APPENDICES

1 INTRODUCTION

1.1.1. On 24 August 2022 a Section 62A Planning Application was submitted for 130 dwellings at the Land to the South of Henham Road in Elsenham (REF: S62A/22/0007).

1.1.2. The development is forecast to generate 62 vehicle trips in the AM peak and 61 vehicle trips in the PM peak.

1.1.3. This application has not yet been determined, as such it has not been included in the 2027 baseline scenario. However, given the proximity of this development to the Land East of Station Road and the potential impact on the highway network, particularly through Stansted Mountfitchet, a sensitivity test has been undertaken.

1.1.4. The sensitivity test adds traffic generated by this development to the 2027 baseline flows described in **Section 5** of the Transport Assessment.

1.1.5. Two additional scenarios have been assessed as a part of this sensitivity test. These are:

- **2027 Baseline (Sensitivity Test)** (2027 baseline flows + traffic generated by the Land to the South of Henham Road); and
- **2027 Baseline with Development (Sensitivity Test)** (2027 baseline flows + traffic generated by the Land to the South of Henham Road + development flows).

1.1.6. This sensitivity test only assesses the impact on the operation of the local highway network.

2 2027 BASELINE

2.1 INTRODUCTION

2.1.1. The performance of the highway network in the 2027 baseline (sensitivity test) scenario has been assessed using Junctions 10 and the Stansted Mountfitchet VISSIM micro-simulation model.

2.1.2. Further detail on the VISSIM micro-simulation model is provided in the Modelling Technical Note provided in **Appendix M** of the Transport Assessment.

2.1.3. A network flow diagram showing the distribution of trips in the highway network is provided at **Appendix A** of this report.

2.2 STANDALONE JUNCTION MODELLING

2.2.1. The operation of the junction listed below have been assessed using the 2027 baseline sensitivity test data and to estimate the capacity at these junctions:

- Site Access Priority Junction
- High Street Double Mini Roundabout
- Hall Road / Henham Road Priority Junction
- Coopers End Mini Roundabout

2.2.2. The Assessment of Roundabout Capacity and Delay (ARCADY) and the Priority Intersection Capacity and Delay (PICADY) modules of Junctions 10 were used to assess the junctions listed above.

2.2.3. The results of the Junctions 10 capacity assessment provide an Ratio of Flow to Capacity (RFC) figure, junction delay and a queue length. The RFC model output is typically used to assess the performance of each arm. The Design Manual for Roads and Bridges (DMRB) industry-standard 0.85 RFC threshold is generally accepted for new junctions, with an RFC of up to 1.00 generally accepted for the operation of existing junctions in peak periods. The RFC determines how a particular arm of the junction is operating, thus:

- An RFC of 0.85 or less - the relevant arm of the junction is considered to be operating within its design capacity with minimal delay.
- An RFC greater than 0.85 and less than 1.0 - the junction is operating close to its design capacity, and as such, some queues and delays may start to occur.
- An RFC greater than 1.0 - the arm of the junction is operating at or exceeding its design capacity and is likely to result in longer delays, and queues will start to form.

2.2.4. The results of the standalone junction modelling are summarised below. The full capacity assessment results are attached in **Appendix M** of the Transport Assessment.

2.2.5. The change in the performance of each junction between the 2022 Baseline (as reported in **Section 4** of the Transport Assessment) and the 2027 Baseline (Sensitivity Test) scenarios is shown in brackets.

SITE ACCESS PRIORITY JUNCTION

2.2.6. The primary vehicular access into the Phase 2 development will be via a new priority junction on Henham Road (as shown in **Appendix B.2** of the Transport Assessment). This junction is being delivered as a part of the consented Phase 1 development to the south of the Site. In the 2027 sensitivity test scenario it will serve vehicular trips generated by the consented Phase 1 development.

2.2.7. The results of the Site Access capacity assessment using Junctions 10 is summarised in **Table 2-2**.

Table 2-1 – 2027 Baseline (Sensitivity Test) Junction Capacity Assessment Results - Site Access

Stream	Description	AM Peak Hour			PM Peak Hour		
		Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)	Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)
Stream B-C	Site Access - Head Road East	0.01	7.32	0.00	0.00	6.78	0.00
Stream B-A	Site Access - Head Road North	0.33	11.81	0.50	0.16	9.15	0.20
Stream C-AB	Head Road East - Site Access	0.00	5.57	0.00	0.01	5.75	0.00

2.2.8. As illustrated in **Table 2-2** above, the Site Access is predicted to operate within its theoretical design capacity in both the AM and PM peaks, with minimal delays and insignificant queues.

2.2.9. In the AM peak hour, the junction is predicted to operate with a maximum RFC of 0.33 and queue of less than 1 PCU. In the PM peak hour, the junction is predicted to operate with a maximum RFC of 0.16 and queue of less than 1 PCU.

HIGH STREET DOUBLE MINI ROUNDABOUT

2.2.10. The results of the High Street Double Mini Roundabout capacity assessment using Junctions 10 is summarised in **Table 2-2**.

Table 2-2 – 2027 Baseline (Sensitivity Test) Junction Capacity Assessment Results- High Street Double Mini Roundabout

Junction	Stream	Description	AM Peak Hour			PM Peak Hour		
			Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)	Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)
Roundabout 1	Arm 1	High Street (Entry)	0.41 (+0.07)	6.84 (+0.70)	0.70 (+0.20)	0.50 (+0.15)	8.19 (+1.89)	1.00 (+0.50)
	Arm 2	Robinhood Road	0.07 (+0.02)	5.50 (+0.29)	0.10 (+0.00)	0.05 (+0.01)	5.36 (+0.57)	0.10 (+0.10)
	Arm 3	Stansted Road (Entry)	0.50 (+0.14)	7.92 (+1.70)	0.00 (+0.00)	0.44 (+0.09)	7.01 (+0.96)	0.00 (+0.00)
Roundabout 2	Arm 1	Stansted Road	0.37 (+0.05)	9.35 (+1.48)	0.60 (+0.10)	0.31 (+0.05)	8.10 (+1.11)	0.50 (+0.20)
	Arm 2	High Street	0.50 (+0.12)	6.76 (+1.37)	1.00 (+0.40)	0.41 (+0.08)	5.76 (+0.73)	0.70 (+0.20)
	Arm 3	Station Road	0.42 (+0.12)	5.94 (+1.08)	0.00 (+0.00)	0.34 (+0.08)	5.11 (+0.54)	0.00 (+0.00)

2.2.11. As illustrated in **Table 2-2** above, the High Street Double Mini Roundabout is predicted to continue to operate within its theoretical design capacity in the 2027 sensitivity test baseline in both the AM and PM peaks, with minimal delays and insignificant queues.

2.2.1. In the AM peak hour, the junction is predicted to operate with a maximum RFC of 0.50 and queue of 1 PCU. In the PM peak hour, the junction is predicted to operate with a maximum RFC of 0.50 and queue of 1 PCU.

2.2.2. In the AM peak the committed development is expected to result in a maximum increase in RFC of 012 and less than 1 PCU increase in queue length. In the PM peak, the committed development is expected to result in a maximum increase in RFC of 0.09 and less than 1 PCU increase in queueing.

HALL ROAD / HENHAM ROAD PRIORITY JUNCTION

2.2.3. The results of the Hall Road / Henham Road Priority Junction capacity assessment using Junctions 10 is summarised in **Table 2-3**. As the junction is not a standard T-junction, it has been modelled as three separate T-junctions to provide the best estimation of the junction's operation and capacity.

Table 2-3 - 2027 Baseline (Sensitivity Test) Junction Capacity Assessment Results- - Hall Road / Henham Road Priority Junction

Junction	Stream	Description	AM Peak Hour			PM Peak Hour		
			Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)	Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)
Hall Road - High Street - Henham Road	B-AC	Hall Road - High Street	0.29 (+0.04)	9.84 (+1.02)	0.40 (+0.10)	0.41 (+0.06)	10.74 (+1.14)	0.70 (+0.20)
	C-AB	High Street - Hall Road	0.41 (+0.07)	9.34 (+0.98)	0.80 (+0.20)	0.27 (+0.06)	7.31 (+0.30)	0.40 (+0.10)
Hall Road Slip - Hall Road	B-AC	Hall Road Slip - Hall Road South	0.25 (+0.13)	8.16 (+1.20)	0.30 (+0.20)	0.13 (+0.07)	6.79 (+0.57)	0.10 (+0.00)
	C-AB	Hall Road South - Hall Road Slip	0.12 (+0.05)	6.66 (+0.19)	0.10 (+0.00)	0.20 (+0.11)	6.69 (+0.54)	0.30 (+0.20)
Hall Road Slip - High Street - Henham Road	B-AC	Hall Road Slip - High Street	0.18 (+0.08)	11.47 (+1.81)	0.20 (+0.10)	0.29 (+0.16)	11.81 (+2.77)	0.40 (+0.30)
	C-AB	High Street - Hall Road Slip	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)

2.2.4. As illustrated in **Table 2-3** above, the Hall Road / Henham Road priority junction is predicted to continue to operate within its theoretical design capacity in the 2027 sensitivity test baseline in both the AM and PM peaks, with minimal delays and insignificant queues.

2.2.5. In the AM peak hour, the junction is predicted to operate with a maximum RFC of 0.41 and queue of less than 1 PCU. In the PM peak hour, the junction is predicted to operate with a maximum RFC of 0.41 and queue of less than 1 PCU.

2.2.6. In the AM peak the committed development is expected to result in a maximum increase in RFC of 0.13 and less than 1 PCU increase in queue length. In the PM peak, the committed development is expected to result in a maximum increase in RFC of 0.16 and less than 1 PCU increase in queueing.

COOPERS END MINI ROUNDABOUT

2.2.7. The results of the Coopers End Mini Roundabout capacity assessment using Junctions 10 is summarised in **Table 2-4**.

Table 2-4 – 2027 Sensitivity Test Junction Capacity Assessment Results- Coopers End Mini Roundabout

Stream	Description	AM Peak Hour			PM Peak Hour		
		Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)	Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)
Arm A	Hall Road	0.91 (+0.21)	53.00 (+34.17)	7.60 (+5.40)	0.67 (+0.15)	18.38 (+6.64)	2.00 (+0.90)
Arm B	Parsonage Road	0.47 (+0.16)	8.21 (+2.26)	0.90 (+0.40)	0.36 (+0.06)	6.29 (+0.75)	0.60 (+0.20)
Arm C	Coopers End Roundabout Access	0.55 (+0.08)	11.35 (+1.78)	1.20 (+0.30)	0.75 (+0.24)	19.97 (+9.79)	2.90 (+1.90)

2.2.8. As illustrated in **Table 2-4** above, the Coopers End Mini Roundabout is predicted to continue to operate within its theoretical design capacity in the 2027 sensitivity test baseline in both the AM and PM peaks. With the exception of Hall Road (Arm A) in the AM peak, minimal delays and insignificant queues are forecast on all arms.

2.2.9. In the AM peak Hall Road (Arm A) is forecast to operate close to its design capacity with an RFC 0.91 and queue of 8 PCUs. The maximum delay per PCU is also forecast to increase by 34 seconds (53 seconds).

2.2.10. In the PM peak hour, the junction is predicted to operate with a maximum RFC of 0.75 and queue of close to 3 PCUs.

2.2.11. In the AM peak the committed development is expected to result in a maximum increase in RFC of 0.21 and 5 PCU increase in queue length. In the PM peak, the committed development is expected to result in a maximum increase in RFC of 0.24 and 2 PCU increase in queueing.

SUMMARY

2.2.12. The results of the standalone junction modelling demonstrate that with committed development traffic flows all of the assessed junctions are predicted to continue to operate within capacity with low levels of delay and queuing. The only exception is at Coopers End Mini-roundabout in the AM peak, where there is expected to be a small increase in queuing (+ 5 PCUs) and delay (+ 34 seconds per vehicle) on the Hall Road Arm.

2.3 VISSIM MICRO-SIMULATION MODEL – STANSTED MOUNTFITCHET (SENSITIVITY TEST)

2.3.1. The 2027 committed development sensitivity test trips were loaded into the micro-simulation model in addition to the 2022 base flows. The baseline scenarios are shown in **Table 2-5.**

Table 2-5 – VISSIM Micro-Simulation Model Sensitivity Test Scenarios

Model Name	Code (Graph Legend)	Description
2022 Base	2022	2022 validated base model
2027 Sensitivity Test	2027+C	2022 base model + committed developments + Land South of Henham Road

Network Performance

2.3.2. The average time a vehicle spends in the network, average time per mile, average speed and average delay per vehicle has been obtained from the model. The results are shown in Table 2-6 based on the modelling scenarios shown in Table 2-5.

Table 2-6 – Network Performance Indicators (Base and Reference Case)

Network Statisitic	AM Peak			AM Peak		
	2022	2027+C	Change	2022	2027+C	Change
Average Time (s) / Vehicle	130	146	+16	128	131	+3
Average Time (s) / Mile	190	194	+4	204	199	-5
Average Speed (mph)	19	19	0	18	18	0
Average Delay / Vehicle (s)	44	54	+10	47	47	0

2.3.3. The above tables show that there is an increase in travel time and delay and reduction in speed forecast in Stansted Mountfitchet in 2027 as a result of committed developments. However, the modelling indicates that, even with the committed development, the section through Stansted Mountfitchet continues to operate within overall capacity, with minimal increase in average journey time and delay per vehicle.

Maximum Queue Lengths

2.3.4. The maximum queue lengths recorded by the 2027 reference case model have been logged and are summarised in **Table 2-7** and **Table 2-8** for the AM and PM peaks respectively. The 2027 reference case maximum queues have been compared to the 2022 base model results to identify the impact of the additional committed development vehicle demands.

Table 2-7 – 2027 Sensitivity Test VISSIM Results - Maximum Queue Length (m) Record during the AM Peak

Junction	Arm	2022	2027+C	Change (m)	Change (Veh)
Junction 4 - Grove Hill signalised junction	41 - J4 - Lower Street LT	34	40	+6	+1
	42 - J4 - Lower Street RT	37	42	+5	+1
	43 - J4 - B1051 (N) RT	5	9	+4	+1
	44 - J4 - B1051 (S) Signal Stopline	52	58	+6	+1
	45 - J4 - B1051 (N) Signal Stopline	30	29	-1	0
	46 - Grove Hill (2nd queue)	116	119	+4	+1
Junction 5 - Chapel Hill roundabout	51 - J5 - B1051 (N)	63	63	+1	0
	52 - J5 - Castle	2	2	0	0
	53 - J5 - Church Road	49	60	+11	+2
	54 - J5 - Station Road LT	2	4	+2	0
	55 - J5 - Station Road RT	1	2	+1	0
	56 - J5 - Chapel Hill	51	81	+30	+5
Junction 10- Cambridge Road / Chapel Hill	101 - J10 - Cambridge Road (N) RT	10	42	+32	+6
	102 - J10 - Chapel Hill LT	62	116	+54	+9
	103 - J10 - Chapel Hill RT	25	38	+13	+2
	104 - J10 - Silver Street RT	63	109	+46	+8
	105 - J10 Bentfield Road LT	12	16	+4	+1
	106 - J10 Bentfield Road RT	14	17	+2	0
Chapel Hill	991 - Chapel Hill (E)	77	99	+23	+4
	992 - Chapel Hill (W)	87	140	+53	+9

2.3.5. **Table 2-7** shows that in the AM peak hour, the additional committed development trips are predicted to result in a maximum increase of 54 metres (+ 9 vehicles). The locations where the impact of the additional development generated vehicle trips is predicted to be greatest are:

- Junction 10 - Chapel Hill Left Turn, Silver Street Right Turn and Cambridge Road (N) - queues increases by 54m (+ 9 vehicles), 46m (+ 8 vehicles) and 32m (+ 6 vehicles) respectively.
- Junction 5 - Chapel Hill roundabout – queue increases by 30m (+ 5 vehicles).
- Chapel Hill eastern and western approach to the on-street parked vehicles section – queues increase by 23m and 53m (+ 4 and +9 vehicles) respectively.

2.3.6. Overall, the results show that in the AM weekday period the additional committed development vehicle trips are predicted to have a minor impact on additional queue lengths, this will not have a severe impact on the operation of the local highway network through Stansted Mountfitchet.

Table 2-8 – 2027 Sensitivity Test VISSIM Results - Maximum Queue Length (m) Record during the PM Peak

Junction	Arm	2022	2027+C	Change (m)	Change (Veh)
Junction 4 - Grove Hill signalised junction	41 - J4 - Lower Street LT	14	13	-1	0
	42 - J4 - Lower Street RT	16	16	0	0
	43 - J4 - B1051 (N) RT	3	3	0	0
	44 - J4 - B1051 (S) Signal Stopline	52	72	+20	+3
	45 - J4 - B1051 (N) Signal Stopline	26	26	0	0
	46 - Grove Hill (2nd queue)	115	61	-54	0
Chapel Hill / Church Road roundabout Junction 5 - Chapel Hill roundabout	51 - J5 - B1051 (N)	28	33	+5	+1
	52 - J5 - Castle	7	11	+4	+1
	53 - J5 - Church Road	43	47	+4	+1
	54 - J5 - Station Road LT	14	17	+3	0
	55 - J5 - Station Road RT	5	5	0	0
	56 - J5 - Chapel Hill	66	77	+11	+2
Cambridge Road / Chapel Hill	101 - J10 - Cambridge Road (N) RT	22	25	+3	+1
	102 - J10 - Chapel Hill LT	19	31	+12	+2
	103 - J10 - Chapel Hill RT	36	45	+9	+2
	104 - J10 - Silver Street RT	147	177	+30	+5
	105 - J10 Bentfield Road LT	16	16	+1	0
	106 - J10 Bentfield Road RT	16	17	0	0
Chapel Hill	991 - Chapel Hill (E)	60	86	+26	+5
	992 - Chapel Hill (W)	76	102	+26	+4

2.3.7. **Table 2-8** shows that in the PM peak, the committed development results in the maximum recorded queue length increasing by 30 metres (+5 vehicles). The most significant increases in maximum queue length between the with and without committed development scenarios occurred in these locations:

- Silver Street at the Cambridge Road / Chapel Hill – queue increases by 30m (+ 5 vehicles).

- Chapel Hill eastern and western approach to the on-street parked vehicles section – queue increases by 25m (+ 4 vehicles) on the eastern arm and 28m (+ 5 vehicles) on the western arm.

2.3.8. Overall, the results show that in the PM weekday period the additional committed development vehicle trips are predicted to have a minor impact on additional queue lengths, this will not have a severe impact on the operation of the local highway network through Stansted Mountfitchet.

Average Journey Times

2.3.9. The 2027 baseline average journey times over the modelled network have been collated and averaged over multiple model runs. **Table 2-9** compares the 2027 baseline sensitivity test model results with the 2022 base model results.

Table 2-9 – 2027 Sensitivity Test VISSIM Results - Average Journey Times Record in Seconds

Route	AM Peak		Change	PM Peak		Change
	2022	2027+C		2022	2027+C	
101 - B1051 (SB): Farm to Lower Road turning	90	51	-39	172	60	-112
102 - B1051 (SB): Lower Rd turning to Chapel Hill Rdbt	21	24	+4	17	19	+2
103 - B1051 (WB): Chapel Hill Rdbt to Crafton Green	87	97	+10	86	94	+8
104 - Silver Street (SB): Crafton Green to Blythwood Gardens	30	30	+1	30	30	0
105 - Silver Street (NB): Blythwood Gardens to Crafton Green	43	51	+9	47	53	+6
106 - B1051 (EB): Crafton Green to Chapel Hill Rdbt	93	136	+43	81	102	+21
107 - B1051 (NB): Chapel Hill Rdbt to Lower Rd turning	32	38	+6	27	31	+4
108 - B1051 (NB): Lower Rd turning to Farm	29	30	+1	30	31	+1
200 - Elsenham to Stansted Mountfitchet	123	126	+3	126	118	-8

2.3.10. **Table 2-9** shows that in the AM peak, the additional committed development generated trips are predicted to increase in average journey times along Crafton Green to Chapel Hill Roundabout (route 106) by up to 43 second. From Chapel Hill Roundabout to Lower Road turning, the average increase in journey times is 6 seconds (route 107). Along Chapel Hill to Crafton Green and Blythwood Gardens to Crafton Green, the average journey times are predicted to increase by 10 and 9 seconds (routes 103 and 105) respectively.

2.3.11. **Table 2-9** shows that in the PM peak, the additional committed development generated trips are predicted to result in up to 21 seconds increase in average journey times along Crafton Green to Chapel Hill Roundabout (route 106). From Chapel Hill Roundabout to Lower Road turning, the average increase in journey times is 4 seconds (routes 107). Along Chapel Hill to Crafton Green and Blythwood Gardens to Crafton Green, the average journey times are predicted to increase by 8 and 6 seconds (route 103 and 105) respectively.

2.3.12. It is worth noting that as a result of the planned signal improvements on Grove Hill (described in **Section 5.2** of the Transport Assessment), there is a significant decrease in average journey time between the base year and forecast year scenarios in journey time section 101 (39 second reduction in the AM peak and 112 second reduction in the PM peak).

2.3.13. The results presented in **Table 2-9** show that overall, the additional committed development vehicle trips are predicted to result in small increases in journey times through Stansted Mountfitchet in the AM peak period. It is considered that the scale of the increase in journey times observed through the village in the AM peak is within normal daily variation. There is no change in journey times through Stansted Mountfitchet in the PM peak.

Summary

2.3.14. The VISSIM modelling shows that overall, the committed development sensitivity test vehicle trips are predicted to have small negative impacts on the operation of the B1051 through Stansted Mountfitchet in the AM and PM peak periods. Within the peak hours the maximum queue increases by 9 vehicles between the 2022 base and 2027 Sensitivity Test scenarios (the AM maximum queue increases from 10 to 19 vehicles). This would not result in significant operational issues.

3 2027 BASELINE WITH DEVELOPMENT

3.1 INTRODUCTION

3.1.1. The performance of the highway network in the 2027 baseline with development (sensitivity test) scenario has been assessed using Junctions 10 and the Stansted Mountfitchet VISSIM micro-simulation model.

3.1.2. Further detail on the VISSIM micro-simulation model is provided in the Modelling Technical Note provided in **Appendix M** of the Transport Assessment.

3.1.3. A network flow diagram showing the distribution of trips in the highway network is provided at **Appendix A** of this report.

3.2 STANDALONE JUNCTION MODELLING

3.2.1. The operation of the junctions listed below have been assessed using the 2022 base data with committed development (including Land to the South of Henham Road) and the proposed development flows (presented within **Section 6** of the Transport Assessment) to predict the future performance of these junctions:

- Site Access Priority Junction
- High Street Double Mini Roundabout
- Hall Road / Henham Road Priority Junction
- Coopers End Mini Roundabout

3.2.2. The ARCADY and PICADY modules of Junctions 10 were used to assess the junctions listed above.

3.2.3. The results of the Junctions 10 capacity assessment provide an RFC figure, junction delay and a queue length. The RFC model output is typically used to assess the performance of each arm. The DMRB industry-standard 0.85 RFC threshold is generally accepted for new junctions, with an RFC of up to 1.00 generally accepted for the operation of existing junctions in peak periods. The RFC determines how a particular arm of the junction is operating:

- An RFC of 0.85 or less - the relevant arm of the junction is considered to be operating within its design capacity with minimal delay.
- An RFC greater than 0.85 and less than 1.0 - the junction is operating close to its design capacity, and as such, some queues and delays may start to occur.
- An RFC greater than 1.0 - the arm of the junction is operating at or exceeding its design capacity and is likely to result in longer delays, and queues will start to form.

3.2.4. The results of the standalone junction modelling are summarised below. The full capacity assessment results are attached in **Appendix M** of the Transport Assessment.

3.2.5. The change in the performance of each junction between the 2027 Baseline (Sensitivity Test) and the 2027 Baseline with Development (Sensitivity Test) scenarios is shown in brackets.

SITE ACCESS PRIORITY JUNCTION

3.2.6. The results of the Site Access capacity assessment using Junctions 10 is summarised in **Table 3-1**.

Table 3-1 – 2027 Baseline with Development Junction Capacity Assessment Results – Site Access

Stream	Description	AM Peak Hour			PM Peak Hour		
		Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)	Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)
Stream B-C	Site Access - Henham Road East	0.01 (+0.00)	8.77 (+1.45)	0.00 (+0.00)	0.01 (+0.01)	7.14 (+0.36)	0.00 (+0.00)
Stream B-A	Site Access - Henham Road North	0.52 (+0.19)	16.49 (+4.68)	1.00 (+0.50)	0.25 (+0.09)	10.46 (+1.31)	0.30 (+0.10)
Stream C-AB	Henham Road East - Site Access	0.00 (+0.00)	5.62 (+0.05)	0.00 (+0.00)	0.01 (+0.00)	5.96 (+0.21)	0.00 (+0.00)

3.2.7. As illustrated in **Table 3-1** above, the Site Access is predicted to operate within its theoretical design capacity in the 2027 sensitivity test with development scenario in both the AM and PM peaks, with minimal delays and insignificant queues.

3.2.8. In the AM peak hour, the junction is predicted to operate with a maximum RFC of 0.52 with queue of less than 1 PCU predicted. In the PM peak hour, the junction is predicted to operate with a maximum RFC of 0.25 with queue of less than 1 PCU.

3.2.9. In the AM peak the Proposed Development is expected to result in a maximum increase in RFC of 0.19 and less than 1 PCU increase in queue length. In the PM peak, the Proposed Development is expected to result in a maximum increase in RFC of 0.09 and less than 1 PCU increase in queueing.

3.2.10. The change in the levels of queuing and delay with the Proposed Development in the AM and PM peak is small and will have an imperceptible impact on existing road users.

HIGH STREET DOUBLE MINI ROUNDABOUT

3.2.11. The results of the High Street Double Mini Roundabout capacity assessment using Junctions 10 is summarised in Error! Reference source not found..

Table 3-2 – High Street Double Mini Roundabout

Junction	Stream	Description	AM Peak Hour			PM Peak Hour		
			Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)	Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)
Roundabout 1	Arm 1	High Street (Entry)	0.42 (+0.01)	6.99 (+0.15)	0.70 (+0.00)	0.55 (+0.05)	9.02 (+0.83)	1.20 (+0.20)
	Arm 2	Robinhood Road	0.08 (+0.01)	5.56 (+0.06)	0.10 (+0.00)	0.05 (+0.00)	5.57 (+0.21)	0.10 (+0.00)
	Arm 3	Stansted Road (Entry)	0.55 (+0.05)	8.77 (+0.85)	0.00 (+0.00)	0.47 (+0.03)	7.33 (+0.32)	0.00 (+0.00)
Roundabout 2	Arm 1	Stansted Road	0.39 (+0.02)	10.02 (+0.67)	0.60 (+0.00)	0.33 (+0.02)	8.51 (+0.41)	0.50 (+0.00)
	Arm 2	High Street	0.55 (+0.05)	7.52 (+0.76)	1.20 (+0.20)	0.44 (+0.03)	6.02 (+0.26)	0.80 (+0.10)
	Arm 3	Station Road	0.47 (+0.05)	6.48 (+0.54)	0.00 (+0.00)	0.36 (+0.02)	5.29 (+0.18)	0.00 (+0.00)

3.2.12. As illustrated in Error! Reference source not found. above, the High Street Double Mini Roundabout is predicted to continue to operate within its theoretical design capacity in the 2027 sensitivity test with development scenario in both the AM and PM peaks, with minimal delays and insignificant queues.

3.2.13. In the AM peak hour, the junction is predicted to operate with a maximum RFC of 0.55 and queue of 1 PCU predicted. In the PM peak hour, the junction is predicted to operate with a maximum RFC of 0.55 with queue of 1 PCU.

3.2.14. In the AM peak the proposed development is expected to result in a maximum increase in RFC of 0.05 and less than 1 PCU increase in queueing. In the PM peak, the proposed development is expected to result in a maximum increase in RFC of 0.05 and less than 1 PCU increase in queueing.

3.2.15. The change in the levels of queuing and delay with the Proposed Development in the AM and PM peak is small and will have an imperceptible impact on existing road users.

HALL ROAD / HENHAM ROAD PRIORITY JUNCTION

3.2.16. The results of the Hall Road / Henham Road Priority Junction capacity assessment using Junctions 10 is summarised in **Table 3-3**. As the junction is not a standard T-junction, it has been modelled as three separate T-junctions to provide the best estimation of the junction's operation and capacity.

Table 3-3 - – Road / Henham Road junction

Junction	Stream	Description	AM Peak Hour			PM Peak Hour		
			Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)	Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)
Hall Road - High Street - Henham Road	B-AC	Hall Road - High Street	0.30 (+0.01)	10.19 (+0.35)	0.40 (+0.00)	0.41 (+0.00)	10.95 (+0.21)	0.70 (+0.00)
	C-AB	High Street - Hall Road	0.42 (+0.01)	9.59 (+0.25)	0.80 (+0.00)	0.27 (+0.00)	7.27 (--0.04)	0.40 (+0.00)
Hall Road Slip - Hall Road	B-AC	Hall Road Slip - Hall Road South	0.30 (+0.05)	8.73 (+0.57)	0.40 (+0.10)	0.15 (+0.02)	6.98 (+0.19)	0.20 (+0.10)
	C-AB	Hall Road South - Hall Road Slip	0.13 (+0.01)	6.71 (+0.05)	0.20 (+0.10)	0.24 (+0.04)	6.94 (+0.25)	0.30 (+0.00)
Hall Road Slip - High Street - Henham Road	B-AC	Hall Road Slip - High Street	0.21 (+0.03)	12.42 (+0.95)	0.30 (+0.10)	0.36 (+0.07)	13.58 (+1.77)	0.60 (+0.20)
	C-AB	High Street - Hall Road Slip	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)

3.2.17. As illustrated in **Table 3-3** above, the Hall Road / Henham Road Priority Junction is predicted to operate within its theoretical design capacity in the 2027 sensitivity test with development scenario in both the AM and PM peaks, with minimal delays and insignificant queues.

3.2.18. In the AM peak hour, the junction is predicted to operate with a maximum RFC of 0.42 with queue of less than 1 PCU predicted. In the PM peak hour, the junction is predicted to operate with a maximum RFC of 0.41 with queue of less than 1 PCU.

3.2.19. In the AM peak the Proposed Development is expected to result in a maximum increase in RFC of 0.03 and less than 1 PCU increase in queue length. In the PM peak, the Proposed Development is expected to result in a maximum increase in RFC of 0.07 and less than 1 PCU increase in queueing.

3.2.20. The change in the levels of queuing and delay with the Proposed Development in the AM and PM peak is small and will have an imperceptible impact on existing road users.

COOPERS END MINI ROUNDABOUT

3.2.21. The results of the Coopers End Mini Roundabout capacity assessment using Junctions 10 is summarised in **Table 3-4**.

Table 3-4 – Coopers End Mini Roundabout

Stream	Description	AM Peak Hour			PM Peak Hour		
		Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)	Max RfC	Max Delay (PCU/Secs)	Max Queue (PCU)
Arm A	Hall Road	0.95 (+0.04)	74.11 (+21.11)	11.40 (+3.80)	0.70 (+0.03)	19.80 (+1.42)	2.20 (+0.20)
Arm B	Parsonage Road	0.48 (+0.01)	8.49 (+0.28)	0.90 (+0.00)	0.37 (+0.01)	6.40 (+0.11)	0.60 (+0.00)
Arm C	Coopers End Roundabout Access	0.56 (+0.01)	11.60 (+0.25)	1.30 (+0.10)	0.79 (+0.04)	23.00 (+3.03)	3.50 (+0.60)

3.2.22. As illustrated in **Table 3-4** above, the Coopers End Mini Roundabout is predicted to continue to operate within its theoretical design capacity in the 2027 sensitivity test with development scenario in both the AM and PM peaks.

3.2.23. With the exception of Hall Road (Arm A) in the AM peak, minimal delays and insignificant queues are forecast on all arms.

3.2.24. In the AM peak Hall Road (Arm A) is forecast to operate close to its design capacity with an RFC 0.95 and queue of 11 PCUs. The maximum delay per PCU is also forecast to increase by 21 seconds (74 seconds).

3.2.25. In the PM peak hour, the junction is predicted to operate with a maximum RFC of 0.79 and queue of 4 PCUs.

3.2.26. In the AM peak the Proposed Development is expected to result in a maximum increase in RFC of 0.04 and less than 1 PCU increase in queue length. In the PM peak, the Proposed Development is expected to result in a maximum increase in RFC of 0.04 and less than 1 PCU increase in queueing.

3.2.27. Whilst the Proposed Development does result in a small increase in the level of delay on Hall Road in the AM peak (21 seconds), this is likely to be within normally experienced daily variation. As such it is considered that the Proposed Development will have an imperceptible impact on existing road users in the AM and PM peaks.

SUMMARY

3.2.28. The results of the standalone junction modelling demonstrate that the existing junctions can accommodate the additional AM and PM peak hour development generated vehicle trips. All the assessed junctions are predicted to continue to operate within capacity with low levels of delay and queuing. As such no junction capacity improvements are required at these junctions to mitigate the impact of the Proposed Development.

3.3 VISSIM MICRO-SIMULATION MODEL – STANSTED MOUNTFITCHET

3.3.1. A sensitivity test was performed on the forecast year scenarios (2027 reference case and 2027 reference case + development) to consider the additional committed development trips from the "Land South of Henham Road" development.

NETWORK PERFORMANCE

3.3.2. The average time a vehicle spends in the network, average time per mile, average speed and average delay per vehicle has been obtained for each model scenario. The results are shown in

Table 3-5 for the AM and PM peaks. In the '**change**' column the results shown in brackets are the without the sensitivity test flow results for comparison. The number shown in bracket in the 'change' column represents the change without "Land South of Henham Road" development flows.

Table 3-5 – Network Performance Indicators

Network Statisitic	AM Peak				AM Peak			
	2022	2027+C	2027+C+ D	Change (2027+C+ D minus 2027+C)	2022	2027+C	2027+C+ D	Change (2027+C+ D minus 2027+C)
Average Time (s) / Vehicle	130	146	153	+7 (+7)	128	131	134	+3 (+4)
Average Time (s) / Mile	190	194	201	+7 (+6)	204	199	201	+2 (+4)
Average Speed (mph)	19	19	18	-1 (-1)	18	18	18	0 (0)
Average Delay / Vehicle (s)	44	54	60	+6 (+7)	47	47	50	+3 (+3)

3.3.3. **Table 3-5** shows that there is generally an insignificant change in the network performance with and without the inclusion of the "Land South of Henham Road" development flows.

3.3.4. The results shows that the average increase in travel time as a result of the proposed development is forecast to be an extra 7 seconds on average per vehicle in the AM peak, from an average journey time of 146 seconds in the 2027 reference case scenario to 153 seconds in the 2027 with-development scenario.

3.3.5. In the PM peak, the increase in average journey time per vehicle is 4 seconds, from an average journey time of 131 seconds in the 2027 reference case scenario to 134 seconds in the 2027 reference with development.

3.3.6. The impacts are considered minimal and unlikely to be noticeable from the variation inherent in day-to-day traffic flows and journey times.

MAXIMUM QUEUE LENGTHS

3.3.7. The maximum queue lengths recorded for each model scenario have been logged and are summarised in **Table 3-6** and **Table 3-7** for the AM and PM peaks respectively.

Table 3-6 - Maximum Queue Length (m) Record during the AM Peak

Junction	Arm	2022	2027+C	2027+C+D	Change (m) (2027+C+D minus 2027+C)	Change (Veh) (2027+C+D minus 2027+C)
Junction 4 - Grove Hill Signalised Junction	41 - J4 - Lower Street LT	34	40	36	-3	0
	42 - J4 - Lower Street RT	37	42	38	-3	0
	43 - J4 - B1051 (N) RT	5	9	15	+6	+1
	44 - J4 - B1051 (S) Signal Stopline	52	58	58	+1	0
	45 - J4 - B1051 (N) Signal Stopline	30	29	29	+1	0
	46 - Grove Hill (2nd queue)	116	119	124	+4	+1
Chapel Hill / Church Road roundabout Junction 5 - Chapel Hill Roundabout	51 - J5 - B1051 (N)	63	63	82	+18	+3
	52 - J5 - Castle	2	2	4	+2	0
	53 - J5 - Church Road	49	60	73	+13	+2
	54 - J5 - Station Road LT	2	4	5	+1	0
	55 - J5 - Station Road RT	1	2	2	0	0
	56 - J5 - Chapel Hill	51	81	94	+14	+2
Junction 10 - Cambridge Road / Chapel Hill	101 - J10 - Cambridge Road (N) RT	10	42	64	+23	+4
	102 - J10 - Chapel Hill LT	62	116	119	+3	+1
	103 - J10 - Chapel Hill RT	25	38	38	0	0
	104 - J10 - Silver Street RT	63	109	181	+72	+12
	105 - J10 Bentfield Road LT	12	16	25	+8	+1
	106 - J10 Bentfield Road RT	14	17	25	+9	+1
Chapel Hill	991 - Chapel Hill (E)	77	99	114	+15	+3
	992 - Chapel Hill (W)	87	140	185	+45	+8

3.3.8. The locations where the impact of the additional development generated vehicle trips is predicted to be greatest are:

- Chapel Hill western approach to the on-street parked vehicles section – AM queue increases by 45m (+ 8 vehicles) and
- Silver Street right turn onto Chapel Hill – AM queue increases by 72m (+ 12 vehicles)

3.3.9. Despite these increases, the maximum queue length between the 2022 reference case scenario and the 2027 proposed development scenario remains relatively similar when considering the reference case scenario maximum length in these locations – 140m (24 vehicles) on Chapel Hill westbound and 109m (19 vehicles) on Silver Street right turn onto Chapel Hill.

3.3.10. As discussed in the following sections the increase in maximum queue length in these locations result in limited increases in journey times and delays. As such the Proposed Development is not expected to result in a severe impact on the operation of the local highway network.

3.3.11. Elsewhere in the network the results show that in the AM weekday period the additional development generated vehicle trips is expected to cause either very small or no increases to the maximum queue lengths which would not result in a severe impact on the operation of the local highway network.

Table 3-7 – Maximum Queue Length Record during the PM Peak

Junction	Arm	2022	2027+C	2027+C+D	Change (m)	Change (Veh)
Junction 4 - Grove Hill signalised junction	41 - J4 - Lower Street LT	14	13	13	+1	0
	42 - J4 - Lower Street RT	16	16	16	+1	0
	43 - J4 - B1051 (N) RT	3	3	2	-1	0
	44 - J4 - B1051 (S) Signal Stopline	52	72	72	0	0
	45 - J4 - B1051 (N) Signal Stopline	26	26	26	0	0
	46 - Grove Hill (2nd queue)	115	61	67	+6	+1
Chapel Hill / Church Road roundabout Junction 5 - Chapel Hill roundabout	51 - J5 - B1051 (N)	28	33	53	+20	+4
	52 - J5 - Castle	7	11	10	-1	0
	53 - J5 - Church Road	43	47	51	+4	+1
	54 - J5 - Station Road LT	14	17	19	+2	0
	55 - J5 - Station Road RT	5	5	6	+1	0
	56 - J5 - Chapel Hill	66	77	93	+15	+3
Cambridge Road / Chapel Hill	101 - J10 - Cambridge Road (N) RT	22	25	31	+6	+1
	102 - J10 - Chapel Hill LT	19	31	37	+6	+1
	103 - J10 - Chapel Hill RT	36	45	43	-2	0
	104 - J10 - Silver Street RT	147	177	199	+22	+4
	105 - J10 Bentfield Road LT	16	16	17	+1	0
	106 - J10 Bentfield Road RT	16	17	18	+1	0
Chapel Hill	991 - Chapel Hill (E)	60	86	95	+9	+2
	992 - Chapel Hill (W)	76	102	117	+15	+3

3.3.12. **Table 3-7** shows that the most significant increases in maximum queue length between the with and without proposed development scenarios occurred in these locations:

- Chapel Hill roundabout B1051 approach – queue increases by 20m (+ 4 vehicles); and
- Silver Street right turn onto Chapel Hill – queue increases by 22m (+ 4 vehicles).

3.3.13. An additional 4 vehicles to the maximum queue length in the proposed development scenario in these locations is not likely to be perceptible to the average driver. The changes to maximum queue lengths expected at other locations on the local highway network in the PM peak from the additional development generated vehicle trips are either very small or does not change. As such the change in maximum queue lengths in the PM peak period will not result in a severe impact on the operation of the local highway network.

AVERAGE JOURNEY TIMES

3.3.14. **Table 3-8** shows the average journey time between Grove Hill (at Gorsefield school) and the Silver Street / Mill Side junction via Chapel Hill. For the westbound direction, the Grove Hill end of the section has been extended up to the M11 bridge to capture the additional delay caused by queuing vehicles on Grove Hill.

3.3.15. The average journey times have been collated for each model scenario and are presented in **Table 3-8** for the AM and PM peaks.

Table 3-8 – Average Journey Times Recorded in Seconds

Route	AM Peak				PM Peak			
	2022	2027+C	2027+C+D	Change (2027+C+D minus 2027+C)	2022	2027+C	2027+C+D	Change (2027+C+D minus 2027+C)
101 - B1051 (SB): Farm to Lower Road turning	90	51	54	+3	172	60	63	+3
102 - B1051 (SB): Lower Rd turning to Chapel Hill Rdbt	21	24	25	+1	17	19	20	+1
103 - B1051 (WB): Chapel Hill Rdbt to Crafton Green	87	97	98	+1	86	94	94	0
104 - Silver Street (SB): Crafton Green to Blythwood Gardens	30	30	30	0	30	30	30	0
105 - Silver Street (NB): Blythwood Gardens to Crafton Green	43	51	57	6	47	53	54	+1
106 - B1051 (EB): Crafton Green to Chapel Hill Rdbt	93	136	150	+13	81	102	106	+4
107 - B1051 (NB): Chapel Hill Rdbt to Lower Rd turning	32	38	40	+2	27	31	32	+1
108 - B1051 (NB): Lower Rd turning to Farm	29	30	30	0	30	31	31	0
200 - Elsenham to Stansted Mountfitchet	123	126	128	+2	126	118	119	+1

3.3.16. **Table 3-8** demonstrates that in the AM peak the majority of the increase in average journey time through Stanstead Mountfitchet is concentrated on Chapel Hill eastbound (journey time section 106). At this location the Proposed Development would result in an increase in average journey time of 13 seconds.

3.3.17. The increase in average journey time for the rest of the road sections is not greater than 10 seconds and is not likely to be perceptible to the average driver.

3.3.18. In the PM peak, **Table 3-8** shows the increase in journey times for all of the road sections is no greater than 10 seconds and is therefore not likely to be perceptible by drivers.

3.3.19. Like the 2027 Sensitivity Test scenario, a decrease in journey times is observed at journey time section 101 and journey time section 200. This is associated with the proposed improvements to the Grove Hill signals.

AVERAGE DELAY

3.3.20. **Table 3-9** shows the average delay per approach and scenario. The delay shown in the table is the average delay recorded every 15-minute interval weighted by turning proportion and averaged over all simulation runs.

Table 3-9 – Average delay (s) per approach

Junction	Arm	2022	2027+C	2027+C +D	Change	2022	2027+C	2027+C +D	Change
Junction 4 - Grove Hill signalised Junction	Grove Hill	85.8	51.1	55.9	+5	170.2	53.3	56.8	+4
	Lower Street (S)	21.4	28.3	30.2	+2	16.5	21.4	22	+1
	Lower Street (N)	13.4	19	19.4	0	6.6	8.2	8.4	0
Junction 5 - Chapel Hill Roundabout	Lower Street	12.3	14.4	16.3	+2	10.6	14.2	14.8	+1
	Station Car Park	15.9	21.8	24.1	+2	15	21.5	23.3	+2
	Church Road	15.7	22.7	25.4	+3	29.1	38.1	40.7	+3
	Station Road	10.9	13	13.7	+1	9.7	12	12	0
	Chapel Hill	8.2	11.2	12.5	+1	5.4	7.4	8.3	+1
Junction 10 - Cambridge Road / Chapel Hill / Silver Street / Bentfield Road Priority junction	Cambridge Road	15.5	17.3	19.8	+3	13.2	13.5	13.9	0
	Chapel Hill	12.3	19.2	20.9	+2	8.5	10.1	10.7	+1
	Silver Street	14.5	22.1	29.1	+7	19.8	26.1	28.3	+2
	Bentfield Road	8.9	11.5	18.2	+7	10.6	12.4	13.4	+1
Chapel Hill	Westbound	29	32.4	32.7	0	33.7	40.4	40.4	0
	Eastbound	43.6	78.6	92.5	+14	30.8	44.9	47.2	+2

3.3.21. **Table 3-9** demonstrates that the level of delay experienced at most of the approaches to the junctions remains similar between the reference case and with development scenarios in the AM and PM peak.

3.3.22. The most significant increase occurs at Chapel Hill eastbound in the AM peak, where the average delay is expected to increase by 14 seconds as a result of the proposed development. The increase average delay between the reference case scenario and the proposed development scenario in the PM peak is not expected to exceed 5 seconds at any of the junctions and therefore is not likely to be perceptible to drivers.

3.3.23. Generally, delay across the network is not significant post development, as such the impact of the development proposals on the highway network is not considered to be severe.

SUMMARY

3.3.24. The results of the VISSIM micro-simulation model demonstrate that the additional development generated trips are predicted to result in minor increases in queuing and delay on the main route through Stansted Mountfitchet when compared to the 2022 baseline and 2027 baseline conditions. Therefore overall, the impact of the development traffic on the B1051 through Stansted Mountfitchet is considered to be minimal, and as such so no mitigation in the form of highway capacity enhancements are proposed in Stansted Mountfitchet.

4 SUMMARY

4.1.1. Overall, impact assessment shows that the additional trips predicted to be generated by the proposed development can be accommodated on the existing local transport networks without significant impacts to their efficient operation. As such no mitigation is proposed.

Appendix A

NETWORK FLOW DIAGRAM