From:	
Sent:	27 April 2016 15:16
To:	
Cc:	
Subject:	270216 1516 RE: Brook Green Braintree
Attachments:	TN02_Land_at Flitch Way Rayne TN_Response_Review_Issued.pdf

Before we meet you it would be useful to have your response to the attached AECOM technical note

Regards

Highways England Woodlands Manton Lane Bedford MK41 7LW	
Tel:	
Web: http://www.highways.gov.uk	
GTN:	

From:	
Sent: 27 April 2016 10:53	•
To:	
Cc:	
Subject: Brook Green Braintree	

Hi

Following your respective consultation responses on the Outline Application for the Brook Green proposals I believe it would be useful to meet up to discuss the way forward, the need for any additional assessment required and to discuss any potential solutions etc.

If you could indicate your respective availability over the next two weeks ($W/C 2^{nd}$ May-13th May) that would be most helpful.

I could arrange a meeting room here if required. Please feel free to call me to discuss.

Kind Regards



Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line: Mobile: www.journeytp.co.uk



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Project:	Highways England Spatial Planning Arrangement	Job No:	60343567 DX077.002
Subject:	Land at Flitch Way, Rayne Response Review		
Prepared by:		Date:	20 th April 2016
Checked by:		Date:	21 st April 2016
Verified & Approved by:		Date:	25 th April 2016

1. Introduction

- 1.1. This Technical Note (TN02) has been prepared by AECOM on behalf of Highways England (HE) to document a review of a follow up Technical Note Response (TNR) associated with a proposed development at the Land at Flitch Way, Rayne (LaFW), Braintree. The TNR has been prepared by Journey Transport Planning (JTP) on behalf of the developers, Acorn Group Braintree Ltd (AGB).
- 1.2. AECOM previously completed a review of the Transport Assessment (TA) and Travel Plan (TP) prepared by JTP in October 2015, in relation to the LaFW proposed development. The results of AECOM's review of the TA is contained in our Technical Note (TN01) dated 26th February 2016..
- 1.3. The intention of this TN02 is to review the contents of the additional information in the TNR to determine to what extent JTP has addressed the concerns of AECOM raised within TN01, regarding the potential impact of the proposed development on the Strategic Road Network (SRN). In the event a material impact is anticipated, this TN02 will provide advice and recommendations to assist HE in understanding the potential impact of the proposed LaFW development on the SRN.
- 1.4. The proposed development is for up to 1,600 new dwellings, up to 0.6 hectares of employment land and associated facilities, including a primary school, a local centre including shops and green infrastructure. The proposed development is located immediately to the west of Braintree, which is to the west of Colchester and north of Chelmsford, within Essex. The closest junctions on the SRN are the A131/Pods Brook Road roundabout and Galleys Corner roundabout on the A120, which are located approximately 0.5km and 4km from the proposed development site respectively.

2. Policy Review

- 2.1. In the previous TN, AECOM expressed concern that this site was not included in any Local Plan or in any other strategy document. There is therefore a risk that the implications of this development on the SRN have not been considered fully as the emerging Local Plan has not been finalised. <u>This concern is still outstanding.</u>
- 2.2. AECOM previously noted that JTP had not referenced the HE's "Planning for the Future" document within their TA. The TNR acknowledges this and explains this was due to the timescale of the publication of the HE document overlapping with the production of the TA, leaving JTP with no time for specific inclusion. The TNR confirms the aims of the document are considered within the LaFW assessment. AECOM consider this reasonable.



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3. Site Accessibility

- 3.1. AECOM previously highlighted the need for Road Safety Audits (RSA) for the two new access junctions and the two junction capacity mitigation schemes proposed for the development. Given that these works are located on the Local Road Network but are necessary to mitigate the impact of the development on the SRN, it was recommended that the view of Essex County Council (ECC) is obtained to confirm acceptance of the schemes.
- 3.2. JTP acknowledge the requirement for a RSA and state that this has now been completed. However, Appendix A of the TNR, which purports to contain the RSA is missing from the PDF and the contents page lists it as TBF (to be finalised?). No details have been provided by JTP to confirm that ECC have reviewed the RSA and accept it. <u>Therefore AECOM's original recommendation is still outstanding; the view of ECC is required to determine if the scheme is compliant and safe before the HE can confirm acceptance of the proposed scheme.</u>

4. Highway Safety

- 4.1. AECOM previously requested that the extent of the study area used to assess accident data is confirmed. JTP detailed in the TNR that the assessment included:
 - Rayne Road
 - Pods Brook Road
 - A120
 - A120 Slips at the A131 Junction
 - A120 Roundabouts at the A131 junction
 - Skyline Roundabout on the A131
- 4.2. AECOM consider this to be reasonable. <u>Considering the impact of the proposed development on</u> <u>Galleys Corner (as detailed below) it is recommended that the study area is extended to include</u> <u>Galleys Corner.</u>

5. Scope of Study

Assessment Year

5.1. In TN01, AECOM queried the lack of information about an Opening Year for this development. The junction capacity tests have all been carried out in an Assessment Year of 2025. AECOM concluded that, if the junction improvements proposed mitigate the development's impact in the Assessment Year, there would be little merit in requesting an Opening Year assessment. However, it is not yet clear that this is the case and an Opening Year assessment may still be required.

Study Area

- 5.2. In the previous TN, AECOM noted that the Galleys Corner Roundabout should be included in the study area, as this is an already congested roundabout and the HE would be interested to understand the development's impact on this junction.
- 5.3. The TNR presents the quantum of development trips at Galleys Corner Roundabout. The proposed impact is presented in **Table 1** below, this shows the proposed development impact with and without a Travel Plan in place.



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	AM F	Peak	PM Peak	
Direction	Traffic impact without TP	Traffic impact with TP	Traffic impact without TP	Traffic impact with TP
A120 Eastbound (towards roundabout)	105	92	45	40
A120 Westbound (away from roundabout)	44	39	74	65

Table 1: Summary of Development Vehicle Trips at Galleys Corner Roundabout – JTP Analysis

- 5.4. It is worth noting there are discrepancies between the A120 Eastbound and Westbound traffic impact presented in the TNR in relation to Galleys Corner (paragraphs 9.4 and 9.5) and that in paragraph 6.4 of the TNR. <u>AECOM recommend that it is confirmed which the correct impact is.</u>
- 5.5. The additional traffic generated by the proposed LaFW development at Galleys Corner Roundabout is likely to have a material impact on the junction. It is therefore recommended that the Galleys Corner Roundabout is included within the study area, although it is recognised that due to the presence of a VISSIM model no additional traffic counts are required. It is recommended that an additional run of the VISSIM model to fully determine this impact is completed to understand the potential contribution required by the development towards a mitigation scheme.

Peak Hours

- 5.6. In TN01, AECOM noted that the raw traffic data was not provided therefore it had not been possible to confirm the peak hours presented. The TNR provides the raw traffic data in Appendix 2. It should be noted that Appendix 2 only contains traffic flow data for Springwood roundabout, and the A120 North and South roundabout.
- 5.7. The peak hours presented in the TA are 08:00 to 09:00 for the AM peak and 17:00 to 18:00 for the PM peak which represent an average of the surveys across the survey area. AECOM have used the traffic survey data to verify the peak hours. Using the provided survey data the average AM peak for the three junctions is 07:30-08:30 and the PM peak is 16:45-17:45. <u>AECOM recommend that JTP provide justification for using a different peak hour or update their capacity assessment based on the peak hour identified by AECOM.</u>

6. Trip Generation and Distribution

Vehicular Trip Generation

- 6.1. AECOM previously reviewed the trip generation and estimated that a two form entry primary school would total approximately 420 pupils. AECOM recommended that JTP revise the trip generation based on the trip generation for 420 pupils. JTP agree with this recommendation in the TNR and the trip rates proposed by AECOM previously have been utilised in the revised assessment. AECOM consider this reasonable.
- 6.2. **Table 2** presents a summary of the AECOM agreed proposed trip numbers accounting for the increase in pupils at the primary school.



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	AM Peak		PM Peak	
Land Use	In	Out	In	Out
1600 Dwellings	200	545	447	232
Business Park	31	7	5	30
Primary School (210 Pupils) *	61	44	4	8
Total	292	596	456	270

Table 2: Summary of Development Vehicle Trips

* - after the application of an agreed 50% internalisation factor

Vehicular Trip Distribution

- 6.3. Within the previous TN, a comparison was made between JTP and AECOM peak hour vehicular trip distribution. AECOM considered the difference between the AECOM and JTP distribution to be material on the SRN and requested that JTP provide further justification of their distribution, in particular on the SRN.
- 6.4. JTP responded in the TNR and agreed to use the trip distribution presented by AECOM in the previous TN. AECOM consider this concern resolved.
- 6.5. **Table 3** provides a summary of the peak hour vehicular trips and their distribution based upon the AECOM vehicular trip distribution assumptions set out in TN01.

Table 5. Guinnary of Deve		Peak		Peak
Destination				Cur
Destination	In	Out	In	Out
A131 South (27%)	78	160	123	73
A120 East (19%)	44	106	87	50
A120 West (28%)	64	154	126	73
Non SRN (26%)	105	176	121	74
Total	292	596	456	270

Table 3: Summary of Development Generated Vehicle Trip Distribution

7. Traffic Impact

Traffic Re-assignment

- 7.1. AECOM previously queried the assumptions used to calculate the re-assigned traffic flows associated with the opening up of Panfield Lane, as presented within Figures 7-10 of the TA.
- 7.2. JTP indicate that the re-assignment was based on the submitted TA relating to Panfield Lane in support of allocating the site in the Local Plan. The relevant figures from the Panfield Lane TA are contained in Appendix 3 of the TNR. It should be noted that the segment of text provided from Panfield Lane TA details that Figures 18 and 19 present the reassignment of traffic to/from the industrial estate and Figures 20 and 21 present the reassignment of traffic associated with the existing residential population of Bocking North and South Wards. Appendix 3 of the TNR only contains Figures 18 and 19 therefore it is not possible to verify the reassigned residential traffic presented in Figure 8 and 10 of the TNR. <u>AECOM recommend that this information is provided.</u>



AECOM House 63-77 Victoria Street St Albans AL1 3ER United Kingdom (Rayne)Reports & Technical Notes)Draff11 7.3. AECOM has reviewed the distribution proposed as part of the Panfield Lane TA in relation to the employment trips and are unable to determine how the TNR Figures 7 and 9 have been calculated. The Panfield TA details that 10% of the to/from Rayne Road/Aetheric Road/Panfield Lane south and 10% of traffic to/from Pierefitte Way/Aetheric Road/Panfield Lane South will reassign if it has an origin or destination in Bocking North or South Wards. <u>Using this assumption it has not been possible for AECOM to verify the numbers presented by JTP. It is recommended that further information is provided.</u>

8. Capacity Analysis

- 8.1. In the previous TN AECOM detailed that accurate HGV percentages should have been utilised within the junction modelling considering that traffic survey data was available, instead of the default 10% HGV proportion assumption used within the modelling.
- 8.2. JTP responded in the TNR that the use of HGV defaults at 10% was to represent a robust assumption, as the observed HGV flows are significantly lower. The junction models were re-run for the TNR utilising the actual HGV percentages. AECOM consider this now resolved.
- 8.3. AECOM previously noted that the junction modelling could not be verified because there was no queue data and advised a weekday queue length survey is completed to help understand if the base models are a reasonable reflection of the current junction operation.
- 8.4. The TNR details that queue length surveys were completed on Wednesday 9th and Thursday 10th March in the AM and PM peaks in 5 minute intervals. The queue data is provided within Appendix 5 of the TNR. It is assumed that the queue survey data was collected in 2016. It is acknowledged that the queue data is collected on a different day to the traffic count survey therefore a comparison between modelled and observed queues may not fully reliable but will allow for a sense check of the model. The TNR does not provide any commentary or analysis of the observed queue data in comparison to the base junction models. It is confirmed that the junction models have been re-run using the updated traffic flows and are presented in the TNR.
- 8.5. For the majority of the model assessments the following scenarios were provided:
 - 2015 Base Flows
 - 2025 Forecast Flows
 - 2025 Forecast + Committed Development Flows
 - 2025 with Development Flows
 - 2025 with Development and Travel Plan Reduction Flows

Springwood Drive / Rayne Road / Pod's Brook Road Roundabout - Existing Layout

8.6. The updated results of the ARCADY model for the Springwood Drive / Rayne Road / Pod's Brook Road roundabout with a comparison to the observed maximum queue are presented in **Table 4**.

 Table 4: Springwood Drive / Rayne Road / Pod's Brook Road roundabout (existing layout)

 ARCADY results (JTP figures) with comparison to observed queue data

Arm	Max RFC	Max Queue (PCUs)	Obs Max Queue (PCUs)	Max RFC	Max Queue (PCUs)	Obs Max Queue (PCUs)
	,	1 2015 Base Flo		_	M 2015 Base Fl	
Springwood Drive	0.24	<1	10	0.78	4	82
Rayne Road East	0.71	3	7	0.45	1	11
Pod's Brook Road	1.08	46	35	0.68	3	70
Rayne Road West	0.46	1	15	0.24	<1	11
	AM 2025 F	orecast Flows			25 Forecast Flows	
Springwood Drive	0.28	<1		0.94	11	
Rayne Road East	0.81	5		0.53	2	
Pod's Brook Road	1.26	124		0.78	4	
Rayne Road West	0.52	2		0.28	<1	
	AM 2025 Forecast + Committed				25 Forecast + mmitted	
Springwood Drive	0.49	2		0.91	9	
Rayne Road East	0.70	3		0.51	2	
Pod's Brook Road	1.23	121		0.89	8	
Rayne Road West	0.50	2		0.34	1	
	AM 20	025 With		PM	2025 With	
	Deve	lopment		Dev	elopment	
Springwood Drive	0.56	2		0.94	12	
Rayne Road East	0.83	5		0.57	2	
Pod's Brook Road	1.46	286		1.04	34	
Rayne Road West	0.66	2		0.33	1	
		025 With			2025 With	
Development inc.TP				pment inc.TP		
	Reduction				eduction	
Springwood Drive	0.59	2		0.99	19	
Rayne Road East	0.81	4		0.58	2	
Pod's Brook Road	1.67	486		1.03	30	
Rayne Road West	0.64	2		0.4	1	

- 8.7. It should be noted that Pods Brook Road is approximately 800m long and a queue of 140 PCUs back from Rayne Road would effectively tail back as far as the north roundabout at the A120/A131 Panners junction. This would be regarded as a 'Severe' impact in the context of Circular 02/2013 para 9.
- 8.8. Table 4 highlights some significant variations between the modelled maximum queues and those observed on site in March 2016, in particular within the PM peak. It is acknowledged that the traffic flow data and queue data has been collected on different dates and this can account for some variation in the data but is not likely to be responsible for such large differences. The risk of a long queue causing a severe impact at the Trunk Road would be much more likely with the observed queues than with the modelled ones. It is therefore vital that the base models are re-evaluated to



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- 8.9. The '2025 Forecast AM' and '2025 Forecast PM' ARCADY models are assumed to be based on the 'AM Peak 08:00-09:00 2025 Forecast Flows Braintree' (Figure 3) and 'PM Peak 17:00-18:00 2025 Forecast Flows Braintree' (Figure 4) traffic flow diagrams.
- 8.10. The '2025 Reassigned AM' and '2025 Reassigned PM' ARCADY models are assumed to be based on the 'AM Peak 08:00-09:00 Total 2025 Re-assigned Base Flows with Panfield Lane' (Figure 11) and 'PM Peak 17:00-18:00 Total 2025 Re-assigned Base Flows with Panfield Lane' (Figure 12) traffic flow diagrams. The results of this modelling are presented in the '2025 Forecast + Committed' section of **Table 4**.
- 8.11. Similarly, the '2025 Reassigned with Development, AM' and '2025 Reassigned with Development, PM' ARCADY models are assumed to be based on the 'AM Peak 2025 Total with Development Flows' (Figure 22) and 'PM Peak 2025 Total with Development Trips 2025' (Figure 30) traffic flow diagrams.
- 8.12. The '2025, with Mitigated Development AM' and '2025, with Mitigated Development PM' ARCADY models are assumed to be based on the 'AM Peak 2025 Total with Mitigated Development Flows' (Figure 23) and 'PM Peak 2025 Total with Mitigated Development Trips 2025' (Figure 31) traffic flow diagrams. The results of this modelling is presented in the '2025 with Development' section of **Table 4**.
- 8.13. Some slight discrepancies were found which are not very significant. The only significant discrepancies found are shown below. AECOM considers this discrepancy significant and recommend that the modelling is redone as currently the results with a 'TP reduction' are worse than without which is not correct..
- 8.14. According to the Traffic Flow diagram (Figure 23), in the '2025, with Mitigated Development AM' model, the turning flows for:
 - Arm C, Pod's Brook Road, to Arm B, Rayne Road East, should be 385 (it is inputted as 585)
- 8.15. Taking the updated ARCADY modelling results at face value (notwithstanding AECOM's concern regarding the base model queue length comparison), the results in **Table 4** show that the addition of development generated traffic at the roundabout has an adverse effect on the capacity and predicted queuing on the Pod's Brook arm. Therefore the previously raised concern is still outstanding as there is the potential for vehicles to queue back to the Trunk Road. The results after the re-run of the model show that mitigation measures are required to improve the capacity of the Springwood Drive roundabout. JTP have acknowledged that the proposed development would add further strain to this roundabout and as such they have proposed an improved roundabout layout.

Springwood Drive / Rayne Road / Pod's Brook Road Roundabout - Proposed Layout

8.16. The updated results of the Springwood Drive / Rayne Road / Pod's Brook Road roundabout ARCADY modelling for the proposed layout are presented in **Table 5**.



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Table 5:	Springwood Drive / Rayne Road / Pod's Brook Road roundabout (proposed layout)
	ARCADY results and comparison to observed queue data

Arm	Max RFC	Max Queue (PCUs)	Max RFC	Max Queue (PCUs)
	AM 2015 E	Base Flows	PM 2015	Base Flows
Springwood Drive	0.25	<1	0.78	4
Rayne Road East	0.71	3	0.45	1
Pod's Brook Road	0.50	1	0.33	1
Rayne Road West	0.49	1	0.24	<1
	AM 2025 Forecast + Committed		PM 2025 Fore	cast + Committed
Springwood Drive	0.50	2	0.91	9
Rayne Road East	0.70	3	0.51	1
Pod's Brook Road	0.58	2	0.45	1
Rayne Road West	0.58	3	0.34	1
	AM 2025 With D	evelopment (not	PM 2025 With	Development (not
	inc.TP R	eduction)	inc.TP I	Reduction)
Springwood Drive	0.62	2	0.96	15
Rayne Road East	0.81	5	0.56	1
Pod's Brook Road	0.69	3	0.50	1
Rayne Road West	0.86	6	0.34	1

- 8.17. As mentioned in paragraph 8.13 of this TN, AECOM found a discrepancy between the traffic flow diagrams and the turning counts entered into the model. However, this discrepancy only affects the 'with TP' scenario and therefore does not affect the results in this table. It should be noted, a 2025 with development including TP reduction model is not presented.
- 8.18. The updated ARCADY results show the proposed mitigation measures at the Springwood Drive / Rayne Road / Pod's Brook Road roundabout to be sufficient to absorb the growth from the development on the Pod's Brook Road arm. AECOM consider this to be sufficient to minimise the risk of queuing back to the SRN. Springwood Drive could still experience some queuing following the development, which is an issue for ECC to confirm acceptance of. It should be noted that this conclusion should be revisited once further comparisons between the base model observed and modelled queues have been undertaken and any changes to the model have been transferred to the forecast scenarios.
- 8.19. This conclusion is also dependent upon the acceptance by Essex County Council (the Local Highway Authority) of the mitigation measures proposed. <u>Although a Stage 1 RSA of the proposed design is said to have been completed, AECOM have not seen this document and there is no evidence that ECC have accepted it. Until this acceptance is confirmed, it would be premature for Highways England to rely upon this scheme to mitigate a potentially severe impact at the Trunk Road. <u>AECOM's previous recommendation that ECC's approval is confirmed is therefore still outstanding.</u></u>

A120 / Pod's Brook Road / A131 (North) roundabout - Existing Layout

8.20. The updated results of the ARCADY model for the A120 / Pod's Brook Road / A131 (North) roundabout are presented in **Table 6.**



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Arm	Max RFC	Max Queue (PCUs)	Obs Max Queue (PCUs)	Max RFC	Max Queue (PCUs)	Obs Max Queue (PCUs)
	AI	VI 2015 Base Flo	WS	PM	2015 Base Flow	/S
Pod's Brook Road	0.50	1	*	0.75	3	*
A131 Under Bridge	0.42	1	6	0.28	<1	4
A120 Entry	0.30	<1	17	0.60	2	11
	AM 202	5 Forecast + Co	mmitted	PM 2025	Forecast + Con	nmitted
Pod's Brook Road	0.67	2		0.98	19	
A131 Under Bridge	0.50	1		0.34	1	
A120 Entry	0.37	1		0.73	3	
	A	M 2025 Total Flo	WS	PM	2025 Total Flow	'S
Pod's Brook Road	0.99	26		1.17	93	
A131 Under Bridge	0.55	2		0.42	1	
A120 Entry	0.43	1		0.85	6	
	AM 2025 T	AM 2025 Total Flows inc.TP Reduction			al Flows inc.TP	Reduction
Pod's Brook Road	0.96	43		1.15	85	
A131 Under Bridge	0.54	4		0.42	1	
A120 Entry	0.42	4		0.85	6	

Table 6: A120 / Pod's Brook Road / A131 (North) roundabout (existing layout) ARCADY results and comparison to observed queue data

*no queue data presented in Appendix 4 of TNR

- 8.21. The 'Scenario 1, PM 2015 Base' ARCADY model is assumed to be based on the 'PM Peak 17:00-18:00 Base Network Traffic Flows 2015 Braintree' (Figure 2) traffic flow diagram. According to the traffic flow diagram (Figure 2).
- 8.22. The 'Scenario 1, PM 2015 Base' model, the turning flow for Arm D, A120 Entry, to Arm A, Pod's Brook Road, should be 283 (it is inputted as 293). This discrepancy in flows, on its own, is not significant enough to be worth re-running the model. However, table 6 highlights some discrepancies between the observed queues and those presented in the model on the A120 entry arm. There is some concern that the model may be underestimating the queuing on this arm in both peaks. It is recommended that the base models are re-evaluated to ensure they more accurately represent the observed queue data or that justification is provided for the results shown.
- 8.23. If we take the rest of the flows as correct, the modelling results indicate that the roundabout is currently operating within capacity with minimal queuing. The results show that the junction is operating at or over capacity on Pod's Brook Road by 2025. The A120 Entry, which is of primary concern to HE, is predicted to operate within or at capacity in 2025 following the addition of development flows. It should be noted that this should be reassessed following further consideration of the base model observed queue comparisons.



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- 8.24. Based on the modelling results, JTP have proposed mitigation measures at the A120 / Pod's Brook Road / A131 (North) roundabout to address the capacity and queuing issues.

A120 / Pod's Brook Road / A131 (North) Roundabout - Proposed Layout

8.25. The updated results of the A120 / Pod's Brook Road / A131 (North) roundabout ARCADY modelling for the proposed layout are presented in **Table 7**.

Arm	Max RFC	Max Queue (PCUs)	Max RFC	Max Queue (PCUs)
	AM 2015 E	Base Flows	PM 2015	Base Flows
Pod's Brook Road	0.38	< 1	0.53	1
A131 Under Bridge	0.42	< 1	0.28	< 1
A120 Entry	0.32	< 1	0.60	2
	AM 2025 Foreca	ast + Committed	PM 2025 Fore	cast + Committed
Pod's Brook Road	0.56	1	0.69	2
A131 Under Bridge	0.50	1	0.34	< 1
A120 Entry	0.56	1	0.73	3
	AM 2025 Total F	lows not incl.TP	PM 2025 Total	Flows not incl.TP
reduction		ction	red	uction
Pod's Brook Road	0.71	3	0.81	4
A131 Under Bridge	0.54	1	0.42	< 1
A120 Entry	0.43	< 1	0.85	6

Table 7: A120 / Pod's Brook Road / A131 (North) roundabout (proposed layout) ARCADY results

- 8.26. The 'Scenario 1, AM 2025 Re-assigned plus Committed' ARCADY model is assumed to be based on the 'AM Peak 08:00-09:00 Total 2025 Re-assigned Base Flows with Panfield Lane' (Figure 11) traffic flow diagram. According to the traffic flow diagram (Figure 11), in the 'Scenario 1, AM 2025 Re-assigned plus Committed' model, the turning flow for Arm D, A120 Entry, to Arm B, A120 Exit, should be 0 (it is inputted as 302). This was noted by AECOM in the previous TN, but remains unchanged.
- 8.27. The 'Scenario 1, AM 2025 Total with Development' and 'Scenario 1, PM 2025 Total with Development' ARCADY models are assumed to be based on the 'AM Peak Total with Development Trips 2025' (Figure 22) and 'PM Peak Total with Development Trips 2025' (Figure 30) traffic flow diagrams.
- 8.28. It is worth noting that no with 'mitigation' model is presented to show the junction with reduced flows due to the travel plan.
- 8.29. According to the Traffic Flow Diagram (Figure 22), in the 'Scenario 1: 2025 Total With Development AM' model, the turning flows for:
 - Arm 1, Pods Brook Road, to Arm 2, A120 east exit, should be 260 (it is inputted as 227)
 - Arm 1, Pods Brook Road, to Arm 3, A120 Underbridge, should be 1010 (it is inputted as 992)
 - Arm 3, A120 Underbridge, to Arm 1, Pods Brook Road, should be 897 (it is inputted as 878)



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- 8.30. According to this traffic flow diagram, in the 'Scenario 1, PM 2025 Total with Development' model, the turning flow for
 - Arm 1, Pods Brook Road, to Arm 2, A120 east exit, should be 244 (it is inputted as 230)
 - Arm 1, Pods Brook Road, to Arm 3, A120 Underbridge, should be 842 (it is inputted as 837)
 - Arm 3, A120 Underbridge, to Arm 1, Pod's Brook Road, should be 674 (it is inputted as 638).

AECOM considers these discrepancies to be significant enough to affect the modelling results and therefore recommend that the flows are corrected in ARCADY and the model is re-run to gain a more accurate prediction of the capability of the proposed layout for the A120 / Pod's Brook Road / A131 (North) roundabout.

- 8.31. It is noted that if AECOM consider the model outputs at face value, the proposed layout is predicted to bring the roundabout back within capacity with reduced queues. It should be noted that, in addition to required flow changes, this conclusion should be revisited once further comparisons between the base model observed and modelled queues have been undertaken and any changes to the model have been transferred to the forecast scenarios.
- 8.32. Previously AECOM noticed that JTP had not assessed the feasibility of the proposed roundabout layout in terms of its compliance with current design standards, since this would be a matter for the Local Highway Authority, ECC. <u>Although a Stage 1 RSA of the proposed design is said to have been completed</u>, <u>AECOM have not seen this document and there is no evidence that ECC have accepted it</u>. Until this acceptance is confirmed, it would be premature for Highways England to rely upon this scheme to mitigate a potentially severe impact at the Trunk Road. <u>AECOM's previous recommendation that ECC's approval is confirmed is therefore still outstanding</u>.

Pod's Brook Road / Site Access Proposed Roundabout

8.33. The updated results of the proposed Pod's Brook Road / Site Access roundabout ARCADY modelling are presented in Table 8. They have been undertaken assuming the total 2025 with Development traffic flows.

Arm	Max RFC	Max Queue (PCUs)	Max RFC	Max Queue (PCUs)
	AM 2025 Total Flows		PM 2025 Total Flows	
Pod's Brook Road North	0.75	3	0.68	2
Pod's Brook Road South	0.76	3	0.71	2
Development Access	0.68	2	0.22	<1

Table 8: Pod's Brook Road / Site Access Proposed Roundabout ARCADY Results

8.34. Previously AECOM noticed that JTP had not assessed the feasibility of the proposed roundabout layout in terms of its compliance with current design standards, since this would be a matter for the Local Highway Authority, ECC. <u>Although a RSA has been completed it has not been confirmed that ECC approve it therefore the original request still stands.</u>

A120 / B1256 / A131 (South) Roundabout – Existing Layout

8.35. The updated results of the ARCADY model for the A120 / B1256 / A131 (South) roundabout are presented in **Table 9**.



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Arm	Max RFC	Max Queue (PCUs)	Obs Max Queue (PCUs)	Max RFC	Max Queue (PCUs)	Obs Max Queue (PCUs)	
	AM	2015 Base Flo	ows.	PM 2015 Base Flows			
A131 Under Bridge	0.38	1	4	0.68	2	5	
A120 Slip	0.27	<1	7	0.2	<1	5	
B1256	0.47	1	6	0.21	<1	50	
A131	0.29	<1		0.28	<1		
	AM 2025 Forecast + Committed		PM 2025 Forecast + Committed				
A131 Under Bridge	0.46	1		0.81	4		
A120 Slip	0.34	1		0.27	<1		
B1256	0.61	2		0.27	<1		
A131	0.36	1		0.33	1		
	AM 2025 Total Flows not incl.TP reduction		PM 2025 Total Flows not incl.TP reduction				
A131 Under Bridge	0.60	2		0.87	7		
A120 Slip	0.40	1		0.33	1		
B1256	0.77	3		0.30	<1		
A131	0.39	1		0.38	1		

Table 9: A120 / B1256 / A131 (South) Roundabout (existing layout) ARCADY Results with comparison to observed queue data

- 8.36. The '2015 Existing Flows AM' and '2015 Existing Flows PM' ARCADY models are assumed to be based on the 'AM Peak 08:00-09:00 Base Network Traffic Flows 2015 Braintree' (Figure 1) and 'AM Peak 08:00-09:00 Base Network Traffic Flows 2015 Braintree' (Figure 2) traffic flow diagrams.
- 8.37. **Table 9** highlights a significant difference between the observed queues and the model queues on the B1256. It is recommended that the base models are re-evaluated to ensure they more accurately represent the observed queue data or that justification is provided for the results shown.
- 8.38. Similarly, the '2025 Reassigned Base Flows AM' and '2025 Reassigned Base Flows PM' ARCADY models are assumed to be based on the 'AM Peak 08:00-09:00 Total 2025 Re-assigned Base Flows with Panfield Lane' (Figure 11) and 'AM Peak 08:00-09:00 Total 2025 Re-assigned Base Flows with Panfield Lane' (Figure 12) traffic flow diagrams.
- 8.39. The '2025 Total With Development AM' and '2025 Total With Development PM' ARCADY models are assumed to be based on the 'AM Peak 2025 Total with Development Flows' (Figure 22) and 'PM Peak 2025 Total with Development Trips 2025' (Figure 30) traffic flow diagrams. It should be noted there are no ARCADY models presented which represent 2025 total trips with mitigated development in consistency with the other modelling presented.
- 8.40. It is worth noting that no with 'mitigation' model is presented to demonstrate the reduction in traffic associated with a travel plan. There were discrepancies between the flows shown in the diagrams and those entered into ARCADY. These discrepancies are shown below. <u>AECOM considers these discrepancies are significant enough to affect the modelling and therefore recommend that the flows are corrected in ARCADY and the model is re-run.</u>



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- 8.41. According to the Traffic Flow Diagram (Figure 11), in the '2025 Reassigned Base Flows AM' model, the turning flows for:
 - Arm 4, A131 West, to Arm 1, A131 Underbridge, should be 633 (it is inputted as 684),
- 8.42. According to the Traffic Flow Diagram (Figure 22), in the '2025 Total With Development AM' model, the turning flows for:
 - Arm 1, A131 Underbridge, to Arm 4, A131 West, should be 706 (it is inputted as 688),
 - Arm 2, A120 Entry, to Arm 1, A131 Underbridge, should be 338 (it is inputted as 325),
 - Arm 4, A131 West, to Arm 1, A131 Underbridge, should be 705 (it is inputted as 696),
- 8.43. According to the Traffic Flow Diagram (Figure 30), in the '2025 Total With Development PM' model, the turning flows for:
 - Arm 1, A131 Underbridge, to Arm 4, A131 West, should be 832 (it is inputted as 828),
 - Arm 2, A120 Entry, to Arm 1, A131 Underbridge, should be 169 (it is inputted as 146),
 - Arm 4, A120 West, to Arm 1, A131 Underbridge, should be 670 (it is inputted as 661),

Recommendations

- 8.44. Based on the modelling results presented, AECOM make the following recommendations:
 - <u>AECOM recommend that the base models are re-evaluated to more accurately represent the observed queue data or justification is provided if this is not completed.</u>
 - Remodel the '2025, with Mitigated Development AM' model for the Springwood Drive / Rayne Road / Pod's Brook Road existing layout roundabout; and
 - <u>Remodel the 'Scenario 1, AM 2025 Re-assigned plus Committed' ARCADY model and the</u> <u>'2025 Total with Development AM' and '2025 Total With Development PM' ARCADY model for</u> <u>the A120 / Pod's Brook Road / A131 (North) proposed layout roundabout; and</u>
 - <u>Remodel the '2025 Reassigned Base Flows AM', , '2025 Total With Development AM' and '2025</u> <u>Total With Development PM' models ARCADY model for the A120 / B1256 / A131 (South)</u> <u>existing layout roundabout.</u>

9. Mitigation

Bus Strategy

- 9.1. In the previous TN, AECOM agreed with the proposed investments to the bus network, but asked for further details. The TNR indicates that the bus strategy will be detailed with the Section 106 Agreement, but confirm that it will contain the following criteria as a minimum proposed:
 - Minimum 15 min frequency during peak hours Mon-Fri.
 - Half hourly frequency Mon-Sat.
 - Routing will ensure all residential units within the site are within 400m of a bus stop.



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- Detailed off site routing will be determined to some extent by the operator however given that Rayne Road forms the only sensible route into Braintree Town Centre, a loop route through the site incorporating the route into town via Rayne Road is proposed.
- 9.2. AECOM consider this reasonable at this stage. However, it is unclear whether or not the developer has approached a bus operator to find out if they would be interested in providing such a service on a commercial basis. This should be confirmed as part of the planning application process.

10. Travel Plan

- 10.1. AECOM previously commented that no details were provided within the Interim Travel Plan (ITP) about the requirements of the business, school and residential Travel Plans. AECOM recommended that JTP updated the ITP to account for the need of separate TP documents for each land use due the varying travel needs and present a separate document in relation to the business and school TP's.
- 10.2. JTP acknowledged this situation and explained that more detailed TP documents will be provided with the detailed application for the separate developments. In the meantime, the submitted ITP would form the principles for the development of detailed Travel Plans for the separate uses. JTP recognise that a successful implementation of a Travel Plan will have a positive impact on sustainable travel patterns and behaviours such as an overall decrease of the generated vehicles on the local highway network. Table 10.0 of the TNR presents the interim TP targets and forecast model shift. It forecasts a 12% reduction in single-occupancy car driving due to a modal shift to other measures. AECOM consider this target to be reasonable.
- 10.3. The reduction in car trips has been used to calculate the 'mitigated' development traffic flows and this has been used to complete the 'mitigated' capacity assessments. AECOM consider this to be reasonable. However, it is important that the Travel Plan can demonstrate that these targets can be met and that sufficient measures are implemented to achieve the targets and ensure that the traffic flows do not exceed those used within the 'mitigated' traffic flow scenarios.
- 10.4. These measures, targets and mechanisms will have to be agreed as the planning application progresses and, ideally, incorporated in the planning conditions.

11. Conclusion

- 11.1. This technical note reviews the Journey Transport Planning (JTP) response to the AECOM's previous Technical Note 01 (which reviewed a Transport Assessment) on behalf of Acorn Group Braintree Ltd in relation to the proposed Land at Flitch Way development. The development is for a residential development of 1,600 dwellings, up to 0.6 hectares of employment land use, a local centre, neighbourhood facilities and a primary schools.
- 11.2. In summary AECOM's review of the TNR provides further detail of the proposal and its potential impact on the strategic road network (SRN). AECOM recommend that JTP provide further details on the peak hour calculations and traffic re-assignment presented in the appendices. AECOM recommend that JTP commission an additional VISSIM run to verify the impact of the development on Galleys Corner.



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- 11.3. Discrepancies in the junction modelling have been found by AECOM and it is recommended that JTP update accordingly and rerun the junction capacity assessments. Queuing data does not appear to have been used to verify the base models so they represent realistic queuing levels. AECOM recommend that this re-evaluated to determine whether the base models are a reasonable reflection of the current junction operation.
- 11.4. Mitigation was found to be required at two locations where junctions that are operating over-capacity on the Local Road Network have the potential to affect the SRN. AECOM recommend that Highways England seek assurances from Essex County Council that the improvements proposed are acceptable to them.
- 11.5. More detail regarding these recommendations is provided throughout this technical note and has been underlined for ease of reference. It is recommended that JTP address these concerns regarding the potential impact of the development on the SRN and provide the additional information requested to Highways England for review.

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From: To:	
CC:	
Subject:	030516 0618 RE: Brook Green Braintree
Date:	03 May 2016 06:24:16

All

Attachments:

I spoke to at Braintree DC on Friday and we agreed that we need to arrange a combined meeting with Essex County Highways, Highways for England, Braintree District Council and us as promoters with a consultant. Whilst we are aware of some of the additional data needed and a bas been instructed to investigate same, we do need to meet sooner rather than later, to ascertain what else is needed. So would everyone provide a selection of suitable dates from Monday 9th onwards and let's try and find a date that works for everyone. In terms of venue, I am completely relaxed and for now let's assume we are meeting either at Braintree DC or Essex CC.

Thanks very much

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image001.png

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From:	
To:	
Cc:	
Subject:	RE:040516 1327 Brook Green Braintree
Date:	04 May 2016 13:28:05
Attachments:	image001.png image002.png image003.jpg
,	

Further to your e-mail I am available to attend the meeting on 13th May at 11am. I have booked a meeting room at the Council offices at Causeway House. Kind Regards,

From:

Sent: 03 May 2016 10:53 AM

To: Cc:

Subject: RE: Brook Green Braintree

Everyone, we have a date -13^{th} May say 11:00 AM

can you please confirm your availability and whether you can arrange a room and I will send out invites in a moment

Thanks very much

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_ 1	

From:	
Sent: 03 May 2016 10:49	
То:	
Cc:	
Subject: RE: Brook Green Braintree	
,	
Myself and Aecom can make late morning c	onwards on the 13 th
Regards	

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW Tel: Web: http://www.highways.gov.uk

GTN:	
From:	
Sent: 03 May 2016 10:40	
To:	
Cc:	
Subject: RE: Brook Green Braintree	

Dear

I am on leave next week but see there has been some email traffic exploring dates to meet for next week,

I can do 10th May, 11th May from 1400 onwards or 13th May.

County Hall rooms are often well booked up so if Braintree have anything available that would be useful.

Thanks.



Economic Growth and Development

Essex County Council | telephone: | email:



Please consider the environment before printing this e-mail

From:	
Sent: 27 April 2016 10:53	
То:	
Cc:	
Subject: Brook Green Braintree	

Hi

Following your respective consultation responses on the Outline Application for the Brook Green proposals I believe it would be useful to meet up to discuss the way forward, the need for any additional assessment required and to discuss any potential solutions etc.

If you could indicate your respective availability over the next two weeks (W/C 2^{nd} May-13th May) that would be most helpful.

I could arrange a meeting room here if required. Please feel free to call me to discuss. Kind Regards

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line:

www.journeytp.co.uk

cid:image001.jpg@01CE4D93.F2E68D10

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From: To: Cc:	
Subject:	20616 1140 RE: 15/01538/OUT - Brook Green, Land North And South Of Flitch Way - Highways
Date:	20 June 2016 11:40:37
Attachments:	image003.jpg

Dear

Further to our recent meeting we wish to examine in greater detail Braintree's wider highways issues relating to Galleys Corner in the context of the residential development of our Brook Green site. Cleary, works to address highways capacity and movement at Galleys Corner for Braintree's current and future growth (including Brook Green) would be highly beneficial.

I know we discussed that the approximate cost of the required works would be in the region of \pm 10M and that, in addition, the land needed to be acquired, as a current best guess, could cost in the region of \pm 3-5M.

It would be appreciated if you could give us some feedback on any contribution that we could make to this scheme. Assuming a contribution could be made, it could be ring fenced for a maximum period of 10 years.

Just so we can get a better feel for the question of the sum in question, do you have a formula for calculating the sum, that you would wish us to contribute?

I don't mind at this stage if the dialogue is informal, as I am just trying to get a handle on the quantum of any contributions and we could then discuss how to formulise this process.

We have a meeting with the vendors later this week to provide a general update and would it be possible for you to respond in principle early this week.

I will look forward to hearing from you

Best Regards

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line: Mobile:

cid:image001.jpg@01CE4D93.F2E68D10

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Subject: Date: Attachments: 130716 0930 RE: 15/01538/OUT - Brook Green, Land North And South Of Flitch Way - Highways 13 July 2016 09:30:11 image001.png image002.jpg

Morning.

It has been some weeks since sent his email below and whilst I have been having regular conversations with sent his email below and update, as to where we are and when we can expect a formal response?

In the meantime, I have just spoken with **a second second** and his final report with the junction improvements by Morrisions will be with us next week.

I look forward to hearing from you.

Many thanks

cid:image001.png@01D09B97.D7F885E0

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From:		
Sent: 20 June 2016 11:40	_	
To:		
Cc:		

Subject: RE: 15/01538/OUT - Brook Green, Land North And South Of Flitch Way - Highways Dear **Control of Place**,

Further to our recent meeting we wish to examine in greater detail Braintree's wider highways issues relating to Galleys Corner in the context of the residential development of our Brook Green site. Cleary, works to address highways capacity and movement at Galleys Corner for Braintree's current and future growth (including Brook Green) would be highly beneficial.

I know we discussed that the approximate cost of the required works would be in the region of \pm 10M and that, in addition, the land needed to be acquired, as a current best guess, could cost in the region of \pm 3-5M.

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Director

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From: To: Cc:	
Subject:	130716 1049 RE: 15/01538/OUT - Brook Green, Land North And South Of Flitch Way - Highways
Date:	13 July 2016 10:49:26
Attachments:	image001.png image002.jpg



when will you be in a position to confirm your thoughts and more importantly the sums needed from us.

I am very conscious that we all agreed that the determination of this application would be deferred until mid-August and we have our team on standby to react to the various issues and the silly season is fast approaching.

Thanks again

cid:image001.png@01D09B97.D7F885E0

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From:
Sent: 13 July 2016 09:58
To:
Cc:
Subject: RE: 15/01538/OUT - Brook Green, Land North And South Of Flitch Way - Highways
As far as the A120 is concerned provided the works you are proposing are conditioned
we are content with the development going ahead. The problem is I cannot condition

we are content with the development going ahead. The problem is I cannot condition these without the consent of Essex CC as the works are on their network and they have not yet agreed them

Regards

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

Tel:

Web: <u>http://www.highways.gov.uk</u>

GTN:

From: Sent: 13 July 2016 09:30

То:
Cc:
Subject: RE: 15/01538/OUT - Brook Green, Land North And South Of Flitch Way - Highways
Morning.
It has been some weeks since sent his email below and whilst I have been having regular
conversations with set , I wonder if you could provide an update, as to where we are and when
we can expect a formal response?
In the meantime, I have just spoken with the second and his final report with the junction
improvements by Morrisions will be with us next week.
I look forward to hearing from you.
Many thanks
cid:image001.png@01D09B97.D7F885E0

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From:	
Sent: 20 June 2016 11:40	
To:	
Cc:	

Subject: RE: 15/01538/OUT - Brook Green, Land North And South Of Flitch Way - Highways Dear and the second second

Further to our recent meeting we wish to examine in greater detail Braintree's wider highways issues relating to Galleys Corner in the context of the residential development of our Brook Green site. Cleary, works to address highways capacity and movement at Galleys Corner for Braintree's current and future growth (including Brook Green) would be highly beneficial. I know we discussed that the approximate cost of the required works would be in the region of £10M and that, in addition, the land needed to be acquired, as a current best guess, could cost in the region of £3-5M.

It would be appreciated if you could give us some feedback on any contribution that we could make to this scheme. Assuming a contribution could be made, it could be ring fenced for a maximum period of 10 years.

Just so we can get a better feel for the question of the sum in question, do you have a formula for calculating the sum, that you would wish us to contribute?

I don't mind at this stage if the dialogue is informal, as I am just trying to get a handle on the quantum of any contributions and we could then discuss how to formulise this process. We have a meeting with the vendors later this week to provide a general update and would it be possible for you to respond in principle early this week.

I will look forward to hearing from you

Best Regards

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From: To:

Cc: Subject: Date: Attachments:

180716 1658 Brook Green, Further Transport Assessment Report 18 July 2016 17:00:44 R04 06414.zip

Dear

Please see the attached Transport report responding to matters raised by Highways England and Essex County Council.

If you have any comments or queries, please feel free to contact me.

Best Regards

Director

Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line: Mobile:



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From: To:	
Cc:	180716 1735 RE: Brook Green, Further Transport Assessment Report
Subject:	18 July 2016 17:35:06
Date:	image001.png
Attachments:	image002.jpg

Thanks very much.

Just in case anyone is unable to download the file, you can access a copy as follows;

https://www.dropbox.com/s/xg7xbttho29pava/R04_06414.pdf?dl=0

, I will call you tomorrow to discuss, etc

Regards

cid:image001.png@01D09B97.D7F885E0

	1
12	_

From:	
Sent: 18 July 2016 16:58	
То:	
Cc:	

Subject: Brook Green, Further Transport Assessment Report

Dear

Please see the attached Transport report responding to matters raised by Highways England and Essex County Council.

If you have any comments or queries, please feel free to contact me.

Best Regards

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line: Mobile:

www.journeytp.co.uk

cid:image001.jpg@01CE4D93.F2E68D10



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Apologies for the delay, I've been away.

The re-assignment is slightly confusing I agree, more so because I did not update those sheets when I updated the design year to 2033 so the re-assignment is slightly lower than shown (although representing the worst case). In any event the same traffic ends up on the SRN as the quantum is roughly the same.

The basis for the re-assignment is as follows: taking the percentage of traffic turning left into Springwood Drive as a percentage of all traffic heading west on Rayne Road then applying that percentage to the total traffic turning right out of Aetheric Way. So in the AM Peak 2033, right turners from Rayne Road into Springwood Drive represent 27% of the west bound flow on Rayne Road, this is then applied to the right turn at Atheric Way. This figure is then applied as a negative on the Atheric right turn and a positive on the Rayne Road into Springwood Drive right turn. This procedure is followed for the other movements and then followed through the network on the basis of turning proportions.

(It took me a while to realise that this was how the re-assignment for the Panfield Lane was actually carried out and not specifically as suggested in the text)

Figure 17 should read Rayne Road Residential Development Flows

Figure 1 and 2 are Base AM and PM 2015

Figures 3 & 4 are 2033 without the link road or any committed development

Your assumption on 2033 re-assigned base is correct with Fig 3 and 4 plus 5 and 6 and Fig 7 an 8 with the link road

Yes Figure 22 and 30 include all committed dev and reassignment with the link road. I hope this is clear, if not please call me.

I will be in the office Monday but will be in the hospital for the remainder of the week. Best Regards

From:

Sent: 04 August 2016 18:03

To:

Cc:

Subject: DX077 Flitch Way, Rayne - Response to AECOM's TN02

AECOM have been asked to review the latest response from Journey Transport Planning to our Technical Note 02. I'm in the process of reviewing the note dated July 2016 and we are due to report back to

at Highways England on 19th August.

With a view to progressing this review and resolving previously raised issues, would you mind answering the following questions regarding the traffic flow diagrams:

Figures 7 & 9: AM/PM Peak Existing Springwood Drive Employment Re-assigned Traffic

Figures 8 & 10: AM/PM Peak Existing Springwood Drive Residential Re-assigned Traffic

I understand that these flows have been derived from the Panfield Lane TA Figures 18-21), but please can you confirm what the diagrams are showing and how the numbers have been arrived at. I was unable to trace the methodology from the current and previous documents issued by JTP. These figures appear to feed into the '2033 Reassignment base' scenarios in the updated ARCADY models for the Springwood Drive / Rayne Road roundabout.

Figures 16 & 17 – both are labelled as AM Peak Pod's Brook Rd Residential Dev Flows. Please can you explain

the difference between these two diagrams. They are labelled the same but the flows are different. Can you confirm which of the traffic flow diagrams relates to each modelling scenario. The scenarios names vary between the ARCADY files and description in the note so I wanted to confirm this with you: 2015 Base AM & PM – Figures 1 & 2

2033 Forecast AM & PM - Figures 3 & 4 - without the link road?

2033 Re-assignment Base (2033 Forecast + Committed Development) AM & PM – Figures 3 & 4 plus 5 & 6 plus Figures 7 & 8 – with the link road?

2033 With Development AM & PM – Figures 22 and 30 (I assume that this include Committed Development and all re-assignments)

I'm out of the office tomorrow and Monday but if you wish to discuss this I'll be back on Tuesday 9th August. Once I have heard back from you regarding these points, I can continue with the review of the updated ARCADY models.

Kind Regards

AECOM

Saxon House, 27 Duke Street Chelmsford, Essex, CM1 1HT, United Kingdom

T aecom.com

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From: To:	
Cc: Subject:	220816 1056 RE: Brook Green
Date:	22 August 2016 10:55:50
Attachments:	image002.png
morning	
Have you had	
Thanks	
- (JolDev
	JUIJEV
G	U: www.goldev.com oldev Ltd, P.O. Box 235, Rodlett, Herts, WD7 0RQ
1.0	
From:	
	st 2016 12:41
io:	
Cc:	
Subject: RE: B	rook Green
,	
am expectin	g a response by the 19 August
Regards	
Highways Eng	gland Woodlands Manton Lane Bedford MK41 7LW
Tel:	
	vww.highways.gov.uk
GTN:	
rom:	
Sent: 03 August	2016 11:50
o:	
Cc:	
ubject: Brook (ireen
Dear ,	
	response to the meeting and other matters raised with respect to the Transport
	would appreciate an update with regard to progress on its review.
	would be extremely helpful if the network flows could be confirmed as being
urranie of it a	ny changes are required as soon as possible so that they can be input to the
Iccin A madel	
/ISSIM model Best Regards	as it is understood that this will take at least three weeks to run.
Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line: Mobile:



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info@highwaysengland.co.uk

Registered in England and Wales no 9346363 | Registered Office: Bridge House, 1 Walnut

Tree Close, Guildford, Surrey GU1 4LZ

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From: To:	
Cc:	
Subject: Date:	220816 1056 RE: Brook Green 22 August 2016 10:55:50
Attachments:	image002.png
	image003.jpg
morning	
, morning Have you had a	response ?
Thanks	
cid:image001.pr	ng@01D09B97.D7F885E0
0 1	
	2
From:	
Sent: 03 August	2016 12:41
То:	
Cc:	
Subject: RE: Bro	ok Green
,	
I am expecting	a response by the 19 August
Regards	
Highways Engla	and Woodlands Manton Lane Bedford MK41 7LW
Tel:	
Web: http://ww	ww.highways.gov.uk
GTN:	
From:	
Sent: 03 August 20	016 11:50
To:	
Cc:	
Subject: Brook Gre	een
Dear ,	
Further to my re	sponse to the meeting and other matters raised with respect to the Transport

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cid:image001.jpg@01CE4D93.F2E68D10

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From:	
To:	
Cc:	
Subject:	250816 1623 RE: Brook Green
Date:	25 August 2016 16:23:36
Attachments:	image001.png
	RE DX077 Flitch Way Ravne - Response to AECOM's TN02.msg

has forwarded your email to me as I have been carrying out the review of the latest material relating to Brook Green from Journey Transport Planning.

For your information has been on leave since 15th August and I believe he will be back in the office from 1st September.

I contacted **at** the beginning of August to advise that I had emailed **beginning** with some questions regarding the traffic flows which needed to be clarified before I could continue the review of the ARCADY models. **The provided** a response on 21st August to my email of 4th August following his leave (attached). For this reason, the original 19th August deadline was extended.

I will now continue the review and will agree a new delivery date with when he returns from leave. I estimate that the review will take a further 2 weeks to allow for checking and approval and will suggest the new date of Friday 9th September to **100**.

To assist the progression of the VISSIM model I will confirm to and Cc when the traffic flows have been checked.

Kind Regards

Senior Consultant, Transportation

AECOM

Saxon House, 27 Duke Street Chelmsford, Essex, CM1 1HT, United Kingdom T +44-1245-77-1200 aecom.com

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From:			
Sent: 25 August 2016 09:53	-		
To:			
Cc:			,
·			

Subject: RE: Brook Green

Whilst i appreciate this is the silly season, can we please agree a timescale for responding, so we can agree the way forward, etc

I know is away this week or what is left of it and can everyone please come back to me with the time needed to respond.

Many thanks



To: Subject: RE: Brook Green morning Have you had a response ? Thanks	From: Control of the second seco	
Cc: Subject: RE: Brook Green morning Have you had a response ? Thanks Thanks	Sent: 22 August 2016 10:55	
Subject: RE: Brook Green morning Have you had a response ? Thanks Thanks	То:	1 A 1
Subject: RE: Brook Green morning Have you had a response ? Thanks Thanks		
morning Have you had a response ? Thanks Thanks Thanks To Coldev tud, P.O. Box 235, Rochett, Hierts, UD7 OPQ From: Sent: 03 August 2016 12:41 To: Cc: Subject: RE: Brook Green / r am expecting a response by the 19 August Regards Highways England Woodlands Manton Lane Bedford MK41 7LW Tel: Web: http://www.highways.gov.uk GTN:		
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Thanks		
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Regards Highways England Woodlands Manton Lane Bedford MK41 7LW Tel: Web: <u>http://www.highways.gov.uk</u> GTN:	Subject. RE. Brook Green	
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Web: <u>http://www.highways.gov.uk</u> GTN:	Tel:	
GTN:		

Sent: 03 August 2016 11:50

To: Cc:

Subject: Brook Green

Dear

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Director
Journey Transport Planning Ltd
Room 436
4 th Floor
Victoria House
Chelmsford
Essex
CM1 1JR
Direct line:
Mobile:

www.journeytp.co.uk



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From: To: Cc:

Subject: Date: Attachments:

Have a great weekend.

260816 0801 RE: Brook Green 26 August 2016 08:02:00 image001.png

Thanks for your email and its much appreciated.

I will speak to next week to make sure all the questions have been answered.



From:

Sent: 25 August 2016 16:23

To: Cc: Subject: RE: Brook Green has forwarded your email to me as I have been carrying out the review of the latest material relating to Brook Green from Journey Transport Planning. has been on leave since 15th August and I believe he will be back in the For your information office from 1st September. at the beginning of August to advise that I had emailed with some questions regarding I contacted the traffic flows which needed to be clarified before I could continue the review of the ARCADY models. provided a response on 21st August to my email of 4th August following his leave (attached). For this reason, the original 19th August deadline was extended. I will now continue the review and will agree a new delivery date with when he returns from leave. I estimate that the review will take a further 2 weeks to allow for checking and approval and will suggest the new date of Friday 9th September to To assist the progression of the VISSIM model I will confirm to and Cc. when the traffic flows have been checked. **Kind Regards** Senior Consultant, Transportation D

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Saxon House, 27 Duke Street Chelmsford, Essex, CM1 1HT, United Kingdom T +44-1245-77-1200 aecom.com

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From:
Sent: 03 August 2016 12:41
To:
Cc:
Subject: RE: Brook Green
I am expecting a response by the 19 August
Regards
Highways England Woodlands Manton Lane Bedford MK41 7LW
Tel:
Web: http://www.highways.gov.uk
GTN:
From:
Sent: 03 August 2016 11:50
To:
Cc:
Subject: Brook Green
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Director

Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line: Mobile: www.journeytp.co.uk



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From:	
To:	
Cc:	
Subject:	060916 1704 RE: DX077 Flitch Way, Rayne - Response to AECOM"s TN02
Date:	06 September 2016 17:04:56
Attachments:	Panfield Ln Reassigned Flows Vectos.pdf

Hi

I've been going through the re-assignment diagrams for Flitch Way again. I have been unable to trace the numbers. I wanted to try and bottom this out before responding to Highways England.

In Figures 7 and 9 – I was expecting these flows to add up to flows in Figure 18 in Appendix 6. For example, I was expecting the total AM peak re-assignment to be -71 for the right turn from Rayne Rd into Springwood Drive.

Can you explain where the -168 stems from (Figure 7)?

The same applies to Figures 8 - 10 - 1 can't trace these flows from the information provided.

I have also referred to the most recent TA for the Panfield Lane development, carried out by Vectos and submitted with their planning application to Braintree District Council to try and match these flows. This TA is in the public domain and includes re-assignment traffic flow diagrams (see attached). I was also unable to match Figures 7 - 10 with these flows.

I'd be grateful if you could clarify these points.

Kind Regards

From:

Sent: 21 August 2016 16:40

To:

Subject: RE: DX077 Flitch Way, Rayne - Response to AECOM's TN02

Hi

Apologies for the delay, I've been away.

The re-assignment is slightly confusing I agree, more so because I did not update those sheets when I updated the design year to 2033 so the re-assignment is slightly lower than shown (although representing the worst case). In any event the same traffic ends up on the SRN as the quantum is roughly the same.

The basis for the re-assignment is as follows: taking the percentage of traffic turning left into Springwood Drive as a percentage of all traffic heading west on Rayne Road then applying that percentage to the total traffic turning right out of Aetheric Way. So in the AM Peak 2033, right turners from Rayne Road into Springwood Drive represent 27% of the west bound flow on Rayne Road, this is then applied to the right turn at Atheric Way. This figure is then applied as a negative on the Atheric right turn and a positive on the Rayne Road into Springwood Drive right turn. This procedure is followed for the other movements and then followed through the network on the basis of turning proportions.

(It took me a while to realise that this was how the re-assignment for the Panfield Lane was actually carried out and not specifically as suggested in the text)

Figure 17 should read Rayne Road Residential Development Flows

Figure 1 and 2 are Base AM and PM 2015

Figures 3 & 4 are 2033 without the link road or any committed development

Your assumption on 2033 re-assigned base is correct with Fig 3 and 4 plus 5 and 6 and Fig 7 an 8 with the link road

Yes Figure 22 and 30 include all committed dev and reassignment with the link road.

I hope this is clear, if not please call me.

I will be in the office Monday but will be in the hospital for the remainder of the week. Best Regards

From:

Sent: 04 August 2016 18:03

To: Cc:

Subject: DX077 Flitch Way, Rayne - Response to AECOM's TN02

AECOM have been asked to review the latest response from Journey Transport Planning to our Technical Note 02. I'm in the process of reviewing the note dated July 2016 and we are due to report back to

at Highways England on 19th August.

With a view to progressing this review and resolving previously raised issues, would you mind answering the following questions regarding the traffic flow diagrams:

Figures 7 & 9: AM/PM Peak Existing Springwood Drive Employment Re-assigned Traffic

Figures 8 & 10: AM/PM Peak Existing Springwood Drive Residential Re-assigned Traffic

I understand that these flows have been derived from the Panfield Lane TA Figures 18-21), but please can you confirm what the diagrams are showing and how the numbers have been arrived at. I was unable to trace the methodology from the current and previous documents issued by JTP. These figures appear to feed into the '2033 Reassignment base' scenarios in the updated ARCADY models for the Springwood Drive / Rayne Road roundabout.

Figures 16 & 17 – both are labelled as AM Peak Pod's Brook Rd Residential Dev Flows. Please can you explain the difference between these two diagrams. They are labelled the same but the flows are different.

Can you confirm which of the traffic flow diagrams relates to each modelling scenario. The scenarios names vary between the ARCADY files and description in the note so I wanted to confirm this with you:

2015 Base AM & PM – Figures 1 & 2

2033 Forecast AM & PM – Figures 3 & 4 – without the link road?

2033 Re-assignment Base (2033 Forecast + Committed Development) AM & PM – Figures 3 & 4 plus 5 & 6 plus Figures 7 & 8 – with the link road?

2033 With Development AM & PM – Figures 22 and 30 (I assume that this include Committed Development and all re-assignments)

I'm out of the office tomorrow and Monday but if you wish to discuss this I'll be back on Tuesday 9th August. Once I have heard back from you regarding these points, I can continue with the review of the updated ARCADY models.

Kind Regards

Senior Consultant, Transportation

AECOM

Saxon House, 27 Duke Street Chelmsford, Essex, CM1 1HT, United Kingdom T +44-1245-77-1200 aecom.com

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?







on Brook Green today. I would appreciate it if you could confirm the suitability of the flows ASAP so I can get the VISSIM modelling commissioned.

Many Thanks

S

Director Journey Transport Planning Ltd Room 436, 4th Floor Victoria House Chelmsford, Essex CM1 1JR

W: <u>www.journeytp.co.uk</u>

From:	
To: Cc:	
Subject: Date:	080916 1117 RE: Brook Green, Braintree 08 September 2016 11:17:17
Many Thanks	
From:	ambar 2016 11.11
To:	ember 2016 11:11
Cc:	
	rook Green, Braintree
I will confirm	these as soon as I can
Regards	
Highways En	gland Woodlands Manton Lane Bedford MK41 7LW
Tel:	
Web: <u>http://</u>	www.highways.gov.uk
GTN:	
From:	
_	nber 2016 11:05
To:	
Hi ner ,	Green, Braintree
	at AECOM will be sending you through a response regarding traffic flows etc
	en today. I would appreciate it if you could confirm the suitability of the flows ASAP
	e VISSIM modelling commissioned.
Many Thanks	
-	S
Director	
	sport Planning Ltd
Room 436, 4th Floo	
Victoria House Chelmsford, Essex	
CM1 1JR	
W: <u>www.iournev</u>	
	ay contain information which is confidential and is intended only for use of
the recipient/	's named above. If you are not an intended recipient, you are hereby notified

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From:	
То:	
Cc:	
Subject:	080916 1158 RE: Brook Green - Traffic Flows
Date:	08 September 2016 11:59:06

After speaking with **constant** yesterday, I have been able to trace the re-assignment traffic flow figures. I have now checked these through to the 2033 forecast diagrams and confirm that I broadly agree with the flows shown. Although I found some discrepancies (as **const** has already pointed out) these are not considered to be significant enough to affect the modelling for the SRN junctions.

I'm aware that Essex CC will also be reviewing the revised documents, but from Highways England's point of view, the traffic flow diagrams provided offer a sound base for the VISSIM modelling.

Full details of AECOM's review will be documented in our forthcoming technical note. I will now proceed with checking the ARCADY models based on the traffic flow diagrams appended to JTP's latest response (July 2016).

Please let me know if you have any questions.

Kind Regards



From: Sent: 08 September 2016 11:11 To: Cc: Subject: RE: Brook Green, Braintree
To: Cc:
Subject: RE: Brook Green, Braintree
,
I will confirm these as soon as I can
Regards
Highways England Woodlands Manton Lane Bedford MK41 7LW
Tel:
Web: <u>http://www.highways.gov.uk</u>
GTN:
From:
Sent: 08 September 2016 11:05

To:

Subject: Brook Green, Braintree

Hi

I understand at AECOM will be sending you through a response regarding traffic flows etc on Brook Green today. I would appreciate it if you could confirm the suitability of the flows ASAP so I can get the VISSIM modelling commissioned.

Many Thanks

Director Journey Transport Planning Ltd Room 436, 4th Floor Victoria House Chelmsford, Essex CM1 1JR

W: <u>www.journeytp.co.uk</u>

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From: To: Cc:	
Subject:	090916 1002 RE: Brook Green - Traffic Flows
Date:	09 September 2016 10:11:19

,

Further to our telephone conversation, the development generated flows to be included in the VISSIM assessment are as follows:

	AM F	Peak	PM Peak		
Direction	Traffic impact without TP	Traffic impact with TP	Traffic impact without TP	Traffic impact with TP	
A120 Eastbound (towards roundabout)	138	121	78	69	
A120 Westbound (away from roundabout)	57	51	126	110	

For the purposes of the modelling, the worst case scenario is the 'without Travel Plan' flows.

Please let me know if you require any further information.





From:

Sent: 08 September 2016 11:58

To: Cc:

Subject: RE: Brook Green - Traffic Flows

After speaking with yesterday, I have been able to trace the re-assignment traffic flow figures. I have now checked these through to the 2033 forecast diagrams and confirm that I broadly agree with the flows shown. Although I found some discrepancies (as **second** has already pointed out) these are not considered to be significant enough to affect the modelling for the SRN junctions.

I'm aware that Essex CC will also be reviewing the revised documents, but from Highways England's point of view, the traffic flow diagrams provided offer a sound base for the VISSIM modelling.

Full details of AECOM's review will be documented in our forthcoming technical note. I will now proceed with checking the ARCADY models based on the traffic flow diagrams appended to JTP's latest response (July 2016).

Please let me know if you have any questions. Kind Regards

From: Sent: 08 September 2016 11:11

To: Cc:

Subject: RE: Brook Green, Braintree

I will confirm these as soon as I can Regards



Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

Tel:

Web: <u>http://www.highways.gov.uk</u>

GTN:

From:

Sent: 08 September 2016 11:05

To:

Subject: Brook Green, Braintree

Hi

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Many Thanks

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Director Journey Transport Planning Ltd Room 436, 4th Floor Victoria House Chelmsford, Essex CM1 1JR

W: <u>www.journeytp.co.uk</u>

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From:	
To:	
Cc:	
Subject:	120916 0932 RE: Brook Green, Braintree
Date:	12 September 2016 09:31:53

Good Morning

Thank you for confirming the flows to be used for modelling purposes. I have now instructed AECOM as discussed.

It would be helpful to understand the process by which the potential contribution mechanism will be calculated once the modelling results are finalised and also the timescale for that process once those results are received.

Would it also be possible to have a view of the draft proposed scheme, showing the land required for the improvement.

Many Thanks

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line: Mobile: www.journeytp.co.uk



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Before you print, please think of the environment.

From:

Sent: Friday, September 9, 2016 11:08 AM

To: Cc: Subject: RE: Brook Green, Braintree

Further to your email of yesterday I agree the development generated flows to be included in the VISSIM assessment are as follows:

	AM Peak		PM Peak	
Direction	Traffic impact without TP	Traffic impact with TP	Traffic impact without TP	Traffic impact with TP
A120 Eastbound (towards roundabout)	138	121	78	69
A120 Westbound (away from roundabout)	57	51	126	110

Regards



Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW Tel: + Web: http://www.highways.gov.uk GTN: From: Sent: 08 September 2016 11:17 To: Cc: Subject: RE: Brook Green, Braintree Many Thanks From: Sent: 08 September 2016 11:11 To: Cc: Subject: RE: Brook Green, Braintree I will confirm these as soon as I can Regards Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW Tel: Web: http://www.highwavs.gov.uk

GTN: From: Sent: 08 September 2016 11:05 To: Subject: Brook Green, Braintree Hi I understand at AECOM will be sending you through a response regarding traffic flows etc on Brook Green today. I would appreciate it if you could confirm the suitability of the flows ASAP so I can get the VISSIM modelling commissioned.

Many Thanks



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info@highwaysengland.co.uk

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S

From: To: Cc:		
Subject: Date: Attachments:	201016 1207 RE: BROOK GREEN, BRAINTREE 20 October 2016 12:07:16 image001.png	

From Highways England's perspective, as I mentioned in my last email to we are reviewing the latest response from JTP regarding the proposed development. This is still ongoing and we are due to report

back to Highways England next week, **and the set of the**

We have some initial concerns about the proposed mitigation measures at the A120 eastbound off-slip (A120 / Pod's Brook Road / A131) which will be covered fully in our response.

Once Highways England have had the opportunity to review our comments on the latest material submitted by JTP, Mark can form a full response to your queries. It would be premature to do so while there are still issues outstanding with elements of the Transport Assessment.

I'm also unsure what the status of the proposals is with Braintree District Council and Essex County Council regarding the planning application and proposed mitigation measures on the local highway network. Kind Regards



AECOM

Saxon House, 27 Duke Street Chelmsford, Essex, CM1 1HT, United Kingdom T +44-1245-77-1200 aecom.com

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?

From:	
Sent: 20 October 2016 08:29	
То:	
Cc:	
	;
Subject: BROOK GREEN, BRAINTREE	
All	

Where are we in the process?

When will you be able to provide the following;

• Total cost of works and land required

- Our contribution
- Better plans showing works required.

I need to know the timescales please, as the matter will shortly be presented for determination and this is obviously a major aspect that needs to be included.

Can someone please come back to me.

Many thanks



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То: Сс:		
Subject:	201016 1222 RE: BROOK GREEN, BRAINTREE	
Date: Attachments:	20 October 2016 12:21:44 image001.png	

I could possibly make the morning of the 2nd Nov but I can't help thinking it may be better for you to wait until you have had our response and a little time to digest it

Regards



GTN: Seat belt on phone off

From:

Sent: 20 October 2016 12:15

To: Cc:

Subject: RE: BROOK GREEN, BRAINTREE

thanks very much for your response, which is very helpful.

As we are now a lot further forward, then when we all last met, I wonder whether a further meeting can now be arranged for the first week of November, so we can all update each other and agree a basis for moving this forward.

Can i suggest the 1st or 2nd November and i am sure will be happy to host again at Braintree DC.

Would everyone that needs or wants to attend, please confirm their avilability? Thanks







Subject: RE: BROOK GREEN, BRAINTREE

From Highways England's perspective, as I mentioned in my last email to reviewing the latest response from JTP regarding the proposed development. This is still ongoing and we are due to report back to Highways England next week, will be on leave from

the 21 to 31st October and is unlikely to be able to provide you with a response until early November.

We have some initial concerns about the proposed mitigation measures at the A120 eastbound offslip (A120 / Pod's Brook Road / A131) which will be covered fully in our response.

Once Highways England have had the opportunity to review our comments on the latest material submitted by JTP, **set of** can form a full response to your queries. It would be premature to do so while there are still issues outstanding with elements of the Transport Assessment.

I'm also unsure what the status of the proposals is with Braintree District Council and Essex County Council regarding the planning application and proposed mitigation measures on the local highway network.

Kind Regards



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From:	
Sent: 20 October 2016 08:29	
То:	
Cc:	
Subject: BROOK GREEN, BRAINTREE	

All

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- Our contribution
- Better plans showing works required.

I need to know the timescales please, as the matter will shortly be presented for determination

and this is obviously a major aspect that needs to be included. Can someone please come back to me. Many thanks



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To: Cc:	
Subject: Date: Attachments:	201016 1250 RE: BROOK GREEN, BRAINTREE 20 October 2016 12:50:20
Attachments:	image001.png
thanks	
I have just spo	
	ranged and perhaps with everyone available, this would be a good place to start ogress my discussion as far as we are able and if need be, a further meeting can be
arranged.	ogress my discussion as fail as we are able and it need be, a fullitier meeting can i
So I will sugges	st 10:30 at office at Braintree DC and I will send out an invite shortly to
everyone.	
Have a great b	oreak.
Regards	
Wayne	
(GolDev
	اللہ www.goidev.com
	اللہ www.goidev.com
G From:	یل: www.goidev.com
G From:	U: www.goldev.com oldev Ltd, P.O. Box 235, Rodlett, Herts, WD7 0AQ
G From: Sent: 20 Octo	U: www.goldev.com oldev Ltd, P.O. Box 235, Rodlett, Herts, WD7 0AQ
G From: Sent: 20 Octo To:	U: www.goldev.com oldev Ltd, P.O. Box 235, Rodlett, Herts, WD7 0AQ
G From: Sent: 20 Octo To: Cc:	JJ: www.goldev.com oldev Ltd, P.O. Box 235, Radlett, Herts, WD7 ORQ ber 2016 12:22
G From: Sent: 20 Octo To: Cc:	U: www.goldev.com oldev Ltd, P.O. Box 235, Rodlett, Herts, WD7 0AQ
G From: Sent: 20 Octo To: Cc: Subject: RE: B	U: www.goldev.com oldev Utd, P.O. Box 235, Rodlett, Herts, WD7 OAQ ber 2016 12:22 , ROOK GREEN, BRAINTREE
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G From: Sent: 20 Octo To: Cc: Subject: RE: B Subject: RE: B I could possib better for you Regards Highways Engl Tel: Subject: RE: B	Li: www.goldev.com oldev ud, P.O. Box 235, Rodlett, Herts, WD7 ORQ ber 2016 12:22 , ROOK GREEN, BRAINTREE oly make the morning of the 2 nd Nov but I can't help thinking it may be u to wait until you have had our response and a little time to digest it and Woodlands Manton Lane Bedford MK41 7LW
G From: Sent: 20 Octo To: Cc: Subject: RE: B Subject: RE: B I could possib better for you Regards Highways Engl Tel: Web: http://w	ber 2016 12:22 ROOK GREEN, BRAINTREE
G From: Sent: 20 Octo To: Cc: Cc: Cc: Cc: Cc: Cc: Cc: Cc: Cc: Cc	J: www.goldev.com oldev tid, P.O. Box 235, Rodlett. Herts. WD7 ORQ ber 2016 12:22 ROOK GREEN, BRAINTREE bly make the morning of the 2 nd Nov but I can't help thinking it may be u to wait until you have had our response and a little time to digest it and Woodlands Manton Lane Bedford MK41 7LW
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G From: Sent: 20 Octo To: Cc: Cc: Cc: Cc: Cc: Cc: Cc: Cc: Cc: Cc	U: www.goldev.com oldev trd, P.O. Box 235, Bodlett, Herts, WD7 0AQ ber 2016 12:22 ROOK GREEN, BRAINTREE bly make the morning of the 2 nd Nov but I can't help thinking it may be u to wait until you have had our response and a little time to digest it and Woodlands Manton Lane Bedford MK41 7LW www.highways.gov.uk

Cc:

Subject: RE: BROOK GREEN, BRAINTREE

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Can i suggest the 1st or 2nd November and i am sure will be happy to host again at Braintree DC.

Would everyone that needs or wants to attend, please confirm their avilability? Thanks



From:	
ent: 20 October 2016 12:07	
o:	
	1
	100

Subject: RE: BROOK GREEN, BRAINTREE

From Highways England's perspective, as I mentioned in my last email to **provide and**, we are reviewing the latest response from JTP regarding the proposed development. This is still ongoing and we are due to report back to Highways England next week, **provide and** will be on leave from the 21 to 31st October and is unlikely to be able to provide you with a response until early November.

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I'm also unsure what the status of the proposals is with Braintree District Council and Essex County Council regarding the planning application and proposed mitigation measures on the local highway network. Kind Regards





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From: Sent: 20 October 2016 08:29 To: Cc: Subject: BROOK GREEN, BRAINTREE

All

Where are we in the process?

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Many thanks



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info@highwaysengland.co.uk

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From:	
To:	
Cc:	
Subject:	311016 0531 RE: BROOK GREEN, BRAINTREE
Date:	31 October 2016 05:31:16
Attachments:	image001.png

thanks for your email.

As you say it is unfortunate that you can't attend and a shame that has now left. However there were two reasons for the meeting, one being technical and the second planning. As the technical is really between us and Highways for England with AECOM advising, I propose that the meeting continue as planned and be classed as a technical meeting and that we arrange a further meeting, to discuss the planning process, etc.

Assuming that is acceptable to everyone, I will stand down as he will have little interest in discussing technical issues !!

and I will be happy to attend at offices in Chelmsford.

Can everyone please confirm that this is acceptable and after the meeting, I will write again suggesting a further date for the next meeting.

Thanks



FIOID.				
Sent:	30	October	2016	23:11

- C - C - C - C - C - C - C - C - C - C			-
LO.			

Cc:

Subject: RE: BROOK	GREEN,	BRAINTREE
--------------------	--------	-----------

I understand that you are keen to progress the application and that understanding the position on highway impacts is a key element of doing this. However I am afraid I'll have to ask that this Wednesday's meeting is postponed as I won't be available – I apologise for the short notice. I note that the had previously said that he thinks a meeting would be more productive once Highways England has produced their updated response / advice. Unfortunately is unavailable on Wednesday and he has said that following departure from Essex County Council he needs some time to get fully up to speed with the application. I'd suggest that and the meeting advise on when we should look to rearrange the meeting so there can be a meaningful discussion. Kind Regards,

rom:	
	ober 2016 9:48 AM
o:	
Cc	
ubject: DE-	BROOK GREEN, BRAINTREE
thank	
	bpy to go to either venue.
egards	
-0	
	GolDev
	11 unanu and day and
	U: www.goldev.com Goldev Ltd, P.O. Box 235, Rodlett, Herts, WD7 0AQ
	Construct, p.y., dox 255, house, mars, days drag
rom:	1 1 2016 00 40
	ctober 2016 09:40
0:	
c:	
ubject: RE	E: BROOK GREEN, BRAINTREE
- (1	and an atom has been accord back to family have in Chalmaford as one would be available to
	oon meeting has been moved back to 1pm here in Chelmsford so we would be available to eting at 10:30. If the meeting is in Braintree we want to leave by 12:00 to get back in time.
	AECOM can host the meeting at our offices in Chelmsford if this suits everyone.
	you be happy to attend a meeting here in Chelmsford or would you prefer it to be held at
raintree's o	
100	
rom:	
ent: 25 0	ctober 2016 14:57
o:	
ic:	
ubject: RE	E: BROOK GREEN, BRAINTREE
erfect and	I thanks
are you	u available?



From:

Sent: 25 October 2016 14:55

To:

Cc:

Subject: RE: BROOK GREEN, BRAINTREE

is now on leave and has asked me to confirm the meeting arrangements in his absence.

I'm just waiting for confirmation that other meeting can be moved to the afternoon so he can attend the Brook Green meeting in the morning.

I'll get back to you to confirm either way.

Kind Regards





Subject: RE: BROOK GREEN, BRAINTREE

Have you been able to rearrange your other meeting, etc

Thanks



From:	
Sent: 20	October 2016 12:22

Cc:			
			1.8
1			

Subject: RE: BROOK GREEN, BRAINTREE

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Subject: RE: BROOK GREEN, BRAINTREE

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AECOM

Saxon House, 27 Duke Street Chelmsford, Essex, CM1 1HT, United Kingdom T +44-1245-77-1200 aecom.com

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LinkedIn Twitter Facebook Instagram

From: Sent: 20 October 2016 08:29

To: Cc:

Subject: BROOK GREEN, BRAINTREE

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From: To: Cc:	
Subject: Date: Attachments:	311016 1114 RE: BROOK GREEN, BRAINTREE 31 October 2016 11:14:06 image001.png DX077 TN04 (issued).pdf

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Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

Web: http://www.highways.gov.uk

GTN:

From: Sent: 31 October 2016 05:31

To: Cc:

Subject: RE: BROOK GREEN, BRAINTREE

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Sent: 30 October 2016 23:11

To:

Subject: RE: BROOK GREEN, BRAINTREE

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From: Sent: 28 October 2016 9:48 AM To:

Subject: RE: BROOK GREEN, BRAINTREE thanks

We are happy to go to either venue. Regards

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Sent: 25 October 2016 14:2	8
To:	
Cc:	,
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<u> </u>	
	Dev
	JJ: www.goldev.com
Goldev Ltd, P.O. Box	235, Radlett, Herts, WD7 0RQ
From:	
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Subject: Date: Attachments: 011116 0636 RE: BROOK GREEN, BRAINTREE 01 November 2016 06:37:18 image001.png DX077 TN04 (issued).pdf

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- Total cost of works and land required
- Our contribution
- Better plans showing works required.

I need to know the timescales please, as the matter will shortly be presented for determination and this is obviously a major aspect that needs to be included.

Can someone please come back to me.

Many thanks



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Technical Note 04

Project:	Highways England Spatial Planning Arrangement 2016-2020	Job No:	60506522 / DX077
Subject:	Land at Flitch Way, Rayne – Review of Developer Consultant's 'Response to Technical Note 03'		
Prepared by:		Date:	18 th October 2016
Checked by:		Date:	19 th October 2016
Verified by:		Date:	24 th October 2016
Approved by:		Date:	26 th October 2016

1. Introduction

- 1.1. This Technical Note (TN04) has been prepared by AECOM, on behalf of Highways England, to document a review of Journey Transport Planning's (JTP) 'Response to Technical Note 03' dated September 2016 relating to the proposed development at Land at Flitch Way, Rayne (LaFW), Braintree. JTP's response will hereafter be referred to as Technical Note Response 3 (TNR3).
- 1.2. This note follows AECOM's previous reviews of the Transport Assessment (TA) which supported the planning application for the proposed development at LaFW (reference 15/01538/OUT) lodged with Braintree District Council (BDC). The most recent of AECOM's previous reviews is Technical Note 03 (TN03), dated 12th September 2016 to which the TNR3 refers.
- 1.3. The objective of this TN04 is to determine whether the issues raised in AECOM's TN03 have been fully addressed in order to allow the potential impact of the proposed development on the operation of the Strategic Road Network (SRN) to be fully understood. Where mitigation measures are proposed, AECOM will advise Highways England as to whether they are sufficient to accommodate traffic estimated to be generated by the LaFW development.

2. Background

2.1. The development proposal comprises 1,600 dwellings and 0.6 hectares of employment land and ancillary land uses including a primary school and local centre. The LaFW site is located to the west of Braintree north of the A120, west of Pod's Brook Road and south of Rayne Road. Access to the site is proposed via a new roundabout off Pod's Brook Road, with a second access off Rayne Road. The closest access to the SRN from the site is via the A120 / A131 / Pod's Brook Road roundabout known locally as the 'Panner's junction'. The proposed site access roundabout is located some 120m north of this junction.

3. Issues raised in AECOM's TN03 and JTP responses

3.1. For ease of reference, the issues raised in AECOM's TN03 have been provided in this Technical Note in text boxes with the original paragraph numbers provided. A review of JTP's current response follows this and AECOM have stated whether or not we consider previous points to be resolved. Any new or outstanding recommendations from AECOM have been highlighted in bold and underlined text.



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3.2. Comments relating to the collision review and junction capacity modelling are provided in Sections 4 and 5 of this note respectively.

Policy: TN03 Para. 5.2 (a):

AECOM expressed concern that this site was not included in any Local Plan or in any other strategy document. There is therefore a risk that the implications of this development on the SRN have not been considered fully as the emerging Local Plan has not been finalised. This is an ongoing concern and has been acknowledged by JTP at the recent meeting. Acorn Group are hopeful that the site will be included in BDC's emerging Local Plan.

3.3. AECOM have no further comments to make.

Site Access and mitigation measures on ECC network: TN03 Para. 5.2 (b and c):

In the absence of effective mitigation measures, the assessment points to a potentially severe impact at the SRN caused by traffic queuing back along Pod's Brook Road from the Springwood Drive roundabout towards the A120.

ECC's view of the proposed site access roundabout and mitigation measures at the Springwood Drive / Rayne Road / Pod's Brook Road, Rayne Road / Aetheric Road and A120 / Pod's Brook Road / A131 roundabouts is required to determine if the schemes are compliant and safe before Highways England can rely on the proposed scheme to mitigate this potentially severe impact.

- 3.4. JTP advised in their covering email dated 4th October 2016 that confirmation of the acceptability of the proposed mitigation at the Springwood Drive / Rayne Road / Pod's Brook Road and Rayne Road / Aetheric Road junctions had been requested from ECC and that they were awaiting a response. JTP also confirmed that, at the time of writing, a Road Safety Audit of the proposed mitigation measures at the A120 / Pod's Brook Road / A131 (north) roundabout was being undertaken.
- 3.5. **AECOM's previous recommendation is still outstanding.** Furthermore, In light of the newly proposed mitigation measures at the A120 eastbound off-slip at the A120 / Pod's Brook Road / A131 (north) roundabout, Highways England will need to confirm acceptance of the proposed mitigation measures as these now affect the Trunk Road. AECOM's comments on the mitigation measures are provided in Section 6 of this note.

4. Collision Data Review: Galleys Corner

Collision Review: TN03 Para. 5.2 (d):

AECOM recommend that an analysis of the collision data recorded at Galleys Corner is carried out to review whether there are any common causation factors, which may be exacerbated by additional development traffic. The collision records should also be provided for scrutiny.

- 4.1. In response to these comments JTP have provided collision records for Galleys Corner with the TNR3. Collision data for the most recent 5 year period to 31st May 2016 has been obtained. It should be noted that the data covers a different time period to that analysed in JTP's TNR2 which is why there are differences in the total number of slight and serious accidents recorded.
- 4.2. Section 2 of the TNR3 includes a review of collision data in the vicinity of Galleys Corner, undertaken by JTP. The data is contained at Appendix 1 of TNR3. AECOM have not undertaken a detailed audit of the collision data, however we have reviewed JTP's findings to see if the data supports them.

- 4.3. The collision data covers a 61-month period from April 2011 to May 2016. The area of search includes the Galleys Corner and Fowlers Farm roundabouts and approximately 300m of the main roads that converge there.
- 4.4. JTP have identified 31 collisions that took place at, or on the approaches to the Galleys Corner roundabout, of which 27 were slight and 4 serious. AECOM note one fatal collision in the dataset close to the roundabout, however the description makes it clear that this collision was link-related, not junction-related.
- 4.5. AECOM broadly agree with the number of collisions attributed to Galleys Corner. Our reading of the data identified 27 collisions, not 31 but this would just be a matter of the definition of 'at or on the approach'.
- 4.6. The collisions identified by AECOM as being at or close to the roundabout fall into a number of distinct groups as shown in Table 1.

Type of collision	Number
Conflicts on the circulatory carriageway	16
Rear end shunt on approach to roundabout	4
Side swipe on approach to roundabout	1
Rear end shunt at roundabout entry	2
Failure to give way at roundabout entry	1
Enter roundabout and strike vehicle already on circulatory	1
No description given	2

Table 1: Types of Collisions Recorded at Galleys Corner Roundabout

- 4.7. It is evident that the largest single category are conflicts on the circulatory carriageway, followed by rear end shunts on the roundabout approaches.
- 4.8. The conflicts on the circulatory are typically exit/ circulating conflicts, for example where a vehicle in an offside lane (closest to the central island) needs to take an exit and comes into conflict with a vehicle in the nearside lane (closest to the outside of the roundabout), wanting to continue around.
- 4.9. Various attempts have been made over the years to enforce lane discipline and minimise such conflicts. In AECOM's view, the potential to address these problems is hampered by the small size of the roundabout relative to the number of arms it accommodates, which leads to very short circulatory sections between successive arms.
- 4.10. From examination of Google Streetview imagery (dated November 2015) it appears that the roundabout is not provided with lane destination signs on the approaches, and that the lane destination road markings are only present on the immediate approach to the roundabout entry. In a context in which long queues are common, this may lead to vehicles not being able to enter the roundabout in the correct lane for their intended exit.
- 4.11. There are road markings on the circulatory carriageway. However, these are conventional lane markings and do not guide drivers into their exits, as a system of spiral marking would.
- 4.12. It is therefore possible that the number of collisions on the circulatory results from a combination of high traffic volumes, short circulatory sections, lengthy queues on the approaches and a lack of adequate guidance as to the correct lane to take on the roundabout.

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- 4.13. The reason for the interest in the collision record at Galleys Corner is that AECOM have previously identified that a significant number of additional vehicles are forecast to use Galleys Corner roundabout as a result of the development and we had recommended that it be included within the study area for the collision analysis.
- 4.14. The predicted increases in flow at Galleys Corner are summarised in Table 2.

AM Peak PM Peak A120 A120 A120 A120 eastbound westbound eastbound westbound Existing flow (2015) 1,374 2.0371,687 1,261 Development traffic 138 57 78 126 % increase attributable to development 10% 3% 5% 10% 4,520 4,469 Total flow through roundabout (2015) Development traffic 195 204 % increase attributable to development 4.3% 4.6%

Table 2: Predicted Increases in Traffic Flow at Galleys Corner Roundabout

- 4.15. JTP conclude that the addition of development traffic is likely to lead to a marginal increase in collisions.
- 4.16. AECOM suggest that this level of increase at a junction which has a significant number of collisions on the circulatory carriageway lends itself to a road safety enhancement in the form of a package of signs and road markings, whether or not there is a requirement for capacity enhancements at this location.

5. Junction Capacity Assessments

Junction Capacity A120 North and South roundabouts: TN03 Para. 5.2 (e, f, g and h):

AECOM recommend that all modelled queue results presented in the TNR2 (for the existing roundabouts) are treated with caution as the base models are not calibrated to observed levels of queuing;

AECOM recommend that the ARCADY base models for the A120 / Pod's Brook Road / A131 (north) and A120 / B1256 / A131 (south) roundabouts are re-run with appropriate adjustments to calibrate the model to observed levels of queuing. Once the base models have been calibrated, the adjustments should be applied to the proposed layouts (where applicable) before the models are re-run;

AECOM recommend that the traffic flow inputs discrepancies for the A120 / B1256 / A131 (south) roundabout should also be corrected when the model is re-run.

Highways England should reserve judgement on whether mitigation measures are required on the A120 eastbound off-slip approach until such time as the updated ARCADY model results for the A120 North roundabout are available for review;

- 5.1. As identified and agreed in a previous response from JTP, the peak hours used in the assessment are 08:00-09:00 and 17:00-18:00. As previously agreed with ECC and Highways England, JTP have identified 2033 as the development Opening Year. The assessment scenarios are as follows:
 - 2015 and 2033 Base AM and PM peak; and

2033 Reassigned and 2033 with Development AM and PM peak.

The '2033 Reassigned' and '2033 with Development' scenarios include committed development and the reassignment of traffic to the link road between Panfield Lane and Springwood Drive, which is being proposed by the developer of the 'Land west of Panfield Lane / north of Springwood Drive, Braintree' site.

5.2. The TNR3 contains revised ARCADY models for the A120 / Pod's Brook Road / A131 (north) roundabout of the existing and proposed layouts and a revised model of the existing layout of the A120 / B1256 / A131 (south) roundabout.

A120 / Pod's Brook Road / A131 (North) Roundabout – Existing Layout

5.3. AECOM previously commented on the difference between the modelled and observed queues on the A120 eastbound off-slip arm of the roundabout and recommended that the model was reviewed and calibrated to better represent existing levels of queuing. Table 3 presents 2015 observed queues on the roundabout approaches (JTP data).

	AM Peak	PM Peak
Pod's Brook Road	No data	No data
A131	6	4
A120 eastbound off-slip	17	11

- 5.4. An intercept adjustment has been applied to the existing layout model in an attempt to calibrate it to represent the observed queue lengths shown in Table 1.
- 5.5. The Junctions 9 User Guide describes intercept adjustments as follows:

"These adjustments are applied directly to the intercept and represent changes to the maximum flow that would be possible across the give-way line in the absence of any circulating traffic. Intercept adjustments can be calculated automatically from observations of entry flows and circulating flows at any arm, and apply to each arm individually."

- 5.6. No explanation has been provided in the TNR3 to justify the specific intercept adjustments applied, however AECOM can infer from the modelling output file that a 47% and 70% adjustment has been made to the intercept for the A120 arm in the AM and PM peak respectively.
- 5.7. These adjustments mean that the intercept for the A120 arm predicted by ARCADY has been reduced by 53% and 30% for the AM and PM peaks respectively. In other words, factors such as the physical layout of the roundabout and driver behaviour are affecting the operation of the A120 arm and contributing to the delay on the approach.
- 5.8. In order to try and understand this further, AECOM have analysed the 2015 base traffic flow data for the roundabout. The AM and PM peak traffic flow diagrams (Figures 1 and 2 from JTP's TNR2) have been replicated in Figures 1 and 2.


Figure 1: 2015 AM Traffic Flows at the A120 / Pod's Brook Road / A131 (North) Roundabout



Figure 2: 2015 PM Traffic Flows at the A120 / Pod's Brook Road / A131 (North) Roundabout

5.9. Figures 1 and 2 demonstrate that in the AM peak, the A120 approach traffic is quite balanced between left and right turners, however in the PM peak the number of right turners is significantly higher. In both peaks the A131 approach traffic has a dominant south to north movement from the A131 to Pod's Brook Road. It should be noted that the A131 approach traffic does not have to give-way to any circulating traffic (other than u-turners) which is likely to result in this traffic entering the roundabout at speed. Visibility to the right for vehicles giving way at the A120 approach arm is limited due to the presence of the bridge over the A120 (refer to Figure 3).

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Figure 3: View from the A120 approach arm to the left towards the A131 (Source: Google Streetview imagery)

- 5.10. These two factors are likely to result in delays to vehicles waiting on the A120 approach arm with drivers having to wait for gaps in the circulating flow, which is exacerbated by a dominant south – north flow.
- 5.11. For these reasons, AECOM consider the adjustment to the intercept values in the ARCADY models to be justified. AECOM acknowledge that the 2015 existing layout models now better represent observed levels of queuing.
- 5.12. Table 4 presents the results of the ARCADY modelling for the A120 / Pod's Brook Road / A131 (north) roundabout existing layout.

		Pod's Br	Pod's Brook Rd		er Bridge	A120 EE	A120 EB off-slip	
		Max RFC	Max Queue	Max RFC	Max Queue	Max RFC	Max Queue	
2015 Base	AM	0.50	1	0.43	1	1.00	17	
	PM	0.76	3	0.28	<1	0.87	6	
2033 Forecast + CD +	AM	0.69	2	0.54	1	1.81	176	
Re-assignment	PM	1.03	34	0.37	1	1.23	155	
2033 With Dev (incl.	AM	1.07	66	0.61	2	2.94	366	
CD + Re-assignment)	PM	1.16	112	0.51	1	1.69	493	

Table 4: A120 / Pod's Brook Road / A131	(North) Roundabout	- Existing Layout ARCADY Results
Table 4. A1207 Fous block Road / A151	(North) Noundabout	- LAISting Layout ANCADT Mesults

- 5.13. The ARCADY results for the existing layout indicate that A120 arm of the roundabout is already over-capacity in the AM peak. By 2033 with committed development traffic and the re-assignment of traffic to the Panfield Lane/Springwood Drive link road considered, the capacity issues are predicted to be significantly worse.
- 5.14. It should be noted that, for arms with an RFC greater than 1, ARCADY predicts an exponential increase in queueing. Therefore modelled queues may be over-estimated. Notwithstanding this, the model indicates a significant queuing issue by 2033. The addition of development generated traffic adds to this and indicates that mitigation is required to accommodate the impact of development traffic.

A120 / Pod's Brook Road / A131 (North) Roundabout – Proposed Layout

- 5.15. Based on the modelling results of the existing layout, JTP have proposed amendments to the roundabout layout in order to mitigate the impact of additional traffic generated by the development. These mitigation measures include widening on the Pod's Brook Road approach to provide two lanes and widening on the A120 approach to provide a segregated left turn lane (SLTL) to allow left turners from the A120 into Pod's Brook Road to effectively bypass the roundabout.
- 5.16. AECOM have reviewed the layout and feasibility of the proposed amendments to the A120 approach. The results of our review can be found in Section 6 of this TN. The effectiveness of the proposed mitigation measures will depend on their feasibility in terms of compliance with current design standards and acceptance by Highways England. The proposed layout will also be subject to a Stage 1 Road Safety Audit which JTP have confirmed is underway (JTP email to AECOM dated 4th October 2016). AECOM have not carried out a detailed review of the proposals at Pod's Brook Road as this road is the responsibility of ECC and JTP are awaiting confirmation of their acceptance of these proposals.
- 5.17. Taking the proposed design 'as read' the A120 / Pod's Brook Road / A131 (north) roundabout has been re-modelled with amended geometry to take into account the SLTL. The 'Bypass' function in ARCADY has been applied to account for traffic that will effectively bypass the roundabout using the SLTL into Pod's Brook Road. The proportion of left turning traffic assumed to use the SLTL has been set at 100% and AECOM agree that this is a reasonable assumption.
- 5.18. AECOM have reviewed the geometric parameters entered into ARCADY for the proposed layout and do not agree with some of the measurements. The geometry for the A120 arm seems to be based on that for the existing layout and not the proposed layout. This will affect the modelling results. Table 5 highlights the differences between AECOM and JTP's measurements. The most significant of these are the approach width, entry width and flare length where these measurements seem to include the width of the SLTL. AECOM would consider an entry width of 6.6m to be appropriate.

	Approach width (v)	Entry width (e)	Effective flare (f)	Entry radius (r)	Inscribed circle diameter (icd)	Conflict Angle
JTP	6.50	10.00	22.00	40.00	65.00	34.00
AECOM	4.00	6.60	9.00	30.00	60.00	29.00

 Table 5: Comparison of JTP and AECOM geometry for the A120 arm of the roundabout (Proposed Layout)

5.19. Table 6 presents the results of the ARCADY modelling for the A120 / Pod's Brook Road / A131 (north) roundabout proposed layout as provided by JTP.

			rook Rd	A131 Und	der Bridge	A120 EB off-slip		
		Max RFC	Max Queue	Max RFC	Max Queue	Max RFC	Max Queue	
0045 Dava	AM	0.40	1	0.43	1	0.52	1	
2015 Base	PM	0.58	1	0.28	<1	0.65	2	
2033 Forecast + CD +	AM	0.57	1	0.54	1	0.93	9	
Re-assignment	PM	0.86	6	0.37	1	0.89	8	
2033 With Dev (incl.	AM	0.88	7	0.61	2	1.32	47	
CD + Re-assignment)	PM	1.04	43	0.51	1	1.09	56	

Table 6: A120 / Pod's Brook Road / A131 (North) Roundabout - Proposed Layout ARCADY Results

- 5.20. Notwithstanding the discrepancies with the geometry described in paragraph 5.18, the ARCADY results indicate that the A120 arm of the roundabout will still be over capacity in 2033, but with reduced queueing compared to the existing layout. It should be noted however, that the 'bypass' feature within ARCADY simply removes the left turning traffic from the model, it does not account for the effects of entry lane starvation where traffic may be unable to reach the SLTL due to queuing at the give line by traffic turning right. The SLTL will only be effective if left turning traffic is able to reach it.
- 5.21. A 56 vehicle queue equates to an approximate 322m long queue. The A120 eastbound off-slip is approximately 470m in length from the end of the diverge. A queue of this length would not be desirable as traffic travelling at speed would have to brake immediately after exiting the mainline carriageway. Long queues may therefore have safety implications. AECOM acknowledge that the modelling results do not take account of a reduction in trips to account for Travel Plan (TP) measures. However, JTP have not provided the '2033 mitigated' modelling results for the A120 / Pod's Brook Road / A131 (north) roundabout proposed layout (including TP reductions) and therefore the effectiveness of TP measures cannot be quantified.
- 5.22. In view of the comments regarding the proposed layout design in Section 6, re-modelling the junction with the amended geometry would be of little merit at this stage. <u>AECOM consider that the recommendations in Section 6 should be addressed prior to the proposed layout being re-modelled in ARCADY. When the proposed layout is re-modelled, the '2033 Mitigated' results should also be provided.</u>

A120 / B1256 / A131 (South) Roundabout

- 5.23. AECOM previously commented on differences between the modelled queue lengths compared with those observed on site, particularly for the B1256 arm of the roundabout.
- 5.24. In TNR3, JTP assert that they consider the March 2016 observed queue lengths to be unrepresentative of typical conditions on this arm, and carried out spot counts in September 2016 in order to demonstrate this. Although, as JTP have acknowledged, the observed queues cannot be directly compared to the previously recorded queues as they were recorded at different times of year, they do suggest much lower levels of queuing than originally assessed. The maximum queue on the B1256 recorded in the March 2016 surveys was found to be 50 vehicles in the PM peak, whereas the maximum queue recorded in September 2016 was 4 vehicles.
- 5.25. Notwithstanding this, AECOM consider that levels of queuing at all arms of the roundabout have been under-represented in the base models and therefore recommend that the modelled queues presented should be treated with caution.
- 5.26. AECOM have reviewed the revised A120 / B1256 / A131 (south) roundabout model and are content that the traffic flow inputs have been corrected. The updated ARCADY model results are

presented in Table 7. The observed queues are shown in brackets in red text next to the modelled 'Max Queue' (no queue data was provided for the A131 south arm).

		A131	North	A120 W	B off-slip	B1:	256	A131 South	
		Max RFC	Max Queue	Max RFC	Max Queue	Max RFC	Max Queue	Max RFC	Max Queue
2015 Base	AM	0.37	<1 (4)	0.27	<1 (7)	0.46	1 (6)	0.29	<1
2015 Base	PM	0.68	2 (5)	0.20	<1 (5)	0.21	<1 (4)	0.28	<1
2022 Desseigned	AM	0.49	1	0.37	1	0.68	2	0.37	1
2033 Reassigned	PM	0.88	7	0.31	1	0.31	<1	0.36	1
2033 With	AM	0.68	2	0.48	1	0.98	14	0.46	1
Development	PM	0.97	20	0.46	1	0.37	1	0.45	1
2033 With Mitigated	AM	0.66	2	0.47	<1	0.93	9	0.45	<1
Development	PM	0.97	22	0.46	<1	0.38	<1	0.45	<1

Table 7: A120 / B1256 / A131 (South) Roundabout - ARCADY Model Results

- 5.27. The results in the ARCADY output file were slightly different to those in Table 3.5 of TNR3. AECOM have amended the results in Table 7 to match the ARCADY files.
- 5.28. The '2033 with Mitigated Development' results have been provided for the A120 / B1256 / A131 (south) roundabout. The results show that the 'mitigated flows' i.e. the traffic flows with a reduction applied to account for TP measures, does not make a significant difference to the overall modelling results. In the '2033 with development' scenario the A120 westbound off-slip has a low RFC and predicted queue and therefore would not be of concern to Highways England.
- 5.29. In the PM peak the A131 arm is indicated to operate over capacity with an RFC of 0.97 and predicted queue of 20 vehicles. JTP assert that the forecast level of queuing in 2033 can be accommodated in the dual carriageway link between the A120 / Pods' Brook Road / A131 (north) and A120 / B1256 / A131 (south) roundabouts. AECOM consider this to be a reasonable conclusion assuming that queuing traffic would be split over two lanes. The lanes on the A131 approach to the roundabout do not have destination markings and the PM peak traffic flows are fairly well balanced between the B1256 (42%) and A131 (47%) with 11% travelling to the A120 westbound off-slip. AECOM therefore consider that the queuing would be balanced between the two lanes of the dual carriageway link.

6. A120 Mitigation Measures: Design Review

- 6.1. AECOM have undertaken a review of the junction layout proposed by JTP as mitigation of the impact of the development at the A120/ Pod's Brook Road/ A131 (north) roundabout. The layout proposed is shown on drawing no: JTP 06414, DR8 appended to the TNR3. The existing junction consists of a four arm roundabout comprising of the A120 eastbound on and off slip roads, B1256 Pod's Brook Road and the A131. The proposed mitigation includes introducing a Segregated Left Turn Lane (SLTL) from the A120 off-slip to Pod's Brook Road and widening the Pod's Brook Road approach to the roundabout to provide two lanes southbound between the proposed site access roundabout and the A120/ A131 (north) roundabout. AECOM have reviewed the junction design to assess its feasibility.
- 6.2. It should be noted that only the horizontal alignment has been made available to AECOM and therefore neither a full design check against Design Manual for Roads and Bridges (DMRB) standards nor a Stage 1 Road Safety Audit (RSA) has been carried out. This document therefore provides a high level 'in principle' review of the junction proposal submitted, evaluating the layout feasibility and seeking to identify any 'showstoppers' that may exist which could prevent the junction being constructed. Additional issues could arise which could relate to level differences,

vertical alignment, visibility envelopes, issues off plan etc. which cannot be identified within the scope of this review. Swept path plots of the roundabout have not been carried out.

6.3. The design assessment has been carried out in two stages. The first stage considers the appropriateness of the roundabout as it will exist with the SLTL in place, to comply with DMRB, in particular TD 16/07. The second stage considers the suitability of the SLTL in compliance with TD 51/03. Where text is highlighted in bold, this is an area where the proposed layout does not comply with DMRB standards and would therefore require a Departure from Standard to be submitted and approved.

Compliance with TD 16/07

Inscribed Circle Diameter, Circulatory Width, Central Island

- 6.4. The proposed junction alignment intends to retain the majority of the existing roundabout geometric layout at its current location. The Inscribed Circle Diameter (ICD) is 64m, with a central island of 42m. The width of the circulatory carriageway is currently 11.2m, which is not in accordance with current standards (it should be between 1.0 and 1.2 times the maximum entry width).
- 6.5. The introduction of the proposed SLTL would encroach on the existing circulatory carriageway which should generally be circular and of a constant width, creating a variable width of between 8.5m and 11.2m. This introduces the concern that a vehicle following the outer edge of the circulatory carriageway could come into conflict with a vehicle using the SLTL, or alternatively swerve to the right to avoid doing so and come into conflict with another vehicle on its offside. In order to avoid this problem, <u>AECOM recommend that the SLTL is repositioned to avoid taking width out of the roundabout</u>; or alternatively, that the width of the circulatory carriageway is reduced, possibly by hatching, so as to guide drivers of vehicles using it to take a path that does not conflict with users of the SLTL.

Entry Dimensions

- 6.6. The entry dimensions for the A131 and A120 eastbound off-slip (circulatory traffic) approaches; including approach half width, entry width, entry flaring and entry kerb radius are appropriate for the number of lanes provided at the junction. It should be noted that the existing entry width for the A131 approach remains wider than TD 16/07 advises as an appropriate multi-lane entry width of between 3 and 3.5m, which could be seen as an overprovision, although below the absolute maximum. Also, the approach width of the A120 off-slip road is of a standard that pre-dates the current version of TD22 and is therefore not in accordance with current standards.
- 6.7. The proposed Pod's Brook Road approach has an approach width of 6.35m which would need to be agreed with the Local Highway Authority to be acceptable as this is not a DMRB, TD 27/05, standard cross section. Similar to the A131, Pod's Brook Road entry width could be seen as an overprovision with a dimension of 7.95m but again is below the absolute maximum.
- 6.8. A summary of the entry dimensions can be seen in the Table 8. Measurements highlighted in red indicate elements of the existing or proposed layout which do not confirm with current design standards. 'Req' refers to a required standard in TD 16/07 which is mandatory; 'Rec' refers to a recommended standard.

Table 8: Entry Dimensions

No. of		Approach Half Width		Entry Width		Entry Flaring		Entry Kerb Radius	
Arm	lanes Entry	Actual	Req	Actual	Rec (Req)	Actual	Rec	Actual	Rec
A131	2	7.30m	7.30m	8.50m	6-7m (15m max)	6m	25-100m	40m	20- 100m
A120 EB off-slip*	2	4.00m	-	6.60m	6-7m (10.5m max)	9m	25-100m	30m	20- 100m
Pod's Brook Rd	2	6.35m	7.30m	7.95m	6-7m (15m max)	25m	25-100m	30m	20- 100m
A120 EB on-slip	Exit only								

*excluding the SLTL

Exit Dimensions

- 6.9. The exit dimensions of all three exit arms of the roundabout have aspects that are not recommended by TD 16/07. The A131 arm has an appropriate exit kerb radius however the exit width is narrower than the recommended 10-11m width recommended where the downstream link is a two-lane dual carriageway. The taper is also sharper than is recommended. These are existing features which the proposed layout adjustment would not affect.
- 6.10. The Pod's Brook Road exit has a larger than recommended exit kerb radius which could generate high exit speeds. There is also a narrower exit width than recommended by the standard; with the location of the traffic island and proposed SLTL alignment this would make it difficult for traffic to overtake a stationary vehicle. The exit width then tapers down to an under provision carriageway width with a sharper than recommended taper. The alignment of the SLTL also encroaches on the exit lanes with a non-constant taper gradient. <u>Overall, the introduction of the SLTL results in a significant deterioration in the layout of this roundabout exit relative to both the current layout and the design standard and would introduce new Departures from Standard where there are none at present.</u>
- 6.11. The A120 eastbound on-slip road has an appropriate exit width but has an exit kerb radius that is larger than recommended by the standard. Similar to the A120 eastbound off-slip road the carriageway width on this arm relates to a superseded standard for slip roads. The information available does not allow the taper length to be determined due to the road markings not being presented. Again, these are existing features which the proposed layout adjustment would not affect.
- 6.12. There are a number of straight or reverse curve transitions between successive entries and exits. TD16/07 advises these to be avoided where possible; however this is not a mandatory requirement.
- 6.13. A summary of the exit dimensions can be seen in Table 9.

Table 9: Exit dimensions

	No. of				Exit Width Entry		Exit Width Exit		Taper	
Arm	lanes Exit	Actual	Rec	Actual	Rec	Actual	Rec	Actual	Rec	
A131	2	40	20-100m	7.80m	10-11m	7.30m	7.30m	1:10	1:20	
A120 EB off-slip		Entry only								
Pod's Brook Rd	2	140	20-100m	<mark>5.50m</mark> (8.00m*)	7-7.5m	<mark>3.20m</mark> (6.55m*)	3.65m	1:10	1:20	
A120 EB on-slip	2	120	20-100m	7.25m	7-7.5m	4.00m	-	Not available	1:20	

(*) - This value represents a reduction from the existing width available due to the introduction of the SLTL

Conflict Angles

6.14. The conflict angles for two of the arms, Pod's Brook Road and A120 eastbound off-slip road are within the recommended limits advised in TD 16/07. The A131 is below the recommended 20°. However, this is an existing feature unaffected by the Scheme.

Entry Path Radius

6.15. TD 16/07 requires that the entry path radius must not exceed 100m. For all approaches onto the circulatory, the entry path radiii have been measured to be equal or below 100m.

<u>Visibility</u>

- 6.16. As noted previously no vertical alignment of the layout has been made available for this review. This means that Crossfall and Longitudinal Gradient on the approaches, circulatory and exits have not been established as this is beyond the scope of this review. Similarly visual intrusions caused by signs, street furniture and planting etc. have not been available for review.
- 6.17. The A120 off-slip approach is assumed to have a design speed of 70kph and therefore requires a Stopping Sight Distance (SSD) of 120m from TD 9/93 with an acceptable line of sight available. The A131 approach is assumed to have a design speed of 50kph and therefore requires 70m SSD. With no vertical alignment it is not possible to tell whether this distance is achieved whilst going under the bridge, however the horizontal line of sight appears to remain within the carriageway and appears to not be obstructed by the bridge pier. The Pod's Brook Road approach is assumed to have a 70kph design speed and therefore requires 120m SSD. It is not currently obvious that this can be achieved and this may have implications on the earthworks, tree and foliage cover and land take. <u>Achievement of this SSD should be confirmed before the layout is accepted in principle.</u>

Compliance with TD 51/03

- 6.18. The second stage of the design assessment is to consider the compliance of the proposed SLTL alignment with TD 51/03. Where text refers to "the standard" in this section, this should be taken as TD 51/03.
- 6.19. It should be noted that only the horizontal alignment has been considered in this assessment. Aspects of design including road markings, NMU provision or lighting considerations have not been included in this assessment.

Traffic Flows and Capacity

- 6.20. The standard advises that the inclusion of a SLTL should be considered where the flow of left turning vehicles is greater than or equal to the total entry arm in the inflow in vehicles per hour, divided by the number of proposed entry lanes onto the roundabout (including the SLTL).
- 6.21. Using the 2033 (design year) traffic flows and the equation detailed in the standard, the traffic flows forecast for the AM and PM peak indicate that a SLTL could be beneficial to the capacity of the junction and should therefore be considered.

Approach Layout

- 6.22. The layout provided to AECOM indicates a small physical island on the A120 off-slip approach which could be seen as a Subsidiary Deflection Island (SDI). However, from the entry path radius section above, a satisfactory entry path radius of 80m is achieved which is below the required maximum radius of 100m specified in TD 16/07, thus resulting in the SDI not being required. Inclusion of an SDI to a layout must be considered only as a last resort where conventional measures do not achieve the entry path radius of 100m. There does not appear to be a strong NMU desire line to cross the A120 off-slip approach, which would require the need for a pedestrian traffic island. <u>AECOM recommend that either the traffic island is extended to provide a physical island that complies with the standard, or alternatively a non-physical island using road markings compliant with the Traffic Signs Regulations and General Directions (TSRGD) is used instead.</u>
- 6.23. For the physical island provision the island must extend 1.5m beyond the traffic deflection island on the approach, 6m beyond the traffic island on the exit and have a minimum width of 1.5m. For a non-physical island, the island must extend perpendicular from the traffic islands on the approach and exit, to the nearside kerb and have a minimum width of 1.0m.
- 6.24. As noted previously, AECOM do not have access to the vertical alignment of the proposed layout and therefore it is assumed that the longitudinal gradient within the immediate approach to the junction, applicable to the design speed of the approach measured back from the start of the entry taper, does not exceed 4%. If the longitudinal gradient is in excess of 4% this will require a Departure from Standard for a SLTL to be accepted. <u>This should be confirmed before the layout is accepted in principle.</u>
- 6.25. The proposed minimum inside corner radius on the approach is 20m which, with a physical island less than 50m long, would require a 6.2m carriageway width to accommodate a Large Goods Vehicle, provided as a 3.5m minimum marked lane with hatched markings developed over the radius to provide the 6.2m total carriageway width required to comply with the standard. The carriageway width proposed would need to be increased from the total width of 3.8m shown at the entry radius to avoid a Departure from Standard.
- 6.26. A minimum marked lane provision of 3.5m is required to be compliant with the standard. The proposed SLTL alignment does not provide a constant 3.5m marked lane provision. At one point it reduces down to approximately 3.0m and vehicles using it would therefore encroach on the current 'non-physical island'. This would need to be brought up to standard before the layout is accepted in principle.
- 6.27. The maximum curve radius of the proposed layout is measured as 105m at the exit radius. This would mean that a 215m SSD would be required to avoid a Departure from Standard. However, because the road has been assumed to have a design speed of 70kph, the required SSD is the lesser value between TD 9/93 and TD 51/93, which equates to a Desirable Minimum SSD of 120m. It is not currently obvious that this can be achieved and this may have implications on the

earthworks, tree and foliage cover and land take. <u>Achievement of this SSD should be</u> confirmed before the layout is accepted in principle.

- 6.28. It is currently proposed to provide a diverge layout as a means of starting the SLTL. This will require an approach taper of 1:15 for a design speed greater than 60kph to comply with the standard, therefore requiring an approach taper length of at least 52.5m, assuming a minimum width at the start of the entry taper of 3.5m. The taper is introduced from a slip road that currently comprises a wide single lane set within a 6m wide carriageway. It is unclear from the drawing how the SLTL is to be introduced. AECOM have therefore been unable to verify whether the proposed layout is compliant with the standard. <u>Confirmation of the layout proposed and its compliance with the standard should be provided before the layout is accepted in principle.</u>
- 6.29. An entry taper with a minimum entry taper width of 3.5m requires an entry length factor of 20 for an assumed design speed of 70kph. For a physical island provision the entry taper must be developed with a taper of at least 42m to avoid a Departure from Standard. For a non-physical island the entry taper must be a length of at least 20m.
- 6.30. The proposed entry taper is greater than 42m so would therefore be compliant with the standard, however the carriageway width is an under provision to TD 51/03 and does not provide a constant minimum marked lane provision of 3.5m.

Exit Layout

- 6.31. The current proposal includes a merge exit. This does not comply with the standard as a merge exit should only be provided where two or more lanes are available on the downstream link and Pod's Brook Road reduces to a single lane carriageway. This is a particularly serious point, since the merge introduces an increased risk of head-on collisions with southbound traffic. The alternative of introducing an additional lane on the exit (i.e. creating a short section of single four-lane carriageway) would have implications for providing an adequate weaving length. TD 22/06 specifies an absolute minimum weaving length for an urban road of approximately 175m for a 70kph design speed. It would not be possible to achieve this, as the distance to the next junction (the proposed site access roundabout) is approximately 80m from the end of the SLTL.
- 6.32. Alternatively a give way line could be provided for this layout to allow it to comply with the standard. This is currently not proposed. If a give way line is provided, its capacity to accommodate the design flows predicted should be tested using PICADY. Where the SLTL ends in a give-way line, a minimum entry angle of 20° is recommended.
- 6.33. Should the concept of a merge exit taper be accepted in principle, the layout would need to be adjusted to comply with the design standard. The proposed exit taper width is greater than the minimum 3.5m required by the standard and is therefore compliant. The end taper similarly to the entry taper must be developed with a minimum taper of 1:15 and should have an end taper of 52.5m. The proposed end taper provision is measured as 45m which is an under provision and therefore would require a Departure from Standard.

6.34. As things stand at present, it is not obvious to AECOM that there is a satisfactory way to terminate the SLTL into Pods Brook Road and this should be confirmed before the layout is accepted in principle.

Summary

6.35. In summary there are a number of areas where the proposed layout requires adjustments to ensure compliance with DMRB standards. Table 9 summarises the areas where adjustments to the horizontal alignment are recommended or required by TD 16/07 or TD 51/03.

Arm	Geometric Parameter	DMRB Standard	Compliance
Overall junction	Circulatory carriageway width	TD 16/07	Inconsistent circulatory carriageway width reducing from 11.2m to 8.5m once the SLTL is introduced;
A131 (Circulatory Traffic)	Exit width entry	TD 16/07	Below recommended minimum (an existing problem unaffected by the proposed improvement)
A131 (Circulatory Traffic)	Conflict Angle	TD 16/07	Below recommended minimum (an existing problem unaffected by the proposed improvement)
A131 (Circulatory Traffic)	Exit Taper	TD 16/07	Below recommended taper (an existing problem unaffected by the proposed improvement)
Pod's Brook Rd	Approach half width	TD 27/05	Below recommended minimum – due to the introduction of a second lane on the approach
Pod's Brook Rd	Exit kerb radius	TD 16/07	Above recommended maximum- adversely affected by the introduction of the SLTL
Pod's Brook Rd	Exit width entry	TD 16/07	Below recommended minimum- adversely affected by the introduction of the SLTL
Pod's Brook Rd	Exit width exit	TD 16/07	Below recommended minimum – adversely affected by the introduction of the SLTL
Pod's Brook Rd	Exit Taper	TD 16/07	Below recommended taper – adversely affected by the introduction of the SLTL
A120	Exit kerb radius	TD 16/07	Above recommended maximum (an existing problem unaffected by the proposed improvement)
A120 EB off-slip (SLTL)	Approach and entry tapers		Unable to verify compliance with standard because of uncertainty over how the SLTL is to be developed from the current non-standard carriageway
A131 (SLTL)	Physical Island Extent	TD 51/03	Below required physical island extents for approach and exit
A131 (SLTL)	Carriageway width	TD 51/03	Width below required minimum and inconsistent
A131 (SLTL)	Forward visibility for users of SLTL	TD 9/93	Could be compromised by other aspects of design e.g. Earthworks, street furniture etc.
A131 (SLTL)	Exit Layout	TD 51/03	Incorrect layout for single lane exit: concern that a satisfactory alternative layout may not be achievable
A131 (SLTL)	Exit taper	TD 51/03	Below required taper

Table 9: Summary of adjustments to horizontal alignment (recommended or required by DMRB)

6.36. In summary the layout does not fully comply with the horizontal requirements advised in DMRB standards, in particular TD 16/07 and TD 51/03. Some significant geometric adjustments are required for the layout to be fully compliant with the design standard when assessed in the horizontal plane and it is not obvious at present that these can all be achieved. Although some of these adjustments are to parameters which are 'recommended' rather than 'required', there are a number of mandatory requirements which would require significant horizontal alignment adjustments in order to avoid a multiplicity of Departures from Standard, which it is not certain would be granted. <u>AECOM recommend that these should be addressed before the Scheme illustrated here is accepted 'in principle' as mitigation for the development.</u>



7. Conclusion and Recommendations

- 7.1. AECOM, on behalf of Highways England, have reviewed the 'Response to Technical Note 03' dated September 2016 prepared by Journey Transport Planning (JTP) relating to the proposed development at Land at Flitch Way, Rayne, Braintree.
- 7.2. This Technical Note 04 (TN04) follows AECOM's previous reviews of the original Transport Assessment for the proposed development and several responses to recommendations raised.
- 7.3. Amongst other things, JPM have provided an analysis of the collision record at the Galleys Corner roundabout. On the base of our review of this, AECOM suggests a possible safety-based mitigation scheme for the junction.
- 7.4. The latest response from JTP included revised ARCADY models which had been calibrated to represent observed queueing levels at the A120 / Pod's Brook Road / A131 (north) roundabout. Mitigation measures in the form of a segregated left turn lane (SLTL) from the A120 eastbound off-slip to the Pod's Brook Road arm of the roundabout have been designed and provided for review.
- 7.5. This TN04 provides a detailed review of the ARCADY models. There are still some outstanding issues that need to be resolved, for example, the proposed layout model of the A120 / Pod's Brook Road / A131 roundabout is based on the geometry for the existing layout, which will affect the modelling results.
- 7.6. Notwithstanding this, Highways England will primarily be concerned with the proposed adjustments to the A120 eastbound off-slip which has been reviewed to ensure it complies with current design standards. In principle, a SLTL can be seen to offer some improvement to the operation of the A120 eastbound off-slip. However, from a design and safety point of view, the design presented needs to be reconsidered. The ability of the proposed layout to accommodate development traffic ultimately relies upon this.
- 7.7. Therefore, along with the other recommendations highlighted in this note, AECOM recommend that the proposed mitigation is reviewed and revised to address the comments in Section 6 of this note. The ARCADY model should then be updated and re-run based on the revised geometry. If the SLTL design is altered to provide a give-way layout at its junction with the Pod's Brook Road exit, a PICADY model would also be required to test its capacity.
- 7.8. The view of ECC is critical to Highways England's acceptance of the development proposal as the ability of both the local and strategic road network to accommodate the traffic generated by the development is dependent on the effectiveness of the proposed mitigation at the Springwood Drive / Rayne Road / Pod's Brook Road, Rayne Road / Aetheric Way and A120 / Pod's Brook Road / A131 (north) roundabouts. At the time of writing, JTP advised that they were awaiting ECC's comments.

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From: To:	
Cc:	
Subject:	031116 1336 RE: BROOK GREEN, BRAINTREE
Date:	03 November 2016 13:36:42
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meeting w	ould be good, I think you are travelling a lot faster on this than the rest of
	, I will give a fuller response hopefully next week
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we can all meet? The meeting will be to discuss response and how he is to formally respond, etc

Next is the concept of the A120 improvements. When we last met and on an informal basis, your best guess was that the works in question were going to cost in the order of £10M and the land acquisition costs were in the order of £3-5M.

and I are of the view that even if everything in **the second** document can be agreed, it will be many months before your detailed design is finalised and costed and therefore at the moment, our main interest is agreeing the principles, such that we can promote same to the members and public and get our site allocated and a grant of planning, so we can fund these works. We can protect the delivery of these works and the funding of same, through the S106 – so there is no misunderstanding and as a starter for 10, we are suggesting the following:-

- We will fund all the A120 works to be CAPPED at £15M
- Once our contribution is determined, we will seek the recovery of the difference from future development sites through their S106 contributions
- The funding will be secured through the S106 and we will provide some guarantee provision
- The money will not be available before the sale of the 200th dwelling or 2 years from implementation, whichever is the sooner
- If the money is not used within 10 years of implementation, the funding obligation will cease

I have a PR company on standby awaiting instructions to meet with the various Councillors and press, to make this subject public and we have delayed this approach, in the hope that we can get further forward.

Regardless of what we agree, unless we get planning, all of these efforts will be in vain and we need to get support and equally as important, we need to be singing from the same hymn sheet ! I will do no more until we have met and I suggest we discuss this aspect at our meeting. Please let me know when you will be available.

Thanks



From:	
Sent: 31 October 2016 11:14	
To:	
Cc:	
Subject: RE: BROOK GREEN, BRAINTREE	

Given that neither **Construction** or **Construction** can now make it and you will not have had time to address any of the issues raised in Aecoms latest response, attached. I think it would be inappropriate for me to travel to a meeting with neither the Planning Authority or County Highway Authority represented. Especially as the County Highways issues and ours are interrelated. Can we look to reschedule for slightly latter in the month. I know this will come as a disappointment and appreciate your frustration with progress on this application, but I do think a lot more would be achieved by holding back just a few days and attending a meeting with all parties around the one table. If anything in the note is unclear or you wish to discuss further please feel free to drop me an email or ring me

Regards

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

 Tel:
 Web: http://www.highways.gov.uk

 GTN:
 GTN:

 From:
 Sent: 31 October 2016 05:31

 To:
 Cc:

 Subject: RE: BROOK GREEN, BRAINTREE
 Subject: RE: BROOK GREEN, BRAINTREE

 It hanks for your email.
 As you say it is unfortunate that you can't attend and a shame that has now left.

 However there were two reasons for the meeting, one being technical and the second planning.

As the technical is really between us and Highways for England with AECOM advising, I propose that the meeting continue as planned and be classed as a technical meeting and that we arrange a further meeting, to discuss the planning process, etc.

Assuming that is acceptable to everyone, I will stand down as he will have little interest in discussing technical issues !!

and I will be happy to attend at offices in Chelmsford.

Can everyone please confirm that this is acceptable and after the meeting, I will write again suggesting a further date for the next meeting.

Thanks



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Sent: 30 October 2016 23:11 To: Cc:

Subject: RE: BROOK GREEN, BRAINTREE

I understand that you are keen to progress the application and that understanding the position on highway impacts is a key element of doing this. However I am afraid I'll have to ask that this Wednesday's meeting is postponed as I won't be available – I apologise for the short notice. I note that the had previously said that he thinks a meeting would be more productive once Highways England has produced their updated response / advice. Unfortunately is unavailable on Wednesday and he has said that following departure from Essex County Council he needs some time to get fully up to speed with the application. I'd suggest that and the meeting advise on when we should look to rearrange the meeting so there can be a meaningful discussion.

Kind Regards,

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Subject: RE: BI		BRAINTREE				
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Sent: 28 Oct	ober 2016 0	9:40				
To:						
Cc:						
Subject: RE:	BROOK GRE	EN, BRAIN	TREE			

afternoon meeting has been moved back to 1pm here in Chelmsford so we would be available to attend a meeting at 10:30. If the meeting is in Braintree we want to leave by 12:00 to get back in time. Alternatively AECOM can host the meeting at our offices in Chelmsford if this suits everyone.

- would you be happy to attend a meeting here in Chelmsford or would you prefer it to be held at Braintree's offices?

Kind Regards

From: Sent: 25 October 2016 14:57 To: Cc: Subject: RE: BROOK GREEN, BRAINTREE Perfect and thanks are you available? GolDev L! www.coldev.cor Goldev Ltd, P.O. Box 235, Radlett, Herts, WD7 0AQ From: Sent: 25 October 2016 14:55 To: Cc: Subject: RE: BROOK GREEN, BRAINTREE is now on leave and has asked me to confirm the meeting arrangements in his absence. I'm just waiting for confirmation that other meeting can be moved to the afternoon so he can attend the Brook Green meeting in the morning. I'll get back to you to confirm either way. **Kind Regards** From: Sent: 25 October 2016 14:28 To: Cc:

Subject: RE: BROOK GREEN, BRAINTREE

Have you been able to rearrange your other meeting, etc Thanks



From:			
Sent: 20 October 2010	12:22		
To:			
Cc:			
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Subject: RE: BROOK GREEN, BRAINTREE

I could possibly make the morning of the 2nd Nov but I can't help thinking it may be better for you to wait until you have had our response and a little time to digest it Regards

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

Tel: Web: http://www.highways.gov.uk GTN: Seat belt on phone off From: Sent: 20 October 2016 12:15 To: Cc: ,

Subject: RE: BROOK GREEN, BRAINTREE

thanks very much for your response, which is very helpful.

As we are now a lot further forward, then when we all last met, I wonder whether a further meeting can now be arranged for the first week of November, so we can all update each other and agree a basis for moving this forward.

Can i suggest the 1st or 2nd November and i am sure will be happy to host again at Braintree

DC.

Would everyone that needs or wants to attend, please confirm their avilability? Thanks



From:	
Sent: 20 October 2016 12:07	
To:	
Cc:	

Subject: RE: BROOK GREEN, BRAINTREE

From Highways England's perspective, as I mentioned in my last email to **sector and**, we are reviewing the latest response from JTP regarding the proposed development. This is still ongoing and we are due to report back to Highways England next week, **sector and** will be on leave from the 21 to 31st October and is unlikely to be able to provide you with a response until early November.

We have some initial concerns about the proposed mitigation measures at the A120 eastbound off-slip (A120 / Pod's Brook Road / A131) which will be covered fully in our response.

Once Highways England have had the opportunity to review our comments on the latest material submitted by JTP, **see and a set of the set of the**

I'm also unsure what the status of the proposals is with Braintree District Council and Essex County Council regarding the planning application and proposed mitigation measures on the local highway network. Kind Regards

AECOM Saxon House, 27 Duke Street Chelmsford, Essex, CM1 1HT, United Kingdom T +44-1245-77-1200 aecom.com

Built to deliver a better world

From:	
Sent: 20 October 2016 08:29	
To:	
Cc:	
Subject: BROOK GREEN, BRAINTREE	
All	
Where are we in the process?	

When will you be able to provide the following;

- Total cost of works and land required
- Our contribution
- Better plans showing works required.

I need to know the timescales please, as the matter will shortly be presented for determination and this is obviously a major aspect that needs to be included.

Can someone please come back to me.

Many thanks



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From:	
То:	
Subject:	071116 0949 BROOK GREEN HIGHWAY MEETING

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From:	
То:	
Subject:	071116 0949 BROOK GREEN HIGHWAY MEETING

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From:	
То:	
Cc:	
Subject:	Accepted: BROOK GREEN HIGHWAY MEETING

Thanks for your emails. and I can attend a meeting to discuss Brook Green on 28th November from 15:00-17:00.

AECOM are able to host the meeting if required. I have provisionally held a meeting room at our offices in Chelmsford in case it is needed.

Please can you let us know if representatives from Braintree and Essex are also able to attend.

Kind Regards



AECOM Saxon House, 27 Duke Street Chelmsford, Essex, CM1 1HT, United Kingdom T +44-1245-77-1200 HYPERLINK "http://www.aecom.com/" aecom.com

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From: To: Cc: Subject:	101116 0929 RE: Brook Green
Date:	10 November 2016 09:29:49

Hi

It would be wise to hold off on commissioning a Stage 1 Road Safety Audit on the A120 / Pod's Brook Road / A131 (north) roundabout) until the proposed layout has been accepted in principle as feasible by Highways England.

Furthermore, the details of any Road Safety audit for works on the Trunk Road need to be agreed with Highways England prior to an audit being carried out as per DMRB HD19.

Maybe this is something we could discuss further at the 28th November meeting.

Please can you copy all correspondence relating to the Brook Green proposals to **Correspondence** at Highways England.

Kind Regards



From:

Sent: 10 November 2016 09:09

To:

Subject: Brook Green

Hi

Quick Question before I send over the revised/new proposed layout... should I hold off on a stage one audit until you've had the opportunity to review.

Regards

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line: Mobile: www.journeytp.co.uk



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From: To: Cc:	
Subject:	111116 1146 Brook Green
Date:	11 November 2016 11:46:02
Attachments:	Brook Green 111116.pdf

Please find attached a letter setting out the situation as I see it, I hope this is helpful;

Regards

Highways England | Manton Lane | Bedford | Mk41 7LW Tel

Web http//www.highways.gov.uk

From:		
To:		
Cc:		;
Subject:	111116 1444 RE: Brook Green	
Date:	11 November 2016 14:44:02	
Attachments:	image001.png Brook Green 111116.pdf	

thanks

This is very helpful and I look forward to discussing same when we meet. Regards



From:

Sent: 11 November 2016 11:46

o:			
C:			

Subject: Brook Green

Please find attached a letter setting out the situation as I see it, I hope this is helpful; Regards

Mark Norman

Highways England | Manton Lane | Bedford | Mk41 7LW

Tel

Web http//www.highways.gov.uk

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Our	ref:
You	r ref:



Woodlands Manton Lane Bedford MK41 7LW

Direct Line: Fax:

11 November 2016

Dear

A120 BROOK GREEN FITCH WAY BRAINTREE

Dear ,

Thank you for your email dated 12th October on the subject of the funding of mitigation works related to the proposed Land at Flitch Way (Brook Green) development. Please accept my apologies for the delay in getting you this response, I have had to seek advice from a number of colleagues internally Highways England's position is determined by the following policy documents:

- Braintree District Council's Local Plan;
- The National Planning Policy Framework (NPPF); and
- Department for Transport (DfT) Circular 02/2013.

Braintree District Council's Local Plan

Highways England has a duty to co-operate in the delivery of Braintree District Council's Local Plan and this must inform our approach to the delivery of infrastructure within the Local Plan area.

Braintree District Council's Local Plan is currently subject to a review. The consultation draft of the emerging Local Plan identifies a number of potential strategic growth locations within the Braintree area. These are the locations for growth preferred by Braintree District Council, the Local Planning Authority. The Plan makes clear that these sites will be expected to contribute to the infrastructure required to deliver the Plan. Whilst the Plan does not explicitly identify them, it is inferred that the potential slip roads at Millennium Way are part of the strategic improvements to the A120 referred to in the Local Plan. The Brook Green site is not one of the preferred growth locations but is identified as an 'alternative' location.



Highways England's position is therefore that the preferred development sites that come forward through the Local Plan process must, together with the public sector, combine to provide the infrastructure to deliver the Plan. Whilst Highways England would not reject an offer of funding towards infrastructure, it cannot be allowed to influence the position of the Brook Green proposed site, relative to other sites, that are coming forward through the Local Plan process. The Local Plan must determine the priorities.

The NPPF

The NPPF sets out three tests which must be followed (para 204). Planning Obligations should only be sought where they are:

- Necessary to make the development acceptable in planning terms;
- Directly related to the development; and
- Fairly and reasonably related in scale and kind to the development.

Circular 02/2013

Circular 02/2013 states that:

33. Only after travel plan and demand management measures have been fully explored and applied will capacity enhancement measures be considered. While capacity enhancements should normally be addressed at the plan-making stage, such measures may be considered at the time when individual planning applications are submitted, subject to the over-riding principle that delivery of the adopted Local Plan proposals should not be compromised.

34. Where insufficient capacity exists to provide for overall forecast demand at the time of opening, the impact of the development will be mitigated to ensure that at that time, the strategic road network is able to accommodate existing and development generated traffic. Any associated mitigation works should be appropriate to the overall connectivity and capacity of any affected part of the strategic road network.

Localised Impacts

In the case of the proposed Brook Green development, in addition to the provision of a site access roundabout on Pod's Brook Road, it is evident that mitigation of some form will be required in respect of the site's impact at the following locations:

- A120/B1256 (north) roundabout;
- B1256 Pods Brook Way/ Rayne Road/ Springwood Drive roundabout; and
- Rayne Road/ Pierrefitte Way/ Aetheric Road signalised junction.

These locations are directly affected by traffic generated by the proposed Brook Green development. It is evident that there is insufficient capacity available to accommodate overall forecast demand and that the proposed development has the potential for a



'severe' impact at these locations. Mitigation of these impacts will be required and this must be funded in full by the Applicant if the development is to be agreed as acceptable.

We are still in discussion with both Journey Transport Planning and Essex County Council about the form and adequacy of the mitigation proposed. It is of note that, whilst JTP have carried out an assessment of 'mitigated' flows (i.e. with a reduction applied to account for the beneficial effects of sustainable mode measures), it is our understanding that the nature of those sustainable mode measures has not yet been agreed. However, the beneficial effects of the sustainable mode measures are not sufficient to fully mitigate the impact of the development and some physical traffic capacity measures will be required. The exact nature of those measures, their acceptability in design and road safety terms and their effectiveness as mitigation have also not yet been agreed. We are therefore some way off agreeing a mitigation package for the localised impacts of the proposed Brook Green development.

It is important to note that an offer of funding towards a large infrastructure scheme could not overcome the requirement for a site such as Brook Green to mitigate its own direct localised impacts on the transport network.

Wider Network Impacts

In respect of the wider network, from previous discussions we understand that you are prepared to fund mitigation works at Galleys Corner roundabout. The mitigation works identified are west-facing slip roads between the A120 and Millennium Way, which are intended to relieve Galleys Corner roundabout of much of its turning traffic.

Highways England's understanding of the relationship between the proposed Brook Green development and the problems at Galleys Corner can be summarised as follows:

- There is currently a significant congestion problem at Galleys Corner;
- This is predicted to get worse over time if no mitigation is brought forward;
- The proposed development will contribute to making conditions worse than they would otherwise have been;
- The slip roads between the A120 and Millennium Way are currently an aspiration and have not been adopted as a 'Scheme';
- It would be appropriate for Highways England to accept an offer to part-fund the slip roads once they are adopted as a Highways England scheme;
- In the interim, a process of assembling funding from developers would have to be carried out by a 'ring master' – in this case the Local Planning Authority would be the preferred body to undertake this role to ensure parity in this process;
- The scale of that funding would have to be agreed using a transparent process of apportionment with respect to contributions from other developers and the public sector;



Any offer of funding must meet the requirements of both the Circular and the NPPF 'fair and reasonable' tests and must be seen in the context of the emerging Local Plan.

It is therefore the case that any acceptance of funding from any one individual developer must clearly be seen in the context of a larger funding package, with the funding from one being in proportion to the scale of their site's impact relative to the overall scale of the problem.

At present, the slip roads have been subject to an initial engineering feasibility study, however, they have not been formally adopted by Highways England as a Scheme. They have not been costed in any detail, nor have the relative impacts of the various development sites been assessed. It would therefore be premature for Highways England to accept an offer to part fund the works.

Conclusion

As a next step, Highways England recommend that we focus on reaching agreement on the package of sustainable mode and local mitigation works; following which we have a joint meeting with Essex County Council and Braintree District Council to discuss the potential for the Brook Green development to part-fund works on the wider network and to agree which organisation will assemble contributions. In the meantime Highways England will continue to support Braintree District Council in the production of the Local Plan.

I trust this clarifies the situation.

Yours sincerely

Operations Directorate Email:



Dear

Further to our discussions and my submissions with respect to Technical note 4, if there are any other matters requiring my attention prior to the meeting I would be grateful if you could let me know so I can address them, otherwise I look forward to meeting you Monday. Best Regards

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line: Mobile: www.journeytp.co.uk



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From: To:	
Cc:	
Subject:	241116 1230 RE: Brook Green mtg
Date:	24 November 2016 12:30:20
Attachments:	DX077 TN05 (issued).pdf

Please find attached AECOMs latest technical review the content of which I agree with

I am not expecting that you will be able to address these by our meeting on Monday

Regards

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

Tel: Web: <u>http://www.highways.gov.uk</u>

GTN:

Dear

From: Sent: 24 November 2016 09:04 To: Cc:

Subject: Brook Green mtg

Further to our discussions and my submissions with respect to Technical note 4, if there are any other matters requiring my attention prior to the meeting I would be grateful if you could let me know so I can address them, otherwise I look forward to meeting you Monday. Best Regards

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line: Mobile:


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To:	
Cc:	
Subject: Date:	241116 1235 RE: Brook Green mtg 24 November 2016 12:36:51
Attachments:	image002.png
	DX077 TN05 (issued).pdf
Mark, thanks	
	t about how you respond and what can be done by Monday
2	
1	
(GolDev
	,LI: www.goldev.com
G	oldev Utd, P.O. Box 235, Radlett, Herts, WD7 ORQ
- 11-2-1-0	
From:	ember 2016 12:30
To:	11ber 2010 12.30
Cc:	
Subject: RE: B	rook Green mtg
Please find at	tached AFCOMs latest technical review the content of which Lagree with
	ttached AECOMs latest technical review the content of which I agree with ecting that you will be able to address these by our meeting on Monday –
l am not expe	
l am not expe am !!	
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I am not expe am !! Regards	ecting that you will be able to address these by our meeting on Monday –
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l am not expe am !! Regards Highways Eng Tel:	ecting that you will be able to address these by our meeting on Monday – gland Woodlands Manton Lane Bedford MK41 7LW
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am not expe am !! Regards Highways Eng Tel: Web: <u>http://w</u> GTN: From: Sent: 24 Novem	ecting that you will be able to address these by our meeting on Monday – gland Woodlands Manton Lane Bedford MK41 7LW

other matters requiring my attention prior to the meeting I would be grateful if you could let me know so I can address them, otherwise I look forward to meeting you Monday. Best Regards

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR Direct line:

www.journeytp.co.uk



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Technical Note 05

Project:	Highways England S Arrangement 2016-20	-	Job No:	60506522 / DX077
Subject:	Land at Flitch Way, F AECOM Technical No	ayne – Review of Deve ote 04	eloper Consultar	nt's 'Response to
Prepared by:			Date:	16 th November 2016
Checked by:			Date:	22 nd November 2016
Verified by:			Date:	23 rd November 2016
Approved by:			Date:	23 rd November 2016

1. Introduction

- 1.1. This Technical Note (TN05) has been prepared by AECOM, on behalf of Highways England, to document a review of the revised layout of the mitigation scheme at the A120/A131 (north) roundabout, proposed by Journey Transport Planning (JTP), in support of the proposed development at Land at Flitch Way, Rayne (LaFW), drawing number: JTP 06414-DR10. This Technical Note also reports on a set of updated ARCADY model runs carried out in support of the revised layout.
- 1.2. The revised alignment has been produced in response to AECOM's Technical Note 04 (TN04) which recommended alterations to the horizontal alignment to comply with Design Manual for Roads and Bridges (DMRB) standards, in particular, TD 51/03 and TD 16/07.
- 1.3. This note follows a number of reviews carried out by AECOM to support the planning application for the proposed development at LaFW (reference 15/01538/OUT) lodged with Braintree District Council (BDC). These are listed below:
 - TN01- Transport Assessment Review;
 - TN02- Review of Developer Consultant's 'Response to Technical Note 01';
 - TN03- Review of Developer Consultant's 'Response to Technical Note 02 and Further Matters Raised'; and
 - TN04- Review of Developer Consultant's 'Response to Technical Note 03'.
- 1.4. The objective of TN05 is to determine whether the issues raised in AECOM's previous documents have been fully addressed in order to allow the potential impact of the proposed development on the operation of the Strategic Road Network (SRN) to be fully understood. Where mitigation measures are proposed, AECOM will advise Highways England as to whether they are acceptable in terms of compliance with the DMRB and sufficient to accommodate traffic estimated to be generated by the LaFW development.

2. Background

2.1. The development proposal comprises 1,600 dwellings and 0.6 hectares of employment land and ancillary land uses including a primary school and local centre. The LaFW site is located to the west of Braintree north of the A120, west of Pod's Brook Road and south of Rayne Road. Access to the site is proposed via a new roundabout off Pod's Brook Road, with a second access off Rayne Road. The closest access to the SRN from the site is via the A120 / A131 / Pod's Brook Road roundabout known locally as the 'Panner's junction'. The proposed site access roundabout is located some 120m north of this junction.



Saxon House 27 Duke Street Chelmsford CM1 1HT United Kingdom

Page: 1 of 9 WWW.aecom.com United Kingdom S:\Development Planning_518441\E_Essex CC\Braintree DC\DX077 Land at Flitch Way, Rayne\Reports & Technical Notes\Issued\DX077 TN05 (issued).docx

3. Issues raised in AECOM's TN04 and JTP's revised alignment

- 3.1. As described in TN04, AECOM have undertaken a review of the junction layout proposed by JTP with the following limitations. Only the horizontal alignment has been made available to AECOM and therefore neither a full design check against Design Manual for Roads and Bridges (DMRB) standards nor a Stage 1 Road Safety Audit (RSA) has been carried out. This document therefore provides a high level 'in principle' review of the junction proposal submitted, evaluating the layout feasibility and seeking to identify any 'showstoppers' that may exist which could prevent the junction being constructed. Additional issues could arise which could relate to level differences, vertical alignment, visibility envelopes, issues off plan etc. which cannot be identified within the scope of this review. Swept path plots of the roundabout have not been carried out.
- 3.2. In response to the issues raised in AECOM's TN04, JTP have made a number of adjustments to the Segregated Left Turn Lane (SLTL) which will be discussed in the following section of this report. The other arms of the roundabout remain unaltered from the last revision, retaining the majority of the existing roundabout geometric layout at its current location.
- 3.3. The principal change is the substitution of a physical island to separate the SLTL from the circulatory carriageway of the roundabout (substituting for the previous non-physical island), the relocation of the SLTL to a position where it encroaches less upon the width of the circulatory carriageway, and the provision of a lane gain (rather than a merge) at the downstream end of the SLTL. In addition, further details are provided as to the tapers which will introduce the SLTL from the A120 eastbound off-slip road.

Compliance with TD 16/07

3.4. This Technical Note will firstly review the compliance of the updated layout shown on drawing DR10 with TD 16/07. The following comments have been observed.

Inscribed Circle Diameter, Circulatory Width, Central Island

- 3.5. The Inscribed Diameter (ICD) is 64m with a central island of 42m, retaining the existing overall geometry of the roundabout.
- 3.6. The repositioning of the SLTL physical island extent has led to an improvement to the encroachment of the SLTL on the circulatory carriageway of the junction. However, there is still a non-constant carriageway width, albeit to a lesser extent than the previous layout, leading to a carriageway width between 10.3m and 11.2m. As noted in TN04, the non-constant width could lead to vehicle conflict as vehicles following the outer edge of the circulatory experience a different radius and therefore turning movement, to vehicles in the inner lane of the circulatory. **AECOM therefore recommend that the SLTL is repositioned to provide a constant circulatory carriageway width**.

Entry Dimensions

3.7. The entry width for the A120 east-bound off-slip (circulatory traffic) approach has been increased with the repositioning of the physical island of the SLTL to 9.25m. This dimension, represents an overprovision entry width for a two lane entry. TD 16/07 requires lane widths at the give way line to be between 3.0m and 3.5m for a multi-lane entry. It should be noted that the entry width is below the absolute maximum for a single carriageway approach of 10.5m. However, given the provision of the SLTL, it would not be appropriate to provide three lanes at the roundabout entry, which an entry width of 9.25m would imply. AECOM therefore recommend that the entry width for the A120 EB off-slip (circulatory traffic) is reduced to provide a DMRB compliant entry width.

- 3.8. The entry dimensions for the A131 and Pod's Brook approaches remain the same as the previous layout, DR9, for the approach half width, entry width, entry flaring and entry kerb radius, and are therefore appropriate for the number of lanes provided at the junction with a couple of exceptions, noted below.
- 3.9. The A131 and the Pod's Brook Road entry widths, similar to that detailed in Para. 3.6 have a wider entry width than required by the standard although below the absolute maximum. AECOM do however recognise that these are existing features of the current layout.
- 3.10. There is also overprovision of the circulatory carriageway, as the width of the circulatory carriageway will be greater than 1.0 and 1.2 times the maximum entry width. This may lead to debris building up in under-used areas of the carriageway. AECOM therefore recommend that a solution to this is found, this could include hatching or making the central island larger. Again, AECOM recognise that this is a feature of the existing layout.
- 3.11. As noted in TN04, the proposed Pod's Brook Road approach has an approach width of 6.35m. This would need to be accepted by the Local Highway Authority to be approved in principle as this is a non-standard carriageway width to TD 27/05.
- 3.12. A summary of the entry dimensions can be seen in Table 1 below. Measurements highlighted in red indicate elements of the existing or proposed layout which do not conform with current design standards. 'Req' refers to a required dimension in TD 16/07 which is mandatory; 'Rec' refers to a recommended dimension.

Arm	No. of Approach Half lanes Width		Entry Width		Entry Flaring		Entry Kerb Radius		
	Entry	Actual	Rec	Actual	Req	Actual	Rec	Actual	Rec
A131	2	7.30m	7.30m	8.45m	6-7m (15m max)	7.05m	25- 100m	20m	20- 100m
A120 EB off- slip	2	4.00m	-	9.25m	6-7m (10.5m max)	14.60m	25- 100m	23m	20- 100m
Pod's Brook Road	2	6.35m*	7.30m	7.95m	6-7m (10.5m max)	25m	25- 100m	22m	20- 100m
A120 EB on- slip					Exit only				

Table 1: Entry Dimensions of DR10 Layout

(*)- non-standard carriageway width to TD 27/05.

Exit Dimensions

- 3.13. The exit dimensions of the A120 EB-on-slip and the A131 exit propose to retain the geometry of the existing layout and are appropriate for the number of lanes provided at the junction with one exception. As noted in TN04, the exit width of the A131 exit is below the recommended width of 10-11m, although this is not a mandatory requirement and AECOM recognise that this is an existing issue.
- 3.14. The repositioned SLTL physical island provides Pod's Brook Road with an improved exit kerb radius from the previous alignment, below the maximum radius of 100m required by the standard. However, although the narrow exit width has been increased, at 6.45m it is still below the recommended exit width of 7.0m and it tapers down to a lane width of 4.85m at the end of the physical island that is again below the recommended value of 6.0m to enable traffic to pass a broken down vehicle. The forecast traffic flows suggest a dominant straight ahead traffic flow from

the two-lane A131 entry into this exit and this may result in drivers expecting to be able to enter Pod's Brook Road from both lanes of the circulatory, as they can at present. The underprovision of carriageway width on this exit is therefore especially concerning. AECOM therefore recommend that the exit width is increased to be compliant with the DMRB recommended dimensions at both the roundabout exit and at the end of the physical island, with an appropriate taper.

3.15. A summary of the exit dimensions can be seen in Table 2 below. Unlike the entry dimensions, the exit dimensions are recommended instead of mandatory requirements. However, it is seen as good practice to provide the recommended values.

	No. of Exit Ke		b Radius Exit Widt		Ith Entry Exit Width		th Exit	h Exit Tap	
Arm	lanes Exit	Actual	Rec	Actual	Rec	Actual	Rec	Actual	Rec
A131	2	20m	20-100m	7.90m	10-11m	7.30m	7.30m	1:30	1:20
A120 EB off- slip		Entry only							
Pod's Brook Road (Junction Exit)	2	60m	20-100m	<mark>6.45m</mark> (8.00m*)	7-7.5m	<mark>4.85m</mark> (6.5m**)	6.0m	1:5	1:20
A120 EB on- slip	2	100m	20-100m	7.30m	7-7.5m	4.00m	-	Not available	1:20

Table 2: Exit Dimensions of DR10 Layout

(*)- This value represents a reduction from the existing width of 8.0m available due to the introduction of the SLTL; (**) This value represents a reduction from the existing width of 6.5m available due to the introduction of the SLTL.

Conflict Angles

3.16. The conflict angles for all of the arms are within the recommended limits advised in TD 16/07.

Entry Path Radius

3.17. There is a non-compliant entry path radius that exceeds 100m on the A120 eastbound off-slip approach. An entry path radius below 100m is a mandatory requirement of TD 16/07. This is an existing problem which appears not to be made worse by the provision of the SLTL. However, Highways England would expect any modifications to a non-compliant roundabout entry to include with them the resolution of such a problem. AECOM therefore recommends that adjustments to the alignment are made to the layout to provide a DMRB compliant entry path radius for the A120 EB off-slip approach. This could include, for example, reducing the width of the entry (as suggested at Para. 3.7, above) and increasing the size of the central island of the roundabout (which would resolve the issue of excessive circulatory width referred to at Para. 3.10 above). In AECOM's view, the introduction of the SLTL brings with it the opportunity to seek the resolution of all these issues in an integrated way and we recommend that this is pursued as part of Highways England's response to the current proposal.

Visibility

- 3.18. As noted previously no vertical alignment of the layout has been made available for this review. This means that Crossfall and Longitudinal Gradient on the approaches, circulatory and exits have not been established as this is beyond the scope of this review. Similarly visual intrusions caused by signs, street furniture and planting etc. have not been available for review.
- 3.19. As detailed in TN04, the same visibility considerations need to be addressed to comply with DMRB, in particular TD 9/93. Of particular note is the visibility requirement at the Pod's Brook



Road approach which is proposed to be widened from the existing layout. The introduction of a two lane approach may lead to a non-compliant SSD due to existing trees and street furniture in the verge. Achievement of the compliant SSD for the design speed of the approach should be confirmed before the layout is accepted in principle.

Compliance with TD 51/03

- 3.20. This Technical Note will now review the proposed SLTL's compliance with Design Standard TD 51/03. This review has again only considered the horizontal alignment. Aspects of design including road markings, NMU provision or lighting considerations have not been included in this assessment. The following comments have been observed with respect to the updated layout shown in DR10.
- 3.21. AECOM do not have access to the vertical alignment of the proposed layout and therefore it is assumed that the longitudinal gradient of the A120 eastbound off-slip road in the immediate approach to the junction, applicable to the design speed of the approach measured back from the start of the entry taper, does not exceed 4%. If the longitudinal gradient is in excess of 4% this will require a Departure from Standard for a SLTL to be accepted. This should be confirmed before the layout is accepted in principle.

Physical Island

- 3.22. As recommended in TN04, a physical island has been included in the revised layout, DR 10. The extent and size of the physical island is compliant with TD 51/03.
- 3.23. The carriageway width of the SLTL within the extent of the physical island is determined by the minimum curve radius on the entry or exit of the SLTL. The revised layout has a minimum curve radius of 47m which equates to a minimum carriageway width of 7m for a SLTL with a physical island longer than 50m. The carriageway width measured (6.25m) is narrower than required and is also not of a constant width. This under-provision could lead to a Large Goods Vehicle not being able to negotiate the SLTL safely. **AECOM recommends that the SLTL carriageway width is increased to a DMRB compliant width set by the minimum curve radius of the SLTL and that a constant width is provided.**
- 3.24. The proposed alignment uses reverse curvature to create the SLTL. Although this has the benefit of reducing the land take requirement, it should be noted that the use of reverse curves on the approach and through the roundabout are discouraged by DMRB.

Approach Layout

- 3.25. The SLTL alignment proposes a diverge layout as a means of starting the SLTL from the A120 EB off-slip. The approach and entry tapers are of generous lengths that are significantly greater than the minimum lengths required for the design speed, assumed to be 70kph. However, the extent of the over-provision may promote excessively high speeds of entry to the SLTL. **AECOM therefore recommend that the approach and entry tapers are reduced in length to the values recommended in TD 51/03.**
- 3.26. The lane width at the start of the entry taper is greater than the minimum width required of 3.5m to be compliant to the standard. Coupled with the protracted approach taper, this could increase the likelihood of vehicles entering the SLTL at excessively high speeds. A requirement for the hard strip provision to be terminated at the start of the entry taper is also detailed in TD 51/03. Limited road marking design has been made available so this has not been assessed. **AECOM therefore recommend that the lane width at the beginning of the entry taper is reduced to 3.5m to reduce the risk of excessive entry speeds into the SLTL.**



Exit Layout

- 3.27. The revised layout DR 10, proposes introducing an additional lane on Pods Brook Road northbound to provide users of the SLTL with a dedicated lane, thus creating two lanes northbound between the existing roundabout and the proposed development site access roundabout. AECOM note that both of these lanes are indicated as available for straight ahead traffic towards Pods Brook Road (north). It will therefore be important to ensure that the development site access roundabout. The layout of the development site access roundabout has not been considered in this review as it is a matter for the Local Highway Authority. However, this will also need to be reviewed by the Local Highway Authority and confirmed as acceptable to them before the proposed layout can be accepted in principle by Highways England.
- 3.28. The minimum lane width at the end of the exit taper is recommended to be 3.5m in TD 51/03. The layout proposes a width of 4.20m which could be seen as over-generous, as a 1:20 exit taper is required to reduce the carriageway widening at the end of the physical island to the lane width at the end of the exit taper.
- 3.29. The exit taper for the SLTL is currently below the 1:20 exit taper that is required for a 70kph design speed. If the appropriate carriageway width of 7.0m at the end of the physical island and 3.5m minimum lane width exit width is to be provided, a compliant exit taper of at least 70m is required. The current exit taper, with the non-compliant carriageway width at the termination of the physical island and the generous exit taper lane width, leads to an exit taper of 57m. **AECOM** recommend that the lane width at the end of the exit taper is reduced to the minimum recommended lane width of 3.5m, to reduce the need for excessive land take and assist in creating a compliant exit taper.
- 3.30. The provision of a dedicated exit lane at Pod's Brook Road from the SLTL will introduce a weaving issue for vehicles entering Pod's Brook Road from the circulatory who wish to turn left into the development. This is somewhat mitigated by both lanes allowing for straight-on movement, removing a potential conflict flow for vehicles wanting to continue on Pod's Brook Road from the SLTL. This arrangement as mentioned previously in Para. 3.27, is subject to the development roundabout being approved in principle.
- 3.31. Design Standard TD22/06 is not strictly applicable to weaving sections between successive junctions on the Local Road Network; however, it does provide guidance on appropriate weaving lengths for use at various design speeds. Application of TD22, assuming a 50kph design speed would result in a weaving length of 100m being required. The available weaving length at present is approximately 62m and this would therefore be regarded as substandard. Since this would form part of the Local Road Network, AECOM recommend that Highways England seek confirmation from the Local Highway Authority that they are content with a weaving section this short between the end of the SLTL and the site access roundabout. In connection with this, AECOM would draw attention to the fact that it may be difficult to move the proposed site access roundabout north from its current position without encroaching on the flood risk area associated with the Pods Brook watercourse, as defined by the Environment Agency.

Visibility

3.32. The revised layout proposes a visibility splay on the entry to the SLTL to increase the line of sight available to vehicles. TD 51/03 requires that the Desirable Minimum Stopping Sight Distance (SSD) throughout the SLTL should be the lesser of the SSD obtained from Table 3 of TD 9/93 or Table 2/1 of TD 51/03. Assuming a design speed of 70kph, this would equate to a TD9/93 SSD of 120m. The maximum nearside curve radius using Table 2/1 of TD51/03 gives a SSD of 90m. The available SSD of the revised layout with the visibility splay allows only for a SSD of approximately

60m. AECOM therefore recommend that a larger visibility splay is provided to allow for a compliant SSD of 90m to be available. The implications of this on land take and earthworks should be clearly identified.

4. Updated ARCADY Model Review

- 4.1. AECOM's TN04 recommended that the ARCADY model for the A120 / Pod's Brook Road / A131 (north) roundabout is re-run to take into account the proposed layout geometry. In a previous iteration of the ARCADY model, the geometry for the A120 arm was based on that for the existing layout and not the proposed layout, which affected the modelling results.
- 4.2. As identified and agreed in a previous response from JTP, the peak hours used in the assessment are 08:00-09:00 and 17:00-18:00. As previously agreed with ECC and Highways England, JTP have identified 2033 as the development Opening Year. The assessment scenarios are as follows:
 - 2015 and 2033 Base AM and PM peak; and
 - 2033 Reassigned and 2033 with Development AM and PM peak.
- 4.3. The '2033 Reassigned' and '2033 with Development' scenarios include committed development and the reassignment of traffic to the link road between Panfield Lane and Springwood Drive, which is being proposed by the developer of the 'Land west of Panfield Lane / north of Springwood Drive, Braintree' site.
- 4.4. The ARCADY model results for the existing layout have previously been agreed as presented in Table 3.

		Pod's Brook Rd		A131 Und	ler Bridge	A120 EB off-slip	
		Max RFC	Max Queue	Max RFC	Max Queue	Max RFC	Max Queue
2015 Base	AM	0.50	1	0.43	1	1.00	17
2015 Dase	PM	0.76	3	0.28	<1	0.87	6
2033 Forecast + CD +	AM	0.69	2	0.54	1	1.81	176
Re-assignment	PM	1.03	34	0.37	1	1.23	155
2033 With Dev (incl.	AM	1.07	66	0.61	2	2.94	366
CD + Re-assignment)	PM	1.16	112	0.51	1	1.69	493

Table 3: A120/Pod's Brook Road/ A131 (North) Roundabout- Existing Layout ARCADY Results

4.5. AECOM have reviewed the revised ARCADY model for the proposed layout sent with the email from JTP dated 10th November 2016. The proposed layout includes a segregated left turn filter lane from the A120 eastbound off-slip to Pod's Brook Road as per JTP drawing DR10. Table 4 presents JTP's revised modelling results for the A120 / Pod's Brook Road / A131 (North) roundabout proposed layout. The results for the 2015 and 2033 base scenarios have not been included in Table 4 because the proposed layout would only come into effect in the 'with development' scenarios.

Table 4: A120/ Pod's Brook Road/ A131 (North) Roundabout- Proposed Layout ARCADY Results (JTP Results)

			Pod's Brook Rd		ler Bridge	A120 EB off-slip	
		Max RFC	Max Queue	Max RFC	Max Queue	Max RFC	Max Queue
2033 With Dev (incl.	AM	0.86	6	0.64	2	0.36	1
CD + Re-assignment)	PM	1.00	25	0.54	1	1.03	34

4.6. AECOM have reviewed the geometric parameters entered into the proposed layout ARCADY model to ensure they are representative of the layout presented in drawing DR10. AECOM found discrepancies with the geometric parameters. The differences between JTP and AECOM's geometry measurements of the roundabout are shown in Table 5, with AECOM's measurements in red text.

Table 5: A120/ Pod's Brook Road/ A131 (North) Roundabout- Geometric Parameters

	V - Approach road half width (m)	E - Entry width (m)	L' - Effective Flare (m)	R - Entry radius (m)	ICD - Inscribed circle diameter (m)	PHI - Conflict entry angle (°)	
Pod's Brook Rd	7.00 (6.35)	7.90 (7.95)	5.00 (25.00)	32.00 (22.00)	64.00	34.00 (42.00)	
A120 EB on-slip		Exit Only					
A131	7.50 (7.30)	7.50 (8.45)	0.00 (7.05)	20.00	64.00	36.00 (32.00)	
A120 EB off-slip	4.00	8.00 (9.25)	10.00 (14.60)	23.00	64.00	27.00 (25.00)	

- 4.7. AECOM consider that these differences could make a material difference to the modelling results and therefore recommend that the ARCADY model is updated to match the geometry measured by AECOM as shown in Table 5.
- 4.8. In addition, the proposed layout model does not appear to include the intercept adjustments that have been applied to the A120 entry arm in the existing layout model. In order for the existing and proposed models to be comparable, it is AECOM's view that the same intercept adjustments should be applied. This could explain why the proposed layout model is showing significantly different results to the existing layout model in the 2033 'with development' scenario.
- 4.9. AECOM recommend that JTP either provide their rationale for excluding the intercept adjustment from the proposed layout model, or provide an alternative set of ARCADY model results to include them.
- 4.10. Until the model inputs are revised and justification is provided for excluding the intercept adjustment as described above, AECOM do not consider the proposed layout model to be comparable to the existing layout model that has been previously agreed.

5. Conclusion and Recommendations

- 5.1. AECOM, on behalf of Highways England have reviewed the revised layout of the proposed mitigation scheme at the A120/A131 (north) roundabout, shown in Journey Transport Planning (JTP) drawing DR10, proposed in support of the proposed development at Land at Flitch Way, Rayne, Braintree, together with the supporting ARCADY models.
- 5.2. This Technical Note (TN04) follows AECOM's previous reviews of the original Transport Assessment for the proposed development and several responses to recommendations raised.

Technical Note 05



- 5.3. Although, the repositioning of the Segregated Left Turn Lane (SLTL) has led to an improvement to the proposed layout there are still a number of areas that will require adjustments to achieve full compliance with Design Manual for Roads and Bridges, or where there are significant road safety concerns.
- 5.4. Recommendations for further adjustments to the layout are summarised below:

Roundabout

- The SLTL should be repositioned to provide a constant circulatory carriageway width;
- The entry width of the A120 EB off-slip should be reduced to an appropriate width for a two lane entry;
- The circulatory carriageway width should be reduced to a dimension appropriate for the maximum entry width (this is an existing issue but addressing it could help to resolve a number of others);
- The exit width and the lane width at the end of the physical island of the Pod's Brook Road exit from the circulatory should be increased to the recommended dimensions with an appropriate taper
- The entry path radius for the A120 EB off-slip (circulatory traffic) should be reduced to the appropriate dimension
- The achievement of the required SSD on the Pod's Brook Road approach to the junction should be confirmed

Segregated Left Turn Lane (SLTL)

- The gradient of the A120 off-slip road approaching the roundabout should be confirmed as being less than 4%;
- The SLTL carriageway width within the physical island should be increased to the value required by the minimum curve radius and should be of a constant width
- · The exit taper of the SLTL should be increased to the required value;
- The entry taper length should be reduced to the value recommended in DMRB;
- The entry and exit taper width should be reduced to the values recommended in DMRB;
- The visibility splay available to vehicles using the SLTL should be increased to provide the Stopping Sight Distance appropriate to the design speed;
- The exit geometry of the Site Access Roundabout into Pods Brook Road north should be confirmed by the Local Highway Authority as adequate to accommodate a two-lane entry from Pods Brook Road south (and if it is not, its geometry should be enhanced);
- The weaving length between the end of the SLTL and the Site Access Roundabout should be confirmed by the Local Highway Authority as adequate for their requirements.
- 5.5. The ARCADY modelling should also be reviewed with the appropriate dimensions once a layout has been approved in principle.

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Date:

051216 1248 Land at Flitch Way (Brook Green) - working m 05 December 2016 12:48:14

You will recall at our recent meeting with you and your Client, that we agreed to make provision for a working meeting to discuss with you your response to the comments made by both Essex County Council and Highways England on your recent proposals. The objective of this meeting is to ensure, as far as possible, that the next submission of technical material is substantially acceptable to both highway authorities before it is submitted.

I understand that you were to commence work straight away on a response to the highway authorities' comments and that you expected to complete this work just before Christmas. The working meeting should therefore take place within the next two weeks. (Please note: I am on annual leave from 19th December until the new year).

In order to facilitate this meeting, can I check out your availability (and that of for Tuesday 13th December. We can host, although our usual (large) meeting room will not be available. Since this is intended to be a technical meeting, I envisage it will involve a smaller group: yourself, for the form of myself; if we need to bring others in from here we can do so as and when they are required. So a meeting room seating 4 should suffice. Please let me know what you think.

Regards,



AECOM Saxon House 27 Duke Street Chelmsford, Essex CM1 1HT, UK T +1245-771200 aecom.com

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From:	
To:	
Cc:	
Subject:	051216 1613 RE: Land at Flitch Way (Brook Green) - working meeting
Date:	05 December 2016 16:13:25
Attachments:	image001.png

I am free on the afternoon of Monday 12th or any time on Thursday 14th. Not sure about

or			
Regards,			

AECOM

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Chelmsford, Essex CM1 1HT, UK
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PROPOSED RESIDENTIAL DEVELOPMENT AT BROOK GREEN, BRAINTREE – SECTION 106 AGREEMENT

ADVICE NOTE ON CONTRIBUTION TOWARDS OFF-SITE HIGHWAY WORKS

1 Introduction

- 1.1 In January 2016, an outline planning application was submitted to Braintree District Council (the District Council) for development comprising up to 1,600 residential dwellings (Class C3) on 32.75 ha of land, a 800 sqm local centre (Use Classes A1/A2/D1/D2 with no more than 200 sqm A1) on 0.29 ha of land, a 2.2 ha primary school site (Class D1), 0.65 ha of employment land (Class B1), 12.3 ha of public open space, associated highway works with a new access via Pods Brook Road and Rayne Road and demolition of nos. 27 and 29 Gilda Terrace (the Proposed Development), with all matters reserved, on land north and south of Flitch Way, Brook Green, Pods Brook Road, Braintree, Essex (the Site). The planning application was validated by the District Council on 19 January 2016 and was allocated application no. 15/01538/OUT.
- 1.2 Accompanying the planning application was an Environmental Statement and a Transport Assessment prepared by Journey Transport Planning.
- 1.3 Following consultation with the District Council and Essex County Council (the County Council), further transport assessment by Journey Transport Planning has been undertaken which has also now been subject to input from the County Council and Highways England.
- 1.4 The further transport assessment has concluded that the Proposed Development will generate additional traffic which will have an impact on the A120 which will require significant improvement works to the A120 to be carried out. Further information on this impact and on the works to the A120 that are required as a result of the Proposed Development (the Off-site Highway Works) are contained in the letter from Journey Transport Planning to GolDev dated 5 December 2016 which is attached to this note.
- 1.5 It is intended that the required works to the A120 will be secured by way of a financial contribution (the Off-site Highway Works Contribution) set out in a Section 106 Agreement with the District Council and the County Council which will be completed prior to the issue of planning permission for the Proposed Development.
- 1.6 Whilst the exact wording of the relevant provisions of the Section 106 Agreement has not yet been prepared and will, of course, need to be the subject of negotiation with the District Council and the County Council, the purpose of this note is to set out certain points of principle in relation to the Off-site Highway Works Contribution and other matters that the relevant provisions of the Section 106 Agreement would be likely to cover.
- 1.7 It is understood that the Proposed Development is the most significant development proposed for the Braintree area and, in addition, that it is the most advanced significant development scheme in terms of the progress of the planning application through the planning system.

2 Legislation and Guidance

- 2.1 The legislation and guidance relevant to the use of planning obligations is set out in a number of different places and these are briefly summarised below.
- 2.2 Section 106 of the Town and Country Planning Act 1990 (as amended) allows any person interested in land in the area of a local planning authority to enter into a planning obligation requiring a sum or sums to be paid to that authority on a specified date or dates or periodically.
- 2.3 Regulation 122 of the Community Infrastructure Levy Regulations 2010 (as amended) (the CIL Regulations) sets out that a planning obligation may only constitute a reason for granting planning permission for a development if the obligation is: (a) necessary to make the development acceptable in planning terms; (b) directly related to the development; and (c) fairly and reasonably related in scale and kind to the development.
- 2.4 The requirements set out in Regulation 122 of the CIL Regulations are reinforced by guidance in the same terms which is contained in paragraph 204 of the National Planning Policy Framework which appears in the section on planning conditions and obligations.

3 Section 106 Agreement for Proposed Development

- 3.1 By reference to the attached letter from Journey Transport Planning, it is considered that the payment of the Off-site Highway Works Contribution would satisfy the three tests set out in Regulation 122 of the CIL Regulations. This is, in particular, because of the amount of traffic which will be generated by the Proposed Development (and its impact on the A120) and also because there are unlikely to be any other proposed developments which will contribute towards the Off-site Highway Works which will be granted planning permission (with an accompanying section 106 agreement containing a contribution towards the Off-site Highway Works) before the Section 106 Agreement for the Proposed Development and it is commenced.
- 3.2 Having provided the Off-site Highway Works, the Proposed Development would have created "spare" capacity not required for its own use and thus enabling future development to come forward. Accordingly, it is accepted that it would be appropriate for other developments to make a contribution towards the cost of the Off-site Highway Works where those contributions, if secured, would then be repaid to the developer of the Proposed Development, this being fair and equitable and an acknowledgement that the Proposed Development was required to fund the entirety of the Off-site Highway Works given that it was necessary for all of those works to be carried out "up front" and that the Proposed Development was thus required to fund them as being the first relevant development to be granted planning permission.
- 3.3 In light of the point made immediately above, suggested wording is proposed (see attached) that contemplates a repayment to the developer of the Proposed Development of any contributions towards the Off-site Highway Works which the District Council and/or the County Council is able to secure from other relevant developments.

3.4 The wording attached is a modified version of a clause contained in a section 106 agreement entered into between the development consortium, East Devon District Council and Devon County Council on 29 October 2010 for a large mixed use development at Cranbrook in East Devon where permission currently exists for some 3,487 dwellings as part of a new settlement. Extracts from the Cranbrook section 106 agreement are attached to this note. This firm negotiated 106 agreement with the Councils on behalf of the development consortium and it is understood that pursuant to the relevant provisions, some £511,000 has now been returned to the development consortium following development on the Off-Site Development Land (as defined in the Cranbrook section 106 agreement) coming forward.

4 Summary

- 4.1 A planning application has been submitted to the District Council for the Proposed Development.
- 4.2 Following a subsequent transport assessment, it has been concluded that the Proposed Development will generate a level of traffic such that the Off-site Highway Works need to be carried out.
- 4.3 It is intended that the Off-site Highway Works are funded by way of the payment by the developers of the Proposed Development of an Off-site Highway Works Contribution to be secured by a Section 106 Agreement.
- 4.4 It is considered that the payment of the Off-site Highways Contribution complies with the relevant tests for planning obligations as set out in the CIL Regulations.
- 4.5 It is proposed that the Section 106 Agreement should contain a provision relating to the payment to the developers of the Proposed Development of contributions towards the Off-site Highway Works which are secured by the District Council or the County Council from other relevant development sites.
- 4.6 Wording very similar to that referred to immediately above appears in a section 106 agreement for the Cranbrook new settlement and this has led to the repayment of a contribution in a similar situation.

6 December 2016



Sent: 05 December 2016 16 10 To: Cc: Flitch Way (Brook Green) - working meetir :RE Land at Dear I will struggle with 13th I could do 12th after 10:30, or 14th or 15th Dec after 14:00 if they are any good ransportation Planning and Development -Council Please consider the environment before printing this e-mail From Sent То

You will recall at our recent meeting with you and your Client that we agreed to make provision for a working meeting to discuss with you your response to the comments made by both Essex County Council and Highways England on your recent proposals. The objective of this meeting is to ensure as far as possible that the next submission of technical material is substantially acceptable to both highway authorities before it is submitted.

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From: To: Cc:

Subject: Date: Attachments: 061216 1710 BROOK GREEN, BRAINTREE 06 December 2016 17:11:03 image002.png Advice Note - Brook Green Braintree 2.12.16.pdf 1010 06114.pdf Wording for Contributions from Off-Site Development re__Brook Green Brai....pdf document pages.pdf

Following our recent meeting, we have as agreed spoken with our solicitor and please find attached the following;

- Advice note dated today from Clark Wilmott LLP setting out their proposed strategy
- Letter from Journey Transport Planning which sets out the general picture as we see it
- Draft clause for the proposed S106 agreement, which will clearly need more drafting, but sets the scene as to how it could be drafted
- An extract with the relevant pages from a completed S106 (2010) in respect of a site in Devon, which was also drafted by Clark Wilmott LLP, which in effect has the same clause which we are presently promoting

There is no doubt that what we are proposing has been carried out elsewhere and most importantly can be achieved in respect of our site.

As we discussed we now want James from SP Broadway to start making approaches to the various members and can you please confirm that you are content that are approach is viable and that James can start arranging appointments, etc. This will establish members support for the proposed highway improvements and ultimately the development of Brook Green. I look forward to hearing from you.

Many thanks

Wayne



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Agreement relating to land north of Rockbeare, Devon (Cranbrook)

Section 106 of the Town and Country Planning Act 1990

East Devon District Council (1)

and

Devon County Council (2)

and

Taylor Wimpey Developments Limited (3)

and

Hallam Land Management Limited (4)

and

Persimmon Homes (South West) Limited (5)

and

Redrow Homes Limited (6)

and

The Owners (7)

and

-The Mortgagees (0)- Hk 22/10/10

and

Chargees (9)

0

CERTIFIED A TRUE AND COMPLETE COPY OF THE ORIGINAL
DATE: 15 November 2012
SOLICITOR'S REFERENCE: AMIG / 30762.1

One Glass Wharf, Bristol BS2 0ZX Burges Salmon LLP is regulated by The Solleltor Regulation Authority

di.

25.4 If after complying with the terms of this clause 25 and after the period referred to in clause 25.1.3 no sale has been concluded in relation to a Parcel of Land then it shall be deemed that the Owners' obligations to Market in respect of such Parcel under the Agreement shall be discharged and the Owners shall be free to deal with such Parcel as though the relevant obligations in this Agreement to Market did not exist

26 WORKS AND PAYMENTS

- 26.1 EDDC acknowledges that the works and payments that are required by the provisions of this Deed (together with the requirements of any conditions attached to the Planning Permission) constitute the whole of EDDC's planning obligation requirements in relation to the Development and that no further works or payments shall be required or sought by EDDC from the Owners in connection with or as a consequence of any reserved matters application or consent under the Planning Permission or the approval of any matter pursuant to a condition attached to the Planning Permission
- 26.2 DCC acknowledges that the works and payments that are required by the provisions of this Deed (together with the requirements of any conditions attached to the Planning Permission) constitute the whole of DCC's planning obligation requirements in relation to the Development and that no further works or payments shall be required or sought by DCC from the Owners in connection with or as a consequence of any reserved matters application or consent under the Planning Permission or the approval of any matter or the approval of any matter pursuant to a condition attached to the Planning Permission

27 CONTRIBUTIONS FROM OFF-SITE DEVELOPMENT

27.1 If such is in line with relevant EDDC and/or DCC policy prevailing from time to time and is reasonable in all the circumstances EDDC and or DCC shall secure under an agreement or undertaking made under Section 106 of the Act from the owners and/or developers of the Off-Site Development Land the payment of financial contributions towards any infrastructure premises or land provided works undertaken or other contributions paid by the Owners pursuant to this Agreement and EDDC or DCC (as the case may be) shall pay such contributions to the Owners within 28 days of receipt (and EDDC and DCC covenant that in the event of default by the owners/developers of the Off-Site Development Land such agreement or undertaking shall be enforced to secure compliance by the owners/developers of the Off-Site Development Land) **PROVIDED ALWAYS THAT** such payments are payable by the owners and/or developers of the Off-Site Development Land specifically to reimburse the Owners towards the infrastructure premises or land provided works undertaken or other contributions made pursuant to this Agreement (as opposed to any further infrastructure premises or land to be provided works to be undertaken or other contributions to be made as a requirement of a grant of planning permission for the Off-Site Development Land)

28 TOWN COUNCIL

28.1 EDDC hereby agrees and covenants with the Owners that EDDC shall undertake Corporate Governance Reviews in respect of each Phase of the Development as follows:

(a) as soon as legally possible after the grant of the Planning Permission and

(b) as soon as legally possible after the Commencement of the second Phase of the Development and

(c) as soon as legally possible after the Commencement of the third Phase of the Development

Unless otherwise agreed in writing or material considerations arising after the date of this Agreement prevent such Corporate Governance Reviews being undertaken

- 28.2 In setting the terms of reference for the Corporate Governance Reviews EDDC shall specify the relevant Phase of the Land and shall consider whether to:
 - 28.2.1 Constitute a new Parish having boundaries consistent with the boundaries of the relevant Phase of the Development by aggregating parts of the areas of existing Parishes
 - 28.2.2 Constitute a new Parish having boundaries consistent with the boundaries of the relevant Phase of the Development which is not a Parish and does not form part of an existing Parish
 - 28.2.3 Constitute a new Parish having boundaries consistent with the boundaries of the relevant Phase of the Development by the aggregation of such areas as referred to in 28.2.2 with an existing Parish
 - 28.2.4 Amalgamate two or more existing Parishes into a new Parish having boundaries consistent with the boundaries of the relevant Phase of the Development
- 28.7 In each case the aim of the terms of reference being to determine whether Parishes should be established for the area of

67

Your Ref: Our Ref: L10_06414 Date: 5th December 2016





Room 436, 4th Floor, Victoria House Chelmsford, Essex, CM1 1JR

www.journeytp.co.uk

Dear

Brook Green – Highways England A120 Improvements

Further to our recent discussions, this letter provides a summary, so far, of the ongoing traffic assessment work being carried out in connection with the development proposals for Brook Green and, specifically, details the relationship between the traffic impacts of the development and the need for the proposed Highways England slip road works on the A120 toward Braintree Freeport to the east of the site.

Following detailed additional traffic assessment work carried out in consultation with Highways England and Essex County Council, the level of traffic generated by the Brook Green development having an impact on the A120 has been determined and it has been agreed that the traffic associated with a development of 1600 dwellings at Brook Green would have a detrimental impact on the operation of the A120 and, specifically, the Galleys Corner Roundabout at Braintree Freeport to the extent that significant mitigation would be required in order to mitigate that impact.

Highways England have been working toward a significant highway improvement scheme involving the provision of western slip roads on and off the B1018 and this has been assessed as being appropriate to mitigate the impact of the additional development traffic.

It has been accepted that the development traffic will have also have a detrimental impact on the local road network and, specifically, on Braintree Town Centre. It is recognised that improvements to the A120 will have a significant beneficial effect as through traffic in Braintree will be able to re-route back onto the A120. In view of the limited potential to provide improvements given the on-site constraints at the town centre junctions, the A120 improvements are considered essential to allow the Brook Green development to come forward and will also allow the release of other strategic development sites in Braintree.

Further tests are now being undertaken to provide detail on the level of development that could be released before funding for the works on the A120 is made available.

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During discussions with Highways England, costs for the works have been estimated at around £15 million. It is currently anticipated that the Brook Green development could fund the entire works, with financial contributions, on a pro-rata basis, being provided through development on strategic sites in Braintree then coming forward.

Yours sincerely,

Director Journey Transport Planning



PROPOSED RESIDENTIAL DEVELOPMENT AT BROOK GREEN, BRAINTREE – SECTION 106 AGREEMENT

SUGGESTED WORDING RELATING TO OFF-SITE DEVELOPMENT CONTRIBUTIONS TOWARDS FUNDING OF THE OFF-SITE HIGHWAY WORKS

CONTRIBUTIONS FROM OFF-SITE DEVELOPMENT

X. If such is in line with relevant BDC and/or ECC policy prevailing from time to time and is reasonable in all the circumstances BDC and/or ECC shall secure under an agreement or undertaking made pursuant to Section 106 of the Act from the owners and/or developers of the Off-Site Development Land the [payment of financial contributions towards the Off-Site Highway Works] and BDC or ECC (as the case may be) shall pay such contributions to the Owners within 28 (twenty eight) days of receipt (and BDC and ECC covenant that in the event of default by the owners/developers of the Off-Site Development Land be enforced to secure compliance by the owners/developers of the Off-Site Development Land) **PROVIDED ALWAYS THAT** such payments are payable by the owners towards the costs of the Off-Site Highway Works (as opposed to any further infrastructure premises or land to be provided works to be undertaken or other contributions to be made as a requirement of a grant of planning permission for the Off-Site Development Land)



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From:	
To:	
Cc:	<u>e</u>
Subject:	121216 1704 Brook Green - A120/ A131 (north) roundabout improvement - Geometric Checks 15 11 16
Date:	12 December 2016 17:04:14
Attachments:	001 CHECKED.PDF 002 CHECKED.PDF 003 CHECKED.PDF

Please find attached the drawings produced during the course of our review of your previous design. These are intended to support the comments made in our Technical Note 5 in respect of both the layout's compliance with design standards and the accuracy of the measurements input into ARCADY.

Regards,

AECOM

Saxon House 27 Duke Street Chelmsford, Essex CM1 1HT, UK T +1245-771200 aecom.com

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LinkedIn Twitter Facebook Instagram

(C)	<u>k</u>
	-
141216 1959 Re: Highways	England
14 December 2016 20:20:02	
	141216 1959 Re: Highways 14 December 2016 20:20:02

Gents,

Please find attached confirmation of my SoRSA membership for 2016/17.

Membership | CIHT <membership@ciht.org.uk>

Today 02.09.16 at 10:06 Dear Thank you for contacting us. I can confirm that you were elected a member of the Society of Road Safety Auditors (SoRSA) 8 December 2008 and your membership is still current. If you have any further queries, please do not hesitate to get in touch with us on 020 7336 1571 or email membership@ciht.org.uk. Kind regards Kerry Francis www.ciht.org.uk I trust this is now in order. Regards On Wed, 14/12/16, Subject: Highways England To: Cc: Date: Wednesday, 14 December, 2016, 10:56 Highways England need to Hi confirm you as an accredited Safety Audit practitioner, if you could send your details through to at HE Cheers Journey Transport Planning LtdRoom 4364th FloorVictoria HouseChelmsfordEssexCM1 1JRDirect line: +44

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 From:
 Image: 003 png

 To:
 291216 1045 Brook Green Highways Matters

 Subject:
 291216 1045 Brook Green Highways Matters

 Date:
 29 December 2016 10:46:03

 Attachments:
 image003.png

Hi

I hope you had a good Christmas.

Please see the attached report providing a response to the matters raised in Technical Note 5 and as discussed during our meetings.

If there are any matters or items requiring further clarification please feel free to call me so we can discuss.

Best Regards and All the Best for the New Year.

R07 06414d.pdf

Director

Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR

www.journeytp.co.uk



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From: To:	
Cc:	
Subject: Date:	110117 1036 RE: Brook Green Highways Matters 11 January 2017 10:36:27
Attachments:	image001.png
Hi	ked. No the constitution tests don't include the cohecol or employment
Cheers	kedNo the sensitivity tests don't include the school or employment
Steve	
	/ [mailto:Kelly.Davis2@aecom.com]
Sent: 11 January	
То	
Cc:	
Hi	k Green Highways Matters
Thanks for your re	eply.
•	t the sensitivity test includes the school and employment land uses in terms of their traffic
generation, but th	ne school/employment uses are not proposed to be delivered in the first Phase of either
-	s? From the masterplan it's not clear how the 200/400 dwellings, school and employment
	ll be served via Rayne Road.
Kind Regards	liscuss this later today.
Kind Kegulus	
_	
From:	
Sent: 11 Januar	ý 2017 09:31
To:	
Cc:	
Subject: RE: Bro	ook Green Highways Matters
Hi	
Thanks for this.	
1. Yes the s	ensitivity test includes employment and school so is v robust
2. 400 units	can be accessed via Rayne Road.
I will forward re	e-annotated diagrams shortly.
Regards	
From:	
Sent: 11 January	2017 09:24
To:	
Cc:	
Subject: RE: Broo	k Green Highways Matters
Happy New Year and thanks for your email.

We have now agreed a task brief with Highways England to review the latest Flitch Way report. To assist us in doing so please can you provide clarification on the following:

- 1. Does the sensitivity test for the development phases with 200 / 400 dwellings include any employment land use?
- 2. Can 400 dwellings be accessed via Rayne Road only without the need for an access on Pod's Brook Road?

Please can I also request that the new traffic flow diagrams are re-labelled and re-issued with the correct date and new figure numbers to avoid confusion (Appendices 11 and 12). At present there are several different drawings with the same Figure number and date so it's difficult to check them against each other. For example there are three different 'Figure 3' diagrams each with the same date but each representing a different scenario.

Kind Regards



From:		
Sent: 29 December 2016 10:45		
То:	.>	
Cc:		
<		

Subject: Brook Green Highways Matters

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Best Regards and All the Best for the New Year.

)
Director
Journey Transport Planning Ltd
Room 436
4 th Floor
Victoria House
Chelmsford
Essex
CM1 1JR

www.journeytp.co.uk



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From: To:	
Cc:	
Subject:	110117 0931 RE: Brook Green Highways Matters
Date:	11 January 2017 09:31:39
Attachments:	image001.png

Hi Kelly

Thanks for this.

1. Yes the sensitivity test includes employment and school so is v robust

2. 400 units can be accessed via Rayne Road.

I will forward re-annotated diagrams shortly.

Regards

Steve

From:
Sent: 11 January 2017 09:24
То:
Cc:

Subject: RE: Brook Green Highways Matters

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Hi
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Happy New Year and thanks for your email.

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Kind Regards



From:			
Sent: 29 December 2016 10:45		_	
То:	1		
Cc:	Ī	1	

Subject: Brook Green Highways Matters

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Director

Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR





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From: To: Cc:

Subject: Date: Attachments: 180117 1142 RE: Brook Green, Braintree 18 January 2017 11:43:21 image002.png BROOK GREEN BRAINTREE.msg



An update as follows;

- The final LVIA is now printed and awaiting submission
- The final TIA is now printed and awaiting submission
- The ES amendments should be finished this week and all being well, all THREE reports will be formally submitted for the 21 day consultation next week.
- we are still awaiting a response from you reference my email dated 6th December attached for ease
- Once that submission has taken place, we should arrange a further meeting between us (not highways) to discuss the way forward
- SP Broadway have now started arranging meetings with members and councillors to gain their support for the proposals generally and specifically the proposed highway solution
- The only plan we have is the one as attached and do you have a better plan we can have, that will show in better detail or graphics what is proposed?
- Once the submission as above has been submitted, we will issue a press release

I look forward to hearing from you both.

Thanks



From:	
To:	
Cc:	
Subject:	180117 1252 RE: Brook Green Highways Matters
Date:	18 January 2017 12:52:35
Attachments:	image001.png

Hi

Please can you let me know when we can expect to receive the re-annotated diagrams? We have got to a point with our review where we are waiting for these before we can proceed further.

Would you also be able to send us your ARCADY models of the Springwood Drive/Rayne Road and A120 North roundabouts for the 200 dwelling sensitivity test.

We noticed that although there are traffic flow diagrams for the 400 dwelling scenario there are no ARCADY results for this. Did you run the models with 400 dwellings as well? If so, please can you also send us these models.

Thanks



From:

Sent: 11 January 2017 09:31

To: Cc:

Subject: RE: Brook Green Highways Matters

Hi

Thanks for this.

- 1. Yes the sensitivity test includes employment and school so is v robust
- 2.400 units can be accessed via Rayne Road.
- I will forward re-annotated diagrams shortly.

Regards

From: Sent: 11 January 2017 09:24 To: Cc:

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Kind Regards

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Sent: 29 December 2016 10:45

To: Cc:

Subject: Brook Green Highways Matters

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Best Regards and All the Best for the New Year.

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR

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From: To: Cc: Subject: Date: Attachments:

240117 1631 Brook Green Amended Report 24 January 2017 16:32:36 image003.png R07_06414f.pdf

Hi

As discussed please see the attached amended report following on our various discussions Ay issues please call me.

Regards

Director

Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR

www.journeytp.co.uk



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From:	
To:	
Cc:	
Subject:	250117 0845 RE: Brook Green Amended Report
Date:	25 January 2017 08:44:44
Attachments:	image001.png

Thanks we'll have a look through this and will get back to you if necessary.

Kind Regards

ards

From:

Sent: 24 January 2017 16:31

To:

Cc:

Subject: Brook Green Amended Report

Hi

As discussed please see the attached amended report following on our various discussions Ay issues please call me.

Regards

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR

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From:	
To:	
Subject:	250117 0952 RE: Brook Green Amended Report
Date:	25 January 2017 09:51:49
Attachments:	image002.png

Hi

The plans are also in the PDF report sent yesterday

Cheers

From:

Sent: 25 January 2017 09:38

To:

Subject: RE: Brook Green Amended Report

Please can you send me this as a pdf as I cant open .dwg files

Regards

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

Tel:

Web: <u>http://www.highways.gov.uk</u>

GTN

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

Tel: +

Web: <u>http://www.highways.gov.uk</u>

GTN:

Web: http://www.highways.gov.uk

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Get live traffic information at <u>http://www.trafficengland.com</u> or download our apps for free by going to the <u>iTunes store</u> or <u>Google Play</u> store

Customer Contact Centre is available 24/7 on 0300 123 5000 or info@highwaysengland.co.uk

From: Sent: 25 January 2017 08:49 To: Sent: 25 January 2017 08:49 Cc: Subject: RE: Brook Green Amended Report Thanks Sent: 25 January 2017 08:45 To: Sent: 25 January 2017 08:45 To: Sent: 25 January 2017 08:45 Subject: RE: Brook Green Amended Report

Thanks we'll have a look through this and will get back to you if necessary. Kind Regards

From:

Sent: 24 January 2017 16:31

To: Cc:

Subject: Brook Green Amended Report

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Director

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260117 1144 RE: Bro

Date: Attachments: 260117 1144 RE: Brook Green Amended Report 26 January 2017 11:43:58 image001.png

Hi

To confirm our conversation this morning:

- As I understand it you are waiting for HE and ECC agreement of the modelling and proposed mitigation measures before providing a conclusion to the report to suggest a way forward with regards to the phasing of the development;
- Table 4.3 of the report shows the Existing Layout Springwood Drive ARCADY results. The results for Pod's Brook Road are slightly different to the previous iteration of the report in the 2033 total flow scenario. You mentioned that this was probably down to a correction of the traffic flow inputs but please can you clarify that this is the case; and
- The traffic flow diagrams for the 200 dwelling scenario will be re-labelled and re-issued (Figures 1, 2, 3, 4, 11, 12, 14 and 17 are all labelled 'PM Peak 2020 Total With Mitigated Development Flows 200

Units' and Figures 15, 18 and 19 are all labelled 'PM Peak 2020 Development Flows 200 Units'). Kind Regards

From:

Sent: 25 January 2017 08:45

To: Cc:

Subject: RE: Brook Green Amended Report

Thanks we'll have a look through this and will get back to you if necessary.

Kind Regards

From: Sent: 24 January 2017 16:31 To: Cc:

Subject: Brook Green Amended Report

Hi

As discussed please see the attached amended report following on our various discussions Ay issues please call me.

Regards

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR

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From: To: Cc:

Subject: Date: Attachments: -260117 1615 RE: Brook Green Amended Report 26 January 2017 16:15:56 image001.png image004.png Net Flows 200.pdf

Hi

As discussed:

- Agreed I will await outcome of agreements prior to adopting conclusions, I suspect 200 units may be a bridge too far in queuing terms although I think to insist on the full scheme at this phase may be a requirement out of proportion with respect to the level of development being proposed
- The table is slightly different and there was a minor flow error correction but nothing else (non-material)
- Flow diagrams sorted (attached)

Regards

Director

Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR

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From:

Sent: 26 January 2017 11:44

To:

Cc:

Subject: RE: Brook Green Amended Report

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From: To: Cc:

Subject: Date: Attachments: 310117 1543 RE: Brook Green Amended Report 31 January 2017 15:43:02 image001.png image002.png

Hi

Could you possibly re-send the proposed A120 North Roundabout mitigation layout ARCADY files please? We have checked Appendix 7 of the updated response (version R07_06414f) and it looks as though the PM file included is for the existing layout. Regards,



Industrial Placement, Transportation

AECOM

Saxon House, 27 Duke Street Chelmsford, Essex, CM1 1HT, United Kingdom T +44-1245-77-1200 aecom.com

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From:

Sent: 26 January 2017 16:15

To:

Cc:

Subject: RE: Brook Green Amended Report

Hi

As discussed:

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Dear Andrew,

Further to our recent meeting, I have now had the opportunity to review your comments on our latest proposals and have discussed your comments with my clients.

We intend to continue with a segregated left turn lane and accept that it may be conditional on a TRO to divert the footpath via the proposed footbridge over Pods Brook Road, (if we don't achieve a departure from standard).

The other matters highlighted, specifically the reverse curve on the lane and the entry path curvature will be reviewed.

I will have a revised plan by the end of the week.

Regards

Director

Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR

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From: To: Cc:	
Subject: Date: Attachments:	220217 1451 RE: Flitch Way Braintree 22 February 2017 14:51:00 image003.png
Thanks	
Understood.	
Regards	
From:	
Sent: 22 February	2017 14:45
То:	
Cc:	,
	1
Subject: RE: Flitch	Way Braintree

It is for you to pursue which ever option you think you can get to work, the suggestion of signal control is just that an alternative.

I have no preference as to which solution you pursue. Only that whatever you come up with must be acceptable in terms of standard (with agreed departure if necessary although agreeing that is a long and complicated process) and works in terms of capacity and safety.

Regards

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From: Sent: 22 February 2017 14:36

To:

Cc:

Subject: RE: Flitch Way Braintree

For the sake of clarity, are you saying is that you do not believe a segregated lane is a workable solution for accommodating the development impact due to the identified design issues and that signal control of the A131 north arm and the A120 slip road with an additional lane for left turning traffic would represent a your identified preferred solution? i.e you are very unlikely to

accept a segregated left turn lane approach.? Regards

0

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From:

Sent: 22 February 2017 12:20

To:

Cc:

Subject: Flitch Way Braintree

Please find attached Aecom note 6 the content of which I agree with and I await your response

Regards

Mark

IVIAIK

Mark Norman

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW Tel: +44 (0) 300 4704938

Web: <u>http://www.highways.gov.uk</u>

GTN: 0300 470 4938

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,
230217 1114 Brook Green
23 February 2017 11:14:28
image003.png

Hi

Further to email.

It is fully understood that you wish to ensure that any proposed solutions are implementable and achieve the required outcome in terms of capacity and design. We are cognisant that the design process is iterative and lengthy by necessity however I am confident that a suitable and implementable solution exists, with this in mind would Highway England be comfortable with a Grampian style negative condition relating to the proposed mitigation to the effect that *Highways England have no objection to the proposals subject to the design of a deliverable approved mitigation scheme ensuring that the proposed development does not have a severe impact on the A120 trunk road.*

I believe this accords with the approach allowed for in the context of the applicability of planning conditions relating to off-site works.

In this way, even if permission was to be granted, the development could only be implemented if a workable approved scheme was brought forward and implemented. This would therefore protect your position and the safety and capacity of strategic road network.

I look forward to your thoughts.

Best Regards

Director Journey Transport Planning Ltd Room 436 4th Floor Victoria House Chelmsford Essex CM1 1JR

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From:		
To:		
Cc:		
Subject:	280217 1124 RE: Flitch Way Braintree	
Date:	28 February 2017 11:27:27	
Attachments:	image001.png	
	image003.png	

Thanks for coming back so quickly, even if it wasn't what i wanted to hear !!

over to you !!!!

We will attempt to find a solution before this goes to committee, as i am sure we all want to find the right solution and your approval to same.

Speak soon



From:	
Sent: 28 February 2017 11:18	
To:	
Cc:	
t.	

Subject: RE: Flitch Way Braintree

Further to our conversation yesterday, I have spoken to our policy people, unfortunately unless I have more certainty that an acceptable solution is actually achievable and deliverable I will have no choice but to recommend a refusal if I am forced to make a recommendation at this point in time.

I know this response will come as a disappointment, we are willing to continue to work with you either within or outside of the planning process to develop an acceptable solution

Regards

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F	r	o	r	r	۱	1

To: Cc:

Sent: 22 February 2017 16:19

Subject: RE: Flitch Way Braintree

I have seen the various emails between you and etc. A quick question please.

We seem to collectively be coming up with various ideas and the final solution will develop. Clearly we are confident that a solution can be achieved, especially as our site can be used to widen the slip road or provide any other amendment as needed.

We are now seeking a meeting with to discuss the matter being taken to committee in April or sooner if possible and whilst this clearly needs to be resolved and I am happy for to keep finding solutions, would it not be possible to agree that we need to find and agree a solution and fund same and the solution needs to be agreed before implementation. That way you have the safeguard that we must get this right and not develop until it is sorted and we stop spending money designing a scheme that may not get planning ! What do you think?

Thanks



Sent: 22 February 2017 14:45

To: Cc:

Subject: RE: Flitch Way Braintree

It is for you to pursue which ever option you think you can get to work, the suggestion of signal control is just that an alternative.

I have no preference as to which solution you pursue. Only that whatever you come up with must be acceptable in terms of standard (with agreed departure if necessary although agreeing that is a long and complicated process) and works in terms of capacity and safety.

Regards

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From: Sent: 22 February 2017 14:36

To:

Cc:

Subject: RE: Flitch Way Braintree

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From:

Sent: 22 February 2017 12:20

To: Cc:

Subject: Flitch Way Braintree

Please find attached Aecom note 6 the content of which I agree with and I await your response

Regards

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From:	
To:	
Cc:	

Subject: Date: Attachments: 140317 0521 BROOK GREEN, BRAINTREE 14 March 2017 05:22:37 image001.png ACO101 2301 stratacces01.pdf ACO101 2302 stratacces02.pdf ACO101 2303 stratacces03.pdf

All

More out of courtesy, please find attached our extended proposals for the Freeport A120 works. These were presented to **previously** yesterday and will be presented to the press today and as previously proposed, we are prepared to provide 100% of the funding, until such time as other developments can pick up the difference.

We have approached Freeport, who are in support of these proposals.

In the meantime, **Sector** is continuing to explore the A120 slip road alternatives into Pods Brook Road and hopefully we will find a working solution very soon.

Thanks



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Strategic Access Strategy

- New A120 off slip road providing a westbound connection between the A120 and Millennium Way improving
 access to the town centre and Freeport Village whilst giving significant relief to the Galleys Roundabout
- New A120 on slip from Millennium Way allowing easy egress west along the A120 significantly reducing traffic at the Galleys Roundabout
- Reductions in Braintree Town centre through traffic as lower levels of traffic divert to avoid Galley Roundabout
- Reduced delays at town centre junctions improving traffic flow throughout the network
- Reduction in delays to public transport
- Proposed public transport service enhancements with additional and extended services to the town centre from the development area
- Improvements to the Springwood Drive Roundabout increasing capacity and reducing delays
- Improvements to the A120 roundabout at Pods Brook Road reducing delays and improving safety

dient:

Acorn Braintree project: Brook Green, Braintree

drawing fitle: Strategic Access Plan 1

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A120 On-Slip

Signalled Approach



Plan 2 - Proposed A120 Access Improvements



Strategic Access Strategy

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- Reduction in delays to public transport ٠
- Proposed public transport service enhancements with additional and extended services to the town centre ٠ from the development area
- Improvements to the Springwood Drive Roundabout increasing capacity and reducing delays ٠
- . Improvements to the A120 roundabout at Pods Brook Road reducing delays and improving safety

client: Acorn Braintree

project: Brook Green, Braintree drawing title:

Strategic Access Plan 2

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Plan 3 - Proposed A120 Wider Benefits



Strategic Access Strategy

- New A120 off slip road providing a westbound connection between the A120 and Millennium Way improving access to the town centre and Freeport Village whilst giving significant relief to the Galleys Roundabout
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- . Proposed public transport service enhancements with additional and extended services to the town centre from the development area
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- Improvements to the A120 roundabout at Pods Brook Road reducing delays and improving safety

client:

Acorn Braintree

project: Brook Green, Braintree

drawing title: Strategic Access Plan 2

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March 2017

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Objections to homes near nature hotspot

A DEVELOPER has spoker in response to fears over his proposals for hundreds of new homes either side of a nature hotspot.

As part of the Brook Green development 1,120 flats and 480 homes would be built around the Flitch Way.

But campaigners have objected to the proposal amid concerns the homes would be visible from a great distance and would result in damage to the nature area and surrounding countryside. Residents set up the No to Brook

Green campaign to protest against the development even holding a

summer party to raise awareness. Other objections have included feared congestion, the strain on village facilities and the lack of communication. But Wayne Gold, of the Acorn

Property Group, said the team had tried to meet with the campaign group and was willing to make financial contribution. Mr Gold said

the developers appreciated the value of the Flitch Way "It is a good way for people

to walk their dogs and enjoy the countryside," he said. "We don't have any vehicles crossing over Flitch Way as it

stands, there are some pedestrian routes on to it but no vehicles transporting across Mr Gold said the buffer zone

of trees between the properties and the Flitch Way had also been widened.

The developers are now hoping a decision will be made by Braintree Council's planning committee in May.

Mr Gold said if approved the proposed 1,600 homes would be built over a period of ten years to ensure they were "commercially viable"

Mr Gold said they would appeal the decision if the plan is rejecte Developers also applied to be cted

included in Braintree Council's Local Plan but were not accepted.



CAMPAIGN: Ann Hooks and Emma Wood of No to Brook Green with petition against the homes

Brook Green developer pledges £15m for A120

Man behind plan for 1,600 homes to pay for congestion-busting scheme

By Rebecca Creed

DEVELOPERS behind plans for 1,600 homes have pledged £15 million for a new congestion-busting junction off the A120, the Times can reveal.

An outline application to build on Brook Green was submitted by Wayne Gold of the Acorn Property Group, back in December 2015.

The controversial plans to build the homes, primary school, GP surgery, employment land and open space on nearly 50 hectares of land have so far attracted 300 objection comments, along with a protest March.

Now developers have brought forward proposals for two new slip roads off the A120 at Millennium Way in Braintree.

Mr Gold estimates the project, which is the result of a year of work, will cost in the region of £15million.

The plans have been supported by nearby Freeport and could shave ten minutes off commutes

Mr Gold told the Times: "We have had objections from people living in



PLANS: How two new junctions on the A120 would look if 1,600 homes are built

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Braintree

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appointment today

Ravne over highways and the traffic problems at peak times. "This comes as the result of nearly

a year of discussions but will mean

new junctions on the A120 linking in to where Freeport is. "At peak times the A120 is rammed

because of people trying to get to

Freeport and Colchester. This will provide an alternative exit for people getting into Braintree town centre.

'We have met with agents and officers and Freeport for obvious reasons is in complete support.

"We are prepared to fund it 100 per cent."

Mr Gold said the money for the scheme would be secured via a section 106 agreement.

He added: "Once we get permission it will take probably take the county council and Highways England a year to come up with the final designs.

"We are trying to make people aware of the site and the benefits. "It will benefit the larger area of Braintree and the people who move

around Braintree at peak times. Mr Gold said he hoped people would look at the scheme "on balance" and see it as "something very positive" for congestion around the town. A decision is due in May.

> CONTACT ME: rebecca.creed@nqe.com @Becky_Creed

IN BRIEF

Fatal crash plea

A PARAMEDIC has denied causing the death of a dentist by driving an

ambulance carelessly. Faye Parson 40, was charged with one count of causing death by careless driving and appeared at Chelmsford Crown Court on Tuesday. In February last year Dr

Michael Daly was using a crossing on the A414 Main Road, Danbury, when he was struck by a vehicle.

He suffered multiple head injuries, brain damage, a shattered bone in his neck, a lung puncture, and lost movement in his hands and the function of his

right eye. Dr Daly died on June 3, four months after the crash.

Parson, of Church Street, Braintree, will go on trial at Chelmsford Crown

Court on July 3. Members of Dr Daly's family were in court to hear her deny the charge and her plea.

Colleagues from the East of England Ambulance Service NHS Trust also attended to support their colleague.

Cardiac arrest

A MAN has died after being found unconscious in the street.

Police and ambulance staff were called to the scene near Vernon Way , Braintree, shortly after 8pm on Monday, following concerns for a man's welfare.

The man was in cardiac arrest and although every effort was made by the paramedics, including the East Anglian Air Ambulance, he died at the scene.

A spokesman for the ambulance service said: "We dispatched two rapid response vehicles, an ambulance crew, ambulance officer, hazardous area response team, and air ambulance from the East Anglian Air Ambulance.

"Sadly, despite the best efforts of everyone involved, the man was pronounced dead at the scene. Our thoughts are with the friends and family involved at this time. His death is not being

treated as suspicious. A file is being prepared for the coroner.

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East of England

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From:		
To:		
Cc:		
Subject:	203017 1737 RE: BROOK GREEN, BRAINTREE	
Date:	20 March 2017 17:37:02	
Attachments:	image001.png	
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	please respond with their availability, etc	
Many thanks	· · · · · · · · · · · · · · · · · · ·	
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G From: Sent: 16 Marc To: Cc:	U: www.go oldev utd, P.O. Box 235, Radlett, Herts, WD7 OAQ n 2017 11:25	ldev.com

and I have spoken and he is finalising the latest design for the A120 exit into Pods

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Clearly we are keen to find a solution to all the highways proposals and can we please meet

week commencing 27th March to present the latest idea and agree a solution, etc

Please can someone suggest a date or even let me know what days you can't make.

I am happy to travel to Braintree or Chelmsford, so we can fix the location once we know the day.

Thanks



From:	
Sent: 14 March 2017 05:21	
To:	
Cc:	
	1

Subject: BROOK GREEN, BRAINTREE

All

More out of courtesy, please find attached our extended proposals for the Freeport A120 works. These were presented to **previously** yesterday and will be presented to the press today and as previously proposed, we are prepared to provide 100% of the funding, until such time as other developments can pick up the difference.

We have approached Freeport, who are in support of these proposals.

In the meantime, **Sector** is continuing to explore the A120 slip road alternatives into Pods Brook Road and hopefully we will find a working solution very soon.

Thanks



From	
To:	
Cc:	

Subject: Date: Attachments: 230317 1619 RE: BROOK GREEN, BRAINTREE 23 March 2017 16:19:40 image001.png

thanks

will be issuing to everyone by the latest next Wednesday and then let's try and agree a timetable and even a meeting, once you have the revised reports and plans, etc. Speak soon



From:

Sent: 23 March 2017 16:15

To: Cc:

Subject: RE: BROOK GREEN, BRAINTREE

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Regards

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From:

Sent: 23 March 2017 15:49

To: Cc:

Subject: RE: BROOK GREEN, BRAINTREE

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Are you and anyone else, available to meet next Friday 31st March, so we can either agree the revised plans or agree what other changes are required so we can find a workable solution. Thanks



Subject: RE: BROOK GREEN, BRAINTREE

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Whilst I am happy to attend a meeting I am not sure what that will achieve at this time until we receive a copy of your proposals. Whilst your offer of funding for the millennium slips is appreciated the acceptance or not of that offer is a matter of discussion and agreement with the planning authority

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Sent: 16 March 2017 11:25
To:
Cc:

Subject: RE: BROOK GREEN, BRAINTREE

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Cc:	
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From: To: Cc:	
Subject: Date: Attachments:	260317 0718 RE: BROOK GREEN, BRAINTREE 26 March 2017 07:18:41 image001.png
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From:	L 2017 00 05
Sent: 24 Marc To:	m 2017 09:05
Cc:	
Subject: DE. D	ROOK GREEN BRAINTREE
Subject: RE: B	ROOK GREEN, BRAINTREE
Once we hav	e received the info and I have had a chance to look at it I will get back t
	metable for our response and whether or not we consider a meeting wo
Regards	
Highways Eng	and Woodlands Manton Lane Bedford MK41 7LW
Web. http://w	ww.highways.gov.uk
1100. <u>1100.771</u>	
Follow Highway	s England East on Twitter 😏
Keep up to date	with our roads projects at <u>Highways England East Road Projects</u>
	nformation at http://www.trafficengland.com or download our apps for free by going to
	<u>Google Play</u> store ct Centre is available 24/7 on 0300 123 5000 or <u>info@highwaysengland.co.uk</u>
From:	
Sent: 23 March	2017 16:19
To: Cc:	
CC.	
Subject: RE: BRO	DOK GREEN, BRAINTREE

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From:		
Sent: 23 March 2017 09:29	5.0	
To:	(1 ······	
Cc:		

Subject: RE: BROOK GREEN, BRAINTREE

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From: To:	
Cc:	n
Subject: Date:	040417 1315 RE: Transport assessment response 04 April 2017 13:15:54
Attachments:	image003.png image005.png
	ven't had much time to look at second latest report ! n is really when do you think you will be able to respond as opposed to what do
you think !	This really when do you think you will be able to respond as opposed to what do
	reviously, we are both happy to attend a meeting, if that will make it easier.
Thanks	
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	GolDev
(GODEV U: WWW.goldev.com
G	Oldev Ltd, P.O. Box 235, Radlett, Herts, UD7 ORQ
From:	oldev Ltd, P.O. Box 235, Badlett, Herts, WD7 0AQ
From: Sent: 29 Marc	oldev Ltd, P.O. Box 235, Badlett, Herts, WD7 0AQ
From: Sent: 29 Marc To:	oldev Ltd, P.O. Box 235, Badlett, Herts, WD7 0AQ
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From: Sent: 29 Marc To: Cc	oldev Ltd, P.O. Box 235, Badlett, Herts, WD7 0AQ
From: Sent: 29 Marc To: Co Subject: RE: To	h 2017 16:37 ; ransport assessment response
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From: Sent: 29 Marc To: Control Contro	oldev Ltd, P.O. Box 235. Rodlett, Herts. LUD7 DAQ h 2017 16:37 ; ransport assessment response r this and Woodlands Manton Lane Bedford MK41 7LW

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From:

Sent: 29 March 2017 16:16

To: Cc:

Subject: Transport assessment response

Dear

Please see the attached report responding to the various issues raised in Technical Note 6 and our subsequent discussions.

If you have any queries, require further clarification or additional information, please feel free to contact me. I will forward the CAD dwg separately.

Best Regards

Director

Journey Transport Planning Ltd Victoria House Chelmsford Essex CM1 1JR





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From:	
To:	
Cc:	
Subject:	110417 1400 RE: Transport assessment response
Date:	11 April 2017 14:01:10
Attachments:	image001.png
Attachinents.	
	image003.png
Thanks and no	image003.png
Thanks and no	image003.png
Thanks and no	image003.png oted. ere any chance we can get your response as well, within that timescale.
Thanks and no	image003.png



Given the amount of material and past experience of this job and the Easter break it is anticipated it will not be until the end of April that we will be able to get back to you with a full response

Regards

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From: Sent: 10 April 2017 10:45 To: Cc:			
Subject: RE: Transport asses	' ssment response		
morning. Have you had a chance t	o consider timescales?		
Thanks			
G	olDev	: www.goldev.com	
Goldev Ltd, P.C From: Sent: 04 April 2017 13:1), Box 235, Aodlett, Herts, WD7 Of		
To:			1
Subject: RE: Transport a:	ssessment response		
I know you haven't had r		latest report !	
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	we are both happy to at	tend a meeting, if that will i	make i
	ID		
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	D. Box 235, Rodlett, Herts, WD7 Of		
From: Sent: 29 March 2017 16	:37		
To:			

Cc:

Subject: RE: Transport assessment response

Thank you for this

Regards

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Cc:		
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info@highwaysengland.co.uk

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From:	
To:	
Cc:	
Subject:	120417 0848 RE: Transport Assessment additional information request
Date:	12 April 2017 08:48:31
Attachments:	image001.png
	image002.png
	A120 North Model.lsg3x

Linsig Model Attached.

You will appreciate that the model is in development to an extent insofar as I wish to establish the principle that it is feasible and an acceptable approach before I spend further time on it at this stage and further tweaking in terms of design and parameters may be required. Regards

From:]
Sent: 12 April 2017 08:38
To: ______
Cc: _____
Subject: Transport Assessment additional information request
Hi
Further to yesterday's request, would you also be able to provide us with the AM Peak ARCADY
results outputs for the A120 North Roundabout please? I have just started reviewing the results

results outputs for the A120 North Roundabout please? I have just started reviewing the results and noticed that only the PM results have been included in Appendix 9 of your response. Thanks,

From:

Sent: 11 April 2017 15:58

To:

Hi

Cc:

Subject: Transport Assessment additional information request

We have now been instructed by **a t** Highways England to begin work reviewing your transport assessment response. To assist us with our review, would you please be able to provide us with the following information:

- Broomhills Industrial Estate Essex County Council confirmation: Thank you for providing the methodological clarification requested in TN06. Would you possibly be able to send us some confirmation from ECC to show that they accept the methodology used; whether that be a response from ECC to an email from yourself proposing the methodology, or alternatively the correspondence you had from ECC suggesting the method.
- **Proposed Mitigation Phasing:** The timing of the implementation of the proposed signalisation at the A120 / Pod's Brook Rd / A131 (north) roundabout relative to the phasing of the development is unclear from the document presented. At one point in the text, it suggests that the signalisation will be in place prior to the occupation of the development; at another, prior to completion of 200 dwellings. Could you please confirm specifically when you propose that the mitigation is going to be provided.
- LinSig Model: Could you please send us the proposed A120 / Pod's Brook Rd / A131 (north) roundabout mitigation LinSig file so that we can thoroughly review the model and cover off any potential issues at this early stage.

Kind regards,

Industrial Placement, Transportation

AECOM

Saxon House, 27 Duke Street Chelmsford, Essex, CM1 1HT, United Kingdom T +44-1245-77-1200 aecom.com

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From:

Sent: 29 March 2017 16:16

To:

Cc:

Subject: Transport assessment response

Dear

Please see the attached report responding to the various issues raised in Technical Note 6 and our subsequent discussions.

If you have any queries, require further clarification or additional information, please feel free to contact me. I will forward the CAD dwg separately.

Best Regards

Director Journey Transport Planning Ltd Victoria House Chelmsford Essex CM1 1JR

www.journeytp.co.uk



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From:	
То:	
Cc:	
Subject:	120417 1252 RE: Brook Green ARCADY information request
Date:	12 April 2017 12:52:52
Attachments:	image001.png
	A120 North Roundabout Exisitng Layout HE Dist AM.pdf
	A120 North Roundabout Exisitng Layout HE Dist PM.pdf
	Pages 9-10.pdf

Please see the amended ARCADY output and text confirming commitment to fund works to the slip road.

Regards

From:

Sent: 12 April 2017 12:16

To: Cc:

Subject: Brook Green ARCADY information request

Hi

Thank you for providing the requested LinSig model and ARCADY results file. We have conducted an initial review of the ARCADY files for the A120 North Roundabout and have the following observations. Would these please be addressed in accordance with any proposals as to when you would like to implement the signalised mitigation scheme.

In JTP's 'Response to Technical Note 3', dated September 2016, the following geometries and intercept adjustments were presented:

Arm	Approach road half- width (m)	Entry width (m)	Effective flare length (m)	Entry radius (m)	Inscribed circle diameter (m)	Conflict (entry) angle (deg)
PBR	3.65	7.00	15.0	45.0	65.0	28.0
A120 exit	-	-	-	-	-	-
A131 und.	7.50	7.50	0.0	20.0	65.0	20.0
A120 ent.	6.50	10.0	22.0	40.0	65.0	34.0

A120 Entry intercept adjustments: AM- 47%; PM- 70%

Based upon the above parameters, AECOM's TN04 Paragraph 5.11 states that 'AECOM consider the adjustment to the intercept values in the ARCADY models to be justified. AECOM acknowledge that the 2015 existing layout models now better represent observed levels of queuing'. As such, AECOM consider these parameters to be acceptable for use in Existing Layout ARCADY assessments.

AECOM note that JTP's 'Response to Technical Note 6', dated March 2017, the following geometries and intercept adjustments have been applied:

Arm	Approach road half- width (m)	Entry width (m)	Effective flare length (m)	Entry radius (m)	Inscribed circle diameter (m)	Conflict (entry) angle (deg)
PBR	3.65	7.00	18.0	37.5	64.0	28.0
A120 exit	-	-	-	-	-	-
A131 und.	7.30	8.20	7.1	17.6	64.0	42.0
A120 ent.	4.00	8.00	14.6	23.0	64.0	25.0

A120 Entry intercept adjustments: AM- 58%; PM- 91%

It is unclear why the geometries and adjustments applied in JTP's 'Response to Technical Note 6' have deviated from those previously agreed by AECOM in TN04. AECOM note that Para 4.2.8 of AECOM's TN06 identified a similar deviation of geometries and intercept adjustments from those previously agreed, although the geometries were different to either of those presented in this email. **AECOM recommend that JTP clarify the rationale behind any changes and provide the supporting evidence (for example if you have been able to obtain more detailed junction plans than previously used).**

In the absence of the above clarification, and in the interests of consistency, AECOM recommend that JTP utilise the geometries and intercept adjustments presented in JTP's 'Response to Technical Note 3' and agreed in AECOM's TN04. Use of these parameters for the following scenarios for both AM and PM peak hours would be an appropriate way forward:

- 2020 Base
- 2020 Base with 200 dwellings (full impact)
- 2020 Base with 200 dwellings (accounting for Travel Plan implementation)
- 2022 Base
- 2022 Base with 400 dwellings (full impact)
- 2022 Base with 400 dwellings (accounting for Travel Plan implementation)

Regards,

Industrial Placement, Transportation

AECOM

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From:	
То:	
Cc:	
Subject:	120417 1403 RE: Brook Green ARCADY information request
Date:	12 April 2017 14:03:27
Attachments:	image001.png

Thanks for the updated ARCADY files, I will get onto reviewing them soon and include any comments in our note. The extra paragraph (5.22) adequately clarifies the proposed mitigation timings.

Thank you again for your responses so far, I believe that you have covered them all except for the one relating to Broomhills Industrial Estate ('Would you possibly be able to send us some confirmation from ECC to show that they accept the methodology used; whether that be a response from ECC to an email from yourself proposing the methodology, or alternatively the correspondence you had from ECC suggesting the method.'). I don't recall a response to this question, how do you intend to address it?

Thanks,

From: Sent: 12 April 2017 12:52

To:

Cc:

Subject: RE: Brook Green ARCADY information request

Please see the amended ARCADY output and text confirming commitment to fund works to the slip road.

Regards

From:

Sent: 12 April 2017 12:16

To:

Cc:

Subject: Brook Green ARCADY information request

Hi

Thank you for providing the requested LinSig model and ARCADY results file. We have conducted an initial review of the ARCADY files for the A120 North Roundabout and have the following observations. Would these please be addressed in accordance with any proposals as to when you would like to implement the signalised mitigation scheme.

In JTP's 'Response to Technical Note 3', dated September 2016, the following geometries and intercept adjustments were presented:

Arm	Approach road half- width (m)	Entry width (m)	Effective flare length (m)	Entry radius (m)	Inscribed circle diameter (m)	Conflict (entry) angle (deg)
PBR	3.65	7.00	15.0	45.0	65.0	28.0
A120 exit	-	-	-	-	-	-
A131 und.	7.50	7.50	0.0	20.0	65.0	20.0
A120 ent.	6.50	10.0	22.0	40.0	65.0	34.0

A120 Entry intercept adjustments: AM- 47%; PM- 70%

Based upon the above parameters, AECOM's TN04 Paragraph 5.11 states that 'AECOM consider

the adjustment to the intercept values in the ARCADY models to be justified. AECOM acknowledge that the 2015 existing layout models now better represent observed levels of queuing'. As such, AECOM consider these parameters to be acceptable for use in Existing Layout ARCADY assessments.

AECOM note that JTP's 'Response to Technical Note 6', dated March 2017, the following geometries and intercept adjustments have been applied:

Arm	Approach road half- width (m)	Entry width (m)	Effective flare length (m)	Entry radius (m)	Inscribed circle diameter (m)	Conflict (entry) angle (deg)
PBR	3.65	7.00	18.0	37.5	64.0	28.0
A120 exit		1.807		e.		4
A131 und.	7.30	8.20	7.1	17.6	64.0	42.0
A120 ent.	4.00	8.00	14.6	23.0	64.0	25.0

A120 Entry intercept adjustments: AM- 58%; PM- 91%

It is unclear why the geometries and adjustments applied in JTP's 'Response to Technical Note 6' have deviated from those previously agreed by AECOM in TN04. AECOM note that Para 4.2.8 of AECOM's TN06 identified a similar deviation of geometries and intercept adjustments from those previously agreed, although the geometries were different to either of those presented in this email. <u>AECOM recommend that JTP clarify the rationale behind any changes and provide</u> the supporting evidence (for example if you have been able to obtain more detailed junction plans than previously used).

In the absence of the above clarification, and in the interests of consistency, AECOM recommend that JTP utilise the geometries and intercept adjustments presented in JTP's 'Response to Technical Note 3' and agreed in AECOM's TN04. Use of these parameters for the following scenarios for both AM and PM peak hours would be an appropriate way forward:

- 2020 Base
- 2020 Base with 200 dwellings (full impact)
- 2020 Base with 200 dwellings (accounting for Travel Plan implementation)
- 2022 Base
- 2022 Base with 400 dwellings (full impact)
- 2022 Base with 400 dwellings (accounting for Travel Plan implementation)

Regards,

Industrial Placement, Transportation

AECOM

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From:	
To:	
Cc;	
Subject:	120417 1413 RE: Transport assessment response
Date:	12 April 2017 14:14:06
Attachments:	image001.png image002.png
	image004.png

Thanks very much and I am sure will be happy to get his colouring crayons out ! If you need anything else, please just ask.

Once has made these changes, we will circulate to everyone so we are all using the same plans, etc

Regards



From:		
Sent: 11 April 2017 16:29		
То		
Cc:		

Subject: RE: Transport assessment response

Dear

Thanks for your e-mail.

I shall do my best to collate our comments in a similar timeframe and I will base this around the position statement that I issued last time we all met last year. Clearly the proposed introduction of a signal controlled junction at the Panners (A120) junction is a different approach and I will now need to engage with our signals team. Some of the data they will need to examine is the LINSIG data that the Highways England consultant will be reviewing and commenting on at the end of April so I shall need some time after that to consider implications on the Local Road network. Where proposed mitigation has changed or been revised there will also be a requirement for Stage One Road Safety Audits to be completed.

I shall require an additional drawings(s) to show the relationship in particular between the A120 junction proposals and the site access roundabout off Pods Brook Road and will contact **contract proposals** directly and copy you in.

Thanks.

Development Manager

Transportation, Planning and Development



Given the amount of material and past experience of this job and the Easter break it is anticipated it will not be until the end of April that we will be able to get back to you with a full response

Regards

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

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Sent: 10 April 2017 10:45
To:
Subject: RE: Transport assessment response
morning.
Have you had a chance to consider timescales?
Thanks
GolDev
.U: www.goldev.com
Goldev Ltd, P.O. Box 235, Rodlett, Herts, UID7 OAQ
From:
Sent: 04 April 2017 13:15
To:
Cc:
Subject: RE: Transport assessment response
I know you haven't had much time to look at least latest report !
So my question is really when do you think you will be able to respond as opposed to what do
you think !

As discussed previously, we are both happy to attend a meeting, if that will make it easier. Thanks



From:
Sent: 29 March 2017 16:37
То:
Cc:
Subject: RE: Transport assessment response
Thank you for this
Regards
Highways England Woodlands Manton Lane Bedford MK41 7LW
Tel: +
Web: http://www.highways.gov.uk
Web. http://www.hbhwdyb.bov.dk
Follow Highways England East on Twitter 💙
Keep up to date with our roads projects at Highways England East Road Projects
Get live traffic information at <u>http://www.trafficengland.com</u> or download our apps for free by going to the <u>iTunes store</u> or <u>Google Play</u> store
Customer Contact Centre is available 24/7 on 0300 123 5000 or info@highwaysengland.co.uk
From:
Sent: 29 March 2017 16:16
To:
Cc:
Subject: Transport assessment response
Dear Martin Contraction Contraction Contraction
Please see the attached report responding to the various issues raised in Technical Note 6 and
our subsequent discussions.

If you have any queries, require further clarification or additional information, please feel free to contact me. I will forward the CAD dwg separately.

Best Regards

-			
11	ro	ct	or
11	ire		01

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Full Input Data And Results Full Input Data And Results

User and Project Details

Project:	Brook Green	
Title:	A120 North Roundabout	
Location:	A120/A131 Northern Roundabout Great Notley	
Client:	Acorn	
Date Started:	10 March 2017	
Date Completed:	30 March 2017	
Model Purpose:	Scheme Evaluation	
Additional detail:		
File name:	A120 North Model.lsg3x	
Author:		
Company:	Journey Transport Planning	
Address:		

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min	
A	Traffic	1		7	7	
В	Traffic	1		7	7	

Phase Intergreens Matrix



Phases in Stage

Stream	Stage No.	Phases in Stage					
1	1	A					
1	2	в					

Full Input Data And Results



Phase Delays Stage Stream: 1

Term. Stage	Start Stage	Phase	Туре	Value	Cont value
	There are no	Phase D	elays o	lefined	

Prohibited Stage Change Stage Stream: 1



Full Input Data And Results Give-Way Lane Input Data

Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)		Opp. Lane Coeff.	Opp. Mvmnts.	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RTF	Right Turn Move up (s)	Max Turns in Intergreen (PCU)
2/1 (A131 Pods brook road entry)	4/1 (Left)	1439	0	1/3	1.09	All	-		-	-	
				5/2	1.09	All					
	6/1 (Ahead)	1439	0	1/3	1.09	All					
				5/2	1.09	All					
2/2 (A131 Pods brook road entry)	6/1 (Ahead) 1439	1420	0	1/3	1.09	All				1	
		U	5/2	1.09	All				-	1	
Full Input Data And Results Lane Input Data

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (A120 off Slip entry)	U	A	2	3	26.1	Geom	÷	3.50	0.00	Y	Arm 3 Left	Inf
1/2 (A120 off Slip entry)	U	А	2	3	60.0	Geom	÷	3.50	0.00	N	Arm 6 Right	Inf
1/3 (A120 off Slip	U	A	2	3	60.0	Geom		3.50	0.00	N	Arm 4 Ahead	Inf
entry)	Ū	, A	-	Ū	00.0	CCOM		0.00	0.00		Arm 6 Right	Inf
2/1 (A131 Pods	0		2	3	60.0	Geom		3.50	0.00	Y	Arm 4 Left	Inf
brook road entry)								0.00	0.00		Arm 6 Ahead	Inf
2/2 (A131 Pods brook road entry)	0		2	3	60.0	Geom		3.50	0.00	N	Arm 6 Ahead	Inf
3/1 (A131 Pods Brook Road Exit)	U		2	3	60.0	Geom	÷	3.50	0.00	N		
4/1 (A120 Exit on slip)	U		2	3	60.0	Inf			3-3-			÷
5/1 (A131 underbridge entry)	U	в	2	3	60.0	Geom		3.50	0.00	Y	Arm 3 Ahead	Inf
5/0											Arm 3 Ahead	Inf
5/2 (A131 underbridge	U	в	2	3	60.0	Geom	- S. 1	3.50	0.00	Ν	Arm 4 Right	Inf
entry)											Arm 6 U-Turn	Inf
6/1 (A131 underbridge exit)	U		2	3	60.0	Inf	÷	2.	2.	30	÷	

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'AM 2033 Total Flows'	08:00	09:00	01:00	·
2: 'PM Total Flows 2033'	17:00	18:00	01:00	

Scenario 1: 'New Scenario' (FG1: 'AM 2033 Total Flows', Plan 1: 'Network Control Plan 1') Traffic Flows, Desired Desired Flow :

Desile	U FIOW	
	Desti	nation
Origin		Tot.
Oligin	Tot.	1

Traffic Lane Flows

Lane	Scenario 1: New Scenario
Junction: A120 Nor	th Roundabout Braintree
1/1 (short)	405
1/2 (with short)	.567(In) 162(Out)
1/3	162
2/1	896
2/2	591
3/1	1443
4/1	591
5/1	1038
5/2	286
6/1	1511

Lane Saturation Flows

Junction: A120 North Rounda	Lane	anniee	1	1.000	Turning	harrie ([La contrata de la contrat	
Lane	Width (m)	Gradient	Nearside Lane	Allowed Turns	Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)	
1/1 (A120 off Slip entry)	3.50	0.00	Y	Arm 3 Left	Inf	100.0 %	1965	1965	
1/2 (A120 off Slip entry)	3.50	0.00	N	Arm 6 Right	Inf	100.0 %	2105	2105	
1/3	2.50		1	Arm 4 Ahead	Inf	0.0 %	0105	2105	
(A120 off Slip entry)	3.50	0.00	N	Arm 6 Right	Inf	100.0 %	2105	2105	
2/1	2.50	0.00	Y	Arm 4 Left	Inf	34.0 %	1005	1005	
(A131 Pods brook road entry)	3.50	0.00	Ŷ	Arm 6 Ahead	Inf	66.0 %	1965	1965	
2/2 (A131 Pods brook road entry)	3.50	0.00	N	Arm 6 Ahead	Inf	100.0 %	2105	2105	
3/1 (A131 Pods Brook Road Exit)	3.50	0.00	N				2105	2105	
4/1 (A120 Exit on slip Lane 1)			Infinite S	aturation Flow			Inf	Inf	
5/1 (A131 underbridge entry)	3.50	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1965	1965	
		11		Arm 3 Ahead	Inf	0.0 %			
5/2 (A131 underbridge entry)	3.50	0.00	Ν	Arm 4 Right	Inf	100.0 %	100.0 % 2105	2105	
				Arm 6 U-Turn	Inf	0.0 %			
6/1 (A131 underbridge exit Lane 1)			Infinite S	aturation Flow			Inf	Inf	

Scenario 2: 'Scenario 1' (FG2: 'PM Total Flows 2033', Plan 1: 'Network Control Plan 1') Traffic Flows, Desired Desired Flow :

	Desti	nation
Orinin		Tot.
Origin	Tot.	÷

Traffic Lane Flows

Lane	Scenario 2: Scenario 1
Junction: A120 Nort	h Roundabout Braintree
1/1 (short)	579
1/2 (with short)	1099(In) 520(Out)
1/3	520
2/1	655
2/2	655
3/1	1395
4/1	574
5/1	816
5/2	277
6/1	2053

Lane Saturation Flows

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (A120 off Slip entry)	3.50	0.00	Y	Arm 3 Left	Inf	100.0 %	1965	1965
1/2 (A120 off Slip entry)	3.50	0.00	N	Arm 6 Right	Inf	100.0 %	2105	2105
1/3 (A120 off Slip entry)	3.50	0.00	N	Arm 4 Ahead Arm 6 Right	Inf Inf	0.0 %	2105	2105
2/1 (A131 Pods brook road entry)	3.50	0.00	Y	Arm 4 Left Arm 6 Ahead	Inf Inf	45.3 % 54.7 %	1965	1965
2/2 (A131 Pods brook road entry)	3.50	0.00	N	Arm 6 Ahead	Inf	100.0 %	2105	2105
3/1 (A131 Pods Brook Road Exit)	3.50	0.00	N				2105	2105
4/1 (A120 Exit on slip Lane 1)			Infinite S	aturation Flow			Inf	Inf
5/1 (A131 underbridge entry)	3.50	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1965	1965
				Arm 3 Ahead	Inf	0.0 %	0.1-1	
5/2 (A131 underbridge entry)	3.50	0.00	Ν	Arm 4 Right	Inf	100.0 %	2105	2105
,	1.1			Arm 6 U-Turn Inf		0.0 %		
6/1 (A131 underbridge exit Lane 1)			Infinite S	aturation Flow			Inf	Inf

Scenario 1: 'New Scenario' (FG1: 'AM 2033 Total Flows', Plan 1: 'Network Control Plan 1') Stage Sequence Diagram Stage Stream: 1

1	÷	Min: 7 2		Min: 7
				F
5	23s	5	62s	₿

Stage Timings Stage Stream: 1

Stage	1	2
Duration	23	62
Change Point	0	28

Signal Timings Diagram



Full Input Data And Results Network Layout Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A120 North Roundabout		-	N/A	-			1.	1	-	-	1.6.1	1.4	85.5%
A120 North Roundabout Braintree		*	N/A	-	-		-	-	-	-			85.5%
1/2+1/1	A120 off Slip entry Left Right	U	1	N/A	A		1	23		567	2105:1965	199+496	81.6 : 81.6%
1/3	A120 off Slip entry Ahead Right	U	1	N/A	A		1	23	÷	162	2105	532	30.5%
2/1	A131 Pods brook road entry Left Ahead	0	N/A	N/A	114				-	896	1965	1048	85.5%
2/2	A131 Pods brook road entry Ahead	0	N/A	N/A	4	Î	4	-	÷	591	2105	1048	56.4%
3/1	A131 Pods Brook Road Exit	U	N/A	N/A	1.0		÷.	-		1443	2105	2105	68.6%
4/1	A120 Exit on slip	U	N/A	N/A	-	Í	-	1 -	-	591	Inf	Inf	0.0%
5/1	A131 underbridge entry Ahead	U	1	N/A	В	ĺ	1	62	÷	1038	1965	1303	79.7%
5/2	A131 underbridge entry Ahead Right U-Turn	U	1	N/A	в		1	62	-	286	2105	1396	20.5%
6/1	A131 underbridge exit	U	N/A	N/A	-		-	-		1511	Inf	Inf	0.0%

ltem	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A120 North Roundabout	18-	÷.	1362	125	0	10.6	9.0	0.0	19.6	-	1		-
A120 North Roundabout Braintree	÷		1362	125	0	10.6	9.0	0.0	19.6	-	-	+	
1/2+1/1	567	567	-	-	· •	5.1	2.1	-	7.2	45.7	10.0	2.1	12.2
1/3	162	162	-	-	-	1.3	0.2	-	1.5	33.6	3.4	0.2	3.6
2/1	896	896	821	75	0	0.3	2.8	-	3.2	12.7	6.0	2.8	8.8
2/2	591	591	541	50	0	0.1	0.6	1 -	0.8	4.6	1.8	0.6	2.5
3/1	1443	1443	-	-	-	0.0	1.1		1.1	2.7	0.0	1.1	1,1
4/1	591	591	-	-	-	0.0	0.0	1 -	0.0	0.0	0.0	0.0	0.0
5/1	1038	1038	÷	÷	-	3.3	1.9	12	5.2	18.1	19.3	1.9	21.2
5/2	286	286	1 -	1 4	-	0.5	0.1	1 +	0.6	7.9	2.9	0.1	3.1
6/1	1511	1511				0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results Scenario 2: 'Scenario 1' (FG2: 'PM Total Flows 2033', Plan 1: 'Network Control Plan 1') Stage Sequence Diagram Stage Stream: 1

1	+	Min: 7	2		Min: 7
					-
5	33s		5	52s	8

Stage Timings Stage Stream: 1

Stage	1	2
Duration	33	52
Change Point	0	38

Signal Timings Diagram



Full Input Data And Results Network Layout Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A120 North Roundabout		-	N/A	-			112			-		1.4	82.3%
A120 North Roundabout Braintree		*	N/A		-			-	÷	-		-	82.3%
1/2+1/1	A120 off Slip entry Left Right	U	1	N/A	A	Ì	1	33		1099	2105:1965	726+703	71.6 : 82.3%
1/3	A120 off Slip entry Ahead Right	U	1	N/A	A	Ì	1	33	+	520	2105	753	69.0%
2/1	A131 Pods brook road entry Left Ahead	0	N/A	N/A			1	-	-	655	1965	804	81.4%
2/2	A131 Pods brook road entry Ahead	0	N/A	N/A	-	Ì	-	-	÷	655	2105	804	81.4%
3/1	A131 Pods Brook Road Exit	U	N/A	N/A	1		÷	-		1395	2105	2105	66.3%
4/1	A120 Exit on slip	U	N/A	N/A	-	Í	-	-	-	574	Inf	Inf	0.0%
5/1	A131 underbridge entry Ahead	U	1	N/A	В	ĺ	1	52	÷.,	816	1965	1096	74.4%
5/2	A131 underbridge entry Ahead Right U-Turn	U	1	N/A	в		1	52	-	277	2105	1174	23.6%
6/1	A131 underbridge exit	U	N/A	N/A	-			-		2053	Inf	Înf	0_0%

ltem	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A120 North Roundabout	18.0	÷.	1134	176	0	19.4	9.6	0.0	29.0	1	-	191	-
A120 North Roundabout Braintree	÷		1134	176	0	19.4	9.6	0.0	29.0	-		-	
1/2+1/1	1099	1099	-	-	· ·	8.2	1.6	-	9.9	32.3	13.8	1.6	15.5
1/3	520	520	-	-	-	3.8	1.1	1 -	4.9	33.7	11.7	1.1	12.8
2/1	655	655	567	88	0	1.5	2.1	-	3.7	20.1	12.4	2.1	14.5
2/2	655	655	567	88	0	1.5	2.1	1 +	3.7	20.1	12.4	2.1	14.5
3/1	1395	1395	1 - 2 - 1	-	-	0.0	1.0		1.0	2.5	0.0	1.0	1.0
4/1	574	574	-	-	-	0.0	0.0	1 -	0.0	0.0	0.0	0.0	0.0
5/1	816	816	÷ .	÷	-	3.6	1.4		5.0	22.2	16.1	1.4	17.5
5/2	277	277	Î ~	1 -	-	0.8	0.2	1 -	1.0	12.7	3.7	0.2	3.8
6/1	2053	2053	1		·	0.0	0.0		0.0	0.0	0.0	0.0	0.0



Junctions 9
ARCADY 9 - Roundabout Module
Version: 9.0.1.4646 [] © Copyright TRL Limited, 2017
For sales and distribution information, program advice and maintenance, contact TRL: Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk

Filename: A120 North Roundabout Exisiting Layout HE Dist AM.j9 Path: C:\Users\Steve\OneDrive\Journey\Projects\2014 Projects\064_14 Brook Green\Signals Report generation date: 12/04/2017 12:26:53

»2020, AM Reassigned Base
»2022, AM Reassigned Base
»2020, AM Reassigned with 200 Units
»2022, AM Reassigned with 400 Units

Summary of junction performance

	1	AM Rea	assigr	ned B	ase	AM R	eassig	ned v	vith 2	00 Units	AM R	eassig	ned v	vith 4	00 Units
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
				A		-		2020)						
1 - Pods Brook Road North	1.7	6.86	0 63	Α	-18 %	2.1	7.83	0.67	Α	-19 %					
3 - A131 Underbridge	1.1	3.46	0 51	A	[4 - A120	1.1	3.52	0.52	A	[4 - A120					
4 - A120 Entry	78.6	437.81	1 31	F	Entry]	89.9	503.15	1.37	F	Entry]			- 1	_	
								2022	2						
1 - Pods Brook Road North	1.8	7.11	0 64	A	-20 %			1			2.8	9.56	0.73	Α	-23 %
3 - A131 Underbridge	1.2	3.56	0 52	Α	[4 - A120						1.2	3.67	0.54	A	[4 - A120
4 - A120 Entry	96.5	543.74	1.40	"F	Entry]		1.1	S	-		121.0	692.80	1.53	F	Entry]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	11/05/2016
Version	
Status	(new file)
Identifier	·
Client	
Jobnumber	Contraction of the
Enumerator	STEVE-PC\Steve
Description	



Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75			✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH mm)	Finish time (HH mm)	Time segment length (min)	Run automatically
D5	2020	AM Reassigned Base	Reassigned Flows	ONE HOUR	07:45	09:15	15	✓
D7	2022	AM Reassigned Base	Reassigned Flows	ONE HOUR	07:45	09:15	15	✓
D8	2020	AM Reassigned with 200 Units	Reassigned Flows	ONE HOUR	07:45	09:15	15	√
D9	2022	AM Reassigned with 400 Units	Reassigned Flows	ONE HOUR	07:45	09:15	15	√

Analysis Set Details

ID	Description	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	A120 North Roundabout	~	100 000	100 000



2020, AM Reassigned Base

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	A120 North Existing Roundabout	Standard Roundabout	1,2,3,4	104.70	F

Junction Network Options

Driving sid	e Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-18	4 - A120 Entry

Arms

Arms

Arm	Name	Description
1	Pods Brook Road North	
2	A120 Exit	
3	A131 Underbridge	
4	A120 Entry	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Pods Brook Road North	3 65	7.00	15.0	45.0	65 0	28.0	
2 - A120 Exit							✓
3 - A131 Underbridge	7 50	7.50	0.0	20.0	65 0	34.0	
4 - A120 Entry	6 50	10.00	22.0	40.0	65 0	34.0	

Slope / Intercept / Capacity

Arm Intercept Adjustments

Arm	Туре	Reason	Percentage intercept adjustment (%)
1 - Pods Brook Road North	None		
2 - A120 Exit			
3 - A131 Underbridge	None		
4 - A120 Entry	Percentage		47.00

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Pods Brook Road North	0.547	1756
2 - A120 Exit		
3 - A131 Underbridge	0.615	2241
4 - A120 Entry	0.697	1269

The slope and intercept shown above include any corrections and adjustments.



Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH mm)	Finish time (HH mm)	Time segment length (min)	Run automatically
D5	2020	AM Reassigned Base	Reassigned Flows	ONE HOUR	07:45	09:15	15	\checkmark

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Pods Brook Road North		ONE HOUR	✓	840	100 000
2 - A120 Exit					
3 - A131 Underbridge		ONE HOUR	✓	1034	100 000
4 - A120 Entry		ONE HOUR	✓	561	100 000

Origin-Destination Data

Demand (PCU/hr)

		То									
		1 - Pods Brook Road North 2 - A120 Exit		3 - A131 Underbridge	4 - A120 Entry						
	1 - Pods Brook Road North	5	149	686	0						
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only						
	3 - A131 Underbridge	783	250	1	0						
	4 - A120 Entry	278 0		283	0						

Vehicle Mix

Heavy Vehicle Percentages

	То										
		1 - Pods Brook Road North 2 - A120 Exit 3		3 - A131 Underbridge	4 - A120 Entry						
	1 - Pods Brook Road North	20	8	4	0						
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only						
	3 - A131 Underbridge	5	8	0	5						
	4 - A120 Entry	6	0	12	0						

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s) Max Queue (PCU)		Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Pods Brook Road North	0.63	6.86	1.7	А	771	1156
2 - A120 Exit						
3 - A131 Underbridge	0.51	3.46	1.1	А	949	1423
4 - A120 Entry	1.31	437 81	78.6	F	515	772



Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	632	158	399	1538	0.411	629	798	0.0	0.7	4.140	А
2 - A120 Exit			729				299				
3 - A131 Underbridge	778	195	4	2239	0.348	776	725	0.0	0.6	2 599	А
4 - A120 Entry	422	106	780	725	0.582	416	0	0.0	1.5	12.473	В

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	755	189	475	1496	0.505	754	953	0.7	1.1	5 072	А
2 - A120 Exit			870				358				
3 - A131 Underbridge	930	232	4	2238	0.415	929	866	0.6	0.7	2 904	А
4 - A120 Entry	504	126	933	618	0.815	494	0	1.5	4.1	29 283	D

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	925	231	511	1476	0.627	922	1098	1.1	1.7	6.779	А
2 - A120 Exit			995				439				
3 - A131 Underbridge	1138	285	5	2238	0.509	1137	990	0.7	1.1	3.453	A
4 - A120 Entry	618	154	1143	473	1.307	466	0	4.1	41.9	196.806	F

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	925	231	514	1474	0.627	925	1101	1.7	1.7	6.859	А
2 - A120 Exit			999				439				
3 - A131 Underbridge	1138	285	6	2238	0.509	1138	994	1.1	1.1	3.461	А
4 - A120 Entry	618	154	1144	472	1.310	471	0	41 9	78.6	437.807	F

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	755	189	533	1464	0.516	758	1011	1.7	1.1	5.359	А
2 - A120 Exit			931				359				
3 - A131 Underbridge	930	232	5	2238	0.415	931	927	1.1	0.8	2.913	А
4 - A120 Entry	504	126	935	617	0.817	609	0	78 6	52.5	380.461	F

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	632	158	505	1479	0.427	634	904	1.1	0.8	4.468	А
2 - A120 Exit			838				301				
3 - A131 Underbridge	778	195	4	2239	0.348	779	834	0.8	0.6	2.608	А
4 - A120 Entry	422	106	783	723	0.584	626	0	52 5	1.7	103.254	F



2022, AM Reassigned Base

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	A120 North Existing Roundabout	Standard Roundabout	1,2,3,4	129.11	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-20	4 - A120 Entry

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH mm)	Finish time (HH mm)	Time segment length (min)	Run automatically
D7	2022	AM Reassigned Base	Reassigned Flows	ONE HOUR	07:45	09:15	15	~

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Pods Brook Road North		ONE HOUR	✓	859	100 000
2 - A120 Exit					
3 - A131 Underbridge		ONE HOUR	✓	1061	100 000
4 - A120 Entry		ONE HOUR	✓	574	100 000

Origin-Destination Data

Demand (PCU/hr)

		То				
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry	
	1 - Pods Brook Road North	5	152	702	0	
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only	
	3 - A131 Underbridge	803	257	1	0	
	4 - A120 Entry	284	0	290	0	

Vehicle Mix

Heavy Vehicle Percentages

		То			
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry
	1 - Pods Brook Road North	20	8	4	0
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only
	3 - A131 Underbridge	5	8	0	5
	4 - A120 Entry	6	0	12	0



Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Pods Brook Road North	0.64	7.11	1.8	А	788	1182
2 - A120 Exit						
3 - A131 Underbridge	0.52	3.56	1.2	А	974	1460
4 - A120 Entry	1.40	543.74	96.5	F	527	790

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	647	162	409	1532	0.422	644	817	0.0	0.8	4 231	А
2 - A120 Exit			746				307				
3 - A131 Underbridge	799	200	4	2239	0.357	796	742	0.0	0.6	2 634	А
4 - A120 Entry	432	108	800	711	0.608	426	0	0.0	1.6	13.446	В

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	772	193	485	1490	0.518	771	974	0.8	1.1	5 232	А
2 - A120 Exit			889				367				
3 - A131 Underbridge	954	238	4	2238	0.426	953	884	0.6	0.8	2 959	А
4 - A120 Entry	516	129	958	602	0.858	502	0	1.6	5.1	35 312	E

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	946	236	510	1477	0.641	943	1110	1.1	1.8	7.029	А
2 - A120 Exit			1003				449				
3 - A131 Underbridge	1168	292	5	2238	0.522	1167	998	0.8	1.1	3.549	А
4 - A120 Entry	632	158	1172	452	1.399	448	0	5.1	51.1	245.057	F

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	946	236	512	1476	0.641	946	1113	1.8	1.8	7.113	А
2 - A120 Exit			1007				450				
3 - A131 Underbridge	1168	292	6	2238	0.522	1168	1002	1.1	1.2	3.557	А
4 - A120 Entry	632	158	1174	451	1.402	451	0	51.1	96.5	543.745	F



08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	772	193	532	1465	0.527	775	1021	1.8	1.2	5.489	Α
2 - A120 Exit			938				369				
3 - A131 Underbridge	954	238	5	2238	0.426	955	934	1.2	0.8	2.968	A
4 - A120 Entry	516	129	960	600	0.860	593	0	96 5	77.2	506.626	F

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	647	162	548	1456	0.444	648	955	1.2	0.8	4.677	А
2 - A120 Exit			887				308				
3 - A131 Underbridge	799	200	4	2239	0.357	800	884	0.8	0.6	2.645	А
4 - A120 Entry	432	108	803	709	0.609	699	0	77 2	10.4	232.331	F



2020, AM Reassigned with 200 Units

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	A120 North Existing Roundabout	Standard Roundabout	1,2,3,4	117.76	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-19	4 - A120 Entry

Traffic Demand

Demand Set Details

I	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH mm)	Finish time (HH mm)	Time segment length (min)	Run automatically
D	8 2020	AM Reassigned with 200 Units	Reassigned Flows	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over turn Vehicle mix varies over entry		PCU Factor for a HV (PCU)	
✓	✓	HV Percentages	2.00	

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Pods Brook Road North		ONE HOUR	✓	907	100 000
2 - A120 Exit					
3 - A131 Underbridge		ONE HOUR	✓	1050	100 000
4 - A120 Entry		ONE HOUR	✓	570	100 000

Origin-Destination Data

Demand (PCU/hr)

		То			
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry
	1 - Pods Brook Road North	5	166	736	0
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only
	3 - A131 Underbridge	799	250	1	0
	4 - A120 Entry	287	0	283	0

Vehicle Mix

Heavy Vehicle Percentages

		То			
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry
	1 - Pods Brook Road North	20	8	4	0
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only
	3 - A131 Underbridge	5	8	0	5
	4 - A120 Entry	6	0	12	0



Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Pods Brook Road North	0.67	7.83	2.1	А	832	1248
2 - A120 Exit						
3 - A131 Underbridge	0.52	3.52	1.1	А	963	1445
4 - A120 Entry	1.37	503.15	89.9	F	523	785

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	683	171	398	1538	0.444	680	816	0.0	0.8	4 379	А
2 - A120 Exit			766				312				
3 - A131 Underbridge	790	198	4	2239	0.353	788	762	0.0	0.6	2 618	А
4 - A120 Entry	429	107	792	717	0.598	423	0	0.0	1.6	13 067	В

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	815	204	474	1497	0.545	814	974	0.8	1.2	5 511	А
2 - A120 Exit			914				373				
3 - A131 Underbridge	944	236	4	2238	0.422	943	909	0.6	0.8	2 936	A
4 - A120 Entry	512	128	948	608	0.842	500	0	1.6	4.7	32 872	D

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	999	250	502	1481	0.674	995	1114	1.2	2.1	7.709	А
2 - A120 Exit			1040				457				
3 - A131 Underbridge	1156	289	5	2238	0.517	1155	1035	0.8	1.1	3.509	А
4 - A120 Entry	628	157	1160	460	1.363	456	0	4.7	47.7	226.030	F

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	999	250	504	1480	0.675	999	1116	2.1	2.1	7.833	А
2 - A120 Exit			1045				458				
3 - A131 Underbridge	1156	289	6	2238	0.517	1156	1039	1.1	1.1	3.517	А
4 - A120 Entry	628	157	1162	459	1.366	459	0	47.7	89.9	503.149	F



08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	815	204	524	1469	0.555	819	1026	2.1	1.3	5.830	Α
2 - A120 Exit			967				375				
3 - A131 Underbridge	944	236	5	2238	0.422	945	963	1.1	0.8	2.945	A
4 - A120 Entry	512	128	950	607	0.844	600	0	89 9	68.1	459.147	F

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	683	171	533	1464	0.466	684	955	1.3	0.9	4.850	А
2 - A120 Exit			904				314				
3 - A131 Underbridge	790	198	4	2239	0.353	791	900	0.8	0.6	2.631	А
4 - A120 Entry	429	107	795	715	0.600	693	0	68.1	2.2	181.884	F





2022, AM Reassigned with 400 Units

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	A120 North Existing Roundabout	Standard Roundabout	1,2,3,4	158.71	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-23	4 - A120 Entry

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH mm)	Finish time (HH mm)	Time segment length (min)	Run automatically
D9	2022	AM Reassigned with 400 Units	Reassigned Flows	ONE HOUR	07:45	09:15	15	~

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	~	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Pods Brook Road North		ONE HOUR	✓	992	100 000
2 - A120 Exit					
3 - A131 Underbridge		ONE HOUR	✓	1092	100 000
4 - A120 Entry		ONE HOUR	✓	594	100 000

Origin-Destination Data

Demand (PCU/hr)

		То			
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry
	1 - Pods Brook Road North	5	186	801	0
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only
	3 - A131 Underbridge	834	257	1	0
	4 - A120 Entry	304	0	290	0

Vehicle Mix

Heavy Vehicle Percentages

		То			
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry
	1 - Pods Brook Road North	20	8	4	0
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only
	3 - A131 Underbridge	5	8	0	5
	4 - A120 Entry	6	0	12	0



Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Pods Brook Road North	0.73	9.56	2.8	А	910	1365
2 - A120 Exit						
3 - A131 Underbridge	0.54	3.67	1.2	А	1002	1503
4 - A120 Entry	1.53	692 80	121.0	F	545	818

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	747	187	408	1532	0.487	743	855	0.0	1.0	4.755	А
2 - A120 Exit			819				332				
3 - A131 Underbridge	822	206	4	2239	0.367	820	815	0.0	0.6	2 676	А
4 - A120 Entry	447	112	823	695	0.643	440	0	0.0	1.9	14 941	В

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	892	223	482	1492	0.598	890	1016	1.0	1.5	6 240	А
2 - A120 Exit			974				398				
3 - A131 Underbridge	982	245	4	2238	0.439	981	969	0.6	0.8	3 024	А
4 - A120 Entry	534	133	985	582	0.917	512	0	1.9	7.3	46 376	E

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	1092	273	492	1487	0.735	1087	1141	1.5	2.8	9.325	А
2 - A120 Exit			1092				486				
3 - A131 Underbridge	1202	301	5	2238	0.537	1201	1087	0.8	1.2	3.665	А
4 - A120 Entry	654	164	1206	428	1.527	426	0	7.3	64.2	320.634	F

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	1092	273	492	1486	0.735	1092	1142	2.8	2.8	9.556	А
2 - A120 Exit			1097				488				
3 - A131 Underbridge	1202	301	6	2238	0.537	1202	1091	1.2	1.2	3.674	А
4 - A120 Entry	654	164	1208	427	1.531	427	0	64 2	121.0	692.797	F



08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	892	223	513	1475	0.605	897	1050	2.8	1.6	6.577	Α
2 - A120 Exit			1010				400				
3 - A131 Underbridge	982	245	5	2238	0.439	983	1006	1.2	0.8	3.037	A
4 - A120 Entry	534	133	988	580	0.920	575	0	121.0	110.7	679.050	F

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	747	187	529	1466	0.509	749	983	1.6	1.1	5.278	А
2 - A120 Exit			944				334				
3 - A131 Underbridge	822	206	4	2239	0.367	823	940	0.8	0.6	2.690	А
4 - A120 Entry	447	112	827	693	0.646	686	0	110.7	51.0	427.307	F



Junctions 9
ARCADY 9 - Roundabout Module
Version: 9.0.1.4646 [] © Copyright TRL Limited, 2017
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Filename: A120 North Roundabout Exisiting Layout HE Dist PM.j9 Path: C:\Users\Steve\OneDrive\Journey\Projects\2014 Projects\064_14 Brook Green\Signals Report generation date: 12/04/2017 12:30:05

»2020, PM Reassigned Base
»2022, PM Reassigned Base
»2020, PM Reassigned with 200 Units
»2022, PM Reassigned with 400 Units

Summary of junction performance

	F	M Rea	assig	ned B	lase	PM R	eassig	ned v	vith 2	00 Units	PM R	eassig	ned v	vith 4	00 Units
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
								202	0						
1 - Pods Brook Road North	8.6	33.23	0 91	D	-5 %	10.7	40.00	0.93	E	-7 %					
3 - A131 Underbridge	0.5	2.30	0 32	A	[4 - A120	0.5	2 36	0.34	A	[4 - A120					
4 - A120 Entry	25.3	67.26	1 00	F	Entry]	42.2	102.57	1.04	F	Entry]					
								202	2						
1 - Pods Brook Road North	11.1	42.06	0 94	E	-7 %				-	1	17.2	59.17	0.98	F	-12 %
3 - A131 Underbridge	0.5	2.33	0 33	A	[4 - A120		1			-	0.6	2.46	0.36	A	[4 - A120
4 - A120 Entry	40.5	98.15	1 03	F	Entry]		L	1		-	86.4	192.59	1.12	F	Entry]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	11/05/2016
Version	
Status	(new file)
Identifier	·
Client	
Jobnumber	in the second second
Enumerator	STEVE-PC\Steve
Description	



Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75			✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH mm)	Finish time (HH mm)	Time segment length (min)	Run automatically
D6	2020	PM Reassigned Base	ONE HOUR	16:45	18:15	15	✓
D8	2022	PM Reassigned Base	ONE HOUR	16:45	18:15	15	✓
D9	2020	PM Reassigned with 200 Units	ONE HOUR	16:45	18:15	15	✓
D10	2022	PM Reassigned with 400 Units	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Description	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A 1	A120 North Roundabout	✓	100 000	100 000



2020, PM Reassigned Base

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

[Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
	1	A120 North Existing Roundabout	Standard Roundabout	1,2,3,4	40.61	E

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-5	4 - A120 Entry

Arms

Arms

Arm	Name	Description
1	Pods Brook Road North	
2	A120 Exit	
3	A131 Underbridge	
4	A120 Entry	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Pods Brook Road North	3 65	7.00	15.0	45.0	65 0	28.0	
2 - A120 Exit							✓
3 - A131 Underbridge	7 50	7.50	0.0	20.0	65 0	20.0	
4 - A120 Entry	6 50	10.00	22.0	40.0	65 0	34.0	

Slope / Intercept / Capacity

Arm Intercept Adjustments

Arm	Туре	Reason	Percentage intercept adjustment (%)
1 - Pods Brook Road North	None		
2 - A120 Exit			
3 - A131 Underbridge	None		
4 - A120 Entry	Percentage		70.00

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Pods Brook Road North	0.547	1756
2 - A120 Exit		
3 - A131 Underbridge	0.646	2351
4 - A120 Entry	0.697	1890

The slope and intercept shown above include any corrections and adjustments.



Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH mm)	Finish time (HH mm)	Time segment length (min)	Run automatically
D6	2020	PM Reassigned Base	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)		
✓	~	HV Percentages	2.00		

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Pods Brook Road North		ONE HOUR	✓	899	100 000
2 - A120 Exit					
3 - A131 Underbridge		ONE HOUR	✓	686	100 000
4 - A120 Entry		ONE HOUR	✓	1235	100 000

Origin-Destination Data

Demand (PCU/hr)

		То			
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry
	1 - Pods Brook Road North	1	197	701	0
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only
	3 - A131 Underbridge	447	237	2	0
	4 - A120 Entry	344	0	891	0

Vehicle Mix

Heavy Vehicle Percentages

		То			
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry
	1 - Pods Brook Road North	0	3	2	0
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only
	3 - A131 Underbridge	2	2	50	0
	4 - A120 Entry	4	0	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max delay (s) Max Queue (PCU)		Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Pods Brook Road North	0.91	33.23	8.6	D	825	1237
2 - A120 Exit						
3 - A131 Underbridge	0.32	2.30	0.5	А	629	944
4 - A120 Entry	1.00	67.26	25.3	F	1133	1700



Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	677	169	846	1293	0.524	672	594	0.0	1.1	5.891	А
2 - A120 Exit			1193				325				
3 - A131 Underbridge	516	129	0.75	2351	0.220	515	1192	0.0	0.3	2.001	А
4 - A120 Entry	930	232	516	1531	0.607	924	0	0.0	1.6	6.022	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	808	202	1011	1202	0.672	804	710	1.1	2.0	9.167	А
2 - A120 Exit			1426				389				
3 - A131 Underbridge	617	154	0.89	2351	0.262	616	1426	0.3	0.4	2.119	А
4 - A120 Entry	1110	278	617	1460	0.760	1104	0	1.6	3.1	10.196	В

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	990	247	1201	1098	0.901	969	855	2.0	7.2	25 244	D
2 - A120 Exit			1697				473				
3 - A131 Underbridge	755	189	1	2351	0.321	755	1696	0.4	0.5	2 303	А
4 - A120 Entry	1360	340	756	1363	0.997	1300	0	3.1	18.1	40.132	E

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	990	247	1223	1086	0.911	984	864	7.2	8.6	33 226	D
2 - A120 Exit			1731				477				
3 - A131 Underbridge	755	189	1	2351	0.321	755	1730	0.5	0.5	2 303	А
4 - A120 Entry	1360	340	756	1363	0.998	1331	0	18.1	25.3	67 264	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	808	202	1079	1165	0.694	833	737	8.6	2.4	11 835	В
2 - A120 Exit			1516				396				
3 - A131 Underbridge	617	154	0.93	2351	0.262	617	1515	0.5	0.4	2.120	А
4 - A120 Entry	1110	278	618	1459	0.761	1198	0	25.3	3.5	18 592	С

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	677	169	856	1287	0.526	682	599	2.4	1.1	6.127	А
2 - A120 Exit			1210				328				
3 - A131 Underbridge	516	129	0.76	2351	0.220	517	1209	0.4	0.3	2.003	А
4 - A120 Entry	930	232	518	1529	0.608	937	0	3.5	1.6	6.309	А



2022, PM Reassigned Base

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	A120 North Existing Roundabout	Standard Roundabout	1,2,3,4	56.99	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-7	4 - A120 Entry

Traffic Demand

Demand Set Details

ID	Scenario name	Scenario name Time Period name		Traffic profile type Start time (HH mm)		Time segment length (min)	Run automatically
D8	2022	PM Reassigned Base	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)	
✓	✓	HV Percentages	2.00	

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Pods Brook Road North		ONE HOUR	~	921	100 000
2 - A120 Exit					
3 - A131 Underbridge		ONE HOUR	✓	703	100 000
4 - A120 Entry		ONE HOUR	✓	1268	100 000

Origin-Destination Data

Demand (PCU/hr)

	То											
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry							
	1 - Pods Brook Road North	1	202	718	0							
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only							
	3 - A131 Underbridge	458	243	2	0							
	4 - A120 Entry	353	0	915	0							

Vehicle Mix

Heavy Vehicle Percentages

		То			
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry
	1 - Pods Brook Road North	0	3	2	0
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only
	3 - A131 Underbridge	2	2	50	0
	4 - A120 Entry	4	0	2	0



Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Pods Brook Road North	0.94	42.06	11.1	E	845	1268
2 - A120 Exit						
3 - A131 Underbridge	0.33	2.33	0.5	А	645	968
4 - A120 Entry	1.03	98.15	40.5	F	1164	1745

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	693	173	868	1281	0.541	689	609	0.0	1.2	6.167	А
2 - A120 Exit			1223				334				
3 - A131 Underbridge	529	132	0.75	2351	0.225	528	1222	0.0	0.3	2.015	А
4 - A120 Entry	955	239	529	1522	0.627	948	0	0.0	1.7	6.362	А

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	828	207	1037	1188	0.697	824	728	1.2	2.3	9 981	А
2 - A120 Exit			1462				399				
3 - A131 Underbridge	632	158	0.89	2351	0.269	632	1461	0.3	0.4	2.137	А
4 - A120 Entry	1140	285	633	1449	0.787	1132	0	1.7	3.6	11 384	В

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	1014	254	1214	1091	0.929	987	869	2.3	8.9	29 831	D
2 - A120 Exit			1717				484				
3 - A131 Underbridge	774	194	1	2351	0.329	774	1716	0.4	0.5	2 330	А
4 - A120 Entry	1396	349	775	1350	1.034	1308	0	3.6	25.5	51.453	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	1014	254	1234	1080	0.939	1005	877	8.9	11.1	42 057	E
2 - A120 Exit			1751				488				
3 - A131 Underbridge	774	194	1	2351	0.329	774	1750	0.5	0.5	2 330	Α
4 - A120 Entry	1396	349	775	1350	1.034	1336	0	25.5	40.5	98.152	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	828	207	1148	1127	0.734	861	771	11.1	3.0	15 293	С
2 - A120 Exit			1601				407				
3 - A131 Underbridge	632	158	0.93	2351	0.269	632	1600	0.5	0.4	2.140	А
4 - A120 Entry	1140	285	633	1449	0.787	1285	0	40.5	4.2	37.716	Е



18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	693	173	880	1274	0.544	700	614	3.0	1.2	6.490	А
2 - A120 Exit			1244				337				
3 - A131 Underbridge	529	132	0.76	2351	0.225	530	1243	0.4	0.3	2.019	А
4 - A120 Entry	955	239	530	1521	0.628	964	0	4.2	1.8	6.745	А



2020, PM Reassigned with 200 Units

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	A120 North Existing Roundabout	Standard Roundabout	1,2,3,4	57.66	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-7	4 - A120 Entry

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type			Time segment length (min)	Run automatically
D9	2020	PM Reassigned with 200 Units	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Pods Brook Road North		ONE HOUR	~	933	100 000
2 - A120 Exit					
3 - A131 Underbridge		ONE HOUR	✓	724	100 000
4 - A120 Entry		ONE HOUR	✓	1258	100 000

Origin-Destination Data

Demand (PCU/hr)

		То			
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry
	1 - Pods Brook Road North	1	206	726	0
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only
	3 - A131 Underbridge	485	237	2	0
	4 - A120 Entry	367	0	891	0

Vehicle Mix

Heavy Vehicle Percentages

		То				
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry	
	1 - Pods Brook Road North	0	3	2	0	
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only	
	3 - A131 Underbridge	2	2	50	0	
	4 - A120 Entry	4	0	2	0	



Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Pods Brook Road North	0.93	40.00	10.7	E	856	1284
2 - A120 Exit						
3 - A131 Underbridge	0.34	2.36	0.5	А	664	997
4 - A120 Entry	1.04	102 57	42.2	F	1154	1732

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	702	176	846	1293	0.543	698	639	0.0	1.2	6.133	А
2 - A120 Exit			1211				332				
3 - A131 Underbridge	545	136	0.75	2351	0.232	544	1210	0.0	0.3	2.033	А
4 - A120 Entry	947	237	545	1511	0.627	940	0	0.0	1.7	6.403	Α

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	839	210	1010	1203	0.697	834	764	1.2	2.3	9 877	А
2 - A120 Exit			1448				397				
3 - A131 Underbridge	651	163	0.89	2351	0.277	651	1447	0.3	0.4	2.161	А
4 - A120 Entry	1131	283	651	1436	0.787	1123	0	1.7	3.6	11 531	В

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	1027	257	1180	1110	0.925	1001	912	2.3	8.7	28 850	D
2 - A120 Exit			1699				482				
3 - A131 Underbridge	797	199	1	2351	0.339	797	1698	0.4	0.5	2 365	А
4 - A120 Entry	1385	346	798	1334	1.038	1294	0	3.6	26.3	53 097	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	1027	257	1199	1099	0.934	1019	921	8.7	10.7	40.005	E
2 - A120 Exit			1732				486				
3 - A131 Underbridge	797	199	1	2351	0.339	797	1731	0.5	0.5	2.365	А
4 - A120 Entry	1385	346	798	1334	1.038	1321	0	26 3	42.2	102.567	F



17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	839	210	1124	1141	0.735	870	812	10.7	3.0	14 958	В
2 - A120 Exit			1588				405				
3 - A131 Underbridge	651	163	0.93	2351	0.277	651	1587	0.5	0.4	2.164	А
4 - A120 Entry	1131	283	652	1436	0.788	1283	0	42.2	4.2	41.164	E

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	702	176	858	1286	0.546	709	645	3.0	1.2	6.455	А
2 - A120 Exit			1232				335				
3 - A131 Underbridge	545	136	0.76	2351	0.232	545	1231	0.4	0.3	2.035	А
4 - A120 Entry	947	237	546	1510	0.627	957	0	4.2	1.8	6.795	А



2022, PM Reassigned with 400 Units

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	A120 North Existing Roundabout	Standard Roundabout	1,2,3,4	101.72	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-12	4 - A120 Entry

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH mm)	Finish time (HH mm)	Time segment length (min)	Run automatically
D10	2022	PM Reassigned with 400 Units	ONE HOUR	16:45	18:15	15	\checkmark

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Pods Brook Road North		ONE HOUR	✓	989	100 000
2 - A120 Exit					
3 - A131 Underbridge		ONE HOUR	✓	778	100 000
4 - A120 Entry		ONE HOUR	✓	1313	100 000

Origin-Destination Data

Demand (PCU/hr)

		То										
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry							
	1 - Pods Brook Road North	1	219	769	0							
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only							
	3 - A131 Underbridge	533	243	2	0							
	4 - A120 Entry	398	0	915	0							

Vehicle Mix

Heavy Vehicle Percentages

		То										
		1 - Pods Brook Road North	2 - A120 Exit	3 - A131 Underbridge	4 - A120 Entry							
	1 - Pods Brook Road North	0	3	2	0							
From	2 - A120 Exit	Exit-only	Exit-only	Exit-only	Exit-only							
	3 - A131 Underbridge	2	2	50	0							
	4 - A120 Entry	4	0	2	0							



Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Pods Brook Road North	0.98	59.17	17.2	F	908	1361
2 - A120 Exit						
3 - A131 Underbridge	0.36	2.46	0.6	А	714	1071
4 - A120 Entry	1.12	192 59	86.4	F	1205	1807

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	745	186	867	1281	0.581	739	698	0.0	1.4	6.722	А
2 - A120 Exit			1260				346				
3 - A131 Underbridge	586	146	0.75	2351	0.249	584	1259	0.0	0.3	2.080	А
4 - A120 Entry	988	247	585	1482	0.667	980	0	0.0	2.0	7.250	Α

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	889	222	1035	1189	0.747	883	834	1.4	2.9	11.789	В
2 - A120 Exit			1504				414				
3 - A131 Underbridge	699	175	0.89	2351	0.298	699	1503	0.3	0.4	2 225	А
4 - A120 Entry	1180	295	700	1402	0.842	1169	0	2.0	4.9	15 092	С

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	1089	272	1159	1122	0.971	1049	974	2.9	12.9	38.147	Е
2 - A120 Exit			1708				500				
3 - A131 Underbridge	857	214	1	2351	0.364	856	1707	0.4	0.6	2.457	А
4 - A120 Entry	1446	361	857	1293	1.118	1276	0	4.9	47.4	84 973	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	1089	272	1169	1116	0.976	1072	979	12 9	17.2	59.170	F
2 - A120 Exit			1736				505				
3 - A131 Underbridge	857	214	1	2351	0.364	857	1734	0.6	0.6	2.459	А
4 - A120 Entry	1446	361	858	1292	1.119	1290	0	47.4	86.4	192.591	F



17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	889	222	1186	1107	0.803	940	900	17 2	4.6	26.772	D
2 - A120 Exit			1699				427				
3 - A131 Underbridge	699	175	0.95	2351	0.298	700	1698	0.6	0.4	2.226	A
4 - A120 Entry	1180	295	701	1402	0.842	1385	0	86.4	35.2	160.498	F

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
1 - Pods Brook Road North	745	186	966	1227	0.607	757	742	4.6	1.6	8 008	А
2 - A120 Exit			1371				351				
3 - A131 Underbridge	586	146	0.76	2351	0.249	586	1371	0.4	0.3	2 084	А
4 - A120 Entry	988	247	587	1481	0.667	1121	0	35.2	2.1	14 690	В



AM	2020 200 Units	0.67	2.1	0.52	1.1	1.37	89.9
PM	2020 200 Units	0.93	10.7	0.34	0.5	1.04	42.2

- 5.12 The ARCADY assessment indicates that the addition of the traffic generated by an initial phase of 200 units would result in increased queuing at the junction and specifically on the A120 slip road.
- 5.13 The ARCADY indicates that the level of queuing on the A120 slip road during the AM peak would already exceed the length of the slip road without the addition of the development traffic during the 2020 with committed development scenario. In view of this, improvements to the A120 off slip road approach to the A120 north roundabout would be required in 2020 without any development at Brook Green.
- 5.14 The ARCADY results indicate that the addition of the traffic associated with 200 units at Brook Green would marginally add to the queue already on the slip road.
- 5.15 Notwithstanding the fact that the queue at 2020 would be a pre-existing issue and the fact that the development traffic associated with 200 units would only lead to a marginal increase of that queue, it is proposed that the development would fund improvements identified in 4.4 above to the slip road prior to the completion of 200 units.
- 5.16 The north roundabout ARCADY results are held in Appendix 9.
- 5.17 The impact of a 400 unit phase in 2020 has also been assessed in the context of the operation of the A120 north roundabout junction. The network flow diagrams for 400 units are held in Appendix 10.
- 5.18 **Table 5.3** below provides a summary of the ARCADY assessment of the A120 North Roundabout assuming 400 residential units off Rayne Road.

 Table 5.3
 A120 North Roundabout Existing Layout ARCADY Summary 400 Units

		Pods Brook Rd		A131 Und	A120 Entry		
	and a second	RFC	Q	RFC	Q	RFC	Q
AM	2022 Base	0.64	1.8	0.52	1.2	1.40	96.5
PM	2022 Base	0.94	11.1	0.33	0.5	1.03	40.5
AM	2022 400 Units	0.73	2.8	0.54	1.2	1.53	121.0
PM	2022 400 Units	0.98	17.2	0.36	0.6	1.12	86.4

- 5.19 The ARCADY assessment indicates that the addition of the traffic generated by an initial phase of 400 units would result in increased queuing at the junction and specifically on the A120 slip road.
- 5.20 The ARCADY indicates that the level of queuing on the A120 slip road during the AM peak would already exceed the length of the slip road without the addition of the development traffic during



the 2022 with committed development scenario. In view of this, improvements to the A120 off slip road approach to the A120 north roundabout would be required in 2022 without any development at Brook Green.

- 5.21 The ARCADY results indicate that the addition of the traffic associated with 400 units at Brook Green would significantly add to the queue already on the slip road and as such would require some mitigation.
- 5.22 Given that background growth in 2020 would be likely to lead to a situation whereby queuing would extend beyond the slip road length and additional traffic associated with either 200 or 400 units would compound that situation, the development would bring forward the aforementioned improvement prior to 2020 or the occupation of 200 units, whichever is the sooner.