HIGHWAYS AGENCY

Tamworth Core Strategy

Preferred Option Test Modelling

Final Report

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1 Introduction

1.1 This report presents the findings of a technical study undertaken by JMP on behalf of the Highways Agency (HA) into the traffic impact of growth proposed for Tamworth Borough on the Strategic Road Network (SRN).

1.2 This growth is proposed through the emerging Tamworth Core Strategy, which will set out the Borough's local planning policy including target for delivering housing and employment.

1.3 The Tamworth Core Strategy proposes a target of delivering 2,900 dwellings and 42 hectares of employment land in the period 2006–2026. As the body responsible for maintaining the safe and efficient flow of the SRN on behalf of the Secretary of State for Transport, it is therefore important for the Highways Agency to understand what impact this growth may have on the SRN. In doing so, it is also crucial to understand what, if any, mitigation measures are required to support this growth so that they can be secured through the planning process.

1.4 In Tamworth the SRN comprises the A5 including the junctions at Ventura Park, Marlborough Way, and Stoneydelph. The Mile Oak junction, although sitting within the neighbouring authority of Lichfield District, will also form part of the study as the effect of Tamworth's growth is likely to be felt there in terms of traffic impact. A map showing Tamworth and these junctions is provided overleaf as Figure 1.1.

1.5 Ultimately, the purpose of this study is to assist Tamworth Borough Council (TBC) to plan effectively for growth and to assist with development management matters as appropriate. It will also be shared with the local highways authority – Staffordshire County Council, to ensure that the transport picture of Tamworth is as up-to-date and comprehensive as possible.

1.6 Section 2 of this report describes the current traffic conditions of the relevant section of the SRN and Section 3 provides the planning context. An overview of the traffic models used to undertake this technical study – the type of model, methodology employed and mitigation scenarios tested, is given in Section 4 along with identifying those sites which TBC is considering bringing forward for development. Sections 5, 6 and 7 set out the results from the different scenarios tested and Section 8 draws together a summary of these findings. Finally, Section 9 presents our conclusions and recommended next step

Figure 1.1 Tamworth Area A5 Strategic Road Network

2 Current Traffic Conditions

2.1 The SRN in Tamworth Borough consists of approximately 3½ miles of the A5, including junctions at Ventura Park, Marlborough Way and Stoneydelph. To the west of Tamworth Borough the A5 continues to a junction at Mile Oak (located within Lichfield District), and this junction has been included as a part of this technical assessment. The Mile Oak junction has been included as it is expected to experience increases in traffic as a result of Tamworth's future growth. Parts of the SRN (and also the associated local road network) in the study area are currently under stress during peak traffic periods.

2.2 The study seeks to substantiate anecdotal evidence of existing traffic problems at the A5 junctions in Tamworth. These problems include queuing at the A5 Mile Oak, Marlborough Way and Stoneydelph junctions, mainly during weekday peak hours and to a lesser extent during the working day. At the A5 Ventura Park junction problems also arise, mainly during peak shopping periods at weekends, largely as a result of the retail area being in close proximity to the junction. Whilst not part of the SRN and under the jurisdiction of Staffordshire County Council, many of the local roads which connect with the aforementioned junctions also experience similar issues during peak traffic periods.

2.3 The current situation is represented by the 'Do Nothing' model as described in detail in **Section 5.0** of this report.

2.4 The A5 and its junctions included within this study are not located within an Air Quality Management Area (AQMA)[1].

2.5 Throughout the Highways Agency Area 9 (Staffordshire, Shropshire, West Midlands, Gloucester, Warwickshire and Worcestershire) an analysis of accident sites for the Area Safety Action Plan has identified a total of 169 accident cluster sites. These 169 sites are ranked in order of total number of accidents over the most recent five year period 2004 to 2008 inclusive.

2.6 Within Area 9, a rank of 1 indicates the most significant accident issues, whereas a rank of 169 indicates the least significant accident issues. The slip roads at the A5 Ventura Park junction are ranked no. 28 in the listing which indicates a significant accident issue. However the Mile Oak, Marlborough Way and Stoneydelph junctions do not appear in this accident cluster analysis, which is an indication that accidents are a less significant issue at these locations.

2.7 There are several existing facilities for non-motorised users at A5 Marlborough Way junction. There are signalised crossing facilities across the A5 Eastbound off-slip and also across the A5 Westbound entry slip roads. In addition, to the north and south of the junction, and on the local road network, there are signalised crossing facilities on B5440 Marlborough Way.

2.8 However the existing A5 Mile Oak, A5 Ventura Park and A5 Stoneydelph junctions have limited facilities for pedestrians and cyclists. This creates community severance issues and is a deterrent to local trips being made by foot or bike and thereby encourages car use.

2.9 Part of the brief for this investigation was therefore to consider how improved facilities for non-motorised users could be incorporated into any design solution and thereby encouraging less reliance on car journeys particularly for short local trips.

[1] Source: DERFA – Department for Environment Food and Rural Affairs

3 Planning Context

3.1 An objective of this study is to identify the impact of growth on the SRN proposed to take place in Tamworth and inform the plan making process. It is, however, useful to consider the wider context within which this work forms part.

3.2 This study will be used to help TBC prepare its planning policy and plan its growth for the period up to 2026. Local planning policy should now be set out in a Local Development Framework (LDF) – a suite of documents prepared by a local planning authority (TBC in this case). The central document is the Core Strategy and this should identify:

- the vision for how places will develop;
- strategic objectives for how issues should be addressed;
- a strategy for achieving these objectives, including how much development should be delivered and broad directions of growth; and
- arrangements for managing and monitoring the implementation of the strategy.

3.3 Government guidance on preparing an LDF, and in particular the Core Strategy, is set out in the Planning Policy Statement 12 – PPS12: Local Spatial Planning.

3.4 Regarding infrastructure, PPS12 states that the Core Strategy should be supported by evidence of what physical, social and green infrastructure is required to support the proposed levels of growth. Furthermore, the particular needs and costs, the phasing of developments, funding sources and responsibilities for delivery should be identified in an Infrastructure Delivery Plan. This plan also serves to prioritise what infrastructure is required and identifies delivery partners.

3.5 Key infrastructure stakeholders such as the HA are encouraged to discuss infrastructure planning with the relevant local planning authority as they can often be a delivery partner. It is therefore crucial for the HA to be fully engaged in the preparation of the Core Strategy and to inform the plan-making process.

3.6 Insofar as Tamworth is concerned, the Council proposes growth targets of:

- 2,900 dwellings (whilst recognising that any houses required in addition to this will have to be delivered outside of the authority, in Lichfield or North Warwickshire);
- 42 hectares of employment uses;
- 35,000sqm of comparison retail floor space; and
- 30,000sqm of office floor space.

3.7 This growth is based on figures set by the draft regional plan – the draft West Midlands Regional Spatial Strategy (WMRSS) and whilst the Government has announced its intention through the Localism Bill to abolish this strategic tier of planning policy, TBC has decided to continue with these growth levels. This is because the targets reflect the needs of the Borough.

3.8 It is anticipated that the Localism Bill will be enacted towards the end of this year, at the earliest. Legal action is currently being taken to determine whether the intended abolition of the RSS

should be a material consideration for policy and development management matters. In the event that the WMRSS is, essentially, deleted, it is highly likely that the impact on the Tamworth Core Strategy, in terms of its preparation and subsequent application, will be minimal.

3.9 The HA has developed a close working relationship with TBC and has collaborated in terms of this study and also the wider LDF preparation process. TBC's planning officers have provided the HA with relevant information relating to the spatial options under consideration, and also sought the HA's views throughout formal public consultation stages and also informal channels. The HA has formally responded to the public consultations carried out by TBC, and also been informed through contributions and advice provided from Staffordshire CC as the local highway authority. Since January 2010 the HA has also, at regular intervals, to inform and update TBC officers of its objectives and intentions in respect of this Study and other related technical work in which it has been involved.

3.10 The Council has recently consulted on its housing policies only (the total number of dwellings to come forward remains set, however) and will then continue progressing the whole Core Strategy towards publication in early 2012.

3.11 As explained in the following section, the Study relied on certain assumptions with regard the location and quantum of development in order to develop a suitable and realistic model of traffic growth and movement. These were adopted from the housing and employment figures set out in the Council's Core Strategy consultation documents, as then published, and refined as necessary through discussions with the LPA's planning officers. As noted in the Introduction, at the time of the Study, the figures reflected those set out in the West Midlands RSS2.

3.12 In terms of how this Study feeds into the Core Strategy and its preparation, it will form a core part of the transport evidence base. Any measures identified by the Study as necessary to support growth will be fed into the Infrastructure Delivery Plan and it is crucial for the HA that any infrastructure required to mitigate impact on the SRN is appropriately prioritised. This is to ensure that delivery of this infrastructure is timely and that development is not unnecessarily slowed as a result of poor infrastructure planning.

3.13 The information will also be used to inform the Council's funding strategies. This forms a crucial part of delivering infrastructure and setting out the options open to TBC for securing funds through the use of Planning Obligations (or Section 106 agreements) and the Community Infrastructure Levy (CIL).

4 Modelling Scope and Methodology

Introduction

4.1 Four separate VISSIM micro-simulation models have been developed with a base year of 2010 for the A5/A453 Mile Oak, A5/A51 Ventura Park, A5/B5440 Marlborough Way and A5/B5080 Stoneydelph junctions.

4.2 For each of the above junctions the A5 mainline carriageway is included, as is the local road network in the immediate vicinity. This is to ensure that the interaction between the SRN and local road network is taken into account.

4.3 For all four of the junctions, weekday AM and PM peak period models have been developed. In addition, because of the particular issues experienced at the A5 Ventura Park junction during peak shopping periods, a Saturday model has been developed for this junction.

4.4 Figures 4.2 to 4.5 show VISSIM screenshots of the models for A5 Mile Oak, A5 Ventura Park, A5 Marlborough Way and A5 Stoneydelph Junctions.

Methodology

4.5 The modelling has been undertaken in compliance with the latest guidance contained within the Design Manual for Roads and Bridges (DMRB), published by the Department for Transport (DfT).

4.6 Year 2010 traffic surveys were undertaken consisting of Manual Classified Counts (MCC), link counts, journey time, and queue length surveys. The traffic data obtained reflects normal traffic flow conditions, and was collected in April 2010 – a neutral month in traffic terms.

4.7 Each of the models are calibrated and validated.

Scenarios

4.8 In order to provide a detailed understanding of the implications of development growth, the possible requirement for highway improvements and the testing of any identified necessary highway improvements, three scenarios have been run using the VISSIM models.

4.9 The **'Do Nothing'** scenario considers the existing junction arrangements for the base year 2010 traffic flows. This provides a detailed understanding of existing operations and a reference case to compare with the impact of committed development and LDF related traffic.

4.10 The **'Do Minimum'** scenario considers the committed improvement schemes[2] where applicable for the year 2026 incorporating traffic from committed sites. This scenario includes the committed improvement schemes in the vicinity of the A5 Ventura Park junction. This includes the signalisation of the A51/A453 Bonehill Road Roundabout (known as the Jolly Sailor roundabout) and Bitterscote Drive/Ventura Park Road Roundabout (known as the Sainsbury's roundabout) to the north of the A5, and also the roundabout access junction[3] to serve the Bitterscote South site.

4.11 The **'Do Something'** scenario considers the impact of committed sites and LDF sites for the year 2026. For A5 Ventura Park, this includes the committed improvement schemes. The requirement

[2] See Appendix A
[3] See Appendix A

for further mitigation schemes is then considered, and where applicable any such schemes are tested utilising the relevant traffic model(s).

Background Traffic Growth Rates

4.12 TEMPRO (Trip End Model Presentation Program) Version 5.4 published by DfT was interrogated to establish the extent of the background traffic growth from the year 2010 to 2026.

4.13 Analysis indicated that the level of development growth proposed for Tamworth Borough is greater than the development assumptions contained within TEMPRO.

4.14 Therefore, in order to avoid double counting, base Year 2010 traffic was **not factored** to Year 2026 traffic using TEMPRO. Increases in traffic within the traffic models arise solely as a result of the specific identified development sites.

LDF Development Sites

4.15 Figure 4.1 overleaf illustrates the location of the LDF sites in relation to the HA's SRN network. This figure has been directly derived from data supplied by Tamworth Borough Council. The site numbers shown on Figure 4.1 relate to the following type and quantum of LDF development:

- Site 6: Bitterscote South: Employment 99,406 sqm;
- Site 13: Bitterscote North: Employment 34,350 sqm;
- Site 14: South of A453: Employment 22,203 sqm;
- Site 15: Bitterscote North: Employment 6,903 sqm;
- Site 16: South of A453: Employment 6,872 sqm;
- Site 17: M42 J10 South of A5; Employment 7,437 sqm;
- Site 18: M42 J10 North of A5: Employment 25,630 sqm;
- Site 19: Anker Valley: Residential 900-1150 dwellings[4];
- Site 20: Two Gates: Residential 49 dwellings;
- Site 21: Two Gates: Residential 45 dwellings;
- Site 23: Pennine Way: Residential 100 dwellings;
- Site 26: Town Centre: Employment 20,000 sqm, Retail 35,000 sqm[5]

4.16 The above LDF sites are as supplied by Tamworth Borough Council. For the employment sites, the quantum of the development shown above relates to the total site area.

4.17 In order to calculate the likely traffic generation of each site, the GFA (Gross Floor Area) of each of the sites is required. For the purposes of this assessment it has been assumed that GFA represents 40% of the total site area.

[4] For the purposes of the technical assessment, 1150 dwellings have been assumed at Anker Valley with the associated link road.
[5] The HA's technical assessment has not included the Town Centre retail allocation as this is predicted to have a negligible impact on the A5.

4.18 For each of the employment sites, Tamworth Borough Council has supplied an indicative land use split between B1 Business, B2 General & Industrial and B8 Storage & Distribution. This has been taken into account in the calculation of trip generation forecasts. **Tables 4.1 and 4.2** show the vehicular trip generation of the LDF sites that were included as individual traffic generators within the model. Staffordshire County Council has accepted the basis of the calculation of the vehicular trips rates shown.

Table 4.1 Modelled LDF Development Trips: Weekday Peak Periods

Site Name	AM Peak 0800-0900		PM Peak 1700-1800	
	Arrivals	Departures	Arrivals	Departures
Site 6: Bitterscote South	309	65	59	268
Site 13: Bitterscote North	107	22	20	93
Site 14: South of A453	69	15	13	60
Site 15: Bitterscote North	21	5	4	19
Site 16: South of A453	43	5	6	35
Site 17: M42 J10 South of A5	23	5	4	20
Site 18: M42 J10 North of A5	80	17	15	69
Site 19: Anker Valley	145	485	459	233
Site 20: Two Gates	6	21	20	10
Site 21: Two Gates	6	19	18	9
Site 23: Pennine Way	13	42	40	20
Site 26: Town Centre	217	27	29	176

N.B. This table shows total development vehicular trips, and is inclusive of a 5% reduction in vehicular trips as a result of the implementation of Travel Plans and other Smarter Choices initiatives.

Table 4.2 Modelled LDF Development Trips: Saturday Peak Period

Site Name	Saturday 1100-1200	
	Arrivals	Departures
Site 6: Bitterscote South	8	8
Site 13: Bitterscote North	3	3
Site 14: South of A453	2	2
Site 15: Bitterscote North	1	1
Site 16: South of A453	0	0
Site 17: M42 J10 South of A5	1	1
Site 18: M42 J10 North of A5	2	2
Site 19: Anker Valley	275	245
Site 20: Two Gates	12	10
Site 21: Two Gates	11	10
Site 23: Pennine Way	24	21
Site 26: Town Centre	0	0

N.B. This table shows total development vehicular trips, and is inclusive of a 5% reduction in vehicular trips as a result of the implementation of Travel Plans and other Smarter Choices initiatives.

4.19 As noted in Tables 4.1 and 4.2, the technical analysis assumes a 5% reduction in vehicular trips as a result of the implementation of Travel Plans and other Smarter Choices initiatives.

4.20 Smarter choices initiatives are aimed at encouraging people to alter their travel behaviour using initiatives such as school and workplace travel plans; personalised travel planning; public transport marketing; and travel awareness campaigns rather than forcing them to do so by prohibiting activities such as parking or the use of financial constraints.

4.21 The 5% reduction figure was derived from analysing the results of the DfT's report on *'The effects of smarter choice programmes in the sustainable travel towns'* (March 2010), which outlined the typical modal shift levels that were attained from the implementation of a variety of different interventions in selected towns in England. The analysis of this report was then compared to the list of interventions, and description of implementation, that is outlined in the proposed spatial strategy document.

Committed Development Sites

4.22 The inclusion of committed developments (i.e. consented developments which have not as yet come forward) is standard transport planning practice. The following committed developments were also included as individual traffic generators within the model:

- Amington Industrial Estate – Employment;
- Cardinal Point, Winchester Road – Employment;
- North of Bonehill Rd, Land adj Dunstall Lane –Employment;
- Tame Valley Industrial Estate – Employment;
- Cardinal Point – Retail;
- Lichfield Road Industrial Estate – Car Sales;
- Birch Coppice – Employment;
- South of St Peters Close – Residential;
- Hedging Lane – Residential
- Aucott Site, Ventura Park Road - Retail

Figure 4.1 Modelled LDF Sites and Committed Sites

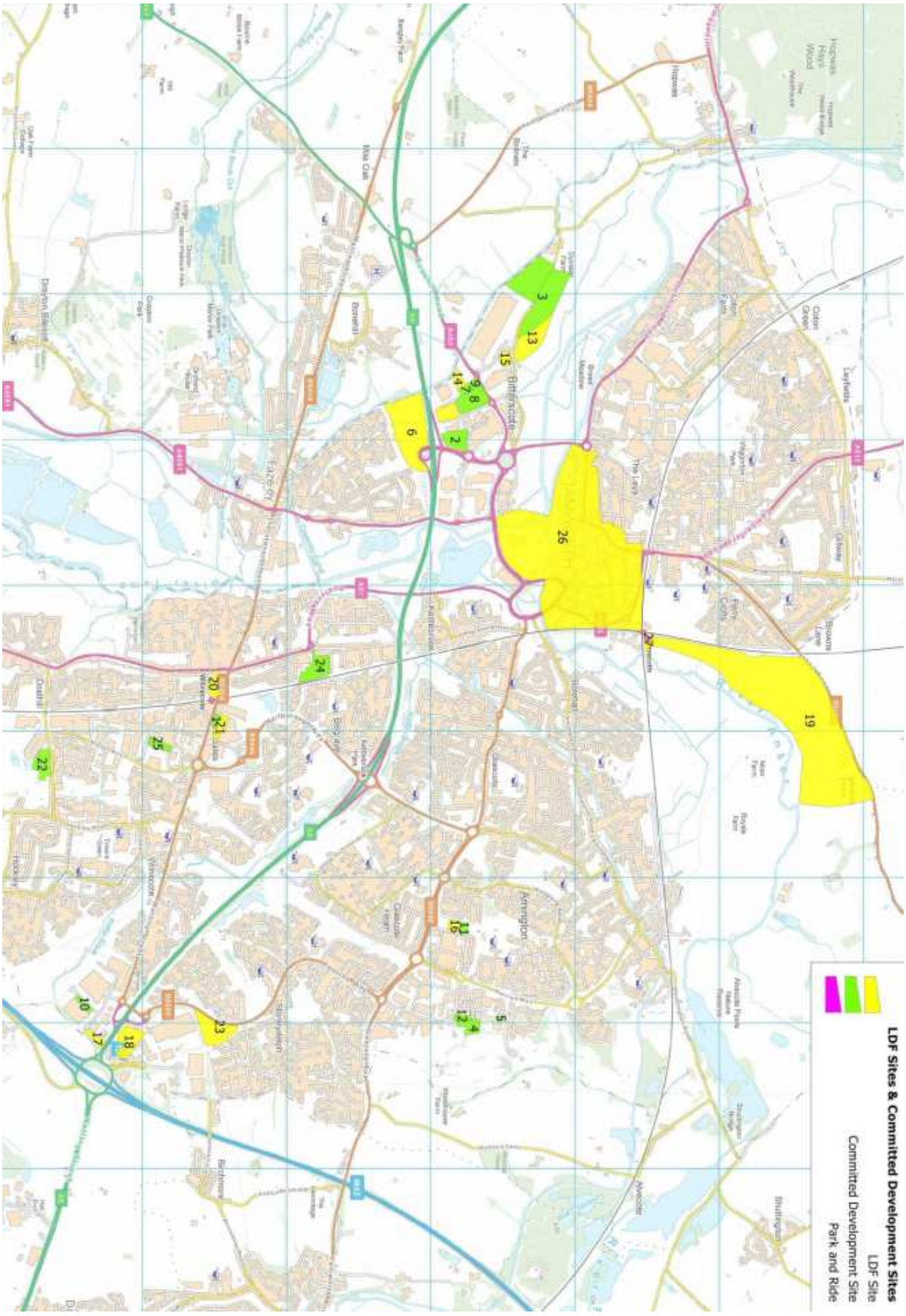


Figure 4.2 Modelled Area – A5 Mile Oak VISSIM Model

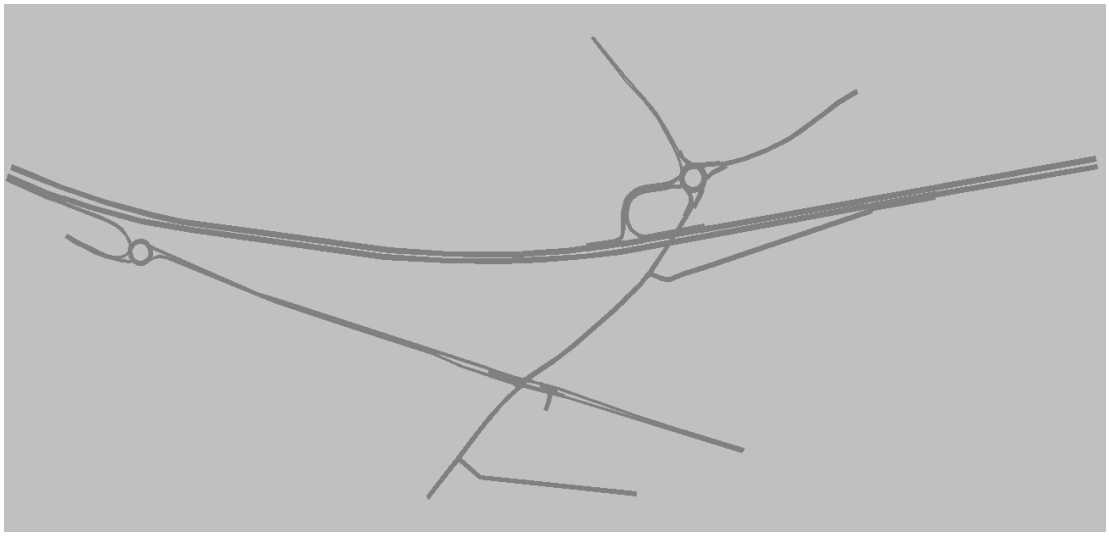


Figure 4.3 Modelled Area – A5 Ventura Park VISSIM Model

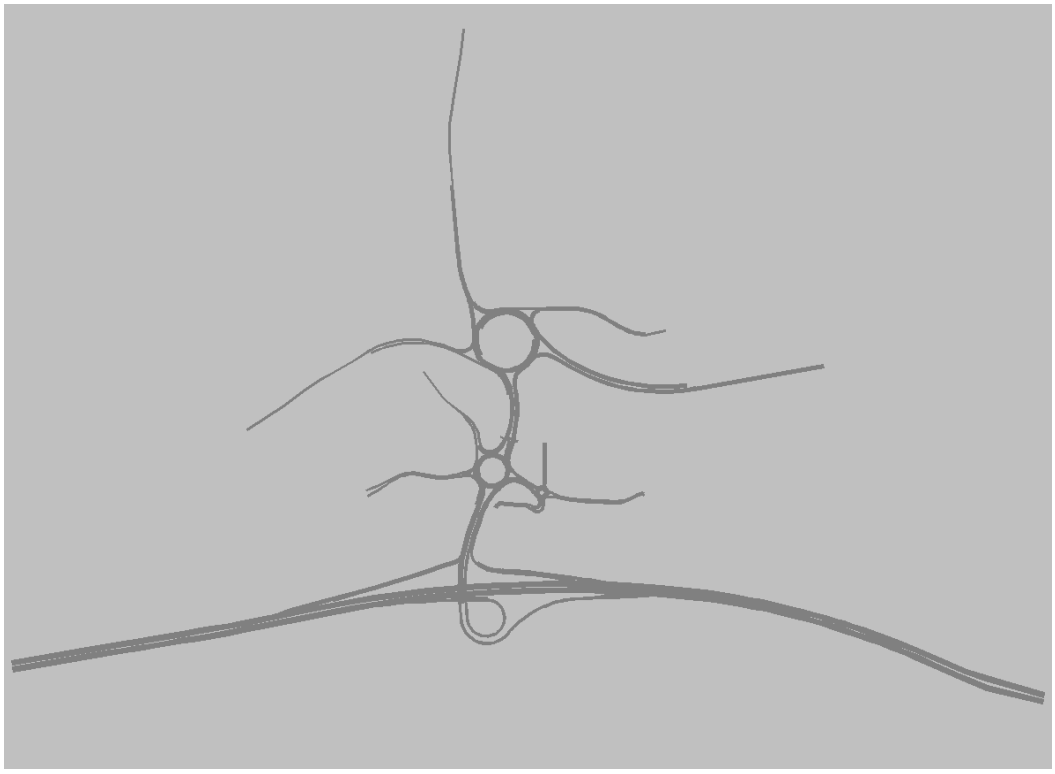


Figure 4.4 Modelled Area – A5 Marlborough Way VISSIM Model

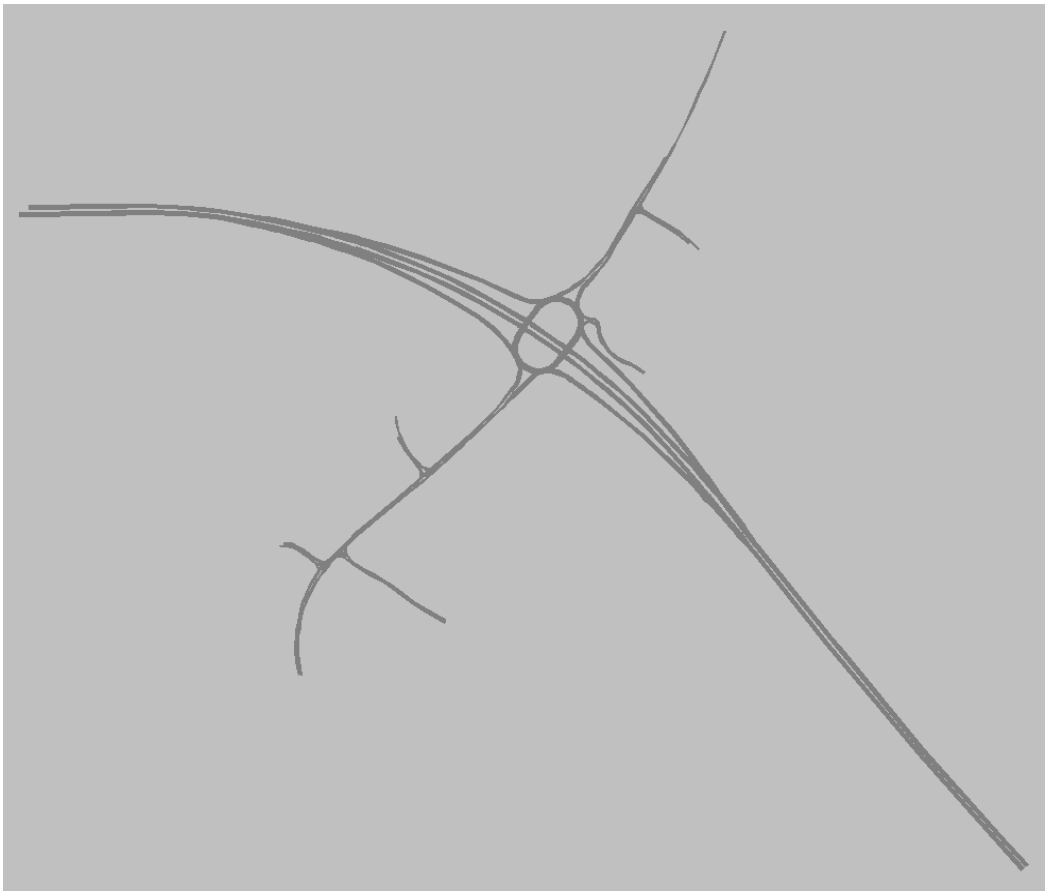
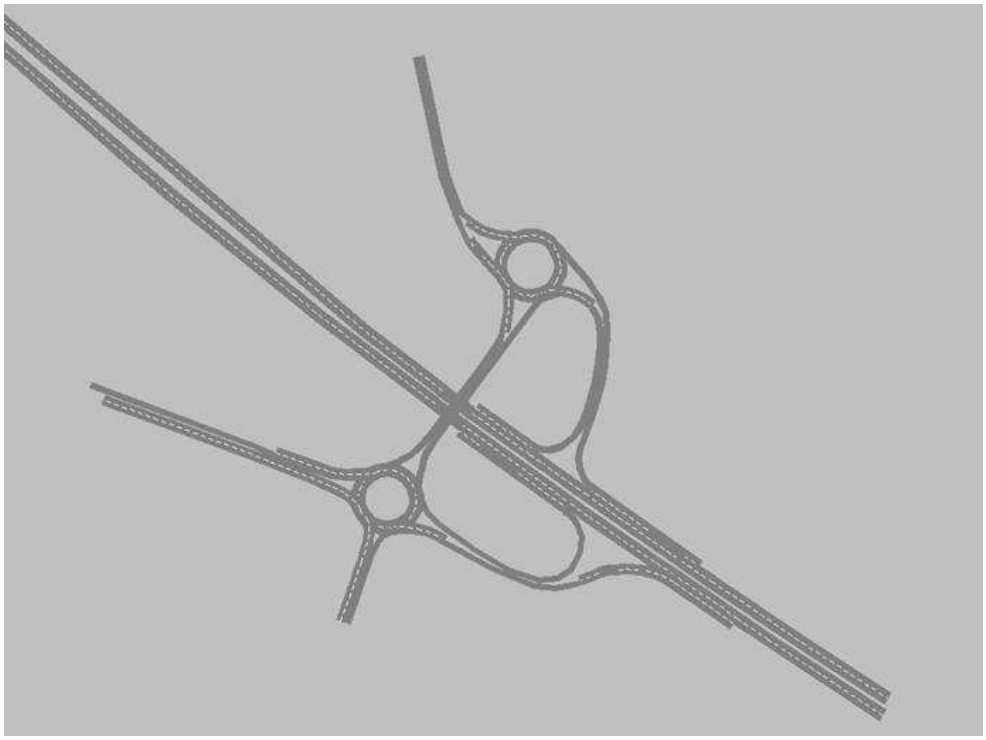


Figure 4.5 Modelled Area – A5 Stoneydelph VISSIM Model



5 Do Nothing Model Test

Introduction

5.1 The 'Do Nothing' Model test considers network operations based on existing highway layouts and year 2010 traffic flows. This provides a benchmark against which the impact of committed and LDF sites can subsequently be compared.

5.2 This has been carried out for the A5 Mile Oak, A5 Ventura Park, A5 Marlborough Way and A5 Stoneydelph junctions.

Results

5.3 **Tables 5.1 to 5.4** show the overall modelling results for the 2010 existing network models in both weekday peak periods. For A5 Ventura Park, results are additionally shown for the Saturday peak period.

5.4 In order to make a reasonable comparison between the four networks and compare scenarios, the results will be looked at on two levels, on an overall network performance level and also in more detail on individual approaches at each of the junctions.

5.5 **Tables 5.1 and 5.2** show the detailed analysis in the form of modelled maximum and average queues for each of the junctions.

5.6 **Tables 5.3 and 5.4** show the overall network statistics. The performance indicators selected for comparison are:

- Average delay in seconds;
- Average speed in mph;
- Total delay;
- Total travel time.

5.7 It is considered that by measuring the network performance by these parameters in conjunction with the more detailed queue analysis, a reasonable comparison can be made between all modelled scenarios. Using these wide ranging tests a clear picture of the network problems could be established, and the benefits from design changes could be quantified.

Table 5.1 2010 Weekday AM Do Nothing Queue Summary

Location	Description	AM 2010 DN	
		Avg Q Metres	Max Q Metres
A5 Mile Oak	A453 Sutton Rd NB	45	183
	B5404 Hints Rd EB	4	29
	A453 Sutton Rd SB	59	243
	B5404 Lichfield St WB	37	162
	A5 WB off-slip	24	93
	A5 EB off-slip	0	8
	B5404 Plantation Lane SB	3	42
	A453 Bonehill Rd WB	0	5
	A453 Bonehill Rd NB	1	29
A5 Ventura Park	A5 EB off-slip	0	4
	A51 NB	4	52
	Ventura Park Rd EB	0	6
	Ventura Park Rd WB	0	4
	Elmhurst Drive SB	0	7
	Bitterscote Drive SB	0	9
	Bitterscote Drive NB	32	98
	Bonehill Rd WB	0	8
	Tame Drive SB	2	30
	Bonehill Rd EB	29	131
	River Drive WB	50	141
A5 Marlborough Way	B5440 Marlborough Way NB approaching Field Farm Rd	97	115
	Field Farm Rd EB	19	24
	B5440 Marlborough Way SB approaching Field Farm Rd	9	11
	B5440 Marlborough Way NB approaching A5 RAB	107	124
	A5 WB off-slip	15	20
	A5 EB off-slip	34	39
	B5440 Marlborough Way SB approaching A5 RAB	28	38
	B5440 Marlborough Way NB approaching Silver Link Rd	53	61
	Silver Link Rd WB	55	73
	B5440 Marlborough Way SB approaching Silver Link Rd	278	318
A5 Stoneydelph	B5404 Watling St EB	37	51
	Centurion Way NB	8	13
	A5 WB off-slip	26	28
	Pennine Way SB approaching southern RAB	14	15
	Pennine Way NB approaching northern RAB	24	42
	Pennine Way SB approaching northern RAB	49	71
	A5 EB off-slip	18	25

Table 5.2 2010 Weekday PM Do Nothing Queue Summary

Location	Description	PM 2010 DN	
		Avg Q Metres	Max Q Metres
A5 Mile Oak	A453 Sutton Rd NB	109	624
	B5404 Hints Rd EB	5	31
	A453 Sutton Rd SB	83	301
	B5404 Lichfield St WB	56	188
	A5 WB off-slip	45	118
	A5 EB off-slip	0	6
	B5404 Plantation Lane SB	4	50
	A453 Bonehill Rd WB	1	21
	A453 Bonehill Rd NB	2	36
A5 Ventura Park	A5 EB off-slip	0	5
	A51 NB	2	37
	Ventura Park Rd EB	6	51
	Ventura Park Rd WB	28	73
	Elmhurst Drive SB	29	343
	Bitterscote Drive SB	24	86
	Bitterscote Drive NB	18	75
	Bonehill Rd WB	0	9
	Tame Drive SB	23	200
	Bonehill Rd EB	34	145
	River Drive WB	113	492
A5 Marlborough Way	B5440 Marlborough Way NB approaching Field Farm Rd	92	107
	Field Farm Rd EB	20	25
	B5440 Marlborough Way SB approaching Field Farm Rd	15	23
	B5440 Marlborough Way NB approaching A5 RAB	169	177
	A5 WB off-slip	21	24
	A5 EB off-slip	131	214
	B5440 Marlborough Way SB approaching A5 RAB	31	34
	B5440 Marlborough Way NB approaching Silver Link Rd	71	82
	Silver Link Rd WB	45	55
	B5440 Marlborough Way SB approaching Silver Link Rd	192	283
A5 Stoneydelph	B5404 Watling St EB	60	111
	Centurion Way NB	25	31
	A5 WB off-slip	54	93
	Pennine Way SB approaching southern RAB	11	14
	Pennine Way NB approaching northern RAB	55	98
	Pennine Way SB approaching northern RAB	36	51
	A5 EB off-slip	34	38

Table 5.3 2010 Saturday Do Nothing Queue Summary

Location	Description	AM 2010 DN	
		Avg Q Metres	Max Q Metres
A5 Ventura Park	A5 EB off-slip	0	7
	A51 NB	8	69
	Ventura Park Rd EB	1	19
	Ventura Park Rd WB	5	133
	Elmhurst Drive SB	37	151
	Bitterscote Drive SB	20	92
	Bitterscote Drive NB	19	75
	Bonehill Rd WB	0	14
	Tame Drive SB	1	22
	Bonehill Rd EB	12	75
	River Drive WB	76	196

5.8 At Marlborough Way, the AM peak scenario resulted in the longest queue on the A5 roundabout along Marlborough Way northbound and reaches 124 metres. Whereas, the PM results show the A5 off-slip to have the longest queue with it reaching a maximum of 214 metres in the hour.

5.9 The Stoneydelph scenario shows the northern roundabout at Pennine Road (west) to have the greatest queue, in the AM, which equates to a maximum of 71 metres. Whereas, in the PM peak, the southern roundabout at Watling Street has the longest queue and reaches 111 metres. The queues leading onto the A5 for the AM and PM peaks show the westbound slip to reach a maximum of 28 and 93 metres, respectively, with the eastbound slip reaching a maximum of 25 and 38 respectively.

5.10 The A5 Mile Oak junction experiences heavy queues at the signalised crossroads between A453 Sutton Road NB and SB, B5404 Hints Road and B5404 Lichfield Street. During the AM peak there is a maximum queue of 243 metres on the A453 Sutton Road SB and during the PM peak there is a maximum queue of 624 metres on A453 Sutton Road NB and 301 metres on the A453 Sutton Road SB. The queue on the A453 southbound is intermittent but has been observed to extend up to and beyond the A5 Westbound off-slip junction with the A453. This has the effect of obstructing vehicles turning out of the slip road. Consequently queues build up on the slip road.

5.11 The Ventura Park Junction is less congested in the AM peak than the PM and Saturday peaks. During the AM peak the longest queue is on River Drive WB which has a maximum queue of 141 metres. In the PM peak there are heavy queues on Elmhurst Drive SB, Tame Drive SB and River Drive WB. The longest of which is on River Drive WB which has a maximum of 492 metres. The Saturday peak is also congested with heavy queues on Elmhurst, Ventura Park Rd WB and River Drive WB. The longest maximum queue is 196 metres on River Drive WB.

5.12 **Tables 5.3 to 5.11** show the overall network statistics.

Table 5.3 2010 Weekday AM Do Nothing Network Statistics: A5 Mile Oak

Indicator	2010 AM DN
Av Delay /s	19
Av Speed /mph	66
Total Delay /h	36
Total Travel Time /h	159

Table 5.4 2010 Weekday AM Do Nothing Network Statistics: A5 Ventura Park

Indicator	2010 AM DN
Av Delay /s	20
Av Speed /mph	39
Total Delay /h	47
Total Travel Time /h	211

Table 5.5 2010 Weekday AM Do Nothing Network Statistics: A5 Marlborough Way

Indicator	2010 AM DN
Av Delay /s	29
Av Speed /mph	29
Total Delay /h	66
Total Travel Time /h	303

Table 5.6 2010 Weekday AM Do Nothing Network Statistics: A5 Stoneydelph

Indicator	2010 AM DN
Av Delay /s	8
Av Speed /mph	30
Total Delay /h	11
Total Travel Time /h	77

Table 5.7 2010 Weekday PM Do Nothing Network Statistics: A5 Mile Oak

Indicator	2010 PM DN
Av Delay /s	28
Av Speed /mph	61
Total Delay /h	57
Total Travel Time /h	189

Table 5.8 2010 Weekday PM Do Nothing Network Statistics: A5 Ventura Park

Indicator	2010 PM DN
Av Delay /s	41
Av Speed /mph	32
Total Delay /h	117
Total Travel Time /h	313

Table 5.9 2010 Weekday PM Do Nothing Network Statistics: A5 Marlborough Way

Indicator	2010 PM DN
Av Delay /s	35
Av Speed /mph	29
Total Delay /h	101
Total Travel Time /h	400

Table 5.10 2010 Weekday PM Do Nothing Network Statistics: A5 Stoneydelph

Indicator	2010 PM DN
Av Delay /s	12
Av Speed /mph	30
Total Delay /h	23
Total Travel Time /h	109

Table 5.11 2010 Saturday Do Nothing Network Statistics: A5 Ventura Park

Indicator	2010 SATURDAY DN
Av Delay /s	37
Av Speed /mph	29
Total Delay /h	93
Total Travel Time /h	264

5.13 **Table 5.5** and **5.9** shows the Marlborough Way scenario network statistics results for the AM and PM peak respectively. It is notable that the average delay, total delay and travel time is greater in the PM peak than the AM peak, which demonstrates a higher level of congestion in the evening scenario.

5.14 **Table 5.6** and **5.10** shows Stoneydelph scenario network statistics results for the AM and PM peak respectively. It is notable that the average delay, total delay and travel time is greater in the PM peak than the AM peak, with the PM also showing a reduction in speed.

5.15 **Tables 5.3** and **5.7** show the Mile Oak junction network statistics results for the AM and PM peak respectively. It is notable that the average delay, total delay and travel time is greater in the PM peak than the AM peak, which demonstrates a higher level of congestion in the evening scenario.

5.16 **Tables 5.4**, **5.8** and **5.11** shows the Ventura Park junction network statistics results for the AM and PM and Saturday peaks respectively. The AM peak has the lowest levels of delay and total travel time together with the highest average speed. The PM peak has the greatest levels of delay and total travel time, whereas the Saturday peak has the lowest average speed.

6 Do Minimum Model Test

Background

6.1 The purpose of the 'do minimum' test is to assess network performance in 2026 including committed development with the committed schemes in place. This scenario does not include LDF growth.

6.2 As previously stated elsewhere in this report, there are various committed schemes in the vicinity of A5 Ventura Park junction. In the vicinity of the A5 Ventura Park Junction, the following schemes are committed:

- 'Jolly Sailor' Roundabout signalisation and improvement (Bitterscote Drive/A453 Bonehill Road/A51 Tame Drive/Bonehill Road/A453 River Drive);
- 'Sainsbury's' Roundabout signalisation and improvement (Bitterscote Drive/Ventura Park Road/A5/Ventura Park Road/Elmhurst Drive), and;
- Bitterscote South site access roundabout.

6.3 Scheme drawings of the above are included within Appendix A.

6.4 The committed schemes at A5 Ventura Park junction (as identified above) are included for this scenario. There is however no committed schemes relating to the A5 Mile Oak, A5 Marlborough Way and A5 Stoneydelph junctions, and accordingly these junctions are tested as per the existing layouts.

Results

6.5 The modelling results for the Do Minimum scenario are shown below in **Tables 6.1 to Tables 6.3.**

Table 6.1 2026 Weekday AM Do Minimum Queue Summary

Location	Description	AM 2026	
		Avg Q Metres	Max Q Metres
A5 Mile Oak	A453 Sutton Rd NB	59	269
	B5404 Hints Rd EB	4	29
	A453 Sutton Rd SB	67	258
	B5404 Lichfield St WB	37	158
	A5 WB off-slip	38	113
	A5 EB off-slip	0	12
	B5401 Plantation Lane SB	6	62
	A453 Bonehill Rd WB	0	8
	A453 Bonehill Rd NB	1	42
A5 Ventura Park	A5 WB off-slip, approach to Bitterscote South Roundabout	0	0
	A51 SB, approach to Bitterscote South Roundabout	0	0
	A51 NB	13	57
	Ventura Park Rd EB	0	3
	Ventura Park Rd WB	5	30
	Elmhurst Drive SB	0	11
	Bitterscote Drive SB	7	56
	Bitterscote Drive NB	18	98
	Bonehill Rd WB	0	6
	Tame Drive SB	12	55
	Bonehill Rd EB	12	64
	River Drive WB	497	1317
	Bitterscote South site access	0	0
	A5 EB off-slip	1	21
A5 Marlborough Way	B5440 Marlborough Way NB approaching Field Farm Rd	93	101
	Field Farm Rd EB	21	29
	B5440 Marlborough Way SB approaching Field Farm Rd	10	25
	B5440 Marlborough Way NB approaching A5 RAB	101	124
	A5 WB off-slip	17	22
	A5 EB off-slip	41	52
	B5440 Marlborough Way SB approaching A5 RAB	29	36
	B5440 Marlborough Way NB approaching Silver Link Rd	62	76
	Silver Link Rd WB	68	83
	B5440 Marlborough Way SB approaching Silver Link Rd	309	332
A5 Stoneydelph	B5404 Watling St EB	71	98
	Centurion Way NB	11	14
	A5 WB off-slip	28	32
	Pennine Way SB approaching southern RAB	16	20
	Pennine Way NB approaching northern RAB	28	33
	Pennine Way SB approaching northern RAB	45	68
	A5 EB off-slip	23	27

Table 6.2 2026 Weekday PM Do Minimum Queue Summary

Location	Description	PM 2026	
		Avg Q Metres	Max Q Metres
A5 Mile Oak	A453 Sutton Rd NB	139	857
	B5404 Hints Rd EB	5	31
	A453 Sutton Rd SB	95	300
	B5404 Lichfield St WB	55	181
	A5 WB off-slip	119	195
	A5 EB off-slip	0	11
	B5404 Plantation Lane SB	4	56
	A453 Bonehill Rd WB	0	21
	A453 Bonehill Rd NB	5	72
A5 Ventura Park	A5 WB off-slip, approach to Bitterscote South Roundabout	0	0
	A51 SB, approach to Bitterscote South Roundabout	0	0
	A51 NB	9	44
	Ventura Park Rd EB	6	60
	Ventura Park Rd WB	103	213
	Elmhurst Drive SB	75	1572
	Bitterscote Drive SB	10	69
	Bitterscote Drive NB	9	51
	Bonehill Rd WB	0	3
	Tame Drive SB	361	976
	Bonehill Rd EB	41	172
	River Drive WB	487	1787
	Bitterscote South site access	0	0
	A5 EB off-slip	0	7
A5 Marlborough Way	B5440 Marlborough Way NB approaching Field Farm Rd	85	104
	Field Farm Rd EB	21	26
	B5440 Marlborough Way SB approaching Field Farm Rd	21	22
	B5440 Marlborough Way NB approaching A5 RAB	191	279
	A5 WB off-slip	19	23
	A5 EB off-slip	149	188
	B5440 Marlborough Way SB approaching A5 RAB	35	39
	B5440 Marlborough Way NB approaching Silver Link Rd	127	142
	Silver Link Rd WB	77	88
	B5440 Marlborough Way SB approaching Silver Link Rd	348	348
A5 Stoneydelph	B5404 Watling St EB	89	141
	Centurion Way NB	25	33
	A5 WB off-slip	70	126
	Pennine Way SB approaching southern RAB	12	14
	Pennine Way NB approaching northern RAB	79	101
	Pennine Way SB approaching northern RAB	51	83
	A5 EB off-slip	49	61

Table 6.3 2026 Saturday Do Minimum Queue Summary

Location	Description	SAT 2026	
		Avg Q Metres	Max Q Metres
A5 Ventura Park	A5 WB off-slip, approach to Bitterscote South Roundabout	49	77
	A51 SB, approach to Bitterscote South Roundabout	0	0
	A51 NB	198	221
	Ventura Park Rd EB	159	642
	Ventura Park Rd WB	207	1137
	Elmhurst Drive SB	83	1719
	Bitterscote Drive SB	81	123
	Bitterscote Drive NB	112	61
	Bonehill Rd WB	35	39
	Tame Drive SB	394	134
	Bonehill Rd EB	108	188
	River Drive WB	426	2099
	Bitterscote South site access	0	0
	A5 EB off-slip	115	158

6.6 In the Marlborough Way scenario the AM and PM peak have the longest queue on the A5 roundabout along Marlborough Way northbound. In the Do Minimum scenario the queue reaches 124 metres in the AM peak and 279 metres in the PM peak.

6.7 Within the Stoneydelph scenario the southern roundabout at Watling Street arm has the greatest queue, in the AM and PM, which equates to a maximum of 98 and 141 metres respectively. The queues leading onto the A5 for the AM and PM peaks show the westbound slip to reach a maximum of 32 and 126 metres, respectively, with the eastbound slip reaching a maximum of 27 and 61 metres respectively.

6.8 The Mile Oak junction model results indicate heavy queuing on the A453 Sutton Road in both directions at the signalised crossroads. This is to a greater extent in the PM peak, where the queue on the Sutton Road is also accompanied by heavy queues on the A5 Westbound off-slip.

6.9 The Ventura Park junction model shows relatively light queues during the AM peak with the exception of River Drive which has a maximum queue of 1317 metres. The large increase in the queues on this approach is due to the growth in background traffic from 2010 to 2026 and also the significant amount of committed development traffic which would impact on this junction. The committed signalisation scheme would enable control of traffic flow at this junction. It has been used a mechanism to prevent queues from extending back onto the A5 mainline from the “Sainsburys” roundabout. The only way to prevent the two roundabout junctions from becoming gridlocked is to restrict the amount of vehicles discharging from some of the approaches. It was considered that River Drive would be used for this purpose, hence the extensive queuing. The PM peak is more congested with heavy queues on many of the approaches including Elmhurst Drive SB, River Drive WB and Tame Drive SB which have maximum queues of 1572, 1787 and 976 metres respectively. The Saturday peak hour is also heavily congested with heavy queues

on many approaches including Ventura Park EB, Ventura Park WB, Elmhurst Drive SB and River Drive WB with maximum queues of 642, 1137, 1719 and 2099 metres respectively.

6.10 The level of predicted queues would extend beyond the modelled extent of the network. The queue summary tables include vehicles which were unable to enter the network so that the results show the full extent of the queueing which is predicted and is not artificially limited by the size of the network. The model does not explicity model Lichfield Road but it would be likely that queues would extend past that particular point on the local highway network.

6.11 **Tables 6.4 to 6.12** below show the network statistics for the Do Minimum scenario.

Table 6.4 2026 Weekday AM Do Minimum Network Statistics: A5 Mile Oak

Indicator	2026 AM DN	2026 AM DM	Difference
Av Delay /s	19	23	4
Av Speed /mph	66	64	-2
Total Delay /h	36	43	7
Total Travel Time /h	159	171	12

Table 6.5 2026 Weekday AM Do Minimum Network Statistics: A5 Ventura Park

Indicator	2026 AM DN	2026 AM DM	Difference
Av Delay /s	20	59	39
Av Speed /mph	39	27	-12
Total Delay /h	47	151	104
Total Travel Time /h	211	329	118

Table 6.6 2026 Weekday AM Do Minimum Network Statistics: A5 Marlborough Way

Indicator	2026 AM DN	2026 AM DM	Difference
Av Delay /s	29	32	4
Av Speed /mph	29	28	-1
Total Delay /h	66	80	14
Total Travel Time /h	303	331	28

Table 6.7 2026 Weekday AM Do Minimum Network Statistics: A5 Stoneydelph

Indicator	2026 AM DN	2026 AM DM	Difference
Av Delay /s	8	10	2
Av Speed /mph	30	30	0
Total Delay /h	11	15	4
Total Travel Time /h	77	85	8

Table 6.8 2026 Weekday PM Do Minimum Network Statistics: A5 Mile Oak

Indicator	2026 PM DN	2026 PM DM	Difference
Av Delay /s	28	38	10
Av Speed /mph	61	55	-6

Total Delay /h	57	81	24
Total Travel Time /h	189	219	30

Table 6.9 2026 Weekday PM Do Minimum Network Statistics: A5 Ventura Park

Indicator	2026 PM DN	2026 PM DM	Difference
Av Delay /s	41	74	33
Av Speed /mph	32	24	-8
Total Delay /h	117	222	105
Total Travel Time /h	313	426	113

Table 6.10 2026 Weekday PM Do Minimum Network Statistics: A5 Marlborough Way

Indicator	2026 PM DN	2026 PM DM	Difference
Av Delay /s	35	45	10
Av Speed /mph	29	27	-2
Total Delay /h	101	137	46
Total Travel Time /h	400	447	69

Table 6.11 2026 Weekday PM Do Minimum Network Statistics: A5 Stoneydelph

Indicator	2026 PM DN	2026 PM DM	Difference
Av Delay /s	12	14	2
Av Speed /mph	30	29	-1
Total Delay /h	23	28	5
Total Travel Time /h	109	117	8

Table 6.12 2026 Saturday Do Minimum Network Statistics: A5 Ventura Park

Indicator	2010 SATURDAY DN	2026 SATURDAY DM	Difference
Av Delay /s	37	180	143
Av Speed /mph	29	16	-13
Total Delay /h	93	345	252
Total Travel Time /h	264	491	227

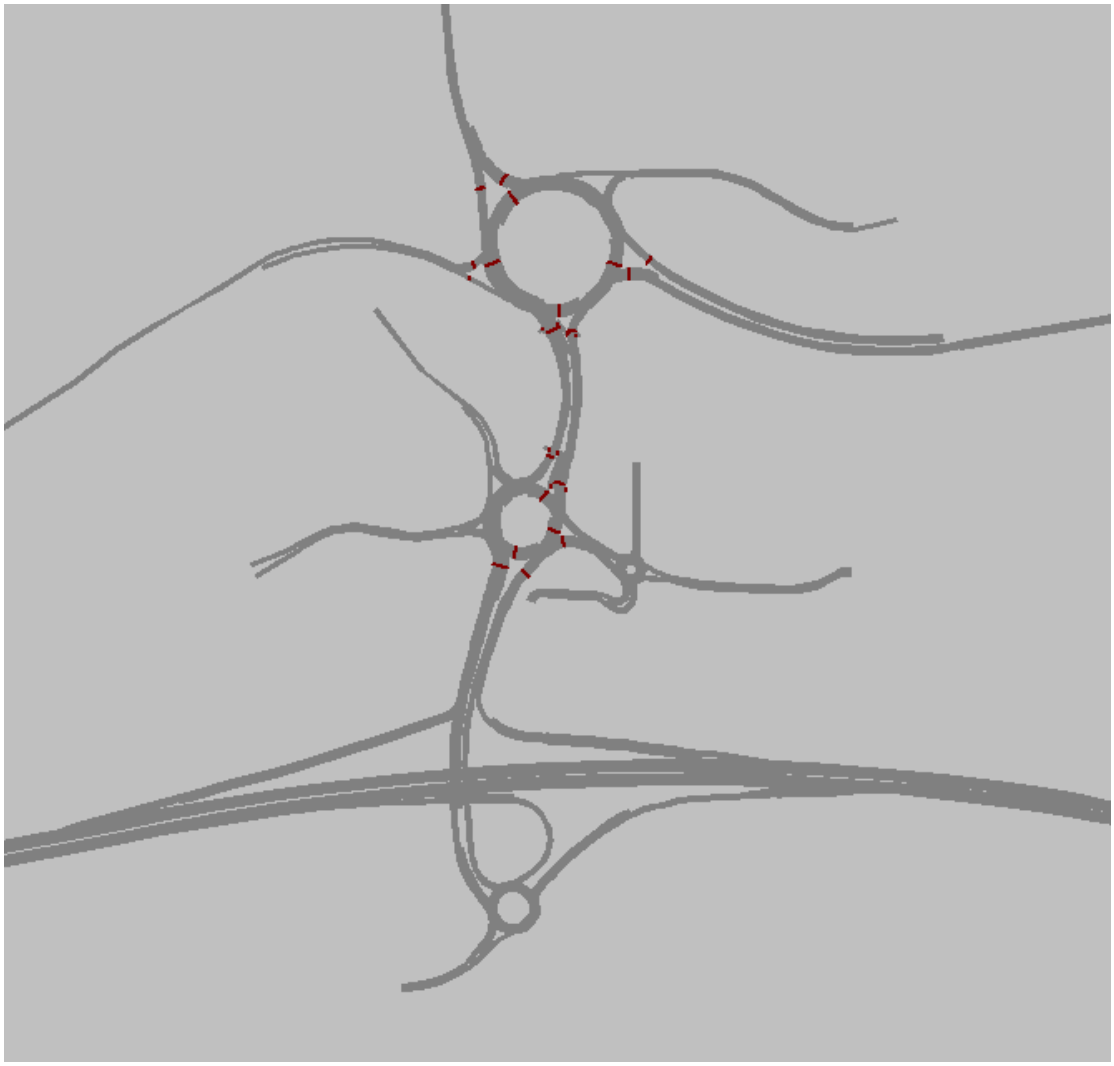
6.12 **Table 6.6** and **6.10** shows the Marlborough Way scenario network statistics results for the AM and PM peak respectively. It is notable that the average delay, total delay and travel time is greatest in the PM peak than the AM peak, which demonstrates a higher level of congestion in the evening scenario.

6.13 **Table 6.7** and **6.11** shows Stoneydelph scenario network statistics results for the AM and PM peak respectively. It is notable that the average delay, total delay and travel time is greatest in the PM peak than the AM peak with the PM also showing a reduction in speed.

6.14 **Tables 6.4** and **6.8** shows Mile Oak scenario network statistics results for the AM and PM peak respectively. It is notable that the average delay, total delay and travel time is greatest in the PM peak than the AM peak with the PM also showing a reduction in average speed.

6.15 **Tables 6.5, 6.9** and **6.12** shows Ventura Park scenario network statistics results for the AM, PM and Saturday peaks respectively. Generally the results show an incremental increase in delay and travel time from AM to PM and then with the greatest levels of delay and total travel time together with the lowest average speed in the Saturday peak hour.

Figure 6.1 Do Minimum Highway Network at Ventura Park – VISSIM Model



7 Do Something Model Tests

Background

7.1 The Do Something model tests consist of two overall scenarios, referred to as Do Something 1 (DS1) and Do Something 2 (DS2), as described below:

7.2 The **DS 1** scenario considers network operations for the year 2026 taking into account committed development traffic, and traffic associated with LDF allocations.

7.3 The committed schemes at A5 Ventura Park junction are included for this scenario. There is however no committed schemes relating to the A5 Mile Oak, A5 Marlborough Way and A5 Stoneydelph junctions, and accordingly these junctions are tested as per the existing layouts.

7.4 The DS 1 scenario permits an analysis to be undertaken of network operations in the year 2026 which takes into account all development traffic. It is then possible to determine whether further mitigation measures are likely to be required in order to address any identified issues.

7.5 The **DS 2** scenario (where identified as necessary by the DS1 scenario), tests further mitigation measures to confirm their effectiveness. As per the DS1 scenario, committed development traffic and traffic associated with LDF allocations are taken into account.

Do Something 1 Scenario

7.6 The modelling results for the Do Something 1 scenario are shown below in **Tables 7.1 to Tables 7.3.**

Table 7.1 2026 Weekday AM Do Something 1 Queue Summary

Location	Description	AM 2026	
		Avg Q Metres	Max Q Metres
A5 Mile Oak	A453 Sutton Rd NB	53	210
	B5404 Hints Rd EB	5	28
	A453 Sutton Rd SB	104	309
	B5404 Lichfield St WB	305	697
	A5 WB off-slip	356	525
	A5 EB off-slip	0	17
	B5401 Plantation Lane SB	13	87
	A453 Bonehill Rd WB	0	17
	A453 Bonehill Rd NB	7	110
A5 Ventura Park	A5 WB off-slip, approach to Bitterscote South roundabout	0	11
	A51 SB, approach to Bitterscote South roundabout	0	2
	A51 NB	62	157
	Ventura Park Rd EB	4	28
	Ventura Park Rd WB	5	31
	Elmhurst Drive SB	1	16
	Bitterscote Drive SB	11	76
	Bitterscote Drive NB	69	179
	Bonehill Rd WB	1	12
	Tame Drive SB	28	146
	Bonehill Rd EB	22	104
	River Drive WB	568	2286
	Bitterscote South site access	0	2
	A5 EB off-slip	32	108
A5 Marlborough Way	B5440 Marlborough Way NB approaching Field Farm Rd	102	118
	Field Farm Rd EB	23	33
	B5440 Marlborough Way SB approaching Field Farm Rd	12	15
	B5440 Marlborough Way NB approaching A5 RAB	122	179
	A5 WB off-slip	19	22
	A5 EB off-slip	49	60
	B5440 Marlborough Way SB approaching A5 RAB	28	32
	B5440 Marlborough Way NB approaching Silver Link Rd	64	72
	Silver Link Rd WB	84	96
	B5440 Marlborough Way SB approaching Silver Link Rd	347	347
A5 Stoneydelph	B5404 Watling St EB	116	139
	Centurion Way NB	15	18
	A5 WB off-slip	34	48
	Pennine Way SB approaching southern RAB	20	22
	Pennine Way NB approaching northern RAB	33	56
	Pennine Way SB approaching northern RAB	44	63
	A5 EB off-slip	26	30

Table 7.2 2026 Weekday PM Do Something 1 Queue Summary

Location	Description	PM 2026	
		Avg Q Metres	Max Q Metres
A5 Mile Oak	A453 Sutton Rd NB	103	571
	B5404 Hints Rd EB	5	31
	A453 Sutton Rd SB	224	454
	B5401 Lichfield St WB	101	260
	A5 WB off-slip	664	781
	A5 EB off-slip	0	11
	B5404 Plantation Lane SB	13	86
	A453 Bonehill Rd WB	39	256
	A453 Bonehill Rd NB	8	101
A5 Ventura Park	A5 WB off-slip, approach to Bitterscote South roundabout	0	1
	A51 SB, approach to Bitterscote South roundabout	0	2
	A51 NB	22	83
	Ventura Park Rd EB	35	140
	Ventura Park Rd WB	38	119
	Elmhurst Drive SB	78	1968
	Bitterscote Drive SB	18	85
	Bitterscote Drive NB	12	59
	Bonehill Rd WB	0	2
	Tame Drive SB	497	1666
	Bonehill Rd EB	378	584
	River Drive WB	489	1790
	Bitterscote South site access	1	20
	A5 WB off-slip	8	52
A5 Marlborough Way	B5440 Marlborough Way NB approaching Field Farm Rd	85	107
	Field Farm Rd EB	26	39
	B5440 Marlborough Way SB approaching Field Farm Rd	23	41
	B5440 Marlborough Way NB approaching A5 RAB	261	323
	A5 WB off-slip	34	46
	A5 EB off-slip	125	157
	B5440 Marlborough Way SB approaching A5 RAB	32	36
	B5440 Marlborough Way NB approaching Silver Link Rd	198	218
	Silver Link Rd WB	99	103
	B5440 Marlborough Way SB approaching Silver Link Rd	349	350
A5 Stoneydelph	B5404 Watling St EB	120	163
	Centurion Way NB	32	38
	A5 WB off-slip	144	209
	Pennine Way SB approaching southern RAB	17	25
	Pennine Way NB approaching northern RAB	118	202
	Pennine Way SB approaching northern RAB	63	96
	A5 EB off-slip	50	59

Table 7.3 2026 Saturday Do Something 1 Queue Summary

Location	Description	SAT 2026	
		Avg Q Metres	Max Q Metres
A5 Ventura Park	A5 WB off-slip, approach to Bitterscote South roundabout	31	54
	A51 SB approach to Bitterscote South roundabout	0	0
	A51 NB	179	267
	Ventura Park Rd EB	163	806
	Ventura Park Rd WB	186	591
	Elmhurst Drive SB	69	1899
	Bitterscote Drive SB	93	175
	Bitterscote Drive NB	21	75
	Bonehill Rd WB	30	53
	Tame Drive SB	110	850
	Bonehill Rd EB	122	229
	River Drive WB	468	2144
	Bitterscote South site access	0	0
	A5 WB off-slip	135	189

7.7 In the Marlborough Way scenario the AM and PM peak have the longest queue on the A5 roundabout along Marlborough Way northbound. In the Do Something scenario the queue reaches 347 metres in the AM peak and 350 metres in the PM peak.

7.8 Within the Stoneydelph scenario the southern roundabout at Watling Street arm has the greatest queue, in the AM which equates to a maximum of 139 metres, whereas the PM peak shows the longest queue to be 209 metres. The queues leading onto the A5 for the AM and PM peaks show the westbound slip to reach a maximum of 48 and 209 metres, respectively, with the eastbound slip reaching a maximum of 30 and 59 metres respectively.

7.9 The Mile Oak junction results show that the junction is very congested in both the morning and evening peak hours with extensive queues on the network, most notably the Lichfield Street WB and the A5 Westbound off-slip with maximum queues of 697 and 525 metres respectively. The increase in traffic flows creates a heavier movement on the A453 Bonehill Road southbound which then obstructs the traffic on the A5 westbound off-slip. The A453 North approach to the signalised crossroads is given priority in order to try and keep the queues from reaching the Plantation Lane/Bonehill Road roundabout. The PM peak slightly more congested with heavy queues on several approaches including the A453 Sutton Road NB and SB at the signalised crossroads and the A5 WB off-slip, with maximum queues of 571, 454 and 781 metres respectively.

7.10 The Ventura Park junction results show some heavy queues on a few of the approaches and of particular note on River Drive WB which has a maximum queue of 2286 metres during the AM peak hour. The PM peak is quite congested with heavy queues on several approaches including Elmhurst Drive SB, Tame Drive SB, Bonehill Road EB and River Drive WB which have maximum

queues of 1968, 1666, 584 and 1790 metres respectively. The most congested modelled time period is the Saturday peak with significant queues on most of the approaches including the A51 NB, Ventura Park Road EB, Ventura Park Road WB, Elmhurst Drive SB, Tame Drive SB and River Drive WB with maximum queues of 267, 806, 591, 1899, 850 and 2144 metres respectively.

7.11 **Tables 7.4 to 7.12** below show the network statistics for the Do Something 1 scenario.

Table 7.4 2026 Weekday AM Do Something 1 Network Statistics: A5 Mile Oak

Indicator	2026 AM DM	2026 AM DS1	Difference
Av Delay /s	23	74	51
Av Speed /mph	64	40	-24
Total Delay /h	43	153	110
Total Travel Time /h	171	287	116

Table 7.5 2026 Weekday AM Do Something 1 Network Statistics: A5 Ventura Park

Indicator	2026 AM DM	2026 AM DS1	Difference
Av Delay /s	59	78	19
Av Speed /mph	27	24	-3
Total Delay /h	151	220	69
Total Travel Time /h	329	417	88

Table 7.6 2026 Weekday AM Do Something 1 Network Statistics: A5 Marlborough Way

Indicator	2026 AM DM	2026 AM DS1	Difference
Av Delay /s	32	41	9
Av Speed /mph	28	27	-2
Total Delay /h	80	114	34
Total Travel Time /h	331	390	59

Table 7.7 2026 Weekday AM Do Something 1 Network Statistics: A5 Stoneydelph

Indicator	2026 AM DM	2026 AM DS1	Difference
Av Delay /s	10	13	3
Av Speed /mph	30	29	-1
Total Delay /h	15	21	6
Total Travel Time /h	85	98	13

Table 7.8 2026 Weekday PM Do Something 1 Network Statistics: A5 Mile Oak

Indicator	2026 PM DM	2026 PM DS1	Difference
Av Delay /s	38	132	94
Av Speed /mph	55	27	28
Total Delay /h	81	248	167
Total Travel Time /h	219	365	146

Table 7.9 2026 Weekday PM Do Something 1 Network Statistics: A5 Ventura Park

Indicator	2026 PM DM	2026 PM DS1	Difference
Av Delay /s	74	89	15

Av Speed /mph	24	22	-2
Total Delay /h	222	281	59
Total Travel Time /h	426	498	72

Table 7.10 2026 Weekday PM Do Something 1 Network Statistics: A5 Marlborough Way

Indicator	2026 PM DM	2026 PM DS1	Difference
Av Delay /s	45	55	11
Av Speed /mph	27	25	-2
Total Delay /h	137	183	46
Total Travel Time /h	447	516	69

Table 7.11 2026 Weekday PM Do Something 1 Network Statistics: A5 Stoneydelph

Indicator	2026 PM DM	2026 PM DS1	Difference
Av Delay /s	14.30	19.72	5.42
Av Speed /mph	28.54	26.28	-2.26
Total Delay /h	28.17	41.88	13.71
Total Travel Time /h	117.44	137.37	19.93

Table 7.12 2026 Saturday Do Something 1 Network Statistics: A5 Ventura Park

Indicator	2010 SATURDAY DM	2026 SATURDAY DS1	Difference
Av Delay /s	180	186	6
Av Speed /mph	16	15	-1
Total Delay /h	345	373	28
Total Travel Time /h	491	519	28

7.12 **Table 7.6** and **7.10** shows the Marlborough Way scenario network statistics results for the AM and PM peak respectively. It is notable that the average delay, total delay and travel time is greatest in the PM peak than the AM peak, which demonstrates a higher level of congestion in the evening scenario.

7.13 **Table 7.7** and **7.11** shows Stoneydelph scenario network statistics results for the AM and PM peak respectively. It is notable that the average delay, total delay and travel time is greatest in the PM peak than the AM peak with the PM also showing a reduction in speed.

7.14 **Tables 7.4** and **7.8** shows Mile Oak scenario network statistics results for the AM and PM peak respectively. It is notable that the average delay, total delay and travel time is greatest in the PM peak than the AM peak, which demonstrates a higher level of congestion in the evening scenario with lower average speeds.

7.15 At Ventura Park, **Tables 7.5, 7.9** and **7.12** show an incremental increase in total delays and travel times from AM to PM and Saturday with the highest levels of congestion together with the lowest average speed shown in the Saturday peak.

7.16 At **A5 Ventura Park** junction the already committed highway improvement schemes are sufficient in order to accommodate development growth. Continued dialogue and cooperation will be required between the Highways Agency and Staffordshire County Council to ensure that the

signalisation scheme operates in a manner which safeguards the operation of the A5. There is therefore no requirement for further highway mitigation works at this location.

7.17 At **A5 Marlborough Way** junction with the addition of traffic associated with development growth there are no issues of concern affecting the operation of the A5. As is the case at the Ventura Park junction, continued dialogue and cooperation will be required between the Highways Agency and Staffordshire County Council to ensure that the existing traffic signals operate in a manner which safeguards the operation of the A5. There is therefore no requirement for highway mitigation works at this location.

7.18 At **A5 Mile Oak** junction, the additional development traffic results in increased queuing on A453 southbound approaching the signalised crossroads. In turn, this results in significantly increased queuing on the A5 westbound off-slip, because of insufficient gaps in the opposing traffic. The queues on the A5 westbound off-slip extend to the A5 mainline carriageway leading to flow breakdown. This is a significant concern, and accordingly there is a requirement for highway mitigation at this location.

7.19 At **A5 Stoneydelph** junction, queuing northbound on the Pennine Way bridge is increased as is queuing on Watling Street eastbound. This increases congestion at the southern roundabout which in turn increases queuing on the A5 westbound off-slip which extends to the A5 mainline carriageway leading to flow breakdown. This is a significant concern, and accordingly there is a requirement for highway mitigation at this location.

Do Something 2 Scenario

7.20 The DS1 Scenario has identified that capacity issues affecting the operation of the A5 are forecast to arise at the A5 Mile Oak and A5 Stoneydelph junctions.

7.21 As a result, JMP began the process of considering designs that would achieve a number of HA requirements at the A5 Mile Oak, and A5 Stoneydelph junctions:

- Improve network performance on the A5;
- Provide safety improvements, and;
- Provide control of queues.

7.22 A number of constraints limited the options available to the designers. Firstly, the physical restrictions of the land available and geography of the area ruled out a number of potential options. In addition, any scheme would have to be deliverable from a cost perspective.

Preferred Options

7.23 Accordingly, JMP developed preferred options for each of the junctions, and drawings of these schemes are presented in Appendix B of this report.

7.24 At **A5 Mile Oak**, the preferred option consists of widening the A453 southbound towards the existing signal controlled crossroads to two lanes for part of its length. A dedicated left turn lane is provided at the A453 southbound at the signalised junction. Furthermore, the junction of the A5 westbound off-slip and the A453 is to be signalised and NMU (Non Motorised User) facilities are to be provided at the A5 westbound off-slip/A453 junction.

7.25 The scheme provides a number of benefits. First, increased capacity is provided at the A453 southbound approach to the signalised junction, and this significantly reduces blocking back of queuing traffic across the A453/A5 westbound off-slip. Second, the signalisation of the A453/A5 westbound off-slip provides balance and control of traffic flows to ensure that vehicles can emerge from the A5 slip road. The combined effect of each of the two elements of the scheme protects the operation of the A5 and ensures that the queuing on the A5 off-slip does not reach the mainline carriageway. In addition, the provision of NMU facilities at the A5 westbound off-slip/A453 is a betterment compared to the existing situation.

7.26 At **A5 Stoneydelph**, the preferred option consists of the A5 westbound off-slip being widened to two lanes throughout its length and the provision of a dedicated 'express' left turn lane at the Pennine Way northbound approach to the northern roundabout. At present much of the existing footway at the northern roundabout is obscured behind dense vegetation. The preferred option includes a relocated shared cycleway and footway at this location.

7.27 There are several benefits provided by this scheme. First, the provision of the dedicated 'express' left turn lane improves the flow of traffic on Pennine Way northbound over the bridge. In turn, this reduces congestion at Watling Street eastbound and also at the southern roundabout. This creates additional gaps for vehicles to exit the A5 westbound off-slip more freely, reducing queues. The provision of an additional lane on the A5 westbound off-slip further reduces the length of the queue and protects the operation of the A5. The relocated shared cycleway and footway at the northern roundabout, in addition to catering for the needs of cyclists, benefits all NMU's as the new facility is more visible from the road thereby providing a higher level of natural surveillance.

Modelling Notes

7.28 As noted in the preceding section, the A5 Mile Oak scheme includes an element of additional signalisation. It is understood that the existing signals at the Mile Oak crossroads (under the jurisdiction of Staffordshire County Council) are MOVA optimised signals.

7.29 It is considered that if the suggested designs are pursued, MOVA optimised signals will be included within the design to allow efficient use of the junctions. The signals at the A5 westbound off-slip would be linked to the existing signals at the Mile Oak crossroads. MOVA are 'smart' signals that automatically adjust signals timings based on the levels of queues on approaches. However, at this early design stage fixed time signals have been used. Within these signal timings, fixed pedestrian phases have been incorporated. The inclusion of MOVA signals may well increase efficiency at the junction by approximately 15%, and greater betterment is likely to be achieved.

Results

7.30 The results of the 'Do Something 2' models are shown below in **Table 7.1 and 7.2.**

Table 7.3 2026 AM Do Something 2 Queue Summary

Location	Description	AM 2026	
		Avg Q Metres	Max Q Metres
A5 Mile Oak	A453 Sutton Rd NB	79	223
	B5404 Hints Rd EB	5	29
	A453 Sutton Rd SB	98	277
	B5404 Lichfield St WB	364	1331
	A5 WB off-slip	35	106
	A5 EB off-slip	0	16
	B5404 Plantation Lane SB	27	110
	A453 Bonehill Rd WB	0	19
	A453 Bonehill Rd NB	0	3
A5 Stoneydelph	B5404 Watling St EB	105	128
	Centurion Way NB	16	19
	A5 WB off-slip	52	61
	Pennine Way SB approaching southern RAB	23	29
	Pennine Way NB approaching northern RAB	3	5
	Pennine Way SB approaching northern RAB	50	70
	A5 EB off-slip	18	20

Table 7.4 2026 PM Do Something 2 Queue Summary

Location	Description	AM 2026	
		Avg Q Metres	Max Q Metres
A5 Mile Oak	A453 Sutton Rd NB	126	415
	B5404 Hints Rd EB	7	34
	A453 Sutton Rd SB	427	576
	B5404 Lichfield St WB	373	1940
	A5 WB off-slip	195	291
	A5 EB off-slip	0	13
	B5404 Plantation Lane SB	17	93
	A453 Bonehill Rd WB	77	439
	A453 Bonehill Rd NB	95	213
A5 Stoneydelph	B5404 Watling St EB	64	94
	Centurion Way NB	28	35
	A5 WB off-slip	52	73
	Pennine Way SB approaching southern RAB	16	18
	Pennine Way NB approaching northern RAB	11	17
	Pennine Way SB approaching northern RAB	71	106
	A5 EB off-slip	31	39

7.31 From analysing the AM and PM peak Stoneydelph results shown in **Table 7.3** and **7.4**, the queues leading onto the A5 from the westbound slip are 61 and 73 metres respectively, and for the eastbound slip are 20 and 59 metres which is a significant reduction when compared to the DS1 scenario.

7.32 **Tables 7.5 to 7.8** show the overall network statistics for each junction comparing the DS1 and DS 2 scenarios (comparing junction operations without and with the proposed schemes respectively):

Table 7.5 2026 AM Do Something 2 Network Statistics : A5 Mile Oak

Indicator	2026 DS 1	2026 DS 2	Difference
Av Delay /s	74	44	-30
Av Speed /mph	40	52	12
Total Delay /h	153	90	-63
Total Travel Time /h	287	226	-61

Table 7.6 2026 AM Do Something 2 Network Statistics : A5 Stoneydelph

Indicator	2026 DS 1	2026 DS 2	Difference
Av Delay /s	13	12	-1
Av Speed /mph	29	29	0
Total Delay /h	21	19	-2
Total Travel Time /h	98	96	-2

Table 7.7 2026 PM Do Something 2 Network Statistics : A5 Mile Oak

Indicator	2026 DS 1	2026 DS 2	Difference
Av Delay /s	132	74	-58
Av Speed /mph	27	41	14
Total Delay /h	248	162	-86
Total Travel Time /h	365	304	-61

Table 7.8 2026 PM Do Something 2 Network Statistics : A5 Stoneydelph

Indicator	2026 DS 1	2026 DS 2	Difference
Av Delay /s	20	14	-6
Av Speed /mph	26	29	3
Total Delay /h	42	20	-22
Total Travel Time /h	137	125	-12

7.33 **Table 7.6** and **7.8** illustrate the Stoneydelph results for the AM and PM peak, respectively. The network statistics for these peak hours show the PM peak to continue to have the highest average delay, total delay and total travel time, and the lowest speed, which suggest the evening peak to be more congested than the AM peak. However, it is notable that these figures show a reduction in delay and increase in speed when compared to the DS1 scenario, which suggests the mitigation measures proposed will have a positive impact to the operation of the A5.

7.34 **Tables 7.5** and **7.7** illustrate the A5 Mile Oak results for the AM and PM peaks respectively. The network statistics for these peak hours show that the PM peak has higher levels of delay and total travel times together with lower average speeds than the AM peak. The figures indicate that both morning and evening peak hours would be heavily congested. However with the addition of the potential improvement scheme, the levels of delay decrease and average speed increases. This demonstrates that the proposed mitigation measures will have a positive impact on the overall operation of the junction as well as preventing the risk of any queues building up on the A5 Westbound off-slip reaching the A5 mainline. This removes the potential safety hazard of main line queuing and safeguards the free flow of traffic on the A5.

Do Something Costs Estimates

7.35 The cost estimates for the two schemes are as outlined in the following **Table 7.9**:

Table 7.9 Estimated Costs for Do Something Schemes

Location	Construction Cost	Quantified Risk	Commuted Sum 60 Year[6]	Total Cost
A5 Mile Oak	£702,661	£316,197	£330,372	£1,349,230
A5 Stoneydelph	£590,550	£265,748	£117,028	£973,326

7.36 The costs of transport schemes are important for decisions on scheme funding. Unrealistic cost estimates may adversely affect the affordability and viability of the required transport infrastructure delivered through the Infrastructure Delivery Plan.

7.37 The scheme cost estimation for this exercise has used best practice procedures set out in Unit 3.5.9, The Estimation and Treatment of Scheme Costs (Department for Transport: Transport Analysis Guidance (TAG)).

7.38 It should be noted that each of the schemes are on both the Highways Agency and Staffordshire County Council highway networks. Accordingly the HA has made best estimates of the scheme costs relating to the SCC network.

7.39 A cost adjustment for quantified risk has been included in the scheme cost estimates. The appropriate level of quantified risk for these schemes has been estimated at 45%[7]. This has been calculated on the basis of uncertainty with regards to the levels of statutory undertakers' diversion works required for the schemes. In the event that some certainty can be provided as to the extent of work required on statutory undertaker's plant, this figure could be reduced to 20%.

[6]. Commuted sums are included for the elements of the schemes on the Highways Agency network, however are excluded for the elements of the schemes on the Staffordshire County Council network.

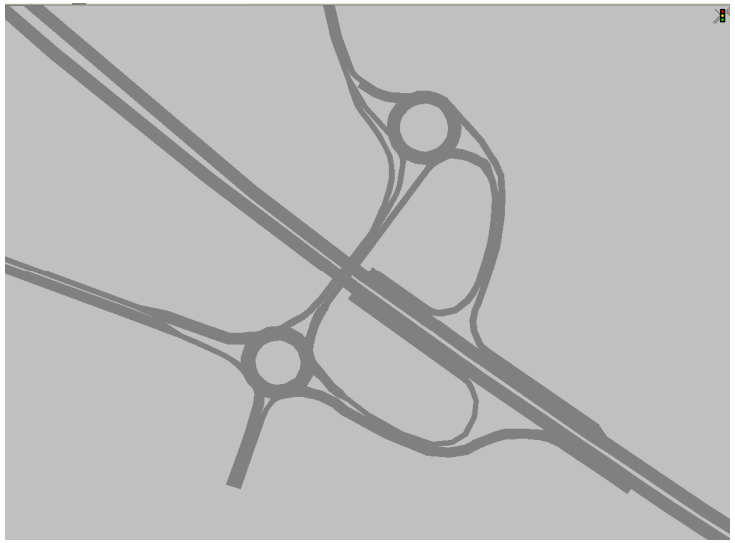
[7] This has been estimated by the Highways Agency Area 9 Managing Agent Contractor, Amey

7.40 Commuted sums are an amount of money to cover realistic and reasonable operating and non-traffic related maintenance cost estimates. The Highways Agency does not have any dispensation to exclude commuted sums from our costings for third party schemes, and the current policy is to recover 60 years worth of maintenance sums. This is a requirement for the Agency to be full aligned with Treasury policy. As noted in Table 7.9, commuted sums are included for the elements of the schemes on the Highways Agency network, however are excluded for the elements of the schemes on the Staffordshire County Council network.

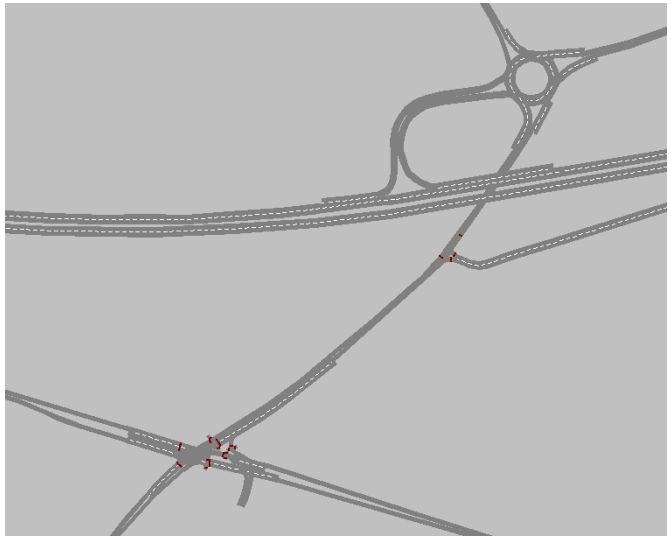
7.41 As the scheme at A5 Stoneydelph may require the acquisition of third party land, a further allowance for this will be required in budget costs. This allowance has not been made in the figures presented in this report.

7.42 Furthermore, no allowance has been to include any provision for possible fees associated with the schemes that require approval through Infrastructure Planning Commission or any subsequent successor.

Figure 7.1 Do Something Designs - VISSIM Models



A5 Stoneydelph



A5 Mile Oak

8 Summary of Findings

8.1 There are already committed junction improvement schemes in the vicinity of A5 Ventura Park junction. These schemes are sufficient in order to accommodate development growth. Accordingly, there is no requirement for further highway mitigation works at this location.

8.2 However, the committed schemes in the vicinity of A5 Ventura Park junction do not address capacity issues that are predicted to occur elsewhere on the A5.

8.3 At A5 Stoneydelph junction, a preferred option has been developed which provides betterment and reduces queues on the A5 westbound off-slip. The scheme also provides enhanced facilities for Non Motorised Users, thereby encouraging the use of more sustainable modes of travel.

8.4 At A5 Mile Oak junction, a preferred option has been developed which provides betterment and reduces queues on the A5 westbound off-slip. As is the case at Stoneydelph, the scheme provides improved facilities for Non Motorised Users, thereby encouraging use of more sustainable modes of travel.

8.5 However at the A5 Marlborough Way junction, it has been established that there is no requirement for junction improvements as a result of the development growth.

9 Conclusion and Next Steps

9.1 This Study was undertaken by the Highways Agency to assess the additional traffic that may be generated by further planned development within Tamworth, as a consequence of the emerging LDF and, critically, how any detrimental impact upon the SRN could be allayed through identified and tested mitigation measures. It reflects the approach set out Department for Transport's Circular 2/2007 'Planning and the Strategic Road Network'.

9.2 Tamworth Borough Council's emerging Core Strategy has provided the Highways Agency with a perfect opportunity to undertake a technical assessment of how the A5 would respond to ever-increasing pressures from the potential impact of new development in the locality as a result of LDF policies.

9.3 A 'micro-simulation' model - in this case with VISSIM software – has allowed different development scenarios to be assessed in terms of their direct impact (number of trips, queue length, and so on) on the A5 junctions. The year 2026 was the selected 'assessment horizon', in order to be consistent with the timeframe of both the emerging LDF and the WMRSS development plan context.

9.4 This report has set out in detail the approach to this assessment and the modelling technique that was employed. It has described the planning assumptions that have shaped the inputs to the model, to ensure that the outputs are robust and sound as possible.

9.5 The findings of this study show that the proposed growth in the Core Strategy will put additional pressure on the A5 and that improvements to a number of junctions will therefore be required.

9.6 There is broad agreement on what transport improvements are necessary on the SRN in the area to support the proposed growth. The pressing question is how the required infrastructure is going to be delivered. The next step is therefore to give further consideration to this matter and to review possible planning and fiscal mechanisms to deliver the identified improvements. As the HA is currently unable to contribute full or partial funding to such improvements in the foreseeable future, other funding sources will therefore need to be identified.

9.7 The HA considers that funding for the necessary improvements on the A5 may be secured from new developments in the area through CIL or S106 Agreements. Further consideration needs to be given to the level of funding required for the junction improvements, the delivery timescales and the detailed funding mechanisms – including the consideration of any other potential funding sources which may become available. Although the HA cannot be a direct party to s106 agreements the HA would be happy to assist the authority in developing an appropriate delivery strategy.

9.8 The study shows that the proposed growth will have the greatest impact on the A5 Mile Oak junction. In the context of current funding constraints, the HA is currently of the view that priority should be given to delivering improvements at the A5 Mile Oak junction followed by the A5 Stonydelph junction. As the Mile Oak junction falls within the administrative area of Lichfield District Council, a collaborative approach is likely to be needed to bring forward these required infrastructure improvements to accommodate growth within the two neighbouring authorities.

9.9 Against this background, it is clear that there is broad agreement between the HA and the LPA as to the need for a planned approach to the delivery of infrastructure. The current economic

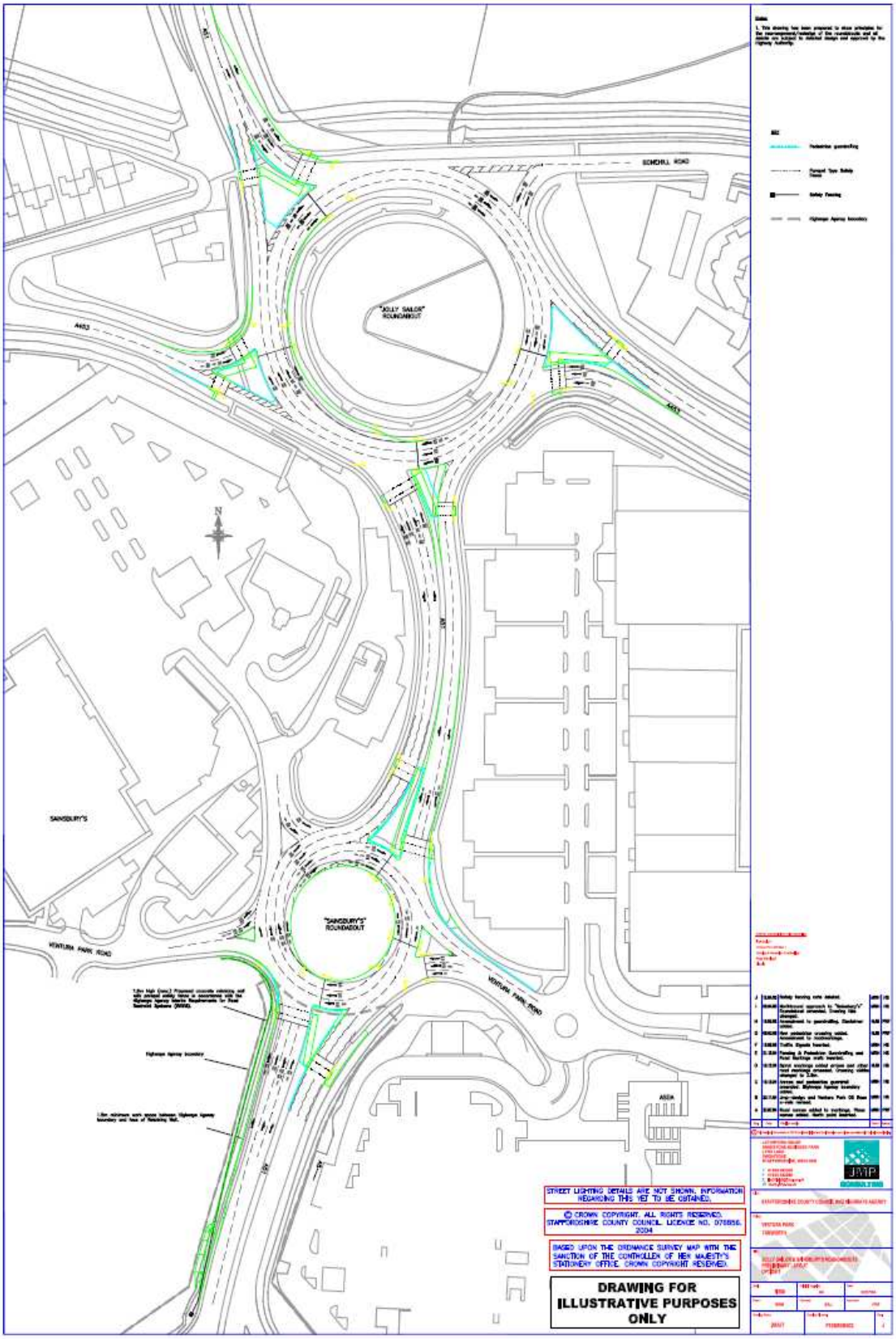
downturn has implications for both the timing of development and ability of both the private and public sectors to invest in infrastructure, and the identification of phasing and delivery priorities should be a focus for the Local Authority as it progresses its Core Strategy towards Submission and Adoption. The HA would very much welcome further partnership working with the Council towards the goal of delivering a sound and dynamic spatial strategy for the borough.

Appendix A

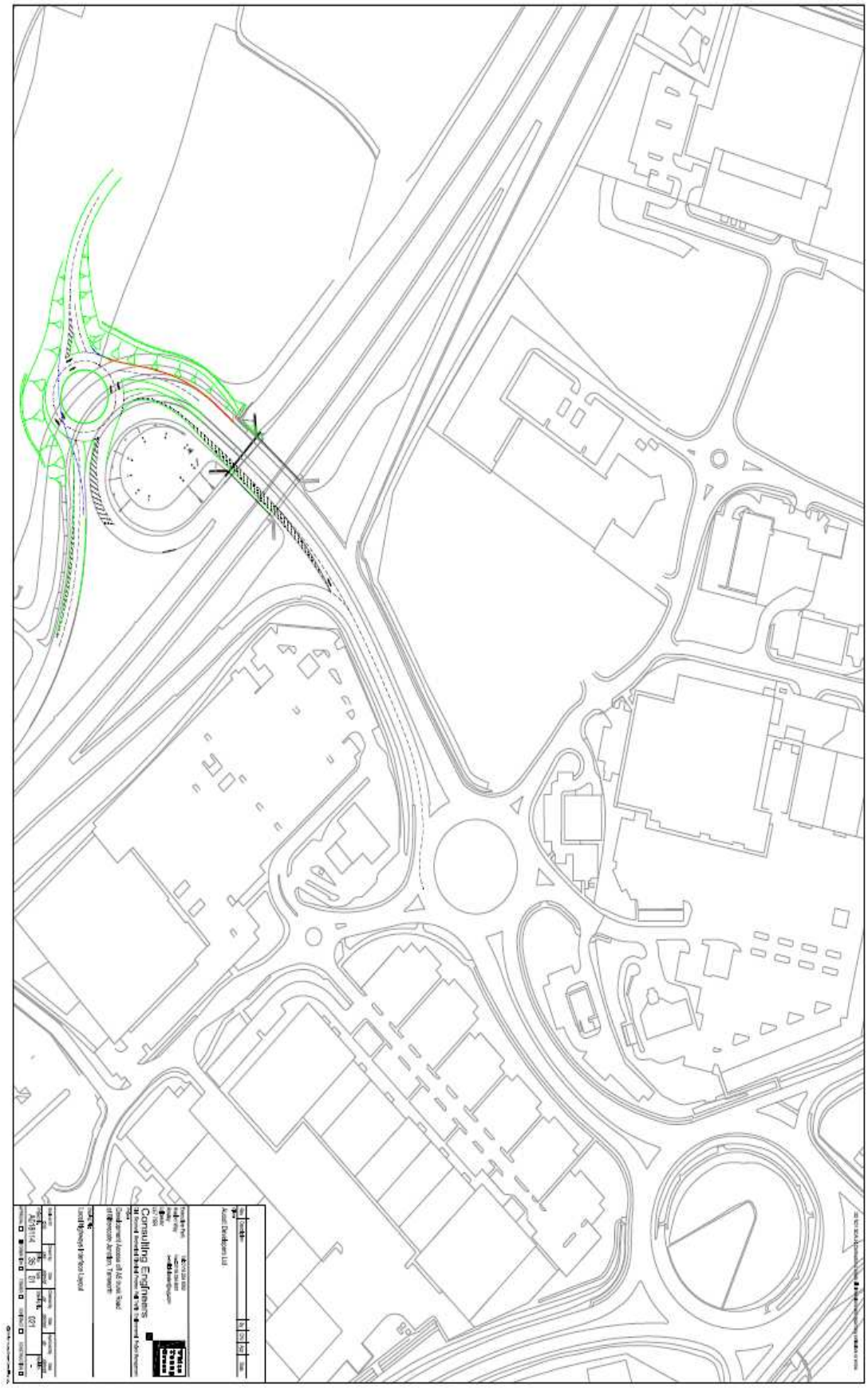
Do Minimum Design Drawings

Do Minimum Design Drawings

Jolly Sailor and Sainsbury's Roundabout Developer Committed Schemes



Bitterscote South Access Roundabout Developer Committed Scheme

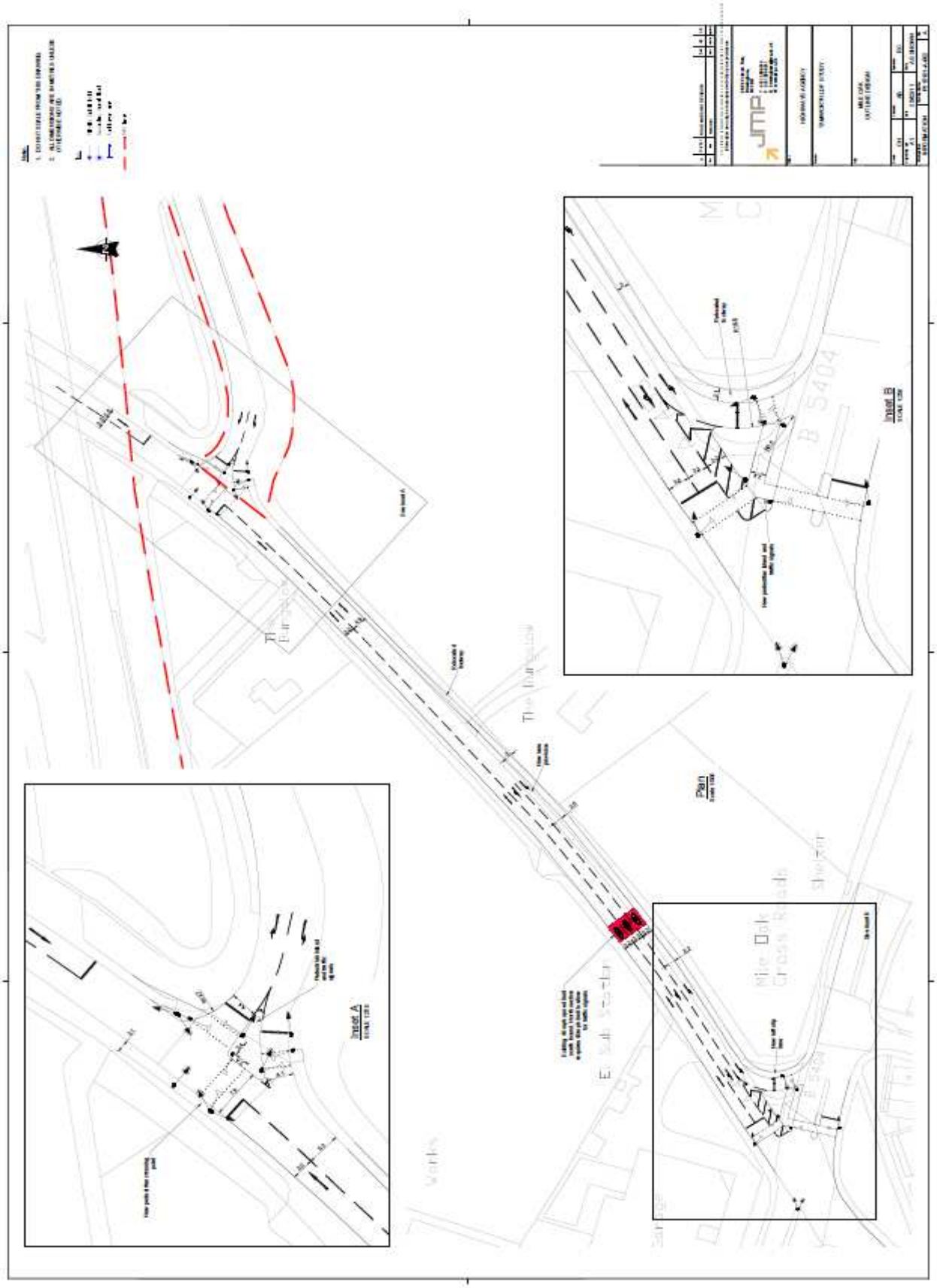


Appendix B

Do Something Design Drawings

Do Something Design Drawings

A5 Mile Oak



A5 Stoneydelph