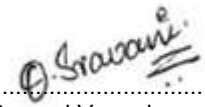
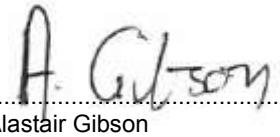
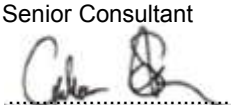
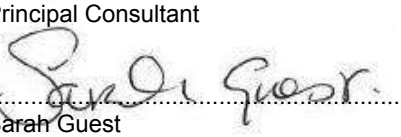
Minworth Roundabout – Option Development and Appraisal Report

Final Report

Prepared by:		Checked by:	
	Sravani Vuppala Senior Consultant		Alastair Gibson Principal Consultant
Verified by:		Approved by:	
	Graham Stevenson Principal Consultant		Sarah Guest Associate Director

Minworth Roundabout – Option Development and Appraisal Report

Rev No	Comments	Prepared by	Checked by	Verified by	Approved by	Date
0.1	Internal Issue	SV				06/02/2014
0.2	Internal Issue	SV	AG	GS		07/02/2014
0.3	DRAFT Final Report	SV	AG	GS	SG	07/02/2014
0.4	Final Report	SV	SG	AG	SG	26/06/2014

Colmore Plaza, Colmore Circus Queensway, Birmingham, B4 6AT
Telephone: 0121 262 1900 Website: http://www.aecom.com

Job No 60313511 Reference Minworth Option Report Date Created February 2014

f:\tem\project\traffic - bcc - minworth rbt options\03 execution\modelling\report\minworth option report rev 0.4.doc

Capabilities on project:
Transportation

Table of Contents

Construction (Design and Management) Notes

1. A high pressure oil pipeline operating at 1400psi passes close to the south side of Minworth roundabout. A six metre “safety zone” has been installed around the pipelines. No works of any kind should be undertaken without prior permission from Fisher German LLP. Prior to the works commencing Mr Richard Gent should be contacted on 0845 4378293.
2. Three 500mm 32 kVA High Voltage power cables at 1.44 metre depth pass directly through the junction. No works should be undertaken without contacting and requesting permission from Western Power Distribution.
3. A National Grid gas main runs to the south and east of the junction. It is not considered that the works will not affect this utility.
4. It has been identified that this area has an enhanced risk of discovering unexploded ordnance near to the site. Appropriate measures should therefore be taken.
5. A stream is located to the north perimeter of the site and should be considered before the construction phase
6. Pedestrian provision will need to be managed during the construction phase. The base provision of the junction is poor.

Capabilities on project:
Transportation

Appendix B - Base Model – ARCADY Inputs

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Base Model - ARCADY Parameters
Date: Jan-14

Geometric Input Data ARCADY Parameters.dwg

Approach		A38 N	Lindridge Drive	A4097 Kingsbury Road	A38S	Walmley Ash Road
Approach road half width (m)	v	7.4	6.1	7.6	7.2	7.1
Entry width (m)	e	7.4	6.1	7.6	7.2	7.1
Effective length over which the flare is developed	l'	0.0	0.0	0.0	0.0	0.0
Entry radius (m)	r	45.6	18.7	61.5	49.7	35.3
Inscribed circle diameter (m)	D	100.0	91.8	94.1	207.9	81.5
Entry conflict angle (m)	Phi	29.0	52.0	51.0	40.0	36.0

NOTE:

Due to dedicated left turn lane on the A38 south approach, lane widths for two lanes are used for ARCADY analysis, to represent the operation of the arm.

As the lane towards the approach is marked with hatching, this has been removed in measuring the geometry paramaters for ARCADY analysis to represent the operation of the arm.

Circulating Flows Minworth Circulating flows.xls

Seperation Distance ARCADY Parameters.dwg

	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38S	Wamley Ash Road
Entry to exit Seperation distance (m)	44	37.5	55.8	95.3	34.7

Prepared by:	**Sravani Vuppala**		31.01.14
Checked by:	**Matthew Rainsford**		03.02.14

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Base Model - ARCADY flows Inputs
Date: Jan-14

AM Peak: 07:30-08:30
Source: Minworth Roundabout PCC Data.xlsm
Survey undertaken on Tuesday, 19th November 2013

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	1	250	554	220
B	Lindridge Drive	6	0	53	47	20
C	A4097 Kingsbury Road	220	10	0	276	298
D	A38 South	251	11	354	0	195
E	Walmley Ash Road	160	4	341	740	0

HGV = OGV1+OGV2+Bus		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	17	44	4
B	Lindridge Drive	0	0	2	0	1
C	A4097 Kingsbury Road	12	0	0	35	10
D	A38 South	33	3	28	0	10
E	Walmley Ash Road	4	0	7	12	0

Percentage of HGV		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0%	0%	7%	8%	2%
B	Lindridge Drive	0%	0%	4%	0%	5%
C	A4097 Kingsbury Road	5%	0%	0%	13%	3%
D	A38 South	13%	27%	8%	0%	5%
E	Walmley Ash Road	3%	0%	2%	2%	0%

OGV 1		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	6	19	1
B	Lindridge Drive	0	0	2	0	0
C	A4097 Kingsbury Road	7	0	0	18	0
D	A38 South	14	1	15	0	5
E	Walmley Ash Road	0	0	1	5	0

OGV 2		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	11	25	3
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	5	0	0	16	0
D	A38 South	19	0	13	0	1
E	Walmley Ash Road	2	0	2	3	0

Bus		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	0	0	0
B	Lindridge Drive	0	0	0	0	1
C	A4097 Kingsbury Road	0	0	0	1	10
D	A38 South	0	2	0	0	4
E	Walmley Ash Road	2	0	4	4	0

Prepared by:	**Sravani Vuppala**		31.01.14
Checked by:	**Matthew Rainsford**		03.02.14

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Base Model - ARCADY flows Inputs
Date: Jan-14

AM Peak: 07:30-08:30 **Suppressed Demand**
Source: Minworth Roundabout PCC Data.xlsm
Survey undertaken on Tuesday, 19th November 2013

Note: Following on site visit on 14th Jan 2014 for AM peak only, it is observed that there are severe queues on A38 N approach. Therefore it is assumed a suppressed demand of 250 vehicles as cars on this approach
A factor of 1.25 has been applied for A38 N approach total flows

1.25

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	1	313	693	275
B	Lindridge Drive	6	0	53	47	20
C	A4097 Kingsbury Road	220	10	0	276	298
D	A38 South	251	11	354	0	195
E	Walmley Ash Road	160	4	341	740	0

This flows are removed in ARCADY as it is dedicated left turn at the roundabout

HGV = OGV1+OGV2+Bus		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	17	44	4
B	Lindridge Drive	0	0	2	0	1
C	A4097 Kingsbury Road	12	0	0	35	10
D	A38 South	33	3	28	0	10
E	Walmley Ash Road	4	0	7	12	0

Percentage of HGV		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0%	0%	5%	6%	1%
B	Lindridge Drive	0%	0%	4%	0%	5%
C	A4097 Kingsbury Road	5%	0%	0%	13%	3%
D	A38 South	13%	27%	8%	0%	5%
E	Walmley Ash Road	3%	0%	2%	2%	0%

OGV 1		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	6	19	1
B	Lindridge Drive	0	0	2	0	0
C	A4097 Kingsbury Road	7	0	0	18	0
D	A38 South	14	1	15	0	5
E	Walmley Ash Road	0	0	1	5	0

OGV 2		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	11	25	3
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	5	0	0	16	0
D	A38 South	19	0	13	0	1
E	Walmley Ash Road	2	0	2	3	0

Bus		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	0	0	0
B	Lindridge Drive	0	0	0	0	1
C	A4097 Kingsbury Road	0	0	0	1	10
D	A38 South	0	2	0	0	4
E	Walmley Ash Road	2	0	4	4	0

Prepared by:	**Sravani Vuppala**		31.01.14
Checked by:	**Matthew Rainsford**		03.02.14

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Base Model - ARCADY flows Inputs
Date: Jan-14

PM Peak: 17:00-18:00
Source: Minworth Roundabout PCC Data.xlsm

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	9	135	318	301
B	Lindridge Drive	4	0	15	8	10
C	A4097 Kingsbury Road	274	2	0	248	535
D	A38 South	594	32	456	0	437
E	Walmley Ash Road	167	12	198	503	0

This flows are removed in ARCADY as it is dedicated left turn at the roundabout

HGV = OGV1+OGV2+Bus		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	16	20	4
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	6	0	0	24	5
D	A38 South	28	0	10	0	6
E	Walmley Ash Road	3	0	6	11	0

OGV 1		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	7	8	1
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	3	0	0	10	2
D	A38 South	7	0	4	0	1
E	Walmley Ash Road	2	0	3	2	0

Percentage of HGV		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0%	0%	12%	6%	1%
B	Lindridge Drive	0%	0%	0%	0%	0%
C	A4097 Kingsbury Road	2%	0%	0%	10%	1%
D	A38 South	5%	0%	2%	0%	1%
E	Walmley Ash Road	2%	0%	3%	2%	0%

OGV 2		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	9	12	3
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	2	0	0	14	0
D	A38 South	20	0	4	0	3
E	Walmley Ash Road	1	0	2	2	0

Bus		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	0	0	0
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	1	0	0	0	3
D	A38 South	1	0	2	0	2
E	Walmley Ash Road	0	0	1	7	0

Prepared by:	**Sravani Vuppala**		30.01.14
Checked by:	**Matthew Rainsford**		03.02.14

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Base Model - Observed Queues
Date: Jan-14

Source:

Observed Queues from surevy data — Minworth Roundabout PCC Data.xlsm

Site visit AM observed queues — Photos

Note: It is assumed queues are in vehicles

Time	A38 (N)		Lindridge Drive		Kingsbury Road		A38 (S)		Walmley Ash Road	
	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2	Lane 1	Lane 2
07:45	14	6	2	0	18	3	5	2	6	3
08:00	16	9	3	0	16	2	4	3	7	2
08:15	12	5	2	0	20	4	5	3	6	3
08:30	11	6	3	0	23	3	3	3	7	3
Average Queues	**13**	**7**	**3**	**0**	**19**	**3**	**4**	**3**	**7**	**3**
Average queues for arm	**10**		**1**		**11**		**4**		**5**	
Observed Queues on 14/01/14 - Site Visit	**200**		**1**		**10**		**4**		**5**	

17:15	7	2	1	0	18	3	11	2	9	2
17:30	5	1	2	0	22	4	12	2	11	3
17:45	8	3	1	0	14	3	9	3	9	3
18:00	6	2	1	1	8	1	6	2	10	4
Average Queues	**7**	**2**	**1**	**0**	**16**	**3**	**10**	**2**	**10**	**3**
Average queues for arm	**4**		**1**		**9**		**6**		**6**	

Prepared by:	**Sravani Vuppala**		31.01.14
Checked by:	**Matthew Rainsford**		03.02.14

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Base Model - Circulating Flows
Date: Jan-14

Circulating flows for large roundabouts

AM Peak

	A	B	C	D	E
A	0	1	313	693	275
B	6	0	53	47	20
C	220	10	0	276	298
D	251	11	354	0	0
E	150	4	341	740	0

AM Peak

A		B		C		D		E	
b-b	0	c-c	0	d-d	0	e-e	0	a-a	0
c-b	10	d-c	354	e-d	740	a-e	275	b-b	0
c-c	0	d-d	0	e-e	0	a-a	0	b-a	6
d-c	354	e-c	341	a-d	692.5	b-b	0	c-a	220
d-b	11	e-d	740	a-e	275	b-a	6	c-b	10
d-d	0	e-e	0	a-a	0	b-e	20	c-c	0
e-b	4	a-c	312.5	b-b	0	c-c	0	d-a	251
e-c	341	a-d	692.5	b-d	47	c-e	298	d-b	11
e-d	740	a-e	275	b-e	20	c-a	220	d-c	354
e-e	0	a-a	0	b-a	6	c-b	10	d-d	0
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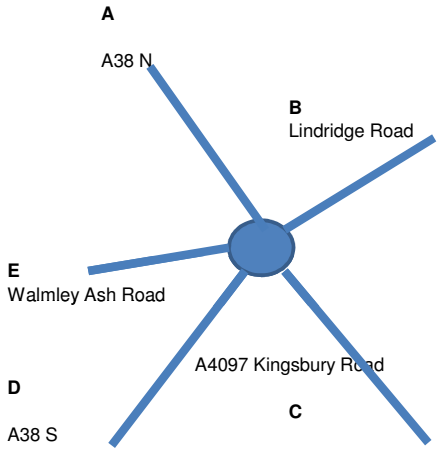
	24		45		30		14		14



Prepared by:	**Sravani Vuppala**	31.01.14
Checked by:	**Graham Stevenson**	3.02.14

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Base Model - Circulating Flows
Date: Jan-14

Circulating flows for large roundabouts

AM Peak

	A	B	C	D	E
A	0	9	135	318	301
B	4	0	15	8	10
C	274	2	0	248	535
D	594	32	456	0	20
E	167	12	198	503	0

AM Peak

A		B		C		D		E	
b-b	0	c-c	0	d-d	0	e-e	0	a-a	0
c-b	2	d-c	456	e-d	503	a-e	301	b-b	0
c-c	0	d-d	0	e-e	0	a-a	0	b-a	4
d-c	456	e-c	198	a-d	318	b-b	0	c-a	274
d-b	32	e-d	503	a-e	301	b-a	4	c-b	2
d-d	0	e-e	0	a-a	0	b-e	10	c-c	0
e-b	12	a-c	135	b-b	0	c-c	0	d-a	594
e-c	198	a-d	318	b-d	8	c-e	535	d-b	32
e-d	503	a-e	301	b-e	10	c-a	274	d-c	456
e-e	0	a-a	0	b-a	4	c-b	2	d-d	0
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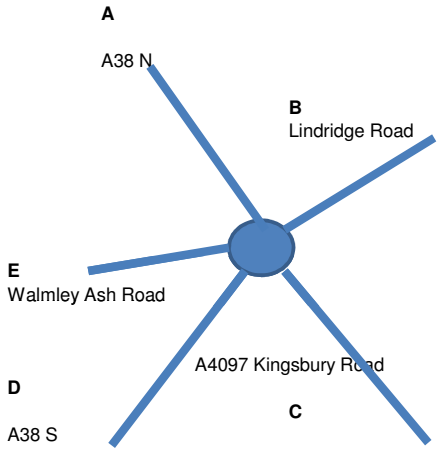
	20		32		19		19		23



Prepared by:	**Sravani Vuppala**	31.01.14
Checked by:	**Graham Stevenson**	3.02.14

Capabilities on project:
Transportation

Appendix C – 2013 Base model outputs

ARCADY 6

GUI Version: 6.2 AG
Analysis Program: Release 7.0 (FEBRUARY 2010)

For sales and distribution information, program advice and maintenance, contact:

TRL Limited
Crowthorne House
Nine Mile Ride
Wokingham, Berks.
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Email: software@ trl.co.uk
Web:www.trlsoftware.co.uk

Run Information

Run with file:- **f:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Base Model\2013 AM Supp Dem BM.vai**
At: **15:44:26 on Wednesday, February 05, 2014**
Mode: **Drive On The Left**
Units: **Metric**

Arm Labelling

Arm	Full Arm Names
Arm A	A38 North
Arm B	Lindridge Drive
Arm C	A4097 Kingsbury Road
Arm D	A38 South
Arm E	Walmley Ash Road

Flow Scaling Factor

Arm	Flow Scaling Factor (%)
Arm A	100
Arm B	100
Arm C	100
Arm D	100
Arm E	100

Geometric Data

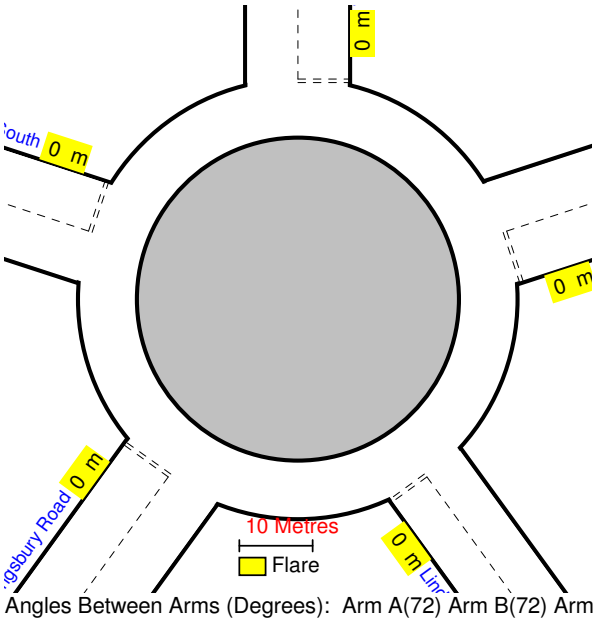
Data Item	Arm A	Arm B	Arm C	Arm D	Arm E
Approach Road Half-Width (m)	7.40	6.05	7.64	7.20	7.14
Entry Width (m)	7.40	6.05	7.64	7.20	7.14
Flare Length (m)	0.00	0.00	0.00	0.00	0.00
Entry Radius (m)	45.60	18.70	61.50	49.70	35.30
Inscribed Circle Diameter (m)	100.00	91.80	94.10	207.90	81.50
Entry Angle (degrees)	29.00	52.00	51.00	40.00	36.00
Slope	0.860	0.481	0.751	0.926	0.976
Intercept (PCU/Min)	45.878	30.789	42.573	43.977	46.068

Grade-separated/motorway factors apply to all arms

Large Roundabout Data

Arm	Circulating Flow (PCU/Min)	Separation (PCU)
Arm A	24.0	44.0
Arm B	45.0	37.5
Arm C	30.0	55.8
Arm D	14.0	95.3
Arm E	14.0	34.7

Junction Diagram: (View Extent = 80m)



Angles Between Arms (Degrees): Arm A(72) Arm B(72) Arm C(72) Arm D(72) Arm E(72)

Demand Data

Demand Profiles are Synthesised using **ODTAB** Data
Period of interest (for Queue and Delay calculations): **07:15 to 08:45**
Length of Time Period: **90 min**
Length of Time Segment: **15 min**

Total Traffic Demand (Vehicles/Hour) for Demand Set: 2013 AM Supp demand

From/To	Arm A	Arm B	Arm C	Arm D	Arm E
Arm A	0.0	1.0	313.0	693.0	275.0
Arm B	6.0	0.0	53.0	47.0	20.0
Arm C	220.0	10.0	0.0	276.0	298.0
Arm D	251.0	11.0	354.0	0.0	0.0
Arm E	160.0	4.0	341.0	740.0	0.0

Entry Flow Data for Demand Set: 2013 AM Supp demand

Arms	Number of Minutes From Start When			Rate of flow (Veh/Min)		
	Flow Starts To Rise	Top of Peak is Reached	Flow Stops Falling	Before Peak	At Top of Peak	After Peak
Arm A	15.00	45.00	75.00	16.02	24.04	16.02
Arm B	15.00	45.00	75.00	1.58	2.36	1.58
Arm C	15.00	45.00	75.00	10.05	15.08	10.05
Arm D	15.00	45.00	75.00	7.70	11.55	7.70
Arm E	15.00	45.00	75.00	15.56	23.34	15.56

Turning Proportions

ODTAB Demand Data type is used, no turning proportions available.

Heavy Vehicle Percentages for Demand Set: 2013 AM Supp demand

Vary over entry

Time Period	From/To	Arm A	Arm B	Arm C	Arm D	Arm E
07:15 to 08:45	Arm A	0.0	0.0	5.0	6.0	1.0
	Arm B	0.0	0.0	4.0	0.0	5.0
	Arm C	5.0	0.0	0.0	13.0	3.0
	Arm D	13.0	27.0	8.0	0.0	0.0
	Arm E	3.0	0.0	2.0	2.0	0.0

Queues and Delay:

Segment	Arm	Demand (Veh / Min)	Capacity (Veh / Min)	Demand / Capacity (RFC)	Ped Flow (Ped / Min)	Start Queue (Veh)	End Queue (Veh)	Delay (Veh.Min / Time Segment)	Geometric Delay (Veh.Min / Time Segment)	Arrival Delay (Min / Veh)
Segment : 1 - 07:15 to 07:30	A	16.09	28.28	0.569	-	0.0	1.3	18.8	-	0.081
	B	1.58	13.46	0.117	-	0.0	0.1	1.9	-	0.084
	C	10.09	23.66	0.426	-	0.0	0.7	10.7	-	0.073
	D	7.73	30.91	0.250	-	0.0	0.3	4.9	-	0.043
	E	15.62	34.04	0.459	-	0.0	0.8	12.3	-	0.054
Segment : 2 - 07:30 to 07:45	A	19.21	25.23	0.761	-	1.3	3.1	42.3	-	0.160
	B	1.89	10.23	0.184	-	0.1	0.2	3.3	-	0.120
	C	12.05	20.52	0.587	-	0.7	1.4	20.0	-	0.117
	D	9.23	29.17	0.316	-	0.3	0.5	6.8	-	0.050
	E	18.65	31.86	0.585	-	0.8	1.4	20.3	-	0.075
Segment : 3 - 07:45 to 08:00	A	23.53	21.13	1.113	-	3.1	44.1	373.5	-	1.313
	B	2.31	7.10	0.326	-	0.2	0.5	6.8	-	0.207
	C	14.75	17.67	0.835	-	1.4	4.5	58.2	-	0.302
	D	11.30	27.33	0.414	-	0.5	0.7	10.3	-	0.062
	E	22.85	28.94	0.790	-	1.4	3.6	49.1	-	0.157
Segment : 4 - 08:00 to 08:15	A	23.53	21.02	1.119	-	44.1	82.3	949.1	-	3.072
	B	2.31	6.94	0.333	-	0.5	0.5	7.3	-	0.216
	C	14.75	17.50	0.843	-	4.5	4.9	71.7	-	0.353
	D	11.30	27.19	0.416	-	0.7	0.7	10.6	-	0.063
	E	22.85	28.87	0.791	-	3.6	3.7	54.7	-	0.165
Segment : 5 - 08:15 to 08:30	A	19.21	25.08	0.766	-	82.3	4.2	610.8	-	1.738
	B	1.89	7.54	0.250	-	0.5	0.3	5.3	-	0.178
	C	12.05	17.49	0.689	-	4.9	2.3	37.5	-	0.196
	D	9.23	28.08	0.329	-	0.7	0.5	7.5	-	0.053
	E	18.65	31.78	0.587	-	3.7	1.4	22.6	-	0.078
Segment : 6 - 08:30 to 08:45	A	16.09	28.19	0.571	-	4.2	1.3	21.5	-	0.085
	B	1.58	13.28	0.119	-	0.3	0.1	2.1	-	0.086
	C	10.09	23.46	0.430	-	2.3	0.8	11.9	-	0.076
	D	7.73	30.77	0.251	-	0.5	0.3	5.1	-	0.043
	E	15.62	33.96	0.460	-	1.4	0.9	13.2	-	0.055

Queuing Delay Information Over Whole Period

Arm	Total Demand		Queueing Delay		Inclusive Queueing Delay	
	(Veh)	(Veh/Hr)	(Min)	(Min/Veh)	(Min)	(Min/Veh)
A	1764.6	1176.4	2015.9	1.14	2016.0	1.14
B	173.4	115.6	26.6	0.15	26.6	0.15
C	1106.6	737.8	210.1	0.19	210.1	0.19
D	847.9	565.3	45.2	0.05	45.2	0.05
E	1713.7	1142.4	172.2	0.10	172.2	0.10
ALL	5606.2	3737.5	2470.1	0.44	2470.1	0.44

Delay is that occuring only within the time period.
Inclusive delay includes delay suffered by vehicles that are still queueing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

File Properties

Run Title	A38/A4097 Minworth roundabout
Location	Birmingham
Date	30/01/2014
Client	Birmingham City Council
Enumerator	vuppalas [UKBHM2LT26704]
Job Number	60313511
Status	Preliminary
Description	2013 Base Model with suppressed demand in AM peak on A38 N approach. In addition intercept corrections have been used to replicate queues on the A38 N approach and also unequal lane usage at A4097 Kingsbury Road. All supporting calculations are:F:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Base Model

Run Information

Run with file:- **f:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Base Model\2013 AM Supp Dem BM Inter Corre.vai**
At: **13:18:07 on Friday, February 07, 2014**
Mode: **Drive On The Left**
Units: **Metric**

Arm Labelling

Arm	Full Arm Names
Arm A	A38 North
Arm B	Lindridge Drive
Arm C	A4097 Kingsbury Road
Arm D	A38 South
Arm E	Walmley Ash Road

Flow Scaling Factor

Arm	Flow Scaling Factor (%)
Arm A	100
Arm B	100
Arm C	100
Arm D	100
Arm E	100

File Properties

Run Title	A38/A4097 Minworth roundabout
Location	Birmingham
Date	30/01/2014
Client	Birmingham City Council
Enumerator	vuppalas [UKBHM2LT26704]
Job Number	60313511
Status	Preliminary
Description	2013 Base Model with suppressed demand in AM peak on A38 N approach. In addition intercept corrections have been used to replicate queues on the A38 N approach and also unequal lane usage at A4097 Kingsbury Road. All supporting calculations are:F:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Base Model

Errors and Warnings

WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

Geometric Data

Data Item	Arm A	Arm B	Arm C	Arm D	Arm E
Approach Road Half-Width (m)	7.40	6.05	7.64	7.20	7.14
Entry Width (m)	7.40	6.05	7.64	7.20	7.14
Flare Length (m)	0.00	0.00	0.00	0.00	0.00
Entry Radius (m)	45.60	18.70	61.50	49.70	35.30
Inscribed Circle Diameter (m)	100.00	91.80	94.10	207.90	81.50
Entry Angle (degrees)	29.00	52.00	51.00	40.00	36.00
Slope	0.860	0.481	0.751	0.926	0.976
Intercept (PCU/Min)	41.878*	30.789	38.573*	43.977	46.068

Grade-separated/motorway factors apply to all arms

One or more intercept values (flagged * in the table) have been adjusted according to local values input from a previous run

Large Roundabout Data

Arm	Circulating Flow (PCU/Min)	Separation (PCU)
Arm A	24.0	44.0
Arm B	45.0	37.5
Arm C	30.0	55.8
Arm D	14.0	95.3
Arm E	14.0	34.7

Demand Data

Demand Profiles are Synthesised using **ODTAB** Data
Period of interest (for Queue and Delay calculations): **07:15 to 08:45**
Length of Time Period: **90 min**
Length of Time Segment: **15 min**

Total Traffic Demand (Vehicles/Hour) for Demand Set: 2013 AM Supp demand

From/To	Arm A	Arm B	Arm C	Arm D	Arm E
Arm A	0.0	1.0	313.0	693.0	275.0
Arm B	6.0	0.0	53.0	47.0	20.0
Arm C	220.0	10.0	0.0	276.0	298.0
Arm D	251.0	11.0	354.0	0.0	0.0
Arm E	160.0	4.0	341.0	740.0	0.0

Entry Flow Data for Demand Set: 2013 AM Supp demand

Arms	Number of Minutes From Start When			Rate of flow (Veh/Min)		
	Flow Starts To Rise	Top of Peak is Reached	Flow Stops Falling	Before Peak	At Top of Peak	After Peak
Arm A	15.00	45.00	75.00	16.02	24.04	16.02
Arm B	15.00	45.00	75.00	1.58	2.36	1.58
Arm C	15.00	45.00	75.00	10.05	15.08	10.05
Arm D	15.00	45.00	75.00	7.70	11.55	7.70
Arm E	15.00	45.00	75.00	15.56	23.34	15.56

Turning Proportions

ODTAB Demand Data type is used, no turning proportions available.

Heavy Vehicle Percentages for Demand Set: 2013 AM Supp demand

Vary over entry

Time Period	From/To	Arm A	Arm B	Arm C	Arm D	Arm E
07:15 to 08:45	Arm A	0.0	0.0	5.0	6.0	1.0
	Arm B	0.0	0.0	4.0	0.0	5.0
	Arm C	5.0	0.0	0.0	13.0	3.0
	Arm D	13.0	27.0	8.0	0.0	0.0
	Arm E	3.0	0.0	2.0	2.0	0.0

Site-Specific Data

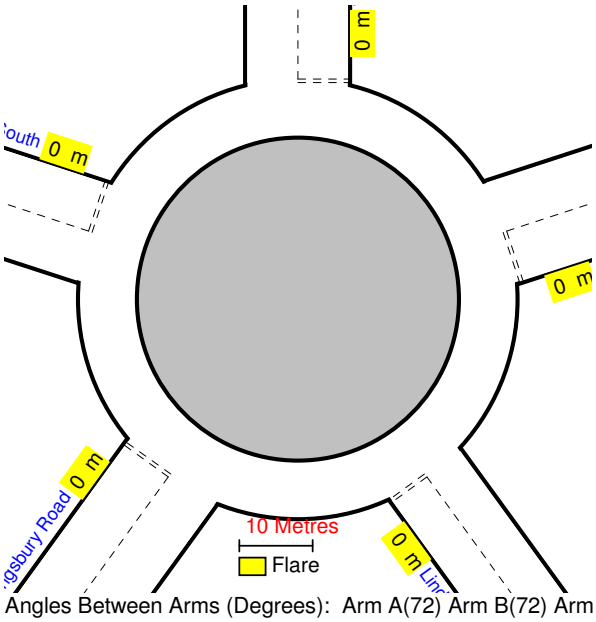
Arm	Adjustment to Intercept (PCU/Min)
Arm A	-4.000
Arm B	-
Arm C	-4.000
Arm D	-
Arm E	-

Queuing Delay Information Over Whole Period

Arm	Total Demand		Queueing Delay		Inclusive Queueing Delay	
	(Veh)	(Veh/Hr)	(Min)	(Min/Veh)	(Min)	(Min/Veh)
A	1764.6	1176.4	7464.6	4.23	7505.7	4.25
B	173.4	115.6	22.7	0.13	22.7	0.13
C	1106.6	737.8	386.5	0.35	386.6	0.35
D	847.9	565.3	44.4	0.05	44.4	0.05
E	1713.7	1142.4	171.6	0.10	171.6	0.10
ALL	5606.2	3737.5	8089.9	1.44	8131.1	1.45

Delay is that occuring only within the time period.
Inclusive delay includes delay suffered by vehicles that are still queueing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

Junction Diagram: (View Extent = 80m)



Angles Between Arms (Degrees): Arm A(72) Arm B(72) Arm C(72) Arm D(72) Arm E(72)

Queues and Delay:

Segment	Arm	Demand (Veh / Min)	Capacity (Veh / Min)	Demand / Capacity (RFC)	Ped Flow (Ped / Min)	Start Queue (Veh)	End Queue (Veh)	Delay (Veh.Min / Time Segment)	Geometric Delay (Veh.Min / Time Segment)	Arrival Delay (Min / Veh)
Segment : 1 - 07:15 to 07:30	A	16.09	24.46	0.658	-	0.0	1.9	26.5	-	0.116
	B	1.58	13.48	0.117	-	0.0	0.1	1.9	-	0.084
	C	10.09	19.95	0.506	-	0.0	1.0	14.5	-	0.100
	D	7.73	30.93	0.250	-	0.0	0.3	4.9	-	0.043
	E	15.62	34.04	0.459	-	0.0	0.8	12.3	-	0.054
Segment : 2 - 07:30 to 07:45	A	19.21	21.41	0.897	-	1.9	7.0	86.7	-	0.354
	B	1.89	10.35	0.182	-	0.1	0.2	3.2	-	0.118
	C	12.05	16.92	0.712	-	1.0	2.4	32.7	-	0.198
	D	9.23	29.24	0.316	-	0.3	0.5	6.8	-	0.050
	E	18.65	31.88	0.585	-	0.8	1.4	20.3	-	0.075
Segment : 3 - 07:45 to 08:00	A	23.53	17.31	**1.359**	-	7.0	101.1	815.4	-	3.292
	B	2.31	8.83	0.262	-	0.2	0.3	5.1	-	0.153
	C	14.75	15.89	**0.929**	-	2.4	8.5	98.7	-	0.546
	D	11.30	28.09	0.402	-	0.5	0.7	9.8	-	0.059
	E	22.85	28.99	0.788	-	1.4	3.5	48.8	-	0.156
Segment : 4 - 08:00 to 08:15	A	23.53	17.20	**1.367**	-	101.1	196.0	2228.1	-	8.124
	B	2.31	8.80	0.263	-	0.3	0.4	5.3	-	0.154
	C	14.75	15.86	**0.930**	-	8.5	10.0	140.2	-	0.726
	D	11.30	27.92	0.405	-	0.7	0.7	10.1	-	0.060
	E	22.85	28.89	0.791	-	3.5	3.7	54.4	-	0.165
Segment : 5 - 08:15 to 08:30	A	19.21	21.26	**0.904**	-	196.0	166.8	2721.0	-	8.296
	B	1.89	9.14	0.207	-	0.4	0.3	4.1	-	0.138
	C	12.05	15.56	0.774	-	10.0	3.7	68.2	-	0.358
	D	9.23	28.53	0.324	-	0.7	0.5	7.3	-	0.052
	E	18.65	31.71	0.588	-	3.7	1.4	22.8	-	0.078
Segment : 6 - 08:30 to 08:45	A	16.09	24.37	0.660	-	166.8	44.7	1586.8	-	4.405
	B	1.58	9.37	0.169	-	0.3	0.2	3.2	-	0.129
	C	10.09	15.32	0.659	-	3.7	2.0	32.2	-	0.200
	D	7.73	29.32	0.264	-	0.5	0.4	5.5	-	0.046
	E	15.62	33.96	0.460	-	1.4	0.9	13.2	-	0.055

Run Information

Run with file:- **f:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Base Model\2013 PM BM.vai**
At: **13:08:29 on Monday, February 03, 2014**
Mode: **Drive On The Left**
Units: **Metric**

Arm Labelling

Arm	Full Arm Names
Arm A	A38 North
Arm B	Lindridge Drive
Arm C	A4097 Kingsbury Road
Arm D	A38 South
Arm E	Walmley Ash Road

Flow Scaling Factor

Arm	Flow Scaling Factor (%)
Arm A	100
Arm B	100
Arm C	100
Arm D	100
Arm E	100

File Properties

Run Title	A38/A4097 Minworth roundabout
Location	Birmingham
Date	30/01/2014
Client	Birmingham City Council
Enumerator	vuppalas [UKBHM2LT26704]
Job Number	60313511
Status	Preliminary
Description	2013 Base Model in PM peak. All supporting calculations are:F:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Base Model

Geometric Data

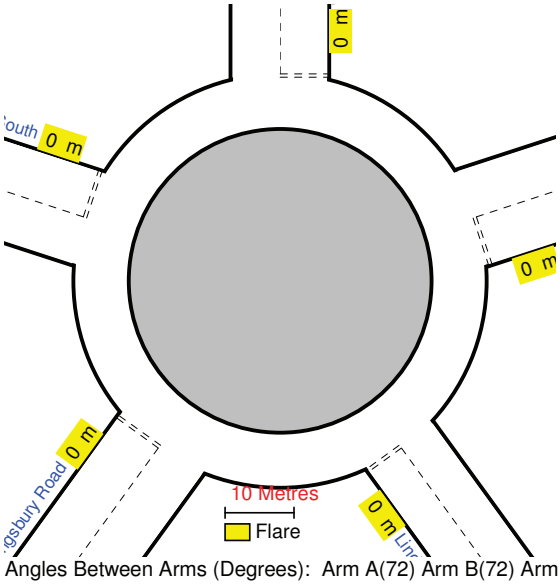
Data Item	Arm A	Arm B	Arm C	Arm D	Arm E
Approach Road Half-Width (m)	7.40	6.05	7.64	7.20	7.14
Entry Width (m)	7.40	6.05	7.64	7.20	7.14
Flare Length (m)	0.00	0.00	0.00	0.00	0.00
Entry Radius (m)	45.60	18.70	61.50	49.70	35.30
Inscribed Circle Diameter (m)	100.00	91.80	94.10	207.90	81.50
Entry Angle (degrees)	29.00	52.00	51.00	40.00	36.00
Slope	0.910	0.612	0.882	0.868	0.865
Intercept (PCU/Min)	46.806	33.805	45.125	42.817	43.980

Grade-separated/motorway factors apply to all arms

Large Roundabout Data

Arm	Circulating Flow (PCU/Min)	Separation (PCU)
Arm A	20.0	44.0
Arm B	32.0	37.5
Arm C	19.0	55.8
Arm D	19.0	95.3
Arm E	23.0	34.7

Junction Diagram: (View Extent = 80m)



Angles Between Arms (Degrees): Arm A(72) Arm B(72) Arm C(72) Arm D(72) Arm E(72)

Demand Data

Demand Profiles are Synthesised using **ODTAB** Data
Period of interest (for Queue and Delay calculations): **16:45 to 18:15**
Length of Time Period: **90 min**
Length of Time Segment: **15 min**

Total Traffic Demand (Vehicles/Hour) for Demand Set: 2013 PM

From/To	Arm A	Arm B	Arm C	Arm D	Arm E
Arm A	0.0	9.0	135.0	318.0	301.0
Arm B	4.0	0.0	15.0	8.0	10.0
Arm C	274.0	2.0	0.0	248.0	535.0
Arm D	594.0	32.0	456.0	0.0	0.0
Arm E	167.0	12.0	198.0	503.0	0.0

Entry Flow Data for Demand Set: 2013 PM

Arms	Number of Minutes From Start When			Rate of flow (Veh/Min)		
	Flow Starts To Rise	Top of Peak is Reached	Flow Stops Falling	Before Peak	At Top of Peak	After Peak
Arm A	15.00	45.00	75.00	9.54	14.31	9.54
Arm B	15.00	45.00	75.00	0.46	0.69	0.46
Arm C	15.00	45.00	75.00	13.24	19.86	13.24
Arm D	15.00	45.00	75.00	13.52	20.29	13.52
Arm E	15.00	45.00	75.00	11.00	16.50	11.00

Turning Proportions

ODTAB Demand Data type is used, no turning proportions available.

Heavy Vehicle Percentages for Demand Set: 2013 PM

Vary over entry

Time Period	From/To	Arm A	Arm B	Arm C	Arm D	Arm E
16:45 to 18:15	Arm A	0.0	0.0	12.0	6.0	1.0
	Arm B	0.0	0.0	0.0	0.0	0.0
	Arm C	2.0	0.0	0.0	10.0	1.0
	Arm D	5.0	0.0	2.0	0.0	0.0
	Arm E	2.0	0.0	3.0	2.0	0.0

Queues and Delay:

Segment	Arm	Demand (Veh / Min)	Capacity (Veh / Min)	Demand / Capacity (RFC)	Ped Flow (Ped / Min)	Start Queue (Veh)	End Queue (Veh)	Delay (Veh.Min / Time Segment)	Geometric Delay (Veh.Min / Time Segment)	Arrival Delay (Min / Veh)
Segment : 1 - 16:45 to 17:00	A	9.57	31.27	0.306	-	0.0	0.4	6.5	-	0.046
	B	0.46	18.71	0.025	-	0.0	0.0	0.4	-	0.055
	C	13.29	31.11	0.427	-	0.0	0.7	10.8	-	0.056
	D	13.58	29.39	0.462	-	0.0	0.9	12.4	-	0.063
	E	11.04	28.17	0.392	-	0.0	0.6	9.4	-	0.058
Segment : 2 - 17:00 to 17:15	A	11.43	28.66	0.399	-	0.4	0.7	9.7	-	0.058
	B	0.55	15.75	0.035	-	0.0	0.0	0.5	-	0.066
	C	15.87	28.65	0.554	-	0.7	1.2	17.9	-	0.078
	D	16.21	27.05	0.599	-	0.9	1.5	21.3	-	0.092
	E	13.19	25.25	0.522	-	0.6	1.1	15.7	-	0.082
Segment : 3 - 17:15 to 17:30	A	14.00	25.22	0.555	-	0.7	1.2	17.8	-	0.089
	B	0.68	11.79	0.058	-	0.0	0.1	0.9	-	0.090
	C	19.43	25.34	0.767	-	1.2	3.1	43.4	-	0.162
	D	19.86	23.91	0.830	-	1.5	4.5	59.6	-	0.225
	E	16.15	21.42	0.754	-	1.1	2.9	40.1	-	0.182
Segment : 4 - 17:30 to 17:45	A	14.00	25.07	0.559	-	1.2	1.3	18.7	-	0.090
	B	0.68	11.67	0.058	-	0.1	0.1	0.9	-	0.091
	C	19.43	25.26	0.769	-	3.1	3.2	48.2	-	0.171
	D	19.86	23.82	0.834	-	4.5	4.8	69.8	-	0.249
	E	16.15	21.23	0.761	-	2.9	3.1	45.3	-	0.196
Segment : 5 - 17:45 to 18:00	A	11.43	28.44	0.402	-	1.3	0.7	10.4	-	0.059
	B	0.55	15.57	0.036	-	0.1	0.0	0.6	-	0.067
	C	15.87	28.53	0.556	-	3.2	1.3	19.9	-	0.081
	D	16.21	26.93	0.602	-	4.8	1.5	24.7	-	0.097
	E	13.19	24.99	0.528	-	3.1	1.1	17.8	-	0.087
Segment : 6 - 18:00 to 18:15	A	9.57	31.17	0.307	-	0.7	0.4	6.8	-	0.046
	B	0.46	18.62	0.025	-	0.0	0.0	0.4	-	0.055
	C	13.29	31.04	0.428	-	1.3	0.8	11.6	-	0.057
	D	13.58	29.32	0.463	-	1.5	0.9	13.4	-	0.064
	E	11.04	28.06	0.394	-	1.1	0.7	10.0	-	0.059

Queuing Delay Information Over Whole Period

Arm	Total Demand		Queueing Delay		Inclusive Queueing Delay	
	(Veh)	(Veh/Hr)	(Min)	(Min/Veh)	(Min)	(Min/Veh)
A	1050.2	700.1	69.9	0.07	69.9	0.07
B	50.9	34.0	3.7	0.07	3.7	0.07
C	1457.6	971.8	151.7	0.10	151.7	0.10
D	1489.3	992.9	201.2	0.14	201.2	0.14
E	1211.3	807.5	138.3	0.11	138.4	0.11
ALL	5259.3	3506.2	564.8	0.11	564.9	0.11

Delay is that occuring only within the time period.
Inclusive delay includes delay suffered by vehicles that are still queueing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

ARCADY 6

GUI Version: 6.2 AG
Analysis Program: Release 7.0 (FEBRUARY 2010)

For sales and distribution information, program advice and maintenance, contact:

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Web:www.trlsoftware.co.uk

Run Information

Run with file:- **f:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Base Model\2013 PM BM.vai**
At: **11:42:26 on Friday, February 07, 2014**
Mode: **Drive On The Left**
Units: **Metric**

Arm Labelling

Arm	Full Arm Names
Arm A	A38 North
Arm B	Lindridge Drive
Arm C	A4097 Kingsbury Road
Arm D	A38 South
Arm E	Walmley Ash Road

Flow Scaling Factor

Arm	Flow Scaling Factor (%)
Arm A	100
Arm B	100
Arm C	100
Arm D	100
Arm E	100

File Properties

Run Title	A38/A4097 Minworth roundabout
Location	Birmingham
Date	30/01/2014
Client	Birmingham City Council
Enumerator	vuppalas [UKBHM2LT26704]
Job Number	60313511
Status	Preliminary
Description	2013 Base Model in PM peak. All supporting calculations are:F:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Base Model

Geometric Data

Data Item	Arm A	Arm B	Arm C	Arm D	Arm E
Approach Road Half-Width (m)	7.40	6.05	7.64	7.20	7.14
Entry Width (m)	7.40	6.05	7.64	7.20	7.14
Flare Length (m)	0.00	0.00	0.00	0.00	0.00
Entry Radius (m)	45.60	18.70	61.50	49.70	35.30
Inscribed Circle Diameter (m)	100.00	91.80	94.10	207.90	81.50
Entry Angle (degrees)	29.00	52.00	51.00	40.00	36.00
Slope	0.910	0.612	0.882	0.868	0.865
Intercept (PCU/Min)	42.806*	33.805	41.125*	42.817	43.980

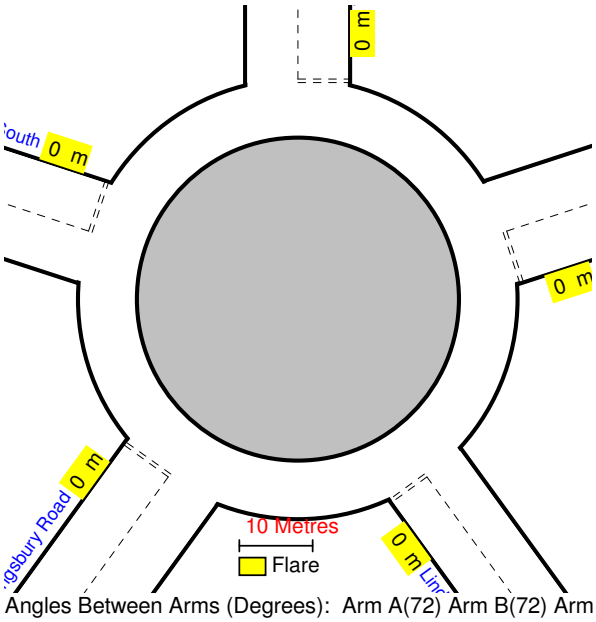
Grade-separated/motorway factors apply to all arms

One or more intercept values (flagged * in the table) have been adjusted according to local values input from a previous run

Large Roundabout Data

Arm	Circulating Flow (PCU/Min)	Separation (PCU)
Arm A	20.0	44.0
Arm B	32.0	37.5
Arm C	19.0	55.8
Arm D	19.0	95.3
Arm E	23.0	34.7

Junction Diagram: (View Extent = 80m)



Angles Between Arms (Degrees): Arm A(72) Arm B(72) Arm C(72) Arm D(72) Arm E(72)

Demand Data

Demand Profiles are Synthesised using **ODTAB** Data
Period of interest (for Queue and Delay calculations): **16:45 to 18:15**
Length of Time Period: **90 min**
Length of Time Segment: **15 min**

Total Traffic Demand (Vehicles/Hour) for Demand Set: 2013 PM

From/To	Arm A	Arm B	Arm C	Arm D	Arm E
Arm A	0.0	9.0	135.0	318.0	301.0
Arm B	4.0	0.0	15.0	8.0	10.0
Arm C	274.0	2.0	0.0	248.0	535.0
Arm D	594.0	32.0	456.0	0.0	0.0
Arm E	167.0	12.0	198.0	503.0	0.0

Entry Flow Data for Demand Set: 2013 PM

Arms	Number of Minutes From Start When			Rate of flow (Veh/Min)		
	Flow Starts To Rise	Top of Peak is Reached	Flow Stops Falling	Before Peak	At Top of Peak	After Peak
Arm A	15.00	45.00	75.00	9.54	14.31	9.54
Arm B	15.00	45.00	75.00	0.46	0.69	0.46
Arm C	15.00	45.00	75.00	13.24	19.86	13.24
Arm D	15.00	45.00	75.00	13.52	20.29	13.52
Arm E	15.00	45.00	75.00	11.00	16.50	11.00

Turning Proportions

ODTAB Demand Data type is used, no turning proportions available.

Heavy Vehicle Percentages for Demand Set: 2013 PM

Vary over entry

Time Period	From/To	Arm A	Arm B	Arm C	Arm D	Arm E
16:45 to 18:15	Arm A	0.0	0.0	12.0	6.0	1.0
	Arm B	0.0	0.0	0.0	0.0	0.0
	Arm C	2.0	0.0	0.0	10.0	1.0
	Arm D	5.0	0.0	2.0	0.0	0.0
	Arm E	2.0	0.0	3.0	2.0	0.0

Site-Specific Data

Arm	Adjustment to Intercept (PCU/Min)
Arm A	-4.000
Arm B	-
Arm C	-4.000
Arm D	-
Arm E	-

Errors and Warnings

WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

Queuing Delay Information Over Whole Period

Arm	Total Demand		Queueing Delay		Inclusive Queueing Delay	
	(Veh)	(Veh/Hr)	(Min)	(Min/Veh)	(Min)	(Min/Veh)
A	1050.2	700.1	96.4	0.09	96.4	0.09
B	50.9	34.0	3.7	0.07	3.7	0.07
C	1457.6	971.8	298.0	0.20	298.0	0.20
D	1489.3	992.9	198.5	0.13	198.5	0.13
E	1211.3	807.5	138.1	0.11	138.1	0.11
ALL	5259.3	3506.2	734.7	0.14	734.7	0.14

Delay is that occuring only within the time period.
Inclusive delay includes delay suffered by vehicles that are still queueing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

Queues and Delay:

Segment	Arm	Demand (Veh / Min)	Capacity (Veh / Min)	Demand / Capacity (RFC)	Ped Flow (Ped / Min)	Start Queue (Veh)	End Queue (Veh)	Delay (Veh.Min / Time Segment)	Geometric Delay (Veh.Min / Time Segment)	Arrival Delay (Min / Veh)
Segment : 1 - 16:45 to 17:00	A	9.57	27.46	0.349	-	0.0	0.5	7.8	-	0.056
	B	0.46	18.71	0.025	-	0.0	0.0	0.4	-	0.055
	C	13.29	27.24	0.488	-	0.0	0.9	13.7	-	0.071
	D	13.58	29.41	0.462	-	0.0	0.9	12.4	-	0.063
	E	11.04	28.17	0.392	-	0.0	0.6	9.4	-	0.058
Segment : 2 - 17:00 to 17:15	A	11.43	24.85	0.460	-	0.5	0.8	12.3	-	0.074
	B	0.55	15.75	0.035	-	0.0	0.0	0.5	-	0.066
	C	15.87	24.78	0.640	-	0.9	1.7	25.0	-	0.111
	D	16.21	27.07	0.599	-	0.9	1.5	21.3	-	0.091
	E	13.19	25.26	0.522	-	0.6	1.1	15.7	-	0.082
Segment : 3 - 17:15 to 17:30	A	14.00	21.39	0.654	-	0.8	1.8	26.2	-	0.133
	B	0.68	11.80	0.058	-	0.0	0.1	0.9	-	0.090
	C	19.43	21.48	**0.905**	-	1.7	7.5	90.7	-	0.366
	D	19.86	24.08	0.825	-	1.5	4.3	57.8	-	0.218
	E	16.15	21.45	0.753	-	1.1	2.9	39.9	-	0.181
Segment : 4 - 17:30 to 17:45	A	14.00	21.25	0.659	-	1.8	1.9	28.2	-	0.138
	B	0.68	11.66	0.058	-	0.1	0.1	0.9	-	0.091
	C	19.43	21.38	**0.909**	-	7.5	8.5	121.2	-	0.467
	D	19.86	23.85	0.832	-	4.3	4.7	68.4	-	0.245
	E	16.15	21.24	0.760	-	2.9	3.1	45.2	-	0.195
Segment : 5 - 17:45 to 18:00	A	11.43	24.64	0.464	-	1.9	0.9	13.6	-	0.077
	B	0.55	15.55	0.036	-	0.1	0.0	0.6	-	0.067
	C	15.87	24.64	0.644	-	8.5	1.8	32.5	-	0.126
	D	16.21	26.72	0.607	-	4.7	1.6	25.2	-	0.099
	E	13.19	24.93	0.529	-	3.1	1.1	17.9	-	0.087
Segment : 6 - 18:00 to 18:15	A	9.57	27.36	0.350	-	0.9	0.5	8.3	-	0.056
	B	0.46	18.61	0.025	-	0.0	0.0	0.4	-	0.055
	C	13.29	27.16	0.489	-	1.8	1.0	15.0	-	0.073
	D	13.58	29.31	0.463	-	1.6	0.9	13.4	-	0.064
	E	11.04	28.05	0.394	-	1.1	0.7	10.0	-	0.059

Capabilities on project:
Transportation

Appendix D – 2031 Future Year Flows

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Scenario 2 - Development Flows
Date: Jan-14

AM Peak: 08:00-09:00
Source: Minworth Roundabout Vehicle Flows.xlsx

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	361	886	0
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	372	0	0	0	0
D	A38 South	884	0	0	0	0
E	Walmley Ash Road	0	0	0	0	0

PM peak 17:00-18:00

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	397	953	0
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	271	0	0	0	0
D	A38 South	669	0	0	0	0
E	Walmley Ash Road	0	0	0	0	0

Prepared by:	**Sravani Vuppala**		31.01.14
Checked by:	**Matthew Rainsford**		03.02.14

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Future Year Model - ARCADY flows Inputs
Date: Jan-14

AM Peak: 07:30-08:30
2013 AM Supp demand flows ARCADY Inputs and outputs Rev 1.xls

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	1	313	693	275
B	Lindridge Drive	6	0	53	47	20
C	A4097 Kingsbury Road	220	10	0	276	298
D	A38 South	251	11	354	0	195
E	Walmley Ash Road	160	4	341	740	0

This flows are removed in ARCADY as it is dedicated left turn at the roundabout

Sc2 development flows - It is assumed all the development trips are cars and no HGV's in the peak hour.
Note: HGV percentages are assumed same as base year scenario

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	361	886	0
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	372	0	0	0	0
D	A38 South	884	0	0	0	0
E	Walmley Ash Road	0	0	0	0	0

2031 SC2 flows - AM peak with suppressed demand

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	1	674	1579	275
B	Lindridge Drive	6	0	53	47	20
C	A4097 Kingsbury Road	592	10	0	276	298
D	A38 South	1135	11	354	0	
E	Walmley Ash Road	160	4	341	740	0

Percentage of HGV		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0%	0%	5%	6%	1%
B	Lindridge Drive	0%	0%	4%	0%	5%
C	A4097 Kingsbury Road	5%	0%	0%	13%	3%
D	A38 South	13%	27%	8%	0%	5%
E	Walmley Ash Road	3%	0%	2%	2%	0%

Prepared by:	**Sravani Vuppala**		31.01.14
Checked by:	**Matthew Rainsford**		03.02.14

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Future Year Model - ARCADY flows Inputs
Date: Jan-14

PM peak 17:00-18:00
2013 PM peak flows ARCADY Inputs and outputs Rev 1.xls

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	9	135	318	301
B	Lindridge Drive	4	0	15	8	10
C	A4097 Kingsbury Road	274	2	0	248	535
D	A38 South	594	32	456	0	437
E	Walmley Ash Road	167	12	198	503	0

This flows are removed in ARCADY as it is dedicated left turn at the roundabout

Sc2 development flows - It is assumed all the development trips are cars and no HGV's in the peak hour.
Note: HGV percentages are assumed same as base year scenario

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	397	953	0
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	271	0	0	0	0
D	A38 South	669	0	0	0	0
E	Walmley Ash Road	0	0	0	0	0

2031 SC2 flows - PM peak

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	9	532	1271	301
B	Lindridge Drive	4	0	15	8	10
C	A4097 Kingsbury Road	545	2	0	248	535
D	A38 South	1263	32	456	0	
E	Walmley Ash Road	167	12	198	503	0

Percentage of HGV		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0%	0%	12%	6%	1%
B	Lindridge Drive	0%	0%	0%	0%	0%
C	A4097 Kingsbury Road	2%	0%	0%	10%	1%
D	A38 South	5%	0%	2%	0%	1%
E	Walmley Ash Road	2%	0%	3%	2%	0%

Prepared by:	**Sravani Vuppala**		31.01.14
Checked by:	**Matthew Rainsford**		03.02.14

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Future Year Model - Circulating Flows
Date: Jan-14

Circulating flows for large roundabouts

AM Peak

	A	B	C	D	E
A	0	1	674	1579	275
B	6	0	53	47	20
C	592	10	0	276	298
D	1135	11	354	0	
E	160	4	341	740	0

This flows are removed in ARCADY as it is dedicated left turn at the roundabout

A	A38 N
B	Lindridge Drive
C	A4097 Kingsbury Road
D	A38 South
E	Walmley Ash Road

AM Peak

A		B		C		D		E	
b-b	0	c-c	0	d-d	0	e-e	0	a-a	0
c-b	10	d-c	354	e-d	740	a-e	275	b-b	0
c-c	0	d-d	0	e-e	0	a-a	0	b-a	6
d-c	354	e-c	341	a-d	1579	b-b	0	c-a	592
d-b	11	e-d	740	a-e	275	b-a	6	c-b	10
d-d	0	e-e	0	a-a	0	b-e	20	c-c	0
e-b	4	a-c	674	b-b	0	c-c	0	d-a	1135
e-c	341	a-d	1579	b-d	47	c-e	298	d-b	11
e-d	740	a-e	275	b-e	20	c-a	592	d-c	354
e-e	0	a-a	0	b-a	6	c-b	10	d-d	0
	1460		3963		2667		1201		2108
	24		66		44		20		35

Prepared by:	**Sravani Vuppala**	31.01.14
Checked by:	**Matthew Rainsford**	03.02.14

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Future Year Model - Circulating Flows
Date: Jan-14

Circulating flows for large roundabouts

PM Peak

	A	B	C	D	E
A	0	9	532	1271	301
B	4	0	15	8	10
C	545	2	0	248	535
D	1263	32	456	0	
E	167	12	198	503	0

This flows are removed in ARCADY as it is dedicated left turn at the roundabout

A	A38 N
B	Lindridge Drive
C	A4097 Kingsbury Road
D	A38 South
E	Walmley Ash Road

PM Peak

A		B		C		D		E	
b-b	0	c-c	0	d-d	0	e-e	0	a-a	0
c-b	2	d-c	456	e-d	503	a-e	301	b-b	0
c-c	0	d-d	0	e-e	0	a-a	0	b-a	4
d-c	456	e-c	198	a-d	1271	b-b	0	c-a	545
d-b	32	e-d	503	a-e	301	b-a	4	c-b	2
d-d	0	e-e	0	a-a	0	b-e	10	c-c	0
e-b	12	a-c	532	b-b	0	c-c	0	d-a	1263
e-c	198	a-d	1271	b-d	8	c-e	535	d-b	32
e-d	503	a-e	301	b-e	10	c-a	545	d-c	456
e-e	0	a-a	0	b-a	4	c-b	2	d-d	0
	1203		3261		2097		1397		2302
	20		54		35		23		38

Prepared by:	**Sravani Vuppala**		31.01.14
Checked by:	**Matthew Rainsford**		03.02.14

Capabilities on project:
Transportation

Appendix E – 2031 Future Year Modelling Results on Existing Layout

ARCADY 6

GUI Version: 6.2 AG
Analysis Program: Release 7.0 (FEBRUARY 2010)

For sales and distribution information, program advice and maintenance, contact:

TRL Limited
Crowthorne House
Nine Mile Ride
Wokingham, Berks.
RG40 3GA, UK

Tel: +44 (0)1344 770758
Fax:+44 (0)1344 770864
Email: software@ trl.co.uk
Web:www.trlsoftware.co.uk

Run Information

Run with file:- **f:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Future Year Model\2031 SC2 AM.vai**
At: **13:13:33 on Friday, February 07, 2014**
Mode: **Drive On The Left**
Units: **Metric**

Arm Labelling

Arm	Full Arm Names
Arm A	A38 North
Arm B	Lindridge Drive
Arm C	A4097 Kingsbury Road
Arm D	A38 South
Arm E	Walmley Ash Road

Flow Scaling Factor

Arm	Flow Scaling Factor (%)
Arm A	100
Arm B	100
Arm C	100
Arm D	100
Arm E	100

File Properties

Run Title	A38/A4097 Minworth roundabout
Location	Birmingham
Date	31/01/2014
Client	Birmingham City Council
Enumerator	vuppalas [UKBHM2LT26704]
Job Number	60313511
Status	Preliminary
Description	2031 Scenario 2 future year model. All supporting data is in:F:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Future year Model

Errors and Warnings

WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

Geometric Data

Data Item	Arm A	Arm B	Arm C	Arm D	Arm E
Approach Road Half-Width (m)	7.40	6.05	7.64	7.20	7.14
Entry Width (m)	7.40	6.05	7.64	7.20	7.14
Flare Length (m)	0.00	0.00	0.00	0.00	0.00
Entry Radius (m)	45.60	18.70	61.50	49.70	35.30
Inscribed Circle Diameter (m)	100.00	91.80	94.10	207.90	81.50
Entry Angle (degrees)	29.00	52.00	51.00	40.00	36.00
Slope	0.860	0.271	0.584	0.856	0.716
Intercept (PCU/Min)	41.878*	25.917	35.325*	42.585	41.196

Grade-separated/motorway factors apply to all arms

One or more intercept values (flagged * in the table) have been adjusted according to local values input from a previous run

Large Roundabout Data

Arm	Circulating Flow (PCU/Min)	Separation (PCU)
Arm A	24.0	44.0
Arm B	66.0	37.5
Arm C	44.0	55.8
Arm D	20.0	95.3
Arm E	35.0	34.7

Demand Data

Demand Profiles are Synthesised using **ODTAB** Data
Period of interest (for Queue and Delay calculations): **07:15 to 08:45**
Length of Time Period: **90 min**
Length of Time Segment: **15 min**

Total Traffic Demand (Vehicles/Hour) for Demand Set: 2031 SC2 AM

From/To	Arm A	Arm B	Arm C	Arm D	Arm E
Arm A	0.0	1.0	674.0	1579.0	275.0
Arm B	6.0	0.0	53.0	47.0	20.0
Arm C	592.0	10.0	0.0	276.0	298.0
Arm D	1135.0	11.0	354.0	0.0	0.0
Arm E	160.0	4.0	341.0	740.0	0.0

Entry Flow Data for Demand Set: 2031 SC2 AM

Arms	Number of Minutes From Start When			Rate of flow (Veh/Min)		
	Flow Starts To Rise	Top of Peak is Reached	Flow Stops Falling	Before Peak	At Top of Peak	After Peak
Arm A	15.00	45.00	75.00	31.61	47.42	31.61
Arm B	15.00	45.00	75.00	1.58	2.36	1.58
Arm C	15.00	45.00	75.00	14.70	22.05	14.70
Arm D	15.00	45.00	75.00	18.75	28.13	18.75
Arm E	15.00	45.00	75.00	15.56	23.34	15.56

Turning Proportions

ODTAB Demand Data type is used, no turning proportions available.

Heavy Vehicle Percentages for Demand Set: 2031 SC2 AM

Vary over entry

Time Period	From/To	Arm A	Arm B	Arm C	Arm D	Arm E
07:15 to 08:45	Arm A	0.0	0.0	5.0	6.0	1.0
	Arm B	0.0	0.0	4.0	0.0	5.0
	Arm C	5.0	0.0	0.0	13.0	3.0
	Arm D	13.0	27.0	8.0	0.0	0.0
	Arm E	3.0	0.0	2.0	2.0	0.0

Site-Specific Data

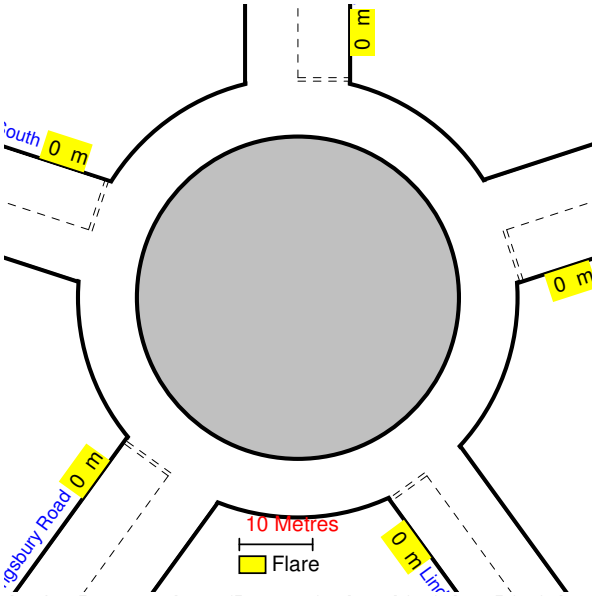
Arm	Adjustment to Intercept (PCU/Min)
Arm A	-4.000
Arm B	-
Arm C	-4.000
Arm D	-
Arm E	-

Queuing Delay Information Over Whole Period

Arm	Total Demand		Queueing Delay		Inclusive Queueing Delay	
	(Veh)	(Veh/Hr)	(Min)	(Min/Veh)	(Min)	(Min/Veh)
A	3481.0	2320.7	60137.4	17.28	99179.6	28.49
B	173.4	115.6	14.8	0.09	14.8	0.09
C	1618.7	1079.1	6524.8	4.03	6810.7	4.21
D	2064.6	1376.4	2935.8	1.42	2936.0	1.42
E	1713.7	1142.4	15823.5	9.23	19743.7	11.52
ALL	9051.4	6034.3	85436.3	9.44	128684.9	14.22

Delay is that occuring only within the time period.
Inclusive delay includes delay suffered by vehicles that are still queueing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

Junction Diagram: (View Extent = 80m)



Angles Between Arms (Degrees): Arm A(72) Arm B(72) Arm C(72) Arm D(72) Arm E(72)

Queues and Delay:

Segment	Arm	Demand (Veh / Min)	Capacity (Veh / Min)	Demand / Capacity (RFC)	Ped Flow (Ped / Min)	Start Queue (Veh)	End Queue (Veh)	Delay (Veh.Min / Time Segment)	Geometric Delay (Veh.Min / Time Segment)	Arrival Delay (Min / Veh)
Segment : 1 - 07:15 to 07:30	A	31.73	24.49	**1.296**	-	0.0	111.9	860.0	-	2.422
	B	1.58	13.68	0.116	-	0.0	0.1	1.9	-	0.083
	C	14.76	17.30	0.853	-	0.0	5.0	62.6	-	0.318
	D	18.82	26.95	0.698	-	0.0	2.3	31.6	-	0.119
	E	15.62	20.20	0.773	-	0.0	3.2	43.1	-	0.200
Segment : 2 - 07:30 to 07:45	A	37.89	23.09	**1.641**	-	111.9	334.0	3344.3	-	9.571
	B	1.89	13.57	0.139	-	0.1	0.2	2.4	-	0.086
	C	17.62	17.42	**1.012**	-	5.0	18.3	190.5	-	0.908
	D	22.47	25.58	0.878	-	2.3	6.3	80.6	-	0.276
	E	18.65	16.53	**1.128**	-	3.2	39.3	334.9	-	1.542
Segment : 3 - 07:45 to 08:00	A	46.41	23.98	**1.936**	-	334.0	670.4	7532.9	-	20.968
	B	2.31	13.62	0.170	-	0.2	0.2	3.0	-	0.088
	C	21.58	17.56	**1.229**	-	18.3	79.4	735.3	-	2.960
	D	27.53	24.97	**1.102**	-	6.3	49.1	429.7	-	1.290
	E	22.85	14.29	**1.599**	-	39.3	167.8	1553.8	-	7.421
Segment : 4 - 08:00 to 08:15	A	46.41	24.06	**1.929**	-	670.4	1005.7	12570.6	-	34.882
	B	2.31	13.62	0.170	-	0.2	0.2	3.1	-	0.088
	C	21.58	17.58	**1.228**	-	79.4	139.6	1642.4	-	6.339
	D	27.53	24.92	**1.104**	-	49.1	88.8	1034.8	-	2.893
	E	22.85	14.11	**1.619**	-	167.8	298.9	3500.3	-	16.452
Segment : 5 - 08:15 to 08:30	A	37.89	23.99	**1.579**	-	1005.7	1214.1	16648.2	-	47.505
	B	1.89	13.62	0.139	-	0.2	0.2	2.5	-	0.085
	C	17.62	17.70	**0.996**	-	139.6	139.8	2095.0	-	7.988
	D	22.47	24.98	0.900	-	88.8	55.4	1081.1	-	2.945
	E	18.65	14.25	**1.309**	-	298.9	365.0	4979.2	-	22.368
Segment : 6 - 08:30 to 08:45	A	31.73	23.11	**1.373**	-	1214.1	1343.4	19181.4	-	55.382
	B	1.58	13.57	0.116	-	0.2	0.1	2.0	-	0.083
	C	14.76	17.52	0.842	-	139.8	100.1	1799.1	-	6.913
	D	18.82	25.22	0.746	-	55.4	3.2	277.9	-	0.736
	E	15.62	16.22	**0.963**	-	365.0	356.6	5412.2	-	22.308

Run Information

Run with file:- **f:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Future Year Model\2031 SC2 PM.vai**
At: **11:46:13 on Friday, February 07, 2014**
Mode: **Drive On The Left**
Units: **Metric**

Arm Labelling

Arm	Full Arm Names
Arm A	A38 North
Arm B	Lindridge Drive
Arm C	A4097 Kingsbury Road
Arm D	A38 South
Arm E	Walmley Ash Road

Flow Scaling Factor

Arm	Flow Scaling Factor (%)
Arm A	100
Arm B	100
Arm C	100
Arm D	100
Arm E	100

File Properties

Run Title	A38/A4097 Minworth roundabout
Location	Birmingham
Date	31/01/2014
Client	Birmingham City Council
Enumerator	vuppalas [UKBHM2LT26704]
Job Number	60313511
Status	Preliminary
Description	2031 Scenario 2 in PM peak. All supporting calculations are:F:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Future Year Model

Geometric Data

Data Item	Arm A	Arm B	Arm C	Arm D	Arm E
Approach Road Half-Width (m)	7.40	6.05	7.64	7.20	7.14
Entry Width (m)	7.40	6.05	7.64	7.20	7.14
Flare Length (m)	0.00	0.00	0.00	0.00	0.00
Entry Radius (m)	45.60	18.70	61.50	49.70	35.30
Inscribed Circle Diameter (m)	100.00	91.80	94.10	207.90	81.50
Entry Angle (degrees)	29.00	52.00	51.00	40.00	36.00
Slope	0.910	0.391	0.691	0.821	0.679
Intercept (PCU/Min)	42.806*	28.701	37.417*	41.889	40.500

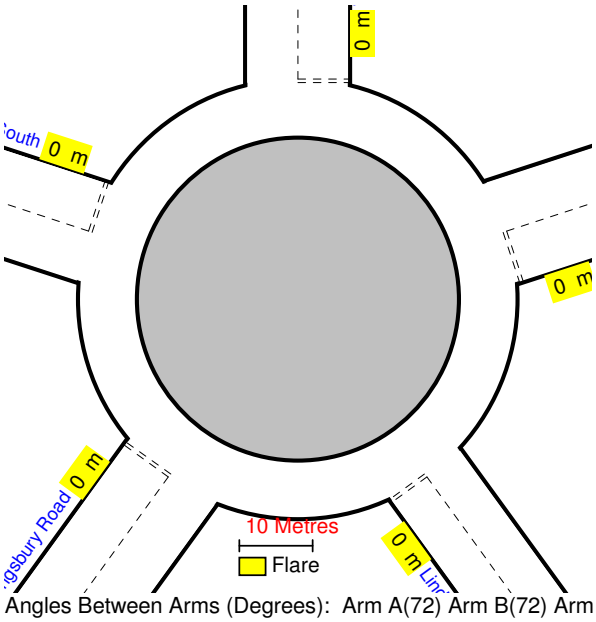
Grade-separated/motorway factors apply to all arms

One or more intercept values (flagged * in the table) have been adjusted according to local values input from a previous run

Large Roundabout Data

Arm	Circulating Flow (PCU/Min)	Separation (PCU)
Arm A	20.0	44.0
Arm B	54.0	37.5
Arm C	35.0	55.7
Arm D	23.0	95.3
Arm E	38.0	34.7

Junction Diagram: (View Extent = 80m)



Angles Between Arms (Degrees): Arm A(72) Arm B(72) Arm C(72) Arm D(72) Arm E(72)

Demand Data

Demand Profiles are Synthesised using **ODTAB** Data
Period of interest (for Queue and Delay calculations): **16:45 to 18:15**
Length of Time Period: **90 min**
Length of Time Segment: **15 min**

Total Traffic Demand (Vehicles/Hour) for Demand Set: 2031 SC2 PM

From/To	Arm A	Arm B	Arm C	Arm D	Arm E
Arm A	0.0	9.0	532.0	1271.0	301.0
Arm B	4.0	0.0	15.0	8.0	10.0
Arm C	545.0	2.0	0.0	248.0	535.0
Arm D	1263.0	32.0	456.0	0.0	0.0
Arm E	167.0	12.0	198.0	503.0	0.0

Entry Flow Data for Demand Set: 2031 SC2 PM

Arms	Number of Minutes From Start When			Rate of flow (Veh/Min)		
	Flow Starts To Rise	Top of Peak is Reached	Flow Stops Falling	Before Peak	At Top of Peak	After Peak
Arm A	15.00	45.00	75.00	26.41	39.62	26.41
Arm B	15.00	45.00	75.00	0.46	0.69	0.46
Arm C	15.00	45.00	75.00	16.63	24.94	16.63
Arm D	15.00	45.00	75.00	21.89	32.83	21.89
Arm E	15.00	45.00	75.00	11.00	16.50	11.00

Turning Proportions

ODTAB Demand Data type is used, no turning proportions available.

Heavy Vehicle Percentages for Demand Set: 2031 SC2 PM

Vary over entry

Time Period	From/To	Arm A	Arm B	Arm C	Arm D	Arm E
16:45 to 18:15	Arm A	0.0	0.0	12.0	6.0	1.0
	Arm B	0.0	0.0	0.0	0.0	0.0
	Arm C	2.0	0.0	0.0	10.0	1.0
	Arm D	5.0	0.0	2.0	0.0	0.0
	Arm E	2.0	0.0	3.0	2.0	0.0

Site-Specific Data

Arm	Adjustment to Intercept (PCU/Min)
Arm A	-4.000
Arm B	-
Arm C	-4.000
Arm D	-
Arm E	-

Errors and Warnings

WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

Queuing Delay Information Over Whole Period

Arm	Total Demand		Queueing Delay		Inclusive Queueing Delay	
	(Veh)	(Veh/Hr)	(Min)	(Min/Veh)	(Min)	(Min/Veh)
A	2908.4	1938.9	32594.0	11.21	42592.0	14.64
B	50.9	34.0	4.6	0.09	4.6	0.09
C	1830.6	1220.4	12041.0	6.58	13659.4	7.46
D	2410.1	1606.7	10247.2	4.25	10858.0	4.51
E	1211.3	807.5	496.1	0.41	496.2	0.41
ALL	8411.3	5607.6	55382.9	6.58	67610.2	8.04

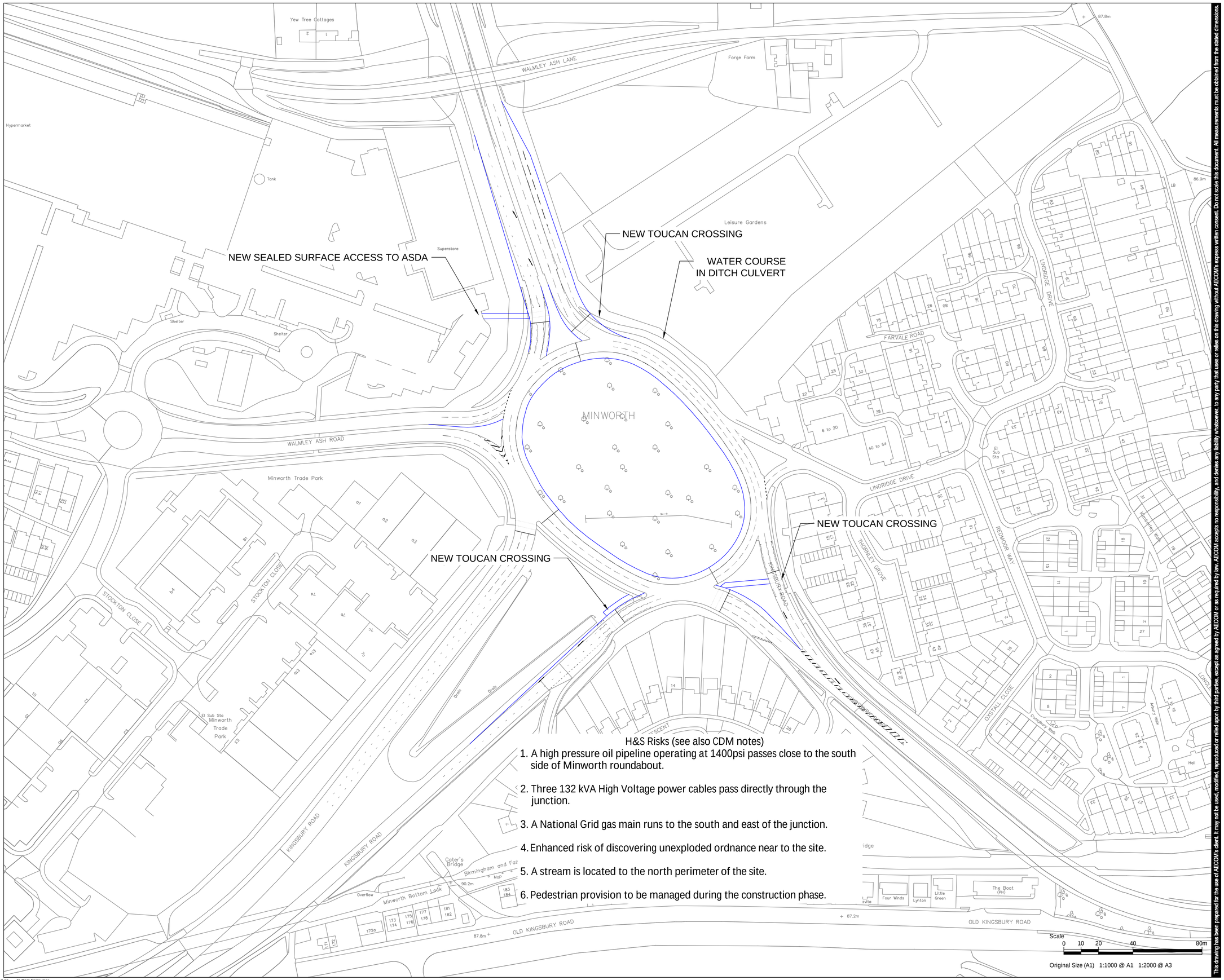
Delay is that occuring only within the time period.
Inclusive delay includes delay suffered by vehicles that are still queueing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

Queues and Delay:

Segment	Arm	Demand (Veh / Min)	Capacity (Veh / Min)	Demand / Capacity (RFC)	Ped Flow (Ped / Min)	Start Queue (Veh)	End Queue (Veh)	Delay (Veh.Min / Time Segment)	Geometric Delay (Veh.Min / Time Segment)	Arrival Delay (Min / Veh)
Segment : 1 - 16:45 to 17:00	A	26.51	27.08	**0.979**	-	0.0	15.7	163.9	-	0.469
	B	0.46	12.36	0.038	-	0.0	0.0	0.6	-	0.084
	C	16.69	18.48	**0.903**	-	0.0	7.2	84.5	-	0.384
	D	21.97	26.64	0.825	-	0.0	4.4	57.7	-	0.192
	E	11.04	20.06	0.550	-	0.0	1.2	17.2	-	0.109
Segment : 2 - 17:00 to 17:15	A	31.66	24.82	**1.276**	-	15.7	119.1	1013.8	-	2.903
	B	0.55	11.64	0.048	-	0.0	0.0	0.7	-	0.090
	C	19.93	17.98	**1.108**	-	7.2	39.9	362.8	-	1.538
	D	26.24	25.70	**1.021**	-	4.4	24.4	240.1	-	0.754
	E	13.19	17.40	0.758	-	1.2	2.9	40.1	-	0.225
Segment : 3 - 17:15 to 17:30	A	38.77	22.84	**1.697**	-	119.1	358.1	3578.4	-	10.572
	B	0.68	11.56	0.059	-	0.0	0.1	0.9	-	0.092
	C	24.41	17.96	**1.359**	-	39.9	136.7	1324.6	-	5.052
	D	32.13	25.75	**1.248**	-	24.4	120.7	1090.5	-	2.945
	E	16.15	16.77	**0.963**	-	2.9	11.4	126.5	-	0.647
Segment : 4 - 17:30 to 17:45	A	38.77	22.58	**1.717**	-	358.1	601.0	7192.9	-	21.297
	B	0.68	11.55	0.059	-	0.1	0.1	0.9	-	0.092
	C	24.41	17.96	**1.359**	-	136.7	233.4	2775.6	-	10.383
	D	32.13	25.77	**1.247**	-	120.7	216.2	2526.8	-	6.632
	E	16.15	16.73	**0.965**	-	11.4	14.6	197.8	-	0.950
Segment : 5 - 17:45 to 18:00	A	31.66	24.06	**1.316**	-	601.0	714.9	9869.4	-	26.451
	B	0.55	11.60	0.048	-	0.1	0.1	0.8	-	0.091
	C	19.93	18.03	**1.105**	-	233.4	261.9	3714.7	-	13.797
	D	26.24	25.60	**1.025**	-	216.2	226.0	3316.1	-	8.726
	E	13.19	16.85	0.782	-	14.6	3.9	84.1	-	0.401
Segment : 6 - 18:00 to 18:15	A	26.51	26.06	**1.018**	-	714.9	721.8	10775.5	-	27.617
	B	0.46	11.67	0.040	-	0.1	0.0	0.6	-	0.089
	C	16.69	18.09	**0.923**	-	261.9	242.0	3778.9	-	13.985
	D	21.97	25.40	0.865	-	226.0	176.2	3016.0	-	7.962
	E	11.04	17.06	0.647	-	3.9	1.9	30.4	-	0.174

Capabilities on project:
Transportation

Appendix F – Preferred Option Drawing



H&S Risks (see also CDM notes)

1. A high pressure oil pipeline operating at 1400psi passes close to the south side of Minworth roundabout.
2. Three 132 kVA High Voltage power cables pass directly through the junction.
3. A National Grid gas main runs to the south and east of the junction.
4. Enhanced risk of discovering unexploded ordnance near to the site.
5. A stream is located to the north perimeter of the site.
6. Pedestrian provision to be managed during the construction phase.

AECOM

PROJECT

MINWORTH ROUNDABOUT OPTIONS

CLIENT

Birmingham City Council

CONSULTANT

AECOM
Colmore Plaza
Colmore Circus Queensway
Birmingham
0121 262 1900 tel 0121 262 1999 fax
www.aecom.com

REGISTRATION

NOTES

CDM NOTES

1. THE CONTRACTOR SHALL DETERMINE THE LOCATION AND STATUS OF ANY STATUTORY UTILITY APPARATUS PRIOR TO THE COMMENCEMENT OF ANY WORKS.
2. A HIGH PRESSURE OIL PIPELINE OPERATING AT 1400psi PASSES CLOSE TO THE SOUTH SIDE OF MINWORTH ROUNDABOUT. A SIX METRE "SAFETY ZONE" HAS BEEN INSTALLED AROUND THE PIPLINES.NO WORKS OF ANY KIND SHOULD BE UNDERTAKEN WITHOUT PRIOR PERMISSION FROM FISHER GERMAN LLP.PRIOR TO WORKS COMMENCING MR RICHARD GENT SHOULD BE CONTACTED 08454378293.
3. THREE 132kVA HIGH VOLTAGE POWER CABLES PASS DIRECTLY THROUGH THE JUNCTION. NO WORKS SHOULD BE UNDERTAKEN WITHOUT CONTACTING AND OBTAINING PERMISSION FROM WESTERN POWER DISTRIBUTION
4. A NATIONAL GRID GAS MAIN RUNS TO THE SOUTH OF AND EAST OF THE JUNCTION. IT IS NOT CONSIDERED THAT THE WORKS WILL NOT AFFECT THIS UTILITY.
5. IT HAS BEEN IDENTIFIED THAT THIS AREA HAS AN ADVANCED RISK OF DISCOVERING UNEXPLODED ORDNANCE NEAR TO THE SITE. APPROPRIATE MEASURES SHOULD THEREFORE BE TAKEN.
6. A STREAM IS LOCATED TO THE NORTH PERIMETER OF THE SITE AND SHOULD BE CONSIDERED BEFORE CONSTRUCTION PHASE
7. PEDESTRIAN PROVISION WILL NEED TO BE MANAGED DURING THE CONSTRUCITON PHASE. THE BASE PROVISION OF THE JUNCITON IS POOR.

ISSUE/REVISION

B	25/06/2014	Walmley Ash Rd Amended
A	21/02/2014	Final Issue
I/R	DATE	DESCRIPTION

KEY PLAN

PROJECT NUMBER

60313511

SHEET TITLE

OPTION 4 - PREFFERED OPTION

SHEET NUMBER

60313511-SKE-20-CT-0004

Capabilities on project:
Transportation

Appendix G – 2031 Option Model TRANSYT outputs

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Future Year Model - TRANSYT flows in pcus
Date: Jan-14

AM Peak: 07:30-08:30
2013 AM Supp demand flows ARCADY Inputs and outputs.xls

Total Pcus		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	1	347	781	283
B	Lindridge Drive	6	0	57	47	22
C	A4097 Kingsbury Road	244	10	0	346	318
D	A38 South	317	17	410	0	215
E	Walmley Ash Road	168	4	355	764	0

Sc2 development flows - It is assumed all the development trips are cars and no HGV's in the peak hour.
Source: Minworth Roundabout Vehicle Flows.xlsx

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	361	886	0
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	372	0	0	0	0
D	A38 South	884	0	0	0	0
E	Walmley Ash Road	0	0	0	0	0

2031 SC2 flows - AM peak with suppressed demand

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	1	708	1667	283
B	Lindridge Drive	6	0	57	47	22
C	A4097 Kingsbury Road	616	10	0	346	318
D	A38 South	1201	17	410	0	215
E	Walmley Ash Road	168	4	355	764	0

Prepared by:	**Sravani Vuppala**		31.01.14
Checked by:	**Matthew Rainsford**		06.02.14

A38/A4097 Minworth Roundabout

AECOM

Project Name: A38/A4097 Minworth roundabout
Project Number: 60313511
Subject: Future Year Model - TRANSYT flows in pcus
Date: Jan-14

PM peak 17:00-18:00
2013 PM peak flows ARCADY Inputs and outputs.xls

Total Pcus		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	9	167	358	309
B	Lindridge Drive	4	0	15	8	10
C	A4097 Kingsbury Road	286	2	0	296	545
D	A38 South	650	32	476	0	449
E	Walmley Ash Road	173	12	210	525	0

Sc2 development flows - It is assumed all the development trips are cars and no HGV's in the peak hour.
Source: Minworth Roundabout Vehicle Flows.xlsx

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	0	397	953	0
B	Lindridge Drive	0	0	0	0	0
C	A4097 Kingsbury Road	271	0	0	0	0
D	A38 South	669	0	0	0	0
E	Walmley Ash Road	0	0	0	0	0

2031 SC2 flows - PM peak

Total Vehicles		A	B	C	D	E
Arms	Approach	A38 N	Lindridge Drive	A4097 Kingsbury Road	A38 South	Walmley Ash Road
A	A38 N	0	9	564	1311	309
B	Lindridge Drive	4	0	15	8	10
C	A4097 Kingsbury Road	557	2	0	296	545
D	A38 South	1319	32	476	0	449
E	Walmley Ash Road	173	12	210	525	0

Prepared by:	**Sravani Vuppala**		31.01.14
Checked by:	**Matthew Rainsford**		06.02.14

TRANSYT 14

Version: 14.1.2.315 [26-09-12]

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758 E-mail: software@trl.co.uk Web: http://www.trlsoftware.co.uk

Last run: 07/02/2014 15:43:49
Analysis Set used for last run: A1 - 2031 AM Scenario 2

Filename: Option 4 AM rev 3.t14
Path: F:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Options\FINAL
Report generation date: 07/02/2014 15:49:42

File summary

File Description

Title	A38 Minworth roundabout
Location	Birmingham
Site Number	
UTCRegion	
Driving Side	Left
Date	27/01/2014
Version	
Status	Proposed Option 4
Identifier	
Client	Birmingham City Council
Jobnumber	60313511
Enumerator	EU\vuppalas
Description	2031 SC2 - Option Model for Minworth roundabout

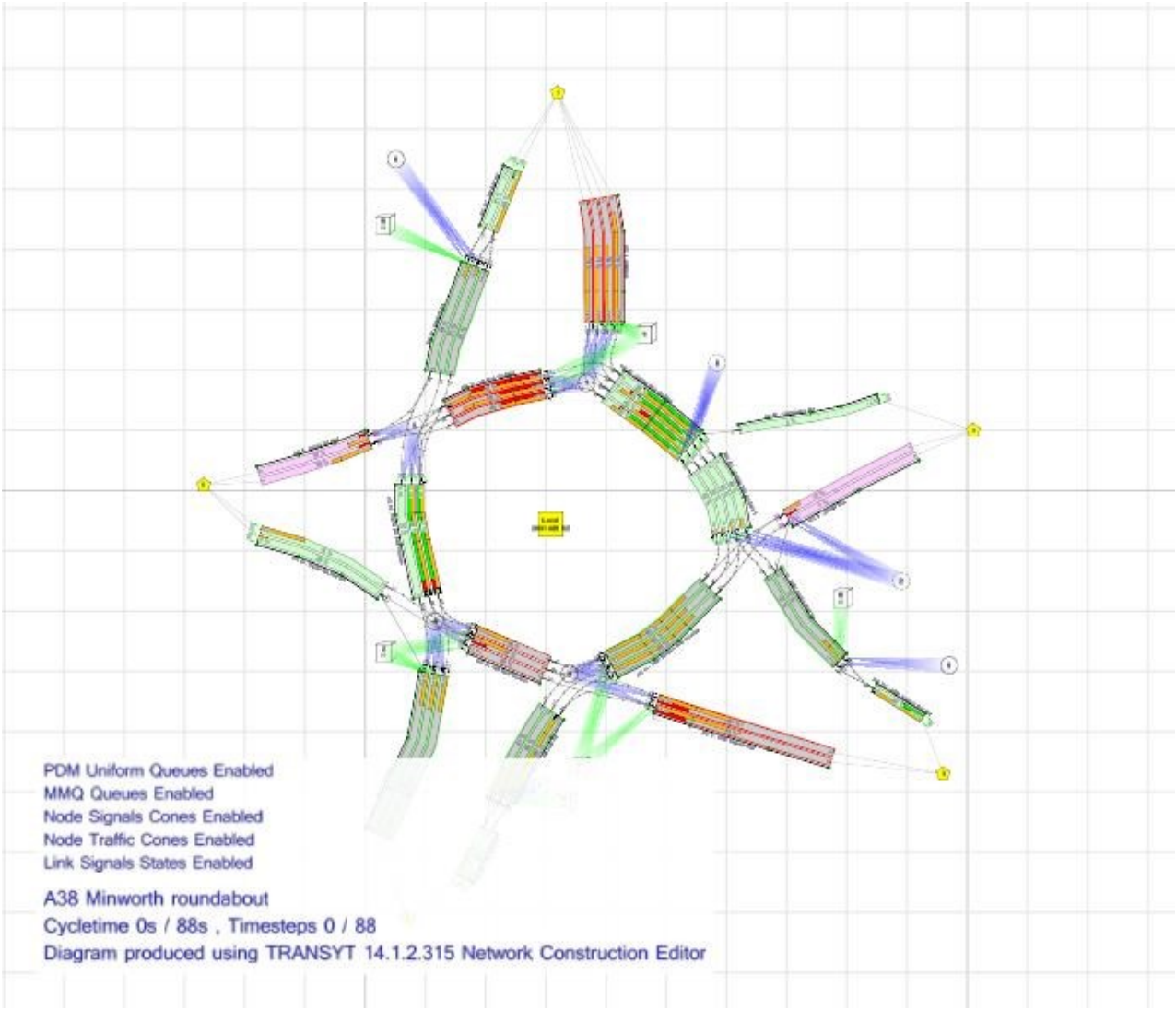
Units

Speed Units	Distance Units	Fuel Economy Units	Fuel Rate Units	Mass Units	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
kph	m	mpg	l/h	kg	perHour	s	-Hour	perHour

Sorting

Show Names Instead of IDs (For Aimsun)	Sorting Direction	Sorting Type	Ignore Prefixes When Sorting	Link Grouping	Source Grouping
	Ascending	Numerical		Normal	Normal

Network Diagrams



A1 - 2031 AM Scenario 2 : D1 - 2031 AM Scenario 2 *

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC	Network Within Capacity
A1 - 2031 AM Scenario 2	07/02/2014 15:43:12	07/02/2014 15:43:49	08:00	88	83.45	84.99	Cx1/1	0	0	C/1	Cx1/1	Cx1/1	✓

Analysis Set Details

Name	Description	Demand Set	Include In Report	Locked

2031 AM Scenario 2		D1	✓	

Demand Set Details

Name	Description	Composite	Demand Sets	Start Time (HH:mm)	Locked
2031 AM Scenario 2				08:00	

Network Options

Network Timings

Network Cycle Time (s)	Resolution	Number Of Steps	Time Segment Length (min)	Number Of Time Segments	Modelled Time Period (min)
88	1	88	60	1	60

Signals Options

Equal Length Multiple Cycling	Start Displacement (s)	End Displacement (s)	Phase Minimum Broken Penalty (£)	Phase Maximum Broken Penalty (£)	Intergreen Broken Penalty (£)
✓	2	3	10000.00	10000.00	10000.00

Traffic Options

Traffic Model	DOS Threshold (%)	Flow Scaling Factor (%)	Cruise Scaling Factor (%)	Cruise Times Or Speeds	Use Link Stop Weightings	Use Link Delay Weightings	Exclude Pedestrian Links	Random Delay Mode	Type of Vehicle-in-Service	Type Of Random Parameter	PCU Length (m)
Quick PDM	90	100	100	Cruise Speeds	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75

Optimisation Options

Auto Redistribute	Optimisation Type	Optimisation Level	Hill Climb Increments	Use Enhanced Optimisation	Optimisation Order	Locked Green Splits	Full Simulation
✓	Hill Climb (Fast)	Offsets And Green Splits	15,40,-1,15,40,1,-1,1		2,1,3,5,6,7		

Economics

Unit Of Cost	Monetary Value Of Delay (£ per PCU-hr)	Monetary Value Of Stops (£ per 100 stops)
£	14.20	2.60

Traffic Nodes

Traffic Nodes

Traffic Node	Name	Description
1	A38 N	
2	Lindridge Drive	
3	A4097 Kinsbury Road	
4	A38 S	
5	Wamley Ash Road	
6	Lindridge Drive Circulatory	
7	A38 South Exit	
8	A38 North Exit	
9	A4097 Kingsbury Road Exit	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic Node
A	A38 North		1
Ax1	A38 North Exit		
B	Lindridge Drive		2
C	A4097 Kingsbury Road		3
Ac	A38 North Circulatory		1
Ax	A38 North Exit		8
Bc	Lindridge Drive Circulatory		6
Bc1	Lindridge Drive Circulatory 2		2
Bx	Lindridge drive Exit		
Cc	A4097 Kingsbury Road Circulatory		3
Cx	A4097 Kinsbury Road Exit		9
Cx1	A4097 Kingsbury Road Exit		
D	A38 South		4
E	Wamley Ash Road		5
Dc	A38 South Circulatory		4
Dx	A38 South Exit		7
Dx1	A38 South Exit		
Ec	Wamley Ash Road Circulatory		5
Ex	Wamley Ash Road Exit		

Traffic Streams

Arm	Traffic Stream	Name	Description	Length (m)	Traffic Model	Has Restricted Flow	Saturation Flow Source	Saturation Flow (PCU/hr)	Is Signal Controlled	Controller Stream	Phase	Phase2 Enabled	Is Give Way	Traffic Type
A	1	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	2128	✓	1	A			Normal
A	2	(untitled)		150.00	[QuickPDM]	✓	SumOfLanes	2279	✓	1	A			Normal
A	3	A38 North Entry		150.00	[QuickPDM]	✓	SumOfLanes	2279	✓	1	A			Normal
A	4	(untitled)		150.00	[QuickPDM]	✓	SumOfLanes	2279	✓	1	A			Normal
B	1	(untitled)		30.00	[QuickPDM]		N/A	N/A		N/A	N/A		✓	Normal
B	2	(untitled)		30.00	[QuickPDM]		N/A	N/A		N/A	N/A		✓	Normal
C	1	(untitled)		200.00	[QuickPDM]	✓	SumOfLanes	2263	✓	3	A			Normal
C	2	(untitled)		200.00	[QuickPDM]	✓	SumOfLanes	2263	✓	3	A			Normal
Ac	1	(untitled)		54.00	[QuickPDM]	✓	SumOfLanes	2112	✓	1	B			Normal
Ac	2	(untitled)		54.00	[QuickPDM]	✓	SumOfLanes	2263	✓	1	B			Normal
Ac	3	(untitled)		54.00	[QuickPDM]	✓	SumOfLanes	2263	✓	1	B			Normal
Ax	1	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1965	✓	5	A			Normal
Ax	2	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	2105	✓	5	A			Normal
Ax	3	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	2105	✓	5	A			Normal
Ax1	1	A38 North Exit		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Ax1	2	A38 North Exit		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc	1	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc	2	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc	3	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc	4	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc1	1	(untitled)		30.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc1	2	(untitled)		30.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal

Bc1	**3**	(untitled)		30.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc1	**4**	(untitled)		30.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bx	**1**	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Cc	**1**	(untitled)		65.00	[QuickPDM]	✓	SumOfLanes	2059	✓	3	B			Normal
Cc	**2**	(untitled)		65.00	[QuickPDM]	✓	SumOfLanes	2209	✓	3	B			Normal
Cc	**3**	(untitled)		65.00	[QuickPDM]	✓	SumOfLanes	2181	✓	3	B			Normal
Cx	**1**	A4097 Kinsbury Road Exit		100.00	[QuickPDM]	✓	SumOfLanes	2120	✓	6	A			Normal
Cx	**2**	A4097 Kinsbury Road Exit		100.00	[QuickPDM]	✓	SumOfLanes	2120	✓	6	A			Normal
Cx1	**1**	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
D	**1**	(untitled)		300.00	[QuickPDM]	✓	SumOfLanes	2159	✓	2	A			Normal
D	**2**	(untitled)		300.00	[QuickPDM]	✓	SumOfLanes	2317	✓	2	A			Normal
D	**3**	(untitled)		300.00	[QuickPDM]	✓	SumOfLanes	2317	✓	2	A			Normal
E	**1**	(untitled)		200.00	[QuickPDM]		N/A	N/A		N/A	N/A		✓	Normal
E	**2**	(untitled)		200.00	[QuickPDM]		N/A	N/A		N/A	N/A		✓	Normal
Dc	**1**	(untitled)		90.00	[QuickPDM]	✓	SumOfLanes	2059	✓	2	B			Normal
Dc	**2**	(untitled)		90.00	[QuickPDM]	✓	SumOfLanes	2172	✓	2	B			Normal
Dc	**3**	(untitled)		90.00	[QuickPDM]	✓	SumOfLanes	2185	✓	2	B			Normal
Dx	**1**	(untitled)		56.00	[QuickPDM]	✓	SumOfLanes	1915	✓	7	A			Normal
Dx	**2**	(untitled)		56.00	[QuickPDM]	✓	SumOfLanes	2055	✓	7	A			Normal
Dx	**3**	(untitled)		56.00	[QuickPDM]	✓	SumOfLanes	2055	✓	7	A			Normal
Dx1	**1**	A38 South Exit		250.00	[QuickPDM]	✓	SumOfLanes	2155		N/A	N/A			Normal
Dx1	**2**	A38 South Exit		250.00	[QuickPDM]	✓	SumOfLanes	2155		N/A	N/A			Normal
Ec	**1**	(untitled)		50.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Ec	**2**	(untitled)		50.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Ec	**3**	(untitled)		50.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Ex	**1**	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Ex	**2**	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface Condition	Site Quality Factor	Gradient (%)	Width (m)	Proportion That Turn (%)	Turning Radius (m)	Nearside Lane	Saturation Flow (PCU/hr)
A	**1**	**2**	A38 North Entry		✓	N/A	Clearly Good	0	3.65	0	N/A	✓	2128
A	**2**	**1**	A38 North Entry		✓	N/A	Clearly Good	0	3.65	0	N/A		2279
A	**3**	**3**	(untitled)		✓	N/A	Clearly Good	0	3.65	0	N/A		2279
A	**4**	**2**	A38 North Entry		✓	N/A	Clearly Good	0	3.65	0	N/A		2279
B	**1**	**1**	Lindridge Drive Entry			N/A	N/A	N/A	N/A	N/A	N/A		1800
B	**2**	**2**	Lindridge Drive Entry			N/A	N/A	N/A	N/A	N/A	N/A		1800
C	**1**	**1**	A4097 Kingsbury Road Entry		✓	N/A	Clearly Good	0	3.50	0	N/A		2263

C	**2**	**2**	A4097 Kingsbury Road Entry		✓	N/A	Clearly Good	0	3.50	0	N/A		2263
Ac	**1**	**1**	A38 North Circulatory		✓	N/A	Clearly Good	0	3.50	0	N/A	✓	2112
Ac	**2**	**2**	A38 North Circulatory		✓	N/A	Clearly Good	0	3.50	0	N/A		2263
Ac	**3**	**1**	A38 North Circulatory		✓	N/A	Clearly Good	0	3.50	0	N/A		2263
Ax	**1**	**2**	A38 North Exit		✓	N/A	N/A	0	3.50	0	N/A	✓	1965
Ax	**2**	**1**	A38 North Exit		✓	N/A	N/A	0	3.50	0	N/A		2105
Ax	**3**	**1**	A38 North Exit		✓	N/A	N/A	0	3.50	0	N/A		2105
Ax1	**1**	**1**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
Ax1	**2**	**1**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc	**1**	**2**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc	**2**	**1**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc	**3**	**3**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc	**4**	**3**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc1	**1**	**2**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc1	**2**	**1**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc1	**3**	**3**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc1	**4**	**3**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bx	**1**	**2**	Lindridge drive Exit			N/A	N/A	N/A	N/A	N/A	N/A		1800
Cc	**1**	**1**	A4097 Kingsbury Road Circulatory		✓	N/A	Clearly Good	0	3.00	0	N/A	✓	2059
Cc	**2**	**2**	A4097 Kingsbury Road Circulatory		✓	N/A	Clearly Good	0	3.00	0	N/A		2209
Cc	**3**	**2**	A4097 Kingsbury Road Circulatory		✓	N/A	Clearly Good	0	3.00	43	50.00		2181
Cx	**1**	**2**	A4097 Kinsbury Road Exit		✓	N/A	N/A	0	3.65	0	N/A		2120
Cx	**2**	**3**	A4097 Kinsbury Road Exit		✓	N/A	N/A	0	3.65	0	N/A		2120
Cx1	**1**	**1**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
D	**1**	**2**	A38 South Entry		✓	N/A	Clearly Good	0	4.00	10	42.00	✓	2159
D	**2**	**1**	A38 South Entry		✓	N/A	Clearly Good	0	4.00	0	N/A		2317
D	**3**	**3**	A38 South Entry		✓	N/A	Clearly Good	0	4.00	0	N/A		2317
E	**1**	**3**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
E	**2**	**3**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
Dc	**1**	**2**	A38 South Circulatory		✓	N/A	Clearly Good	0	3.00	0	N/A	✓	2059
Dc	**2**	**1**	A38 South Circulatory		✓	N/A	Clearly Good	0	3.00	56	49.00		2172

Dc	**3**	**1**	A38 South Circulatory		✓	N/A	Clearly Good	0	3.00	35	49.00		2185
Dx	**1**	**1**	A38 South Exit		✓	N/A	N/A	0	3.00	0	N/A	✓	1915
Dx	**2**	**2**	A38 South Exit		✓	N/A	N/A	0	3.00	0	N/A		2055
Dx	**3**	**2**	A38 South Exit		✓	N/A	N/A	0	3.00	0	N/A		2055
Dx1	**1**	**1**	(untitled)		✓	N/A	N/A	0	4.00	0	N/A		2155
Dx1	**2**	**1**	(untitled)		✓	N/A	N/A	0	4.00	0	N/A		2155
Ec	**1**	**2**	Wamley Ash Road Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Ec	**2**	**1**	Wamley Ash Road Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Ec	**3**	**3**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
Ex	**1**	**1**	Wamley Ash Road Exit			N/A	N/A	N/A	N/A	N/A	N/A		1800
Ex	**2**	**2**	Wamley Ash Road Exit			N/A	N/A	N/A	N/A	N/A	N/A		1800

Modelling

Arm	Traffic Stream	Stop Weighting Multiplier (%)	Delay Weighting Multiplier (%)	Exclude From Results Calculation	Max Queue Storage (PCU)	Has Queue Limit	Queue Limit (PCU)	Excess Queue Penalty (£)	Has Degree Of Saturation Limit
A	**1**	0	40		0.00		N/A	N/A	
A	**2**	0	40		0.00		N/A	N/A	
A	**3**	0	40		0.00		N/A	N/A	
A	**4**	0	40		0.00		N/A	N/A	
B	**1**	100	100		0.00		N/A	N/A	
B	**2**	100	100		0.00		N/A	N/A	
C	**1**	0	40		0.00		N/A	N/A	
C	**2**	0	40		0.00		N/A	N/A	
Ac	**1**	100	100		7.00	✓	7	80.00	
Ac	**2**	100	100		7.00	✓	7	0.00	
Ac	**3**	100	100		7.00	✓	7	0.00	
Ax	**1**	100	100		0.00		N/A	N/A	
Ax	**2**	100	100		0.00		N/A	N/A	
Ax	**3**	100	100		0.00		N/A	N/A	
Ax1	**1**	100	100		0.00		N/A	N/A	
Ax1	**2**	100	100		0.00		N/A	N/A	
Bc	**1**	100	100		0.00	✓	15	0.00	
Bc	**2**	100	100		0.00	✓	15	0.00	
Bc	**3**	100	100		0.00	✓	15	0.00	
Bc	**4**	100	100		0.00	✓	15	0.00	
Bc1	**1**	100	100		0.00	✓	5	0.00	
Bc1	**2**	100	100		0.00	✓	5	0.00	
Bc1	**3**	100	100		0.00	✓	5	0.00	
Bc1	**4**	100	100		0.00	✓	5	0.00	
Bx	**1**	100	100		0.00		N/A	N/A	
Cc	**1**	100	100		6.00	✓	6	60.00	
Cc	**2**	100	100		6.00	✓	6	60.00	
Cc	**3**	100	100		6.00	✓	6	60.00	
Cx	**1**	100	100		0.00		N/A	N/A	
Cx	**2**	100	100		0.00		N/A	N/A	
Cx1	**1**	100	100		0.00		N/A	N/A	
D	**1**	0	40		0.00		N/A	N/A	

D	2	0	40		0.00		N/A	N/A	
D	3	0	40		0.00		N/A	N/A	
E	1	100	40		0.00		N/A	N/A	
E	2	100	40		0.00		N/A	N/A	
Dc	1	1000	1000		0.00	✓	13	60.00	
Dc	2	100	100		0.00	✓	13	30.00	
Dc	3	100	100		0.00	✓	13	0.00	
Dx	1	100	100		0.00		N/A	N/A	
Dx	2	100	100		0.00		N/A	N/A	
Dx	3	100	100		0.00		N/A	N/A	
Dx1	1	100	100		0.00		N/A	N/A	
Dx1	2	100	100		0.00		N/A	N/A	
Ec	1	100	100		0.00	✓	6	0.00	
Ec	2	100	100		0.00	✓	6	60.00	
Ec	3	100	100		0.00	✓	6	60.00	
Ex	1	100	100		0.00		N/A	N/A	
Ex	2	100	100		0.00		N/A	N/A	

Modelling - Advanced

Arm	Traffic Stream	Normal Dispersal Type	Normal Dispersal Coefficient	Normal Travel Time Coefficient	Initial Queue (PCU)	Point1 Time Step (s)	Point2 Time Step (s)	Type of Vehicle-in-Service	Vehicle-in-Service	Type Of Random Parameter	Random Parameter
A	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
A	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
A	3	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
A	4	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
B	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
B	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
C	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
C	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ac	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ac	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ac	3	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ax	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ax	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ax	3	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ax1	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ax1	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Bc	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc	**4**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc1	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc1	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc1	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc1	**4**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bx	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cc	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cc	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cc	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cx	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cx	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cx1	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
D	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
D	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
D	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
E	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
E	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dc	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dc	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dc	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dx	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dx	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dx	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dx1	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dx1	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ec	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ec	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ec	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ex	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Ex	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)	Bus Flow (PCU/hr)	Tram Flow (PCU/hr)	Cruise Sensitivity Multiplier (%)	Calculated Cruise Speed (kph)
A	1	631	631	0	0	100	1.00
A	2	676	676	0	0	100	1.00
A	3	676	676	0	0	100	1.00
A	4	676	676	0	0	100	1.00
B	1	66	66	0	0	100	1.00
B	2	66	66	0	0	100	1.00
C	1	645	645	0	0	100	1.00
C	2	645	645	0	0	100	1.00
Ac	1	591	591	0	0	100	1.00
Ac	2	460	460	0	0	100	1.00
Ac	3	509	509	0	0	100	1.00
Ax	1	746	746	0	0	100	1.00
Ax	2	836	836	0	0	100	1.00
Ax	3	409	409	0	0	100	1.00
Ax1	1	746	746	0	0	100	1.00
Ax1	2	1245	1245	0	0	100	1.00
Bc	1	1222	1222	0	0	100	1.00
Bc	2	1136	1136	0	0	100	1.00
Bc	3	931	931	0	0	100	1.00
Bc	4	931	931	0	0	100	1.00
Bc1	1	1190	1190	0	0	100	1.00
Bc1	2	1136	1136	0	0	100	1.00
Bc1	3	931	931	0	0	100	1.00
Bc1	4	931	931	0	0	100	1.00
Bx	1	32	32	0	0	100	1.00
Cc	1	862	862	0	0	100	1.00
Cc	2	950	950	0	0	100	1.00
Cc	3	978	978	0	0	100	1.00
Cx	1	1247	1247	0	0	100	1.00
Cx	2	283	283	0	0	100	1.00
Cx1	1	1530	1530	0	0	100	1.00
D	1	586	586	0	0	100	1.00
D	2	629	629	0	0	100	1.00
D	3	629	629	0	0	100	1.00
E	1	527	527	0	0	100	1.00
E	2	764	764	0	0	100	1.00
Dc	1	299	299	0	0	100	1.00
Dc	2	531	531	0	0	100	1.00
Dc	3	425	425	0	0	100	1.00
Dx	1	1208	1208	0	0	100	1.00
Dx	2	950	950	0	0	100	1.00
Dx	3	667	667	0	0	100	1.00
Dx1	1	1208	1208	0	0	100	1.00
Dx1	2	1616	1616	0	0	100	1.00
Ec	1	578	578	0	0	100	1.00
Ec	2	836	836	0	0	100	1.00
Ec	3	846	846	0	0	100	1.00
Ex	1	514	514	0	0	100	1.00

Ex	2	324	324	0	0	100	1.00

Normal - Modelling

Arm	Traffic Stream	Stop Weighting (%)	Delay Weighting (%)
A	1	100	100
A	2	100	100
A	3	100	100
A	4	100	100
B	1	100	100
B	2	100	100
C	1	100	100
C	2	100	100
Ac	1	100	100
Ac	2	100	100
Ac	3	100	100
Ax	1	100	100
Ax	2	100	100
Ax	3	100	100
Ax1	1	100	100
Ax1	2	100	100
Bc	1	100	100
Bc	2	100	100
Bc	3	100	100
Bc	4	100	100
Bc1	1	100	100
Bc1	2	100	100
Bc1	3	100	100
Bc1	4	100	100
Bx	1	100	100
Cc	1	100	100
Cc	2	100	100
Cc	3	100	100
Cx	1	100	100
Cx	2	100	100
Cx1	1	100	100
D	1	100	100
D	2	100	100
D	3	100	100
E	1	100	100
E	2	100	100
Dc	1	100	100
Dc	2	100	100
Dc	3	100	100
Dx	1	100	100
Dx	2	100	100
Dx	3	100	100
Dx1	1	100	100
Dx1	2	100	100
Ec	1	100	100
Ec	2	100	100
Ec	3	100	100
Ex	1	100	100
Ex	2	100	100

Sources - default sources for entries

Arm	Traffic Stream	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
A	1	3.60	100.00	Buses Not Permittted	Trams Not Permitted
A	2	5.40	100.00	Buses Not Permittted	Trams Not Permitted
A	3	5.40	100.00	Buses Not Permittted	Trams Not Permitted
A	4	5.40	100.00	Buses Not Permittted	Trams Not Permitted
B	1	2.24	48.28	Buses Not Permittted	Trams Not Permitted
B	2	2.24	48.28	Buses Not Permittted	Trams Not Permitted
C	1	11.19	64.37	Buses Not Permittted	Trams Not Permitted
C	2	11.19	64.37	Buses Not Permittted	Trams Not Permitted
D	1	16.78	64.37	Buses Not Permittted	Trams Not Permitted
D	2	16.78	64.37	Buses Not Permittted	Trams Not Permitted
D	3	16.78	64.37	Buses Not Permittted	Trams Not Permitted
E	1	14.91	48.28	Buses Not Permittted	Trams Not Permitted
E	2	14.91	48.28	Buses Not Permittted	Trams Not Permitted

Sources - sources for internals

Arm	Traffic Stream	Source	Source Type	Source Traffic Stream	Source Total Flow (PCU/hr)	Source Normal Flow (PCU/hr)	Source Bus Flow (PCU/hr)	Source Tram Flow (PCU/hr)	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
Ac	1	1	TrafficStream	E/1	359	359	0	0	4.03	48.28	Buses Not Permittted	Trams Not Permitted
Ac	1	2	TrafficStream	Ec/3	232	232	0	0	4.03	48.28	Buses Not Permittted	Trams Not Permitted
Ac	2	1	TrafficStream	Ec/3	205	205	0	0	4.03	48.28	Buses Not Permittted	Trams Not Permitted
Ac	2	2	TrafficStream	E/2	255	255	0	0	4.03	48.28	Buses Not Permittted	Trams Not Permitted
Ac	3	1	TrafficStream	E/2	509	509	0	0	4.03	48.28	Buses Not Permittted	Trams Not Permitted
Ax	1	1	TrafficStream	Ec/1	578	578	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax	1	2	TrafficStream	E/1	168	168	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax	2	1	TrafficStream	Ec/2	836	836	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax	3	1	TrafficStream	Ec/3	409	409	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax1	1	1	TrafficStream	Ax/1	746	746	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax1	2	1	TrafficStream	Ax/3	409	409	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax1	2	2	TrafficStream	Ax/2	836	836	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Bc	1	1	TrafficStream	Ac/1	591	591	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc	1	2	TrafficStream	A/1	631	631	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc	2	1	TrafficStream	A/2	676	676	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc	2	2	TrafficStream	Ac/2	460	460	0	0	12.00	30.00	Buses Not Permittted	Trams Not Permitted
Bc	3	1	TrafficStream	Ac/3	255	255	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc	3	2	TrafficStream	A/3	676	676	0	0	12.00	30.00	Buses Not Permittted	Trams Not Permitted

Bc	**4**	**1**	TrafficStream	Ac/3	255	255	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc	**4**	**2**	TrafficStream	A/4	676	676	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc1	**1**	**1**	TrafficStream	Bc/1	1190	1190	0	0	2.24	48.28	Buses Not Permittted	Trams Not Permitted
Bc1	**2**	**1**	TrafficStream	Bc/2	1136	1136	0	0	2.24	48.28	Buses Not Permittted	Trams Not Permitted
Bc1	**3**	**1**	TrafficStream	Bc/3	931	931	0	0	2.24	48.28	Buses Not Permittted	Trams Not Permitted
Bc1	**4**	**1**	TrafficStream	Bc/4	931	931	0	0	2.24	48.28	Buses Not Permittted	Trams Not Permitted
Bx	**1**	**1**	TrafficStream	Bc/1	32	32	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**1**	**1**	TrafficStream	B/1	9	9	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**1**	**2**	TrafficStream	Bc1/2	853	853	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**2**	**1**	TrafficStream	B/2	19	19	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**2**	**2**	TrafficStream	Bc1/3	931	931	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**3**	**1**	TrafficStream	B/2	47	47	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**3**	**2**	TrafficStream	Bc1/4	931	931	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cx	**1**	**1**	TrafficStream	Bc1/1	1190	1190	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Cx	**1**	**2**	TrafficStream	B/1	57	57	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Cx	**2**	**1**	TrafficStream	Bc1/2	283	283	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Cx1	**1**	**1**	TrafficStream	Cx/1	1247	1247	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Cx1	**1**	**2**	TrafficStream	Cx/2	283	283	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Dc	**1**	**1**	TrafficStream	C/1	299	299	0	0	6.71	48.28	Buses Not Permittted	Trams Not Permitted
Dc	**2**	**1**	TrafficStream	C/2	224	224	0	0	6.71	48.28	Buses Not Permittted	Trams Not Permitted
Dc	**2**	**2**	TrafficStream	Cc/3	307	307	0	0	6.71	48.28	Buses Not Permittted	Trams Not Permitted
Dc	**3**	**1**	TrafficStream	C/2	421	421	0	0	6.71	48.28	Buses Not Permittted	Trams Not Permitted
Dc	**3**	**2**	TrafficStream	Cc/3	4	4	0	0	6.71	48.28	Buses Not Permittted	Trams Not Permitted
Dx	**1**	**1**	TrafficStream	Cc/1	862	862	0	0	3.13	64.37	Buses Not Permittted	Trams Not Permitted
Dx	**1**	**2**	TrafficStream	C/1	346	346	0	0	3.13	64.37	Buses Not Permittted	Trams Not Permitted
Dx	**2**	**1**	TrafficStream	Cc/2	950	950	0	0	3.13	64.37	Buses Not Permittted	Trams Not Permitted
Dx	**3**	**1**	TrafficStream	Cc/3	667	667	0	0	3.13	64.37	Buses Not Permittted	Trams Not Permitted
Dx1	**1**	**1**	TrafficStream	Dx/1	1208	1208	0	0	13.98	64.37	Buses Not Permittted	Trams Not Permitted
Dx1	**2**	**1**	TrafficStream	Dx/2	950	950	0	0	13.98	64.37	Buses Not Permittted	Trams Not Permitted
Dx1	**2**	**2**	TrafficStream	Dx/3	667	667	0	0	13.98	64.37	Buses Not Permittted	Trams Not Permitted

Ec	1	1	TrafficStream	D/1	371	371	0	0	3.73	48.28	Buses Not Permittted	Trams Not Permitted
Ec	1	2	TrafficStream	Dc/2	207	207	0	0	6.00	30.00	Buses Not Permittted	Trams Not Permitted
Ec	2	1	TrafficStream	D/2	629	629	0	0	3.73	48.28	Buses Not Permittted	Trams Not Permitted
Ec	2	2	TrafficStream	Dc/3	207	207	0	0	6.00	30.00	Buses Not Permittted	Trams Not Permitted
Ec	3	1	TrafficStream	D/3	629	629	0	0	3.73	48.28	Buses Not Permittted	Trams Not Permitted
Ec	3	2	TrafficStream	Dc/3	217	217	0	0	3.73	48.28	Buses Not Permittted	Trams Not Permitted
Ex	1	1	TrafficStream	Dc/1	299	299	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Ex	1	2	TrafficStream	D/1	215	215	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Ex	2	1	TrafficStream	Dc/2	324	324	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted

Give Way Data

Arm	Traffic Stream	Opposed Traffic	Use Step-wise Opposed Turn Model	Visibility Restricted
B	1	AllTraffic		
B	2	AllTraffic		
E	1	AllTraffic		
E	2	AllTraffic		

Give Way Data - All Movements - Conflicts

Traffic Stream	Description	Controlling Type	Controlling Traffic Stream	Percentage Opposing (%)	Slope Coefficient	Upstream Signals Visible	Conflict Shift	Conflict Duration
1		TrafficStream	Bc1/1	100	0.44		0	0
1		TrafficStream	Bc1/2	100	0.44		0	0
2		TrafficStream	Bc1/1	100	0.44		0	0
2		TrafficStream	Bc1/2	100	0.44		0	0
2		TrafficStream	Bc1/3	100	0.44		0	0
2		TrafficStream	Bc1/4	100	0.44		0	0
1	Roundabout Circulating	TrafficStream	Ec/1	100	0.50		0	0
1		TrafficStream	Ec/2	100	0.50		0	0
1		TrafficStream	Ec/3	100	0.50		0	0
2	Roundabout Circulating	TrafficStream	Ec/1	100	0.50		0	0
2		TrafficStream	Ec/2	100	0.50		0	0
2		TrafficStream	Ec/3	100	0.50		0	0

Quick Flares

Arm	Traffic Stream	Description	Saturation Flow (PCU/hr)	Effective Storage (Vehs)
C	1		1800	7
C	2		1800	7

Flow Allocation Tool Tables - Local Matrix: 2031 AM S2

Normal Input Flows (PCU/hr)

	To

		1	2	3	4	5
From	1	0	1	708	1667	283
	2	6	0	57	47	22
	3	616	10	0	346	318
	4	1201	17	410	0	215
	5	168	4	355	764	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

Local Matrix	Location	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
2031 AM S2	1	(untitled)	A/1,A/2,A/3,A/4	Ax1/2,Ax1/1	2659	2659	0	0	1991	1991	0	0
2031 AM S2	2	(untitled)	B/1,B/2	Bx/1	132	132	0	0	32	32	0	0
2031 AM S2	3	(untitled)	C/1,C/2	Cx1/1	1290	1290	0	0	1530	1530	0	0
2031 AM S2	4	(untitled)	D/1,D/2,D/3	Dx1/2,Dx1/1	1843	1843	0	0	2824	2824	0	0
2031 AM S2	5	(untitled)	E/1,E/2	Ex/1,Ex/2	1291	1291	0	0	838	838	0	0

Paths

Local Matrix	Path	Description	Path Items	Calculated Total Flow (PCU/hr)
2031 AM S2	1		D/1,Ec/1,Ax/1,Ax1/1	371
2031 AM S2	2		D/1,Ex/1	215
2031 AM S2	3		D/2,Ec/2,Ax/2,Ax1/2	629
2031 AM S2	4		D/3,Ec/3,Ax/3,Ax1/2	202
2031 AM S2	5		D/3,Ec/3,Ac/1,Bc/1,Bx/1	17
2031 AM S2	6		D/3,Ec/3,Ac/1,Bc/1,Bc1/1,Cx/1,Cx1/1	205
2031 AM S2	7		D/3,Ec/3,Ac/2,Bc/2,Bc1/2,Cc/1,Dx/1,Dx1/1	0
2031 AM S2	8		D/3,Ec/3,Ac/2,Bc/2,Bc1/2,Cx/2,Cx1/1	205
2031 AM S2	9		E/1,Ax/1,Ax1/1	168
2031 AM S2	10		E/1,Ac/1,Bc/1,Bx/1	4
2031 AM S2	11		E/1,Ac/1,Bc/1,Bc1/1,Cx/1,Cx1/1	355
2031 AM S2	12		E/2,Ac/2,Bc/2,Bc1/2,Cc/1,Dx/1,Dx1/1	255
2031 AM S2	13		E/2,Ac/2,Bc/2,Bc1/2,Cx/2,Cx1/1	0
2031 AM S2	14		E/2,Ac/3,Bc/3,Bc1/3,Cc/2,Dx/2,Dx1/2	255
2031 AM S2	15		E/2,Ac/3,Bc/4,Bc1/4,Cc/3,Dc/2,Ex/2	0
2031 AM S2	16		E/2,Ac/3,Bc/4,Bc1/4,Cc/3,Dx/3,Dx1/2	255
2031 AM S2	17		B/1,Cc/1,Dx/1,Dx1/1	9
2031 AM S2	18		B/1,Cx/1,Cx1/1	57
2031 AM S2	19		B/2,Cc/2,Dx/2,Dx1/2	19
2031 AM S2	20		B/2,Cc/3,Dc/2,Ec/1,Ax/1,Ax1/1	2
2031 AM S2	21		B/2,Cc/3,Dc/2,Ex/2	22
2031 AM S2	22		B/2,Cc/3,Dc/3,Ec/2,Ax/2,Ax1/2	2
2031 AM S2	23		B/2,Cc/3,Dc/3,Ec/3,Ax/3,Ax1/2	2
2031 AM S2	24		B/2,Cc/3,Dc/3,Ec/3,Ac/1,Bc/1,Bx/1	0

2031 AM S2	**25**		B/2,Cc/3,Dx/3,Dx1/2	19
2031 AM S2	**26**		C/1,Dc/1,Ex/1	299
2031 AM S2	**27**		C/1,Dx/1,Dx1/1	346
2031 AM S2	**28**		C/2,Dc/2,Ec/1,Ax/1,Ax1/1	205
2031 AM S2	**29**		C/2,Dc/2,Ex/2	19
2031 AM S2	**30**		C/2,Dc/3,Ec/2,Ax/2,Ax1/2	205
2031 AM S2	**31**		C/2,Dc/3,Ec/3,Ax/3,Ax1/2	205
2031 AM S2	**32**		C/2,Dc/3,Ec/3,Ac/1,Bc/1,Bx/1	10
2031 AM S2	**33**		C/2,Dc/3,Ec/3,Ac/1,Bc/1,Bc1/1,Cx/1,Cx1/1	0
2031 AM S2	**34**		C/2,Dc/3,Ec/3,Ac/2,Bc/2,Bc1/2,Cx/2,Cx1/1	0
2031 AM S2	**35**		A/1,Bc/1,Bx/1	1
2031 AM S2	**36**		A/1,Bc/1,Bc1/1,Cx/1,Cx1/1	630
2031 AM S2	**37**		A/2,Bc/2,Bc1/2,Cc/1,Dx/1,Dx1/1	598
2031 AM S2	**38**		A/2,Bc/2,Bc1/2,Cx/2,Cx1/1	78
2031 AM S2	**39**		A/3,Bc/3,Bc1/3,Cc/2,Dx/2,Dx1/2	676
2031 AM S2	**40**		A/4,Bc/4,Bc1/4,Cc/3,Dc/2,Ec/1,Ax/1,Ax1/1	0
2031 AM S2	**41**		A/4,Bc/4,Bc1/4,Cc/3,Dc/2,Ex/2	283
2031 AM S2	**42**		A/4,Bc/4,Bc1/4,Cc/3,Dc/3,Ec/2,Ax/2,Ax1/2	0
2031 AM S2	**43**		A/4,Bc/4,Bc1/4,Cc/3,Dc/3,Ec/3,Ax/3,Ax1/2	0
2031 AM S2	**44**		A/4,Bc/4,Bc1/4,Cc/3,Dx/3,Dx1/2	393

Normal Path Flows

Local Matrix	Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
2031 AM S2	**1**	✓	Normal	N/A	N/A	371
2031 AM S2	**2**	✓	Normal	N/A	N/A	215
2031 AM S2	**3**	✓	Normal	N/A	N/A	629
2031 AM S2	**4**	✓	Normal	N/A	N/A	202
2031 AM S2	**5**	✓	Normal	N/A	N/A	17
2031 AM S2	**6**	✓	Normal	N/A	N/A	205
2031 AM S2	**7**	✓	Normal	N/A	N/A	0
2031 AM S2	**8**	✓	Normal	N/A	N/A	205
2031 AM S2	**9**	✓	Normal	N/A	N/A	168
2031 AM S2	**10**	✓	Normal	N/A	N/A	4
2031 AM S2	**11**	✓	Normal	N/A	N/A	355
2031 AM S2	**12**	✓	Normal	N/A	N/A	255
2031 AM S2	**13**	✓	Normal	N/A	N/A	0
2031 AM S2	**14**	✓	Normal	N/A	N/A	255
2031 AM S2	**15**	✓	Normal	N/A	N/A	0
2031 AM S2	**16**	✓	Normal	N/A	N/A	255
2031 AM S2	**17**	✓	Normal	N/A	N/A	9
2031 AM S2	**18**	✓	Normal	N/A	N/A	57
2031 AM S2	**19**	✓	Normal	N/A	N/A	19
2031 AM S2	**20**	✓	Normal	N/A	N/A	2
2031 AM S2	**21**	✓	Normal	N/A	N/A	22
2031 AM S2	**22**	✓	Normal	N/A	N/A	2
2031 AM S2	**23**	✓	Normal	N/A	N/A	2
2031 AM S2	**24**	✓	Normal	N/A	N/A	0
2031 AM S2	**25**	✓	Normal	N/A	N/A	19
2031 AM S2	**26**	✓	Normal	N/A	N/A	299
2031 AM S2	**27**	✓	Normal	N/A	N/A	346
2031 AM S2	**28**	✓	Normal	N/A	N/A	205
2031 AM S2	**29**	✓	Normal	N/A	N/A	19

2031 AM S2	**30**	✓	Normal	N/A	N/A	205
2031 AM S2	**31**	✓	Normal	N/A	N/A	205
2031 AM S2	**32**	✓	Normal	N/A	N/A	10
2031 AM S2	**33**	✓	Normal	N/A	N/A	0
2031 AM S2	**34**	✓	Normal	N/A	N/A	0
2031 AM S2	**35**	✓	Normal	N/A	N/A	1
2031 AM S2	**36**	✓	Normal	N/A	N/A	630
2031 AM S2	**37**	✓	Normal	N/A	N/A	598
2031 AM S2	**38**	✓	Normal	N/A	N/A	78
2031 AM S2	**39**	✓	Normal	N/A	N/A	676
2031 AM S2	**40**	✓	Normal	N/A	N/A	0
2031 AM S2	**41**	✓	Normal	N/A	N/A	283
2031 AM S2	**42**	✓	Normal	N/A	N/A	0
2031 AM S2	**43**	✓	Normal	N/A	N/A	0
2031 AM S2	**44**	✓	Normal	N/A	N/A	393

Signal Timings

88s cycle time; 88 steps

Controller Stream

Controller Stream	Name	Description	Gaining Delay Type	Signals Manipulation Mode	Multiple Cycling	Offset Relative To	Offset Valid	Offset Positive (s)	Offset Negative (s)	Auto Redistribute	Optimisation Level	Use Sequence
1	(untitled)		Absolute	StageBased	Single	1	✓	0	0	✓	Offsets And Green Splits	1
2	(untitled)		Absolute	StageBased	Single	1	✓	14	-74	✓	Offsets And Green Splits	1
3	(untitled)		Absolute	StageBased	Single	1	✓	69	-19	✓	Offsets And Green Splits	1
5	(untitled)		Absolute	StageBased	Single	1	✓	84	-4	✓	Offsets And Green Splits	1
6	(untitled)		Absolute	StageBased	Single	1	✓	11	-77	✓	Offsets And Green Splits	1
7	(untitled)		Absolute	PhaseBased	Single	3	✓	4	-84	✓	Offsets And Green Splits	1

Phases

Controller Stream	Phase	Name	Minimum Green (s)	Maximum Green (s)	Relative Start Displacement (s)	Relative End Displacement (s)	Dummy
1	**A**	(untitled)	7	300	0	0	
1	**B**	(untitled)	7	300	0	0	
1	**C**	(untitled)	7	300	0	0	
2	**A**	(untitled)	7	300	0	0	
2	**B**	(untitled)	7	300	0	0	
2	**C**	(untitled)	5	300	0	0	
3	**A**	(untitled)	7	300	0	0	
3	**B**	(untitled)	7	300	0	0	
3	**C**	(untitled)	5	300	0	0	
5	**A**	(untitled)	7	300	0	0	
5	**B**	(untitled)	5	300	0	0	
6	**A**	(untitled)	7	300	0	0	
6	**B**	(untitled)	5	300	0	0	
7	**A**	(untitled)	7	300	0	0	

7	B	(untitled)	5	300	0	0	

Library Stages

Controller Stream	Library Stage	Phases In Stage	User Stage Minimum (s)
1	1	A	1
1	2	B,C	1
2	1	A	1
2	2	B,C	1
3	1	A	1
3	2	B,C	1
5	1	A	1
5	2	B	1
6	1	A	1
6	2	B	1
7	1	A	1
7	2	B	1

Losing/ Gaining delays at each Controller Stream

Controller Stream	Delay	Type	Phase	From Stage	To Stage	Relative Delay	Absolute Delay
1	1	Losing	B	2	1	9	N/A
2	1	Losing	B	2	1	5	N/A
3	1	Losing	B	2	1	9	N/A

Stage Sequences

Controller Stream	Stage Sequence	Name	Stage IDs	Stage Ends	Multiple Cycling Stage IDs	Multiple Cycling Stage Ends
1	1	(untitled)	1,2	85,39		
2	1	(untitled)	1,2	22,57		
3	1	(untitled)	1,2	52,20		
5	1	(untitled)	1,2	28,38		
6	1	(untitled)	1,2	46,56		
7	1	(untitled)	1,2	18,28		

Resultant Stages

Controller Stream	Stage	Is Base Stage	Library Stage ID	Phases In This Stage	Stage Start (s)	Stage End (s)	Stage Duration (s)	User Stage Minimum (s)	Stage Minimum (s)
1	1	✓	1	A	53	85	32	1	7
1	2	✓	2	B,C	2	39	37	1	7
2	1	✓	1	A	67	22	43	1	7
2	2	✓	2	B,C	27	57	30	1	5
3	1	✓	1	A	34	52	18	1	7
3	2	✓	2	B,C	57	20	51	1	5
5	1	✓	1	A	49	28	67	1	7
5	2	✓	2	B	33	38	5	1	5
6	1	✓	1	A	64	46	70	1	7
6	2	✓	2	B	51	56	5	1	5
7	1	✓	1	A	38	18	68	1	7
7	2	✓	2	B	23	28	5	1	5

Resultant Phase Green Periods

Controller Stream	Phase	Green Period	Is Base Green Period	Start Time (s)	End Time (s)	Duration (s)
1	A	1	✓	53	85	32
1	B	1	✓	2	48	46

1	C	1	✓	2	39	37
2	A	1	✓	67	22	43
2	B	1	✓	27	62	35
2	C	1	✓	27	57	30
3	A	1	✓	34	52	18
3	B	1	✓	57	29	60
3	C	1	✓	57	20	51
5	A	1	✓	49	28	67
5	B	1	✓	33	38	5
6	A	1	✓	64	46	70
6	B	1	✓	51	56	5
7	A	1	✓	38	18	68
7	B	1	✓	23	28	5

Intergreen Matrix for Controller Stream 1

		To		
		A	B	C
From	A	-	5	5
	B	5	-	
	C	14		-

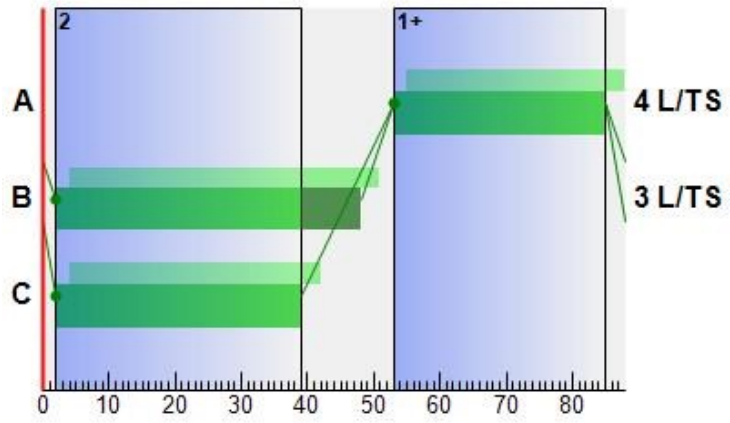
Interstage Matrix for Controller Stream 1

		To	
		1	2
From	1	-	5
	2	14	-

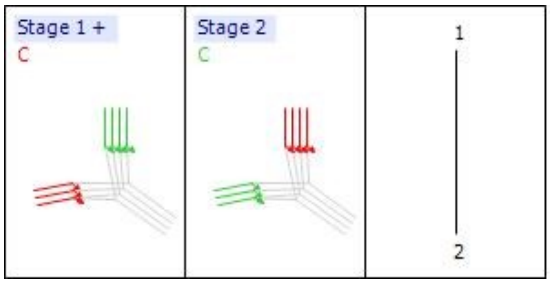
Banned Stage transitions for Controller Stream 1

		To	
		1	2
From	1	-	
	2		-

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

		To		
		A	**B**	**C**
From	**A**	-	5	5
	B	5	-	
	C	10		-

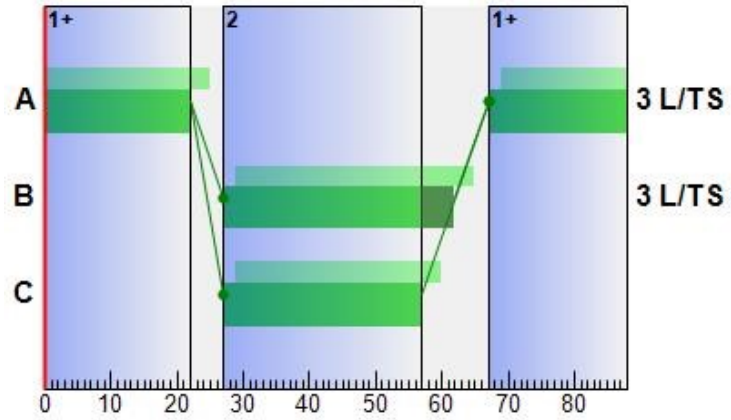
Interstage Matrix for Controller Stream 2

		To	
		1	**2**
From	**1**	-	5
	2	10	-

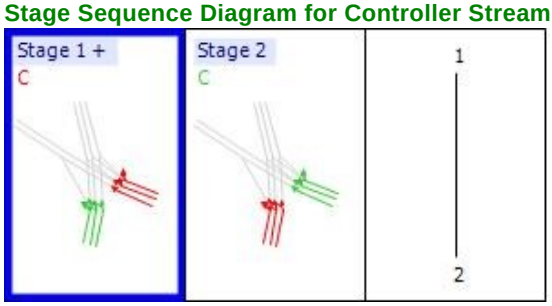
Banned Stage transitions for Controller Stream 2

		To	
		1	**2**
From	**1**	-	
	2		-

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2



Intergreen Matrix for Controller Stream 3

		To		
		A	B	C
From	A	-	5	5
	B	5	-	
	C	14		-

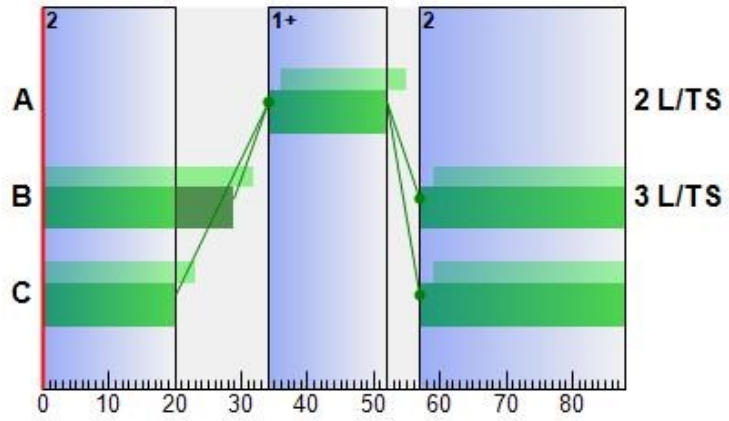
Interstage Matrix for Controller Stream 3

		To	
		1	2
From	1	-	5
	2	14	-

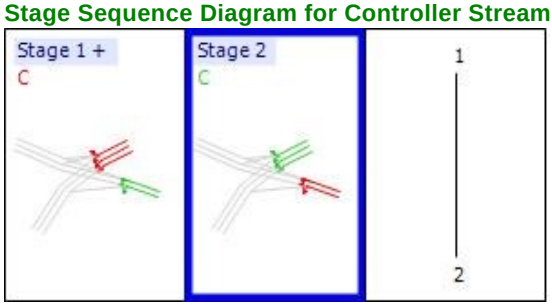
Banned Stage transitions for Controller Stream 3

		To	
		1	2
From	1	-	
	2		-

Phase Timings Diagram for Controller Stream 3



Stage Sequence Diagram for Controller Stream 3



Intergreen Matrix for Controller Stream 5

		To	
		A	B
From	A	-	5
	B	11	-

Interstage Matrix for Controller Stream 5

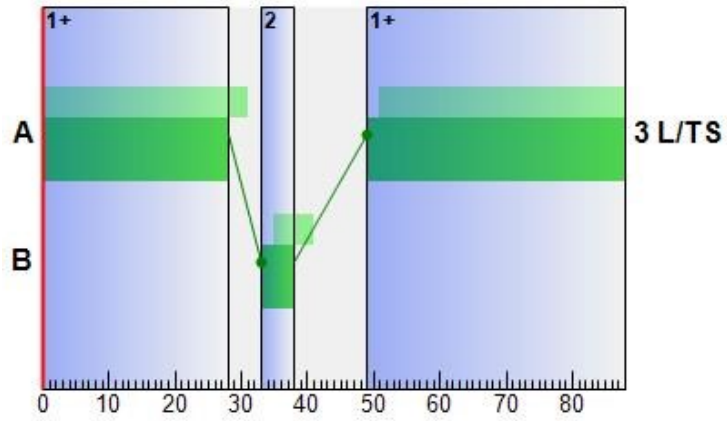
		To	
		1	2

From	1	-	5
	2	11	-

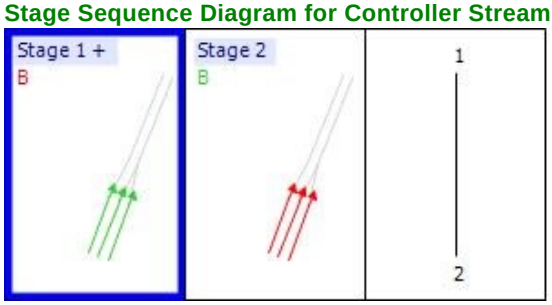
Banned Stage transitions for Controller Stream 5

		To	
		1	2
From	1	-	
	2		-

Phase Timings Diagram for Controller Stream 5



Stage Sequence Diagram for Controller Stream 5



Intergreen Matrix for Controller Stream 6

		To	
		A	B
From	A	-	5
	B	8	-

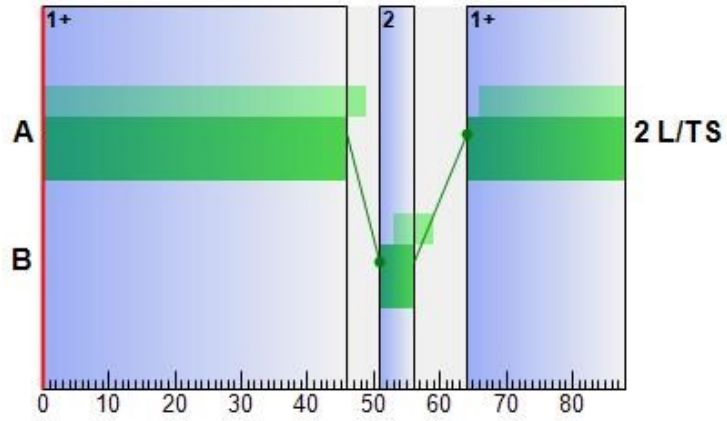
Interstage Matrix for Controller Stream 6

		To	
		1	2
From	1	-	5
	2	8	-

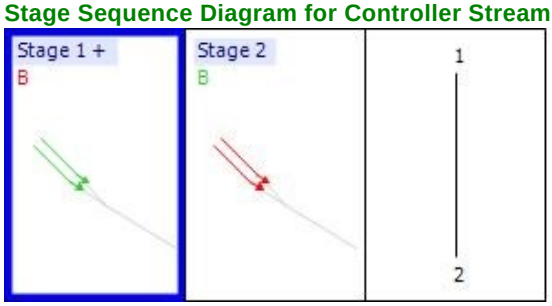
Banned Stage transitions for Controller Stream 6

		To	
		1	2
From	1	-	
	2		-

Phase Timings Diagram for Controller Stream 6



Stage Sequence Diagram for Controller Stream 6



Intergreen Matrix for Controller Stream 7

		To	
		A	B
From	A	-	5
	B	10	-

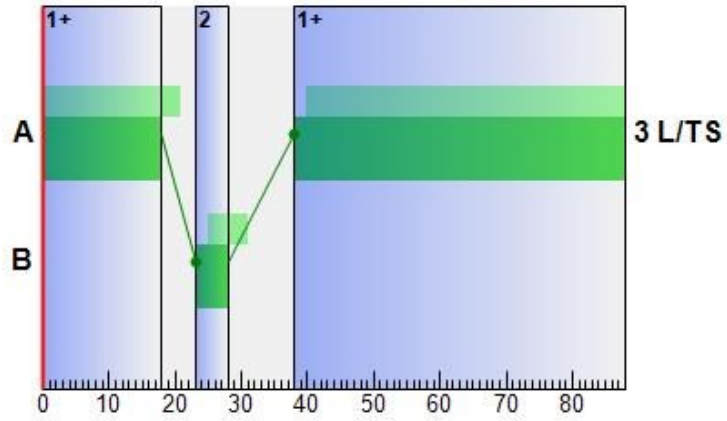
Interstage Matrix for Controller Stream 7

		To	
		1	2
From	1	-	5
	2	10	-

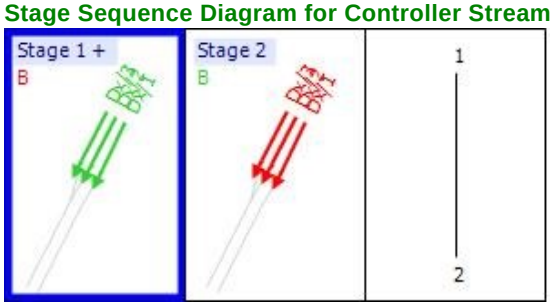
Banned Stage transitions for Controller Stream 7

		To	
		1	2
From	1	-	
	2		-

Phase Timings Diagram for Controller Stream 7



Stage Sequence Diagram for Controller Stream 7



Traffic Stream Results

Traffic Stream Results: Summary

Time Segment	Arm	Traffic Stream	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	U P I
08:00-09:00	A	1	631	631	0		2128	798	79		14	32.00	33.00	0.00	
08:00-09:00	A	2	676	676	0		2279	855	79		14	32.00	33.00	0.00	
08:00-09:00	A	3	676	676	0		2279	855	79		14	32.00	33.00	0.00	
08:00-09:00	A	4	676	676	0		2279	855	79		14	32.00	33.00	0.00	
08:00-09:00	B	1	66	66	0		977	977	7		1232	88.00	88.00	0.00	
08:00-09:00	B	2	66	66	0		512	512	13		598	88.00	88.00	0.00	
08:00-09:00	C	1	645	645	0		3589	775	83		8	18.00	19.00	0.00	
08:00-09:00	C	2	645	645	-1	✓	3589	775	83		8	18.00	19.00	0.00	
08:00-09:00	Ac	1	591	591	0		2112	1128	52		72	46.00	47.00	9.44	
08:00-09:00	Ac	2	460	460	0		2263	1209	38		137	46.00	47.00	0.00	
08:00-09:00	Ac	3	509	509	1		2263	1209	42		114	46.00	47.00	0.00	
08:00-09:00	Ax	1	746	746	0		1965	1518	49		83	67.00	68.00	0.00	

08:00-09:00	Ax	2	836	836	0		2105	1627	51		75	67.00	68.00	0.00
08:00-09:00	Ax	3	409	409	0		2105	1627	25		258	67.00	68.00	0.00
08:00-09:00	Ax1	1	746	746	0		1800	1800	41		117	88.00	88.00	0.00
08:00-09:00	Ax1	2	1245	1245	0		1800	1800	69		30	88.00	88.00	0.00
08:00-09:00	Bc	1	1222	1222	0		1800	1800	68		33	88.00	88.00	0.00
08:00-09:00	Bc	2	1135	1135	1		1800	1800	63		43	88.00	88.00	0.00
08:00-09:00	Bc	3	931	931	0		1800	1800	52		74	88.00	88.00	0.00
08:00-09:00	Bc	4	931	931	0		1800	1800	52		74	88.00	88.00	0.00
08:00-09:00	Bc1	1	1190	1190	0		1800	1800	66		36	88.00	88.00	0.00
08:00-09:00	Bc1	2	1135	1135	1		1800	1800	63		43	88.00	88.00	0.00
08:00-09:00	Bc1	3	931	931	0		1800	1800	52		74	88.00	88.00	0.00
08:00-09:00	Bc1	4	931	931	0		1800	1800	52		74	88.00	88.00	0.00
08:00-09:00	Bx	1	32	32	0		1800	1800	2		4962	88.00	88.00	0.00
08:00-09:00	Cc	1	862	862	0		2059	1427	60		49	60.00	61.00	0.00
08:00-09:00	Cc	2	950	950	0		2209	1531	62		45	60.00	61.00	0.00
08:00-09:00	Cc	3	978	978	0		2181	1512	65		39	60.00	61.00	0.00
08:00-09:00	Cx	1	1247	1247	0		2120	1710	73		23	70.00	71.00	0.00
08:00-09:00	Cx	2	283	283	0		2120	1710	17		444	70.00	71.00	0.00
08:00-09:00	Cx1	1	1530	1530	0		1800	1800	85		6	88.00	88.00	0.00
08:00-09:00	D	1	586	586	0		2159	1080	54		66	43.00	44.00	0.00
08:00-09:00	D	2	629	629	0		2317	1159	54		66	43.00	44.00	0.00
08:00-09:00	D	3	629	629	0		2317	1159	54		66	43.00	44.00	0.00
08:00-09:00	E	1	527	527	0		955	955	55		63	88.00	88.00	0.00
08:00-09:00	E	2	764	764	1		955	955	80		12	88.00	88.00	0.00
08:00-09:00	Dc	1	299	299	0		2059	842	35		154	35.00	36.00	0.00
08:00-09:00	Dc	2	531	531	0		2172	889	60		51	35.00	36.00	0.00
08:00-09:00	Dc	3	425	425	-1	✓	2185	894	48		89	35.00	36.00	0.00
08:00-09:00	Dx	1	1208	1208	0		1915	1502	80		12	68.00	69.00	0.00
08:00-09:00	Dx	2	950	950	0		2055	1611	59		53	68.00	69.00	0.00
08:00-09:00	Dx	3	667	667	0		2055	1611	41		118	68.00	69.00	0.00

08:00-09:00	Dx1	1	1208	1208	0		2155	2155	56		61	88.00	88.00	0.00
08:00-09:00	Dx1	2	1616	1616	1	✓	2155	2155	75		20	88.00	88.00	0.00
08:00-09:00	Ec	1	578	578	0		1800	1800	32		180	88.00	88.00	0.00
08:00-09:00	Ec	2	836	836	0		1800	1800	46		94	88.00	88.00	26.58
08:00-09:00	Ec	3	846	846	0		1800	1800	47		91	88.00	88.00	26.57
08:00-09:00	Ex	1	514	514	0		1800	1800	29		215	88.00	88.00	0.00
08:00-09:00	Ex	2	324	324	0		1800	1800	18		400	88.00	88.00	0.00

Traffic Stream Results: Stops And Delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
08:00-09:00	A	1	3.60	C	32.75	4.28	1.46	81.52	32.61	92.80	527.52	58.21	81.60	0.00
08:00-09:00	A	2	5.40	C	32.21	4.59	1.46	85.88	34.35	92.22	564.95	58.40	86.84	0.00
08:00-09:00	A	3	5.40	C	32.21	4.59	1.46	85.88	34.35	92.22	564.95	58.40	86.84	0.00
08:00-09:00	A	4	5.40	C	32.21	4.59	1.46	85.88	34.35	92.22	564.95	58.40	86.84	0.00
08:00-09:00	B	1	2.24	N/A	0.13	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00
08:00-09:00	B	2	2.24	N/A	6.70	0.11	0.01	1.74	1.74	37.68	24.09	0.78	0.81	0.81
08:00-09:00	C	1	11.19	D	43.21	5.76	1.98	109.92	43.97	100.83	571.87	78.50	37.54	0.00
08:00-09:00	C	2	11.19	D	43.21	5.76	1.98	109.92	43.97	100.83	571.87	78.50	37.54	0.00
08:00-09:00	Ac	1	4.03	B	11.37	1.58	0.29	26.51	26.51	57.22	326.38	11.69	10.98	10.98
08:00-09:00	Ac	2	4.03	A	8.65	0.99	0.12	15.68	15.68	48.48	218.04	4.75	7.24	7.24
08:00-09:00	Ac	3	4.03	A	9.48	1.19	0.15	19.04	19.04	30.53	149.26	6.25	5.05	5.05
08:00-09:00	Ax	1	5.59	A	2.22	0.22	0.24	6.53	6.53	9.65	62.32	9.66	4.16	4.16
08:00-09:00	Ax	2	5.59	A	1.76	0.14	0.27	5.80	5.80	4.84	29.38	11.06	2.33	2.33
08:00-09:00	Ax	3	5.59	A	0.85	0.05	0.04	1.37	1.37	4.26	15.70	1.73	1.01	1.01
08:00-09:00	Ax1	1	5.59	N/A	0.71	0.00	0.15	2.08	2.08	0.00	0.00	0.00	0.00	0.00
08:00-09:00	Ax1	2	5.59	N/A	3.91	0.58	0.77	19.23	19.23	40.46	441.44	62.38	29.08	29.08
08:00-09:00	Bc	1	7.46	N/A	2.97	0.29	0.71	14.32	14.32	33.70	354.11	57.75	13.37	13.37
08:00-09:00	Bc	2	9.30	N/A	3.06	0.43	0.54	13.72	13.72	36.34	369.12	43.52	12.80	12.80
08:00-09:00	Bc	3	10.76	N/A	2.22	0.30	0.28	8.15	8.15	37.25	335.42	11.27	4.41	4.41
08:00-09:00	Bc	4	7.46	N/A	2.58	0.39	0.28	9.46	9.46	37.64	339.06	11.27	11.38	11.38

08:00-09:00	Bc1	1	2.24	N/A	1.94	0.00	0.64	9.12	9.12	0.00	0.00	0.00	0.00	0.00
08:00-09:00	Bc1	2	2.24	N/A	1.70	0.00	0.54	7.63	7.63	1.93	0.00	21.87	0.71	0.71
08:00-09:00	Bc1	3	2.24	N/A	1.07	0.00	0.28	3.92	3.92	1.21	0.00	11.27	0.37	0.37
08:00-09:00	Bc1	4	2.24	N/A	1.07	0.00	0.28	3.92	3.92	1.21	0.00	11.27	0.37	0.37
08:00-09:00	Bx	1	7.46	N/A	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08:00-09:00	Cc	1	4.85	A	4.50	0.62	0.46	15.31	15.31	20.20	155.38	18.64	5.65	5.65
08:00-09:00	Cc	2	4.85	A	4.37	0.65	0.50	16.38	16.38	18.42	154.41	20.52	5.68	5.68
08:00-09:00	Cc	3	4.85	A	4.72	0.69	0.59	18.21	18.21	19.26	164.35	23.95	6.11	6.11
08:00-09:00	Cx	1	5.59	A	3.58	0.27	0.97	17.63	17.63	10.29	88.82	39.52	7.41	7.41
08:00-09:00	Cx	2	5.59	A	0.85	0.05	0.02	0.95	0.95	4.92	13.25	0.67	0.80	0.80
08:00-09:00	Cx1	1	7.46	N/A	7.82	0.97	2.35	47.21	47.21	61.71	757.57	186.47	30.66	30.66
08:00-09:00	D	1	16.78	B	17.07	2.46	0.32	39.44	15.78	65.90	372.95	13.05	22.28	0.00
08:00-09:00	D	2	16.78	B	16.94	2.64	0.32	42.00	16.80	65.75	400.24	13.06	23.86	0.00
08:00-09:00	D	3	16.78	B	16.94	2.64	0.32	42.00	16.80	65.75	400.24	13.06	23.86	0.00
08:00-09:00	E	1	14.91	N/A	7.87	0.81	0.34	16.36	6.54	54.19	258.20	27.36	9.27	9.27
08:00-09:00	E	2	14.91	N/A	15.67	1.76	1.57	47.23	18.89	83.60	515.81	122.87	20.74	20.74
08:00-09:00	Dc	1	6.71	A	1.35	0.01	0.10	1.60	15.96	1.69	1.07	3.98	0.16	1.64
08:00-09:00	Dc	2	6.71	C	20.19	2.54	0.44	42.32	42.32	61.13	306.85	17.93	10.55	10.55
08:00-09:00	Dc	3	6.71	A	2.76	0.11	0.21	4.63	4.63	26.16	102.35	8.72	3.61	3.61
08:00-09:00	Dx	1	3.13	A	7.06	0.74	1.63	33.62	33.62	38.72	338.24	129.39	26.99	26.99
08:00-09:00	Dx	2	3.13	A	4.30	0.71	0.42	16.12	16.12	19.92	154.97	34.18	10.92	10.92
08:00-09:00	Dx	3	3.13	A	3.01	0.41	0.15	7.91	7.91	15.85	99.73	5.95	6.10	6.10
08:00-09:00	Dx1	1	13.98	N/A	1.06	0.00	0.36	5.06	5.06	0.00	0.00	0.00	0.00	0.00
08:00-09:00	Dx1	2	13.98	N/A	4.49	0.90	1.12	28.60	28.60	46.44	616.28	134.25	43.33	43.33
08:00-09:00	Ec	1	4.54	N/A	0.47	0.00	0.08	1.08	1.08	0.00	0.00	0.00	0.00	0.00
08:00-09:00	Ec	2	4.29	N/A	1.88	0.24	0.20	6.20	6.20	28.49	229.91	8.21	7.69	7.69
08:00-09:00	Ec	3	3.73	N/A	1.88	0.23	0.21	6.27	6.27	28.05	228.81	8.49	7.71	7.71
08:00-09:00	Ex	1	7.46	N/A	0.40	0.00	0.06	0.81	0.81	0.51	0.31	2.33	0.09	0.09
08:00-09:00	Ex	2	7.46	N/A	0.62	0.04	0.02	0.79	0.79	17.97	57.41	0.81	1.89	1.89

Traffic Stream Results: Queues And Blocking

Time Segment	Arm	Traffic Stream	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
08:00-09:00	A	1	0.00	15.13	17.39	0.00	0.00	0.00	1.46	11.10	0.00	0.00	0.00	
08:00-09:00	A	2	0.00	16.10	26.09	0.00	0.00	0.00	1.46	11.79	0.00	0.00	0.00	
08:00-09:00	A	3	0.00	16.10	26.09	0.00	0.00	0.00	1.46	11.79	0.00	0.00	0.00	
08:00-09:00	A	4	0.00	16.10	26.09	0.00	0.00	0.00	1.46	11.79	0.00	0.00	0.00	
08:00-09:00	B	1	0.00	0.00	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	B	2	0.00	0.63	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	C	1	0.00	16.67	34.78	0.00	0.00	0.00	1.98	14.34	0.00	6.00	6.00	
08:00-09:00	C	2	0.00	16.67	34.78	0.00	0.00	0.00	1.98	14.34	0.00	0.00	0.00	
08:00-09:00	Ac	1	0.00	9.27	7.00	0.12	0.12	9.44	0.29	5.84	0.00	0.00	0.00	
08:00-09:00	Ac	2	0.00	5.93	7.00	0.00	0.00	0.00	0.12	4.46	0.00	0.00	0.00	
08:00-09:00	Ac	3	0.00	3.80	7.00	0.00	0.00	0.00	0.15	3.80	0.00	0.00	0.00	
08:00-09:00	Ax	1	0.00	2.10	17.39	0.00	0.00	0.00	0.24	1.66	0.00	0.00	0.00	
08:00-09:00	Ax	2	0.00	1.04	17.39	0.00	0.00	0.00	0.27	0.98	0.00	0.00	0.00	
08:00-09:00	Ax	3	0.00	0.68	17.39	0.00	0.00	0.00	0.04	0.52	0.00	0.00	0.00	
08:00-09:00	Ax1	1	0.00	0.15	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Ax1	2	0.00	17.39	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Bc	1	0.00	13.81	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Bc	2	0.00	15.78	17.39	0.00	0.02	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Bc	3	0.00	13.94	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Bc	4	0.00	15.41	17.39	0.00	0.01	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Bc1	1	0.00	0.64	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Bc1	2	0.00	0.54	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Bc1	3	0.00	0.28	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Bc1	4	0.00	0.28	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Cc	1	0.00	4.56	6.00	0.00	0.00	0.00	0.46	3.80	0.00	0.00	0.00	
08:00-09:00	Cc	2	0.00	4.48	6.00	0.00	0.00	0.00	0.50	3.99	0.00	0.00	0.00	
08:00-09:00	Cc	3	0.00	4.85	6.00	0.00	0.00	0.00	0.59	4.26	0.00	0.00	0.00	
08:00-09:00	Cx	1	0.00	3.94	17.39	0.00	0.00	0.00	0.97	3.04	0.00	11.00	11.00	

08:00-09:00	Cx	2	0.00	0.36	17.39	0.00	0.00	0.00	0.02	0.36	0.00	11.00	11.00	
08:00-09:00	Cx1	1	0.00	21.48	17.39	0.33	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	D	1	0.00	10.08	52.17	0.00	0.00	0.00	0.32	7.48	0.00	0.00	0.00	
08:00-09:00	D	2	0.00	10.80	52.17	0.00	0.00	0.00	0.32	8.00	0.00	8.00	8.00	
08:00-09:00	D	3	0.00	10.80	52.17	0.00	0.00	0.00	0.32	8.00	0.00	8.00	8.00	
08:00-09:00	E	1	0.00	6.34	34.78	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	E	2	0.00	12.60	34.78	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Dc	1	0.00	0.12	15.65	0.00	0.00	0.00	0.10	0.12	11.00	0.00	11.00	
08:00-09:00	Dc	2	0.00	7.95	15.65	0.00	0.00	0.00	0.44	7.85	0.00	0.00	0.00	
08:00-09:00	Dc	3	0.00	7.79	15.65	0.00	0.00	0.00	0.21	0.33	0.00	0.00	0.00	
08:00-09:00	Dx	1	0.00	12.03	9.74	0.18	0.00	0.00	1.63	3.93	0.00	0.00	0.00	
08:00-09:00	Dx	2	0.00	4.19	9.74	0.00	0.00	0.00	0.42	4.19	12.00	0.00	12.00	
08:00-09:00	Dx	3	0.00	2.65	9.74	0.00	0.00	0.00	0.15	2.64	12.00	0.00	12.00	
08:00-09:00	Dx1	1	0.00	0.36	43.48	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Dx1	2	0.00	23.13	43.48	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Ec	1	0.00	0.08	8.70	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Ec	2	0.00	10.93	8.70	0.13	0.44	26.58	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Ec	3	0.00	10.93	8.70	0.13	0.44	26.57	N/A	N/A	0.00	9.00	9.00	
08:00-09:00	Ex	1	0.00	1.07	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
08:00-09:00	Ex	2	0.00	5.64	17.39	0.00	0.00	0.00	N/A	N/A	29.00	0.00	29.00	

Traffic Stream Results: Journey Times

Time Segment	Arm	Traffic Stream	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
08:00-09:00	A	1	63.12	6.37	9.90	36.35
08:00-09:00	A	2	101.39	7.06	14.36	37.61
08:00-09:00	A	3	101.39	7.06	14.36	37.61
08:00-09:00	A	4	101.39	7.06	14.36	37.61
08:00-09:00	B	1	1.98	0.04	45.56	2.37
08:00-09:00	B	2	1.98	0.16	12.09	8.93
08:00-09:00	C	1	129.00	9.75	13.24	54.39
08:00-09:00	C	2	129.00	9.75	13.24	54.39
08:00-09:00	Ac	1	31.91	2.53	12.80	15.40
08:00-09:00	Ac	2	24.82	1.62	15.34	12.68
08:00-09:00	Ac	3	27.50	1.91	14.40	13.50
08:00-09:00	Ax	1	74.62	1.62	46.17	7.81
08:00-09:00	Ax	2	83.59	1.71	49.03	7.35
08:00-09:00	Ax	3	40.92	0.73	55.88	6.44
08:00-09:00	Ax1	1	74.62	1.31	57.14	6.30

08:00-09:00	Ax1	2	124.51	3.29	37.87	9.51
08:00-09:00	Bc	1	122.20	3.54	34.57	10.43
08:00-09:00	Bc	2	113.55	3.90	29.38	12.36
08:00-09:00	Bc	3	93.06	3.35	29.40	12.98
08:00-09:00	Bc	4	93.06	2.59	36.22	10.03
08:00-09:00	Bc1	1	35.70	1.38	25.84	4.18
08:00-09:00	Bc1	2	34.06	1.24	27.41	3.94
08:00-09:00	Bc1	3	27.92	0.85	32.67	3.31
08:00-09:00	Bc1	4	27.92	0.85	32.67	3.31
08:00-09:00	Bx	1	3.20	0.07	48.16	7.47
08:00-09:00	Cc	1	56.01	2.24	28.73	9.35
08:00-09:00	Cc	2	61.72	2.43	28.97	9.22
08:00-09:00	Cc	3	63.54	2.60	27.63	9.57
08:00-09:00	Cx	1	124.70	3.18	39.25	9.18
08:00-09:00	Cx	2	28.29	0.51	55.89	6.44
08:00-09:00	Cx1	1	152.99	6.49	23.56	15.28
08:00-09:00	D	1	175.73	5.51	31.91	33.85
08:00-09:00	D	2	188.59	5.89	32.03	33.71
08:00-09:00	D	3	188.59	5.89	32.03	33.71
08:00-09:00	E	1	105.40	3.34	31.60	22.78
08:00-09:00	E	2	152.80	6.49	23.54	30.59
08:00-09:00	Dc	1	26.91	0.67	40.18	8.06
08:00-09:00	Dc	2	47.82	3.97	17.95	26.90
08:00-09:00	Dc	3	38.22	1.12	34.74	9.47
08:00-09:00	Dx	1	67.63	3.42	19.85	10.19
08:00-09:00	Dx	2	53.18	1.96	28.44	7.44
08:00-09:00	Dx	3	37.33	1.14	32.84	6.14
08:00-09:00	Dx1	1	301.90	5.05	59.82	15.04
08:00-09:00	Dx1	2	404.06	8.29	48.73	18.47
08:00-09:00	Ec	1	28.91	0.81	37.45	5.02
08:00-09:00	Ec	2	41.80	1.43	29.29	6.17
08:00-09:00	Ec	3	42.30	1.32	32.50	5.61
08:00-09:00	Ex	1	51.39	1.12	45.82	7.86
08:00-09:00	Ex	2	32.40	0.73	44.59	8.07

Network Results

Run Summary

Time Segment	Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC
08:00-09:00	A1 - 2031 AM Scenario 2	07/02/2014 15:43:12	07/02/2014 15:43:49	08:00	88	83.45	84.99	Cx1/1	0	0	C/1	Cx1/1	Cx1/1

Network Results: Summary

Time Segment	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	Unweighted Performance Index (£ per hr)
08:00-09:00	37044	37044	7	✓	0	0	85		6	3285.00	3311.00	62.58	1981.57

Network Results: Stops And Delays

Time Segment	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
08:00-09:00	6.98	B	8.11	55.34	28.11	1184.94	751.69	34.95	11447.56	1500.30	796.63	310.88

Network Results: Queues And Blocking

Time Segment	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
08:00-09:00	0.00	0.00	911.70	0.00	0.00	62.58	0.00	0.00	64.00	53.00	117.00	

Network Results: Journey Times

Time Segment	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
08:00-09:00	4134.62	155.32	27.02	15.09

Point to Point Journey Time

Average Journey Time (s) for Local Matrix: 2031 AM S2

		To				
		1	2	3	4	5
From	1	0.00	53.61	75.75	85.37	104.18
	2	76.37	0.00	26.92	42.49	67.49
	3	85.45	122.23	0.00	79.31	72.09
	4	54.99	72.51	92.32	0.00	41.70
	5	37.23	54.99	76.39	99.86	0.00

Path Journey Time

Path	Avg Journey Time (s)	Normal Journey Time (s)	Bus Journey Time (s)	Tram Journey Time (s)
1	51.83	51.83	0.00	0.00
2	41.70	41.70	0.00	0.00
3	56.66	56.66	0.00	0.00
4	55.61	55.61	0.00	0.00
5	72.51	72.51	0.00	0.00
6	93.19	93.19	0.00	0.00
7	0.00	0.00	0.00	0.00
8	91.46	91.46	0.00	0.00
9	37.23	37.23	0.00	0.00
10	54.99	54.99	0.00	0.00
11	76.39	76.39	0.00	0.00
12	102.95	102.95	0.00	0.00
13	0.00	0.00	0.00	0.00
14	100.26	100.26	0.00	0.00
15	0.00	0.00	0.00	0.00
16	96.36	96.36	0.00	0.00
17	39.28	39.28	0.00	0.00
18	26.92	26.92	0.00	0.00
19	45.71	45.71	0.00	0.00

20	80.33	80.33	0.00	0.00
21	67.49	67.49	0.00	0.00
22	75.75	75.75	0.00	0.00
23	73.03	73.03	0.00	0.00
24	0.00	0.00	0.00	0.00
25	40.80	40.80	0.00	0.00
26	70.31	70.31	0.00	0.00
27	79.31	79.31	0.00	0.00
28	85.19	85.19	0.00	0.00
29	100.04	100.04	0.00	0.00
30	86.94	86.94	0.00	0.00
31	84.22	84.22	0.00	0.00
32	122.23	122.23	0.00	0.00
33	0.00	0.00	0.00	0.00
34	0.00	0.00	0.00	0.00
35	53.61	53.61	0.00	0.00
36	75.88	75.88	0.00	0.00
37	84.64	84.64	0.00	0.00
38	74.68	74.68	0.00	0.00
39	87.17	87.17	0.00	0.00
40	0.00	0.00	0.00	0.00
41	104.18	104.18	0.00	0.00
42	0.00	0.00	0.00	0.00
43	0.00	0.00	0.00	0.00
44	83.38	83.38	0.00	0.00

TRANSYT 14

Version: 14.1.2.315 [26-09-12]

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Last run: 07/02/2014 15:55:20
Analysis Set used for last run: A1 - 2031 PM Scenario 2

Filename: Option 4 PM rev 3.t14
Path: F:\TEM\Project\Traffic - BCC - Minworth Rbt Options\03 EXECUTION\Modelling\Options\FINAL
Report generation date: 07/02/2014 16:04:11

File summary

File Description

Title	A38 Minworth roundabout
Location	Birmingham
Site Number	
UTCRegion	
Driving Side	Left
Date	27/01/2014
Version	
Status	Proposed Option 4
Identifier	
Client	Birmingham City Council
Jobnumber	60313511
Enumerator	EU\vuppalas
Description	2031 SC2 - Option Model for Minworth roundabout

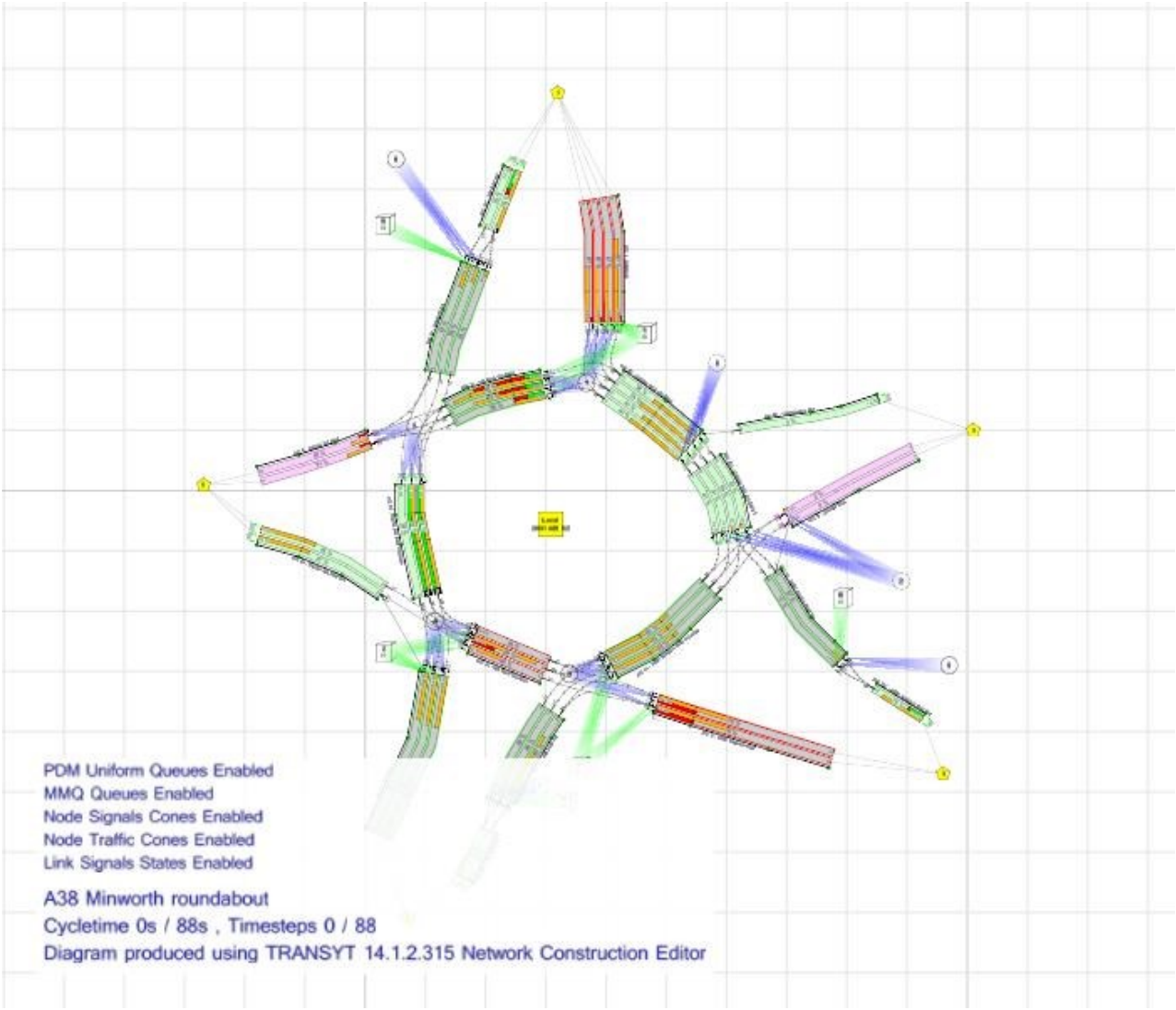
Units

Speed Units	Distance Units	Fuel Economy Units	Fuel Rate Units	Mass Units	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
kph	m	mpg	l/h	kg	perHour	s	-Hour	perHour

Sorting

Show Names Instead of IDs (For Aimsun)	Sorting Direction	Sorting Type	Ignore Prefixes When Sorting	Link Grouping	Source Grouping
	Ascending	Numerical		Normal	Normal

Network Diagrams



A1 - 2031 PM Scenario 2 : D1 - 2031 PM Scenario 2 *

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC	Network Within Capacity
A1 - 2031 PM Scenario 2	07/02/2014 15:54:49	07/02/2014 15:55:20	17:00	88	69.40	78.81	Ax1/2	0	0	C/1	Ax1/2	Ax1/2	✓

Analysis Set Details

Name	Description	Demand Set	Include In Report	Locked

2031 PM Scenario 2		D1	✓	

Demand Set Details

Name	Description	Composite	Demand Sets	Start Time (HH:mm)	Locked
2031 PM Scenario 2				17:00	

Network Options

Network Timings

Network Cycle Time (s)	Resolution	Number Of Steps	Time Segment Length (min)	Number Of Time Segments	Modelled Time Period (min)
88	1	88	60	1	60

Signals Options

Equal Length Multiple Cycling	Start Displacement (s)	End Displacement (s)	Phase Minimum Broken Penalty (£)	Phase Maximum Broken Penalty (£)	Intergreen Broken Penalty (£)
✓	2	3	10000.00	10000.00	10000.00

Traffic Options

Traffic Model	DOS Threshold (%)	Flow Scaling Factor (%)	Cruise Scaling Factor (%)	Cruise Times Or Speeds	Use Link Stop Weightings	Use Link Delay Weightings	Exclude Pedestrian Links	Random Delay Mode	Type of Vehicle-in-Service	Type Of Random Parameter	PCU Length (m)
Quick PDM	90	100	100	Cruise Speeds	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75

Optimisation Options

Auto Redistribute	Optimisation Type	Optimisation Level	Hill Climb Increments	Use Enhanced Optimisation	Optimisation Order	Locked Green Splits	Full Simulation
✓	Hill Climb (Fast)	Offsets And Green Splits	15,40,-1,15,40,1,-1,1		2,1,3,5,6,7		

Economics

Unit Of Cost	Monetary Value Of Delay (£ per PCU-hr)	Monetary Value Of Stops (£ per 100 stops)
£	14.20	2.60

Traffic Nodes

Traffic Nodes

Traffic Node	Name	Description
1	A38 N	
2	Lindridge Drive	
3	A4097 Kinsbury Road	
4	A38 S	
5	Wamley Ash Road	
6	Lindridge Drive Circulatory	
7	A38 South Exit	
8	A38 North Exit	
9	A4097 Kingsbury Road Exit	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic Node
A	A38 North		1
Ax1	A38 North Exit		
B	Lindridge Drive		2
C	A4097 Kingsbury Road		3
Ac	A38 North Circulatory		1
Ax	A38 North Exit		8
Bc	Lindridge Drive Circulatory		6
Bc1	Lindridge Drive Circulatory 2		2
Bx	Lindridge drive Exit		
Cc	A4097 Kingsbury Road Circulatory		3
Cx	A4097 Kinsbury Road Exit		9
Cx1	A4097 Kingsbury Road Exit		
D	A38 South		4
E	Wamley Ash Road		5
Dc	A38 South Circulatory		4
Dx	A38 South Exit		7
Dx1	A38 South Exit		
Ec	Wamley Ash Road Circulatory		5
Ex	Wamley Ash Road Exit		

Traffic Streams

Arm	Traffic Stream	Name	Description	Length (m)	Traffic Model	Has Restricted Flow	Saturation Flow Source	Saturation Flow (PCU/hr)	Is Signal Controlled	Controller Stream	Phase	Phase2 Enabled	Is Give Way	Traffic Type
A	1	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	2128	✓	1	A			Normal
A	2	(untitled)		150.00	[QuickPDM]	✓	SumOfLanes	2279	✓	1	A			Normal
A	3	A38 North Entry		150.00	[QuickPDM]	✓	SumOfLanes	2279	✓	1	A			Normal
A	4	(untitled)		150.00	[QuickPDM]	✓	SumOfLanes	2279	✓	1	A			Normal
B	1	(untitled)		30.00	[QuickPDM]		N/A	N/A		N/A	N/A		✓	Normal
B	2	(untitled)		30.00	[QuickPDM]		N/A	N/A		N/A	N/A		✓	Normal
C	1	(untitled)		200.00	[QuickPDM]	✓	SumOfLanes	2263	✓	3	A			Normal
C	2	(untitled)		200.00	[QuickPDM]	✓	SumOfLanes	2263	✓	3	A			Normal
Ac	1	(untitled)		54.00	[QuickPDM]	✓	SumOfLanes	2112	✓	1	B			Normal
Ac	2	(untitled)		54.00	[QuickPDM]	✓	SumOfLanes	2263	✓	1	B			Normal
Ac	3	(untitled)		54.00	[QuickPDM]	✓	SumOfLanes	2263	✓	1	B			Normal
Ax	1	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1965	✓	5	A			Normal
Ax	2	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	2105	✓	5	A			Normal
Ax	3	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	2105	✓	5	A			Normal
Ax1	1	A38 North Exit		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Ax1	2	A38 North Exit		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc	1	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc	2	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc	3	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc	4	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc1	1	(untitled)		30.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc1	2	(untitled)		30.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal

Bc1	**3**	(untitled)		30.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bc1	**4**	(untitled)		30.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Bx	**1**	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Cc	**1**	(untitled)		65.00	[QuickPDM]	✓	SumOfLanes	2059	✓	3	B			Normal
Cc	**2**	(untitled)		65.00	[QuickPDM]	✓	SumOfLanes	2209	✓	3	B			Normal
Cc	**3**	(untitled)		65.00	[QuickPDM]	✓	SumOfLanes	2181	✓	3	B			Normal
Cx	**1**	A4097 Kinsbury Road Exit		100.00	[QuickPDM]	✓	SumOfLanes	2120	✓	6	A			Normal
Cx	**2**	A4097 Kinsbury Road Exit		100.00	[QuickPDM]	✓	SumOfLanes	2120	✓	6	A			Normal
Cx1	**1**	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
D	**1**	(untitled)		300.00	[QuickPDM]	✓	SumOfLanes	2159	✓	2	A			Normal
D	**2**	(untitled)		300.00	[QuickPDM]	✓	SumOfLanes	2317	✓	2	A			Normal
D	**3**	(untitled)		300.00	[QuickPDM]	✓	SumOfLanes	2317	✓	2	A			Normal
E	**1**	(untitled)		200.00	[QuickPDM]		N/A	N/A		N/A	N/A		✓	Normal
E	**2**	(untitled)		200.00	[QuickPDM]		N/A	N/A		N/A	N/A		✓	Normal
Dc	**1**	(untitled)		90.00	[QuickPDM]	✓	SumOfLanes	2059	✓	2	B			Normal
Dc	**2**	(untitled)		90.00	[QuickPDM]	✓	SumOfLanes	2172	✓	2	B			Normal
Dc	**3**	(untitled)		90.00	[QuickPDM]	✓	SumOfLanes	2185	✓	2	B			Normal
Dx	**1**	(untitled)		56.00	[QuickPDM]	✓	SumOfLanes	1915	✓	7	A			Normal
Dx	**2**	(untitled)		56.00	[QuickPDM]	✓	SumOfLanes	2055	✓	7	A			Normal
Dx	**3**	(untitled)		56.00	[QuickPDM]	✓	SumOfLanes	2055	✓	7	A			Normal
Dx1	**1**	A38 South Exit		250.00	[QuickPDM]	✓	SumOfLanes	2155		N/A	N/A			Normal
Dx1	**2**	A38 South Exit		250.00	[QuickPDM]	✓	SumOfLanes	2155		N/A	N/A			Normal
Ec	**1**	(untitled)		50.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Ec	**2**	(untitled)		50.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Ec	**3**	(untitled)		50.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Ex	**1**	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal
Ex	**2**	(untitled)		100.00	[QuickPDM]	✓	SumOfLanes	1800		N/A	N/A			Normal

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface Condition	Site Quality Factor	Gradient (%)	Width (m)	Proportion That Turn (%)	Turning Radius (m)	Nearside Lane	Saturation Flow (PCU/hr)
A	**1**	**2**	A38 North Entry		✓	N/A	Clearly Good	0	3.65	0	N/A	✓	2128
A	**2**	**1**	A38 North Entry		✓	N/A	Clearly Good	0	3.65	0	N/A		2279
A	**3**	**3**	(untitled)		✓	N/A	Clearly Good	0	3.65	0	N/A		2279
A	**4**	**2**	A38 North Entry		✓	N/A	Clearly Good	0	3.65	0	N/A		2279
B	**1**	**1**	Lindridge Drive Entry			N/A	N/A	N/A	N/A	N/A	N/A		1800
B	**2**	**2**	Lindridge Drive Entry			N/A	N/A	N/A	N/A	N/A	N/A		1800
C	**1**	**1**	A4097 Kingsbury Road Entry		✓	N/A	Clearly Good	0	3.50	0	N/A		2263

C	**2**	**2**	A4097 Kingsbury Road Entry		✓	N/A	Clearly Good	0	3.50	0	N/A		2263
Ac	**1**	**1**	A38 North Circulatory		✓	N/A	Clearly Good	0	3.50	0	N/A	✓	2112
Ac	**2**	**2**	A38 North Circulatory		✓	N/A	Clearly Good	0	3.50	0	N/A		2263
Ac	**3**	**1**	A38 North Circulatory		✓	N/A	Clearly Good	0	3.50	0	N/A		2263
Ax	**1**	**2**	A38 North Exit		✓	N/A	N/A	0	3.50	0	N/A	✓	1965
Ax	**2**	**1**	A38 North Exit		✓	N/A	N/A	0	3.50	0	N/A		2105
Ax	**3**	**1**	A38 North Exit		✓	N/A	N/A	0	3.50	0	N/A		2105
Ax1	**1**	**1**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
Ax1	**2**	**1**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc	**1**	**2**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc	**2**	**1**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc	**3**	**3**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc	**4**	**3**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc1	**1**	**2**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc1	**2**	**1**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc1	**3**	**3**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bc1	**4**	**3**	Lindridge Drive Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Bx	**1**	**2**	Lindridge drive Exit			N/A	N/A	N/A	N/A	N/A	N/A		1800
Cc	**1**	**1**	A4097 Kingsbury Road Circulatory		✓	N/A	Clearly Good	0	3.00	0	N/A	✓	2059
Cc	**2**	**2**	A4097 Kingsbury Road Circulatory		✓	N/A	Clearly Good	0	3.00	0	N/A		2209
Cc	**3**	**2**	A4097 Kingsbury Road Circulatory		✓	N/A	Clearly Good	0	3.00	43	50.00		2181
Cx	**1**	**2**	A4097 Kinsbury Road Exit		✓	N/A	N/A	0	3.65	0	N/A		2120
Cx	**2**	**3**	A4097 Kinsbury Road Exit		✓	N/A	N/A	0	3.65	0	N/A		2120
Cx1	**1**	**1**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
D	**1**	**2**	A38 South Entry		✓	N/A	Clearly Good	0	4.00	10	42.00	✓	2159
D	**2**	**1**	A38 South Entry		✓	N/A	Clearly Good	0	4.00	0	N/A		2317
D	**3**	**3**	A38 South Entry		✓	N/A	Clearly Good	0	4.00	0	N/A		2317
E	**1**	**3**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
E	**2**	**3**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
Dc	**1**	**2**	A38 South Circulatory		✓	N/A	Clearly Good	0	3.00	0	N/A	✓	2059
Dc	**2**	**1**	A38 South Circulatory		✓	N/A	Clearly Good	0	3.00	56	49.00		2172

Dc	**3**	**1**	A38 South Circulatory		✓	N/A	Clearly Good	0	3.00	35	49.00		2185
Dx	**1**	**1**	A38 South Exit		✓	N/A	N/A	0	3.00	0	N/A	✓	1915
Dx	**2**	**2**	A38 South Exit		✓	N/A	N/A	0	3.00	0	N/A		2055
Dx	**3**	**2**	A38 South Exit		✓	N/A	N/A	0	3.00	0	N/A		2055
Dx1	**1**	**1**	(untitled)		✓	N/A	N/A	0	4.00	0	N/A		2155
Dx1	**2**	**1**	(untitled)		✓	N/A	N/A	0	4.00	0	N/A		2155
Ec	**1**	**2**	Wamley Ash Road Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Ec	**2**	**1**	Wamley Ash Road Circulatory			N/A	N/A	N/A	N/A	N/A	N/A		1800
Ec	**3**	**3**	(untitled)			N/A	N/A	N/A	N/A	N/A	N/A		1800
Ex	**1**	**1**	Wamley Ash Road Exit			N/A	N/A	N/A	N/A	N/A	N/A		1800
Ex	**2**	**2**	Wamley Ash Road Exit			N/A	N/A	N/A	N/A	N/A	N/A		1800

Modelling

Arm	Traffic Stream	Stop Weighting Multiplier (%)	Delay Weighting Multiplier (%)	Exclude From Results Calculation	Max Queue Storage (PCU)	Has Queue Limit	Queue Limit (PCU)	Excess Queue Penalty (£)	Has Degree Of Saturation Limit
A	**1**	0	40		0.00		N/A	N/A	
A	**2**	0	40		0.00		N/A	N/A	
A	**3**	0	40		0.00		N/A	N/A	
A	**4**	0	40		0.00		N/A	N/A	
B	**1**	100	100		0.00		N/A	N/A	
B	**2**	100	100		0.00		N/A	N/A	
C	**1**	0	40		0.00		N/A	N/A	
C	**2**	0	40		0.00		N/A	N/A	
Ac	**1**	100	100		7.00	✓	7	80.00	
Ac	**2**	100	100		7.00	✓	7	0.00	
Ac	**3**	100	100		7.00	✓	7	0.00	
Ax	**1**	100	100		0.00		N/A	N/A	
Ax	**2**	100	100		0.00		N/A	N/A	
Ax	**3**	100	100		0.00		N/A	N/A	
Ax1	**1**	100	100		0.00		N/A	N/A	
Ax1	**2**	100	100		0.00		N/A	N/A	
Bc	**1**	100	100		0.00	✓	15	0.00	
Bc	**2**	100	100		0.00	✓	15	0.00	
Bc	**3**	100	100		0.00	✓	15	0.00	
Bc	**4**	100	100		0.00	✓	15	0.00	
Bc1	**1**	100	100		0.00	✓	5	0.00	
Bc1	**2**	100	100		0.00	✓	5	0.00	
Bc1	**3**	100	100		0.00	✓	5	0.00	
Bc1	**4**	100	100		0.00	✓	5	0.00	
Bx	**1**	100	100		0.00		N/A	N/A	
Cc	**1**	100	100		6.00	✓	6	60.00	
Cc	**2**	100	100		6.00	✓	6	60.00	
Cc	**3**	100	100		6.00	✓	6	60.00	
Cx	**1**	100	100		0.00		N/A	N/A	
Cx	**2**	100	100		0.00		N/A	N/A	
Cx1	**1**	100	100		0.00		N/A	N/A	
D	**1**	0	40		0.00		N/A	N/A	

D	2	0	40		0.00		N/A	N/A	
D	3	0	40		0.00		N/A	N/A	
E	1	100	40		0.00		N/A	N/A	
E	2	100	40		0.00		N/A	N/A	
Dc	1	1000	1000		0.00	✓	13	60.00	
Dc	2	100	100		0.00	✓	13	30.00	
Dc	3	100	100		0.00	✓	13	0.00	
Dx	1	100	100		0.00		N/A	N/A	
Dx	2	100	100		0.00		N/A	N/A	
Dx	3	100	100		0.00		N/A	N/A	
Dx1	1	100	100		0.00		N/A	N/A	
Dx1	2	100	100		0.00		N/A	N/A	
Ec	1	100	100		0.00	✓	6	0.00	
Ec	2	100	100		0.00	✓	6	60.00	
Ec	3	100	100		0.00	✓	6	60.00	
Ex	1	100	100		0.00		N/A	N/A	
Ex	2	100	100		0.00		N/A	N/A	

Modelling - Advanced

Arm	Traffic Stream	Normal Dispersal Type	Normal Dispersal Coefficient	Normal Travel Time Coefficient	Initial Queue (PCU)	Point1 Time Step (s)	Point2 Time Step (s)	Type of Vehicle-in-Service	Vehicle-in-Service	Type Of Random Parameter	Random Parameter
A	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
A	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
A	3	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
A	4	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
B	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
B	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
C	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
C	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ac	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ac	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ac	3	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ax	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ax	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ax	3	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ax1	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ax1	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc	1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Bc	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc	**4**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc1	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc1	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc1	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bc1	**4**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Bx	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cc	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cc	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cc	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cx	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cx	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Cx1	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
D	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
D	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
D	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
E	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
E	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dc	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dc	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dc	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dx	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dx	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dx	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dx1	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Dx1	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ec	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ec	**2**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ec	**3**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ex	**1**	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Ex	2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)	Bus Flow (PCU/hr)	Tram Flow (PCU/hr)	Cruise Sensitivity Multiplier (%)	Calculated Cruise Speed (kph)
A	1	521	521	0	0	100	1.00
A	2	557	557	0	0	100	1.00
A	3	557	557	0	0	100	1.00
A	4	557	557	0	0	100	1.00
B	1	18	18	0	0	100	1.00
B	2	18	18	0	0	100	1.00
C	1	700	700	0	0	100	1.00
C	2	700	700	0	0	100	1.00
Ac	1	494	494	0	0	100	1.00
Ac	2	413	413	0	0	100	1.00
Ac	3	350	350	0	0	100	1.00
Ax	1	634	634	0	0	100	1.00
Ax	2	963	963	0	0	100	1.00
Ax	3	455	455	0	0	100	1.00
Ax1	1	634	634	0	0	100	1.00
Ax1	2	1419	1419	0	0	100	1.00
Bc	1	1015	1015	0	0	100	1.00
Bc	2	970	970	0	0	100	1.00
Bc	3	732	732	0	0	100	1.00
Bc	4	732	732	0	0	100	1.00
Bc1	1	960	960	0	0	100	1.00
Bc1	2	970	970	0	0	100	1.00
Bc1	3	732	732	0	0	100	1.00
Bc1	4	732	732	0	0	100	1.00
Bx	1	55	55	0	0	100	1.00
Cc	1	684	684	0	0	100	1.00
Cc	2	735	735	0	0	100	1.00
Cc	3	749	749	0	0	100	1.00
Cx	1	975	975	0	0	100	1.00
Cx	2	290	290	0	0	100	1.00
Cx1	1	1265	1265	0	0	100	1.00
D	1	723	723	0	0	100	1.00
D	2	776	776	0	0	100	1.00
D	3	776	776	0	0	100	1.00
E	1	395	395	0	0	100	1.00
E	2	525	525	0	0	100	1.00
Dc	1	404	404	0	0	100	1.00
Dc	2	647	647	0	0	100	1.00
Dc	3	376	376	0	0	100	1.00
Dx	1	980	980	0	0	100	1.00
Dx	2	735	735	0	0	100	1.00
Dx	3	426	426	0	0	100	1.00
Dx1	1	980	980	0	0	100	1.00
Dx1	2	1160	1160	0	0	100	1.00
Ec	1	461	461	0	0	100	1.00
Ec	2	963	963	0	0	100	1.00
Ec	3	965	965	0	0	100	1.00
Ex	1	853	853	0	0	100	1.00

Ex	2	460	460	0	0	100	1.00

Normal - Modelling

Arm	Traffic Stream	Stop Weighting (%)	Delay Weighting (%)
A	1	100	100
A	2	100	100
A	3	100	100
A	4	100	100
B	1	100	100
B	2	100	100
C	1	100	100
C	2	100	100
Ac	1	100	100
Ac	2	100	100
Ac	3	100	100
Ax	1	100	100
Ax	2	100	100
Ax	3	100	100
Ax1	1	100	100
Ax1	2	100	100
Bc	1	100	100
Bc	2	100	100
Bc	3	100	100
Bc	4	100	100
Bc1	1	100	100
Bc1	2	100	100
Bc1	3	100	100
Bc1	4	100	100
Bx	1	100	100
Cc	1	100	100
Cc	2	100	100
Cc	3	100	100
Cx	1	100	100
Cx	2	100	100
Cx1	1	100	100
D	1	100	100
D	2	100	100
D	3	100	100
E	1	100	100
E	2	100	100
Dc	1	100	100
Dc	2	100	100
Dc	3	100	100
Dx	1	100	100
Dx	2	100	100
Dx	3	100	100
Dx1	1	100	100
Dx1	2	100	100
Ec	1	100	100
Ec	2	100	100
Ec	3	100	100
Ex	1	100	100
Ex	2	100	100

Sources - default sources for entries

Arm	Traffic Stream	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
A	1	3.60	100.00	Buses Not Permittted	Trams Not Permitted
A	2	5.40	100.00	Buses Not Permittted	Trams Not Permitted
A	3	5.40	100.00	Buses Not Permittted	Trams Not Permitted
A	4	5.40	100.00	Buses Not Permittted	Trams Not Permitted
B	1	2.24	48.28	Buses Not Permittted	Trams Not Permitted
B	2	2.24	48.28	Buses Not Permittted	Trams Not Permitted
C	1	11.19	64.37	Buses Not Permittted	Trams Not Permitted
C	2	11.19	64.37	Buses Not Permittted	Trams Not Permitted
D	1	16.78	64.37	Buses Not Permittted	Trams Not Permitted
D	2	16.78	64.37	Buses Not Permittted	Trams Not Permitted
D	3	16.78	64.37	Buses Not Permittted	Trams Not Permitted
E	1	14.91	48.28	Buses Not Permittted	Trams Not Permitted
E	2	14.91	48.28	Buses Not Permittted	Trams Not Permitted

Sources - sources for internals

Arm	Traffic Stream	Source	Source Type	Source Traffic Stream	Source Total Flow (PCU/hr)	Source Normal Flow (PCU/hr)	Source Bus Flow (PCU/hr)	Source Tram Flow (PCU/hr)	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
Ac	1	1	TrafficStream	E/1	222	222	0	0	4.03	48.28	Buses Not Permittted	Trams Not Permitted
Ac	1	2	TrafficStream	Ec/3	272	272	0	0	4.03	48.28	Buses Not Permittted	Trams Not Permitted
Ac	2	1	TrafficStream	Ec/3	238	238	0	0	4.03	48.28	Buses Not Permittted	Trams Not Permitted
Ac	2	2	TrafficStream	E/2	175	175	0	0	4.03	48.28	Buses Not Permittted	Trams Not Permitted
Ac	3	1	TrafficStream	E/2	350	350	0	0	4.03	48.28	Buses Not Permittted	Trams Not Permitted
Ax	1	1	TrafficStream	Ec/1	461	461	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax	1	2	TrafficStream	E/1	173	173	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax	2	1	TrafficStream	Ec/2	963	963	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax	3	1	TrafficStream	Ec/3	455	455	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax1	1	1	TrafficStream	Ax/1	634	634	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax1	2	1	TrafficStream	Ax/3	455	455	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Ax1	2	2	TrafficStream	Ax/2	963	963	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Bc	1	1	TrafficStream	Ac/1	494	494	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc	1	2	TrafficStream	A/1	521	521	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc	2	1	TrafficStream	A/2	557	557	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc	2	2	TrafficStream	Ac/2	413	413	0	0	12.00	30.00	Buses Not Permittted	Trams Not Permitted
Bc	3	1	TrafficStream	Ac/3	175	175	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc	3	2	TrafficStream	A/3	557	557	0	0	12.00	30.00	Buses Not Permittted	Trams Not Permitted

Bc	**4**	**1**	TrafficStream	Ac/3	175	175	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc	**4**	**2**	TrafficStream	A/4	557	557	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Bc1	**1**	**1**	TrafficStream	Bc/1	960	960	0	0	2.24	48.28	Buses Not Permittted	Trams Not Permitted
Bc1	**2**	**1**	TrafficStream	Bc/2	970	970	0	0	2.24	48.28	Buses Not Permittted	Trams Not Permitted
Bc1	**3**	**1**	TrafficStream	Bc/3	732	732	0	0	2.24	48.28	Buses Not Permittted	Trams Not Permitted
Bc1	**4**	**1**	TrafficStream	Bc/4	732	732	0	0	2.24	48.28	Buses Not Permittted	Trams Not Permitted
Bx	**1**	**1**	TrafficStream	Bc/1	55	55	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**1**	**1**	TrafficStream	B/1	4	4	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**1**	**2**	TrafficStream	Bc1/2	680	680	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**2**	**1**	TrafficStream	B/2	2	2	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**2**	**2**	TrafficStream	Bc1/3	732	732	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**3**	**1**	TrafficStream	B/2	16	16	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cc	**3**	**2**	TrafficStream	Bc1/4	732	732	0	0	4.85	48.28	Buses Not Permittted	Trams Not Permitted
Cx	**1**	**1**	TrafficStream	Bc1/1	960	960	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Cx	**1**	**2**	TrafficStream	B/1	15	15	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Cx	**2**	**1**	TrafficStream	Bc1/2	290	290	0	0	5.59	64.37	Buses Not Permittted	Trams Not Permitted
Cx1	**1**	**1**	TrafficStream	Cx/1	975	975	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Cx1	**1**	**2**	TrafficStream	Cx/2	290	290	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Dc	**1**	**1**	TrafficStream	C/1	404	404	0	0	6.71	48.28	Buses Not Permittted	Trams Not Permitted
Dc	**2**	**1**	TrafficStream	C/2	327	327	0	0	6.71	48.28	Buses Not Permittted	Trams Not Permitted
Dc	**2**	**2**	TrafficStream	Cc/3	320	320	0	0	6.71	48.28	Buses Not Permittted	Trams Not Permitted
Dc	**3**	**1**	TrafficStream	C/2	373	373	0	0	6.71	48.28	Buses Not Permittted	Trams Not Permitted
Dc	**3**	**2**	TrafficStream	Cc/3	3	3	0	0	6.71	48.28	Buses Not Permittted	Trams Not Permitted
Dx	**1**	**1**	TrafficStream	Cc/1	684	684	0	0	3.13	64.37	Buses Not Permittted	Trams Not Permitted
Dx	**1**	**2**	TrafficStream	C/1	296	296	0	0	3.13	64.37	Buses Not Permittted	Trams Not Permitted
Dx	**2**	**1**	TrafficStream	Cc/2	735	735	0	0	3.13	64.37	Buses Not Permittted	Trams Not Permitted
Dx	**3**	**1**	TrafficStream	Cc/3	426	426	0	0	3.13	64.37	Buses Not Permittted	Trams Not Permitted
Dx1	**1**	**1**	TrafficStream	Dx/1	980	980	0	0	13.98	64.37	Buses Not Permittted	Trams Not Permitted
Dx1	**2**	**1**	TrafficStream	Dx/2	735	735	0	0	13.98	64.37	Buses Not Permittted	Trams Not Permitted
Dx1	**2**	**2**	TrafficStream	Dx/3	426	426	0	0	13.98	64.37	Buses Not Permittted	Trams Not Permitted

Ec	1	1	TrafficStream	D/1	274	274	0	0	3.73	48.28	Buses Not Permittted	Trams Not Permitted
Ec	1	2	TrafficStream	Dc/2	187	187	0	0	6.00	30.00	Buses Not Permittted	Trams Not Permitted
Ec	2	1	TrafficStream	D/2	776	776	0	0	3.73	48.28	Buses Not Permittted	Trams Not Permitted
Ec	2	2	TrafficStream	Dc/3	187	187	0	0	6.00	30.00	Buses Not Permittted	Trams Not Permitted
Ec	3	1	TrafficStream	D/3	776	776	0	0	3.73	48.28	Buses Not Permittted	Trams Not Permitted
Ec	3	2	TrafficStream	Dc/3	189	189	0	0	3.73	48.28	Buses Not Permittted	Trams Not Permitted
Ex	1	1	TrafficStream	Dc/1	404	404	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Ex	1	2	TrafficStream	D/1	449	449	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted
Ex	2	1	TrafficStream	Dc/2	460	460	0	0	7.46	48.28	Buses Not Permittted	Trams Not Permitted

Give Way Data

Arm	Traffic Stream	Opposed Traffic	Use Step-wise Opposed Turn Model	Visibility Restricted
B	1	AllTraffic		
B	2	AllTraffic		
E	1	AllTraffic		
E	2	AllTraffic		

Give Way Data - All Movements - Conflicts

Traffic Stream	Description	Controlling Type	Controlling Traffic Stream	Percentage Opposing (%)	Slope Coefficient	Upstream Signals Visible	Conflict Shift	Conflict Duration
1		TrafficStream	Bc1/1	100	0.44		0	0
1		TrafficStream	Bc1/2	100	0.44		0	0
2		TrafficStream	Bc1/1	100	0.44		0	0
2		TrafficStream	Bc1/2	100	0.44		0	0
2		TrafficStream	Bc1/3	100	0.44		0	0
2		TrafficStream	Bc1/4	100	0.44		0	0
1	Roundabout Circulating	TrafficStream	Ec/1	100	0.50		0	0
1		TrafficStream	Ec/2	100	0.50		0	0
1		TrafficStream	Ec/3	100	0.50		0	0
2	Roundabout Circulating	TrafficStream	Ec/1	100	0.50		0	0
2		TrafficStream	Ec/2	100	0.50		0	0
2		TrafficStream	Ec/3	100	0.50		0	0

Quick Flares

Arm	Traffic Stream	Description	Saturation Flow (PCU/hr)	Effective Storage (Vehs)
C	1		1800	7
C	2		1800	7

Flow Allocation Tool Tables - Local Matrix: 2031 AM S2

Normal Input Flows (PCU/hr)

	To

		1	2	3	4	5
From	1	0	9	564	1311	309
	2	4	0	15	8	10
	3	557	2	0	296	545
	4	1319	32	476	0	449
	5	173	12	210	525	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

Local Matrix	Location	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
2031 AM S2	1	(untitled)	A/1,A/2,A/3,A/4	Ax1/2,Ax1/1	2193	2193	0	0	2053	2053	0	0
2031 AM S2	2	(untitled)	B/1,B/2	Bx/1	37	37	0	0	55	55	0	0
2031 AM S2	3	(untitled)	C/1,C/2	Cx1/1	1400	1400	0	0	1265	1265	0	0
2031 AM S2	4	(untitled)	D/1,D/2,D/3	Dx1/2,Dx1/1	2276	2276	0	0	2140	2140	0	0
2031 AM S2	5	(untitled)	E/1,E/2	Ex/1,Ex/2	920	920	0	0	1313	1313	0	0

Paths

Local Matrix	Path	Description	Path Items	Calculated Total Flow (PCU/hr)
2031 AM S2	1		D/1,Ec/1,Ax/1,Ax1/1	274
2031 AM S2	2		D/1,Ex/1	449
2031 AM S2	3		D/2,Ec/2,Ax/2,Ax1/2	776
2031 AM S2	4		D/3,Ec/3,Ax/3,Ax1/2	268
2031 AM S2	5		D/3,Ec/3,Ac/1,Bc/1,Bx/1	32
2031 AM S2	6		D/3,Ec/3,Ac/1,Bc/1,Bc1/1,Cx/1,Cx1/1	238
2031 AM S2	7		D/3,Ec/3,Ac/2,Bc/2,Bc1/2,Cc/1,Dx/1,Dx1/1	0
2031 AM S2	8		D/3,Ec/3,Ac/2,Bc/2,Bc1/2,Cx/2,Cx1/1	238
2031 AM S2	9		E/1,Ax/1,Ax1/1	173
2031 AM S2	10		E/1,Ac/1,Bc/1,Bx/1	12
2031 AM S2	11		E/1,Ac/1,Bc/1,Bc1/1,Cx/1,Cx1/1	210
2031 AM S2	12		E/2,Ac/2,Bc/2,Bc1/2,Cc/1,Dx/1,Dx1/1	175
2031 AM S2	13		E/2,Ac/2,Bc/2,Bc1/2,Cx/2,Cx1/1	0
2031 AM S2	14		E/2,Ac/3,Bc/3,Bc1/3,Cc/2,Dx/2,Dx1/2	175
2031 AM S2	15		E/2,Ac/3,Bc/4,Bc1/4,Cc/3,Dc/2,Ex/2	0
2031 AM S2	16		E/2,Ac/3,Bc/4,Bc1/4,Cc/3,Dx/3,Dx1/2	175
2031 AM S2	17		B/1,Cc/1,Dx/1,Dx1/1	4
2031 AM S2	18		B/1,Cx/1,Cx1/1	15
2031 AM S2	19		B/2,Cc/2,Dx/2,Dx1/2	2
2031 AM S2	20		B/2,Cc/3,Dc/2,Ec/1,Ax/1,Ax1/1	1
2031 AM S2	21		B/2,Cc/3,Dc/2,Ex/2	10
2031 AM S2	22		B/2,Cc/3,Dc/3,Ec/2,Ax/2,Ax1/2	1
2031 AM S2	23		B/2,Cc/3,Dc/3,Ec/3,Ax/3,Ax1/2	1
2031 AM S2	24		B/2,Cc/3,Dc/3,Ec/3,Ac/1,Bc/1,Bx/1	0

2031 AM S2	**25**		B/2,Cc/3,Dx/3,Dx1/2	2
2031 AM S2	**26**		C/1,Dc/1,Ex/1	404
2031 AM S2	**27**		C/1,Dx/1,Dx1/1	296
2031 AM S2	**28**		C/2,Dc/2,Ec/1,Ax/1,Ax1/1	186
2031 AM S2	**29**		C/2,Dc/2,Ex/2	141
2031 AM S2	**30**		C/2,Dc/3,Ec/2,Ax/2,Ax1/2	186
2031 AM S2	**31**		C/2,Dc/3,Ec/3,Ax/3,Ax1/2	186
2031 AM S2	**32**		C/2,Dc/3,Ec/3,Ac/1,Bc/1,Bx/1	2
2031 AM S2	**33**		C/2,Dc/3,Ec/3,Ac/1,Bc/1,Bc1/1,Cx/1,Cx1/1	0
2031 AM S2	**34**		C/2,Dc/3,Ec/3,Ac/2,Bc/2,Bc1/2,Cx/2,Cx1/1	0
2031 AM S2	**35**		A/1,Bc/1,Bx/1	9
2031 AM S2	**36**		A/1,Bc/1,Bc1/1,Cx/1,Cx1/1	512
2031 AM S2	**37**		A/2,Bc/2,Bc1/2,Cc/1,Dx/1,Dx1/1	505
2031 AM S2	**38**		A/2,Bc/2,Bc1/2,Cx/2,Cx1/1	52
2031 AM S2	**39**		A/3,Bc/3,Bc1/3,Cc/2,Dx/2,Dx1/2	557
2031 AM S2	**40**		A/4,Bc/4,Bc1/4,Cc/3,Dc/2,Ec/1,Ax/1,Ax1/1	0
2031 AM S2	**41**		A/4,Bc/4,Bc1/4,Cc/3,Dc/2,Ex/2	309
2031 AM S2	**42**		A/4,Bc/4,Bc1/4,Cc/3,Dc/3,Ec/2,Ax/2,Ax1/2	0
2031 AM S2	**43**		A/4,Bc/4,Bc1/4,Cc/3,Dc/3,Ec/3,Ax/3,Ax1/2	0
2031 AM S2	**44**		A/4,Bc/4,Bc1/4,Cc/3,Dx/3,Dx1/2	248

Normal Path Flows

Local Matrix	Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
2031 AM S2	**1**	✓	Normal	N/A	N/A	274
2031 AM S2	**2**	✓	Normal	N/A	N/A	449
2031 AM S2	**3**	✓	Normal	N/A	N/A	776
2031 AM S2	**4**	✓	Normal	N/A	N/A	268
2031 AM S2	**5**	✓	Normal	N/A	N/A	32
2031 AM S2	**6**	✓	Normal	N/A	N/A	238
2031 AM S2	**7**	✓	Normal	N/A	N/A	0
2031 AM S2	**8**	✓	Normal	N/A	N/A	238
2031 AM S2	**9**	✓	Normal	N/A	N/A	173
2031 AM S2	**10**	✓	Normal	N/A	N/A	12
2031 AM S2	**11**	✓	Normal	N/A	N/A	210
2031 AM S2	**12**	✓	Normal	N/A	N/A	175
2031 AM S2	**13**	✓	Normal	N/A	N/A	0
2031 AM S2	**14**	✓	Normal	N/A	N/A	175
2031 AM S2	**15**	✓	Normal	N/A	N/A	0
2031 AM S2	**16**	✓	Normal	N/A	N/A	175
2031 AM S2	**17**	✓	Normal	N/A	N/A	4
2031 AM S2	**18**	✓	Normal	N/A	N/A	15
2031 AM S2	**19**	✓	Normal	N/A	N/A	2
2031 AM S2	**20**	✓	Normal	N/A	N/A	1
2031 AM S2	**21**	✓	Normal	N/A	N/A	10
2031 AM S2	**22**	✓	Normal	N/A	N/A	1
2031 AM S2	**23**	✓	Normal	N/A	N/A	1
2031 AM S2	**24**	✓	Normal	N/A	N/A	0
2031 AM S2	**25**	✓	Normal	N/A	N/A	2
2031 AM S2	**26**	✓	Normal	N/A	N/A	404
2031 AM S2	**27**	✓	Normal	N/A	N/A	296
2031 AM S2	**28**	✓	Normal	N/A	N/A	186
2031 AM S2	**29**	✓	Normal	N/A	N/A	141

2031 AM S2	**30**	✓	Normal	N/A	N/A	186
2031 AM S2	**31**	✓	Normal	N/A	N/A	186
2031 AM S2	**32**	✓	Normal	N/A	N/A	2
2031 AM S2	**33**	✓	Normal	N/A	N/A	0
2031 AM S2	**34**	✓	Normal	N/A	N/A	0
2031 AM S2	**35**	✓	Normal	N/A	N/A	9
2031 AM S2	**36**	✓	Normal	N/A	N/A	512
2031 AM S2	**37**	✓	Normal	N/A	N/A	505
2031 AM S2	**38**	✓	Normal	N/A	N/A	52
2031 AM S2	**39**	✓	Normal	N/A	N/A	557
2031 AM S2	**40**	✓	Normal	N/A	N/A	0
2031 AM S2	**41**	✓	Normal	N/A	N/A	309
2031 AM S2	**42**	✓	Normal	N/A	N/A	0
2031 AM S2	**43**	✓	Normal	N/A	N/A	0
2031 AM S2	**44**	✓	Normal	N/A	N/A	248

Signal Timings

88s cycle time; 88 steps

Controller Stream

Controller Stream	Name	Description	Gaining Delay Type	Signals Manipulation Mode	Multiple Cycling	Offset Relative To	Offset Valid	Offset Positive (s)	Offset Negative (s)	Auto Redistribute	Optimisation Level	Use Sequence
1	(untitled)		Absolute	StageBased	Single	1	✓	0	0	✓	Offsets And Green Splits	1
2	(untitled)		Absolute	StageBased	Single	1	✓	11	-77	✓	Offsets And Green Splits	1
3	(untitled)		Absolute	StageBased	Single	1	✓	62	-26	✓	Offsets And Green Splits	1
5	(untitled)		Absolute	StageBased	Single	1	✓	75	-13	✓	Offsets And Green Splits	1
6	(untitled)		Absolute	StageBased	Single	1	✓	12	-76	✓	Offsets And Green Splits	1
7	(untitled)		Absolute	PhaseBased	Single	3	✓	32	-56	✓	Offsets And Green Splits	1

Phases

Controller Stream	Phase	Name	Minimum Green (s)	Maximum Green (s)	Relative Start Displacement (s)	Relative End Displacement (s)	Dummy
1	**A**	(untitled)	7	300	0	0	
1	**B**	(untitled)	7	300	0	0	
1	**C**	(untitled)	7	300	0	0	
2	**A**	(untitled)	7	300	0	0	
2	**B**	(untitled)	7	300	0	0	
2	**C**	(untitled)	5	300	0	0	
3	**A**	(untitled)	7	300	0	0	
3	**B**	(untitled)	7	300	0	0	
3	**C**	(untitled)	5	300	0	0	
5	**A**	(untitled)	7	300	0	0	
5	**B**	(untitled)	5	300	0	0	
6	**A**	(untitled)	7	300	0	0	
6	**B**	(untitled)	5	300	0	0	
7	**A**	(untitled)	7	300	0	0	

7	B	(untitled)	5	300	0	0	

Library Stages

Controller Stream	Library Stage	Phases In Stage	User Stage Minimum (s)
1	1	A	1
1	2	B,C	1
2	1	A	1
2	2	B,C	1
3	1	A	1
3	2	B,C	1
5	1	A	1
5	2	B	1
6	1	A	1
6	2	B	1
7	1	A	1
7	2	B	1

Losing/ Gaining delays at each Controller Stream

Controller Stream	Delay	Type	Phase	From Stage	To Stage	Relative Delay	Absolute Delay
1	1	Losing	B	2	1	9	N/A
2	1	Losing	B	2	1	5	N/A
3	1	Losing	B	2	1	9	N/A

Stage Sequences

Controller Stream	Stage Sequence	Name	Stage IDs	Stage Ends	Multiple Cycling Stage IDs	Multiple Cycling Stage Ends
1	1	(untitled)	1,2	80,35		
2	1	(untitled)	1,2	13,50		
3	1	(untitled)	1,2	47,9		
5	1	(untitled)	1,2	15,25		
6	1	(untitled)	1,2	43,53		
7	1	(untitled)	1,2	35,45		

Resultant Stages

Controller Stream	Stage	Is Base Stage	Library Stage ID	Phases In This Stage	Stage Start (s)	Stage End (s)	Stage Duration (s)	User Stage Minimum (s)	Stage Minimum (s)
1	1	✓	1	A	49	80	31	1	7
1	2	✓	2	B,C	85	35	38	1	7
2	1	✓	1	A	60	13	41	1	7
2	2	✓	2	B,C	18	50	32	1	5
3	1	✓	1	A	23	47	24	1	7
3	2	✓	2	B,C	52	9	45	1	5
5	1	✓	1	A	36	15	67	1	7
5	2	✓	2	B	20	25	5	1	5
6	1	✓	1	A	61	43	70	1	7
6	2	✓	2	B	48	53	5	1	5
7	1	✓	1	A	55	35	68	1	7
7	2	✓	2	B	40	45	5	1	5

Resultant Phase Green Periods

Controller Stream	Phase	Green Period	Is Base Green Period	Start Time (s)	End Time (s)	Duration (s)
1	A	1	✓	49	80	31
1	B	1	✓	85	44	47

1	C	1	✓	85	35	38
2	A	1	✓	60	13	41
2	B	1	✓	18	55	37
2	C	1	✓	18	50	32
3	A	1	✓	23	47	24
3	B	1	✓	52	18	54
3	C	1	✓	52	9	45
5	A	1	✓	36	15	67
5	B	1	✓	20	25	5
6	A	1	✓	61	43	70
6	B	1	✓	48	53	5
7	A	1	✓	55	35	68
7	B	1	✓	40	45	5

Intergreen Matrix for Controller Stream 1

		To		
		A	B	C
From	A	-	5	5
	B	5	-	
	C	14		-

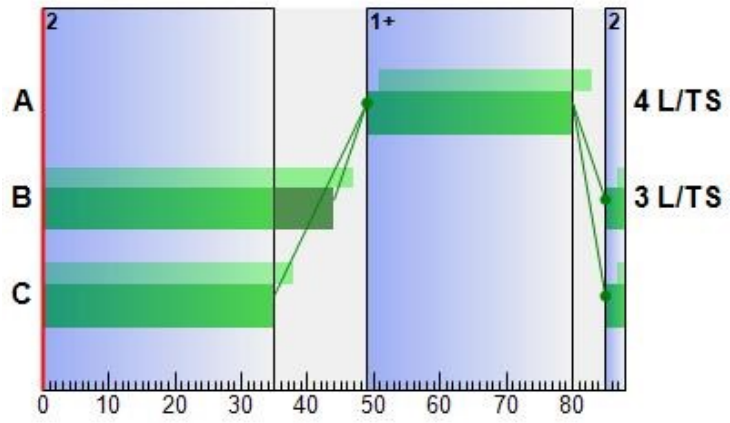
Interstage Matrix for Controller Stream 1

		To	
		1	2
From	1	-	5
	2	14	-

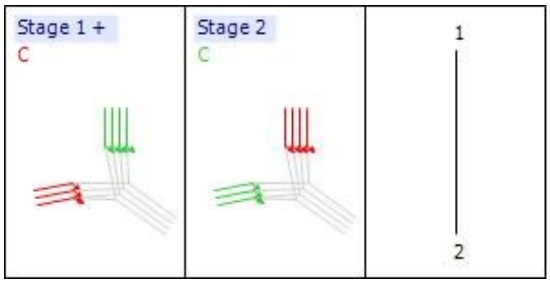
Banned Stage transitions for Controller Stream 1

		To	
		1	2
From	1	-	
	2		-

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Intergreen Matrix for Controller Stream 2

		To		
		A	B	C
From	A	-	5	5
	B	5	-	
	C	10		-

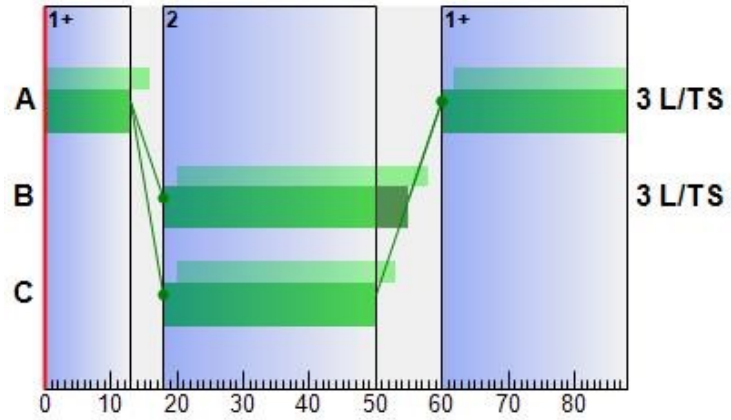
Interstage Matrix for Controller Stream 2

		To	
		1	2
From	1	-	5
	2	10	-

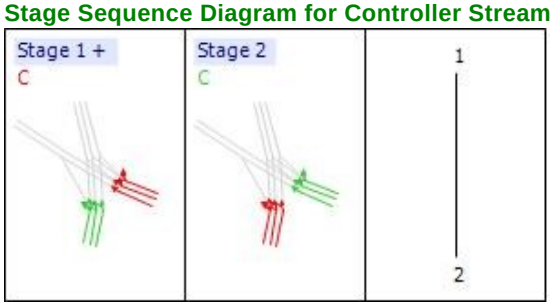
Banned Stage transitions for Controller Stream 2

		To	
		1	2
From	1	-	
	2		-

Phase Timings Diagram for Controller Stream 2



Stage Sequence Diagram for Controller Stream 2



Intergreen Matrix for Controller Stream 3

		To		
		A	B	C
From	A	-	5	5
	B	5	-	
	C	14		-

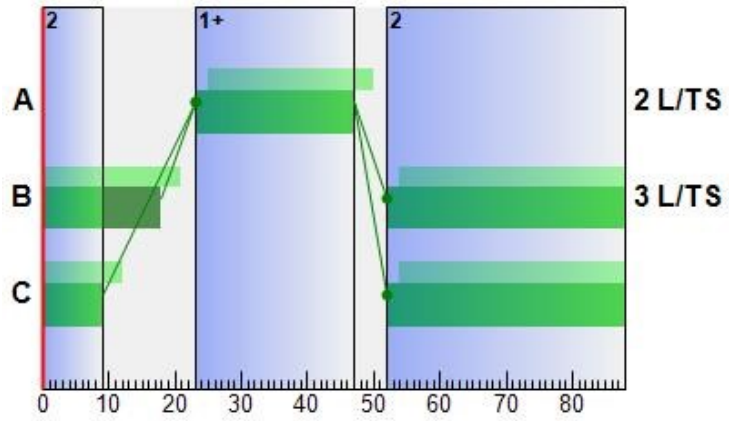
Interstage Matrix for Controller Stream 3

		To	
		1	2
From	1	-	5
	2	14	-

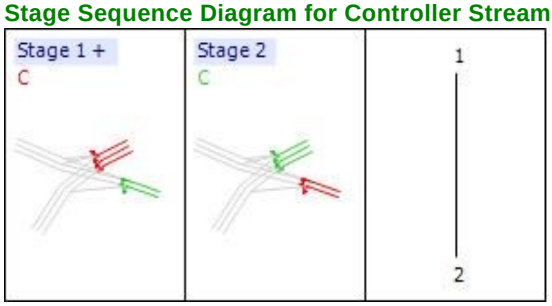
Banned Stage transitions for Controller Stream 3

		To	
		1	2
From	1	-	
	2		-

Phase Timings Diagram for Controller Stream 3



Stage Sequence Diagram for Controller Stream 3



Intergreen Matrix for Controller Stream 5

		To	
		A	B
From	A	-	5
	B	11	-

Interstage Matrix for Controller Stream 5

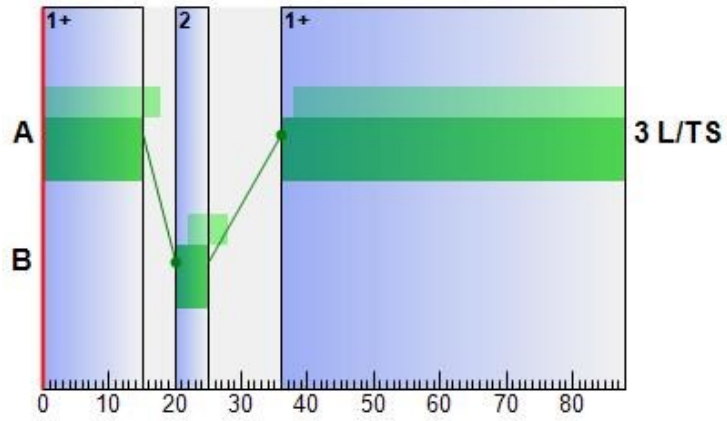
		To	
		1	2

From	1	-	5
	2	11	-

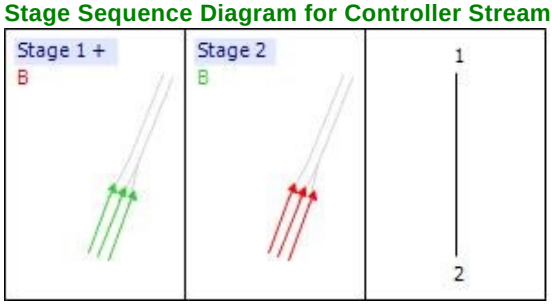
Banned Stage transitions for Controller Stream 5

		To	
		1	2
From	1	-	
	2		-

Phase Timings Diagram for Controller Stream 5



Stage Sequence Diagram for Controller Stream 5



Intergreen Matrix for Controller Stream 6

		To	
		A	B
From	A	-	5
	B	8	-

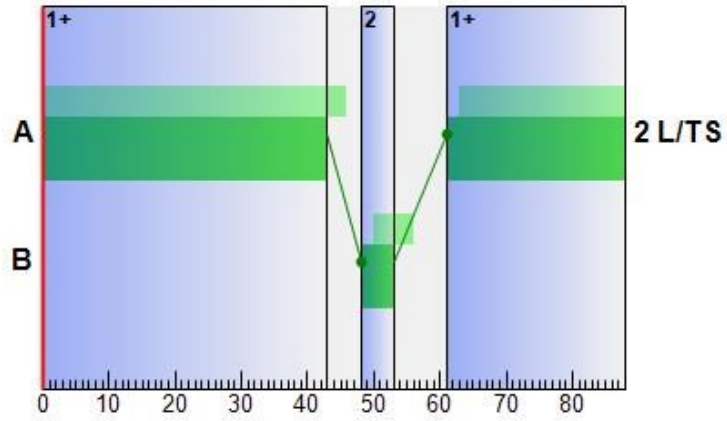
Interstage Matrix for Controller Stream 6

		To	
		1	2
From	1	-	5
	2	8	-

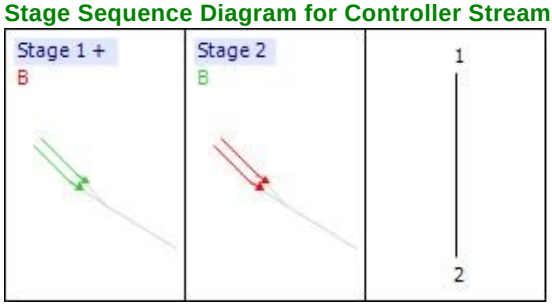
Banned Stage transitions for Controller Stream 6

		To	
		1	2
From	1	-	
	2		-

Phase Timings Diagram for Controller Stream 6



Stage Sequence Diagram for Controller Stream 6



Intergreen Matrix for Controller Stream 7

		To	
		A	B
From	A	-	5
	B	10	-

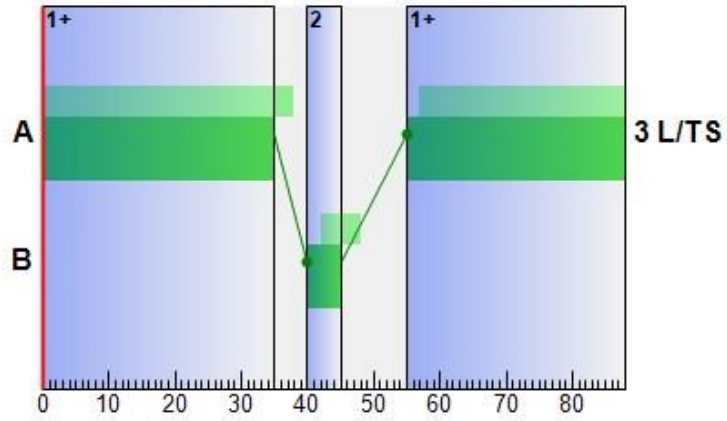
Interstage Matrix for Controller Stream 7

		To	
		1	2
From	1	-	5
	2	10	-

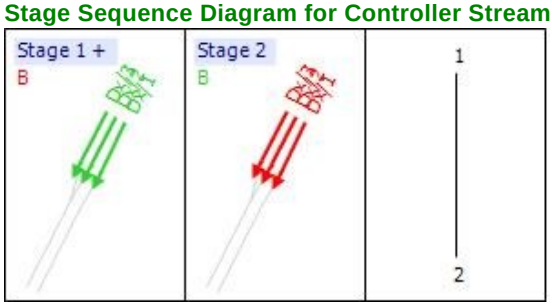
Banned Stage transitions for Controller Stream 7

		To	
		1	2
From	1	-	
	2		-

Phase Timings Diagram for Controller Stream 7



Stage Sequence Diagram for Controller Stream 7



Traffic Stream Results

Traffic Stream Results: Summary

Time Segment	Arm	Traffic Stream	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	U P I
17:00-18:00	A	1	521	521	0		2128	774	67		34	31.00	32.00	0.00	
17:00-18:00	A	2	557	557	0		2279	829	67		34	31.00	32.00	0.00	
17:00-18:00	A	3	557	557	0		2279	829	67		34	31.00	32.00	0.00	
17:00-18:00	A	4	557	557	0		2279	829	67		34	31.00	32.00	0.00	
17:00-18:00	B	1	19	19	1	✓	1151	1151	2		5498	88.00	88.00	0.00	
17:00-18:00	B	2	18	18	-1		758	758	2		3588	88.00	88.00	0.00	
17:00-18:00	C	1	700	700	0		3271	929	75		19	24.00	25.00	0.00	
17:00-18:00	C	2	700	700	1	✓	3271	929	75		19	24.00	25.00	0.00	
17:00-18:00	Ac	1	494	494	0		2112	1152	43		110	47.00	48.00	0.00	
17:00-18:00	Ac	2	413	413	0		2263	1234	33		169	47.00	48.00	0.00	
17:00-18:00	Ac	3	350	350	0		2263	1234	28		217	47.00	48.00	0.00	
17:00-18:00	Ax	1	634	634	0		1965	1518	42		115	67.00	68.00	0.00	

17:00-18:00	Ax	2	963	963	0		2105	1627	59		52	67.00	68.00	0.00	
17:00-18:00	Ax	3	455	455	0		2105	1627	28		222	67.00	68.00	0.00	
17:00-18:00	Ax1	1	634	634	0		1800	1800	35		155	88.00	88.00	0.00	
17:00-18:00	Ax1	2	1419	1419	-1	✓	1800	1800	79		14	88.00	88.00	0.00	
17:00-18:00	Bc	1	1015	1015	0		1800	1800	56		60	88.00	88.00	0.00	
17:00-18:00	Bc	2	971	971	-1		1800	1800	54		67	88.00	88.00	0.00	
17:00-18:00	Bc	3	732	732	0		1800	1800	41		121	88.00	88.00	0.00	
17:00-18:00	Bc	4	732	732	0		1800	1800	41		121	88.00	88.00	0.00	
17:00-18:00	Bc1	1	960	960	0		1800	1800	53		69	88.00	88.00	0.00	
17:00-18:00	Bc1	2	971	971	-1		1800	1800	54		67	88.00	88.00	0.00	
17:00-18:00	Bc1	3	732	732	0		1800	1800	41		121	88.00	88.00	0.00	
17:00-18:00	Bc1	4	732	732	0		1800	1800	41		121	88.00	88.00	0.00	
17:00-18:00	Bx	1	55	55	0		1800	1800	3		2845	88.00	88.00	0.00	
17:00-18:00	Cc	1	684	684	0	✓	2059	1287	53		69	54.00	55.00	0.00	
17:00-18:00	Cc	2	735	735	-1		2209	1381	53		69	54.00	55.00	0.00	
17:00-18:00	Cc	3	749	749	-2		2181	1363	55		64	54.00	55.00	0.00	
17:00-18:00	Cx	1	975	975	0		2120	1710	57		58	70.00	71.00	0.00	
17:00-18:00	Cx	2	290	290	0		2120	1710	17		431	70.00	71.00	0.00	
17:00-18:00	Cx1	1	1265	1265	0		1800	1800	70		28	88.00	88.00	0.00	
17:00-18:00	D	1	723	723	0		2159	1030	70		28	41.00	42.00	0.00	
17:00-18:00	D	2	776	776	0		2317	1106	70		28	41.00	42.00	0.00	
17:00-18:00	D	3	776	776	0		2317	1106	70		28	41.00	42.00	0.00	
17:00-18:00	E	1	395	395	0		856	856	46		95	88.00	88.00	0.00	
17:00-18:00	E	2	525	525	0		856	856	61		47	88.00	88.00	0.00	
17:00-18:00	Dc	1	404	404	0		2059	889	45		98	37.00	38.00	0.00	
17:00-18:00	Dc	2	647	647	0		2172	938	69		30	37.00	38.00	0.16	
17:00-18:00	Dc	3	376	376	0	✓	2185	944	40		126	37.00	38.00	0.00	
17:00-18:00	Dx	1	980	980	0		1915	1502	65		38	68.00	69.00	0.00	
17:00-18:00	Dx	2	735	735	-1	✓	2055	1611	46		97	68.00	69.00	0.00	
17:00-18:00	Dx	3	425	425	0		2055	1611	26		241	68.00	69.00	0.00	

17:00-18:00	Dx1	1	980	980	0		2155	2155	45		98	88.00	88.00	0.00
17:00-18:00	Dx1	2	1160	1160	-1	✓	2155	2155	54		67	88.00	88.00	0.00
17:00-18:00	Ec	1	461	461	0		1800	1800	26		251	88.00	88.00	0.00
17:00-18:00	Ec	2	963	963	0		1800	1800	54		68	88.00	88.00	104.35
17:00-18:00	Ec	3	965	965	0		1800	1800	54		68	88.00	88.00	104.27
17:00-18:00	Ex	1	853	853	0		1800	1800	47		90	88.00	88.00	0.00
17:00-18:00	Ex	2	460	460	0		1800	1800	26		252	88.00	88.00	0.00

Traffic Stream Results: Stops And Delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
17:00-18:00	A	1	3.60	C	28.32	3.41	0.68	58.15	23.26	84.61	412.84	27.61	61.36	0.00
17:00-18:00	A	2	5.40	C	28.01	3.65	0.68	61.59	24.64	84.27	442.13	27.65	65.45	0.00
17:00-18:00	A	3	5.40	C	28.01	3.65	0.68	61.59	24.64	84.27	442.13	27.65	65.45	0.00
17:00-18:00	A	4	5.40	C	28.01	3.65	0.68	61.59	24.64	84.27	442.13	27.65	65.45	0.00
17:00-18:00	B	1	2.24	N/A	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17:00-18:00	B	2	2.24	N/A	3.46	0.02	0.00	0.25	0.25	25.94	4.79	0.01	0.16	0.16
17:00-18:00	C	1	11.19	C	33.07	5.30	1.13	91.30	36.52	88.53	574.16	45.53	35.77	0.00
17:00-18:00	C	2	11.19	C	33.07	5.30	1.13	91.30	36.52	88.53	574.16	45.53	35.77	0.00
17:00-18:00	Ac	1	4.03	A	8.83	1.05	0.16	17.22	17.22	49.04	235.73	6.56	7.87	7.87
17:00-18:00	Ac	2	4.03	A	7.77	0.81	0.08	12.65	12.65	45.59	184.89	3.43	6.12	6.12
17:00-18:00	Ac	3	4.03	A	8.58	0.78	0.06	11.84	11.84	27.25	93.09	2.29	3.10	3.10
17:00-18:00	Ax	1	5.59	A	3.84	0.53	0.15	9.61	9.61	21.58	130.73	6.11	7.90	7.90
17:00-18:00	Ax	2	5.59	A	2.97	0.36	0.43	11.27	11.27	9.73	76.32	17.46	5.41	5.41
17:00-18:00	Ax	3	5.59	A	1.41	0.12	0.05	2.53	2.53	6.78	28.62	2.22	1.78	1.78
17:00-18:00	Ax1	1	5.59	N/A	0.54	0.00	0.10	1.36	1.36	0.66	0.29	3.91	0.24	0.24
17:00-18:00	Ax1	2	5.59	N/A	6.87	1.26	1.45	38.46	38.46	54.34	654.78	116.07	44.50	44.50
17:00-18:00	Bc	1	7.46	N/A	1.74	0.13	0.36	6.97	6.97	20.14	174.87	29.51	6.64	6.64
17:00-18:00	Bc	2	9.39	N/A	1.97	0.22	0.31	7.55	7.55	25.88	225.60	25.59	7.86	7.86
17:00-18:00	Bc	3	10.91	N/A	1.35	0.14	0.14	3.90	3.90	27.24	193.85	5.69	2.53	2.53
17:00-18:00	Bc	4	7.46	N/A	1.67	0.20	0.14	4.82	4.82	29.69	211.77	5.69	7.06	7.06

17:00-18:00	Bc1	1	2.24	N/A	1.14	0.00	0.30	4.31	4.31	0.00	0.00	0.00	0.00	0.00
17:00-18:00	Bc1	2	2.24	N/A	1.17	0.00	0.31	4.47	4.47	0.00	0.00	0.00	0.00	0.00
17:00-18:00	Bc1	3	2.24	N/A	0.69	0.00	0.14	1.98	1.98	0.00	0.00	0.00	0.00	0.00
17:00-18:00	Bc1	4	2.24	N/A	0.69	0.00	0.14	1.98	1.98	0.00	0.00	0.00	0.00	0.00
17:00-18:00	Bx	1	7.46	N/A	0.03	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
17:00-18:00	Cc	1	4.85	A	4.11	0.48	0.30	11.09	11.09	19.44	120.70	12.24	4.32	4.32
17:00-18:00	Cc	2	4.85	A	4.07	0.53	0.30	11.79	11.79	18.60	124.39	12.30	4.44	4.44
17:00-18:00	Cc	3	4.85	A	4.16	0.53	0.33	12.28	12.28	18.80	127.17	13.59	4.57	4.57
17:00-18:00	Cx	1	5.59	A	1.97	0.16	0.38	7.56	7.56	6.65	49.46	15.34	3.74	3.74
17:00-18:00	Cx	2	5.59	A	0.49	0.02	0.02	0.56	0.56	2.15	5.54	0.71	0.36	0.36
17:00-18:00	Cx1	1	7.46	N/A	3.48	0.40	0.83	17.36	17.36	35.91	387.60	66.65	14.75	14.75
17:00-18:00	D	1	16.78	C	22.16	3.63	0.82	63.22	25.29	77.63	528.44	33.11	32.42	0.00
17:00-18:00	D	2	16.78	C	21.88	3.90	0.82	67.01	26.80	77.32	567.11	33.16	34.65	0.00
17:00-18:00	D	3	16.78	C	21.88	3.90	0.82	67.01	26.80	77.32	567.11	33.16	34.65	0.00
17:00-18:00	E	1	14.91	N/A	11.04	1.01	0.20	17.21	6.88	53.73	196.23	15.99	6.89	6.89
17:00-18:00	E	2	14.91	N/A	13.67	1.51	0.48	28.31	11.32	64.36	299.03	38.87	10.97	10.97
17:00-18:00	Dc	1	6.71	A	2.24	0.06	0.19	3.57	35.66	14.49	50.84	7.68	1.90	19.01
17:00-18:00	Dc	2	6.71	B	18.48	2.56	0.76	47.18	47.18	64.86	389.02	30.73	13.63	13.63
17:00-18:00	Dc	3	6.71	A	1.74	0.05	0.13	2.58	2.58	2.66	4.61	5.38	0.32	0.32
17:00-18:00	Dx	1	3.13	A	4.96	0.74	0.61	19.16	19.16	25.63	226.38	24.80	14.50	14.50
17:00-18:00	Dx	2	3.13	A	0.94	0.00	0.19	2.72	2.72	1.19	0.94	7.79	0.50	0.50
17:00-18:00	Dx	3	3.13	A	0.40	0.00	0.05	0.67	0.67	0.45	0.00	1.93	0.11	0.11
17:00-18:00	Dx1	1	13.98	N/A	0.70	0.00	0.19	2.69	2.69	0.00	0.00	0.00	0.00	0.00
17:00-18:00	Dx1	2	13.98	N/A	1.56	0.19	0.31	7.13	7.13	21.26	221.17	25.50	14.24	14.24
17:00-18:00	Ec	1	4.65	N/A	0.34	0.00	0.04	0.63	0.63	0.00	0.00	0.00	0.00	0.00
17:00-18:00	Ec	2	4.17	N/A	3.17	0.54	0.31	12.05	12.05	44.35	414.73	12.54	13.83	13.83
17:00-18:00	Ec	3	3.73	N/A	3.16	0.54	0.31	12.04	12.04	44.14	413.54	12.62	13.84	13.84
17:00-18:00	Ex	1	7.46	N/A	1.04	0.03	0.21	3.51	3.51	7.57	55.88	8.70	2.10	2.10
17:00-18:00	Ex	2	7.46	N/A	0.77	0.05	0.04	1.39	1.39	18.50	83.32	1.79	2.76	2.76

Traffic Stream Results: Queues And Blocking

Time Segment	Arm	Traffic Stream	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
17:00-18:00	A	1	0.00	11.38	17.39	0.00	0.00	0.00	0.68	8.78	0.00	0.00	0.00	
17:00-18:00	A	2	0.00	12.14	26.09	0.00	0.00	0.00	0.68	9.36	0.00	0.00	0.00	
17:00-18:00	A	3	0.00	12.14	26.09	0.00	0.00	0.00	0.68	9.36	0.00	0.00	0.00	
17:00-18:00	A	4	0.00	12.14	26.09	0.00	0.00	0.00	0.68	9.36	0.00	0.00	0.00	
17:00-18:00	B	1	0.00	0.00	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	B	2	0.00	0.13	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	C	1	0.00	15.91	34.78	0.00	0.00	0.00	1.13	13.38	0.00	0.00	0.00	
17:00-18:00	C	2	0.00	15.91	34.78	0.00	0.00	0.00	1.13	13.38	0.00	0.00	0.00	
17:00-18:00	Ac	1	0.00	6.41	7.00	0.00	0.00	0.00	0.16	4.65	0.00	0.00	0.00	
17:00-18:00	Ac	2	0.00	5.13	7.00	0.00	0.00	0.00	0.08	3.90	0.00	0.00	0.00	
17:00-18:00	Ac	3	0.00	2.33	7.00	0.00	0.00	0.00	0.06	2.33	2.00	0.00	2.00	
17:00-18:00	Ax	1	0.00	3.63	17.39	0.00	0.00	0.00	0.15	3.17	0.00	0.00	0.00	
17:00-18:00	Ax	2	0.00	2.34	17.39	0.00	0.00	0.00	0.43	2.28	0.00	4.00	4.00	
17:00-18:00	Ax	3	0.00	0.81	17.39	0.00	0.00	0.00	0.05	0.75	0.00	4.00	4.00	
17:00-18:00	Ax1	1	0.00	0.61	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Ax1	2	0.00	23.19	17.39	0.96	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Bc	1	0.00	9.96	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Bc	2	0.00	11.56	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Bc	3	0.00	9.78	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Bc	4	0.00	11.31	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Bc1	1	0.00	0.30	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Bc1	2	0.00	0.31	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Bc1	3	0.00	0.14	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Bc1	4	0.00	0.14	5.22	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Cc	1	0.00	3.47	6.00	0.00	0.00	0.00	0.30	3.06	0.00	0.00	0.00	
17:00-18:00	Cc	2	0.00	3.49	6.00	0.00	0.00	0.00	0.30	3.22	0.00	0.00	0.00	
17:00-18:00	Cc	3	0.00	3.59	6.00	0.00	0.00	0.00	0.33	3.30	0.00	0.00	0.00	
17:00-18:00	Cx	1	0.00	1.81	17.39	0.00	0.00	0.00	0.38	1.60	0.00	0.00	0.00	

17:00-18:00	Cx	2	0.00	0.16	17.39	0.00	0.00	0.00	0.02	0.16	0.00	0.00	0.00	
17:00-18:00	Cx1	1	0.00	13.95	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	D	1	0.00	14.68	52.17	0.00	0.00	0.00	0.82	10.06	0.00	0.00	0.00	
17:00-18:00	D	2	0.00	15.70	52.17	0.00	0.00	0.00	0.82	10.74	0.00	19.00	19.00	
17:00-18:00	D	3	0.00	15.70	52.17	0.00	0.00	0.00	0.82	10.74	0.00	19.00	19.00	
17:00-18:00	E	1	0.00	5.24	34.78	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	E	2	0.00	7.78	34.78	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Dc	1	0.00	6.67	15.65	0.00	0.00	0.00	0.19	0.25	9.00	0.00	9.00	
17:00-18:00	Dc	2	0.00	13.46	15.65	0.00	0.01	0.16	0.76	8.54	0.00	0.00	0.00	
17:00-18:00	Dc	3	0.00	0.25	15.65	0.00	0.00	0.00	0.13	0.25	0.00	0.00	0.00	
17:00-18:00	Dx	1	0.00	7.25	9.74	0.00	0.00	0.00	0.61	3.49	0.00	0.00	0.00	
17:00-18:00	Dx	2	0.00	1.38	9.74	0.00	0.00	0.00	0.19	0.19	0.00	0.00	0.00	
17:00-18:00	Dx	3	0.00	0.05	9.74	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	
17:00-18:00	Dx1	1	0.00	0.19	43.48	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Dx1	2	0.00	14.82	43.48	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Ec	1	0.00	0.04	8.70	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Ec	2	0.00	16.55	8.70	1.09	1.74	104.35	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Ec	3	0.00	16.55	8.70	1.09	1.74	104.27	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Ex	1	0.00	6.76	17.39	0.00	0.00	0.00	N/A	N/A	0.00	0.00	0.00	
17:00-18:00	Ex	2	0.00	7.12	17.39	0.00	0.00	0.00	N/A	N/A	25.00	0.00	25.00	

Traffic Stream Results: Journey Times

Time Segment	Arm	Traffic Stream	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
17:00-18:00	A	1	52.05	4.62	11.28	31.92
17:00-18:00	A	2	83.62	5.17	16.16	33.41
17:00-18:00	A	3	83.62	5.17	16.16	33.41
17:00-18:00	A	4	83.62	5.17	16.16	33.41
17:00-18:00	B	1	0.56	0.01	47.73	2.26
17:00-18:00	B	2	0.56	0.03	18.95	5.70
17:00-18:00	C	1	140.00	8.60	16.27	44.25
17:00-18:00	C	2	140.00	8.60	16.27	44.25
17:00-18:00	Ac	1	26.68	1.77	15.14	12.86
17:00-18:00	Ac	2	22.31	1.35	16.53	11.79
17:00-18:00	Ac	3	18.90	1.23	15.42	12.61
17:00-18:00	Ax	1	63.42	1.66	38.93	9.43
17:00-18:00	Ax	2	96.34	2.29	42.30	8.56
17:00-18:00	Ax	3	45.52	0.89	51.41	7.00
17:00-18:00	Ax1	1	63.42	1.08	58.66	6.14

17:00-18:00	Ax1	2	141.86	4.91	28.88	12.47
17:00-18:00	Bc	1	101.47	2.59	39.18	9.20
17:00-18:00	Bc	2	97.06	3.06	32.28	11.36
17:00-18:00	Bc	3	73.25	2.50	30.77	12.27
17:00-18:00	Bc	4	73.25	1.86	39.60	9.13
17:00-18:00	Bc1	1	28.79	0.90	31.98	3.38
17:00-18:00	Bc1	2	29.12	0.92	31.72	3.40
17:00-18:00	Bc1	3	21.97	0.59	36.96	2.92
17:00-18:00	Bc1	4	21.97	0.59	36.96	2.92
17:00-18:00	Bx	1	5.50	0.11	48.08	7.49
17:00-18:00	Cc	1	44.46	1.70	30.65	8.96
17:00-18:00	Cc	2	47.76	1.82	30.70	8.92
17:00-18:00	Cc	3	48.67	1.87	30.55	9.01
17:00-18:00	Cx	1	97.47	2.05	48.31	7.56
17:00-18:00	Cx	2	29.01	0.49	59.22	6.08
17:00-18:00	Cx1	1	126.48	3.84	32.92	10.94
17:00-18:00	D	1	217.01	7.82	27.74	38.94
17:00-18:00	D	2	232.89	8.34	27.94	38.66
17:00-18:00	D	3	232.89	8.34	27.94	38.66
17:00-18:00	E	1	79.00	2.85	27.74	25.96
17:00-18:00	E	2	105.00	4.17	25.19	28.58
17:00-18:00	Dc	1	36.36	1.00	36.21	8.95
17:00-18:00	Dc	2	58.24	4.53	15.47	25.19
17:00-18:00	Dc	3	33.85	0.88	38.98	8.45
17:00-18:00	Dx	1	54.88	2.20	25.00	8.09
17:00-18:00	Dx	2	41.15	0.83	49.53	4.07
17:00-18:00	Dx	3	23.83	0.42	57.07	3.53
17:00-18:00	Dx1	1	244.98	4.00	61.32	14.68
17:00-18:00	Dx1	2	290.05	5.01	57.91	15.54
17:00-18:00	Ec	1	23.06	0.64	37.78	4.99
17:00-18:00	Ec	2	48.17	1.96	24.53	7.34
17:00-18:00	Ec	3	48.27	1.85	26.84	6.89
17:00-18:00	Ex	1	85.32	2.01	42.37	8.50
17:00-18:00	Ex	2	46.01	1.05	43.78	8.22

Network Results

Run Summary

Time Segment	Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC
17:00-18:00	A1 - 2031 PM Scenario 2	07/02/2014 15:54:49	07/02/2014 15:55:20	17:00	88	69.40	78.81	Ax1/2	0	0	C/1	Ax1/2	Ax1/2

Network Results: Summary

Time Segment	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	Unweighted Performance Index (£ per hr)
17:00-18:00	33197	33197	-12	✓	0	0	79		14	3278.00	3304.00	208.77	1645.35

Network Results: Stops And Delays

Time Segment	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
17:00-18:00	7.15	B	7.53	51.42	17.98	985.44	616.56	32.46	9936.11	840.75	659.91	246.04

Network Results: Queues And Blocking

Time Segment	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
17:00-18:00	0.00	0.00	911.70	0.00	0.00	208.77	0.00	0.00	36.00	46.00	82.00	

Network Results: Journey Times

Time Segment	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
17:00-18:00	3809.66	135.37	28.50	14.68

Point to Point Journey Time

Average Journey Time (s) for Local Matrix: 2031 AM S2

		To				
		1	2	3	4	5
From	1	0.00	48.46	62.87	75.06	90.75
	2	81.16	0.00	20.24	36.43	69.99
	3	78.47	97.65	0.00	66.80	67.27
	4	64.85	75.18	89.96	0.00	47.29
	5	42.66	55.50	71.50	91.33	0.00

Path Journey Time

Path	Avg Journey Time (s)	Normal Journey Time (s)	Bus Journey Time (s)	Tram Journey Time (s)
1	57.09	57.09	0.00	0.00
2	47.29	47.29	0.00	0.00
3	67.37	67.37	0.00	0.00
4	65.51	65.51	0.00	0.00
5	75.18	75.18	0.00	0.00
6	89.03	89.03	0.00	0.00
7	0.00	0.00	0.00	0.00
8	90.89	90.89	0.00	0.00
9	42.66	42.66	0.00	0.00
10	55.50	55.50	0.00	0.00
11	71.50	71.50	0.00	0.00
12	97.59	97.59	0.00	0.00
13	0.00	0.00	0.00	0.00
14	88.40	88.40	0.00	0.00
15	0.00	0.00	0.00	0.00
16	88.01	88.01	0.00	0.00
17	38.26	38.26	0.00	0.00
18	20.24	20.24	0.00	0.00
19	38.70	38.70	0.00	0.00

20	84.82	84.82	0.00	0.00
21	69.99	69.99	0.00	0.00
22	80.63	80.63	0.00	0.00
23	78.04	78.04	0.00	0.00
24	0.00	0.00	0.00	0.00
25	31.30	31.30	0.00	0.00
26	61.86	61.86	0.00	0.00
27	66.80	66.80	0.00	0.00
28	79.08	79.08	0.00	0.00
29	82.77	82.77	0.00	0.00
30	79.46	79.46	0.00	0.00
31	76.87	76.87	0.00	0.00
32	97.65	97.65	0.00	0.00
33	0.00	0.00	0.00	0.00
34	0.00	0.00	0.00	0.00
35	48.46	48.46	0.00	0.00
36	62.77	62.77	0.00	0.00
37	75.82	75.82	0.00	0.00
38	63.83	63.83	0.00	0.00
39	76.01	76.01	0.00	0.00
40	0.00	0.00	0.00	0.00
41	90.75	90.75	0.00	0.00
42	0.00	0.00	0.00	0.00
43	0.00	0.00	0.00	0.00
44	71.37	71.37	0.00	0.00

Capabilities on project:
Transportation

Appendix H – Cost Estimate for Preferred Option

Client	**BIRMINGHAM CITY COUNCIL**
Project Name	**Minworth Rbt: Option 4**
Project Number	**60313511**
Calculation number	**60313511/COST/PSE/001**
Location	**60313511/03/Cost Estimate/Option 4**
Prepared by	**PSE**
Date	**04/02/2014**
Checked by	**VUM**

Title **PRELIMINARY COST ESTIMATE**

SUMMARY SHEET

Series	Description			**COST (£)**
200	Site Clearance			10886.42
300	Fencing			2371.20
400	Safety Fencing, Barriers and Guard Rails			2438.05
500	Drainage and Service Ducts			200039.17
600	Earthworks			166496.96
700	Pavement			424933.25
1100	Footways and Paved Areas			32080.29
1200	Traffic signs and Road Markings			72042.11
1300	Lighting Columns and CCTV Masts			5351.91
1400	Electrical Works for Lighting Columns and Traffic Signs			16355.63
1700	Structural Concrete			0.00
2400	Brickwork, Blockwork and Stonework			0.00
2600	Miscellaneous			0.00
3000	Landscaping and Ecology			14293.50
TSE	Traffic Signal Equipment			247637.00
			Subtotal	1194925.48
	PRELIMINARIES @	20%		238985.10
	TRAFFIC MANAGEMENT	45%		537716.47
			Subtotal	1971627.04
	SCHEME DEVELOPMENT FEES @	10%		197162.70
			Subtotal	2168789.74
	OPTIMISM BIAS	44%		954267.49
			TOTAL	**3123057.23**

Notes

Based on Drg 60313511/SKE/20/CT/0004

Standard Caveats and exclusions:

** - Land 3rd Party Land acquisition costs and accommodation works costs*

** - Dedication of Land, Land to be passed over to the council as highway.*

** - Legal costs*

** - Landscaping design*

** - Statutory Undertakers design fee*

** - Statutory Undertakers diversion and or protection costs*

** - Third Party Ground Investigation costs. Trial Pits and Geotechnical surveying will be supplied by third parties*

** - Traffic Regulation Orders & any associated TRO consultation*

** - Contract documentation for appointment of the preferred contractor, as this is being progressed by others.*

** - Tendering of the works*

Capabilities on project:
Transportation

Appendix I – Risk Register

LIKELIHOOD

Description	Scenario	Code Letter
High	More likely to occur than not	H
Medium	Fairly likely to happen	M
Low	Low but not impossible	L

IMPACT

Description	Scenario	Code Letter
High	Major impact on costs, objectives. Serious impact on output and/or quality and reputation. Medium to long-term effect and expensive to recover.	H
Medium	Reduces viability significant waste of time and resources and impact on operational efficiency, output, and quality. Medium term effect, which may be expensive to recover.	M
Low	Minor loss, delay, inconvenience or interruption. Short to medium term effect.	L

Project Risk Register

Project Name: BCC- Minworth Roundabout Options
Project Number: 60313511

Category	Risk Factor	Before Mitigation			Mitigation Measure	After Mitigation		
		Likelihood	Consequence	Risk Level		Likelihood	Consequence	Risk Level
Statutory Undertakers								
1.00	High pressure oil pipeline operating at 1400psi on south of junction. Risks include oil leaks, power outages and environmental damage.	H	H	H	No works to be undertaken before contacting Fisher German. 6 metre safety zone is also present. Protection will likely also be needed.	H	M	M
1.01	Three 132 kVA power cables of 500mm thickness and 1.44 metres depth run directly through the junction. Risk of electric shocks and power outages to thousands of homes.	H	H	H	No works to take place before contacting Western Power Distribution. Protection of the cables will also be needed.	H	M	M
1.02	National Grid Gas main on approaches to the junction. Risk of gas leaks if hit. However works are unlikely to effect this utility.	M	M	M	Contact the National Grid before undertaking any works.	L	M	L
1.03	Virgin cables on all arms of junction, trunk route appears to run along A38. Cost risk is high if hit.	H	H	H	Contact Virgin Media to establish location prior to works commencing	H	M	M
1.04	Severn Trent Water6in Cast Iron Water Main runs along southern kerb of central island from Walmley Ash Rd to Lindridge Drive	H	M	M	Establish diverison, protection measures requried with Severn Trent Water	H	M	M
1.05	Severn Trent Surface Water concrete gravity sewer 525mm dia crosses the central island from Walmley Ash Rd to Kingsbury Road.	H	H	H	Establish diverison, protection measures requried with Severn Trent Sewers	H	M	M
1.06	BT cables on all aprroach arms likely to be affected by the works	H	M	M	Establish protection measures with BT.	M	L	M
Health and Safety								
1.07	Risks of unexploded ordnance.	H	H	H	Implement a management plan. Contractor is responsible for co-ordination.	M	H	M
1.08	Stream to the north of the perimeter of the junction.	M	M	M	Put up barriers or tape near to the section of the river that work will take place on. Provide details of this during the site induction health and safety talk.	L	M	L
1.09	Pedestrian provision during construction.	M	M	M	Ensure pedestrian walkways are maintained and barriers are implemented to protect pedestrians.	L	L	L
1.10	High pressure oil pipeline operating at 1400psi on south of junction. Risks include oil leaks, power outages and environmental damage.	H	H	H	See risk 1.00	M	M	M
1.11	Three 132 kVA power cables of 500mm thickness and 1.44 metres depth run directly through the junction. Risk of electric shocks and power outages to thousands of homes.	H	H	H	See risk 1.01	M	M	M
1.12	National Grid Gas main on approaches to the junction. Risk of gas leaks if hit. However works are unlikely to effect this utility.	H	H	H	See risk 1.03	M	M	M
Cost								
1.13	Protection and mitigation of large statutory undertakers equipment.	H	H	M	Undertake C3 enquiries to establish cost estimates.	M	M	M
1.14	Possible land transfer requirement. Land is assumed to belong to BCC.	M	M	M	This should be investigated and a plan put in place for this transfer.	L	L	L
1.15	Stream to the north requires culverting. Cost assumptions will need confirmation.	M	M	M	A detailed design and estimate of the costs and a plan for this should be produced to refine the assumptions.	L	M	L
1.16	Enhanced risk of unexploded ordnance.	H	H	H	Conduct a detailed survey and study to refine risk assumptions.	M	H	M
Capacity								
1.17	Uncertainty over demand forecasts. Best estimate has currently been used.	M	M	M	A best estimate has been used, some caution should be taken when using the forecast.	L	M	L
1.18	A one hour queue observation was undertaken due to original queue surveys being incorrect.	M	M	M	Caution should be taken when using the queues survey results. Further queue survey results should be undertaken if needed.	L	M	L
1.19	Capacity of proposed junction exceeds capacity of downstream junction towards Birmingham. Additional works are likely to be required at these junctions.	H	H	H	Capacity assessments should be completed and future plans should start to be produced.	L	M	L
Programme Risks								
1.20	Trees removal may require environmental survey during specific season.	H	M	M	Estimates should be undertaken to establish the cost of this and the impact upon the project. Obtain details of surveys required to confirm programme.	M	L	L
1.21	Increase in impermeable area, meaning there is a possibility of an increase in flooding in the area. Therefore will require permission from Severn Trent Water.	M	M	M	This should be investigated and should contact Severn Trent to check this.	L	M	M
1.22	Junction is congested in base year. Off peak working will be needed.	H	M	M	Plans should be made that involve working to be carried out off peak only.	M	M	M
1.23	Co-ordination with statutory undertakers.	H	H	M	Undertake C3 enquiries to establish cost estimates of equipment changes.	M	M	M

Project Risk Register

AECOM

Project Name: BCC- Minworth Roundabout Options
Project Number: 60313511

Category	Risk Factor	Before Mitigation			Mitigation Measure	After Mitigation		
		Likelihood	Consequence	Risk Level		Likelihood	Consequence	Risk Level
Statutory Undertakers								
1.00	High pressure oil pipeline operating at 1400psi on south of junction. Risks include oil leaks, power outages and environmental damage.	H	H	H	No works to be undertaken before contacting Fisher German. 6 metre safety zone is also present. Protection will likely also be needed.	H	M	M
1.01	Three 132 kVA power cables of 500mm thickness and 1.44 metres depth run directly through the junction. Risk of electric shocks and power outages to thousands of homes.	H	H	H	No works to take place before contacting Western Power Distribution. Protection of the cables will also be needed.	H	M	M
1.02	National Grid Gas main on approaches to the junction. Risk of gas leaks if hit. However works are unlikely to effect this utility.	M	M	M	Contact the National Grid before undertaking any works.	L	M	L
1.03	Unknown statutory undertakers such as Severn Trent Water sewerage systems.	H	H	H	If found a contingency plan will be needed. Contractor will be responsible for co-ordination.	M	M	M
Health and Safety								
1.04	Risks of unexploded ordnance.	H	H	H	Implement a management plan. Contractor is responsible for co-ordination.	M	H	M
1.05	Stream to the north of the perimeter of the junction.	M	M	M	Put up barriers or tape near to the section of the river that work will take place on. Provide details of this during the site induction health and safety talk.	L	M	L
1.06	Pedestrian provision during construction.	M	M	M	Ensure pedestrian walkways are maintained and barriers are implemented to protect pedestrians.	L	L	L
1.07	High pressure oil pipeline operating at 1400psi on south of junction. Risks include oil leaks, power outages and environmental damage.	H	H	H	See risk 1.00	M	M	M
1.08	Three 132 kVA power cables of 500mm thickness and 1.44 metres depth run directly through the junction. Risk of electric shocks and power outages to thousands of homes.	H	H	H	See risk 1.01	M	M	M
1.09	National Grid Gas main on approaches to the junction. Risk of gas leaks if hit. However works are unlikely to effect this utility.	H	H	H	See risk 1.03	M	M	M
Cost								
1.10	Protection and mitigation of large statutory undertakers equipment.	H	H	M	Undertake C3 enquiries to establish cost estimates.	M	M	M
1.11	Possible land transfer requirement. Land is assumed to belong to BCC.	M	M	M	This should be investigated and a plan put in place for this transfer.	L	L	L
1.12	Stream to the north requires culverting. Cost assumptions will need confirmation.	M	M	M	A detailed design and estimate of the costs and a plan for this should be produced to refine the assumptions.	L	M	L
1.13	Enhanced risk of unexploded ordnance.	H	H	H	Conduct a detailed survey and study to refine risk assumptions.	M	H	M
Capacity								
1.14	Uncertainty over demand forecasts. Best estimate has currently been used.	M	M	M	A best estimate has been used, some caution should be taken when using the forecast.	L	M	L
1.15	A one hour queue observation was undertaken due to original queue surveys being incorrect.	M	M	M	Caution should be taken when using the queues survey results. Further queue survey results should be undertaken if needed.	L	M	L
1.16	Capacity of proposed junction exceeds capacity of downstream junction towards Birmingham. Additional works are likely to be required at these junctions.	H	H	H	Capacity assessments should be completed and future plans should start to be produced.	L	M	L
Programme Risks								
1.17	Trees removal may require environmental survey during specific season.	H	M	M	Estimates should be undertaken to establish the cost of this and the impact upon the project. Obtain details of surveys required to confirm programme.	M	L	L
1.18	Increase in impermeable area, meaning there is a possibility of an increase in flooding in the area. Therefore will require permission from Severn Trent Water.	M	M	M	This should be investigated and should contact Severn Trent to check this.	L	M	M
1.19	Junction is congested in base year. Off peak working will be needed.	H	M	M	Plans should be made that involve working to be carried out off peak only.	M	M	M
1.20	Co-ordination with statutory undertakers.	H	H	M	Undertake C3 enquiries to establish cost estimates of equipment changes.	M	M	M

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