Proposed Lidl Food Store, Hayes

Impact Assessment Report

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Version control and approval

Version	Date	Prepared by	Approved by
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Proposed Lidl Food Store Impact Assessment

1. Introduction

1.1. Multimodal Ltd have been commissioned by Gateway TSP to test the impact of a proposed Lidl Food store on the surrounding network in Hayes town centre. The new food store is to be located on the former Hayes Pool / Fitness Centre site adjacent to Botwell Lane and accessed via a new link onto Central Avenue.

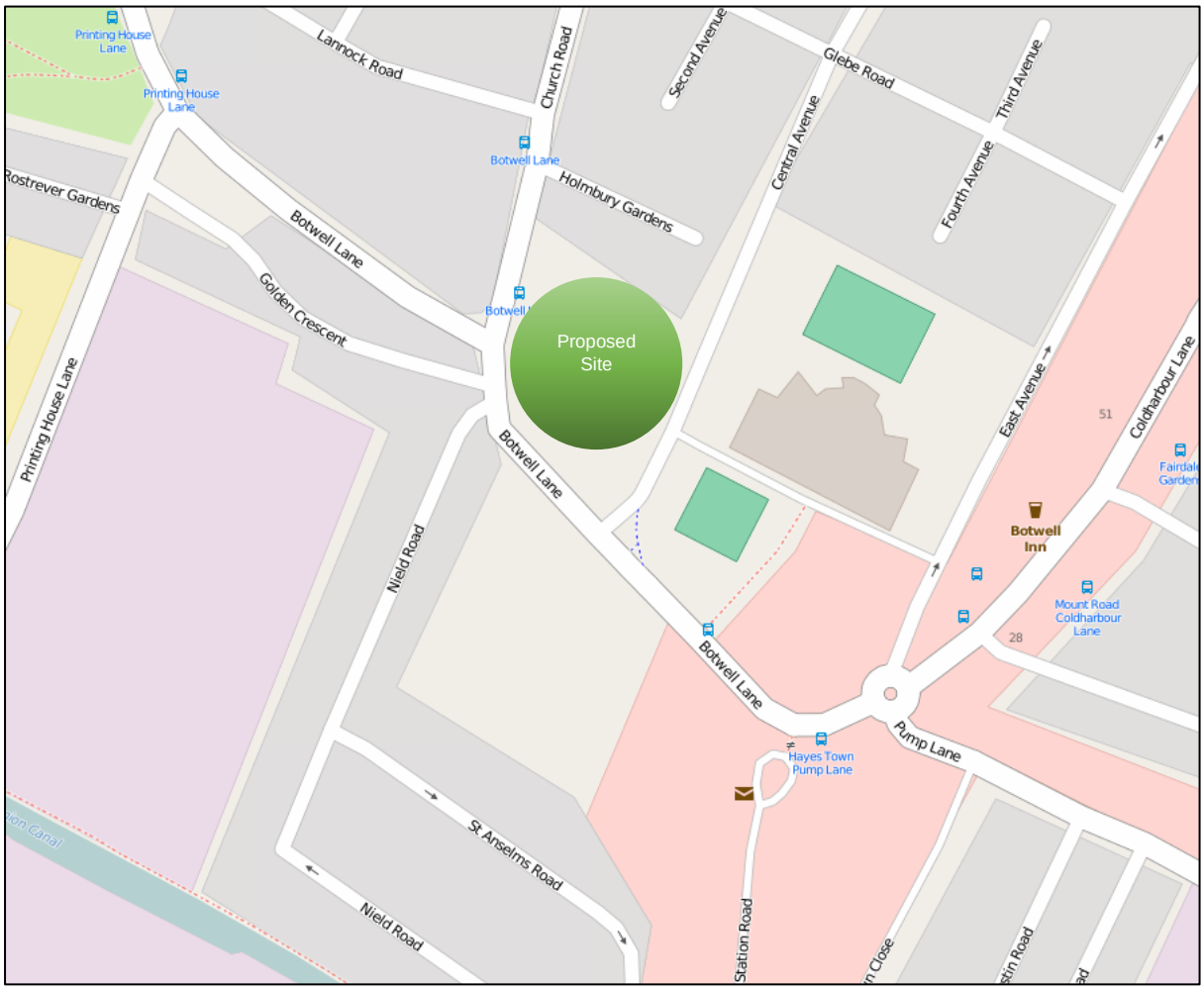

Figure 1: Site Location

1.2. The site is expected to generate:

- 114 arrivals and 117 departures in the PM Peak;
- 161 arrivals and 177 departures in the Saturday Peak.

1.3. The AM Peak trips are not considered in this assessment.

1.4. The following paragraphs summarise the traffic modelling undertaken to assess the impact of the proposed Lidl Food store.

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2. Previous Modelling

2.1. To take into account the proposed re-opening of Station Road (works currently ongoing), which may impact the assignment of trips in the area of interest, a Hayes Town Centre model, produced by Steer Davies Gleave has been used as the base on which to test the proposed site. This model, built in VISSIM version 5.4, has caused a lot of issues due to the inherent possibility of locking up as a result of the coding methodology and internal routing. As a result, a revised model extent has been produced, 'cutting down' the original model so that only the immediate area is assessed. Figure 2 shows the original model and the edited extents.

Figure 2: Hayes Town Centre VISSIM model

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3. Trip Distribution

3.1. The development traffic flows have been distributed based on the observed turning proportions at the following junctions:

- The Site Access/Central Avenue junction, from passing traffic flows;
- The Central Avenue/Botwell Lane junction; and
- The Botwell Lane/Church Road junction.

3.2. Beyond this area, traffic to the east of the site has been distributed on a gravity model basis as follows:

- 40% of traffic turning left out and right into Central Avenue is distributed along Coldharbour Lane;
- 40% of traffic turning left out and right into Central Avenue is distributed along Station Road; and
- 20% of traffic turning left out and right into Central Avenue is distributed along Pump Lane.

3.3. These distributions replicate those included within the Addendum Transport Assessment prepared by Gateway TSP, which provides full details of the traffic distribution methodology. Figures 3 & 4 show the food store trips for the PM and Saturday peaks respectively.

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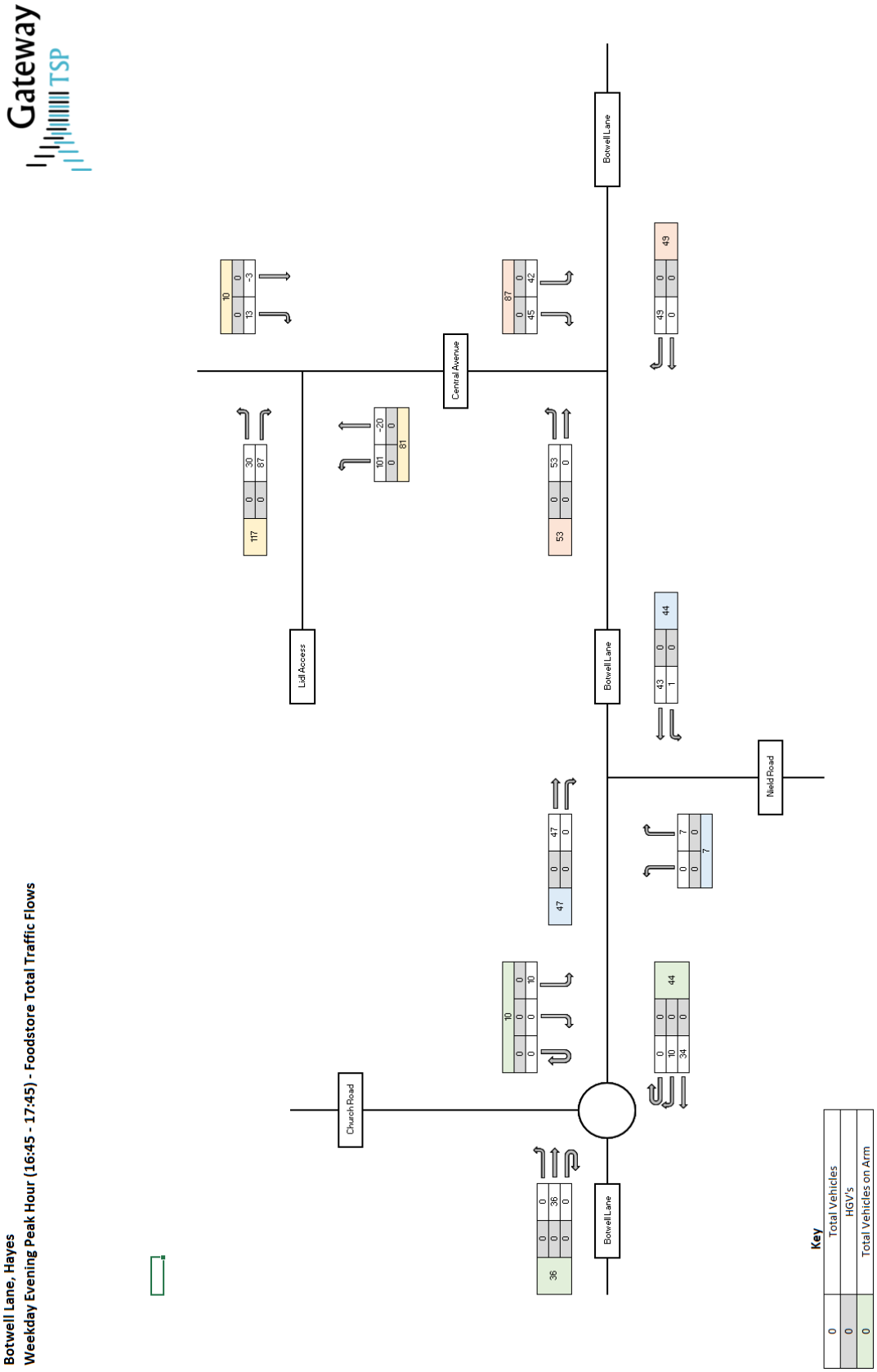

Figure 3: PM Peak Food Store Total Trips

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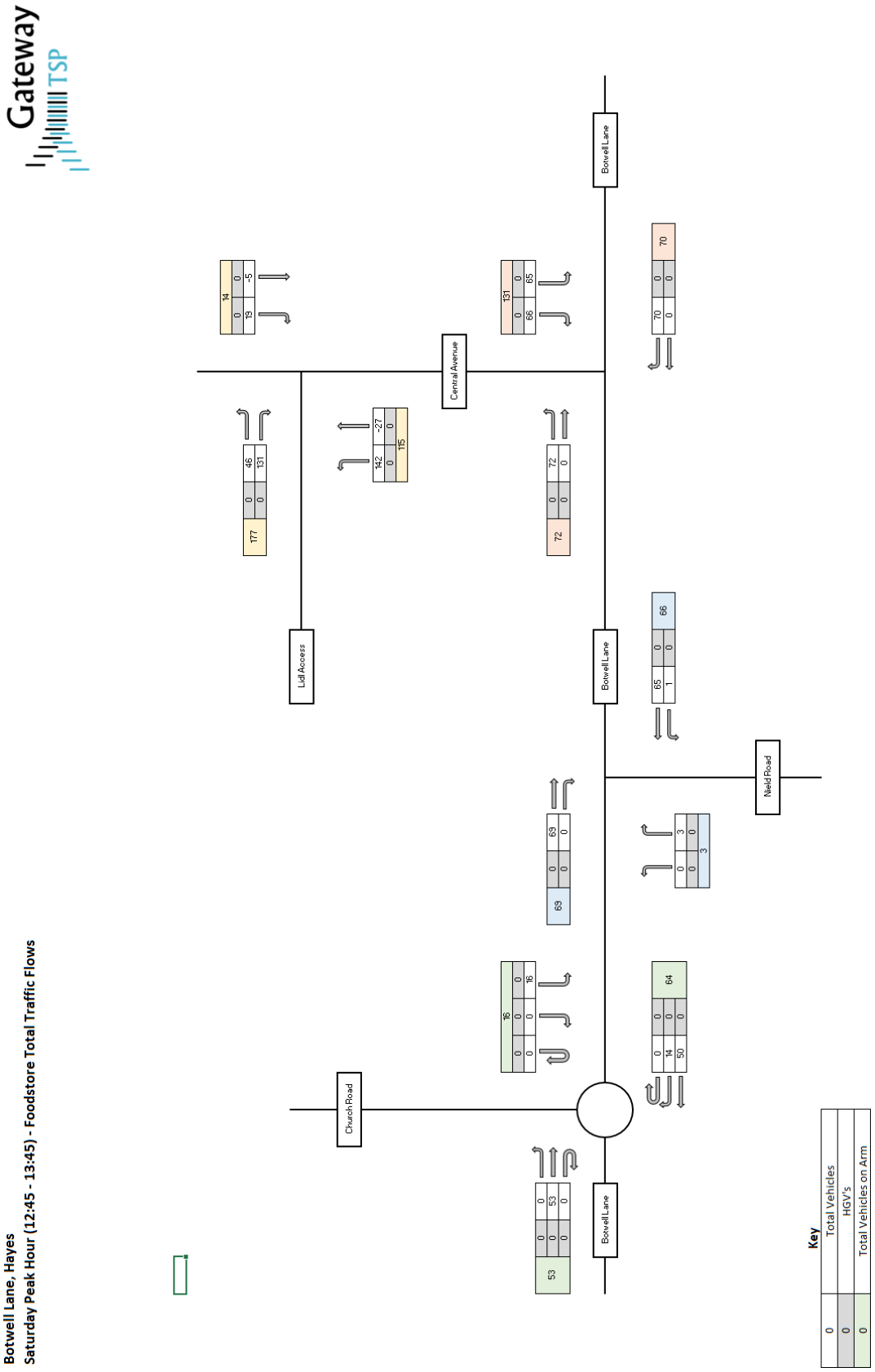

Figure 4: Saturday Peak Food Store Total Trips

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4. Assessment Years

4.1. The impact of the proposed food store has been assessed for:

- The opening year (planned for 2016).

The following growth factors have been used to uplift background traffic in the models to the assessment year, as shown in Table 1.

Time Period	Weekday PM Growth Factor	Saturday Daytime Growth Factor
2015-2016	1.0174	1.0183

Table 1: Tempro Growth Factors*

**source: Page 29 Transport Assessment On behalf of Lidl UK - Gateway TSP*

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5. VISSIM Model Specification

5.1. Based on the Hayes Town Centre modelling already undertaken, the traffic models have been developed using the following specification:

VISSIM Version – 5.40-13.

Testing Year – 2016.

Time Periods

- PM Peak period between 16:30 and 18:30 (includes 30-minute warm up and cool down periods); and
- Saturday Peak period between 12:15 and 14:15 (includes 30-minute warm up and cool down periods).

Evaluation Periods

- PM Peak period between 17:00 and 18:00; and
- Saturday Peak period between 12:45 and 13:45.

6. Model Results Comparison

6.1. The models have been run for results over 10 random seeds to reflect day to day variation in arrival patterns and averaged for comparison.
The models have been assessed for:

- Junction Delays;
- Overall Network Performance; and
- Average and Average Maximum Queues.

7. 2016 Junction Delays

7.1. Appendix A summarises the junction delay comparison between the *2016 Base* and *2016 with Development* Scenarios.

7.2. In the PM Peak, the 2016 with/without development scenarios have very similar levels of delay with small fluctuations which are considered negligible for the majority of the network. Broadly speaking, the differences in delay are within 1-10 seconds. The most significant difference is on the Central Avenue approach to the Botwell Lane / Central Avenue Junction, where there is a large increase in delay due to traffic leaving the proposed site, in the region of 120 seconds;

7.3. The Saturday Peak has a similar outcome with generally small fluctuations between the 2016 with/without development scenarios. There are larger delays for traffic exiting Nield Road, particularly for right turners with increases of around 23 seconds, most likely attributed to the combination of an increase in development traffic turning right onto Botwell Lane, and queueing/blocking conditions heading southeast-bound on Botwell Lane. Delays on Central Avenue due to development traffic leaving the proposed site are higher than in the PM Peak with a delay increase between 140 to 150 seconds.

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7.4. Interestingly in the Saturday Peak, there appears to be a reduction in delay on Church Road of around 60 seconds for right turning traffic and a smaller six seconds delay reduction for left turning traffic. Although these results may seem counterintuitive, watching the models it is apparent that as the southeast exit becomes increasingly blocked due to an increase in slow moving traffic travelling along Botwell Lane, traffic turning right out of Church Road have more opportunities due to yellow box behaviour, whereby traffic does not enter the roundabout unless it can exit (travelling southeast).

8. 2016 Network Performance

8.1. Table 2 summarises an overall network performance comparison between the *2016 Base and 2016 with Development* Scenarios. The main conclusions from this comparison are:

- There is a general increase in delay across the network, in both moving and stopped delay, leading to reduced average speeds in both peaks.
- The results show that both peaks end up producing similar performance statistics. This demonstrates the development having a greater impact on the PM peak, where the difference between the base and development measures is larger;
- However, overall the results show that the *2016 with Development* Scenario has a reasonably small impact on delay per trip in the PM Peak with a 3.08% increase. The Saturday Peaks shows a lower increase in delay per trip of 2.36%.

	PM PEAK		SAT PEAK	
Network Performance Data 2016	**Base**	**With Development**	**Base**	**With Development**
Total travel time (hr)	169.69	179.80	174.53	179.51
Average Delay per vehicle (secs)	153.97	176.10	194.53	216.94
Average Stopped Delay per vehicle (secs)	70.52	80.52	100.52	112.24
Average speed (mph)	5.22	4.76	4.60	4.23
Total delay time (hr)	111.89	124.10	121.81	129.51
Percentage delay per trip (%)	**65.94%**	**69.02%**	**69.79%**	**72.15%**
Number of vehicles in the network at end of simulation	169.60	182.40	184.80	195.80

Table 2: 2016 Network Performance

9. 2016 Queue comparison

9.1. Figures 5 to 8 show the PM and Saturday Peak Average and Average Maximum queue lengths for each junction approach. Overall, the *2016 Base and 2016 with Development* Scenarios have similar queue profiles, suggesting the additional development vehicles have minimal impact on the wider network.

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9.2. There is more of a noticeable effect at the main development junction itself (Central Avenue/Botwell Lane) which can be purely attributed to development traffic.

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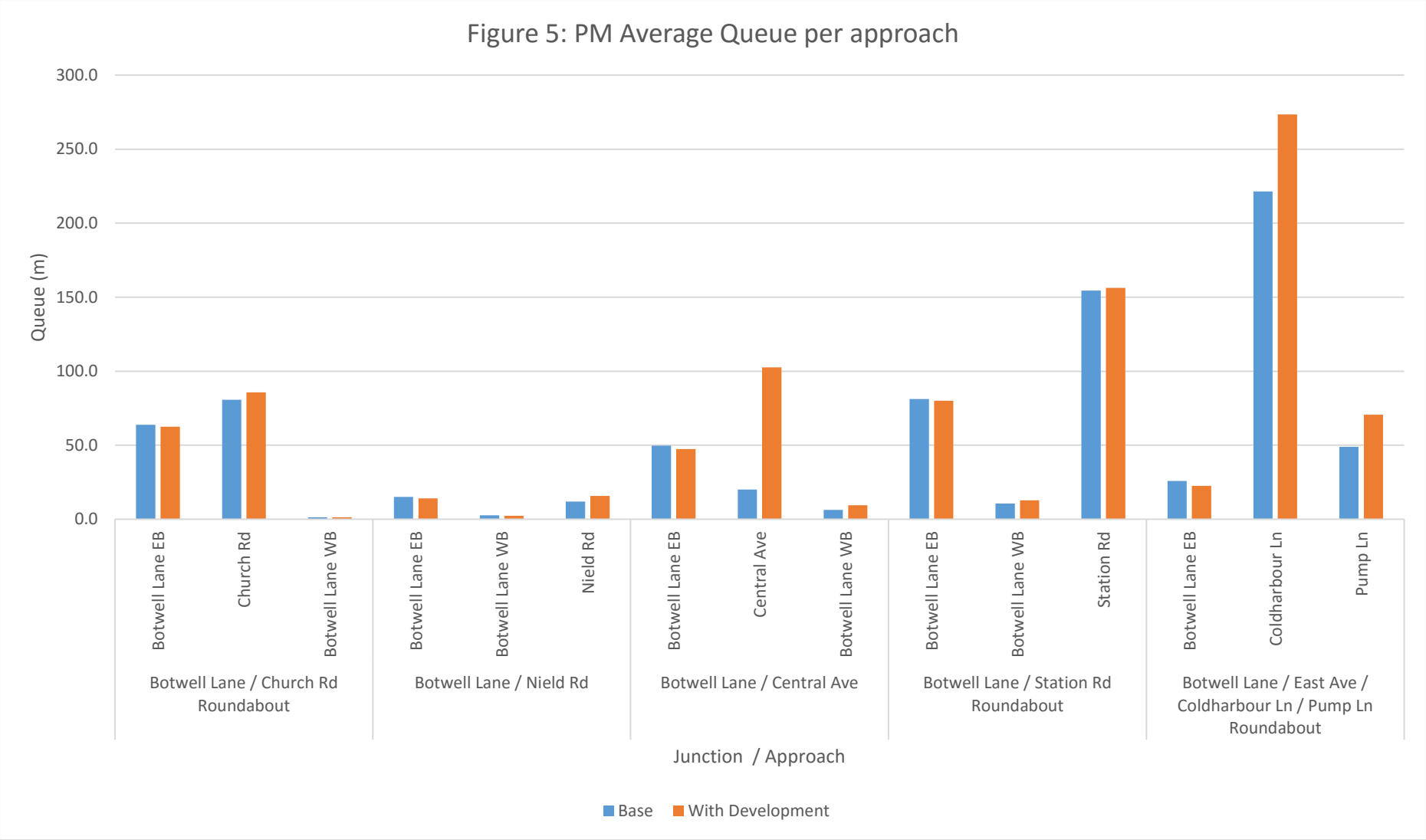

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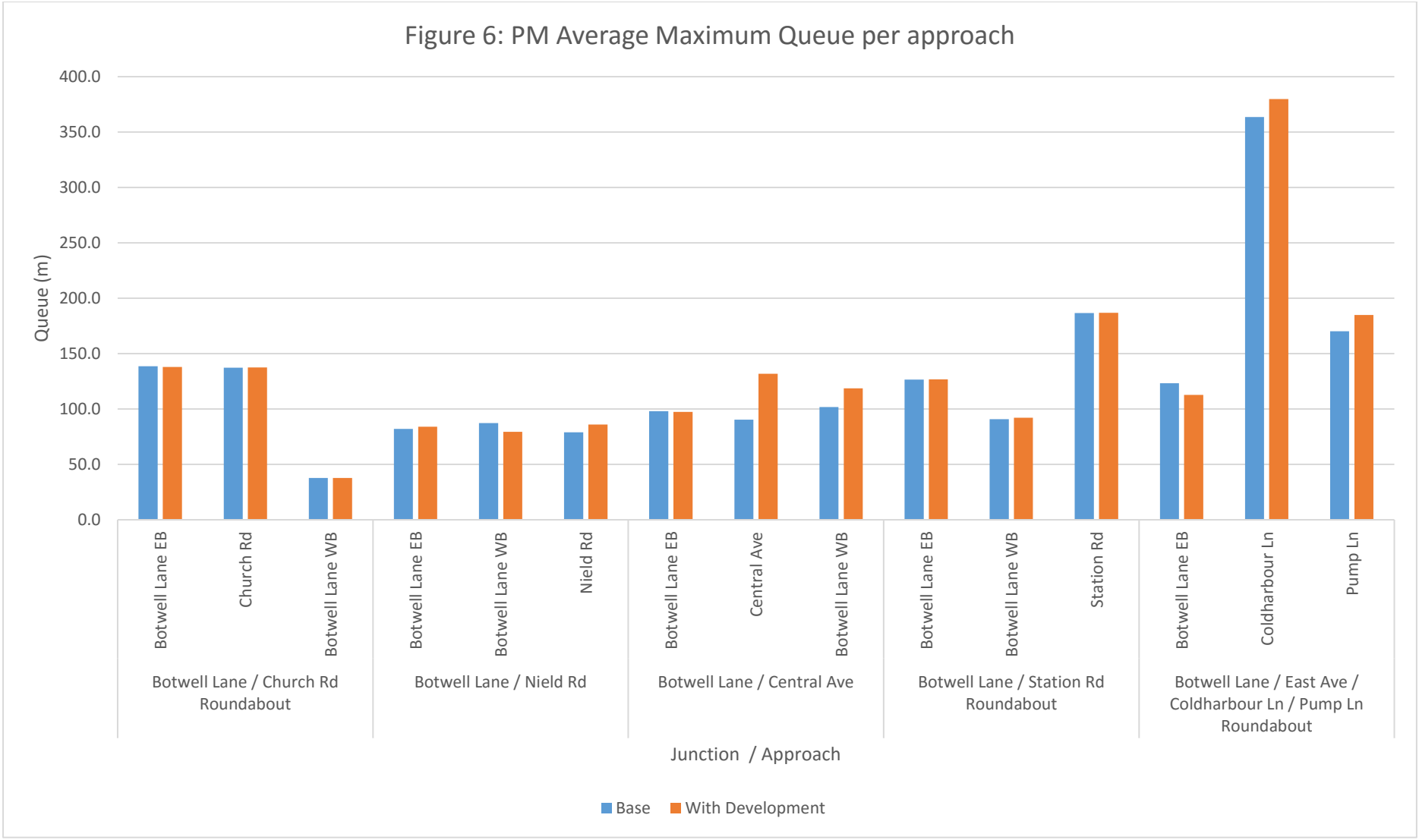

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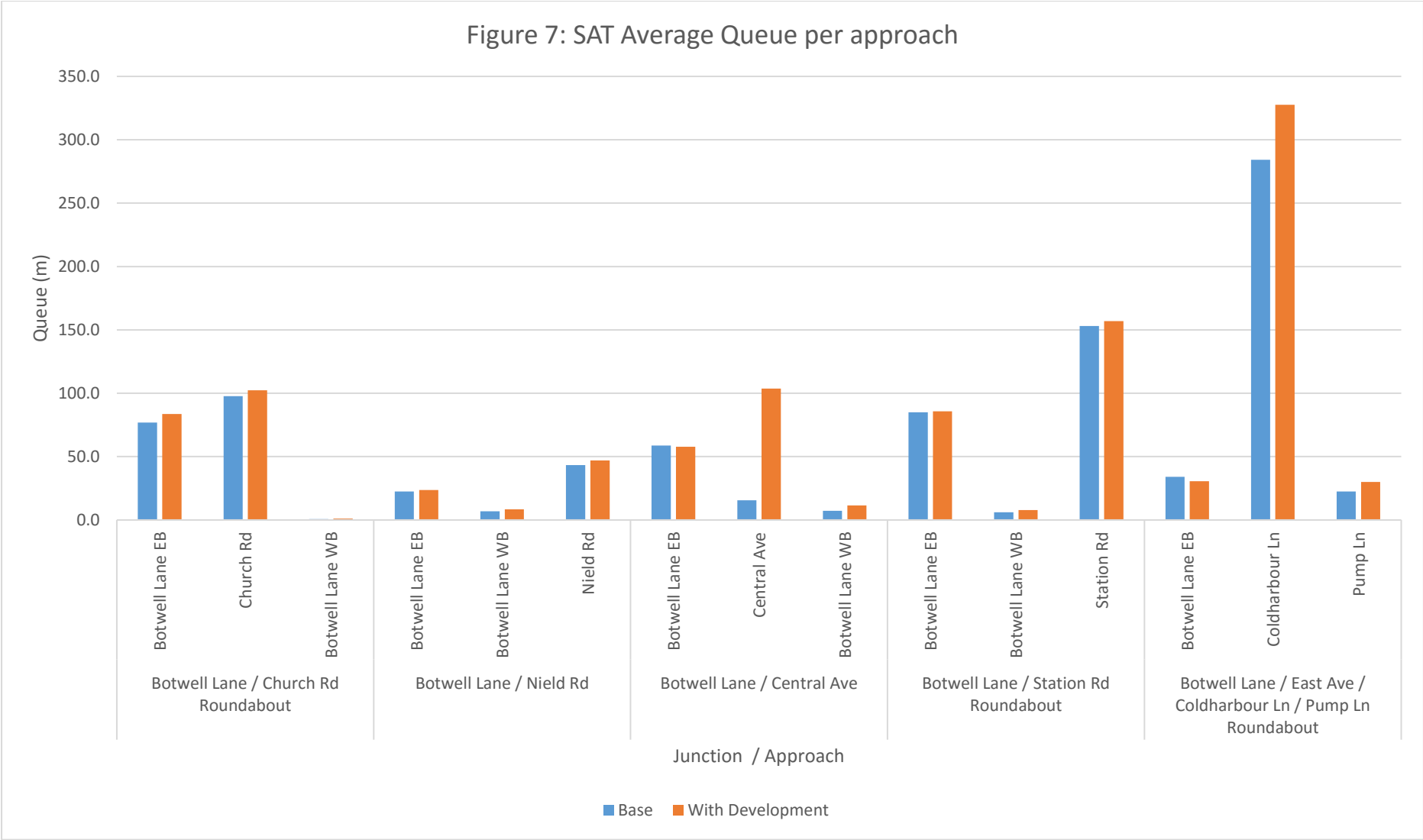

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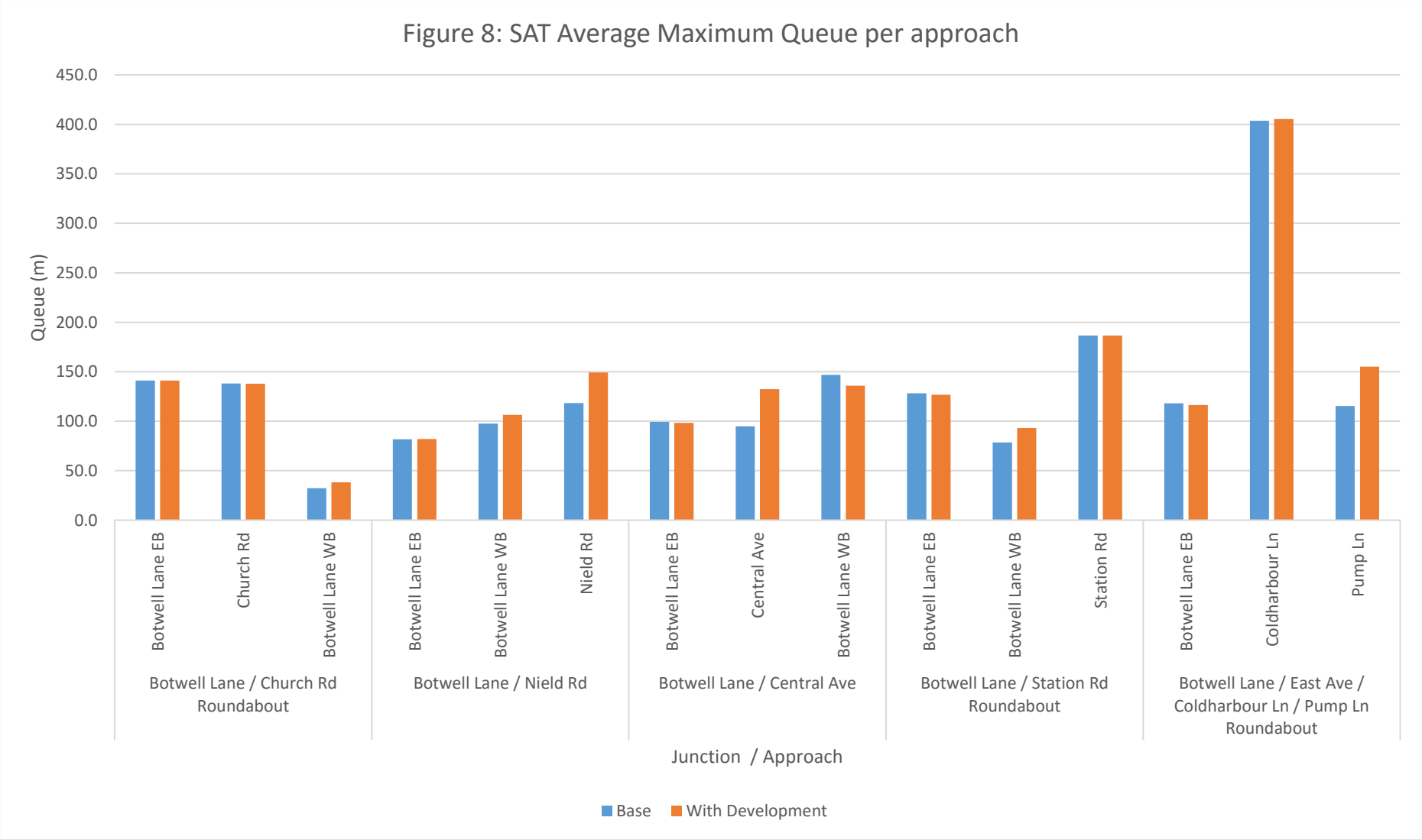

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10. Conclusion

10.1. The testing undertaken using the Hayes Town Centre model to assess the impact of a proposed food store located adjacent to Botwell Lane and accessed via Central Avenue shows that the increase of development trips has minimal impact on the surrounding network in both the PM and Saturday Peaks. However, the PM peak appears to be worst affected with an overall increase in delay per trip of 3.08%, compared to a 2.36% increase to delay per trip on Saturday.

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APPENDIX A – JUNCTION DELAYS

Junction Delays			PM PEAK				SAT PEAK			
			Base	With Development			Base	With Development		
	Movement		Delay (s)		Diff.	% Diff.	Delay (s)		Diff.	% Diff.
Junction	Approach	Turn								
Botwell Lane / Church Rd Roundabout	Botwell Lane EB	Church Rd	60.3	54.0	-6.3	-10.4%	101.0	91.8	-9.2	-9.1%
		Ahead	67.3	62.1	-5.2	-7.7%	128.5	128.7	0.1	0.1%
	Church Rd	Left	210.8	205.7	-5.1	-2.4%	450.2	444.5	-5.7	-1.3%
		Right	185.7	183.8	-1.9	-1.0%	461.8	402.6	-59.2	-12.8%
	Botwell Lane WB	Ahead	1.7	1.7	0.0	1.5%	1.1	1.5	0.3	30.4%
		Church Rd	2.0	2.0	0.0	0.0%	2.1	2.9	0.8	37.1%
	Junction Total		**527.7**	**509.2**	**-18.5**	**-3.5%**	**1144.8**	**1071.9**	**-72.9**	**-6.4%**
Botwell Lane / Nield Rd	Botwell Lane EB	Ahead	21.3	18.3	-2.9	-13.8%	35.7	32.5	-3.3	-9.1%
		Nield Rd	14.3	13.7	-0.6	-4.4%	16.5	15.2	-1.3	-8.0%
	Botwell Lane WB	Nield Rd	3.9	4.0	0.1	3.9%	6.7	8.7	2.0	30.1%
		Ahead	6.2	5.9	-0.4	-5.8%	11.0	11.5	0.5	4.4%
	Nield Rd	Left	33.2	42.2	8.9	26.9%	128.4	134.3	5.8	4.5%
		Right	72.3	81.4	9.1	12.6%	181.4	204.6	23.2	12.8%
	Junction Total		**151.2**	**165.4**	**14.3**	**9.4%**	**379.7**	**406.7**	**27.0**	**7.1%**
Botwell Lane / Central Ave	Botwell Lane EB	Central Ave	41.6	36.5	-5.1	-12.3%	52.0	53.3	1.3	2.4%
		Ahead	56.3	51.0	-5.2	-9.3%	75.2	69.7	-5.5	-7.3%
	Central Ave	Left	55.6	179.2	123.6	222.1%	58.5	198.2	139.7	238.8%
		Right	44.6	165.2	120.7	270.7%	42.7	192.9	150.2	351.6%
	Botwell Lane WB	Ahead	7.6	10.0	2.3	30.7%	8.1	11.0	2.9	35.2%
		Central Ave	11.9	17.0	5.2	43.5%	10.2	16.0	5.8	56.8%
	Junction Total		**217.5**	**458.9**	**241.4**	**111.0%**	**246.8**	**541.2**	**294.4**	**119.3%**
Botwell Lane / Station Rd Roundabout	Botwell Lane EB	Ahead	82.6	76.7	-5.9	-7.2%	98.6	93.5	-5.0	-5.1%
		Station Rd	86.8	82.1	-4.8	-5.5%	96.3	96.3	-0.1	-0.1%
	Botwell Lane WB	Station Rd	8.9	9.0	0.1	0.6%	8.3	8.2	-0.1	-1.0%
		Ahead	10.8	11.3	0.4	4.0%	9.8	10.6	0.8	7.9%
	Station Rd	Left	164.7	175.9	11.2	6.8%	174.8	180.3	5.5	3.2%
		Right	166.8	174.5	7.7	4.6%	176.3	180.6	4.3	2.4%
	Junction Total		**520.8**	**529.5**	**8.7**	**1.7%**	**564.1**	**569.5**	**5.4**	**1.0%**
Botwell Lane / East Ave / Coldharbour Ln / Pump Ln Roundabout	Botwell Lane EB	East Ave	8.9	8.6	-0.3	-3.2%	11.4	10.8	-0.5	-4.7%
		Coldharbour Ln	15.1	15.5	0.4	2.6%	17.5	16.2	-1.3	-7.2%
		Pump Ln	12.7	12.4	-0.3	-2.7%	14.7	13.7	-1.0	-6.5%
	Coldharbour Ln	Pump Ln	96.9	96.7	-0.2	-0.2%	97.5	99.9	2.4	2.5%
		Botwell Lane WB	102.1	102.8	0.8	0.8%	99.2	103.7	4.5	4.5%
		East Ave	97.5	97.3	-0.2	-0.2%	101.0	92.7	-8.3	-8.2%
	Pump Ln	Botwell Lane WB	54.5	64.4	9.9	18.2%	33.8	40.2	6.4	18.9%
		East Ave	45.5	55.8	10.2	22.5%	27.4	33.5	6.2	22.6%
		Coldharbour Ln	54.7	64.5	9.7	17.8%	35.7	41.6	5.9	16.6%
	Junction Total		**487.9**	**517.9**	**30.0**	**6.1%**	**438.2**	**452.6**	**14.3**	**3.3%**
		Network Total	**1905.1**	**2180.9**	**275.8**	**25%**	**2773.7**	**3041.9**	**268.2**	**25%**

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APPENDIX B – TRAFFIC FLOW COMPARISON

Traffic Flow Comparison			PM PEAK				SAT PEAK			
			Base	With Development			Base	With Development		
	Movement		All Vehicles		Diff.	% Diff.	All Vehicles		Diff.	% Diff.
Junction	Approach	Turn								
Botwell Lane / Church Rd Roundabout	Botwell Lane EB	Church Rd	115.5	116.1	0.6	0.5%	43.8	41.8	-2.0	-4.6%
		Ahead	375.4	412.8	37.4	10.0%	278.0	305.2	27.2	9.8%
	Church Rd	Left	78.3	86.3	8.0	10.2%	48.8	58.0	9.2	18.9%
		Right	118.8	119.5	0.8	0.6%	62.2	59.2	-3.0	-4.8%
	Botwell Lane WB	Ahead	546.9	547.5	0.6	0.1%	449.8	464.0	14.2	3.2%
		Church Rd	204.3	203.3	-1.0	-0.5%	152.0	154.2	2.2	1.4%
Botwell Lane / Nield Rd	Botwell Lane EB	Ahead	432.9	478.9	46.0	10.6%	303.2	338.2	35.0	11.5%
		Nield Rd	19.8	19.9	0.1	0.6%	21.6	22.2	0.6	2.8%
	Botwell Lane WB	Nield Rd	19.1	19.1	0.0	0.0%	26.6	25.2	-1.4	-5.3%
		Ahead	625.0	624.5	-0.5	-0.1%	536.6	554.8	18.2	3.4%
	Nield Rd	Left	127.0	126.0	-1.0	-0.8%	64.8	63.6	-1.2	-1.9%
		Right	54.3	57.6	3.4	6.2%	85.8	82.2	-3.6	-4.2%
Botwell Lane / Central Ave	Botwell Lane EB	Central Ave	101.1	145.4	44.3	43.8%	61.8	100.0	38.2	61.8%
		Ahead	382.3	390.5	8.3	2.2%	322.0	315.4	-6.6	-2.0%
	Central Ave	Left	123.8	141.6	17.9	14.4%	129.8	158.8	29.0	22.3%
		Right	151.4	169.8	18.4	12.1%	94.2	130.0	35.8	38.0%
	Botwell Lane WB	Ahead	493.3	474.3	-19.0	-3.9%	469.2	450.4	-18.8	-4.0%
		Central Ave	69.0	105.6	36.6	53.1%	67.6	122.0	54.4	80.5%
Botwell Lane / Station Rd Roundabout	Botwell Lane EB	Ahead	415.6	425.5	9.9	2.4%	391.0	398.2	7.2	1.8%
		Station Rd	80.8	95.6	14.9	18.4%	50.8	70.6	19.8	39.0%
	Botwell Lane WB	Station Rd	145.9	141.5	-4.4	-3.0%	96.2	93.8	-2.4	-2.5%
		Ahead	407.3	425.4	18.1	4.5%	402.6	430.6	28.0	7.0%
	Station Rd	Left	152.5	151.9	-0.6	-0.4%	124.4	135.4	11.0	8.8%
		Right	247.1	234.3	-12.9	-5.2%	252.4	235.4	-17.0	-6.7%
Botwell Lane / East Ave / Coldharbour Ln / Pump Ln Roundabout	Botwell Lane EB	East Ave	33.8	32.0	-1.8	-5.2%	44.6	41.0	-3.6	-8.1%
		Coldharbour Ln	257.0	265.4	8.4	3.3%	214.0	228.0	14.0	6.5%
		Pump Ln	369.1	361.4	-7.8	-2.1%	404.2	383.4	-20.8	-5.1%
	Coldharbour Ln	Pump Ln	161.4	157.6	-3.8	-2.3%	171.2	162.4	-8.8	-5.1%
		Botwell Lane WB	272.1	279.4	7.3	2.7%	280.2	290.4	10.2	3.6%
		East Ave	40.6	40.8	0.1	0.3%	21.0	18.8	-2.2	-10.5%
	Pump Ln	Botwell Lane WB	281.4	287.6	6.3	2.2%	240.0	253.6	13.6	5.7%
		East Ave	53.3	53.0	-0.3	-0.5%	43.4	43.4	0.0	0.0%
		Coldharbour Ln	129.6	129.5	-0.1	-0.1%	176.0	176.4	0.4	0.2%

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APPENDIX C – AVERAGE QUEUE DATA

Junction	Approach	Turn	PM PEAK Average Queue per movement Base	PM PEAK Average Queue per movement With Development	Diff.	% Diff.	SAT PEAK Average Queue per movement Base	SAT PEAK Average Queue per movement With Development	Diff.	% Diff.
Botwell Lane / Church Rd Roundabout	Botwell Lane EB	Church Rd	63.8	62.5	-1.3	-2.1%	76.8	83.7	6.9	9.0%
		Ahead	63.8	62.5	-1.3	-2.1%	76.8	83.7	6.9	9.0%
	Church Rd	Left	80.7	85.6	4.9	6.1%	97.7	102.3	4.6	4.7%
		Right	80.7	85.6	4.9	6.1%	97.7	102.3	4.6	4.7%
	Botwell Lane WB	Ahead	1.4	1.4	0.0	-2.7%	0.6	1.1	0.4	68.8%
		Church Rd	1.4	1.4	0.0	-2.7%	0.6	1.1	0.4	68.8%
Botwell Lane / Nield Rd	Botwell Lane EB	Ahead	15.1	14.1	-0.9	-6.2%	22.5	23.6	1.1	4.9%
		Nield Rd	15.1	14.1	-0.9	-6.2%	22.5	23.6	1.1	4.9%
	Botwell Lane WB	Nield Rd	1.4	1.2	-0.2	-15.9%	4.5	5.7	1.2	27.4%
		Ahead	4.0	3.3	-0.6	-16.1%	9.4	11.2	1.8	18.9%
	Nield Rd	Left	12.0	15.8	3.8	31.4%	43.3	47.0	3.7	8.6%
		Right	11.9	15.7	3.8	31.8%	43.2	46.9	3.7	8.7%
Botwell Lane / Central Ave	Botwell Lane EB	Central Ave	45.1	42.9	-2.2	-4.9%	54.1	53.1	-1.0	-1.8%
		Ahead	54.2	51.9	-2.2	-4.2%	63.5	62.5	-1.0	-1.5%
	Central Ave	Left	20.2	102.7	82.5	409.4%	15.6	103.9	88.3	567.6%
		Right	20.0	102.5	82.5	411.9%	15.4	103.7	88.3	573.2%
	Botwell Lane WB	Ahead	8.8	11.3	2.5	28.6%	9.6	12.6	3.0	31.3%
		Central Ave	3.8	7.6	3.9	102.7%	5.0	10.5	5.5	110.4%
Botwell Lane / Station Rd Roundabout	Botwell Lane EB	Ahead	81.2	80.0	-1.1	-1.4%	85.0	85.8	0.7	0.9%
		Station Rd	81.2	80.0	-1.1	-1.4%	85.0	85.8	0.7	0.9%
	Botwell Lane WB	Station Rd	10.6	12.8	2.2	20.9%	6.2	7.9	1.8	28.6%
		Ahead	10.6	12.8	2.2	20.9%	6.2	7.9	1.8	28.6%
	Station Rd	Left	154.5	156.3	1.8	1.2%	153.1	157.0	3.9	2.5%
		Right	154.5	156.3	1.8	1.2%	153.1	157.0	3.9	2.5%
Botwell Lane / East Ave / Coldharbour Ln / Pump Ln Roundabout	Botwell Lane EB	East Ave	25.9	22.6	-3.3	-12.9%	34.1	30.6	-3.5	-10.2%
		Coldharbour Ln	25.9	22.6	-3.3	-12.9%	34.1	30.6	-3.5	-10.2%
		Pump Ln	25.9	22.6	-3.3	-12.9%	34.1	30.6	-3.5	-10.2%
	Coldharbour Ln	Pump Ln	221.3	273.5	52.1	23.6%	284.3	327.6	43.4	15.3%
		Botwell Lane WB	221.3	273.5	52.1	23.6%	284.3	327.6	43.4	15.3%
		East Ave	221.3	273.5	52.1	23.6%	284.3	327.6	43.4	15.3%
	Pump Ln	Botwell Lane WB	49.0	70.6	21.6	44.2%	22.5	30.0	7.5	33.4%
		East Ave	49.0	70.6	21.6	44.2%	22.5	30.0	7.5	33.4%
		Coldharbour Ln	49.0	70.6	21.6	44.2%	22.5	30.0	7.5	33.4%

Junction	Approach	PM PEAK Average Queue per approach Base	PM PEAK Average Queue per approach With Development	Diff.	% Diff.	SAT PEAK Average Queue per approach Base	SAT PEAK Average Queue per approach With Development	Diff.	% Diff.
Botwell Lane / Church Rd Roundabout	Botwell Lane EB	63.8	62.5	-1.3	-2.1%	76.8	83.7	6.9	9.0%
	Church Rd	80.7	85.6	4.9	6.1%	97.7	102.3	4.6	4.7%
	Botwell Lane WB	1.4	1.4	0.0	-2.7%	0.6	1.1	0.4	68.8%
Botwell Lane / Nield Rd	Botwell Lane EB	15.1	14.1	-0.9	-6.2%	22.5	23.6	1.1	4.9%
	Botwell Lane WB	2.7	2.3	-0.4	-16.0%	7.0	8.5	1.5	21.6%
	Nield Rd	11.9	15.7	3.8	31.6%	43.2	47.0	3.7	8.6%
Botwell Lane / Central Ave	Botwell Lane EB	49.7	47.4	-2.2	-4.5%	58.8	57.8	-1.0	-1.7%
	Central Ave	20.1	102.6	82.5	410.6%	15.5	103.8	88.3	570.4%
	Botwell Lane WB	6.3	9.5	3.2	50.7%	7.3	11.6	4.3	58.4%
Botwell Lane / Station Rd Roundabout	Botwell Lane EB	81.2	80.0	-1.1	-1.4%	85.0	85.8	0.7	0.9%
	Botwell Lane WB	10.6	12.8	2.2	20.9%	6.2	7.9	1.8	28.6%
	Station Rd	154.5	156.3	1.8	1.2%	153.1	157.0	3.9	2.5%
Botwell Lane / East Ave / Coldharbour Ln / Pump Ln Roundabout	Botwell Lane EB	25.9	22.6	-3.3	-12.9%	34.1	30.6	-3.5	-10.2%
	Coldharbour Ln	221.3	273.5	52.1	23.6%	284.3	327.6	43.4	15.3%
	Pump Ln	49.0	70.6	21.6	44.2%	22.5	30.0	7.5	33.4%

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APPENDIX D – MAXIMUM QUEUE DATA

Junction	Movement: Approach	Movement: Turn	PM PEAK: Average Maximum Queue per movement: Base (Avg Max Q (m))	PM PEAK: Average Maximum Queue per movement: With Development (Avg Max Q (m))	PM PEAK: Diff.	PM PEAK: % Diff.	SAT PEAK: Average Maximum Queue per movement: Base (Avg Max Q (m))	SAT PEAK: Average Maximum Queue per movement: With Development (Avg Max Q (m))	SAT PEAK: Diff.	SAT PEAK: % Diff.
Botwell Lane / Church Rd Roundabout	Botwell Lane EB	Church Rd	138.6	137.9	-0.7	-0.5%	141.1	141.1	0.0	0.0%
		Ahead	138.6	137.9	-0.7	-0.5%	141.1	141.1	0.0	0.0%
	Church Rd	Left	137.3	137.6	0.3	0.2%	138.1	137.9	-0.2	-0.2%
		Right	137.3	137.6	0.3	0.2%	138.1	137.9	-0.2	-0.2%
	Botwell Lane WB	Ahead	37.7	37.8	0.1	0.2%	32.3	38.3	6.0	18.7%
		Church Rd	37.7	37.8	0.1	0.2%	32.3	38.3	6.0	18.7%
Botwell Lane / Nield Rd	Botwell Lane EB	Ahead	82.1	84.0	1.9	2.3%	81.7	82.0	0.4	0.4%
		Nield Rd	82.1	84.0	1.9	2.3%	81.7	82.0	0.4	0.4%
	Botwell Lane WB	Nield Rd	74.0	66.0	-8.0	-10.9%	84.3	93.1	8.7	10.4%
		Ahead	100.7	92.7	-8.0	-8.0%	111.0	119.8	8.7	7.9%
	Nield Rd	Left	79.1	86.0	6.8	8.6%	118.4	149.2	30.8	26.0%
		Right	79.0	85.9	6.8	8.7%	118.3	149.1	30.8	26.0%
Botwell Lane / Central Ave	Botwell Lane EB	Central Ave	92.5	92.0	-0.6	-0.6%	93.8	92.8	-1.1	-1.1%
		Ahead	103.4	102.9	-0.6	-0.6%	104.7	103.7	-1.1	-1.0%
	Central Ave	Left	90.5	131.8	41.3	45.6%	95.0	132.5	37.5	39.5%
		Right	90.3	131.6	41.3	45.7%	94.8	132.3	37.5	39.6%
	Botwell Lane WB	Ahead	104.2	118.1	13.9	13.3%	164.2	137.5	-26.7	-16.3%
		Central Ave	99.4	119.3	19.9	20.1%	129.3	134.6	5.3	4.1%
Botwell Lane / Station Rd Roundabout	Botwell Lane EB	Ahead	126.6	126.7	0.1	0.1%	128.2	126.9	-1.3	-1.0%
		Station Rd	126.6	126.7	0.1	0.1%	128.2	126.9	-1.3	-1.0%
	Botwell Lane WB	Station Rd	90.9	92.1	1.1	1.3%	78.5	93.2	14.6	18.6%
		Ahead	90.9	92.1	1.1	1.3%	78.5	93.2	14.6	18.6%
	Station Rd	Left	186.6	186.8	0.1	0.1%	186.6	186.5	0.0	0.0%
		Right	186.6	186.8	0.1	0.1%	186.6	186.5	0.0	0.0%
Botwell Lane / East Ave / Coldharbour Ln / Pump Ln Roundabout	Botwell Lane EB	East Ave	123.3	112.8	-10.5	-8.5%	118.2	116.3	-1.9	-1.6%
		Coldharbour Ln	123.3	112.8	-10.5	-8.5%	118.2	116.3	-1.9	-1.6%
		Pump Ln	123.3	112.8	-10.5	-8.5%	118.2	116.3	-1.9	-1.6%
	Coldharbour Ln	Pump Ln	363.6	379.8	16.2	4.5%	403.8	405.4	1.6	0.4%
		Botwell Lane WB	363.6	379.8	16.2	4.5%	403.8	405.4	1.6	0.4%
		East Ave	363.6	379.8	16.2	4.5%	403.8	405.4	1.6	0.4%
	Pump Ln	Botwell Lane WB	170.2	184.8	14.6	8.6%	115.5	155.1	39.6	34.3%
		East Ave	170.2	184.8	14.6	8.6%	115.5	155.1	39.6	34.3%
		Coldharbour Ln	170.2	184.8	14.6	8.6%	115.5	155.1	39.6	34.3%

Junction	Movement: Approach	PM PEAK: Average Maximum Queue per approach: Base (Avg Max Q (m))	PM PEAK: Average Maximum Queue per approach: With Development (Avg Max Q (m))	PM PEAK: Diff.	PM PEAK: % Diff.	SAT PEAK: Average Maximum Queue per approach: Base (Avg Max Q (m))	SAT PEAK: Average Maximum Queue per approach: With Development (Avg Max Q (m))	SAT PEAK: Diff.	SAT PEAK: % Diff.
Botwell Lane / Church Rd Roundabout	Botwell Lane EB	138.6	137.9	-0.7	-0.5%	141.1	141.1	0.0	0.0%
	Church Rd	137.3	137.6	0.3	0.2%	138.1	137.9	-0.2	-0.2%
	Botwell Lane WB	37.7	37.8	0.1	0.2%	32.3	38.3	6.0	18.7%
Botwell Lane / Nield Rd	Botwell Lane EB	82.1	84.0	1.9	2.3%	81.7	82.0	0.4	0.4%
	Botwell Lane WB	87.4	79.4	-8.0	-9.2%	97.7	106.4	8.7	8.9%
	Nield Rd	79.1	85.9	6.8	8.7%	118.4	149.2	30.8	26.0%
Botwell Lane / Central Ave	Botwell Lane EB	98.0	97.4	-0.6	-0.6%	99.3	98.2	-1.1	-1.1%
	Central Ave	90.4	131.7	41.3	45.7%	94.9	132.4	37.5	39.6%
	Botwell Lane WB	101.8	118.7	16.9	16.6%	146.7	136.0	-10.7	-7.3%
Botwell Lane / Station Rd Roundabout	Botwell Lane EB	126.6	126.7	0.1	0.1%	128.2	126.9	-1.3	-1.0%
	Botwell Lane WB	90.9	92.1	1.1	1.3%	78.5	93.2	14.6	18.6%
	Station Rd	186.6	186.8	0.1	0.1%	186.6	186.5	0.0	0.0%
Botwell Lane / East Ave / Coldharbour Ln / Pump Ln Roundabout	Botwell Lane EB	123.3	112.8	-10.5	-8.5%	118.2	116.3	-1.9	-1.6%
	Coldharbour Ln	363.6	379.8	16.2	4.5%	403.8	405.4	1.6	0.4%
	Pump Ln	170.2	184.8	14.6	8.6%	115.5	155.1	39.6	34.3%

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