

Project	South Caldecotte		
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1 Introduction

- 1.1 BWB Consulting Ltd (BWB) has been appointed by Hampton Brook (UK) Ltd (The Client) to produce a microsimulation traffic model of the A5 junction, also known as Kelly's Kitchen roundabout, in support of an outline planning application for an employment development. The site is located to the west of V10 Brickhill Street in Danesborough & Walton, Milton Keynes.
- 1.2 A copy of the VISSIM base model as well as the forecast year scenarios was submitted to, HE on 16th December 2019 for AECOM to review. Subsequently, comments were forwarded by HE on 29th January 2020 detailing that changes were required to the future year scenarios to provide a robust model for analysis.
- 1.3 This Technical Note has been produced to outline the changes made and provide updated results illustrating the impact on the highway network.

2 Model Changes

- 2.1 The following changes have been made to the model:
 - i. Vehicle routing has been updated to ensure compliance with committed scheme drawing.
 - ii. Emergency stopping distance has been increased on A5 North and South approaches respectively to stop lane changes in hatched areas.
 - iii. Minimum green times have been set to 7 seconds to enable faster clearance of circulatory carriageway. However, issues were still particularly noticed on the A4146 approach arm. Therefore, maximum green times have been restricted at this however due to the three-stage sequence northbound of this arm, there is delay in clearing the queue at times.
 - iv. Priority rule has been added at A4146 approach to restrict overlapping of vehicles with the circulatory carriageway.
- 2.2 Based on the changes above the models were rerun and subsequently the following mitigation measures have been proposed:
 - i. Two lane exit merge northbound of Tilbrook Roundabout

- ii. Alterations of road markings on committed Kelly's Kitchen scheme on A5 North approach to change left only nearside lane to left and ahead.

3 Model Results

3.1 A copy of the journey time results have been presented in **Table 1** below.

Table 1: Journey Time Summary

	AM										PM									
	2023 DM	2023 DS	2023 DS + Mit	2023 DS 2023 DM	2023 DS + Mit 2023 DM	2031 DM	2031 DS	2031 DS + Mit	2031 DS 2031 DM	2031 DS + Mit 2031 DM	2023 DM	2023 DS	2023 DS + Mit	2023 DS 2023 DM	2023 DS + Mit 2023 DM	2031 DM	2031 DS	2031 DS + Mit	2031 DS 2031 DM	2031 DS + Mit 2031 DM
1: A-GW	99	101	102	1	3	100	101	102	1	3	103	104	108	2	6	103	105	111	2	7
2: A-B	26	26	26	0	0	26	26	26	0	0	26	26	26	0	0	26	26	26	0	0
3: A-C	105	106	106	0	1	111	110	113	-1	2	102	99	121	-3	18	100	102	138	2	37
4: A-D	107	107	105	1	-1	107	110	110	3	3	89	94	102	5	13	94	103	119	9	25
6: B-GW	124	131	148	6	24	164	173	224	9	60	43	43	47	0	4	43	44	51	1	8
7: B-A	295	358	219	63	-76	315	377	227	62	-88	193	201	210	8	17	197	216	241	19	43
8: B-C	59	58	57	0	-1	59	59	60	0	0	66	64	77	-2	12	64	65	86	0	21
9: B-D	69	68	67	-1	-2	69	69	68	0	-1	59	62	64	3	5	65	70	76	5	11
10: B-E	99	100	97	2	-2	100	100	97	0	-3	94	98	108	3	14	99	100	131	1	32
11: C-GW	149	183	171	34	22	156	187	169	31	12	61	65	77	4	16	67	87	132	20	65
12: C-A	265	333	190	69	-74	301	364	203	63	-98	175	179	184	4	9	178	187	203	9	25
13: C-B	104	107	103	3	-1	110	110	103	1	-7	98	101	117	2	19	102	106	139	4	37
14: C-D	45	45	45	0	0	45	46	46	1	1	43	44	44	0	1	44	44	44	-1	0
15: C-E	89	87	87	-2	-2	91	89	88	-2	-3	78	78	83	1	6	81	82	88	1	7
16: D-GW	128	172	165	44	38	313	370	241	57	-72	78	83	119	5	40	138	188	399	51	262
17: D-A	225	290	148	66	-77	267	304	163	38	-104	142	144	141	2	-1	143	143	148	0	4
18: D-B	67	71	62	5	-4	69	70	64	1	-6	71	70	80	0	9	70	72	94	2	24
19: D-C	146	148	140	2	-6	153	150	147	-3	-7	143	140	172	-3	29	142	146	199	4	57
20: D-E	50	50	50	0	0	50	50	50	-1	-1	48	48	49	1	1	47	48	50	0	3
21: E-GW	71	150	51	79	-20	257	324	52	67	-205	383	421	67	38	-315	453	463	171	10	-281
23: E-B	44	44	45	0	1	44	44	46	0	2	45	46	53	1	8	45	46	58	1	12
24: E-C	112	115	113	3	1	119	120	117	2	-2	106	105	123	0	17	106	107	145	1	39
25: E-D	125	126	124	1	-1	126	127	129	1	3	106	112	127	6	21	112	120	146	8	34

3.2 As illustrated in **Table 1**, with the mitigation measures proposed within the highway network, both peak hours in the 2023 scenario illustrate an improvement in the operation of the junction overall.

3.3 Results of 2031 scenarios has also been provided in **Table 1** however it is understood that this is only to provide information for HE on the likely operation of the junction. This illustrates that although there are increases in journey times on most routes in both the morning and evening peak hour respectively, significant improvements in journey time can be seen on the A5 North arm.

3.4 Further to the above, the overall network performance of the junction has been analysed. These are presented in **Table 2** below.

Table 2: Network Performance

	AM				PM			
	Delay (s)	Speed (mph)	Veh Arr	Latent Demand	Delay (s)	Speed (mph)	Veh Arr	Latent Demand
2023 Base	127	20	6327	703	159	17	6076	553
2023 Base + Dev	166	16	6364	1038	165	17	6207	762
2023 Base + Dev + Mitigation	128	19	6644	810	88	25	6840	72
2031 Base	220	13	6439	1122	175	16	6246	1147
2031 Base + Dev	252	12	6478	1535	185	15	6375	1316
2031 Base + Dev + Mitigation	166	16	6864	1232	165	17	6978	295

3.5 **Table 2** demonstrates that in 2023 the AM peak hour period, the net increase in delay is one second however approximately 300 additional vehicles are able to enter the network. An analysis of the remaining scenarios when comparing Base DM with the mitigation scenarios indicate a betterment in delay and also an increase in the number vehicles able to enter the network.

4 Conclusion

4.1 Following a review of the model by AECOM, changes were made to the VISSIM model and subsequently the results have been updated. These indicate that the mitigation measures proposed by BWB would result in an improved operation of the junction therefore it is considered no further mitigation measures should be required as part of the proposed scheme.

