

Lower Thames Crossing

9.15 Localised Traffic Modelling Appendix F - Thurrock East-West Forecasting Report

Infrastructure Planning
(Examination Procedure)
Rules 2010

Volume 9

DATE: July 2023
DEADLINE: 1

Planning Inspectorate Scheme Ref: TR010032
Examination Document Ref: TR010032/EXAM/9.15

VERSION: 1.0

Lower Thames Crossing

9.15 Localised Traffic Modelling Appendix F - Thurrock East-West Forecasting Report

List of contents

	Page number
1 Introduction	1
1.1 Purpose of document.....	1
1.2 Modelling software.....	1
1.3 The Project	1
2 Modelling scope	4
3 Model development & forecasting	7
3.1 Introduction.....	7
3.2 Network development – Do Minimum	7
3.3 Network development – Do Something	8
3.4 Forecast traffic demand	9
3.5 Public transport.....	13
3.6 Traffic signals optimisation.....	13
3.7 DM and DS VISSIM model calibration	13
4 Traffic condition analysis	14
4.1 Introduction.....	14
4.2 Junction results.....	14
4.3 2030 results – AM peak first hour (07:00 – 08:00)	15
4.4 2030 results – AM peak second hour (08:00 – 09:00)	23
4.5 2030 results – PM peak hour (17:00 – 18:00).....	31
4.6 2045 results – AM peak first hour (07:00 – 08:00).....	39
4.7 2045 results – AM peak second hour (08:00 – 09:00)	47
4.8 2045 results – PM peak hour (17:00 – 18:00).....	55
4.9 Junction performance - summary	62
4.10 Journey Times	65
4.11 2030 journey times – AM peak first hour (07:00 – 08:00)	66
4.12 2030 journey times – AM peak second hour (08:00 – 09:00)	68
4.13 2030 journey times – PM peak hour (17:00 – 18:00).....	70
4.14 2045 journey times – AM peak first hour (07:00 – 08:00)	72
4.15 2045 journey times – AM peak second hour (08:00 – 09:00)	74

4.16	2045 journey times – PM peak hour (17:00 – 18:00)	76
4.17	Relative Delays	78
4.18	Network performance statistics	79
5	Conclusions	81
	References	82
	Glossary	83
	Appendix A School flow diagrams	85
	Appendix B Daneholes flow diagrams	91
	Appendix C Junction results	95
	Appendix D Relative delay plots	133

List of plates

	Page number
Plate 1.1 Lower Thames Crossing route.....	2
Plate 2.1 Traffic Operations Study Area	4
Plate 3.1 Orsett Heath Academy	7
Plate 3.2 Orsett Heath Academy – new junction.....	8
Plate 3.3 Rectory Road/ A1013 Stanford Road DS junction reconfiguration	9
Plate 3.4 Forecast Traffic Demand Calculation for VISSIM	9
Plate 3.5 DM and DS VISSIM Zones	12
Plate 3.6 Daneholes Flow Diagram including school flows 2030 DM 08:00 – 09:00.....	13
Plate 4.1 Treacle Mine Roundabout Map	15
Plate 4.2 Lodge Lane / Hathaway Road Junction Map	17
Plate 4.3 Daneholes Roundabout Map	18
Plate 4.4 A1013 Stanford Road / Rectory Road Junction Map	20
Plate 4.5 Old Dock Approach Rd / Marshfoot Rd Roundabout Map	21
Plate 4.6 Treacle Mine Roundabout Map	23
Plate 4.7 Lodge Lane / Hathaway Road Junction Map	25
Plate 4.8 Daneholes Roundabout Map	26
Plate 4.9 A1013 Stanford Road / Rectory Road Junction Map	28
Plate 4.10 Old Dock Approach Rd / Marshfoot Rd Roundabout Map	29
Plate 4.11 Treacle Mine Roundabout Map	31
Plate 4.12 Lodge Lane / Hathaway Road Junction Map	33
Plate 4.13 Daneholes Roundabout Map	34
Plate 4.14 A1013 Stanford Road / Rectory Road Junction Map	36
Plate 4.15 Old Dock Approach Rd / Marshfoot Rd Roundabout Map	37
Plate 4.16 Treacle Mine Roundabout Map	39
Plate 4.17 Lodge Lane / Hathaway Road Junction Map	41
Plate 4.18 Daneholes Roundabout Map	42
Plate 4.19 A1013 Stanford Road / Rectory Road Junction Map	44
Plate 4.20 Old Dock Approach Rd / Marshfoot Rd Roundabout Map	45
Plate 4.21 Treacle Mine Roundabout Map	47
Plate 4.22 Lodge Lane / Hathaway Road Junction Map	49
Plate 4.23 Daneholes Roundabout Map	50
Plate 4.24 A1013 Stanford Road / Rectory Road Junction Map	52
Plate 4.25 Old Dock Approach Rd / Marshfoot Rd Roundabout Map	53
Plate 4.26 Treacle Mine Roundabout Map	55
Plate 4.27 Lodge Lane / Hathaway Road Junction Map	57
Plate 4.28 Daneholes Roundabout Map	58
Plate 4.29 A1013 Stanford Road / Rectory Road Junction Map	60
Plate 4.30 Old Dock Approach Rd / Marshfoot Rd Roundabout Map	61
Plate 4.31 Junction Approaches with Delays Increase by >20s in 2030	63
Plate 4.32 Junction Approaches with Delays Increase by >20s in 2045.....	64
Plate 4.33 Journey Time Start and End Locations.....	65

Plate 4.34 2030 Journey Time Charts AM (07:00 – 08:00).....	67
Plate 4.35 2030 Journey Time Charts AM (8.00 – 9.00).....	69
Plate 4.36 2030 Journey Time Charts PM (17.00 – 18.00).....	71
Plate 4.37 2045 Journey Time Charts AM (7.00 –8.00).....	73
Plate 4.38 2045 Journey Time Charts AM (08:00 –09:00).....	75
Plate 4.39 2045 Journey Time Charts PM (17.00 – 18.00).....	77
Plate A.1 Orsett Heath Academy AM 08:00 – 09:00 Flow Diagram.....	85
Plate A.2 Orsett Heath Academy PM 17:00 – 18:00 Flow Diagram.....	86
Plate A.3 Treetops School AM 08:00 – 09:00 Flow Diagram.....	87
Plate A.4 Treetops School PM 17:00 – 18:00 Flow Diagram.....	88
Plate A.5 Thames Park Secondary School Grays AM 08:00 – 09:00 Flow Diagram	89
Plate A.6 Thames Park Secondary School Grays PM 17:00 – 18:00 Flow Diagram	90
Plate B.1 Daneholes Flow Diagram including school flows 2030 DM 08:00 – 09:00	91
Plate B.2 Daneholes Flow Diagram including school flows 2030 DS 08:00 – 09:00.....	92
Plate B.3 Daneholes Flow Diagram including school flows 2045 DM 08:00 – 09:00	93
Plate B.4 Daneholes Flow Diagram including school flows 2045 DS 08:00 – 09:00.....	94
Plate D.1 Relative Delay Plot (2030 DM 07:00 – 08:00)	133
Plate D.2 Relative Delay Plot (2030 DM 08:00 – 09:00)	134
Plate D.3 Relative Delay Plot (2030 DM 17:00 – 18:00)	135
Plate D.4 Relative Delay Plot (2030 DS 07:00 – 08:00).....	136
Plate D.5 Relative Delay Plot (2030 DS 08:00 – 09:00).....	137
Plate D.6 Relative Delay Plot (2030 DS 17:00 – 18:00).....	138
Plate D.7 Relative Delay Plot (2045 DM 07:00 – 08:00)	139
Plate D.8 Relative Delay Plot (2045 DM 08:00 – 09:00)	140
Plate D.9 Relative Delay Plot (2045 DM 17:00 – 18:00)	141
Plate D.10 Relative Delay Plot (2045 DS 07:00 – 08:00).....	142
Plate D.11 Relative Delay Plot (2045 DS 08:00 – 09:00).....	143
Plate D.12 Relative Delay Plot (2045 DS 17:00 – 18:00).....	144

List of tables

	Page number
Table 2.1 Main Junctions and Source of Data	5
Table 2.2 Signalised Pedestrian Crossings	5
Table 3.1 2030 Traffic Volumes in Study Area by Scenario.....	11
Table 3.2 2045 Traffic Volumes in Study Area by Scenario.....	11
Table 4.1 07:00 – 08:00 Treacle Mine Roundabout - Junction Results 2030	15
Table 4.2 07:00 – 08:00 Lodge Lane / Hathaway Road - Junction Results 2030	17
Table 4.3 07:00 – 08:00 Daneholes Roundabout - Junction Results 2030	18
Table 4.4 07:00 – 08:00 A1013 Stanford Road / Rectory Road - Junction Results 2030 ..	20
Table 4.5 07:00 – 08:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2030.	21

Table 4.6 08:00 – 09:00 Treacle Mine Roundabout - Junction Results 2030	23
Table 4.7 08:00 – 09:00 Lodge Lane / Hathaway Road - Junction Results 2030	25
Table 4.8 08:00 – 09:00 Daneholes Roundabout - Junction Results 2030	26
Table 4.9 08:00 – 09:00 A1013 Stanford Road / Rectory Road - Junction Results 2030 ..	28
Table 4.10 08:00 – 09:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2030	29
Table 4.11 17:00 – 18:00 Treacle Mine Roundabout - Junction Results 2030	31
Table 4.12 17:00 – 18:00 Lodge Lane / Hathaway Road - Junction Results 2030	33
Table 4.13 17:00 – 18:00 Daneholes Roundabout - Junction Results 2030	34
Table 4.14 17:00 – 18:00 A1013 Stanford Road / Rectory Road - Junction Results 2030	36
Table 4.15 17:00 – 18:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2030	37
Table 4.16 07:00 – 08:00 Treacle Mine Roundabout - Junction Results 2045	39
Table 4.17 07:00 – 08:00 Lodge Lane / Hathaway Road - Junction Results 2045	41
Table 4.18 07:00 – 08:00 Daneholes Roundabout - Junction Results 2045	42
Table 4.19 07:00 – 08:00 A1013 Stanford Road / Rectory Road - Junction Results 2045	44
Table 4.20 07:00 – 08:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2045	45
Table 4.21 08:00 – 09:00 Treacle Mine Roundabout - Junction Results 2045	47
Table 4.22 08:00 – 09:00 Lodge Lane / Hathaway Road - Junction Results 2045	49
Table 4.23 08:00 – 09:00 Daneholes Roundabout - Junction Results 2045	50
Table 4.24 08:00 – 09:00 A1013 Stanford Road / Rectory Road - Junction Results 2045	52
Table 4.25 08:00 – 09:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2045	53
Table 4.26 17:00 – 18:00 Treacle Mine Roundabout - Junction Results 2045	55
Table 4.27 17:00 – 18:00 Lodge Lane / Hathaway Road - Junction Results 2045	57
Table 4.28 17:00 – 18:00 Daneholes Roundabout - Junction Results 2045	58
Table 4.29 17:00 – 18:00 A1013 Stanford Road / Rectory Road - Junction Results 2045	60
Table 4.30 17:00 – 18:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2045	61
Table 4.31 Junction Approaches with Delays Increase by >20s in 2030	63
Table 4.32 Junction Approaches with Delays Increase by >20s in 2045	64
Table 4.33 2030 Journey Time Comparison AM 07:00 – 08:00.....	66
Table 4.34 2030 Journey Time Comparison 08:00 – 09:00	68
Table 4.35 2030 Journey Time Comparison 17:00 – 18:00	70
Table 4.36 2045 Journey Time Comparison AM 07:00 – 08:00.....	72
Table 4.37 2045 Journey Time Comparison 08:00 – 09:00	74
Table 4.38 2045 Journey Time Comparison 17:00 – 18:00	76
Table 4.39 2030 Network Performance Statistics	79
Table 4.40 2045 Network Performance Statistics	80
Table C.1 2030 07:00 – 08:00 Junction Results	95
Table C.2 2030 08:00 – 09:00 Junction Results	101
Table C.3 2030 17:00 – 18:00 Junction Results	107

Table C.4 2045 07:00 – 08:00 Junction Results	113
Table C.5 2045 08:00 – 09:00 Junction Results	120
Table C.6 2045 17:00 – 18:00 Junction Results	126

1 Introduction

1.1 Purpose of document

- 1.1.1 The purpose of this document is to present the findings from the traffic operation appraisal undertaken for the local road network in Thurrock, south of A13, extending from the Stifford interchange to west of the Orsett Cock junction in the east/west direction and from the A13 to the Marshfoot roundabout in the north/south direction.

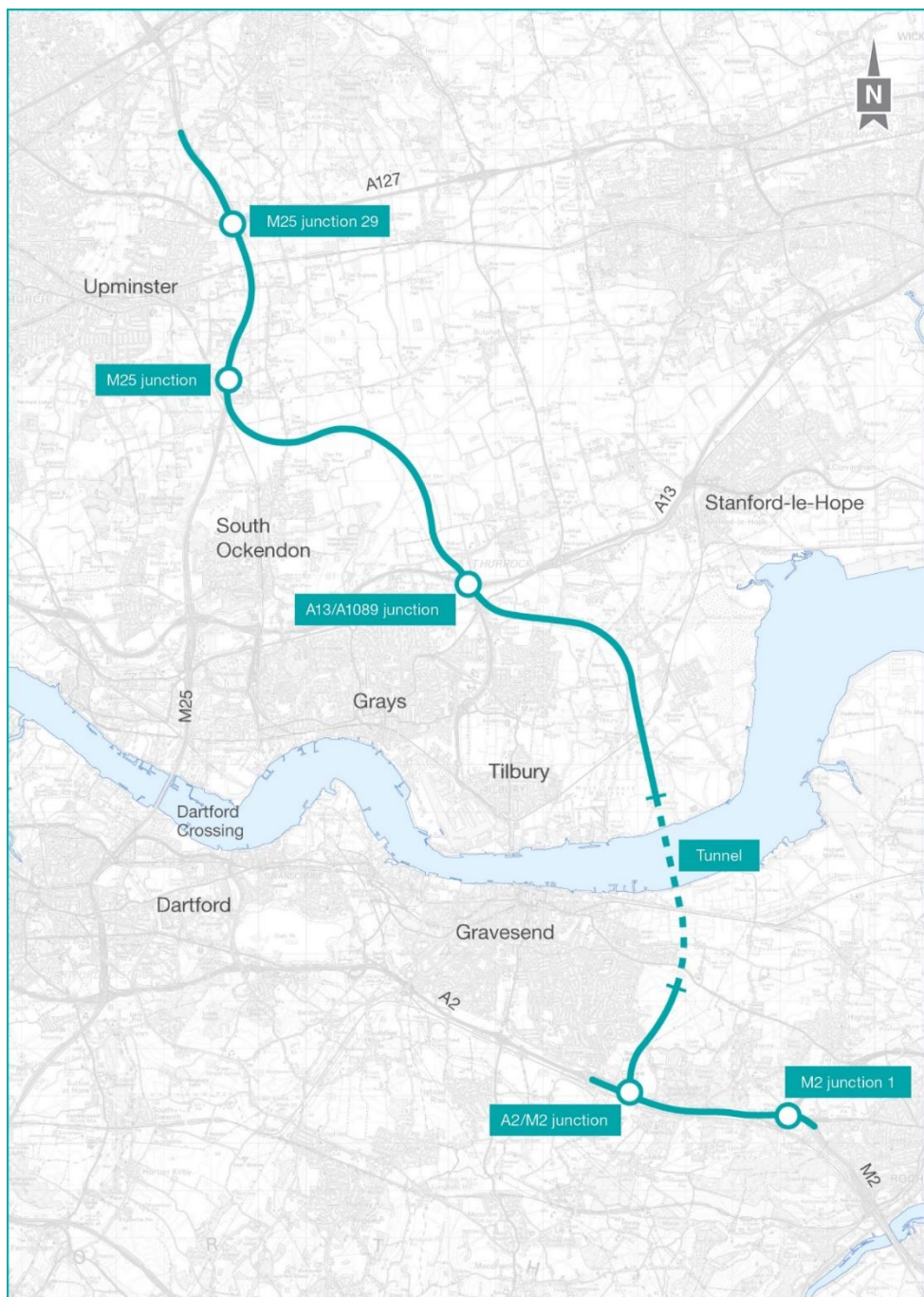
1.2 Modelling software

- 1.2.1 Road traffic micro-simulation models represent individual vehicles travelling within the road network, providing realistic driver behaviour such as lane changing and overtaking. The micro-simulation software selected for the Lower Thames Crossing is VISSIM. The model has been developed in VISSIM version 2020 (SP13).

1.3 The Project

- 1.3.1 The A122 Lower Thames Crossing (the Project) would provide a connection between the A2 and M2 in Kent, south-east of Gravesend, crossing under the River Thames through a tunnel, before joining the M25 south of junction 29. The Project route is presented in Plate 1.1.

Plate 1.1 Lower Thames Crossing route



- 1.3.2 The A122 would be approximately 23km long, 4.25km of which would be in tunnel. On the south side of the River Thames, the Project route would link the tunnel to the A2 and M2. On the north side, it would link to the A13, M25 junction 29 and the M25 south of junction 29. The tunnel entrances would be located to the east of the village of Chalk on the south of the River Thames and to the west of East Tilbury on the north side.
- 1.3.3 Junctions are proposed at the following locations:
- New junction with the A2 to the south-east of Gravesend
 - Modified junction with the A13/A1089 in Thurrock
 - New junction with the M25 between junctions 29 and 30

- 1.3.4 To align with NPSNN policy and to help the Project meet the Scheme Objectives, it is proposed that road user charges would be levied in line with the Dartford Crossing. Vehicles would be charged for using the new tunnel.
- 1.3.5 The Project route would be three lanes in both directions, except for:
- a. link roads
 - b. stretches of the carriageway through junctions
 - c. the southbound carriageway from the M25 to the junction with the A13/A1089, which would be two lanes
- 1.3.6 In common with most A-roads, the A122 would operate with no hard shoulder but would feature a 1m hard strip on either side of the carriageway. It would also feature technology including stopped vehicle and incident detection, lane control, variable speed limits and electronic signage and signalling. The A122 design outside of the tunnel would include emergency areas. The tunnel would include a range of enhanced systems and response measures instead of emergency areas.
- 1.3.7 The A122 would be classified as an ‘all-purpose trunk road’ with green signs. For safety reasons, walkers, cyclists, horse-riders and slow-moving vehicles would be prohibited from using it.
- 1.3.8 The Project would include adjustment to a number of local roads. There would also be changes to a number of public rights of way, used by walkers, cyclists and horse riders. Construction of the Project would also require the installation and diversion of a number of utilities, including gas mains, overhead electricity powerlines and underground electricity cables, as well as water supplies and telecommunications assets and associated infrastructure.
- 1.3.9 The Project has been developed to avoid or minimise significant effects on the environment. Some of the measures adopted include landscaping, noise mitigation, green bridges, floodplain compensation, new areas of ecological habitat and two new parks.

2 Modelling scope

- 2.1.1 The traffic operation study area, modelling years and time periods were defined based on discussion and agreement with Thurrock Council and their consultants during a workshop on 14 December 2021.
- 2.1.2 The study area is located on the north-east part of Grays, south of the A13 and as drawn in Plate 2.1 covering 16 key junctions and 6 signalised pedestrian crossings.

Plate 2.1 Traffic Operations Study Area



- 2.1.3 The list of junctions included in the model is shown in Table 2.1, as well as the description of the junction type and the data source, while
- 2.1.4 Table 2.2 lists the standalone signalised pedestrian crossings.

Table 2.1 Main Junctions and Source of Data

Nr	Junction	Date	Data	Junction Type
1	A13 / A1012 / Stifford Clays Rd / High Rd	17.05.2018	Automatic Number Plate Recognition (ANPR)	Priority Roundabout
2	Treacle Mine Roundabout	17.05.2018	Classified Turning Counts (CTC)	Signalised Roundabout
3	Lodge Lane / Nutberry Ave	17.05.2018	CTC	Priority
4	Lodge Lane / Hathaway Rd	17.05.2018	CTC	Signalised
5	Lodge Lane / Connaught Ave	17.05.2018	CTC	Priority
6	Lodge Lane / Victoria Ave	17.05.2018	CTC	Priority
7	Lodge Rd / Southend Rd	17.05.2018	CTC	Signalised
8	Daneholes Roundabout	17.05.2018	CTC	Priority Roundabout
9	A1013 Stanford Rd / King Edward Drive	17.05.2018	CTC	Priority
10	A1013 Stanford Rd / B188 Baker St / Heath Rd	17.05.2018	CTC	Priority
11	A1013 Stanford Rd / Rectory Rd	17.05.2018	CTC	Priority
12	Old Dock Approach Rd / Marshfoot Rd	17.05.2018	CTC	Priority Roundabout
13	Marshfoot Rd / Slip Rd	17.05.2018	CTC	Priority
14	Marshfoot Rd / B149 Chadwell Bypass / Chadwell Hill	2016	SATURN	Priority Roundabout
15	Chadwell Hill / Brentwood Rd / Linford Rd	2016	SATURN	Signalised
16	Orsett Heath Academy/Treetops School	2020	Transport Assessment	New Signalised Junction

Table 2.2 Signalised Pedestrian Crossings

A	Pedestrian Crossings West of Daneholes Roundabout
B	Pedestrian Crossings East of Daneholes Roundabout
C	Pedestrian Crossing at A126 Marshfoot Road
D	Pedestrian Crossing at B149
E	New Pedestrian Crossing at A1013 Stanford Road
F	New Pedestrian Crossing at road to Treetops School

- 2.1.5 The VISSIM base year model was developed to reflect the road network and traffic condition in 2018, before the construction work commenced. Accordingly, a Local Model Validation Report (LMVR) was issued in June 2022 explaining how the Base Year model was developed and validated for two time periods:
- a. AM Peak Period (07:00 - 09:00) to capture the peak hour for the A13, A1089 and overall strategic road network (07:00–08:00) and the peak hour for the local roads (08:00–09:00); and
 - b. PM Peak Period (17:00 - 18:00).
- 2.1.6 Following this, a Do Minimum (DM) model was developed representing forecast years 2030 and 2045 without the Project. 2030 and 2045 Do Something (DS) models with the Project were also developed.
- 2.1.7 This report explains how the Do Minimum and Do Something models were developed and compares results from the DS model with the results of the DM model to understand how the forecast network conditions change from the Do Minimum model (without the Project) to the Do Something model (with the Project).

3 Model development & forecasting

3.1 Introduction

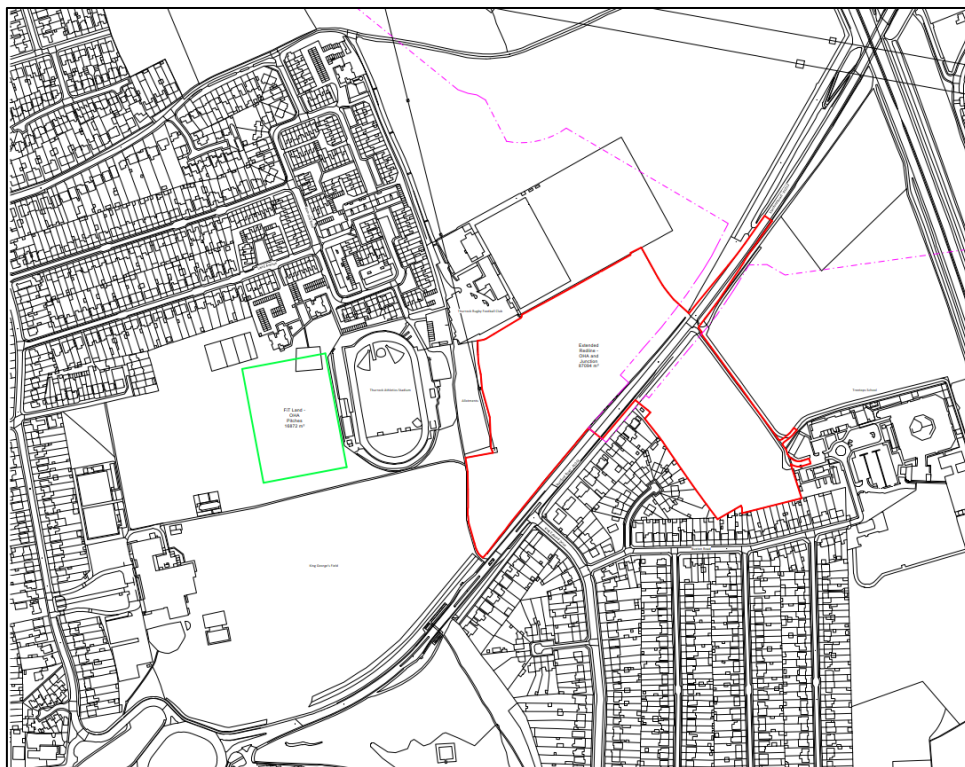
3.1.1 This section describes the development of the 2030 and 2045, Do Minimum (DM) and Do Something (DS) VISSIM models in terms of:

- a. Network Development
- b. Forecast Traffic Demand
- c. Traffic Signal Optimisation
- d. Model Calibration
- e. Initial Visual Observations

3.2 Network development – Do Minimum

3.2.1 The DM network was developed from the 2018 base year network by incorporating the expansion of Orsett Heath Academy (OHE) as detailed in the Orsett Heath Academy Transport Assessment (TA), which is the development of an 8-form entry school at the existing school site in Grays, within the Thurrock Council authority area. The additional land used for the Orsett Heath Academy is marked with the red line in Plate 3.1.

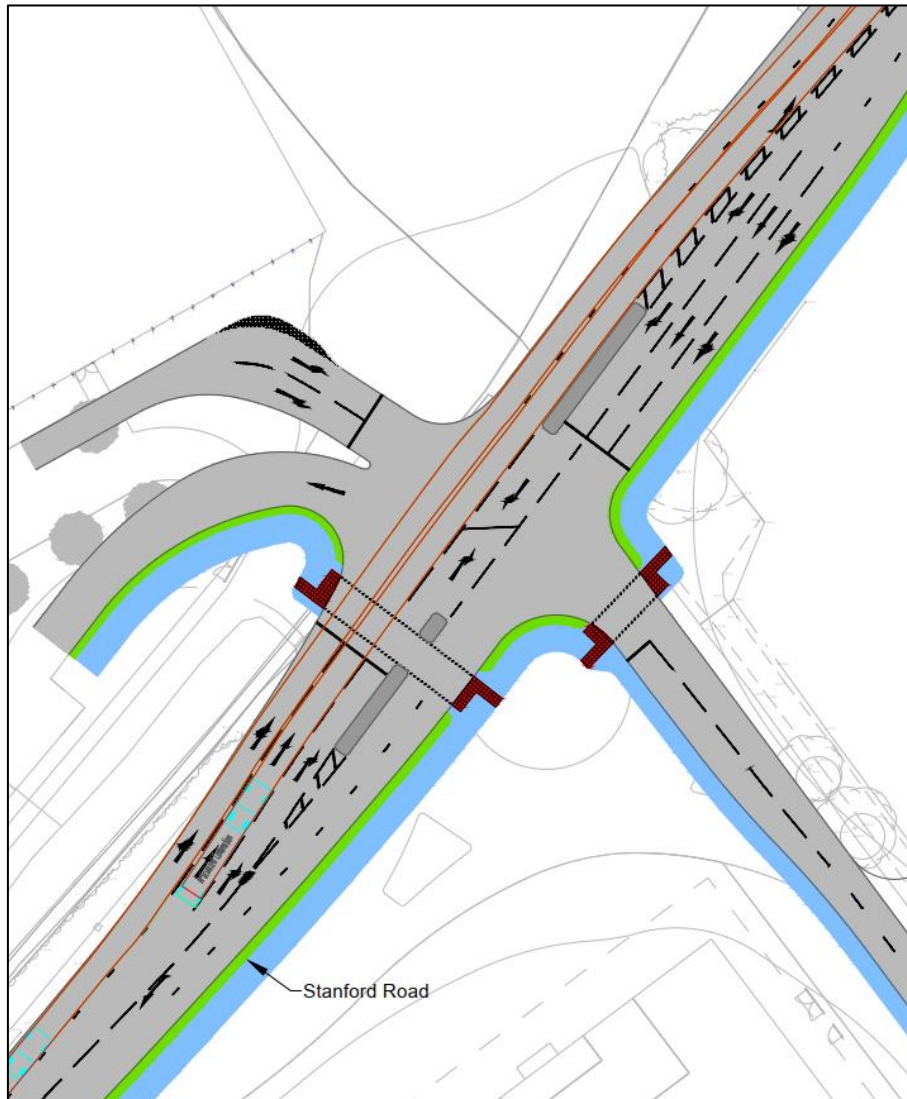
Plate 3.1 Orsett Heath Academy



Source: Orsett Heath Academy Transport Assessment Project no. 2550/1190 doc no. D002 July 2021

- 3.2.2 The only network change between the 2018 base year and the Do Minimum was the introduction of a controlled junction to serve the school entry on the north (OHE) and south of the Stanford Road (Treetops) shown in Plate 3.2.

Plate 3.2 Orsett Heath Academy – new junction



Source: Orsett Heath Academy Transport Assessment Project no. 2550/1190 doc no. D002 July 2021 Appendix I

3.3 Network development – Do Something

- 3.3.1 The DS network was developed from the DM network. The only network change between the DM and DS models was:
- Reconfiguration of the A1013/ Rectory Road junction. Due to the creation of the Project the Rectory Road/ Stanford Road junction would be moved slightly to the south as shown in Plate 3.3.

Plate 3.3 Rectory Road/ A1013 Stanford Road DS junction reconfiguration

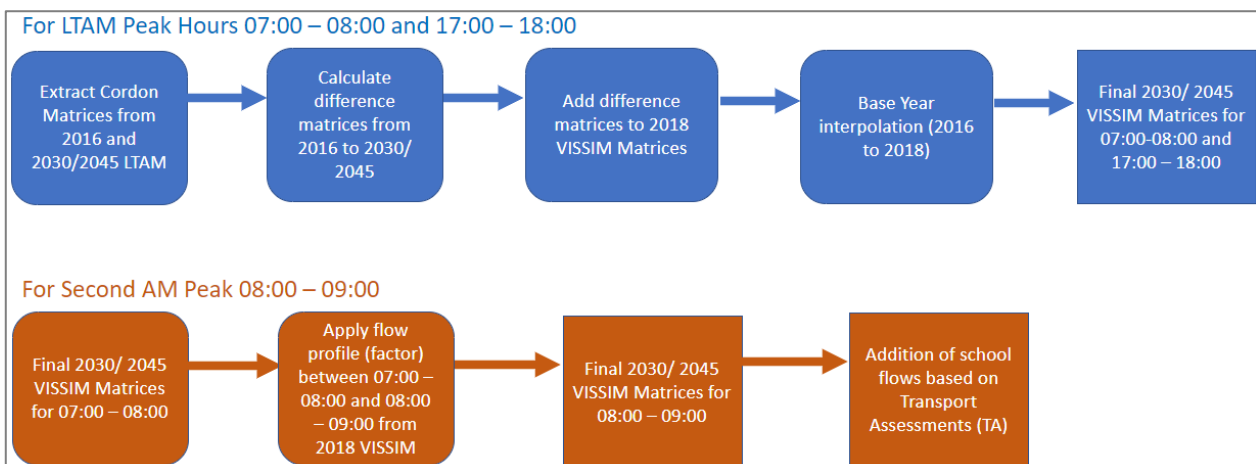


3.3.2 The network coding for both DM and DS networks was undertaken using highway design drawings.

3.4 Forecast traffic demand

3.4.1 The forecast traffic demand matrices for each vehicle type in VISSIM were calculated as shown in Plate 3.4 and described in detail in subsequent sections.

Plate 3.4 Forecast Traffic Demand Calculation for VISSIM



- 3.4.2 The DM forecast traffic demand in VISSIM was determined by examining the differences in forecast traffic flows (for model zones) predicted by the 2016 base year and 2030, 2045 DM LTAM (CM49) models for the available hours of 07:00 – 08:00 in the AM Peak and 17:00 – 18:00 in the PM Peak.
- 3.4.3 The flow differences between these models were calculated and then applied to the 2018 Base Year VISSIM model to develop the DM matrices. This was undertaken on the basis of origin-destination matrices, applying a matrix of ‘flow differences’ to the 2018 Base Year matrix.
- 3.4.4 The next step included interpolating the 2030 and 2045 VISSIM matrices, using the exponential formula to account for the difference in Base Year between LTAM and VISSIM. The VISSIM Base matrix was multiplied by the percentage growth between the VISSIM Base Matrix and calculated forecasted VISSIM Matrices, calculated from year differences as shown below, to the power of 0.86 and 0.93 for 2030 and 2045 respectively:
- $$\frac{2030 \text{ (or 2045)} - 2018}{2030 \text{ (or 2045)} - 2016}$$
- 3.4.5 Where applying the flow differences resulted in negative values, the percentage difference was used instead. This was the case for some of the origin–destination pairs for which the forecast from the Project’s transport model – the Lower Thames Area Model (the LTAM) indicated negative growth. If the 2018 base year flows in VISSIM were lower than the LTAM base flows, applying this negative flow difference would lead in some instances to a negative number, therefore it was preferred to use percentage difference where this occurred.
- 3.4.6 For the second hour in the AM (08:00 – 09:00), which is not available in the LTAM, the existing base year flow profile in VISSIM (derived from observed count data) was used to factor the 2030 matrices from the 07:00 – 08:00 hour to the 08:00 – 09:00 hour.
- 3.4.7 The comparison of the VISSIM 2018 Base and VISSIM 2030 and 2045 traffic demands is presented in Table 3.1 and Table 3.2 respectively. The summary indicates that the overall 2030 traffic demand is forecasted to increase by 23% in the DM and 24% in the DS scenario when the A13 and A1089 mainline flows are excluded. When the A13 and A1089 mainline flows are included, the increase is 33% in the DM and 28% in the DS scenario respectively.
- 3.4.8 The overall 2045 traffic demand is forecasted to increase by 34% in the DM and 35% in the DS scenario when A13 and A1089 mainline flows are excluded. When the A13 and A1089 mainline flows are included, the increase is 45% in the DM and 39% in the DS scenario respectively.

Table 3.1 2030 Traffic Volumes in Study Area by Scenario

Peak	Vehicle Type	2018 Base		2030 DM		2030 DS	
		Without A13, A1089 mainline flows	Total *	Without A13, A1089 mainline flows	Total *	Without A13, A1089 mainline flows	Total *
AM (07:00 – 08:00)	Car	7963	12224	9928	16679	10028	16000
	LGV	1317	2757	1583	3596	1676	3447
	HGV	312	1587	327	2245	330	2002
	Total	9592	16569	11838	22521	12035	21449
AM (08:00 – 09:00)	Car	9917	13970	12692	19104	12781	18481
	LGV	1170	2335	1461	3083	1423	2868
	HGV	312	1578	317	2226	321	1974
	Total	11399	17883	14470	24413	14526	23323
PM (17:00 – 18:00)	Car	10529	15987	12437	20094	12639	19654
	LGV	1249	2495	1422	3160	1420	3112
	HGV	183	1006	216	1555	192	1445
	Total	11962	19487	14075	24810	14251	24211
Comparing to Base				+23%	+33%	+24%	+28%

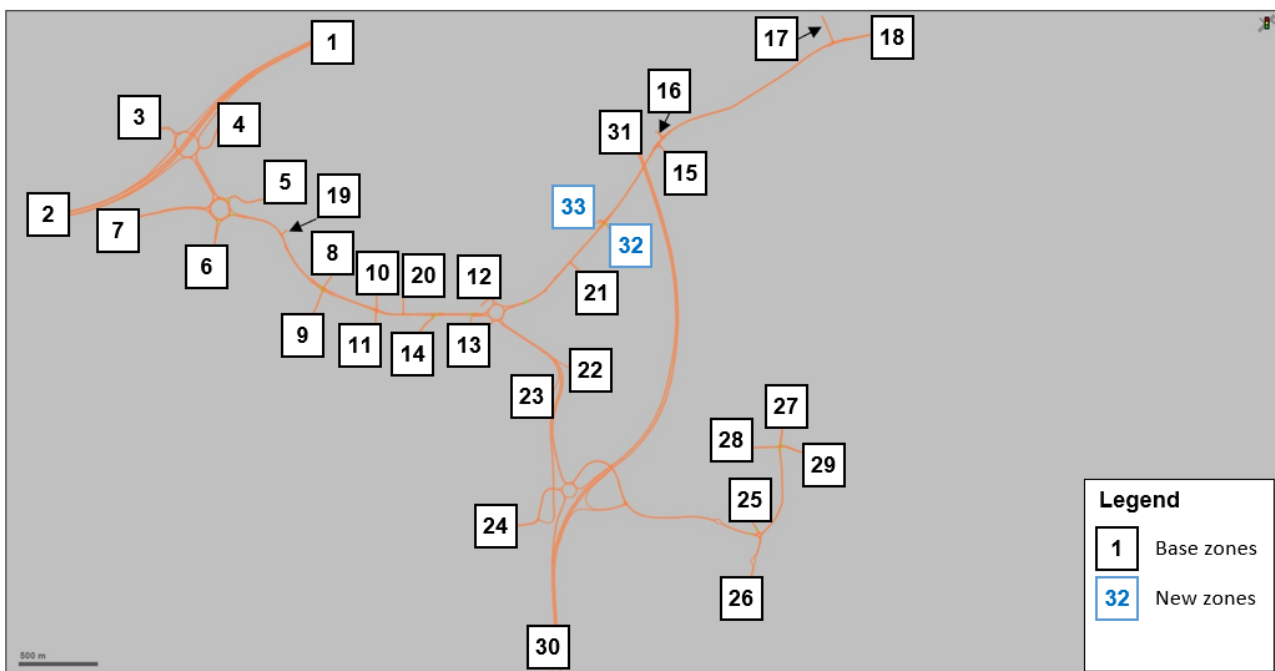
Table 3.2 2045 Traffic Volumes in Study Area by Scenario

Peak	Vehicle Type	2018 Base		2045 DM		2045 DS	
		Without A13, A1089 mainline flows	Total *	Without A13, A1089 mainline flows	Total *	Without A13, A1089 mainline flows	Total *
AM (07:00 – 08:00)	Car	7963	12224	10847	18259	10955	17483
	LGV	1317	2757	1730	3911	1884	3853
	HGV	312	1587	343	2324	363	2053
	Total	9592	16569	12920	24494	13201	23390
AM (08:00 – 09:00)	Car	9917	13970	14019	21061	13996	20231
	LGV	1170	2335	1617	3363	1570	3174
	HGV	312	1578	337	2308	360	2031
	Total	11399	17883	15973	26732	15926	25436
PM (17:00 – 18:00)	Car	10529	15987	13369	21619	13455	21165
	LGV	1249	2495	1559	3505	1592	3475
	HGV	183	1006	209	1615	194	1498
	Total	11962	19487	15138	26740	15241	26138
Comparing to Base				+34%	+45%	+35%	+39%

Note: * Total traffic volumes include A13 and A1089 mainline flows

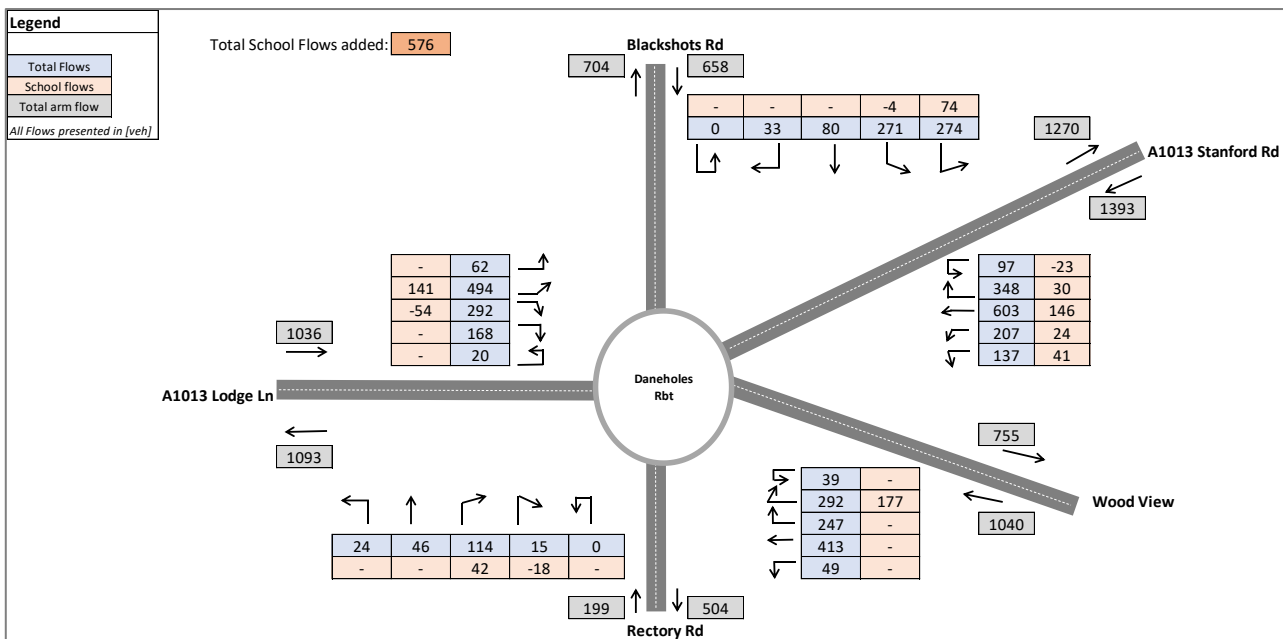
- 3.4.9 The 2030 and 2045 DS forecast traffic demand matrices in VISSIM were determined using the same method as the 2030 and 2045 DM matrices, that is by examining the differences in forecast traffic flows predicted by the 2016 Base Year and 2030, 2045 DS (CS72) LTAM models.
- 3.4.10 There are two new zones associated with the new traffic from/to Orsett Heath Academy and Treetops School. The new zones are shown in Plate 3.5. The traffic demand and the distributions for these zones were taken directly from the Orsett Heath Academy Transport Assessment (July 2021) and added to the VISSIM matrices. The school Traffic Flow Diagrams are shown in Appendix A.
- 3.4.11 The Thames Park Secondary School Grays, located east of zone 22 is not within the model extent, nevertheless the traffic affects the model area. Therefore, predicted traffic associated with the development was taken directly from the transport assessment submitted by the school as part of the planning application and added to the VISSIM matrices. The school traffic flow diagrams are also presented in Appendix A.
- 3.4.12 It should be noted that while the traffic associated with these schools has been added into the model, trips to the current school locations have not been removed from the model. Therefore, the total number of school trips is overstated in the model on a precautionary basis, which is of particular relevance to the 08:00-09:00 models.

Plate 3.5 DM and DS VISSIM Zones



- 3.4.13 The new school traffic flow mainly affects the second AM peak hour and impacts the Daneholes Roundabout. The 2030 DM 08.00 – 09.00 Daneholes Flow Diagram, showing the additional school flows, is presented in Plate 3.6. The diagrams for all scenarios are presented in Appendix B.

Plate 3.6 Daneholes Flow Diagram including school flows 2030 DM 08:00 – 09:00



3.4.14 As shown in Plate 3.6 in the Do Minimum 2030 there are 576 additional trips going through Daneholes roundabout between 08:00-09:00.

3.5 Public transport

3.5.1 Bus services and location of bus stops in the DM and DS models were assumed to remain consistent with those in the base year model.

3.6 Traffic signals optimisation

3.6.1 The operation of traffic signals in the 2030, 2045 DM and DS network were optimised in VISSIM to reflect the changes in demand and arrival patterns.

3.7 DM and DS VISSIM model calibration

3.7.1 The network coding method and model parameters used in the DM and DS models were consistent with those calibrated in the base year model.

4 Traffic condition analysis

4.1 Introduction

- 4.1.1 This section compares the results of the 2030 and 2045 DM and DS VISSIM models in terms of the following traffic condition indicators:
- a. Average delays per vehicle
 - b. Average queues
 - c. Predicted journey times
 - d. Relative delays on links
 - e. Network Performance Statistics
- 4.1.2 Consistent with the base year model validation, the results of the DM and DS models are the averages of the same 20 random seeds used in the base model.

4.2 Junction results

- 4.2.1 The junction results at the main junctions are shown in Table 4.1 to Table 4.30 – Table 4.1 to Table 4.15 provide the 2030 results and Table 4.16 to Table 4.30 the 2045 results. The junction results for all the East - West model junctions are shown in Appendix C.
- 4.2.2 The results include the total throughput flow in vehicles, average delay per vehicle in seconds and mean max queue length in meters for each hour within the AM and PM peak period.
- 4.2.3 The delays are measured for each vehicle completing the full movement from the entry to the exit and therefore include delays from the traffic signals.
- 4.2.4 The mean max queue lengths are calculated by taking the average of the maximum queue length in each five-minute interval. This is more reliable in comparison to taking the maximum queue length over a one-hour interval, where the maximum queue can sometimes be misleading as it may have occurred only for a very short time/ single time step during the simulation. Vehicles are defined to be in a queue when their headway and speed drops below 20 meters and 3.1mph respectively and exit the queue when their speed increases above 6.2mph.

4.3 2030 results – AM peak first hour (07:00 – 08:00)

Treacle Mine Roundabout

Plate 4.1 Treacle Mine Roundabout Map

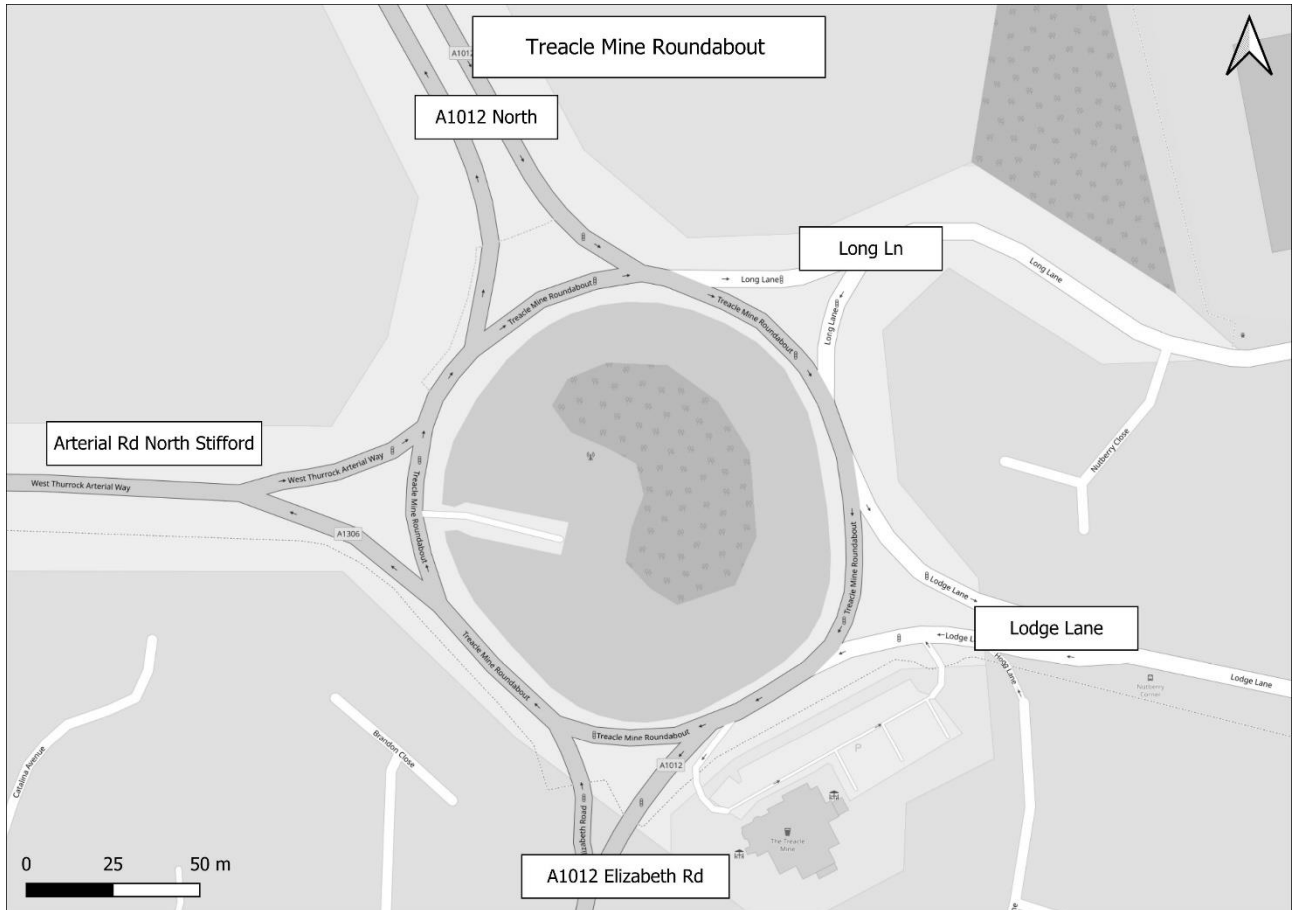


Table 4.1 07:00 – 08:00 Treacle Mine Roundabout - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Arterial Rd North Stifford	A1012 North	373	330	26	63	157	172
	Long Ln	101	74	66	79		
	Lodge Ln	247	230	94	109		
	A1012 Elizabeth Rd	134	139	97	113		
	Arterial Rd North Stifford	0	0	99	90		
A1012 North	Long Ln	27	26	17	15	51	50
	Lodge Ln	150	165	23	22		
	A1012 Elizabeth Rd	320	320	31	30		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
	Arterial Rd North Stifford	228	207	31	30		
	A1012 North	0	0	0	0		
Long Ln	Lodge Ln	20	20	31	22	80	58
	A1012 Elizabeth Rd	124	110	42	35		
	Arterial Rd North Stifford	261	193	61	54		
	A1012 North	58	55	72	87		
	Long Ln	0	0	0	0		
Lodge Ln	A1012 Elizabeth Rd	118	101	47	47	166	211
	Arterial Rd North Stifford	378	320	75	77		
	A1012 North	210	272	85	113		
	Long Ln	10	9	91	101		
	Lodge Ln	1	0	112	0		
A1012 Elizabeth Rd	Arterial Rd North Stifford	291	228	32	39	177	218
	A1012 North	587	690	33	57		
	Long Ln	95	81	45	52		
	Lodge Ln	40	33	79	83		
	A1012 Elizabeth Rd	3	2	79	78		

4.3.1 Treacle Mine roundabout delays are at similar levels in the Do Minimum and the Do Something for A1012 North, Long Lane and Lodge Lane approaches. A1012 Elizabeth Road approach has also similar delays in the Do Something and the Do Minimum, except movement to A1012 North for which the Do Something delay has increased by 24s due to flow increase. Arterial Road North Stifford arm has the highest delays in both scenarios of up to approx. two minutes, with the Do Something delays being approx. 20s higher than the Do Minimum.

4.3.2 The mean max queue is quite similar in Do Minimum and Do Something across all approaches. The longest queues are at A1012 Elizabeth Road approx. 44 vehicles long in the Do Something, which is approx. eight vehicles longer than the Do Minimum.

4.3.3 Lodge Lane and Hathaway Road junction delays are similar in the Do Minimum and the Do Something across all arms. The highest delays are up to approx. One and a half minutes at Lodge Lane East and West. In the Do Something scenario there is a half-minute delay increase for the Lodge Lane West to Hathaway Road movement.

4.3.4 The mean max queue is similar in the Do Minimum and the Do Something for Windsor Avenue and Hathaway Road. The queue at Lodge Lane West is approx. four vehicles longer in the Do Something, while at Lodge Lane East it is shorter in the Do Something by approx. two vehicles.

Daneholes Roundabout

Plate 4.3 Daneholes Roundabout Map



Table 4.3 07:00 – 08:00 Daneholes Roundabout - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 Lodge Ln	Blackshots Ln	48	54	9	7	23	20
	A1013 Stanford Rd	231	226	8	6		
	B149 Wood View	275	317	8	6		
	Rectory Rd	31	31	9	7		
	A1013 Lodge Ln	18	20	9	8		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Blackshots Ln	A1013 Stanford Rd	179	135	24	26	61	68
	B149 Wood View	164	215	24	26		
	Rectory Rd	37	31	26	28		
	A1013 Lodge Ln	39	33	29	30		
	Blackshots Ln	2	2	22	26		
A1013 Stanford Rd	B149 Wood View	59	117	16	25	112	152
	Rectory Rd	125	127	17	26		
	A1013 Lodge Ln	507	427	19	27		
	Blackshots Ln	143	103	20	28		
	A1013 Stanford Rd	91	73	20	27		
B149 Wood View	Rectory Rd	30	29	26	10	43	22
	A1013 Lodge Ln	231	208	25	12		
	Blackshots Ln	130	92	24	12		
	A1013 Stanford Rd	66	66	24	11		
	B149 Wood View	21	20	24	13		
Rectory Rd	A1013 Lodge Ln	17	41	27	18	22	23
	Blackshots Ln	11	27	25	24		
	A1013 Stanford Rd	58	38	29	20		
	B149 Wood View	30	49	28	20		
	Rectory Rd	2	2	14	12		

4.3.5 Daneholes Roundabout delays across all approaches in both scenarios are less than 30 seconds. The delays in the Do Something are similar to the Do Minimum.

4.3.6 A1013 Lodge Lane, Rectory Road and Blackshots Lane mean max queues are similar in both scenarios, whereas the queues at B149 Wood View are approx. three vehicles shorter in the Do Something and at A1013 Stanford Road are approx. two vehicles longer than in the Do Minimum.

Stanford Road / Rectory Road

Plate 4.4 A1013 Stanford Road / Rectory Road Junction Map



Table 4.4 07:00 – 08:00 A1013 Stanford Road / Rectory Road - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 West	Rectory Rd	42	46	1	1	26	63
	A1013 Stanford Rd East	515	425	2	2		
Rectory Rd	A1013 Stanford Rd East	103	81	11	41	26	63
	A1013 Stanford Rd West	97	161	21	49		
A1013 East	A1013 Stanford Rd West	680	538	1	3	10	26
	Rectory Rd	91	74	3	4		

4.3.7 A1013 Stanford Road / Rectory Road delays across all approaches are similar in both scenarios. The highest delay is less than one minute for the right turn movement from Rectory Road to A1013 Stanford Road West.

4.3.8 The mean max queue for that junction have increased by approx. seven vehicles at the A1013 West and Rectory Road approaches respectively.

Old Dock Approach Road / Marshfoot Road

Plate 4.5 Old Dock Approach Rd / Marshfoot Rd Roundabout Map



Table 4.5 07:00 – 08:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Old Dock Approach Rd	A126 Marshfoot Rd North	187	201	12	23	20	41
	A1089 Dock Approach Rd (slip on)	44	201	11	20		
	A126 Marshfoot Rd South	56	89	11	14		
A126 Marshfoot Rd North	A1089 Dock Approach Rd (slip on)	256	387	4	30	24	146
	A126 Marshfoot Rd South	274	216	9	36		
	A126 Marshfoot Rd North	0	0	0	0		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1089 Dock Approach Rd (slip off)	A126 Marshfoot Rd South	165	144	3	2	5	3
	A126 Marshfoot Rd North	29	30	7	6		
	A1089 Dock Approach Rd (slip on)	0	0	0	0		
A126 Marshfoot Rd South	A126 Marshfoot Rd North	262	195	6	6	5	7
	A1089 Dock Approach Rd (slip on)	260	324	3	3		
	A126 Marshfoot Rd South	0	0	0	0		

- 4.3.9 Old Dock Approach Rd / Marshfoot Rd Roundabout delays are similar in the Do Minimum and the Do Something across all approaches, except at the A126 Marshfoot Road North arm where the delay is 27 seconds higher in the Do Something.
- 4.3.10 The mean max queue is similar in the Do Minimum and the Do Something across the three approaches for which the delays were similar. The A126 Marshfoot Road North approach has the longest queue of approx. five vehicles in the Do Minimum, whereas in the Do Something the queue is approx. 29 vehicles.

4.4 2030 results – AM peak second hour (08:00 – 09:00)

Treacle Mine Roundabout

Plate 4.6 Treacle Mine Roundabout Map

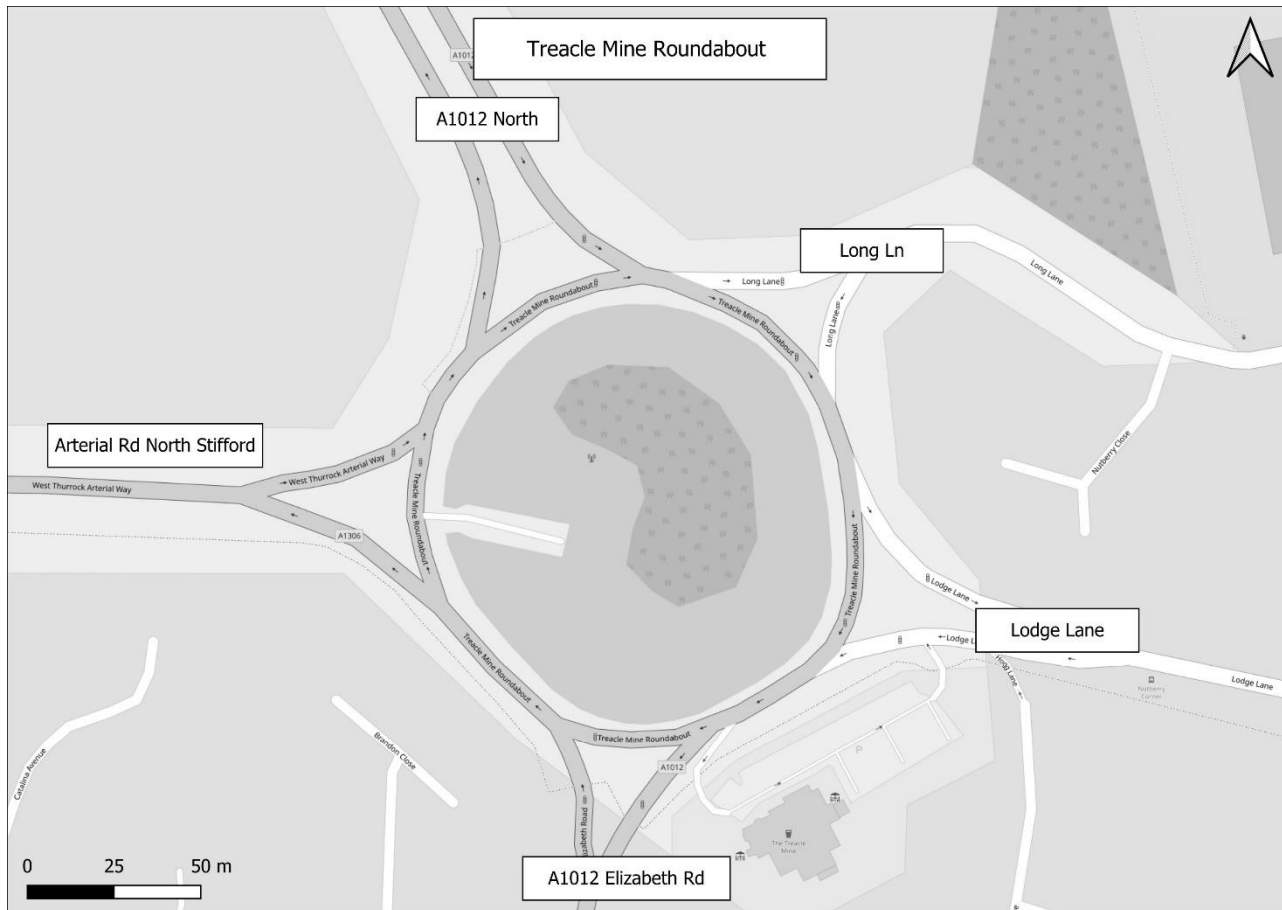


Table 4.6 08:00 – 09:00 Treacle Mine Roundabout - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Arterial Rd North Stifford	A1012 North	311	283	14	85	505	506
	Long Ln	120	74	101	131		
	Lodge Ln	355	302	135	181		
	A1012 Elizabeth Rd	203	170	147	175		
	Arterial Rd North Stifford	0	0	151	129		
A1012 North	Long Ln	33	33	81	83	287	281
	Lodge Ln	303	322	93	111		
	A1012 Elizabeth Rd	465	442	119	113		
	Arterial Rd North Stifford	251	214	117	113		
	A1012 North	0	0	0	0		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Long Ln	Lodge Ln	12	10	166	161	269	230
	A1012 Elizabeth Rd	122	116	189	190		
	Arterial Rd North Stifford	204	157	189	186		
	A1012 North	81	86	205	220		
	Long Ln	0	0	0	0		
Lodge Ln	A1012 Elizabeth Rd	182	151	54	61	249	435
	Arterial Rd North Stifford	452	414	69	76		
	A1012 North	274	354	84	120		
	Long Ln	9	8	101	124		
	Lodge Ln	0	0	0	0		
A1012 Elizabeth Rd	Arterial Rd North Stifford	270	193	53	65	354	355
	A1012 North	533	624	56	94		
	Long Ln	178	135	85	104		
	Lodge Ln	57	48	121	159		
	A1012 Elizabeth Rd	0	0	110	192		

4.4.1 Treacle Mine roundabout delays are similar in the Do Minimum and the Do Something across most of the approaches. Long Lane arm has the highest delays in both scenarios of up to approx. three and a half minutes.

4.4.2 Mean max queues are at similar levels in both scenarios for Arterial Road North, A1012 North Stifford and A1012 Elizabeth Road. Queues at Lodge Lane are approx. 37 vehicles longer in the Do Something scenario, but approx. eight vehicles shorter at Long Lane.

Lodge Lane / Hathaway Road

Plate 4.7 Lodge Lane / Hathaway Road Junction Map



Table 4.7 08:00 – 09:00 Lodge Lane / Hathaway Road - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Lodge Ln West	Windsor Ave	1	0	66	124	177	396
	Lodge Ln East	536	450	57	107		
	Hathaway Rd	147	136	93	188		
Windsor Ave	Lodge Ln East	16	19	184	83	95	61
	Hathaway Rd	128	145	193	79		
	Lodge Ln West	19	20	193	82		
Lodge Ln East	Hathaway Rd	96	69	65	71	300	388
	Lodge Ln West	695	708	62	70		
	Windsor Ave	4	3	83	86		
Hathaway Rd	Lodge Ln West	146	145	166	165	327	328
	Windsor Ave	80	77	167	163		
	Lodge Ln East	80	96	163	165		

4.4.3 Lodge Lane and Hathaway Road junction delays are similar in the Do Minimum and the Do Something at Lodge Lane East and Hathaway Road. There are delay increases at Lodge Lane West up to approx. one and half minutes. At Windsor Avenue the Do Something delay is less than half of the Do Minimum delay.

4.4.4 Mean max queues are similar in Do Minimum and Do Something at Hathaway Road. The queues at Lodge Lane West are 200m longer in the Do Something than in the Do Minimum. At Windsor Avenue the queue is approx. seven vehicles shorter in the Do Something, and at Lodge Lane East the queue is 17 vehicles longer in the Do Something.

Daneholes roundabout

Plate 4.8 Daneholes Roundabout Map

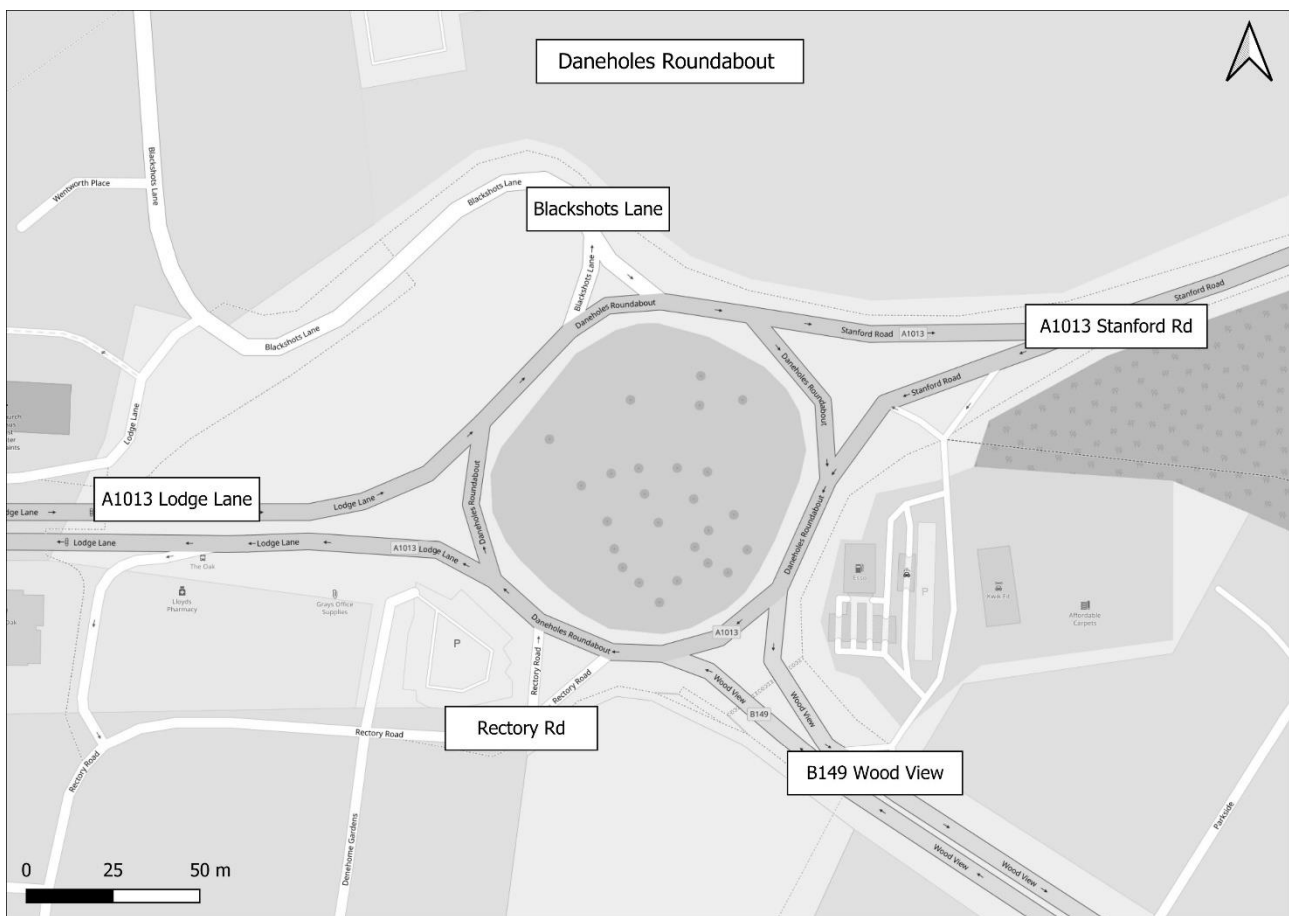


Table 4.8 08:00 – 09:00 Daneholes Roundabout - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 Lodge Ln	Blackshots Ln	49	59	25	17	58	48
	A1013 Stanford Rd	358	347	22	16		
	B149 Wood View	253	285	18	14		
	Rectory Rd	127	120	23	18		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
	A1013 Lodge Ln	17	18	16	13		
Blackshots Ln	A1013 Stanford Rd	165	147	90	97	225	246
	B149 Wood View	213	232	92	97		
	Rectory Rd	58	49	96	100		
	A1013 Lodge Ln	27	21	101	109		
	Blackshots Ln	0	0	56	70		
A1013 Stanford Rd	B149 Wood View	129	192	28	38	320	414
	Rectory Rd	191	193	29	39		
	A1013 Lodge Ln	542	517	31	40		
	Blackshots Ln	306	221	32	41		
	A1013 Stanford Rd	89	73	31	41		
B149 Wood View	Rectory Rd	28	39	131	91	469	376
	A1013 Lodge Ln	227	289	132	93		
	Blackshots Ln	132	132	132	94		
	A1013 Stanford Rd	189	211	148	106		
	B149 Wood View	25	25	144	105		
Rectory Rd	A1013 Lodge Ln	23	47	28	32	29	36
	Blackshots Ln	20	52	29	36		
	A1013 Stanford Rd	106	87	30	35		
	B149 Wood View	7	12	30	38		
	Rectory Rd	0	0	0	0		

4.4.5 Daneholes roundabout delays across all approaches in the Do Something are comparable to the Do Minimum. The highest delay of all arms is at B149 Wood View – approx. two minutes in the Do Minimum and approx. one and a half minutes in the Do Something. The delay at Wood View is higher than in the first AM peak hour due to the additional school traffic flows.

4.4.6 Across all the approaches the mean max queues are also similar in the Do Something than in the Do Minimum. At B149 Wood View the queue is approx. 94 vehicles in the Do Minimum and approx. 75 vehicles in the Do Something. The longer queues in the second AM peak hour at Wood View are due to the additional school traffic flows.

Stanford Road / Rectory Road

Plate 4.9 A1013 Stanford Road / Rectory Road Junction Map



Table 4.9 08:00 – 09:00 A1013 Stanford Road / Rectory Road - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 West	Rectory Rd	50	56	1	1	56	276
	A1013 Stanford Rd East	501	445	3	2		
Rectory Rd	A1013 Stanford Rd East	173	125	27	201	55	276
	A1013 Stanford Rd West	126	165	49	213		
A1013 East	A1013 Stanford Rd West	851	672	2	6	28	60
	Rectory Rd	192	158	5	6		

4.4.7 Rectory Road delays are higher in Do Something due to junction geometry changes.

4.4.8 Mean max queues have increased in Do Something of approx. 44 vehicles at A1013 West approach and Rectory Road. At A1013 East the queues have increased of approx. six vehicles due to reduction of A1013 right turn lane in Do Something scenario.

Old Dock Approach Road / Marshfoot Road

Plate 4.10 Old Dock Approach Rd / Marshfoot Rd Roundabout Map

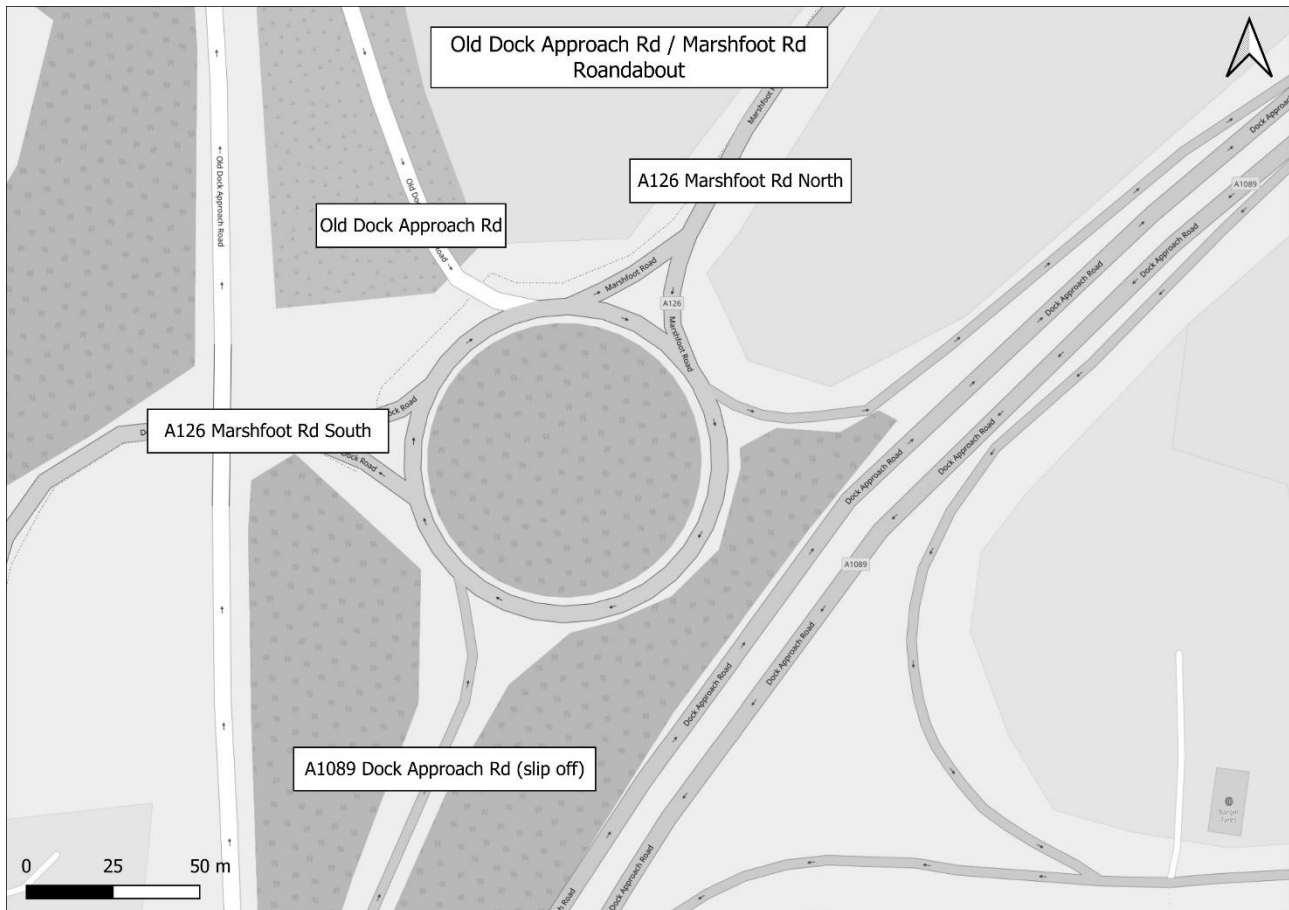


Table 4.10 08:00 – 09:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Old Dock Approach Rd	A126 Marshfoot Rd North	180	175	7	11	15	27
	A1089 Dock Approach Rd (slip on)	56	193	7	10		
	A126 Marshfoot Rd South	73	117	8	10		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A126 Marshfoot Rd North	A1089 Dock Approach Rd (slip on)	288	451	5	54	34	455
	A126 Marshfoot Rd South	437	406	11	59		
	A126 Marshfoot Rd North	0	0	0	0		
A1089 Dock Approach Rd (slip off)	A126 Marshfoot Rd South	245	217	5	5	13	11
	A126 Marshfoot Rd North	37	39	8	8		
	A1089 Dock Approach Rd (slip on)	0	0	0	0		
A126 Marshfoot Rd South	A126 Marshfoot Rd North	252	198	5	5	3	2
	A1089 Dock Approach Rd (slip on)	227	285	3	3		
	A126 Marshfoot Rd South	0	0	0	0		

4.4.9 Old Dock Approach Rd / Marshfoot Rd Roundabout delays are similar in the Do Minimum and the Do Something across all approaches, except at the A126 Marshfoot Road North arm where the delay is 48 seconds higher in the Do Something.

4.4.10 The Mean max queue in the Do Minimum is comparable to the Do Something across the three approaches with similar delays. At the A126 Marshfoot Road North approach the queue is approximately 84 vehicles longer in the Do Something than in the Do Minimum.

4.5 2030 results – PM peak hour (17:00 – 18:00)

Treacle Mine roundabout

Plate 4.11 Treacle Mine Roundabout Map

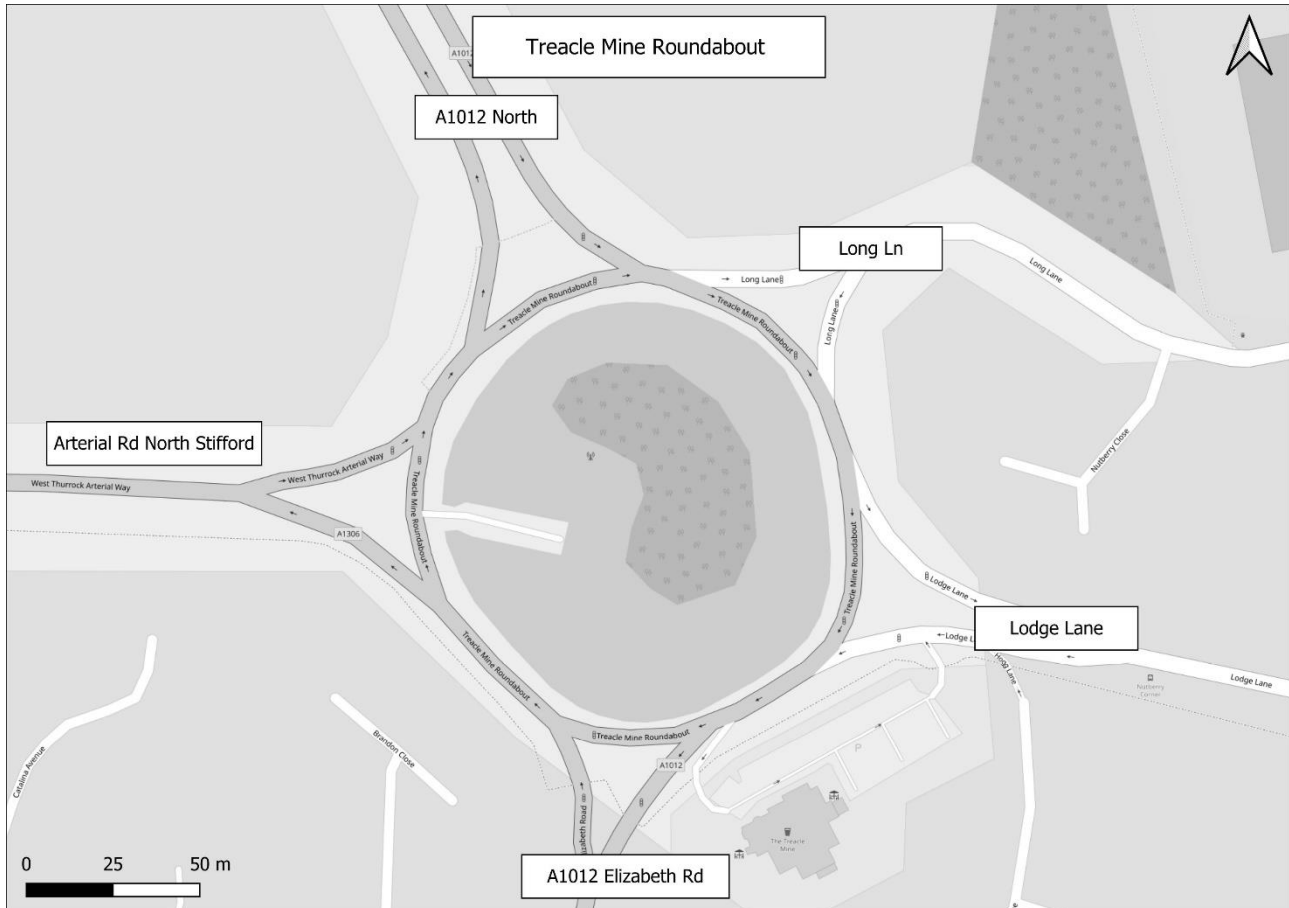


Table 4.11 17:00 – 18:00 Treacle Mine Roundabout - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Arterial Rd North Stifford	A1012 North	511	432	17	18	363	438
	Long Ln	142	117	103	150		
	Lodge Ln	395	325	133	184		
	A1012 Elizabeth Rd	150	122	136	192		
	Arterial Rd North Stifford	2	2	130	183		
A1012 North	Long Ln	51	49	79	69	291	298
	Lodge Ln	258	311	84	81		
	A1012 Elizabeth Rd	544	628	102	103		
	Arterial Rd North Stifford	256	288	97	93		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
	A1012 North	0	0	0	0		
Long Ln	Lodge Ln	6	9	263	342	283	282
	A1012 Elizabeth Rd	103	94	296	355		
	Arterial Rd North Stifford	146	102	305	366		
	A1012 North	33	34	332	386		
	Long Ln	0	0	0	0		
Lodge Ln	A1012 Elizabeth Rd	135	156	73	69	385	306
	Arterial Rd North Stifford	448	433	102	97		
	A1012 North	251	243	143	139		
	Long Ln	29	31	174	188		
	Lodge Ln	0	0	0	0		
A1012 Elizabeth Rd	Arterial Rd North Stifford	276	290	44	45	342	348
	A1012 North	657	653	61	61		
	Long Ln	141	133	88	108		
	Lodge Ln	144	141	121	147		
	A1012 Elizabeth Rd	6	7	125	157		

- 4.5.1 Treacle Mine roundabout delays are quite similar or slightly higher in the Do Something than in the Do Minimum across all approaches. Long Lane arm has the highest delays in both scenarios of up to approx. six and a half minutes.
- 4.5.2 The mean max queue is quite similar in the Do Minimum and the Do Something across most of the approaches. The longest queue is at Arterial Road North Stifford which is approx. 15 vehicles longer in the Do Something.

Lodge Lane / Hathaway Road

Plate 4.12 Lodge Lane / Hathaway Road Junction Map



Table 4.12 17:00 – 18:00 Lodge Lane / Hathaway Road - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Lodge Ln West	Windsor Ave	4	3	52	61	303	355
	Lodge Ln East	653	581	58	70		
	Hathaway Rd	127	146	101	129		
Windsor Ave	Lodge Ln East	17	17	62	61	36	33
	Hathaway Rd	67	63	61	61		
	Lodge Ln West	15	15	58	63		
Lodge Ln East	Hathaway Rd	95	58	49	42	181	130
	Lodge Ln West	681	673	48	39		
	Windsor Ave	12	11	63	61		
Hathaway Rd	Lodge Ln West	187	182	154	146	293	266
	Windsor Ave	78	78	153	146		
	Lodge Ln East	77	92	150	145		

4.5.3 Lodge Lane and Hathaway Road Junction delays are similar in the Do Minimum and the Do Something across all arms. The highest delays are up to approx. two and a half minutes at Hathaway Road.

4.5.4 Mean max queues are similar or lower in the Do Something at Windsor Avenue, Lodge Lane East and Hathaway Road. The queues at Lodge Lane West are approx. ten vehicles longer in the Do Something than in the Do Minimum.

Daneholes Roundabout

Plate 4.13 Daneholes Roundabout Map

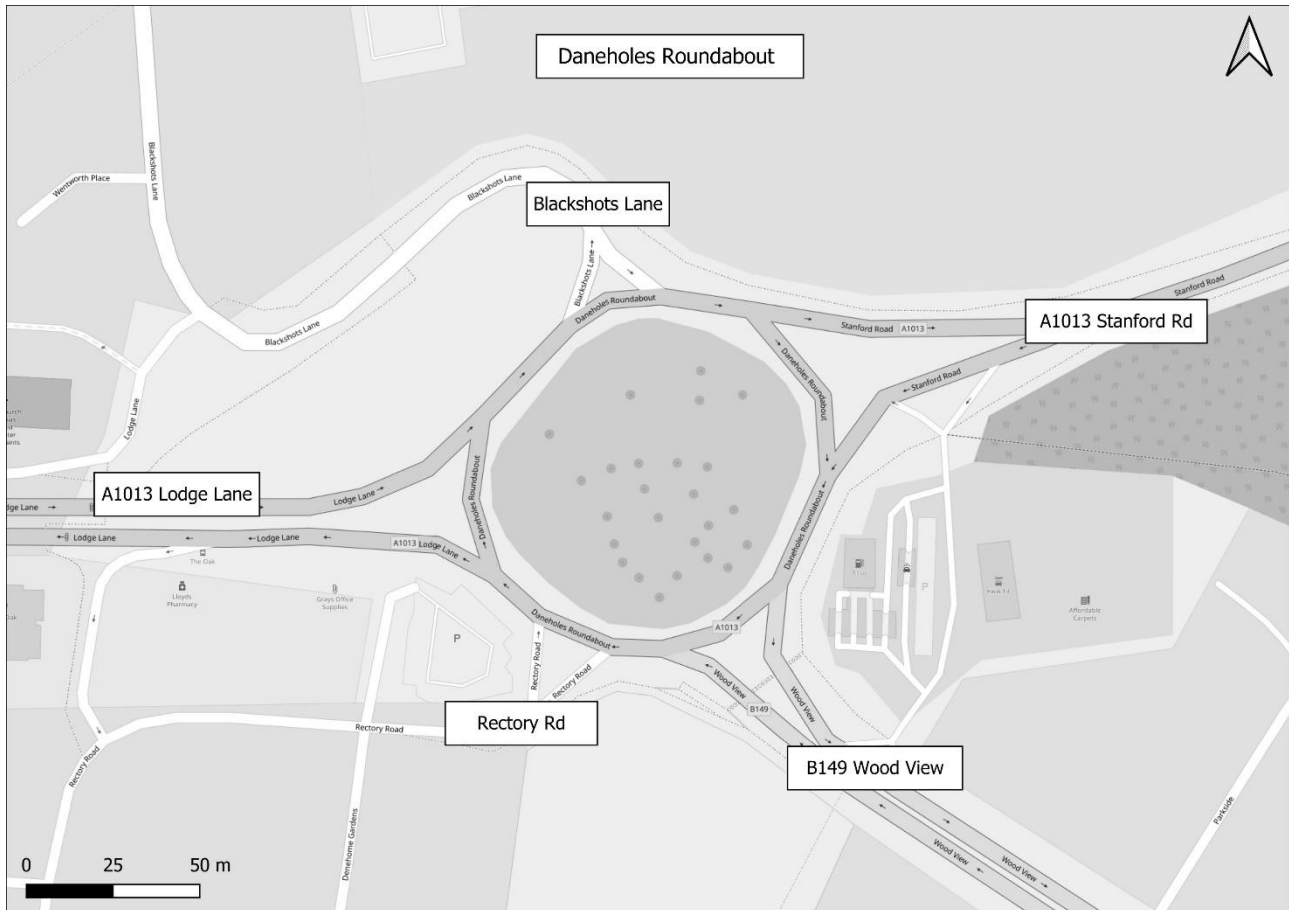


Table 4.13 17:00 – 18:00 Daneholes Roundabout - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 Lodge Ln	Blackshots Ln	131	121	27	16	75	55
	A1013 Stanford Rd	521	482	23	14		
	B149 Wood View	347	363	18	12		
	Rectory Rd	38	35	20	13		
	A1013 Lodge Ln	23	24	18	11		
	A1013 Stanford Rd	165	142	125	118	330	321

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Blackshots Ln	B149 Wood View	159	204	127	120		
	Rectory Rd	57	50	128	121		
	A1013 Lodge Ln	59	58	132	122		
	Blackshots Ln	0	0	0	0		
A1013 Stanford Rd	B149 Wood View	94	194	23	38	112	213
	Rectory Rd	144	145	25	38		
	A1013 Lodge Ln	496	429	27	40		
	Blackshots Ln	209	182	28	42		
	A1013 Stanford Rd	22	14	28	41		
B149 Wood View	Rectory Rd	40	40	23	14	44	31
	A1013 Lodge Ln	230	218	23	14		
	Blackshots Ln	179	133	24	15		
	A1013 Stanford Rd	140	139	24	14		
	B149 Wood View	34	28	24	15		
Rectory Rd	A1013 Lodge Ln	49	63	36	18	40	29
	Blackshots Ln	35	21	36	18		
	A1013 Stanford Rd	84	64	36	19		
	B149 Wood View	53	83	38	21		
	Rectory Rd	0	0	0	0		

4.5.5 Daneholes Roundabout delays across all approaches are lower in the Do Something than in the Do Minimum. The highest delays of all arms are at Blackshots Lane of approx. two minutes in the Do Minimum and the Do Something.

4.5.6 Across all the approaches the mean max queues are lower in the Do Something than in the Do Minimum. At Blackshots Lane the queue is approx. 66 vehicles in the Do Minimum and approx. two vehicles shorter in the Do Something.

Stanford Road / Rectory Road

Plate 4.14 A1013 Stanford Road / Rectory Road Junction Map



Table 4.14 17:00 – 18:00 A1013 Stanford Road / Rectory Road - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 West	Rectory Rd	134	147	1	1	104	305
	A1013 Stanford Rd East	737	649	4	3		
Rectory Rd	A1013 Stanford Rd East	176	97	70	292	103	304
	A1013 Stanford Rd West	153	96	90	313		
A1013 East	A1013 Stanford Rd West	705	717	2	10	17	92
	Rectory Rd	106	90	9	13		

4.5.7 Rectory Road approach delays are higher in the Do Something due to junction geometry changes.

4.5.8 Mean max queues have increased from 21 vehicles in the Do Minimum to 61 vehicles in the Do Something at A1013 West approach and Rectory Road. At A1013 East the queues have increased by approx. 15 vehicles due to reduction of the A1013 right turn lane in the Do Something scenario.

Old Dock Approach Road / Marshfoot Road

Plate 4.15 Old Dock Approach Rd / Marshfoot Rd Roundabout Map

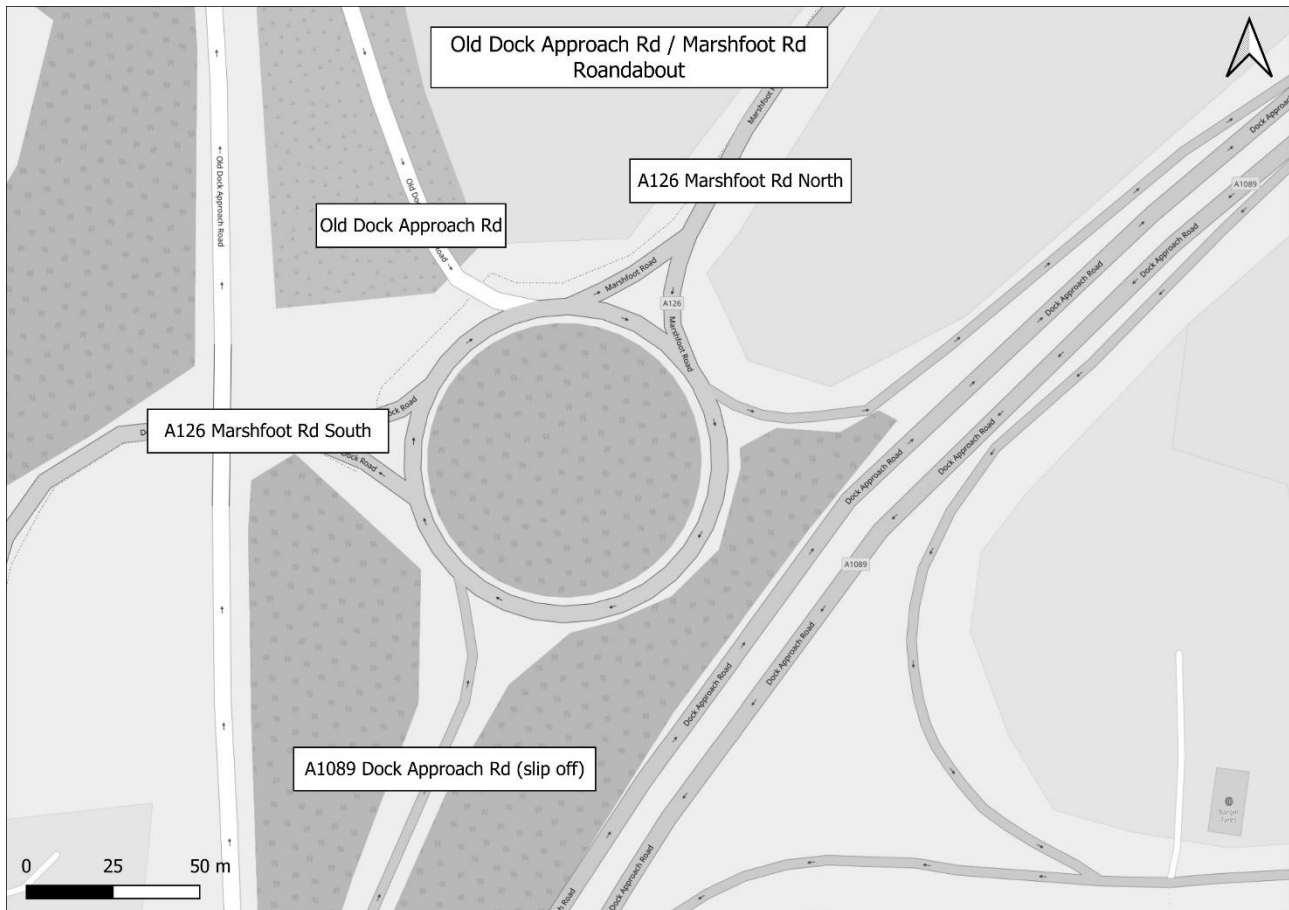


Table 4.15 17:00 – 18:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2030

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Old Dock Approach Rd	A126 Marshfoot Rd North	160	169	16	36	21	56
	A1089 Dock Approach Rd (slip on)	36	260	14	33		
	A126 Marshfoot Rd South	60	68	15	22		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A126 Marshfoot Rd North	A1089 Dock Approach Rd (slip on)	133	266	4	25	22	92
	A126 Marshfoot Rd South	340	310	9	30		
	A126 Marshfoot Rd North	0	0	0	0		
A1089 Dock Approach Rd (slip off)	A126 Marshfoot Rd South	349	309	5	4	16	12
	A126 Marshfoot Rd North	116	115	8	8		
	A1089 Dock Approach Rd (slip on)	0	0	0	0		
A126 Marshfoot Rd South	A126 Marshfoot Rd North	360	294	7	7	13	18
	A1089 Dock Approach Rd (slip on)	180	286	4	5		
	A126 Marshfoot Rd South	0	0	0	0		

4.5.9 Old Dock Approach Rd / Marshfoot Rd Roundabout delays are similar or up to 20 seconds higher in the Do Something than in the Do Minimum.

4.5.10 Mean max queues are similar in the Do Minimum and the Do Something across most of the approaches, except at the A126 Marshfoot Road North approach where the queue is approximately 14 vehicles longer in the Do Something than in the Do Minimum.

4.6 2045 results – AM peak first hour (07:00 – 08:00)

Treacle Mine roundabout

Plate 4.16 Treacle Mine Roundabout Map

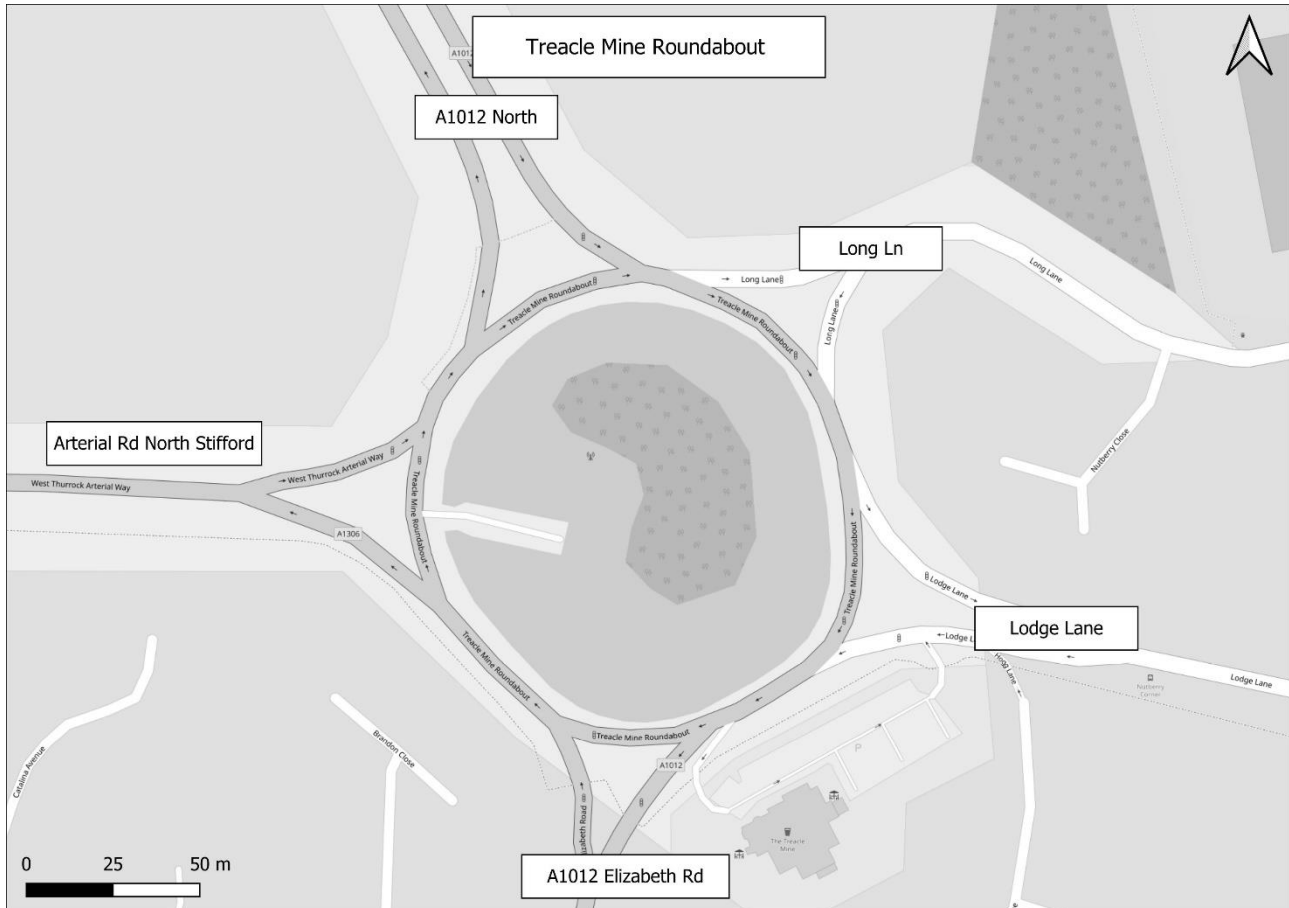


Table 4.16 07:00 – 08:00 Treacle Mine Roundabout - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Arterial Rd North Stifford	A1012 North	376	333	17	88	158	237
	Long Ln	136	88	48	105		
	Lodge Ln	266	233	76	133		
	A1012 Elizabeth Rd	153	141	79	138		
	Arterial Rd North Stifford	0	0	74	151		
A1012 North	Long Ln	23	24	22	16	63	51
	Lodge Ln	157	192	29	23		
	A1012 Elizabeth Rd	328	348	37	32		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
	Arterial Rd North Stifford	288	185	43	32		
	A1012 North	0	0	0	0		
Long Ln	Lodge Ln	20	22	44	23	114	62
	A1012 Elizabeth Rd	129	118	54	37		
	Arterial Rd North Stifford	309	208	75	56		
	A1012 North	56	55	91	110		
	Long Ln	0	0	0	0		
Lodge Ln	A1012 Elizabeth Rd	113	96	56	54	209	277
	Arterial Rd North Stifford	412	334	85	85		
	A1012 North	189	275	116	143		
	Long Ln	10	10	134	121		
	Lodge Ln	0	1	154	170		
A1012 Elizabeth Rd	Arterial Rd North Stifford	293	212	37	50	216	228
	A1012 North	633	639	40	83		
	Long Ln	110	76	49	64		
	Lodge Ln	42	28	80	98		
	A1012 Elizabeth Rd	3	3	73	105		

- 4.6.1 Treacle Mine Roundabout delays are similar in the Do Minimum and the Do Something for all approaches, except Arterial Road North Stifford arm for which the Do Something delay has increased by approx. a minute. Lodge Lane arm has the highest delays in both scenarios of up to approx. two to three minutes.
- 4.6.2 The mean max queue is similar in the Do Minimum and the Do Something across three approaches. The longest queues in the Do Something are at Lodge Lane at approx. 55 vehicles, and Arterial Road at approx. 46 vehicles long.

Lodge Lane / Hathaway Road

Plate 4.17 Lodge Lane / Hathaway Road Junction Map



Table 4.17 07:00 – 08:00 Lodge Lane / Hathaway Road - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Lodge Ln West	Windsor Ave	4	2	36	37	71	84
	Lodge Ln East	315	278	36	48		
	Hathaway Rd	143	171	71	90		
Windsor Ave	Lodge Ln East	10	9	143	116	42	38
	Hathaway Rd	58	58	133	121		
	Lodge Ln West	12	11	141	131		
Lodge Ln East	Hathaway Rd	64	32	40	35	138	124
	Lodge Ln West	595	580	39	39		
	Windsor Ave	1	1	55	67		
Hathaway Rd	Lodge Ln West	141	155	91	94	130	138
	Windsor Ave	37	35	91	94		
	Lodge Ln East	66	84	88	90		

4.6.3 Lodge Lane and Hathaway Road Junction delays are similar in the Do Minimum and the Do Something across all arms. The highest delays are up to approx. two and a half minutes at Windsor Avenue.

4.6.4 The mean max queue is also similar in the Do Minimum and the Do Something for all arms. At Lodge Lane East and Hathaway Road, the queues are the longest in both scenarios, approx. 26-27 vehicles.

Daneholes roundabout

Plate 4.18 Daneholes Roundabout Map



Table 4.18 07:00 – 08:00 Daneholes Roundabout - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 Lodge Ln	Blackshots Ln	53	65	9	7	25	20
	A1013 Stanford Rd	205	215	8	7		
	B149 Wood View	326	356	9	7		
	Rectory Rd	31	33	10	8		
	A1013 Lodge Ln	17	20	10	8		
	A1013 Stanford Rd	182	138	40	45	103	121

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Blackshots Ln	B149 Wood View	181	229	41	45		
	Rectory Rd	40	38	43	47		
	A1013 Lodge Ln	41	36	44	46		
	Blackshots Ln	2	2	31	48		
A1013 Stanford Rd	B149 Wood View	53	136	26	42	186	236
	Rectory Rd	128	130	29	46		
	A1013 Lodge Ln	498	380	31	45		
	Blackshots Ln	135	94	30	46		
	A1013 Stanford Rd	88	55	29	38		
B149 Wood View	Rectory Rd	28	29	32	9	63	23
	A1013 Lodge Ln	248	207	31	10		
	Blackshots Ln	179	115	31	11		
	A1013 Stanford Rd	67	64	30	10		
	B149 Wood View	20	19	30	10		
Rectory Rd	A1013 Lodge Ln	10	25	47	16	38	26
	Blackshots Ln	6	24	41	17		
	A1013 Stanford Rd	75	40	53	17		
	B149 Wood View	65	111	58	19		
	Rectory Rd	2	2	18	12		

4.6.5 Daneholes Roundabout delays across all approaches in both scenarios are up to approx. one minute. The delays are lower in the Do Something than in the Do Minimum for the majority of movements.

4.6.6 A1013 Lodge Lane, Rectory Road and Blackshots Lane mean max queues are similar in both scenarios, whereas the queues at B149 Wood View is eight vehicles shorter in the Do Something. At A1013 Stanford Road the queues are approx. 10 vehicles longer in the Do Something.

Stanford Road / Rectory Road

Plate 4.19 A1013 Stanford Road / Rectory Road Junction Map



Table 4.19 07:00 – 08:00 A1013 Stanford Road / Rectory Road - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 West	Rectory Rd	75	69	1	1	37	69
	A1013 Stanford Rd East	505	374	2	2		
Rectory Rd	A1013 Stanford Rd East	134	51	17	47	36	69
	A1013 Stanford Rd West	101	177	32	57		
A1013 East	A1013 Stanford Rd West	732	577	1	3	13	30
	Rectory Rd	91	70	4	4		

4.6.7 The delays for the A1013 approaches are similar in both scenarios. The highest delay is less than 1 minute for the right turn movement from Rectory Road to A1013 Stanford Road West, which is approx. half a minute higher in the Do Something because of the changes in the junction alignment.

4.6.8 Mean max queues for that junction have increased by approx. 6 vehicles at A1013 Stanford West and Rectory Road approaches in the Do Something.

Old Dock Approach Road / Marshfoot Road

Plate 4.20 Old Dock Approach Rd / Marshfoot Rd Roundabout Map

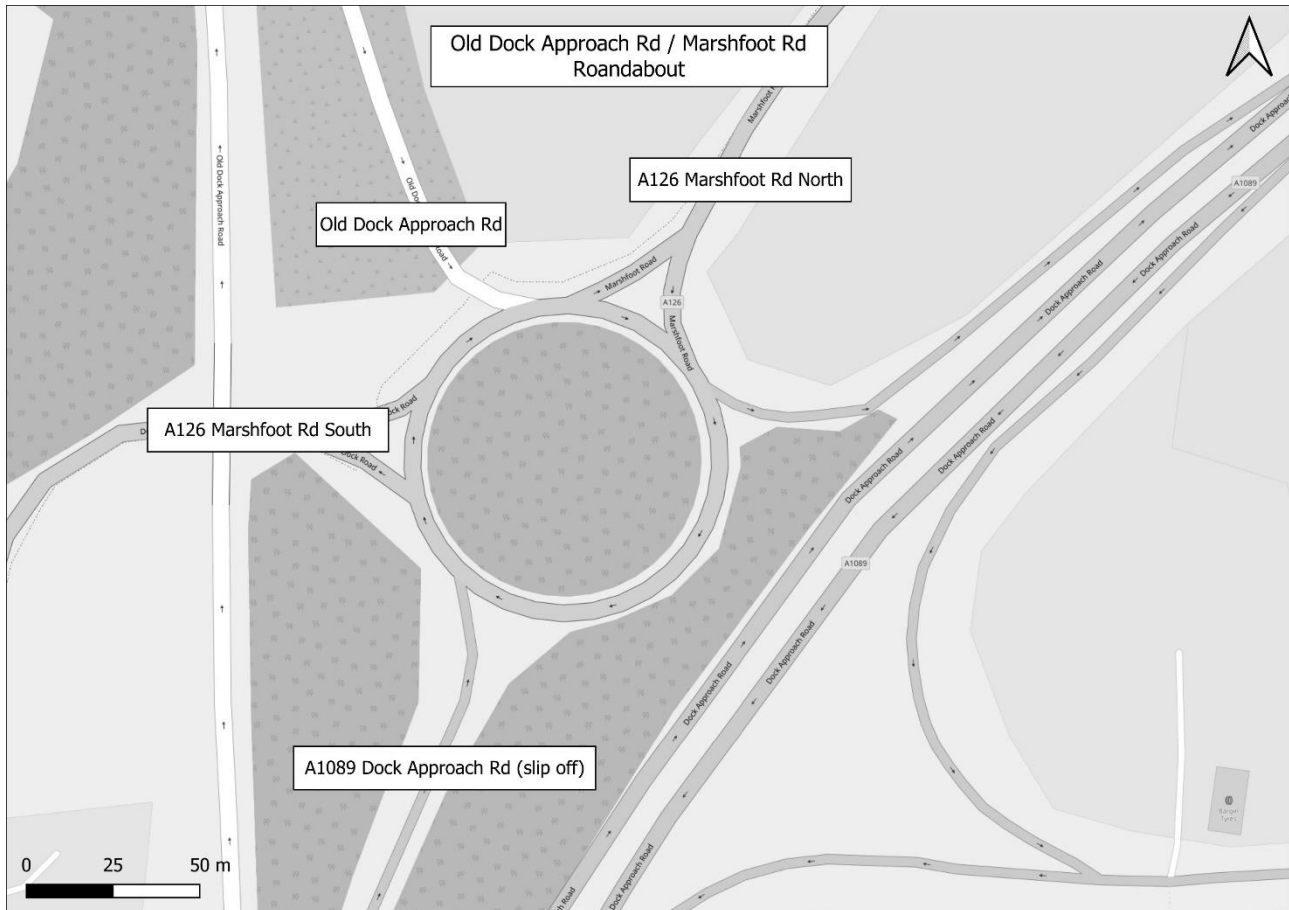


Table 4.20 07:00 – 08:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Old Dock Approach Rd	A126 Marshfoot Rd North	270	268	23	53	37	75
	A1089 Dock Approach Rd (slip on)	59	275	20	45		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
	A126 Marshfoot Rd South	51	85	15	39		
A126 Marshfoot Rd North	A1089 Dock Approach Rd (slip on)	223	385	7	57	36	277
	A126 Marshfoot Rd South	338	205	12	64		
	A126 Marshfoot Rd North	0	0	0	0		
A1089 Dock Approach Rd (slip off)	A126 Marshfoot Rd South	169	141	3	2	5	3
	A126 Marshfoot Rd North	32	30	7	7		
	A1089 Dock Approach Rd (slip on)	0	0	0	0		
A126 Marshfoot Rd South	A126 Marshfoot Rd North	235	165	6	6	7	9
	A1089 Dock Approach Rd (slip on)	358	400	3	4		
	A126 Marshfoot Rd South	0	0	0	0		

4.6.9 Old Dock Approach Road / Marshfoot Road roundabout delays are similar in the Do Minimum and the Do Something across most of the approaches, except at the A126 Marshfoot Road North arm where the delay is 52 seconds higher in the Do Something.

4.6.10 The mean max queue in the Do Minimum is comparable to the Do Something at the two approaches for which the delay is similar. A126 Marshfoot Road North approach has the longest queues of approx. 48 vehicles in the Do Something compared to approx. seven vehicles in the Do Minimum.

4.7 2045 results – AM peak second hour (08:00 – 09:00)

Treacle Mine roundabout

Plate 4.21 Treacle Mine Roundabout Map

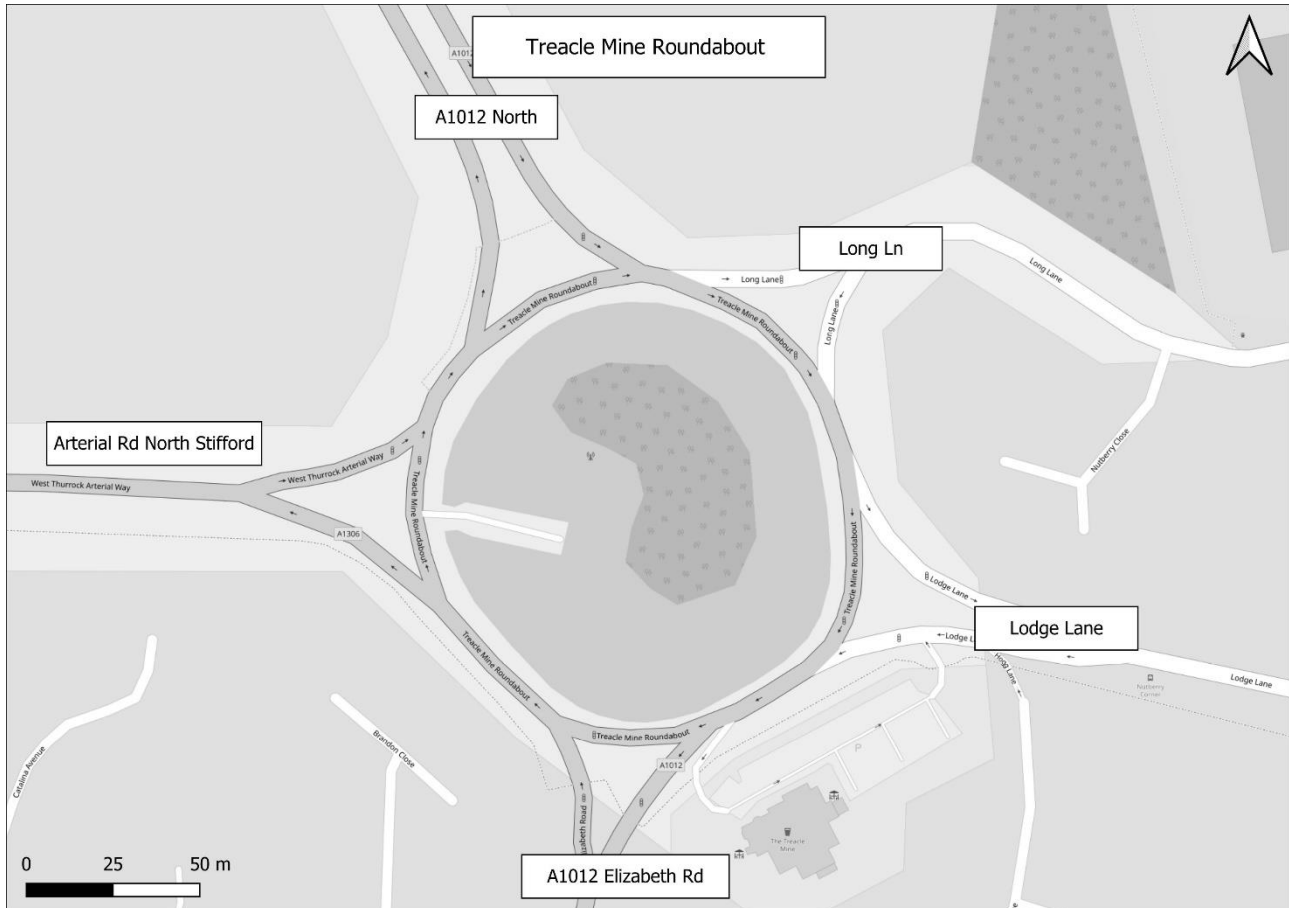


Table 4.21 08:00 – 09:00 Treacle Mine Roundabout - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Arterial Rd North Stifford	A1012 North	272	253	12	99	506	506
	Long Ln	138	70	107	163		
	Lodge Ln	334	259	143	207		
	A1012 Elizabeth Rd	201	142	148	228		
	Arterial Rd North Stifford	0	0	125	182		
A1012 North	Long Ln	26	33	88	72	396	284
	Lodge Ln	310	378	103	92		
	A1012 Elizabeth Rd	453	511	126	121		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
	Arterial Rd North Stifford	279	207	130	108		
	A1012 North	0	0	0	0		
Long Ln	Lodge Ln	12	10	164	269	283	270
	A1012 Elizabeth Rd	121	90	188	278		
	Arterial Rd North Stifford	234	125	196	275		
	A1012 North	72	63	220	303		
	Long Ln	0	0	0	0		
Lodge Ln	A1012 Elizabeth Rd	164	159	70	42	471	253
	Arterial Rd North Stifford	478	417	86	55		
	A1012 North	243	358	115	102		
	Long Ln	9	7	146	126		
	Lodge Ln	0	0	162	144		
A1012 Elizabeth Rd	Arterial Rd North Stifford	254	189	55	68	355	355
	A1012 North	532	612	61	102		
	Long Ln	180	138	97	124		
	Lodge Ln	63	47	136	176		
	A1012 Elizabeth Rd	0	0	97	0		

- 4.7.1 Treacle Mine roundabout delays are similar in the Do Something and in the Do Minimum across majority of the approaches. Long Lane arm has the highest delays in both scenarios of up to approx. five minutes.
- 4.7.2 Mean max queues are to a large extent the same in both scenarios for Arterial Road North, Long Lane and A1012 Elizabeth Road. Queues at A1012 North Stifford are approx. 20 vehicles shorter in the Do Something and at Lodge Lane approx. 22 vehicles shorter in the Do Something.

Lodge Lane / Hathaway Road

Plate 4.22 Lodge Lane / Hathaway Road Junction Map



Table 4.22 08:00 – 09:00 Lodge Lane / Hathaway Road - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Lodge Ln West	Windsor Ave	1	1	39	72	176	244
	Lodge Ln East	517	444	53	75		
	Hathaway Rd	158	190	92	120		
Windsor Ave	Lodge Ln East	10	11	579	542	144	141
	Hathaway Rd	80	80	579	556		
	Lodge Ln West	12	11	556	541		
Lodge Ln East	Hathaway Rd	88	40	53	44	231	144
	Lodge Ln West	697	667	53	44		
	Windsor Ave	3	2	67	67		
Hathaway Rd	Lodge Ln West	148	154	154	156	329	329
	Windsor Ave	80	76	150	152		
	Lodge Ln East	78	102	153	152		

- 4.7.3 Delays at the junction are slightly higher in the Do Something at Lodge Lane West arm, however on all the other arms they are lower.
- 4.7.4 Mean max queue are similar in the Do Minimum and the Do Something at Windsor Avenue and Hathaway Road. The queues at Lodge Lane West are 14 vehicles longer in the Do Something than in the Do Minimum. At the Lodge Lane East the queue is approx. 17 vehicles shorter in the Do Something.

Daneholes roundabout

Plate 4.23 Daneholes Roundabout Map

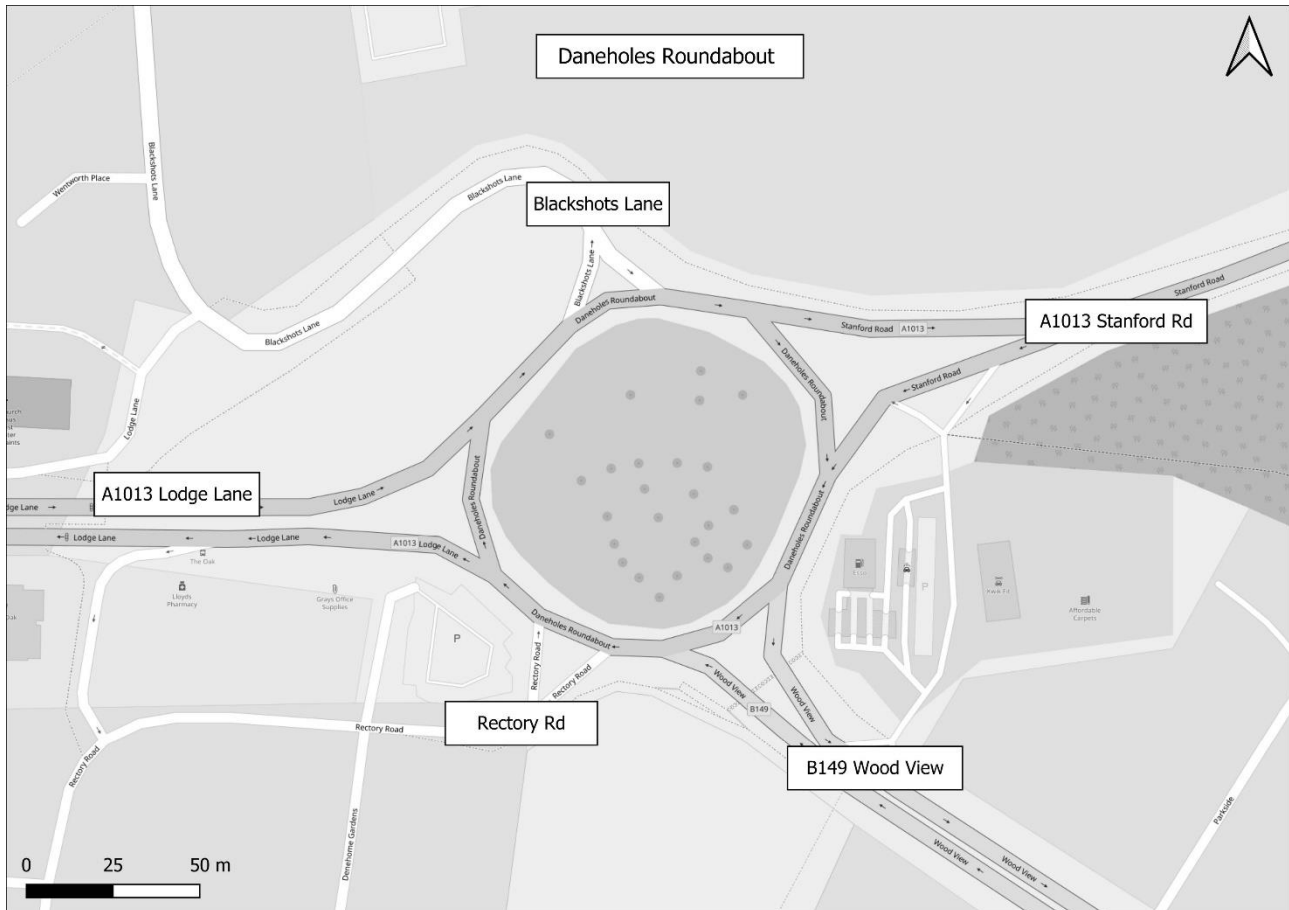


Table 4.23 08:00 – 09:00 Daneholes Roundabout - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 Lodge Ln	Blackshots Ln	57	69	21	14	52	43
	A1013 Stanford Rd	319	311	21	14		
	B149 Wood View	307	293	17	12		
	Rectory Rd	127	118	22	17		
	A1013 Lodge Ln	16	16	15	12		
	A1013 Stanford Rd	160	157	112	94	314	289

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Blackshots Ln	B149 Wood View	219	253	113	96		
	Rectory Rd	65	64	116	99		
	A1013 Lodge Ln	27	25	118	98		
	Blackshots Ln	0	0	43	99		
A1013 Stanford Rd	B149 Wood View	106	197	41	48	498	502
	Rectory Rd	192	199	44	49		
	A1013 Lodge Ln	503	454	46	52		
	Blackshots Ln	291	205	46	51		
	A1013 Stanford Rd	80	49	46	51		
B149 Wood View	Rectory Rd	23	37	127	91	488	363
	A1013 Lodge Ln	233	304	131	91		
	Blackshots Ln	151	155	132	91		
	A1013 Stanford Rd	170	182	148	103		
	B149 Wood View	25	18	145	96		
Rectory Rd	A1013 Lodge Ln	12	24	29	22	32	29
	Blackshots Ln	9	48	30	24		
	A1013 Stanford Rd	123	89	33	24		
	B149 Wood View	25	30	36	25		
	Rectory Rd	0	0	0	0		

4.7.5 Daneholes Roundabout delays across all approaches are to a large extent lower in the Do Something than in the Do Minimum. The highest delays of all arms in the Do Something are at B149 Wood View and Blackshots Lane of approx. one and a half minutes. The delays at Wood View are higher than in the first AM peak hour due to the additional school traffic flows.

4.7.6 Across all the approaches the mean max queues are similar or lower in the Do Something than in the Do Minimum. At B149 Wood View the queue is approx. 98 vehicles in the Do Minimum and approx. 73 vehicles in the Do Something. The longer queues in the second AM peak hour at Wood View are due to the additional school traffic flows.

Stanford Road / Rectory Road

Plate 4.24 A1013 Stanford Road / Rectory Road Junction Map



Table 4.24 08:00 – 09:00 A1013 Stanford Road / Rectory Road - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 West	Rectory Rd	88	63	1	1	109	280
	A1013 Stanford Rd East	461	362	3	2		
Rectory Rd	A1013 Stanford Rd East	224	76	66	241	107	280
	A1013 Stanford Rd West	129	170	98	250		
A1013 East	A1013 Stanford Rd West	913	733	2	7	34	77
	Rectory Rd	188	149	6	7		

4.7.7 Rectory Road delays are very similar in both scenarios for the A1013 arms. The highest delays are at the Rectory Road arm, where the vehicles have to give way to the A1013 mainline flow.

4.7.8 Mean max queues have increased in the Do Something by approx. 34 vehicles at A1013 West approach and Rectory Road respectively. At A1013 East the queues have increased by approx. nine vehicles due to the reduction of the A1013 right turn lane in the Do Something scenario.

Old Dock Approach Road / Marshfoot Road

Plate 4.25 Old Dock Approach Rd / Marshfoot Rd Roundabout Map

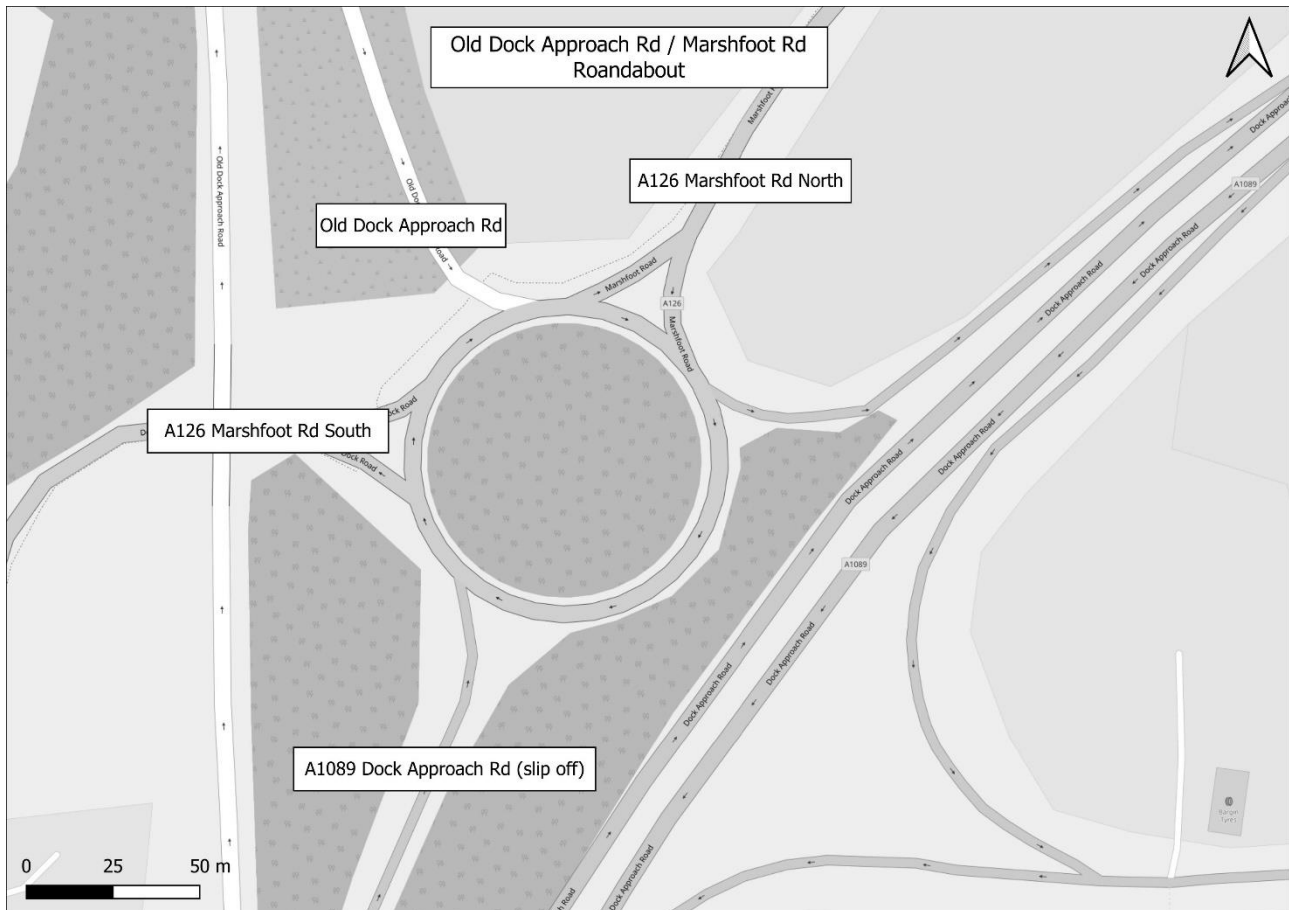


Table 4.25 08:00 – 09:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Old Dock Approach Rd	A126 Marshfoot Rd North	239	229	11	27	21	44
	A1089 Dock Approach Rd (slip on)	43	221	9	23		
	A126 Marshfoot Rd South	62	122	9	18		
	A1089 Dock Approach Rd (slip on)	242	422	6	69	38	504

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A126 Marshfoot Rd North	A126 Marshfoot Rd South	492	335	12	74		
	A126 Marshfoot Rd North	0	0	0	0		
A1089 Dock Approach Rd (slip off)	A126 Marshfoot Rd South	251	212	5	4	13	8
	A126 Marshfoot Rd North	40	40	8	7		
	A1089 Dock Approach Rd (slip on)	0	0	0	0		
A126 Marshfoot Rd South	A126 Marshfoot Rd North	229	179	5	5	4	5
	A1089 Dock Approach Rd (slip on)	310	357	3	3		
	A126 Marshfoot Rd South	0	0	0	0		

- 4.7.9 Old Dock Approach Rd / Marshfoot Rd Roundabout delays are slightly higher in the Do Something, with delays at A126 Marshfoot Road North increasing by approx. one minute.
- 4.7.10 Mean max queues are quite similar in the Do Minimum and the Do Something across the approaches, except at A126 Marshfoot Road North approach where the queue is approximately 93 vehicles longer in the Do Something than in the Do Minimum. The queue occasionally extends back to A1089 SB on-slip as shown in the delay heatmaps in Appendix D.

4.8 2045 results – PM peak hour (17:00 – 18:00)

Treacle Mine roundabout

Plate 4.26 Treacle Mine Roundabout Map

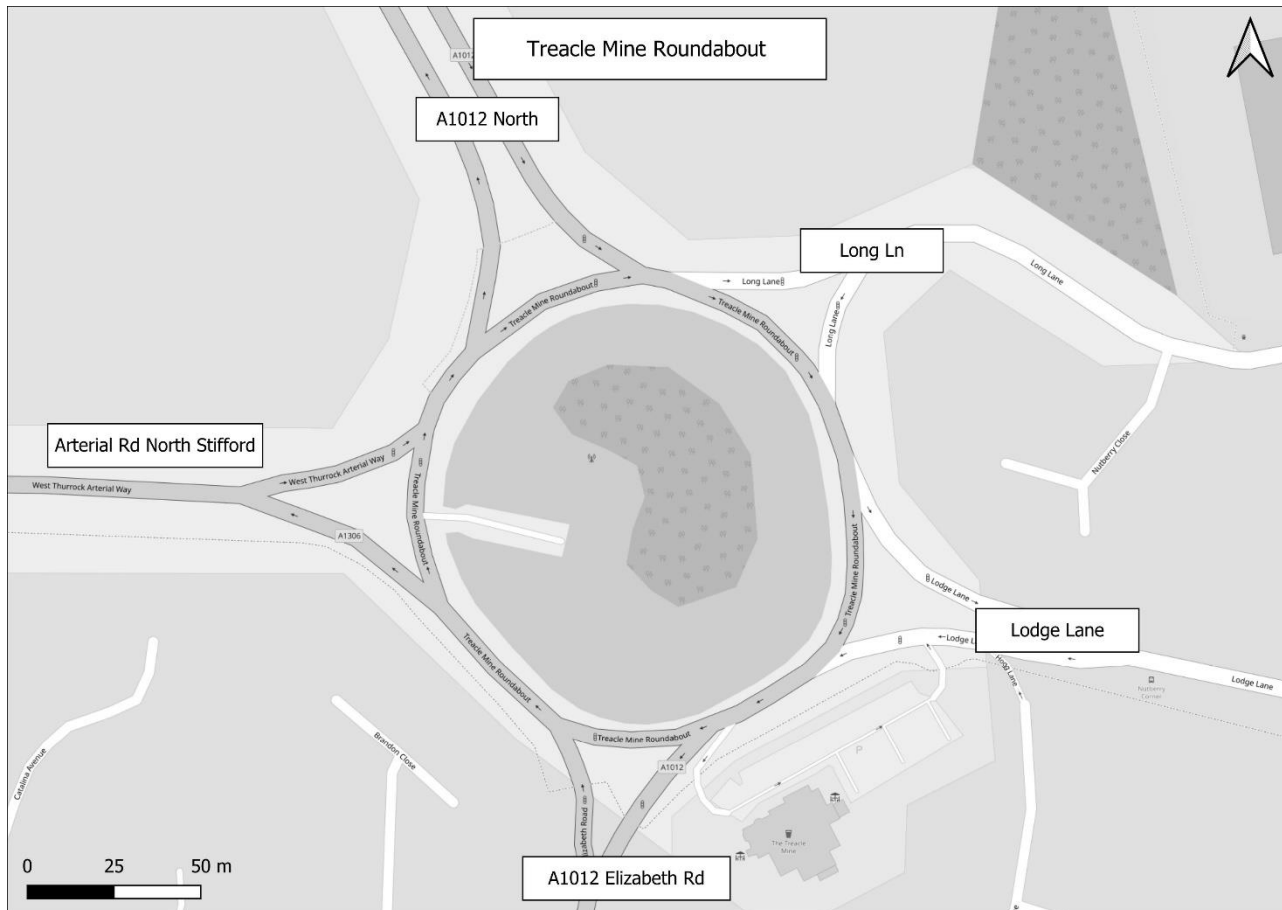


Table 4.26 17:00 – 18:00 Treacle Mine Roundabout - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Arterial Rd North Stifford	A1012 North	415	383	17	17	506	495
	Long Ln	114	104	164	185		
	Lodge Ln	312	289	196	214		
	A1012 Elizabeth Rd	123	112	207	233		
	Arterial Rd North Stifford	2	2	208	227		
A1012 North	Long Ln	54	49	60	56	206	209
	Lodge Ln	264	332	67	67		
	A1012 Elizabeth Rd	619	714	88	90		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
	Arterial Rd North Stifford	284	222	77	75		
	A1012 North	0	0	0	0		
Long Ln	Lodge Ln	4	13	350	358	282	283
	A1012 Elizabeth Rd	79	85	358	371		
	Arterial Rd North Stifford	134	100	360	376		
	A1012 North	20	29	389	404		
	Long Ln	0	0	0	0		
Lodge Ln	A1012 Elizabeth Rd	155	131	44	87	137	430
	Arterial Rd North Stifford	438	431	65	116		
	A1012 North	261	221	102	159		
	Long Ln	29	28	154	223		
	Lodge Ln	0	0	0	0		
A1012 Elizabeth Rd	Arterial Rd North Stifford	280	271	44	44	347	352
	A1012 North	629	663	61	60		
	Long Ln	152	136	113	120		
	Lodge Ln	147	139	147	154		
	A1012 Elizabeth Rd	6	7	157	169		

4.8.1 Treacle Mine Roundabout delays are quite similar in both scenarios across all approaches. Long Lane arm has the highest delays in both scenarios of up to approx. six and a half minutes.

4.8.2 Mean max queues are quite similar in the Do Minimum and the Do Something across all approaches, except at Lodge Lane where the queue increases from approx. 24 vehicles in the Do Minimum to 75 vehicles in the Do Something. The longest queues are at Arterial Road North Stifford with approx. 100 vehicles in both the Do Minimum and the Do Something.

Lodge Lane / Hathaway Road

Plate 4.27 Lodge Lane / Hathaway Road Junction Map



Table 4.27 17:00 – 18:00 Lodge Lane / Hathaway Road - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Lodge Ln West	Windsor Ave	3	3	59	56	201	230
	Lodge Ln East	581	560	55	56		
	Hathaway Rd	123	171	82	82		
Windsor Ave	Lodge Ln East	19	19	106	183	46	61
	Hathaway Rd	73	72	106	185		
	Lodge Ln West	15	15	107	193		
Lodge Ln East	Hathaway Rd	123	50	72	57	303	154
	Lodge Ln West	632	626	66	58		
	Windsor Ave	14	13	80	77		
Hathaway Rd	Lodge Ln West	210	203	135	144	310	316
	Windsor Ave	82	77	135	139		
	Lodge Ln East	77	90	135	139		

- 4.8.3 The delays are quite similar in the Do Minimum and the Do Something at both Lodge Lane East & West approaches, and Hathaway Road. At Windsor Avenue the delays increase in the Do Something scenario by approx. just more than one minute.
- 4.8.4 Mean max queues are quite similar in the Do Minimum and the Do Something at Lodge Lane West, Windsor Avenue and Hathaway Road, increasing by two to three vehicles. The queues at Lodge Lane East reduce by approx. half its length in the Do Something compared to the Do Minimum.

Daneholes roundabout

Plate 4.28 Daneholes Roundabout Map

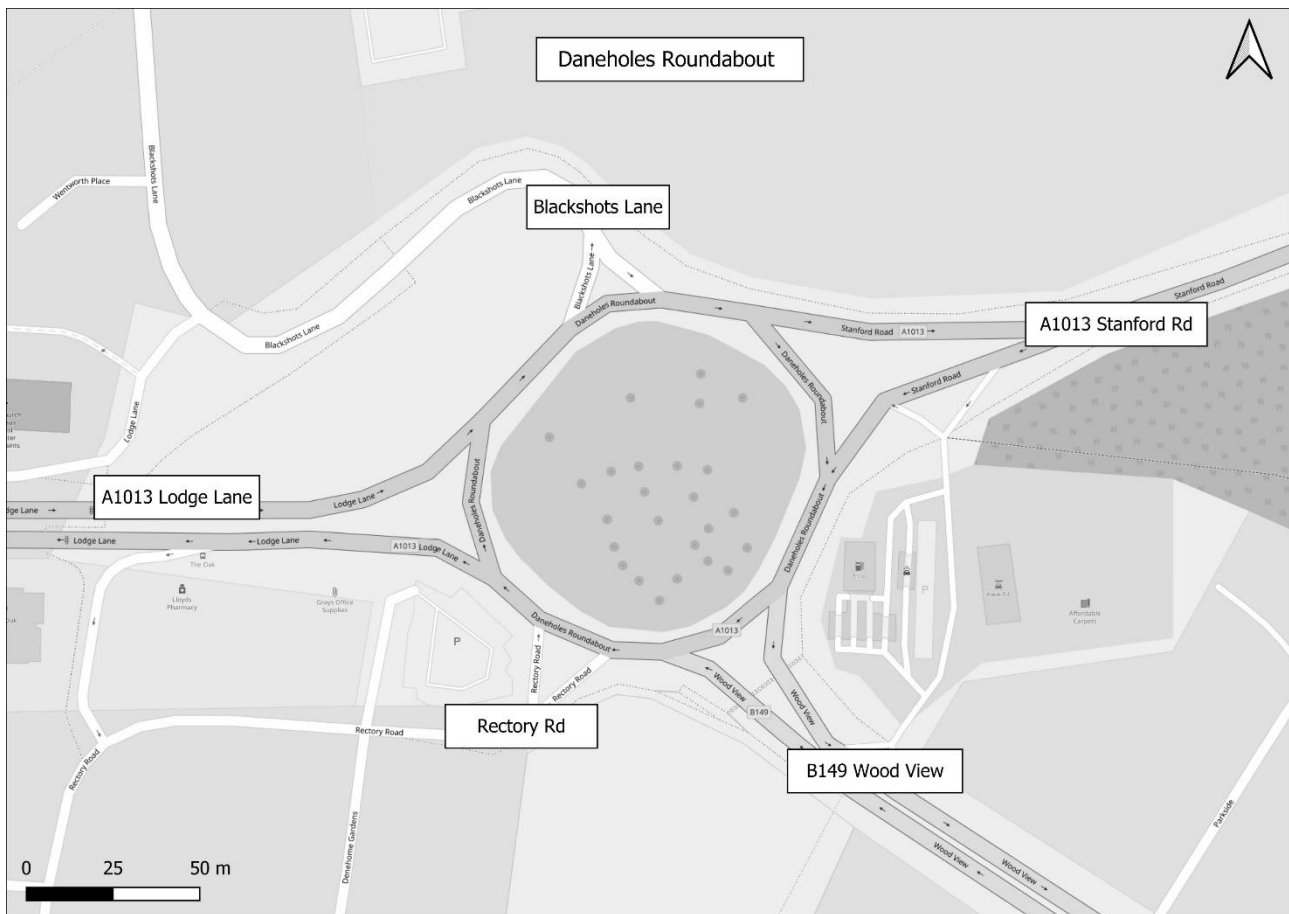


Table 4.28 17:00 – 18:00 Daneholes Roundabout - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 Lodge Ln	Blackshots Ln	122	115	33	16	77	50
	A1013 Stanford Rd	482	438	29	14		
	B149 Wood View	332	390	24	12		
	Rectory Rd	37	36	26	13		

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
	A1013 Lodge Ln	20	18	24	12		
Blackshots Ln	A1013 Stanford Rd	189	141	113	127	329	331
	B149 Wood View	166	192	114	129		
	Rectory Rd	52	50	115	128		
	A1013 Lodge Ln	68	51	118	131		
	Blackshots Ln	0	0	0	0		
A1013 Stanford Rd	B149 Wood View	111	175	28	53	183	338
	Rectory Rd	164	159	29	52		
	A1013 Lodge Ln	526	435	33	56		
	Blackshots Ln	223	162	33	57		
	A1013 Stanford Rd	23	9	34	59		
B149 Wood View	Rectory Rd	39	38	37	12	76	26
	A1013 Lodge Ln	221	199	39	13		
	Blackshots Ln	232	140	41	14		
	A1013 Stanford Rd	141	134	42	13		
	B149 Wood View	26	28	44	14		
Rectory Rd	A1013 Lodge Ln	41	64	73	22	60	37
	Blackshots Ln	50	23	70	23		
	A1013 Stanford Rd	89	66	69	23		
	B149 Wood View	50	122	71	24		
	Rectory Rd	0	0	0	0		

4.8.5 Daneholes roundabout delays across all approaches are similar or lower in the Do Something than in the Do Minimum. The highest delays of all arms are at Blackshots Lane of approx. two minutes in both scenarios.

4.8.6 Across most of the approaches the mean max queues are similar or lower in the Do Something than in the Do Minimum, except at A1013 Stanford Road where the queue is approx. 37 vehicles in the Do Minimum and approx. 67 vehicles in the Do Something.

Stanford Road / Rectory Road

Plate 4.29 A1013 Stanford Road / Rectory Road Junction Map



Table 4.29 17:00 – 18:00 A1013 Stanford Road / Rectory Road - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A1013 West	Rectory Rd	176	193	2	2	135	317
	A1013 Stanford Rd East	698	563	4	4		
Rectory Rd	A1013 Stanford Rd East	161	90	115	287	133	317
	A1013 Stanford Rd West	131	101	143	307		
A1013 East	A1013 Stanford Rd West	832	809	2	11	30	112
	Rectory Rd	119	66	12	16		

4.8.7 Rectory Road delays are higher in the Do Something due to junction geometry changes and requiring giving way to the A1013 mainline traffic. The highest delays are on Rectory Road of up to approx. five minutes.

4.8.8 Mean max queues have increased from 27 vehicles in the Do Minimum to 63 vehicles in the Do Something at the A1013 West approach and Rectory Road respectively. At A1013 East the queues have increased by approx. 16 vehicles due to the removal of the A1013 right turn flare in the Do Something scenario.

Old Dock Approach Road / Marshfoot Road

Plate 4.30 Old Dock Approach Rd / Marshfoot Rd Roundabout Map

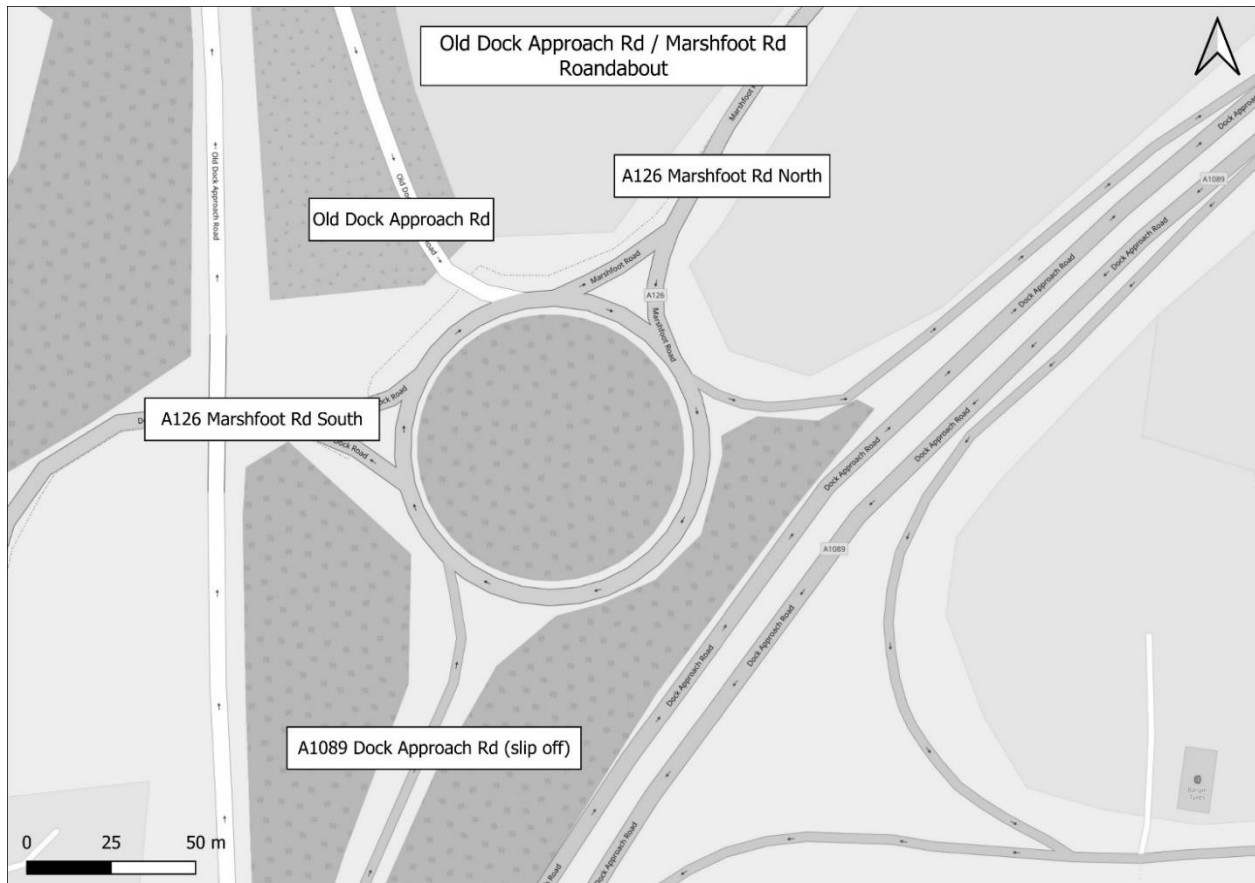


Table 4.30 17:00 – 18:00 Old Dock Approach Rd / Marshfoot Rd - Junction Results 2045

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
Old Dock Approach Rd	A126 Marshfoot Rd North	174	210	28	102	31	106
	A1089 Dock Approach Rd (slip on)	57	307	25	95		
	A126 Marshfoot Rd South	54	71	22	82		
	A1089 Dock Approach Rd (slip on)	149	305	4	76	26	332

Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
		DM	DS	DM	DS	DM	DS
A126 Marshfoot Rd North	A126 Marshfoot Rd South	299	296	10	82		
	A126 Marshfoot Rd North	0	0	0	0		
A1089 Dock Approach Rd (slip off)	A126 Marshfoot Rd South	373	324	4	4	13	12
	A126 Marshfoot Rd North	115	113	8	8		
	A1089 Dock Approach Rd (slip on)	0	0	0	0		
A126 Marshfoot Rd South	A126 Marshfoot Rd North	413	296	8	8	18	24
	A1089 Dock Approach Rd (slip on)	207	332	5	6		
	A126 Marshfoot Rd South	0	0	0	0		

4.8.9 Old Dock Approach Rd / Marshfoot Rd Roundabout delays are similar in the Do Minimum and the Do Something across most of the approaches. Except at A126 Marshfoot Road North and Old Dock Approach Road where delays are over a minute longer in the Do Something than in the Do Minimum.

4.8.10 The mean max queue in the Do Minimum is comparable to the Do Something across all approaches, except at the A126 Marshfoot Road North approach where the queue is approximately 61 vehicles longer in the Do Something than in the Do Minimum.

4.9 Junction performance - summary

4.9.1 The overall average delay per vehicle on each approach at the five key junctions in the Do Something scenario were compared against the Do Minimum and the approaches with delays increasing by more than 20 seconds in 2030 are shown in Table 4.31 and Plate 4.31. Six approaches have delays increase by more than 20 seconds in 2030.

Table 4.31 Junction Approaches with Delays Increase by >20s in 2030

ID	Junction	Approach	Average Delay increase by >20s
1	Treacle Mine Roundabout	Arterial Rd North Stifford	AM (both hrs) and PM
2	Treacle Mine Roundabout	Long Ln	PM
3	Treacle Mine Roundabout	A1012 Elizabeth Rd	AM (08.00-09.00)
4	Lodge Lane / Hathaway Road	Lodge Ln West	AM (08.00-09.00)
5	A1013 Stanford Road / Rectory Road	Rectory Rd	AM (both hrs) and PM
6	Old Dock Approach Rd / Marshfoot Rd	A126 Marshfoot Rd South	AM (both hrs) and PM

Plate 4.31 Junction Approaches with Delays Increase by >20s in 2030



4.9.2 The approaches with delays increasing by more than 20 seconds in 2045 are shown in Table 4.32 and Plate 4.32. Ten approaches have delays increase by more than 20 seconds in 2045.

Table 4.32 Junction Approaches with Delays Increase by >20s in 2045

ID	Junction	Approach	Average Delay increase by >20s
1	Treacle Mine Roundabout	Arterial Rd North Stifford	AM (both hrs)
2	Treacle Mine Roundabout	Long Ln	AM (08.00-09.00)
3	Treacle Mine Roundabout	Lodge Ln	PM
4	Treacle Mine Roundabout	A1012 Elizabeth Rd	AM (both hrs)
5	Lodge Lane / Hathaway Road	Lodge Ln West	AM (08.00-09.00)
6	Lodge Lane / Hathaway Road	Windsor Ave	PM
7	Daneholes Roundabout	A1013 Stanford Rd	PM
8	A1013 Stanford Road / Rectory Road	Rectory Rd	AM (both hrs) and PM
9	Old Dock Approach Rd / Marshfoot Rd	Old Dock Approach Rd	AM (07.00-08.00) and PM
10	Old Dock Approach Rd / Marshfoot Rd	A126 Marshfoot Rd South	AM (both hrs) and PM

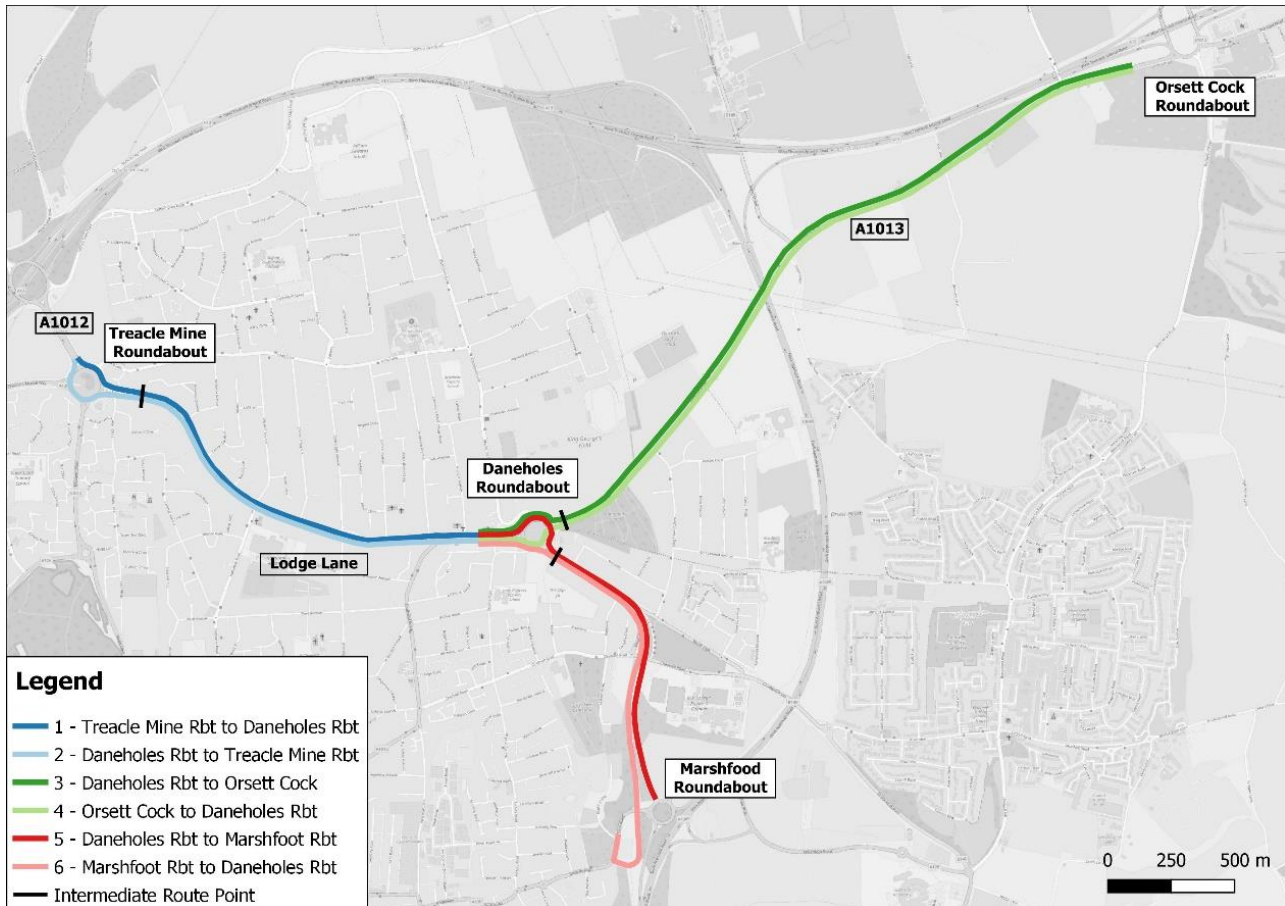
Plate 4.32 Junction Approaches with Delays Increase by >20s in 2045



4.10 Journey Times

4.10.1 Journey time comparison has been carried out on the same routes used for the base year model validation. These cover all movements between the origins and destinations illustrated in Plate 4.33.

Plate 4.33 Journey Time Start and End Locations



4.10.2 Table 4.33 to Table 4.38 show a summary comparing the journey times for the 2018 base year, 2030 DM and 2030 DS for the AM and PM peak periods.

4.10.3 More detailed journey time results are shown in Plate 4.34 to Plate 4.39, with each route broken down into a number of timing points and are presented in the form of cumulative distance and time graphs.

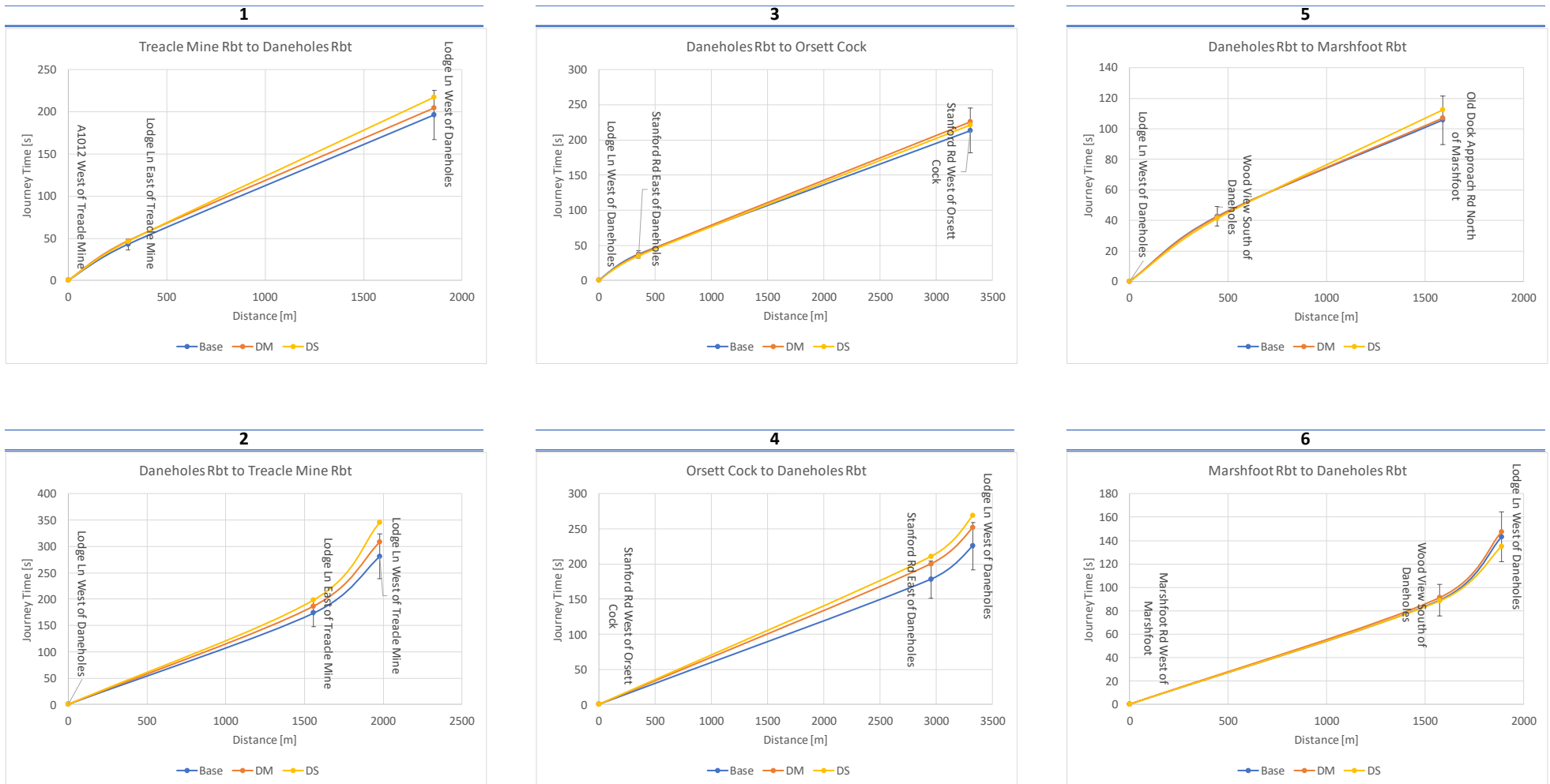
4.11 2030 journey times – AM peak first hour (07:00 – 08:00)

Table 4.33 2030 Journey Time Comparison AM 07:00 – 08:00

Route	Name	Distance [m]	JT [s]				Average Speed [mph]			
			Base	2030 DM	2030 DS	DS-DM	Base	2030 DM	2030 DS	DS-DM
1	Treacle Mine Rbt to Daneholes Rbt	1,860	196	205	218	13	21	20	19	-1
2	Daneholes Rbt to Treacle Mine Rbt	1,976	281	308	345	37	16	14	13	-2
3	Daneholes Rbt to Orsett Cock	3,302	213	226	222	-4	35	33	33	1
4	Orsett Cock to Daneholes Rbt	3,327	225	252	269	17	33	30	28	-2
5	Daneholes Rbt to Marshfoot Rbt	1,591	106	107	112	5	34	33	32	-2
6	Marshfoot Rbt to Daneholes Rbt	1,890	143	147	135	-13	30	29	31	3

- 4.11.1 The journey time comparison between the 2018 Base Year and the 2030 Do Minimum and Do Something scenarios for the 07:00 – 08:00 period shows that the journey times in the Do Minimum and Do Something are to a large extent similar or slightly higher than the base year across all routes.
- 4.11.2 The journey time comparison between the 2030 Do Something and 2030 Do Minimum scenarios for the 07:00 – 08:00 period shows that the journey times in the Do Something scenario are comparable to the Do Minimum scenario across majority of the routes, except for the route from Daneholes Roundabout to Treacle Mine Roundabout (Route 2) where there is an increase of 37s in the Do Something.
- 4.11.3 The similarities across the scenarios can be seen in Plate 4.34.

Plate 4.34 2030 Journey Time Charts AM (07:00 – 08:00)



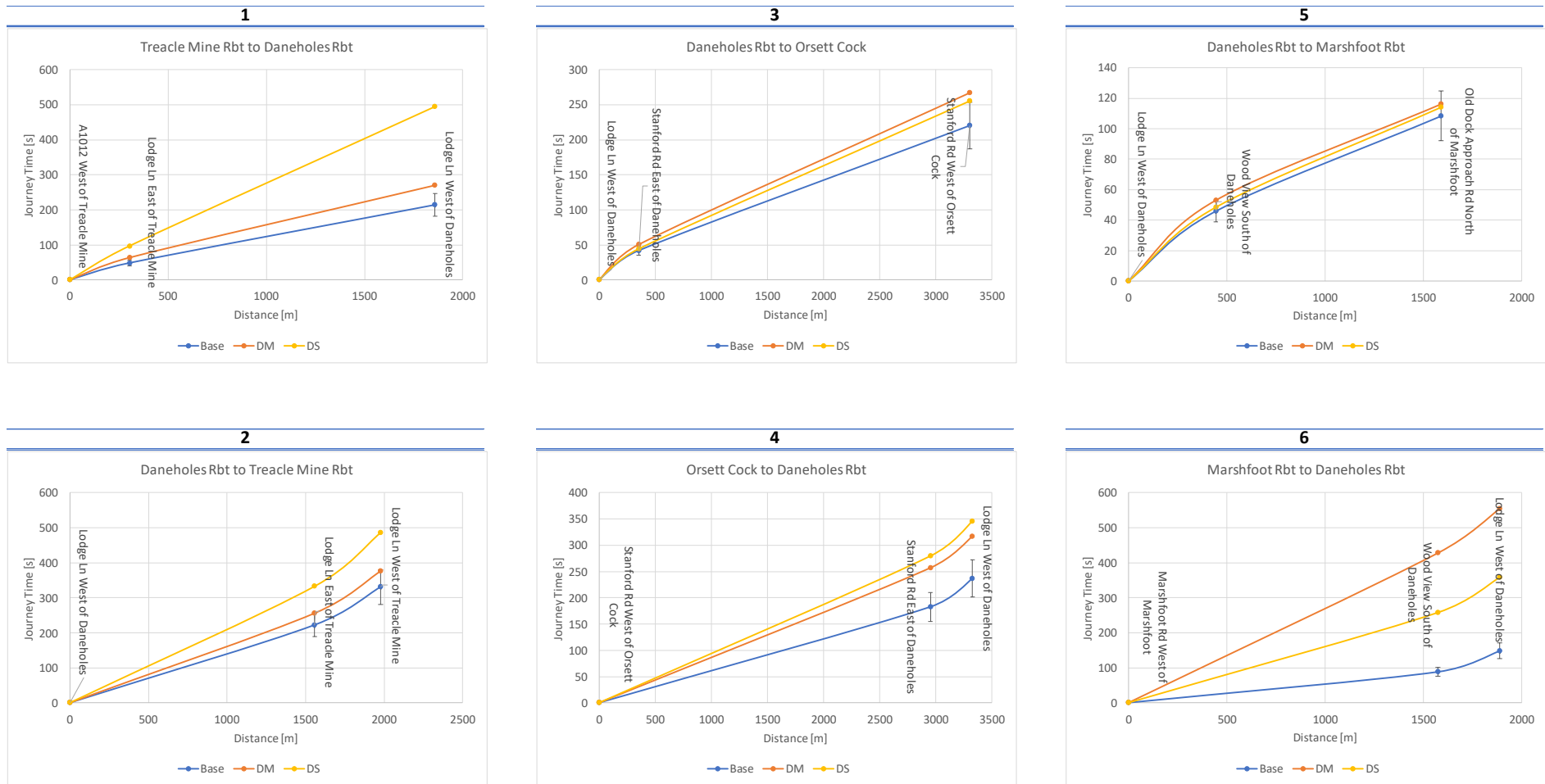
4.12 2030 journey times – AM peak second hour (08:00 – 09:00)

Table 4.34 2030 Journey Time Comparison 08:00 – 09:00

Route	Name	Distance [m]	JT [s]				Average Speed [mph]			
			Base	2030 DM	2030 DS	DS-DM	Base	2030 DM	2030 DS	DS-DM
1	Treacle Mine Rbt to Daneholes Rbt	1,860	215	269	494	225	19	15	8	-7
2	Daneholes Rbt to Treacle Mine Rbt	1,976	330	376	486	110	13	12	9	-3
3	Daneholes Rbt to Orsett Cock	3,302	220	267	255	-12	34	28	29	1
4	Orsett Cock to Daneholes Rbt	3,327	237	316	345	29	31	24	22	-2
5	Daneholes Rbt to Marshfoot Rbt	1,591	108	116	114	-2	33	31	31	1
6	Marshfoot Rbt to Daneholes Rbt	1,890	148	554	358	-196	29	8	12	4

- 4.12.1 The journey time comparison between the 2030 Do Minimum and Do Something scenarios, and the 2018 Base Year for the 08:00 – 09:00 period shows that the journey times in the forecasting scenarios are to a large extent higher than the base year across the majority of the routes.
- 4.12.2 The route from Marshfoot roundabout to Daneholes roundabout (Route 6) is impacted by the additional school trips, resulting in an increase in journey time in the forecasting scenarios. The journey times between Treacle Mine roundabout and Daneholes roundabout (Routes 1 & 2) are also impacted by the additional school trips in the forecasting scenarios.
- 4.12.3 The journey time comparison between the 2030 Do Something and 2030 Do Minimum scenarios for the 08:00 – 09:00 period shows that journey times in the Do Something scenario are comparable to the Do Minimum scenario across most of the routes, except for those routes between Daneholes roundabout and Treacle Mine roundabout (Routes 1 & 2) where the Do Something journey times increase by approx. two to four minutes.
- 4.12.4 The journey time from Marshfoot Roundabout to Daneholes Roundabout (Route 6) decrease by approx. three minutes in the Do Something compared to the Do Minimum.
- 4.12.5 A comparison of all three scenarios for each route can be seen in Plate 4.35.

Plate 4.35 2030 Journey Time Charts AM (8.00 – 9.00)



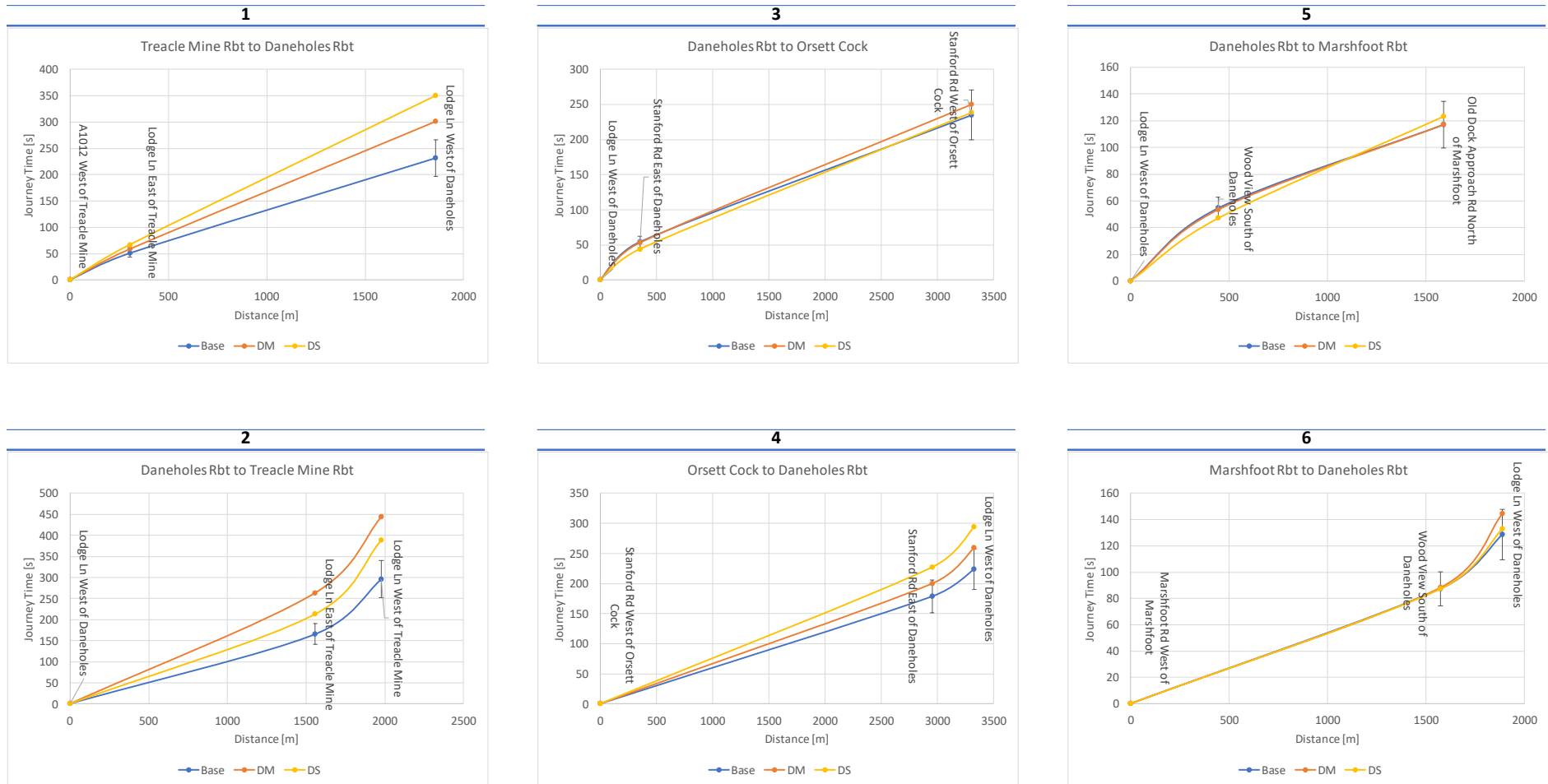
4.13 2030 journey times – PM peak hour (17:00 – 18:00)

Table 4.35 2030 Journey Time Comparison 17:00 – 18:00

Route	Name	Distance [m]	JT [s]				Average Speed [mph]			
			Base	2030 DM	2030 DS	DS-DM	Base	2030 DM	2030 DS	DS-DM
1	Treacle Mine Rbt to Daneholes Rbt	1,860	232	301	350	48	18	14	12	-2
2	Daneholes Rbt to Treacle Mine Rbt	1,976	296	443	389	-54	15	10	11	1
3	Daneholes Rbt to Orsett Cock	3,302	235	250	238	-12	31	29	31	1
4	Orsett Cock to Daneholes Rbt	3,327	224	259	294	35	33	29	25	-3
5	Daneholes Rbt to Marshfoot Rbt	1,591	117	117	123	6	30	30	29	-2
6	Marshfoot Rbt to Daneholes Rbt	1,890	129	144	133	-11	33	29	32	2

- 4.13.1 The journey time comparison between the 2030 Do Minimum and Do Something scenarios and the 2018 Base Year for the 17:00 – 18:00 period shows that the journey times in the Do Minimum and the Do Something are higher than the base year across all routes.
- 4.13.2 The journey time comparison between the 2030 Do Something and 2030 Do Minimum scenarios for the 17:00 – 18:00 period shows that journey times are to a large extent similar or smaller than in the Do Minimum scenario across majority of the routes. The highest increase of journey time of 48 seconds is recorded for Route 1 from Treacle Mine Roundabout to Daneholes Roundabout
- 4.13.3 The results across the scenarios are shown in Plate 4.36.

Plate 4.36 2030 Journey Time Charts PM (17.00 – 18.00)



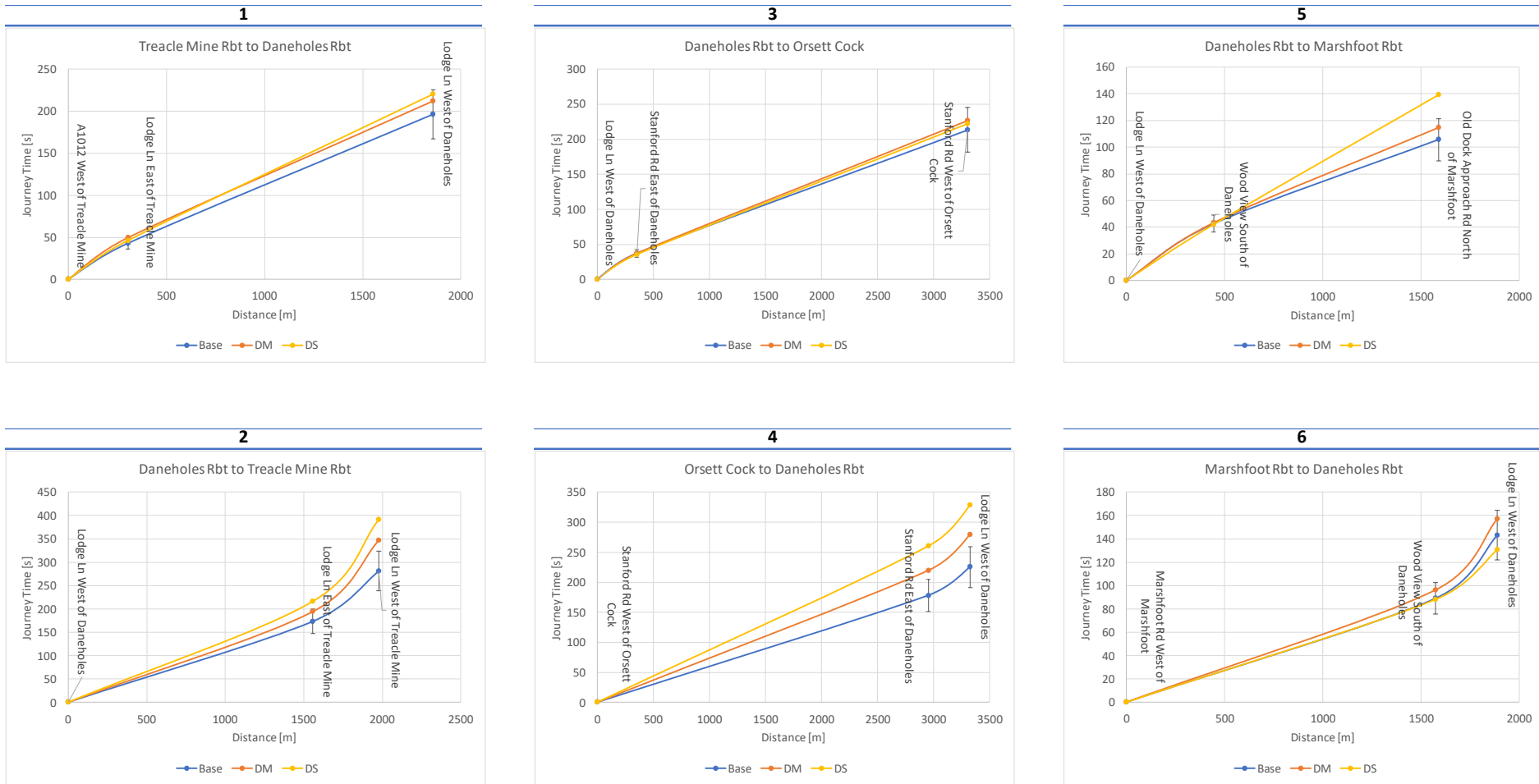
4.14 2045 journey times – AM peak first hour (07:00 – 08:00)

Table 4.36 2045 Journey Time Comparison AM 07:00 – 08:00

Route	Name	Distance [m]	JT [s]				Average Speed [mph]			
			Base	2030 DM	2030 DS	DS-DM	Base	2030 DM	2030 DS	DS-DM
1	Treacle Mine Rbt to Daneholes Rbt	1,860	196	212	220	8	21	20	19	-1
2	Daneholes Rbt to Treacle Mine Rbt	1,976	281	346	392	45	16	13	11	-1
3	Daneholes Rbt to Orsett Cock	3,302	213	226	222	-5	35	33	33	1
4	Orsett Cock to Daneholes Rbt	3,327	225	279	329	50	33	27	23	-4
5	Daneholes Rbt to Marshfoot Rbt	1,591	106	115	139	24	34	31	26	-5
6	Marshfoot Rbt to Daneholes Rbt	1,890	143	157	131	-26	30	27	32	5

- 4.14.1 The journey time comparison between the 2018 Base Year and the 2045 Do Minimum and Do Something scenarios for the 07:00 – 08:00 period shows that the journey times in the Do Minimum and the Do Something are similar or higher than the base year across all routes.
- 4.14.2 The journey time comparison between the 2045 Do Something and 2045 Do Minimum scenarios for the 07:00 – 08:00 period shows the journey times in the Do Something scenario are similar to the Do Minimum scenario across all the routes with changes of less than a minute.
- 4.14.3 The similarities across the scenarios are shown in Plate 4.37.

Plate 4.37 2045 Journey Time Charts AM (7.00 –8.00)



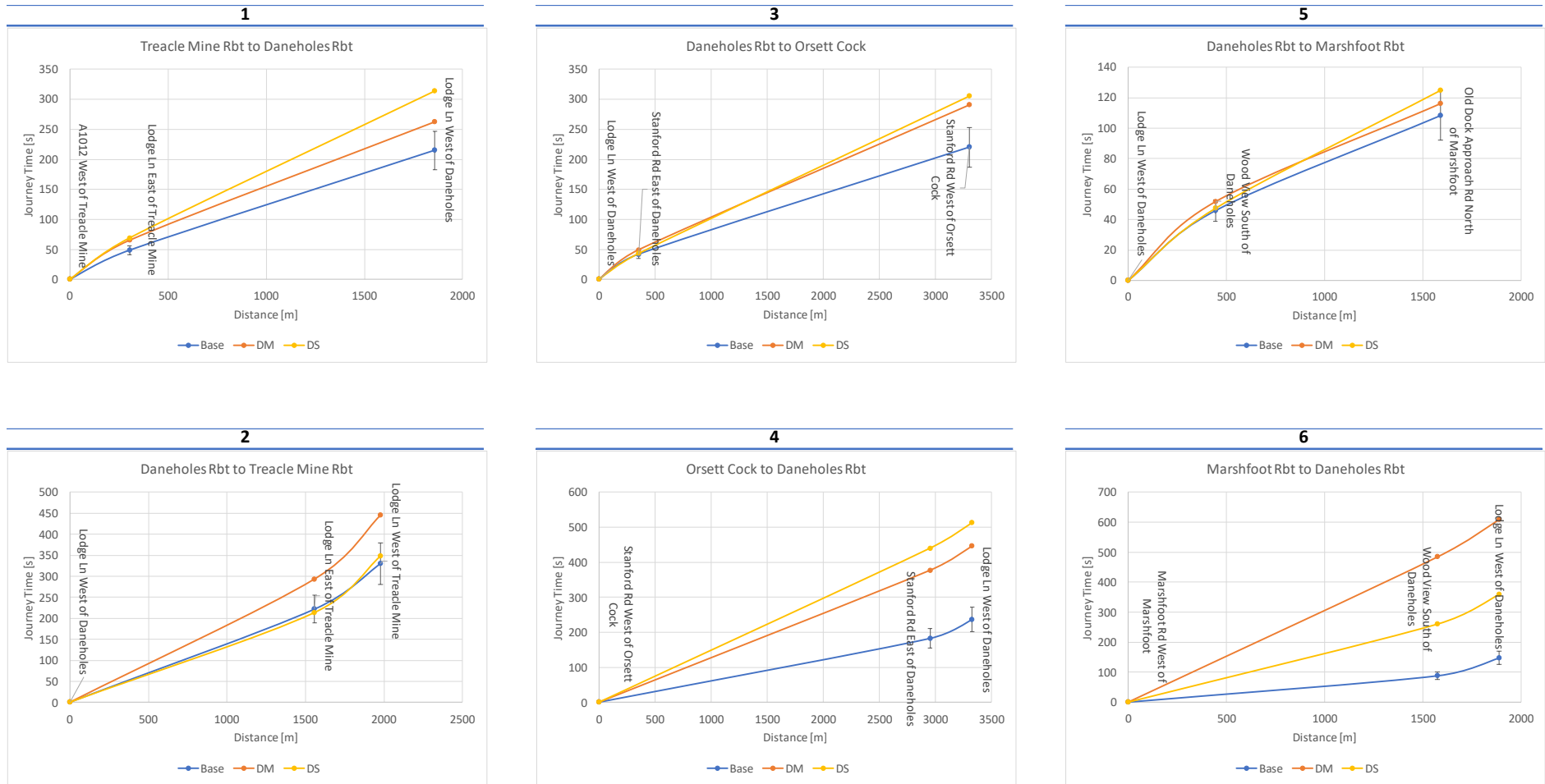
4.15 2045 journey times – AM peak second hour (08:00 – 09:00)

Table 4.37 2045 Journey Time Comparison 08:00 – 09:00

Route	Name	Distance [m]	JT [s]				Average Speed [mph]			
			Base	2030 DM	2030 DS	DS-DM	Base	2030 DM	2030 DS	DS-DM
1	Treacle Mine Rbt to Daneholes Rbt	1,860	215	263	313	51	19	16	13	-3
2	Daneholes Rbt to Treacle Mine Rbt	1,976	330	445	348	-96	13	10	13	3
3	Daneholes Rbt to Orsett Cock	3,302	220	291	306	15	34	25	24	-1
4	Orsett Cock to Daneholes Rbt	3,327	237	446	513	67	31	17	15	-2
5	Daneholes Rbt to Marshfoot Rbt	1,591	108	116	125	8	33	31	29	-2
6	Marshfoot Rbt to Daneholes Rbt	1,890	148	608	359	-249	29	7	12	5

- 4.15.1 The journey time comparison between the 2045 Do Minimum and Do Something scenarios, and the 2018 Base Year for the 08:00 – 09:00 period shows that the journey times in the forecasting scenarios are similar or higher than the base year across the majority of the routes.
- 4.15.2 The routes from Marshfoot Roundabout and Orsett Cock to Daneholes Roundabout (Route 6 & Route 4 respectively), and between Treacle Mine Roundabout and Daneholes Roundabout (Routes 1 & 2), are impacted by the additional school trips, resulting in an increase in journey time in the forecasting scenarios.
- 4.15.3 The journey time comparison between the 2045 Do Something and 2045 Do Minimum scenarios for the 08:00 – 09:00 period shows that journey times in the Do Something scenario are similar or lower than the Do Minimum scenario across most routes, with increases just under and over a minute on Routes 1 and 4 respectively.
- 4.15.4 Routes 2 and 6 recorded journey time reductions of approx. one and a half minutes and approx. four minutes respectively.
- 4.15.5 The journey times across the scenarios for each route can be seen in Plate 4.38.

Plate 4.38 2045 Journey Time Charts AM (08:00 –09:00)



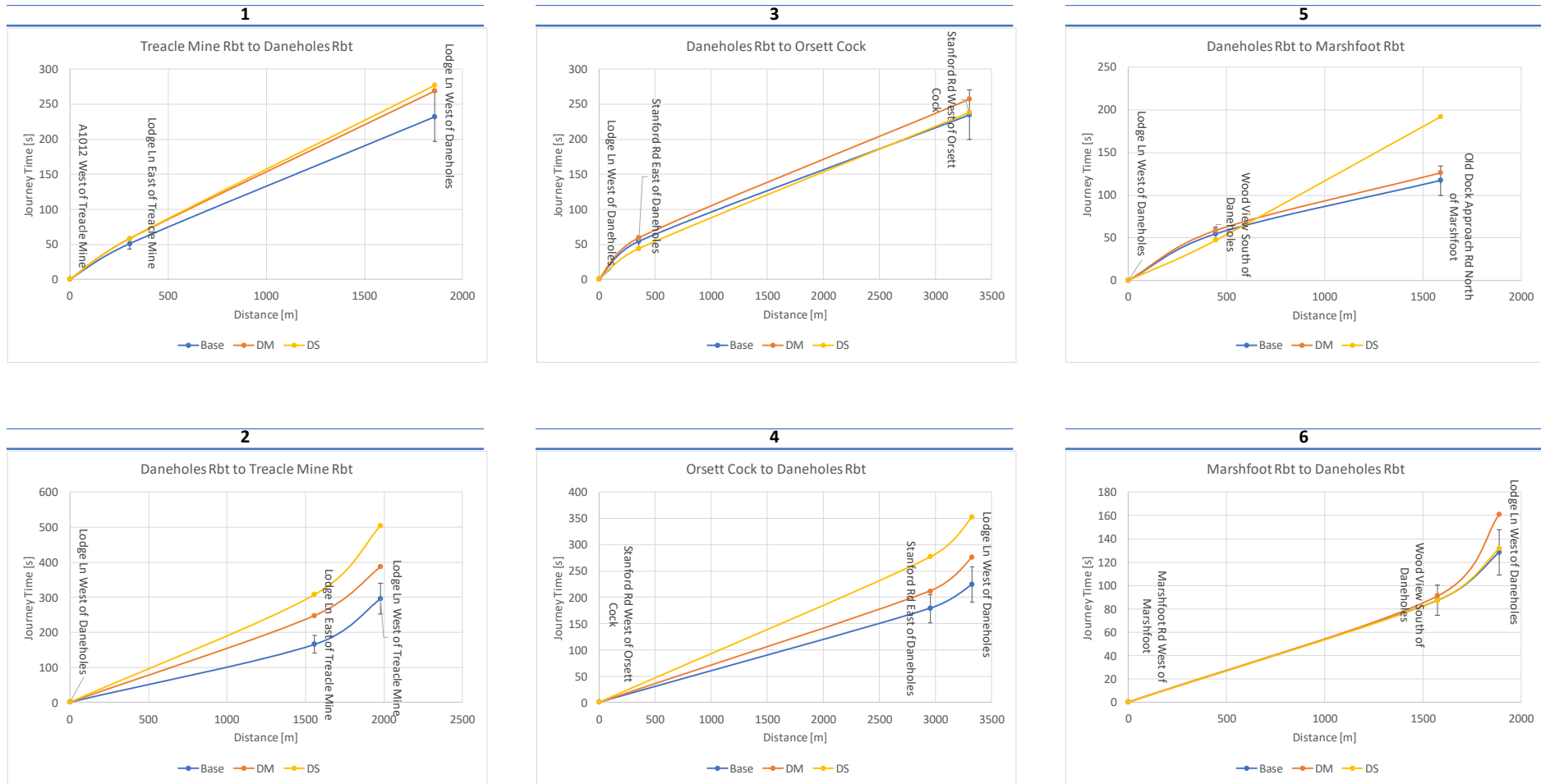
4.16 2045 journey times – PM peak hour (17:00 – 18:00)

Table 4.38 2045 Journey Time Comparison 17:00 – 18:00

Route	Name	Distance [m]	JT [s]				Average Speed [mph]			
			Base	2030 DM	2030 DS	DS-DM	Base	2030 DM	2030 DS	DS-DM
1	Treacle Mine Rbt to Daneholes Rbt	1,860	232	269	277	8	18	15	15	0
2	Daneholes Rbt to Treacle Mine Rbt	1,976	296	386	504	118	15	11	9	-3
3	Daneholes Rbt to Orsett Cock	3,302	235	257	238	-19	31	29	31	2
4	Orsett Cock to Daneholes Rbt	3,327	224	276	353	77	33	27	21	-6
5	Daneholes Rbt to Marshfoot Rbt	1,591	117	126	192	66	30	28	19	-10
6	Marshfoot Rbt to Daneholes Rbt	1,890	129	161	131	-30	33	26	32	6

- 4.16.1 The journey time comparison between the 2045 Do Minimum and Do Something scenarios and the 2018 Base Year for the 17:00 – 18:00 period shows that the journey times in the Do Minimum and the Do Something are to a large extent similar or higher than the base year across all routes.
- 4.16.2 The journey time comparison between the 2045 Do Something and 2045 Do Minimum scenarios for the 17:00 – 18:00 period shows that the journey times in the Do Something scenario are to a large extent higher than in the Do Minimum scenario across majority of the routes. The highest increase of journey time of approx. two minutes is recorded on Route 2 from Daneholes roundabout to Treacle Mine roundabout.
- 4.16.3 The results across the scenarios are shown in Plate 4.39.

Plate 4.39 2045 Journey Time Charts PM (17.00 – 18.00)



4.17 Relative Delays

- 4.17.1 The relative delay in VISSIM is the total segment delay divided by the total segment travel time on a link, with the link made up of 10m length segments. The relative delay plots on all links in the network are shown in Appendix D. They provide a visual representation of the delays at all junctions.
- 4.17.2 The 2030 and 2045 Do Something plots show similar patterns as in the Do Minimum across the majority of junctions for all peaks. The highest relative delays are in the second AM peak hour, which is the busiest peak in the Base Year as it includes the additional school traffic flows.
- 4.17.3 In 2030 the first AM peak hour appears to have low levels of congestion.
- 4.17.4 The plots show that the queues in the second AM peak hour are at the Treacle Mine roundabout, Lodge Lane/ Hathaway Road junction, Lodge Road/ Southern Road junction, Daneholes roundabout and three arms of the Chadwell Hill/ Brentwood Road junction.
- 4.17.5 Additionally, for 2045 during the second AM peak hour there is a queue at Marshfoot Road extending back to the A1089 on-slip as shown in the relative delay plots in Plate D.11. In the PM peak hour, the most congested arms are High Road entering the Stifford Interchange, Long Lane to Treacle Mine roundabout, Hathaway Road, Southern Road and Blackshots Lane entering the Daneholes roundabout.

4.18 Network performance statistics

4.18.1 In addition to the traffic flows, journey time results and relative delay plots some general statistics are also provided for the models. These are general metrics about the network performance and are a good baseline to compare against future year scenarios, summarising the network performance statistics for the modelled network.

2030 Network Performance Statistics

4.18.2 Table 4.39 shows the 2030 network performance statistics. In general, the second AM peak hour is shown to be the busiest from all the peaks, which is expected as the flow profile analysis showed the main morning peak is from 8:00 to 9:00.

4.18.3 The first AM peak hour is less congested than the PM peak hour. Most of the statistics in the second AM peak hour are at a similar level as the PM peak hour.

Table 4.39 2030 Network Performance Statistics

	AM (07:00-08:00)		AM (08:00-09:00)		PM (17:00-18:00)	
	DM	DS	DM	DS	DM	DS
Average Delay [sec]	52	64	123	159	113	140
Average Stops	1	2	4	6	5	6
Average Speed [km/h]	53	49	35	31	38	34
Total Distance [km]	55,522	53,434	57,775	55,582	60,939	5,9864
Total Travel Time [h]	1057	1089	1630	1796	1611	1755
Total Vehicles [veh]	21,761	20,385	23,534	21,965	24,108	23,098
Latent Delay [h]	28	52	596	916	319	410
Latent Demand [veh]	179	352	1,213	1,715	641	933

4.18.4 Latent demand is the number of vehicles not being able to deploy in the network within the evaluation period because of congestion. It is typically the total difference between the demand flow and the modelled flow on all the entry links. A small number of vehicles were unable to deploy in 07:00-08:00 and these vehicles have been deployed at the beginning of the 08:00-09:00 period instead.

4.18.5 The latent demand of the second AM peak hour in the Do Minimum and the Do Something is mainly at the B149 Wood View (Daneholes roundabout) northbound arm – this is due to the additional school traffic flows. Some latent demand is also recorded at some side roads such Hathaway Road and Windsor Avenue.

4.18.6 The PM latent demand in both scenarios is at High Road and Long Lane entering Treacle Mine roundabout and Linford Road. These vehicles were unable to deploy during the peak hour due to congestion and have been deployed in the cool down period instead.

2045 Network Performance Statistics

- 4.18.7 Table 4.40 shows the 2045 network performance statistics. Similar to 2030, the second AM peak hour is the busiest from all the peaks and the first AM peak hour is less congested than the PM peak hour. Most of the statistics in second AM peak hour corresponds to the PM peak hour statistics.
- 4.18.8 The statistics are similar in the Do Minimum and the Do Something.

Table 4.40 2045 Network Performance Statistics

	AM (07:00-08:00)		AM (08:00-09:00)		PM (17:00-18:00)	
	DM	DS	DM	DS	DM	DS
Average Delay [sec]	60	86	147	187	129	163
Average Stops	2	3	6	7	5	7
Average Speed [km/h]	50	44	32	28	36	32
Total Distance [km]	59,503	56,727	60,444	57,562	64,136	63,177
Total Travel Time [h]	1,192	1,293	1,880	2,055	1,806	2,003
Total Vehicles [veh]	23,356	21,534	24,645	22,786	25,270	2,4139
Latent Delay [h]	67	153	1363	2,207	804	1,029
Latent Demand [veh]	390	870	2,674	3,696	1,469	2,023

- 4.18.9 The latent demand of the second AM peak hour in the Do Minimum and the Do Something is mainly at the B149 Wood View (Daneholes roundabout) northbound arm – this is due to the additional school traffic flows.
- 4.18.10 The latent demand also appears at some side roads along Lodge Lane such as at Hathaway Road and Windsor Avenue. The PM latent demand in both scenarios is at High Road and Long Lane entering Treacle Mine Roundabout and Linford Road. These vehicles were unable to deploy during the peak hour due to congestion and have been deployed in the cool down period instead.

5 Conclusions

- 5.1.1 This report describes the development of the 2030 and 2045 Do Minimum and the 2030 and 2045 Do Something VISSIM models of the Thurrock East-West study area that includes 16 junctions and compares the modelling results between the two models.
- 5.1.2 The main implemented changes to create the future year models from the base model are the new signalised junction on the A1013 as part of the Orsett Heath Academy development (included in both the Do Minimum and Do Something models), and the Do Something reconfiguration of the A1013/ Rectory Road junction.
- 5.1.3 The first AM peak hour journey times and delays are quite similar across all the modelled scenarios (Base Year, 2030 & 2045 Do Minimum and Do Something).
- 5.1.4 In the second AM peak hour and the PM peak hour, the Do Something journey times increase the most on the Treacle Mine roundabout to Daneholes roundabout route. However, in the second AM peak hour journey times reduce on the route from Marshfoot roundabout to Daneholes Roundabout in the Do Something compared to the Do Minimum.
- 5.1.5 Treacle Mine Roundabout is busy in both the Do Minimum and Do Something models. The queues and delays increase on the Arterial Road North Stifford arm and Long Lane entering the Treacle Mine roundabout due to the increase in traffic flows.
- 5.1.6 Daneholes Roundabout is shown to be busy and is impacted by the additional school traffic flows in the second AM peak hour (08:00-09:00).
- 5.1.7 Overall, the network performance in 2030 during the first AM peak hour (07:00-08:00) is comparable between the Do Minimum and Do Something scenarios, with an increase of 12 seconds in average delay and 173 vehicles in latent demand. During the second AM peak hour (08:00-09:00) the network is busier and the Do Something scenario record an increased average delay of 36 seconds compared to the Do Minimum, and an increase of approx. 500 vehicles in latent demand compared to the Do Minimum. During the PM peak hour (17:00-18:00) the average delay increases by 27 seconds and the latent demand increase by 292 vehicles in the Do Something compared to the Do Minimum.
- 5.1.8 Overall, for 2045, the network performance during the first AM peak hour (07:00-08:00) is comparable between the Do Minimum and Do Something scenarios, with an increase of 26 seconds in average delay and 480 vehicles in latent demand. During the second AM peak hour (08:00-09:00) the network is busier and the Do Something scenario record an increased average delay of 40 seconds compared to the Do Minimum, and an increase of approx. 1,000 vehicles in latent demand compared to the Do Minimum. During the PM peak hour (17:00-18:00) the average delay increases by 34 seconds and the latent demand increase by 554 vehicles in the Do Something compared to the Do Minimum.

References

Transport for London (September 2021). Traffic Modelling Guidelines Version 4.0.

<https://content.tfl.gov.uk/traffic-modelling-guidelines.pdf>

Transport for London (March 2017). Model Auditing Process (MAP) Version 3.5. Engineer Guide for Design Engineer (DE), Checking Engineer (CE) and Model Auditing Engineer (MAE).

<https://content.tfl.gov.uk/map-v3-5-engineer-guide.pdf>

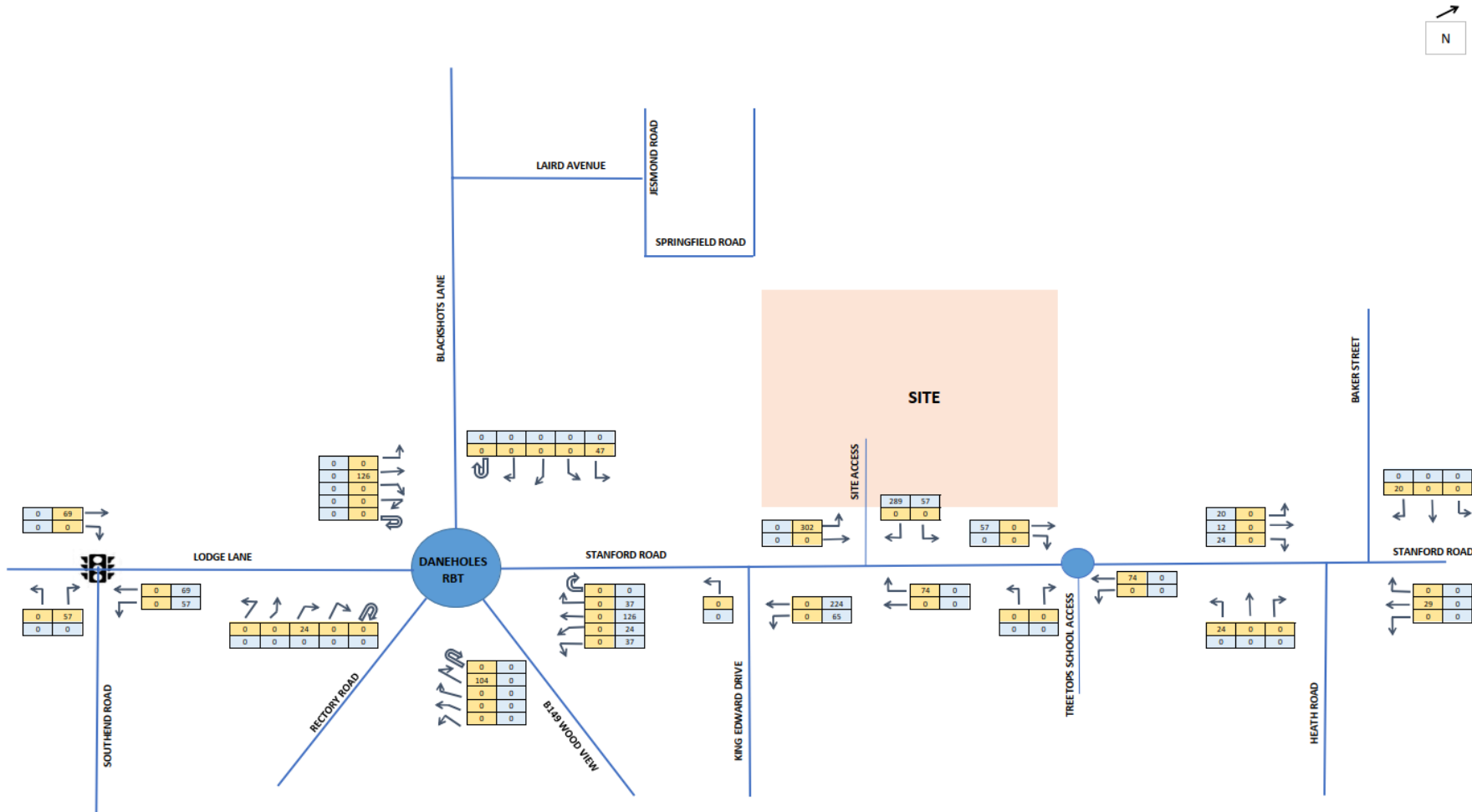
Glossary

Term	Explanation
ANPR	Automatic Number Plate Recognition
ATC	Automatic Traffic Count
DCO	Development Consent Order - Means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects (NSIPs)
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges: A comprehensive manual which contains requirements, advice and other published documents relating to works on motorway and all-purpose trunk roads for which one of the Overseeing Organisations (National Highways, Transport Scotland, the Welsh Government or the Department for Regional Development (Northern Ireland)) is the highway authority. For the Lower Thames Crossing, the Overseeing Organisation is National Highways.
Do Minimum	A future year scenario which includes changes to the road network and planned development that is forecast to go ahead, but not the Lower Thames Crossing.
Do Something	A future year scenario which includes changes to the road network and planned development that is forecast to go ahead, and the Lower Thames Crossing.
EB	Eastbound
GEH	A formula used to compare two traffic volumes, named after its originator, Geoff E. Havers. It is similar to a chi-squared test.
HGV	Heavy Goods Vehicle
LGV	Light Goods Vehicle
LinSig	A Design and Assessment Tool for Traffic Signal Junctions and Urban Networks
LMVR	Local Model Validation Report
LTC	Lower Thames Crossing
NB	Northbound
OS	Ordnance Survey
PTV	German for Planning Transport and Traffic Software package
SATURN	Simulation and Assignment of Traffic to Urban Networks
SB	Southbound
TAG	Transport Analysis Guidance published by DfT
TfL	Transport for London - The integrated body responsible for London's transport system

Term	Explanation
VISSIM	Micro-simulation software developed by PTV. Verkehr In Städten - SIMulationsmodell (German for "Traffic in cities - simulation model")
WB	Westbound

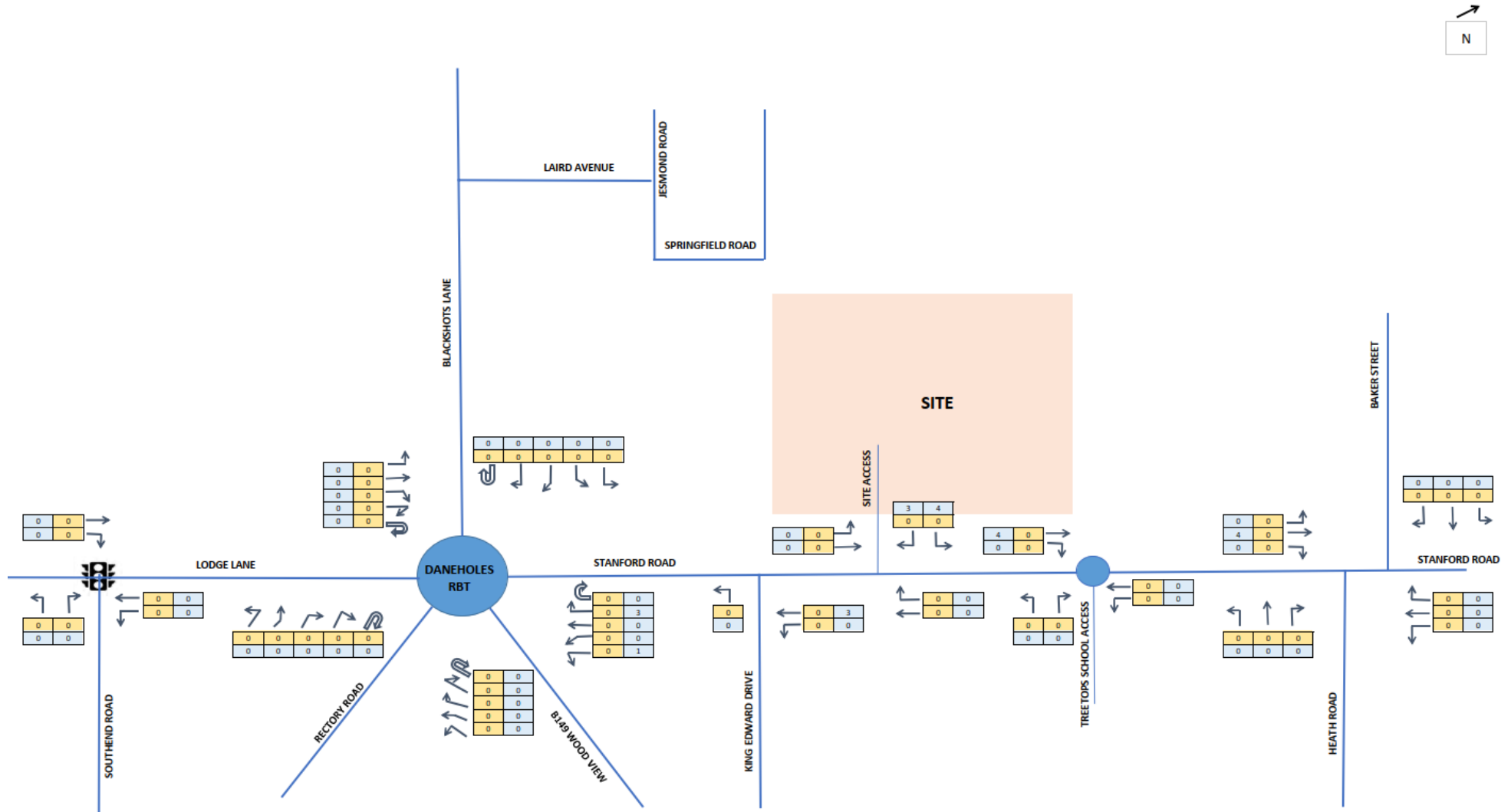
Appendix A School flow diagrams

Plate A.1 Orsett Heath Academy AM 08:00 – 09:00 Flow Diagram



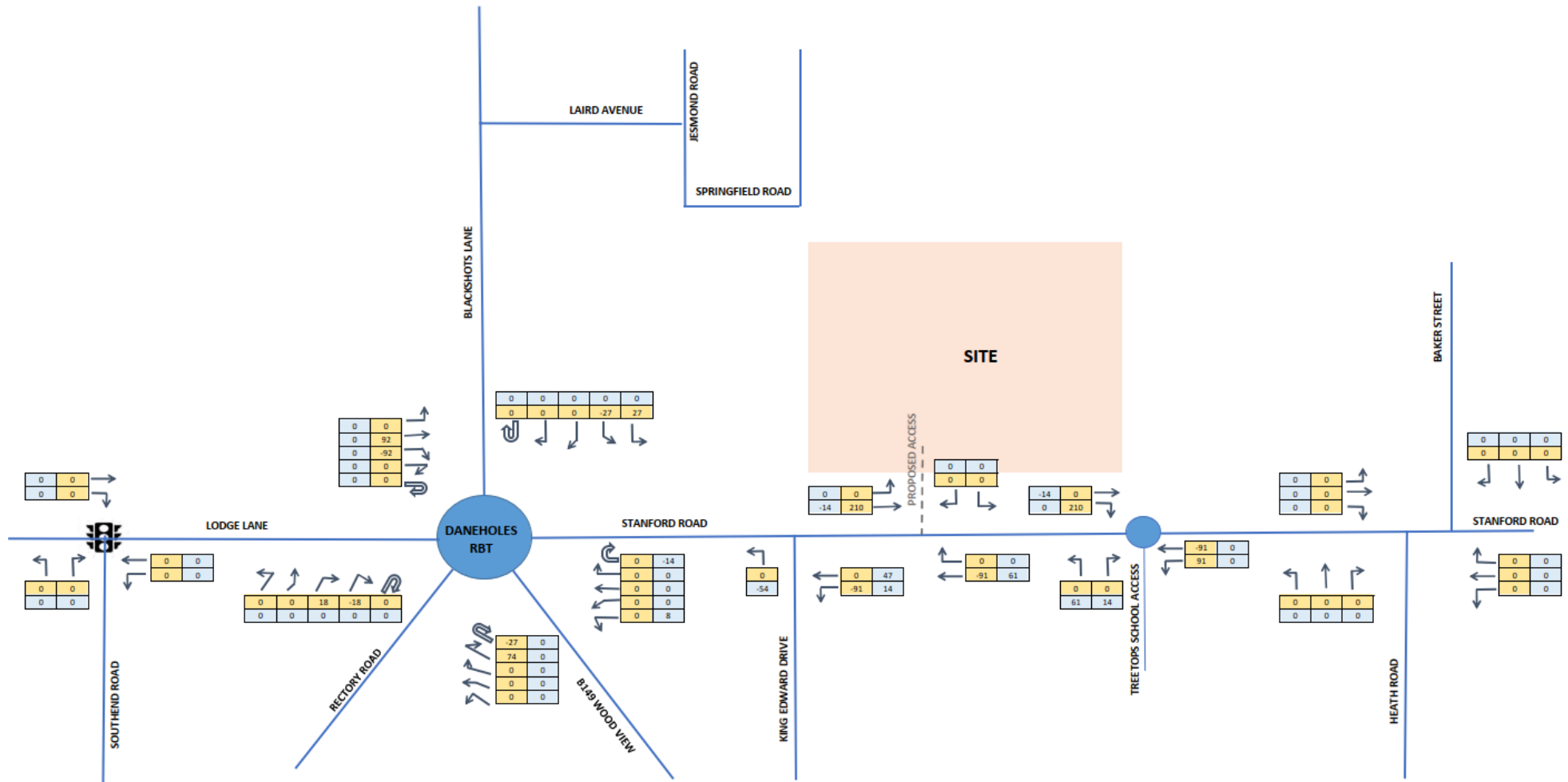
Source: Orsett Heath Academy Transport Assessment Project no. 2550/1190 doc no. D002 July 2021

Plate A.2 Orsett Heath Academy PM 17:00 – 18:00 Flow Diagram



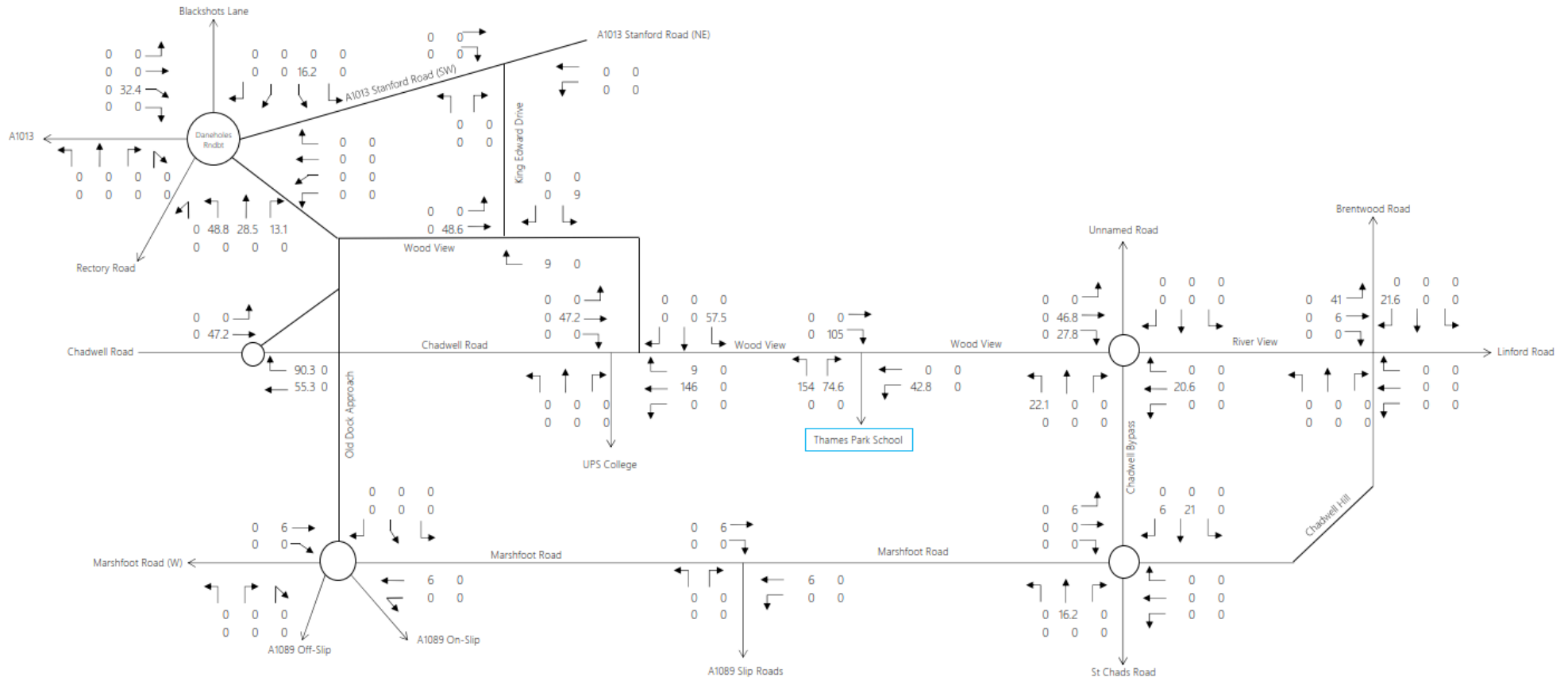
Source: Orsett Heath Academy Transport Assessment Project no. 2550/1190 doc no. D002 July 2021

Plate A.3 Treetops School AM 08:00 – 09:00 Flow Diagram



Source: Orsett Heath Academy Transport Assessment Project no. 2550/1190 doc no. D002 July 2021

Plate A.6 Thames Park Secondary School Grays PM 17:00 – 18:00 Flow Diagram



Source: Thames Park Secondary School Grays Thurrock Transport Assessment Addendum, December 2020

Appendix B Daneholes flow diagrams

Plate B.1 Daneholes Flow Diagram including school flows 2030 DM 08:00 – 09:00

Legend	
Total Flows	
School flows	
Total arm flow	
<i>All Flows presented in [veh]</i>	

Total School Flows added: 576

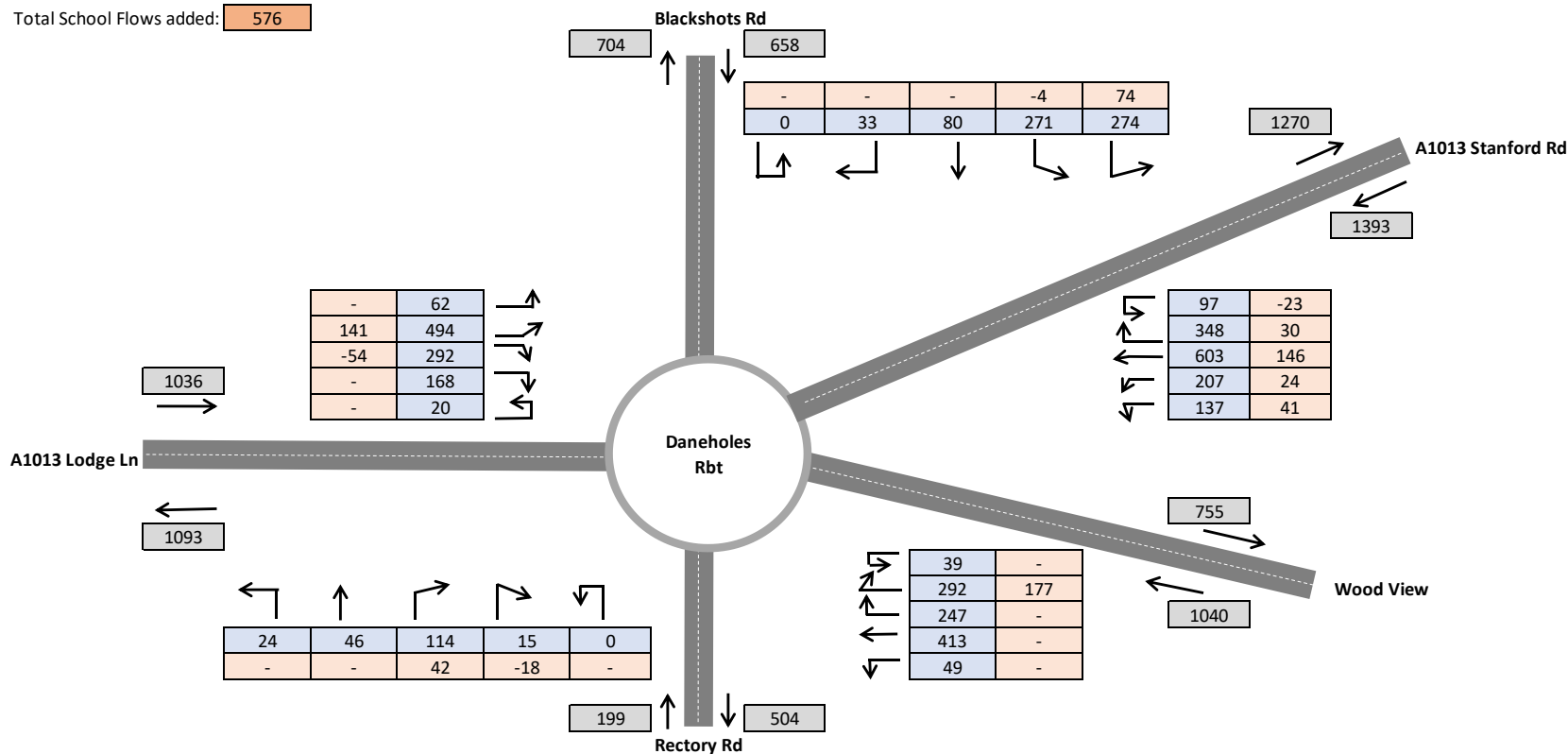


Plate B.2 Daneholes Flow Diagram including school flows 2030 DS 08:00 – 09:00

Legend	
Total Flows	
School flows	
Total arm flow	
All Flows presented in [veh]	

Total School Flows added: 576

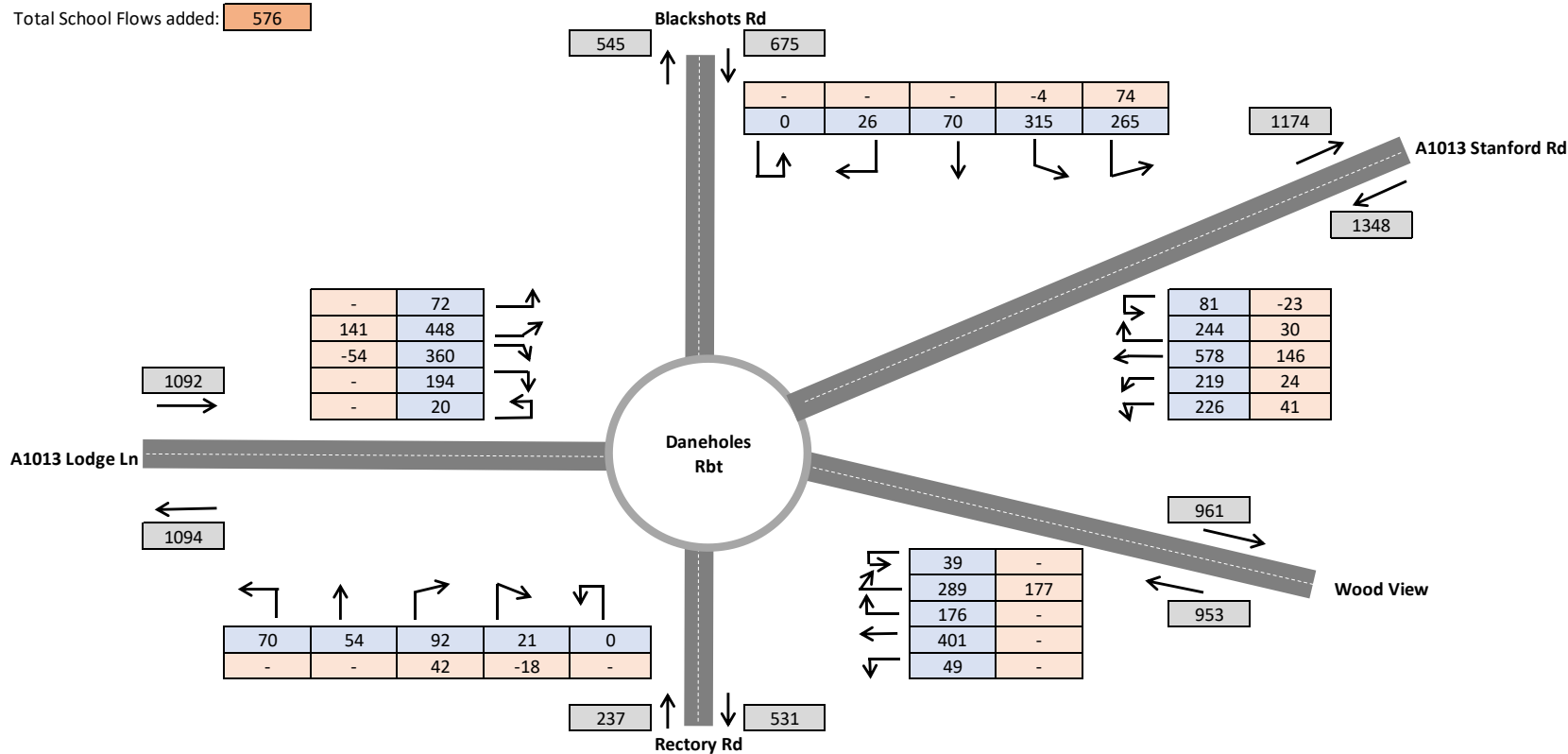


Plate B.3 Daneholes Flow Diagram including school flows 2045 DM 08:00 – 09:00

Legend	
Total Flows	
School flows	
Total arm flow	

All Flows presented in [veh]

Total School Flows added: 576

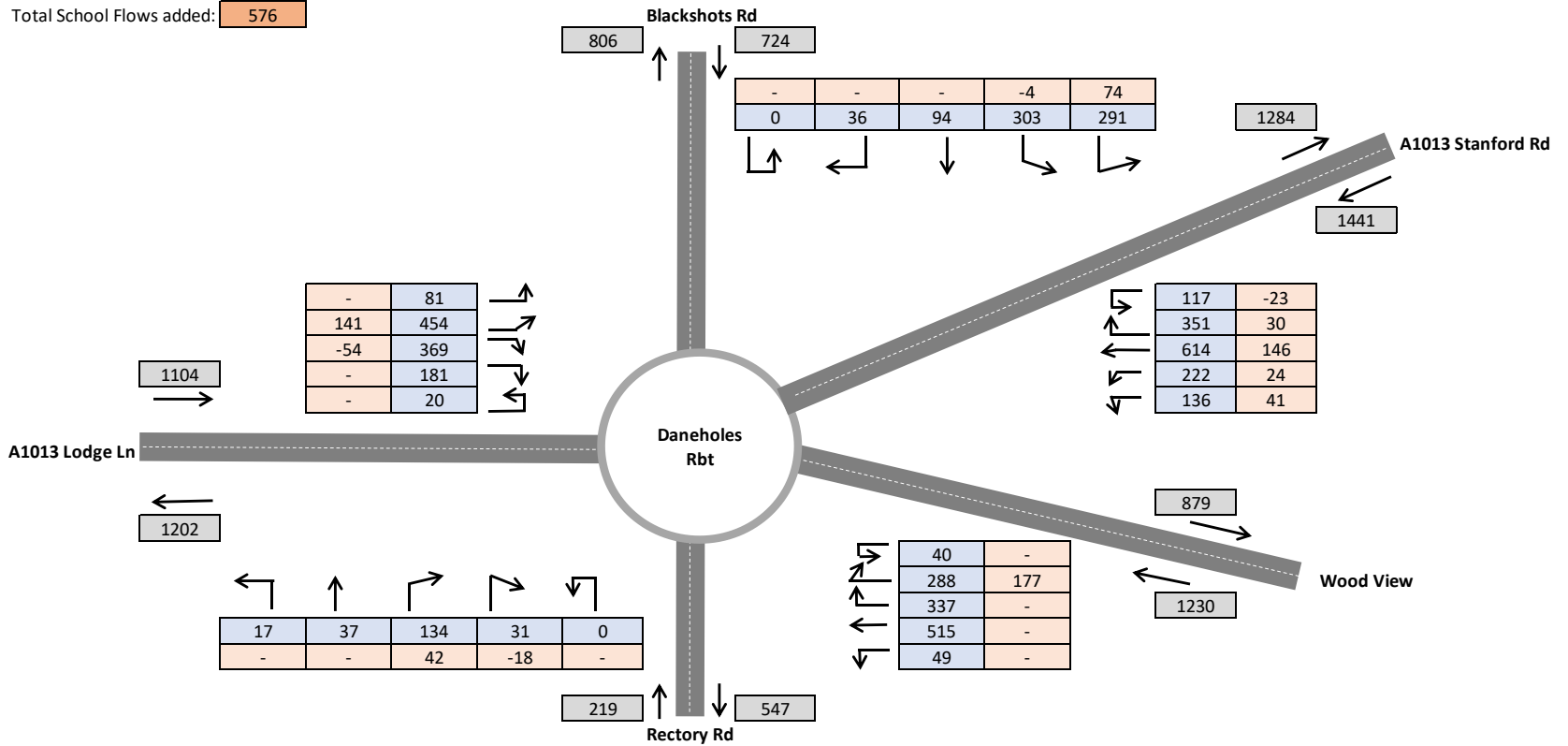
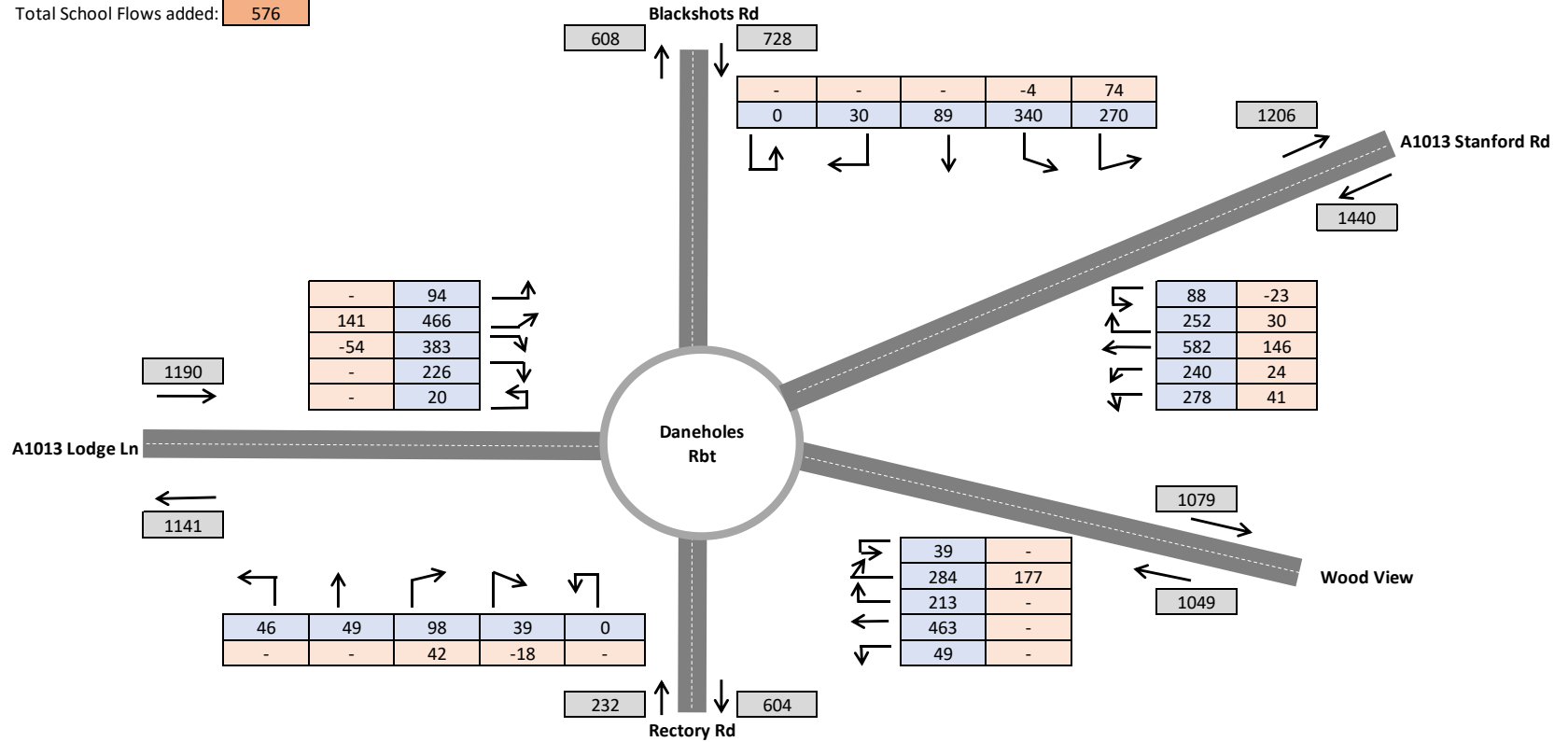


Plate B.4 Daneholes Flow Diagram including school flows 2045 DS 08:00 – 09:00

Legend	
Total Flows	
School flows	
Total arm flow	
All Flows presented in [veh]	

Total School Flows added: 576



Appendix C Junction results

Table C.1 2030 07:00 – 08:00 Junction Results

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
A13 / A1012 / Stifford Clays Rd / High Rd	A13 West (slip off)	High Rd	24	24	6.1	4.7	11	10
		A13 East (slip on)	0	0	0.0	0.0		
		Stifford Clays Rd	88	85	9.7	7.8		
		A1012	231	248	9.8	7.8		
		A13 West (slip on)	0	0	0.0	0.0		
	High Rd	A13 East (slip on)	209	217	27.4	15.2	41	22
		Stifford Clays Rd	50	51	26.3	13.7		
		A1012	71	74	25.0	13.1		
		A13 West (slip on)	9	9	25.2	15.7		
		High Rd	0	0	0.0	0.0		
	A13 East (slip off)	Stifford Clays Rd	5	17	2.6	2.2	7	9
		A1012	285	317	2.2	2.7		
		A13 West (slip on)	0	0	0.0	0.0		
		High Rd	217	217	3.3	3.7		
		A13 East (slip on)	1	1	8.4	5.7		
	Stifford Clays Rd	A1012	145	88	4.0	4.9	17	21
		A13 West (slip on)	118	232	3.9	5.0		
		High Rd	73	75	4.6	5.3		
		A13 East (slip on)	36	57	8.4	8.0		
		Stifford Clays Rd	0	0	0.0	0.0		
A1012	A13 West (slip on)	398	594	11.9	41.7	50	218	
	High Rd	94	84	9.5	34.1			
	A13 East (slip on)	699	609	13.5	37.6			
	Stifford Clays Rd	22	15	10.7	39.8			
	A1012	0	0	0.0	0.0			
Treacle Mine Roundabout	Arterial Rd North Stifford	A1012 North	373	330	26.3	63.3	157	172
		Long Ln	101	74	65.9	79.4		
		Lodge Ln	247	230	94.0	108.9		
		A1012 Elizabeth Rd	134	139	96.6	112.8		
		Arterial Rd North Stifford	0	0	99.1	89.8		
	A1012 North	Long Ln	27	26	16.9	15.4	51	50

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
		Lodge Ln	150	165	23.2	22.3		
		A1012 Elizabeth Rd	320	320	30.6	30.4		
		Arterial Rd North Stifford	228	207	31.1	30.2		
		A1012 North	0	0	0.0	0.0		
	Long Ln	Lodge Ln	20	20	30.6	22.1	80	58
		A1012 Elizabeth Rd	124	110	42.1	35.0		
		Arterial Rd North Stifford	261	193	60.7	53.6		
		A1012 North	58	55	72.4	86.9		
		Long Ln	0	0	0.0	0.0		
	Lodge Ln	A1012 Elizabeth Rd	118	101	46.5	47.4	166	211
		Arterial Rd North Stifford	378	320	74.5	77.0		
		A1012 North	210	272	85.0	112.6		
		Long Ln	10	9	90.7	101.4		
		Lodge Ln	1	0	111.8	0.0		
	A1012 Elizabeth Rd	Arterial Rd North Stifford	291	228	31.8	38.7	177	218
		A1012 North	587	690	33.3	56.9		
		Long Ln	95	81	45.3	51.9		
		Lodge Ln	40	33	78.9	83.5		
		A1012 Elizabeth Rd	3	2	78.6	77.9		
	Lodge Lane / Nutberry Avenue	Lodge Ln West	Nutberry Ave	13	15	0.6	0.6	0
Lodge Ln East			442	433	0.7	0.7		
Nutberry Ave		Lodge Ln East	7	6	4.9	6.2	6	12
		Lodge Ln West	32	49	14.4	15.3		
Lodge Ln East		Lodge Ln West	721	700	3.2	6.4	21	63
		Nutberry Ave	3	4	8.5	10.5		
Lodge Lane / Hathaway Road	Lodge Ln West	Windsor Ave	1	1	32.9	38.8	54	72
		Lodge Ln East	317	291	32.3	43.8		
		Hathaway Rd	122	130	62.9	97.6		
	Windsor Ave	Lodge Ln East	10	10	57.2	53.7	30	28
		Hathaway Rd	59	56	60.0	56.3		
		Lodge Ln West	11	10	63.0	56.6		
	Lodge Ln East	Hathaway Rd	70	55	42.4	37.5	148	136
		Lodge Ln West	588	579	38.7	36.4		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	Hathaway Rd	Windsor Ave	1	1	81.1	73.6		
		Lodge Ln West	136	140	76.0	76.7	94	103
		Windsor Ave	34	33	77.3	77.3		
		Lodge Ln East	68	85	78.1	75.5		
Lodge Lane / Connaught Avenue	Lodge Ln West	Connaught Ave	6	6	0.6	0.6	21	21
		Lodge Ln East	317	312	0.5	0.4		
		Bradleigh Ave	68	66	12.4	12.1		
	Connaught Ave	Lodge Ln East	45	46	4.2	3.4	7	7
		Bradleigh Ave	20	20	14.1	13.5		
		Lodge Ln West	5	5	13.3	11.6		
	Lodge Ln East	Bradleigh Ave	45	40	1.5	1.1	11	7
		Lodge Ln West	584	566	2.3	1.7		
		Connaught Ave	5	5	4.4	2.8		
	Bradleigh Ave	Lodge Ln West	95	88	9.0	8.9	9	9
		Connaught Ave	10	10	12.6	8.8		
		Lodge Ln East	7	6	14.8	11.3		
	Lodge Lane / Victoria Avenue	Lodge Ln West	Victoria Ave	9	10	0.7	0.7	6
Lodge Ln East			361	353	0.4	0.3		
Victoria Ave		Lodge Ln East	36	35	4.3	3.5	5	4
		Lodge Ln West	16	15	8.1	9.0		
Lodge Ln East		Lodge Ln West	622	598	0.4	0.4	3	2
		Victoria Ave	22	20	2.7	2.7		
Lodge Road / Southend Road	Lodge Ln West	Lodge Ln East	346	338	15.7	16.9	65	60
		Southend Road	47	48	37.8	37.7		
	Lodge Ln East	Southend Road	263	203	17.7	25.2	139	156
		Lodge Ln West	538	515	18.0	25.2		
	Southend Road	Lodge Ln West	107	105	100.4	26.9	104	69
		Lodge Ln East	261	314	127.3	40.9		
Daneholes Roundabout	A1013 Lodge Ln	Blackshots Ln	48	54	8.9	7.3	23	20
		A1013 Stanford Rd	231	226	7.6	6.2		
		B149 Wood View	275	317	7.7	6.4		
		Rectory Rd	31	31	9.3	7.4		
		A1013 Lodge Ln	18	20	8.8	7.9		
	Blackshots Ln	A1013 Stanford Rd	179	135	23.6	26.4	61	68

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
		B149 Wood View	164	215	24.1	25.7		
		Rectory Rd	37	31	26.5	28.0		
		A1013 Lodge Ln	39	33	28.9	29.9		
		Blackshots Ln	2	2	22.3	26.5		
	A1013 Stanford Rd	B149 Wood View	59	117	16.2	25.1	112	152
		Rectory Rd	125	127	17.1	25.8		
		A1013 Lodge Ln	507	427	19.4	27.2		
		Blackshots Ln	143	103	19.6	27.6		
		A1013 Stanford Rd	91	73	19.6	27.2		
	B149 Wood View	Rectory Rd	30	29	25.6	10.4	43	22
		A1013 Lodge Ln	231	208	24.5	11.9		
		Blackshots Ln	130	92	23.8	11.9		
		A1013 Stanford Rd	66	66	24.1	11.2		
		B149 Wood View	21	20	23.9	13.3		
	Rectory Rd	A1013 Lodge Ln	17	41	27.3	17.8	22	23
		Blackshots Ln	11	27	24.7	23.5		
		A1013 Stanford Rd	58	38	28.5	20.0		
		B149 Wood View	30	49	28.5	20.4		
		Rectory Rd	2	2	14.2	11.7		
	A1013 Stanford Road / King Edward Drive	A1013 Stanford Rd South	A1013 Stanford Rd North	711	657	2.8	4.0	1
A1013 Stanford Rd North		King Edward Drive	117	125	1.6	2.4	1	3
		A1013 Stanford Rd South	620	533	0.4	0.4		
King Edward Drive	A1013 Stanford Rd South	244	232	19.0	23.6	36	39	
A1013 Stanford Road / B188 Baker St / Heath Road	A1013 Stanford Rd West	B188 Baker St	16	15	3.6	3.6	5	5
		A1013 Stanford Rd East	549	462	1.8	1.8		
		Heath Rd	26	30	6.0	5.1		
	B188 Baker St	A1013 Stanford Rd East	15	14	0.3	0.3	3	4
		Heath Rd	11	10	9.8	8.0		
		A1013 Stanford Rd West	14	45	9.9	8.8		
	A1013 Stanford Rd East	Heath Rd	6	5	0.8	0.8	4	3
A1013 Stanford Rd West		736	663	1.9	1.9			

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)		
			DM	DS	DM	DS	DM	DS	
	Heath Rd	B188 Baker St	25	24	4.2	3.0	6	7	
		A1013 Stanford Rd West	71	70	3.5	3.1			
		B188 Baker St	13	25	8.1	8.6			
		A1013 Stanford Rd East	1	2	10.5	10.5			
A1013 Stanford Road / Rectory Road	A1013 Stanford Rd West	Rectory Rd	42	46	0.6	0.6	26	63	
		A1013 Stanford Rd East	515	425	2.3	1.8			
	Rectory Rd	A1013 Stanford Rd East	103	81	11.1	41.5	26	63	
		A1013 Stanford Rd West	97	161	21.4	49.2			
	A1013 Stanford Rd East	A1013 Stanford Rd West	680	538	1.2	3.2	10	26	
		Rectory Rd	91	74	3.4	3.6			
Old Dock Approach Rd / Marshfoot Rd	Old Dock Approach Rd	A126 Marshfoot Rd North	187	201	11.6	22.5	20	41	
		A1089 Dock Approach Rd (slip on)	44	201	11.5	20.1			
		A126 Marshfoot Rd South	56	89	11.2	13.5			
	A126 Marshfoot Rd North	A1089 Dock Approach Rd (slip on)	256	387	4.3	30.0	24	146	
		A126 Marshfoot Rd South	274	216	9.4	36.0			
		A126 Marshfoot Rd North	0	0	0.0	0.0			
	A1089 Dock Approach Rd (slip off)	A126 Marshfoot Rd South	165	144	2.8	2.4	5	3	
		A126 Marshfoot Rd North	29	30	6.6	6.3			
		A1089 Dock Approach Rd (slip on)	0	0	0.0	0.0			
	A126 Marshfoot Rd South	A126 Marshfoot Rd North	262	195	5.7	5.8	5	7	
		A1089 Dock Approach Rd (slip on)	260	324	3.0	3.2			
		A126 Marshfoot Rd South	0	0	0.0	0.0			
	Marshfoot Rd / Slip Road	A126 Marshfoot Rd North	A126 Marshfoot Rd South	187	162	2.3	2.6	23	22
			A126 Marshfoot Rd West	289	260	7.7	9.2		
		A126 Marshfoot Rd South	A126 Marshfoot Rd West	132	108	0.6	0.6	0	0
A126 Marshfoot Rd North			462	552	1.5	1.7			

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	A126 Marshfoot Rd West	A126 Marshfoot Rd North	72	82	25.0	19.6	40	35
		A126 Marshfoot Rd South	147	118	45.9	40.8		
Marshfoot Rd / B149 Chadwell Bypass / Chadwell Hill	B149 Chadwell Bypass	Chadwell Hill	0	0	0.0	0.0	17	20
		St. Chads Rd	156	159	8.3	7.4		
		A126 Marshfoot Rd	32	67	10.1	9.9		
		B149 Chadwell Bypass	0	0	0.0	0.0		
	Chadwell Hill	St. Chads Rd	76	69	15.7	19.5	52	60
		A126 Marshfoot Rd	333	327	13.4	16.6		
		B149 Chadwell Bypass	0	0	0.0	0.0		
		Chadwell Hill	0	0	0.0	0.0		
	St. Chads Rd	A126 Marshfoot Rd	235	269	13.8	24.0	68	99
		B149 Chadwell Bypass	245	213	13.6	23.8		
		Chadwell Hill	119	91	12.5	22.1		
		St. Chads Rd	0	0	0.0	0.0		
	A126 Marshfoot Rd	B149 Chadwell Bypass	23	24	9.9	7.9	29	19
		Chadwell Hill	151	122	8.0	6.2		
		St. Chads Rd	156	130	8.1	6.1		
		A126 Marshfoot Rd	0	0	0.0	0.0		
Chadwell Hill / Brentwood Road / Linford Road	Brentwood Rd	Linford Rd	34	77	225.2	220.0	130	281
		Chadwell Hill	106	117	229.2	221.2		
		River View	3	5	144.8	187.1		
	Linford Rd	Chadwell Hill	298	283	75.4	81.3	283	309
		River View	177	136	72.0	74.7		
		Brentwood Rd	69	78	73.4	76.0		
	Chadwell Hill	River View	6	6	118.6	152.4	115	96
		Brentwood Rd	93	65	100.7	120.7		
		Linford Rd	141	116	100.5	119.1		
	River View	Brentwood Rd	2	2	40.6	39.5	42	31
		Linford Rd	151	104	30.2	29.1		
		Chadwell Hill	4	4	46.9	57.3		
	Orsett Heath Academy/Treetops School	Orsett Heath Academy	A1013 Stanford Rd East	0	0	0.0	0.0	4
Treetops School			0	0	0.0	0.0		
A1013 Stanford Rd West			9	9	42.5	41.2		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	A1013 Stanford Rd East	Treetops School	0	0	0.0	0.0	39	36
		A1013 Stanford Rd West	815	770	9.6	9.3		
		Orsett Heath Academy	0	0	0.0	0.0		
	Treetops School	A1013 Stanford Rd West	9	9	39.7	38.3	4	4
		Orsett Heath Academy	0	0	0.0	0.0		
		A1013 Stanford Rd East	0	0	0.0	0.0		
	A1013 Stanford Rd West	Orsett Heath Academy	9	9	8.3	7.1	34	29
		A1013 Stanford Rd East	596	510	9.1	8.5		
		Treetops School	9	9	43.1	41.6		

Table C.2 2030 08:00 – 09:00 Junction Results

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
A13 / A1012 / Stifford Clays Rd / High Rd	A13 West (slip off)	High Rd	22	23	10.5	10.5	27	30
		A13 East (slip on)	0	0	0.0	0.0		
		Stifford Clays Rd	197	183	17.2	23.9		
		A1012	426	473	37.6	47.6		
		A13 West (slip on)	0	0	0.0	0.0		
	High Rd	A13 East (slip on)	249	241	49.3	64.6	96	146
		Stifford Clays Rd	111	109	42.9	68.1		
		A1012	119	115	65.9	96.7		
		A13 West (slip on)	17	16	49.9	79.6		
		High Rd	0	0	0.0	0.0		
	A13 East (slip off)	Stifford Clays Rd	6	36	13.7	44.2	27	96
		A1012	338	349	38.1	79.1		
		A13 West (slip on)	0	0	0.0	0.0		
		High Rd	223	210	21.9	59.2		
		A13 East (slip on)	0	0	16.9	5.3		
	Stifford Clays Rd	A1012	216	127	91.9	96.2	119	111
		A13 West (slip on)	83	136	79.2	92.1		
		High Rd	93	77	69.4	93.1		
		A13 East (slip on)	26	38	74.3	90.9		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
		Stifford Clays Rd	0	0	0.0	0.0		
	A1012	A13 West (slip on)	429	638	9.0	38.0	39	230
		High Rd	93	89	7.4	36.5		
		A13 East (slip on)	639	612	12.3	43.1		
		Stifford Clays Rd	50	51	12.2	40.8		
		A1012	0	0	0.0	0.0		
Treacle Mine Roundabout	Arterial Rd North Stifford	A1012 North	311	283	14.4	85.2	505	506
		Long Ln	120	74	101.4	131.4		
		Lodge Ln	355	302	135.4	181.2		
		A1012 Elizabeth Rd	203	170	146.9	174.5		
		Arterial Rd North Stifford	0	0	151.3	129.4		
	A1012 North	Long Ln	33	33	80.7	83.3	287	281
		Lodge Ln	303	322	93.2	111.1		
		A1012 Elizabeth Rd	465	442	119.0	113.0		
		Arterial Rd North Stifford	251	214	116.6	113.2		
		A1012 North	0	0	0.0	0.0		
	Long Ln	Lodge Ln	12	10	165.7	161.1	269	230
		A1012 Elizabeth Rd	122	116	189.3	190.5		
		Arterial Rd North Stifford	204	157	189.5	186.4		
		A1012 North	81	86	205.1	220.1		
		Long Ln	0	0	0.0	0.0		
	Lodge Ln	A1012 Elizabeth Rd	182	151	54.1	60.6	249	435
		Arterial Rd North Stifford	452	414	69.2	76.3		
		A1012 North	274	354	83.6	120.0		
		Long Ln	9	8	101.4	124.0		
		Lodge Ln	0	0	0.0	0.0		
A1012 Elizabeth Rd	Arterial Rd North Stifford	270	193	53.3	65.2	354	355	
	A1012 North	533	624	55.6	93.5			
	Long Ln	178	135	85.4	103.9			
	Lodge Ln	57	48	121.1	158.8			
	A1012 Elizabeth Rd	0	0	110.3	192.4			
Lodge Lane / Nutberry Avenue	Lodge Ln West	Nutberry Ave	34	31	2.0	26.7	0	0
		Lodge Ln East	690	619	3.2	32.3		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	Nutberry Ave	Lodge Ln East	7	3	89.8	611.6	15	41
		Lodge Ln West	39	18	112.7	1241.3		
	Lodge Ln East	Lodge Ln West	864	887	5.4	16.8	56	209
		Nutberry Ave	3	3	23.3	240.1		
Lodge Lane / Hathaway Road	Lodge Ln West	Windsor Ave	1	0	65.7	123.9	177	396
		Lodge Ln East	536	450	57.3	106.5		
		Hathaway Rd	147	136	92.9	188.2		
	Windsor Ave	Lodge Ln East	16	19	183.8	83.5	95	61
		Hathaway Rd	128	145	192.9	79.3		
		Lodge Ln West	19	20	192.7	81.6		
	Lodge Ln East	Hathaway Rd	96	69	65.2	70.6	300	388
		Lodge Ln West	695	708	62.0	70.0		
		Windsor Ave	4	3	83.1	85.9		
	Hathaway Rd	Lodge Ln West	146	145	166.0	164.7	327	328
		Windsor Ave	80	77	167.2	163.4		
		Lodge Ln East	80	96	163.2	164.7		
Lodge Lane / Connaught Avenue	Lodge Ln West	Connaught Ave	3	2	0.9	1.3	41	56
		Lodge Ln East	520	478	1.3	3.1		
		Bradleigh Ave	110	80	38.1	93.3		
	Connaught Ave	Lodge Ln East	53	56	35.2	93.3	19	33
		Bradleigh Ave	38	37	58.4	146.2		
		Lodge Ln West	1	1	115.0	175.1		
	Lodge Ln East	Bradleigh Ave	37	38	4.3	9.2	43	91
		Lodge Ln West	630	646	7.3	15.2		
		Connaught Ave	31	27	7.2	9.1		
	Bradleigh Ave	Lodge Ln West	157	134	36.4	94.6	32	48
Connaught Ave		33	31	45.5	112.3			
Lodge Ln East		10	11	42.2	106.6			
Lodge Lane / Victoria Avenue	Lodge Ln West	Victoria Ave	12	9	0.8	1.0	10	9
		Lodge Ln East	571	537	0.8	1.1		
	Victoria Ave	Lodge Ln East	49	48	8.8	9.2	9	9
		Lodge Ln West	23	22	16.9	17.5		
			Lodge Ln West	671	691	0.6	1.7	8

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	Lodge Ln East	Victoria Ave	51	40	6.4	6.3		
Lodge Road / Southend Road	Lodge Ln West	Lodge Ln East	516	498	16.5	16.8	109	105
		Southend Road	103	86	40.9	40.0		
	Lodge Ln East	Southend Road	275	322	16.5	16.7	121	132
		Lodge Ln West	564	571	16.5	17.8		
	Southend Road	Lodge Ln West	158	158	251.0	114.8	181	137
		Lodge Ln East	292	333	258.6	153.5		
Daneholes Roundabout	A1013 Lodge Ln	Blackshots Ln	49	59	24.8	16.7	58	48
		A1013 Stanford Rd	358	347	21.8	15.7		
		B149 Wood View	253	285	18.0	13.5		
		Rectory Rd	127	120	22.8	17.9		
		A1013 Lodge Ln	17	18	16.0	13.2		
	Blackshots Ln	A1013 Stanford Rd	165	147	90.3	96.8	225	246
		B149 Wood View	213	232	91.5	97.0		
		Rectory Rd	58	49	96.0	99.6		
		A1013 Lodge Ln	27	21	101.2	108.7		
		Blackshots Ln	0	0	56.1	70.2		
	A1013 Stanford Rd	B149 Wood View	129	192	27.7	37.6	320	414
		Rectory Rd	191	193	29.1	39.4		
		A1013 Lodge Ln	542	517	30.6	40.4		
		Blackshots Ln	306	221	31.8	40.9		
		A1013 Stanford Rd	89	73	30.8	40.8		
	B149 Wood View	Rectory Rd	28	39	131.3	90.6	469	376
		A1013 Lodge Ln	227	289	132.3	92.8		
		Blackshots Ln	132	132	132.1	94.4		
		A1013 Stanford Rd	189	211	147.6	106.1		
		B149 Wood View	25	25	143.7	104.9		
	Rectory Rd	A1013 Lodge Ln	23	47	27.6	32.2	29	36
		Blackshots Ln	20	52	29.3	36.3		
		A1013 Stanford Rd	106	87	29.9	35.0		
		B149 Wood View	7	12	29.9	38.1		
Rectory Rd		0	0	0.0	0.0			

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
A1013 Stanford Road / King Edward Drive	A1013 Stanford Rd South	A1013 Stanford Rd North	1032	959	6.0	9.4	1	3
	A1013 Stanford Rd North	King Edward Drive	244	227	3.5	5.6	1	3
		A1013 Stanford Rd South	903	863	1.2	0.9		
King Edward Drive	A1013 Stanford Rd South	218	226	64.2	140.6	56	93	
A1013 Stanford Road / B188 Baker St / Heath Road	A1013 Stanford Rd West	B188 Baker St	35	36	1.5	1.6	9	8
		A1013 Stanford Rd East	538	485	1.9	1.9		
		Heath Rd	65	70	9.6	7.0		
	B188 Baker St	A1013 Stanford Rd East	13	12	2.4	1.4	10	13
		Heath Rd	54	48	16.1	13.3		
		A1013 Stanford Rd West	45	84	20.8	12.7		
	A1013 Stanford Rd East	Heath Rd	23	17	1.6	1.2	8	4
		A1013 Stanford Rd West	920	784	3.2	2.3		
		B188 Baker St	37	36	4.9	4.2		
	Heath Rd	A1013 Stanford Rd West	117	117	8.2	3.8	9	8
		B188 Baker St	11	20	15.8	11.9		
		A1013 Stanford Rd East	1	3	21.0	10.3		
A1013 Stanford Road / Rectory Road	A1013 Stanford Rd West	Rectory Rd	50	56	0.8	0.6	56	276
		A1013 Stanford Rd East	501	445	2.8	2.1		
	Rectory Rd	A1013 Stanford Rd East	173	125	27.1	200.6	55	276
		A1013 Stanford Rd West	126	165	49.1	213.5		
	A1013 Stanford Rd East	A1013 Stanford Rd West	851	672	2.0	6.5	28	60
Rectory Rd	192	158	5.4	6.0				
Old Dock Approach Rd / Marshfoot Rd	Old Dock Approach Rd	A126 Marshfoot Rd North	180	175	7.3	11.1	15	27
		A1089 Dock Approach Rd (slip on)	56	193	7.3	10.0		
		A126 Marshfoot Rd South	73	117	8.2	10.0		
	A126 Marshfoot Rd North	A1089 Dock Approach Rd (slip on)	288	451	5.2	54.3	34	455
		A126 Marshfoot Rd South	437	406	10.5	59.3		
		A126 Marshfoot Rd North	0	0	0.0	0.0		
	A1089 Dock	A126 Marshfoot Rd South	245	217	5.3	5.1	13	11
		A126 Marshfoot Rd North	37	39	8.1	8.2		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	Approach Rd (slip off)	A1089 Dock Approach Rd (slip on)	0	0	0.0	0.0		
	A126 Marshfoot Rd South	A126 Marshfoot Rd North	252	198	5.0	5.0	3	2
		A1089 Dock Approach Rd (slip on)	227	285	2.5	2.7		
		A126 Marshfoot Rd South	0	0	0.0	0.0		
Marshfoot Rd / Slip Road	A126 Marshfoot Rd North	A126 Marshfoot Rd South	251	225	1.5	2.9	19	24
		A126 Marshfoot Rd West	221	188	7.6	14.2		
	A126 Marshfoot Rd South	A126 Marshfoot Rd West	164	134	0.5	10.0	0	0
		A126 Marshfoot Rd North	572	709	1.7	17.3		
	A126 Marshfoot Rd West	A126 Marshfoot Rd North	153	152	17.1	110.4	51	161
		A126 Marshfoot Rd South	116	87	37.6	103.8		
Marshfoot Rd / B149 Chadwell Bypass / Chadwell Hill	B149 Chadwell Bypass	Chadwell Hill	0	0	0.0	0.0	27	34
		St. Chads Rd	153	149	26.0	30.4		
		A126 Marshfoot Rd	54	84	27.6	33.5		
		B149 Chadwell Bypass	0	0	0.0	0.0		
	Chadwell Hill	St. Chads Rd	42	39	13.4	19.7	46	59
		A126 Marshfoot Rd	339	392	13.4	18.4		
		B149 Chadwell Bypass	0	0	0.0	0.0		
		Chadwell Hill	0	0	0.0	0.0		
	St. Chads Rd	A126 Marshfoot Rd	340	375	16.0	37.8	81	155
		B149 Chadwell Bypass	247	214	16.3	38.8		
		Chadwell Hill	86	77	25.1	54.4		
		St. Chads Rd	0	0	0.0	0.0		
	A126 Marshfoot Rd	B149 Chadwell Bypass	22	21	20.4	23.1	45	38
		Chadwell Hill	142	125	27.5	36.9		
		St. Chads Rd	199	158	17.5	19.8		
		A126 Marshfoot Rd	0	0	0.0	0.0		
Chadwell Hill / Brentwood Road / Linford Road	Brentwood Rd	Linford Rd	42	93	439.8	253.4	370	498
		Chadwell Hill	89	106	434.7	255.5		
		River View	5	7	328.4	219.1		
	Linford Rd	Chadwell Hill	285	317	88.9	90.3	412	412
		River View	215	158	86.6	84.8		
		Brentwood Rd	82	89	91.2	85.7		
			River View	5	4	215.0	286.2	384

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	Chadwell Hill	Brentwood Rd	106	84	195.4	266.6		
		Linford Rd	121	98	194.3	266.4		
	River View	Brentwood Rd	3	3	27.7	46.5	38	33
		Linford Rd	148	106	28.8	29.7		
		Chadwell Hill	8	6	39.3	34.9		
Orsett Heath Academy/Treetops School	Orsett Heath Academy	A1013 Stanford Rd East	55	55	60.7	63.4	77	80
		Treetops School	0	0	0.0	0.0		
		A1013 Stanford Rd West	280	278	65.2	70.3		
	A1013 Stanford Rd East	Treetops School	68	62	27.1	24.7	235	137
		A1013 Stanford Rd West	938	851	34.8	32.0		
		Orsett Heath Academy	72	71	57.4	57.0		
	Treetops School	A1013 Stanford Rd West	58	58	48.9	50.2	20	20
		Orsett Heath Academy	0	0	0.0	0.0		
		A1013 Stanford Rd East	14	14	48.0	48.9		
	A1013 Stanford Rd West	Orsett Heath Academy	225	230	30.8	29.3	148	123
		A1013 Stanford Rd East	566	520	32.7	30.3		
		Treetops School	96	95	86.2	86.7		

Table C.3 2030 17:00 – 18:00 Junction Results

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
A13 / A1012 / Stifford Clays Rd / High Rd	A13 West (slip off)	High Rd	21	21	40.5	69.9	94	217
		A13 East (slip on)	0	0	0.0	0.0		
		Stifford Clays Rd	289	318	57.4	93.7		
		A1012	492	631	76.7	109.1		
		A13 West (slip on)	0	0	0.0	0.0		
	High Rd	A13 East (slip on)	141	130	226.4	250.9	505	506
		Stifford Clays Rd	102	94	215.1	243.0		
		A1012	102	96	242.8	266.4		
		A13 West (slip on)	4	4	217.3	243.3		
		High Rd	0	0	0.0	0.0		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	A13 East (slip off)	Stifford Clays Rd	38	36	85.5	139.1	152	286
		A1012	456	489	109.8	158.4		
		A13 West (slip on)	0	0	0.0	0.0		
		High Rd	193	182	96.7	148.0		
		A13 East (slip on)	4	4	95.6	154.9		
	Stifford Clays Rd	A1012	72	75	122.0	63.4	99	64
		A13 West (slip on)	137	115	102.0	53.9		
		High Rd	80	83	107.8	59.4		
		A13 East (slip on)	9	16	116.0	66.4		
		Stifford Clays Rd	0	0	0.0	0.0		
	A1012	A13 West (slip on)	453	438	13.3	8.8	67	43
		High Rd	117	115	12.0	7.7		
		A13 East (slip on)	741	682	18.8	14.9		
		Stifford Clays Rd	134	123	18.7	14.7		
		A1012	0	0	0.0	0.0		
Treacle Mine Roundabout	Arterial Rd North Stifford	A1012 North	511	432	17.3	17.5	363	438
		Long Ln	142	117	102.5	150.4		
		Lodge Ln	395	325	132.8	183.8		
		A1012 Elizabeth Rd	150	122	136.0	192.2		
		Arterial Rd North Stifford	2	2	129.8	183.5		
	A1012 North	Long Ln	51	49	78.8	68.8	291	298
		Lodge Ln	258	311	83.8	81.3		
		A1012 Elizabeth Rd	544	628	101.9	103.4		
		Arterial Rd North Stifford	256	288	97.4	92.7		
		A1012 North	0	0	0.0	0.0		
	Long Ln	Lodge Ln	6	9	263.2	341.6	283	282
		A1012 Elizabeth Rd	103	94	295.7	355.3		
		Arterial Rd North Stifford	146	102	305.4	365.9		
		A1012 North	33	34	332.2	385.7		
		Long Ln	0	0	0.0	0.0		
	Lodge Ln	A1012 Elizabeth Rd	135	156	72.8	69.2	385	306
		Arterial Rd North Stifford	448	433	102.1	97.4		
		A1012 North	251	243	143.2	138.6		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
		Long Ln	29	31	173.8	188.4		
		Lodge Ln	0	0	0.0	0.0		
	A1012 Elizabeth Rd	Arterial Rd North Stifford	276	290	44.2	44.6	342	348
		A1012 North	657	653	60.5	60.9		
		Long Ln	141	133	88.5	107.6		
		Lodge Ln	144	141	121.2	146.6		
		A1012 Elizabeth Rd	6	7	124.9	156.7		
Lodge Lane / Nutberry Avenue	Lodge Ln West	Nutberry Ave	16	48	6.7	12.5	28	88
		Lodge Ln East	782	731	6.9	14.5		
	Nutberry Ave	Lodge Ln East	2	4	205.4	257.0	24	22
		Lodge Ln West	15	23	341.4	431.8		
	Lodge Ln East	Lodge Ln West	858	853	17.2	8.1	176	73
		Nutberry Ave	5	5	70.4	218.2		
Lodge Lane / Hathaway Road	Lodge Ln West	Windsor Ave	4	3	52.0	61.2	303	355
		Lodge Ln East	653	581	58.4	70.0		
		Hathaway Rd	127	146	101.4	128.9		
	Windsor Ave	Lodge Ln East	17	17	62.3	61.3	36	33
		Hathaway Rd	67	63	61.0	61.3		
		Lodge Ln West	15	15	58.5	62.9		
	Lodge Ln East	Hathaway Rd	95	58	49.3	42.3	181	130
		Lodge Ln West	681	673	47.8	38.7		
		Windsor Ave	12	11	62.9	60.7		
	Hathaway Rd	Lodge Ln West	187	182	154.0	145.9	293	266
		Windsor Ave	78	78	153.1	146.0		
		Lodge Ln East	77	92	149.5	145.1		
Lodge Lane / Connaught Avenue	Lodge Ln West	Connaught Ave	8	9	0.7	0.6	30	29
		Lodge Ln East	618	565	0.6	0.5		
		Bradleigh Ave	118	114	14.4	11.7		
	Connaught Ave	Lodge Ln East	38	41	8.0	6.6	10	9
		Bradleigh Ave	34	33	21.1	17.8		
		Lodge Ln West	2	2	34.2	23.7		
	Lodge Ln East	Bradleigh Ave	12	10	0.8	0.4	13	8
		Lodge Ln West	667	615	1.1	0.6		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	Bradleigh Ave	Connaught Ave	43	35	9.6	8.6		
		Lodge Ln West	133	129	8.5	6.3	15	12
		Connaught Ave	20	20	23.6	17.6		
		Lodge Ln East	8	9	20.5	15.3		
Lodge Lane / Victoria Avenue	Lodge Ln West	Victoria Ave	8	8	1.4	1.1	9	8
		Lodge Ln East	656	606	2.6	1.3		
	Victoria Ave	Lodge Ln East	44	42	12.5	9.0	8	7
		Lodge Ln West	14	13	17.5	14.2		
	Lodge Ln East	Lodge Ln West	709	647	0.3	0.3	7	4
		Victoria Ave	44	28	10.2	7.2		
Lodge Road / Southend Road	Lodge Ln West	Lodge Ln East	555	513	27.1	24.9	158	135
		Southend Road	145	133	51.0	48.6		
	Lodge Ln East	Southend Road	220	231	27.4	24.2	171	135
		Lodge Ln West	634	561	28.4	24.7		
	Southend Road	Lodge Ln West	118	115	114.3	76.2	151	134
		Lodge Ln East	508	513	131.5	103.8		
Daneholes Roundabout	A1013 Lodge Ln	Blackshots Ln	131	121	26.5	15.9	75	55
		A1013 Stanford Rd	521	482	22.9	13.9		
		B149 Wood View	347	363	18.0	11.7		
		Rectory Rd	38	35	20.5	13.1		
		A1013 Lodge Ln	23	24	18.1	11.4		
	Blackshots Ln	A1013 Stanford Rd	165	142	125.2	117.8	330	321
		B149 Wood View	159	204	126.9	120.5		
		Rectory Rd	57	50	127.8	120.7		
		A1013 Lodge Ln	59	58	131.6	121.6		
		Blackshots Ln	0	0	0.0	0.0		
	A1013 Stanford Rd	B149 Wood View	94	194	23.4	38.2	112	213
		Rectory Rd	144	145	24.7	38.3		
		A1013 Lodge Ln	496	429	26.9	40.3		
		Blackshots Ln	209	182	28.0	41.5		
		A1013 Stanford Rd	22	14	27.7	41.3		
	B149 Wood View	Rectory Rd	40	40	23.1	13.7	44	31
		A1013 Lodge Ln	230	218	22.8	13.7		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
		Blackshots Ln	179	133	24.5	14.9		
		A1013 Stanford Rd	140	139	24.3	14.0		
		B149 Wood View	34	28	23.9	15.3		
	Rectory Rd	A1013 Lodge Ln	49	63	35.6	18.2	40	29
		Blackshots Ln	35	21	35.7	18.0		
		A1013 Stanford Rd	84	64	36.3	18.8		
		B149 Wood View	53	83	37.9	20.7		
Rectory Rd	0	0	0.0	0.0				
A1013 Stanford Road / King Edward Drive	A1013 Stanford Rd South	A1013 Stanford Rd North	867	804	2.0	3.9	0	4
	A1013 Stanford Rd North	King Edward Drive	131	142	1.2	2.3	0	4
		A1013 Stanford Rd South	933	841	0.6	0.5		
	King Edward Drive	A1013 Stanford Rd South	112	181	7.1	20.7	14	27
A1013 Stanford Road / B188 Baker St / Heath Road	A1013 Stanford Rd West	B188 Baker St	51	52	2.8	2.7	17	16
		A1013 Stanford Rd East	814	724	2.8	2.7		
		Heath Rd	128	123	8.7	8.7		
	B188 Baker St	A1013 Stanford Rd East	40	40	1.8	1.2	14	10
		Heath Rd	45	37	16.9	13.9		
		A1013 Stanford Rd West	39	39	19.1	15.3		
	A1013 Stanford Rd East	Heath Rd	42	49	1.0	1.1	5	5
		A1013 Stanford Rd West	782	734	2.2	2.2		
		B188 Baker St	27	26	6.2	5.5		
	Heath Rd	A1013 Stanford Rd West	47	46	3.7	3.9	7	8
B188 Baker St		6	6	20.1	19.2			
A1013 Stanford Rd East		19	30	18.0	19.9			
A1013 Stanford Road / Rectory Road	A1013 Stanford Rd West	Rectory Rd	134	147	1.2	1.2	104	305
		A1013 Stanford Rd East	737	649	3.6	3.5		
	Rectory Rd	A1013 Stanford Rd East	176	97	70.4	292.2	103	304
		A1013 Stanford Rd West	153	96	89.8	312.9		
	A1013 Stanford Rd East	A1013 Stanford Rd West	705	717	1.6	10.0	17	92
		Rectory Rd	106	90	9.2	13.4		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
Old Dock Approach Rd / Marshfoot Rd	Old Dock Approach Rd	A126 Marshfoot Rd North	160	169	16.3	36.2	21	56
		A1089 Dock Approach Rd (slip on)	36	260	14.2	32.9		
		A126 Marshfoot Rd South	60	68	14.8	22.3		
	A126 Marshfoot Rd North	A1089 Dock Approach Rd (slip on)	133	266	4.0	24.8	22	92
		A126 Marshfoot Rd South	340	310	8.9	29.6		
		A126 Marshfoot Rd North	0	0	0.0	0.0		
	A1089 Dock Approach Rd (slip off)	A126 Marshfoot Rd South	349	309	4.5	3.8	16	12
		A126 Marshfoot Rd North	116	115	8.2	7.7		
		A1089 Dock Approach Rd (slip on)	0	0	0.0	0.0		
	A126 Marshfoot Rd South	A126 Marshfoot Rd North	360	294	6.9	7.1	13	18
		A1089 Dock Approach Rd (slip on)	180	286	4.0	4.5		
		A126 Marshfoot Rd South	0	0	0.0	0.0		
Marshfoot Rd / Slip Road	A126 Marshfoot Rd North	A126 Marshfoot Rd South	483	439	1.5	1.4	13	12
		A126 Marshfoot Rd West	153	138	2.9	3.3		
	A126 Marshfoot Rd South	A126 Marshfoot Rd West	82	78	0.6	0.5	0	0
		A126 Marshfoot Rd North	299	395	1.2	1.2		
	A126 Marshfoot Rd West	A126 Marshfoot Rd North	173	177	12.7	10.4	51	40
		A126 Marshfoot Rd South	210	206	28.3	23.3		
Marshfoot Rd / B149 Chadwell Bypass / Chadwell Hill	B149 Chadwell Bypass	Chadwell Hill	0	0	0.0	0.0	29	40
		St. Chads Rd	119	127	51.7	73.6		
		A126 Marshfoot Rd	18	37	51.4	69.7		
		B149 Chadwell Bypass	0	0	0.0	0.0		
	Chadwell Hill	St. Chads Rd	143	150	14.2	16.0	48	52
		A126 Marshfoot Rd	167	206	15.7	16.6		
		B149 Chadwell Bypass	4	3	28.8	28.9		
		Chadwell Hill	3	2	43.8	47.5		
	St. Chads Rd	A126 Marshfoot Rd	195	229	6.2	7.5	27	30
		B149 Chadwell Bypass	174	162	8.1	9.2		
		Chadwell Hill	104	95	28.8	30.2		
		St. Chads Rd	0	0	0.0	0.0		
	A126 Marshfoot Rd	B149 Chadwell Bypass	29	24	33.6	34.6	172	138
		Chadwell Hill	259	250	51.9	52.3		
		St. Chads Rd	364	335	35.4	33.8		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
		A126 Marshfoot Rd	0	0	0.0	0.0		
Chadwell Hill / Brentwood Road / Linford Road	Brentwood Rd	Linford Rd	67	134	222.7	177.5	144	442
		Chadwell Hill	151	170	223.0	177.2		
		River View	2	2	178.9	176.7		
	Linford Rd	Chadwell Hill	170	195	85.2	158.5	112	359
		River View	181	119	83.1	158.1		
		Brentwood Rd	48	53	91.5	161.9		
	Chadwell Hill	River View	3	3	157.8	184.9	416	436
		Brentwood Rd	113	103	147.9	173.3		
		Linford Rd	223	209	147.6	172.3		
	River View	Brentwood Rd	2	2	18.9	10.1	89	55
		Linford Rd	309	216	65.1	51.3		
		Chadwell Hill	2	2	61.4	62.4		
Orsett Heath Academy/Treetops School	Orsett Heath Academy	A1013 Stanford Rd East	2	2	47.0	46.7	2	2
		Treetops School	0	0	0.0	0.0		
		A1013 Stanford Rd West	2	2	41.4	42.1		
	A1013 Stanford Rd East	Treetops School	0	0	0.0	0.0	42	42
		A1013 Stanford Rd West	865	815	10.2	10.6		
		Orsett Heath Academy	0	0	0.0	0.0		
	Treetops School	A1013 Stanford Rd West	134	134	41.3	41.4	38	38
		Orsett Heath Academy	0	0	0.0	0.0		
		A1013 Stanford Rd East	60	59	41.6	41.1		
	A1013 Stanford Rd West	Orsett Heath Academy	0	0	0.0	0.0	57	46
		A1013 Stanford Rd East	932	841	11.7	10.7		
		Treetops School	0	0	0.0	0.0		

Table C.4 2045 07:00 – 08:00 Junction Results

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	A13 West (slip off)	High Rd	24	24	8.8	5.2	16	12
		A13 East (slip on)	0	0	0.0	0.0		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
A13 / A1012 / Stifford Clays Rd / High Rd		Stifford Clays Rd	104	121	14.1	7.8		
		A1012	237	265	14.0	7.9		
		A13 West (slip on)	0	0	0.0	0.0		
	High Rd	A13 East (slip on)	199	217	48.5	14.5	70	20
		Stifford Clays Rd	46	51	48.8	11.8		
		A1012	68	74	46.8	12.9		
		A13 West (slip on)	9	9	46.0	13.6		
		High Rd	0	0	0.0	0.0		
	A13 East (slip off)	Stifford Clays Rd	2	18	3.4	2.4	9	10
		A1012	319	318	2.8	3.0		
		A13 West (slip on)	0	0	0.0	0.0		
		High Rd	216	217	4.0	4.0		
		A13 East (slip on)	1	1	12.9	7.5		
	Stifford Clays Rd	A1012	188	101	4.4	6.0	20	29
		A13 West (slip on)	41	275	4.3	6.0		
		High Rd	73	76	5.1	6.6		
		A13 East (slip on)	66	67	10.7	9.3		
		Stifford Clays Rd	0	0	0.0	0.0		
	A1012	A13 West (slip on)	368	564	8.9	56.5	43	285
		High Rd	92	78	7.5	49.5		
A13 East (slip on)		736	603	13.1	51.7			
Stifford Clays Rd		47	13	10.9	49.6			
A1012		0	0	0.0	0.0			
Treacle Mine Roundabout	Arterial Rd North Stifford	A1012 North	376	333	17.5	88.0	158	237
		Long Ln	136	88	47.6	104.7		
		Lodge Ln	266	233	75.7	132.8		
		A1012 Elizabeth Rd	153	141	78.8	137.9		
		Arterial Rd North Stifford	0	0	74.2	150.6		
	A1012 North	Long Ln	23	24	22.5	16.2	63	51
		Lodge Ln	157	192	28.8	22.5		
		A1012 Elizabeth Rd	328	348	37.4	31.5		
		Arterial Rd North Stifford	288	185	43.0	32.3		
		A1012 North	0	0	0.0	0.0		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	Long Ln	Lodge Ln	20	22	44.1	23.1	114	62
		A1012 Elizabeth Rd	129	118	54.1	37.1		
		Arterial Rd North Stifford	309	208	75.5	56.4		
		A1012 North	56	55	90.7	109.7		
		Long Ln	0	0	0.0	0.0		
	Lodge Ln	A1012 Elizabeth Rd	113	96	55.6	53.8	209	277
		Arterial Rd North Stifford	412	334	84.8	85.2		
		A1012 North	189	275	115.7	142.6		
		Long Ln	10	10	134.4	121.5		
		Lodge Ln	0	1	154.5	170.1		
	A1012 Elizabeth Rd	Arterial Rd North Stifford	293	212	36.6	50.5	216	228
		A1012 North	633	639	40.5	83.2		
		Long Ln	110	76	49.3	64.3		
		Lodge Ln	42	28	80.4	97.8		
		A1012 Elizabeth Rd	3	3	72.7	105.4		
Lodge Lane / Nutberry Avenue	Lodge Ln West	Nutberry Ave	16	18	0.5	0.6	0	0
		Lodge Ln East	467	457	0.9	0.8		
	Nutberry Ave	Lodge Ln East	7	6	6.5	25.7	13	18
		Lodge Ln West	38	53	19.4	35.8		
	Lodge Ln East	Lodge Ln West	720	709	6.3	10.5	60	107
Nutberry Ave		5	10	8.1	12.7			
Lodge Lane / Hathaway Road	Lodge Ln West	Windsor Ave	4	2	36.3	36.8	71	84
		Lodge Ln East	315	278	36.5	47.9		
		Hathaway Rd	143	171	70.5	90.4		
	Windsor Ave	Lodge Ln East	10	9	142.6	116.2	42	38
		Hathaway Rd	58	58	133.0	121.2		
		Lodge Ln West	12	11	140.9	130.6		
	Lodge Ln East	Hathaway Rd	64	32	40.0	35.3	138	124
		Lodge Ln West	595	580	38.7	39.3		
		Windsor Ave	1	1	54.7	67.3		
	Hathaway Rd	Lodge Ln West	141	155	90.6	94.1	130	138
		Windsor Ave	37	35	90.8	93.7		
		Lodge Ln East	66	84	88.1	90.1		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
Lodge Lane / Connaught Avenue	Lodge Ln West	Connaught Ave	5	4	0.7	0.7	21	20
		Lodge Ln East	312	299	0.5	0.4		
		Bradleigh Ave	70	67	11.9	10.0		
	Connaught Ave	Lodge Ln East	59	51	4.6	3.3	8	6
		Bradleigh Ave	21	20	14.5	12.4		
		Lodge Ln West	5	4	13.5	8.5		
	Lodge Ln East	Bradleigh Ave	38	34	0.8	0.7	7	3
		Lodge Ln West	578	535	1.5	1.1		
		Connaught Ave	10	5	4.6	3.1		
	Bradleigh Ave	Lodge Ln West	100	95	7.1	6.2	9	8
		Connaught Ave	10	10	12.9	9.5		
		Lodge Ln East	7	7	11.4	11.1		
Lodge Lane / Victoria Avenue	Lodge Ln West	Victoria Ave	11	10	0.8	0.7	6	5
		Lodge Ln East	367	346	0.4	0.3		
	Victoria Ave	Lodge Ln East	39	39	4.4	3.2	5	5
		Lodge Ln West	17	17	9.3	8.2		
	Lodge Ln East	Lodge Ln West	611	558	0.3	0.3	3	2
Victoria Ave	23	20	3.1	3.2				
Lodge Road / Southend Road	Lodge Ln West	Lodge Ln East	348	336	16.1	17.5	72	65
		Southend Road	56	48	38.3	36.8		
	Lodge Ln East	Southend Road	288	215	17.7	21.9	131	128
		Lodge Ln West	515	448	17.1	22.0		
	Southend Road	Lodge Ln West	119	130	129.4	58.6	117	98
		Lodge Ln East	288	356	146.6	78.9		
Daneholes Roundabout	A1013 Lodge Ln	Blackshots Ln	53	65	9.5	7.2	25	20
		A1013 Stanford Rd	205	215	8.4	6.9		
		B149 Wood View	326	356	8.7	7.1		
		Rectory Rd	31	33	10.2	7.7		
		A1013 Lodge Ln	17	20	10.1	7.7		
	Blackshots Ln	A1013 Stanford Rd	182	138	39.9	44.9	103	121
		B149 Wood View	181	229	40.7	44.8		
		Rectory Rd	40	38	42.8	47.2		
A1013 Lodge Ln		41	36	44.3	46.3			

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
		Blackshots Ln	2	2	30.6	48.3		
	A1013 Stanford Rd	B149 Wood View	53	136	25.9	41.6	186	236
		Rectory Rd	128	130	29.2	46.1		
		A1013 Lodge Ln	498	380	30.7	45.3		
		Blackshots Ln	135	94	30.2	45.7		
		A1013 Stanford Rd	88	55	29.0	38.3		
	B149 Wood View	Rectory Rd	28	29	31.8	9.3	63	23
		A1013 Lodge Ln	248	207	30.8	10.2		
		Blackshots Ln	179	115	31.3	11.1		
		A1013 Stanford Rd	67	64	30.0	9.8		
		B149 Wood View	20	19	29.9	10.5		
	Rectory Rd	A1013 Lodge Ln	10	25	46.9	15.8	38	26
		Blackshots Ln	6	24	41.1	17.1		
		A1013 Stanford Rd	75	40	52.9	17.0		
		B149 Wood View	65	111	57.5	19.4		
		Rectory Rd	2	2	18.5	12.4		
	A1013 Stanford Road / King Edward Drive	A1013 Stanford Rd South	A1013 Stanford Rd North	734	682	6.0	11.9	9
A1013 Stanford Rd North		King Edward Drive	125	127	3.6	7.9	9	43
		A1013 Stanford Rd South	614	509	0.4	0.4		
King Edward Drive		A1013 Stanford Rd South	208	164	40.1	50.7	50	55
A1013 Stanford Road / B188 Baker St / Heath Road	A1013 Stanford Rd West	B188 Baker St	14	14	3.7	3.6	5	7
		A1013 Stanford Rd East	548	430	1.8	1.7		
		Heath Rd	28	48	6.2	5.9		
	B188 Baker St	A1013 Stanford Rd East	17	14	0.5	0.4	4	6
		Heath Rd	20	21	10.6	9.2		
		A1013 Stanford Rd West	13	46	12.3	9.3		
	A1013 Stanford Rd East	Heath Rd	7	4	0.9	1.1	5	4
		A1013 Stanford Rd West	777	716	2.1	2.0		
		B188 Baker St	38	25	4.3	3.3		
Heath Rd	A1013 Stanford Rd West	70	69	4.1	3.9	7	7	

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
		B188 Baker St	4	13	11.2	9.2		
		A1013 Stanford Rd East	24	3	9.8	6.2		
A1013 Stanford Road / Rectory Road	A1013 Stanford Rd West	Rectory Rd	75	69	0.7	0.8	37	69
		A1013 Stanford Rd East	505	374	2.5	1.9		
	Rectory Rd	A1013 Stanford Rd East	134	51	17.2	47.1	36	69
		A1013 Stanford Rd West	101	177	31.6	56.7		
	A1013 Stanford Rd East	A1013 Stanford Rd West	732	577	1.3	3.5	13	30
		Rectory Rd	91	70	4.5	3.8		
Old Dock Approach Rd / Marshfoot Rd	Old Dock Approach Rd	A126 Marshfoot Rd North	270	268	22.8	52.8	37	75
		A1089 Dock Approach Rd (slip on)	59	275	20.0	45.3		
		A126 Marshfoot Rd South	51	85	14.9	38.7		
	A126 Marshfoot Rd North	A1089 Dock Approach Rd (slip on)	223	385	7.2	57.5	36	277
		A126 Marshfoot Rd South	338	205	12.2	63.8		
		A126 Marshfoot Rd North	0	0	0.0	0.0		
	A1089 Dock Approach Rd (slip off)	A126 Marshfoot Rd South	169	141	3.2	2.1	5	3
		A126 Marshfoot Rd North	32	30	6.9	6.9		
		A1089 Dock Approach Rd (slip on)	0	0	0.0	0.0		
	A126 Marshfoot Rd South	A126 Marshfoot Rd North	235	165	5.8	6.1	7	9
		A1089 Dock Approach Rd (slip on)	358	400	3.3	4.1		
		A126 Marshfoot Rd South	0	0	0.0	0.0		
Marshfoot Rd / Slip Road	A126 Marshfoot Rd North	A126 Marshfoot Rd South	246	227	2.4	2.5	25	25
		A126 Marshfoot Rd West	287	230	8.2	9.8		
	A126 Marshfoot Rd South	A126 Marshfoot Rd West	133	95	0.6	12.2	0	73
		A126 Marshfoot Rd North	498	568	1.5	15.9		
	A126 Marshfoot Rd West	A126 Marshfoot Rd North	68	70	44.6	48.2	54	39
		A126 Marshfoot Rd South	136	120	66.6	47.5		
Marshfoot Rd / B149 Chadwell Bypass / Chadwell Hill	B149 Chadwell Bypass	Chadwell Hill	0	0	0.0	0.0	19	28
		St. Chads Rd	170	172	9.0	10.3		
		A126 Marshfoot Rd	42	96	11.4	13.4		
		B149 Chadwell Bypass	0	0	0.0	0.0		
	Chadwell Hill	St. Chads Rd	79	51	19.6	30.4	53	71
		A126 Marshfoot Rd	326	316	15.9	24.9		
		B149 Chadwell Bypass	0	0	0.0	0.0		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	St. Chads Rd	Chadwell Hill	0	0	0.0	0.0	94	154
		A126 Marshfoot Rd	269	307	18.5	36.9		
		B149 Chadwell Bypass	294	216	18.2	36.6		
		Chadwell Hill	90	96	17.1	38.3		
		St. Chads Rd	0	0	0.0	0.0		
	A126 Marshfoot Rd	B149 Chadwell Bypass	23	23	12.4	10.5	38	27
		Chadwell Hill	153	114	9.9	10.6		
		St. Chads Rd	201	197	10.2	8.1		
		A126 Marshfoot Rd	0	0	0.0	0.0		
	Chadwell Hill / Brentwood Road / Linford Road	Brentwood Rd	Linford Rd	51	104	126.3	229.4	90
Chadwell Hill			121	88	132.9	232.5		
River View			4	6	103.7	201.5		
Linford Rd		Chadwell Hill	279	286	82.9	72.6	306	383
		River View	183	156	79.5	69.9		
		Brentwood Rd	60	123	81.2	70.0		
Chadwell Hill		River View	6	4	171.0	354.9	129	222
		Brentwood Rd	65	57	133.1	299.0		
		Linford Rd	138	89	131.0	289.5		
River View		Brentwood Rd	2	2	40.3	36.6	48	31
		Linford Rd	174	117	32.2	26.8		
		Chadwell Hill	4	4	49.1	49.1		
Orsett Heath Academy/Treetops School	Orsett Heath Academy	A1013 Stanford Rd East	0	0	0.0	0.0	4	4
		Treetops School	0	0	0.0	0.0		
		A1013 Stanford Rd West	9	9	42.7	46.8		
	A1013 Stanford Rd East	Treetops School	0	0	0.0	0.0	42	50
		A1013 Stanford Rd West	851	808	10.4	15.5		
		Orsett Heath Academy	0	0	0.0	0.0		
	Treetops School	A1013 Stanford Rd West	9	9	40.7	44.0	4	4
		Orsett Heath Academy	0	0	0.0	0.0		
		A1013 Stanford Rd East	0	0	0.0	0.0		
	A1013 Stanford Rd West	Orsett Heath Academy	8	6	7.3	6.8	32	27
A1013 Stanford Rd East		592	494	8.6	8.0			
Treetops School		8	6	39.7	41.9			

Table C.5 2045 08:00 – 09:00 Junction Results

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
A13 / A1012 / Stifford Clays Rd / High Rd	A13 West (slip off)	High Rd	21	22	11.8	12.8	34	40
		A13 East (slip on)	0	0	0.0	0.0		
		Stifford Clays Rd	236	273	26.7	22.6		
		A1012	459	509	66.6	40.0		
		A13 West (slip on)	0	0	0.0	0.0		
	High Rd	A13 East (slip on)	254	238	93.3	76.8	226	167
		Stifford Clays Rd	112	108	92.8	77.1		
		A1012	119	115	134.9	95.0		
		A13 West (slip on)	16	16	109.6	80.9		
		High Rd	0	0	0.0	0.0		
	A13 East (slip off)	Stifford Clays Rd	1	42	74.0	33.2	118	68
		A1012	368	386	138.6	56.3		
		A13 West (slip on)	0	0	0.0	0.0		
		High Rd	217	222	107.4	42.6		
		A13 East (slip on)	0	0	20.3	0.0		
	Stifford Clays Rd	A1012	160	164	263.6	95.7	206	131
		A13 West (slip on)	16	177	275.7	87.5		
		High Rd	50	88	250.3	92.8		
		A13 East (slip on)	26	48	231.3	91.5		
		Stifford Clays Rd	0	0	0.0	0.0		
A1012	A13 West (slip on)	363	630	5.0	44.7	24	248	
	High Rd	84	79	5.0	38.8			
	A13 East (slip on)	612	575	11.6	47.3			
	Stifford Clays Rd	70	42	17.3	40.0			
	A1012	0	0	0.0	0.0			
Treacle Mine Roundabout	Arterial Rd North Stifford	A1012 North	272	253	12.0	99.2	506	506
		Long Ln	138	70	107.2	163.3		
		Lodge Ln	334	259	142.9	207.2		
		A1012 Elizabeth Rd	201	142	147.7	228.1		
		Arterial Rd North Stifford	0	0	124.9	182.4		
	A1012 North	Long Ln	26	33	88.5	71.8	396	284
		Lodge Ln	310	378	103.0	91.9		
		A1012 Elizabeth Rd	453	511	126.2	120.6		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)		
			DM	DS	DM	DS	DM	DS	
		Arterial Rd North Stifford	279	207	129.5	108.0			
		A1012 North	0	0	0.0	0.0			
	Long Ln	Lodge Ln	12	10	164.0	269.1	283	270	
		A1012 Elizabeth Rd	121	90	188.2	278.3			
		Arterial Rd North Stifford	234	125	195.8	275.5			
		A1012 North	72	63	220.2	302.9			
		Long Ln	0	0	0.0	0.0			
	Lodge Ln	A1012 Elizabeth Rd	164	159	69.8	41.7	471	253	
		Arterial Rd North Stifford	478	417	86.4	55.3			
		A1012 North	243	358	114.5	102.0			
		Long Ln	9	7	146.1	125.7			
		Lodge Ln	0	0	162.4	143.9			
	A1012 Elizabeth Rd	Arterial Rd North Stifford	254	189	55.3	67.9	355	355	
		A1012 North	532	612	61.3	102.0			
		Long Ln	180	138	96.6	124.0			
		Lodge Ln	63	47	135.5	175.7			
		A1012 Elizabeth Rd	0	0	96.8	0.0			
	Lodge Lane / Nutberry Avenue	Lodge Ln West	Nutberry Ave	38	31	1.7	5.0	0	0
			Lodge Ln East	679	652	2.5	6.7		
Nutberry Ave		Lodge Ln East	5	9	657.1	129.7	38	26	
		Lodge Ln West	27	72	873.3	155.4			
Lodge Ln East		Lodge Ln West	864	846	20.4	5.7	258	96	
	Nutberry Ave	4	9	25.7	27.1				
Lodge Lane / Hathaway Road	Lodge Ln West	Windsor Ave	1	1	38.6	71.6	176	244	
		Lodge Ln East	517	444	52.8	74.7			
		Hathaway Rd	158	190	92.5	120.4			
	Windsor Ave	Lodge Ln East	10	11	578.7	541.7	144	141	
		Hathaway Rd	80	80	579.4	555.9			
		Lodge Ln West	12	11	556.2	540.9			
	Lodge Ln East	Hathaway Rd	88	40	52.7	43.9	231	144	
		Lodge Ln West	697	667	52.6	43.8			
		Windsor Ave	3	2	67.0	67.5			
			Lodge Ln West	148	154	154.2	155.7	329	329

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	Hathaway Rd	Windsor Ave	80	76	149.7	152.4		
		Lodge Ln East	78	102	152.6	151.8		
Lodge Lane / Connaught Avenue	Lodge Ln West	Connaught Ave	2	2	0.7	0.6	28	20
		Lodge Ln East	501	476	0.6	0.4		
		Bradleigh Ave	101	79	23.7	10.6		
	Connaught Ave	Lodge Ln East	65	61	23.3	7.3	17	11
		Bradleigh Ave	38	38	44.6	17.5		
		Lodge Ln West	1	1	51.6	14.5		
	Lodge Ln East	Bradleigh Ave	35	30	2.7	0.9	33	12
		Lodge Ln West	600	538	4.5	1.5		
		Connaught Ave	52	38	8.1	6.5		
	Bradleigh Ave	Lodge Ln West	173	154	25.4	8.6	28	17
		Connaught Ave	33	33	39.5	15.0		
		Lodge Ln East	10	11	32.6	16.1		
Lodge Lane / Victoria Avenue	Lodge Ln West	Victoria Ave	8	9	0.7	0.6	11	9
		Lodge Ln East	567	539	0.8	0.5		
	Victoria Ave	Lodge Ln East	55	52	9.4	6.5	11	8
		Lodge Ln West	26	24	15.7	12.3		
	Lodge Ln East	Lodge Ln West	659	581	0.4	0.3	7	5
		Victoria Ave	51	40	5.7	4.8		
Lodge Road / Southend Road	Lodge Ln West	Lodge Ln East	518	501	16.9	16.0	106	95
		Southend Road	102	87	44.8	39.7		
	Lodge Ln East	Southend Road	278	370	15.9	15.8	109	108
		Lodge Ln West	519	450	16.0	15.7		
	Southend Road	Lodge Ln West	192	172	233.3	236.7	181	181
		Lodge Ln East	308	310	241.3	242.1		
Daneholes Roundabout	A1013 Lodge Ln	Blackshots Ln	57	69	21.3	14.2	52	43
		A1013 Stanford Rd	319	311	20.5	14.5		
		B149 Wood View	307	293	16.8	12.3		
		Rectory Rd	127	118	21.7	17.1		
		A1013 Lodge Ln	16	16	15.3	11.8		
	Blackshots Ln	A1013 Stanford Rd	160	157	112.2	94.1	314	289
		B149 Wood View	219	253	113.0	95.5		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
		Rectory Rd	65	64	115.6	99.1		
		A1013 Lodge Ln	27	25	118.1	97.8		
		Blackshots Ln	0	0	43.4	99.1		
	A1013 Stanford Rd	B149 Wood View	106	197	41.5	48.3	498	502
		Rectory Rd	192	199	43.6	49.3		
		A1013 Lodge Ln	503	454	45.9	51.9		
		Blackshots Ln	291	205	46.0	51.3		
		A1013 Stanford Rd	80	49	45.6	51.2		
	B149 Wood View	Rectory Rd	23	37	127.3	91.1	488	363
		A1013 Lodge Ln	233	304	131.3	90.9		
		Blackshots Ln	151	155	132.0	91.3		
		A1013 Stanford Rd	170	182	147.8	103.4		
		B149 Wood View	25	18	144.7	95.8		
	Rectory Rd	A1013 Lodge Ln	12	24	29.3	22.4	32	29
		Blackshots Ln	9	48	30.3	23.6		
		A1013 Stanford Rd	123	89	33.1	23.6		
		B149 Wood View	25	30	36.1	25.5		
		Rectory Rd	0	0	0.0	0.0		
	A1013 Stanford Road / King Edward Drive	A1013 Stanford Rd South	A1013 Stanford Rd North	1004	968	15.5	19.7	9
A1013 Stanford Rd North		King Edward Drive	275	244	10.1	12.9	9	43
		A1013 Stanford Rd South	847	785	1.7	0.7		
King Edward Drive		A1013 Stanford Rd South	163	121	369.5	506.0	144	146
A1013 Stanford Road / B188 Baker St / Heath Road	A1013 Stanford Rd West	B188 Baker St	34	33	18.8	31.2	82	120
		A1013 Stanford Rd East	497	410	16.6	27.9		
		Heath Rd	59	83	87.9	90.2		
	B188 Baker St	A1013 Stanford Rd East	10	11	63.8	103.8	43	47
		Heath Rd	75	78	187.1	136.2		
		A1013 Stanford Rd West	36	70	197.5	146.9		
			Heath Rd	25	16	9.4	13.0	147
A1013 Stanford Rd West			958	850	18.6	24.7		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	A1013 Stanford Rd East	B188 Baker St	61	35	9.8	8.1		
	Heath Rd	A1013 Stanford Rd West	99	101	149.7	180.0	46	47
		B188 Baker St	3	9	225.2	278.0		
		A1013 Stanford Rd East	39	3	200.7	371.0		
A1013 Stanford Road / Rectory Road	A1013 Stanford Rd West	Rectory Rd	88	63	1.0	0.9	109	280
		A1013 Stanford Rd East	461	362	3.2	2.3		
	Rectory Rd	A1013 Stanford Rd East	224	76	66.3	240.6	107	280
		A1013 Stanford Rd West	129	170	97.9	250.3		
	A1013 Stanford Rd East	A1013 Stanford Rd West	913	733	2.2	7.4	34	77
		Rectory Rd	188	149	6.3	6.5		
Old Dock Approach Rd / Marshfoot Rd	Old Dock Approach Rd	A126 Marshfoot Rd North	239	229	10.9	27.0	21	44
		A1089 Dock Approach Rd (slip on)	43	221	9.1	22.6		
		A126 Marshfoot Rd South	62	122	9.0	18.3		
	A126 Marshfoot Rd North	A1089 Dock Approach Rd (slip on)	242	422	6.4	69.0	38	504
		A126 Marshfoot Rd South	492	335	11.6	73.7		
		A126 Marshfoot Rd North	0	0	0.0	0.0		
	A1089 Dock Approach Rd (slip off)	A126 Marshfoot Rd South	251	212	5.4	4.1	13	8
		A126 Marshfoot Rd North	40	40	7.7	7.4		
		A1089 Dock Approach Rd (slip on)	0	0	0.0	0.0		
	A126 Marshfoot Rd South	A126 Marshfoot Rd North	229	179	5.0	5.2	4	5
		A1089 Dock Approach Rd (slip on)	310	357	2.6	2.9		
		A126 Marshfoot Rd South	0	0	0.0	0.0		
Marshfoot Rd / Slip Road	A126 Marshfoot Rd North	A126 Marshfoot Rd South	299	282	1.4	4.1	19	30
		A126 Marshfoot Rd West	212	168	7.8	17.3		
	A126 Marshfoot Rd South	A126 Marshfoot Rd West	170	96	0.5	32.1	0	0
		A126 Marshfoot Rd North	585	638	1.6	48.7		
	A126 Marshfoot Rd West	A126 Marshfoot Rd North	152	114	32.3	294.2	89	332
		A126 Marshfoot Rd South	121	78	59.6	223.3		
Marshfoot Rd / B149 Chadwell Bypass / Chadwell Hill	B149 Chadwell Bypass	Chadwell Hill	0	0	0.0	0.0	23	82
		St. Chads Rd	172	96	10.6	304.5		
		A126 Marshfoot Rd	73	70	13.2	308.9		
		B149 Chadwell Bypass	0	0	0.0	0.0		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	Chadwell Hill	St. Chads Rd	41	29	15.6	51.3	40	112
		A126 Marshfoot Rd	283	344	14.8	61.5		
		B149 Chadwell Bypass	0	0	0.0	0.0		
		Chadwell Hill	0	0	0.0	0.0		
	St. Chads Rd	A126 Marshfoot Rd	400	287	16.9	111.3	99	298
		B149 Chadwell Bypass	300	148	16.3	117.0		
		Chadwell Hill	81	53	18.6	246.5		
		St. Chads Rd	0	0	0.0	0.0		
	A126 Marshfoot Rd	B149 Chadwell Bypass	25	16	14.0	131.0	49	202
		Chadwell Hill	148	93	14.5	253.5		
		St. Chads Rd	249	215	11.3	138.3		
		A126 Marshfoot Rd	0	0	0.0	0.0		
Chadwell Hill / Brentwood Road / Linford Road	Brentwood Rd	Linford Rd	55	114	360.6	254.0	276	498
		Chadwell Hill	98	78	357.2	253.8		
		River View	5	7	290.5	221.0		
	Linford Rd	Chadwell Hill	214	285	113.0	77.3	412	412
		River View	211	161	112.6	73.9		
		Brentwood Rd	71	123	116.0	79.8		
	Chadwell Hill	River View	5	5	173.6	442.7	384	484
		Brentwood Rd	109	71	172.9	410.3		
		Linford Rd	125	78	174.2	408.4		
	River View	Brentwood Rd	3	3	32.6	34.9	48	33
		Linford Rd	175	118	34.4	26.5		
		Chadwell Hill	8	6	47.7	36.8		
Orsett Heath Academy/Treetops School	Orsett Heath Academy	A1013 Stanford Rd East	55	53	84.8	123.5	90	103
		Treetops School	0	0	0.0	0.0		
		A1013 Stanford Rd West	276	266	98.4	140.8		
	A1013 Stanford Rd East	Treetops School	65	64	39.7	49.8	420	454
		A1013 Stanford Rd West	945	882	55.0	70.0		
		Orsett Heath Academy	63	64	62.1	76.2		
	Treetops School	A1013 Stanford Rd West	57	58	52.3	57.6	20	20
		Orsett Heath Academy	0	0	0.0	0.0		
		A1013 Stanford Rd East	14	13	51.3	51.8		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	A1013 Stanford Rd West	Orsett Heath Academy	215	206	31.1	31.0	137	109
		A1013 Stanford Rd East	529	474	33.1	36.3		
		Treetops School	85	82	102.3	113.6		

Table C.6 2045 17:00 – 18:00 Junction Results

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
A13 / A1012 / Stifford Clays Rd / High Rd	A13 West (slip off)	High Rd	21	20	25.3	92.7	71	370
		A13 East (slip on)	0	0	0.0	0.0		
		Stifford Clays Rd	292	372	41.5	118.1		
		A1012	500	659	46.7	122.2		
		A13 West (slip on)	0	0	0.0	0.0		
	High Rd	A13 East (slip on)	159	127	191.8	257.2	501	506
		Stifford Clays Rd	115	92	186.0	245.4		
		A1012	116	93	196.8	256.3		
		A13 West (slip on)	4	4	195.6	235.6		
		High Rd	0	0	0.0	0.0		
	A13 East (slip off)	Stifford Clays Rd	44	44	64.5	133.1	112	262
		A1012	527	484	75.9	145.0		
		A13 West (slip on)	0	0	0.0	0.0		
		High Rd	200	189	70.7	140.7		
		A13 East (slip on)	3	4	82.7	147.5		
	Stifford Clays Rd	A1012	87	92	26.7	16.1	44	30
		A13 West (slip on)	179	141	23.3	11.9		
		High Rd	87	88	23.1	12.7		
		A13 East (slip on)	10	26	25.6	21.0		
		Stifford Clays Rd	0	0	0.0	0.0		
A1012	A13 West (slip on)	390	427	12.5	9.6	58	46	
	High Rd	108	107	10.6	8.3			
	A13 East (slip on)	707	647	17.3	14.5			
	Stifford Clays Rd	119	112	16.3	12.8			

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
		A1012	0	0	0.0	0.0		
Treacle Mine Roundabout	Arterial Rd North Stifford	A1012 North	415	383	17.1	16.8	506	495
		Long Ln	114	104	163.7	185.4		
		Lodge Ln	312	289	196.4	214.5		
		A1012 Elizabeth Rd	123	112	206.9	232.8		
		Arterial Rd North Stifford	2	2	207.6	227.2		
	A1012 North	Long Ln	54	49	59.7	56.5	206	209
		Lodge Ln	264	332	67.3	66.6		
		A1012 Elizabeth Rd	619	714	88.2	90.1		
		Arterial Rd North Stifford	284	222	76.9	75.4		
		A1012 North	0	0	0.0	0.0		
	Long Ln	Lodge Ln	4	13	349.8	358.4	282	283
		A1012 Elizabeth Rd	79	85	357.5	371.2		
		Arterial Rd North Stifford	134	100	360.3	375.9		
		A1012 North	20	29	389.1	404.1		
		Long Ln	0	0	0.0	0.0		
	Lodge Ln	A1012 Elizabeth Rd	155	131	43.8	87.4	137	430
		Arterial Rd North Stifford	438	431	65.1	116.0		
		A1012 North	261	221	102.5	159.2		
		Long Ln	29	28	153.7	223.4		
		Lodge Ln	0	0	0.0	0.0		
A1012 Elizabeth Rd	Arterial Rd North Stifford	280	271	44.2	43.7	347	352	
	A1012 North	629	663	61.5	59.7			
	Long Ln	152	136	112.6	120.3			
	Lodge Ln	147	139	147.2	154.4			
	A1012 Elizabeth Rd	6	7	157.2	168.8			
Lodge Lane / Nutberry Avenue	Lodge Ln West	Nutberry Ave	16	51	2.1	3.5	9	17
		Lodge Ln East	707	725	2.7	4.0		
	Nutberry Ave	Lodge Ln East	7	2	42.9	445.0	10	28
		Lodge Ln West	40	10	46.0	751.4		
	Lodge Ln East	Lodge Ln West	848	811	0.7	26.6	4	239
		Nutberry Ave	7	8	16.6	88.8		
		Windsor Ave	3	3	58.6	56.0	201	230

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
Lodge Lane / Hathaway Road	Lodge Ln West	Lodge Ln East	581	560	55.3	56.3		
		Hathaway Rd	123	171	81.7	81.6		
	Windsor Ave	Lodge Ln East	19	19	106.2	183.2	46	61
		Hathaway Rd	73	72	105.9	184.7		
		Lodge Ln West	15	15	106.6	192.6		
	Lodge Ln East	Hathaway Rd	123	50	72.2	57.0	303	154
		Lodge Ln West	632	626	65.8	58.4		
		Windsor Ave	14	13	80.3	77.0		
	Hathaway Rd	Lodge Ln West	210	203	135.0	144.0	310	316
		Windsor Ave	82	77	135.2	139.3		
		Lodge Ln East	77	90	134.8	138.6		
	Lodge Lane / Connaught Avenue	Lodge Ln West	Connaught Ave	9	10	0.7	0.7	53
Lodge Ln East			545	538	2.4	0.5		
Bradleigh Ave			110	119	44.4	12.5		
Connaught Ave		Lodge Ln East	36	51	36.3	8.3	19	10
		Bradleigh Ave	32	34	60.3	16.9		
		Lodge Ln West	2	2	61.9	17.6		
Lodge Ln East		Bradleigh Ave	11	8	4.4	0.8	50	10
		Lodge Ln West	651	565	7.8	1.3		
		Connaught Ave	48	29	10.7	8.3		
Bradleigh Ave		Lodge Ln West	128	134	39.8	6.8	28	12
		Connaught Ave	19	20	52.2	16.4		
		Lodge Ln East	7	8	42.9	16.1		
Lodge Lane / Victoria Avenue	Lodge Ln West	Victoria Ave	8	8	0.9	0.9	9	9
		Lodge Ln East	580	589	1.3	1.0		
	Victoria Ave	Lodge Ln East	48	47	8.7	9.0	8	8
		Lodge Ln West	15	15	18.6	13.4		
	Lodge Ln East	Lodge Ln West	699	588	0.9	0.3	10	5
		Victoria Ave	43	28	7.8	7.4		
Lodge Road / Southend Road	Lodge Ln West	Lodge Ln East	501	505	25.0	23.8	136	128
		Southend Road	130	132	47.9	48.3		
	Lodge Ln East	Southend Road	236	243	28.6	22.5	184	124
		Lodge Ln West	637	523	30.0	22.7		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	Southend Road	Lodge Ln West	105	94	205.1	211.3	180	181
		Lodge Ln East	495	493	196.3	204.1		
Daneholes Roundabout	A1013 Lodge Ln	Blackshots Ln	122	115	33.1	15.5	77	50
		A1013 Stanford Rd	482	438	28.9	13.7		
		B149 Wood View	332	390	23.6	11.9		
		Rectory Rd	37	36	25.6	13.5		
		A1013 Lodge Ln	20	18	24.0	12.4		
	Blackshots Ln	A1013 Stanford Rd	189	141	112.8	127.4	329	331
		B149 Wood View	166	192	114.2	128.6		
		Rectory Rd	52	50	114.9	127.7		
		A1013 Lodge Ln	68	51	118.2	130.5		
		Blackshots Ln	0	0	0.0	0.0		
	A1013 Stanford Rd	B149 Wood View	111	175	28.1	52.6	183	338
		Rectory Rd	164	159	29.4	52.4		
		A1013 Lodge Ln	526	435	32.7	55.8		
		Blackshots Ln	223	162	33.3	56.7		
		A1013 Stanford Rd	23	9	34.4	59.0		
	B149 Wood View	Rectory Rd	39	38	37.3	12.2	76	26
		A1013 Lodge Ln	221	199	39.2	12.6		
		Blackshots Ln	232	140	41.1	13.6		
		A1013 Stanford Rd	141	134	42.0	13.1		
		B149 Wood View	26	28	43.9	14.2		
Rectory Rd	A1013 Lodge Ln	41	64	72.7	22.1	60	37	
	Blackshots Ln	50	23	69.9	23.5			
	A1013 Stanford Rd	89	66	68.7	22.8			
	B149 Wood View	50	122	70.6	24.2			
	Rectory Rd	0	0	0.0	0.0			
A1013 Stanford Road / King Edward Drive	A1013 Stanford Rd South	A1013 Stanford Rd North	955	856	3.6	10.2	4	45
	A1013 Stanford Rd North	King Edward Drive	147	158	2.1	6.8	4	45
		A1013 Stanford Rd South	924	789	0.5	0.5		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
	King Edward Drive	A1013 Stanford Rd South	113	112	17.3	100.1	20	46
A1013 Stanford Road / B188 Baker St / Heath Road	A1013 Stanford Rd West	B188 Baker St	48	44	2.6	2.7	16	19
		A1013 Stanford Rd East	814	678	2.9	2.9		
		Heath Rd	122	124	9.9	10.0		
	B188 Baker St	A1013 Stanford Rd East	41	39	1.5	1.4	11	12
		Heath Rd	22	42	19.0	17.3		
		A1013 Stanford Rd West	39	40	19.1	18.0		
	A1013 Stanford Rd East	Heath Rd	39	65	1.0	1.6	5	7
		A1013 Stanford Rd West	892	814	2.3	2.9		
		B188 Baker St	27	27	6.0	5.1		
	Heath Rd	A1013 Stanford Rd West	45	46	4.5	4.5	8	10
		B188 Baker St	4	4	24.1	20.0		
		A1013 Stanford Rd East	19	39	23.0	21.1		
A1013 Stanford Road / Rectory Road	A1013 Stanford Rd West	Rectory Rd	176	193	1.9	1.8	135	317
		A1013 Stanford Rd East	698	563	4.4	4.3		
	Rectory Rd	A1013 Stanford Rd East	161	90	115.2	286.8	133	317
		A1013 Stanford Rd West	131	101	143.3	307.1		
	A1013 Stanford Rd East	A1013 Stanford Rd West	832	809	2.1	10.6	30	112
		Rectory Rd	119	66	11.7	15.6		
Old Dock Approach Rd / Marshfoot Rd	Old Dock Approach Rd	A126 Marshfoot Rd North	174	210	27.5	101.6	31	106
		A1089 Dock Approach Rd (slip on)	57	307	25.5	95.3		
		A126 Marshfoot Rd South	54	71	21.8	82.1		
	A126 Marshfoot Rd North	A1089 Dock Approach Rd (slip on)	149	305	4.5	76.3	26	332
		A126 Marshfoot Rd South	299	296	9.7	81.9		
		A126 Marshfoot Rd North	0	0	0.0	0.0		
	A1089 Dock Approach Rd (slip off)	A126 Marshfoot Rd South	373	324	3.7	3.7	13	12
		A126 Marshfoot Rd North	115	113	8.1	8.3		
		A1089 Dock Approach Rd (slip on)	0	0	0.0	0.0		
	A126 Marshfoot Rd South	A126 Marshfoot Rd North	413	296	7.5	8.1	18	24
		A1089 Dock Approach Rd (slip on)	207	332	4.8	5.6		
		A126 Marshfoot Rd South	0	0	0.0	0.0		
		A126 Marshfoot Rd South	525	463	8.9	2.9	35	17

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
Marshfoot Rd / Slip Road	A126 Marshfoot Rd North	A126 Marshfoot Rd West	174	155	5.1	3.7		
	A126 Marshfoot Rd South	A126 Marshfoot Rd West	79	69	0.5	2.5	0	0
		A126 Marshfoot Rd North	297	417	1.2	4.8		
	A126 Marshfoot Rd West	A126 Marshfoot Rd North	150	174	45.6	27.8	143	76
		A126 Marshfoot Rd South	167	187	76.1	41.6		
Marshfoot Rd / B149 Chadwell Bypass / Chadwell Hill	B149 Chadwell Bypass	Chadwell Hill	0	0	0.0	0.0	48	63
		St. Chads Rd	138	122	97.4	136.5		
		A126 Marshfoot Rd	19	40	89.8	124.4		
		B149 Chadwell Bypass	0	0	0.0	0.0		
	Chadwell Hill	St. Chads Rd	142	120	15.1	12.8	49	46
		A126 Marshfoot Rd	143	185	17.0	14.7		
		B149 Chadwell Bypass	3	3	28.0	26.5		
		Chadwell Hill	2	2	80.5	68.4		
	St. Chads Rd	A126 Marshfoot Rd	213	260	7.5	8.7	33	38
		B149 Chadwell Bypass	200	179	10.4	12.9		
		Chadwell Hill	123	90	47.9	51.9		
		St. Chads Rd	0	0	0.0	0.0		
	A126 Marshfoot Rd	B149 Chadwell Bypass	20	22	68.0	61.5	332	234
		Chadwell Hill	257	253	101.5	94.0		
		St. Chads Rd	342	298	70.4	60.0		
		A126 Marshfoot Rd	0	0	0.0	0.0		
Chadwell Hill / Brentwood Road / Linford Road	Brentwood Rd	Linford Rd	73	137	261.4	189.4	327	498
		Chadwell Hill	153	144	260.3	189.9		
		River View	2	1	215.1	195.5		
	Linford Rd	Chadwell Hill	141	168	149.1	159.3	407	412
		River View	192	92	147.8	162.6		
		Brentwood Rd	53	81	156.1	168.5		
	Chadwell Hill	River View	3	3	153.0	190.3	482	473
		Brentwood Rd	126	98	140.8	173.3		
		Linford Rd	231	214	140.7	172.5		
	River View	Brentwood Rd	1	2	66.8	7.2	147	52
		Linford Rd	328	224	120.9	43.6		

Junction	Approach	To	Flow (veh)		Delay (s)		Mean Max Queue (m)	
			DM	DS	DM	DS	DM	DS
		Chadwell Hill	2	2	117.7	48.9		
Orsett Heath Academy/ Treetops School	Orsett Heath Academy	A1013 Stanford Rd East	2	2	46.5	46.5	2	2
		Treetops School	0	0	0.0	0.0		
		A1013 Stanford Rd West	2	2	42.9	48.9		
	A1013 Stanford Rd East	Treetops School	0	0	0.0	0.0	49	65
		A1013 Stanford Rd West	972	891	11.1	17.9		
		Orsett Heath Academy	0	0	0.0	0.0		
	Treetops School	A1013 Stanford Rd West	133	133	41.6	46.5	38	39
		Orsett Heath Academy	0	0	0.0	0.0		
		A1013 Stanford Rd East	59	59	41.5	44.3		
	A1013 Stanford Rd West	Orsett Heath Academy	0	0	0.0	0.0	56	42
		A1013 Stanford Rd East	924	789	11.7	10.4		
		Treetops School	0	0	0.0	0.0		

Appendix D Relative delay plots

Plate D.1 Relative Delay Plot (2030 DM 07:00 – 08:00)



Plate D.2 Relative Delay Plot (2030 DM 08:00 – 09:00)



Plate D.3 Relative Delay Plot (2030 DM 17:00 – 18:00)



Plate D.4 Relative Delay Plot (2030 DS 07:00 – 08:00)



Plate D.5 Relative Delay Plot (2030 DS 08:00 – 09:00)



Plate D.6 Relative Delay Plot (2030 DS 17:00 – 18:00)



Plate D.7 Relative Delay Plot (2045 DM 07:00 – 08:00)



Plate D.8 Relative Delay Plot (2045 DM 08:00 – 09:00)



Plate D.9 Relative Delay Plot (2045 DM 17:00 – 18:00)



Plate D.10 Relative Delay Plot (2045 DS 07:00 – 08:00)



Plate D.11 Relative Delay Plot (2045 DS 08:00 – 09:00)



Plate D.12 Relative Delay Plot (2045 DS 17:00 – 18:00)



If you need help accessing this or any other National Highways information, please call **0300 123 5000** and we will help you.

© Crown copyright 2023.

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence:

visit www.nationalarchives.gov.uk/doc/open-government-licence/

write to the **Information Policy Team, The National Archives, Kew, London TW9 4DU**, or email psi@nationalarchives.gsi.gov.uk.

Mapping (where present): © Crown copyright and database rights 2022 OS 100030649. You are permitted to use this data solely to enable you to respond to, or interact with, the organisation that provided you with the data. You are not permitted to copy, sub-licence, distribute or sell any of this data to third parties in any form.

If you have any enquiries about this publication email info@nationalhighways.co.uk or call **0300 123 5000***.

*Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls.

These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone. Calls may be recorded or monitored.

Printed on paper from well-managed forests and other controlled sources when issued directly by National Highways.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ

National Highways Company Limited registered in England and Wales number 09346363