Great Wilsey Park, Haverhill

Technical Note: Update to Southern Access from Chalkstone Way

20th April 2017

1 Introduction

Brookbanks Consulting Limited is appointed by Hallam Land Management and Mrs. Pelly to provide transportation advice for a proposed mixed-use development on land to the east of the A143 Haverhill Road and north of Chalkstone Way in Haverhill, Suffolk.

For the Outline Planning Application, a Traffic Signals Access off Chalkstone Way was offered with the Transport Assessment. The Planning Application subsequently received consent in March 2017.

As part of the ongoing design strategy, it has been proposed that an alternative access junction can be implemented to the south of the development, being a compact roundabout at the existing mini-roundabout site between Chalkstone Way and Millfields Way. This is shown below in Figure 1a:

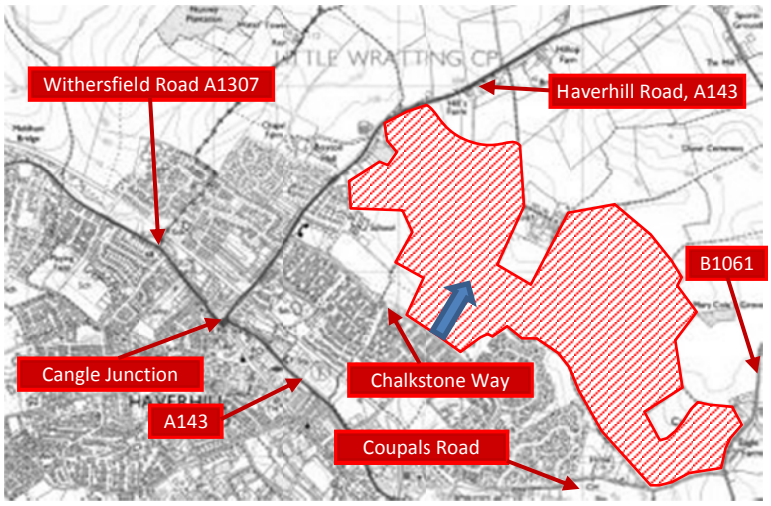

Figure 1a: Proposed Junction Locations

The purpose of this note is to provide the results of a modelling test using Junctions 9 software.

2 Junction Assessment Results

Background

Scoping discussions occurred with the highway authority to ensure that there was an agreed methodology in place for the design of the junction. This included agreement to that a traffic capacity assessment of the junction should be carried out.

For the robustness of this assessment, this has been carried to the most onerous level of development whereby the traffic flows are for the future year 2029 with the North West Growth Area (NWGA) & Great Wilsey Park. All trip rates and growth rates remain as per the original Transport Assessment.

The alternative solution to access the site from the south has been designed as a compact roundabout consisting of four arms with localised improvements to Chalkstone Way and Millfields Way, as indicated below in Figure 2a:

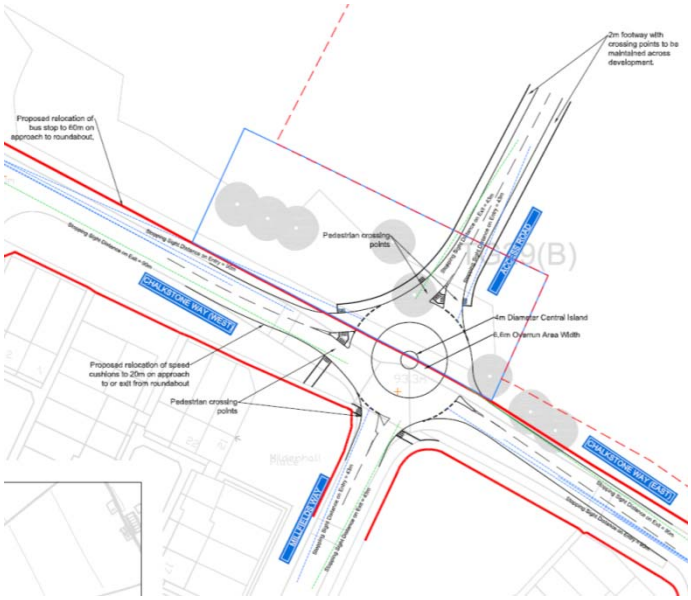

Figure 2a: Alternative Chalkstone Way Access

The results of the design, based on demand flows, as appended, are indicated below.

Link	AM Peak		PM Peak	
	RFC	Max Queue	RFC	Max Queue
Access on to Chalkstone Way	0.577	1.3	0.343	0.5
Chalkstone Way (East)	0.659	1.9	0.585	1.4
Millfields Way	0.105	0.1	0.045	0.0
Chalkstone Way (West)	0.463	0.9	0.531	1.1

Figure 2b: JUNCTIONS 9 results – Proposed Access off Chalkstone Way (2029 with Development)

The results indicate that the proposed junction will operate satisfactorily for the development scenario as the maximum ratio of flow to capacity falls below the 0.85 threshold.

3 Conclusions and Limitations

The technical note has addressed the traffic capacity for alternative site access from Chalkstone Way for the development at Great Wilsey Park at Haverhill.

Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assumes is correct at the time of writing. While all reasonable checks have been made on data sources and the accuracy of data, Brookbanks Consulting Ltd accepts no liability for same.

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Appendix – JUNCTIONS 9 Output Results for Proposed Roundabout Design

Junctions 9

ARCADY 9 - Roundabout Module

Filename: 10173 J15 Chalkstone Way Access HL-19B - Rev4 2029R+NW2+NE2 AM.j9
Path: P:\10173\Traffic\Junctions - Rev3\J15 Chalkstone Way jw Access South\Mini Roundabout
Report generation date: 20/04/2017 10:28:42

Summary of junction performance

	AM						PM					
	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Network Residual Capacity
	Mini Roundabout HL-19 - 2029R +NW2+NE2											
A - Access onto Chalkstone Way	1.3	11.39	0.58	B	11.32	23 % [B - Chalkstone Way (E)]	0.5	6.85	0.34	A	9.31	39 % [B - Chalkstone Way (E)]
B - Chalkstone Way (E)	1.9	16.06	0.66	C			1.4	12.20	0.59	B		
C - Millfields Way	0.1	9.59	0.11	A			0.0	7.68	0.04	A		
D - Chalkstone Way (W)	0.9	6.89	0.46	A			1.1	8.30	0.53	A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

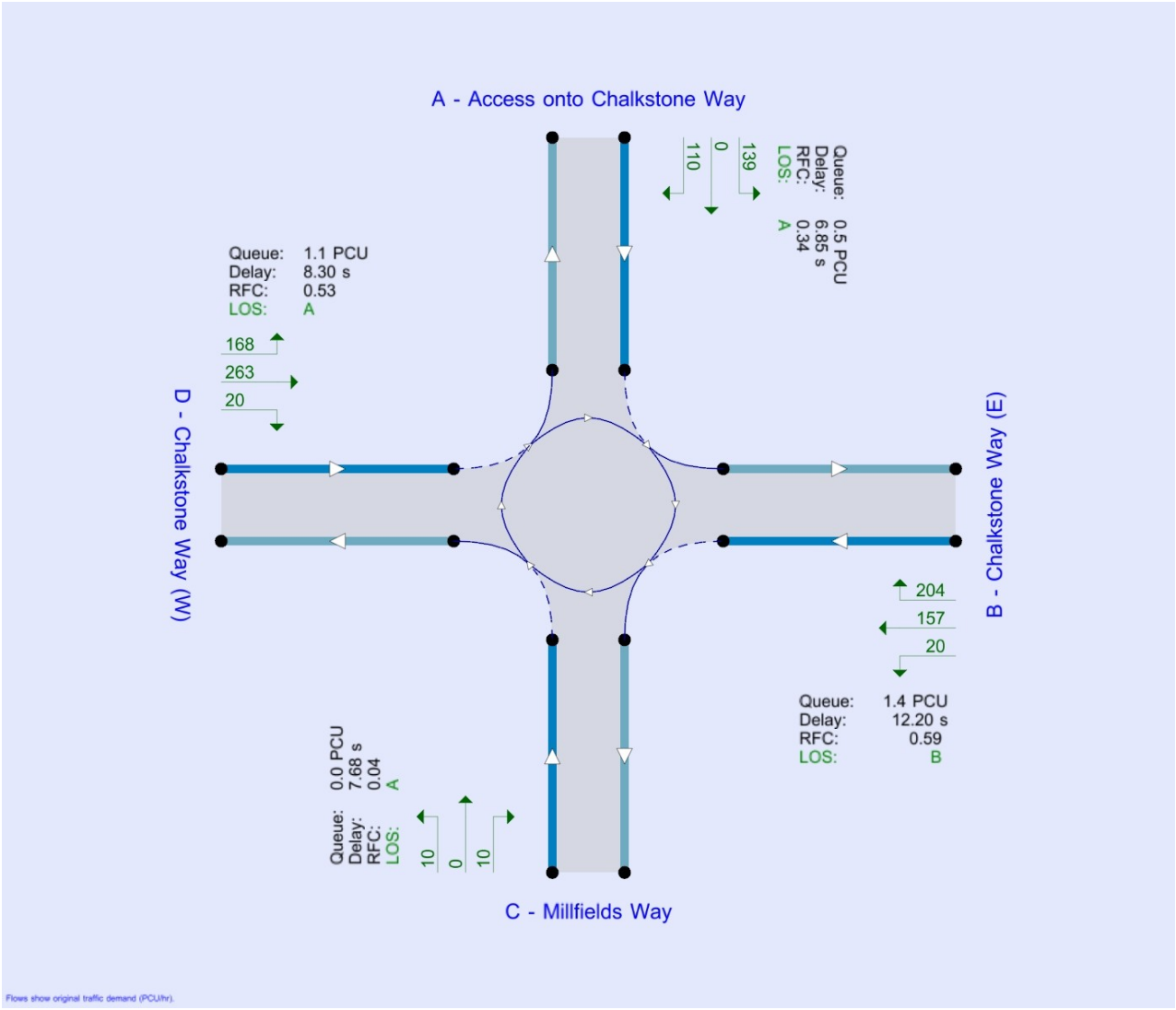
File summary

File Description

Title	10173 J15 Chalkstone Way Access Mini-roundabout - Rev3 2029R+NW2+NE2 AM
Location	Haverhill
Site number	
Date	08/04/2015
Version	
Status	Preliminary
Identifier	
Client	
Jobnumber	10173
Enumerator	matt.moss [BCL25]
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



The junction diagram reflects the last run of Junctions.

Analysis Options

Mini-roundabout model	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)
JUNCTIONS 9	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
D1	2029R +NW2+NE2	AM	ONE HOUR	07:45	09:15	15	✓
D2	2029R +NW2+NE2	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Mini Roundabout HL-19	✓	100.000	100.000

Mini Roundabout HL-19 - 2029R +NW2+NE2, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Southern Access on to Chalkstone Way	Mini-roundabout	A,B,C,D	11.32	B

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		23	B - Chalkstone Way (E)

Arms

Arms

Arm	Name	Description
A	Access onto Chalkstone Way	Access
B	Chalkstone Way (E)	
C	Millfields Way	
D	Chalkstone Way (W)	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
A - Access onto Chalkstone Way	3.00	3.00	4.50	4.0	20.00	18.00	0.0	
B - Chalkstone Way (E)	3.25	3.25	4.50	4.0	17.00	12.00	0.0	
C - Millfields Way	3.25	3.25	4.50	2.0	20.00	15.00	0.0	
D - Chalkstone Way (W)	3.25	3.25	4.50	5.0	19.00	19.00	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A - Access onto Chalkstone Way	0.728	1035
B - Chalkstone Way (E)	0.629	807
C - Millfields Way	0.640	822
D - Chalkstone Way (W)	0.810	1126

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
D1	2029R +NW2+NE2	AM	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 (%)
A - Access onto Chalkstone Way		ONE HOUR	✓	391	100.000
B - Chalkstone Way (E)		ONE HOUR	✓	405	100.000
C - Millfields Way		ONE HOUR	✓	40	100.000
D - Chalkstone Way (W)		ONE HOUR	✓	425	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - Access onto Chalkstone Way	B - Chalkstone Way (E)	C - Millfields Way	D - Chalkstone Way (W)
From	A - Access onto Chalkstone Way	0	214	0	177
	B - Chalkstone Way (E)	109	0	10	286
	C - Millfields Way	0	20	0	20
	D - Chalkstone Way (W)	85	330	10	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - Access onto Chalkstone Way	B - Chalkstone Way (E)	C - Millfields Way	D - Chalkstone Way (W)
From	A - Access onto Chalkstone Way	0	0	0	0
	B - Chalkstone Way (E)	0	0	0	5
	C - Millfields Way	0	0	0	0
	D - Chalkstone Way (W)	0	5	0	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)
A - Access onto Chalkstone Way	0.58	11.39	1.3	B	359	538
B - Chalkstone Way (E)	0.66	16.06	1.9	C	372	557
C - Millfields Way	0.11	9.59	0.1	A	37	55
D - Chalkstone Way (W)	0.46	6.89	0.9	A	390	585

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
A - Access onto Chalkstone Way	294	74	269	839	0.351	292	145	0.0	0.5	6.566	A
B - Chalkstone Way (E)	305	76	140	719	0.424	302	422	0.0	0.7	8.883	A
C - Millfields Way	30	8	427	549	0.055	30	15	0.0	0.1	6.928	A
D - Chalkstone Way (W)	320	80	96	1048	0.305	318	360	0.0	0.5	5.111	A

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
A - Access onto Chalkstone Way	352	88	323	799	0.440	351	174	0.5	0.8	8.000	A
B - Chalkstone Way (E)	364	91	168	701	0.519	363	506	0.7	1.1	10.960	B
C - Millfields Way	36	9	512	494	0.073	36	18	0.1	0.1	7.851	A
D - Chalkstone Way (W)	382	96	116	1032	0.370	381	433	0.5	0.6	5.740	A

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
A - Access onto Chalkstone Way	430	108	395	747	0.576	428	213	0.8	1.3	11.223	B
B - Chalkstone Way (E)	446	111	205	678	0.658	443	619	1.1	1.9	15.627	C
C - Millfields Way	44	11	626	422	0.104	44	22	0.1	0.1	9.520	A
D - Chalkstone Way (W)	468	117	141	1011	0.463	467	528	0.6	0.9	6.849	A

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
A - Access onto Chalkstone Way	430	108	396	746	0.577	430	214	1.3	1.3	11.394	B
B - Chalkstone Way (E)	446	111	206	677	0.659	446	621	1.9	1.9	16.060	C
C - Millfields Way	44	11	630	419	0.105	44	22	0.1	0.1	9.591	A
D - Chalkstone Way (W)	468	117	142	1011	0.463	468	532	0.9	0.9	6.885	A

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
A - Access onto Chalkstone Way	352	88	325	798	0.440	354	175	1.3	0.8	8.135	A
B - Chalkstone Way (E)	364	91	169	700	0.520	367	509	1.9	1.1	11.293	B
C - Millfields Way	36	9	518	491	0.073	36	18	0.1	0.1	7.924	A
D - Chalkstone Way (W)	382	96	117	1031	0.371	383	438	0.9	0.6	5.778	A

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
A - Access onto Chalkstone Way	294	74	272	837	0.352	295	147	0.8	0.5	6.658	A
B - Chalkstone Way (E)	305	76	141	718	0.425	306	426	1.1	0.8	9.089	A
C - Millfields Way	30	8	433	546	0.055	30	15	0.1	0.1	6.989	A
D - Chalkstone Way (W)	320	80	98	1047	0.306	321	365	0.6	0.5	5.153	A

Mini Roundabout HL-19 - 2029R +NW2+NE2, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms B and D have 75% of the total flow for the roundabout for one or more time segments]

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Southern Access on to Chalkstone Way	Mini-roundabout	A,B,C,D	9.31	A

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		39	B - Chalkstone Way (E)

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
D2	2029R +NW2+NE2	PM	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 (%)
A - Access onto Chalkstone Way		ONE HOUR	✓	249	100.000
B - Chalkstone Way (E)		ONE HOUR	✓	381	100.000
C - Millfields Way		ONE HOUR	✓	20	100.000
D - Chalkstone Way (W)		ONE HOUR	✓	451	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - Access onto Chalkstone Way	B - Chalkstone Way (E)	C - Millfields Way	D - Chalkstone Way (W)
From	A - Access onto Chalkstone Way	0	139	0	110
	B - Chalkstone Way (E)	204	0	20	157
	C - Millfields Way	0	10	0	10
	D - Chalkstone Way (W)	168	263	20	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - Access onto Chalkstone Way	B - Chalkstone Way (E)	C - Millfields Way	D - Chalkstone Way (W)
From	A - Access onto Chalkstone Way	1	0	0	0
	B - Chalkstone Way (E)	0	0	0	2
	C - Millfields Way	0	0	0	0
	D - Chalkstone Way (W)	0	2	0	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)
A - Access onto Chalkstone Way	0.34	6.85	0.5	A	228	343
B - Chalkstone Way (E)	0.59	12.20	1.4	B	350	524
C - Millfields Way	0.04	7.68	0.0	A	18	28
D - Chalkstone Way (W)	0.53	8.30	1.1	A	414	621

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
A - Access onto Chalkstone Way	187	47	219	875	0.214	186	278	0.0	0.3	5.227	A
B - Chalkstone Way (E)	287	72	97	745	0.385	284	308	0.0	0.6	7.830	A
C - Millfields Way	15	4	352	597	0.025	15	30	0.0	0.0	6.183	A
D - Chalkstone Way (W)	340	85	160	996	0.341	337	207	0.0	0.5	5.511	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
A - Access onto Chalkstone Way	224	56	263	843	0.265	223	334	0.3	0.4	5.806	A
B - Chalkstone Way (E)	343	86	117	733	0.467	342	370	0.6	0.9	9.241	A
C - Millfields Way	18	4	422	552	0.033	18	36	0.0	0.0	6.739	A
D - Chalkstone Way (W)	405	101	192	970	0.418	405	248	0.5	0.7	6.427	A

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
A - Access onto Chalkstone Way	274	69	322	801	0.342	274	408	0.4	0.5	6.821	A
B - Chalkstone Way (E)	419	105	143	717	0.585	417	452	0.9	1.4	12.039	B
C - Millfields Way	22	6	516	492	0.045	22	44	0.0	0.0	7.661	A
D - Chalkstone Way (W)	497	124	234	936	0.531	495	304	0.7	1.1	8.231	A

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
A - Access onto Chalkstone Way	274	69	323	800	0.343	274	410	0.5	0.5	6.847	A
B - Chalkstone Way (E)	419	105	143	717	0.585	419	454	1.4	1.4	12.202	B
C - Millfields Way	22	6	518	490	0.045	22	44	0.0	0.0	7.684	A
D - Chalkstone Way (W)	497	124	236	935	0.531	497	305	1.1	1.1	8.303	A

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
A - Access onto Chalkstone Way	224	56	264	842	0.266	224	336	0.5	0.4	5.835	A
B - Chalkstone Way (E)	343	86	117	733	0.467	345	372	1.4	0.9	9.393	A
C - Millfields Way	18	4	426	550	0.033	18	36	0.0	0.0	6.770	A
D - Chalkstone Way (W)	405	101	193	969	0.418	407	250	1.1	0.7	6.497	A

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
A - Access onto Chalkstone Way	187	47	221	874	0.215	188	281	0.4	0.3	5.253	A
B - Chalkstone Way (E)	287	72	98	745	0.385	288	311	0.9	0.6	7.958	A
C - Millfields Way	15	4	356	595	0.025	15	30	0.0	0.0	6.213	A
D - Chalkstone Way (W)	340	85	162	995	0.341	340	209	0.7	0.5	5.571	A