Technical Note: 03
Additional Junction Capacity Assessments

1.0 Introduction

1.1 This Technical Note (TN03) has been prepared by BSP Consulting in response to planning consultation comments received by Nottinghamshire County Council (NCC). It also takes account of subsequent correspondence with NCC and the Highways Agency (HA).

1.2 All of the traffic impact assessment work in the original Transport Assessment (and in subsequent work to date) considers a residential development of up to 500 dwellings at Field Farm. However, the outline planning application is for up to 450 dwellings, and therefore all of the trip generation figures and traffic impact assessment results are very robust.

1.3 The planning consultation comments from NCC requested that standalone capacity assessments were carried out at number of additional junctions. These junctions were not highlighted in the MVA report for standalone assessment as these junctions are already at capacity in the reference case, and therefore MVA advise that the development traffic is likely to displace existing traffic rather than lead to significant increases in flow and congestion at the junctions.

1.4 Furthermore, the TA compares the 'reference case' and 'with development' traffic flows (Tables 10 & 11 on pages 28 & 29 of the original TA, and also set out below for the 5 junctions where NCC has suggested that standalone models should be completed). This shows that the magnitude and percentage impact at these junctions as a result of the development are minor. At most there is an increase of 66 PCUs (e.g. 1.1 vehicles per minute) at a junction which has 3800 vehicles per hour passing through it. There is a maximum percentage increase of 3.3% of the traffic anticipated to pass through the junction in the design year, which is considered to be insignificant when compared to the anticipated daily variations in flow of around 10%. At three of the junctions there is a reduction in traffic during the PM peak hour due to re-routing. Therefore the impact of the development at these locations was not considered to require standalone capacity assessments.

1.5 Despite the below information, NCC has requested that the 5 junctions are assessed using standalone capacity assessment models. The first 4 junction capacity assessments have been carried out using ARCADY (roundabout/mini-roundabout), PICADY (priority junctions) and LINSIG (signal controlled junctions).

1.6 The HA/AECOM also requested a standalone capacity assessment of Bramcote Island using LINSIG, and the results are detailed in Technical Note 01. However, NCC has requested that in addition to the LINSIG assessment, a further assessment using a VISSIM is also provided.

Table 1: Number of PCUs and Percentage Increases at Individual Junctions

Junction	AM				PM			
	Total Flow (PCUs)		Net Traffic Impact	% Impact	Total Flow (PCUs)		Net Traffic Impact	% Impact
	Ref Case	With Dev			Ref Case	With Dev		
A6007 Ilkeston Rd / Trowell Rd / B6003 Pasture Rd	1677	1733	56	3.3	1832	1825	-7	-0.4
A609 Nottingham Road/ A6007 Stapleford Rd	2188	2188	56	2.6	2325	2121	-204	-8.8
A6002 Coventry Ln / A609 Nottm Rd/ Wollaton Vale	3748	3793	45	1.2	3799	3865	66	1.7
B5010 Derby Rd / Nottm Rd / B6003 Toton Ln / Church St	1660	1714	54	3.3	1657	1642	-15	-0.9
A52 / A6007 Ilkeston Rd /Derby Rd /Town St (Bramcote Island)	6192	6251	59	1.0	6514	6566	52	0.8

1.7 The results of the capacity assessments for each junction are provided in the sections below.

2.0 A6007 Ilkeston Road / Trowell Road / B6003 Pasture Road Junction

2.1 This mini roundabout is located adjacent to the south-west corner of the site boundary. A model has been set up using ARCADY, and the geometries of the junction layout.

Queue Length Validation

2.2 A traffic count and queue length survey was carried out at this junction on Thursday 29th May 2012, during the AM and PM peak hours. The results are provided in Appendix A. This data was used to compare the observed queues and those provided when running the model with the observed traffic flows, in a validation exercise. The results of the initial ARCADY results are provided below, along with a description of how these compare to the observed situation. The full results are provided in Appendix B.

Table 2: 2012 ARCADY Results – A6007 Ilkeston Rd/Trowell Rd/B6003 Pasture Rd

Arm	AM		PM	
	Max RFC	Max Q	Max RFC	Max Q
Trowell Rd	1.01	21	0.73	3
Ilkeston Rd	0.63	2	0.91	8
Pasture Rd	0.62	2	0.79	4

2.3 The following table considers how these results compare to the observed queue lengths. It is not anticipated that the model will completely replicate the observed situation, due to the assumed flow profile. DMRB guidance states that 'precise validation of queue lengths can be difficult because of the volatility of the observed data' and does not provide an acceptable threshold for modelled versus observed queue lengths.

Table 3: Queue Length Comparison – A6007 Ilkeston Rd/Trowell Rd/B6003 Pasture Rd

Arm	AM			PM		
	ARCADY	Observed		ARCADY	Observed	
	Max Q	Ave Q	*Diff*	Max Q	Ave Q	*Diff*
Trowell Rd	21	**8**	*+13*	3	**6**	*-3*
Ilkeston Rd	2	**3**	*-1*	8	**5**	*+3*
Pasture Rd	2	**3**	*-1*	4	**5**	*-1*

2.4 In general the queue lengths are fairly comparable. The worst queuing is apparent on Trowell Road during the AM peak hour, which is replicated by the model. In fact, the model suggests a higher maximum queue length, which demonstrates that the maximum RFC and maximum queue length results from the ARCADY model will be robust, (e.g. higher than would be expected in reality).

Junction Capacity Assessment

2.5 The results of running the ARCADY model with the 2026 'reference case' and 'with development' traffic flow scenarios, from the GNMMTM, are provided below. The full results are also provided in Appendix B.

Table 4: ARCADY Results – Trowell Road/Ilkeston Road/Pasture Road Junction

Arm	2026 Ref Case				2026 With Development			
	AM		PM		AM		PM	
	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q
Trowell Rd	1.27	110	0.91	9	1.28	115	0.99	17
Ilkeston Rd	0.63	2	1.33	118	0.74	3	1.16	55
Pasture Rd	0.64	2	0.69	2	0.64	2	0.78	4

2.6 The junction is shown to already be over capacity in the 2026 'reference case' scenario. Trowell Road is over capacity in both the AM and PM peak hours, and Ilkeston Road is over capacity in the PM peak hour only. Where the RFC values are over 1, the queue length becomes unreliable. The worst queues occur on the arms which the model was shown to overestimate in the validation exercise, e.g. Trowell Road in the AM peak hour and Ilkeston Road in the PM peak hour

2.7 The results of the 'with development' scenario show a minor impact on the 'reference case' during the AM peak hour, with the maximum RFC value increasing by just 0.01 on Trowell Road, the RFC on Ilkeston Road remaining below 0.85, and increasing the anticipate queue from 2 to 3 PCUs, and no change on Pasture Road.

2.8 During the PM peak hour, Trowell Road already has an RFC of over 0.9 in the 'reference case', and therefore the small increase in RFC of 0.08, does increase the queue length. However, due to the redistribution of existing traffic in the with development scenario the maximum RFC values and queue length actually reduces quite noticeably on Ilkeston Road during the PM peak hour, by 0.17 and 63 PCUs respectively. The RFC on Pasture Road also remains below 0.85 in the PM peak hour, with a minor increase in anticipated queue length from 2 to 4 PCUs.

2.9 On the basis of a minimal impact on the 'reference case' and improvement on Ilkeston Road during the critical PM peak hour, no improvements are proposed.

3.0 A609 Nottingham Road/A6007 Stapleford Road Junction

3.1 This priority junction is located in Trowell, to the north of the site. A model has been set up using PICADY, and the geometries of the junction layout.

Queue Length Validation

3.2 A traffic count and queue length survey was carried out at this junction on Thursday 29th May 2012, during the AM and PM peak hours. The results are provided in Appendix A. This data was used to compare the observed queues and those provided when running the model with the observed traffic flows, in a validation exercise. The results of the initial PICADY results are provided below, along with a description of

how these compare to the observed situation. The full results are provided in Appendix C.

Table 5: 2012 PICADY Results – A609 Nottingham Rd/A6007 Stapleford Rd

Arm	AM		PM	
	Max RFC	Max Q	Max RFC	Max Q
Stapleford Rd – Nottingham Rd	0.303	0	0.559	1
Stapleford Rd – Ilkeston Rd	0.565	1	0.816	4
Ilkeston Rd	0.584	1	0.598	2

3.3 The following table considers how these results compare to the observed queue lengths. It is not anticipated that the model will completely replicate the observed situation, due to the assumed flow profile. It is also noticed that the maximum observed queues had dropped back down by the next result recorded 5 minutes later, usually to less than the average recorded queue for that arm, therefore both the maximum and average observed queue have been considered.

Table 6: Queue Length Comparison – A609 Nottingham Road / A6007 Stapleford Road

Arm	AM			PM		
	ARCADY	Observed		ARCADY	Observed	
	Max Q	Ave Q	*Diff*	Max Q	Ave Q	*Diff*
Stapleford Rd (right)	0	**2**	*-2*	1	**3**	*-2*
Stapleford Rd (left)	1	**2**	*-1*	4	**5**	*-1*
Ilkeston Rd	1	**3**	*-2*	2	**5**	*-3*

3.4 In general the queue lengths are comparable.

Junction Capacity Assessment

3.5 The results of running the PICADY model with the 2026 ‘reference case’ and ‘with development’ traffic flow scenarios, from the GNMMTM, are provided below. The full results are also provided in Appendix C.

Table 7: PICADY Results – A609 Nottingham Road / A6007 Stapleford Road

Arm/ Stream	2026 Ref Case				2026 With Development			
	AM		PM		AM		PM	
	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q
Stapleford–Nottm Rd	1.231	59	1.406	108	1.286	74	1.245	62
Stapleford–Ilkeston Rd	0.924	7	1.128	21	0.952	9	0.953	8
Ilkeston Rd	0.607	2	0.861	6	0.632	2	0.778	4

3.6 The junction is shown to already be over capacity in the 2026 'reference case' scenario. The results of the 'with development' scenario show a very minor impact in terms of RFC on the 'reference case' during the AM peak hour. The RFC value increases by just 0.055 on the Stapleford Road-Nottingham Road stream, but as the junction is already over capacity the calculated anticipated queue increases by 15 PCUs. The other two streams are hardly affected. During the PM peak hour, due to the redistribution of existing traffic in the with development scenario the maximum RFC values and queues actually reduce quite noticeably. On the Stapleford Road-Nottingham Road stream the RFC and queue reduces by 0.161 and 46 PCUs respectively. There is no real change on the Stapleford Road-Ilkeston Road stream, and the Ilkeston Road stream remains within capacity.

3.7 In conclusion, the impact in the AM peak hour is considered to be exaggerated by the RFC values being over 0.9 on two arms in the 'reference case', and is partially offset by the benefits in the PM peak hour. Therefore, the overall conclusion is that mitigation measures are not considered necessary at this junction as a result of the proposed development.

4.0 A6002 Coventry Lane/A609 Nottingham Rd/Wollaton Vale

4.1 This signal controlled junction is locally known as the Balloon Woods junction, and is located to the north east of the site. A model has been set up using LINSIG with the geometries of the junction layout and signal controller information provided by NCC.

Queue Length Validation

4.2 A traffic count and queue length survey was carried out at this junction on Thursday 29th May 2012, during the AM and PM peak hours. The results are provided in Appendix A. This data was used to compare the observed queues and those provided when running the model with the observed traffic flows, in a validation exercise. The results of the initial LINSIG results are provided below, along with a description of

how these compare to the observed situation. The full results are provided in Appendix D.

4.3 Both the AM and PM survey scenarios were modelled assuming a 120 second cycle time. However, it is possible that MOVA may run longer cycle times during congested periods.

4.4 Queue comparisons between the LINSIG model and queue survey are shown in Table 8 below. The model queues presented in the table are the mean maximum queues (the maximum queue per cycle, averaged over all cycles in the modelling period). Where two lanes were modelled as a lane and a flare, the table shows one queue value which represents the predicted queue from the stop line, irrespective of the queue in the flare. Therefore, it should be compared to the longest of the two lane queues from the survey.

Table 8: Nottingham Rd/Trowell Rd Queue Comparisons

Average Queues	AM Peak		PM Peak	
	Survey	Model	Survey	Model
Nottingham Rd (nearside)	12.8	10.5	7.7	5.0
Nottingham Rd (middle)	9.9		5.2	
Nottingham Rd (offside)	14.3	14.6	8.2	6.1
Billborough Rd (nearside)	21.7	19.6	15.0	12.4
Billborough Rd (middle)	12.8	7.0	16.0	8.5
Billborough Rd (offside)	3.2	3.9	4.9	6.3
Trowell Rd (nearside)	8.4	7.7	16.0	13.1
Trowell Rd (middle)	9.1	8.8	17.0	12.6
Trowell Rd (offside)	3.4		4.9	
Wollaton Vale (left turn)	0.3	0.0	0.3	0.0
Wollaton Vale (nearside)	4.9	13.4	8.6	11.9
Wollaton Vale (middle)	10.2		9.8	
Wollaton Vale (offside)	13.3	11.5	13.9	10.7
Coventry Lane (nearside)	10.7	7.7	9.3	6.8
Coventry Lane (middle)	9.6		9.0	
Coventry Lane (offside)	15.3	17.8	9.6	9.1

4.5 The predicted model queues show good correlation with those from the survey. The queue survey shows longer queues in the middle lane of Billborough Rd and shorter queues in the offside lane. This is expected as these two lanes are well within capacity and therefore ahead traffic is likely to choose to stay in the middle lane rather than use the offside lane. LINSIG assumes a better balance of traffic travelling ahead over the two lanes as it seeks to minimise overall delay. Better balancing of traffic travelling ahead is likely once these two lanes become busier.

Junction Capacity Assessment

4.6 A LINSIG model was set up for the Balloon Woods junction which reports the Practical Reserve Capacity (PRC) and other measures such as total time delay for the junction as a whole, as well as the Degree of Saturation (DoS) and queue lengths for each of the links within the junction. Ideally, the PRC values should be greater than zero, although the theoretical capacity is at -10%. The traffic flows and queue lengths are expressed in Passenger Carrier Units (PCUs) and total time delay is expressed in PCUs per hour. The results of the model are in Table 9 below and the full outputs are provided in Appendix D.

Table 9: LINSIG Results

Scenario	AM					PM				
	Cycle Time (s)	PRC (%)	Total Delay (pcuHr)	Max Deg Sat (%)	Mean Max Queue (PCU)	Cycle Time (s)	PRC (%)	Total Delay (pcuHr)	Max Deg Sat (%)	Mean Max Queue (PCU)
2026 Ref Case	90	1.8	52.3	88.4	12.4	120	-11.4	90.1	100.3	24.4
2026 Ref Case + Dev	90	1.8	52.6	88.4	12.4	120	-16.6	122.2	105.0	43.8

4.7 The table above shows that the existing junction operates within capacity in the AM peak with a PRC of 1.8% and a maximum DoS of 88.4% with the development traffic, and that this is unaltered with the development traffic. The only effect is that the total delay increases by 0.3 pcuHr.

4.8 However, the assessment of the 2026 reference case scenario for the PM peak shows that the junction would operate well over capacity with a PRC of -11.5%. Therefore, any additional traffic in the with development scenarios further intensifies capacity issues. The PRC is shown to reduce by 5.2%, with the total delay increasing by 32.1 pcuHr and the maximum queue increasing from 24 PCUs to 44 PCUs.

4.9 Table 10 below shows the arms which are over the 90% DoS threshold in the PM peak hour reference case scenario and by how much the DoS and queue increases when the with development scenarios is modelled:

Table 10: DoS and Queue Comparison Table – PM Only

Scenario	Nottm Rd Right Only		Trowell Rd Ahead Right		Wollaton Vale Left Ahead		Wollaton Vale Ahead Right		Coventry Ln Right U-Turn	
	DoS	Q	DoS	Q	DoS	Q	DoS	Q	DoS	Q
2026 Ref Case	98.7%	11	96.0%	24	98.9%	17	98.8%	16	100.3%	16
2026 Ref Case + Dev	99.5%	12	104.5%	44	105.0%	25	104.9%	21	100.8%	16
Difference	*0.8%*	*1*	*8.5%*	*20*	*7.9%*	*8*	*6.1%*	*5*	*0.5%*	*0*

4.10 Table 10 above demonstrates that the main impact is on Trowell Road (Ahead/Right), and Wollaton Vale (Left/Ahead and Ahead/Right) where the increase in degree of saturation tips over 100% and there is an increase in maximum queue length. The most significant is Trowell Road (Ahead/Right).

4.11 In order to mitigate the impact of the development traffic, we have tested a proposed amendment to the junction layout to increase capacity. This is achieved by widening Trowell Road to provide an improved nearside flare (the model assumes this to be approximately 7 pcus). The lining in the centre of the junction will also be updated to provide unblocking storage for waiting right-turners, from Trowell Road to Billborough Road. The table below illustrates the effect of the proposed mitigation measures. The full LINSIG results are also provided in Appendix D.

Table 11: LINSIG Results

Scenario	AM					PM				
	Cycle Time (s)	PRC (%)	Total Delay (pcuHr)	Max Deg Sat (%)	Mean Max Queue (PCU)	Cycle Time (s)	PRC (%)	Total Delay (pcuHr)	Max Deg Sat (%)	Mean Max Queue (PCU)
2026 Ref Case	90	1.8	52.3	88.4	12.4	120	-11.4	90.1	100.3	24.4
2026 Ref Case + Dev	90	1.8	52.6	88.4	12.4	120	-16.6	122.2	105.0	43.8
2026 Ref Case + Dev + Mitigation	90	1.8	52.5	88.4	12.4	120	-10.2	85.2	99.2	22.4

4.12 The proposed amendments to the junction layout, have a slight benefit to the total delay in the AM peak hour, and are shown to have operational benefits on even the reference case scenario in the PM peak hour. In the PM peak hour, the PRC, total delay, maximum degree of saturation and queue length are all improved with the mitigation measures in place, to give better results than the reference case scenario

with no amendments. Therefore, the proposals are considered to go slightly beyond mitigating the impact of the development.

5.0 B5010 Derby Rd/Nottingham Rd/B6003 Toton Lane/Church St

5.1 This signal controlled junction is located in the centre of Stapleford to the south of the site. A model has been set up using LINSIG, the geometries of the junction layout and signal controller information provided by NCC.

Queue Length Validation

5.2 A traffic count and queue length survey was carried out at this junction on Thursday 29th May 2012 during the AM and PM peak hours. The results are provided in Appendix A. This data was used to compare the observed queues and those provided when running the model with the observed traffic flows, in a validation exercise. The results of the initial LINSIG results are provided below along with a description of how these compare to the observed situation. The full results are provided in Appendix E.

5.3 The AM Survey and PM Survey scenarios were run using 80 second and 60 second cycle times respectively, which produced positive PRC values (i.e. within capacity results).

5.4 Queue comparisons between the LINSIG model and queue survey are shown in Table 12 below. The model queues presented in the table are the mean maximum queues (the maximum queue per cycle, averaged over all cycles in the modelling period).

Table 12: Nottingham Rd/Toton Lane Queue Comparisons

Average Queues	AM Peak		PM Peak	
	Survey	Model	Survey	Model
Church St	11.7	7.5	10.0	9.9
Nottingham Rd	7.8	5.9	9.0	6.7
Toton Ln (nearside)	0.8	0.2	1.1	0.2
Toton Ln (offside)	13.3	11.7	9.9	6.5
Derby Rd	14.8	13.2	13.9	9.8

5.5 On all arms for both peak periods the predicted queues from the LINSIG model show good correlation with those in the survey. In all cases, the survey queues are slightly higher than the model queues. This is to be expected, as the survey queues were taken over 5 minute intervals, with the recorded values likely to have been the longest queue within each 5 minutes. The LINSIG model shows the average queue over all cycles.

Junction Capacity Assessment

5.6 A LINSIG model was set up for the B5010 Derby Rd/Nottingham Rd/B6003 Toton Lane/Church St junction with the results of the model are in Table 13 below:

Table 13: LINSIG Results

Scenario	AM					PM				
	Cycle Time (s)	PRC (%)	Total Time Delay (pcuHr)	Max Deg Sat (%)	Mean Max Queue (PCU)	Cycle Time (s)	PRC (%)	Total Delay (pcuHr)	Max Deg Sat (%)	Mean Max Queue (PCU)
2026 Ref Case	70	6.1	15.1	84.8	10.5	70	15.7	15.7	77.8	9.1
2026 Ref Case + Dev	70	3.6	16.4	86.9	11.6	70	10.6	16.8	81.4	9.6

5.7 The results in Table 13 above show that the base situation is worst in the AM peak hour, but that the development traffic has a greater impact on the overall operation of the junction in the PM peak hour. There is a decrease in PRC of 5.1%, in the PM peak hour, compared to just 2.5% in the AM peak hour. In both case there is a minimal increase in time delay of just 1.1-1.3 pcuHr.

5.8 The arm with the highest degree of saturation and queue length increases by 2.1% and 1.1 PCUs respectively in the AM peak hour, and 3.6% and 0.5 PCUs respectively in the PM peak hour. However, the maximum DoS remains below the 90% threshold for both peak hours, even with the development traffic, and the overall PRC for the junction is positive. Therefore, the results demonstrate that the junction as a whole operates well within capacity with the proposed development traffic in both the AM and PM peaks. Therefore, mitigation measures are not considered necessary at this junction.

6.0 Ilkeston Road/Coventry Lane/Hickings Lane

6.1 An assessment of this double mini roundabout was included in Technical Note 02, but has been subject of further comments from NCC.

6.2 We have validated the double mini roundabout and discovered that the minimum approach width on Coventry Lane should be entered as the width of the two lane approach, rather than further back where this is a single lane, in order to provide modelled results for Coventry Lane that better reflect the observed queues. A few other minor amendments were also made where considered reasonable in order to provide a better match to the observed queues. The revised results are provided in Appendix F and summarised below.

Table 14: 2012 ARCADY Results – Ilkeston Rd/Coventry Lane/Hickings Lane

Arm	Original				Amended			
	AM		PM		AM		PM	
	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q
1-Ilkeston Road W	0.81	4	0.53	1	0.85	6	0.55	1
1-Ilkeston Road E	0.71	3	0.95	14	0.71	3	0.95	13
1-Hickings Lane	0.59	2	0.45	1	0.66	2	0.51	1
2-Ilkeston Road W	1.01	26	0.79	4	1.01	26	0.79	4
2-Coventry Lane	1.06	26	1.73	279	0.61	2	0.99	18
2-Ilkeston Road E	0.52	1	0.66	2	0.62	2	0.85	6

Table 15: New Queue Length Comparison – Ilkeston Rd/Coventry Lane/Hickings Lane

Arm	AM			PM		
	ARCADY	Observed		ARCADY	Observed	
	Max Q	Ave Q	*Diff*	Max Q	Ave Q	*Diff*
1-Ilkeston Road W	6	**10**	*-4*	1	**4**	*-3*
1-Ilkeston Road E	3	**4**	*-1*	13	**4**	*+9*
1-Hickings Lane	2	**3**	*-1*	1	**3**	*-2*
2-Ilkeston Road W	26	**7**	*+15*	4	**7**	*+3*
2-Coventry Lane	2	**9**	*-7*	18	**13**	*+5*
2-Ilkeston Road E	2	**9**	*-7*	6	**11**	*-5*

Junction Capacity Assessment

6.3 The results of running the ARCADY model with the 2026 ‘reference case’ and ‘with development’ traffic flow scenarios, from the GNMMTM, are provided below. The full results are also provided in Appendix F.

Table 16: ARCADY Results – Ilkeston Rd/Coventry Lane/Hickings Lane

Arm	2026 Ref Case				2026 With Development			
	AM		PM		AM		PM	
	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q
1-Ilkeston Road W	1.14	60	0.51	1	1.41	197	0.52	0
1-Ilkeston Road E	0.68	2	1.11	66	0.70	2	1.13	73
1-Hickings Lane	0.78	4	0.92	9	0.75	3	0.91	8
2-Ilkeston Road W	1.52	299	0.88	7	1.74	507	0.89	7
2-Coventry Lane	0.81	5	1.44	215	0.84	5	1.45	221
2-Ilkeston Road E	0.74	3	0.83	5	0.74	2	0.88	7

6.4 The effect of the proposed improvements are also provided in Appendix F and summarised below, presented with the reference case results for comparison.

Table 17: ARCADY Results – Ilkeston Rd/Coventry Ln/Hickings Ln + Improvements

Arm	2026 Ref Case				2026 With Development + Improvements			
	AM		AM		AM		AM	
	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q	Max RFC	Max Q
1-Ilkeston Road W	1.14	60	0.51	1	0.91	9	0.33	1
1-Ilkeston Road E	0.68	2	1.11	66	0.72	3	1.15	83
1-Hickings Lane	0.78	4	0.92	9	0.62	2	0.74	3
2-Ilkeston Road W	1.52	299	0.88	7	1.52	345	0.77	4
2-Coventry Lane	0.81	5	1.44	215	0.64	2	1.05	39
2-Ilkeston Road E	0.74	3	0.83	5	0.66	2	0.88	7

6.5 The proposed improvements remove potential queuing towards the site on Ilkeston Road W at the Hickings Lane junction. The other Ilkeston Road W arm is also brought back down to the reference case RFC in the AM peak hour (and lower in the PM peak hour). The validation suggested that queuing on this arm will be

overestimated, and this is further exaggerated by the RFC being over 1. The anticipated queuing on Coventry Lane in the PM peak hour is reduced significantly from the reference case. There is still a minor impact on Ilkeston Road E at the Hickings Lane junction, but again the theoretical queuing on this arm is exaggerated by the RFC being over 1. On the whole, the improvements bring down the maximum RFC for the junction back to the reference case and therefore are considered to be suitable mitigation for the proposed development.

7.0 A52 / A6007 Ilkeston Rd /Derby Rd /Town St (Bramcote Island)

7.1 The LINSIG assessment for this junction has been set out in Technical Note 01, for approval from the HA/AECOM. Running the GNMMTM 'reference case' and 'with development' traffic flows demonstrated that the development proposals are anticipated to have negligible impact on the 'reference case' PRC and MMQ for the junction in the AM peak hour, and a positive effect in the PM peak hour. In considering the results of the 'with development' scenarios calculated using alternative methods with no re-assignment of existing traffic (required by the HA), the results show no significant detriment to the operation of the junction, with minor differences, and some improvements on critical arms. Therefore, the LinSig results demonstrated that the proposed development is not anticipated to have a significant impact at the Bramcote Island.

7.2 In order to satisfy NCC's requirements, a VISSIM model has also been set up to assess the operation of this junction. Conversely, when comparing the 'reference case' and 'with development' scenarios, this demonstrates some benefits in the overall operation of the junction in the AM peak hour, and a potential worsening of congestion in the PM peak hour, although in both cases less traffic is loaded onto the network.

7.3 Both assessment methods demonstrate that the anticipated increase in traffic from 2012 until 2026 is likely to generate capacity issues at the junction. Although the change in traffic in the 'with development' scenario is small, the traffic growth and re-distribution assumptions in the GNMMTM show the junction to be already over capacity and therefore extremely sensitive in the 2026 reference case scenario. The results of these assessments will be discussed in further detail with NCC and the HA/AECOM.

Jo Posnett
Senior Transportation Engineer
17.07.12

Enc.
Appendix A Traffic Count and Queue Length Survey Results
Appendix B ARCADY Results – A6007 Ilkeston Road / Trowell Road / B6003 Pasture Rd