TECHNICAL NOTE

Job Name: Wintringham, St Neots

Job No: 332210538-400.1

Note No: TN003

Date: 04 March 2025

Prepared By: L Wright

Subject: **Wintringham: Capacity Assessment of A428 / Barford Road Junction**

1 Introduction

1.1 This technical note is prepared by Stantec UK Ltd on behalf of the Wintringham Partners LLP in relation to the Wintringham development, at St Neots, Cambridgeshire. Wintringham is a development of circa 2,800 dwellings (and new employment, district centre, local centre, schools, leisure and open space) which was granted planning permission in 2017 (Huntingdonshire District Council planning ref: 17/02308/OUT). The development is an urban extension to the west of St. Neots between the East Coast Mainline and the A428 (bound by Cambridge Road B1428 to the north and Potton Road B1046 to the south). The development is partially built-out with the first phases of development being completed in the northern part of the site.

1.2 As part of the planning permission for the development there is a Section 106 (S106) obligation that involves highway infrastructure mitigation works on the A428 at the A428 / Barford Road (Barford Roundabout) junction.

1.3 Since, planning was granted, National Highways has commenced building the dualling scheme for the A428 (as part of RIS3) which is expected to be completed in Spring 2027. Once complete, the dualling of the A428 and associated junction improvements will render the highway improvements required as part of the S106 for the A428 / Barford Road junction redundant.

1.4 National Highways have given confirmation on 9 October 2024 that they are content with the evidence provided for the proposal to remove and discharge the obligations requiring mitigation works at the A428 / Barford Road (Barford Roundabout) junction subject to agreement with Cambridgeshire County Council (correspondence attached in **Appendix B**).

1.5 Cambridgeshire County Council (CCC) have agreed that the results from the modelling show the A428 / Barford Road junction will operate within capacity (correspondence attached in **Appendix C**).

1.6 Therefore, there would be no reason that the obligation cannot be discharged; furthermore the provision in Schedule 10, Section 2 of the S106 allows for the discharge of the condition without further mitigation works required on the highway subject to agreement with the relevant highway authorities.

DOCUMENT ISSUE RECORD

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1.7 This technical note therefore sets out:

- A summary of discussion with the highway authorities to-date.
- Updated junction modelling results.
- Conclusion.

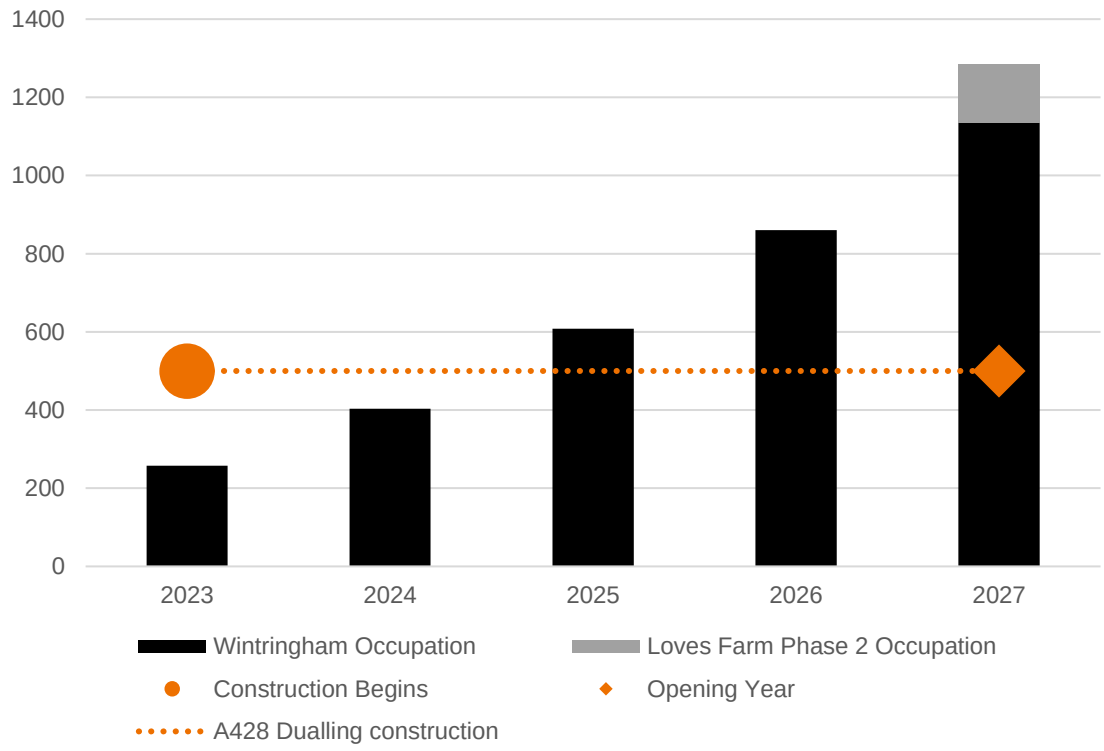
2 Discussion with Highway Authorities

2.1 Stantec met (online) with National Highways on 16 June 2023 to discuss the proposed A428 dualling scheme and how it negates the need for the mitigation works at the junctions on the A428, that would be required under planning conditions and the S106 for Wintringham.

2.2 The meeting concluded with actions for Stantec to provide an updated timeline of the A428 dualling programme against the build-out programme for Wintringham to understand the interim impact on traffic. The second action was to liaise with Cambridgeshire County Council (CCC) who would become the highway authority responsible for the Barford Road junction on the A428 once the dualling scheme was complete (as this section would no longer form part of the Strategic Road Network).

2.3 A timeline of the A428 dualling programme against the build-out programme for Wintringham (and the Loves Farm Phase 2 development to the north of Cambridge Road B1428) is provided in **Figure 2.1**. Preparation works for the A428 Dualling scheme started in late 2023 and the scheme is expected to be completed and open in 2027. The agreed trigger point for works on the A428 as part of the Wintringham development is the occupation of 500 dwellings in the aggregate with the Loves Farm development. This trigger milestone is reached in 2024/2025.

Figure 2.1 – Timeline of A428 Dualling programme and Build-out/Occupation of Wintringham



2.4 There is a period from 2024/2025 to the completion of the A428 dualling works whereby the 500 occupations is exceeded and therefore mitigation on the A428 junction is theoretically required to mitigate the traffic after 500 occupations. The principle was accepted in the meeting June 2023 that there is little benefit in providing the mitigation works longer term, and that in the interim, the disruption caused by undertaking the works on the existing A428 at the same time as the dualling works area progressing, would ultimately have a detrimental impact to traffic in the interim.

2.5 Stantec met (online) with National Highways and CCC on 5 September 2023 and agreed that updated junction capacity modelling should be undertaken for the junctions on the A428 to understand the impact of the development on the A428 in the interim period before the dualling scheme is completed.

2.6 In email correspondence sent on 11 September 2023 (to both National Highways and CCC) Stantec set out an approach to model and assess the Barford Road junction for:

- 2025 Year with 500 dwellings at Wintringham, and
- 2027 year with 1,100 dwellings at Wintringham and a proportion of dwellings at the Loves Farm Phase 2 (it is understood from the developer to be about 150 dwellings).

2.7 This approach was accepted by National Highways in an email response received by Stantec on 15 September 2023.

3 Junction Capacity Modelling

3.1 National Highways provided traffic flows to Stantec in May/June 2024 for the year 2025 to allow the assessment to be undertaken. Flows were provided for A428 / Barford Road junction with and without the new Dualling Scheme in 2025.

3.2 It was agreed with National Highways that background traffic growth would be applied at 1% per year. Therefore the 2025 traffic flows without the A428 Dualling scheme for the two junctions were multiplied by 1.02 to provide the equivalent 2027 traffic flows.

3.3 National Highways' consultant confirmed that within the 2025 traffic flows, there was an assumption that 60% of Wintringham would be occupied; 60% of the 2,800 dwelling development is 1,680 dwellings. This is more than projected occupancy of the Wintringham development in 2025 and of that agreed to be tested in the scenarios.

3.4 The agreed quantum of development to be tested was 500 dwellings at Wintringham in 2025, and 1,100 dwellings at Wintringham and 150 dwellings at Loves Farm Phase 2 in 2027. The traffic flows were therefore adjusted by removing development traffic from the traffic flow scenarios a reduction of 1,180 dwellings for 2025 (1,680 - 500 = 1,180) and a reduction of 430 for 2027 (1,680 - 1,100 - 150 = 430).

3.5 Previously, a 'flat profile' within the modelling software had been used, to represent the fact the network is saturated therefore the volume of traffic across the peak hour would be the same, to account for peak spreading where vehicles will travel earlier or later to avoid maximum traffic (this was based on the modelling agreed as part of the outline planning consent). However, following discussions with CCC, this has been changed to a 'one hour profile'. The modelling has been updated, and the results are presented below.

3.6 The results of the junction capacity assessment for the A428 / Barford Road junction are summarised in **Table 3.1** and **3.2**. The results demonstrate that the Barford Road junction is forecast to operate within capacity in both the 2025 with 500 dwellings occupied at Wintringham and in 2027 with 1,100 dwellings occupied at Wintringham and 150 dwellings at Loves Farm Phase 2 without the A428 dualling scheme being in place. The full results of the junction capacity assessment are provided in **Appendix A**.

Table 3.1 – 2025 (500 Dwellings at Wintringham)

Arm	Morning Peak Hour			Evening Peak Hour		
	End Queue (PCU rounded up)	Av. Delay per arriving vehicle (s)	RFC	End Queue (PCU rounded up)	Av. Delay per arriving vehicle (s)	RFC
B1043 Barford Rd (N)	2	6.60	0.59	1	3.98	0.43
A428 (East)	1	3.13	0.45	2	3.38	0.52
Barford Road (S)	1	5.15	0.29	2	9.56	0.55
A428 (West)	3	6.13	0.69	3	6.04	0.68

Table 3.2 – 2027 (1,100 Dwellings at Wintringham)

Arm	Morning Peak Hour			Evening Peak Hour		
	End Queue (PCU rounded up)	Av. Delay per arriving vehicle (s)	RFC	End Queue (PCU rounded up)	Av. Delay per arriving vehicle (s)	RFC
B1043 Barford Rd (N)	2	7.31	0.62	1	4.43	0.46
A428 (East)	2	3.52	0.51	2	3.62	0.55
Barford Road (S)	1	5.91	0.33	2	11.29	0.60
A428 (West)	3	6.77	0.72	3	7.39	0.74

4 Conclusion

4.1 The junction capacity assessments demonstrate that in the interim period (from the occupation of 500 dwellings at Wintringham in 2025 to the anticipated completion of the A428 dualling scheme in 2027) that the A428 / Barford Road junction is forecast to operate within capacity. Hence, there is no need for improvement works to be undertaken at this junction prior to the opening of the A428 dualling scheme.

4.2 It should be noted that the junction assessment does not account for a reduction in traffic that would be linked to those avoiding roadworks in this area due to the construction works associated with the A428 dualling scheme. This would lead to an improvement in the operation of the junction capacity assessment results.

4.3 The junction capacity assessment work supports the case that improvement works are no longer needed at the junction on the A428 that has been conditioned as part of the Wintringham Development.

4.4 National Highways are content with the evidence provided in this technical note and have confirmed they are happy to move forward with the proposal to remove the S106 Obligation for improvement works to be undertaken. CCC have also agreed that the results show the junction will operate within capacity without the mitigation works, therefore the evidence presented here shows the conditions and S106 obligations can be discharged.

Appendix A – Junction Capacity Results

Junctions 10

ARCADY 10 - Roundabout Module

Version: 10.1.1.1905
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Filename: 240913 - A428_Barford Rd - Hour.j10
Path: J:\332210538 - Wintringham Culverts\Technical\Calcs\Transport\Junction Assessments\A428_Barford Rd
Report generation date: 19/02/2025 14:56:47

»2025 - 500 Dwellings, AM
»2025 - 500 Dwellings, PM
»2027 - 1,100 Dwellings, AM
»2027 - 1,100 Dwellings, PM

Summary of junction performance

	AM									PM							
	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Ju
	2025 - 500 Dwellings																
1 - B1043 Barford Road (N)	D1	1.5	1.7	6.60	0.59	A	5.29	A	29 % [1 - B1043 Barford Road (N)]	D2	0.7	2.8	3.98	0.43	A	5.23	
2 - A428 (East)		0.9	2.4	3.13	0.45	A					1.1	1.6	3.38	0.52	A		
3 - Barford Road (S)		0.4	1.4	5.15	0.29	A					1.2	4.0	9.56	0.55	A		
4 - A428 (West)		2.4	4.3	6.13	0.69	A					2.2	3.8	6.04	0.68	A		
	2027 - 1,100 Dwellings																
1 - B1043 Barford Road (N)	D3	1.7	1.9	7.31	0.62	A	5.82	A	25 % [1 - B1043 Barford Road (N)]	D4	0.9	2.6	4.43	0.46	A	6.09	
2 - A428 (East)		1.1	1.6	3.52	0.51	A					1.3	1.5	3.62	0.55	A		
3 - Barford Road (S)		0.5	2.0	5.91	0.33	A					1.5	4.7	11.29	0.60	B		
4 - A428 (West)		2.7	5.3	6.77	0.72	A					2.8	5.8	7.39	0.74	A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

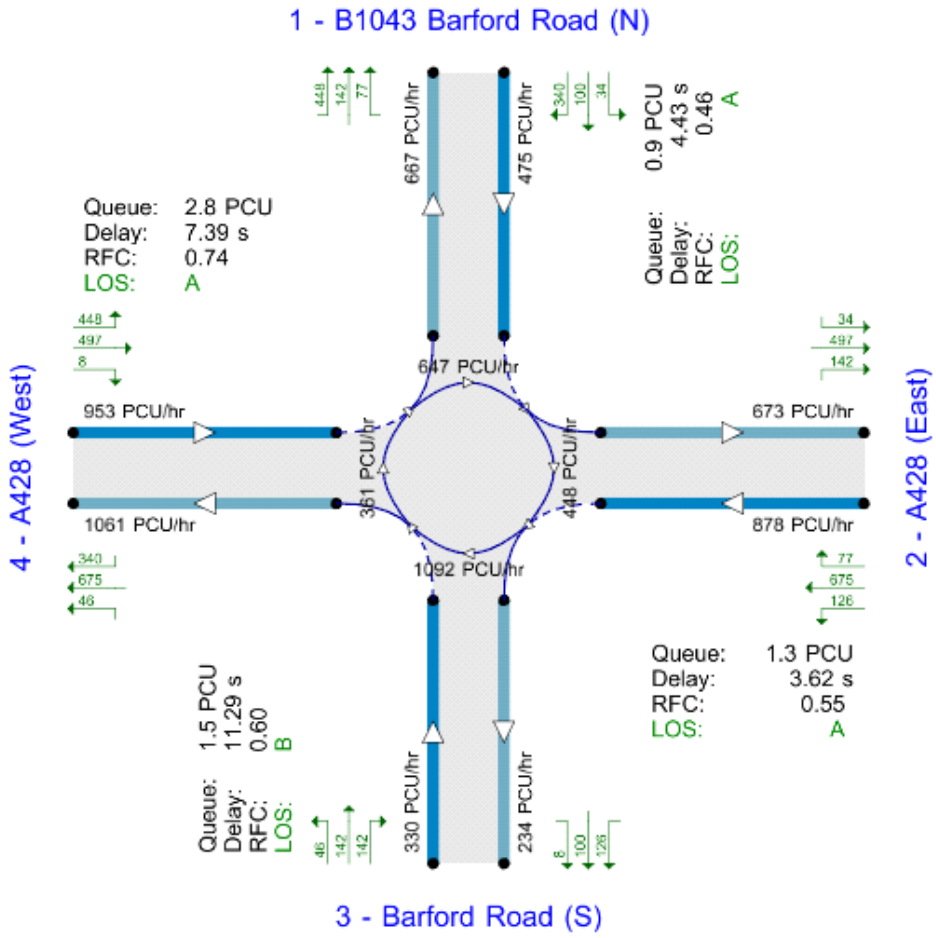
File summary

File Description

Title	Wintringham Park
Location	St.Neots
Site number	J2 A428/Barford Rd
Date	05/10/2017
Version	
Status	Existing Layout
Identifier	
Client	
Jobnumber	41481
Enumerator	PBA\mseiboth
Description	A428 / Barford Road Junction

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	PCU	perHour	s	-Min	perMin



Flows show modelled flow through junction (PCU/hr).

Time Segment: 17:00-17:15

The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use simulation for HCM roundabouts	Use iterations for HCM roundabouts
5.75	✓				✓	Delay	0.85	36.00	20.00		

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2025 - 500 Dwellings	AM	ONE HOUR	08:00	09:30	15	✓
D2	2025 - 500 Dwellings	PM	ONE HOUR	17:00	18:30	15	✓
D3	2027 - 1,100 Dwellings	AM	ONE HOUR	08:00	09:30	15	✓
D4	2027 - 1,100 Dwellings	PM	ONE HOUR	17:00	18:30	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2025 - 500 Dwellings, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	2 - A428 (East) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - Barford Road (S) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	4 - A428 (West) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		2, 3, 4, 1	5.29	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	29	1 - B1043 Barford Road (N)	5.29	A

Arms

Arms

Arm	Name	Description	No give-way line
1	B1043 Barford Road (N)		
2	A428 (East)		
3	Barford Road (S)		
4	A428 (West)		

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Entry only	Exit only
1 - B1043 Barford Road (N)	7.41	7.41	0.0	22.0	48.9	40.0		
2 - A428 (East)	4.68	12.01	59.1	18.2	48.9	40.0		
3 - Barford Road (S)	3.44	7.23	33.9	14.0	48.9	39.0		
4 - A428 (West)	4.67	8.65	33.6	35.5	48.9	37.0		

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - B1043 Barford Road (N)	0.695	2176
2 - A428 (East)	0.829	2889
3 - Barford Road (S)	0.615	1789
4 - A428 (West)	0.723	2282

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2025 - 500 Dwellings	AM	ONE HOUR	08:00	09:30	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - B1043 Barford Road (N)		ONE HOUR	✓	727	100.000
2 - A428 (East)		ONE HOUR	✓	865	100.000
3 - Barford Road (S)		ONE HOUR	✓	260	100.000
4 - A428 (West)		ONE HOUR	✓	1163	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	0	98	235	394
	2 - A428 (East)	47	0	166	652
	3 - Barford Road (S)	105	129	0	26
	4 - A428 (West)	361	768	34	0

Proportions

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	0.00	0.13	0.32	0.54
	2 - A428 (East)	0.05	0.00	0.19	0.75
	3 - Barford Road (S)	0.40	0.50	0.00	0.10
	4 - A428 (West)	0.31	0.66	0.03	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	0	5	0	4
	2 - A428 (East)	5	0	0	10
	3 - Barford Road (S)	0	0	0	8
	4 - A428 (West)	4	13	10	0

Average PCU Per Veh

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	1.000	1.050	1.000	1.040
	2 - A428 (East)	1.050	1.000	1.000	1.100
	3 - Barford Road (S)	1.000	1.000	1.000	1.080
	4 - A428 (West)	1.040	1.130	1.100	1.000

Detailed Demand Data

Demand for each time segment

Arm	Time Segment	Demand (Veh/hr)	Demand in PCU (PCU/hr)
1 - B1043 Barford Road (N)	08:00-08:15	547	563
	08:15-08:30	654	672
	08:30-08:45	800	823
	08:45-09:00	800	823
	09:00-09:15	654	672
	09:15-09:30	547	563
2 - A428 (East)	08:00-08:15	651	702
	08:15-08:30	778	838
	08:30-08:45	952	1027
	08:45-09:00	952	1027
	09:00-09:15	778	838
	09:15-09:30	651	702
3 - Barford Road (S)	08:00-08:15	196	197
	08:15-08:30	234	236
	08:30-08:45	286	289
	08:45-09:00	286	289
	09:00-09:15	234	236
	09:15-09:30	196	197
4 - A428 (West)	08:00-08:15	876	964
	08:15-08:30	1046	1151
	08:30-08:45	1280	1410
	08:45-09:00	1280	1410
	09:00-09:15	1046	1151
	09:15-09:30	876	964

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1043 Barford Road (N)	0.59	6.60	1.5	1.7	A	686	1029
2 - A428 (East)	0.45	3.13	0.9	2.4	A	856	1284
3 - Barford Road (S)	0.29	5.15	0.4	1.4	A	240	361
4 - A428 (West)	0.69	6.13	2.4	4.3	A	1175	1763

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	563	141	776	1636	0.344	561	397	0.0	0.5	3.434	A
2 - A428 (East)	702	176	512	2465	0.285	700	825	0.0	0.4	2.197	A
3 - Barford Road (S)	197	49	883	1246	0.158	197	329	0.0	0.2	3.456	A
4 - A428 (West)	964	241	213	2128	0.453	961	867	0.0	0.9	3.385	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	672	168	928	1530	0.439	671	476	0.5	0.8	4.303	A
2 - A428 (East)	838	210	612	2382	0.352	838	987	0.4	0.6	2.511	A
3 - Barford Road (S)	236	59	1056	1139	0.207	235	394	0.2	0.3	4.012	A
4 - A428 (West)	1151	288	254	2098	0.549	1150	1037	0.9	1.3	4.171	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	823	206	1136	1386	0.594	820	582	0.8	1.5	6.511	A
2 - A428 (East)	1027	257	749	2269	0.453	1026	1207	0.6	0.9	3.118	A
3 - Barford Road (S)	289	72	1293	994	0.290	288	481	0.3	0.4	5.134	A
4 - A428 (West)	1410	353	311	2057	0.686	1406	1269	1.3	2.4	6.051	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	823	206	1139	1384	0.595	823	583	1.5	1.5	6.595	A
2 - A428 (East)	1027	257	751	2267	0.453	1027	1211	0.9	0.9	3.128	A
3 - Barford Road (S)	289	72	1295	993	0.291	289	483	0.4	0.4	5.153	A
4 - A428 (West)	1410	353	312	2056	0.686	1410	1272	2.4	2.4	6.129	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	672	168	933	1527	0.440	675	478	1.5	0.8	4.358	A
2 - A428 (East)	838	210	616	2379	0.352	840	992	0.9	0.6	2.524	A
3 - Barford Road (S)	236	59	1060	1137	0.207	236	395	0.4	0.3	4.030	A
4 - A428 (West)	1151	288	255	2097	0.549	1155	1041	2.4	1.4	4.225	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	563	141	780	1633	0.345	564	400	0.8	0.5	3.466	A
2 - A428 (East)	702	176	515	2463	0.285	703	829	0.6	0.4	2.205	A
3 - Barford Road (S)	197	49	887	1244	0.159	198	331	0.3	0.2	3.471	A
4 - A428 (West)	964	241	214	2128	0.453	966	871	1.4	0.9	3.419	A

Queue Variation Results for each time segment

08:00 - 08:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.54	0.54	1.03	1.44	1.49			N/A	N/A
2 - A428 (East)	0.43	0.00	0.00	0.43	0.43			N/A	N/A
3 - Barford Road (S)	0.19	0.00	0.00	0.19	0.19			N/A	N/A
4 - A428 (West)	0.91	0.61	1.10	1.54	1.60			N/A	N/A

08:15 - 08:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.80	0.07	0.79	1.53	1.56			N/A	N/A
2 - A428 (East)	0.58	0.07	0.72	1.44	1.53			N/A	N/A
3 - Barford Road (S)	0.26	0.00	0.00	0.26	0.26			N/A	N/A
4 - A428 (West)	1.33	0.06	0.71	3.02	4.35			N/A	N/A

08:30 - 08:45

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	1.48	0.03	0.27	1.48	1.48			N/A	N/A
2 - A428 (East)	0.89	0.03	0.27	0.89	0.89			N/A	N/A
3 - Barford Road (S)	0.41	0.03	0.26	0.46	0.49			N/A	N/A
4 - A428 (West)	2.35	0.03	0.30	2.35	2.35			N/A	N/A

08:45 - 09:00

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	1.49	0.03	0.28	1.49	1.66			N/A	N/A
2 - A428 (East)	0.89	0.03	0.30	0.89	2.38			N/A	N/A
3 - Barford Road (S)	0.41	0.03	0.33	1.32	1.43			N/A	N/A
4 - A428 (West)	2.38	0.03	0.29	2.38	2.38			N/A	N/A

09:00 - 09:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.82	0.15	0.93	1.45	1.51			N/A	N/A
2 - A428 (East)	0.59	0.59	1.08	1.51	1.56			N/A	N/A
3 - Barford Road (S)	0.26	0.00	0.00	0.26	0.26			N/A	N/A
4 - A428 (West)	1.35	0.13	1.20	2.16	2.91			N/A	N/A

09:15 - 09:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.54	0.05	0.48	1.34	1.45			N/A	N/A
2 - A428 (East)	0.43	0.00	0.00	0.43	0.43			N/A	N/A
3 - Barford Road (S)	0.19	0.00	0.00	0.19	0.19			N/A	N/A
4 - A428 (West)	0.92	0.06	0.70	1.72	2.19			N/A	N/A

2025 - 500 Dwellings, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	2 - A428 (East) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - Barford Road (S) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	4 - A428 (West) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		2, 3, 4, 1	5.23	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	20	3 - Barford Road (S)	5.23	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2025 - 500 Dwellings	PM	ONE HOUR	17:00	18:30	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - B1043 Barford Road (N)		ONE HOUR	✓	610	100.000
2 - A428 (East)		ONE HOUR	✓	1037	100.000
3 - Barford Road (S)		ONE HOUR	✓	426	100.000
4 - A428 (West)		ONE HOUR	✓	1143	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	0	40	130	440
	2 - A428 (East)	97	0	162	778
	3 - Barford Road (S)	186	181	0	59
	4 - A428 (West)	579	554	10	0

Proportions

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	0.00	0.07	0.21	0.72
	2 - A428 (East)	0.09	0.00	0.16	0.75
	3 - Barford Road (S)	0.44	0.42	0.00	0.14
	4 - A428 (West)	0.51	0.48	0.01	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

	To				
From		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
	1 - B1043 Barford Road (N)	0	2	0	1
	2 - A428 (East)	1	0	0	9
	3 - Barford Road (S)	0	0	0	2
	4 - A428 (West)	1	5	11	0

Average PCU Per Veh

	To				
From		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
	1 - B1043 Barford Road (N)	1.000	1.020	1.000	1.006
	2 - A428 (East)	1.010	1.000	1.000	1.090
	3 - Barford Road (S)	1.005	1.000	1.000	1.016
	4 - A428 (West)	1.011	1.050	1.110	1.000

Detailed Demand Data

Demand for each time segment

Arm	Time Segment	Demand (Veh/hr)	Demand in PCU (PCU/hr)
1 - B1043 Barford Road (N)	17:00-17:15	459	462
	17:15-17:30	548	551
	17:30-17:45	672	675
	17:45-18:00	672	675
	18:00-18:15	548	551
	18:15-18:30	459	462
2 - A428 (East)	17:00-17:15	781	834
	17:15-17:30	932	996
	17:30-17:45	1142	1220
	17:45-18:00	1142	1220
	18:00-18:15	932	996
	18:15-18:30	781	834
3 - Barford Road (S)	17:00-17:15	321	322
	17:15-17:30	383	385
	17:30-17:45	469	471
	17:45-18:00	469	471
	18:00-18:15	383	385
	18:15-18:30	321	322
4 - A428 (West)	17:00-17:15	861	887
	17:15-17:30	1028	1059
	17:30-17:45	1258	1297
	17:45-18:00	1258	1297
	18:00-18:15	1028	1059
	18:15-18:30	861	887

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1043 Barford Road (N)	0.43	3.98	0.7	2.8	A	563	844
2 - A428 (East)	0.52	3.38	1.1	1.6	A	1017	1525
3 - Barford Road (S)	0.55	9.56	1.2	4.0	A	393	589
4 - A428 (West)	0.68	6.04	2.2	3.8	A	1081	1621

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	462	115	580	1772	0.261	460	652	0.0	0.4	2.756	A
2 - A428 (East)	834	209	438	2526	0.330	832	603	0.0	0.5	2.267	A
3 - Barford Road (S)	322	81	1043	1148	0.281	321	228	0.0	0.4	4.363	A
4 - A428 (West)	887	222	349	2030	0.437	884	1014	0.0	0.8	3.227	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	551	138	695	1693	0.326	551	781	0.4	0.5	3.167	A
2 - A428 (East)	996	249	524	2455	0.406	995	721	0.5	0.7	2.633	A
3 - Barford Road (S)	385	96	1247	1022	0.376	384	272	0.4	0.6	5.659	A
4 - A428 (West)	1059	265	418	1980	0.535	1057	1213	0.8	1.2	4.015	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	675	169	849	1585	0.426	674	955	0.5	0.7	3.968	A
2 - A428 (East)	1220	305	642	2358	0.517	1218	882	0.7	1.1	3.371	A
3 - Barford Road (S)	471	118	1527	850	0.554	469	333	0.6	1.2	9.413	A
4 - A428 (West)	1297	324	511	1913	0.678	1293	1485	1.2	2.1	5.950	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	675	169	852	1583	0.426	675	958	0.7	0.7	3.985	A
2 - A428 (East)	1220	305	643	2357	0.518	1220	885	1.1	1.1	3.382	A
3 - Barford Road (S)	471	118	1529	849	0.555	471	334	1.2	1.2	9.564	A
4 - A428 (West)	1297	324	513	1911	0.679	1297	1487	2.1	2.2	6.036	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	551	138	699	1690	0.326	552	785	0.7	0.5	3.183	A
2 - A428 (East)	996	249	526	2454	0.406	998	725	1.1	0.7	2.646	A
3 - Barford Road (S)	385	96	1250	1020	0.377	387	273	1.2	0.6	5.736	A
4 - A428 (West)	1059	265	421	1978	0.535	1063	1216	2.2	1.2	4.073	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	462	115	584	1770	0.261	462	656	0.5	0.4	2.768	A
2 - A428 (East)	834	209	440	2525	0.330	835	606	0.7	0.5	2.278	A
3 - Barford Road (S)	322	81	1046	1146	0.281	323	228	0.6	0.4	4.402	A
4 - A428 (West)	887	222	352	2028	0.437	888	1018	1.2	0.8	3.262	A

Queue Variation Results for each time segment

17:00 - 17:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.35	0.00	0.00	0.35	0.35			N/A	N/A
2 - A428 (East)	0.52	0.00	0.00	0.52	0.52			N/A	N/A
3 - Barford Road (S)	0.39	0.00	0.00	0.39	0.39			N/A	N/A
4 - A428 (West)	0.79	0.57	1.03	1.44	1.49			N/A	N/A

17:15 - 17:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.48	0.00	0.00	0.48	0.48			N/A	N/A
2 - A428 (East)	0.73	0.08	0.81	1.47	1.56			N/A	N/A
3 - Barford Road (S)	0.60	0.07	0.73	1.35	1.43			N/A	N/A
4 - A428 (West)	1.17	0.06	0.66	2.62	3.79			N/A	N/A

17:30 - 17:45

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.74	0.03	0.25	0.74	0.74			N/A	N/A
2 - A428 (East)	1.14	0.03	0.27	1.14	1.14			N/A	N/A
3 - Barford Road (S)	1.22	0.03	0.27	1.22	1.22			N/A	N/A
4 - A428 (West)	2.13	0.03	0.28	2.13	2.13			N/A	N/A

17:45 - 18:00

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.74	0.03	0.28	0.83	2.83			N/A	N/A
2 - A428 (East)	1.14	0.03	0.28	1.14	1.36			N/A	N/A
3 - Barford Road (S)	1.24	0.03	0.28	1.24	3.96			N/A	N/A
4 - A428 (West)	2.15	0.03	0.27	2.15	2.15			N/A	N/A

18:00 - 18:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.49	0.00	0.00	0.49	0.49			N/A	N/A
2 - A428 (East)	0.73	0.59	1.07	1.50	1.55			N/A	N/A
3 - Barford Road (S)	0.61	0.07	0.73	1.35	1.43			N/A	N/A
4 - A428 (West)	1.20	0.13	1.10	1.89	2.40			N/A	N/A

18:15 - 18:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.36	0.00	0.00	0.36	0.36			N/A	N/A
2 - A428 (East)	0.53	0.00	0.00	0.53	0.53			N/A	N/A
3 - Barford Road (S)	0.40	0.03	0.34	1.13	1.32			N/A	N/A
4 - A428 (West)	0.81	0.06	0.64	1.42	1.90			N/A	N/A

2027 - 1,100 Dwellings, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	2 - A428 (East) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - Barford Road (S) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	4 - A428 (West) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		2, 3, 4, 1	5.82	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	25	1 - B1043 Barford Road (N)	5.82	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2027 - 1,100 Dwellings	AM	ONE HOUR	08:00	09:30	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - B1043 Barford Road (N)		ONE HOUR	✓	744	100.000
2 - A428 (East)		ONE HOUR	✓	983	100.000
3 - Barford Road (S)		ONE HOUR	✓	268	100.000
4 - A428 (West)		ONE HOUR	✓	1214	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	0	102	240	402
	2 - A428 (East)	54	0	175	754
	3 - Barford Road (S)	107	134	0	27
	4 - A428 (West)	368	811	35	0

Proportions

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	0.00	0.14	0.32	0.54
	2 - A428 (East)	0.05	0.00	0.18	0.77
	3 - Barford Road (S)	0.40	0.50	0.00	0.10
	4 - A428 (West)	0.30	0.67	0.03	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

	To				
From		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
	1 - B1043 Barford Road (N)	0	5	0	4
	2 - A428 (East)	4	0	0	9
	3 - Barford Road (S)	0	0	0	8
	4 - A428 (West)	4	12	10	0

Average PCU Per Veh

	To				
From		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
	1 - B1043 Barford Road (N)	1.000	1.050	1.000	1.040
	2 - A428 (East)	1.040	1.000	1.000	1.090
	3 - Barford Road (S)	1.000	1.000	1.000	1.080
	4 - A428 (West)	1.040	1.120	1.100	1.000

Detailed Demand Data

Demand for each time segment

Arm	Time Segment	Demand (Veh/hr)	Demand in PCU (PCU/hr)
1 - B1043 Barford Road (N)	08:00-08:15	560	576
	08:15-08:30	669	688
	08:30-08:45	819	842
	08:45-09:00	819	842
	09:00-09:15	669	688
	09:15-09:30	560	576
2 - A428 (East)	08:00-08:15	740	793
	08:15-08:30	884	947
	08:30-08:45	1082	1159
	08:45-09:00	1082	1159
	09:00-09:15	884	947
	09:15-09:30	740	793
3 - Barford Road (S)	08:00-08:15	202	203
	08:15-08:30	241	243
	08:30-08:45	295	297
	08:45-09:00	295	297
	09:00-09:15	241	243
	09:15-09:30	202	203
4 - A428 (West)	08:00-08:15	914	1001
	08:15-08:30	1091	1195
	08:30-08:45	1337	1464
	08:45-09:00	1337	1464
	09:00-09:15	1091	1195
	09:15-09:30	914	1001

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1043 Barford Road (N)	0.62	7.31	1.7	1.9	A	702	1053
2 - A428 (East)	0.51	3.52	1.1	1.6	A	966	1449
3 - Barford Road (S)	0.33	5.91	0.5	2.0	A	248	372
4 - A428 (West)	0.72	6.77	2.7	5.3	A	1220	1830

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	576	144	811	1612	0.357	574	409	0.0	0.6	3.558	A
2 - A428 (East)	793	198	522	2457	0.323	791	862	0.0	0.5	2.312	A
3 - Barford Road (S)	203	51	973	1191	0.171	203	340	0.0	0.2	3.668	A
4 - A428 (West)	1001	250	223	2121	0.472	997	953	0.0	1.0	3.497	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	688	172	970	1501	0.458	687	490	0.6	0.9	4.538	A
2 - A428 (East)	947	237	625	2371	0.399	946	1032	0.5	0.7	2.704	A
3 - Barford Road (S)	243	61	1164	1073	0.226	243	407	0.2	0.3	4.365	A
4 - A428 (West)	1195	299	267	2089	0.572	1193	1140	1.0	1.4	4.392	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	842	211	1186	1351	0.623	839	599	0.9	1.7	7.185	A
2 - A428 (East)	1159	290	764	2256	0.514	1158	1261	0.7	1.1	3.506	A
3 - Barford Road (S)	297	74	1424	913	0.326	297	498	0.3	0.5	5.876	A
4 - A428 (West)	1464	366	326	2046	0.715	1459	1394	1.4	2.7	6.660	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	842	211	1190	1349	0.625	842	601	1.7	1.7	7.311	A
2 - A428 (East)	1159	290	767	2254	0.514	1159	1265	1.1	1.1	3.522	A
3 - Barford Road (S)	297	74	1427	912	0.326	297	499	0.5	0.5	5.908	A
4 - A428 (West)	1464	366	327	2046	0.716	1464	1397	2.7	2.7	6.772	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	688	172	976	1498	0.459	691	493	1.7	0.9	4.608	A
2 - A428 (East)	947	237	629	2368	0.400	948	1038	1.1	0.7	2.720	A
3 - Barford Road (S)	243	61	1168	1071	0.227	244	409	0.5	0.3	4.393	A
4 - A428 (West)	1195	299	268	2088	0.572	1200	1144	2.7	1.5	4.462	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	576	144	815	1609	0.358	577	412	0.9	0.6	3.592	A
2 - A428 (East)	793	198	526	2454	0.323	794	867	0.7	0.5	2.325	A
3 - Barford Road (S)	203	51	977	1188	0.171	204	342	0.3	0.2	3.689	A
4 - A428 (West)	1001	250	224	2120	0.472	1003	957	1.5	1.0	3.537	A

Queue Variation Results for each time segment

08:00 - 08:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.57	0.57	1.03	1.44	1.49			N/A	N/A
2 - A428 (East)	0.51	0.00	0.00	0.51	0.51			N/A	N/A
3 - Barford Road (S)	0.21	0.00	0.00	0.21	0.21			N/A	N/A
4 - A428 (West)	0.97	0.60	1.10	1.53	1.59			N/A	N/A

08:15 - 08:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.86	0.07	0.78	1.42	1.86			N/A	N/A
2 - A428 (East)	0.71	0.08	0.81	1.46	1.55			N/A	N/A
3 - Barford Road (S)	0.29	0.00	0.00	0.29	0.29			N/A	N/A
4 - A428 (West)	1.45	0.06	0.59	3.48	5.27			N/A	N/A

08:30 - 08:45

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	1.67	0.03	0.27	1.67	1.67			N/A	N/A
2 - A428 (East)	1.12	0.03	0.27	1.12	1.12			N/A	N/A
3 - Barford Road (S)	0.48	0.03	0.26	0.48	0.49			N/A	N/A
4 - A428 (West)	2.69	0.03	0.30	2.69	3.94			N/A	N/A

08:45 - 09:00

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	1.69	0.03	0.28	1.69	1.85			N/A	N/A
2 - A428 (East)	1.13	0.03	0.29	1.13	1.54			N/A	N/A
3 - Barford Road (S)	0.49	0.03	0.32	1.46	1.97			N/A	N/A
4 - A428 (West)	2.72	0.03	0.29	2.72	2.72			N/A	N/A

09:00 - 09:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.88	0.12	0.93	1.49	1.49			N/A	N/A
2 - A428 (East)	0.72	0.59	1.07	1.50	1.55			N/A	N/A
3 - Barford Road (S)	0.30	0.00	0.00	0.30	0.30			N/A	N/A
4 - A428 (West)	1.48	0.10	1.19	2.82	3.71			N/A	N/A

09:15 - 09:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.58	0.05	0.48	1.38	1.50			N/A	N/A
2 - A428 (East)	0.51	0.00	0.00	0.51	0.51			N/A	N/A
3 - Barford Road (S)	0.21	0.00	0.00	0.21	0.21			N/A	N/A
4 - A428 (West)	0.99	0.06	0.56	2.03	2.97			N/A	N/A

2027 - 1,100 Dwellings, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	2 - A428 (East) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - Barford Road (S) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	4 - A428 (West) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		2, 3, 4, 1	6.09	A

Junction Network

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold	Network delay (s)	Network LOS
Left	Normal/unknown	15	3 - Barford Road (S)	6.09	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2027 - 1,100 Dwellings	PM	ONE HOUR	17:00	18:30	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - B1043 Barford Road (N)		ONE HOUR	✓	627	100.000
2 - A428 (East)		ONE HOUR	✓	1102	100.000
3 - Barford Road (S)		ONE HOUR	✓	439	100.000
4 - A428 (West)		ONE HOUR	✓	1238	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	0	45	133	449
	2 - A428 (East)	102	0	168	832
	3 - Barford Road (S)	190	189	0	60
	4 - A428 (West)	591	637	10	0

Proportions

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	0.00	0.07	0.21	0.72
	2 - A428 (East)	0.09	0.00	0.15	0.75
	3 - Barford Road (S)	0.43	0.43	0.00	0.14
	4 - A428 (West)	0.48	0.51	0.01	0.00

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	0	2	0	1
	2 - A428 (East)	1	0	0	8
	3 - Barford Road (S)	0	0	0	2
	4 - A428 (West)	1	4	11	0

Average PCU Per Veh

		To			
		1 - B1043 Barford Road (N)	2 - A428 (East)	3 - Barford Road (S)	4 - A428 (West)
From	1 - B1043 Barford Road (N)	1.000	1.020	1.000	1.010
	2 - A428 (East)	1.010	1.000	1.000	1.080
	3 - Barford Road (S)	1.000	1.000	1.000	1.020
	4 - A428 (West)	1.010	1.040	1.110	1.000

Detailed Demand Data

Demand for each time segment

Arm	Time Segment	Demand (Veh/hr)	Demand in PCU (PCU/hr)
1 - B1043 Barford Road (N)	17:00-17:15	472	476
	17:15-17:30	564	569
	17:30-17:45	690	696
	17:45-18:00	690	696
	18:00-18:15	564	569
	18:15-18:30	472	476
2 - A428 (East)	17:00-17:15	830	881
	17:15-17:30	991	1051
	17:30-17:45	1213	1288
	17:45-18:00	1213	1288
	18:00-18:15	991	1051
	18:15-18:30	830	881
3 - Barford Road (S)	17:00-17:15	331	331
	17:15-17:30	395	396
	17:30-17:45	483	485
	17:45-18:00	483	485
	18:00-18:15	395	396
	18:15-18:30	331	331
4 - A428 (West)	17:00-17:15	932	956
	17:15-17:30	1113	1142
	17:30-17:45	1363	1399
	17:45-18:00	1363	1399
	18:00-18:15	1113	1142
	18:15-18:30	932	956

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1043 Barford Road (N)	0.46	4.43	0.9	2.6	A	580	870
2 - A428 (East)	0.55	3.62	1.3	1.5	A	1073	1610
3 - Barford Road (S)	0.60	11.29	1.5	4.7	B	404	606
4 - A428 (West)	0.74	7.39	2.8	5.8	A	1166	1749

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	476	119	647	1726	0.276	475	667	0.0	0.4	2.897	A
2 - A428 (East)	881	220	448	2518	0.350	878	673	0.0	0.6	2.327	A
3 - Barford Road (S)	331	83	1092	1117	0.297	330	234	0.0	0.4	4.574	A
4 - A428 (West)	956	239	361	2021	0.473	953	1061	0.0	0.9	3.448	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	569	142	774	1638	0.347	568	799	0.4	0.5	3.392	A
2 - A428 (East)	1051	263	537	2445	0.430	1051	805	0.6	0.8	2.739	A
3 - Barford Road (S)	396	99	1307	985	0.402	395	280	0.4	0.7	6.101	A
4 - A428 (West)	1142	286	432	1969	0.580	1140	1269	0.9	1.4	4.444	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	696	174	945	1519	0.459	695	976	0.5	0.8	4.403	A
2 - A428 (East)	1288	322	657	2345	0.549	1286	984	0.8	1.3	3.600	A
3 - Barford Road (S)	485	121	1600	805	0.602	481	343	0.7	1.5	11.031	B
4 - A428 (West)	1399	350	528	1900	0.736	1393	1553	1.4	2.8	7.206	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	696	174	950	1516	0.459	696	980	0.8	0.9	4.431	A
2 - A428 (East)	1288	322	658	2344	0.549	1288	988	1.3	1.3	3.615	A
3 - Barford Road (S)	485	121	1602	804	0.603	485	344	1.5	1.5	11.292	B
4 - A428 (West)	1399	350	531	1898	0.737	1399	1556	2.8	2.8	7.386	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	569	142	780	1634	0.348	570	804	0.9	0.5	3.416	A
2 - A428 (East)	1051	263	538	2443	0.430	1053	811	1.3	0.8	2.752	A
3 - Barford Road (S)	396	99	1311	983	0.403	399	281	1.5	0.7	6.212	A
4 - A428 (West)	1142	286	436	1967	0.581	1148	1273	2.8	1.4	4.541	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1043 Barford Road (N)	476	119	651	1723	0.276	477	671	0.5	0.4	2.913	A
2 - A428 (East)	881	220	450	2516	0.350	881	677	0.8	0.6	2.340	A
3 - Barford Road (S)	331	83	1097	1115	0.297	332	235	0.7	0.4	4.621	A
4 - A428 (West)	956	239	364	2019	0.474	959	1065	1.4	0.9	3.489	A

Queue Variation Results for each time segment

17:00 - 17:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.38	0.00	0.00	0.38	0.38			N/A	N/A
2 - A428 (East)	0.57	0.57	1.06	1.49	1.54			N/A	N/A
3 - Barford Road (S)	0.42	0.00	0.00	0.42	0.42			N/A	N/A
4 - A428 (West)	0.92	0.56	1.03	1.44	1.49			N/A	N/A

17:15 - 17:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.53	0.06	0.65	1.34	1.43			N/A	N/A
2 - A428 (East)	0.80	0.07	0.80	1.48	1.48			N/A	N/A
3 - Barford Road (S)	0.67	0.07	0.73	1.38	1.46			N/A	N/A
4 - A428 (West)	1.40	0.05	0.50	3.50	5.37			N/A	N/A

17:30 - 17:45

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.85	0.03	0.26	0.85	0.85			N/A	N/A
2 - A428 (East)	1.28	0.03	0.27	1.28	1.28			N/A	N/A
3 - Barford Road (S)	1.47	0.03	0.27	1.47	1.96			N/A	N/A
4 - A428 (West)	2.78	0.03	0.28	2.78	5.84			N/A	N/A

17:45 - 18:00

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.85	0.03	0.28	0.85	2.62			N/A	N/A
2 - A428 (East)	1.29	0.03	0.28	1.29	1.29			N/A	N/A
3 - Barford Road (S)	1.50	0.03	0.28	1.50	4.74			N/A	N/A
4 - A428 (West)	2.83	0.03	0.27	2.83	2.83			N/A	N/A

18:00 - 18:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.54	0.54	1.01	1.41	1.46			N/A	N/A
2 - A428 (East)	0.81	0.58	1.06	1.49	1.54			N/A	N/A
3 - Barford Road (S)	0.68	0.07	0.72	1.40	1.48			N/A	N/A
4 - A428 (West)	1.44	0.08	1.08	2.89	3.91			N/A	N/A

18:15 - 18:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
1 - B1043 Barford Road (N)	0.39	0.00	0.00	0.39	0.39			N/A	N/A
2 - A428 (East)	0.57	0.07	0.72	1.42	1.51			N/A	N/A
3 - Barford Road (S)	0.43	0.04	0.37	1.22	1.39			N/A	N/A
4 - A428 (West)	0.93	0.05	0.47	2.01	3.05			N/A	N/A

Appendix B – Email from National Highways

Seiboth, Matt

Subject: RE: 332210538 A428 Dualling and Wintringham - junction capacity method

From: Alice Lawman
Sent: 09 October 2024 11:28
To: Seiboth, Matt
Subject: RE: 332210538 A428 Dualling and Wintringham - junction capacity method

Hi Matt

Having reviewed the information provided again, I am content with the evidence provided to move forward with proposal to remove the condition (31?) for follow up assessments. This would be subject to agreement from CCC but presumably you have had the same discussion with them too.

If you have any further queries, please do not hesitate to contact me. I look forward to receiving confirmation of the submission of the application when we are consulted by HDC.

Kind regards
Alice

Alice Lawman MRTPI

Spatial Planner
Operations (East) | National Highways
Woodlands | Manton Lane | Bedford | MK41 7LW

Web: www.nationalhighways.co.uk

For any planning related matters please email PlanningEE@nationalhighways.co.uk

From: Seiboth, Matt
Sent: Thursday, October 3, 2024 9:22 AM
To: Alice Lawman
Subject: RE: 332210538 A428 Dualling and Wintringham - junction capacity method

Morning Alice,

Just following up on this. Any ideas of when we might have a response?

Kind regards,

Matthew Seiboth
Principal Transport Planner

Stantec

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From: Seiboth, Matt
Sent: Tuesday, September 24, 2024 3:54 PM
To: Alice Lawman
Subject: RE: 332210538 A428 Dualling and Wintringham - junction capacity method

Afternoon Alice,

Hope you're well. Was wondering if your consultants had had a chance to look through our technical note and supporting spreadsheet.

Kind regards,

Matthew Seiboth
Principal Transport Planner

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From: Alice Lawman
Sent: Friday, September 13, 2024 5:09 PM
To: Seiboth, Matt
Subject: RE: 332210538 A428 Dualling and Wintringham - junction capacity method

Thanks Matt.

Will be in touch with our formal feedback as soon as possible.

Kind regards
Alice

Alice Lawman MRTPI

Spatial Planner
Operations (East) | National Highways
Woodlands | Manton Lane | Bedford | MK41 7LW

Web: www.nationalhighways.co.uk

For any planning related matters please email PlanningEE@nationalhighways.co.uk

From: Seiboth, Matt
Sent: Friday, September 13, 2024 3:54 PM
To: Jez Tuttle ; Alice Lawman ; Kelly Milburn
Cc: Andrew Connolly ; Atsu, Cristina ; Raymond, Colin ; Stolworthy, Leigh ; Adam Davies
Subject: RE: 332210538 A428 Dualling and Wintringham - junction capacity method

Hi Alice,

Thanks for the call earlier. As mentioned, I notice a slight discrepancy in the calculations this morning. So please find attached the amended version of the note and associated flows.

Kind regards,

Matthew Seiboth
Principal Transport Planner



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From: Jez Tuttle
Sent: Tuesday, September 10, 2024 1:31 PM
To: Seiboth, Matt ; Alice Lawman ; Kelly Milburn ; Lee Cornwell
Cc: Andrew Connolly ; Atsu, Cristina ; Raymond, Colin ; Stolworthy, Leigh ; Adam Davies
Subject: Re: 332210538 A428 Dualling and Wintringham - junction capacity method

Hi all

I can do after 12pm on Friday 13th and 1-2 or after 3pm on Tuesday 17th

Kind Regards

Jez

From: Seiboth, Matt
Sent: 09 September 2024 14:20
To: Alice Lawman ; Kelly Milburn ; Lee Cornwell ; Jez Tuttle
Cc: Andrew Connolly ; Atsu, Cristina ; Raymond, Colin ; Stolworthy, Leigh ; Adam Davies
Subject: RE: 332210538 A428 Dualling and Wintringham - junction capacity method

Hi Alice,

Thanks for these dates, I can make any of those times. @Jez Tuttle which would suit you best?

Kind regards,

Matthew Seiboth
Principal Transport Planner



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From: Alice Lawman
Sent: Monday, September 9, 2024 12:22 PM
To: Seiboth, Matt ; Kelly Milburn ; Lee Cornwell ; Jez Tuttle
Cc: Andrew Connolly ; Atsu, Cristina ; Raymond, Colin ; Stolworthy, Leigh ; Adam Davies
Subject: RE: 332210538 A428 Dualling and Wintringham - junction capacity method

Hi Matt

Thank you for your email and the Technical Note. Happy to arrange a meeting to discuss. My availability is better towards the end of the week / early next week and is as follows:

- Wednesday 11th – 9-12.30 or 4-5.30

- Thursday 12th – 12-2
- Friday 13th – after 12
- Monday 16th – 10-12
- Tuesday 17th – any time apart from between 2-3

Hopefully there is a convenient time amongst the dates and times above.

I look forward to hear from you.

Kind regards
Alice

Alice Lawman MRTPI

Spatial Planner
Operations (East) | National Highways
Woodlands | Manton Lane | Bedford | MK41 7LW

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From: Seiboth, Matt
Sent: Monday, September 9, 2024 11:55 AM
To: Alice Lawman ; Kelly Milburn ; Lee Cornwell ; Jez Tuttle
Cc: Andrew Connolly ; Atsu, Cristina ; Raymond, Colin ; Stolworthy, Leigh ; Adam Davies
Subject: RE: 332210538 A428 Dualling and Wintringham - junction capacity method

Morning both,

Hope you've had a good break over the summer. Was wondering if you've had time to review our previous email and if you were agreeable to discharge the planning conditions / obligations.

Kind regards,

Matthew Seiboth
Principal Transport Planner

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From: Seiboth, Matt
Sent: Friday, August 23, 2024 9:03 AM
To: Alice Lawman ; Kelly Milburn ; Lee Cornwell ; Jez Tuttle
Cc: Andrew Connolly ; Atsu, Cristina ; Raymond, Colin ; Stolworthy, Leigh ; Adam Davies
Subject: RE: 332210538 A428 Dualling and Wintringham - junction capacity method

Morning Alice and Jez,

Following from our previous correspondence, please find attached a technical note summarising our updated modelling of the A428/Barford Road and A428/ Cambridge Road (B1428).

Based on the traffic flows that were available and provided to us from National Highways, we have derived traffic flows for the A428/ Cambridge Road junction without the dualling; hence I have also attached our traffic flow calculation spreadsheet.

The junction capacity assessment show that in the short term (should the dualling of the A428 be delayed) that the junctions will continue to operate within capacity with the development at Wintringham. Therefore the planning conditions and S106 obligations can be discharged.

Perhaps we could have an online meeting to discuss once you have had time to review. If you can let me know your availability at the start of September we can send out a calendar invite.

Kind regards,

Matthew Seiboth
Principal Transport Planner

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Appendix A – Email from Cambridgeshire County Council

Seiboth, Matt

Subject: RE: 3322-10538 - Wintringham development - NH A428 junctions modelling

From: Jez Tuttle
Sent: 03 March 2025 14:24
To: Seiboth, Matt
Cc: James, Paul; Wright, Lauren
Subject: Re: 3322-10538 - Wintringham development - NH A428 junctions modelling

Hi Matt

Thank you for your E-mail

I have had another look at the plans for the A428 scheme, and whilst I agree that the Barford Road junction is predicted to operate below capacity, the Cambridge Road roundabout does not form part of the A428 scheme, therefore improvement will still be required there. Whether this is of the nature proposed previously or an alternative scheme is something that will need to be looked at in more detail.

Kind Regards

Jez

From: Seiboth, Matt
Sent: 03 March 2025 11:03
To: Jez Tuttle
Cc: James, Paul; Wright, Lauren
Subject: RE: 3322-10538 - Wintringham development - NH A428 junctions modelling

Morning Jez,

Hope you were able to enjoy the sun over the weekend. Are you able to respond to our email below.

The results we sent show that the Barford Road junction operates within capacity in the interim period. For the Cambridge Road junction, although the junction is shown to operate at capacity, there is already works happening on site for the dualling and this junction will be changed as part of that scheme. Therefore, I believe we can discharge the conditions/S106 obligations related to these junctions.

Kind regards,

Matthew Seiboth
Principal Transport Planner

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From: Seiboth, Matt
Sent: 20 February 2025 14:49
To: Jez Tuttle

Cc: James, Paul; Wright, Lauren
Subject: RE: 3322-10538 - Wintringham development - NH A428 junctions modelling

Hi Jez,

Thanks for looking at this. We've re-run the Junctions 10 (Arcady) models with a ONE-HOUR profile (which is the standard profile). These are attached.

A summary for the 2027 year scenario with 1,100 dwellings at the Wintringham development is shown below for the two roundabouts.

A428 / Barford Road

Arm	Morning Peak Hour			Evening Peak Hour		
	End Queue (PCU rounded up)	Av. Delay per arriving vehicle (s)	RFC	End Queue (PCU rounded up)	Av. Delay per arriving vehicle (s)	RFC
B1043 Barford Rd (N)	2	7.31	0.62	1	4.43	0.46
A428 (East)	2	3.52	0.51	2	3.62	0.55
Barford Road (S)	1	5.91	0.33	2	11.29	0.60
A428 (West)	3	6.77	0.72	3	7.39	0.74

A428 / Cambridge Road B1428

Arm	Morning Peak Hour			Evening Peak Hour		
	End Queue (PCU rounded up)	Av. Delay per arriving vehicle (s)	RFC	End Queue (PCU rounded up)	Av. Delay per arriving vehicle (s)	RFC
A428 Cambridge Rd (E)	4.6	10.88	0.82	36.9	68.18	1.01
A428 St. Neots Bypass (SW)	17.3	51.13	0.97	12.9	44.86	0.95
B1428 Cambridge Rd (NW)	1.5	7.51	0.59	0.9	5.16	0.48

In short:

- the Barford Road roundabout operates with capacity.
- The Cambridge Road junction will be at capacity. However, given that the dualling has started and this roundabout will be changed by this is it likely that the works here will be delayed to the point that in interim scheme is required?

Kind regards,

Matthew Seiboth
Principal Transport Planner

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From: Jez Tuttle
Sent: 19 February 2025 09:24
To: Seiboth, Matt
Subject: Re: 3322-10538 - Wintringham development - NH A428 junctions modelling

Hi Matt

Further to our conversation and E-mail exchanges, I have now had the opportunity to review the modelling and technical note.

The only outstanding issue that I can see with the modelling is that you appear to have used a 'FLAT' profile for the modelling flow inputs.

In reality this is unlikely to be the case and therefore I would require the modelling to be re-run using a synthesized profile. We would usually require DIRECT (see CCC's Transport Assessment Requirements). However given that this is a future year scenario from the HE model, the 15 minute periods are not available.

My particular concern at this time is the A428 Cambridge Road Arm which exceeds effective capacity in the future years with the FLAT profile and this may increase with a more realistic synthesised profile.

I would therefore be grateful if you could please revise the modelling (and technical note if required) and send this through for review.

Kind Regards

Jez