

Cannock Chase Council's Emerging Local Plan 2038

**The Impact of Preferred Option
Developments on Five Ways
Roundabout – Revised Report with
Lower Levels of Housing (Draft
Regulation 19 Local Plan Sites)**

3 October 2022

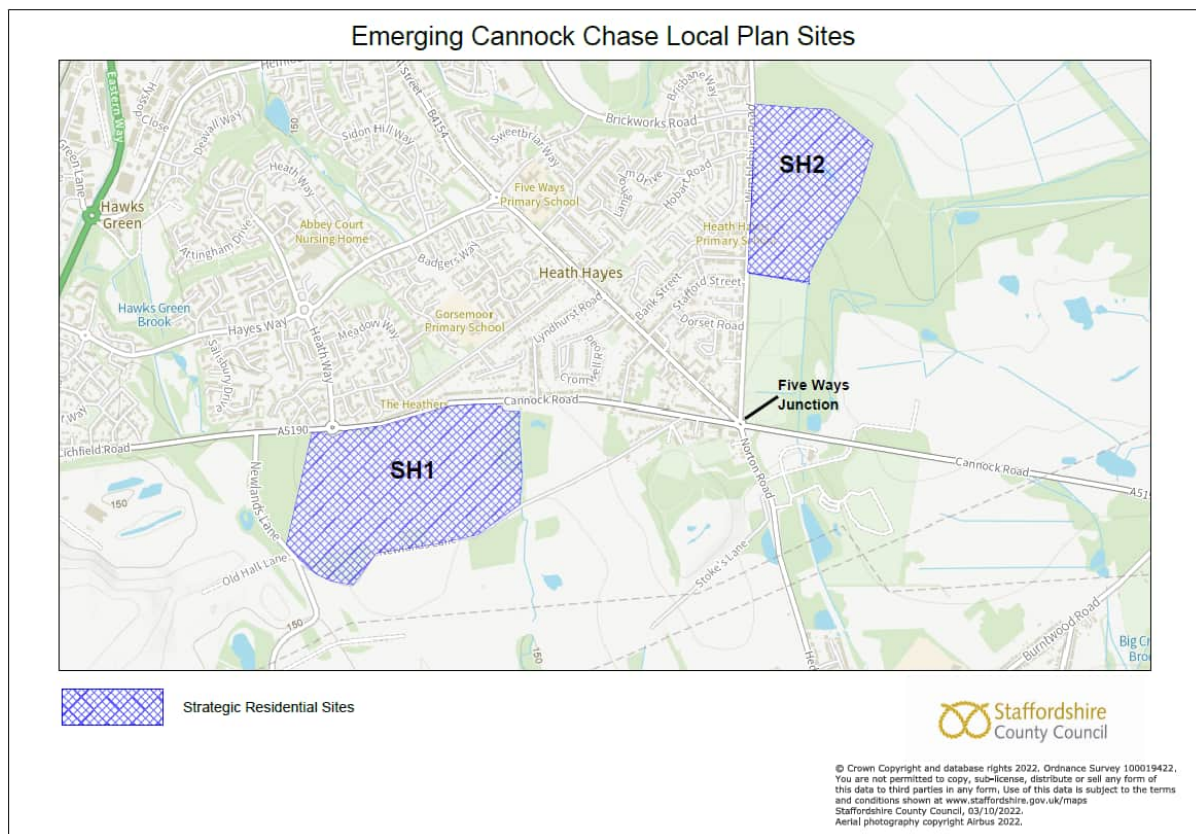
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Introduction

Cannock Chase Council (CCC) consulted on their Local Plan Preferred Options between Friday 19th March 2021 and Friday 30th April 2021. In June 2022, Staffordshire County Council (SCC) prepared a report assessing the traffic impact of the proposed housing sites located near to Five Ways roundabout. CCC has since produced their Draft Regulation 19 Local Plan which contains fewer sites and houses in this location. This report therefore revises the findings in the June 2022 report.

The Draft Regulation 19 Local Plan housing sites are:

- SH1: 700 dwellings south of Lichfield Road (Richborough Estates)
- SH2: 410 dwellings east of Wimblebury Road (Taylor Wimpey)



Five Ways junction already suffers from the effects of traffic congestion and has traffic related air quality issues. Further development in this area will exacerbate the current issues, without suitable mitigation. Available

highway land is limited around the junction, with third party land potentially required to deliver any improvement to the roundabout.

SCC responded to the preferred options consultation with the following comments:

Work is required to establish new baseline traffic conditions or confirm previous conditions at Five Ways. Traffic forecasts need to be developed to the end of the Local Plan Period, that include the cumulative traffic from these sites.

A deliverable improvement scheme needs to be identified that can deliver acceptable travelling conditions through Five Ways and reduce traffic related NO2 emissions to acceptable levels. It is requested that a meeting be held between the County and District council to discuss the issues at hand, potential options and mechanisms for delivery (including roles and responsibilities) so that we can work towards an agreed approach for the Publication Plan and future examination.

It is recommended that Strategic Policies SO 5.1 and SO 5.4 need to be amended to address this issue positively:

1. SO 5.1 • Developments which, individually or cumulatively, cause an unacceptable impact on the highway network in terms of safety, air quality, capacity or congestion will not be supported, *unless it can be demonstrated that they can be satisfactorily mitigated*;

2. SO 5.4 : • Supporting traffic management *and highway improvement* schemes that will provide for the safe and efficient use of the local highway network;
 - Reducing transport pollution and carbon emissions, protect the natural environment, and promote improved public health and wellbeing

Site Specific Policies are needed to require the developers of SH1, SH2 and SH5 to work together to develop an evidence base that demonstrates that residential development in these locations can and be made acceptable in transport terms by delivering the necessary improvements at Five Ways to fully mitigate their transport impact

Since submitting these comments, SCC has worked positively with both Officers from CCC and the developers of the two proposed housing allocations to identify a solution that will allow these developments to come forward through the emerging Local Plan.

Several potential solutions have been discussed, with more detailed assessments being undertaken for the following:

- A large roundabout improvement, requiring third party land including ATS, Five Ways Inn and Gem Carpets and Beds;
- A new form of Wimblebury Road Relief Road (WRRR), connecting Brickworks Road to A5190E through the Taylor Wimpey site, thus removing trips from the junction; and

- a small roundabout improvement, requiring third party land (on non-functional frontage) from ATS. This is being considered in conjunction with the WRRR.

The results of these assessments are detailed later in this report, but the headline findings are:

- A large roundabout improvement, requiring land affecting three businesses, would be difficult to deliver and would not provide a within capacity solution at the end of the Local Plan period.
- The new form of WRRR could deliver enough headroom for the proposed housing sites to be delivered without making the overall traffic situation any worse than it would be in 2038 without development. The roundabout would not, however, be operating within capacity
- A smaller improvement to Five Ways in association with WRRR, requiring some non-functional frontage from ATS, would enable the junction to operate more efficiently at the end of the Local Plan period than it currently does. Discussions will be held with CCC with a view to them facilitating potential land acquisition.

CCC considered all Preferred Option consultation responses and reported these to Full Council on 16 December 2021. Following this CCC prepared their Pre-Submission (Regulation 19) Local Plan, which went to their Cabinet on 25 August 2022. This report is designed to give local politicians and officers the confidence that a transport solution to the traffic issues at Five Ways is available, prior to them consulting on their Pre-Submission (Regulation 19) Local Plan. A solution at Five Ways is crucial to supporting the housing land allocations required to meet local housing need.

included the junction would be significantly over capacity with RFCs reaching 1.14.

Whilst the scheme would no doubt be an improvement on the existing roundabout, it would be difficult to justify extinguishing three businesses and not delivering a within-capacity solution.

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)
2021										
Arm 1	3.5	16.74	0.77	C	22.19	4.2	18.62	0.81	C	17.62
Arm 2	0.5	3.71	0.32	A		0.6	4.22	0.39	A	
Arm 3	5.6	33.71	0.85	D		3.9	27.60	0.79	D	
Arm 4	4.0	29.56	0.80	D		3.0	22.14	0.75	C	
Arm 5	2.5	28.59	0.72	D		0.9	13.92	0.47	B	
2038										
Arm 1	4.5	20.97	0.82	C	30.66	5.5	23.44	0.85	C	21.96
Arm 2	0.5	3.89	0.33	A		0.7	4.46	0.41	A	
Arm 3	8.3	48.25	0.90	E		5.2	35.79	0.84	E	
Arm 4	5.8	41.78	0.86	E		3.8	27.47	0.80	D	
Arm 5	3.7	41.68	0.80	E		1.1	15.60	0.51	C	
2038 + Development										
Arm 1	7.6	34.84	0.89	D	162.59	12.8	51.90	0.94	F	44.31
Arm 2	0.6	4.30	0.37	A		0.9	5.25	0.47	A	
Arm 3	60.6	285.95	1.07	F		12.3	79.79	0.94	F	
Arm 4	10.2	72.83	0.93	F		7.2	51.06	0.89	F	
Arm 5	58.0	466.15	1.14	F		1.6	19.28	0.61	C	

Arms

Arm	Name	Description	No give-way line
1	A5190 (E)		
2	B4154 (S)		
3	A5190 (W)		
4	Hednesford Rd		
5	Wimblebury Rd		

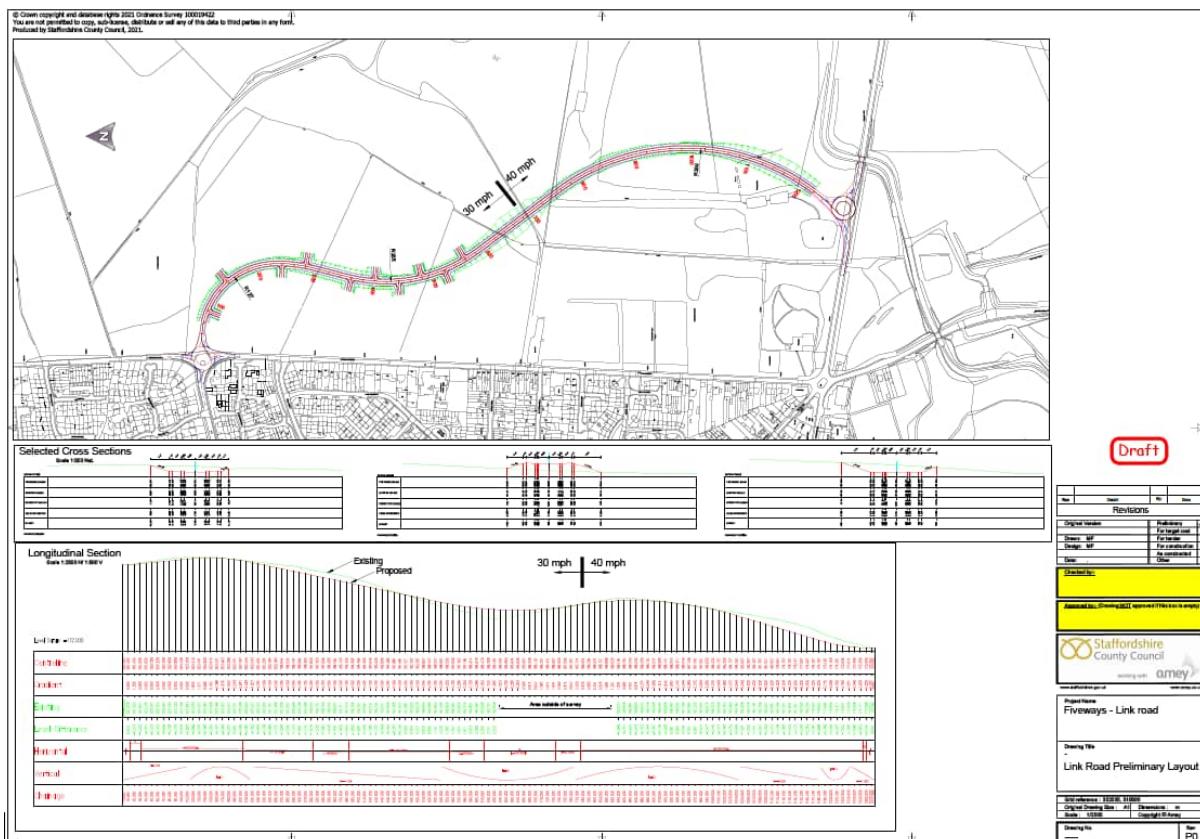
It may be that this proposed improvement could be more accurately modelled in VISSIM (For example, potential unequal lane usage at the junction could be modelled in more detail in Vissim). However, given the land take complexities and the more favourable results of the other two options (see next section) no further modelling has been undertaken at this stage.

Wimblebury Road Relief Road (WRRR) and Small Roundabout Scheme - VISSIM Microsimulation Modelling

As discussed earlier, two other potential solutions were identified for assessment – the WRRR and a small complementary roundabout improvement.

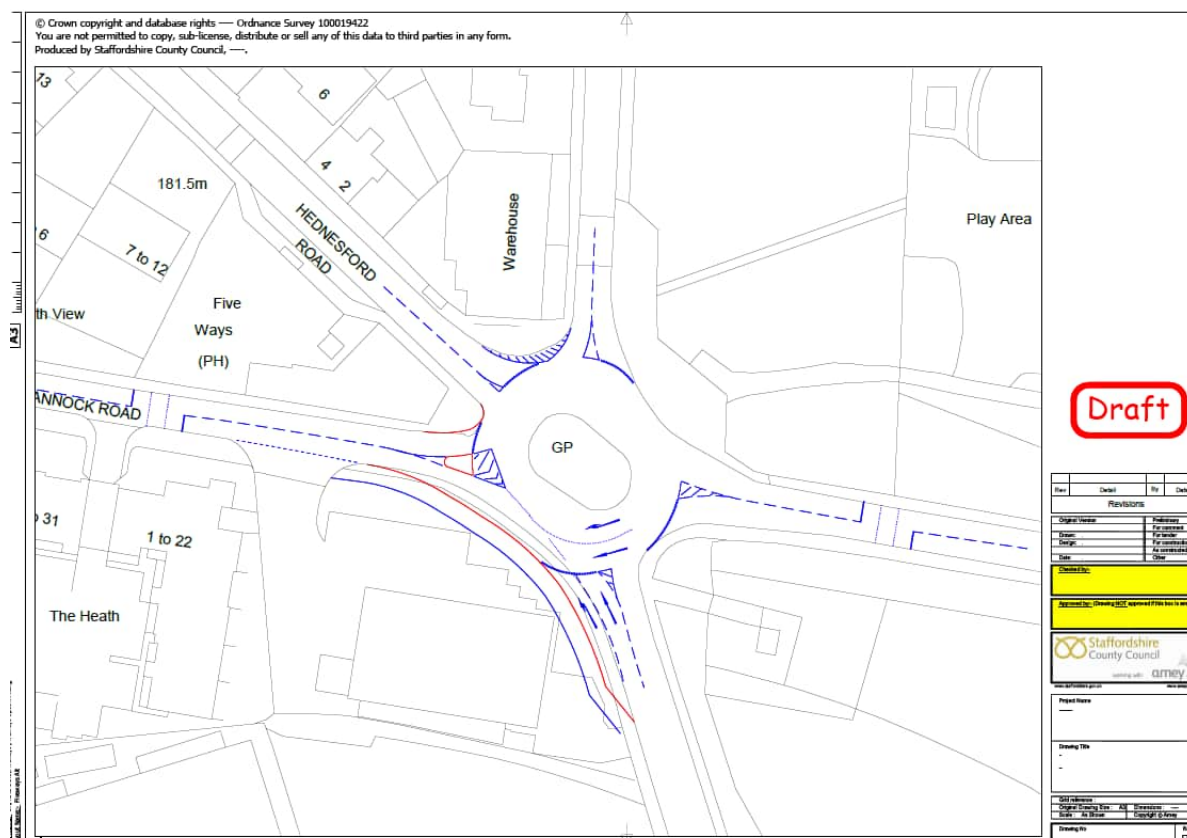
The WRRR runs through the Taylor Wimpey site, connecting Brickworks Road to a new roundabout on the A5190E. The new link road would offer a better alternative for many trips currently travelling through Five Ways, including all those travelling between Wimblebury Road and A5190E and some of those heading between Hednesford Road and A5190E. SCC has used the Trafficmaster Origin Destination (OD) database to estimate the likely reduction in traffic flows at Five Ways as a result of its construction, and this work has informed the VISSIM modelling.

An early draft of the WRRR is shown below, which will be subject to refinement.



A draft design for the smaller complementary roundabout scheme, which focusses on improving the A5190W and Norton Road approaches, can be

seen below. This scheme would require some frontage from ATS, albeit non-functional land which should not impact on the operation of their business.



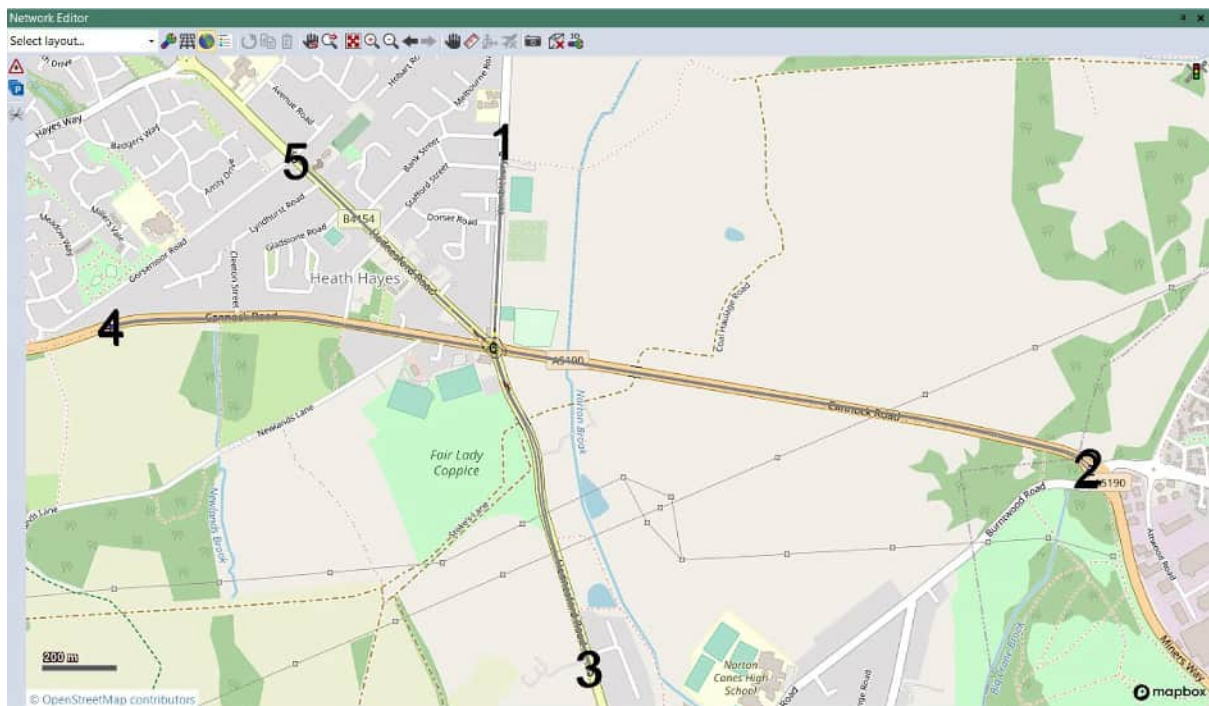
In 2019 SCC commissioned Atkins transport planning consultants to produce a VISSIM microsimulation model of Five Ways to help support a Local Pinch Point bid for funding to provide an improvement at this location. The Department for Transport closed the funding stream to focus on developing the emerging Levelling Up agenda.

Late in 2021 SCC re-engaged Atkins to update the previous modelling to look at the impact of the proposed three housing sites in CCC's emerging Local Plan. They were re-engaged in September 2022 to refine the models based on CCC's Draft Regulation 19 Local Plan which contains fewer houses and sites in the vicinity of Five Ways roundabout. They were tasked with producing the following models:

- 2021 Base Year - updated base year model of the existing junction, based on new September 2021 traffic survey data and observations;

- 2038 Do Nothing (DN) - existing junction layout with background and committed development growth from 2021 to 2038, but none of the emerging Local Plan sites. This will set out how the current junction would perform in 2038 if no new development sites came forward;
- 2038 Do Minimum (DM) – as 2038 DN, plus the introduction of pedestrian crossings on approaches; and emerging Local Plan housing growth, to identify how the existing junction would perform in 2038 if the emerging Local Plan sites came forward and no mitigation was introduced;
- 2038 Do Something 1 (DS1) – as 2038 DM, plus the introduction of the WRRR through the Taylor Wimpey site (located off Wimblebury Road) and associated roundabout junction onto A5190E, to understand how Five Ways would operate with the reduction of traffic which transfers to the new link road; and
- 2038 DS2 – as 2038 DS1, plus the smaller improvement to Five Ways requiring grass frontage at ATS.

The extent of the 2021 base year VISSIM model is shown below. The large numbers (1 to 5) is where the model network ends. This extent was designed to ensure that queue lengths could be accommodated within the modelled network.



The following paragraphs discuss the modelled scenarios outlined above, comparing results to determine how well the DS1 and DS2 scenarios perform against base and DN scenarios (e.g. queues, delays and speeds). A summary table containing all statistics for all scenarios is contained in Appendix 1 of this report.

2021 Base Year

A new survey was undertaken at Five Ways in September 2021 and the base model was updated to incorporate this. Queue and delay observations were also taken on the same day as the surveys.

The new 2021 AM and PM base year models calibrate well to observed traffic conditions, with long queues forming at times on A5190W, Hednesford Road and A5190E in the AM peak and A5190W, A5190E and Norton Road in the PM peak.

In terms of overall junction statistics, VISSIM outputs demonstrate that average delay per vehicle is 106 seconds in the AM and 167 seconds in the PM peak. Average vehicles speeds are 20mph in the AM and 16mph in the PM peak. In terms of total delay at the junction over the hour, there are 79 hours of delay in the AM peak and 126 hours in the PM peak.

2038 DN

The 2038 DN scenario was created to demonstrate what traffic conditions would be like at Five Ways in 2038 should there be no new Local Plan development in the area (i.e. just growth to background traffic and committed development traffic included). This could also be referred to as the 2038 Nil Detriment position, and what could be considered as the position a developer may reasonably be expected to mitigate its impact to under a normal planning application process. However, as can be seen by the model results, this would leave Five Ways junction operating significantly in excess of its operational capacity in 2038.

With the addition of background growth and committed development traffic average queues increase on the affected approaches in both the AM and PM peaks, doubling or worse in length. In the AM peak average queues across the hour reach 349m on A5190W, 338m on Hednesford Road and 430m (70+ vehicles) on the A5190E. In the PM peak queues average 417m on A5190E, 532m on A5190W and 535m on Norton Road (85+ vehicles).

In overall junction terms, average delays per vehicle in the AM peak increase from 106 seconds in 2021 to 172 seconds. In the PM peak this is an increase from 167 to 223 seconds. Average speeds decrease from 20mph in 2021 to 15mph in the AM peak, and 16mph to 13mph in the PM peak. Total delays at the junction increase from 79 hours in the AM peak in 2021 to 136 hours in 2038. In the PM the increase is from 126 to 176 hours.

There is also some latent demand in the PM peak (i.e. vehicles that cannot enter the network due to queuing extending beyond the extent of the modelled network, as shown in the earlier VISSIM screenshot). Some 26 vehicles fail to reach the network and would effectively add to the reported queues and delays. These relate to the A5190W and Hednesford Road approaches, with the majority from the A5190W.

2038 DM

The 2038 DM includes the addition of new development trips from the proposed housing sites in the emerging Local Plan. Once traffic from the proposed sites is added to the model, average queues are further exacerbated. In the AM peak all approaches are suffering from queuing traffic. The A5190W increases on average to 776m (129 vehicles), 322m on Hednesford Road and 746m on the A5190E. Larger queues also start to form on the other two approaches – 354m on Wimblebury Road and 85m on Norton Road.

In the PM peak, average queues increase to 853m (142 vehicles) on A5190W, 473m on A5190E and 765m on Norton Road.

Across the junction overall, average delays per vehicle in the AM peak increase from 172 seconds in the 2038 DN to 274 seconds in the 2038 DM. In the PM peak, the increase is from 223 to 296 seconds. Average speeds decrease from 15mph to 10mph in the AM peak, and from 13mph to 10mph in the PM peak. Total delay at the junction increases from 136 hours in the 2038 base to 249 hours and 176 hours to 245 hours in the AM and PM peaks respectively.

In addition to this there is also large amounts of latent demand with 68 and 208 vehicles unable to enter the network in the AM and PM peaks respectively. In reality these vehicles would be queued in addition to the queue lengths documented above and increase delays.

2038 DS1 Vs 2038 DN

As discussed earlier, one potential solution being considered to provide headroom for the proposed new housing is the provision of the Wimblebury Road Relief Road, linking the junction of Brickworks Road / Wimblebury Road to a new junction on the A5190E. The new link road would offer a better alternative for many trips currently travelling through Five Ways, thus reducing current traffic levels.

In terms of determining whether the link road can mitigate the impact of the emerging Local Plan developments, the VISSIM results for 2038 DS1 model have been compared to those for the 2038 DN model (i.e. the 2038 Nil Detriment position). Mitigating to this 2038 DN position only would still leave Five Ways junction operating significantly over capacity, and ideally SCC would prefer to see the junction operating closer to or within capacity and no worse than the existing 2021 base year results if achievable.

A comparison of the 2038 DS1 and the 2038 DN, in the AM peak, shows that average queues on the A5190W approach are still notably higher than the 2038 DN – 450m compared to 349m. However, average delay per vehicle is reduced to 55 seconds compared to 69 seconds. This indicates that although the queue is longer, it is faster moving and disperses more quickly.

Hednesford Road queues reduce significantly with an average queue of 13m (2 vehicles), compared to 338m, whilst Wimblebury Road queues return to similar levels witnessed in the 2038 DN models.

A5190E queues also reduce significantly and well below those in the 2038 DN (55m vs 430m).

Norton Road queues remain slightly higher than the 2038 DN, with 61m average queue compared to 43m. Average delays per vehicle are also higher (70 seconds vs 62 seconds).

Performance statistics for the junction as a whole in the AM peak show that the average delay per vehicle in the 2038 DS1 is notably lower than 2038 DN (87 seconds vs 172 seconds); average speed per vehicle improves in 2038 DS1 from 15mph to 20mph; and total junction delay reduces from 136 hours to 80 hours. It can therefore be argued that despite the impact on the A5190W approach and, to a lesser degree,

Norton Road that the junction as a whole operates more efficiently in 2038 DS1.

In the PM peak, average queues on the A5190W approach are still higher than the 2038 DN – 669m compared to 532m. However, average delay per vehicle is reduced by 22 seconds to 87 seconds per vehicle. This indicates that although the queue is longer, it is faster moving and disperses more quickly.

Hednesford Road and Wimblebury Road queues return to slightly lower levels witnessed in the 2038 DN, the former following an increase in the 2038 DM scenario.

A5190E queues reduce significantly to about 3 car average queues. This is well below queuing levels in the 2038 DN (15m vs 417m).

Norton Road queues also reduce notably below those seen in the 2038 DN (176m vs 535m), and below the 2021 base queues

Despite the worsening queues on the A5190W arm, it is considered that the junction as a whole is operating more efficiently. Performance statistics for the junction show improvements to average delay per vehicle in the 2038 DS1 when compared to the 2038 DN - 128 seconds vs 223 seconds; average speed per vehicle improved from 13mph to 17mph; and total junction delay reduces from 176 hours to 111 hours.

It should be noted that whilst there is latent demand in both peak hours of the 2038 DS1 (1 vehicles AM; 24 vehicles PM) this is significantly reduced from the 2038 DM. These all relate to vehicles on the A5190W approach and in reality the results for this approach would be slightly worse than reported.

For both peaks, it is concluded that the WRRR would deliver a nil detriment position overall (albeit two arms would experience increased queuing). However, it does not return the junction to a position where it operates within capacity and there would be significant congestion particularly on the A5190W and Norton Road arms.

2038 DS2 Vs 2038 DN

The previous scenario demonstrated that the provision of the WRRR through the TW site provides enough relief to Five Ways junction (through the transfer of traffic away from the roundabout to the link road) to accommodate new traffic associated with the emerging Local Plan

developments. However, this 2038 Nil Detriment position still leaves higher levels of congestion at Five Ways junction than are ideally wanted, particularly on the A5190W and Norton Road approaches.

SCC has therefore devised a small improvement scheme specifically targeted at improving these two arms which could complement the delivery of WRRR. However, this would require some frontage from ATS, albeit non-functional which should not impact on the operation of their business.

SCC, in conjunction with Atkins who built the Vissim models, identified from observations and from the modelling work, that traffic on the A5190W unnecessarily hesitates on entry as drivers are unsure whether vehicles on the roundabout are turning into the A5190W or continuing on the roundabout to the Hednesford Road and Wimblebury Road approaches. The proposed scheme takes away that doubt through better segregation of turns, allowing A5190W traffic to enter the roundabout without as much hesitation. The scheme also adds a flare to Norton Road, giving this approach more capacity to deal with the long queues that form.

The modelling results with the WRRR and this complementary scheme are very encouraging both in terms of comparison to the 2038 DN and the 2021 base year.

In the AM peak, average queues in the 2038 DS2 on the A5190W approach are much reduced compared to the 2038 DN – 20m compared to 349m. Average delay per vehicle is also significantly reduced to 17 seconds compared to 69 seconds. It should also be noted that queue lengths are also considerably less than the 2021 base year (223m).

Hednesford Road queues reduce significantly with an average queue of 15m (3 vehicles), compared to 338m (56 vehicles) in the 2038 DN. This is also an improvement on the 2021 base year queues of 123m (20 vehicles).

Wimblebury Road queues return to similar levels witnessed in the 2038 DN and the 2021 base year.

A5190E queues reduce significantly and well below those in 2038 DN - 7m vs 430m. They are also well below the queues seen in the 2021 base year (207m).

Norton Road queues remain higher, with 71m average queues compared to 43m in 2038 DN. Average delays per vehicle are reduced however,

from 62 seconds to 43 seconds indicating a faster moving queue. In 2021 queues were 38m with delays of 63 seconds.

The performance statistics for the junction as a whole have been considered to see how 2038 DS2 compares to 2038 DN. For each of the three key statistics – average delay per vehicle, average speed per vehicle and total junction delay – the 2038 DS2 performs better than the 2038 DN conditions. Average delay per vehicle in the 2038 DS2 is 42 seconds per vehicle compared to 172 seconds; average speed per vehicle is 11mph faster in 2038 DS2 at 26mph; and total junction delay is 39 hours vs 136 hours. The 2038 DS2 also outperforms the existing 2021 conditions - average delay per vehicle 42 seconds vs 106; average speeds 26mph vs 20mph; and total junction delay 39 hours vs 79 hours. These results indicate the effectiveness of combining this smaller improvement scheme with the WRRR.

In the PM peak, average queues in the 2038 DS2 on the A5190W approach are much reduced compared to the 2038 DN – 18m compared to 532m. Average delay per vehicle is also significantly reduced to 16 seconds compared to 109 seconds. These results are also much better than the 2021 base year where queues were 463m and delays 112 seconds per vehicle.

Hednesford Road queues reduce slightly from approximately 6 vehicles to 2, though neither would be considered an issue (2021 base was 4 vehicles).

Similarly, queues on Wimblebury Road are not an issue in either scenario.

A5190E queues reduce significantly and well below those in 2038 DN (11m vs 417m). These are also significantly lower than seen in 2021 (154m).

Norton Road also reduce significantly, from 535m in 2038 DN (and 364m in 2021) to 17m in 2038 DS2.

Similarly to the AM peak, the performance statistics for the junction as a whole in the PM peak improve considerably in 2038 DS2 when compared to 2038 DN, and indeed the 2021 base year. Average delay per vehicle in the 2038 DS2 are 32 seconds per vehicle compared to 223 seconds in 2038 DN and 167 seconds in 2021. Average speed per vehicle is 28mph in 2038 DS2 compared to 13 and 16 in 2038 DN and 2021 respectively. Total junction delay is 28 hours in 2038 DS2, 176 in 2038 DN and 126 in the 2021 base year. Again, these results indicate the effectiveness of combining this smaller improvement scheme with the WRRR.

It should also be noted that there is no latent demand in the 2038 DS2 scenario and 3153 AM / 2973 PM vehicles pass through the junction compared to 2492 AM / 2436 PM in 2021.

It can be concluded from the results that the junction operation in the 2038 DS2 would be considerably better than in the 2038 DN and in the 2021 base year.

Conclusions

Initial modelling and assessment work undertaken so far to examine the impact of proposed housing developments within Cannock Chase Council's emerging Local Plan indicates that:

- A large roundabout improvement would be difficult to deliver and difficult to justify given the amount of third party land required (and the extinguishment of three businesses) given it would not enable the junction to operate within capacity at the end of the Local Plan period.
- The new form of WRRR could deliver enough headroom for the proposed housing sites to be delivered without making the overall traffic situation at Five Ways roundabout any worse than it would be in 2038 without development. The roundabout would not, however, be operating within capacity.
- A smaller improvement to Five Ways in association with WRRR, requiring some non-functional frontage from ATS, would provide significantly more transport benefits than WRRR alone. It would enable the junction to operate more efficiently at the end of the Local Plan period than it currently does.
- Discussions will be held with CCC to assist in facilitating potential land acquisition, with the cost of such land being met through CIL contributions which would ultimately be repaid via contributions from the private developers.
- Discussions are underway between the developers to determine how they will deliver the required mitigation, with conversations centred around understanding phasing, timing, sharing of costs, etc..

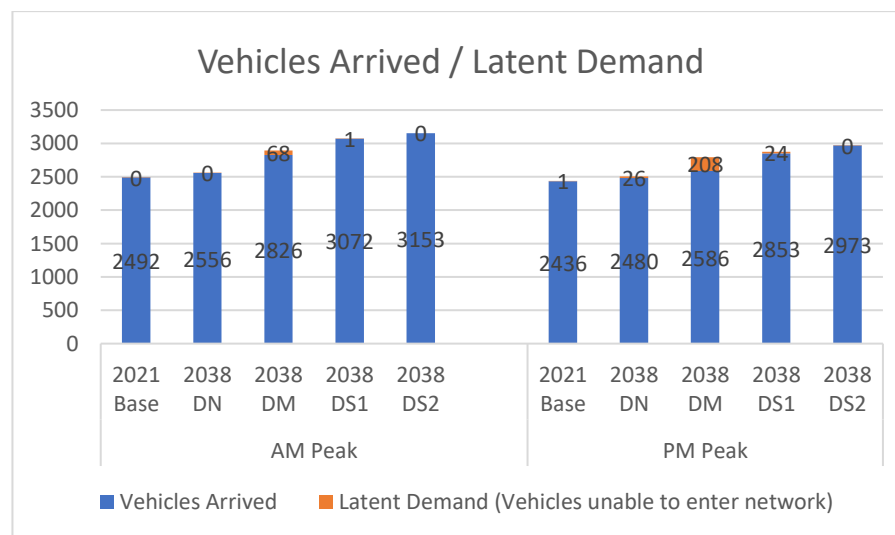
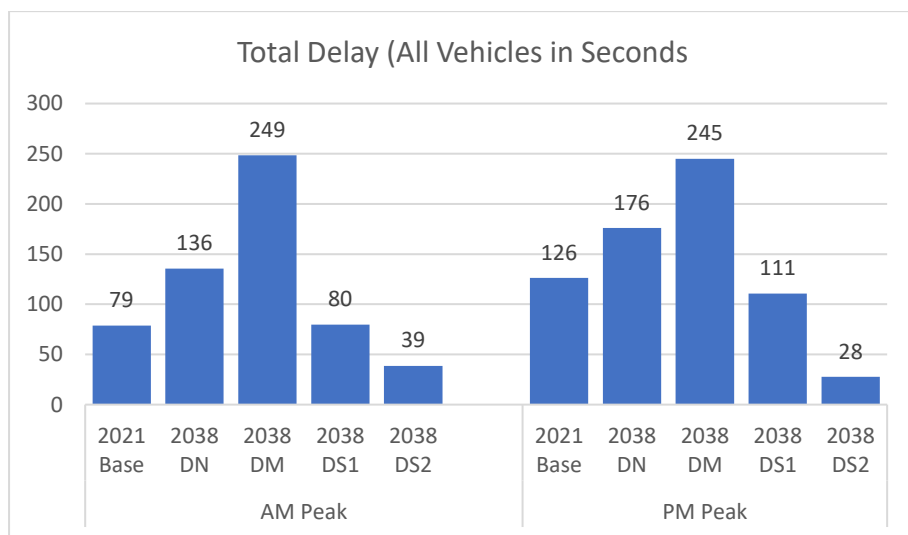
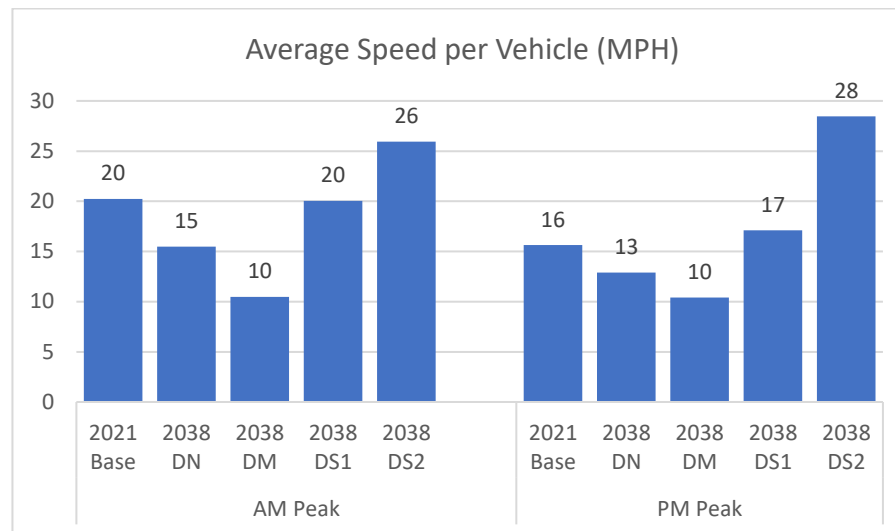
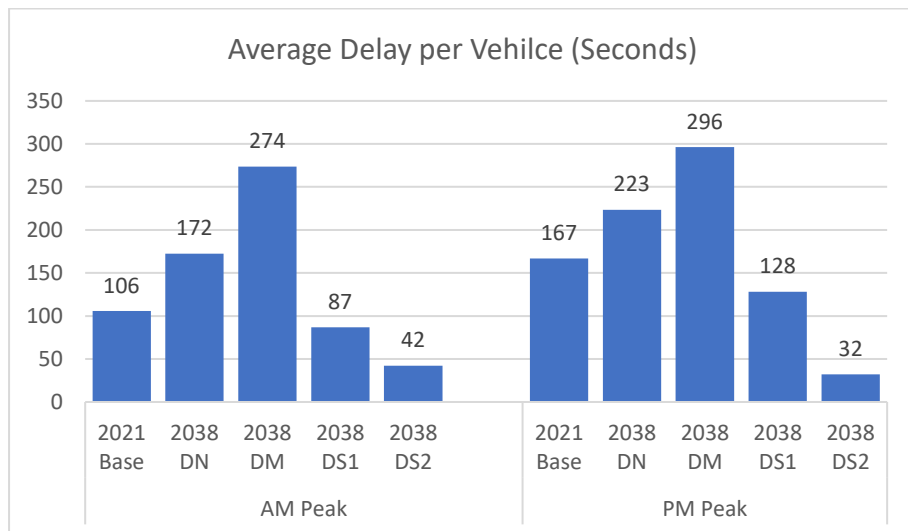
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Appendix 1. Summary of Results

- Scenario 1: 2021 AM Peak Base - Existing Network
 Scenario 2: 2021 PM Peak Base - Existing Network
 Scenario 3: 2038 AM Peak DN - Existing Network, Background and Committed Development Growth
 Scenario 4: 2038 PM Peak DN - Existing Network, Background and Committed Development Growth
 Scenario 5: 2038 AM Peak DM - Existing Network + Pedestrian Crossings, Background, Committed Development and Emerging Local Plan Growth
 Scenario 6: 2038 PM Peak DM - Existing Network + Pedestrian Crossings, Background, Committed Development and Emerging Local Plan Growth
 Scenario 7: 2038 AM Peak DS1 - Existing Network + Pedestrian Crossings + WRRR + Roundabout on A5190E, Background, Committed Development and Emerging Local Plan Growth
 Scenario 8: 2038 PM Peak DS1 - Existing Network + Pedestrian Crossings + WRRR + Roundabout on A5190E, Background, Committed Development and Emerging Local Plan Growth
 Scenario 15: 2038 AM Peak DS2 - Existing Network + Pedestrian Crossings + WRRR + Roundabout on A5190E + Small Five Ways Improvement (ATS) , Background, Committed Development and Emerging Local Plan Growth
 Scenario 16: 2038 PM Peak DS2 - Existing Network + Pedestrian Crossings + WRRR + Roundabout on A5190E + Small Five Ways Improvement (ATS) , Background, Committed Development and Emerging Local Plan Growth

Vehicle Network Performance Evaluation Statistics	AM Peak				
	2021 Base	2038 DN	2038 DM	2038 DS1	2038 DS2
Scenarios	1	3	5	7	15
Average Delay Per Vehicle (Secs)	106	172	274	87	42
Average Speed Per Vehicle (MPH)	20	15	10	20	26
Total Distance Travelled (All Vehicles)	5539	5727	5845	5973	6116
Total Delay (All Vehicles in Hours)	79	136	249	80	39
Vehicles Arrived	2492	2556	2826	3072	3153
Latent Demand (Vehicles unable to enter network)	0	0	68	1	0

PM Peak				
2021 Base	2038 DN	2038 DM	2038 DS1	2038 DS2
2	4	6	8	16
167	223	296	128	32
16	13	10	17	28
5388	5518	5660	5820	6060
126	176	245	111	28
2436	2480	2586	2853	2973
1	26	208	24	0



Node Evaluation Performance Statistics	AM Peak					PM PEAK				
	2021 Base	2038 DN	2038 DM	2038 DS1	2038 DS2	2021 Base	2038 DN	2038 DM	2038 DS1	2038 DS2
Scenarios	1	3	5	7	15	2	4	6	8	16
A5190W										
Average Queue Length (M)	223	349	776	450	20	463	532	853	669	18
Maximum Queue Length (M)	464	676	1016	910	186	895	983	1016	1014	158
Average Delay per Vehicle (Secs)	74	69	70	55	17	112	109	111	87	16
Stopped Delay per Vehicle (Secs)	16	14	19	14	5	33	31	43	26	4
Hednesford Road										
Average Queue Length (M)	123	338	322	13	15	25	32	44	7	11
Maximum Queue Length (M)	319	572	571	95	112	131	145	180	78	100
Average Delay per Vehicle (Secs)	59	81	74	20	27	32	30	40	13	17
Stopped Delay per Vehicle (Secs)	12	17	22	6	12	5	5	9	3	6
Wimblebury Road										
Average Queue Length (M)	18	27	354	10	15	2	3	4	1	1
Maximum Queue Length (M)	110	135	535	88	116	40	48	56	32	33
Average Delay per Vehicle (Secs)	31	41	106	34	32	9	9	11	6	7
Stopped Delay per Vehicle (Secs)	9	12	28	11	15	2	2	2	2	2
A5190E										
Average Queue Length (M)	207	430	746	55	7	154	417	473	15	11
Maximum Queue Length (M)	481	982	1515	242	116	422	810	1010	143	141
Average Delay per Vehicle (Secs)	51	55	61	35	17	40	46	52	13	19
Stopped Delay per Vehicle (Secs)	6	6	15	7	3	4	5	11	2	3
Norton Road										
Average Queue Length (M)	38	43	85	61	71	364	535	765	176	17
Maximum Queue Length (M)	190	190	321	238	240	723	887	894	389	147
Average Delay per Vehicle (Secs)	63	62	76	70	43	91	92	100	68	23
Stopped Delay per Vehicle (Secs)	11	9	10	13	12	19	19	24	14	3

