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# Milldale Primary School NoR – Second s92 Transport Response

**Prepared for:** Ministry of Education  
**Job Number:** MED-J015  
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## 1. Background

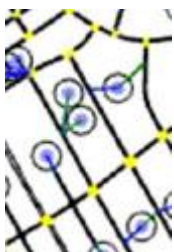
Auckland Council has issued a second request for further information in the form of a technical note prepared by Martin Peake dated 27 March 2020, in which the initial s92 and responses were independently reviewed. Some additional queries and clarifications were raised in relation to the transport aspects of the proposal to designate a site for educational purposes within the Milldale development precinct. These queries are listed below in italics, along with our response below each query. It is noted that the headings are consistent with those from the first and second RFI requests.

## 2. S92 queries and response

### *1) Assessment of operation of the Argent Lane / Road 11 intersection*

The second RFI observed that the Sidra intersection modelling in the first RFI response included a high degree of saturation and extensive queue lengths for the full development scenario with modified demands on the Road 11 eastern approach. Upon review it is acknowledged that the modified demands in the Abley RFI response included double counting of demands for westbound Road 11 traffic, thus ignoring potential additional demand for eastbound Road 11 traffic. As such the modelling presented in the RFI response was overly conservative.

The Stantec modelling upon which it was based already included the school traffic generation, however this appears to have been split across four transport model zones as shown in the excerpt below from Figure 2 of the Stantec memo. This is synonymous with the situation whereby there are multiple school accesses or vehicles pick up and/or drop off children at various locations around the perimeter of the school (which would often be the case where pedestrian accesses are provided on adjoining roads). The impact of assuming the Stantec volumes is that the traffic generation would be distributed across the four model zones pictured to the north of road 11 with network effects spread evenly across the local and wider network.



By contrast the assessment of the school access in our ITA section 5 assumed that the full trip generation was channelled through a single vehicle access at a roundabout on road 11 approx 65m east of Argent Lane. This replicates a worst case scenario where all parking and all pick up and drop off (PUDO) activity occurs within the site through a singular access. It was our intention with the modified assessment in the first RFI to replicate this, however we

inadvertently added the full westbound demand to the Stantec assessment flows which introduced double counting. Whilst the details of the number and location of pedestrian access to the school are yet to be worked through, in reality some of this activity is likely to occur on neighbouring streets in much the same manner as how the traffic is distributed in the Stantec modelling.

To address this double counting we have re-modelled the Argent Lane/Road 11 roundabout flows in Sidra Intersection based on Stantec flows (potentially a best case scenario and included here unchanged in the Appendix as pages 1 and 2) and include an upper bound or worst case scenario based on our ITA section 5 assessment without the doubling up of flows. This provides a genuine worst case to test queuing from the roundabout and can be seen in the Appendix as pages 3 and 4.

The modelling indicates that the roundabout with upper bound flows operates with LoS A overall and all movements and approaches operating at LoS B or better. The degree of saturation is in the 0.74-0.84 range demonstrating spare capacity and 95<sup>th</sup> percentile back-of-queue lengths are manageable including no blocking back along the Road 11 approaches.

The second RFI also requested that the Argent Lane / Road 11 intersection be modelled as a signalised intersection which is the anticipated intersection form following four laning of Argent Lane at some stage in the future. This is included in the attached revised Sidra analysis. Whilst we are not aware of a specific intersection design, it is assumed that two through lanes will be provided with exclusive right turn lanes and a left slip lane from Argent Lane north into Road 11. Both Road 11 approaches are assumed to have two approach lanes with exclusive right turn lanes. Pedestrian crosswalks are included on all approaches.

The modelling indicates that the signalised intersection form operates with LoS D overall and all movements and approaches operating at LoS D or better. The degree of saturation is in the 0.68-0.69 (for Stantec network assessment flows) and 0.78-0.81 (for upper bound) range demonstrating spare capacity and 95<sup>th</sup> percentile back-of-queue lengths are manageable. Crosswalks are provided on all approaches.

On this basis it is concluded that the current roundabout operates satisfactorily under worst-case conditions, and at some stage in the future when the signals are installed as part of the Argent Lane four-laning project, it is evident that a signalised intersection form would also operate satisfactorily under worst-case conditions.

#### 2) *Assessment of the Argent Lane / Road 11 intersection with initial roll and full school roll as a roundabout*

The response to query 1) also addresses this query as it tests the full school roll scenarios. For clarity the roundabout operates satisfactorily and has residual capacity when the full school roll traffic is loaded, both assuming the Stantec network assessment demands and the worst case scenario demands.

#### 3) *Provide an assessment of the amount of over-spill parking from the school site and how this would be managed on the local road network*

This will be assessed at the OPW stage, however it is intended to provide the required rate of parking spaces and pick-up / drop-off provision within the site, so there will be no over-spill parking as such. What cannot be controlled directly is if people make a decision to use on-street parking (where available) instead of the available parking or PUDO spaces on site, and then walk to the school from there. **This will be managed through proactive Travel Planning to minimise any impacts on the network.** Additionally, it may be appropriate to limit parking along the frontage on Road 11 (for example through broken yellow lines) to avoid parking in locations that would be unsafe or impractical. It is noted in any case that the north side of Road 11 does not have parking bays provided. These options will be explored once an access design is confirmed at OPW stage.

#### 4) *Provide details of the access to the ECE and parking arrangements*

These access and parking arrangements will be designed at the OPW stage. For some schools ECE access may be separate while for other schools it may be more appropriate and efficient to share a primary access, therefore it is preferred to reserve these design decisions for OPW.

- 5) *Request details of who would be responsible for providing measures such as wider (2.6m wide) footpaths and pedestrian crossing facilities.*

These have been included in the roading plans for Milldale. 2.6m wide footpaths are proposed around the school perimeter with a small exception on Argent Lane where some additional space is required for bus stops; these plans are currently in the process of consultation between the developer and Auckland Transport. Crossing facilities are proposed on each road around the school perimeter with locations having been selected with likely desire lines for school access in mind. The developer and the Ministry of Education will be responsible for providing these footpaths and crossing facilities.

Therefore, the provision of these facilities is much more advanced than typical for the Designation stage, however these provisions will still be revisited at the OPW stage to ensure they work well for the final school internal design.

- 6) *Provide details of how coaches would enter the site*

Issue resolved.

## 2.1 SIDRA outputs

Road 11 / Argent Lane roundabout – AM Peak (Full buildout using network volumes)

### MOVEMENT SUMMARY

Site: 101 [Milldale Road 11 / Argent Lane Rbout AM]

New Site  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Argent Lane S												
1	L2	12	1.0	0.242	3.3	LOS A	1.7	11.8	0.46	0.44	0.46	38.3
2	T1	232	1.0	0.242	3.0	LOS A	1.7	11.8	0.46	0.44	0.46	38.9
3	R2	23	1.0	0.242	6.7	LOS A	1.7	11.8	0.46	0.44	0.46	39.0
Approach		266	1.0	0.242	3.3	LOS A	1.7	11.8	0.46	0.44	0.46	38.9
East: Road 11 E												
4	L2	28	1.0	0.276	7.9	LOS A	1.8	12.9	0.81	0.84	0.81	36.1
5	T1	23	1.0	0.276	7.6	LOS A	1.8	12.9	0.81	0.84	0.81	36.7
6	R2	128	1.0	0.276	11.3	LOS B	1.8	12.9	0.81	0.84	0.81	36.8
Approach		180	1.0	0.276	10.3	LOS B	1.8	12.9	0.81	0.84	0.81	36.7
North: Argent Lane N												
7	L2	168	1.0	0.611	2.8	LOS A	6.8	48.1	0.42	0.36	0.42	38.4
8	T1	679	1.0	0.611	2.5	LOS A	6.8	48.1	0.42	0.36	0.42	39.1
9	R2	16	1.0	0.611	6.2	LOS A	6.8	48.1	0.42	0.36	0.42	39.2
Approach		863	1.0	0.611	2.7	LOS A	6.8	48.1	0.42	0.36	0.42	39.0
West: Road 11 W												
10	L2	6	1.0	0.056	4.4	LOS A	0.3	2.2	0.54	0.55	0.54	37.8
11	T1	28	1.0	0.056	4.1	LOS A	0.3	2.2	0.54	0.55	0.54	38.4
12	R2	16	1.0	0.056	7.8	LOS A	0.3	2.2	0.54	0.55	0.54	38.6
Approach		51	1.0	0.056	5.3	LOS A	0.3	2.2	0.54	0.55	0.54	38.4
All Vehicles		1360	1.0	0.611	3.9	LOS A	6.8	48.1	0.48	0.44	0.48	38.6

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

Roundabout LOS Method: SIDRA Roundabout LOS.

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

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

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

**Road 11 / Argent Lane roundabout – PM Peak (Full buildout using network volumes)**
**MOVEMENT SUMMARY**
**Site: 101 [Milldale Road 11 / Argent Lane Rbout PM]**

New Site  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Argent Lane S												
1	L2	32	1.0	0.626	3.8	LOS A	6.5	46.0	0.64	0.51	0.64	37.9
2	T1	674	1.0	0.626	3.5	LOS A	6.5	46.0	0.64	0.51	0.64	38.6
3	R2	49	1.0	0.626	7.2	LOS A	6.5	46.0	0.64	0.51	0.64	38.7
Approach		755	1.0	0.626	3.8	LOS A	6.5	46.0	0.64	0.51	0.64	38.5
East: Road 11 E												
4	L2	2	1.0	0.148	4.4	LOS A	0.9	6.1	0.56	0.65	0.56	37.2
5	T1	21	1.0	0.148	4.2	LOS A	0.9	6.1	0.56	0.65	0.56	37.8
6	R2	113	1.0	0.148	7.8	LOS A	0.9	6.1	0.56	0.65	0.56	37.9
Approach		136	1.0	0.148	7.2	LOS A	0.9	6.1	0.56	0.65	0.56	37.9
North: Argent Lane N												
7	L2	124	1.0	0.357	2.8	LOS A	2.7	19.1	0.35	0.37	0.35	38.5
8	T1	316	1.0	0.357	2.5	LOS A	2.7	19.1	0.35	0.37	0.35	39.2
9	R2	23	1.0	0.357	6.2	LOS A	2.7	19.1	0.35	0.37	0.35	39.3
Approach		463	1.0	0.357	2.8	LOS A	2.7	19.1	0.35	0.37	0.35	39.0
West: Road 11 W												
10	L2	8	1.0	0.094	8.7	LOS A	0.6	4.3	0.83	0.77	0.83	36.2
11	T1	23	1.0	0.094	8.4	LOS A	0.6	4.3	0.83	0.77	0.83	36.8
12	R2	19	1.0	0.094	12.1	LOS B	0.6	4.3	0.83	0.77	0.83	36.9
Approach		51	1.0	0.094	9.8	LOS A	0.6	4.3	0.83	0.77	0.83	36.8
All Vehicles		1404	1.0	0.626	4.0	LOS A	6.5	46.0	0.55	0.49	0.55	38.6

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

Roundabout LOS Method: SIDRA Roundabout LOS.

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

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

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

**Road 11 / Argent Lane roundabout – AM Peak Upper Bound**
**MOVEMENT SUMMARY**
**Site: 101 [Milldale Road 11 / Argent Lane Rbout AM UPPER]**

 New Site  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Argent Lane S												
1	L2	12	1.0	0.321	4.7	LOS A	2.3	16.4	0.68	0.63	0.68	37.7
2	T1	232	1.0	0.321	4.5	LOS A	2.3	16.4	0.68	0.63	0.68	38.4
3	R2	40	1.0	0.321	8.1	LOS A	2.3	16.4	0.68	0.63	0.68	38.5
Approach		283	1.0	0.321	5.0	LOS A	2.3	16.4	0.68	0.63	0.68	38.4
East: Road 11 E												
4	L2	61	1.0	0.639	14.1	LOS B	6.8	48.2	0.98	1.18	1.34	34.0
5	T1	51	1.0	0.639	13.9	LOS B	6.8	48.2	0.98	1.18	1.34	34.5
6	R2	278	1.0	0.639	17.5	LOS B	6.8	48.2	0.98	1.18	1.34	34.7
Approach		389	1.0	0.639	16.5	LOS B	6.8	48.2	0.98	1.18	1.34	34.5
North: Argent Lane N												
7	L2	294	1.0	0.744	3.6	LOS A	10.3	72.7	0.67	0.47	0.67	38.0
8	T1	679	1.0	0.744	3.3	LOS A	10.3	72.7	0.67	0.47	0.67	38.6
9	R2	16	1.0	0.744	7.0	LOS A	10.3	72.7	0.67	0.47	0.67	38.7
Approach		988	1.0	0.744	3.5	LOS A	10.3	72.7	0.67	0.47	0.67	38.4
West: Road 11 W												
10	L2	6	1.0	0.095	5.7	LOS A	0.6	4.0	0.68	0.64	0.68	37.5
11	T1	49	1.0	0.095	5.5	LOS A	0.6	4.0	0.68	0.64	0.68	38.2
12	R2	16	1.0	0.095	9.1	LOS A	0.6	4.0	0.68	0.64	0.68	38.3
Approach		72	1.0	0.095	6.3	LOS A	0.6	4.0	0.68	0.64	0.68	38.1
All Vehicles		1733	1.0	0.744	6.8	LOS A	10.3	72.7	0.74	0.66	0.82	37.4

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

Roundabout LOS Method: SIDRA Roundabout LOS.

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

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

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

**Road 11 / Argent Lane roundabout – PM Peak Upper Bound**
**MOVEMENT SUMMARY**
**Site: 101 [Milldale Road 11 / Argent Lane Rbout PM UPPER]**

 New Site  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Argent Lane S												
1	L2	32	1.0	0.843	14.0	LOS B	16.2	114.6	1.00	1.18	1.49	34.8
2	T1	674	1.0	0.843	13.8	LOS B	16.2	114.6	1.00	1.18	1.49	35.3
3	R2	79	1.0	0.843	17.4	LOS B	16.2	114.6	1.00	1.18	1.49	35.4
Approach		784	1.0	0.843	14.1	LOS B	16.2	114.6	1.00	1.18	1.49	35.3
East: Road 11 E												
4	L2	5	1.0	0.375	5.0	LOS A	2.6	18.5	0.67	0.72	0.67	37.0
5	T1	53	1.0	0.375	4.7	LOS A	2.6	18.5	0.67	0.72	0.67	37.6
6	R2	282	1.0	0.375	8.4	LOS A	2.6	18.5	0.67	0.72	0.67	37.7
Approach		340	1.0	0.375	7.8	LOS A	2.6	18.5	0.67	0.72	0.67	37.7
North: Argent Lane N												
7	L2	197	1.0	0.442	3.2	LOS A	3.7	26.4	0.49	0.44	0.49	38.3
8	T1	316	1.0	0.442	3.0	LOS A	3.7	26.4	0.49	0.44	0.49	39.0
9	R2	23	1.0	0.442	6.6	LOS A	3.7	26.4	0.49	0.44	0.49	39.1
Approach		536	1.0	0.442	3.2	LOS A	3.7	26.4	0.49	0.44	0.49	38.7
West: Road 11 W												
10	L2	8	1.0	0.171	12.3	LOS B	1.2	8.6	0.95	0.90	0.95	35.1
11	T1	37	1.0	0.171	12.1	LOS B	1.2	8.6	0.95	0.90	0.95	35.6
12	R2	19	1.0	0.171	15.7	LOS B	1.2	8.6	0.95	0.90	0.95	35.8
Approach		64	1.0	0.171	13.2	LOS B	1.2	8.6	0.95	0.90	0.95	35.6
All Vehicles		1724	1.0	0.843	9.5	LOS A	16.2	114.6	0.77	0.85	1.00	36.8

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

Roundabout LOS Method: SIDRA Roundabout LOS.

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

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

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



**Road 11 / Argent Lane signals – AM Peak (Full buildout using network volumes)**
**MOVEMENT SUMMARY**
**Site: 101v [Milldale Road 11 / Argent Lane Sig AM]**

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Argent Lane S												
1	L2	12	1.0	0.242	26.0	LOS C	3.3	23.6	0.83	0.67	0.83	32.1
2	T1	232	1.0	0.242	22.6	LOS C	3.4	23.7	0.83	0.67	0.83	32.0
3	R2	23	1.0	0.145	37.4	LOS D	0.8	5.5	0.96	0.70	0.96	28.5
Approach		266	1.0	0.242	24.0	LOS C	3.4	23.7	0.84	0.67	0.84	31.7
East: Road 11 E												
4	L2	28	1.0	0.135	28.8	LOS C	1.5	10.5	0.86	0.68	0.86	30.9
5	T1	23	1.0	0.135	25.4	LOS C	1.5	10.5	0.86	0.68	0.86	30.8
6	R2	128	1.0	0.603	37.5	LOS D	4.5	31.8	1.00	0.82	1.06	28.6
Approach		180	1.0	0.603	34.6	LOS C	4.5	31.8	0.96	0.78	1.00	29.2
North: Argent Lane N												
7	L2	168	1.0	0.115	3.8	LOS A	0.6	3.9	0.20	0.49	0.20	38.8
8	T1	679	1.0	0.684	26.5	LOS C	11.1	78.4	0.95	0.84	1.00	31.0
9	R2	16	1.0	0.099	37.1	LOS D	0.5	3.7	0.95	0.68	0.95	28.6
Approach		863	1.0	0.684	22.3	LOS C	11.1	78.4	0.81	0.77	0.84	32.2
West: Road 11 W												
10	L2	6	1.0	0.090	28.4	LOS C	1.0	7.0	0.85	0.64	0.85	31.4
11	T1	28	1.0	0.090	25.0	LOS C	1.0	7.0	0.85	0.64	0.85	31.3
12	R2	16	1.0	0.074	34.4	LOS C	0.5	3.5	0.92	0.68	0.92	29.2
Approach		51	1.0	0.090	28.4	LOS C	1.0	7.0	0.87	0.65	0.87	30.6
All Vehicles		1360	1.0	0.684	24.5	LOS C	11.1	78.4	0.84	0.75	0.86	31.6

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate	
					Pedestrian ped	Distance m			
P1	South Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92	
P2	East Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92	
P3	North Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92	
P4	West Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92	
All Pedestrians		211	29.3	LOS C			0.92	0.92	



**Road 11 / Argent Lane signals – PM Peak (Full buildout using network volumes)**
**MOVEMENT SUMMARY**
**Site: 101v [Milldale Road 11 / Argent Lane Sig PM]**

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Argent Lane S												
1	L2	32	1.0	0.692	29.4	LOS C	11.8	83.1	0.95	0.85	1.00	31.1
2	T1	674	1.0	0.692	25.8	LOS C	11.8	83.1	0.94	0.84	0.99	31.1
3	R2	49	1.0	0.310	38.2	LOS D	1.7	12.1	0.97	0.73	0.97	28.3
Approach		755	1.0	0.692	26.8	LOS C	11.8	83.1	0.95	0.83	0.99	30.9
East: Road 11 E												
4	L2	2	1.0	0.059	28.2	LOS C	0.7	4.6	0.84	0.61	0.84	31.5
5	T1	21	1.0	0.059	24.8	LOS C	0.7	4.6	0.84	0.61	0.84	31.4
6	R2	113	1.0	0.605	38.6	LOS D	4.0	28.3	1.00	0.82	1.07	28.4
Approach		136	1.0	0.605	36.3	LOS D	4.0	28.3	0.97	0.78	1.03	28.9
North: Argent Lane N												
7	L2	124	1.0	0.086	3.9	LOS A	0.5	3.3	0.21	0.49	0.21	38.8
8	T1	316	1.0	0.297	22.2	LOS C	4.4	30.7	0.83	0.68	0.83	32.2
9	R2	23	1.0	0.145	37.4	LOS D	0.8	5.5	0.96	0.70	0.96	28.5
Approach		463	1.0	0.297	18.0	LOS B	4.4	30.7	0.67	0.63	0.67	33.5
West: Road 11 W												
10	L2	8	1.0	0.082	28.4	LOS C	0.9	6.3	0.84	0.64	0.84	31.3
11	T1	23	1.0	0.082	25.0	LOS C	0.9	6.3	0.84	0.64	0.84	31.2
12	R2	19	1.0	0.102	35.8	LOS D	0.6	4.4	0.94	0.69	0.94	28.9
Approach		51	1.0	0.102	29.6	LOS C	0.9	6.3	0.88	0.66	0.88	30.3
All Vehicles		1404	1.0	0.692	24.9	LOS C	11.8	83.1	0.86	0.76	0.89	31.5

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate	
					Pedestrian ped	Distance m			
P1	South Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92	
P2	East Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92	
P3	North Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92	
P4	West Full Crossing	53	29.3	LOS C	0.1	0.1	0.92	0.92	
All Pedestrians		211	29.3	LOS C			0.92	0.92	

**Road 11 / Argent Lane Signals – AM Peak Upper Bound**
**MOVEMENT SUMMARY**
**Site: 101v [Milldale Road 11 / Argent Lane Sig AM UPPER]**

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Argent Lane S												
1	L2	12	1.0	0.277	31.5	LOS C	4.0	28.2	0.87	0.70	0.87	30.6
2	T1	232	1.0	0.277	28.1	LOS C	4.0	28.3	0.87	0.70	0.87	30.5
3	R2	40	1.0	0.286	43.8	LOS D	1.6	11.2	0.98	0.73	0.98	27.1
Approach		283	1.0	0.286	30.5	LOS C	4.0	28.3	0.88	0.70	0.88	30.0
East: Road 11 E												
4	L2	61	1.0	0.312	34.5	LOS C	3.9	27.3	0.91	0.74	0.91	29.5
5	T1	51	1.0	0.312	31.0	LOS C	3.9	27.3	0.91	0.74	0.91	29.4
6	R2	278	1.0	0.780	39.1	LOS D	11.1	78.4	0.98	0.94	1.16	28.3
Approach		389	1.0	0.780	37.3	LOS D	11.1	78.4	0.96	0.88	1.08	28.6
North: Argent Lane N												
7	L2	294	1.0	0.201	4.1	LOS A	1.6	11.3	0.24	0.51	0.24	38.8
8	T1	679	1.0	0.781	35.2	LOS D	13.8	97.6	1.00	0.96	1.14	28.9
9	R2	16	1.0	0.113	42.8	LOS D	0.6	4.3	0.96	0.68	0.96	27.3
Approach		988	1.0	0.781	26.1	LOS C	13.8	97.6	0.77	0.82	0.87	31.2
West: Road 11 W												
10	L2	6	1.0	0.153	33.3	LOS C	1.9	13.1	0.87	0.67	0.87	30.2
11	T1	49	1.0	0.153	29.9	LOS C	1.9	13.1	0.87	0.67	0.87	30.1
12	R2	16	1.0	0.040	30.5	LOS C	0.5	3.5	0.82	0.66	0.82	30.2
Approach		72	1.0	0.153	30.3	LOS C	1.9	13.1	0.86	0.67	0.86	30.1
All Vehicles		1733	1.0	0.781	29.5	LOS C	13.8	97.6	0.84	0.81	0.92	30.4

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate	
					Pedestrian ped	Distance m			
P1	South Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93	
P2	East Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93	
P3	North Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93	
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93	
All Pedestrians		211	34.3	LOS D			0.93	0.93	

**Road 11 / Argent Lane Signals – PM Peak Upper Bound**
**MOVEMENT SUMMARY**
**Site: 101v [Milldale Road 11 / Argent Lane Sig PM UPPER]**

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Argent Lane S												
1	L2	32	1.0	0.808	39.3	LOS D	15.4	108.4	1.00	0.99	1.17	28.7
2	T1	674	1.0	0.808	35.7	LOS D	15.4	108.4	0.99	0.98	1.17	28.7
3	R2	79	1.0	0.565	45.2	LOS D	3.2	22.9	1.00	0.79	1.05	26.9
Approach		784	1.0	0.808	36.8	LOS D	15.4	108.4	0.99	0.97	1.16	28.5
East: Road 11 E												
4	L2	5	1.0	0.158	33.3	LOS C	1.9	13.6	0.87	0.67	0.87	30.2
5	T1	53	1.0	0.158	29.9	LOS C	1.9	13.6	0.87	0.67	0.87	30.1
6	R2	282	1.0	0.801	41.0	LOS D	11.6	82.1	1.00	0.97	1.21	27.9
Approach		340	1.0	0.801	39.1	LOS D	11.6	82.1	0.98	0.92	1.15	28.2
North: Argent Lane N												
7	L2	197	1.0	0.137	4.2	LOS A	1.1	7.9	0.24	0.51	0.24	38.7
8	T1	316	1.0	0.340	27.7	LOS C	5.2	36.8	0.87	0.71	0.87	30.7
9	R2	23	1.0	0.166	43.1	LOS D	0.9	6.4	0.97	0.70	0.97	27.3
Approach		536	1.0	0.340	19.8	LOS B	5.2	36.8	0.64	0.63	0.64	33.0
West: Road 11 W												
10	L2	8	1.0	0.124	33.1	LOS C	1.5	10.6	0.87	0.66	0.87	30.2
11	T1	37	1.0	0.124	29.7	LOS C	1.5	10.6	0.87	0.66	0.87	30.1
12	R2	19	1.0	0.051	31.5	LOS C	0.6	4.3	0.84	0.67	0.84	29.9
Approach		64	1.0	0.124	30.6	LOS C	1.5	10.6	0.86	0.66	0.86	30.0
All Vehicles		1724	1.0	0.808	31.7	LOS C	15.4	108.4	0.87	0.84	0.99	29.8

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate	
					Pedestrian ped	Distance m			
P1	South Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93	
P2	East Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93	
P3	North Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93	
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93	
All Pedestrians		211	34.3	LOS D			0.93	0.93	

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