

# SDC Site Allocations Plan Housing Assessment

## Southam Capacity Assessment

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VM215331.TN002

### Introduction

1. This Technical Note has been produced by Vectos Microsim (VM) in response to a request from Stratford District Council (SDC), and Warwickshire County Council (WCC) to identify the impact associated with the delivery of a range of potential residential sites identified in SDC's Site Allocations Plan (SAP).
2. Testing is required to understand what the implications are of delivering the SAP sites on the transport network. The delivery of the SAP sites may be necessary to bridge any shortfall in the allocated housing delivery rates within the Stratford District, post adoption of the Core Strategy. As such, this assessment considers the cumulative effect of these sites alongside assumptions pertaining to the developments identified within the existing Core Strategy that are not yet permitted.
3. This Note documents the approach followed, development and model scenario assumptions and outputs identified therefrom.

### Background

4. VM has previously undertaken a detailed assessment of the SDC Reserve Sites which, subject to the completions rate, may come forward in addition to the Core Strategy allocation. Modelling work and associated reporting was completed for an assessment of the implications of delivering a range of the Reserve Sites within both Stratford upon Avon and Southam.<sup>1</sup>
5. This study work identified the quantum and locations of Reserve Site development that could be delivered, and the associated network mitigation, above that which was identified through the previous Core Strategy work that would be required to maintain an acceptable level of network operation.
6. This updated assessment is now required to consider the cumulative effect of the SAP sites being proposed by SDC, whereby such additional developments are assessed on top of the Core Strategy allocations.
7. The assessment follows the same format as the previous Reserve Sites testing, with the intention being to identify the cumulative impact on the relevant model networks of delivering these sites alongside existing development proposals.

### Objectives

8. Through discussions between WCC and SDC, VM has identified the core objective of assessing the SAP sites within the Southam model, and to provide commentary on the network operation once the

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<sup>1</sup> VM185174.TN004.SDC\_Reserve\_Sites\_Southam\_Assessment, April 2019

full Core Strategy allocation has been delivered, as well as to identify any additional highway measures which may be required. In addition to this a further objective has been identified, which consists of identifying the impact of the SAP sites on the South Leamington network, using the Warwick and Leamington Wide Area model.

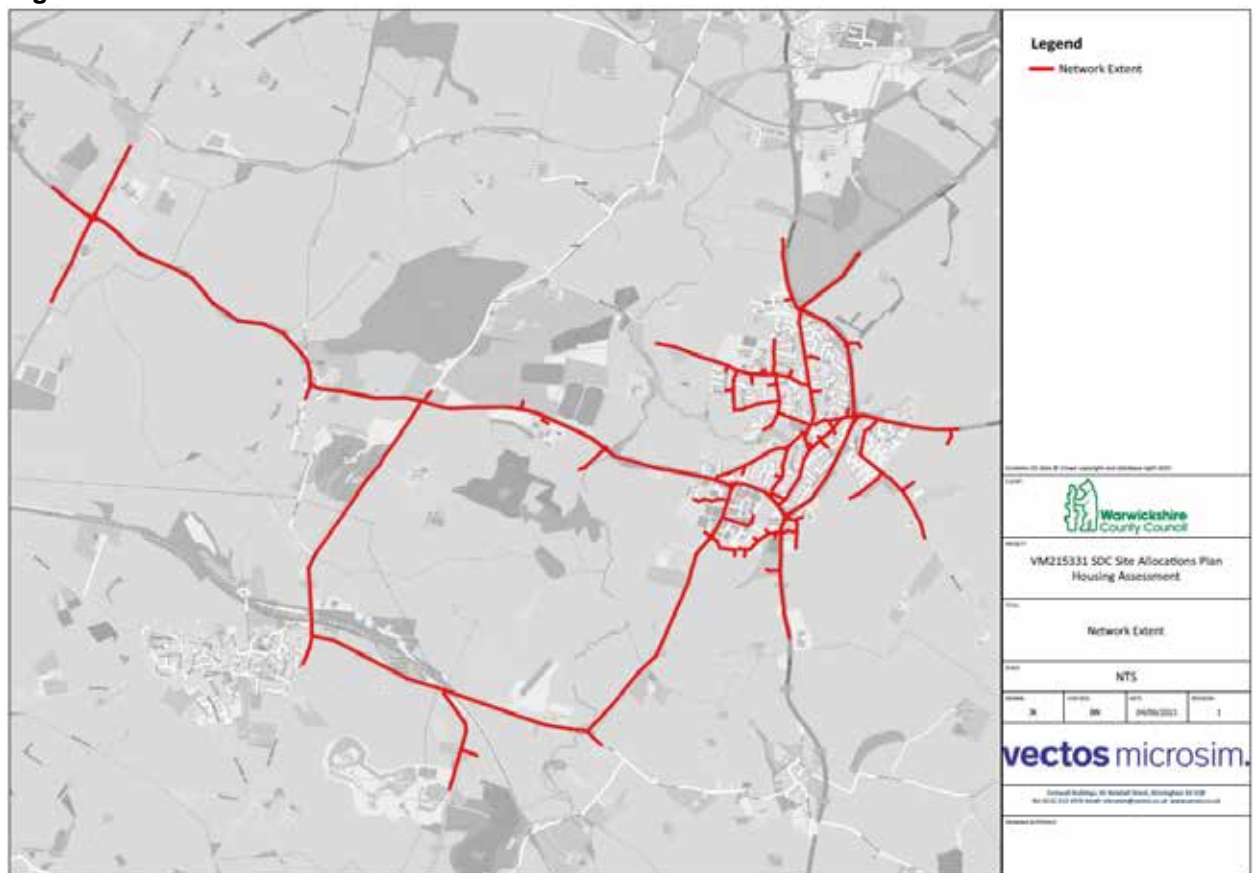
## Methodology

9. The first stage of the assessment centres on the assignment of trips predicted to be generated by the SAP sites into the 2031 Southam Core Strategy Scenario network. The trips will be assigned based upon a trip generation and distribution agreed with WCC, and a review of the resultant network conditions will then be undertaken in light of the inclusion of these sites, with a focus on the impact that the SAP sites will elicit on the network.
10. The second stage of the assessment will establish what additional mitigation measures will be required to ensure the network will continue to operate satisfactorily when all sites are included.

## 2031 Core Strategy Assessment

11. This assessment focusses on the impacts of delivering the identified SAP sites that lie within Southam in addition to the Core Strategy. Accordingly, the 2031 Southam Core Strategy model has been utilised. The extent of this model network is demonstrated within **Figure 1**.

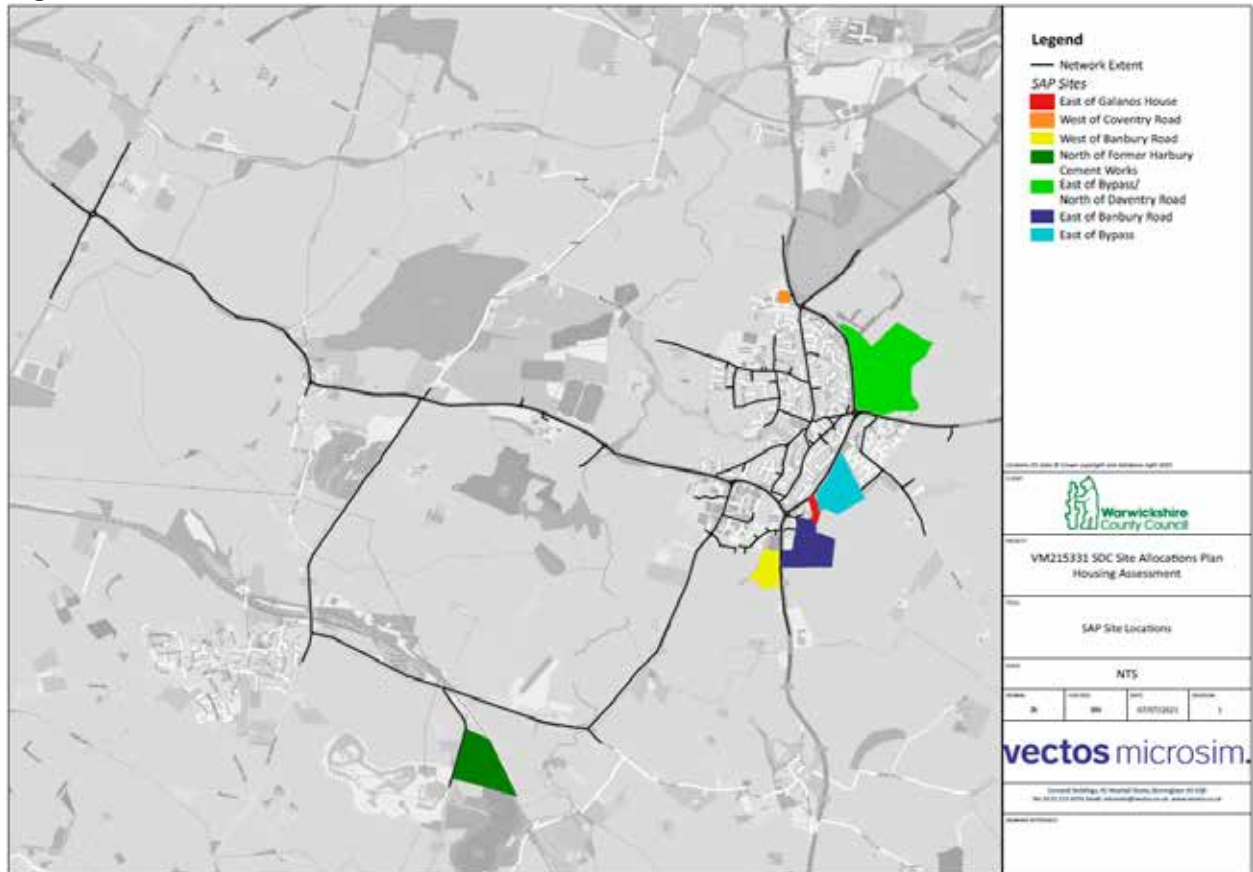
**Figure 1 Southam Model Network**



**SAP Site Inclusions**

- 12. The SAP sites within and close to Southam have been explicitly modelled, and are detailed in **Table 1** and **Figure 2**.

**Figure 2 SAP Site Locations**



**Table 1 Southam SAP Sites Included within Modelling**

SAP Site	Dwellings Assumed	Trip Rates Assigned
East of Bypass	240	STA Residential Trip Rates
East of Banbury Road	240	STA Residential Trip Rates
East of Galanos House	20	STA Residential Trip Rates
West of Coventry Road	15	STA Residential Trip Rates
East of Bypass/North of Daventry Road	210	STA Residential Trip Rates
West of Banbury Road	75	STA Residential Trip Rates
North of Former Harbury Cement Works	210	STA Residential Trip Rates

- 13. WCC have advised that the appropriate trip rate to assign to all of the SAP sites is the WCC Strategic Transport Assessment Residential trip rate.
- 14. Each of the sites have been coded into the updated 2031 Core Strategy model, with access arrangements included to ensure that all traffic leaving each site accesses the wider highway network.

15. The trips generated have been distributed using the WCC mobile network database (MND). The MND has been interrogated, with a distribution being derived dependant on the LSOA (Lower Super Output Area) that each site lies within. **Figure 3** shows the generic zonal distribution applied to each of the SAP sites. Within the plot all zones which represent an origin or destination within the model network are highlighted.

**Figure 3 SAP MND Distribution**



16. Once the demands had been derived, a modal shift allowance of 10% car reduction was made for all SAP Sites, in line with the Reseve Sites testing previously undertaken. The mode shift factor has been applied on the basis that the site promoters will be tasked with achieving this target through the delivery process, and, on that basis, was considered an appropriate assumption for this stage of the testing. These adjustments have been applied only to the SAP sites included within the modelling.
17. No assumptions have been applied to account for the potential shift in background traffic in response to the delivery of enhancements to existing and provision of new sustainable transport services/measures. As a result, when assessed in the context of overall demands assigned within the model, these adjustments affect less than 1% of the assigned demand totals within the model.
18. The cumulative hourly trip generation for the SAP Site demands is summarised in **Table 2**.

**Table 2 SAP Sites Net Trip Generation**

Hour	Total Trips	
0700-0800	370	1228
0800-0900	545	
0900-1000	313	
1600-1700	422	1405
1700-1800	545	
1800-1900	438	

## Model Results Analysis

19. Based upon the above details, for this stage of the assessment, the following model scenarios have been created and reported upon:
  - 2031 Southam Core Strategy
  - 2031 Southam Core Strategy + SAP Sites
20. By assessing the two scenarios outlined above, it will be possible to ascertain the direct impact likely to occur as a result of delivering the SAP sites.
21. Due to increased congestion, several mitigations for the Southam network were identified in the previous SDC Reserve Site testing. Therefore, the model operation was reviewed after inclusion of the SAP Site demands into the 2031 Core Strategy model to ascertain the mitigations needed to negate the impact of the SAP sites.
22. A visual review revealed that congestion across the model had been significantly worsened by the inclusion of the SAP sites. However, the impacts of the congestion were not observed to cause the model to lock up, though there were areas where unreleased vehicles could not enter the model as a result of the congestion.
23. The review of the impact focuses on the AM and PM peak hours (08:00 – 09:00, 17:00 – 18:00) as they cover the period of the biggest impact on the model.

### Queue Length Analysis

24. In order to quantify the impact of including the SAP sites within the model, initially an analysis of the average maximum queue differences between the 2031 Core Strategy scenario and the 2031 Core Strategy + SAP Sites scenario has been undertaken.
25. To visualise the areas of impact, the queue length difference was classified within these plots as follows:
  - **Queue Reduction** (a reduction in queue lengths of greater than 5 vehicles)
  - **Moderate Increase** (an increase in queue lengths of between 10 and 25 vehicles)
  - **Significant Increase** (an increase in queue lengths of between 30 and 50 vehicles)
  - **Very Significant Increase** (an increase in queue length of over 50 vehicles)
26. The classifications detailed above are consistent with the approach adopted during the previous Core Strategy and subsequent Reserve Sites assessment stages. The queue comparison results are shown below in **Figure 4** for the AM peak hour and in **Figure 5** for the PM peak hour.

Figure 4 - 2031 Core Strategy vs 2031 Core Strategy + SAP Sites (AM Peak Hour)



27. The queue analysis presented within **Figure 4** demonstrates the impact of including the SAP sites within the 2031 Core Strategy scenario, during the AM peak hour. The results indicate that there is only likely to be one area of impact, which occurs at the Daventry Road/Welsh Road East junction, specifically on the Welsh Road East northbound approach to the junction.

**Figure 5 - 2031 Core Strategy vs 2031 Core Strategy + SAP Sites (PM Peak Hour)**



28. The queue analysis presented within **Figure 5** demonstrates the impact of including the SAP sites within the 2031 Core Strategy scenario, during the PM peak hour. This analysis indicates that the impact during this period is likely to be more significant than the AM period with queue increases predicted to occur at the following junctions:

- A423/A425/Daventry Road roundabout
- A425 Leamington Road/Banbury Road junction
- A425 Leamington Road/ Warwick Road junction

29. Additionally, queue lengths are predicted to increase at the Banbury Road/Old Road junction and at the Daventry Road/Pendicke Street junction, in both instances as a direct result of queue length increases at the aforementioned junctions.

**Network Observation**

30. Following the queue length analysis, a visual review of the model operation was undertaken, to enable a greater understanding of the areas of impact identified through the queue length analysis.

31. The visual review established that some of the impacts at the A425 Leamington Road/Warwick Road junction were actually impacts from the A425 Leamington Road/B4451 Kineton Road Roundabout. Here, the queue along the western A425 arm extended back past Warwick Road, as seen in **Figure 6**,

resulting in traffic being unable to exit from the Warwick Road approach to the A425/Warwick Road junction.

**Figure 6 – Model Screenshot of the A425 Leamington Road & B4451 Kineton Road Queues**



32. **Figure 6** also shows queueing at the B4451 Kineton Road/Northfield Road junction, with vehicles waiting to turn right into Northfield Road blocking the north to south movement. In addition to this, traffic turning out of Northfield Road is also blocked from doing so by the queues on the B4451 extending back from the A425/B4451 roundabout.

## Mitigation Testing

33. As detailed above, significant congestion issues have been identified once the potential SAP site demands have been included within the Core Strategy model network. This is considered to be a result of the cumulative impact of all SAP sites, since the Core Strategy model already includes mitigation to address congestion caused by the Core Strategy generated traffic.

### Mitigation Scheme Details

34. The following section describes the mitigation measures that have been implemented into the 2031 Core Strategy + SAP site model, in an attempt to directly address the queue impacts identified in the previous section of this note.

#### Scheme 1 - A423/Daventry Rd Roundabout

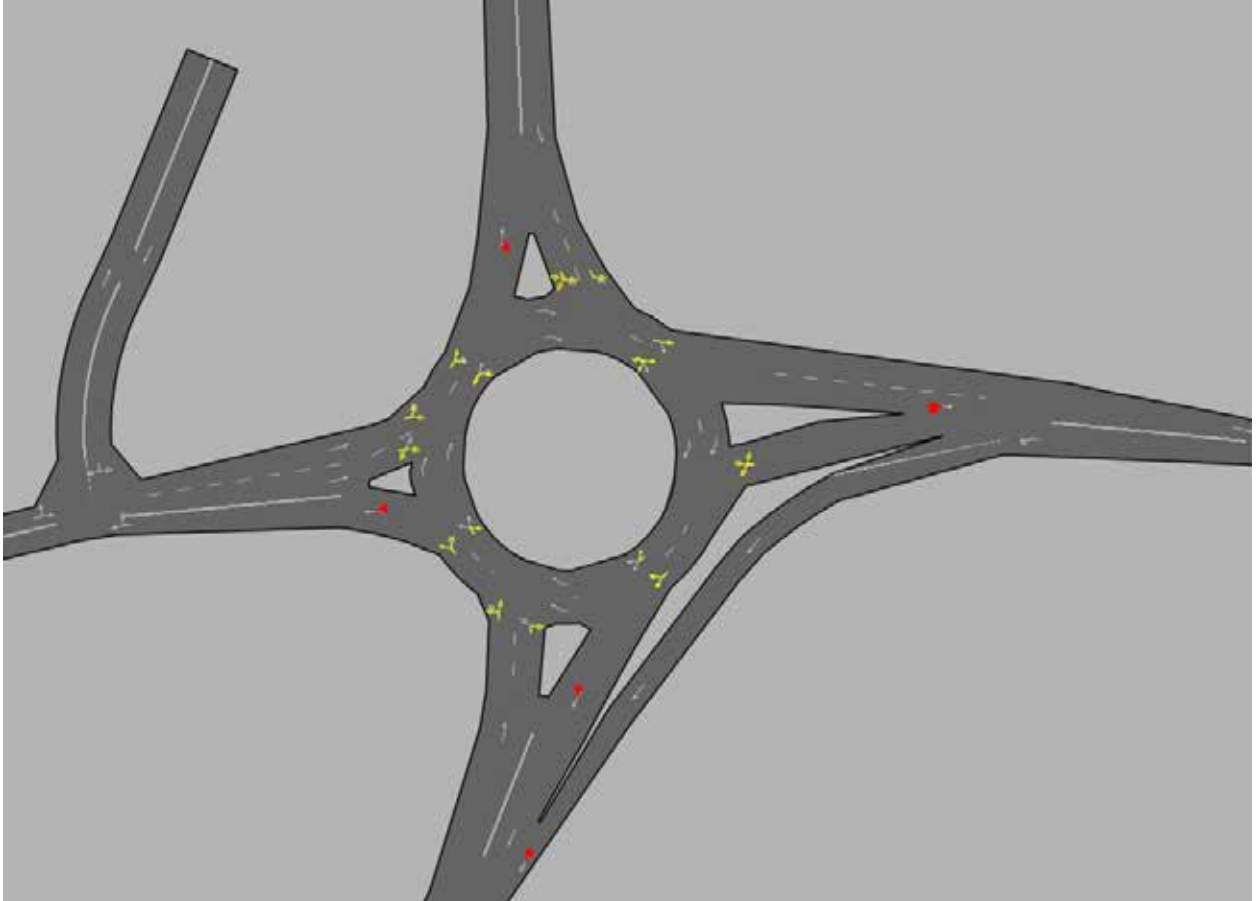
35. The primary focus of mitigation in this area was the A423/Daventry Rd roundabout, due to the extensive queueing here during both the AM and PM period. Accordingly, mitigation has been added to the A423/Daventry Rd roundabout as follows:



- Daventry Road W entry arm has been widened to two lanes
- Daventry Road E exit has been widened to two lanes

36. The resultant roundabout layout is shown in **Figure 7**.

**Figure 7 A423/Daventry Rd Roundabout with Mitigation**

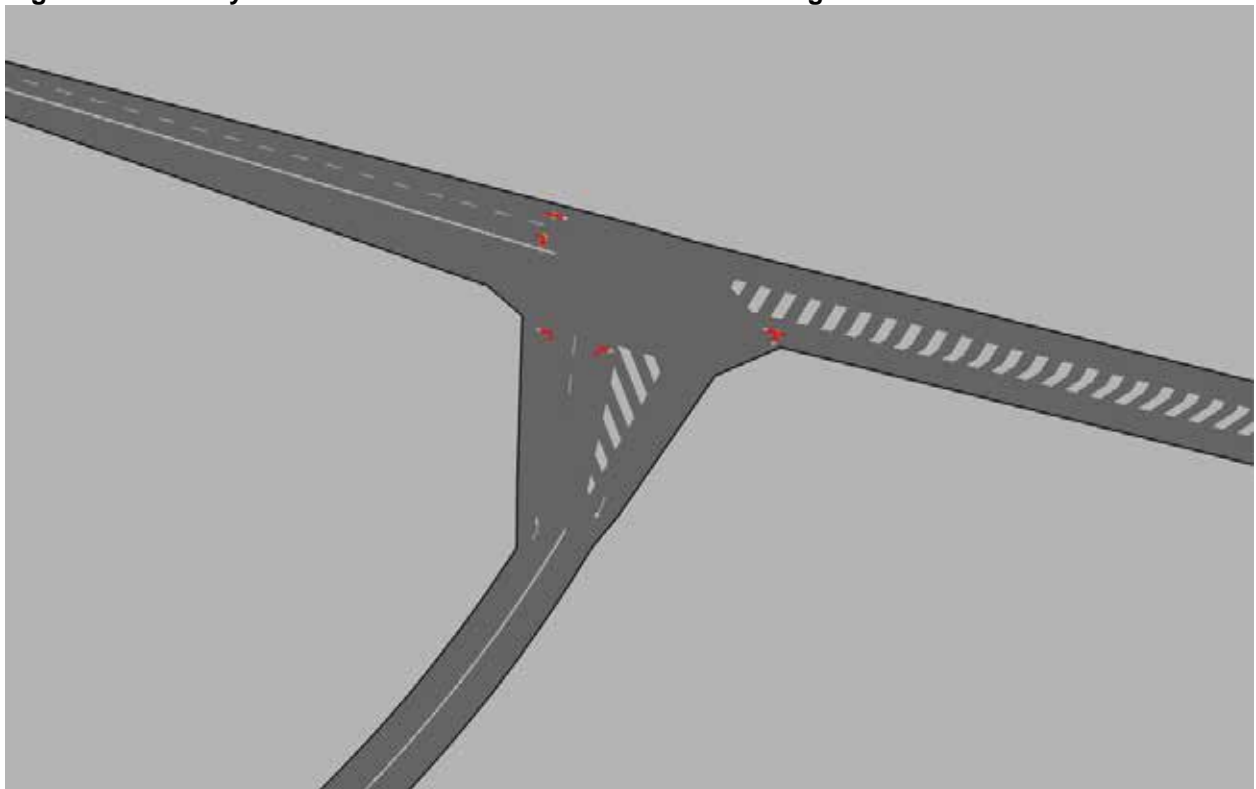


37. A visual review of the model operation prior to the inclusion of the mitigation revealed that a high volume of traffic exits the roundabout at the Daventry Rd east arm as well as travel southbound on the A423, from the northern arm of the roundabout.
38. Increasing the lane numbers on the Daventry Road E exit arm allows traffic travelling towards this exit to do so in two lanes, thus increasing the junction throughput.
39. A review of the model operation also revealed high levels of delay on the Daventry Road W entry arm, which is a result of the high volumes of traffic on the circulatory links, particularly a high volume of trips from the A423 S to Daventry Road during the PM period. Accordingly, mitigation has been included in the form of two lanes on the entry to the roundabout from the Daventry Road W approach, to improve capacity for traffic entering the junction from this approach arm.

**Scheme 2 - Daventry Road/Welsh Road East Junction**

- 40. To mitigate the large queues that occur on the Welsh Rd East arm of the Daventry Road/Welsh Road East junction, the existing priority junction has been upgraded to a signalised junction.
- 41. The signal times have been optimised so that in the AM period the northbound arm is allowed enough time to prevent the levels of traffic build up seen prior to the mitigation inclusion. The PM period does not offer as much time to the northbound movements since there is not the same level of congestion here at that time.
- 42. The Daventry Road/Welsh Road East signalised junction is pictured below in **Figure 8**.

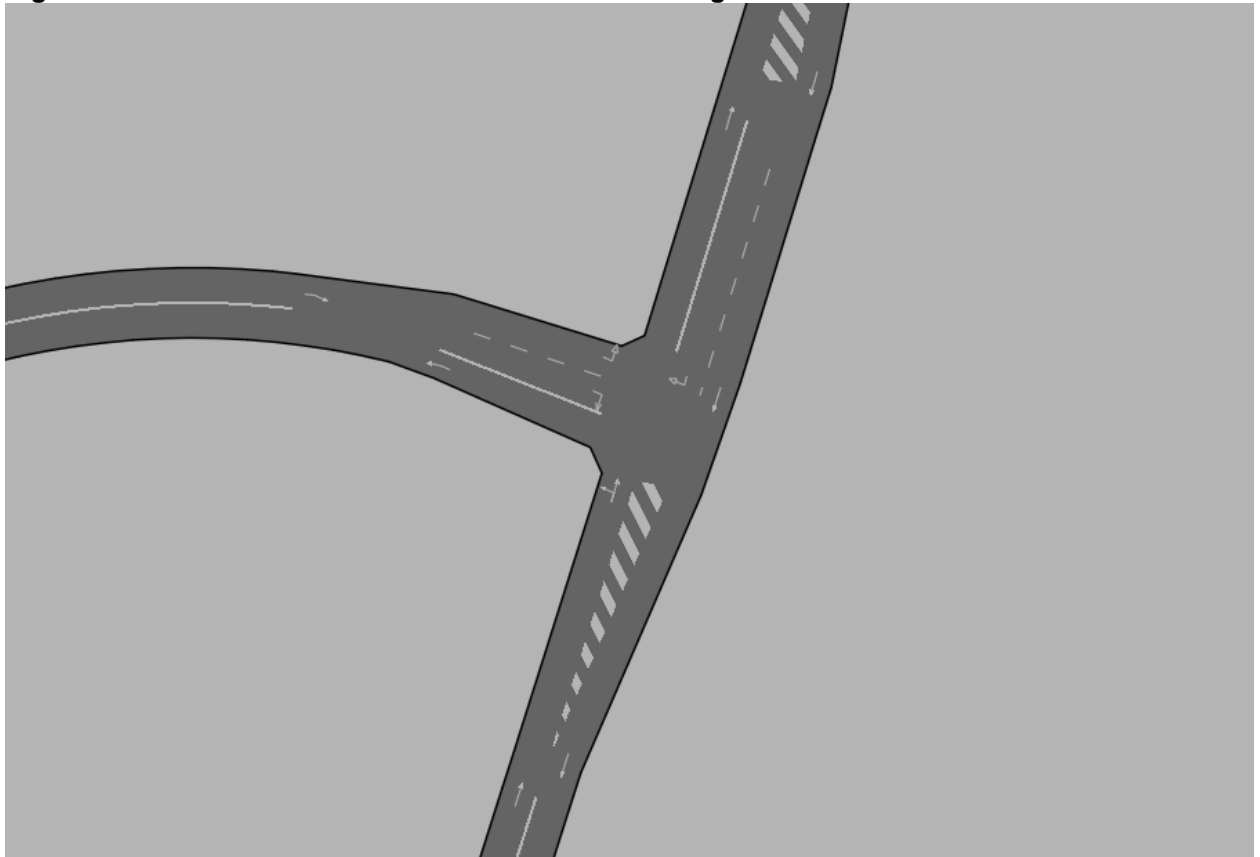
**Figure 8 Daventry Road/Welsh Road East Junction with Mitigation**



**Scheme 3 - B4451/Northfield Road Junction**

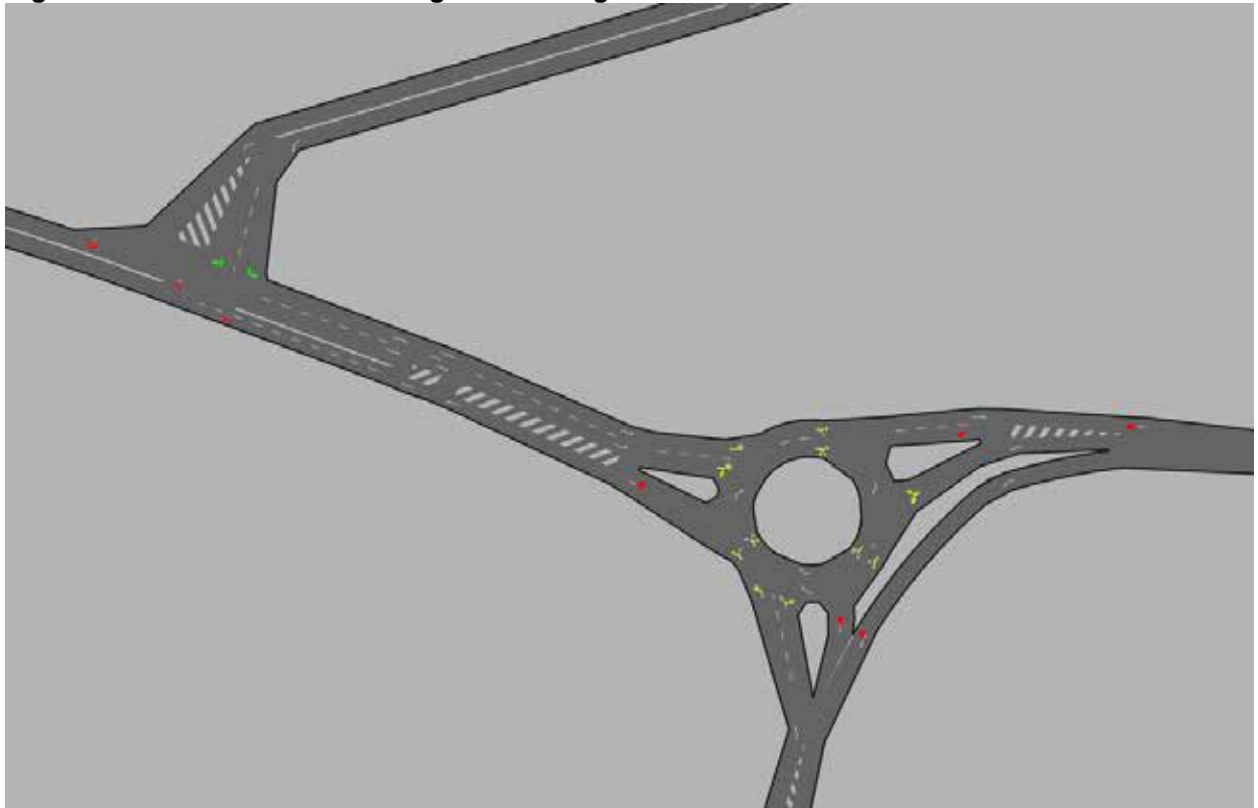
- 43. The model review identified congestion issues occurring at the A425/B4451 junction, which on closer inspection was a direct result of the queues that form on the B4451 southbound approach to the B4451/Northfield Road junction. The queues are seen building on the B4451 southbound, as a result of traffic attempting to turn right blocking back on the B4451 mainline.
- 44. As a mitigation measure a right turn bay has been introduced so that vehicles waiting for a gap in traffic to turn right into Northfield Rd do not block vehicles travelling southbound through the junction. Additional to this, Northfield Rd has been widened to two lanes, with separate lanes for left and right turning vehicles exiting Northfield Rd. **Figure 9** shows the improved Northfield Rd/Kineton Rd junction.

**Figure 9 Northfield Rd/Kineton Rd Junction with Mitigation**



**Scheme 4 – A425/B4451 Roundabout**

45. This scheme is intended to improve the traffic flow along the A425 Leamington Road and reduce the knock-on impact on modelled queues on Warwick Road. The scheme itself consists of widening the A425 Leamington Road EB between Warwick Road and the A425 Leamington Road/B4451 roundabout, as well as the A425 Leamington Road E exit, in both instances from one to two lanes. The layout is shown in **Figure 10**.

**Figure 10 – Warwick Rd/Leamington Rd Mitigation****Scheme 5 – A425/Warwick Road Signals**

46. In addition to the widening outlined as part of Scheme 4, it has been determined that traffic signals would further improve the operation of the A425/Warwick Road junction. Accordingly a further scheme has been included within the modelling in the form of traffic signals at this location, with the intention of balancing the flow of traffic between the A425 and Warwick Road approaches. No further changes have been applied to the junction at this location, and the current on-street lane arrangement is retained.

**Mitigation Summary**

47. To accommodate the additional SAP Sites demands within the 2031 Core Strategy model, requires a range of mitigation measures to enable the network to operate at a satisfactory level.
48. The following list and **Figure 11** summarise all infrastructure alterations that have been included in order to improve the conditions in the network.
- **Scheme 1: A423/Daventry Road Roundabout** - Daventry Road W entry arm and Daventry Road E exit arm widened to two lanes
  - **Scheme 2: Daventry Road/Welsh Road East Junction** - Change from priority junction to signalised junction
  - **Scheme 3: B4451/Northfield Road Junction** - Northfield Road entry widened to two lanes, right turn bay added to B4551 N arm

- **Scheme 4: A425/Leamington Road Roundabout** - A425 E exit widened to two lanes. A425 EB between Warwick Road and B4451 widened to two lanes
- **Scheme 5: A425/Warwick Road Junction** – Signalisation of the existing junction arrangement

Figure 11 – Mitigation Scheme Locations

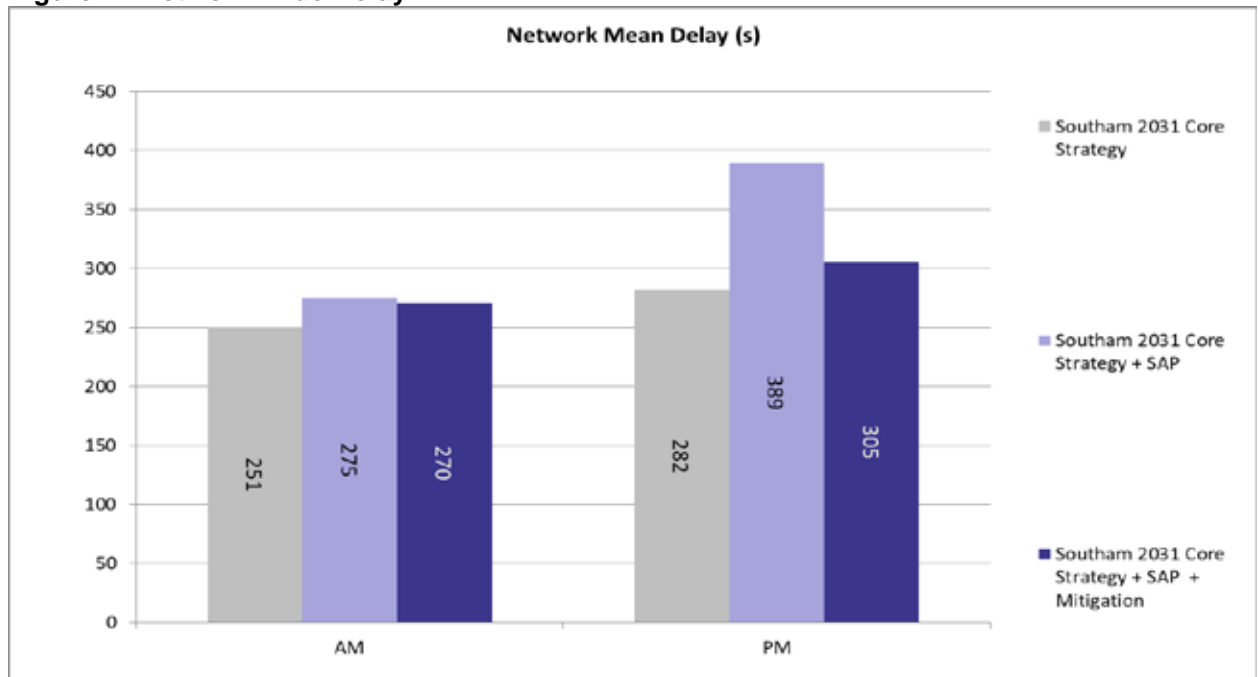


## Model Results Analysis

49. In order to quantify the benefits of the mitigation measures introduced within the model network, headline statistics have been extracted and presented for comparison from the following models:
50. The assessment in this section covers the following scenarios:
- 2031 Core Strategy
  - 2031 Core Strategy + SAP Sites – *inclusive of the SAP sites detailed previously*
  - 2031 Core Strategy + SAP Sites + Mitigation – *as per the above plus the addition of the mitigation measures detailed*
51. The strategic level analysis of the impact of including the SAP Sites brings is outlined through the network wide delay results, which are presented in **Figure 12**.

52. The network wide delay records the average journey time of every single vehicle in the model network, and therefore allows a comparison of the strategic level impacts in terms of additional delay incurred in each SAP scenario relative to the Core Strategy conditions.

**Figure 12 Network Wide Delay**



53. The results presented in **Figure 12** show that the average journey time in the AM increases slightly upon inclusion of the SAP sites, by less than half a minute compared to the 2031 Core Strategy scenario, which is reduced when the mitigation measures are included.
54. In the PM, the inclusion of the SAP sites increases the average journey time significantly, by roughly 2 minutes compared to the 2031 Core Strategy scenario. With the mitigation schemes included however, this is reduced to an increase of around 20 seconds compared to the 2031 Core Strategy scenario.
55. This indicates that the inclusion of the SAP sites would significantly worsen network wide conditions if no mitigation measures were to be included to negate the effect.
56. Furthermore, these results indicate that the identified mitigation schemes are likely to negate any significant impacts occurring through the delivery of the SAP sites.
57. In addition to the comparison of the network wide delay, additional queue analysis has been undertaken, to assess the impact of the SAP Sites + Mitigation scenario, relative to Core Strategy condition, in the AM and PM peak hours. The impact on queue lengths across the model have been compared with those in the 2031 Core Strategy scenario in **Figure 13** and **Figure 14**.

Figure 13 - 2031 Core Strategy vs 2031 Core Strategy + SAP Sites + Mitigation (AM PH)



Figure 14 - 2031 Core Strategy vs 2031 Core Strategy + SAP Sites + Mitigation (PM PH)



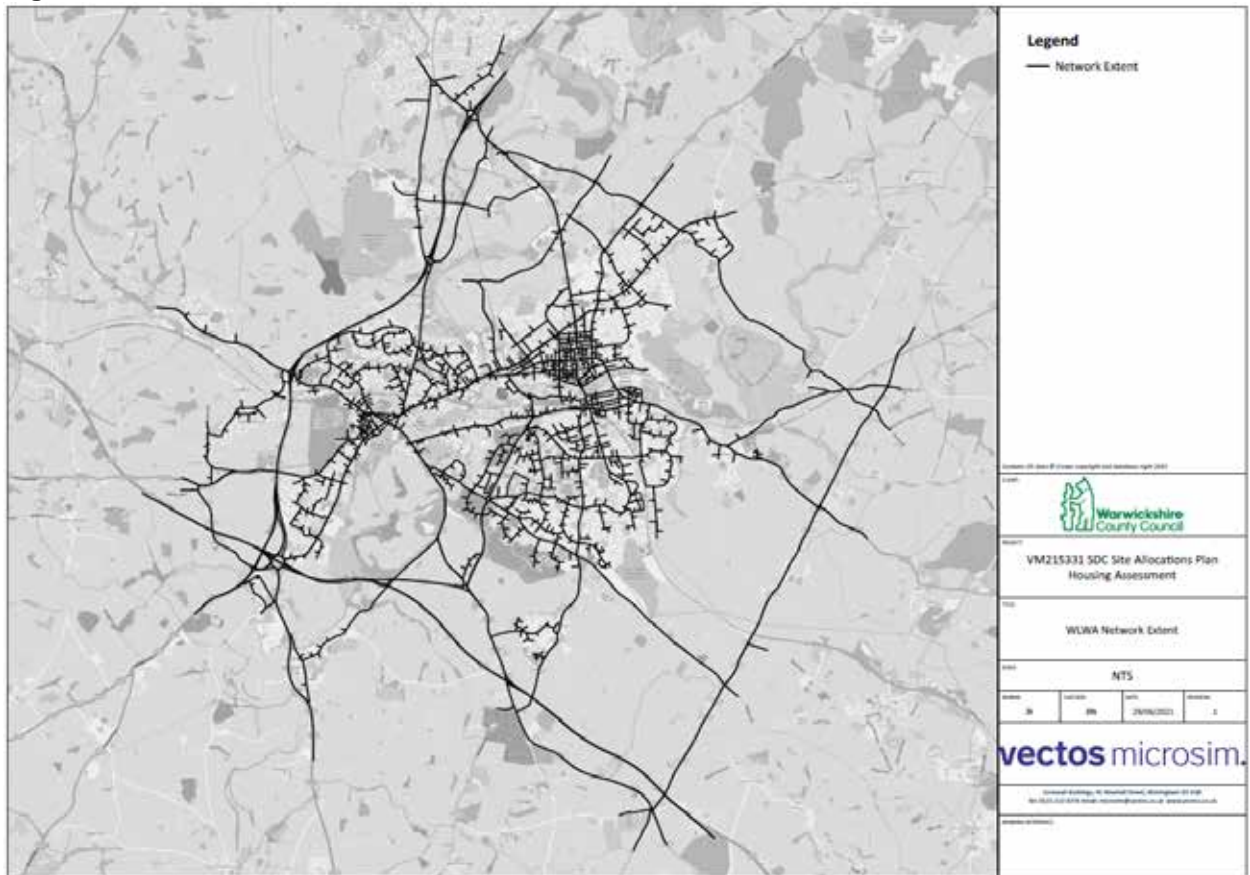
58. The queue results presented in **Figure 13** and **Figure 14** demonstrate that although there are still two instances where there is predicted to be a notable increase in queue lengths, and one instance where there is a moderate increase in queue lengths, the inclusion of the mitigation identified clearly delivers significant betterment on the modelled network across the AM, and most notably in the PM period, when compared with **Figure 4** and **Figure 5** (before the mitigation is included).
59. One instance, where notable queue impacts continue to be observed is at the A425/Fosse Way roundabout. At the time that this modelling has been undertaken, the roundabout scheme design included within the Core Strategy model has not been finalised, and as such no further mitigation was suggested.
60. A further instance of queue increases following the inclusion of mitigation occurs at the A423/Daventry Road junction, specifically on the A423 northbound approach during the PM period. It is likely that this increase in queues occurs as a result of more traffic being able to reach this junction during the peak hours, as a result of upstream mitigation schemes included within the model.
61. A further analysis of this queue impact has identified that the queue increases occur over a short time period during the PM period, and dissipate towards the end of the peak hour, and as such a re-timing of trips to avoid the worst of this queueing would likely occur in reality which in turn would largely reduce any impacts modelled.

## Leamington Spa Model Assessment

62. Previously, when Southam developments were considered in the lead-up to the Core Strategy Examination hearings, it was considered appropriate to test the development impacts within the South Leamington area, with particular attention afforded to the network performance around the Sydenham Drive/Radford Road junction, and also the Bath Street Gyratory area.
63. It is expected that the performance of the network in these areas, once the Southam SAP Sites are delivered, will again require assessment, with the objective of determining the appropriate level of mitigation to be delivered within the Warwick District transport network.
64. Accordingly, to examine these impacts, the SAP site demands have been incorporated into the 2029 Warwick and Leamington Wide Area (WLWA) Local Plan model. Which includes the Sydenham Drive/Radford Road junction and Bath Street Gyratory.
65. The network extent of the 2029 WLWA Local Plan model is shown in **Figure 15**.



Figure 15 – WLWA Network Extent



66. The SAP Sites and Core Strategy demands developed in the Southam model assessment, which enter and exit the Southam model from the Leamington direction have been fed into the WLWA model.
67. Analysis of the WCC Mobile Network Data indicated that around 15% each of the Core Strategy and SAP site demands will travel to or from destinations which routes are covered in the WLWA model. As such, 15% of the SAP Sites and Core Strategy demands from within the Southam model have been fed into the 2029 WLWA Local Plan model.
68. Including the Core Strategy and SAP site demands resulted in three scenarios for assessment:
  - 2029 Local Plan
  - 2029 Local Plan + Southam Core Strategy – *Includes 15% of the Southam Core Strategy demands*
  - 2029 Local Plan + Southam Core Strategy + SAP Sites – *Includes 15% of the Southam Core Strategy demands and 15% of the Southam SAP site demands*
69. The following tables detail the number of Core Strategy and SAP site trips which have been included within the WLWA model.

**Table 3 Core Strategy Demands applied to WLWA model**

Hour	Entering WLWA Model	Exiting WLWA Model	Total
0700-0800	35	41	76
0800-0900	50	33	83
0900-1000	18	11	28
1600-1700	47	30	77
1700-1800	71	44	114
1800-1900	38	26	65

**Table 4 SAP Site Demands applied to WLWA model**

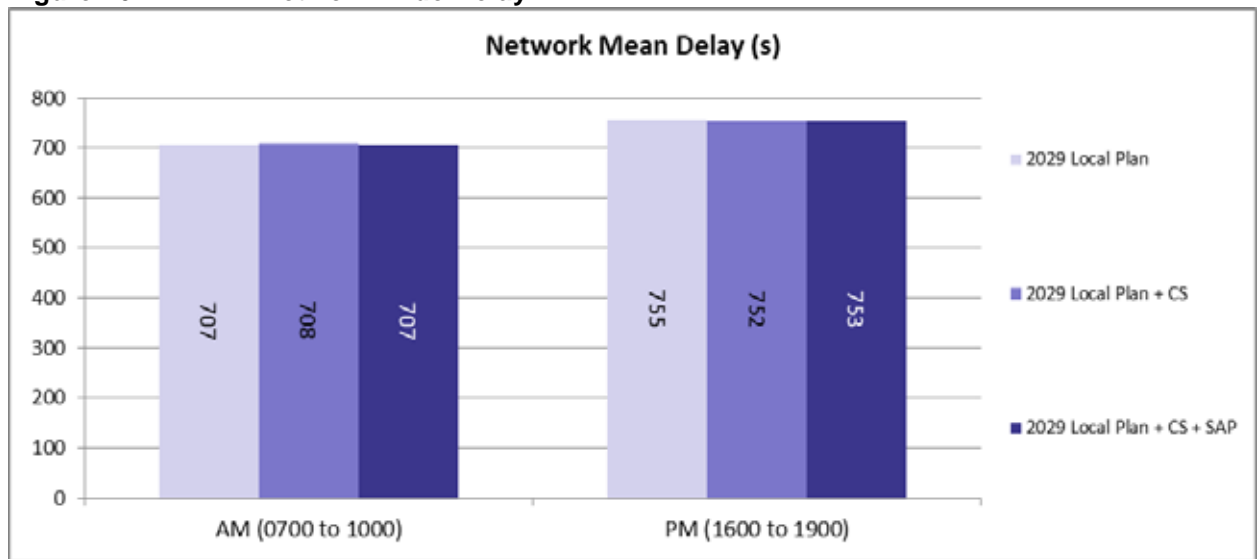
Hour	Entering WLWA Model	Exiting WLWA Model	Total
0700-0800	11	45	55
0800-0900	16	65	82
0900-1000	17	30	47
1600-1700	47	16	63
1700-1800	65	16	82
1800-1900	50	16	66

- 70. It has been determined that the most suitable zone to assign the SAP Site trips to, within the WLWA model is Zone 919. This is an external zone on Radford Road, which represents the most likely route that would be used when travelling between South Leamington and Southam.
- 71. The demands assigned to Zone 919 have been distributed within the WLWA model network based on the existing zone to zone distribution patterns applied within this model.

**WLWA Model Network Impacts**

- 72. In order to quantify the impacts of the additional Core Strategy and SAP Site demands within the model network, headline statistics have been extracted and presented for comparison from the assessment scenarios detailed earlier in this section.
- 73. The network wide average delay results shown in **Figure 16** have been extracted from the following models:
  - 2029 Local Plan
  - 2029 Local Plan + Southam Core Strategy
  - 2029 Local Plan + Southam Core Strategy + SAP Sites

**Figure 16 – WLWA Network Wide Delay**



- 74. The network wide statistics shown in **Figure 16** demonstrate the introduction of the Southam Core Strategy and SAP Site demands within the WLWA is predicted to have no noticeable impact at a strategic level across both the AM and PM period.
- 75. In addition to the comparison of the network wide delay, queue impact analysis has been undertaken, to assess the impact on the level of queuing across the WLWA network once the Southam Core Strategy and SAP sites are included within the model.
- 76. The impact on queue lengths across the 2029 Local Plan + Core Strategy + SAP model have been compared with those in the 2029 Local Plan model.
- 77. The queue impacts for the AM and PM peak hours can be found in **Figure 17** for the AM and in **Figure 18** for the PM.

Figure 17 - 2029 Local Plan vs 2029 Local Plan + Core Strategy + SAP Sites (AM PH)



Figure 18 - 2029 Local Plan vs 2029 Local Plan + Core Strategy + SAP Sites (PM PH)



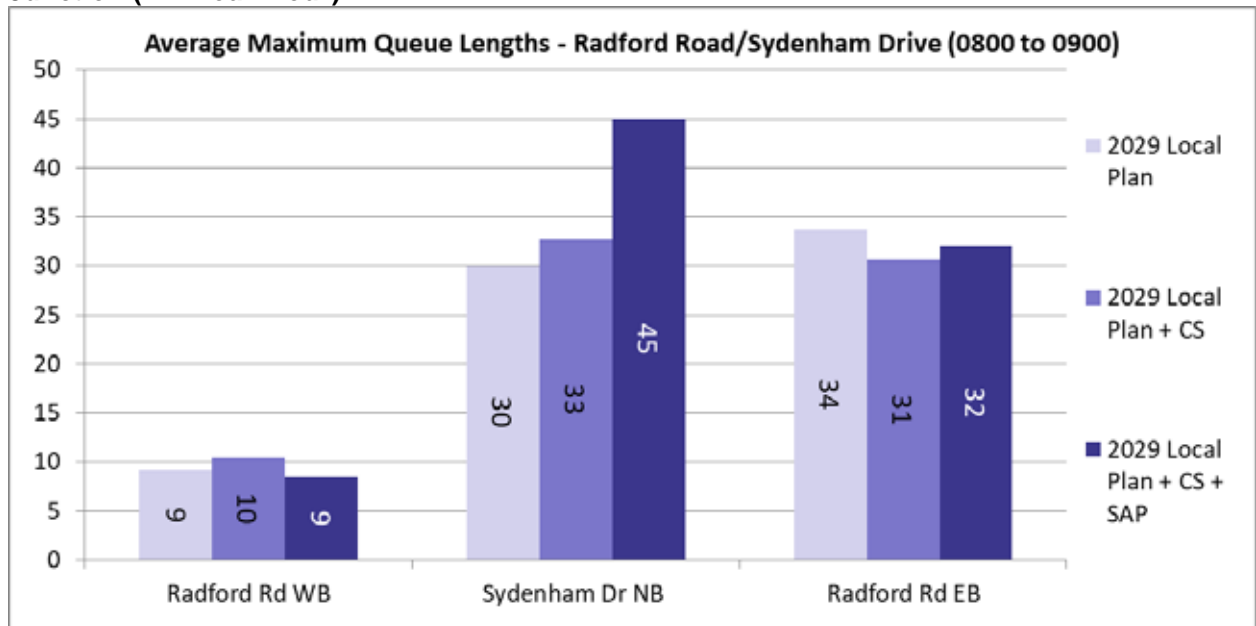
78. As can be seen in **Figure 17** and **Figure 18**, the modelling suggests that there will be only one instance of any impacts occurring once the Core Strategy and SAP Sites demands are included within the WLWA network, which is predicted to occur at the Radford Road/Sydenham Drive junction (in both the AM and PM peak hours). Further detailed analysis of this impact is provided within the following section.

**Radford Road/Sydenham Drive Junction**

79. The results analysis presented in **Figure 17** and **Figure 18** has indicated that the part of the WLWA network most likely to experience an impact as a result of the SAP Site inclusions is the Radford Road/Sydenham Drive junction.

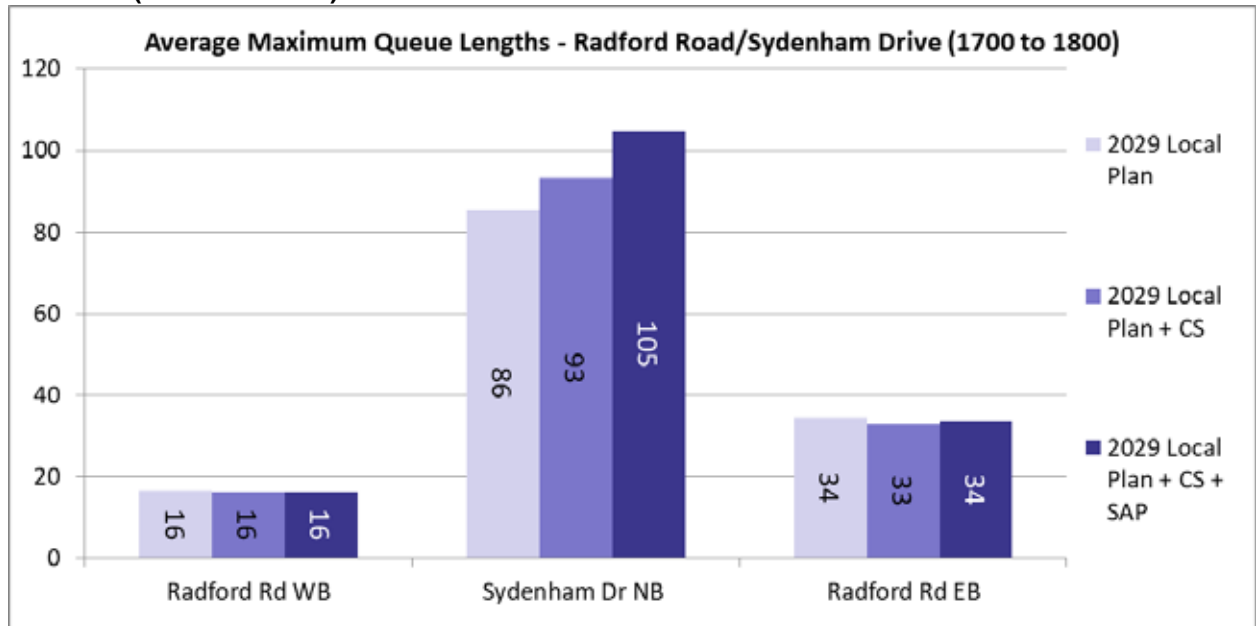
80. Accordingly, a detailed queue length analysis of the Radford Road/Sydenham Drive junction is found in **Figure 19** for the AM peak hour and in **Figure 20** for the PM peak hour, for the three scenarios considered in this assessment

**Figure 19 – Average Maximum Queue Lengths (vehicles) - Radford Road/Sydenham Drive Junction (AM Peak Hour)**



81. **Figure 19** indicates that the inclusion of the SAP Sites results in an increase in the queue length during the AM peak hour on the Sydenham Drive approach arm. Between the 2029 WLWA Local Plan + CS scenario and the 2029 WLWA Local Plan + CS + SAP scenario a moderate increase in queues of 12 vehicles is modelled.

**Figure 20 - Average Maximum Queue Lengths (vehicles) - Radford Road/Sydenham Drive Junction (PM Peak Hour)**



- 82. **Figure 20** demonstrates the PM peak hour queue impacts at the Radford Road/Sydenham Drive junction. As per the AM analysis, this peak hour also demonstrate notable queue increases on the Sydenham Drive approach to the junction once the SAP sites are included within the model network.
- 83. It is likely that should the SAP sites be delivered that mitigation may be needed at this junction. On the basis of the existing constraints that exist at this location, it is likely that further discussions are required between VM, SDC and WCC to determine the preferred approach to dealing with any impacts identified here.

## Summary and Conclusions

### Summary

- 84. This Technical Note has been produced by Vectos Microsim (VM) in response to a request from Stratford District Council (SDC), and Warwickshire County Council (WCC) to identify the impact associated with the delivery of a range of potential residential sites identified in SDC’s Site Allocations Plan (SAP).
- 85. The testing is required to understand what the implications are of delivering such sites, which may be necessary to bridge any shortfall in the allocated housing delivery rates within the Stratford District, post adoption of the Core Strategy.
- 86. The primary objective of this Note is to assess at a final point the impacts on the Southam model network associated with the delivery of the potential SAP Sites identified by SDC, and where possible to do so, identify measures to overcome the impacts identified
- 87. The initial analysis has focused on the impact of the inclusion of the full build out of the potential SAP Sites in the 2031 Core Strategy scenario. This stage outlined that in order to deliver these Sites, and

maintain a reasonable level of model stability, mitigation would be required on the network (additional to the works included within the Core Strategy model).

88. The mitigation is required largely due to the capacity of the 2031 Core Strategy network not being sufficient enough accommodate the additional traffic associated with the potential SAP Sites. This is particularly prominent during the PM period.
89. Impacts continue to be modelled following the inclusion of the identified mitigation schemes on the A423 northbound approach to the A423/Daventry Road roundabout. However, a more detailed review of the model performance has indicated that this impact only occurs for a brief period during the PM period, and would likely be reduced further by a re-timing of trips to avoid the busiest period.
90. In addition to the analysis on the Southam model network, an additional of this assessment was undertaken to quantify the impact of the Southam SAP sites on the nearby town of Leamington Spa. For this, 15% each of the Southam Core Strategy and the Southam SAP site demands were included in the 2029 WLWA Local Plan model.
91. Overall, the impact on Warwick and Leamington for the full three hour AM and PM period is negligible and within the expected model variance. The analysis within this model network however indicated that there would likely be one location, the Radford Road/Sydenham Drive junction, at which impacts would occur.
92. Queue length analysis of this junction has demonstrated a moderate increase of 12 vehicles in queue lengths on Sydenham Drive in both the AM and PM peak hours, when comparing against the WLWA Local Plan scenario. Although this impact has flagged in the analysis as a notable increase, the overall level of queuing at this junction the Local Plan scenario is already high, and it is likely that further mitigation is required at this junction, regardless of the delivery of the SAP Sites.