



## TECHNICAL NOTE 2

DATE:	20 May 2020	CONFIDENTIALITY:	Public
SUBJECT:	Omega Zone 8: Response to Highways England (March 2020 Comments)		
PROJECT:	11191042	AUTHOR:	Adam Stone
CHECKED:	Paul White	APPROVED:	Paul White

## INTRODUCTION

WSP UK Limited (WSP) has been commissioned by Omega Warrington Limited (OWL), to provide transportation advice in support of a hybrid planning application for c. 205,500sqm (c.2,210,500sqft) B2/B8 industrial uses on Omega Zone 8, located in the Borough of St Helens.

The application will comprise a detailed planning application for an c.880,000sqft B8 industrial use to the north of the site and an outline planning application for the remaining B2/B8 industrial uses to the south of the site.

This Technical Note has been prepared in response to comments raised by Highways England upon their review of the Transport Assessment and subsequent Technical Note, which were submitted 13<sup>th</sup> December 2019 and 13<sup>th</sup> March 2020, respectively.

Specifically, this note seeks to address the subsequent follow up points raised by Highways England in their Technical Note Review dated 28 March 2020. This note supersedes the note provided to Highways England on 27 April 2020.

## RESPONSES TO HIGHWAYS ENGLAND COMMENTS

### Highways England Point 10 – TRANSYT model setup data

#### Highways England Comment as per Technical Note Review

*Thank you for providing the signal controller information to allow this to be reviewed. All appears ok except the B-A intergreen on stream 4 is set to 5 seconds in the model when the controller specification indicates 6. Please note, a scenario 4 model has not been provided for review therefore we are assuming the same issue will be present. If the model is to be re-run to address any other comments we would suggest this is adjusted.*

#### WSP Comments

We acknowledge the discrepancy in the intergreen for B-A and will include this on any subsequent model runs, should it be required.



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### Highways England Point 11 – TRANSYT model, manual lane balancing

#### Highways England Comment as per Technical Note Review

*Below is a quote from the TRANSYT user guide regarding lane balancing traffic assignment as applied in the model.*

*“... This mode is useful for modelling single junctions (e.g. crossroads, staggers and roundabouts). It takes account of the saturation flow of each traffic stream (max flow for give-ways), while it is NOT influenced by the travel time through the junction – which reflects reasonably well the nature of decision making required by drivers who are travelling through a single junction and choosing the most appropriate path through it.”*

*This therefore suggests drivers choose their lane through the junction based on the first stop line they reach and this is why lane balancing traffic distribution is applied. It continues:*

*“The flow allocation modes provided simply ‘aid’ the process of establishing suitable traffic flows throughout the network. Inevitably there will be some situations where the allocation of flows by these methods will not be suitable and in such situations users have the freedom to specify flows in a more direct manner.”*

*We would therefore suggest that should the developer’s consultant wish to retain adjustments to routing it should be justified through, for example, observations of the existing traffic distribution between lanes on the Burtonwood S approach, appropriate sections of the circulatory or exits if survey videos are available. Or other amendments to the model if appropriate.*

#### WSP Comments

As previously stated in our previous Technical Note, routing of traffic within the network is initially decided based on the ‘lane balancing’ allocation mode within TRANSYT. Any subsequent adjustments to routing have been carried out to account for no internal weaving on the circulatory carriageway within the models.

To clarify the extent of adjustments to the initial entry lane balancing, this has been summarised as follows:

**Table 1– Adjustments to TRANSYT model routing**

Path	From	To	Adjustment
Proposed Mitigation Scenario 5 – AM Peak			
37/38	Burtonwood Road South (6)	M62 Eastbound (4)	Adjust 50%/50% split (37/38) to 70%/30% distribution. This results in redistribution of 142PCUs from offside lane to middle lane (Less than 3 PCUs per cycle).
Proposed Mitigation Scenario 5 – PM Peak			
37/38	Burtonwood Road South (6)	M62 Eastbound (4)	Adjust 50%/50% split (37/38) to 56%/44% distribution. This results in redistribution of 39 PCUs from offside lane to middle lane (Less than 1 PCU per cycle).

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As shown in Table 1, only one routing adjustment has been made to the Scenario 5 Proposed Mitigation model. The adjustment results in less than 3 PCUs per cycle being redistributed from the offside lane to the middle lane on the Burtonwood Road (S) approach. This has been done to account for no internal weaving in the model that could occur on the longer straight sections on the roundabout, above the motorway. It is considered that this approach provides a more robust result compared to modelling weaving on the links over the M62, where TRANSYT would re-assign the flows accordingly.

The junction operation would also be supported by the current operational efficiencies achieved through MOVA control, which is expected to improve journey time reliability as well as aid in queue management. This cannot be replicated within the TRANSYT modelling and we would expect the junction results to be better than what is shown within the modelling as part of this assessment.

WSP has investigated the Scenario 5 Proposed Mitigation model and undertaken comparisons with and without the exclusive use of the TRANSYT's entry lane balancing function. The figures included within Appendix A show the Scenario 5 Proposed Mitigation model with and without the exclusive use of the TRANSYT's entry lane balancing function in the AM and PM peak. Please note that in this comparison, green split times have not been altered to provide a like for like evaluation, however, offsets have been optimised to manage co-ordination between signals.

The figures demonstrate that TRANSYT cannot appropriately anticipate driver behaviour beyond the entry stop line, particularly when the circulatory carriageway is not consistent throughout the junction. In conclusion, it is considered that the approach applied is entirely reasonable and accords with advice in the TRANSYT User Guide.

Notwithstanding the above, WSP has taken into consideration the concerns raised by Highways England and have re-assessed the proposed layout with the Scenario 5 traffic flows without the manual lane adjustments described in Table 1.

In this assessment, traffic from Skyline Drive to the M62 Eastbound are required to use the middle lane (Stream 25/1) only. This will be achieved through amendments to the existing destination markings on the roundabout.

The operation of the proposed M62 Junction 8 signalised gyratory has been assessed using TRANSYT and the results of the assessment are shown in Table 2. Full Results are included in Appendix D.

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**Table 2 – M62 Junction 8 (Proposed) TRANSYT results**

Arm	Traffic Stream	Scenario 5 2021 AM + Phase 4-7 + Omega Zone 8		Scenario 5 2021 PM + Phase 4-7 + Omega Zone 8	
		DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
J62 Junction 8					
15	1	17	0	48	2
	2	17	0	48	2
16	1	68	8	75	9
	2	70	8	85	10
	3	70	8	78	9
17	1	26	2	37	3
18	1	37	0	44	2
	2	63	3	43	2
19	1	77	5	58	4
	2	73	5	37	4
20	1	47	3	53	2
	2	65	4	85	10
	3	44	2	49	0
21	1	45	6	37	4
	2	37	4	19	2
22	1	0	0	0	0
23	1	30	2	24	2
24	1	44	3	38	4
25	1	80	9	93	14
26	1	7	0	13	0
27	1	30	0	109	51
28	1	54	3	61	5
	2	17	2	22	2
29	1	0	0	0	0
30	1	50	5	69	5



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	2	60	7	56	9
	3	71	5	62	4
31	1	48	5	30	2
32	1	48	3	67	4
33	1	33	3	48	5
34	1	19	1	32	2
35	1	32	0	48	0
	1	48	0	45	0
36	2	88	15	80	10
	3	29	6	13	1
37	1	64	6	58	4
38	1	88	11	90	9
39	1	35	3	56	4
40	1	34	2	26	0
41	1	0	0	0	0
42	1	80	6	71	1
43	1	0	0	0	0
44	1	91	16	79	9
45	2	60	4	34	0
46	1	51	0	50	0
47	1	31	0	56	0
48	1	28	2	82	9
49	1	49	4	29	2
	2	28	2	82	9
50	1	23	0	32	0
51	1	89	11	87	11
	2	89	11	87	11
52	1	0	0	0	0

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As shown in Table 2, the results indicate three traffic streams may operate above the 90% (Southbound Circulatory arm over the bridge in the AM / Skyline Drive in the PM). However, the updated modelling shows that the operation on the circulatory carriageway and slip roads onto the motorway have been improved compared to the proposed model provided in the previous note, with the M62 EB and WB off-slips both operating within capacity and limited levels of queuing. It is also worth noting that the proposals provide a substantial reduction in queuing on the M62 EB off-slip arm in comparison to Scenario 2 (currently committed).

While the results indicate a DOS increase to 93% for the Skyline Drive in the PM for traffic travelling to the M62 EB and Burtonwood Road (North), examination of the queue profile indicates that the queuing clears, or comes close to clearing, each cycle. This indicates that the majority of vehicles will get through in a single cycle.

In addition to this, our assessment of Scenario 5 assumes that the Burtonwood Road Services site still has the majority of its B1 / B2 / B8 development to be constructed. As is discussed in response to Comment 6 in our Technical Note issued 13 March 2020, a large amount of the site has already been built on, with far lower trip generators in the AM peak than the original consent, meaning that we have likely overestimated the future impact of this committed development on the road network. The true level of trip generation from this site is likely to represent a reduction in vehicles on the M62 Junction 8 roundabout, enabling the junction to operate within capacity in 2021 with the addition of development traffic. The result of a reduction in this movement would result in more green time available for the Skyline Drive approach, improving performance.

### M62 J8 2029 SENSITIVITY TEST

As part of the initial scoping discussions undertaken with Highways England, an additional sensitivity test was requested to gauge the performance of the M62 J8 signalised gyratory in a future year scenario.

Using the parameters in Tempro as described in our Technical Note issued 13 March 2020, the 2019 surveyed traffic has been growthed to the agreed future year, 2029. Development traffic flows associated with Scenario 5 have been added to the 2029 AM and PM traffic flows and input into TRANSYT to model the updated junction's performance.

The full TRANSYT results for the sensitivity test are included within Appendix E.



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### Highways England Point 13 – Scenario 5 flow discrepancy & reassessment

#### Highways England Comment as per Technical Note Review

*A revised assessment has been undertaken including the amended B8 traffic flows (as outlined above in point 8), as well as amended HGV trips for the Mountpark and Zones 1-2 B2/B8 developments, which had not previously been converted into PCUs.*

*The Technical Note provided only appears to contain AM peak traffic flows in Appendix A. Please could the PM peak flows also be provided.*

*The results of the scenario 5 assessment (with mitigation) indicate that generally the junction will operate over practical capacity but within absolute capacity. Three lanes (M62 Eastbound off slip in the AM and Skyline Drive in the PM) exceed a DoS value of 90%. The analysis also indicates that the increase in queueing on these arms is predicted to be three PCUs or less. However, we consider that points 11 and 14 still need to be addressed regarding the manual intervention in traffic assignment between lanes and potential unequal lane usage due to exit merging. As such, the results may be revised.*

#### WSP Comments

Updated Scenario 2 and Scenario 5 traffic flows relating to the PM peak period have been included within Appendix B.

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## Highways England Point 14 – Lane utilisation sensitivity test

### Highways England Comment as per Technical Note Review

*This was requested to inform Highways England on the potential range of outcomes that may result from variation in lane utilisation. We would therefore recommend that these sensitivity tests are completed.*

### WSP Comments

As part of further highway improvement works on Skyline Drive, it is proposed to widen the carriageway to support two lanes of traffic in either direction between the Skyline Drive / Fairchild Road roundabout and M62 Junction 8. We have included a drawing of the associated works below, which has also been included within Appendix C.

**Figure 5– Proposed widening works on Skyline Drive**



The continuation of two lanes westbound on Skyline Drive is considered to alleviate the concerns of unequal lane utilisation at the upstream stopline on Junction 8.



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## CONCLUSION

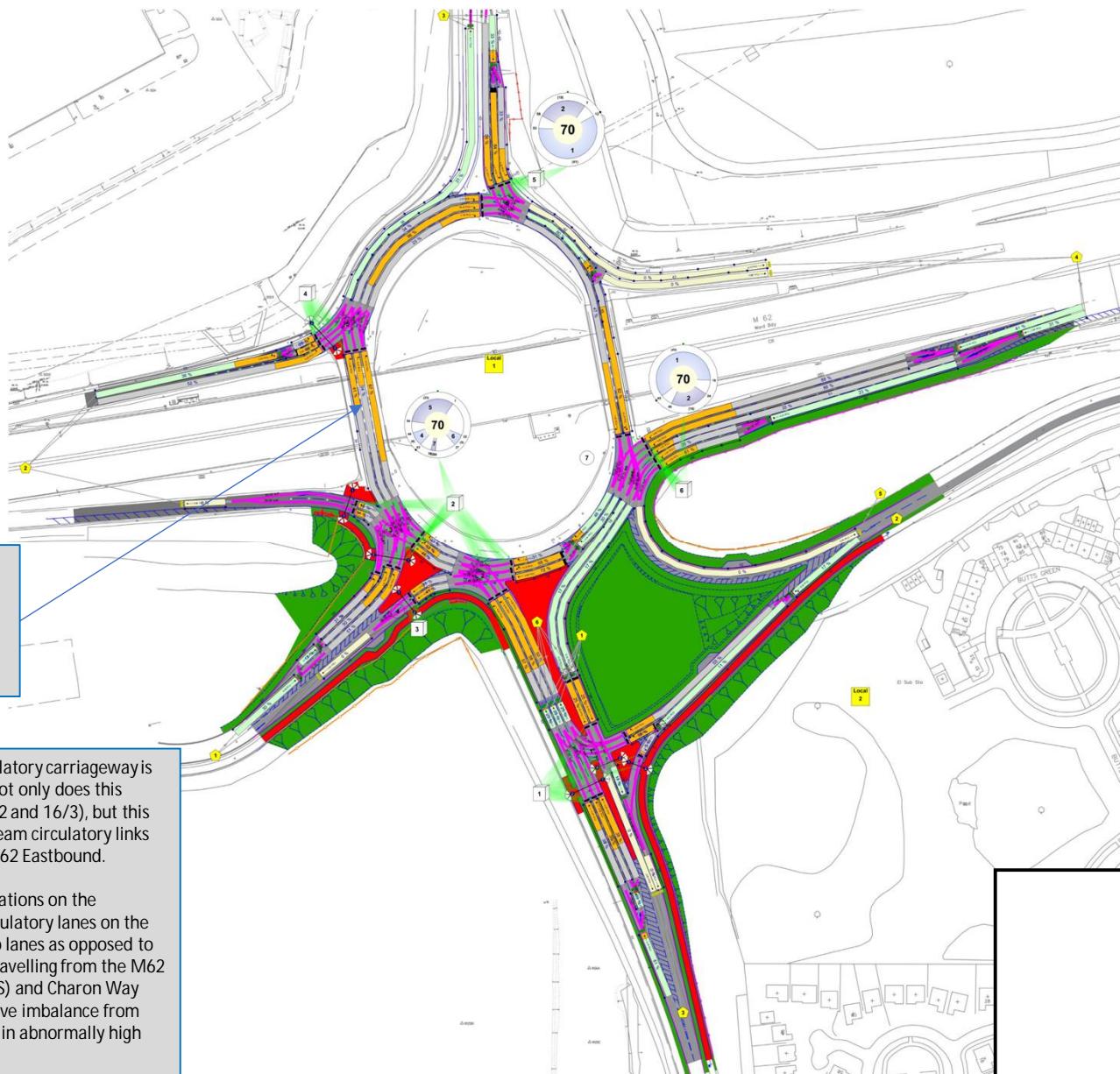
It is concluded, through the provision of additional / updated information within this Technical Note, that Highways England's remaining points have been clarified and addressed. It is considered that the note fully demonstrates the proposed development can be accommodated within the highway network following the measures shown within the proposed mitigation scheme.

# Appendix A

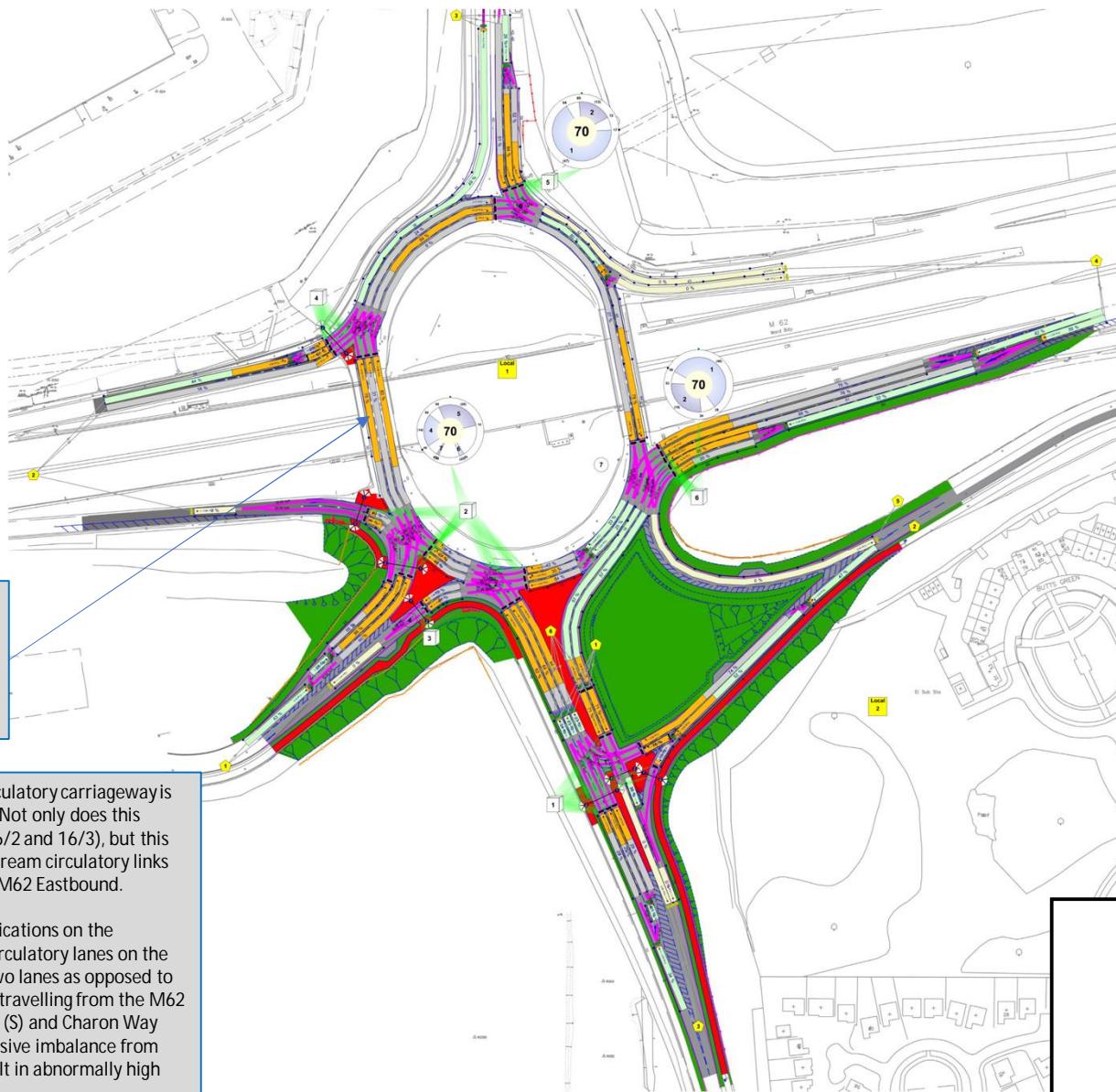
TRANSYT FIGURES



**Proposed Layout**  
**Scenario 4**  
**AM Peak**  
**No Route Alteration**

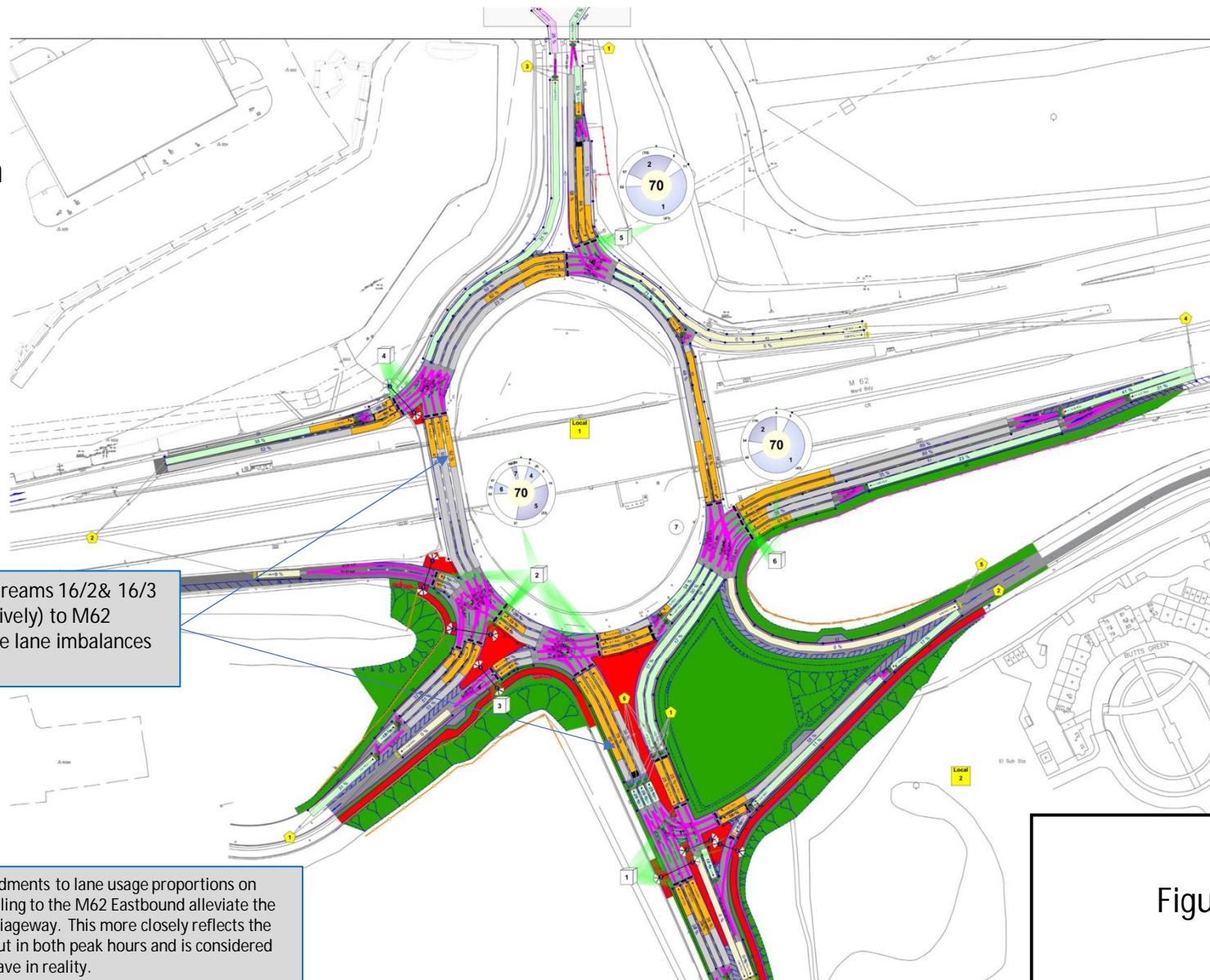


**Proposed Layout**  
**Scenario 4**  
**PM Peak**  
**No Route Alteration**

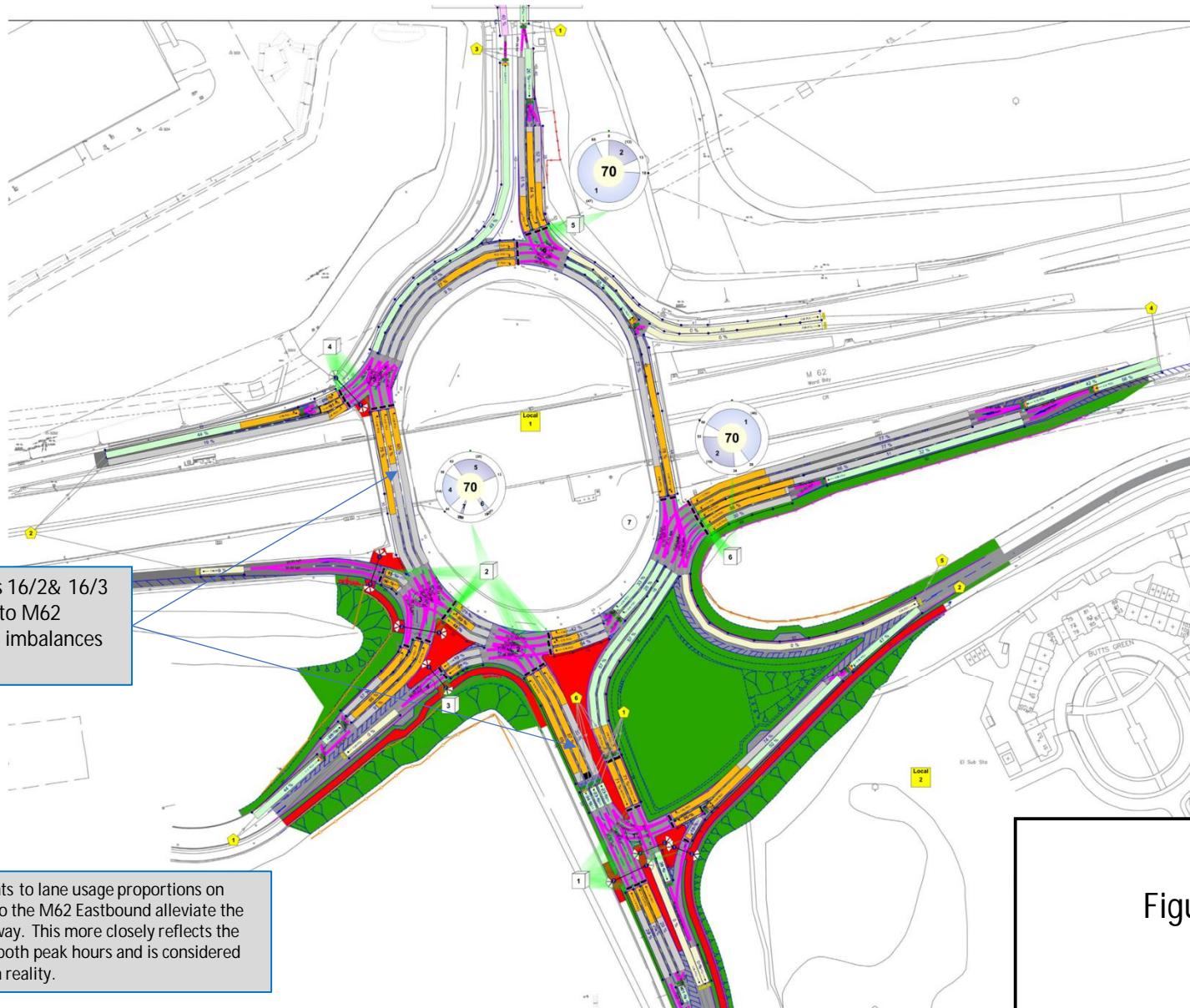


**Figure 2**

Proposed Layout  
Scenario 4  
AM Peak  
With Route Alteration



Proposed Layout  
Scenario 4  
PM Peak  
With Route Alteration



# **Appendix B**

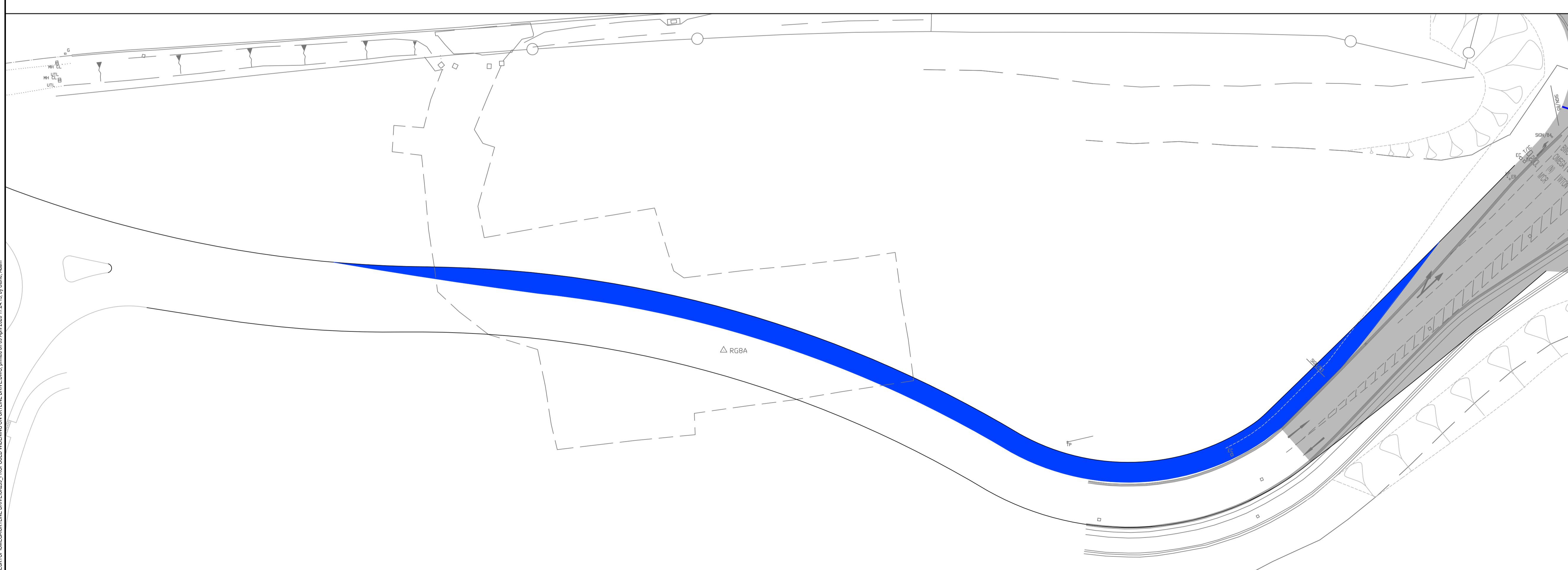
**PROPOSED WIDENING  
ON SKYLINE DRIVE**



DO NOT SCALE



PROPOSED LAYOUT



ADDITIONAL LAND REQUIREMENTS

File name: C:\Users\Warrington\Documents\SKYLINE DRIVE\DRW\PROPOSED WIDENING ON SKYLINE DRIVE.DWG, printed on 20-Apr-2020 17:24:15 by Steve Adam

A	09/04/2020	AS	FIRST ISSUE	XXX	XXX
REV	DATE	BY	DESCRIPTION	CHK	APP
DRAWING STATUS:					
S2 - FOR INFORMATION					
7 Lochside View, Edinburgh Park, Edinburgh, EH12 9DH, UK T+ 44 (0) 131 344 2300, F+ 44 (0) 131 344 2301 wsp.com					
CLIENT: OMEGA WARRINGTON LIMITED					
ARCHITECT:					
SITE/PROJECT: OMEGA ,WARRINGTON					
TITLE: PROPOSED WIDENING ON SKYLINE DRIVE					
SCALE @ A1:	1:500	CHECKED:	DB	APPROVED:	DB
PROJECT NO:	11191042	DESIGNED:	AS	DRAWN:	AS
DRAWING NO:	11191042_SK329				REV: A

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1:500  
0 10m 20m 30m 40m 50m

# **Appendix C**

**BURTONWOOD ROAD / KINGSWOOD  
ROAD / ZONE 4-7 SITE ACCESS  
FULL LINSIG RESULTS**



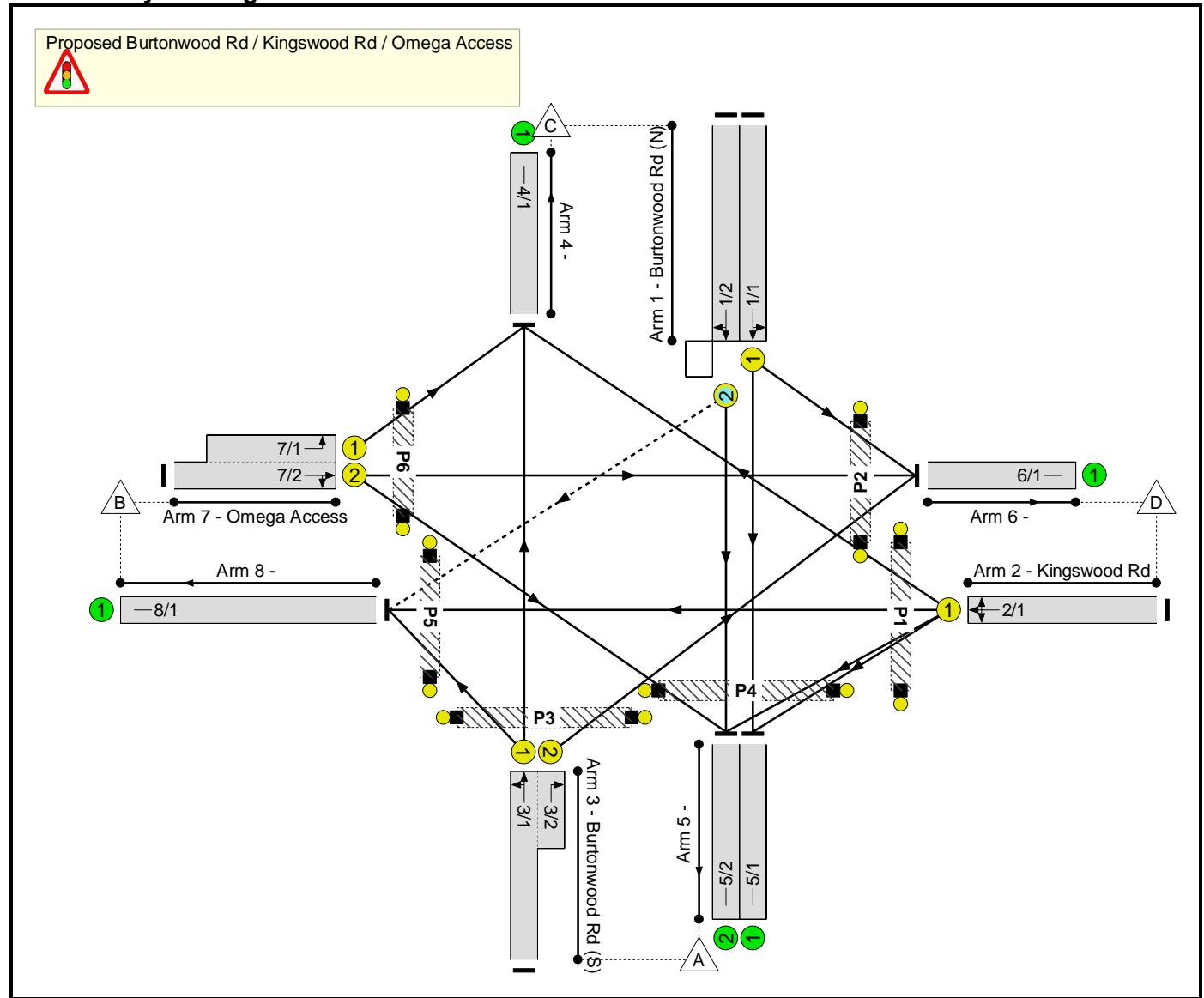
## Full Input Data And Results

### Full Input Data And Results

#### User and Project Details

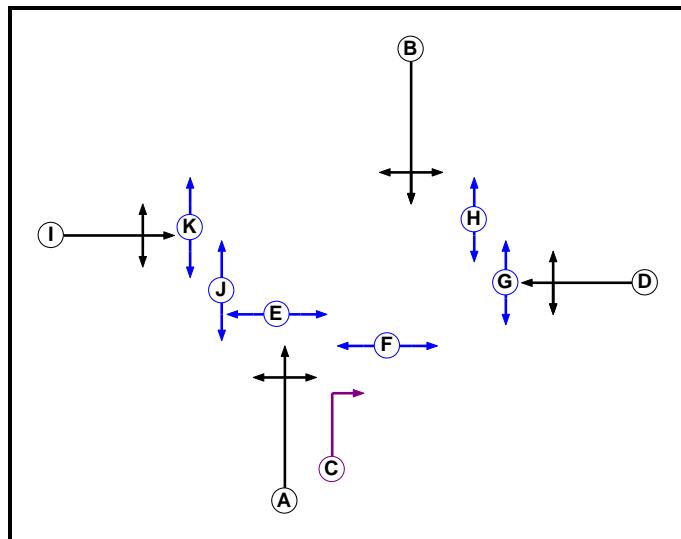
Project:	Omega, Warrington
Title:	Proposed Burtonwood Rd / Kingswood Rd / Omega Access_Revision
Location:	
File name:	Burtonwood Rd_Kingswood _Proposed Layout_ISSUE sc5_Revised.lsg3x
Author:	UKAPS002
Company:	WSP UK
Address:	
Notes:	

#### Network Layout Diagram



## Full Input Data And Results

### Phase Diagram



### Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Ind. Arrow	A	4	4
D	Traffic		7	7
E	Pedestrian		5	5
F	Pedestrian		5	5
G	Pedestrian		5	5
H	Pedestrian		5	5
I	Traffic		7	7
J	Pedestrian		5	5
K	Pedestrian		5	5

## Full Input Data And Results

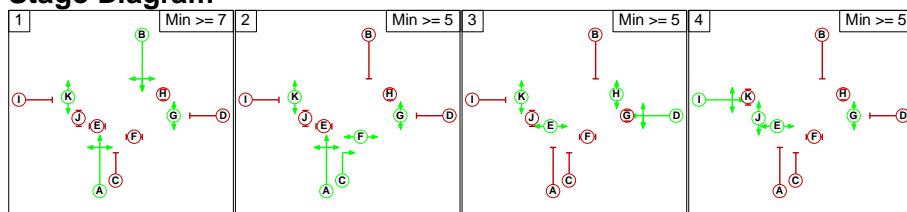
### Phase Intergreens Matrix

		Starting Phase										
		A	B	C	D	E	F	G	H	I	J	K
Terminating Phase	A	-	-	8	7	-	-	12	5	7	-	
	B	-	9	8	7	11	-	9	5	9	-	
	C	-	7	8	7	-	-	12	-	-	-	
	D	7	7	7	-	8	6	-	5	9	-	
	E	0	0	0	-	-	-	-	-	-	-	
	F	-	0	-	0	-	-	-	5	-	-	
	G	-	-	-	0	-	-	-	-	-	-	
	H	0	0	2	-	-	-	-	0	-	-	
	I	8	8	-	9	-	9	-	9	-	-	5
	J	0	0	-	0	-	-	-	-	-	-	
	K	-	-	-	-	-	-	-	0	-	-	

### Phases in Stage

Stage No.	Phases in Stage
1	A B G K
2	A C F G K
3	D E H K
4	E G I J

### Stage Diagram



### Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	3	G	Losing	8	8
1	4	A	Losing	2	2
1	4	B	Losing	2	2
1	4	K	Losing	7	7
2	1	F	Losing	7	7
2	3	F	Losing	8	8
2	3	G	Losing	8	8
2	4	K	Losing	5	5
3	2	H	Losing	5	5

## Full Input Data And Results

### Prohibited Stage Change

		To Stage			
		1	2	3	4
From Stage	1	1	11	12	11
	2	7		12	7
	3	7	8		9
	4	8	X	9	

Full Input Data And Results

**Give-Way Lane Input Data**

Junction: Proposed Burtonwood Rd / Kingswood Rd / Omega Access											
Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)	Opposing Lane	Opp. Lane Coeff.	Opp. Mvmnts.	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RTF	Right Turn Move up (s)	Max Turns in Intergreen (PCU)
1/2 (Burtonwood Rd (N))	8/1 (Right)	1439	0	3/1	1.09	All	2.00	2.00	0.50	2	2.00

Full Input Data And Results

Lane Input Data

Junction: Proposed Burtonwood Rd / Kingswood Rd / Omega Access													
Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)	
1/1 (Burtonwood Rd (N))	U	B	2	3	60.0	Geom	-	3.35	0.00	Y	Arm 5 Ahead	Inf	
1/2 (Burtonwood Rd (N))											Arm 6 Left	20.00	
2/1 (Kingswood Rd)	U	D	2	3	60.0	Geom	-	3.75	0.00	Y	Arm 5 Ahead	Inf	
3/1 (Burtonwood Rd (S))											Arm 8 Right	Inf	
3/2 (Burtonwood Rd (S))											Arm 4 Left	15.00	
4/1	U		2	3	60.0	Inf	-	-	-	-	-	-	
5/1	U		2	3	60.0	Inf	-	-	-	-	-	-	
5/2	U		2	3	60.0	Inf	-	-	-	-	-	-	
6/1	U		2	3	60.0	Inf	-	-	-	-	-	-	
7/1 (Omega Access)	U	I	2	3	8.7	Geom	-	3.65	0.00	Y	Arm 4 Left	15.00	
7/2 (Omega Access)	U	I	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 5 Right	15.00	
8/1	U		2	3	60.0	Inf	-	-	-	-	Arm 6 Ahead	Inf	

## Full Input Data And Results

### Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'Surveyed 2019 AM'	08:00	09:00	01:00	
2: 'Surveyed 2019 PM'	17:00	18:00	01:00	
3: 'Scenario 4 AM '	08:00	09:00	01:00	
4: 'Scenario 4 PM '	17:00	18:00	01:00	
5: 'Scenario 5 AM'	08:00	09:00	01:00	
6: 'Scenario 5 PM'	17:00	18:00	01:00	
7: '2029 Scenario 4 AM'	08:00	09:00	01:00	
8: '2029 Scenario 4 PM'	17:00	18:00	01:00	
9: '2029 Scenario 5 AM'	08:00	09:00	01:00	
10: '2029 Scenario 5 PM'	17:00	18:00	01:00	

**Scenario 1: 'Scenario 4 AM' (FG3: 'Scenario 4 AM ', Plan 1: 'Network Control Plan 1')**

### Traffic Flows, Desired

#### Desired Flow :

Origin	Destination					
		A	B	C	D	Tot.
A	0	17	1067	35	1119	
B	40	0	38	0	78	
C	653	16	0	16	685	
D	87	0	109	0	196	
Tot.	780	33	1214	51	2078	

## Full Input Data And Results

### Traffic Lane Flows

Lane	Scenario 1: Scenario 4 AM	
<b>Junction: Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>		
1/1		323
1/2		362
2/1		196
3/1 (with short)		1119(In) 1084(Out)
3/2 (short)		35
4/1		1214
5/1		351
5/2		429
6/1		51
7/1 (short)		38
7/2 (with short)		78(In) 40(Out)
8/1		33

### Lane Saturation Flows

Junction: Proposed Burtonwood Rd / Kingswood Rd / Omega Access										
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)		
1/1 (Burtonwood Rd (N))	3.35	0.00	Y	Arm 5 Ahead	Inf	95.0 %	1943	1943		
1/2 (Burtonwood Rd (N))	3.35			Arm 6 Left	20.00	5.0 %				
2/1 (Kingswood Rd)	3.75	0.00	N	Arm 5 Ahead	Inf	95.6 %	2090	2090		
				Arm 8 Right	Inf	4.4 %				
3/1 (Burtonwood Rd (S))	3.30	0.00	Y	Arm 4 Right	15.00	55.6 %	1809	1809		
				Arm 5 Left	15.00	44.4 %				
3/2 (Burtonwood Rd (S))	3.20	0.00	N	Arm 8 Ahead	Inf	0.0 %				
4/1	Infinite Saturation Flow						Inf	Inf		
5/1	Infinite Saturation Flow						Inf	Inf		
5/2	Infinite Saturation Flow						Inf	Inf		
6/1	Infinite Saturation Flow						Inf	Inf		
7/1 (Omega Access)	3.65	0.00	Y	Arm 4 Left	15.00	100.0 %	1800	1800		
7/2 (Omega Access)	3.65	0.00		Arm 5 Right	15.00	100.0 %	1800	1800		
8/1	Infinite Saturation Flow						Inf	Inf		

## Full Input Data And Results

### Scenario 2: 'Scenario 4 PM' (FG4: 'Scenario 4 PM ', Plan 1: 'Network Control Plan 1')

#### Traffic Flows, Desired

##### Desired Flow :

Origin		Destination				
		A	B	C	D	Tot.
A	A	0	38	610	63	711
	B	24	0	22	0	46
	C	1369	36	0	82	1487
	D	54	0	35	0	89
Tot.		1447	74	667	145	2333

#### Traffic Lane Flows

Lane	Scenario 2: Scenario 4 PM
<b>Junction: Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>	
1/1	711
1/2	776
2/1	89
3/1 (with short)	711(In) 648(Out)
3/2 (short)	63
4/1	667
5/1	656
5/2	791
6/1	145
7/1 (short)	22
7/2 (with short)	46(In) 24(Out)
8/1	74

## Full Input Data And Results

### Lane Saturation Flows

Junction: Proposed Burtonwood Rd / Kingswood Rd / Omega Access										
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)		
1/1 (Burtonwood Rd (N))	3.35	0.00	Y	Arm 5 Ahead	Inf	88.5 %	1933	1933		
				Arm 6 Left	20.00	11.5 %				
1/2 (Burtonwood Rd (N))	3.35	0.00	N	Arm 5 Ahead	Inf	95.4 %	2090	2090		
				Arm 8 Right	Inf	4.6 %				
2/1 (Kingswood Rd)	3.75	0.00	Y	Arm 4 Right	15.00	39.3 %	1809	1809		
				Arm 5 Left	15.00	60.7 %				
3/1 (Burtonwood Rd (S))	3.30	0.00	Y	Arm 8 Ahead	Inf	0.0 %	1945	1945		
				Arm 4 Ahead	Inf	94.1 %				
3/2 (Burtonwood Rd (S))	3.20	0.00	N	Arm 8 Left	Inf	5.9 %	1886	1886		
				Arm 6 Right	15.00	100.0 %				
4/1	Infinite Saturation Flow						Inf	Inf		
5/1	Infinite Saturation Flow						Inf	Inf		
5/2	Infinite Saturation Flow						Inf	Inf		
6/1	Infinite Saturation Flow						Inf	Inf		
7/1 (Omega Access)	3.65	0.00	Y	Arm 4 Left	15.00	100.0 %	1800	1800		
7/2 (Omega Access)	3.65	0.00	Y	Arm 5 Right	15.00	100.0 %	1800	1800		
				Arm 6 Ahead	Inf	0.0 %				
8/1	Infinite Saturation Flow						Inf	Inf		

### Scenario 3: '2029 Scenario 4 AM' (FG7: '2029 Scenario 4 AM', Plan 1: 'Network Control Plan 1')

#### Traffic Flows, Desired

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	17	1111	37	1165
	B	40	0	38	0	78
	C	685	16	0	17	718
	D	92	0	116	0	208
	Tot.	817	33	1265	54	2169

## Full Input Data And Results

### Traffic Lane Flows

Lane	Scenario 3: 2029 Scenario 4 AM	
<b>Junction: Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>		
1/1		341
1/2		377
2/1		208
3/1 (with short)		1165(In) 1128(Out)
3/2 (short)		37
4/1		1265
5/1		370
5/2		447
6/1		54
7/1 (short)		38
7/2 (with short)		78(In) 40(Out)
8/1		33

### Lane Saturation Flows

Junction: Proposed Burtonwood Rd / Kingswood Rd / Omega Access										
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)		
1/1 (Burtonwood Rd (N))	3.35	0.00	Y	Arm 5 Ahead	Inf	95.0 %	1943	1943		
1/2 (Burtonwood Rd (N))	3.35			Arm 6 Left	20.00	5.0 %				
2/1 (Kingswood Rd)	3.75	0.00	N	Arm 5 Ahead	Inf	95.8 %	2090	2090		
				Arm 8 Right	Inf	4.2 %				
3/1 (Burtonwood Rd (S))	3.30	0.00	Y	Arm 4 Right	15.00	55.8 %	1809	1809		
				Arm 5 Left	15.00	44.2 %				
3/2 (Burtonwood Rd (S))	3.20	0.00	N	Arm 8 Ahead	Inf	0.0 %				
4/1	Infinite Saturation Flow						Inf	Inf		
5/1	Infinite Saturation Flow						Inf	Inf		
5/2	Infinite Saturation Flow						Inf	Inf		
6/1	Infinite Saturation Flow						Inf	Inf		
7/1 (Omega Access)	3.65	0.00	Y	Arm 4 Left	15.00	100.0 %	1800	1800		
7/2 (Omega Access)	3.65	0.00		Arm 5 Right	15.00	100.0 %	1800	1800		
8/1	Infinite Saturation Flow						Inf	Inf		

## Full Input Data And Results

### Scenario 4: '2029 Scenario 4 PM' (FG8: '2029 Scenario 4 PM', Plan 1: 'Network Control Plan 1')

#### Traffic Flows, Desired

##### Desired Flow :

Origin		Destination				
		A	B	C	D	Tot.
A	A	0	38	636	67	741
	B	24	0	22	0	46
	C	1434	36	0	87	1557
	D	58	0	37	0	95
Tot.		1516	74	695	154	2439

#### Traffic Lane Flows

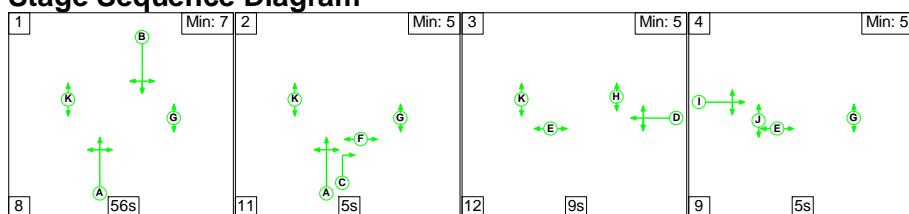
Lane	Scenario 4: 2029 Scenario 4 PM
<b>Junction: Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>	
1/1	744
1/2	813
2/1	95
3/1 (with short)	741(In) 674(Out)
3/2 (short)	67
4/1	695
5/1	686
5/2	830
6/1	154
7/1 (short)	22
7/2 (with short)	46(In) 24(Out)
8/1	74

## Full Input Data And Results

### Lane Saturation Flows

Junction: Proposed Burtonwood Rd / Kingswood Rd / Omega Access										
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)		
1/1 (Burtonwood Rd (N))	3.35	0.00	Y	Arm 5 Ahead	Inf	88.3 %	1933	1933		
				Arm 6 Left	20.00	11.7 %				
1/2 (Burtonwood Rd (N))	3.35	0.00	N	Arm 5 Ahead	Inf	95.6 %	2090	2090		
				Arm 8 Right	Inf	4.4 %				
2/1 (Kingswood Rd)	3.75	0.00	Y	Arm 4 Right	15.00	38.9 %	1809	1809		
				Arm 5 Left	15.00	61.1 %				
3/1 (Burtonwood Rd (S))	3.30	0.00	Y	Arm 8 Ahead	Inf	0.0 %	1945	1945		
				Arm 4 Ahead	Inf	94.4 %				
3/2 (Burtonwood Rd (S))	3.20	0.00	N	Arm 8 Left	Inf	5.6 %	1886	1886		
				Arm 6 Right	15.00	100.0 %				
4/1	Infinite Saturation Flow						Inf	Inf		
5/1	Infinite Saturation Flow						Inf	Inf		
5/2	Infinite Saturation Flow						Inf	Inf		
6/1	Infinite Saturation Flow						Inf	Inf		
7/1 (Omega Access)	3.65	0.00	Y	Arm 4 Left	15.00	100.0 %	1800	1800		
7/2 (Omega Access)	3.65	0.00	Y	Arm 5 Right	15.00	100.0 %	1800	1800		
				Arm 6 Ahead	Inf	0.0 %				
8/1	Infinite Saturation Flow						Inf	Inf		

### Scenario 1: 'Scenario 4 AM' (FG3: 'Scenario 4 AM ', Plan 1: 'Network Control Plan 1') Stage Sequence Diagram

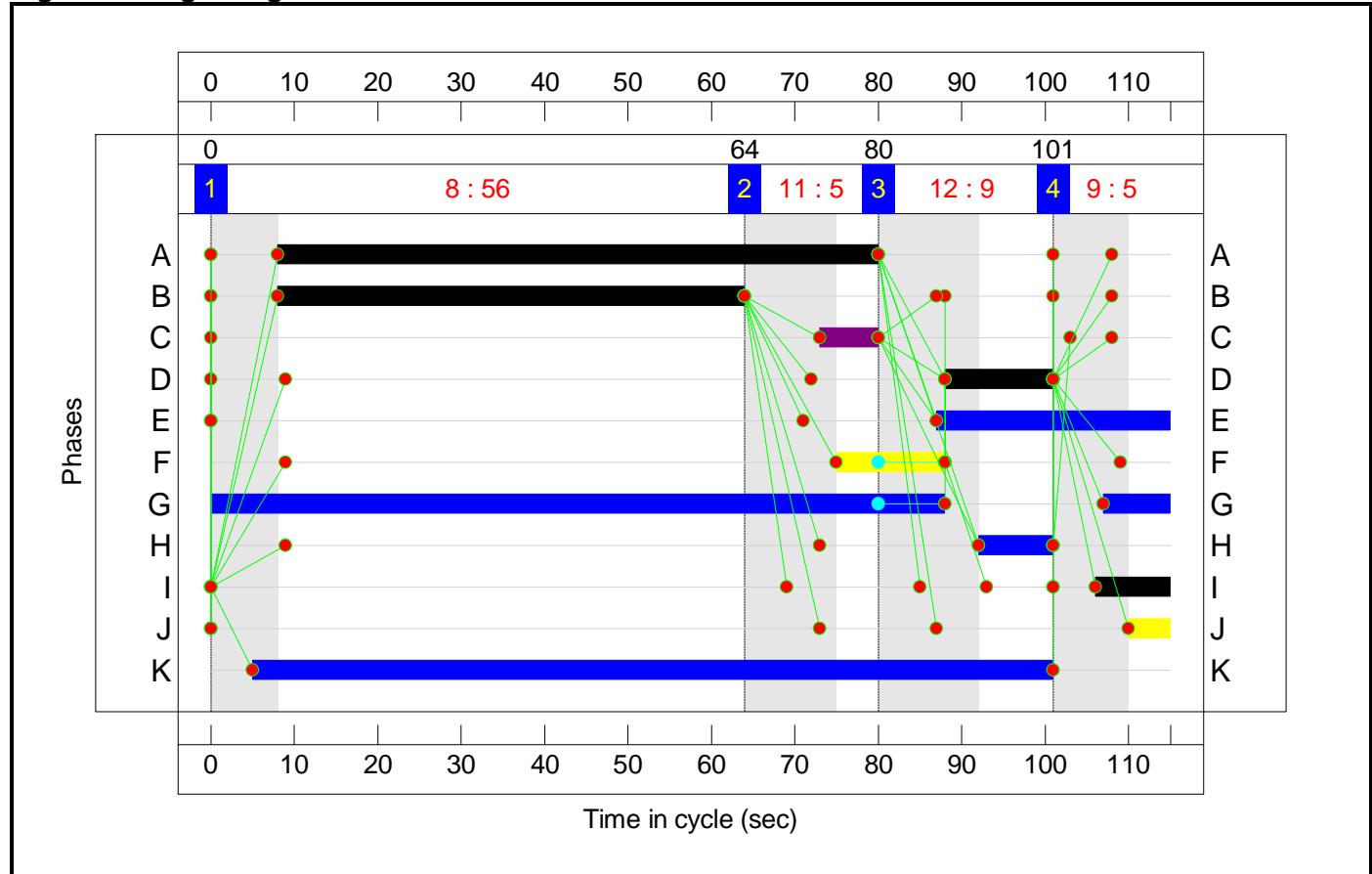


### Stage Timings

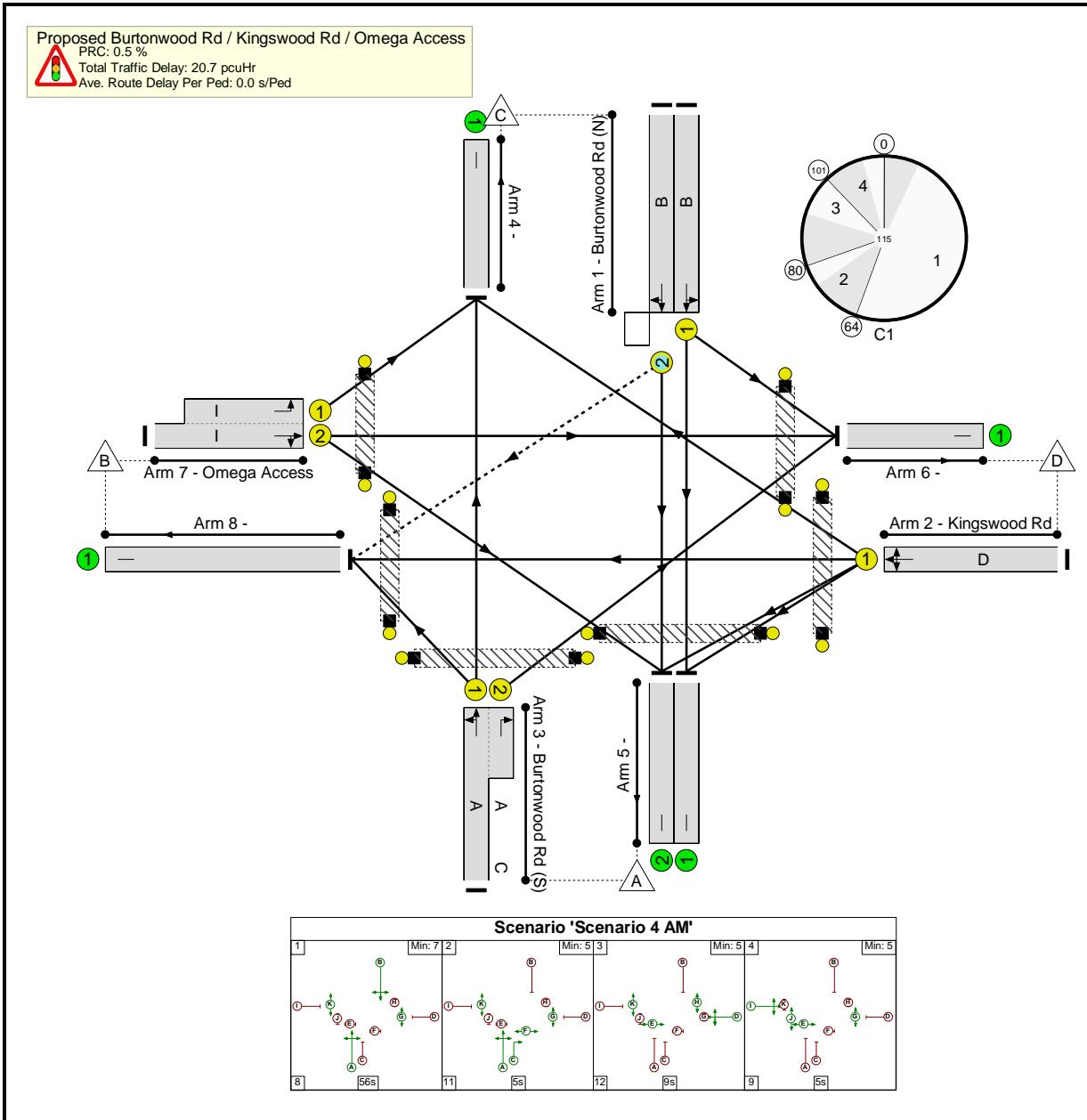
Stage	1	2	3	4
Duration	56	5	9	5
Change Point	0	64	80	101

## Full Input Data And Results

### Signal Timings Diagram



Full Input Data And Results  
Network Layout Diagram



## Full Input Data And Results

### Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network: Proposed Burtonwood Rd / Kingswood Rd / Omega Access_Revision</b>	-	-	N/A	-	-		-	-	-	-	-	-	89.6%
<b>Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>	-	-	N/A	-	-		-	-	-	-	-	-	89.6%
1/1	Burtonwood Rd (N) Ahead Left	U	N/A	N/A	B		1	56	-	323	1943	963	33.5%
1/2	Burtonwood Rd (N) Ahead Right	O	N/A	N/A	B		1	56	-	362	2090	1036	34.9%
2/1	Kingswood Rd Right Left Ahead	U	N/A	N/A	D		1	13	-	196	1809	220	89.0%
3/1+3/2	Burtonwood Rd (S) Ahead Right Left	U	N/A	N/A	A	C	1	72	7	1119	1945:1886	1210+39	89.6 : 89.6%
4/1		U	N/A	N/A	-		-	-	-	1214	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	351	Inf	Inf	0.0%
5/2		U	N/A	N/A	-		-	-	-	429	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	51	Inf	Inf	0.0%
7/2+7/1	Omega Access Left Right Ahead	U	N/A	N/A	I		1	9	-	78	1800:1800	157+157	25.6 : 24.3%
8/1		U	N/A	N/A	-		-	-	-	33	Inf	Inf	0.0%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	G		1	96	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	H		1	9	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	E		1	28	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	F		1	13	-	0	-	0	0.0%

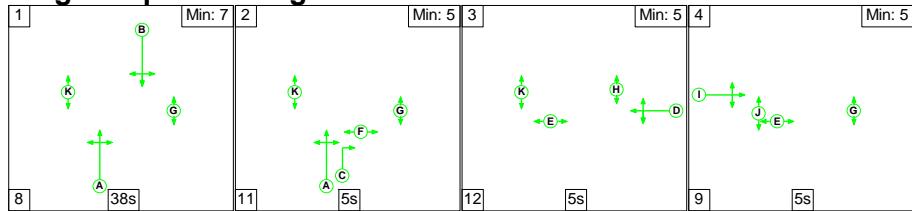
## Full Input Data And Results

Ped Link: P5	Unnamed Ped Link	-	N/A	-	J		1	5	-	0	-	0	0.0%
Ped Link: P6	Unnamed Ped Link	-	N/A	-	K		1	96	-	0	-	0	0.0%
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network: Proposed Burtonwood Rd / Kingswood Rd / Omega Access_Revision</b>	-	-	16	0	0	12.6	7.9	0.2	20.7	-	-	-	-
<b>Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>	-	-	16	0	0	12.6	7.9	0.2	20.7	-	-	-	-
1/1	323	323	-	-	-	1.6	0.3	-	1.8	20.4	6.2	0.3	6.4
1/2	362	362	16	0	0	1.8	0.3	0.2	2.2	22.2	7.0	0.3	7.3
2/1	196	196	-	-	-	2.7	3.2	-	5.9	108.5	6.2	3.2	9.4
3/1+3/2	1119	1119	-	-	-	5.4	4.0	-	9.5	30.5	29.7	4.0	33.7
4/1	1214	1214	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	351	351	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	429	429	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	51	51	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2+7/1	78	78	-	-	-	1.1	0.2	-	1.2	56.7	1.2	0.2	1.4
8/1	33	33	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P5	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P6	0	0	-	-	-	-	-	-	-	-	-	-	-
C1	PRC for Signalled Lanes (%): PRC Over All Lanes (%):			0.5	Total Delay for Signalled Lanes (pcuHr): Total Delay Over All Lanes(pcuHr):			20.68	Cycle Time (s): 115				

## Full Input Data And Results

**Scenario 2: 'Scenario 4 PM'** (FG4: 'Scenario 4 PM ', Plan 1: 'Network Control Plan 1')

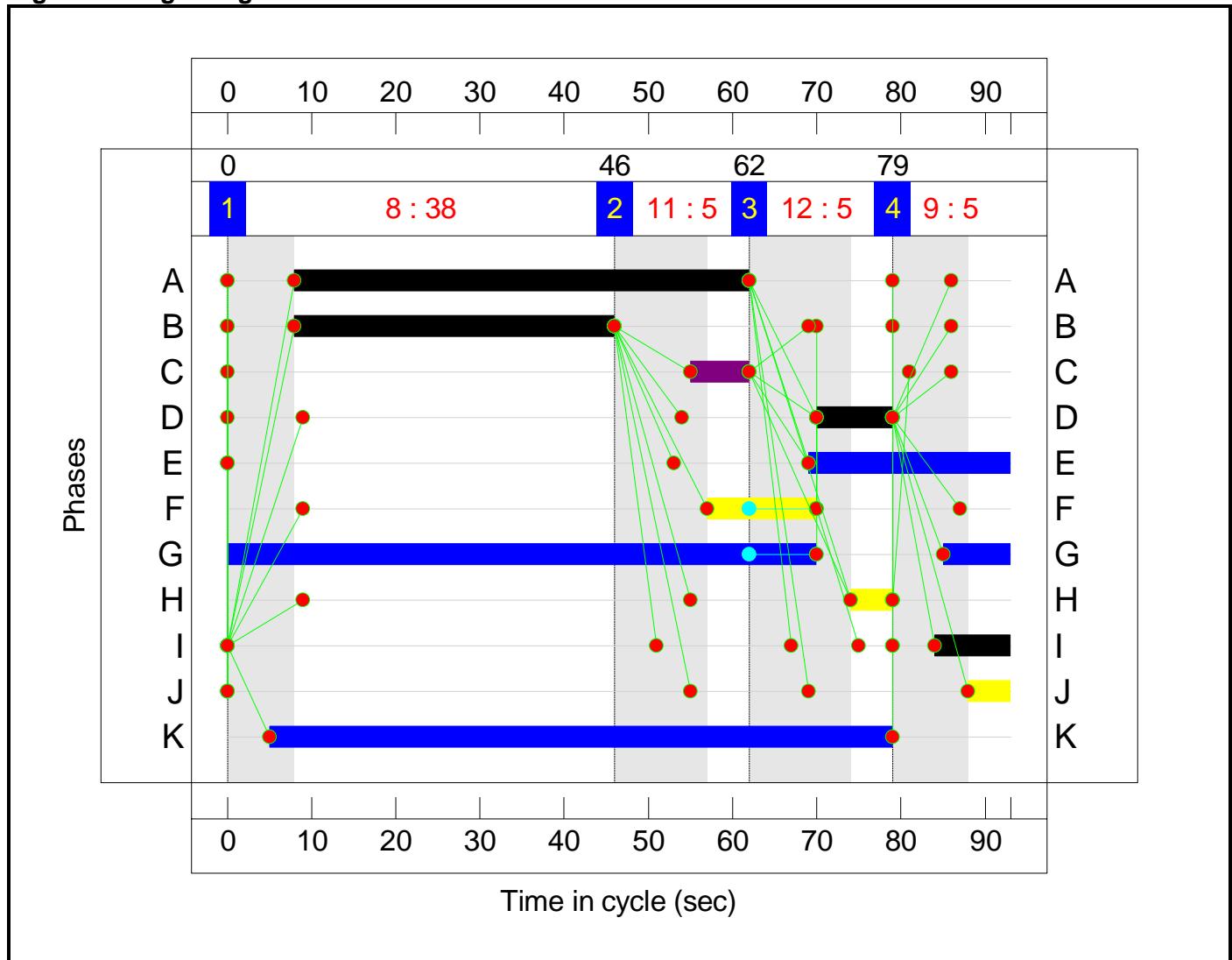
### Stage Sequence Diagram



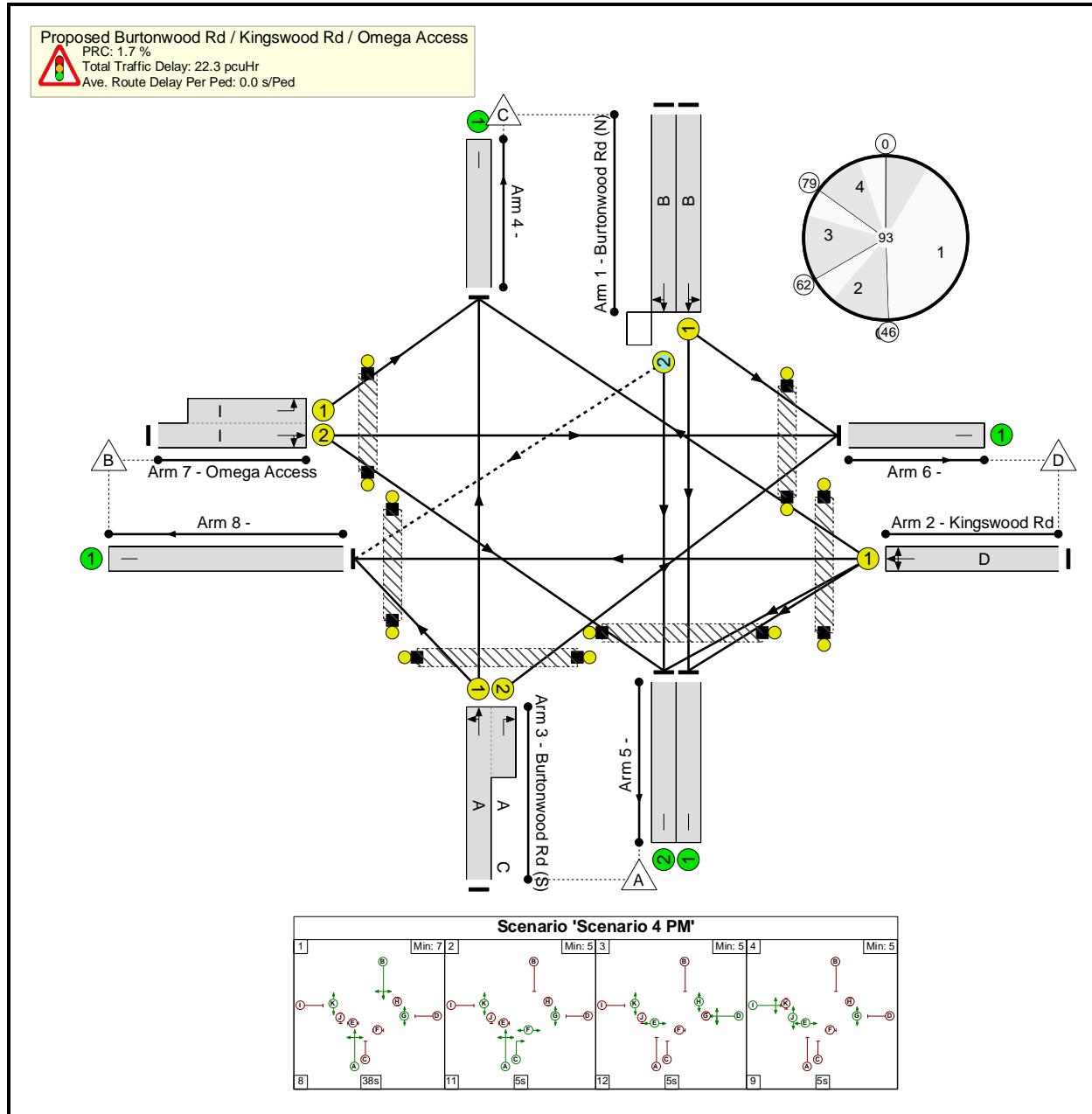
### Stage Timings

Stage	1	2	3	4
Duration	38	5	5	5
Change Point	0	46	62	79

### Signal Timings Diagram



Full Input Data And Results  
**Network Layout Diagram**



## Full Input Data And Results

### Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network: Proposed Burtonwood Rd / Kingswood Rd / Omega Access_Revision</b>	-	-	N/A	-	-	-	-	-	-	-	-	-	88.5%
<b>Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>	-	-	N/A	-	-	-	-	-	-	-	-	-	88.5%
1/1	Burtonwood Rd (N) Ahead Left	U	N/A	N/A	B		1	38	-	711	1933	811	87.7%
1/2	Burtonwood Rd (N) Ahead Right	O	N/A	N/A	B		1	38	-	776	2090	876	88.5%
2/1	Kingswood Rd Right Left Ahead	U	N/A	N/A	D		1	9	-	89	1809	195	45.8%
3/1+3/2	Burtonwood Rd (S) Ahead Right Left	U	N/A	N/A	A	C	1	54	7	711	1945:1886	1074+104	60.4 : 60.4%
4/1		U	N/A	N/A	-		-	-	-	667	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	656	Inf	Inf	0.0%
5/2		U	N/A	N/A	-		-	-	-	791	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	145	Inf	Inf	0.0%
7/2+7/1	Omega Access Left Right Ahead	U	N/A	N/A	I		1	9	-	46	1800:1800	194+194	12.4 : 11.4%
8/1		U	N/A	N/A	-		-	-	-	74	Inf	Inf	0.0%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	G		1	78	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	H		1	5	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	E		1	24	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	F		1	13	-	0	-	0	0.0%

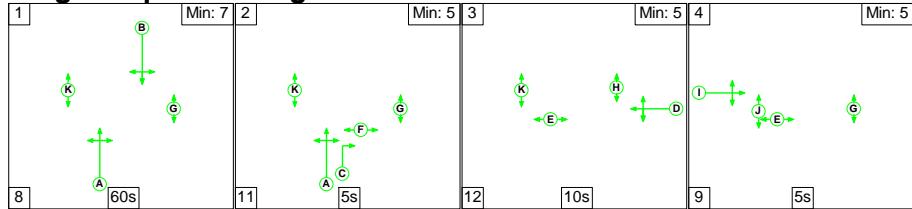
## Full Input Data And Results

Ped Link: P5	Unnamed Ped Link	-	N/A	-	J		1	5	-	0	-	0	0.0%
Ped Link: P6	Unnamed Ped Link	-	N/A	-	K		1	74	-	0	-	0	0.0%
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network: Proposed Burtonwood Rd / Kingswood Rd / Omega Access_Revision</b>	-	-	36	0	0	14.0	8.2	0.1	22.3	-	-	-	-
<b>Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>	-	-	36	0	0	14.0	8.2	0.1	22.3	-	-	-	-
1/1	711	711	-	-	-	4.9	3.3	-	8.2	41.7	16.8	3.3	20.1
1/2	776	776	36	0	0	5.4	3.6	0.1	9.0	42.0	18.3	3.6	21.9
2/1	89	89	-	-	-	1.0	0.4	-	1.4	55.9	2.2	0.4	2.6
3/1+3/2	711	711	-	-	-	2.3	0.8	-	3.1	15.4	10.8	0.8	11.6
4/1	667	667	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	656	656	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	791	791	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	145	145	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2+7/1	46	46	-	-	-	0.5	0.1	-	0.5	42.8	0.6	0.1	0.6
8/1	74	74	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P5	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P6	0	0	-	-	-	-	-	-	-	-	-	-	-
C1	PRC for Signalled Lanes (%):			1.7	Total Delay for Signalled Lanes (pcuHr):			22.27	Cycle Time (s):			93	
	PRC Over All Lanes (%):			1.7	Total Delay Over All Lanes(pcuHr):			22.27					

## Full Input Data And Results

**Scenario 3: '2029 Scenario 4 AM' (FG7: '2029 Scenario 4 AM', Plan 1: 'Network Control Plan 1')**

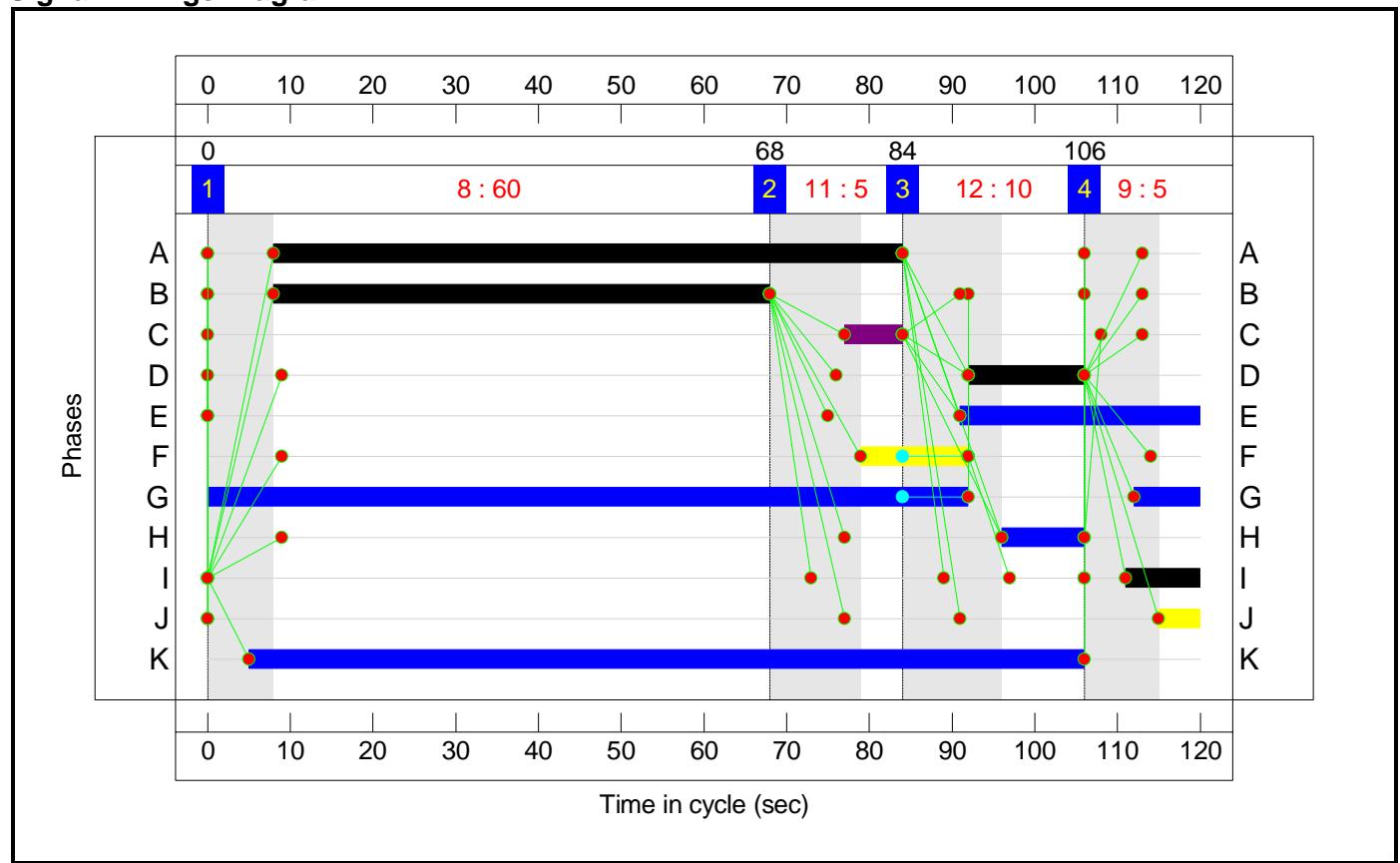
### Stage Sequence Diagram



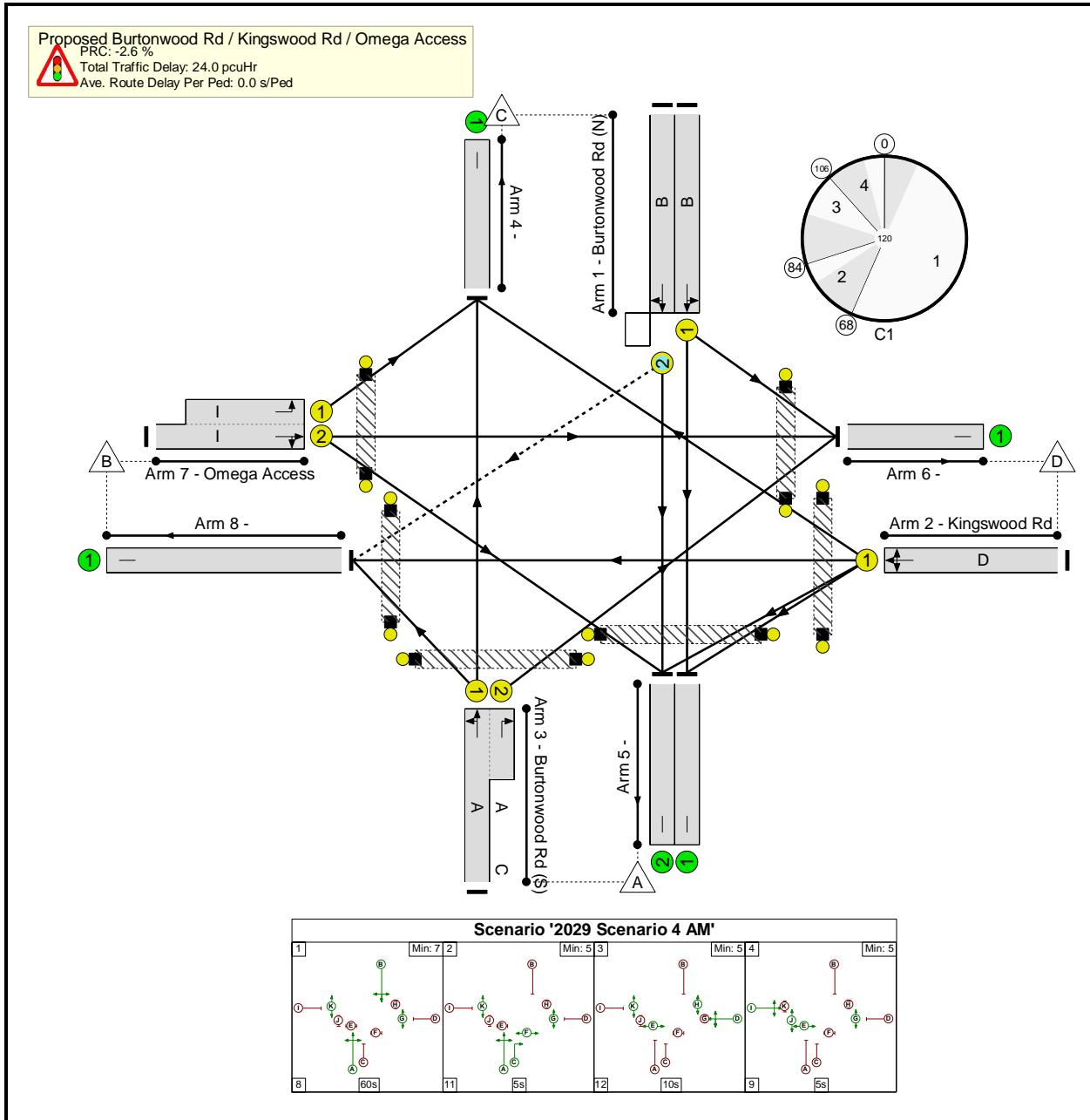
### Stage Timings

Stage	1	2	3	4
Duration	60	5	10	5
Change Point	0	68	84	106

### Signal Timings Diagram



Full Input Data And Results  
Network Layout Diagram



## Full Input Data And Results

### Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network: Proposed Burtonwood Rd / Kingswood Rd / Omega Access_Revision</b>	-	-	N/A	-	-		-	-	-	-	-	-	92.3%
<b>Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>	-	-	N/A	-	-		-	-	-	-	-	-	92.3%
1/1	Burtonwood Rd (N) Ahead Left	U	N/A	N/A	B		1	60	-	341	1943	988	34.5%
1/2	Burtonwood Rd (N) Ahead Right	O	N/A	N/A	B		1	60	-	377	2090	1062	35.5%
2/1	Kingswood Rd Right Left Ahead	U	N/A	N/A	D		1	14	-	208	1809	226	92.0%
3/1+3/2	Burtonwood Rd (S) Ahead Right Left	U	N/A	N/A	A	C	1	76	7	1165	1945:1886	1222+40	92.3 : 92.3%
4/1		U	N/A	N/A	-		-	-	-	1265	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	370	Inf	Inf	0.0%
5/2		U	N/A	N/A	-		-	-	-	447	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	54	Inf	Inf	0.0%
7/2+7/1	Omega Access Left Right Ahead	U	N/A	N/A	I		1	9	-	78	1800:1800	150+150	26.7 : 25.3%
8/1		U	N/A	N/A	-		-	-	-	33	Inf	Inf	0.0%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	G		1	100	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	H		1	10	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	E		1	29	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	F		1	13	-	0	-	0	0.0%

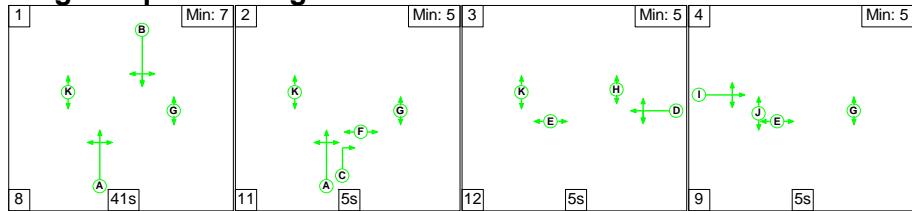
## Full Input Data And Results

Ped Link: P5	Unnamed Ped Link	-	N/A	-	J		1	5	-	0	-	0	0.0%
Ped Link: P6	Unnamed Ped Link	-	N/A	-	K		1	101	-	0	-	0	0.0%
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network: Proposed Burtonwood Rd / Kingswood Rd / Omega Access_Revision</b>	-	-	16	0	0	13.7	10.1	0.2	24.0	-	-	-	-
<b>Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>	-	-	16	0	0	13.7	10.1	0.2	24.0	-	-	-	-
1/1	341	341	-	-	-	1.7	0.3	-	1.9	20.4	6.7	0.3	7.0
1/2	377	377	16	0	0	1.9	0.3	0.2	2.3	22.4	7.4	0.3	7.7
2/1	208	208	-	-	-	3.0	4.0	-	7.0	120.9	6.8	4.0	10.8
3/1+3/2	1165	1165	-	-	-	6.0	5.4	-	11.4	35.3	33.8	5.4	39.2
4/1	1265	1265	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	370	370	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	447	447	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	54	54	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2+7/1	78	78	-	-	-	1.1	0.2	-	1.3	59.7	1.2	0.2	1.4
8/1	33	33	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P5	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P6	0	0	-	-	-	-	-	-	-	-	-	-	-
C1	PRC for Signalled Lanes (%): -2.6			PRC Over All Lanes (%): -2.6			Total Delay for Signalled Lanes (pcuHr): 23.97			Cycle Time (s): 120			
							Total Delay Over All Lanes(pcuHr): 23.97						

## Full Input Data And Results

**Scenario 4: '2029 Scenario 4 PM'** (FG8: '2029 Scenario 4 PM', Plan 1: 'Network Control Plan 1')

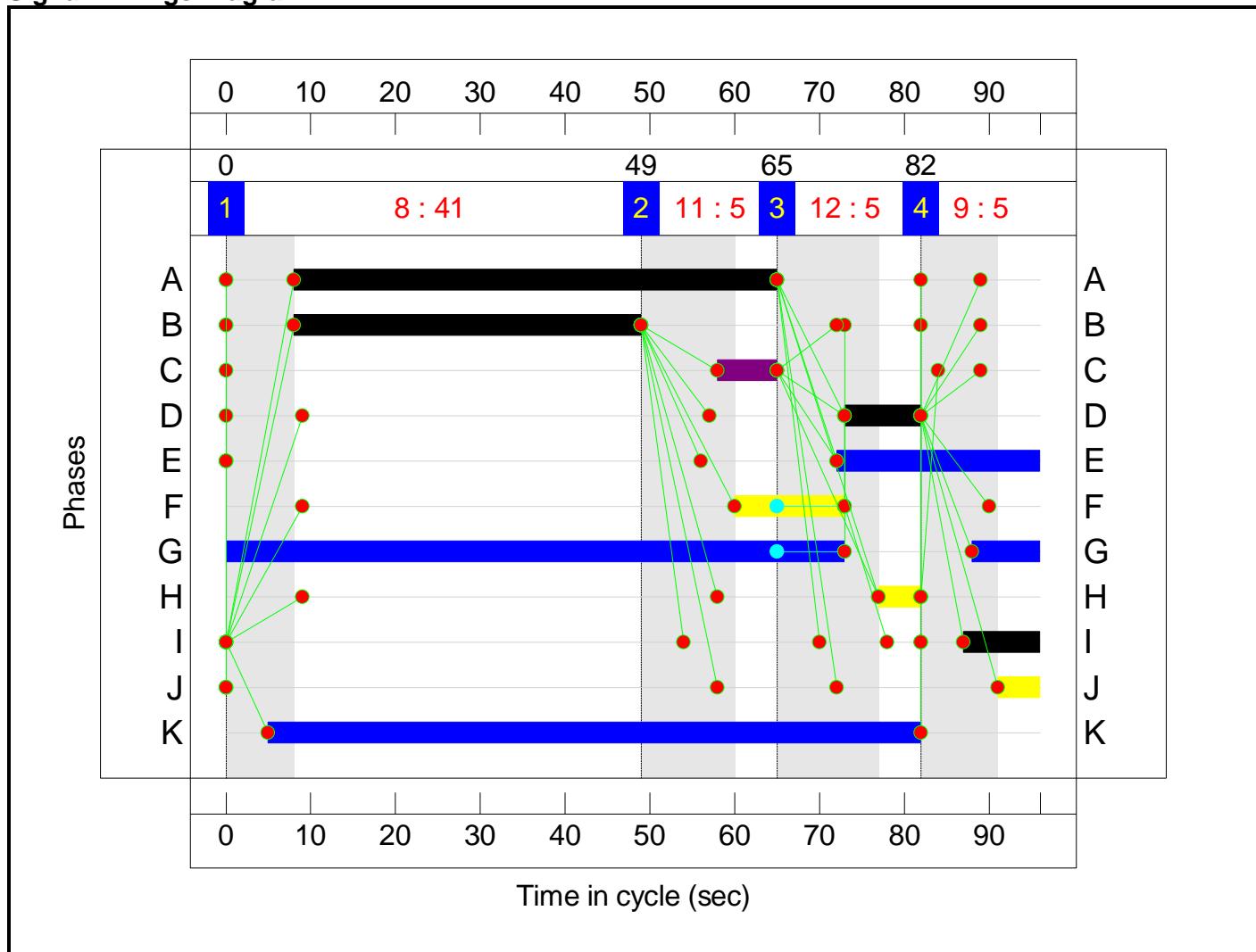
### Stage Sequence Diagram



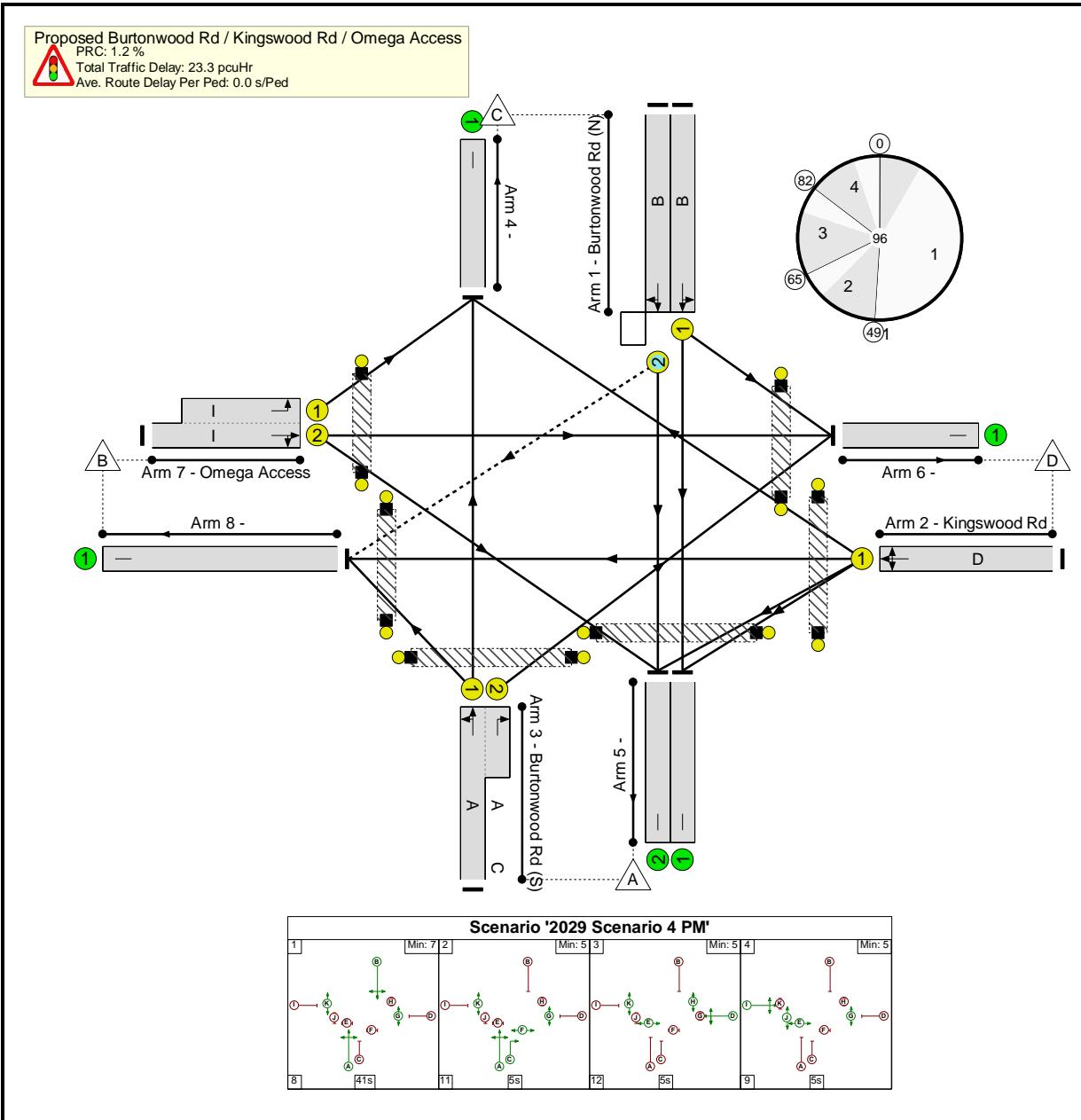
### Stage Timings

Stage	1	2	3	4
Duration	41	5	5	5
Change Point	0	49	65	82

### Signal Timings Diagram



Full Input Data And Results  
Network Layout Diagram



## Full Input Data And Results

### Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network: Proposed Burtonwood Rd / Kingswood Rd / Omega Access_Revision</b>	-	-	N/A	-	-	-	-	-	-	-	-	-	88.9%
<b>Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>	-	-	N/A	-	-	-	-	-	-	-	-	-	88.9%
1/1	Burtonwood Rd (N) Ahead Left	U	N/A	N/A	B		1	41	-	744	1933	846	88.0%
1/2	Burtonwood Rd (N) Ahead Right	O	N/A	N/A	B		1	41	-	813	2090	914	88.9%
2/1	Kingswood Rd Right Left Ahead	U	N/A	N/A	D		1	9	-	95	1809	188	50.4%
3/1+3/2	Burtonwood Rd (S) Ahead Right Left	U	N/A	N/A	A	C	1	57	7	741	1945:1886	1093+109	61.6 : 61.6%
4/1		U	N/A	N/A	-		-	-	-	695	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	686	Inf	Inf	0.0%
5/2		U	N/A	N/A	-		-	-	-	830	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	154	Inf	Inf	0.0%
7/2+7/1	Omega Access Left Right Ahead	U	N/A	N/A	I		1	9	-	46	1800:1800	187+187	12.8 : 11.7%
8/1		U	N/A	N/A	-		-	-	-	74	Inf	Inf	0.0%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	G		1	81	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	H		1	5	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	E		1	24	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	F		1	13	-	0	-	0	0.0%

## Full Input Data And Results

Ped Link: P5	Unnamed Ped Link	-	N/A	-	J		1	5	-	0	-	0	0.0%
Ped Link: P6	Unnamed Ped Link	-	N/A	-	K		1	77	-	0	-	0	0.0%
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network: Proposed Burtonwood Rd / Kingswood Rd / Omega Access_Revision</b>	-	-	36	0	0	14.7	8.5	0.1	23.3	-	-	-	-
<b>Proposed Burtonwood Rd / Kingswood Rd / Omega Access</b>	-	-	36	0	0	14.7	8.5	0.1	23.3	-	-	-	-
1/1	744	744	-	-	-	5.1	3.4	-	8.5	41.3	18.0	3.4	21.4
1/2	813	813	36	0	0	5.6	3.7	0.1	9.4	41.7	19.9	3.7	23.6
2/1	95	95	-	-	-	1.1	0.5	-	1.6	59.7	2.4	0.5	2.9
3/1+3/2	741	741	-	-	-	2.4	0.8	-	3.2	15.4	11.7	0.8	12.5
4/1	695	695	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	686	686	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	830	830	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	154	154	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2+7/1	46	46	-	-	-	0.5	0.1	-	0.6	44.5	0.6	0.1	0.6
8/1	74	74	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P5	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P6	0	0	-	-	-	-	-	-	-	-	-	-	-
C1	PRC for Signalled Lanes (%):			1.2	Total Delay for Signalled Lanes (pcuHr):			23.26	Cycle Time (s):			96	
	PRC Over All Lanes (%):			1.2	Total Delay Over All Lanes(pcuHr):			23.26					

# **Appendix D**

## **PROPOSED MITIGATION TRANSYT MODELLING RESULTS**

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**Filename:** Junction 8 M62 \_PrMit- Sc4 & Sc5 Highways England Response May 2020.t15

**Path:** C:\Users\lukaps002\Desktop\OMEGA\Zone 8 Responses

**Report generation date:** 14/05/2020 17:35:13

»A5 - 2021 AM Scenario 4 : D5 - 2021 AM Scenario 4\* :

»A6 - 2021 PM Scenario 4 : D6 - 2021 PM Scenario 4\* :

## Network Diagrams



# A5 - 2021 AM Scenario 4

## D5 - 2021 AM Scenario 4\*

### Signal Timings

Network Default: 70s cycle time; 70 steps

#### Intergreen Matrix for Controller Stream 1

	To					
	A	B	C	D	E	F
From	A		6		0	
	B		5	5		
	C	6	6			6
	D		11			
	E	8				
	F		5			

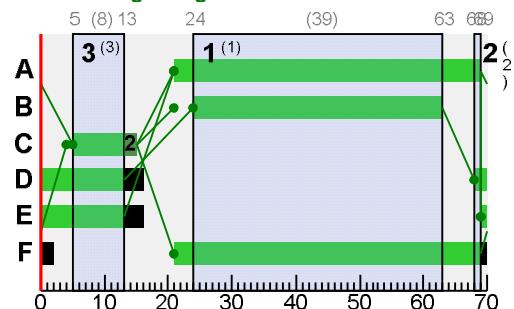
#### Resultant Stages

Controller Stream	Resultant 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	Ü	1	B,F,A	24	63	39	1	7
	2	Ü	2	A,D,F	68	69	1	1	1
	3	Ü	3	C,D,E	5	13	8	1	5

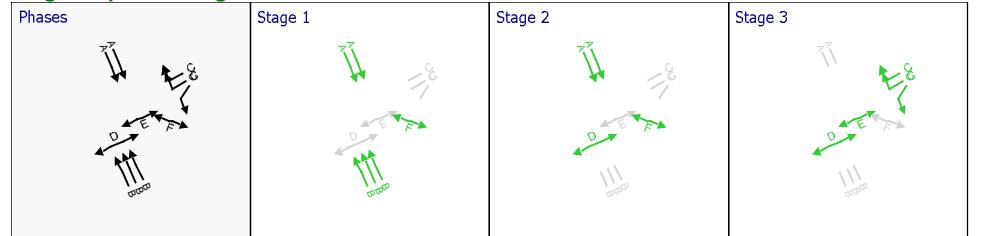
#### Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
1	1	1	1	B	24	63	39
3	2	1	1	B	24	63	39
4	1	1	1	B	24	63	39
5	1	1	1	C	5	15	10
6	1	1	1	C	5	15	10
7	1	1	1	C	5	15	10
54	1	1	1	A	21	69	48
54	2	1	1	A	21	69	48

#### Phase Timings Diagram for Controller Stream 1



**Stage Sequence Diagram for Controller Stream 1**



**Intergreen Matrix for Controller Stream 2**

		To								
		C	D	E	F	G	H	I	J	
From	C	5								
	D	5								
	E			5	5					
	F		5			5				
	G		5			5				
	H			13	13					
	I							6		
	J								9	

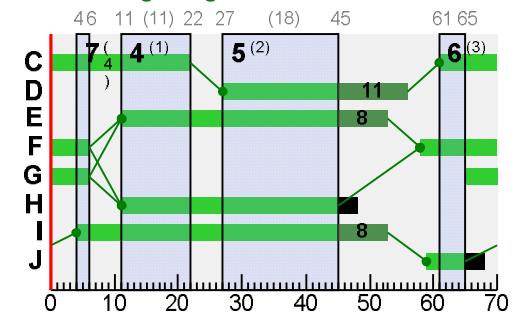
**Resultant Stages**

Controller Stream	Resultant 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)
2	1	Ü	4	C,E,H,I	11	22	11	1	1
	2	Ü	5	D,E,H,I	27	45	18	1	1
	3	Ü	6	C,F,J	61	65	4	1	4
	4	Ü	7	C,F,G,I	4	6	2	1	1

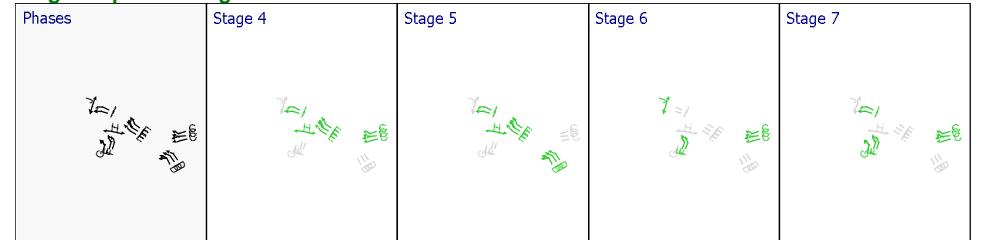
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
16	1	2	2	D	27	56	29
16	2	2	2	D	27	56	29
16	3	2	2	D	27	56	29
17	1	2	2	C	61	22	31
19	1	2	2	C	61	22	31
19	2	2	2	C	61	22	31
20	1	3	2	E	11	53	42
20	2	3	2	E	11	53	42
20	3	3	2	E	11	53	42
23	1	3	2	F	58	6	18
24	1	3	2	G	65	6	11
25	1	3	2	F	58	6	18
28	1	3	2	I	4	53	49
28	2	3	2	I	4	53	49

**Phase Timings Diagram for Controller Stream 2**



**Stage Sequence Diagram for Controller Stream 2**



**Intergreen Matrix for Controller Stream 3**

		To	
		K	L
From	K	6	
	L	8	

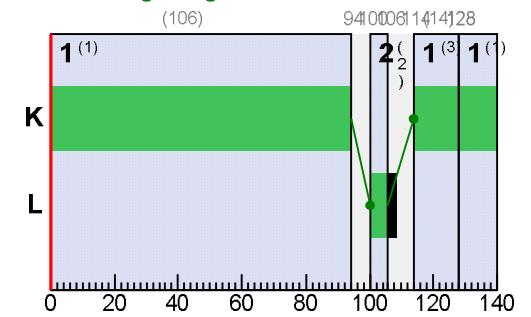
**Resultant Stages**

Controller Stream	Resultant 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)
3	1	Ü	1	K	128	94	106	1	1
	2	Ü	2	L	100	106	6	1	6
	3	Ü	1	K	114	128	14	1	1

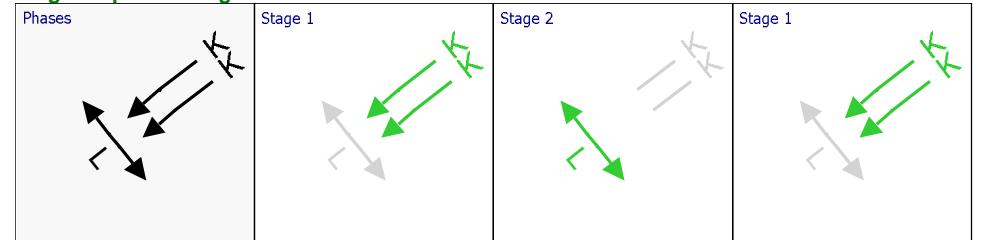
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
21	1	4	3	K	114	94	120
21	2	4	3	K	114	94	120

**Phase Timings Diagram for Controller Stream 3**



**Stage Sequence Diagram for Controller Stream 3**



**Intergreen Matrix for Controller Stream 4**

From	To		
	A	B	E
A	5		
B	6		5
E	12		

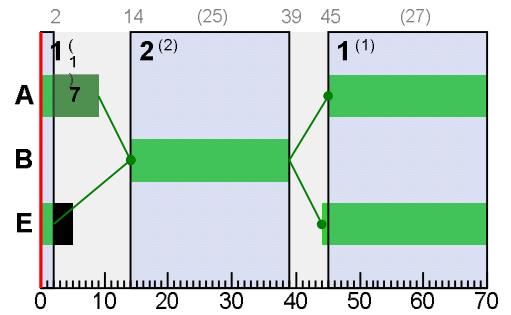
**Resultant Stages**

Controller Stream	Resultant 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)
4	1	Ü	1	A,E	45	2	27	1	6
	2	Ü	2	B	14	39	25	1	7

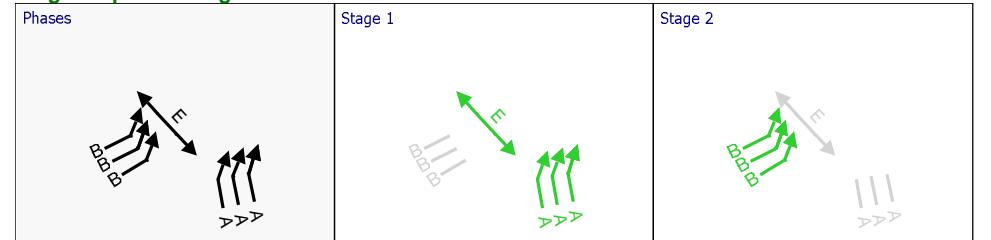
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
30	1	5	4	A	45	9	34
30	2	5	4	A	45	9	34
30	3	5	4	A	45	9	34
31	1	5	4	B	14	39	25
32	1	5	4	B	14	39	25
34	1	5	4	B	14	39	25

**Phase Timings Diagram for Controller Stream 4**



**Stage Sequence Diagram for Controller Stream 4**



**Intergreen Matrix for Controller Stream 5**

		To	
		C	D
From	C		5
	D	5	

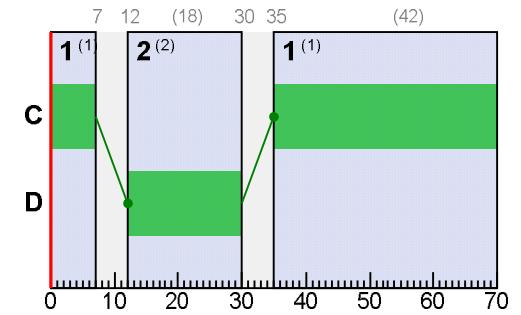
**Resultant Stages**

Controller Stream	Resultant 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)
5	1	Ü	1	C	35	7	42	1	7
	2	Ü	2	D	12	30	18	1	7

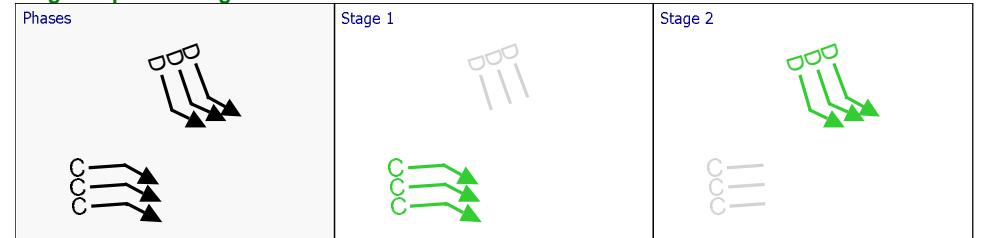
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
36	1	6	5	C	35	7	42
36	2	6	5	C	35	7	42
36	3	6	5	C	35	7	42
37	1	6	5	D	12	30	18
38	1	6	5	D	12	30	18
39	1	6	5	D	12	30	18

**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	6	
	B	5	

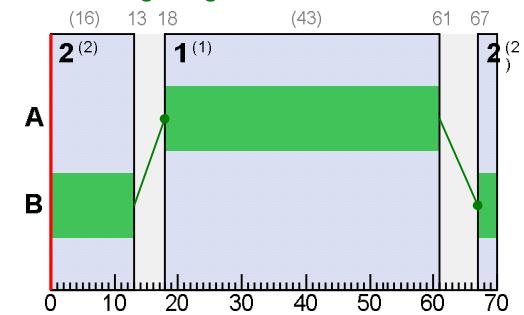
**Resultant Stages**

Controller Stream	Resultant 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)
6	1	Ü	1	A	18	61	43	1	7
	2	Ü	2	B	67	13	16	1	7

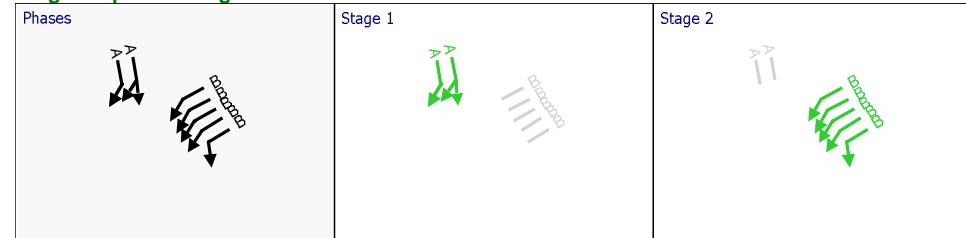
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
44	1	7	6	A	18	61	43
45	2	7	6	A	18	61	43
48	1	7	6	B	67	13	16
49	1	7	6	B	67	13	16
49	2	7	6	B	67	13	16
51	1	7	6	B	67	13	16
51	2	7	6	B	67	13	16

Phase Timings Diagram for Controller Stream 6



Stage Sequence Diagram for Controller Stream 6



## Final Prediction Table

### Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES	WEIGHTS		PENALTIES	P.I.
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting multiplier (%)	Stop weighting multiplier (%)	Cost of traffic penalties (£ per hr)	P.I.
RA	1		R3			590	2299	70	16.00	26	251	12.27	0.27	0.00	0.04	100	100	0.00	0.63
RAC	1		R3			34	Unrestricted	70	70.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RAX	1					913	1800	70	0.00	51	77	13.03	1.03	0.00	0.26	100	100	0.00	3.70
RB	1		R4			78	1395	70	0.00	6	1509	12.08	0.08	0.00	0.00	100	100	0.00	0.02
RBc	1		R4			434	Unrestricted	70	16.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RBx	1					190	Unrestricted	70	16.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RC	1		R1			783	1677	70	0.00	47	93	12.94	0.94	0.00	0.20	100	100	0.00	2.90
RCc	1		R1			74	Unrestricted	70	0.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RCx	1					438	Unrestricted	70	16.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RD	1		R2			90	757	70	0.00	12	657	12.32	0.32	0.00	0.01	100	100	0.00	0.11
RDc	1		R2			857	Unrestricted	70	0.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RDx	1					0	Unrestricted	70	70.00	0	Unrestricted	0.00	0.00	0.00	0.00	100	100	0.00	0.00
1	1	Burtonwood Road South	1	1	B	396	1980	39	0.73	36	152	17.60	9.14	49.84	3.84	100	100	0.00	16.76
2	1	Burtonwood Road South	1			1215	1980	70	0.00	61	47	5.48	1.44	0.00	0.49	100	100	0.00	6.90
3	2	Burtonwood Road South	1	1	B	424	2120	39	1.36	36	148	15.27	9.29	52.63	4.34	100	100	0.00	18.33
4	1	Burtonwood Road South	1	1	B	395	1975	39	0.71	36	153	15.29	9.14	52.56	4.05	100	100	0.00	16.84
5	1	Charon Way Left	1	1	C	17	1995	10	10.00	5	1560	27.63	25.61	83.07	0.28	100	100	0.00	1.89
6	1	Charon Way Right	1	1	C	161 <	1842	10	0.11	56	60	37.33	35.27	98.18	3.08 +	100	100	0.00	24.38

7	1	Charon Way Right	1	1	C	158	1819	10	0.00	55	63	47.94	34.92	97.81	3.01	100	100	0.00	23.70
8	1	Charon Way	1			178	1653	70	0.00	11	736	11.31	0.13	0.00	0.01	100	100	0.00	0.09
10	1	Charon Way	1			336	1962	70	0.00	17	426	5.27	0.19	0.00	0.02	100	100	0.00	0.25
11	1	Burtonwood Road South	1			819	2120	70	0.00	39	133	3.10	0.53	0.00	0.12	100	100	0.00	1.73
12	1	Burtonwood Road South	1			335	1980	70	31.00	17	431	4.91	0.19	0.00	0.02	100	100	0.00	0.25
13	1		1			335	Unrestricted	70	31.00	0	Unrestricted	10.75	0.00	0.00	0.00	100	100	0.00	0.00
14	1					352	Unrestricted	70	30.00	0	Unrestricted	7.24	0.00	0.00	0.00	100	100	0.00	0.00
15	1	Omega Road North	1			336	1934	70	24.21	20	350	17.75	2.42	28.16	1.72	100	100	0.00	4.40
	2	Burtonwood Road North	1			336	1937	70	24.21	20	351	18.14	2.42	28.16	1.72	100	100	0.00	4.40
16	1		2	2	D	513	1900	29	0.00	63	43	26.16	19.57	76.04	7.88	100	100	0.00	44.50
	2		2	2	D	512	1900	29	0.79	65	39	26.73	20.08	76.60	7.92	100	100	0.00	45.46
	3		2	2	D	513	1900	29	0.79	65	39	26.83	20.11	76.72	7.94	100	100	0.00	45.63
17	1		2	2	C	240	1900	31	11.21	28	224	12.57	8.77	45.17	2.10	100	100	0.00	9.64
18	1		2			575	1900	70	31.00	30	198	7.91	0.41	0.00	0.07	100	100	0.00	0.93
	2		2			782	1900	70	26.28	43	109	8.38	0.86	4.46	1.61	100	100	0.00	3.10
19	1		2	2	C	575	1900	31	5.00	66	36	11.32	6.89	18.35	2.67	100	100	0.00	16.94
	2		2	2	C	542 <	1900	31	5.00	62	44	14.34	10.19	45.69	4.82 +	100	100	0.40	25.29
20	1		3	2	E	553	1900	42	15.32	48	89	12.67	6.62	31.92	3.43	100	100	0.00	16.63
	2		3	2	E	752	1900	42	4.13	65	39	13.38	7.36	30.17	4.29	100	100	0.74	25.40
	3		3	2	E	513	1900	42	19.11	44	104	10.44	4.28	14.59	1.62	100	100	0.00	9.60
21	1		4	3	K	607	1900	120	0.47	37	143	8.19	2.60	17.13	4.49	100	100	0.41	7.93
	2		4	3	K	471	1900	120	0.32	29	213	8.15	2.19	16.10	3.10	100	100	0.00	5.02
22	1					607	Unrestricted	140	19.00	0	Unrestricted	7.19	0.00	0.00	0.00	100	100	0.00	0.00
	2					471	Unrestricted	140	19.00	0	Unrestricted	7.22	0.00	0.00	0.00	100	100	0.00	0.00
23	1		3	2	F	154	1900	18	0.21	30	198	30.82	21.85	80.68	2.42	100	100	0.00	14.83
24	1		3	2	G	106	1900	11	0.00	33	177	36.00	28.13	89.47	1.84	100	100	0.00	12.95
25	1		3	2	F	319	1900	18	0.00	62	45	36.87	28.10	92.12	5.72	100	100	0.00	39.04
27	1		3			106	1900	70	0.00	6	1513	4.73	0.06	0.00	0.00	100	100	0.00	0.02
	2		3			473	1900	70	0.00	25	262	4.99	0.31	0.00	0.04	100	100	0.00	0.59
28	1		3	2	I	606	1900	49	22.63	51	75	7.75	3.41	26.16	3.19	100	100	0.00	10.12
	2		3	2	I	183	1900	49	24.32	15	485	7.42	2.73	51.49	1.63	100	100	0.00	3.14
29	1					788	Unrestricted	70	35.00	0	Unrestricted	10.40	0.00	0.00	0.00	100	100	0.00	0.00
30	1		5	4	A	464	1900	34	4.63	50	81	23.27	10.42	58.41	5.34	100	100	0.00	22.48
	2		5	4	A	477	1900	34	4.26	51	78	19.28	6.53	24.33	2.20	100	100	0.00	13.74
	3		5	4	A	667	1900	34	5.05	72	24	23.03	10.36	57.81	12.57	100	100	0.00	32.08
31	1		5	4	B	264	1900	25	0.37	38	137	31.53	17.79	70.81	3.64	100	100	0.00	20.87
32	1		5	4	B	332 <	1900	25	0.26	48	89	19.07	16.60	49.77	3.21 +	100	100	0.00	23.81
33	1		5			464	1900	70	18.80	33	170	14.84	3.77	30.16	3.02	100	100	0.00	8.66
34	1		5	4	B	132	1900	25	3.11	19	379	16.43	14.04	47.28	1.21	100	100	0.00	8.09
35	1		6			596	1900	70	16.00	31	187	22.89	0.43	0.00	0.07	100	100	0.00	1.02
36	1		6	5	C	477	1900	42	16.37	41	118	22.49	8.94	39.98	3.71	100	100	0.00	19.21
	2		6	5	C	999	1900	42	3.95	88	3	30.60	17.64	58.74	11.67	100	100	0.00	76.88
	3		6	5	C	264	1900	42	26.47	23	294	20.21	7.76	83.78	4.45	100	100	0.00	10.86
37	1		6	5	D	304	1900	18	0.53	61	48	39.41	27.83	89.24	5.29	100	100	0.00	36.77
38	1		6	5	D	437 <	1900	18	0.79	88	2	56.23	48.99	122.09	10.62 +	100	100	0.00	91.13
39	1		6	5	D	178	1900	18	1.26	35	157	29.71	22.53	81.27	2.81	100	100	0.00	17.64
40	1		6																

46	1		7			788	1900	70	0.00	41	117	8.50	0.67	0.00	0.15	100	100	0.00	2.08
47	1		7			588	1900	70	0.00	31	191	4.36	0.42	0.00	0.07	100	100	0.00	0.98
48	1		7	6	B	158	1900	16	0.26	35	159	47.33	24.11	81.56	2.51	100	100	0.00	16.64
49	1		7	6	B	272	1900	16	0.47	61	48	36.90	29.75	92.01	4.93	100	100	0.00	35.06
	2		7	6	B	158	1900	16	0.26	35	159	31.34	24.11	81.56	2.51	100	100	0.00	16.64
50	1		7			430	1900	70	0.00	23	298	16.16	0.28	0.00	0.03	100	100	0.00	0.47
51	1		7	6	B	394	1900	16	0.74	89	1	73.97	54.62	125.40	9.91	100	100	0.00	91.08
	2		7	6	B	394	1900	16	0.74	89	1	74.12	54.62	125.40	9.91	100	100	0.00	91.08
52	1					901	Unrestricted	70	13.00	0	Unrestricted	19.45	0.00	0.00	0.00	100	100	0.00	0.00
53	1		1			557	1900	70	19.00	29	207	1.39	0.39	0.00	0.06	100	100	0.00	0.86
	2		1			503	1900	70	19.00	26	240	1.34	0.34	0.00	0.05	100	100	0.00	0.68
	3		1			474	1900	70	19.00	25	261	1.31	0.31	0.00	0.04	100	100	0.00	0.59
54	1		1	1	A	335 <	1980	48	10.64	25	267	4.38	3.38	19.12	1.25 +	100	100	0.00	5.04
	2		1	1	A	335 <	1980	48	10.64	25	267	4.38	3.38	19.12	1.25 +	100	100	0.00	5.04

### Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	2880.43	171.60	16.79	75.49	1071.97	120.23	4.08	1196.29
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	2880.43	171.60	16.79	75.49	1071.97	120.23	4.08	1196.29

- < = adjusted flow warning (upstream links/traffic streams are over-saturated)
- \* = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%
- ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%
- + = average link/traffic stream excess queue is greater than 0
- P.I. = PERFORMANCE INDEX

# A6 - 2021 PM Scenario 4

## D6 - 2021 PM Scenario 4\*

### Signal Timings

Network Default: 70s cycle time; 70 steps

#### Intergreen Matrix for Controller Stream 1

	To					
	A	B	C	D	E	F
From	A		6		0	
	B		5	5		
	C	6	6			6
	D		11			
	E	8				
	F		5			

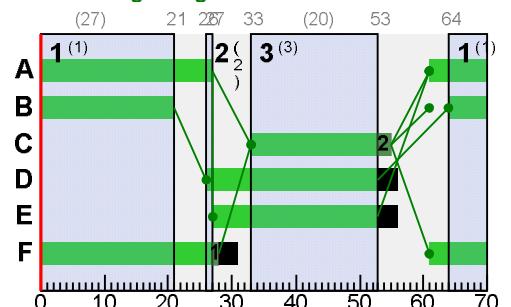
#### Resultant Stages

Controller Stream	Resultant 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	Ü	1	B,F,A	64	21	27	1	7
	2	Ü	2	A,D,F	26	27	1	1	1
	3	Ü	3	C,D,E	33	53	20	1	5

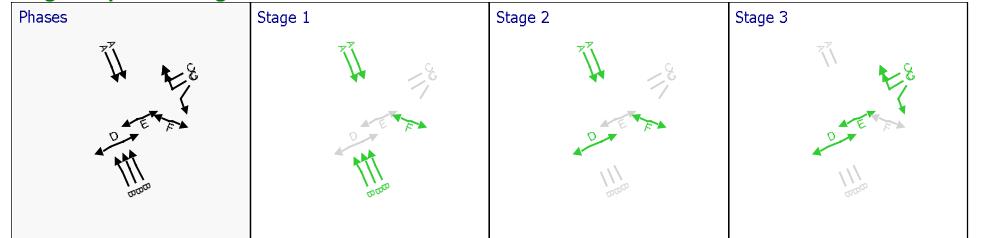
#### Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
1	1	1	1	B	64	21	27
3	2	1	1	B	64	21	27
4	1	1	1	B	64	21	27
5	1	1	1	C	33	55	22
6	1	1	1	C	33	55	22
7	1	1	1	C	33	55	22
54	1	1	1	A	61	27	36
54	2	1	1	A	61	27	36

#### Phase Timings Diagram for Controller Stream 1



**Stage Sequence Diagram for Controller Stream 1**



**Intergreen Matrix for Controller Stream 2**

		To								
		C	D	E	F	G	H	I	J	
From	C	5								
	D	5								
	E			5	5					
	F		5			5				
	G		5			5				
	H			13	13					
	I							6		
	J								9	

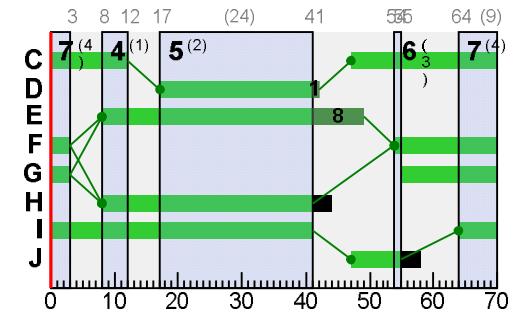
**Resultant Stages**

Controller Stream	Resultant 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)
2	1	Ü	4	C,E,H,I	8	12	4	1	1
	2	Ü	5	D,E,H,I	17	41	24	1	6
	3	Ü	6	C,F,J	54	55	1	1	1
	4	Ü	7	C,F,G,I	64	3	9	1	1

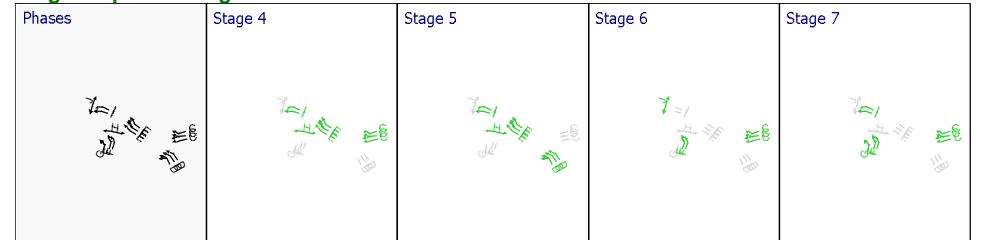
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
16	1	2	2	D	17	42	25
16	2	2	2	D	17	42	25
16	3	2	2	D	17	42	25
17	1	2	2	C	47	12	35
19	1	2	2	C	47	12	35
19	2	2	2	C	47	12	35
20	1	3	2	E	8	49	41
20	2	3	2	E	8	49	41
20	3	3	2	E	8	49	41
23	1	3	2	F	54	3	19
24	1	3	2	G	55	3	18
25	1	3	2	F	54	3	19
28	1	3	2	I	64	41	47
28	2	3	2	I	64	41	47

**Phase Timings Diagram for Controller Stream 2**



**Stage Sequence Diagram for Controller Stream 2**



**Intergreen Matrix for Controller Stream 3**

To		
	K	L
From	K	6
	L	8

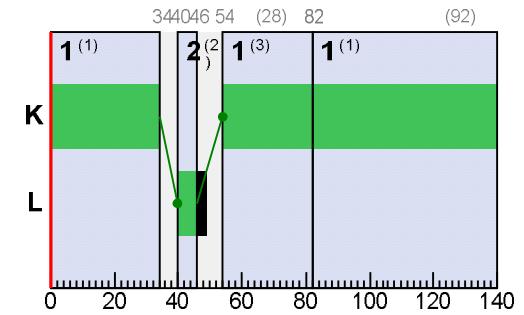
**Resultant Stages**

Controller Stream	Resultant 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)
3	1	Ü	1	K	82	34	92	1	1
	2	Ü	2	L	40	46	6	1	6
	3	Ü	1	K	54	82	28	1	1

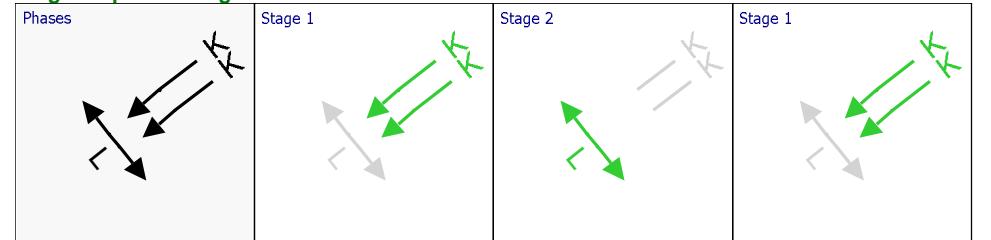
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
21	1	4	3	K	54	34	120
21	2	4	3	K	54	34	120

### Phase Timings Diagram for Controller Stream 3



### Stage Sequence Diagram for Controller Stream 3



### Intergreen Matrix for Controller Stream 4

	To		
	A	B	E
From	5		
	6		5
	12		

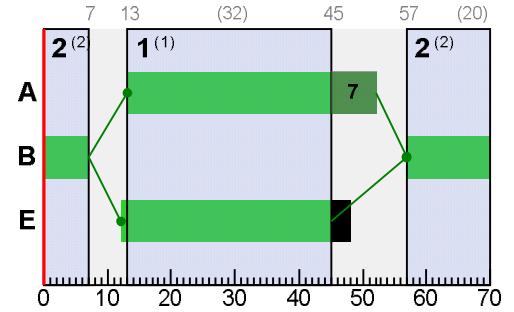
### Resultant Stages

Controller Stream	Resultant 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)
4	1	Ü	1	A,E	13	45	32	1	6
	2	Ü	2	B	57	7	20	1	7

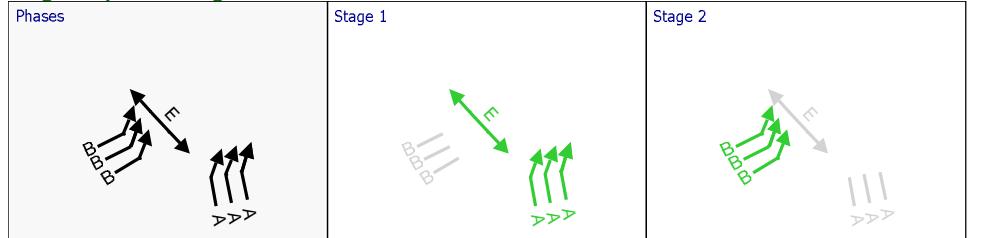
### Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
30	1	5	4	A	13	52	39
30	2	5	4	A	13	52	39
30	3	5	4	A	13	52	39
31	1	5	4	B	57	7	20
32	1	5	4	B	57	7	20
34	1	5	4	B	57	7	20

**Phase Timings Diagram for Controller Stream 4**



**Stage Sequence Diagram for Controller Stream 4**



**Intergreen Matrix for Controller Stream 5**

		To	
		C	D
From	C		5
	D	5	

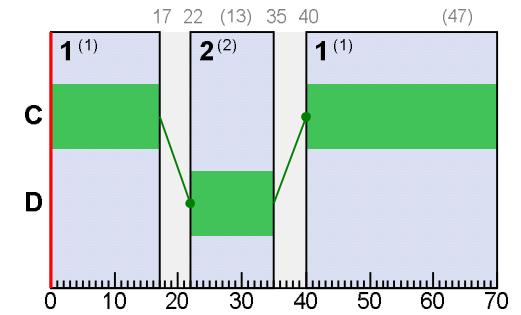
**Resultant Stages**

Controller Stream	Resultant 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)
5	1	Ü	1	C	40	17	47	1	7
	2	Ü	2	D	22	35	13	1	7

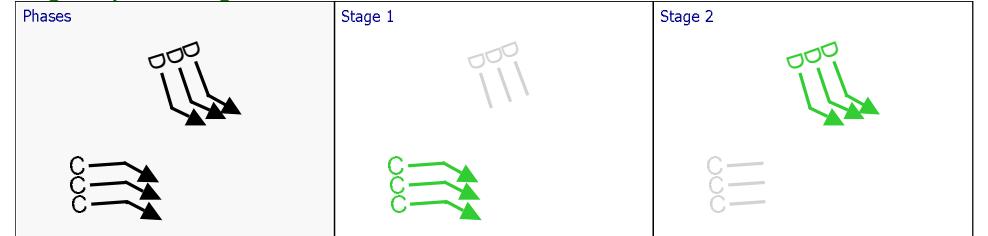
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
36	1	6	5	C	40	17	47
36	2	6	5	C	40	17	47
36	3	6	5	C	40	17	47
37	1	6	5	D	22	35	13
38	1	6	5	D	22	35	13
39	1	6	5	D	22	35	13

**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	6	
	B	5	

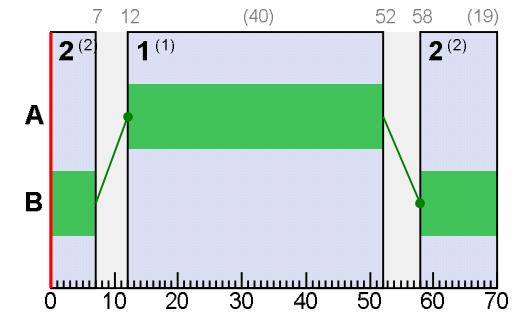
**Resultant Stages**

Controller Stream	Resultant 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)
6	1	Ü	1	A	12	52	40	1	7
	2	Ü	2	B	58	7	19	1	7

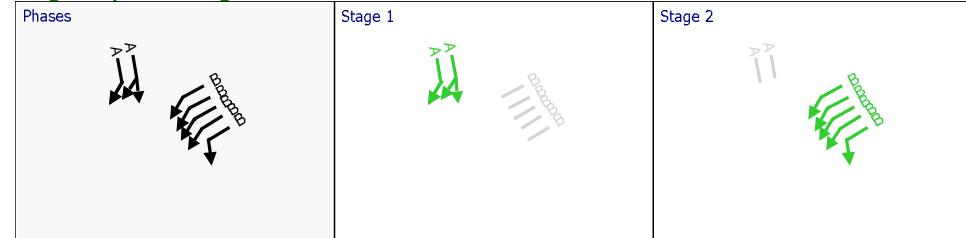
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
44	1	7	6	A	12	52	40
45	2	7	6	A	12	52	40
48	1	7	6	B	58	7	19
49	1	7	6	B	58	7	19
49	2	7	6	B	58	7	19
51	1	7	6	B	58	7	19
51	2	7	6	B	58	7	19

Phase Timings Diagram for Controller Stream 6



Stage Sequence Diagram for Controller Stream 6



## Final Prediction Table

### Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES	WEIGHTS		PENALTIES	P.I.
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting multiplier (%)	Stop weighting multiplier (%)	Cost of traffic penalties (£ per hr)	P.I.
RA	1		R3			922	2312	70	13.00	40	126	12.52	0.52	0.00	0.13	100	100	0.00	1.88
RAC	1		R3			17	Unrestricted	70	70.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RAX	1					683	1800	70	0.00	38	137	12.61	0.61	0.00	0.12	100	100	0.00	1.65
RB	1		R4			179	1156	70	0.00	15	481	12.29	0.29	0.00	0.01	100	100	0.00	0.20
RBc	1		R4			815	Unrestricted	70	13.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RBx	1					124	Unrestricted	70	19.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RC	1		R1			476	1623	70	0.00	29	207	12.46	0.46	0.00	0.06	100	100	0.00	0.86
RCc	1		R1			158	Unrestricted	70	0.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RCx	1					836	Unrestricted	70	13.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RD	1		R2			67	878	70	0.00	8	1079	12.17	0.17	0.00	0.00	100	100	0.00	0.04
RDc	1		R2			633	Unrestricted	70	0.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RDx	1					1	Unrestricted	70	70.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
1	1	Burtonwood Road South	1	1	B	217	1980	27	0.45	28	223	23.68	15.23	64.13	2.71	100	100	0.00	14.78
2	1	Burtonwood Road South	1			667	1980	70	0.00	34	167	4.51	0.46	0.00	0.09	100	100	0.00	1.21
3	2	Burtonwood Road South	1	1	B	233	2120	27	0.91	28	217	21.33	15.35	66.95	3.03	100	100	0.00	16.06
4	1	Burtonwood Road South	1	1	B	217	1975	27	0.44	28	222	21.39	15.23	66.98	2.83	100	100	0.00	14.86
5	1	Charon Way Left	1	1	C	65	1995	22	4.00	10	808	14.78	12.77	36.07	0.46	100	100	0.00	3.57
6	1	Charon Way Right	1	1	C	428 <	1842	22	0.18	71	26	22.57	20.51	45.00	3.77 +	100	100	0.00	37.05

7	1	Charon Way Right	1	1	C	422	1819	22	0.00	71	27	40.70	27.68	89.44	7.36	100	100	0.00	50.81
8	1	Charon Way	1			493	1653	70	28.65	50	78	20.85	9.67	49.90	4.90	100	100	0.00	21.89
10	1	Charon Way	1			915	1962	70	0.00	47	93	5.88	0.80	0.00	0.20	100	100	0.00	2.89
11	1	Burtonwood Road South	1			450	2120	70	0.00	21	324	2.80	0.23	0.00	0.03	100	100	0.00	0.41
12	1	Burtonwood Road South	1			711	1980	70	39.00	36	150	5.23	0.51	0.00	0.10	100	100	0.00	1.43
13	1		1			711	Unrestricted	70	39.00	0	Unrestricted	10.75	0.00	0.00	0.00	100	100	0.00	0.00
14	1					776	Unrestricted	70	20.00	0	Unrestricted	7.24	0.00	0.00	0.00	100	100	0.00	0.00
15	1	Omega Road North	1			714	1934	70	28.77	54	68	19.48	4.16	23.17	3.27	100	100	0.00	13.78
	2	Burtonwood Road North	1			714	1937	70	28.78	53	68	19.87	4.15	23.16	3.27	100	100	0.00	13.76
16	1		2	2	D	508	1900	25	0.00	72	25	32.14	25.55	87.64	8.72	100	100	0.00	56.77
	2		2	2	D	507	1900	25	0.89	74	21	33.43	26.78	89.15	8.86	100	100	0.00	59.22
	3		2	2	D	508	1900	25	0.89	75	21	33.57	26.85	89.27	8.89	100	100	0.00	59.48
17	1		2	2	C	365	1900	35	6.00	37	141	6.67	2.87	7.10	0.50	100	100	0.00	4.46
18	1		2			471	1900	70	38.00	25	263	7.81	0.31	0.00	0.04	100	100	0.00	0.58
	2		2			635	1900	70	31.00	33	170	7.99	0.47	0.00	0.08	100	100	0.00	1.19
19	1		2	2	C	471	1900	35	12.00	48	87	11.21	6.78	23.25	2.25	100	100	0.00	13.95
	2		2	2	C	270	1900	35	5.00	28	226	10.06	5.92	26.86	1.41	100	100	0.00	7.20
20	1		3	2	E	548	1900	41	12.16	48	87	10.46	4.40	17.25	1.82	100	100	0.00	10.70
	2		3	2	E	872	1900	41	1.11	77	17	15.46	9.43	45.34	8.55	100	100	34.92	72.32
	3		3	2	E	508	1900	41	16.00	45	102	7.42	1.27	0.00	0.18	100	100	0.00	2.54
21	1		4	3	K	491	1900	120	0.37	30	200	7.84	2.24	16.44	3.22	100	100	0.00	5.36
	2		4	3	K	209	1900	120	0.11	13	607	7.58	1.63	13.69	1.46	100	100	0.00	1.70
22	1					491	Unrestricted	140	19.00	0	Unrestricted	7.19	0.00	0.00	0.00	100	100	0.00	0.00
	2					209	Unrestricted	140	19.00	0	Unrestricted	7.22	0.00	0.00	0.00	100	100	0.00	0.00
23	1		3	2	F	170	1900	19	0.26	32	184	30.26	21.29	79.36	2.62	100	100	0.00	15.97
24	1		3	2	G	170	1900	18	0.00	33	173	30.01	22.15	79.94	2.68	100	100	0.00	16.55
25	1		3	2	F	487 <	1900	19	0.00	90	0	58.22	49.45	124.65	12.09 +	100	100	0.00	102.61
27	1		3			170	1900	70	0.00	9	906	4.77	0.09	0.00	0.00	100	100	0.00	0.06
	2		3			657	1900	70	0.00	35	160	5.18	0.50	0.00	0.09	100	100	0.00	1.30
28	1		3	2	I	633	1900	47	21.77	59	51	13.01	8.66	43.42	4.21	100	100	0.00	25.07
	2		3	2	I	221	1900	47	17.75	19	367	8.63	3.94	52.63	1.66	100	100	0.00	4.89
29	1					854	Unrestricted	70	34.00	0	Unrestricted	10.40	0.00	0.00	0.00	100	100	0.00	0.00
30	1		5	4	A	747	1900	39	1.42	70	29	20.61	7.76	32.36	4.71	100	100	0.00	25.91
	2		5	4	A	476	1900	39	8.68	45	102	24.83	12.08	72.90	6.75	100	100	0.00	27.03
	3		5	4	A	678	1900	39	13.42	63	43	22.32	9.65	38.39	4.98	100	100	0.00	29.06
31	1		5	4	B	116	1900	20	0.16	21	339	32.92	19.18	74.00	1.67	100	100	0.00	9.85
32	1		5	4	B	376 <	1900	20	0.26	67	35	24.29	21.82	49.90	3.66 +	100	100	0.00	34.71
33	1		5			555	1900	70	31.00	48	86	19.99	8.93	49.95	5.40	100	100	0.00	23.03
34	1		5	4	B	179	1900	20	3.11	32	185	18.66	16.28	43.06	1.50	100	100	0.00	12.46
35	1		6			926	1900	70	13.00	49	85	23.36	0.90	0.00	0.23	100	100	0.00	3.28
36	1		6	5	C	476	1900	47	22.79	37	142	24.61	11.06	77.83	8.82	100	100	0.00	25.40
	2		6	5	C	1054	1900	47	3.37	83	8	24.49	11.53	49.06	17.97	100	100	18.21	72.63
	3		6	5	C	116	1900	47	28.00	9	911	13.19	0.75	3.05	0.07	100	100	0.00	0.39
37	1		6	5	D	189	1900	13	0.32	51	77	41.61	30.02	92.63	3.41	100	100	0.00	24.58
38	1		6	5	D	305	1900	13	0.58	84	7	57.44	50.21	123.18	7.56	100	100	0.00	65.11
39	1		6	5	D	193	1900	13	0.32	52	73	37.47	30.30	93.00	3.50	100	100	0.00	25.32
40	1		6			49													

46	1		7			800	1900	70	0.00	42	114	8.52	0.69	0.00	0.15	100	100	100	0.00	2.17
47	1		7			1059	1900	70	0.00	56	61	5.12	1.19	0.00	0.35	100	100	100	0.00	4.97
48	1		7	6	B	448	1900	19	0.84	86	4	66.72	43.50	113.05	10.09	100	100	100	0.00	83.23
49	1		7	6	B	163	1900	19	0.21	30	197	28.24	21.09	76.36	2.42	100	100	100	0.00	15.12
	2		7	6	B	448	1900	19	0.84	86	4	50.73	43.50	113.05	10.09	100	100	100	0.00	83.23
50	1		7			611	1900	70	0.00	32	180	16.34	0.45	0.00	0.08	100	100	100	0.00	1.08
51	1		7	6	B	400	1900	19	0.74	77	18	53.17	33.82	98.68	7.72	100	100	100	0.00	58.32
	2		7	6	B	400	1900	19	0.74	77	18	53.32	33.82	98.68	7.72	100	100	100	0.00	58.32
52	1					504	Unrestricted	70	14.00	0	Unrestricted	19.45	0.00	0.00	0.00	100	100	100	0.00	0.00
53	1		1			645	1900	70	19.00	34	165	1.49	0.49	0.00	0.09	100	100	100	0.00	1.24
	2		1			444	1900	70	19.00	23	285	1.29	0.29	0.00	0.04	100	100	100	0.00	0.51
	3		1			428	1900	70	19.00	23	300	1.28	0.28	0.00	0.03	100	100	100	0.00	0.46
54	1		1	1	A	711 <	1980	36	6.91	70	29	7.56	6.56	14.39	2.00 +	100	100	100	0.00	19.33
	2		1	1	A	711 <	1980	36	6.91	70	29	7.56	6.56	14.39	2.00 +	100	100	100	0.00	19.33

### Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	3156.69	194.19	16.26	88.84	1261.52	133.75	53.13	1448.40
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	3156.69	194.19	16.26	88.84	1261.52	133.75	53.13	1448.40

- < = adjusted flow warning (upstream links/traffic streams are over-saturated)
- \* = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%
- ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%
- + = average link/traffic stream excess queue is greater than 0
- P.I. = PERFORMANCE INDEX

# **Appendix E**

**M62 J8 - 2029 SENSITIVITY TEST  
-TRANSYT RESULTS**





**Filename:** Junction 8 M62 \_PrMit- Sc4 & Sc5 Highways England Response May 2020.t15

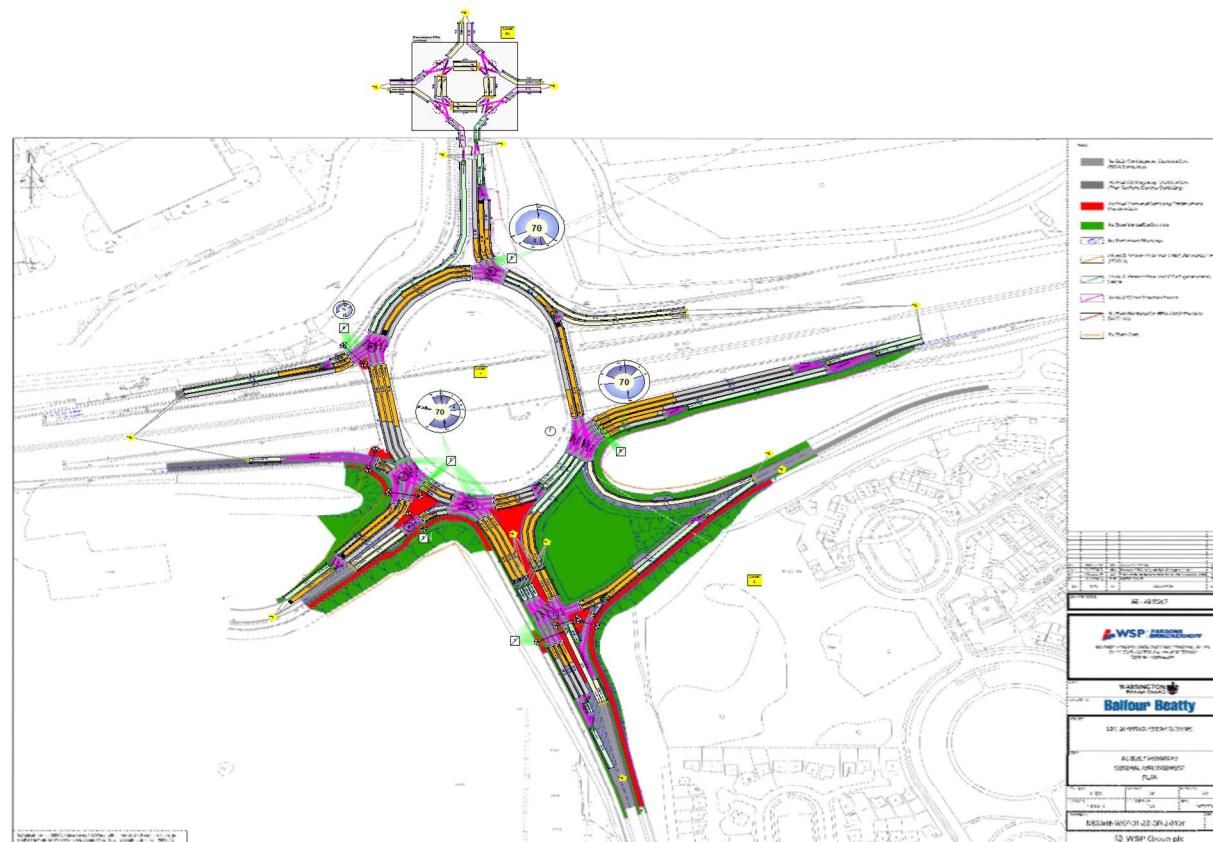
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**Report generation date:** 21/05/2020 01:02:26

»A11 - 2029 AM Scenario 5 : D11 - 2029 AM Scenario 5\* :

»A12 - 2029 PM Scenario 5 : D12 - 2029 PM Scenario 5\* :

## Network Diagrams



# A11 - 2029 AM Scenario 5

## D11 - 2029 AM Scenario 5\*

### Signal Timings

Network Default: 70s cycle time; 70 steps

**Intergreen Matrix for Controller Stream 1**

	To					
	A	B	C	D	E	F
A		6		0		
B		5	5			
C	6	6				6
D		11				
E	8					
F		5				

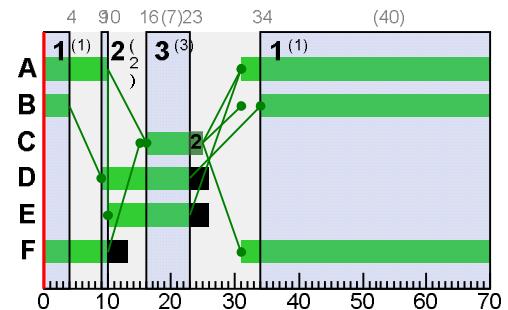
**Resultant Stages**

Controller Stream	Resultant 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	Ü	1	B,F,A	34	4	40	1	7
	2	Ü	2	A,D,F	9	10	1	1	1
	3	Ü	3	C,D,E	16	23	7	1	5

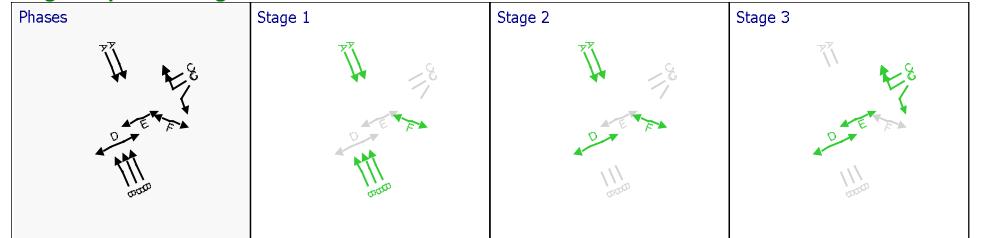
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
1	1	1	1	B	34	4	40
3	2	1	1	B	34	4	40
4	1	1	1	B	34	4	40
5	1	1	1	C	16	25	9
6	1	1	1	C	16	25	9
7	1	1	1	C	16	25	9
54	1	1	1	A	31	10	49
54	2	1	1	A	31	10	49

**Phase Timings Diagram for Controller Stream 1**



**Stage Sequence Diagram for Controller Stream 1**



**Intergreen Matrix for Controller Stream 2**

		To								
		C	D	E	F	G	H	I	J	
From	C	5								
	D	5								
	E			5	5					
	F		5			5				
	G		5			5				
	H			13	13					
	I							6		
	J								9	

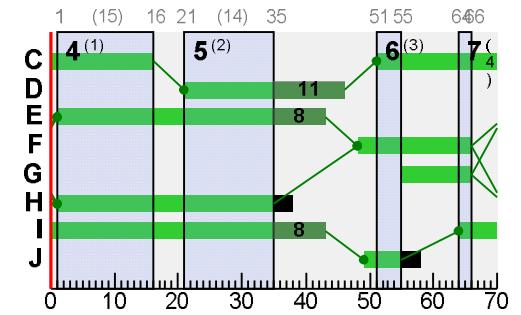
**Resultant Stages**

Controller Stream	Resultant 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)
2	1	Ü	4	C,E,H,I	1	16	15	1	1
	2	Ü	5	D,E,H,I	21	35	14	1	1
	3	Ü	6	C,F,J	51	55	4	1	4
	4	Ü	7	C,F,G,I	64	66	2	1	1

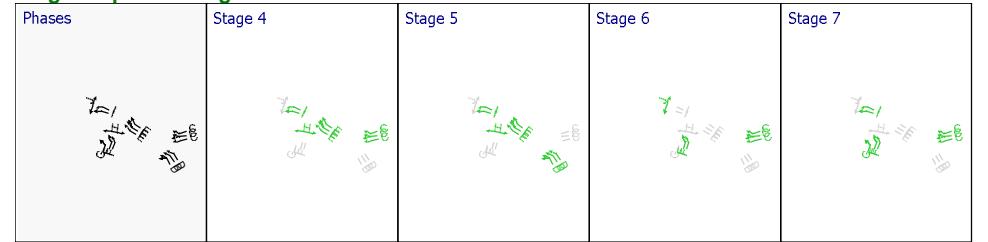
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
16	1	2	2	D	21	46	25
16	2	2	2	D	21	46	25
16	3	2	2	D	21	46	25
17	1	2	2	C	51	16	35
19	1	2	2	C	51	16	35
19	2	2	2	C	51	16	35
20	1	3	2	E	1	43	42
20	2	3	2	E	1	43	42
20	3	3	2	E	1	43	42
23	1	3	2	F	48	66	18
24	1	3	2	G	55	66	11
25	1	3	2	F	48	66	18
28	1	3	2	I	64	43	49
28	2	3	2	I	64	43	49

**Phase Timings Diagram for Controller Stream 2**



**Stage Sequence Diagram for Controller Stream 2**



**Intergreen Matrix for Controller Stream 3**

		To	
		K	L
From	K	6	
	L	8	

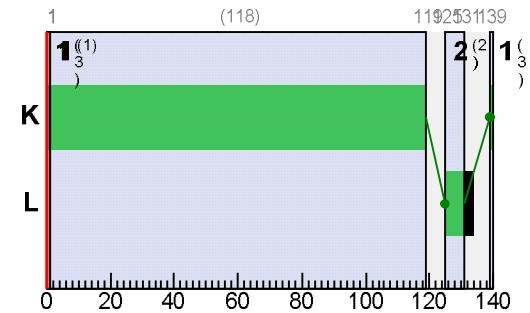
**Resultant Stages**

Controller Stream	Resultant 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)
3	1	Ü	1	K	1	119	118	1	1
	2	Ü	2	L	125	131	6	1	6
	3	Ü	1	K	139	1	2	1	1

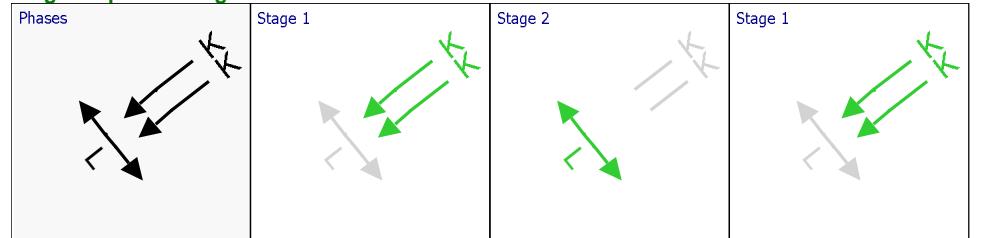
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
21	1	4	3	K	139	119	120
21	2	4	3	K	139	119	120

**Phase Timings Diagram for Controller Stream 3**



**Stage Sequence Diagram for Controller Stream 3**



**Intergreen Matrix for Controller Stream 4**

From	To		
	A	B	E
A	5		
B	6		5
E	12		

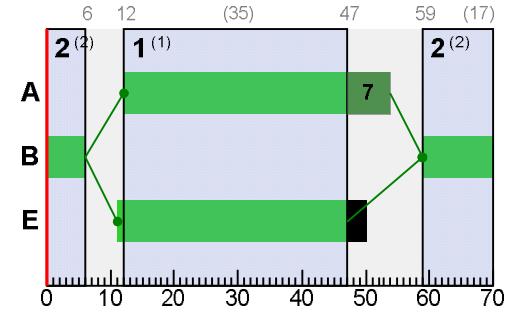
**Resultant Stages**

Controller Stream	Resultant 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)
4	1	Ü	1	A,E	12	47	35	1	6
	2	Ü	2	B	59	6	17	1	7

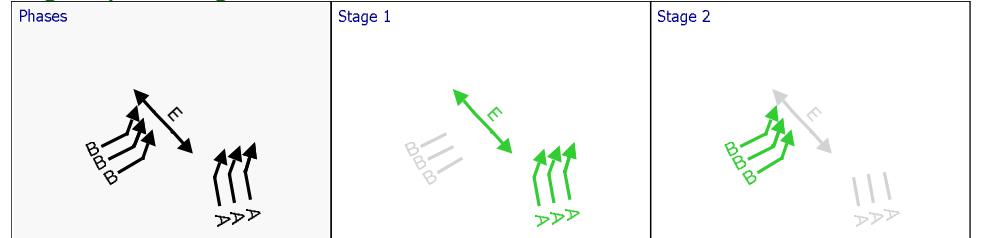
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
30	1	5	4	A	12	54	42
30	2	5	4	A	12	54	42
30	3	5	4	A	12	54	42
31	1	5	4	B	59	6	17
32	1	5	4	B	59	6	17
34	1	5	4	B	59	6	17

**Phase Timings Diagram for Controller Stream 4**



**Stage Sequence Diagram for Controller Stream 4**



**Intergreen Matrix for Controller Stream 5**

		To	
		C	D
From	C		5
	D	5	

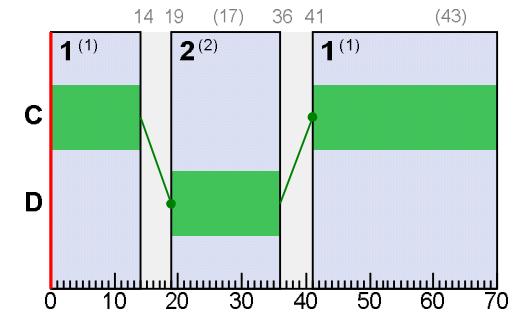
**Resultant Stages**

Controller Stream	Resultant 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)
5	1	Ü	1	C	41	14	43	1	7
	2	Ü	2	D	19	36	17	1	7

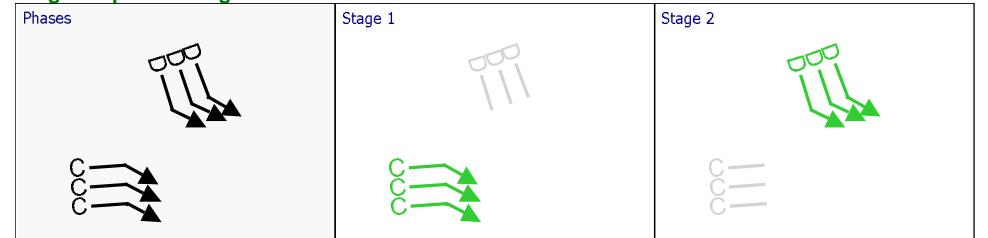
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
36	1	6	5	C	41	14	43
36	2	6	5	C	41	14	43
36	3	6	5	C	41	14	43
37	1	6	5	D	19	36	17
38	1	6	5	D	19	36	17
39	1	6	5	D	19	36	17

**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	6	
	B	5	

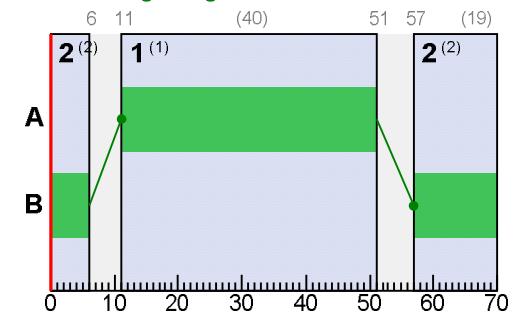
**Resultant Stages**

Controller Stream	Resultant 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)
6	1	Ü	1	A	11	51	40	1	7
	2	Ü	2	B	57	6	19	1	7

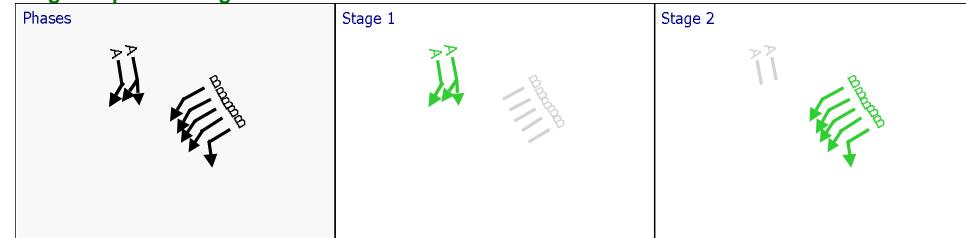
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
44	1	7	6	A	11	51	40
45	2	7	6	A	11	51	40
48	1	7	6	B	57	6	19
49	1	7	6	B	57	6	19
49	2	7	6	B	57	6	19
51	1	7	6	B	57	6	19
51	2	7	6	B	57	6	19

Phase Timings Diagram for Controller Stream 6



Stage Sequence Diagram for Controller Stream 6



## Final Prediction Table

### Traffic Stream Results

Arm	Traffic Stream	Name	Traffic node	SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES	WEIGHTS		PENALTIES	P.I.
				Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting multiplier (%)	Stop weighting multiplier (%)	Cost of traffic penalties (£ per hr)	P.I.
RA	1		R3			629	2298	70	18.00	27	229	12.30	0.30	0.00	0.05	100	100	0.00	0.73
RAC	1		R3			36	Unrestricted	70	70.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RAX	1					985	1800	70	19.62	76	18	22.30	10.30	53.12	11.37	100	100	0.00	46.60
RB	1		R4			84	1376	70	0.00	6	1375	12.08	0.08	0.00	0.00	100	100	0.00	0.03
RBc	1		R4			463	Unrestricted	70	18.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RBx	1					202	Unrestricted	70	18.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RC	1		R1			846	1674	70	0.00	51	78	13.10	1.10	0.00	0.26	100	100	0.00	3.66
RCc	1		R1			79	Unrestricted	70	0.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RCx	1					468	Unrestricted	70	18.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RD	1		R2			96	721	70	0.00	13	576	12.38	0.38	0.00	0.01	100	100	0.00	0.15
RDc	1		R2			925	Unrestricted	70	0.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RDx	1					0	Unrestricted	70	70.00	0	Unrestricted	0.00	0.00	0.00	0.00	100	100	0.00	0.00
1	1	Burtonwood Road South	1	1	B	412	1980	40	0.73	36	149	17.14	8.69	48.41	3.88	100	100	0.00	16.62
2	1	Burtonwood Road South	1			1264	1980	70	0.00	64	41	5.64	1.60	0.00	0.56	100	100	0.00	7.97
3	2	Burtonwood Road South	1	1	B	441	2120	40	1.36	37	145	14.81	8.83	51.20	4.39	100	100	0.00	18.19
4	1	Burtonwood Road South	1	1	B	411	1975	40	0.71	36	149	14.84	8.69	51.17	4.10	100	100	0.00	16.72
5	1	Charon Way Left	1	1	C	18	1995	9	9.00	6	1325	28.60	26.58	84.50	0.30	100	100	0.00	2.08
6	1	Charon Way Right	1	1	C	173 <	1842	9	0.14	67	35	43.82	41.76	104.30	3.54 +	100	100	0.00	30.76

7	1	Charon Way Right	1	1	C	170	1819	9	0.00	65	38	54.14	41.12	108.49	3.63	100	100	0.00	29.89
8	1	Charon Way	1			191	1653	70	5.52	13	618	11.51	0.33	5.55	1.46	100	100	0.00	0.38
10	1	Charon Way	1			361	1962	70	0.00	18	389	5.29	0.21	0.00	0.02	100	100	0.00	0.29
11	1	Burtonwood Road South	1			852	2120	70	0.00	40	124	3.14	0.57	0.00	0.13	100	100	0.00	1.92
12	1	Burtonwood Road South	1			351	1980	70	27.00	18	408	4.92	0.20	0.00	0.02	100	100	0.00	0.27
13	1		1			351	Unrestricted	70	27.00	0	Unrestricted	10.75	0.00	0.00	0.00	100	100	0.00	0.00
14	1					369	Unrestricted	70	26.00	0	Unrestricted	7.24	0.00	0.00	0.00	100	100	0.00	0.00
15	1	Omega Road North	1			354	1934	70	11.00	18	391	15.53	0.21	0.00	0.02	100	100	0.00	0.29
	2	Burtonwood Road North	1			354	1937	70	11.00	18	392	15.93	0.21	0.00	0.02	100	100	0.00	0.29
16	1		2	2	D	543 <	1900	25	0.00	77	17	34.53	27.94	90.60	9.61 +	100	100	0.00	66.01
	2		2	2	D	543 <	1900	25	1.00	80	12	36.73	30.07	93.32	9.91 +	100	100	0.00	70.76
	3		2	2	D	542 <	1900	25	0.95	80	13	36.56	29.85	93.12	9.87 +	100	100	0.00	70.14
17	1		2	2	C	257	1900	35	6.00	26	242	4.82	1.02	9.83	0.49	100	100	0.00	1.35
18	1		2			742	1900	70	30.09	45	101	8.67	1.17	6.52	1.63	100	100	0.00	4.03
	2		2			963	1900	70	23.55	59	53	11.00	3.48	26.22	4.99	100	100	0.00	16.41
19	1		2	2	C	742 <	1900	35	7.00	76	19	16.11	11.68	36.17	5.24 +	100	100	5.19	42.74
	2		2	2	C	707 <	1900	35	0.00	72	24	15.12	10.97	38.28	5.28 +	100	100	6.92	40.90
20	1		3	2	E	580	1900	42	18.37	50	80	12.95	6.89	36.39	4.09	100	100	0.16	18.55
	2		3	2	E	800	1900	42	4.00	69	31	14.52	8.50	35.75	5.59	100	100	11.45	41.84
	3		3	2	E	542	1900	42	21.21	47	93	12.49	6.33	21.31	2.25	100	100	0.00	14.98
21	1		4	3	K	779	1900	120	0.74	48	89	8.87	3.28	20.14	6.37	100	100	9.58	21.63
	2		4	3	K	633	1900	120	0.53	39	132	8.64	2.68	17.74	4.65	100	100	1.24	9.35
22	1					779	Unrestricted	140	19.00	0	Unrestricted	7.19	0.00	0.00	0.00	100	100	0.00	0.00
	2					633	Unrestricted	140	19.00	0	Unrestricted	7.22	0.00	0.00	0.00	100	100	0.00	0.00
23	1		3	2	F	165	1900	18	0.26	32	177	31.13	22.16	80.98	2.60	100	100	0.00	16.10
24	1		3	2	G	148	1900	11	0.00	45	98	38.52	30.65	92.78	2.75	100	100	0.00	19.62
25	1		3	2	F	427	1900	18	0.00	83	9	48.87	40.10	111.39	9.35	100	100	0.00	73.51
27	1		3			148	1900	70	0.00	8	1055	4.76	0.08	0.00	0.00	100	100	0.00	0.05
	2		3			592	1900	70	0.00	31	189	5.11	0.43	0.00	0.07	100	100	0.00	1.00
28	1		3	2	I	654	1900	49	22.25	58	56	10.96	6.61	40.32	4.74	100	100	0.00	20.36
	2		3	2	I	220	1900	49	24.37	19	374	8.39	3.70	57.76	1.78	100	100	0.00	4.80
29	1					874	Unrestricted	70	34.00	0	Unrestricted	10.40	0.00	0.00	0.00	100	100	0.00	0.00
30	1		5	4	A	496	1900	42	6.32	43	110	18.56	5.72	31.82	3.34	100	100	0.00	13.17
	2		5	4	A	585	1900	42	12.74	51	76	26.90	14.15	68.03	7.73	100	100	0.00	37.64
	3		5	4	A	707	1900	42	15.72	62	46	22.24	9.57	46.58	6.60	100	100	0.00	30.81
31	1		5	4	B	346	1900	17	0.63	73	23	47.91	34.17	98.15	6.84	100	100	0.00	50.89
32	1		5	4	B	349 <	1900	17	0.26	72	24	29.73	27.26	57.48	3.93 +	100	100	0.00	40.04
33	1		5			491	1900	70	36.00	44	105	20.03	8.96	50.74	4.90	100	100	0.00	20.48
34	1		5	4	B	142	1900	17	3.11	29	208	20.76	18.38	46.30	1.28	100	100	0.00	11.12
35	1		6			638	1900	70	18.00	34	168	22.93	0.48	0.00	0.08	100	100	0.00	1.20
36	1		6	5	C	585	1900	43	17.95	50	80	25.81	12.26	74.23	9.00	100	100	0.00	33.73
	2		6	5	C	1056 <	1900	43	1.53	92	-2	36.50	23.55	75.31	20.60 +	100	100	61.07	169.12
	3		6	5	C	346	1900	43	29.00	29	211	14.46	2.01	6.59	0.44	100	100	0.00	3.03
37	1		6	5	D	343	1900	17	4.68	73	23	49.68	38.09	114.56	7.55	100	100	0.00	56.41
38	1		6	5	D	458 <	1900	17	0.79	98	-8	113.19	105.95	160.48	15.91 +	100	100	0.00	200.61
39	1		6	5	D	190	1900	17	7.32	40	127	47.36	40.18	90.33	3.34	100	100	0.00	32.25
40																			

46	1		7			1020	1900	70	0.00	54	68	8.93	1.10	0.00	0.31	100	100	100	0.00	4.41
47	1		7			620	1900	70	0.00	33	176	4.39	0.46	0.00	0.08	100	100	100	0.00	1.12
48	1		7	6	B	166	1900	19	0.26	31	190	44.40	21.18	76.42	2.47	100	100	100	0.00	15.46
49	1		7	6	B	288	1900	19	0.47	54	66	32.43	25.28	84.96	4.81	100	100	100	0.00	31.79
	2		7	6	B	166	1900	19	0.26	31	190	28.41	21.18	76.42	2.47	100	100	100	0.00	15.46
50	1		7			454	1900	70	0.00	24	277	16.18	0.30	0.00	0.04	100	100	100	0.00	0.53
51	1		7	6	B	510	1900	19	1.00	99	-9	111.16	91.82	166.29	18.55	100	100	100	0.00	195.34
	2		7	6	B	510	1900	19	1.00	99	-9	111.31	91.82	166.29	18.55	100	100	100	0.00	195.34
52	1					947	Unrestricted	70	10.00	0	Unrestricted	19.45	0.00	0.00	0.00	100	100	100	0.00	0.00
53	1		1			585	1900	70	19.00	31	192	1.42	0.42	0.00	0.07	100	100	100	0.00	0.97
	2		1			526	1900	70	19.00	28	225	1.36	0.36	0.00	0.05	100	100	100	0.00	0.75
	3		1			496	1900	70	19.00	26	245	1.33	0.33	0.00	0.05	100	100	100	0.00	0.65
54	1		1	1	A	351 <	1980	49	7.18	25	262	2.83	1.83	14.23	1.25 +	100	100	100	0.00	2.98
	2		1	1	A	351 <	1980	49	7.18	25	262	2.83	1.83	14.23	1.25 +	100	100	100	0.00	2.98

#### Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	3227.83	238.18	13.55	130.48	1852.81	171.76	123.92	2148.50
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	3227.83	238.18	13.55	130.48	1852.81	171.76	123.92	2148.50

- < = adjusted flow warning (upstream links/traffic streams are over-saturated)
- \* = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%
- ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%
- + = average link/traffic stream excess queue is greater than 0
- P.I. = PERFORMANCE INDEX

## A12 - 2029 PM Scenario 5 D12 - 2029 PM Scenario 5\*

#### Signal Timings

Network Default: 70s cycle time; 70 steps

#### Intergreen Matrix for Controller Stream 1

		To					
		A	B	C	D	E	F
From	A		6		0		
	B		5	5			
	C	6	6				6
	D		11				
	E	8					
	F		5				

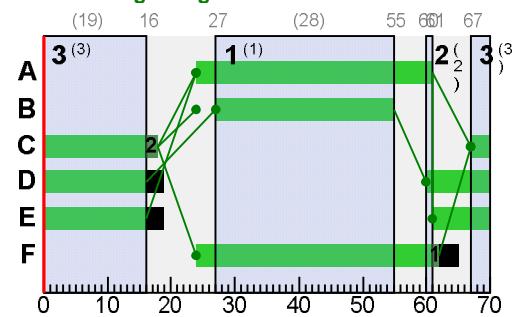
#### Resultant Stages

Controller Stream	Resultant 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	Ü	1	B,F,A	27	55	28	1	7
	2	Ü	2	A,D,F	60	61	1	1	1
	3	Ü	3	C,D,E	67	16	19	1	5

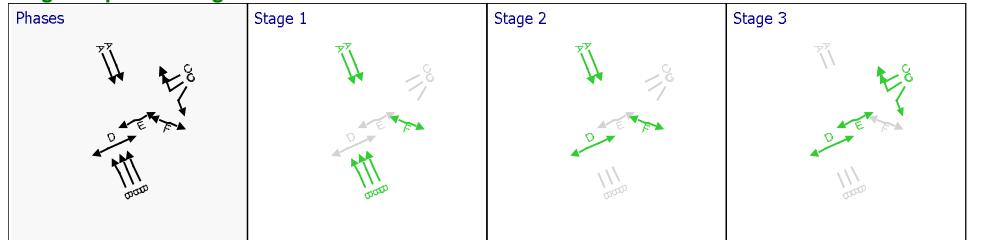
### Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
1	1	1	1	B	27	55	28
3	2	1	1	B	27	55	28
4	1	1	1	B	27	55	28
5	1	1	1	C	67	18	21
6	1	1	1	C	67	18	21
7	1	1	1	C	67	18	21
54	1	1	1	A	24	61	37
54	2	1	1	A	24	61	37

### Phase Timings Diagram for Controller Stream 1



### Stage Sequence Diagram for Controller Stream 1



### Intergreen Matrix for Controller Stream 2

From	To							
	C	D	E	F	G	H	I	J
C		5						
D	5							
E			5	5				
F		5		5				
G		5		5				
H			13	13				
I							6	
J								9

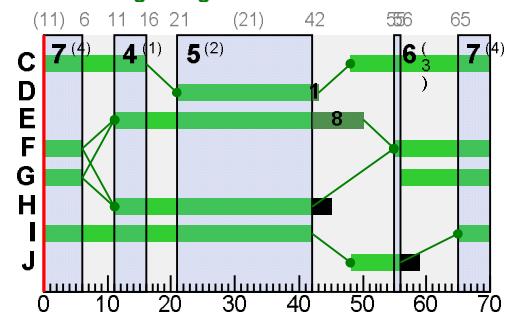
### Resultant Stages

Controller Stream	Resultant 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)
2	1	Ü	4	C,E,H,I	11	16	5	1	1
	2	Ü	5	D,E,H,I	21	42	21	1	6
	3	Ü	6	C,F,J	55	56	1	1	1
	4	Ü	7	C,F,G,I	65	6	11	1	1

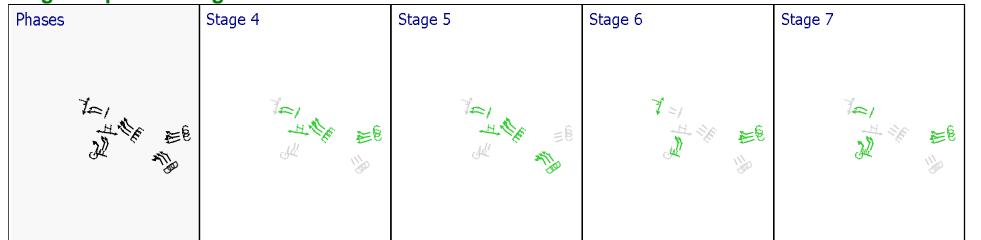
### Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
16	1	2	2	D	21	43	22
16	2	2	2	D	21	43	22
16	3	2	2	D	21	43	22
17	1	2	2	C	48	16	38
19	1	2	2	C	48	16	38
19	2	2	2	C	48	16	38
20	1	3	2	E	11	50	39
20	2	3	2	E	11	50	39
20	3	3	2	E	11	50	39
23	1	3	2	F	55	6	21
24	1	3	2	G	56	6	20
25	1	3	2	F	55	6	21
28	1	3	2	I	65	42	47
28	2	3	2	I	65	42	47

### Phase Timings Diagram for Controller Stream 2



### Stage Sequence Diagram for Controller Stream 2



### Intergreen Matrix for Controller Stream 3

To		
	K	L
From	K	6
	L	8

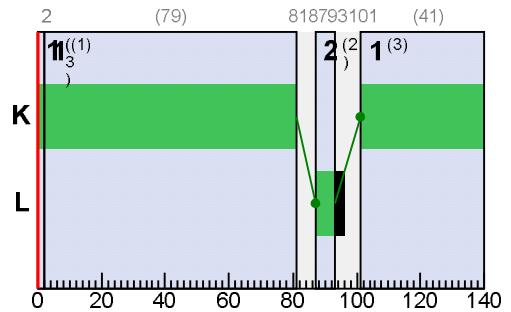
### Resultant Stages

Controller Stream	Resultant 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)
3	1	Ü	1	K	2	81	79	1	1
	2	Ü	2	L	87	93	6	1	6
	3	Ü	1	K	101	2	41	1	1

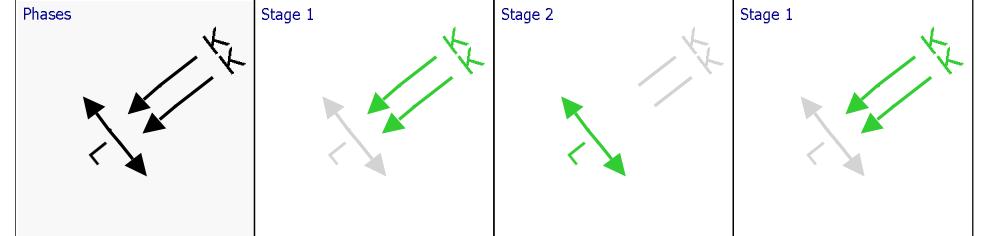
### Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
21	1	4	3	K	101	81	120
21	2	4	3	K	101	81	120

### Phase Timings Diagram for Controller Stream 3



### Stage Sequence Diagram for Controller Stream 3



### Intergreen Matrix for Controller Stream 4

From	To		
	A	B	E
A		5	
B	6		5
E		12	

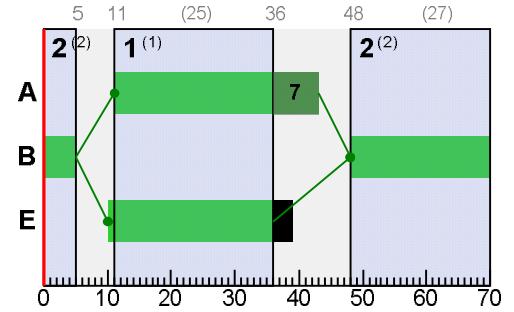
### Resultant Stages

Controller Stream	Resultant 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)
4	1	Ü	1	A,E	11	36	25	1	6
	2	Ü	2	B	48	5	27	1	7

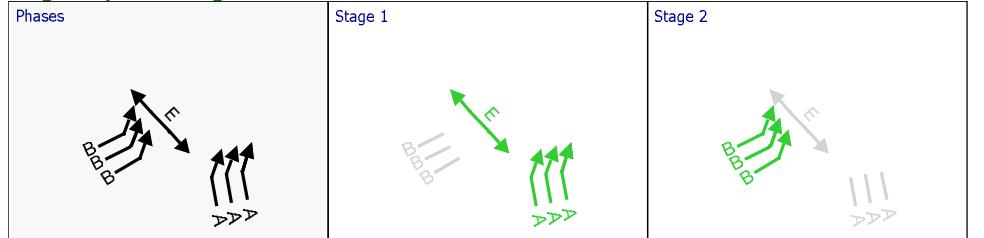
### Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
30	1	5	4	A	11	43	32
30	2	5	4	A	11	43	32
30	3	5	4	A	11	43	32
31	1	5	4	B	48	5	27
32	1	5	4	B	48	5	27
34	1	5	4	B	48	5	27

**Phase Timings Diagram for Controller Stream 4**



**Stage Sequence Diagram for Controller Stream 4**



**Intergreen Matrix for Controller Stream 5**

		To	
		C	D
From	C		5
	D	5	

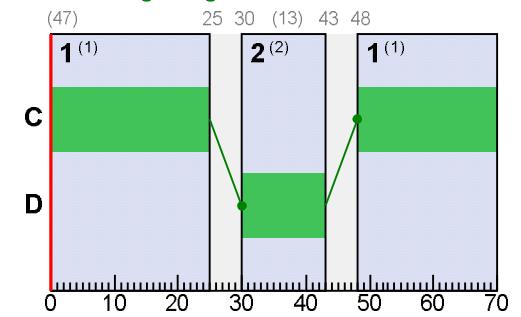
**Resultant Stages**

Controller Stream	Resultant 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)
5	1	Ü	1	C	48	25	47	1	7
	2	Ü	2	D	30	43	13	1	7

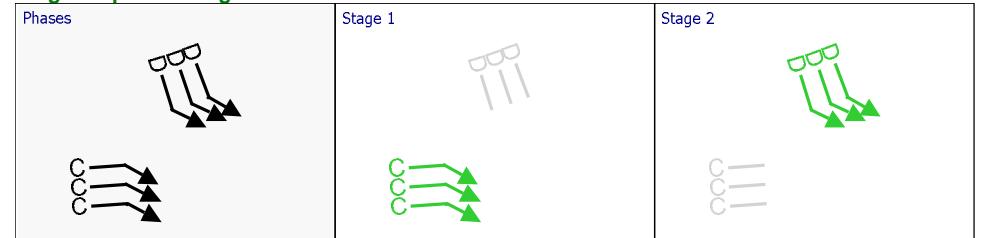
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
36	1	6	5	C	48	25	47
36	2	6	5	C	48	25	47
36	3	6	5	C	48	25	47
37	1	6	5	D	30	43	13
38	1	6	5	D	30	43	13
39	1	6	5	D	30	43	13

**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	6	
	B	5	

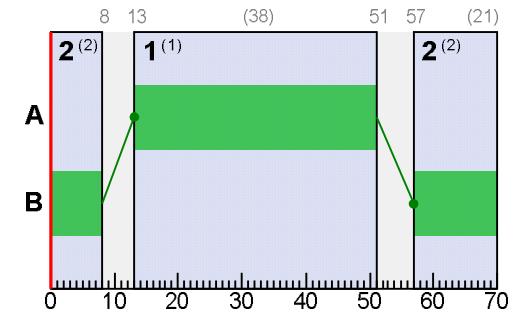
**Resultant Stages**

Controller Stream	Resultant 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)
6	1	Ü	1	A	13	51	38	1	7
	2	Ü	2	B	57	8	21	1	7

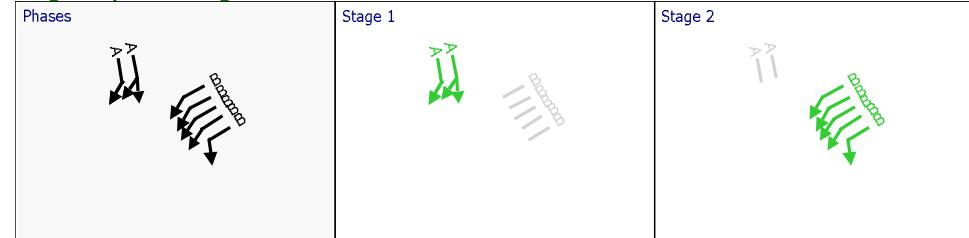
**Traffic Stream Green Times**

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
44	1	7	6	A	13	51	38
45	2	7	6	A	13	51	38
48	1	7	6	B	57	8	21
49	1	7	6	B	57	8	21
49	2	7	6	B	57	8	21
51	1	7	6	B	57	8	21
51	2	7	6	B	57	8	21

Phase Timings Diagram for Controller Stream 6



Stage Sequence Diagram for Controller Stream 6



## Final Prediction Table

### Traffic Stream Results

Arm	Traffic Stream	Name	Traffic node	SIGNALS		FLOWS		PERFORMANCE			PER PCU		QUEUES	WEIGHTS		PENALTIES	P.I.		
				Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting multiplier (%)	Stop weighting multiplier (%)	Cost of traffic penalties (£ per hr)	P.I.
RA	1		R3			955	2311	70	12.00	41	118	12.55	0.55	0.00	0.15	100	100	0.00	2.06
RAC	1		R3			19	Unrestricted	70	70.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RAx	1					735	1800	70	0.00	41	120	12.69	0.69	0.00	0.14	100	100	0.00	2.00
RB	1		R4			191	1136	70	0.00	17	435	12.32	0.32	0.00	0.02	100	100	0.00	0.24
RBc	1		R4			847	Unrestricted	70	12.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RBx	1					127	Unrestricted	70	25.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RC	1		R1			514	1616	70	0.00	32	183	12.52	0.52	0.00	0.07	100	100	0.00	1.05
RCc	1		R1			169	Unrestricted	70	0.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RCx	1					869	Unrestricted	70	12.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RD	1		R2			72	851	70	0.00	8	964	12.20	0.20	0.00	0.00	100	100	0.00	0.06
RDc	1		R2			682	Unrestricted	70	0.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
RDx	1					1	Unrestricted	70	70.00	0	Unrestricted	12.00	0.00	0.00	0.00	100	100	0.00	0.00
1	1	Burtonwood Road South	1	1	B	227	1980	28	0.45	28	220	23.07	14.61	62.67	2.77	100	100	0.00	14.87
2	1	Burtonwood Road South	1			696	1980	70	0.00	35	156	4.54	0.49	0.00	0.10	100	100	0.00	1.35
3	2	Burtonwood Road South	1	1	B	243	2120	28	0.91	29	215	20.72	14.74	65.49	3.09	100	100	0.00	16.12
4	1	Burtonwood Road South	1	1	B	226	1975	28	0.44	28	221	20.76	14.61	65.52	2.88	100	100	0.00	14.88
5	1	Charon Way Left	1	1	C	67	1995	21	4.00	11	742	14.75	12.73	34.28	0.45	100	100	0.00	3.65
6	1	Charon Way Right	1	1	C	453 <	1842	21	0.18	79	14	26.40	24.34	48.43	4.32 +	100	100	0.00	46.25

7	1	Charon Way Right	1	1	C	448	1819	21	0.00	78	15	45.90	32.89	97.81	8.76	100	100	0.00	63.61
8	1	Charon Way	1			520	1653	70	30.74	56	60	23.04	11.86	55.22	5.59	100	100	0.00	27.94
10	1	Charon Way	1			968	1962	70	0.00	49	82	5.98	0.89	0.00	0.24	100	100	0.00	3.41
11	1	Burtonwood Road South	1			469	2120	70	0.00	22	307	2.81	0.24	0.00	0.03	100	100	0.00	0.45
12	1	Burtonwood Road South	1			735	1980	70	35.00	37	142	5.26	0.54	0.00	0.11	100	100	0.00	1.55
13	1		1			735	Unrestricted	70	35.00	0	Unrestricted	10.75	0.00	0.00	0.00	100	100	0.00	0.00
14	1					802	Unrestricted	70	17.00	0	Unrestricted	7.24	0.00	0.00	0.00	100	100	0.00	0.00
15	1	Omega Road North	1			743	1934	70	31.27	56	60	30.48	15.16	71.26	10.54	100	100	0.00	51.08
	2	Burtonwood Road North	1			743	1937	70	31.28	56	60	30.87	15.15	71.25	10.54	100	100	0.00	51.06
16	1		2	2	D	537 <	1900	22	0.00	86	5	45.38	38.79	104.41	11.04 +	100	100	0.00	89.20
	2		2	2	D	538 <	1900	22	1.05	90	0	53.50	46.85	114.04	12.23 +	100	100	0.00	107.11
	3		2	2	D	537 <	1900	22	1.00	90	0	52.69	45.97	113.09	12.09 +	100	100	0.00	104.98
17	1		2	2	C	394	1900	38	12.05	37	142	7.66	3.86	12.56	1.56	100	100	0.00	6.61
18	1		2			609	1900	70	21.00	32	181	7.95	0.45	0.00	0.08	100	100	0.00	1.07
	2		2			786	1900	70	21.00	41	118	8.18	0.67	0.00	0.15	100	100	0.00	2.07
19	1		2	2	C	609	1900	38	10.00	58	56	10.83	6.40	22.41	2.66	100	100	0.00	17.08
	2		2	2	C	393	1900	38	9.00	37	143	12.80	8.65	36.76	2.81	100	100	0.00	15.20
20	1		3	2	E	578	1900	39	13.16	53	69	11.14	5.09	18.35	2.06	100	100	0.00	12.91
	2		3	2	E	932 <	1900	39	1.11	86	5	20.64	14.61	53.61	10.15 +	100	100	76.77	136.72
	3		3	2	E	537	1900	39	17.00	49	82	7.77	1.62	0.00	0.24	100	100	0.00	3.43
21	1		4	3	K	633	1900	120	0.53	39	132	8.28	2.68	17.74	4.65	100	100	1.24	9.35
	2		4	3	K	328	1900	120	0.21	20	350	7.81	1.85	15.17	1.94	100	100	0.00	3.02
22	1					633	Unrestricted	140	19.00	0	Unrestricted	7.19	0.00	0.00	0.00	100	100	0.00	0.00
	2					328	Unrestricted	140	19.00	0	Unrestricted	7.22	0.00	0.00	0.00	100	100	0.00	0.00
23	1		3	2	F	147	1900	21	11.21	25	261	42.32	33.35	84.64	2.42	100	100	0.00	20.94
24	1		3	2	G	250	1900	20	10.27	86	5	62.62	54.76	142.92	6.11	100	100	0.00	58.48
25	1		3	2	F	564 <	1900	21	0.00	94	-5	83.13	74.36	129.05	14.83 +	100	100	0.00	174.49
27	1		3			250	1900	70	0.00	13	584	4.82	0.14	0.00	0.01	100	100	0.00	0.14
	2		3			711 <	1900	70	42.64	122	-26	449.18	444.50	271.64	93.14 +	100	100	0.00	1270.90
28	1		3	2	I	703 <	1900	47	20.72	71	26	19.45	15.10	62.81	6.67 +	100	100	0.00	47.37
	2		3	2	I	277	1900	47	20.37	25	259	9.57	4.88	51.87	2.09	100	100	0.00	7.13
29	1					979	Unrestricted	70	31.00	0	Unrestricted	10.40	0.00	0.00	0.00	100	100	0.00	0.00
30	1		5	4	A	772	1900	32	0.79	88	2	40.74	27.90	70.78	10.74	100	100	0.00	91.81
	2		5	4	A	572	1900	32	8.05	66	37	34.92	22.17	99.95	11.14	100	100	0.00	57.15
	3		5	4	A	684	1900	32	7.11	79	14	48.28	35.61	95.72	12.26	100	100	0.00	104.33
31	1		5	4	B	176	1900	27	0.21	23	286	28.45	14.71	63.89	2.19	100	100	0.00	11.62
32	1		5	4	B	398 <	1900	27	8.86	77	17	26.67	24.20	90.19	4.22 +	100	100	0.00	42.49
33	1		5			592	1900	70	30.00	45	99	17.07	6.01	40.60	4.82	100	100	0.00	17.05
34	1		5	4	B	194	1900	27	3.11	26	251	14.78	12.40	39.89	1.51	100	100	0.00	10.46
35	1		6			966	1900	70	12.00	51	77	23.43	0.98	0.00	0.26	100	100	0.00	3.73
36	1		6	5	C	572	1900	47	26.05	45	101	34.11	20.55	97.28	11.79	100	100	0.00	53.32
	2		6	5	C	1082 <	1900	47	6.84	86	4	36.34	23.38	96.06	19.83 +	100	100	120.55	233.39
	3		6	5	C	176	1900	47	20.00	14	566	12.66	0.22	0.00	0.01	100	100	0.00	0.15
37	1		6	5	D	213	1900	13	0.37	58	56	43.52	31.94	94.81	3.94	100	100	0.00	29.37
38	1		6	5	D	322 <	1900	13	0.63	89	1	67.45	60.22	136.20	8.85 +	100	100	0.00	81.98
39	1		6	5	D	208	1900	13	0.37	56	60	38.69	31.51	97.19	3.94	100	100</		

46	1		7			1006	1900	70	0.00	53	70	8.89	1.06	0.00	0.30	100	100	0.00	4.22
47	1		7			1125	1900	70	0.00	59	52	5.31	1.37	0.00	0.43	100	100	0.00	6.09
48	1		7	6	B	475	1900	21	0.89	83	9	60.02	36.81	104.08	9.74	100	100	0.00	75.16
49	1		7	6	B	175	1900	21	0.26	30	203	26.67	19.52	73.25	2.49	100	100	0.00	15.08
	2		7	6	B	475	1900	21	0.89	83	9	44.03	36.81	104.08	9.74	100	100	0.00	75.16
50	1		7			650	1900	70	0.00	34	163	16.38	0.49	0.00	0.09	100	100	0.00	1.26
51	1		7	6	B	503	1900	21	0.95	88	2	63.04	43.69	112.54	11.61	100	100	0.00	93.78
	2		7	6	B	503	1900	21	0.95	88	2	63.19	43.69	112.54	11.61	100	100	0.00	93.78
52	1					527	Unrestricted	70	12.00	0	Unrestricted	19.45	0.00	0.00	0.00	100	100	0.00	0.00
53	1		1			680	1900	70	19.00	36	151	1.53	0.53	0.00	0.10	100	100	0.00	1.42
	2		1			467	1900	70	19.00	25	266	1.31	0.31	0.00	0.04	100	100	0.00	0.57
	3		1			450	1900	70	19.00	24	280	1.29	0.29	0.00	0.04	100	100	0.00	0.52
54	1		1	1	A	735 <	1980	37	4.00	70	28	7.32	6.32	14.11	2.03 +	100	100	0.00	19.25
	2		1	1	A	735 <	1980	37	4.00	70	28	7.32	6.32	14.11	2.03 +	100	100	0.00	19.25

### Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	3464.09	346.05	10.01	230.44	3272.29	221.16	218.25	3711.70
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	3464.09	346.05	10.01	230.44	3272.29	221.16	218.25	3711.70

- < = adjusted flow warning (upstream links/traffic streams are over-saturated)
- \* = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%
- ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%
- + = average link/traffic stream excess queue is greater than 0
- P.I. = PERFORMANCE INDEX