Land at Pump Farm and Bloors Farm, Lower Rainham

Technical Note 4

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Appendices

1.0 Introduction

1.1 This Technical Note sets out further junction modelling that has been requested by Medway based on the development traffic flows set out in Appendix A of DTA Report 20230-09 Technical Note 2 submitted to the Council in October 2019. For completeness the flows are attached at **Appendix A**.

1.2 Medway have provided no comment on the input assumptions to the modelling as set out in the Transport Assessment and subsequent Technical Notes, despite a formal request for that agreement (23rd December 2020 @09.18). They are therefore assumed to be agreed.

1.3 To be clear, the revised modelling has been undertaken following the suggestion in Mr Canavan's letter of 14th December 2020 that the Transport Assessment was deficient due to lack of that assessment. This is not accepted but the modelling is provided for completeness. It was previously agreed at the meeting with Medway on 22nd January 2020 that the flows from the Council's model should be used in preference to the DTA flows as they considered that was a robust assessment as it included considerably higher development generated traffic flows.

2.0 Model Outputs

2.1 The revised model outputs are set out in the following tables. These include all junctions tested in the Transport Assessment. The model outputs are available on request.

Table 1 – Lower Rainham Road/ Yokosuka Way/ Gads Hill

	AM				PM			
	Set ID	Q (PCU)	Delay (s)	RFC	Set ID	Q (PCU)	Delay (s)	RFC
	2018 Base							
A289 Gads Hill	D1	0.7	2.47	0.42	D2	3.6	6.58	0.78
Lower Rainham Road E		16.8	80.72	0.99		1.9	19.54	0.66
Yokosuka Way		2.4	6.02	0.71		1.0	3.14	0.49
Lower Rainham Road W		0.7	11.55	0.42		0.2	4.50	0.17
	2029 Base							
A289 Gads Hill	D3	0.9	2.76	0.47	D4	7.8	13.10	0.89
Lower Rainham Road E		82.3	320.55	1.21		6.8	66.13	0.91
Yokosuka Way		3.8	8.42	0.80		1.3	3.75	0.57
Lower Rainham Road W		1.3	18.35	0.57		0.3	5.27	0.22
	2029 Base+Dev							
A289 Gads Hill	D7	1.0	2.93	0.50	D8	15.0	24.45	0.95
Lower Rainham Road E		170.0	722.24	1.42		26.1	181.40	1.09
Yokosuka Way		4.0	8.65	0.80		1.4	4.01	0.59
Lower Rainham Road W		1.3	19.17	0.58		0.3	5.62	0.23

2.2 Mitigation is proposed as set out in section 6.2.4 of the Transport Assessment in the form of widening to provide a two-lane entry on the Lower Rainham Road eastern approach. The proposed improvement is shown on **DTA Drawing 20230-10.** The junction assessment with mitigation is shown below.

2.3 There is no material difference in the delay or queuing compared with the results in the Transport Assessment and the mitigation as proposed is appropriate.

Table 2 – Lower Rainham Road/ Yokosuka Way/ Gads Hill with Mitigation

	AM				PM			
	Set ID	Q (PCU)	Delay (s)	RFC	Set ID	Q (PCU)	Delay (s)	RFC
	2018 Base							
A289 Gads Hill	D1	0.7	2.47	0.42	D2	3.6	6.58	0.78
Lower Rainham Road E		1.6	7.56	0.62		0.6	6.05	0.37
Yokosuka Way		2.5	6.14	0.72		1.0	3.14	0.49
Lower Rainham Road W		0.7	11.87	0.43		0.2	4.50	0.17
	2029 Base							
A289 Gads Hill	D3	0.9	2.76	0.47	D4	7.8	13.10	0.89
Lower Rainham Road E		2.8	11.93	0.74		0.9	8.34	0.48
Yokosuka Way		4.8	10.79	0.83		1.3	3.76	0.57
Lower Rainham Road W		1.9	28.32	0.67		0.3	5.29	0.22
	2029 Base+Dev							
A289 Gads Hill	D7	1.0	2.92	0.50	D8	15.0	24.45	0.95
Lower Rainham Road E		6.1	22.87	0.87		1.3	10.23	0.58
Yokosuka Way		6.8	15.25	0.88		1.5	4.13	0.60
Lower Rainham Road W		4.1	61.47	0.84		0.3	5.79	0.24

Table 3 – Beechings Way/ Yokosuka Way/ Cornwallis Avenue/ Ito Way Junction Assessment Results

	AM				PM			
	Set ID	Q (PCU)	Delay (s)	RFC	Set ID	Q (PCU)	Delay (s)	RFC
	2018 Base							
Yokosuka Way	D1	1.4	3.73	0.58	D2	3.5	7.17	0.78
Beechings Way		3.5	10.53	0.78		0.8	4.69	0.45
Ito Way		1.4	4.58	0.58		0.9	3.05	0.47
Cornwallis Avenue		0.5	4.95	0.32		0.3	3.70	0.26
	2029 Base							
Yokosuka Way	D3	2.0	4.87	0.67	D4	8.8	16.63	0.91
Beechings Way		10.8	30.14	0.93		1.2	6.17	0.55
Ito Way		2.3	6.78	0.70		1.2	3.74	0.56
Cornwallis Avenue		0.7	6.76	0.42		0.5	4.48	0.32
	2029 Base+Dev							
Yokosuka Way	D7	2.3	5.34	0.69	D8	12.0	22.69	0.93
Beechings Way		26.8	65.94	1.00		1.3	6.66	0.58
Ito Way		2.6	7.55	0.73		1.5	4.10	0.59
Cornwallis Avenue		0.8	7.20	0.44		0.5	4.91	0.35

2.4 There is no material difference in the delay or queuing compared with the results in the Transport Assessment which showed a queue of 24 on Beechings Way and RFC of 0.99.

Table 4 – A2/ Will Adams Way/ Ito Way Junction Assessment Results

	AM				PM			
	Set ID	Q (PCU)	Delay (s)	RFC	Set ID	Q (PCU)	Delay (s)	RFC
	2018 Base							
1 - Ito Way	D1	1.7	6.46	0.63	D2	2.1	7.56	0.68
2 - A2 East		1.7	4.30	0.63		1.8	3.95	0.64
3 - Will Adams Way		4.5	21.73	0.82		5.2	27.46	0.84
4 - A2 West		2.4	6.58	0.70		1.9	5.61	0.65
	2029 Base							
1 - Ito Way	D3	2.6	9.26	0.73	D4	3.9	12.60	0.80
2 - A2 East		2.5	5.73	0.72		2.6	5.29	0.73
3 - Will Adams Way		26.3	130.02	0.99		72.4	381.87	1.06
4 - A2 West		3.8	9.86	0.79		2.9	7.89	0.75
	2029 Base+Dev							
1 - Ito Way	D9	3.4	11.11	0.77	D10	4.4	13.88	0.82
2 - A2 East		2.8	6.37	0.74		2.8	5.57	0.74
3 - Will Adams Way		65.2	311.71	1.05		129.4	688.07	1.13
4 - A2 West		4.1	10.45	0.81		3.4	8.84	0.77
	2018 Base+Dev							
1 - Ito Way	D11	2.1	7.38	0.67	D12	2.4	8.21	0.70
2 - A2 East		1.8	4.65	0.65		1.8	4.10	0.65
3 - Will Adams Way		6.0	29.10	0.86		7.6	39.62	0.89
4 - A2 West		2.6	7.02	0.72		2.2	6.29	0.69

2.5 The junction is operating within capacity in the base year plus development which is unchanged from the Transport Assessment. The increase in queue is a direct result of background traffic growth and not the proposed development.

Table 5 - *A2/ Sovereign Boulevard/ Hoath Way/ Twydall Lane/ Courteney Road Assessment Results*

Scenario	Cycle Time	Practical Reserve Capacity (%)	Delay (pcuHr)
2018 Base AM Peak	120	23.7	42
2018 Base PM Peak	120	16.5	42
2029 Base AM Peak	120	9.7	54
2029 Base PM Peak	120	7.1	54
2029 + Dev AM Peak	120	4.8	56
2029 + Dev PM Peak	120	8.2	60

2.6 The cycle time has been increased which improves overall performance of the junction compared to the Transport Assessment which is operating within capacity.

Table 6 – Pump Lane/ A2 London Road Priority Assessment Results

	AM				PM			
	Set ID	Q (PCU)	Delay (s)	RFC	Set ID	Q (PCU)	Delay (s)	RFC
	2018							
Stream B-AC	D1	1.2	19.93	0.55	D2	0.6	17.10	0.37
Stream C-AB		0.7	10.26	0.39		0.4	10.10	0.29
	2029							
Stream B-AC	D3	2.1	30.57	0.68	D4	0.9	23.86	0.48
Stream C-AB		0.9	11.14	0.45		0.6	11.13	0.35
	2029+Dev							
Stream B-AC	D7	7.3	93.03	0.90	D8	1.6	35.96	0.63
Stream C-AB		1.0	11.29	0.46		0.6	11.45	0.36

2.7 There is no material difference in the delay or queuing compared with the results in the Transport Assessment which showed a maximum queue of 6 and RFC of 0.86.

Table 7 – Bloors Lane/ A2 London Road/ Playfootball Signal Assessment Results

Scenario	Cycle Time	Practical Reserve Capacity (%)	Delay (pcuHr)
2018 Base AM Peak	90	12.7	23
2018 Base PM Peak	90	3.1	24
2029 Base AM Peak	90	-0.1	31
2029 Base PM Peak	120	-6.3	41
2029 + Dev AM Peak	90	-7.4	39
2029 + Dev PM Peak	120	-14.5	54

2.8 As set out in section 6.2.14 of the Transport Assessment, mitigation is proposed which takes the form of an additional ahead lane on the eastbound approach. The proposed improvement is shown on **DTA Drawing 20230-09.** The results are set out below and show the junction is operating within capacity.

Table 8 – Bloors Lane/ A2 London Road/ Playfootball Signal Assessment Results with Mitigation

Scenario	Cycle Time	Practical Reserve Capacity (%)	Delay (pcuHr)
2029 + Dev AM Peak	60	1.9	28
2029 + Dev PM Peak	60	12.4	25

Table 9 – Beechings Way/ Pump Lane Priority Junction Assessment Results

	AM					PM				
	Set ID	Q (PCU)	Delay (s)	RFC	Res Cap	Set ID	Q (PCU)	Delay (s)	RFC	Res Cap
	2018									
Stream B-AC	D1	0.5	12.94	0.33	54 %	D2	0.2	8.71	0.15	146 %
Stream C-AB		0.3	4.22	0.12	[Stream B-AC]		0.1	5.39	0.06	[Stream B-AC]
	2029									
Stream B-AC	D3	0.5	13.73	0.34	47 %	D4	0.2	9.31	0.17	117 %
Stream C-AB		0.3	4.31	0.13	[Stream B-AC]		0.1	5.36	0.07	[Stream B-AC]
	2029+Dev									
Stream B-AC	D5	13.9	137.34	0.98	-15 %	D6	1.1	18.01	0.52	24 %
Stream C-AB		1.0	5.91	0.34	[Stream B-AC]		0.5	6.86	0.26	[Stream B-AC]

2.9 The results are comparable to the Transport Assessment with a minor increase in queue from 12 to 14 vehicles on Pump Lane in the AM peak.

Table 10 – Beechings Way/ Pump Lane Mini Roundabout Junction Assessment Results

	AM					PM				
	Set ID	Q (PCU)	Delay (s)	RFC	Res Cap	Set ID	Q (PCU)	Delay (s)	RFC	Res Cap
	2018									
1 - Beechings Way (E)	D1	1.2	8.85	0.55	51 %	D2	0.3	4.68	0.21	156 %
2 - Pump Lane		0.5	6.54	0.31	[1 - Beechings Way (E)]		0.2	4.34	0.14	[3 - Beechings Way (W)]
3 - Beechings Way (W)		0.9	5.95	0.46			0.5	4.86	0.35	
	2029									
1 - Beechings Way (E)	D3	1.7	11.03	0.63	33 %	D4	0.3	4.90	0.24	125 %
2 - Pump Lane		0.6	7.53	0.37	[1 - Beechings Way (E)]		0.2	4.54	0.17	[3 - Beechings Way (W)]
3 - Beechings Way (W)		1.1	6.76	0.53			0.6	5.26	0.39	
	2029+Dev									
1 - Beechings Way (E)	D5	2.1	13.36	0.69	23 %	D6	0.4	5.26	0.28	105 %
2 - Pump Lane		0.7	8.27	0.42	[1 - Beechings Way (E)]		0.3	5.02	0.23	[3 - Beechings Way (W)]
3 - Beechings Way (W)		1.6	8.55	0.63			0.8	5.64	0.44	

2.10 The junction is operating within capacity for all scenarios with minimal queueing and delay.

Table 11 – Lower Rainham Road/ Site Access Junction Assessment Results

	AM				PM			
	Set ID	Q (PCU)	Delay (s)	RFC	Set ID	Q (PCU)	Delay (s)	RFC
	2029+Dev							
Stream B-C	D1	0.5	12.06	0.34	D2	0.2	7.69	0.16
Stream B-A		0.1	13.84	0.05		0.0	12.95	0.03
Stream C-AB		0.2	9.38	0.17		0.4	9.00	0.30

2.11 The junction is operating within capacity for all scenarios with minimal queueing and delay.

Table 12 – Pump lane Shuttle Assessment Results

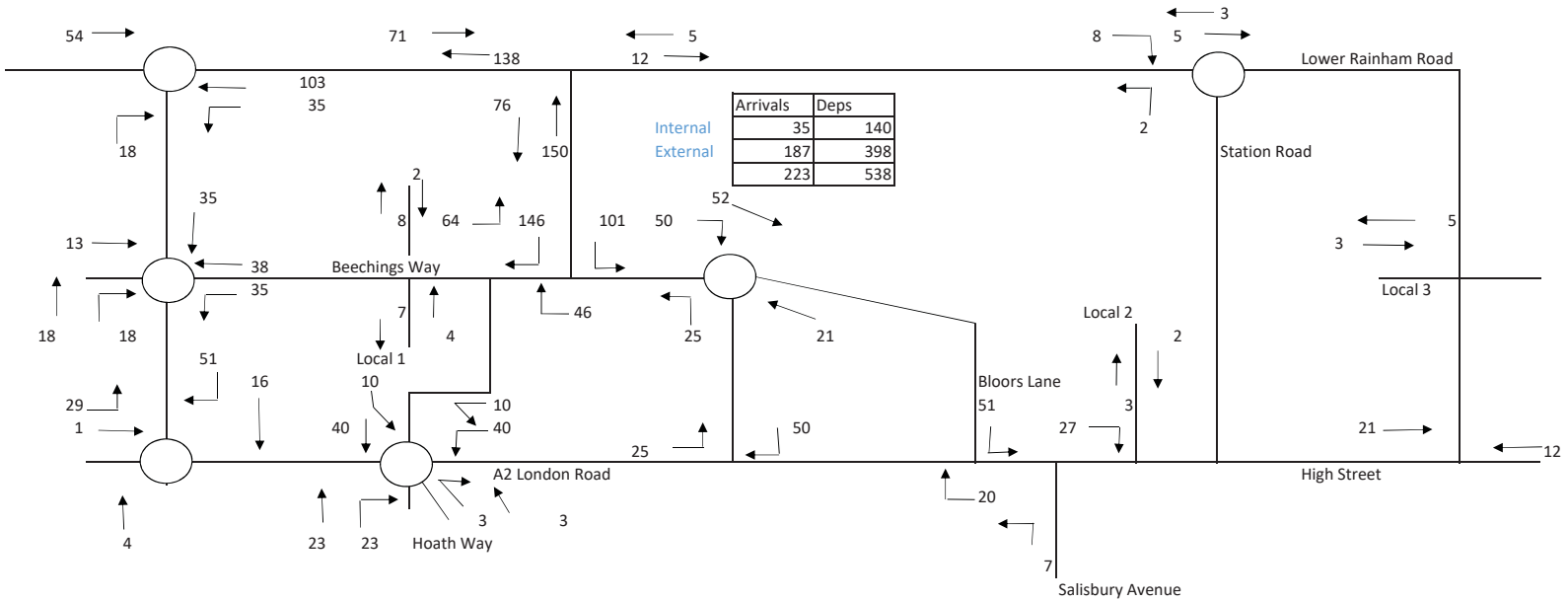
Scenario	Cycle Time	Practical Reserve Capacity (%)	Delay (pcuHr)
2029 Base AM Peak	50	468	1
2029 Base PM Peak	50	601	1
2029 + Dev AM Peak	50	99	3
2029 + Dev PM Peak	50	129	2

2.12 The junction is operating within capacity for all scenarios with minimal queueing and delay.

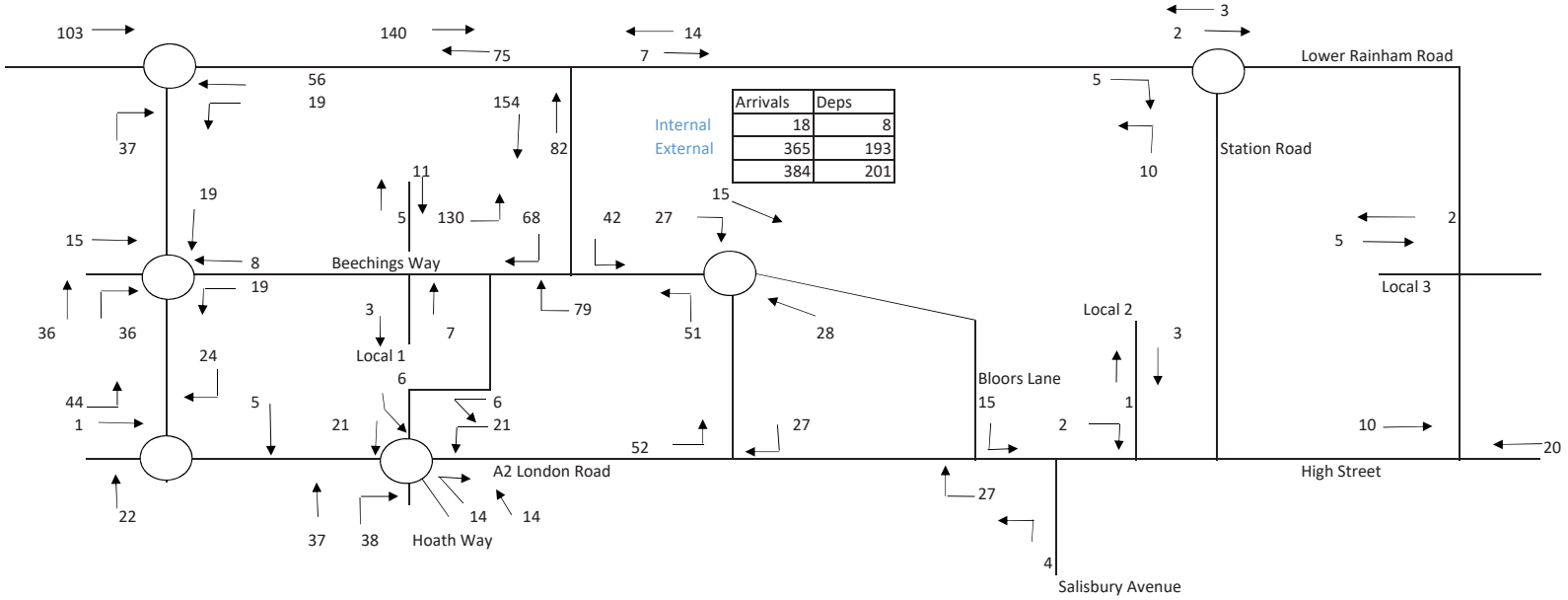
Appendix A

Total Trips

Traffic Flows - AM Peak



Traffic Flows - PM Peak



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