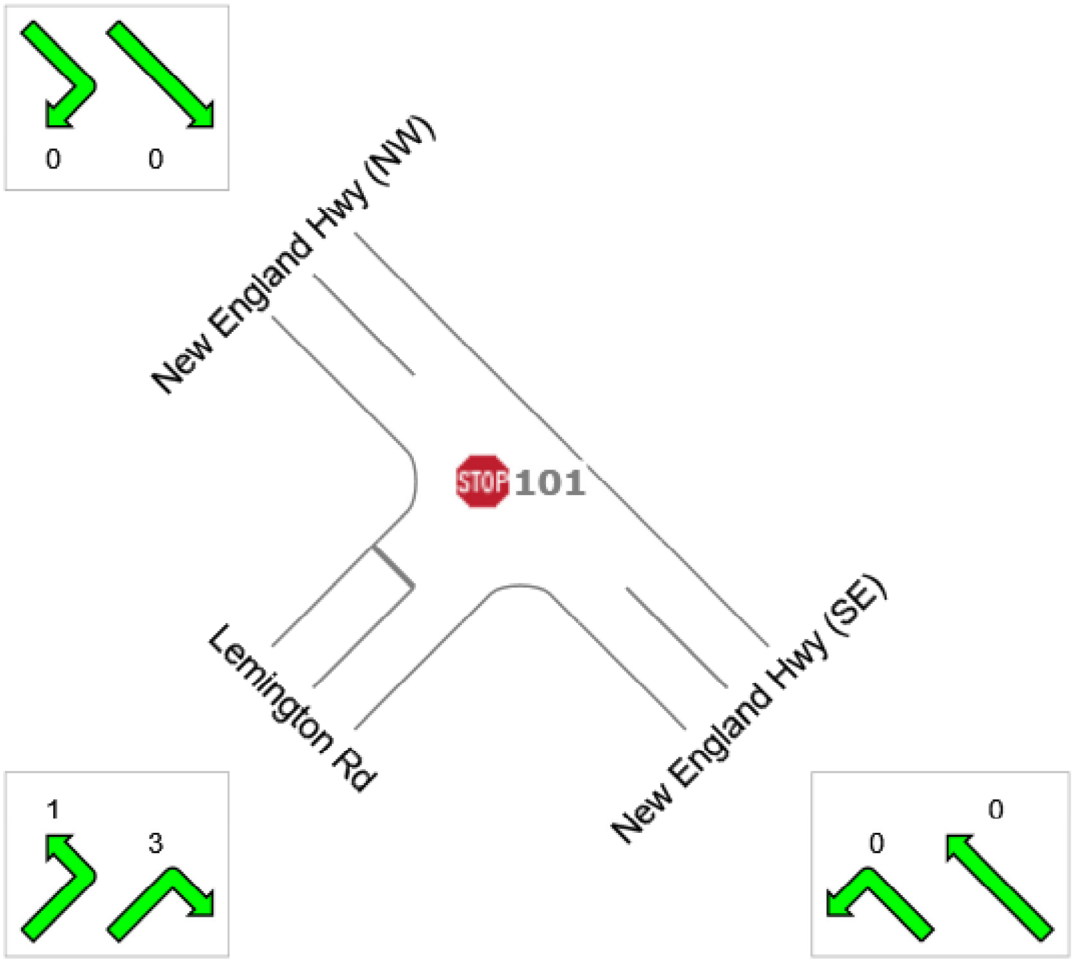
Average Back of Queue Distance for any lane used by vehicle movement (metres)

Site: 101 [New England Hwy-Lemington Rd_2028_AM]

New England Hwy/Lemington Rd
2028 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

All Movement Classes

	Approaches			Intersection
	Southeast	Northwest	Southwest	
Queue Distance (Aver)	0	0	3	3



Colour code based on Queue Storage Ratio

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INPUT VOLUMES

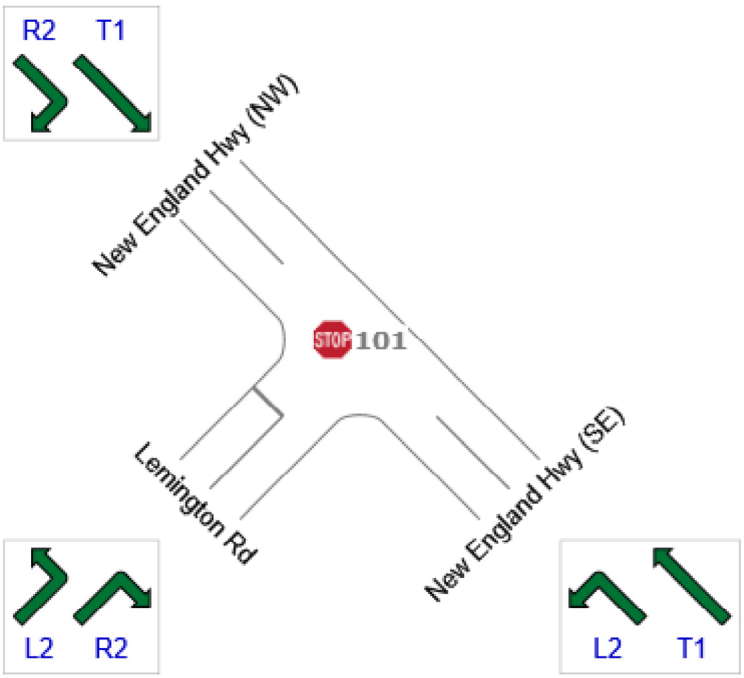
Vehicles and pedestrians per 60 minutes

Site: 101 [New England Hwy-Lemington Rd_2028_AM_withDev]

New England Hwy/Lemington Rd
2028 AM 0800-0900 (with Development)
Site Category: (None)
Stop (Two-Way)

Volume Display Method: Separate

	R2	T1
Tot	29	346
LV	16	282
HV	13	64



	L2	R2
Tot	25	43
LV	10	34
HV	15	9

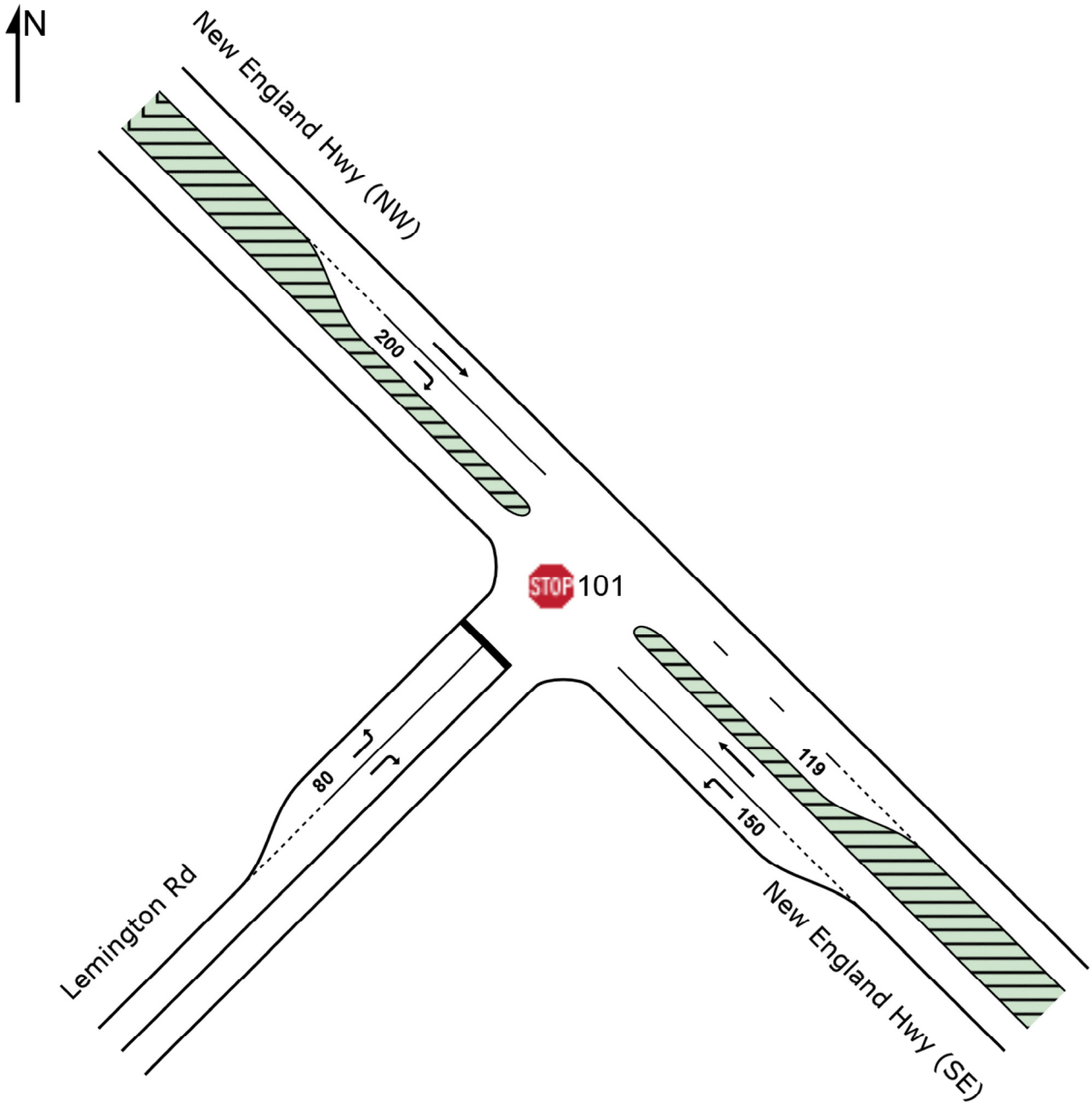
	L2	T1
Tot	64	486
LV	50	402
HV	14	84

	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
SE: New England Hwy (SE)	550	452	98
NW: New England Hwy (NW)	375	298	77
SW: Lemington Rd	68	44	24
Total	993	794	199

SITE LAYOUT

Site: 101 [New England Hwy-Lemington Rd_2028_AM_withDev]

New England Hwy/Lemington Rd
2028 AM 0800-0900 (with Development)
Site Category: (None)
Stop (Two-Way)



Organisation: METIS CONSULTANTS | Created: Sunday, 17 March 2019 7:51:56 PM
Project: C:\Dropbox\@M\MC1824 New England Hwy-Lemington Rd SIDRA Analysis\C3_Mods\NewEnglandHwy-LemingtonRd_v01.sip8

MOVEMENT SUMMARY

Site: 101 [New England Hwy-Lemington Rd_2028_AM_withDev]

New England Hwy/Lemington Rd
2028 AM 0800-0900 (with Development)
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: New England Hwy (SE)												
21	L2	67	21.9	0.042	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.7
22	T1	512	17.3	0.292	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		579	17.8	0.292	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.0
NorthWest: New England Hwy (NW)												
28	T1	364	18.5	0.209	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
29	R2	31	44.8	0.063	11.8	LOS A	0.2	2.2	0.60	0.80	0.60	47.6
Approach		395	20.5	0.209	0.9	NA	0.2	2.2	0.05	0.06	0.05	58.8
SouthWest: Lemington Rd												
30	L2	26	60.0	0.072	18.0	LOS B	0.2	2.6	0.62	1.03	0.62	45.6
32	R2	45	20.9	0.336	40.9	LOS C	1.2	9.8	0.90	1.05	1.07	35.7
Approach		72	35.3	0.336	32.5	LOS C	1.2	9.8	0.80	1.04	0.90	38.8
All Vehicles		1045	20.0	0.336	3.0	NA	1.2	9.8	0.07	0.13	0.08	56.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

QUEUE DISTANCE (%ILE)

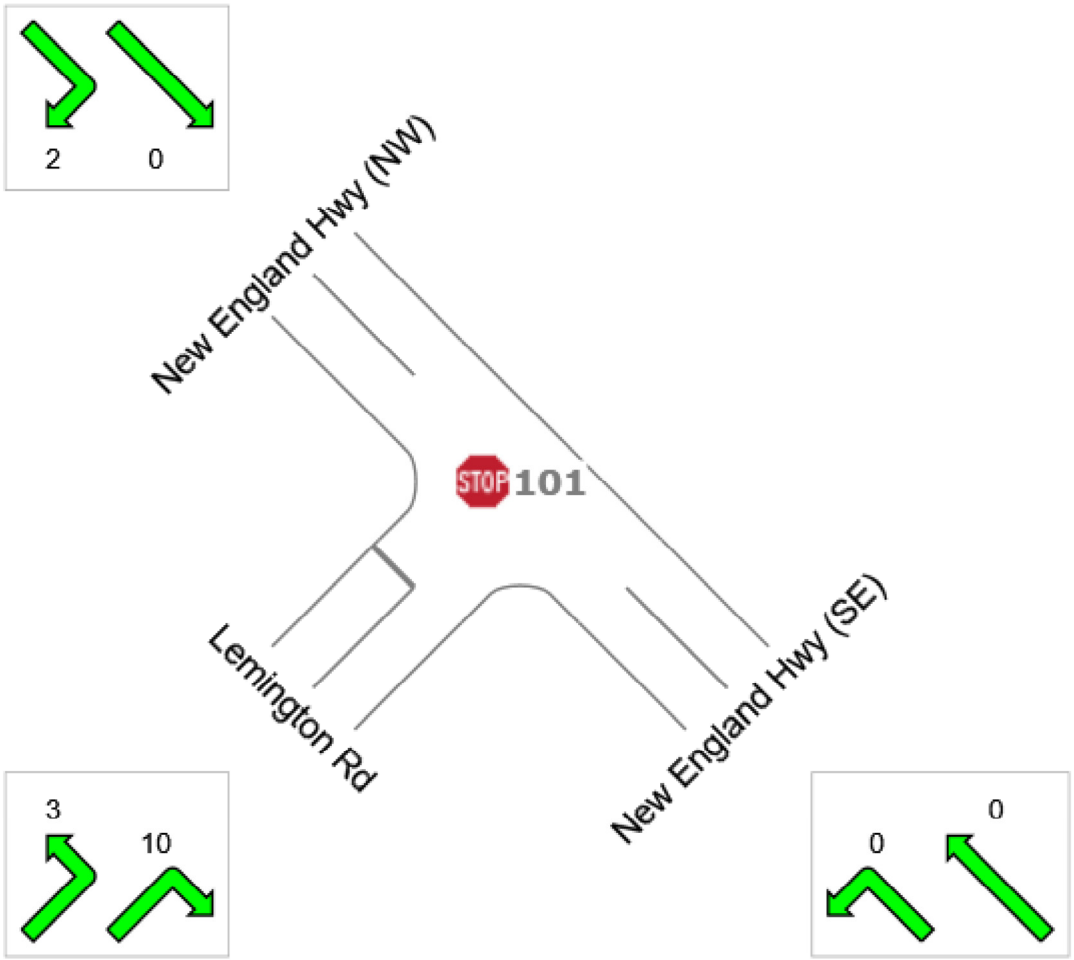
Largest 95% Back of Queue Distance for any lane used by vehicle movement (metres)

Site: 101 [New England Hwy-Lemington Rd_2028_AM_withDev]

New England Hwy/Lemington Rd
2028 AM 0800-0900 (with Development)
Site Category: (None)
Stop (Two-Way)

All Movement Classes

	Approaches			Intersection
	Southeast	Northwest	Southwest	
Vehicle Queue (%ile)	0	2	10	10



Colour code based on Queue Storage Ratio

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QUEUE DISTANCE (AVER)

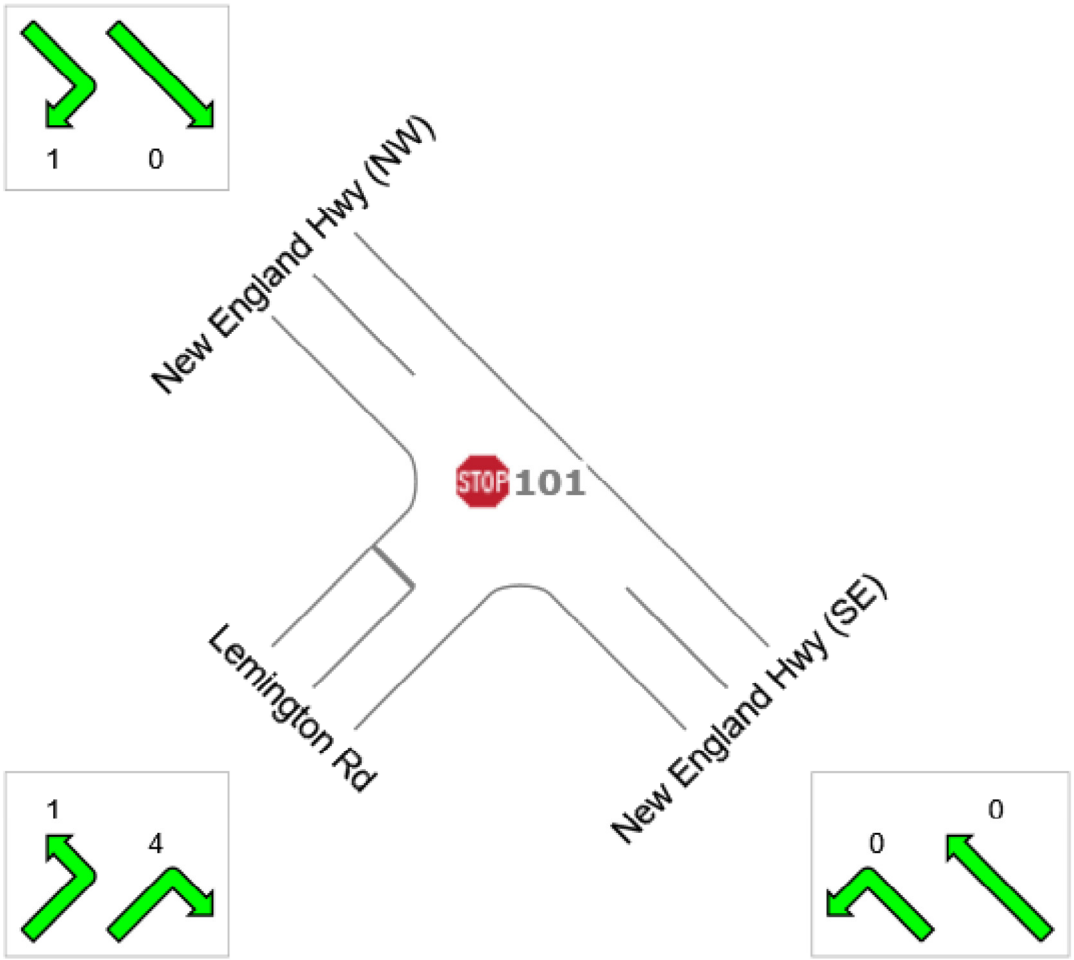
Average Back of Queue Distance for any lane used by vehicle movement (metres)

Site: 101 [New England Hwy-Lemington Rd_2028_AM_withDev]

New England Hwy/Lemington Rd
2028 AM 0800-0900 (with Development)
Site Category: (None)
Stop (Two-Way)

All Movement Classes

	Approaches			Intersection
	Southeast	Northwest	Southwest	
Queue Distance (Aver)	0	1	4	4



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

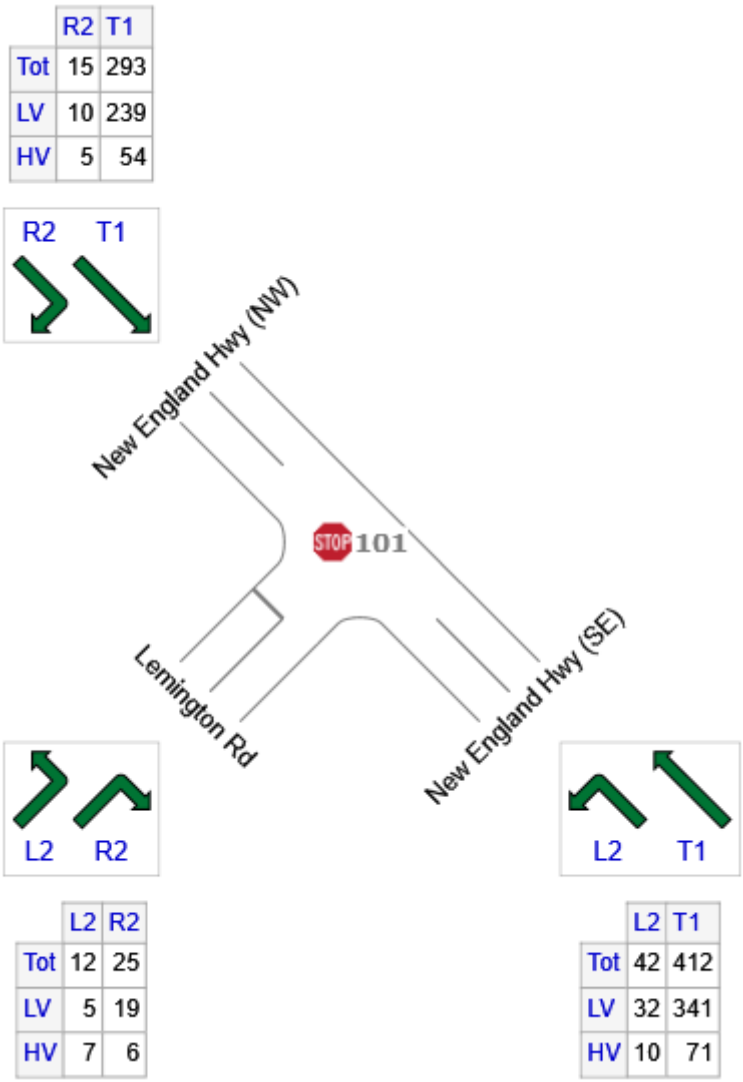
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 101 [New England Hwy-Lemington Rd_2018_AM]

New England Hwy/Lemington Rd
2018 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

Volume Display Method: Separate



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
SE: New England Hwy (SE)	454	373	81
NW: New England Hwy (NW)	308	249	59
SW: Lemington Rd	37	24	13
Total	799	646	153

MOVEMENT SUMMARY

Site: 101 [New England Hwy-Lemington Rd_2018_AM]

New England Hwy/Lemington Rd
2018 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: New England Hwy (SE)												
21	L2	44	23.8	0.028	5.8	LOS A	0.0	0.0	0.00	0.57	0.00	52.6
22	T1	434	17.2	0.247	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		478	17.8	0.247	0.6	NA	0.0	0.0	0.00	0.05	0.00	59.2
NorthWest: New England Hwy (NW)												
28	T1	308	18.4	0.177	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
29	R2	16	33.3	0.025	9.5	LOS A	0.1	0.8	0.53	0.70	0.53	49.4
Approach		324	19.2	0.177	0.5	NA	0.1	0.8	0.03	0.03	0.03	59.3
SouthWest: Lemington Rd												
30	L2	13	58.3	0.029	15.8	LOS B	0.1	1.0	0.54	0.96	0.54	46.8
32	R2	26	24.0	0.135	26.5	LOS B	0.4	3.8	0.81	1.01	0.81	41.4
Approach		39	35.1	0.135	23.0	LOS B	0.4	3.8	0.72	0.99	0.72	43.0
All Vehicles		841	19.1	0.247	1.6	NA	0.4	3.8	0.04	0.09	0.04	58.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

QUEUE DISTANCE (%ILE)

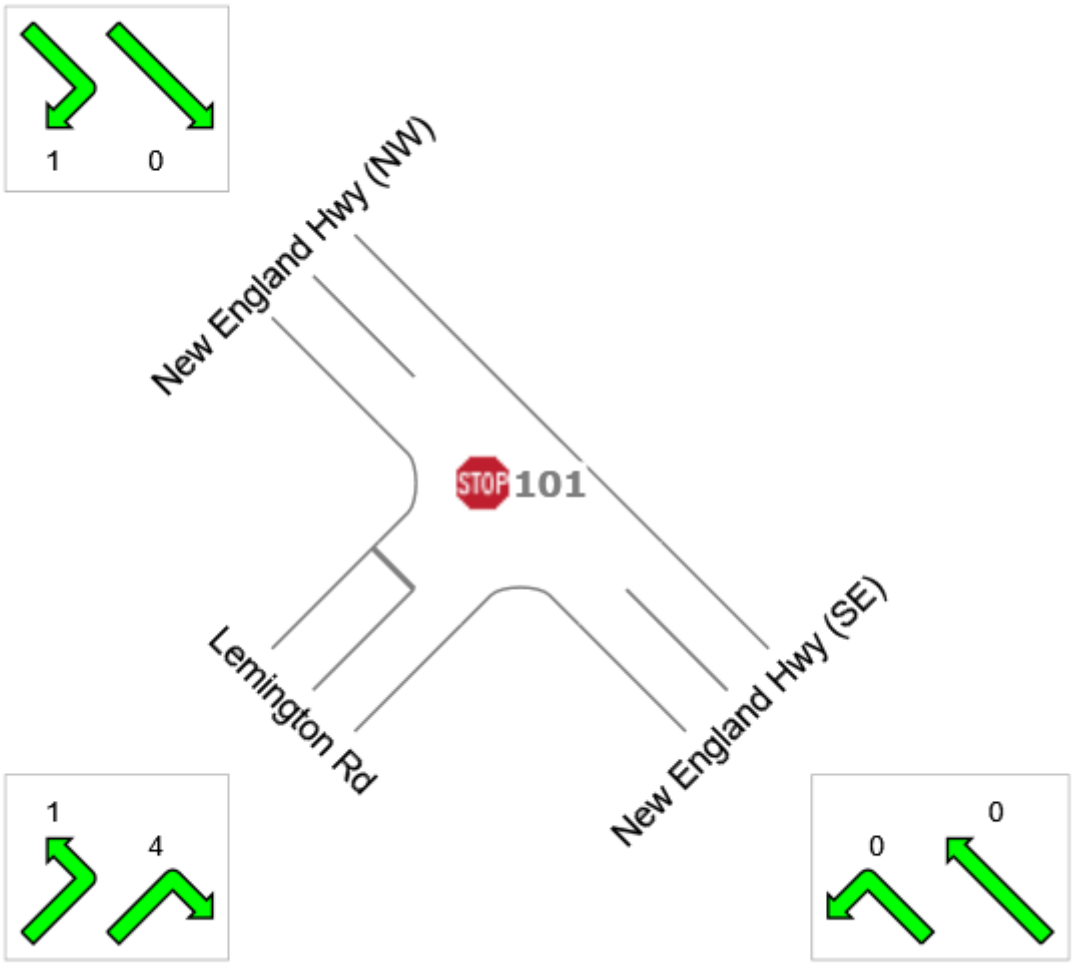
Largest 95% Back of Queue Distance for any lane used by vehicle movement (metres)

Site: 101 [New England Hwy-Lemington Rd_2018_AM]

New England Hwy/Lemington Rd
2018 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

All Movement Classes

	Approaches			Intersection
	Southeast	Northwest	Southwest	
Vehicle Queue (%ile)	0	1	4	4



Colour code based on Queue Storage Ratio

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QUEUE DISTANCE (AVER)

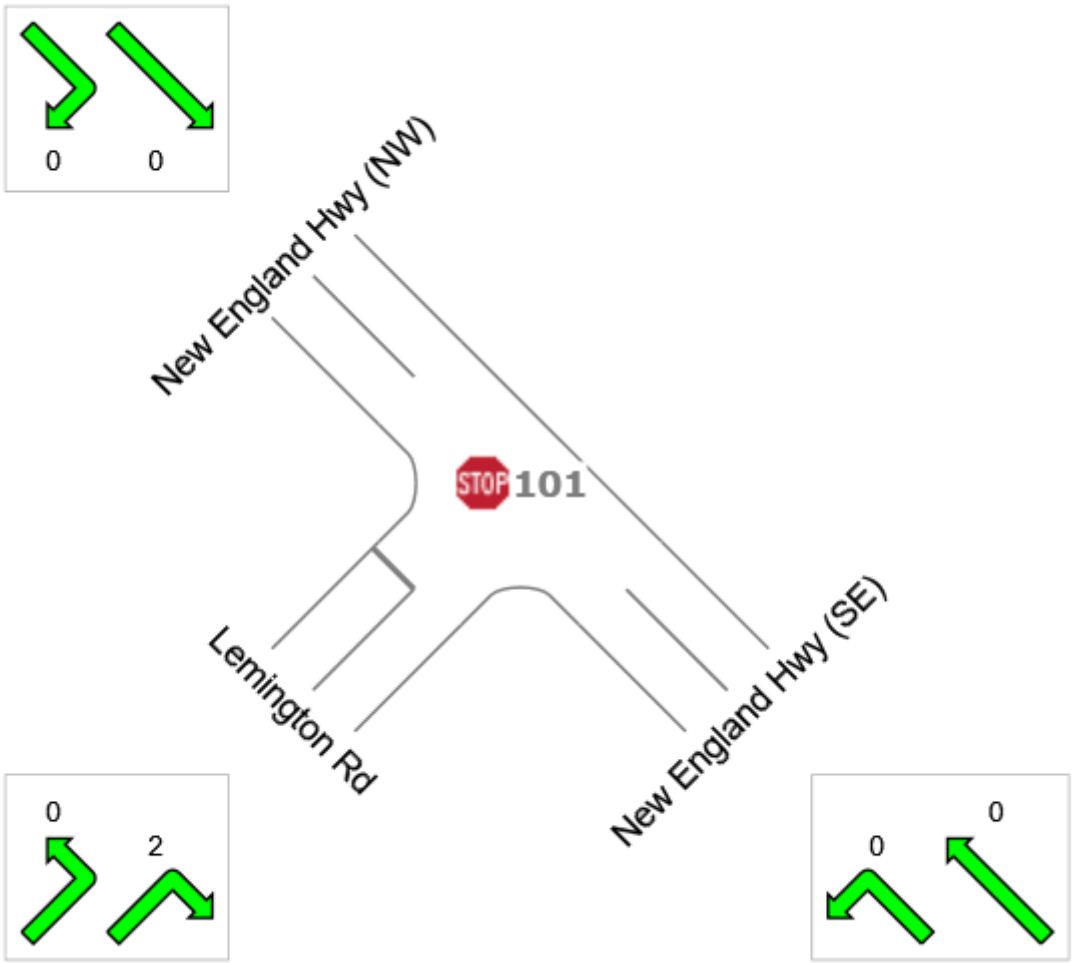
Average Back of Queue Distance for any lane used by vehicle movement (metres)

Site: 101 [New England Hwy-Lemington Rd_2018_AM]

New England Hwy/Lemington Rd
2018 AM 0800-0900
Site Category: (None)
Stop (Two-Way)

All Movement Classes

	Approaches			Intersection
	Southeast	Northwest	Southwest	
Queue Distance (Aver)	0	0	2	2



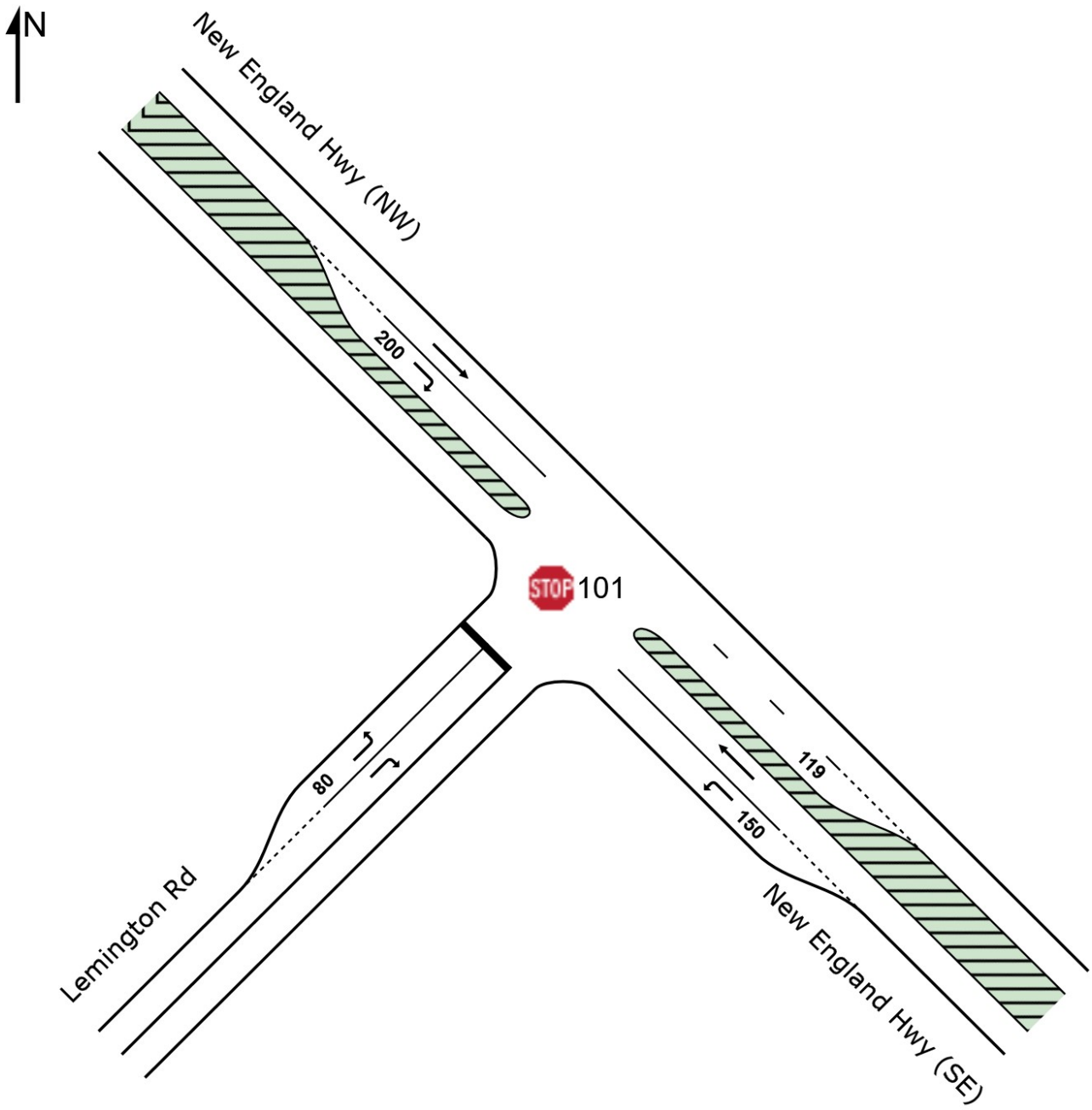
Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

SITE LAYOUT

Site: 101 [New England Hwy-Lemington Rd_2018_AM]

New England Hwy/Lemington Rd
2018 AM 0800-0900
Site Category: (None)
Stop (Two-Way)



Organisation: METIS CONSULTANTS | Created: Monday, 29 October 2018 4:16:33 PM
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