



RiverOak Strategic Partners

Applicant's Appendix Tr.4.1

**TR020002/D10/Tr.4.1
Examination Document**

Project Name:	Manston Airport Development Consent Order
Application Ref:	TR020002
Submission Deadline:	10
Date:	2 July 2019

Technical note:

Appendix TR.4.1 - A256 - Junctions Assessments

1. Introduction

- 1.1.1 This Technical Note (TN) sets out the results of junction modelling to assess the potential impact of Manston airport trips along the A256 corridor. The following three junctions have been modelled based on junction models and baseline traffic data available in the Discovery Park Transport Assessment (Planning ref: 14/00058):
- ▶ A256/Ramsgate Road/Copart Access;
 - ▶ A256/Monks Way; and
 - ▶ A256/Ash Road/A257.
- 1.1.2 Beyond these junctions the development traffic flows are reduced as traffic is dispersed on the network.

2. Junction Capacity Assessments

- 2.1.1 The three junctions have been modelled in Junctions 9 based on the ARCADY outputs for the junctions presented in the Discovery Park Transport Assessment which have been accepted by Kent County Council (KCC). The junction model output is included in Appendix A.

2.2 A256/Ramsgate Road/Copart Access

- 2.2.1 Table 2.1 presents the results of the 2039 Baseline scenario junction modelling.

Table 2.1 A256/Ramsgate Road/Copart Access – 2039 Base – Peak Hour Modelling

Arm	AM Peak		PM Peak	
	Queue (veh)	RFC	Queue (veh)	RFC
A256 North	21	0.97	1	0.58
Ramsgate Road	1	0.57	47	1.10
A256 South	3	0.72	2	0.69
Copart Access	0	0.03	0	0.11
Junction Delay (min)	0.35		0.73	

- 2.2.2 The results show that the A256 North arm is over capacity in the AM peak and the Ramsgate Road arm is over capacity in the PM peak.
- 2.2.3 Table 2.2 presents the results of the 2039 + Development Scenario modelling.

Table 2.2 A256/Ramsgate Road/Copart Access – 2039 + Development – Peak Hour Modelling

Arm	AM Peak		PM Peak	
	Queue (veh)	RFC	Queue (veh)	RFC
A256 North	24	0.98	2	0.64
Ramsgate Road	1	0.54	75	1.19
A256 South	3	0.77	2	0.69
Copart Access	0	0.03	0	0.1
Junction Delay (min)	0.39		1.10	

- 2.2.4 In the AM Peak there is an increase in queuing of 3 vehicles on the A256 North arm, with a marginal change in RFC on other arms. It is considered that this is not a significant impact.
- 2.2.5 In the PM Peak there is an increase in queuing of 28 on the Ramsgate Road arm and 1 on the A256 North arm, with a marginal change in RFC on some of the arms.
- 2.2.6 This is a similar level of impact as that presented in the Discovery Park TA, as shown below, which was accepted by KCC as not severe and not requiring mitigation.

2023 base traffic + permitted development + committed				
A256 Ramsgate Road (North)	0.856	2.2	0.507	1.0
Ramsgate Road (East)	0.350	0.3	0.789	3.6
A256 Ramsgate Road (South)	0.622	1.0	0.61	1.6
Copart Access Road	0.024	0.0	0.087	0.1

2023 base traffic + permitted development + committed + development				
A256 Ramsgate Road (North)	0.930	11.5	0.546	1.2
Ramsgate Road (East)	0.535	1.1	1.054	34.2
A256 Ramsgate Road (South)	0.675	2.1	0.639	1.8
Copart Access Road	0.028	0.0	0.1	0.1

Note: Sourced from Discovery Park Transport Assessment, AECOM, January 2014 – Planning ref: 14/00058

- 2.2.7 Consideration has been given to junction improvement within the highway boundary, and a minor increase to the flare on the Ramsgate Road arm from 6.7 to just 15m would result in betterment on nil detriment.

2.3 A256/Monk's Way

- 2.3.1 Table 2.3 presents the results of the 2039 Baseline Scenario modelling.

Table 2.3 A256/Monk's Way – 2039 Base – Peak Hour Modelling

Arm	AM Peak		PM peak	
	Queue (veh)	RFC	Queue (veh)	RFC
A256 North	12	0.94	2	0.65
Monk's Way	0	0.28	2	0.64
A256 South	10	0.92	2	0.70
Junction Delay (min)	0.31		0.08	

2.3.2 The results show that the A256 North and A256 South arms are over capacity in the AM peak.

2.3.3 Table 2.4 presents the results of the 2039 + Development Scenario modelling.

Table 2.4 A256/Monk's Way – 2039+Dev – Peak Hour Modelling

Arm	AM Peak		PM Peak	
	Queue (veh)	RFC	Queue (veh)	RFC
A256 North	13	0.94	3	0.72
Monk's Way	0	0.28	2	0.69
A256 South	19	0.97	2	0.70
Junction Delay (min)	0.45		0.10	

2.3.4 In the AM Peak there is an increase in queuing of 1 vehicle on the A256 North arm and 9 vehicles on A256 South arm, with a marginal change in RFC on A256 South arms. In the PM Peak there is an increase in queuing of 1 on the A256 North arm, with a marginal change in RFC on some of the arms. It is considered that this is not a significant impact.

2.4 A256/Ash Road/A257

2.4.1 Table 3.5 presents the results of the 2039 Baseline Scenario junction modelling.

Table 2.5 A256/Ash Road/A257 – 2039 Base – Peak Hour Modelling

Junction 28	AM Peak		PM Peak	
	Queue (veh)	RFC	Queue (veh)	RFC
A256 North	203	1.26	716	1.66
Ash Road	1	0.34	1	0.43
A256 South	366	1.45	85	1.13
A257	101	1.23	42	1.09
Junction Delay (min)	11.79		16.69	

- 2.4.2 The results show that all arms of the junction except Ash Road are over capacity in both the peaks.
- 2.4.3 KCC has acknowledged during discussion that the junction has capacity issues and that the highway authority needs to identify an improvement scheme for to address this, with the expectation that developers would contribute to this.
- 2.4.4 Table 3.6 presents the results of the 2039 + Development Scenario modelling.

Table 2.6 A256/Ash Road/A257 – 2039 + Dev – Peak Hour Modelling

Junction 1	AM Peak		PM Peak	
	Queue (veh)	RFC	Queue (veh)	RFC
A256 North	215	1.27	872	1.75
Ash Road	1	0.34	1	0.43
A256 South	459	1.53	96	1.15
A257	121	1.26	45	1.1
Junction Delay (min)	14.17		20.50	

- 2.4.5 The development impact is predominantly on the A256 South arm in the AM peak (queue increase of 156 vehicles and RFC change of 0.08) and the A256 North in the PM peak (queue increase of 93 vehicles and RFC change of 0.09).
- 2.4.6 The impact Discovery Park development resulted in similar levels of increase, more on some arms, as shown below, which was accepted by KCC as not requiring mitigation. In the AM peak had queue increases of 113 vehicles (change in RFC of 0.167) on the A256 North, 91 vehicles (change in RFC of 0.100) on the A256 South and 35 vehicles (change in RFC of 0.098) on the A257 Canterbury Road. In the PM peak the Discovery Park impact had queue increases of 150 vehicles (change in RFC of 0.15) on the A256 North, 35 vehicles (change in RFC of 0.105 RFC) on the A256 South and 35 vehicles (0.098 RFC) on the A257 Canterbury Road.

2023 base traffic + permitted development + committed				
A256 Ramsgate Road (North)	1.044	44.8	1.415	317.1
Ash Road	0.303	0.4	0.394	0.6
A256 Ramsgate Road (South)	1.239	155.6	0.956	13.8
A257 Canterbury Road	1.072	37.8	0.903	7.4
2023 base traffic + permitted development + committed + development				
A256 Ramsgate Road (North)	1.211	158.4	1.565	467.4
Ash Road	0.308	0.4	0.396	0.7
A256 Ramsgate Road (South)	1.359	247.3	1.061	48.3
A257 Canterbury Road	1.170	73.1	1.018	21.6

Note: Sourced from Discovery Park Transport Assessment, AECOM, January 2014 – Planning ref: 14/00058

2.4.7 The Discovery Park TA states at paragraph 6.8.15:

"ARCADY modelling software suite is known to inaccurately forecast queues once the desirable capacity limits have been exceeded. It is therefore prudent to note that the queuing predicted in the future year scenarios is not an accurate representation of queuing at the junction where the RFC has exceeded 0.85"

2.4.8 The Discovery Park TA included an assessment of the full Local Development Order (LDO) for Discovery Park, as shown below, however, the queues on A256 South in the AM and the A256 North in the PM as a result of the development traffic were still +118 and +144.

2023 base traffic + LDO				
A256 Ramsgate Road (North)	1.035	40.1	1.433	322.6
Ash Road	0.297	0.4	0.388	0.6
A256 Ramsgate Road (South)	1.285	190.2	0.951	13.1
A257 Canterbury Road	1.108	50.9	0.873	5.9

Note: Sourced from Discovery Park Transport Assessment, AECOM, January 2014 – Planning ref: 14/00058

The Discovery Park TA states at paragraph 6.8.20:

"The proposed development at Discovery Park is therefore expected to have a marginally worse impact on the operation of the Ramsgate Road / Ash Road / A257 Sandwich Road roundabout than the full LDO permission. The net impact of the proposed development is therefore not considered to be severe."

2.4.9 The impact of the Manston Airport traffic is similar or less than that of Discovery Park which did not result in the need for a mitigation scheme.

2.4.10 As identified, KCC acknowledges that capacity issues into the future year will need to be addressed by an improvement scheme.

3. Summary

3.1.1 The results of the modelling exercise show that the development traffic through the junctions has less of an impact than Discovery Park Development that was granted permission that did not offer any mitigation improvements at the junctions despite putting a larger amount of traffic onto the junctions in the peak hours.

Issued byGlyn Price
.....**Approved by**Bev Coupe
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Management systems

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Appendix A

Junction Modelling

Junctions 9			
ARCADY 9 - Roundabout Module			
Version: 9.5.0.6896 © Copyright TRL Limited, 2018			
For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk			
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Filename: A256 Copart Access Ramsgate Rd.j9

Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\A256 Modelling

Report generation date: 02/07/2019 11:45:34

»2039 Base, AM

»2039 Base , PM

»2039+Dev, AM

»2039+Dev, PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)
	2039 Base							
Arm 1	20.7	0.57	0.97	0.35	1.4	0.06	0.58	0.73
Arm 2	1.0	0.20	0.50		46.9	3.06	1.10	
Arm 3	2.5	0.09	0.72		2.2	0.09	0.69	
Arm 4	0.0	0.21	0.03		0.1	0.17	0.11	
	2039+Dev							
Arm 1	23.8	0.64	0.98	0.39	1.7	0.07	0.64	1.10
Arm 2	1.1	0.22	0.54		74.9	4.92	1.19	
Arm 3	3.4	0.11	0.77		2.2	0.09	0.69	
Arm 4	0.0	0.25	0.03		0.1	0.17	0.10	

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.

File summary

File Description

Title	
Location	
Site number	
Date	18/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
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	mph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	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	2039 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2039 Base	PM	ONE HOUR	16:45	18:15	15	✓
D3	2039+Dev	AM	ONE HOUR	07:45	09:15	15	✓
D4	2039+Dev	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.35	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A256 (N)	
2	Ramsgate Road (E)	
3	A256 (S)	
4	Copart Access Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	7.70	9.80	30.1	20.0	60.0	50.0	
2	3.70	9.70	6.7	13.0	60.0	56.0	
3	7.20	10.00	19.0	40.0	60.0	42.0	
4	5.30	5.30	0.0	10.0	60.0	42.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.704	2655
2	0.476	1406
3	0.728	2711
4	0.492	1461

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	2039 Base	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 (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	2075	100.000
2		ONE HOUR	✓	272	100.000
3		ONE HOUR	✓	1546	100.000
4		ONE HOUR	✓	7	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
From		1	2	3	4
	1	0	626	1406	43
	2	221	0	51	0
	3	1250	296	0	0
	4	6	0	1	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
From		1	2	3	4
	1	0	7	0	23
	2	11	0	0	0
	3	4	5	0	0
	4	50	0	100	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.97	0.57	20.7	D	1904	2856
2	0.50	0.20	1.0	B	250	374
3	0.72	0.09	2.5	A	1419	2128
4	0.03	0.21	0.0	B	6	10

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1562	391	223	2427	0.644	1555	1108	0.0	1.8	0.068	A
2	205	51	1087	813	0.252	203	691	0.0	0.3	0.098	A
3	1164	291	198	2446	0.476	1160	1093	0.0	0.9	0.047	A
4	5	1	1326	494	0.011	5	32	0.0	0.0	0.123	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1865	466	267	2395	0.779	1859	1326	1.8	3.4	0.110	A
2	245	61	1299	719	0.340	244	827	0.3	0.5	0.126	A
3	1390	347	237	2415	0.576	1388	1306	0.9	1.3	0.058	A
4	6	2	1586	408	0.015	6	39	0.0	0.0	0.149	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	2285	571	326	2352	0.971	2231	1621	3.4	16.7	0.389	C
2	299	75	1559	605	0.495	298	998	0.5	1.0	0.194	B
3	1702	426	288	2374	0.717	1698	1569	1.3	2.5	0.088	A
4	8	2	1939	292	0.026	8	46	0.0	0.0	0.211	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	2285	571	327	2352	0.971	2269	1626	16.7	20.7	0.572	D
2	299	75	1585	593	0.505	299	1010	1.0	1.0	0.204	B
3	1702	426	290	2373	0.717	1702	1594	2.5	2.5	0.089	A
4	8	2	1945	290	0.027	8	47	0.0	0.0	0.213	B

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1865	466	268	2395	0.779	1934	1333	20.7	3.7	0.149	A
2	245	61	1351	696	0.351	246	850	1.0	0.5	0.134	A
3	1390	347	240	2412	0.576	1394	1357	2.5	1.4	0.059	A
4	6	2	1595	405	0.016	6	40	0.0	0.0	0.150	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1562	391	224	2426	0.644	1569	1114	3.7	1.8	0.071	A
2	205	51	1097	808	0.253	206	697	0.5	0.3	0.100	A
3	1164	291	200	2444	0.476	1166	1103	1.4	0.9	0.047	A
4	5	1	1333	491	0.011	5	33	0.0	0.0	0.123	A

2039 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.73	E

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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	2039 Base	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 (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1325	100.000
2		ONE HOUR	✓	765	100.000
3		ONE HOUR	✓	1407	100.000
4		ONE HOUR	✓	37	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
	1	2	3	4	
From	1	0	209	1098	18
	2	529	0	235	1
	3	1360	47	0	0
	4	27	2	8	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
From		1	2	3	4
	1	0	8	2	56
	2	4	0	5	0
	3	1	16	0	0
	4	4	0	25	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.58	0.06	1.4	A	1216	1824
2	1.10	3.06	46.9	F	702	1053
3	0.69	0.09	2.2	A	1291	1937
4	0.11	0.17	0.1	B	34	51

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	998	249	43	2527	0.395	995	1435	0.0	0.6	0.039	A
2	576	144	844	952	0.605	570	194	0.0	1.5	0.155	A
3	1059	265	408	2361	0.449	1056	1006	0.0	0.8	0.046	A
4	28	7	1450	676	0.041	28	14	0.0	0.0	0.093	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1191	298	51	2520	0.473	1190	1716	0.6	0.9	0.045	A
2	688	172	1010	874	0.787	680	232	1.5	3.4	0.299	C
3	1265	316	487	2301	0.550	1263	1202	0.8	1.2	0.058	A
4	33	8	1734	544	0.061	33	17	0.0	0.1	0.117	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1459	365	63	2511	0.581	1457	2041	0.9	1.4	0.057	A
2	842	211	1236	767	1.098	748	284	3.4	27.0	1.473	F
3	1549	387	538	2262	0.685	1545	1446	1.2	2.1	0.083	A
4	41	10	2063	392	0.104	41	21	0.1	0.1	0.171	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1459	365	63	2511	0.581	1459	2054	1.4	1.4	0.057	A
2	842	211	1238	767	1.099	763	284	27.0	46.9	3.060	F
3	1549	387	548	2255	0.687	1549	1452	2.1	2.2	0.085	A
4	41	10	2076	385	0.106	41	21	0.1	0.1	0.174	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1191	298	51	2520	0.473	1193	1840	1.4	0.9	0.045	A
2	688	172	1012	873	0.788	852	232	46.9	5.7	1.965	F
3	1265	316	607	2212	0.572	1268	1258	2.2	1.3	0.064	A
4	33	8	1858	486	0.069	33	17	0.1	0.1	0.133	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	998	249	43	2527	0.395	999	1456	0.9	0.7	0.039	A
2	576	144	847	950	0.606	592	194	5.7	1.6	0.175	B
3	1059	265	424	2349	0.451	1061	1015	1.3	0.8	0.047	A
4	28	7	1471	666	0.042	28	14	0.1	0.0	0.094	A

2039+Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.39	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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
D3	2039+Dev	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 (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	2093	100.000
2		ONE HOUR	✓	286	100.000
3		ONE HOUR	✓	1659	100.000
4		ONE HOUR	✓	7	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
	1	2	3	4	
From	1	0	628	1422	43
	2	235	0	51	0
	3	1363	296	0	0
	4	6	0	1	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
	1	2	3	4	
From	1	0	7	0	23
	2	11	0	0	0
	3	4	5	0	0
	4	50	0	100	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.98	0.64	23.8	E	1921	2881
2	0.54	0.22	1.1	B	262	394
3	0.77	0.11	3.4	A	1522	2284
4	0.03	0.25	0.0	C	6	10

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1576	394	223	2427	0.649	1568	1203	0.0	1.8	0.069	A
2	215	54	1099	807	0.267	214	693	0.0	0.4	0.101	A
3	1249	312	208	2438	0.512	1245	1104	0.0	1.0	0.050	A
4	5	1	1421	463	0.011	5	32	0.0	0.0	0.131	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1882	470	267	2396	0.785	1875	1439	1.8	3.5	0.114	A
2	257	64	1313	712	0.361	256	828	0.4	0.6	0.131	A
3	1491	373	249	2406	0.620	1489	1320	1.0	1.6	0.065	A
4	6	2	1700	371	0.017	6	39	0.0	0.0	0.165	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	2304	576	326	2353	0.979	2244	1759	3.5	18.5	0.418	D
2	315	79	1572	599	0.526	313	998	0.6	1.1	0.208	B
3	1827	457	303	2363	0.773	1820	1582	1.6	3.3	0.109	A
4	8	2	2077	247	0.031	8	46	0.0	0.0	0.251	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	2304	576	327	2352	0.980	2283	1766	18.5	23.8	0.643	E
2	315	79	1599	587	0.537	315	1011	1.1	1.1	0.220	B
3	1827	457	305	2361	0.774	1826	1609	3.3	3.4	0.112	A
4	8	2	2085	244	0.032	8	47	0.0	0.0	0.254	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1882	470	268	2395	0.786	1961	1449	23.8	3.8	0.164	A
2	257	64	1374	686	0.375	259	856	1.1	0.6	0.141	A
3	1491	373	253	2402	0.621	1498	1380	3.4	1.7	0.067	A
4	6	2	1711	367	0.017	6	40	0.0	0.0	0.166	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1576	394	224	2427	0.649	1583	1210	3.8	1.9	0.072	A
2	215	54	1109	802	0.268	216	698	0.6	0.4	0.103	A
3	1249	312	210	2436	0.513	1251	1115	1.7	1.1	0.051	A
4	5	1	1429	460	0.011	5	33	0.0	0.0	0.132	A

2039+Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	1.10	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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
D4	2039+Dev	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 (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1452	100.000
2		ONE HOUR	✓	767	100.000
3		ONE HOUR	✓	1434	100.000
4		ONE HOUR	✓	37	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
	1	2	3	4	
From	1	0	222	1212	18
	2	531	0	235	1
	3	1387	47	0	0
	4	27	2	8	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
		1	2	3	4
	1	0	8	2	56
	2	4	0	5	0
	3	1	16	0	0
From	4	4	0	25	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.64	0.07	1.7	A	1332	1999
2	1.19	4.92	74.9	F	704	1056
3	0.69	0.09	2.2	A	1316	1974
4	0.10	0.17	0.1	B	34	51

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1093	273	43	2529	0.432	1090	1456	0.0	0.8	0.042	A
2	577	144	929	912	0.633	571	203	0.0	1.7	0.173	B
3	1080	270	409	2361	0.457	1076	1091	0.0	0.8	0.047	A
4	28	7	1471	666	0.042	28	14	0.0	0.0	0.094	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1305	326	51	2523	0.517	1304	1739	0.8	1.1	0.049	A
2	690	172	1112	826	0.835	679	243	1.7	4.4	0.381	C
3	1289	322	487	2302	0.560	1287	1304	0.8	1.3	0.059	A
4	33	8	1757	533	0.062	33	17	0.0	0.1	0.120	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1599	400	63	2514	0.636	1596	2038	1.1	1.7	0.065	A
2	844	211	1361	709	1.190	700	298	4.4	40.5	2.176	F
3	1579	395	505	2287	0.690	1575	1555	1.3	2.2	0.084	A
4	41	10	2060	394	0.103	41	21	0.1	0.1	0.170	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1599	400	63	2514	0.636	1599	2046	1.7	1.7	0.066	A
2	844	211	1363	708	1.192	707	298	40.5	74.9	4.918	F
3	1579	395	510	2283	0.692	1579	1560	2.2	2.2	0.085	A
4	41	10	2068	390	0.105	41	21	0.1	0.1	0.172	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1305	326	51	2523	0.517	1308	1838	1.7	1.1	0.049	A
2	690	172	1115	825	0.836	814	244	74.9	43.8	4.377	F
3	1289	322	581	2232	0.578	1292	1348	2.2	1.4	0.064	A
4	33	8	1856	487	0.068	33	17	0.1	0.1	0.132	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1093	273	43	2529	0.432	1094	1582	1.1	0.8	0.042	A
2	577	144	933	910	0.635	745	204	43.8	1.8	0.818	E
3	1080	270	531	2270	0.476	1081	1148	1.4	0.9	0.051	A
4	28	7	1597	606	0.046	28	15	0.1	0.0	0.104	A

Junctions 9			
ARCADY 9 - Roundabout Module			
Version: 9.5.0.6896 © Copyright TRL Limited, 2018			
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Filename: A256 Ash Road.j9

Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18
A256 Modelling

Report generation date: 19/06/2019 09:46:29

»2039+Dev, AM
»2039+Dev, PM
»2039 Base, AM
»2039 Base, PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)
	2039+Dev							
Arm 1	214.6	9.42	1.27	14.17	871.6	38.82	1.75	20.50
Arm 2	0.5	0.14	0.34		0.8	0.15	0.43	
Arm 3	459.3	22.58	1.53		96.2	4.46	1.15	
Arm 4	121.4	9.98	1.26		45.3	3.20	1.10	
	2039 Base							
Arm 1	203.2	9.00	1.26	11.79	716.0	32.05	1.66	16.69
Arm 2	0.5	0.14	0.34		0.7	0.15	0.43	
Arm 3	365.9	17.89	1.45		85.4	3.83	1.13	
Arm 4	101.0	8.40	1.23		41.6	2.92	1.09	

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.

File summary

File Description

Title	
Location	
Site number	
Date	18/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
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	mph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
		0.85	0.60	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)
D1	2039+Dev	AM	ONE HOUR	07:45	09:15	15
D2	2039+Dev	PM	ONE HOUR	16:45	18:15	15
D3	2039 Base	AM	ONE HOUR	07:45	09:15	15
D4	2039 Base	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2039+Dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	14.17	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A256 (N)	
2	Ash Road	
3	A256 (S)	
4	A257	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.60	6.20	8.1	18.0	40.0	17.0	
2	3.30	7.10	11.9	35.6	40.0	21.0	
3	3.60	6.70	8.8	26.4	40.0	22.0	
4	3.30	7.20	6.4	29.5	40.0	34.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.622	1538
2	0.648	1652
3	0.633	1593
4	0.583	1403

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)
D1	2039+Dev	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	1541	100.000
2		✓	199	100.000
3		✓	1634	100.000
4		✓	831	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
	1	2	3	4	
From	1	0	45	1057	439
	2	64	0	20	115
	3	1385	27	0	222
	4	610	86	135	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
	1	2	3	4	
From	1	0	11	5	2
	2	10	0	12	3
	3	3	14	0	2
	4	2	4	6	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS
1	1.27	9.42	214.6	F
2	0.34	0.14	0.5	A
3	1.53	22.58	459.3	F
4	1.26	9.98	121.4	F

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1160	181	1360	0.853	1139	5.2	0.253	C
2	150	1205	789	0.190	149	0.2	0.094	A
3	1230	459	1256	0.979	1173	14.2	0.548	D
4	626	1062	741	0.844	607	4.6	0.407	C

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1385	204	1345	1.030	1307	24.8	0.878	F
2	179	1381	677	0.264	178	0.4	0.120	A
3	1469	533	1209	1.215	1205	80.2	2.527	F
4	747	1099	719	1.039	692	18.2	1.254	F

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1697	211	1341	1.265	1339	114.2	3.250	F
2	219	1417	654	0.335	219	0.5	0.138	A
3	1799	578	1180	1.525	1180	235.1	8.115	F
4	915	1090	724	1.264	722	66.6	3.742	F

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1697	212	1341	1.266	1340	203.3	7.196	F
2	219	1419	653	0.336	219	0.5	0.138	A
3	1799	579	1179	1.526	1179	390.0	15.803	F
4	915	1089	724	1.264	723	114.4	7.675	F

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1385	211	1341	1.033	1340	214.6	9.423	F
2	179	1418	653	0.274	179	0.4	0.127	A
3	1469	543	1202	1.222	1202	456.7	21.101	F
4	747	1097	720	1.037	719	121.4	9.976	F

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1160	209	1342	0.864	1336	170.7	8.660	F
2	150	1412	657	0.228	150	0.3	0.119	A
3	1230	516	1220	1.008	1220	459.3	22.581	F
4	626	1102	717	0.872	711	100.0	9.352	F

2039+Dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	20.50	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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)
D2	2039+Dev	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	2047	100.000
2		✓	278	100.000
3		✓	1188	100.000
4		✓	729	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
	1	2	3	4	
From	1	0	92	1382	573
	2	95	0	43	140
	3	986	27	0	175
	4	430	142	157	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
	1	2	3	4	
From	1	0	1	4	2
	2	1	0	3	2
	3	5	0	0	6
	4	1	4	6	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS
1	1.75	38.82	871.6	F
2	0.43	0.15	0.8	A
3	1.15	4.46	96.2	F
4	1.10	3.20	45.3	F

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1541	243	1336	1.153	1313	57.0	1.434	F
2	209	1371	718	0.292	208	0.4	0.117	A
3	894	543	1184	0.756	883	2.9	0.193	B
4	549	824	878	0.625	542	1.6	0.176	B

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1840	288	1308	1.407	1307	190.3	5.804	F
2	250	1387	707	0.354	249	0.5	0.131	A
3	1068	577	1163	0.918	1047	8.2	0.450	D
4	655	978	786	0.834	644	4.3	0.397	C

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	2254	319	1288	1.750	1288	431.7	14.574	F
2	306	1384	709	0.432	305	0.7	0.148	A
3	1308	619	1137	1.150	1128	53.3	1.828	F
4	803	1066	734	1.094	716	26.0	1.538	F

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	2254	323	1285	1.754	1285	673.9	25.867	F
2	306	1384	709	0.432	306	0.8	0.149	A
3	1308	618	1137	1.150	1136	96.2	4.065	F
4	803	1073	730	1.100	726	45.3	3.163	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1840	320	1288	1.429	1288	812.0	34.445	F
2	250	1384	709	0.353	251	0.6	0.131	A
3	1068	572	1166	0.916	1154	74.8	4.455	F
4	655	1069	732	0.896	716	30.2	3.205	F

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1541	295	1303	1.183	1303	871.6	38.819	F
2	209	1386	708	0.296	210	0.4	0.121	A
3	894	542	1184	0.755	1169	6.3	2.181	F
4	549	1068	732	0.750	656	3.5	1.193	F

2039 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	11.79	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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)
D3	2039 Base	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	1525	100.000
2		✓	199	100.000
3		✓	1537	100.000
4		✓	814	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
	1	2	3	4	
From	1	0	45	1043	437
	2	64	0	20	115
	3	1288	27	0	222
	4	593	86	135	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
	1	2	3	4	
From	1	0	11	5	2
	2	10	0	12	3
	3	4	14	0	2
	4	2	4	6	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS
1	1.26	9.00	203.2	F
2	0.34	0.14	0.5	A
3	1.45	17.89	365.9	F
4	1.23	8.40	101.0	F

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1148	182	1359	0.845	1129	4.9	0.243	B
2	150	1195	796	0.188	149	0.2	0.093	A
3	1157	457	1247	0.928	1121	9.0	0.404	C
4	613	1007	767	0.799	599	3.5	0.332	C

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1371	208	1343	1.021	1300	22.7	0.825	E
2	179	1375	680	0.263	178	0.4	0.119	A
3	1382	533	1199	1.152	1190	56.8	1.850	F
4	732	1076	727	1.007	689	14.3	1.030	F

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1679	218	1337	1.256	1335	108.8	3.094	F
2	219	1416	655	0.335	219	0.5	0.137	A
3	1692	579	1170	1.447	1169	187.6	6.380	F
4	896	1071	729	1.229	726	56.9	3.173	F

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1679	218	1337	1.256	1336	194.5	6.899	F
2	219	1418	654	0.335	219	0.5	0.138	A
3	1692	580	1169	1.448	1169	318.4	12.945	F
4	896	1071	729	1.229	729	98.8	6.587	F

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1371	217	1337	1.025	1336	203.2	8.997	F
2	179	1417	654	0.273	179	0.4	0.127	A
3	1382	544	1192	1.159	1192	365.9	17.259	F
4	732	1077	725	1.009	723	101.0	8.400	F

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1148	216	1338	0.858	1331	157.3	8.133	F
2	150	1411	658	0.228	150	0.3	0.118	A
3	1157	517	1210	0.957	1206	353.5	17.890	F
4	613	1080	724	0.846	717	75.0	7.388	F

2039 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	16.69	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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)
D4	2039 Base	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	1932	100.000
2		✓	278	100.000
3		✓	1163	100.000
4		✓	727	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
	1	2	3	4	
From	1	0	92	1283	557
	2	95	0	43	140
	3	961	27	0	175
	4	428	142	157	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
	1	2	3	4	
From	1	0	1	4	2
	2	1	0	3	2
	3	5	0	0	6
	4	1	4	6	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS
1	1.66	32.05	716.0	F
2	0.43	0.15	0.7	A
3	1.13	3.83	85.4	F
4	1.09	2.92	41.6	F

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1455	243	1336	1.088	1302	38.1	1.035	F
2	209	1357	727	0.288	208	0.4	0.115	A
3	876	551	1179	0.743	865	2.8	0.185	B
4	547	805	888	0.616	541	1.6	0.170	B

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1737	289	1307	1.328	1307	145.6	4.353	F
2	250	1383	710	0.352	249	0.5	0.130	A
3	1046	588	1156	0.904	1027	7.3	0.415	C
4	654	958	798	0.819	644	4.0	0.368	C

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	2127	322	1286	1.654	1286	355.8	11.781	F
2	306	1381	711	0.430	305	0.7	0.148	A
3	1280	629	1131	1.132	1119	47.6	1.672	F
4	800	1055	740	1.081	720	24.1	1.437	F

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	2127	327	1284	1.657	1284	566.7	21.624	F
2	306	1380	711	0.430	306	0.7	0.148	A
3	1280	629	1131	1.132	1129	85.4	3.663	F
4	800	1064	735	1.089	730	41.6	2.922	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1737	323	1286	1.351	1286	679.4	28.887	F
2	250	1380	711	0.351	251	0.5	0.130	A
3	1046	583	1159	0.902	1146	60.3	3.833	F
4	654	1059	738	0.886	720	25.0	2.824	F

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1455	287	1308	1.112	1308	716.0	32.051	F
2	209	1383	710	0.295	210	0.4	0.120	A
3	876	555	1176	0.744	1103	3.4	1.470	F
4	547	1009	767	0.713	636	2.7	0.708	E

Junctions 9			
ARCADY 9 - Roundabout Module			
Version: 9.5.0.6896 © Copyright TRL Limited, 2018			
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Filename: A256 Monk's Way.j9

Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\A256 Modelling

Report generation date: 18/06/2019 17:34:20

»2039 Base, AM
»2039 Base , PM
»2039+Dev, AM
»2039+Dev, PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)
	2039 Base							
Arm 1	12.0	0.42	0.94	0.31	1.9	0.08	0.65	0.08
Arm 2	0.4	0.05	0.28		1.8	0.09	0.64	
Arm 3	9.9	0.28	0.92		2.3	0.08	0.70	
	2039+Dev							
Arm 1	13.3	0.47	0.94	0.45	2.6	0.10	0.72	0.10
Arm 2	0.4	0.05	0.28		2.2	0.12	0.69	
Arm 3	19.4	0.52	0.97		2.3	0.08	0.70	

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.

File summary

File Description

Title	
Location	
Site number	
Date	18/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
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	mph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	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	2039 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2039 Base	PM	ONE HOUR	16:45	18:15	15	✓
D3	2039+Dev	AM	ONE HOUR	07:45	09:15	15	✓
D4	2039+Dev	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.31	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A256 (N)	
2	Monk's Way	
3	A256 (S)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	7.32	9.95	14.1	20.0	60.9	48.0	
2	7.32	9.67	8.7	26.0	60.9	10.5	
3	7.34	9.83	15.9	20.0	60.9	41.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.681	2547
2	0.762	2805
3	0.701	2623

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	2039 Base	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 (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1644	100.000
2		ONE HOUR	✓	425	100.000
3		ONE HOUR	✓	2051	100.000

Origin-Destination Data

Demand (Veh/hr)

	To			
	1	2	3	
From	1	0	364	1280
	2	130	0	295
	3	1325	726	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	1	2	3	
From	1	0	1	4
	2	0	0	3
	3	3	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.94	0.42	12.0	D	1509	2263
2	0.28	0.05	0.4	A	390	585
3	0.92	0.28	9.9	C	1882	2823

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1238	309	544	2103	0.589	1232	1091	0.0	1.4	0.068	A
2	320	80	959	2003	0.160	319	817	0.0	0.2	0.036	A
3	1544	386	98	2497	0.618	1538	1181	0.0	1.6	0.062	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1478	369	651	2032	0.727	1473	1305	1.4	2.6	0.107	A
2	382	96	1147	1857	0.206	382	977	0.2	0.3	0.041	A
3	1844	461	117	2484	0.742	1839	1412	1.6	2.8	0.092	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1810	453	790	1939	0.934	1779	1586	2.6	10.4	0.326	C
2	468	117	1385	1672	0.280	467	1184	0.3	0.4	0.050	A
3	2258	565	143	2466	0.916	2233	1709	2.8	9.1	0.236	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1810	453	798	1933	0.936	1804	1600	10.4	12.0	0.425	D
2	468	117	1404	1657	0.282	468	1198	0.4	0.4	0.050	A
3	2258	565	143	2466	0.916	2255	1729	9.1	9.9	0.276	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1478	369	662	2024	0.730	1515	1326	12.0	2.8	0.126	A
2	382	96	1179	1832	0.209	383	998	0.4	0.3	0.041	A
3	1844	461	117	2484	0.742	1871	1445	9.9	3.0	0.102	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1238	309	548	2100	0.589	1243	1099	2.8	1.5	0.070	A
2	320	80	968	1996	0.160	320	824	0.3	0.2	0.036	A
3	1544	386	98	2497	0.618	1549	1190	3.0	1.6	0.064	A

2039 Base , PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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	2039 Base	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 (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1337	100.000
2		ONE HOUR	✓	1048	100.000
3		ONE HOUR	✓	1467	100.000

Origin-Destination Data

Demand (Veh/hr)

	To			
	1	2	3	
From	1	0	132	1205
	2	330	0	718
	3	1088	379	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	1	2	3	
From	1	0	3	0
	2	0	0	0
	3	2	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.65	0.08	1.9	A	1227	1840
2	0.64	0.09	1.8	A	962	1442
3	0.70	0.08	2.3	A	1346	2019

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1007	252	284	2343	0.430	1004	1064	0.0	0.7	0.045	A
2	789	197	904	2116	0.373	787	384	0.0	0.6	0.045	A
3	1104	276	248	2401	0.460	1101	1443	0.0	0.8	0.046	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1202	300	340	2304	0.522	1201	1273	0.7	1.1	0.054	A
2	942	236	1082	1980	0.476	941	459	0.6	0.9	0.058	A
3	1319	330	296	2368	0.557	1317	1727	0.8	1.2	0.057	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1472	368	416	2251	0.654	1469	1557	1.1	1.9	0.076	A
2	1154	288	1324	1796	0.643	1150	561	0.9	1.8	0.092	A
3	1615	404	362	2322	0.696	1611	2112	1.2	2.2	0.084	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1472	368	417	2251	0.654	1472	1561	1.9	1.9	0.077	A
2	1154	288	1327	1794	0.643	1154	563	1.8	1.8	0.094	A
3	1615	404	363	2322	0.696	1615	2117	2.2	2.3	0.085	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1202	300	342	2303	0.522	1205	1279	1.9	1.1	0.055	A
2	942	236	1086	1977	0.477	946	461	1.8	0.9	0.058	A
3	1319	330	298	2367	0.557	1323	1734	2.3	1.3	0.058	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1007	252	286	2342	0.430	1008	1069	1.1	0.8	0.045	A
2	789	197	908	2113	0.373	790	385	0.9	0.6	0.045	A
3	1104	276	249	2400	0.460	1106	1450	1.3	0.9	0.046	A

2039+Dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.45	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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
D3	2039+Dev	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 (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1661	100.000
2		ONE HOUR	✓	425	100.000
3		ONE HOUR	✓	2164	100.000

Origin-Destination Data

Demand (Veh/hr)

	To			
		1	2	3
	1	0	364	1297
	2	130	0	295
	3	1438	726	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		1	2	3
	1	0	1	4
	2	0	0	3
	3	3	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.94	0.47	13.3	D	1524	2286
2	0.28	0.05	0.4	A	390	585
3	0.97	0.52	19.4	D	1986	2979

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1250	313	544	2103	0.595	1245	1175	0.0	1.5	0.069	A
2	320	80	972	1993	0.161	319	817	0.0	0.2	0.036	A
3	1629	407	98	2496	0.653	1622	1193	0.0	1.9	0.068	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1493	373	650	2032	0.735	1488	1405	1.5	2.7	0.109	A
2	382	96	1162	1845	0.207	382	977	0.2	0.3	0.041	A
3	1945	486	117	2483	0.784	1939	1427	1.9	3.5	0.109	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1829	457	783	1944	0.941	1795	1693	2.7	11.2	0.344	C
2	468	117	1401	1660	0.282	467	1176	0.3	0.4	0.050	A
3	2383	596	143	2465	0.967	2332	1726	3.5	16.0	0.363	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1829	457	795	1936	0.945	1820	1717	11.2	13.3	0.465	D
2	468	117	1422	1644	0.285	468	1194	0.4	0.4	0.051	A
3	2383	596	143	2465	0.967	2369	1746	16.0	19.4	0.517	D

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1493	373	674	2016	0.741	1535	1451	13.3	2.9	0.135	A
2	382	96	1198	1817	0.210	383	1010	0.4	0.3	0.042	A
3	1945	486	117	2483	0.784	2008	1464	19.4	3.8	0.143	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1250	313	549	2099	0.596	1256	1185	2.9	1.5	0.072	A
2	320	80	981	1986	0.161	320	824	0.3	0.2	0.036	A
3	1629	407	98	2496	0.653	1637	1203	3.8	1.9	0.070	A

2039+Dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.10	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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
D4	2039+Dev	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 (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1452	100.000
2		ONE HOUR	✓	1048	100.000
3		ONE HOUR	✓	1467	100.000

Origin-Destination Data

Demand (Veh/hr)

	To			
		1	2	3
	1	0	132	1320
	2	330	0	718
	3	1088	379	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		1	2	3
	1	0	0	2
	2	0	0	0
	3	2	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.72	0.10	2.6	A	1332	1999
2	0.69	0.12	2.2	A	962	1442
3	0.70	0.08	2.3	A	1346	2019

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1093	273	284	2308	0.474	1090	1064	0.0	0.9	0.049	A
2	789	197	991	2035	0.388	786	384	0.0	0.6	0.048	A
3	1104	276	248	2401	0.460	1101	1529	0.0	0.8	0.046	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1305	326	340	2270	0.575	1304	1273	0.9	1.3	0.062	A
2	942	236	1185	1884	0.500	941	459	0.6	1.0	0.064	A
3	1319	330	296	2368	0.557	1317	1830	0.8	1.2	0.057	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1599	400	416	2218	0.721	1594	1557	1.3	2.5	0.095	A
2	1154	288	1449	1678	0.687	1149	561	1.0	2.1	0.112	A
3	1615	404	362	2323	0.695	1611	2236	1.2	2.2	0.084	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1599	400	417	2217	0.721	1599	1561	2.5	2.6	0.097	A
2	1154	288	1453	1675	0.689	1154	563	2.1	2.2	0.115	A
3	1615	404	363	2322	0.696	1615	2244	2.2	2.3	0.085	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1305	326	342	2269	0.575	1310	1279	2.6	1.4	0.063	A
2	942	236	1191	1879	0.501	947	461	2.2	1.0	0.065	A
3	1319	330	298	2366	0.557	1323	1840	2.3	1.3	0.058	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1093	273	286	2307	0.474	1095	1069	1.4	0.9	0.050	A
2	789	197	995	2031	0.388	790	385	1.0	0.6	0.048	A
3	1104	276	249	2400	0.460	1106	1537	1.3	0.9	0.046	A