OXFORDSHIRE RAILFREIGHT INTERCHANGE LIMITED

TECHNICAL NOTE 5: M40 JUNCTION 10 OPTIONS REPORT ADDENDUM: RESPONSE TO NATIONAL HIGHWAYS INITIAL COMMENTS ON OPTIONS 11, 13, 18 AND 19

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APPENDICES

1.0 INTRODUCTION

1.1 ADC Infrastructure Ltd and BWB Consulting Ltd are appointed by Oxfordshire Railfreight Interchange Ltd (the Applicant) to assess and design the transport and infrastructure requirements of a Nationally Significant Infrastructure Project (NSIP), that being a proposed Strategic Rail Freight Interchange in Oxfordshire, to be known as Oxfordshire Strategic Rail Freight Interchange (OxSRFI).

1.2 Ensuring good access to the Strategic Road Network (SRN) is a prerequisite for the proposed OxSRFI development. Initial investigations into this, and consultation with Oxfordshire County Council (OCC) and National Highways (formerly Highways England), advanced the access strategy such that it is centred on provision of significant improvements to Junction 10 of the M40 motorway, in combination with a provision of a new bypass for the village of Ardley, a new relief road around the north-east quadrant of the village of Middleton Stoney and a Heyford Park link.

1.3 Technical Note 5[1] (TN5) identified and assessed a long list of potential interventions at M40 Junction 10 that could be implemented by the OxSRFI scheme to mitigate the impact of the OxSRFI development at the junction. A short list of options (Options 11, 13, 18 and 19) was identified to be taken forward for further consideration.

1.4 Following a meeting on the 23 of July 2021, National Highways requested that the option for a large single grade-separated gyratory (Option 3) be given further consideration to examine whether identified capacity constraints could be overcome. Hence, ADC Infrastructure and BWB Consulting jointly prepared and issued Technical Note 8[2] (TN8) which considers in greater detail the opportunity to provide a large single grade-separated gyratory at M40 Junction 10. TN8 concluded that the design team consider that the proposed OxSRFI Options 11, 13, 18 and 19 presented in TN5 offer long-term benefit over a large complex signal controlled multi-lane roundabout.

1.5 National Highways provided initial feedback on the preferred options (Option 11, 13, 18 and 19) presented in TN5 via email on 21 September 2021, including DMRB compliance checks and audits of the LinSig modelling which supports TN5. Attached to the email were a series of audit forms for each of the key junction assessed in TN5. The email and attachments are provided at **Appendix A**.

1.6 National Highways will provide a finalised version of their comments on TN5 in due course. However, it was agreed at Transport Working Group meeting held on 24 September 2021 that to assist National Highways with their ongoing review of TN5, along with TN8, the Applicant would prepare a response to the initial feedback provided by email on 21 September 2021. This document has therefore been prepared to provide that response.

[1] Technical Note 5 – M40 Junction 10 Options Report, report reference ADC1794-RP-M -V3, ADC June 2021.
[2] Technical Note 8 – M40 Junction 10 Options 3A and 3B, report reference ADC1794-RP-Q -V4, ADC October 2021.

2.0 RESPONSE TO NATIONAL HIGHWAYS INTIAL COMMENTS OF 21 SEPTEMBER 2021

2.1 The email from Nation Highways on 21 September 2021 (**Appendix A**) set out their initial feedback and comments on the preferred highway solutions (Options 11, 13, 18 and 19) identified for M40 Junction 10 in TN5. The comments, relating to the principle of the options, the junction arrangements and matters of geometrical compliance with the standards, are reproduced in the table below, which also provides the design team response to each point raised. The National Highways email also provided audits of the LinSig models presented in TN5 and these are discussed in Section 3 of this report.

National Highways comments				Design team response
Item		Drawing number	Comment	
1	General observations	N/A	Large number of junctions are proposed as part of all preferred options. For motorists using the Services at M40 J10, it would mean that will have to negotiate a large number of junctions in order to reach to their destinations.	Options 11, 13, 18 and 19 propose one additional junction when compared to the existing highway layout. The additional junction would only materially affect drivers using the M40 northbound diverge or M40 southbound merge (local access only as A43 to M40 southbound would be provided as a free-flow link). All other movements at the junction would essentially be as existing. However, providing the free-flow link for the large A43 to M40 southbound traffic flow would remove this traffic from two junctions, significantly reducing congestion and improving journey times. Access to Cherwell Valley MSA is considered at paragraphs 7.6 to 7.9 of TN8.
			M40 southbound diverge meets the M40 J10 interchange at signalised T junction. The existing slip road here is single lane and therefore we recommend that the geometry should be checked to ensure compliance with DMRB.	Agreed, we will do this as the design is developed.
			We note that the junction arrangements have not been fully developed and as such are indicative. Therefore, we advise ADC to	The order limits are currently set with sufficient space to permit flexibility in the layout as the design is developed.

National Highways comments				Design team response
Item		Drawing number	Comment	
			consider if the available land is sufficient to modify junctions geometry as required.	
2	Baynards Green Roundabout (options 11, 13, 18 & 19)	OxSRFI-ADC-GEN-XX-SK-CH-SK01	AECOM have not undertaken a detailed review of this layout. As the junction arrangement in this option is signalised, entry curvature is not required. Based on our high-level review, we consider that the design looks feasible with room to adjust if required.	Noted, however, as previously commented we understand that departures for entry path curvature are required. This is the same as for the Growth Deal scheme and we have asked National Highways/Kier for an update on where they are with the departures for that scheme.
3	A43 realigned highway (options 11, 13, 18 & 19)	N/A	No geometric information has been provided as part of the submitted plans, however, the realigned highway appears to be achievable to standards.	Noted and agreed.
4	North facing M40 slip roads (options 11, 13, 18 & 19)	N/A	It is recommended that ADC should confirm that this is a suitable arrangement based on traffic demands from BTM assessments for the proposed development.	Noted and agreed.
5	Junction 10 northbound merge (options 11, 18)	N/A	While no information has been provided, adequate room appears to be available to accommodate the replacement slip road.	Noted and agreed.
6	South facing Junction 10 A43 to M40 southbound free flow link (options 11, 13, 18 & 19)	OxSRFI-BWB-GEN-XX-SK-CH-SK021	We note that this arrangement may cause confusion, as the outside 2 lanes are to M40. Possible alternative is to develop centre lane to go both directions.	The layout is commensurate with a standard diverge, on the basis that the main flow is to the M40 southbound. We can however review this diverge further as the design develops.
			Two lane link road with departures in horizontal alignment R=360m 1 step together with relaxations in transition rate of changes and merge type noted as departure from standard. This may be acceptable as a departure from standard.	Noted, as the design is developed we would have early engagement with National Highways SES to confirm the acceptance of this departure.
			Type B extended merge with lane drop is consistent with 2 lane taper merge.	Noted and agreed.

National Highways comments				Design team response
Item		Drawing number	Comment	
			Visibility splays appear to be achievable. Widening to the slip road bridge is required to achieve desirable minimum visibility.	Noted and agreed.
			Vertical geometry needs modification at nosing but won't have a great impact on the design.	Noted and agreed.
7	Padbury Roundabout (options 11,13, 18 & 19)	OxSRFI-ADC-GEN-XX-SK-CH-SK02	Geometry not detail checked, signalised so entry curvature not required design looks feasible with room to adjust if required. Potential issue with change to signalised T junction form from M40 S/B off slip. Queue lengths may back up to M40. No U turn facility for A43.	Noted but U-turns are readily achievable at Baynard's Green which would be a short detour for errant vehicles. The LinSig modelling presented in Section 3 of this report shows that for a T-junction arrangement, queuing on the southbound diverge slip road would be 6.5 pcus in the morning peak hour and 7.5 pcus in the evening peak hour. Therefore, queue lengths could be easily accommodated on the slip road.
8	Cherwell Roundabout (options 11,13, 18 & 19)	OxSRFI-ADC-GEN-XX-SK-CH-SK03	The geometry of this option has not been checked in detail, however, as the option is signalised entry curvature is not required. The design appears feasible with room to adjust if required.	Noted and agreed. Based on the proposed layout we agree that this is a signal controlled junction and not a signal controlled roundabout.
			We note that this option does not have a U turn facility for A43 / services.	Noted but U-turns are readily achievable at Ardley roundabout which would be a short detour for errant vehicles.
9	Ardley Roundabout (options 13, 19). Options 11 and 18 slight enlargement of existing roundabout	OxSRFI-ADC-GEN-XX-SK-CH-SK20	The geometry of this option has not been checked in detail, however, as the option is signalised entry curvature is not required. The design appears feasible with room to adjust if required.	Noted and agreed. See previous commentary for item 2 regarding entry path curvature.
			We note that the entry path curvature for southwest to north entry does not appear to meet standards as such will need to be considered at future stages.	We will review the entry path curvature as the design is developed.

National Highways comments				Design team response
Item		Drawing number	Comment	
10	Ardley Roundabout slip road loop (options 13, 19)	N/A	Based on a high-level review, the geometry appears to comply with standards, however, the vertical geometry is unknown but we would expect to work as existing.	Noted and agreed.
11	Ardley East Roundabout (options 11, 13, 18 & 19)	OxSRFI-ADC-GEN-XX-SK-CH-SK04	The geometry of this option has not been checked in detail, however, as the option is signalised entry curvature is not required. The design appears feasible with room to adjust if required.	Noted and agreed. See previous commentary for item 2 regarding entry path curvature.
			We note that this option does not allow for a connection to Ardley Village except through link road.	Two of the options (18 and 19) would have no connection to Ardley Road with that being taken over or under the bypass on a bridge, two (11 and 13) would have no connection to Ardley Village (except NMUs) but retain a connection to Bucknell.
12	Ardley East Roundabout (options 18, 19). Options 11 and 13 similar but moved north slightly	OxSRFI-ADC-GEN-XX-SK-CH-SK05	The geometry of this option has not been checked in detail, however, as the option is signalised entry curvature is not required. The design appears feasible with room to adjust if required. We note that this option does not allow for a connection to Ardley Village or Ardley Road to Bucknell except through link road.	As per response to Item 11.
13	Link Road Ardley Roundabout to Ardley Roundabout east	N/A	We note that no information has been provided regarding this but it appears to be achievable to standards.	Noted and agreed.
14	Ardley Road Bridge	N/A	No information provided but appears to be achievable to standards. We note that the vertical alignment on this option may be challenging.	Noted and agreed.
15	South facing M40 slip roads (options 11, 13, 18 & 19) – Junction 10 southbound merge	OxSRFI-BWB-GEN-XX-SK-CH-SK019	Based on the contents of TN5 we note that the traffic flows indicate a requirement for a type E layout with 4 lanes downstream with a lane gain with 2 lanes on the slip road. A permitted change is required (as noted in TN5) to use a two-lane ghost island merge with Auxiliary Lane Type C/E3 Sketch 19 shows a single lane slip road with a type A merge which is not in line with the report. As such we would welcome some clarity.	The table at paragraph 5.26 of TN5 presents the traffic flows that are forecast for the new M40 southbound merge (note that this is local traffic only as the A43 to M40 southbound traffic would use the new free-flow merge). For the preferred options (11, 13, 18 and 19) the merge flows are 377 (AM1) and 399 (AM2) vehicles in the AM

National Highways comments				Design team response
Item		Drawing number	Comment	
				peak hour and 601 in the PM peak hour. When these are input into Figure 3.12b of DMRB CD 122, the appropriate merge is a layout A (taper). Hence this is the arrangement shown on drawing OxSRFI-BWB-GEN-XX-SK-CH-SK019. It is recognised that based on the AM1 flow set, 4 lanes would be required on the M40 mainline. The required lane gain would be at the A43 to M40 southbound free-flow merge and a departure from standard would be required. This is considered in relation to the free-flow link at paragraph 5.11 of TN5. The permitted change relates to the options that would see the upgrading of the existing M40 southbound merge to a two-lane merge.
			In addition, we note that the visibility splays appear to be achievable. With regards to the visibility, we note that widening to the slip road bridge is required to achieve desirable minimum visibility.	Noted and agreed.
			We also note that the length of road is close to that at which it becomes an interchange link which has a higher design speed. The Slip is circa 720m and an interchange link would be required at 750m.	Noted and agreed.
16	South facing M40 slip roads (options 11, 13, 18 & 19) – Junction 10 northbound diverge	OxSRFI-BWB-GEN-XX-SK-CH-SK019	Traffic flows indicate a requirement for a type D layout with 4 lanes upstream with a lane drop to 2 lanes on the slip road. A departure from standard will be required (as noted in TN5) to use a two-lane ghost island diverge Type B1 which appears to be to general geometric standards. We also note that visibility splay will require	Noted and agreed.

National Highways comments				Design team response
Item		Drawing number	Comment	
			widened verges. While it is not shown we consider this to be achievable with the land available.	
17	Link Ardley East Roundabout to OxSRFI principal access Roundabout	N/A	No information provided but appears to be achievable to standards.	Noted and agreed.
18	Options 11 and 18 – drawings	N/A	In addition, we note that Strategic Options 11 and 18, no drawings have been provided. Therefore, it is not clear which models would need to be checked for these options. As such, we would welcome further clarity regarding this.	Except for the Ardley Roundabout, the junction layouts for Options 11 and 18 are the same of the options provided in options 13 and 19, respectively. No drawing was provided at this stage for the Ardley Roundabout under options 11 and 18 as we considered that the layout would be achievable within the land available. Should National Highways wish to pursue either of options 11 and 18, this layout will be developed. As noted at the table at paragraph 6.31 of TN5, no separate assessment of Options 18 and 19 were tested for the Ardley Roundabout as they are a variation on Options 11 and 13 (the difference being the layout of the Ardley East Roundabout). Option 11 was tested (junction option A-3). But we have now updated the modelling for the Ardley Roundabout in line with the comments received on the other junctions and this is presented in Section 3 of this report.
19	Options 13 and 19 LinSig	N/A	Furthermore, for Strategic Option 13 and 19 – we could not find any LinSig models for Ardley roundabout which could match the	As above, Option 19 was not separately tested as it is a variation of Option 13.

National Highways comments				Design team response
Item		Drawing number	Comment	
			provided option drawing layout. As such, we would welcome further information and clarification regarding this	However, Option 13 was tested (junction option A-2). Notwithstanding the above, we have updated the modelling for the Ardley Roundabout in line with the comments received on the other junctions and this is presented in Section 3 of this report.

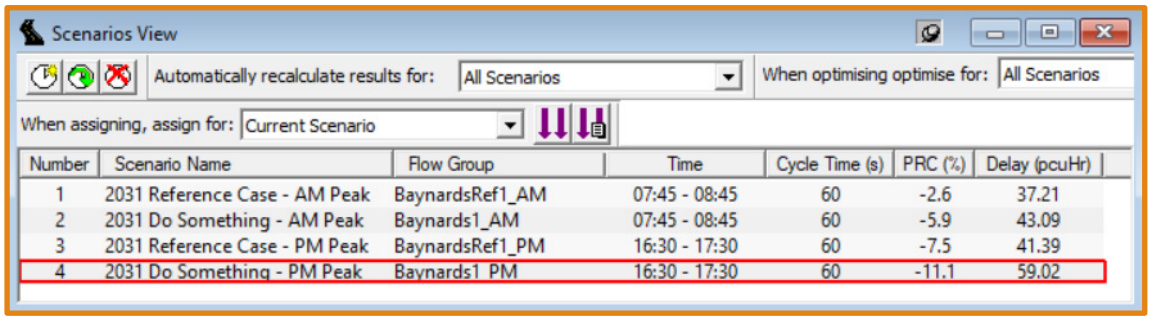
3.0 RESPONSE TO LINSIG MODEL AUDITS

3.1 The email from National Highways on 21 September 2021 (**Appendix A**) provided audit reports of the key LinSig models presented in TN5 in relation to the future baseline and preferred options 11, 13, 18 and 19. The comments provided in these audit reports have been considered and revisions to the LinSig models made were appropriate. The model revisions and implications for the conclusions drawn are discussed in this section.

Baynards Green Roundabout (A43/B4100) – committed scheme

3.2 As discussed in Section 3 of TN5, National Highways have a committed improvement scheme at the Baynards Green roundabout and hence a LinSig model of the committed scheme was prepared and presented in TN5 to establish the future baseline position at the junction. National Highways have audited the committed scheme LinSig model and the audit report is provided at **Appendix B**.

3.3 The issues raised in the Baynards Green committed scheme model audit are largely focused on consistency in the approach to saturation flows. The issues raised have been considered and appropriate amendments to the model have been made. The model changes are logged in the model audit report provided at **Appendix B** for ease of reference. The revised committed scheme model results are also provided at **Appendix B** (the .lsg3x file will be provided via email) and the results are summarised below.



Number	Scenario Name	Flow Group	Time	Cycle Time (s)	PRC (%)	Delay (pcuHr)
1	2031 Reference Case - AM Peak	BaynardsRef1_AM	07:45 - 08:45	60	-2.6	37.21
2	2031 Do Something - AM Peak	Baynards1_AM	07:45 - 08:45	60	-5.9	43.09
3	2031 Reference Case - PM Peak	BaynardsRef1_PM	16:30 - 17:30	60	-7.5	41.39
4	2031 Do Something - PM Peak	Baynards1_PM	16:30 - 17:30	60	-11.1	59.02

3.4 As shown, the revised model forecasts that for both the 2031 morning and evening peak hours, the junction would operate over capacity in both the Reference Case scenario and the Do Something scenario.

3.5 When compared to the results shown at paragraph 3.8 of TN5, the revised model forecast that the junction would operate better than previously shown. However, the model changes have not altered the conclusion drawn in TN5 that the committed scheme does not have the capacity to accommodate the background and development traffic, and mitigation would be required.

Baynards Green Roundabout – proposed mitigation

3.6 TN5 presented a mitigation scheme at Baynards Green which would provide additional widening on the A43 northbound and southbound approaches, with an additional circulating lane on the at the A43 northbound approach. A LinSig model of the proposed mitigation was prepared and showed that the mitigation would provide a better than nil-detriment improvement when compared to the committed scheme.

3.7 National Highways have not provided an audit of the Baynards Green mitigation LinSig model. However, many of the issues identified for the committed scheme model are also applicable to the mitigation model, which has therefore been updated for consistency.

3.8 The revised mitigation scheme model results are provided at **Appendix C** (the .lsg3x file will be provided via email) and the results are summarised below.

Scenarios View

Automatically recalculate results for: All Scenarios | When optimising optimise for: All Scenarios

When assigning, assign for: Current Scenario

Number	Scenario Name	Flow Group	Time	Cycle Time (s)	PRC (%)	Delay (pcuHr)
1	2031 Do Something - AM Peak	Baynards1_AM	07:45 - 08:45	60	0.7	37.89
2	2031 Do Something - PM Peak	Baynards1_PM	16:30 - 17:30	60	1.5	43.01

3.9 As shown, the revised model forecasts that for both the 2031 morning and evening peak hours, the junction would operate acceptably with the development in place. The practical reserve capacity (PRC) is positive for both peak hours, indicating that all links are operating less than 90% saturated.

3.10 Therefore, as concluded in TN5, the mitigation proposals would provide a better than nil-detriment improvement when compared to the committed scheme.

Padbury Roundabout (A43/M40 southbound off-slip) – committed scheme

3.11 As discussed in Section 3 of TN5, National Highways have a committed improvement scheme at the Padbury roundabout and hence a LinSig model of the committed scheme was prepared and presented in TN5 to establish the future baseline position at the junction. National Highways have audited the committed scheme LinSig model and the audit report is provided at **Appendix D**.

3.12 The issues raised in the Padbury committed scheme model audit included changes to flare lengths, consistency in the approach to saturation flows and platoon dispersion. The issues raised have been considered and appropriate amendments to the model have been made. The model changes are logged in the model audit report provided at **Appendix D** for ease of reference. The revised committed scheme model results are also provided at **Appendix D** (the .lsg3x file will be provided via email) and the results are summarised below.

Scenarios View

Automatically recalculate results for: All Scenarios | When optimising optimise for: All Scenarios

When assigning, assign for: Current Scenario

Number	Scenario Name	Flow Group	Time	Cycle Time (s)	PRC (%)	Delay (pcuHr)
1	2031 Reference Case - AM Peak	PadburyRef1_AM	07:45 - 08:45	60	-8.3	41.70
2	2031 Do Something - AM Peak	Padbury1_AM	07:45 - 08:45	60	-29.1	245.89
3	2031 Reference Case - PM Peak	PadburyRef1_PM	16:30 - 17:30	60	3.9	23.50
4	2031 Do Something - PM Peak	Padbury1_PM	16:30 - 17:30	60	-5.8	42.52

3.13 When compared to the results shown at paragraph 3.15 of TN5, the revised model forecast that the junction would operate better in all scenarios than previously shown. In the 2031 morning peak hour the junction is forecast to operate over capacity in both the Reference Case scenario and the Do Something scenario.

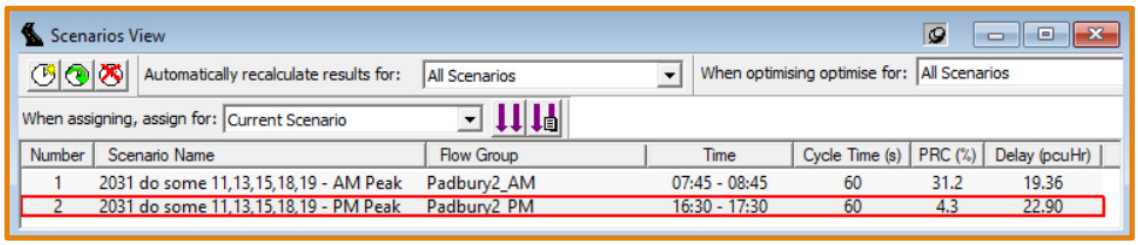
3.14 In the 2031 evening peak hour the results show that the junction would operate within capacity in the Reference Case scenario with a PRC of 3.9%. The addition of the development traffic would force the junction over capacity with a PRC of -5.8% in the Do Something scenario.

3.15 Therefore, as concluded in TN5, the addition of the development traffic exacerbates the congestion issue at the junction in the morning peak hour and would lead to the junction also operating over capacity in the evening peak. Therefore, the junction with the committed improvement does not have the capacity to accommodate the background and development traffic.

Padbury –T-junction mitigation scheme (P-4)

3.16 TN5 considered several options to mitigate the impact of the proposed development at Padbury roundabout, concluding that for strategic options 11, 13, 18 and 19, the most appropriate option was to convert the junction to a traffic signal controlled T-junction. A LinSig model of the proposed T-junction was prepared and showed that it would operate acceptably with PRC of 34.8% and 6.2% in the respective morning and evening peak hours.

3.17 National Highways have audited the committed scheme LinSig model and the audit report is provided at **Appendix E**. The issues raised in the Padbury T-junction scheme model audit included consistency in the approach to saturation flows and changes to some intergreens. The issues raised have been considered and appropriate amendments to the model have been made, as logged in the model audit report provided at **Appendix E**. The revised Padbury T-junction mitigation scheme model results are provided at **Appendix E** (the .lsg3x file will be provided via email) and the results are summarised below.



Number	Scenario Name	Flow Group	Time	Cycle Time (s)	PRC (%)	Delay (pcuHr)
1	2031 do some 11,13,15,18,19 - AM Peak	Padbury2_AM	07:45 - 08:45	60	31.2	19.36
2	2031 do some 11,13,15,18,19 - PM Peak	Padbury2_PM	16:30 - 17:30	60	4.3	22.90

3.18 As shown, the revised model forecasts that for both the 2031 morning and evening peak hours, the junction would operate acceptably with the development in place. Therefore, as concluded in TN5, the proposed mitigation proposal would provide a better than nil-detriment improvement when compared to the committed scheme.

Cherwell Roundabout (A43/MSA/M40 southbound on-slip) – reference case

3.19 The existing Cherwell roundabout was modelled in TN5 to establish the future baseline position at the junction. National Highways have audited the reference case LinSig model and the audit report is provided at **Appendix F**.

3.20 The issues raised in the Cherwell roundabout reference case model audit included changes to short lanes and flare lengths, consistency in the approach to saturation flows and treatment of internal queue limits and random delay. The issues raised have been considered and appropriate amendments to the model have been made, as logged in the model audit report provided at **Appendix F**. The revised reference case model results are also provided at **Appendix F** (the .lsg3x file will be provided via email) and the results are summarised below.

Scenarios View

Automatically recalculate results for: All Scenarios | When optimising optimise for: All Scenarios

When assigning, assign for: Current Scenario

Number	Scenario Name	Flow Group	Time	Cycle Time (s)	PRC (%)	Delay (pcuHr)
1	2031 Reference Case - AM Peak	CherwellRef1_AM	07:45 - 08:45	60	-28.8	235.16
2	2031 Do Something - AM Peak	Cherwell1_AM	07:45 - 08:45	60	-97.3	847.22
3	2031 Reference Case - PM Peak	CherwellRef1_PM	16:30 - 17:30	60	3.1	19.51
4	2031 Do something - PM Peak	Cherwell1_PM	16:30 - 17:30	60	-107.5	596.64

3.21 When compared to the results shown at paragraph 3.22 of TN5, the revised model forecast that the junction would operate better in all scenarios than previously shown. In the 2031 morning peak hour the junction is forecast to operate over capacity in both the Reference Case scenario and the Do Something scenario.

3.22 In the 2031 evening peak hour the results show that the junction would operate within capacity in the Reference Case scenario with a PRC of 3.1%. The addition of the development traffic would force the junction over capacity with a PRC of -107.5% in the Do Something scenario.

3.23 Therefore, as concluded in TN5, the addition of the development traffic exacerbates the congestion issue at the junction in the morning peak hour and would lead to the junction also operating over capacity in the evening peak. Therefore, the junction does not have the capacity to accommodate the background and development traffic.

Cherwell Roundabout – mitigation (C-5)

3.24 TN5 considered several options to mitigate the impact of the proposed development at Cherwell roundabout, concluding that for strategic options 11, 13, 18 and 19, the most appropriate option was to provide a fully signal controlled arrangement, which would effectively form a T-junction arrangement with displaced right-turn movements, as shown on **drawing OxSRFI-ADC-GEN-XX-SK-CH-SK03-S1-P1**. A LinSig model of the proposed mitigation scheme was prepared and showed that it would operate operates acceptably with a PRC of 21.7% in the morning peak hour and a PRC of 5.6% in evening peak hour.

3.25 National Highways have audited the proposed mitigation scheme LinSig model and the audit report is provided at **Appendix G**. The issues raised in the mitigation scheme model audit included changes to a flare length and consistency in the approach to saturation. The issues raised have been considered and appropriate amendments to the model have been made, as logged in the model audit report provided at **Appendix G**. The revised Cherwell mitigation scheme model results are provided at **Appendix G** (the .lsg3x file will be provided via email) and the results are summarised below.

Scenarios View

Automatically recalculate results for: All Scenarios | When optimising optimise for: All Scenarios

When assigning, assign for: Current Scenario

Number	Scenario Name	Flow Group	Time	Cycle Time (s)	PRC (%)	Delay (pcuHr)
1	2031 Cherwell10, 11, 13, 18, 19 AM	Cherwell6_AM	07:45 - 08:45	60	32.1	16.20
2	2031 Cherwell10, 11, 13, 18, 19 PM	Cherwell6_PM	16:30 - 17:30	90	9.3	25.26

3.26 As shown, the revised model forecasts that for both the 2031 morning and evening peak hours, the junction would operate acceptably with the development in place. Therefore, as concluded

in TN5, the proposed mitigation proposal would provide a better than nil-detriment improvement when compared to the committed scheme.

Ardley Roundabout (A43/M40 northbound off-slip/B430) – reference case

3.27 The existing priority controlled Ardley roundabout was modelled in TN5 using the Arcady module of Junctions 9 to establish the future baseline position at the junction. The results showed that the roundabout is forecast to operate acceptably (i.e. within 0.85 RFC) in the morning peak hour 2031 Reference Case scenario. However, in the 2031 Reference Case evening peak hour scenario the roundabout is forecast to operate over capacity, with the M40 northbound off-slip arm of the roundabout operating with a RFC of 0.99.

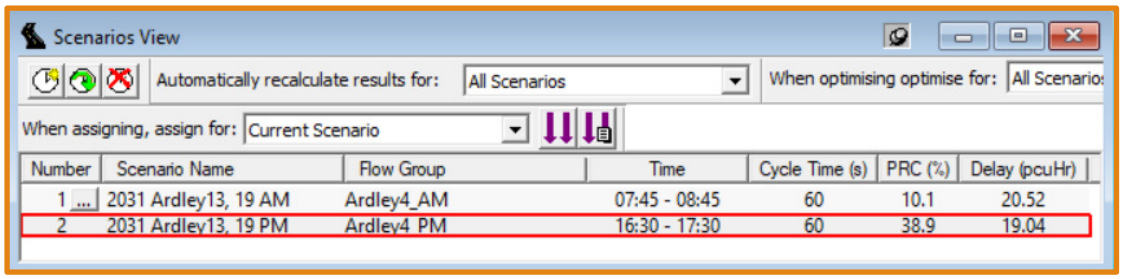
Ardley Roundabout – mitigation (A-2 and A-3)

3.28 TN5 considered several options to mitigate the impact of the proposed development at Ardley roundabout, concluding that for strategic options 11, 13, 18 and 19, the most appropriate option was to provide a fully signal controlled roundabout. Options 11 and 18 (option A-3) would provide a 4-arm roundabout with the M40 northbound merge relocated to the northern side of the roundabout. For options 13 and 19 (option A-2), the roundabout would 3 entry lanes and 4 exit arms, with the M40 northbound merge would remaining as existing, though realigned. LinSig models of both mitigation schemes were prepared. Mitigation option A-3 was shown to operate acceptably with a PRC of 13.3% in the morning peak hour and a PRC of 0.5% in evening peak hour. Mitigation option A-2 was shown to operate acceptably with a PRC of 4.5% in the morning peak hour and a PRC of 25.5% in evening peak hour.

3.29 National Highways have not provided LinSig model audit reports for the Ardley mitigation options. However, so that there is consistency across all option testing modelling, the key issues raised in the model audit reports for the other junctions discussed in this report, primarily consistency in the approach to saturation flows, have also been applied to the Ardley roundabout mitigation option models.

3.30 The revised Ardley mitigation scheme model results are provided at **Appendix H** for A-2 and **Appendix I** for A-3 (the .lsg3x file will be provided via email) and the results are summarised below.

Ardley Roundabout – mitigation A-2



Number	Scenario Name	Flow Group	Time	Cycle Time (s)	PRC (%)	Delay (pcuHr)
1	2031 Ardley13, 19 AM	Ardley4_AM	07:45 - 08:45	60	10.1	20.52
2	2031 Ardley13, 19 PM	Ardley4_PM	16:30 - 17:30	60	38.9	19.04

3.31 As shown, the revised model forecasts that for both the 2031 morning and evening peak hours, the A-2 mitigation scheme would operate acceptably with the development in place.

Ardley Roundabout – mitigation A-2

Scenarios View

Automatically recalculate results for: All Scenarios | When optimising optimise for: All Scenarios

When assigning, assign for: Current Scenario

Number	Scenario Name	Flow Group	Time	Cycle Time (s)	PRC (%)	Delay (pcuHr)
1	2031 Ardley11, 18 AM	Ardley6_AM	07:45 - 08:45	60	16.4	20.87
2	2031 Ardley11, 18 PM	Ardley6_PM	16:30 - 17:30	60	7.8	24.54

3.32 As shown, the revised model forecasts that for both the 2031 morning and evening peak hours, the A-3 mitigation scheme would operate acceptably with the development in place.

Ardley East Roundabout – proposed options AE-6 and AE-8

3.33 TN5 considered several options for the proposed Ardley East roundabout, with option AE-6 (with a connection to Ardley Road) preferred for strategic options 11 and 13, and option AE-8 (no connection to Ardley Road) preferred for strategic options 18 and 19. LinSig models of both AE-6 and AE-8 Ardley East options were prepared as part of TN5. Option AE-6 was shown to operate acceptably with a PRC of 6.8% in the morning peak hour and a PRC of 8.5% in evening peak hour. Option AE-8 was shown to operate acceptably with a PRC of 8.2% in the morning peak hour and a PRC of 13.2% in evening peak hour.

3.34 National Highways have audited the proposed Ardley East roundabout AE-6 and AE-8 LinSig models and the audit reports are provided at **Appendices J and K**, respectively. The issues raised have been considered and appropriate amendments to the model have been made, as logged in the model audit report provided at **Appendices J and K**. The revised Ardley East roundabout AE-6 and AE-8 model results are provided at **Appendices J and K** (the .lsg3x file will be provided via email) and the results are summarised below.

Ardley East Roundabout – mitigation AE-6

Scenarios View

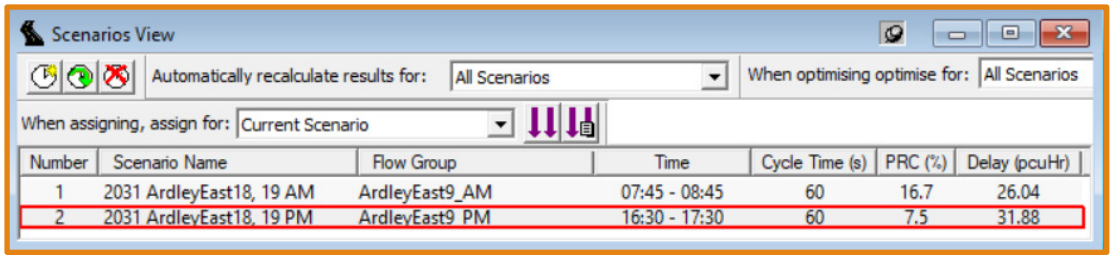
Automatically recalculate results for: All Scenarios | When optimising optimise for: All Scenarios

When assigning, assign for: Current Scenario

Number	Scenario Name	Flow Group	Time	Cycle Time (s)	PRC (%)	Delay (pcuHr)
1	2031 ArdleyEast11, 13 AM	ArdleyEast6 AM	07:45 - 08:45	60	9.8	32.11
2	2031 ArdleyEast11, 13 PM	ArdleyEast6 PM	16:30 - 17:30	60	7.0	38.34

3.35 As shown, the revised model forecasts that for both the 2031 morning and evening peak hours, the AE-6 mitigation scheme would operate acceptably with the development in place.

Ardley East Roundabout – mitigation AE-8



Number	Scenario Name	Flow Group	Time	Cycle Time (s)	PRC (%)	Delay (pcuHr)
1	2031 ArdleyEast18, 19 AM	ArdleyEast9_AM	07:45 - 08:45	60	16.7	26.04
2	2031 ArdleyEast18, 19 PM	ArdleyEast9_PM	16:30 - 17:30	60	7.5	31.88

3.36 As shown, the revised model forecasts that for both the 2031 morning and evening peak hours, the AE-8 mitigation scheme would operate acceptably with the development in place.

Headroom comparison

3.37 The table at paragraph 4.1 of TN8 provides a comparison between the forecast capacity at the existing M40 Junction 10 (no OxSRFI development) with the forecast capacity at the junction under Options 3A, 3B, 11, 13, 18 and 19 with the OxSRFI development in place.

3.38 This table has been updated below to capture the revised model results presented in this report.

Existing		Option 3A	Option 3B	Option 11/18		Option 13/19	
Cherwell (PRC)	Ardley (RFC)	Total (PRC)	Total (PRC)	Cherwell (PRC)	Ardley (PRC)	Cherwell (PRC)	Ardley (PRC)
-28.8% AM 3.1% PM	81% AM 99% PM	0.8% AM 3.1% PM	-15.3% AM -17.5% PM	32.1% AM 9.3% PM	16.4% AM 7.8% PM	32.1% AM 9.3% PM	10.1% AM 38.9% PM

3.39 As shown in the table above, the existing Cherwell and Ardley junctions would be over capacity in 2031 and would therefore require significant improvement to facilitate background growth to 2031 and the proposed development. The table also demonstrates that even compared to the best-case option for a single grade separated junction, the identified Options 11, 13, 18 and 19 offer headroom to accommodate future growth.

APPENDIX A

NATIONAL HIGHWAYS EMAIL RESPONSE

Mark Higgins

From:	Cooper, Eric <Eric.Cooper@highwaysengland.co.uk>
Sent:	21 September 2021 17:37
To:	Stuart Dunhill
Cc:	Joy White (Joy.White@Oxfordshire.gov.uk); jacqui.cox@oxfordshire.gov.uk; Simon Hilditch; Mark Higgins; Steve Harley (steve@oxalisplanning.co.uk); Farooq, Amir; Jopp D, Matthew; Gogna, Sunil
Subject:	FW: OxSRFI - TN5 'M40 J10 Options Report and TN6 'M40 J10 Options Report - Traffic Flow Derivation' - dwgs
Attachments:	1. LINSIG-210406 Baynards Gn - committed scheme Check Sheet.docx; 2. LINSIG-210407 Padbury - committed scheme Check Sheet.docx; 3. LINSIG-210407 Padbury - P-4 T-junction option Check Sheet.docx; 4. LINSIG-2031_DS_M40J10 _Cherwell_reference case Check Sheet.docx; 5. LINSIG-2031_DS_M40J10_Cherwell - Junction option C-5 Check Sheet.docx; 6. LINSIG-2031_DS_M40J10_ArdleyEast_AE6 _ArdleyEast6 (Signals Option) Check Sheet.docx; 7. LINSIG-2031_DS_M40J10 _ArdleyEast_AE8_ArdleyEast9 (Signals Option) - No Ardley Rd Link Check Sheet.docx
Importance:	High
Follow Up Flag:	Follow up
Flag Status:	Flagged

Hi Stuart,

Aecom have undertaken some DMRB compliance checks and modelling reviews. Currently, the advice to National Highways is subject to quality auditing. However, given that we have a meeting on Friday, I am sending you the attached documents and the comments below which will form the basis of the conversation. A finalised version (technical note) will be forwarded in due course picking this up.

Aecom's advice:

Based on our initial review of the preferred options (Options 11,12,18 and 19) identified as part of TN5, we note that the proposals appear to be feasible and generally to the standard or with enough room to adjust if required. However, as you will appreciate, there may be matters which can only be identified at a later stage when a detailed review is undertaken by our designers and various teams at Highways England. In respect to our high level review of the preferred options, in terms of design we have following comments to make:

General observations

- Large number of junctions are proposed as part of all preferred options. For motorists using the Services at M40 J10, it would mean that will have to negotiate a large number of junctions in order to reach to their destinations.
- M40 southbound diverge meets the M40 J10 interchange at signalised T junction. The existing slip road here is single lane and therefore we recommend that the geometry should be checked to ensure compliance with DMRB.
- We note that the junction arrangements have not been fully developed and as such are indicative. Therefore, we advise ADC to consider if the available land is sufficient to modify junctions geometry as required.

Baynards Green Roundabout (Options 11,13, 18 & 19)
Drawing number: OxSRFI-ADC-GEN-XX-SK-CH-SK01

AECOM have not undertaken a detailed review of this layout. As the junction arrangement in this option is signalised, entry curvature is not required. Based on our high level review, we consider that the design looks feasible with room to adjust if required.

A43 realigned highway (options 11,13, 18 & 19)
No geometric information has been provided as part of the submitted plans, however, the realigned highway appears to be achievable to standards.

North Facing M40 slip roads
Drawing number: NONE PROVIDED
J 10 SB diverge (options 11,13, 18 & 19)
It is recommended that ADC should confirm that this is a suitable arrangement based on traffic demands from BTM assessments for the proposed development.

J 10 northbound merge (options 11, 18)
While no information has been provided, adequate room appears to be available to accommodate the replacement slip road.

South Facing M40 J 10 A43 to M40 southbound free flow link (options 11,13, 18 & 19)
Drawing number: OxSRFI-BWB-GEN-XX-SK-CH-SK021
Based on our review of this drawing, we have following comments to make:

- We note that this arrangement may cause confusion, as the outside 2 lanes are to M40. Possible alternative is to develop centre lane to go both directions
- Two lane link road with departures in horizontal alignment R=360m 1 step together with relaxations in transition rate of changes and merge type noted as departure from standard. This may be acceptable as a departure from standard.
- Type B extended merge with lane drop is consistent with 2 lane taper merge.
- Visibility splays appear to be achievable. Widening to the slip road bridge is required to achieve desirable minimum visibility.
- Vertical geometry needs modification at nosing but won't have a great impact on the design.

Padbury Roundabout (options 11,13, 18 & 19)
Drawing number OxSRFI-ADC-GEN-XX-SK-CH-SK02
Geometry not detail checked ,signalised so entry curvature not required design looks feasible with room to adjust if required.
Potential issue with change to signalised T junction form from M40 S/B off slip. Queue lengths may back up to M40.
No U turn facility for A43

Cherwell Roundabout (options 11,13, 18 & 19)
Drawing number OxSRFI-ADC-GEN-XX-SK-CH-SK03
The geometry of this option has not been checked in detail, however, as the option is signalised entry curvature is not required. The design appears feasible with room to adjust if required. We note that this option does not have a U turn facility for A43 / services.

Ardley Roundabout (options 13, 19) Options 11 and 18 slight enlargement of existing roundabout
Drawing number OxSRFI-ADC-GEN-XX-SK-CH-SK20
The geometry of this option has not been checked in detail, however, as the option is signalised entry curvature is not required. The design appears feasible with room to adjust if required. We note that the entry path curvature for south west to north entry does not appear to meet standards as such will need to be considered at future stages.

Ardley Roundabout Slip Road loop (options 13, 19)
Based on a high level review, the geometry appears to comply with standards, however, the vertical geometry is unknown but we would expect to work as existing.

Ardley East Roundabout (options 11,13, 18 & 19)
Drawing number OxSRFI-ADC-GEN-XX-SK-CH-SK04

The geometry of this option has not been checked in detail, however, as the option is signalised entry curvature is not required. The design appears feasible with room to adjust if required. We note that this option does not allow for a connection to Ardley Village except through link road.

Ardley East Roundabout (options 18, 19) Options 11 and 13 similar but moved north slightly
Drawing number OxSRFI-ADC-GEN-XX-SK-CH-SK05
The geometry of this option has not been checked in detail, however, as the option is signalised entry curvature is not required. The design appears feasible with room to adjust if required. We note that this option does not allow for a connection to Ardley Village or Ardley Road to Bucknell except through link road.

Link Road Ardley Rbt to Ardley Rbt east
We note that no information has been provided regarding this but it appears to be achievable to standards.

Ardley Road Bridge
No information provided but appears to be achievable to standards. We note that the vertical alignment on this option may be challenging.

South Facing M40 slip roads (options 11,13, 18 & 19)
Drawing number OxSRFI-BWB-GEN-XX-SK-CH-SK019
J 10 SB merge
Based on the contents of TN5 we note that the traffic flows indicate a requirement for a type E layout with 4 lanes downstream with a lane gain with 2 lanes on the slip road. A permitted change is required (as noted in TN5) to use a two lane ghost island merge with Auxiliary lane Type C/E3 Sketch 19 shows a single lane slip road with a type A merge which is not in line with the report. As such we would welcome some clarity.

In addition, we note that the visibility splays appear to be achievable. With regards to the visibility, we note that widening to the slip road bridge is required to achieve desirable minimum visibility.

We also note that the length of road is close to that at which it becomes an interchange link which has a higher design speed. The Slip is circa 720m and an interchange link would be required at 750m.

J10 NB diverge
Traffic flows indicate a requirement for a type D layout with 4 lanes upstream with a lane drop to 2 lanes on the slip road. A departure from standard will be required (as noted in TN5) to use a Two lane ghost island diverge Type B1 which appears to be to general geometric standards. We also note that visibility splay will require widened verges. While it is not shown we consider this to be achievable with the land available.

Link Ardley East Rbt to OxSRFI Principal access Roundabout
No information provided but appears to be achievable to standards.

In terms of the LinSig assessments, please see attached check sheets and below comments.

- Baynards Green Rbt LinSig – ADC provided LinSig **App 2** - check file: ‘ 1. LINSIG-210406 Baynards Gn - committed scheme Check Sheet’ as attached applies to preferable **Strategic options 11,13,18&19**.
- Padbury HE scheme layout LinSig – ADC provided **LinSig App3** - check file ‘ 2. LINSIG-210407 Padbury - committed scheme Check Sheet’ as attached applies to existing HE **committed scheme** layout.
- Padbury T junction LinSig – ADC provided LinSig **App13** - check file ‘3. LINSIG-210407 Padbury - P-4 T-junction option Check Sheet’ as attached applies to preferable **Strategic options 11, 13, 18&19**.
- Cherwell rbt existing Layout LinSig – ADC provided LinSig **App4** - check file ‘ 4. LINSIG-2031_DS_M40J10_Cherwell_reference case Check Sheet.docx’ as attached applies to **existing layout**.
- Cherwell option Layout LinSig – ADC provided LinSig **App 18** – check file ‘5. LINSIG-2031_DS_M40J10_Cherwell - Junction option C-5 Check Sheet.docx’ as attached applies to preferable **Strategic options 11, 13, 18&19**.

- Ardley East Rbt for option 11&13 Linsig – ADC provided LinSig **App 33** – check file '6. LINSIG-2031_DS_M40J10_ArdleyEast_AE6_ArdleyEast6 (Signals Option) Check Sheet.docx' as attached applies to preferable **Strategic options 11 & 13**.
- Ardley East Rbt for option 18&19 Linsig – ADC provided LinSig **App 34** – check file '7. LINSIG-2031_DS_M40J10_ArdleyEast_AE8_ArdleyEast9 (Signals Option) - No Ardley Rd Link Check Sheet.docx' as attached applies to preferable **Strategic options 18 & 19**.

In addition, we note that Strategic Options 11 and 18, no drawings have been provided. Therefore, it is not clear which models would need to be checked for these options. As such, we would welcome further clarity regarding this. Furthermore, for Strategic Option 13 and 19 – we could not find any LinSig models for Ardley roundabout which could match the provided option drawing layout. As such, we would welcome further information and clarification regarding this.

Regards

eric

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From: Stuart Dunhill <Stuart.Dunhill@ADCinfrastructure.com>
Sent: 12 July 2021 15:17
To: Jopp D, Matthew <Matthew.Jopp@aecom.com>; Farooq, Amir <Amir.Farooq@aecom.com>
Cc: Harriet Moloney (harriet@cuvette.uk) <harriet@cuvette.uk>; Steve Harley (steve@oxalisplanning.co.uk) <steve@oxalisplanning.co.uk>; Mark Higgins <Mark.Higgins@ADCinfrastructure.com>; Simon Hilditch <Simon.Hilditch@bwbconsulting.com>; jacqui.cox@oxfordshire.gov.uk; Cooper, Eric <eric.cooper@highwaysengland.co.uk>; Joy White (Joy.White@Oxfordshire.gov.uk) <Joy.White@Oxfordshire.gov.uk>; Guo, Weiping <Weiping.Guo@aecom.com>
Subject: [EXTERNAL] RE: OxSRFI - TN5 'M40 J10 Options Report and TN6 'M40 J10 Options Report - Traffic Flow Derivation' - dwgs

Thanks for confirming Matt,

Please find attached the following drawings:

- 210617 Working draft Ardley Bypass junction and M40J10 that contains all the concept drawings in one place (other than the below).
- OxSRFI-ADC-GEN-XX-SK-CH-SK04_ Ardley East Roundabout GA (with link with Ardley Road)-S1-P1

To reiterate, these are for proof of concept and not detailed review. You'll also see that further work is required to bring the individual junction solutions together into an overall scheme.

APPENDIX B

BAYNARDS GREEN COMMITTED SCHEME LINSIG MODEL AUDIT AND REVISED RESULTS

LINSIG V3 Model Checking Report

AECOM

Project:	**OXFORDSHIRE SRFI-M40 Junction 10**	Job No:	**xxxxx**
Model:	**210406 Baynards Gn - committed scheme.lsg3x**	Model Submitted:	**16/07/2021**
		Corrections Submitted:	**Date Submitted**

Modelled By: ADC Infrastructure **Checked by: Weiping Guo** **Approved by:**

This note is to document the checks made to LINSIG models. Once completed this should be filed with the model, or model outputs for future reference.

Results Key

× - Changes required before work is signed off
? – Changes may be required before work is signed off, further work required
✓ - No further changes required before work is signed off

File Checked: Hyperlink to model

Network Information

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Scenario title(s) entered	✓			
26/07/21	Project name entered	✓			
26/07/21	Modeller details recorded	✓			
26/07/21	Network location details entered	✓			
26/07/21	File name is logical	✓			

Network Setup

Junction Drawings: In report 'OxSRFI-ADC1794-RP-M-V3 'TN5 M40 Junction 10 Options Report' – appendices' Page no.2
Sat Flow Measurements / Calculations: Hyperlink to Sat Flow Measurements

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	Junctions				
26/07/21	Appropriate junctions setup	✓			
26/07/21	Junction info/ signal controllers complete	✓			
26/07/21	Logical arm structure setup	✓			
	Lanes				
26/07/21	Lane setup reflects junction drawings	✓			
26/07/21	Check each lane that is signal controlled	✓			
26/07/21	Lanes matched to controller and phase	✓	.		
26/07/21	Lane length appropriate	✓			
26/07/21	Custom occupancy (if req)	N/A			
	Saturation Flows				
26/07/21	Justified method to derive saturation flows				
26/07/21	Check observed sat flows (if used)	N/A			
26/07/21	Check RR67 sat flows calculations (if used)	x	1. All the entry arm lanes saturation flows were calculated by RR67 methods, however all the lanes were treated as the 'nearside lane'. And the turning radius seemingly are too low that affect the lanes sat flow calculation. Please double check. 2. All the circulatory lanes Sat flow are directly entered. As all the entry arms are using RR67, we recommend the circulatory lanes adopt the same method of calculations. Also the direct entered Sat flow are lower than the entry arms Sat flow which can cause the issues. In general, the downstream lanes sat flow should be equal or greater than the entry lanes Sat flows, unless there is evidence supporting there is 'bottle neck' issues at the downstream.	1. Central lanes and offside lanes have 'nearside lane' de-selected. All turning radii checked and increased where applicable. 2. All circulating lanes have RR67 parameters applied such that all circulating saturation flows are equal or greater than the entry lanes.	
26/07/21	Check external sat flows calculations (if used)				
26/07/21	Check sat flows for any bottleneck links	?	Please check the Aem5 and Arm11. If the A43 has continues 3 lanes, then the current setup is ok. If there are merging to 2 lanes at some point, the Sat flows should setup to limit the flow distribution on the merging lane rather than 'unconstrained' in the current setup.	Sat flow in 'merging' lane introduced to reflect lane assignment.	
	Advanced Lane Settings				
26/07/21	Use of start / end green displacements (if req)	✓			
26/07/21	Use of queue limits on short links (if req)	✓			
26/07/21	Use of weightings for optimiser constraints (if req)	✓			
26/07/21	Use of random delay or queue de-sliver (if req)	X	1pcu De-sliver is applied for most of the circulatory lanes, which seems be too high after review few lanes queue profile. We recommend to optimise the offset between the controller streams to avoid the requirement of the De-sliver setup, and use 0.5pcu figure if necessary.	De-sliver factors removed where possible and a factor of 0.5 pcu used where still required.	

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			Another reason of queue de-sliver in the current model is possible due to the lanes Sat flows directly entered for all circulatory lanes are lower than the entry arms RR67 sat flow.		
	Give Ways				
26/07/21	Check each lane that is priority controlled	N/A			
26/07/21	Measurement of max/min flow when giving way	N/A			
26/07/21	Flow when opposing traffic stopped reasonable	N/A			
26/07/21	Measurement of give-way co-efficient	N/A			
26/07/21	Measurement of clear conflict time of opposing traffic	N/A			
26/07/21	Check all controlling movements identified	N/A			
26/07/21	Measurement of storage in front of stop-line	N/A			
26/07/21	Max turns in inter-green reasonable	N/A			
26/07/21	Measurement of non-blocking storage	N/A			
	Lane Connectors				
26/07/21	Lane connectors provided reasonable	✓			
26/07/21	Cruise time reasonable	✓	40km/hr cruise speed is applied for all the link connectors.		
26/07/21	Default platoon dispersion used unless observed	✓	The platoon dispersion is switched off due to the short circulatory lanes.		
	Zones				
26/07/21	Zones match O-D matrix	✓	BaynardsRef1_AM flow matches the flow report page 24; BaynardsRef1_PM flow matches the flow report page 25; Baynards1_AM flow matches the flow report page 38; Baynards1_PM flow matches the flow report page 39.		
	Pedestrians				
26/07/21	Ped crossings represented by ped links (if req)	N/A			
26/07/21	Ped link data correct (if req)	N/A			
26/07/21	Ped connector walk times reasonable (if req)	N/A			
26/07/21	Ped links matched to appropriate phases (if req)	N/A			
26/07/21	Ped zones match ped O-D matrix (if req)	N/A			

Controllers

Controller Specifications: Hyperlink to Controller Specification (if req)
Intergreen Calculations: Hyperlink to Intergreen Calculations (if req)

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	General Controller Set-up				
26/07/21	Sufficient controllers setup	✓			
26/07/21	Multiple stage streams setup correctly (if req)	✓			
26/07/21	Non-standard filters setup correctly (if req)	N/A			
	Signal Settings				
26/07/21	Check phases for each controller	✓			
26/07/21	Check phase mins/type reasonable	✓			
26/07/21	Check inter-greens calculations/coding	✓			
26/07/21	Stages reasonable	✓			
26/07/21	Phase delays reasonable (if req)	N/A			

Stage Sequences

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Check stage sequences observed / optimised	✓			
26/07/21	Check stage timings observed / optimised	N/A			

Traffic Counts and Calculations

Traffic Flow Data: Hyperlink to Traffic Flow Data – in report 'OXSRFI-ADC1794-RP-N-V2 'TN6 - M40 J10 OR Traffic Flow Derivation' – bound'
Matrix Calculations: Hyperlink to Matrix Calculations (if required)
Lane Balancing Calculations: Hyperlink to Lane Balancing Calculations (if required)
Site Observations: Hyperlink to Site Flows Observations

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Suitability of traffic surveys undertaken	N/A			
26/07/21	Are there sufficient site observations	N/A			
26/07/21	Check O-D matrix calculations	✓			
26/07/21	Are lane balancing calculations sufficient / consistent	x	Please check the Arm5 and Arm11. If there are merging to 2 lanes at some point, the Sat flows should setup to limit the flow distribution on the merging lane rather than 'unconstrained' in the current setup.	Sat flow in 'merging' lane introduced to reflect lane assignment.	
26/07/21	Does lane balancing match lining	✓			
26/07/21	Does lane balancing match matrices	✓			

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Traffic Flows					
Checked by/date	**Checks Made**	**Result**	**Comments**	**Action taken after Audit**	**Checked by/date**
26/07/21	Traffic & ped flow (if req) groups setup	✓	Multi flow groups setup in the model. Only four flows matrix are used.		
26/07/21	Desired flows match O-D matrices	✓			
26/07/21	Actual flows match desired flows	✓			
26/07/21	Inappropriate routes closed	✓			
26/07/21	Route flows match lane balancing	✓			

Modelling					
Checked by/date	**Checks Made**	**Result**	**Comments**	**Action taken after Audit**	**Checked by/date**
26/07/21	Scenario set up with correct options	✓			
26/07/21	Cycle time appropriate for network control	✓			
26/07/21	Cycle time optimised (if req)	N/A			

Results					
Checked by/date	**Checks Made**	**Result**	**Comments**	**Action taken after Audit**	**Checked by/date**
	Are all values as expected (Demand Flows, Green Times etc)		To be checked after above changes.		
	Deg Sat >100% for existing situation with no modelled suppressed demand?		To be checked after above changes.		
	Deg Sat appropriate? Validated?		To be checked after above changes.		
	Capacity conclusions		To be checked after above changes.		
	If suppressed demand has been modelled, do queues validate?		To be checked after above changes.		
	Queues appropriate?		To be checked after above changes.		
	Queue limits exceeded?		To be checked after above changes.		
	Queuing conclusions (will exit blocking modify these?)		To be checked after above changes.		
	If suppressed demand has been modelled do journey times validate?		To be checked after above changes.		
	Journey time conclusions?		To be checked after above changes.		

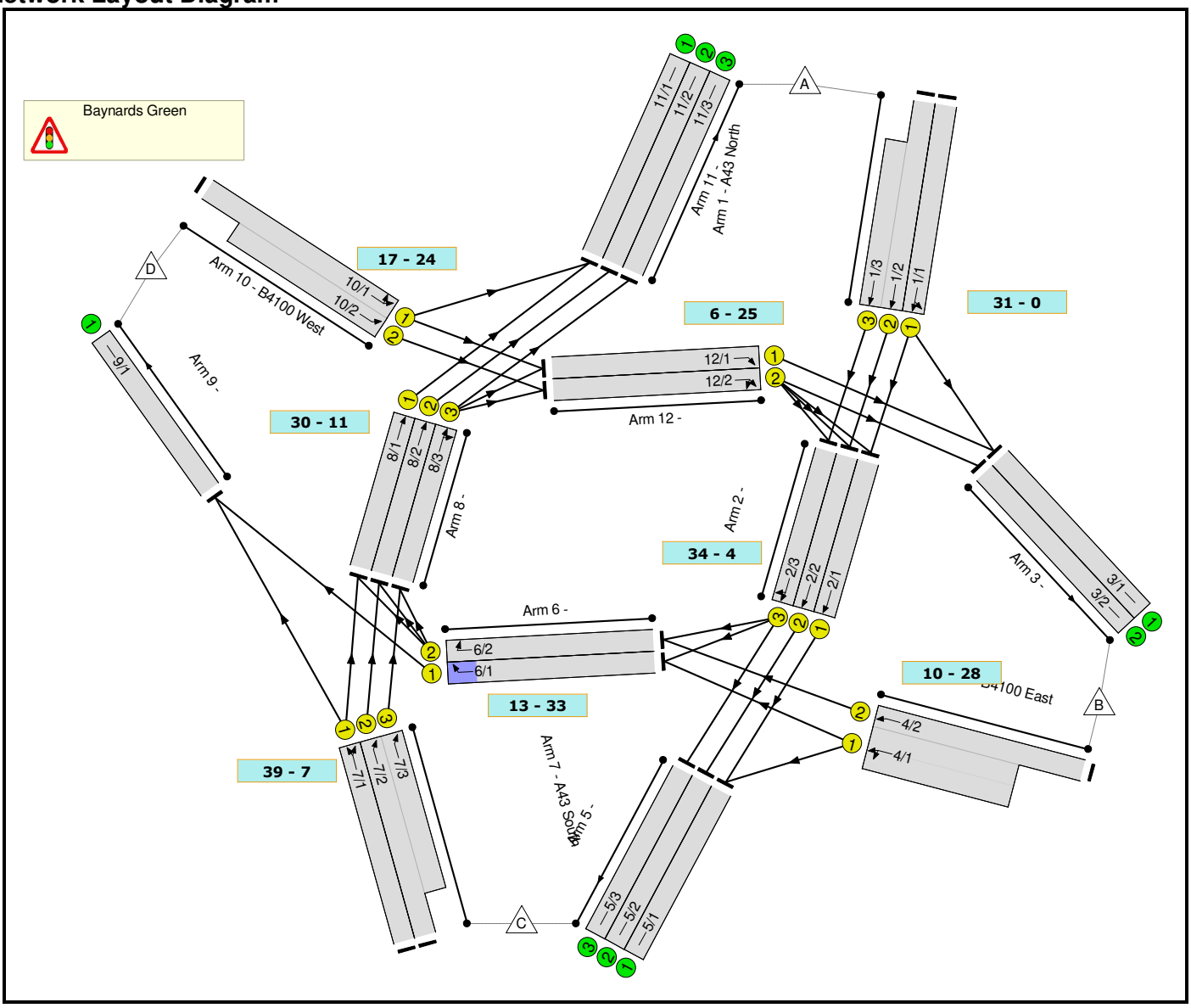
Conclusions and Recommendations

Full Input Data And Results

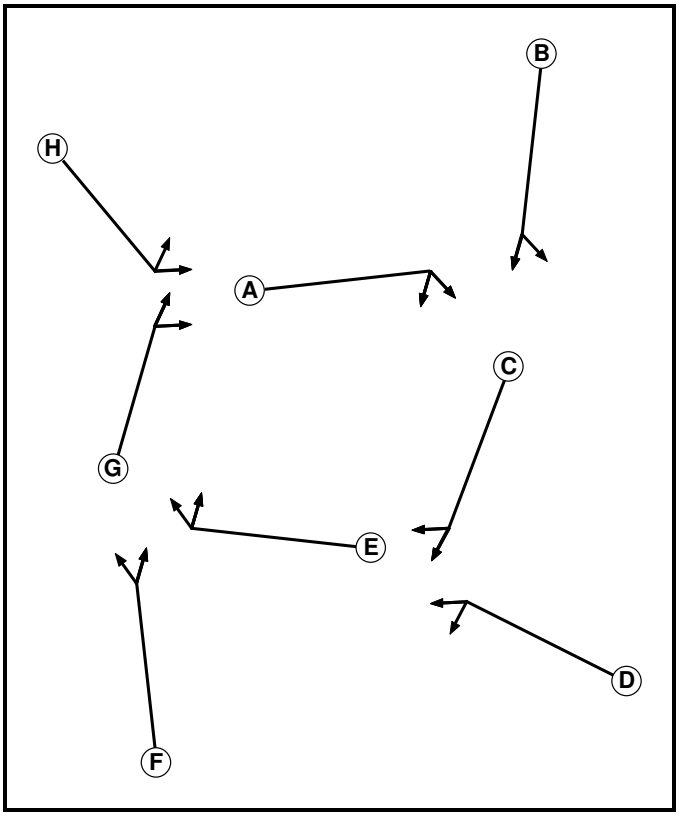
User and Project Details

Project:	**Oxfordshire SRFI**
Title:	**Baynards Green Committed Scheme**
Location:	
Additional detail:	Revised following comment from Aecom
File name:	211005 Baynards Gn - committed scheme.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7
E	Traffic	3		7	7
F	Traffic	3		7	7
G	Traffic	4		7	7
H	Traffic	4		7	7

Phase Intergreens Matrix

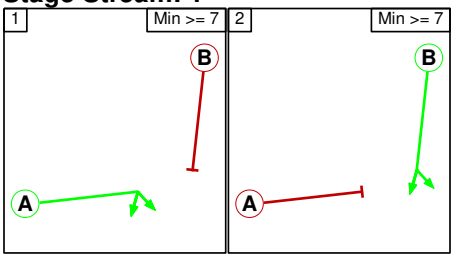
		Starting Phase							
		A	B	C	D	E	F	G	H
Terminating Phase	A		6	-	-	-	-	-	-
	B	6		-	-	-	-	-	-
	C	-	-		6	-	-	-	-
	D	-	-	6		-	-	-	-
	E	-	-	-	-		6	-	-
	F	-	-	-	-	6		-	-
	G	-	-	-	-	-	-		6
	H	-	-	-	-	-	-	6	

Phases in Stage

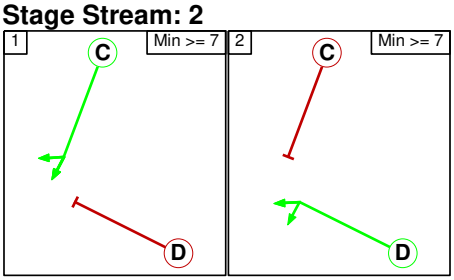
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D
3	1	E
3	2	F
4	1	G
4	2	H

Stage Diagram

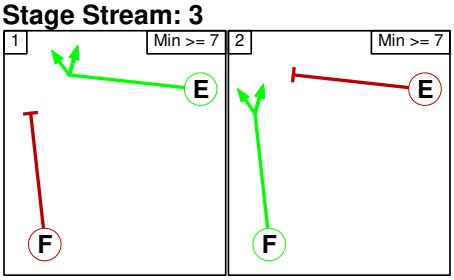
Stage Stream: 1



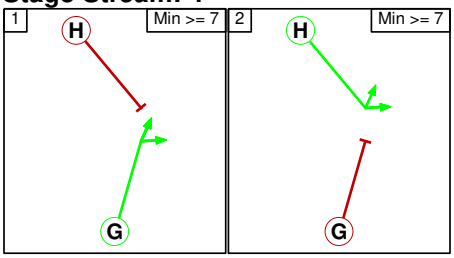
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Prohibited Stage Change

Stage Stream: 1

	To Stage		
		1	2
From Stage	1		6
	2	6	

Stage Stream: 2

	To Stage		
		1	2
From Stage	1		6
	2	6	

Stage Stream: 3

	To Stage		
		1	2
From Stage	1		6
	2	6	

Stage Stream: 4

	To Stage		
		1	2
From Stage	1		6
	2	6	

Lane Input Data

Junction: Baynards Green												
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 (A43 North)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 2 Ahead	60.00
											Arm 3 Left	60.00
1/2 (A43 North)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm 2 Ahead	60.00
1/3 (A43 North)	U	B	2	3	24.3	Geom	-	3.65	0.00	N	Arm 2 Ahead	60.00
2/1	U	C	2	3	8.7	Geom	-	3.65	0.00	Y	Arm 5 Ahead	Inf
2/2	U	C	2	3	8.7	Geom	-	3.65	0.00	N	Arm 5 Ahead	Inf
2/3	U	C	2	3	8.7	Geom	-	3.65	0.00	N	Arm 5 Ahead	Inf
											Arm 6 Right	Inf
3/1	U		2	3	60.0	Inf	-	-	-	-	-	-
3/2	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1 (B4100 East)	U	D	2	3	10.4	User	3800	-	-	-	-	-
4/2 (B4100 East)	U	D	2	3	60.0	Geom	-	3.50	0.00	N	Arm 6 Ahead	70.00
5/1	U		2	3	60.0	User	2000	-	-	-	-	-
5/2	U		2	3	60.0	Inf	-	-	-	-	-	-
5/3	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1	U	E	2	3	10.4	Geom	-	3.65	0.00	Y	Arm 9 Right	Inf
6/2	U	E	2	3	10.4	Geom	-	3.65	0.00	N	Arm 8 Right	Inf
7/1 (A43 South)	U	F	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 8 Ahead	60.00
											Arm 9 Ahead	60.00
7/2 (A43 South)	U	F	2	3	60.0	Geom	-	3.65	0.00	N	Arm 8 Ahead	60.00
7/3 (A43 South)	U	F	2	3	22.6	Geom	-	3.65	0.00	N	Arm 8 Ahead	60.00
8/1	U	G	2	3	8.7	Geom	-	3.65	0.00	Y	Arm 11 Ahead	Inf
8/2	U	G	2	3	8.7	Geom	-	3.65	0.00	N	Arm 11 Ahead	Inf
8/3	U	G	2	3	8.7	Geom	-	3.65	0.00	N	Arm 11 Ahead	Inf
											Arm 12 Right	Inf
9/1	U		2	3	60.0	Inf	-	-	-	-	-	-
10/1	U	H	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 11 Left	30.00

(B4100 West)											Arm 12 Ahead	40.00
10/2 (B4100 West)	U	H	2	3	22.6	Geom	-	3.50	0.00	Y	Arm 12 Ahead	40.00
11/1	U		2	3	60.0	Inf	-	-	-	-	-	-
11/2	U		2	3	60.0	Inf	-	-	-	-	-	-
11/3	U		2	3	60.0	User	2000	-	-	-	-	-
12/1	U	A	2	3	9.6	Geom	-	3.65	0.00	Y	Arm 3 Right	Inf
12/2	U	A	2	3	9.6	Geom	-	3.65	0.00	N	Arm 2 Right	Inf
											Arm 3 Right	Inf

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'Baynards1_AM'	07:45	08:45	01:00	
3: 'Baynards1_PM'	16:30	17:30	01:00	
5: 'BaynardsRef1_AM'	07:45	08:45	01:00	
7: 'BaynardsRef1_PM'	16:30	17:30	01:00	

Scenario 1: '2031 Reference Case - AM Peak' (FG5: 'BaynardsRef1_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	446	2247	70	2763
	B	350	0	212	306	868
	C	1468	287	0	125	1880
	D	72	296	123	1	492
	Tot.	1890	1029	2582	502	6003

Traffic Lane Flows

Lane	Scenario 1: 2031 Reference Case - AM Peak
Junction: Baynards Green	
1/1	854
1/2 (with short)	1909(In) 975(Out)
1/3 (short)	934
2/1	411
2/2	1040
2/3	990
3/1	765
3/2	264
4/1 (short)	518
4/2 (with short)	868(In) 350(Out)
5/1	623
5/2	1040
5/3	919
6/1	377
6/2	350
7/1	543
7/2 (with short)	1337(In) 742(Out)
7/3 (short)	595
8/1	555
8/2	888
8/3	662
9/1	502
10/1 (with short)	492(In) 246(Out)
10/2 (short)	246
11/1	627
11/2	888
11/3	375
12/1	319
12/2	388

Lane Saturation Flows

Junction: Baynards Green								
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 (A43 North)	3.65	0.00	Y	Arm 2 Ahead	60.00	47.8 %	1932	1932
				Arm 3 Left	60.00	52.2 %		
1/2 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
1/3 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
2/1	3.65	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1980	1980
2/2	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
2/3	3.65	0.00	N	Arm 5 Ahead	Inf	92.8 %	2120	2120
				Arm 6 Right	Inf	7.2 %		
3/1	Infinite Saturation Flow						Inf	Inf
3/2	Infinite Saturation Flow						Inf	Inf
4/1 (B4100 East Lane 1)	This lane uses a directly entered Saturation Flow						3800	3800
4/2 (B4100 East)	3.50	0.00	N	Arm 6 Ahead	70.00	100.0 %	2061	2061
5/1	This lane uses a directly entered Saturation Flow						2000	2000
5/2	Infinite Saturation Flow						Inf	Inf
5/3	Infinite Saturation Flow						Inf	Inf
6/1	3.65	0.00	Y	Arm 9 Right	Inf	100.0 %	1980	1980
6/2	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
7/1 (A43 South)	3.65	0.00	Y	Arm 8 Ahead	60.00	77.0 %	1932	1932
				Arm 9 Ahead	60.00	23.0 %		
7/2 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
7/3 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
8/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
8/3	3.65	0.00	N	Arm 11 Ahead	Inf	56.6 %	2120	2120
				Arm 12 Right	Inf	43.4 %		
9/1	Infinite Saturation Flow						Inf	Inf
10/1 (B4100 West)	3.50	0.00	Y	Arm 11 Left	30.00	29.3 %	1887	1887
				Arm 12 Ahead	40.00	70.7 %		
10/2 (B4100 West)	3.50	0.00	Y	Arm 12 Ahead	40.00	100.0 %	1894	1894
11/1	Infinite Saturation Flow						Inf	Inf
11/2	Infinite Saturation Flow						Inf	Inf
11/3	This lane uses a directly entered Saturation Flow						2000	2000
12/1	3.65	0.00	Y	Arm 3 Right	Inf	100.0 %	1980	1980
12/2	3.65	0.00	N	Arm 2 Right	Inf	32.0 %	2120	2120

				Arm 3 Right	Inf	68.0 %		

Scenario 2: '2031 Do Something - AM Peak' (FG1: 'Baynards1_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	446	2516	70	3032
	B	350	0	212	306	868
	C	1587	287	0	125	1999
	D	72	296	123	1	492
	Tot.	2009	1029	2851	502	6391

Traffic Lane Flows

Lane	Scenario 2: 2031 Do Something - AM Peak
Junction: Baynards Green	
1/1	1061
1/2 (with short)	1971(In) 1011(Out)
1/3 (short)	960
2/1	647
2/2	1067
2/3	996
3/1	760
3/2	269
4/1 (short)	518
4/2 (with short)	868(In) 350(Out)
5/1	859
5/2	1067
5/3	925
6/1	377
6/2	350
7/1	610
7/2 (with short)	1389(In) 790(Out)
7/3 (short)	599
8/1	636
8/2	918
8/3	670
9/1	502
10/1 (with short)	492(In) 246(Out)
10/2 (short)	246
11/1	708
11/2	918
11/3	383
12/1	314
12/2	393

Lane Saturation Flows

Junction: Baynards Green								
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 (A43 North)	3.65	0.00	Y	Arm 2 Ahead	60.00	58.0 %	1932	1932
				Arm 3 Left	60.00	42.0 %		
1/2 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
1/3 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
2/1	3.65	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1980	1980
2/2	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
2/3	3.65	0.00	N	Arm 5 Ahead	Inf	92.9 %	2120	2120
				Arm 6 Right	Inf	7.1 %		
3/1	Infinite Saturation Flow						Inf	Inf
3/2	Infinite Saturation Flow						Inf	Inf
4/1 (B4100 East Lane 1)	This lane uses a directly entered Saturation Flow						3800	3800
4/2 (B4100 East)	3.50	0.00	N	Arm 6 Ahead	70.00	100.0 %	2061	2061
5/1	This lane uses a directly entered Saturation Flow						2000	2000
5/2	Infinite Saturation Flow						Inf	Inf
5/3	Infinite Saturation Flow						Inf	Inf
6/1	3.65	0.00	Y	Arm 9 Right	Inf	100.0 %	1980	1980
6/2	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
7/1 (A43 South)	3.65	0.00	Y	Arm 8 Ahead	60.00	79.5 %	1932	1932
				Arm 9 Ahead	60.00	20.5 %		
7/2 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
7/3 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
8/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
8/3	3.65	0.00	N	Arm 11 Ahead	Inf	57.2 %	2120	2120
				Arm 12 Right	Inf	42.8 %		
9/1	Infinite Saturation Flow						Inf	Inf
10/1 (B4100 West)	3.50	0.00	Y	Arm 11 Left	30.00	29.3 %	1887	1887
				Arm 12 Ahead	40.00	70.7 %		
10/2 (B4100 West)	3.50	0.00	Y	Arm 12 Ahead	40.00	100.0 %	1894	1894
11/1	Infinite Saturation Flow						Inf	Inf
11/2	Infinite Saturation Flow						Inf	Inf
11/3	This lane uses a directly entered Saturation Flow						2000	2000
12/1	3.65	0.00	Y	Arm 3 Right	Inf	100.0 %	1980	1980
12/2	3.65	0.00	N	Arm 2 Right	Inf	31.6 %	2120	2120

				Arm 3 Right	Inf	68.4 %		

Scenario 3: '2031 Reference Case - PM Peak' (FG7: 'BaynardsRef1_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	2	467	1283	45	1797
	B	637	0	240	372	1249
	C	2198	230	0	90	2518
	D	37	244	47	3	331
	Tot.	2874	941	1570	510	5895

Traffic Lane Flows

Lane	Scenario 3: 2031 Reference Case - PM Peak
Junction: Baynards Green	
1/1	523
1/2 (with short)	1274(In) 653(Out)
1/3 (short)	621
2/1	99
2/2	655
2/3	626
3/1	706
3/2	235
4/1 (short)	612
4/2 (with short)	1249(In) 637(Out)
5/1	339
5/2	655
5/3	576
6/1	420
6/2	639
7/1	754
7/2 (with short)	1764(In) 934(Out)
7/3 (short)	830
8/1	903
8/2	1188
8/3	976
9/1	510
10/1 (with short)	331(In) 165(Out)
10/2 (short)	166
11/1	940
11/2	1188
11/3	746
12/1	239
12/2	285

Lane Saturation Flows

Junction: Baynards Green								
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 (A43 North)	3.65	0.00	Y	Arm 2 Ahead	60.00	10.7 %	1932	1932
				Arm 3 Left	60.00	89.3 %		
1/2 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
1/3 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
2/1	3.65	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1980	1980
2/2	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
2/3	3.65	0.00	N	Arm 5 Ahead	Inf	92.0 %	2120	2120
				Arm 6 Right	Inf	8.0 %		
3/1	Infinite Saturation Flow						Inf	Inf
3/2	Infinite Saturation Flow						Inf	Inf
4/1 (B4100 East Lane 1)	This lane uses a directly entered Saturation Flow						3800	3800
4/2 (B4100 East)	3.50	0.00	N	Arm 6 Ahead	70.00	100.0 %	2061	2061
5/1	This lane uses a directly entered Saturation Flow						2000	2000
5/2	Infinite Saturation Flow						Inf	Inf
5/3	Infinite Saturation Flow						Inf	Inf
6/1	3.65	0.00	Y	Arm 9 Right	Inf	100.0 %	1980	1980
6/2	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
7/1 (A43 South)	3.65	0.00	Y	Arm 8 Ahead	60.00	88.1 %	1932	1932
				Arm 9 Ahead	60.00	11.9 %		
7/2 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
7/3 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
8/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
8/3	3.65	0.00	N	Arm 11 Ahead	Inf	76.4 %	2120	2120
				Arm 12 Right	Inf	23.6 %		
9/1	Infinite Saturation Flow						Inf	Inf
10/1 (B4100 West)	3.50	0.00	Y	Arm 11 Left	30.00	22.4 %	1889	1889
				Arm 12 Ahead	40.00	77.6 %		
10/2 (B4100 West)	3.50	0.00	Y	Arm 12 Ahead	40.00	100.0 %	1894	1894
11/1	Infinite Saturation Flow						Inf	Inf
11/2	Infinite Saturation Flow						Inf	Inf
11/3	This lane uses a directly entered Saturation Flow						2000	2000
12/1	3.65	0.00	Y	Arm 3 Right	Inf	100.0 %	1980	1980
12/2	3.65	0.00	N	Arm 2 Right	Inf	17.5 %	2120	2120

				Arm 3 Right	Inf	82.5 %		

Scenario 4: '2031 Do Something - PM Peak' (FG3: 'Baynards1_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	2	467	1435	45	1949
	B	637	0	240	372	1249
	C	2473	230	0	90	2793
	D	37	244	47	3	331
	Tot.	3149	941	1722	510	6322

Traffic Lane Flows

Lane	Scenario 4: 2031 Do Something - PM Peak
Junction: Baynards Green	
1/1	489
1/2 (with short)	1460(In) 746(Out)
1/3 (short)	714
2/1	22
2/2	763
2/3	747
3/1	708
3/2	233
4/1 (short)	612
4/2 (with short)	1249(In) 637(Out)
5/1	262
5/2	763
5/3	697
6/1	420
6/2	639
7/1	861
7/2 (with short)	1932(In) 999(Out)
7/3 (short)	933
8/1	1029
8/2	1277
8/3	1036
9/1	510
10/1 (with short)	331(In) 165(Out)
10/2 (short)	166
11/1	1066
11/2	1277
11/3	806
12/1	241
12/2	283

Lane Saturation Flows

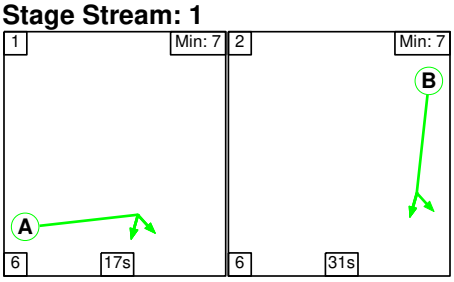
Junction: Baynards Green								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A43 North)	3.65	0.00	Y	Arm 2 Ahead	60.00	4.5 %	1932	1932
				Arm 3 Left	60.00	95.5 %		
1/2 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
1/3 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
2/1	3.65	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1980	1980
2/2	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
2/3	3.65	0.00	N	Arm 5 Ahead	Inf	93.3 %	2120	2120
				Arm 6 Right	Inf	6.7 %		
3/1	Infinite Saturation Flow						Inf	Inf
3/2	Infinite Saturation Flow						Inf	Inf
4/1 (B4100 East Lane 1)	This lane uses a directly entered Saturation Flow						3800	3800
4/2 (B4100 East)	3.50	0.00	N	Arm 6 Ahead	70.00	100.0 %	2061	2061
5/1	This lane uses a directly entered Saturation Flow						2000	2000
5/2	Infinite Saturation Flow						Inf	Inf
5/3	Infinite Saturation Flow						Inf	Inf
6/1	3.65	0.00	Y	Arm 9 Right	Inf	100.0 %	1980	1980
6/2	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
7/1 (A43 South)	3.65	0.00	Y	Arm 8 Ahead	60.00	89.5 %	1932	1932
				Arm 9 Ahead	60.00	10.5 %		
7/2 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
7/3 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
8/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
8/3	3.65	0.00	N	Arm 11 Ahead	Inf	77.8 %	2120	2120
				Arm 12 Right	Inf	22.2 %		
9/1	Infinite Saturation Flow						Inf	Inf
10/1 (B4100 West)	3.50	0.00	Y	Arm 11 Left	30.00	22.4 %	1889	1889
				Arm 12 Ahead	40.00	77.6 %		
10/2 (B4100 West)	3.50	0.00	Y	Arm 12 Ahead	40.00	100.0 %	1894	1894
11/1	Infinite Saturation Flow						Inf	Inf
11/2	Infinite Saturation Flow						Inf	Inf
11/3	This lane uses a directly entered Saturation Flow						2000	2000
12/1	3.65	0.00	Y	Arm 3 Right	Inf	100.0 %	1980	1980
12/2	3.65	0.00	N	Arm 2 Right	Inf	17.7 %	2120	2120

				Arm 3 Right	Inf	82.3 %		

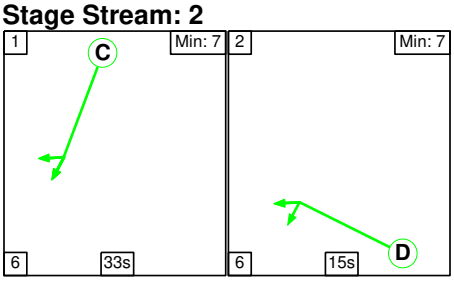
Scenario 1: '2031 Reference Case - AM Peak' (FG5: 'BaynardsRef1_AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

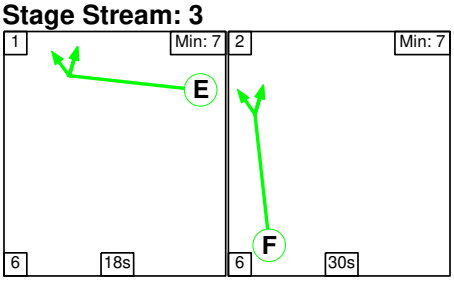
Stage Stream: 1



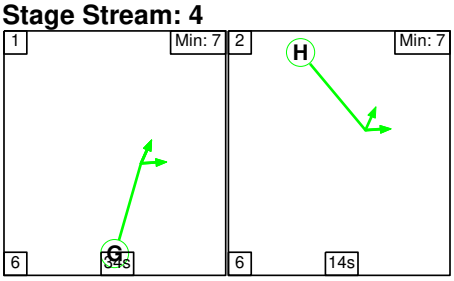
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	17	31
Change Point	0	23

Stage Stream: 2

Stage	1	2
Duration	33	15
Change Point	25	4

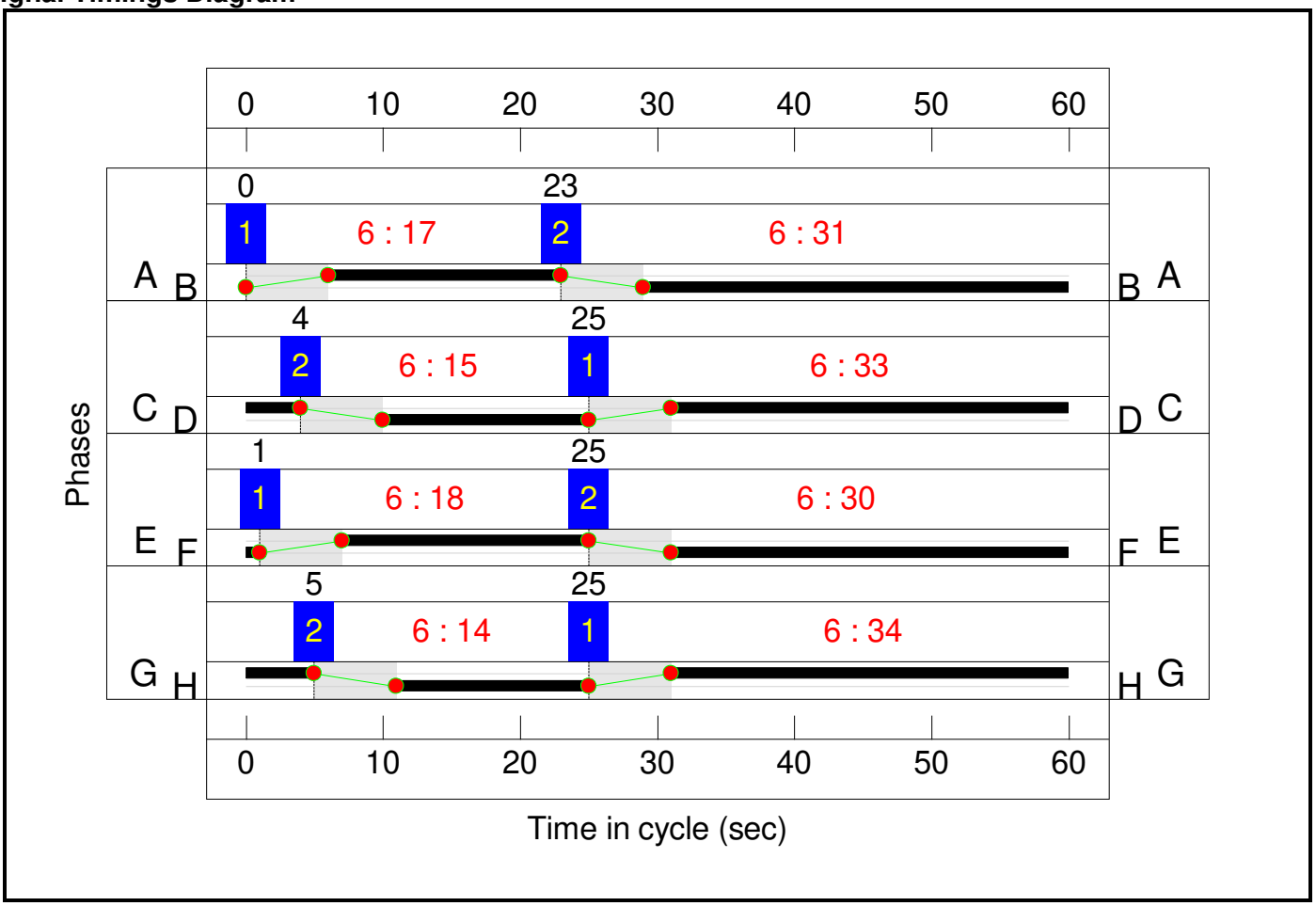
Stage Stream: 3

Stage	1	2
Duration	18	30
Change Point	1	25

Stage Stream: 4

Stage	1	2
Duration	34	14
Change Point	25	5

Signal Timings Diagram



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 (%)
Network: Baynards Green Committed Scheme	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**92.3%**
Baynards Green	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**92.3%**
1/1	A43 North Ahead Left	U	1	N/A	B		1	31	-	854	1932	1030	82.9%
1/2+1/3	A43 North Ahead	U	1	N/A	B		1	31	-	1909	2068:2068	1056+1012	92.3 : 92.3%
2/1	Ahead	U	2	N/A	C		1	33	-	411	1980	1122	36.6%
2/2	Ahead	U	2	N/A	C		1	33	-	1040	2120	1201	86.6%
2/3	Ahead Right	U	2	N/A	C		1	33	-	990	2120	1201	82.4%
4/2+4/1	B4100 East Left Ahead	U	2	N/A	D		1	15	-	868	2061:3800	550+813	63.7 : 63.7%
5/1		U	N/A	N/A	-		-	-	-	623	2000	2000	31.2%
6/1	Right	U	3	N/A	E		1	18	-	377	1980	627	60.1%
6/2	Right	U	3	N/A	E		1	18	-	350	2120	671	52.1%
7/1	A43 South Ahead Ahead2	U	3	N/A	F		1	30	-	543	1932	998	54.4%
7/2+7/3	A43 South Ahead	U	3	N/A	F		1	30	-	1337	2068:2068	1068+920	69.4 : 64.7%
8/1	Ahead	U	4	N/A	G		1	34	-	555	1980	1155	48.1%
8/2	Ahead	U	4	N/A	G		1	34	-	888	2120	1237	71.8%
8/3	Ahead Right	U	4	N/A	G		1	34	-	662	2120	1237	53.5%
10/1+10/2	B4100 West Left Ahead	U	4	N/A	H		1	14	-	492	1887:1894	472+474	52.1 : 52.0%
11/3		U	N/A	N/A	-		-	-	-	375	2000	2000	18.8%
12/1	Right	U	1	N/A	A		1	17	-	319	1980	594	53.7%
12/2	Right Right2	U	1	N/A	A		1	17	-	388	2120	636	61.0%

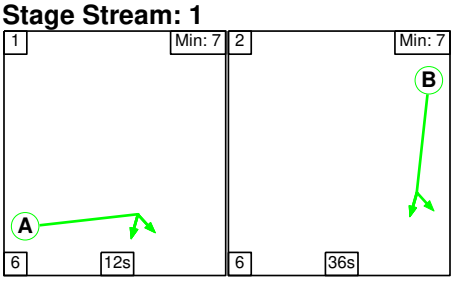
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Baynards Green Committed Scheme	**-**	**-**	**0**	**0**	**0**	**25.9**	**11.3**	**0.0**	**37.2**	**-**	**-**	**-**	**-**
Baynards Green	**-**	**-**	**0**	**0**	**0**	**25.9**	**11.3**	**0.0**	**37.2**	**-**	**-**	**-**	**-**
1/1	854	854	-	-	-	2.8	2.4	-	5.1	21.6	11.9	2.4	14.2
1/2+1/3	1909	1909	-	-	-	6.4	5.6	-	12.0	22.7	14.1	5.6	19.7
2/1	411	411	-	-	-	0.0	0.0	-	0.0	0.1	0.0	0.0	0.0
2/2	1040	1040	-	-	-	0.2	0.0	-	0.2	0.6	1.1	0.0	1.1
2/3	990	990	-	-	-	0.1	0.0	-	0.1	0.5	0.9	0.0	0.9
4/2+4/1	868	868	-	-	-	4.6	0.9	-	5.5	22.6	5.2	0.9	6.0
5/1	623	623	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
6/1	377	377	-	-	-	0.6	0.0	-	0.6	6.2	1.6	0.0	1.6
6/2	350	350	-	-	-	0.3	0.0	-	0.3	3.2	0.5	0.0	0.5
7/1	543	543	-	-	-	1.5	0.6	-	2.1	13.7	6.0	0.6	6.6
7/2+7/3	1337	1337	-	-	-	3.9	1.0	-	4.9	13.2	9.3	1.0	10.3
8/1	555	555	-	-	-	0.4	0.0	-	0.4	2.3	2.3	0.0	2.3
8/2	888	888	-	-	-	0.4	0.0	-	0.4	1.6	5.3	0.0	5.3
8/3	662	662	-	-	-	0.2	0.0	-	0.2	0.8	1.1	0.0	1.1
10/1+10/2	492	492	-	-	-	2.7	0.5	-	3.2	23.4	3.5	0.5	4.0
11/3	375	375	-	-	-	0.0	0.1	-	0.1	1.1	1.1	0.1	1.2
12/1	319	319	-	-	-	0.9	0.0	-	0.9	10.3	2.7	0.0	2.7
12/2	388	388	-	-	-	1.0	0.0	-	1.0	9.0	2.7	0.0	2.7

C1	Stream: 1	PRC for Signalled Lanes (%):	-2.6	Total Delay for Signalled Lanes (pcuHr):	19.07	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	4.0	Total Delay for Signalled Lanes (pcuHr):	5.78	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	29.6	Total Delay for Signalled Lanes (pcuHr):	7.93	Cycle Time (s):	60
C1	Stream: 4	PRC for Signalled Lanes (%):	25.3	Total Delay for Signalled Lanes (pcuHr):	4.09	Cycle Time (s):	60
		PRC Over All Lanes (%):	-2.6	Total Delay Over All Lanes(pcuHr):	37.21		

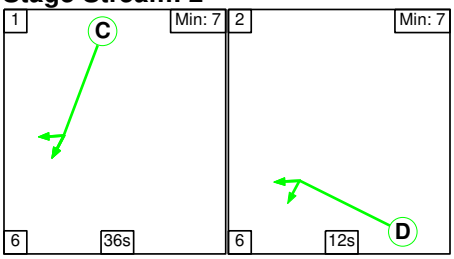
Scenario 2: '2031 Do Something - AM Peak' (FG1: 'Baynards1_AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

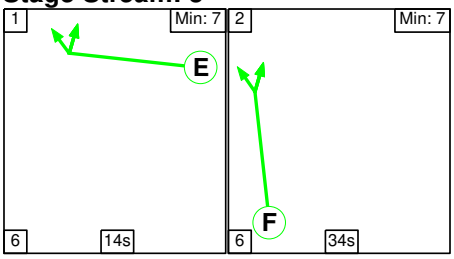
Stage Stream: 1



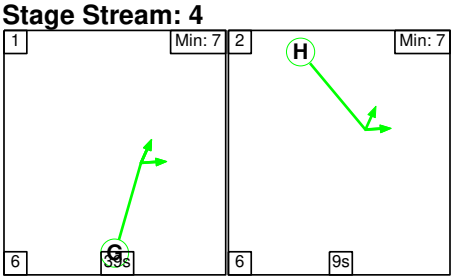
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	12	36
Change Point	0	18

Stage Stream: 2

Stage	1	2
Duration	36	12
Change Point	17	59

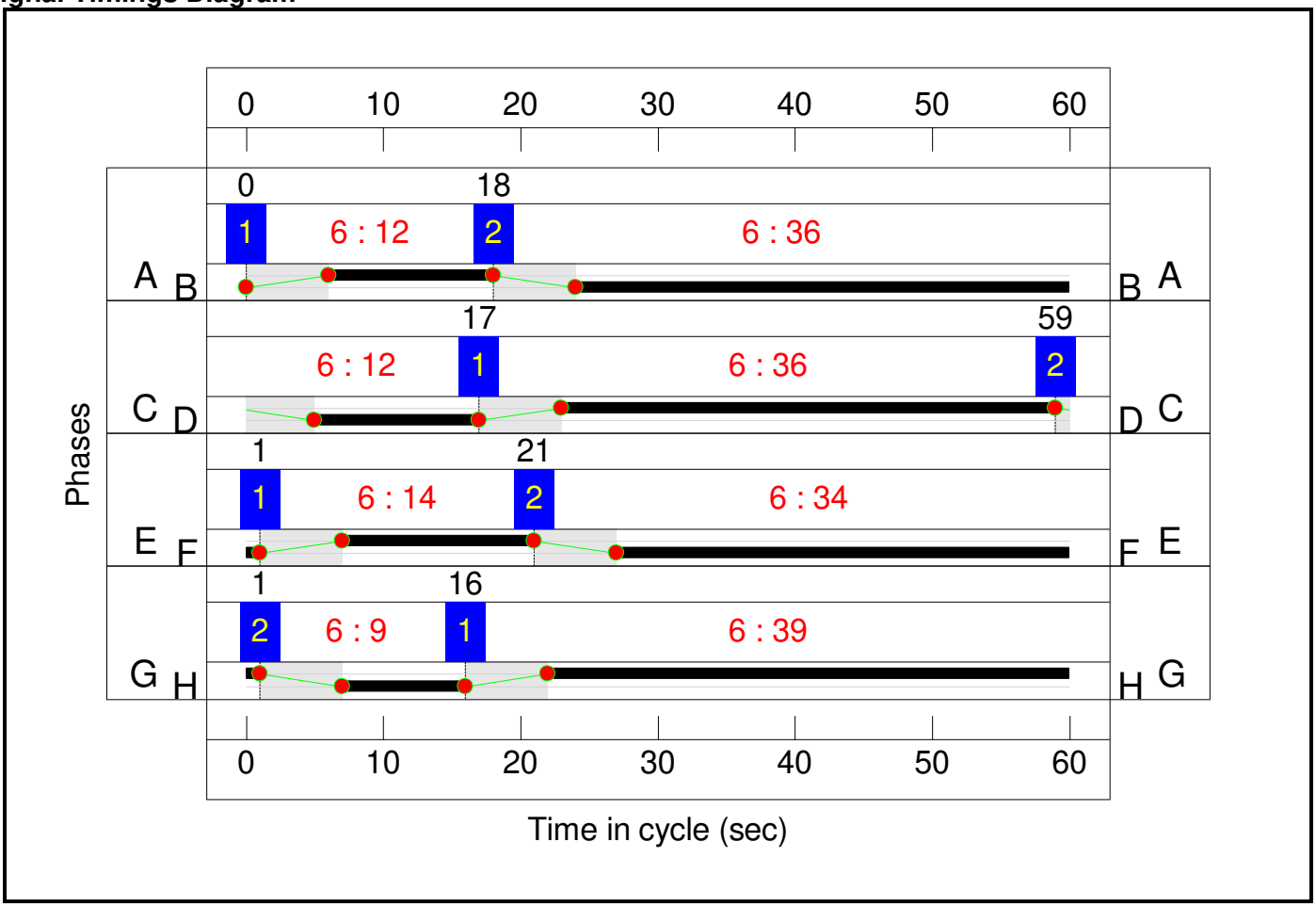
Stage Stream: 3

Stage	1	2
Duration	14	34
Change Point	1	21

Stage Stream: 4

Stage	1	2
Duration	39	9
Change Point	16	1

Signal Timings Diagram



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 (%)
Network: Baynards Green Committed Scheme	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**95.3%**
Baynards Green	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**95.3%**
1/1	A43 North Ahead Left	U	1	N/A	B		1	36	-	1061	1932	1191	89.1%
1/2+1/3	A43 North Ahead	U	1	N/A	B		1	36	-	1971	2068:2068	1061+1007	95.3 : 95.3%
2/1	Ahead	U	2	N/A	C		1	36	-	647	1980	1221	53.0%
2/2	Ahead	U	2	N/A	C		1	36	-	1067	2120	1307	81.6%
2/3	Ahead Right	U	2	N/A	C		1	36	-	996	2120	1307	76.2%
4/2+4/1	B4100 East Left Ahead	U	2	N/A	D		1	12	-	868	2061:3800	447+800	78.4 : 64.7%
5/1		U	N/A	N/A	-		-	-	-	859	2000	2000	43.0%
6/1	Right	U	3	N/A	E		1	14	-	377	1980	495	76.2%
6/2	Right	U	3	N/A	E		1	14	-	350	2120	530	66.0%
7/1	A43 South Ahead Ahead2	U	3	N/A	F		1	34	-	610	1932	1127	54.1%
7/2+7/3	A43 South Ahead	U	3	N/A	F		1	34	-	1389	2068:2068	1176+892	67.2 : 67.2%
8/1	Ahead	U	4	N/A	G		1	39	-	636	1980	1320	48.2%
8/2	Ahead	U	4	N/A	G		1	39	-	918	2120	1413	65.0%
8/3	Ahead Right	U	4	N/A	G		1	39	-	670	2120	1413	47.4%
10/1+10/2	B4100 West Left Ahead	U	4	N/A	H		1	9	-	492	1887:1894	314+316	78.2 : 77.9%
11/3		U	N/A	N/A	-		-	-	-	383	2000	2000	19.2%
12/1	Right	U	1	N/A	A		1	12	-	314	1980	429	73.2%
12/2	Right Right2	U	1	N/A	A		1	12	-	393	2120	459	85.6%

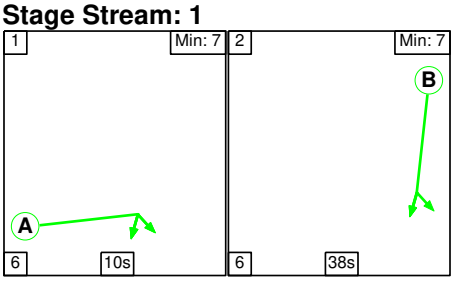
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Baynards Green Committed Scheme	**-**	**-**	**0**	**0**	**0**	**25.6**	**17.4**	**0.0**	**43.1**	**-**	**-**	**-**	**-**
Baynards Green	**-**	**-**	**0**	**0**	**0**	**25.6**	**17.4**	**0.0**	**43.1**	**-**	**-**	**-**	**-**
1/1	1061	1061	-	-	-	2.9	3.8	-	6.7	22.8	15.0	3.8	18.9
1/2+1/3	1971	1971	-	-	-	4.6	8.6	-	13.2	24.2	12.4	8.6	21.0
2/1	647	647	-	-	-	0.4	0.0	-	0.4	2.0	1.4	0.0	1.4
2/2	1067	1067	-	-	-	0.6	0.0	-	0.6	2.1	2.3	0.0	2.3
2/3	996	996	-	-	-	0.5	0.0	-	0.5	2.0	1.9	0.0	1.9
4/2+4/1	868	868	-	-	-	5.2	1.1	-	6.4	26.4	5.4	1.1	6.6
5/1	859	859	-	-	-	0.0	0.4	-	0.4	1.6	0.0	0.4	0.4
6/1	377	377	-	-	-	0.6	0.0	-	0.6	5.4	1.4	0.0	1.4
6/2	350	350	-	-	-	0.1	0.0	-	0.1	0.8	0.1	0.0	0.1
7/1	610	610	-	-	-	1.3	0.6	-	1.9	11.1	6.1	0.6	6.7
7/2+7/3	1389	1389	-	-	-	3.1	1.0	-	4.1	10.6	8.8	1.0	9.8
8/1	636	636	-	-	-	0.4	0.0	-	0.4	2.2	3.1	0.0	3.1
8/2	918	918	-	-	-	0.5	0.0	-	0.5	1.8	3.0	0.0	3.0
8/3	670	670	-	-	-	0.3	0.0	-	0.3	1.6	1.8	0.0	1.8
10/1+10/2	492	492	-	-	-	3.3	1.7	-	5.0	36.7	3.9	1.7	5.6
11/3	383	383	-	-	-	0.0	0.1	-	0.1	1.1	0.6	0.1	0.7
12/1	314	314	-	-	-	1.0	0.0	-	1.0	11.0	2.4	0.0	2.4
12/2	393	393	-	-	-	1.0	0.0	-	1.0	9.5	2.6	0.0	2.6

C1	Stream: 1	PRC for Signalled Lanes (%):	-5.9	Total Delay for Signalled Lanes (pcuHr):	21.96	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	10.3	Total Delay for Signalled Lanes (pcuHr):	7.87	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	18.2	Total Delay for Signalled Lanes (pcuHr):	6.61	Cycle Time (s):	60
C1	Stream: 4	PRC for Signalled Lanes (%):	15.1	Total Delay for Signalled Lanes (pcuHr):	6.16	Cycle Time (s):	60
		PRC Over All Lanes (%):	-5.9	Total Delay Over All Lanes(pcuHr):	43.09		

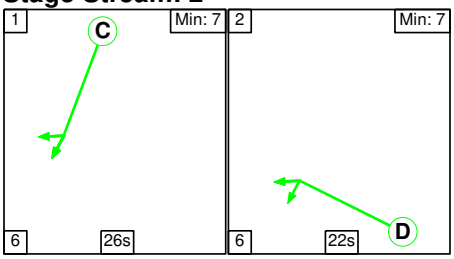
Scenario 3: '2031 Reference Case - PM Peak' (FG7: 'BaynardsRef1_PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

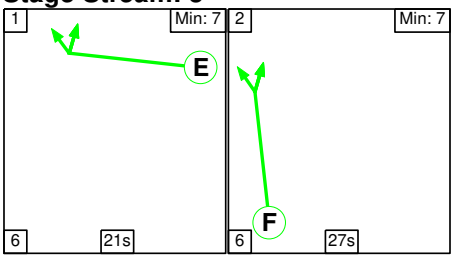
Stage Stream: 1



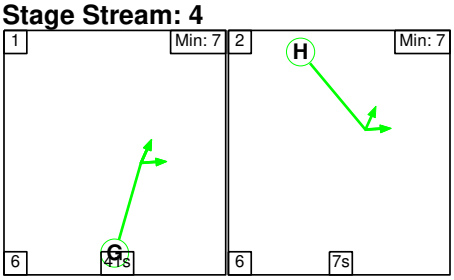
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	10	38
Change Point	0	16

Stage Stream: 2

Stage	1	2
Duration	26	22
Change Point	14	46

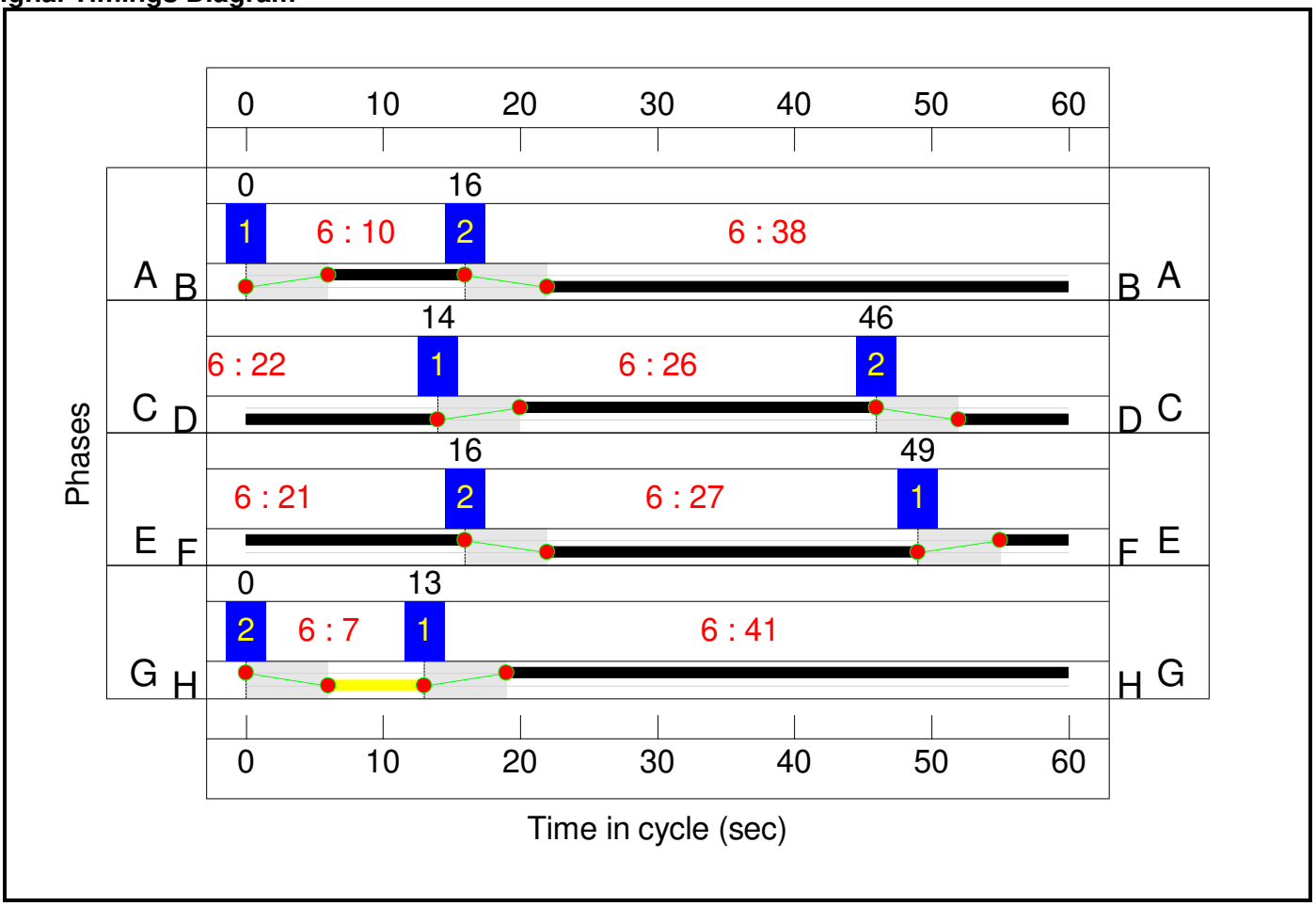
Stage Stream: 3

Stage	1	2
Duration	21	27
Change Point	49	16

Stage Stream: 4

Stage	1	2
Duration	41	7
Change Point	13	0

Signal Timings Diagram



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 (%)
Network: Baynards Green Committed Scheme	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**96.8%**
Baynards Green	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**96.8%**
1/1	A43 North Ahead Left	U	1	N/A	B		1	38	-	523	1932	1256	41.6%
1/2+1/3	A43 North Ahead	U	1	N/A	B		1	38	-	1274	2068:2068	1060+1008	61.6 : 61.6%
2/1	Ahead	U	2	N/A	C		1	26	-	99	1980	891	11.1%
2/2	Ahead	U	2	N/A	C		1	26	-	655	2120	954	68.7%
2/3	Ahead Right	U	2	N/A	C		1	26	-	626	2120	954	65.6%
4/2+4/1	B4100 East Left Ahead	U	2	N/A	D		1	22	-	1249	2061:3800	721+692	88.4 : 88.4%
5/1		U	N/A	N/A	-		-	-	-	339	2000	2000	17.0%
6/1	Right	U	3	N/A	E		1	21	-	420	1980	726	57.9%
6/2	Right	U	3	N/A	E		1	21	-	639	2120	777	82.2%
7/1	A43 South Ahead Ahead2	U	3	N/A	F		1	27	-	754	1932	902	83.6%
7/2+7/3	A43 South Ahead	U	3	N/A	F		1	27	-	1764	2068:2068	965+965	96.8 : 86.0%
8/1	Ahead	U	4	N/A	G		1	41	-	903	1980	1386	65.2%
8/2	Ahead	U	4	N/A	G		1	41	-	1188	2120	1484	80.1%
8/3	Ahead Right	U	4	N/A	G		1	41	-	976	2120	1484	65.8%
10/1+10/2	B4100 West Left Ahead	U	4	N/A	H		1	7	-	331	1889:1894	252+253	65.5 : 65.7%
11/3		U	N/A	N/A	-		-	-	-	746	2000	2000	37.3%
12/1	Right	U	1	N/A	A		1	10	-	239	1980	363	65.8%
12/2	Right Right2	U	1	N/A	A		1	10	-	285	2120	389	73.3%

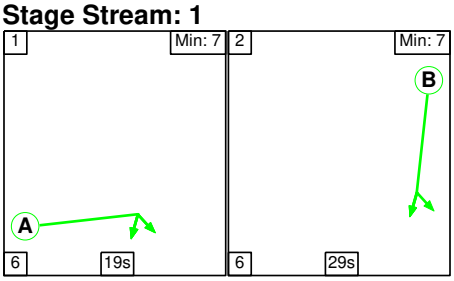
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Baynards Green Committed Scheme	**-**	**-**	**0**	**0**	**0**	**27.8**	**13.6**	**0.0**	**41.4**	**-**	**-**	**-**	**-**
Baynards Green	**-**	**-**	**0**	**0**	**0**	**27.8**	**13.6**	**0.0**	**41.4**	**-**	**-**	**-**	**-**
1/1	523	523	-	-	-	0.7	0.4	-	1.1	7.5	4.1	0.4	4.4
1/2+1/3	1274	1274	-	-	-	1.9	0.8	-	2.7	7.6	5.4	0.8	6.2
2/1	99	99	-	-	-	0.2	0.0	-	0.2	5.7	1.0	0.0	1.0
2/2	655	655	-	-	-	1.5	0.0	-	1.5	8.0	3.3	0.0	3.3
2/3	626	626	-	-	-	1.4	0.0	-	1.4	8.0	3.2	0.0	3.2
4/2+4/1	1249	1249	-	-	-	5.2	3.6	-	8.9	25.6	9.4	3.6	13.0
5/1	339	339	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1
6/1	420	420	-	-	-	0.5	0.0	-	0.5	4.5	1.9	0.0	1.9
6/2	639	639	-	-	-	0.3	0.0	-	0.3	1.9	0.6	0.0	0.6
7/1	754	754	-	-	-	2.9	2.5	-	5.4	25.8	10.9	2.5	13.4
7/2+7/3	1764	1764	-	-	-	7.3	5.0	-	12.3	25.2	15.0	5.0	20.1
8/1	903	903	-	-	-	0.7	0.0	-	0.7	2.9	3.8	0.0	3.8
8/2	1188	1188	-	-	-	0.8	0.0	-	0.8	2.3	4.0	0.0	4.0
8/3	976	976	-	-	-	0.4	0.0	-	0.4	1.4	2.3	0.0	2.3
10/1+10/2	331	331	-	-	-	2.3	0.9	-	3.2	35.0	2.6	0.9	3.5
11/3	746	746	-	-	-	0.0	0.3	-	0.3	1.5	2.3	0.3	2.6
12/1	239	239	-	-	-	0.8	0.0	-	0.8	11.8	1.9	0.0	1.9
12/2	285	285	-	-	-	0.8	0.0	-	0.8	10.7	2.0	0.0	2.0

C1	Stream: 1	PRC for Signalled Lanes (%):	22.7	Total Delay for Signalled Lanes (pcuHr):	5.40	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	1.8	Total Delay for Signalled Lanes (pcuHr):	11.89	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	-7.5	Total Delay for Signalled Lanes (pcuHr):	18.60	Cycle Time (s):	60
C1	Stream: 4	PRC for Signalled Lanes (%):	12.4	Total Delay for Signalled Lanes (pcuHr):	5.10	Cycle Time (s):	60
		PRC Over All Lanes (%):	-7.5	Total Delay Over All Lanes(pcuHr):	41.39		

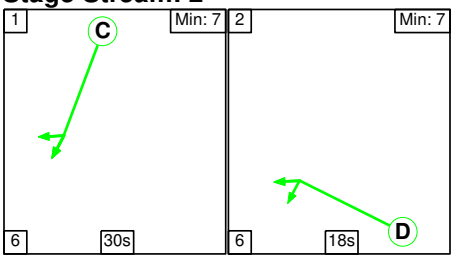
Scenario 4: '2031 Do Something - PM Peak' (FG3: 'Baynards1_PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

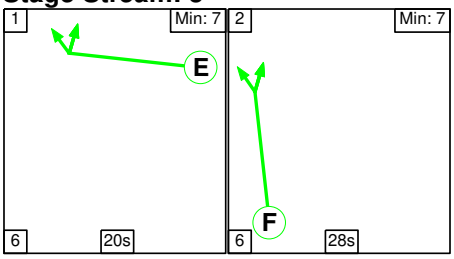
Stage Stream: 1



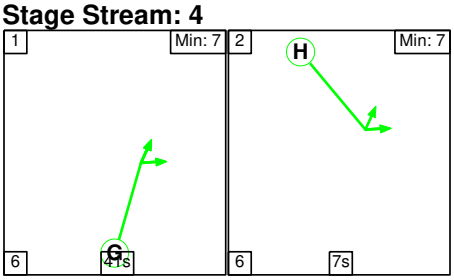
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	19	29
Change Point	0	25

Stage Stream: 2

Stage	1	2
Duration	30	18
Change Point	28	4

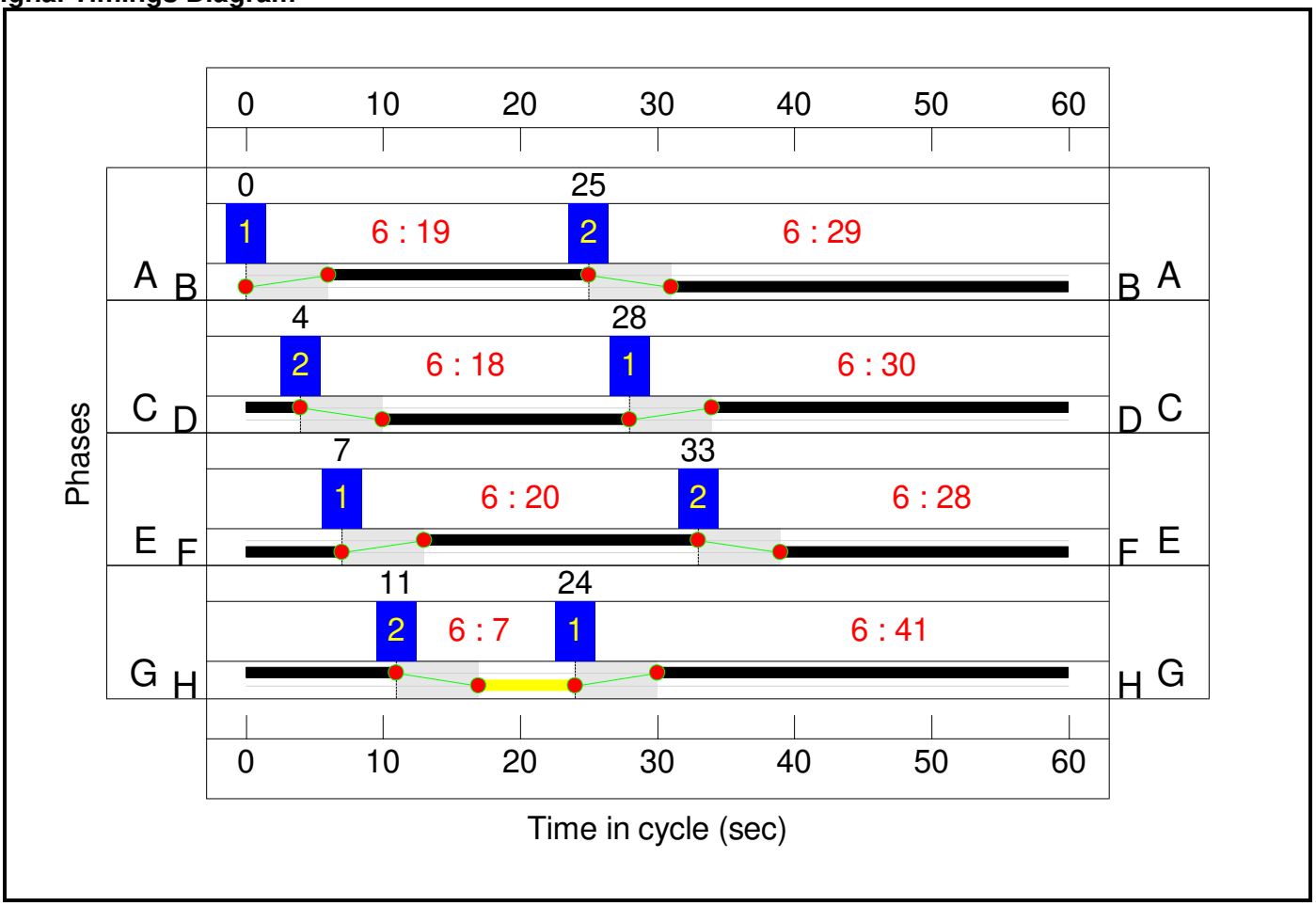
Stage Stream: 3

Stage	1	2
Duration	20	28
Change Point	7	33

Stage Stream: 4

Stage	1	2
Duration	41	7
Change Point	24	11

Signal Timings Diagram



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 (%)
Network: Baynards Green Committed Scheme	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**99.9%**
Baynards Green	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**99.9%**
1/1	A43 North Ahead Left	U	1	N/A	B		1	29	-	489	1932	966	50.6%
1/2+1/3	A43 North Ahead	U	1	N/A	B		1	29	-	1460	2068:2068	1034+1011	72.1 : 70.6%
2/1	Ahead	U	2	N/A	C		1	30	-	22	1980	1023	2.2%
2/2	Ahead	U	2	N/A	C		1	30	-	763	2120	1095	69.7%
2/3	Ahead Right	U	2	N/A	C		1	30	-	747	2120	1095	68.2%
4/2+4/1	B4100 East Left Ahead	U	2	N/A	D		1	18	-	1249	2061:3800	653+627	97.6 : 97.6%
5/1		U	N/A	N/A	-		-	-	-	262	2000	2000	13.1%
6/1	Right	U	3	N/A	E		1	20	-	420	1980	693	60.6%
6/2	Right	U	3	N/A	E		1	20	-	639	2120	742	86.1%
7/1	A43 South Ahead Ahead2	U	3	N/A	F		1	28	-	861	1932	934	92.2%
7/2+7/3	A43 South Ahead	U	3	N/A	F		1	28	-	1932	2068:2068	1000+999	99.9 : 93.4%
8/1	Ahead	U	4	N/A	G		1	41	-	1029	1980	1386	74.2%
8/2	Ahead	U	4	N/A	G		1	41	-	1277	2120	1484	86.1%
8/3	Ahead Right	U	4	N/A	G		1	41	-	1036	2120	1484	69.8%
10/1+10/2	B4100 West Left Ahead	U	4	N/A	H		1	7	-	331	1889:1894	252+253	65.5 : 65.7%
11/3		U	N/A	N/A	-		-	-	-	806	2000	2000	40.3%
12/1	Right	U	1	N/A	A		1	19	-	241	1980	660	36.5%
12/2	Right Right2	U	1	N/A	A		1	19	-	283	2120	707	40.0%

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)
Network: Baynards Green Committed Scheme	**-**	**-**	**0**	**0**	**0**	**28.2**	**30.8**	**0.0**	**59.0**	**-**	**-**	**-**	**-**
Baynards Green	**-**	**-**	**0**	**0**	**0**	**28.2**	**30.8**	**0.0**	**59.0**	**-**	**-**	**-**	**-**
1/1	489	489	-	-	-	1.4	0.5	-	1.9	13.8	5.4	0.5	5.9
1/2+1/3	1460	1460	-	-	-	4.7	1.2	-	5.9	14.7	9.5	1.2	10.8
2/1	22	22	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	763	763	-	-	-	0.0	0.0	-	0.0	0.2	0.3	0.0	0.3
2/3	747	747	-	-	-	0.1	0.0	-	0.1	0.3	0.5	0.0	0.5
4/2+4/1	1249	1249	-	-	-	6.4	11.6	-	18.0	51.9	10.4	11.6	22.0
5/1	262	262	-	-	-	0.0	0.1	-	0.1	1.0	0.0	0.1	0.1
6/1	420	420	-	-	-	0.4	0.0	-	0.4	3.1	2.4	0.0	2.4
6/2	639	639	-	-	-	0.0	0.0	-	0.0	0.1	0.0	0.0	0.0
7/1	861	861	-	-	-	3.5	5.2	-	8.6	36.1	13.2	5.2	18.3
7/2+7/3	1932	1932	-	-	-	8.1	11.0	-	19.0	35.5	16.4	11.0	27.3
8/1	1029	1029	-	-	-	0.3	0.0	-	0.3	1.2	3.9	0.0	3.9
8/2	1277	1277	-	-	-	0.4	0.0	-	0.4	1.0	4.2	0.0	4.2
8/3	1036	1036	-	-	-	0.1	0.0	-	0.1	0.3	1.0	0.0	1.0
10/1+10/2	331	331	-	-	-	2.3	0.9	-	3.2	35.0	2.6	0.9	3.5
11/3	806	806	-	-	-	0.0	0.3	-	0.3	1.5	0.6	0.3	0.9
12/1	241	241	-	-	-	0.3	0.0	-	0.3	4.3	1.5	0.0	1.5
12/2	283	283	-	-	-	0.3	0.0	-	0.3	4.0	1.6	0.0	1.6

C1	Stream: 1	PRC for Signalled Lanes (%):	24.7	Total Delay for Signalled Lanes (pcuHr):	8.43	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	-8.4	Total Delay for Signalled Lanes (pcuHr):	18.12	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	-11.1	Total Delay for Signalled Lanes (pcuHr):	28.05	Cycle Time (s):	60
C1	Stream: 4	PRC for Signalled Lanes (%):	4.6	Total Delay for Signalled Lanes (pcuHr):	4.01	Cycle Time (s):	60
		PRC Over All Lanes (%):	-11.1	Total Delay Over All Lanes(pcuHr):	59.02		

APPENDIX C

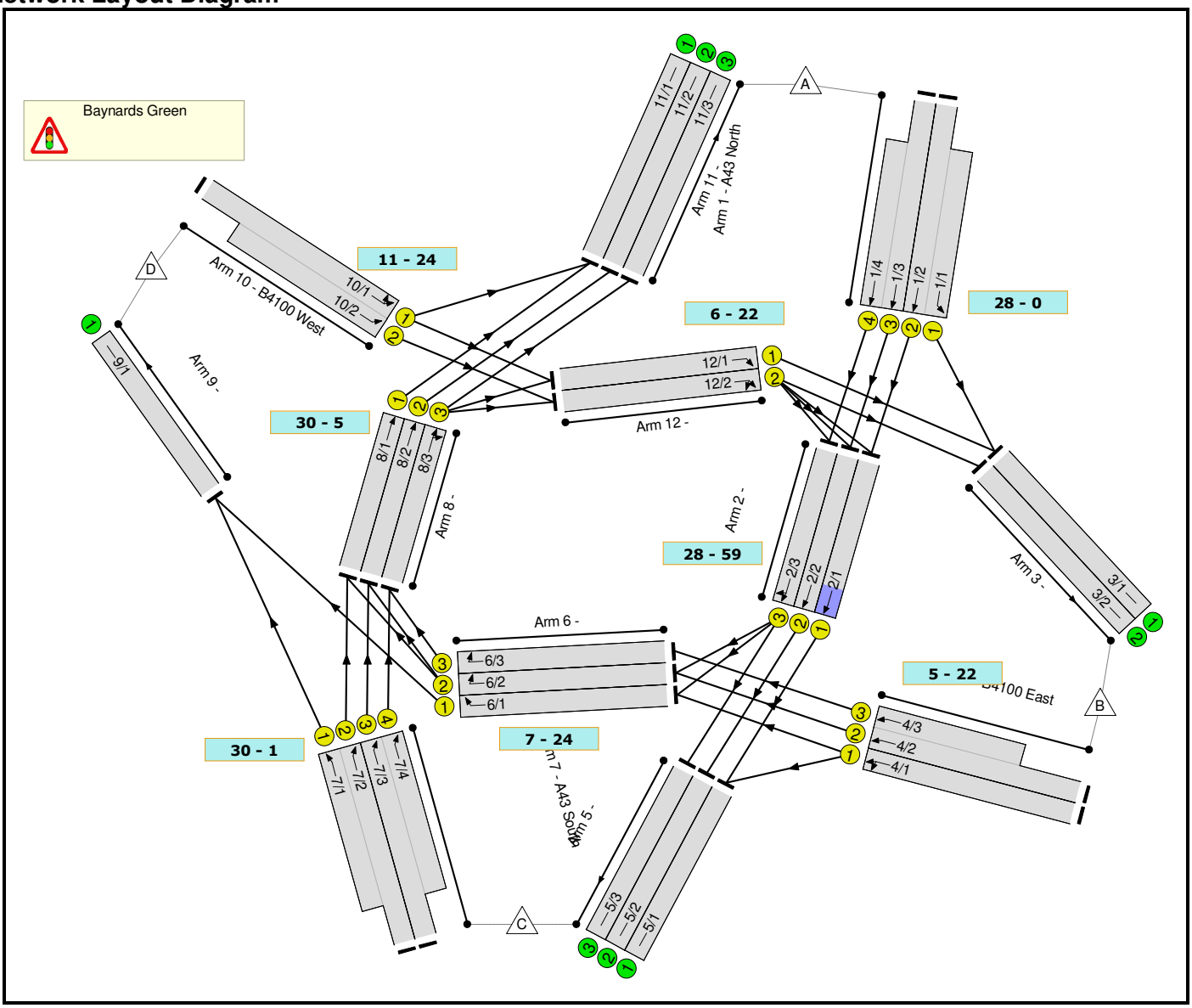
BAYNARDS GREEN MITIGATION SCHEME LINSIG MODEL AUDIT AND REVISED RESULTS

Full Input Data And Results

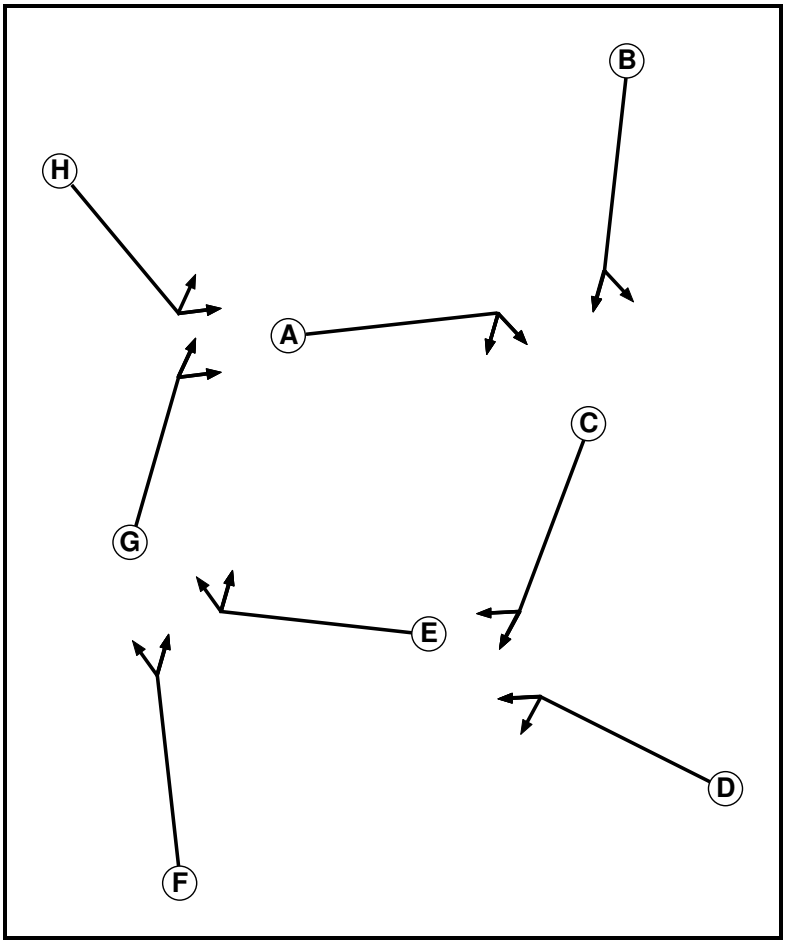
User and Project Details

Project:	**Oxfordshire SRFI**
Title:	**Baynards Green Mitigation scheme**
Location:	
Additional detail:	Amended sat flows following Aecom comments
File name:	211006 Baynards Gn - OxSRFI mitigation.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7
E	Traffic	3		7	7
F	Traffic	3		7	7
G	Traffic	4		7	7
H	Traffic	4		7	7

Phase Intergreens Matrix

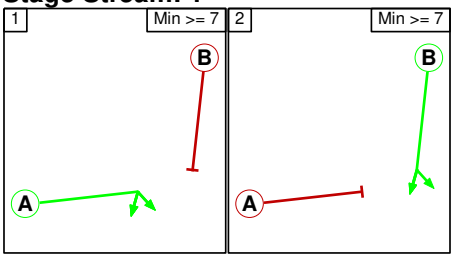
		Starting Phase							
		A	B	C	D	E	F	G	H
Terminating Phase	A		6	-	-	-	-	-	-
	B	6		-	-	-	-	-	-
	C	-	-		6	-	-	-	-
	D	-	-	6		-	-	-	-
	E	-	-	-	-		6	-	-
	F	-	-	-	-	6		-	-
	G	-	-	-	-	-	-		6
	H	-	-	-	-	-	-	6	

Phases in Stage

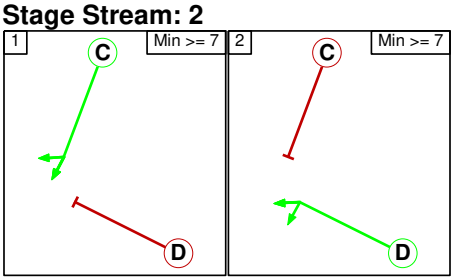
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D
3	1	E
3	2	F
4	1	G
4	2	H

Stage Diagram

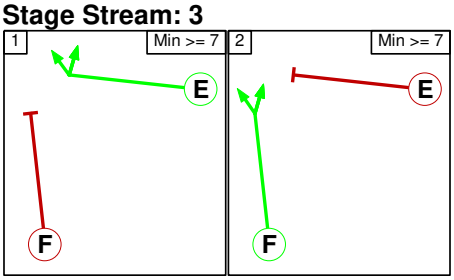
Stage Stream: 1



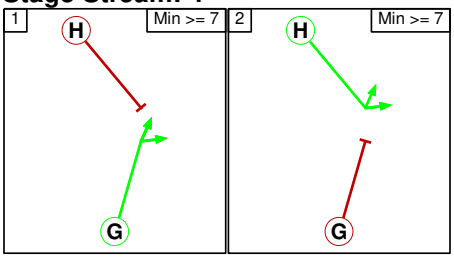
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 2

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 3

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 4

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		6
	2	6	

Stage Stream: 2

		To Stage	
		1	2
From Stage	1		6
	2	6	

Stage Stream: 3

		To Stage	
		1	2
From Stage	1		6
	2	6	

Stage Stream: 4

	To Stage		
		1	2
From Stage	1		6
	2	6	

Lane Input Data

Junction: Baynards Green												
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 (A43 North)	U	B	2	3	20.9	Geom	-	3.65	0.00	Y	Arm 3 Left	60.00
1/2 (A43 North)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm 2 Ahead	60.00
1/3 (A43 North)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm 2 Ahead	60.00
1/4 (A43 North)	U	B	2	3	24.3	Geom	-	3.65	0.00	N	Arm 2 Ahead	60.00
2/1	U	C	2	3	9.6	Geom	-	3.65	0.00	Y	Arm 5 Ahead	Inf
2/2	U	C	2	3	9.6	Geom	-	3.65	0.00	N	Arm 5 Ahead	Inf
2/3	U	C	2	3	9.6	Geom	-	3.65	0.00	N	Arm 5 Ahead Arm 6 Right	Inf Inf
3/1	U		2	3	60.0	Inf	-	-	-	-	-	-
3/2	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1 (B4100 East)	U	D	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 5 Left Arm 6 Ahead	35.00 Inf
4/2 (B4100 East)	U	D	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 6 Ahead	Inf
4/3 (B4100 East)	U	D	2	3	10.4	Geom	-	3.50	0.00	N	Arm 6 Ahead	50.00
5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
5/2	U		2	3	60.0	Inf	-	-	-	-	-	-
5/3	U		2	3	60.0	User	2000	-	-	-	-	-
6/1	U	E	2	3	11.3	Geom	-	3.50	0.00	Y	Arm 9 Right	Inf
6/2	U	E	2	3	11.3	Geom	-	3.65	0.00	N	Arm 8 Right	Inf
6/3	U	E	2	3	11.3	Geom	-	3.65	0.00	N	Arm 8 Right	Inf
7/1 (A43 South)	U	F	2	3	12.2	Geom	-	3.65	0.00	Y	Arm 9 Ahead	60.00
7/2 (A43 South)	U	F	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 8 Ahead	60.00
7/3 (A43 South)	U	F	2	3	60.0	Geom	-	3.65	0.00	N	Arm 8 Ahead	60.00
7/4 (A43 South)	U	F	2	3	22.6	Geom	-	3.65	0.00	N	Arm 8 Ahead	60.00
8/1	U	G	2	3	12.2	Geom	-	3.65	0.00	Y	Arm 11 Ahead	Inf
8/2	U	G	2	3	12.2	Geom	-	3.65	0.00	N	Arm 11 Ahead	Inf
8/3	U	G	2	3	12.2	Geom	-	3.65	0.00	N	Arm 11 Ahead	Inf

											Arm 12 Right	Inf
9/1	U		2	3	60.0	Inf	-	-	-	-	-	-
10/1 (B4100 West)	U	H	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 11 Left	30.00
											Arm 12 Ahead	40.00
10/2 (B4100 West)	U	H	2	3	22.6	Geom	-	3.50	0.00	N	Arm 12 Ahead	40.00
11/1	U		2	3	60.0	Inf	-	-	-	-	-	-
11/2	U		2	3	60.0	Inf	-	-	-	-	-	-
11/3	U		2	3	60.0	User	2000	-	-	-	-	-
12/1	U	A	2	3	11.3	Geom	-	3.65	0.00	Y	Arm 3 Right	Inf
12/2	U	A	2	3	11.3	Geom	-	3.65	0.00	N	Arm 2 Right	Inf
											Arm 3 Right	Inf

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'Baynards1_AM'	07:45	08:45	01:00	
3: 'Baynards1_PM'	16:30	17:30	01:00	

Scenario 1: '2031 Do Something - AM Peak' (FG1: 'Baynards1_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	446	2516	70	3032
	B	350	0	212	306	868
	C	1587	287	0	125	1999
	D	72	296	123	1	492
	Tot.	2009	1029	2851	502	6391

Traffic Lane Flows

Lane	Scenario 1: 2031 Do Something - AM Peak
Junction: Baynards Green	
1/1 (short)	446
1/2 (with short)	1338(In) 892(Out)
1/3 (with short)	1694(In) 928(Out)
1/4 (short)	766
2/1	933
2/2	977
2/3	800
3/1	758
3/2	271
4/1	518
4/2 (with short)	350(In) 278(Out)
4/3 (short)	72
5/1	1145
5/2	977
5/3	729
6/1	377
6/2	278
6/3	72
7/1 (short)	125
7/2 (with short)	690(In) 565(Out)
7/3 (with short)	1309(In) 735(Out)
7/4 (short)	574
8/1	701
8/2	877
8/3	646
9/1	502
10/1 (with short)	492(In) 237(Out)
10/2 (short)	255
11/1	773
11/2	877
11/3	359
12/1	312
12/2	395

Lane Saturation Flows

Junction: Baynards Green								
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 (A43 North)	3.65	0.00	Y	Arm 3 Left	60.00	100.0 %	1932	1932
1/2 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
1/3 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
1/4 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
2/1	3.65	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1980	1980
2/2	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
2/3	3.65	0.00	N	Arm 5 Ahead	Inf	91.1 %	2120	2120
				Arm 6 Right	Inf	8.9 %		
3/1	Infinite Saturation Flow						Inf	Inf
3/2	Infinite Saturation Flow						Inf	Inf
4/1 (B4100 East)	3.50	0.00	Y	Arm 5 Left	35.00	40.9 %	1931	1931
				Arm 6 Ahead	Inf	59.1 %		
4/2 (B4100 East)	3.50	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1965	1965
4/3 (B4100 East)	3.50	0.00	N	Arm 6 Ahead	50.00	100.0 %	2044	2044
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
5/3	This lane uses a directly entered Saturation Flow						2000	2000
6/1	3.50	0.00	Y	Arm 9 Right	Inf	100.0 %	1965	1965
6/2	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
6/3	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
7/1 (A43 South)	3.65	0.00	Y	Arm 9 Ahead	60.00	100.0 %	1932	1932
7/2 (A43 South)	3.65	0.00	Y	Arm 8 Ahead	60.00	100.0 %	1932	1932
7/3 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
7/4 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
8/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
8/3	3.65	0.00	N	Arm 11 Ahead	Inf	55.6 %	2120	2120
				Arm 12 Right	Inf	44.4 %		
9/1	Infinite Saturation Flow						Inf	Inf
10/1 (B4100 West)	3.50	0.00	Y	Arm 11 Left	30.00	30.4 %	1887	1887
				Arm 12 Ahead	40.00	69.6 %		
10/2 (B4100 West)	3.50	0.00	N	Arm 12 Ahead	40.00	100.0 %	2029	2029

11/1	Infinite Saturation Flow						Inf	Inf
11/2	Infinite Saturation Flow						Inf	Inf
11/3	This lane uses a directly entered Saturation Flow						2000	2000
12/1	3.65	0.00	Y	Arm 3 Right	Inf	100.0 %	1980	1980
12/2	3.65	0.00	N	Arm 2 Right	Inf	31.4 %	2120	2120
				Arm 3 Right	Inf	68.6 %		

Scenario 2: '2031 Do Something - PM Peak' (FG3: 'Baynards1_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	467	1435	45	1947
	B	637	0	240	372	1249
	C	2473	230	0	90	2793
	D	37	244	47	3	331
	Tot.	3147	941	1722	510	6320

Traffic Lane Flows

Lane	Scenario 2: 2031 Do Something - PM Peak
Junction: Baynards Green	
1/1 (short)	467
1/2 (with short)	989(In) 522(Out)
1/3 (with short)	958(In) 565(Out)
1/4 (short)	393
2/1	542
2/2	580
2/3	408
3/1	710
3/2	231
4/1	612
4/2 (with short)	637(In) 493(Out)
4/3 (short)	144
5/1	782
5/2	580
5/3	360
6/1	420
6/2	493
6/3	144
7/1 (short)	90
7/2 (with short)	994(In) 904(Out)
7/3 (with short)	1799(In) 940(Out)
7/4 (short)	859
8/1	1142
8/2	1195
8/3	1003
9/1	510
10/1 (with short)	331(In) 165(Out)
10/2 (short)	166
11/1	1179
11/2	1195
11/3	773
12/1	243
12/2	281

Lane Saturation Flows

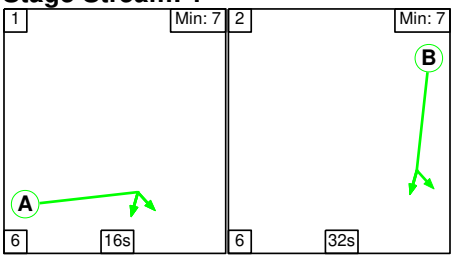
Junction: Baynards Green								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A43 North)	3.65	0.00	Y	Arm 3 Left	60.00	100.0 %	1932	1932
1/2 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
1/3 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
1/4 (A43 North)	3.65	0.00	N	Arm 2 Ahead	60.00	100.0 %	2068	2068
2/1	3.65	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1980	1980
2/2	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
2/3	3.65	0.00	N	Arm 5 Ahead	Inf	88.2 %	2120	2120
				Arm 6 Right	Inf	11.8 %		
3/1	Infinite Saturation Flow						Inf	Inf
3/2	Infinite Saturation Flow						Inf	Inf
4/1 (B4100 East)	3.50	0.00	Y	Arm 5 Left	35.00	39.2 %	1933	1933
				Arm 6 Ahead	Inf	60.8 %		
4/2 (B4100 East)	3.50	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1965	1965
4/3 (B4100 East)	3.50	0.00	N	Arm 6 Ahead	50.00	100.0 %	2044	2044
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
5/3	This lane uses a directly entered Saturation Flow						2000	2000
6/1	3.50	0.00	Y	Arm 9 Right	Inf	100.0 %	1965	1965
6/2	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
6/3	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
7/1 (A43 South)	3.65	0.00	Y	Arm 9 Ahead	60.00	100.0 %	1932	1932
7/2 (A43 South)	3.65	0.00	Y	Arm 8 Ahead	60.00	100.0 %	1932	1932
7/3 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
7/4 (A43 South)	3.65	0.00	N	Arm 8 Ahead	60.00	100.0 %	2068	2068
8/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
8/3	3.65	0.00	N	Arm 11 Ahead	Inf	77.1 %	2120	2120
				Arm 12 Right	Inf	22.9 %		
9/1	Infinite Saturation Flow						Inf	Inf
10/1 (B4100 West)	3.50	0.00	Y	Arm 11 Left	30.00	22.4 %	1889	1889
				Arm 12 Ahead	40.00	77.6 %		
10/2 (B4100 West)	3.50	0.00	N	Arm 12 Ahead	40.00	100.0 %	2029	2029

11/1	Infinite Saturation Flow						Inf	Inf
11/2	Infinite Saturation Flow						Inf	Inf
11/3	This lane uses a directly entered Saturation Flow						2000	2000
12/1	3.65	0.00	Y	Arm 3 Right	Inf	100.0 %	1980	1980
12/2	3.65	0.00	N	Arm 2 Right	Inf	17.8 %	2120	2120
				Arm 3 Right	Inf	82.2 %		

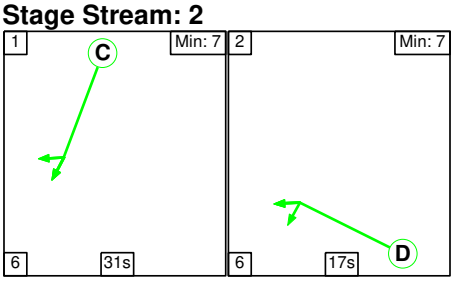
Scenario 1: '2031 Do Something - AM Peak' (FG1: 'Baynards1_AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

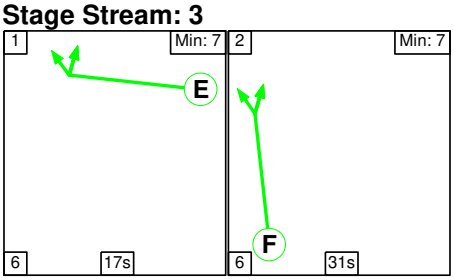
Stage Stream: 1



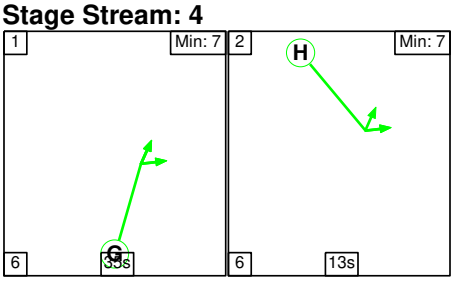
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	16	32
Change Point	0	22

Stage Stream: 2

Stage	1	2
Duration	31	17
Change Point	22	59

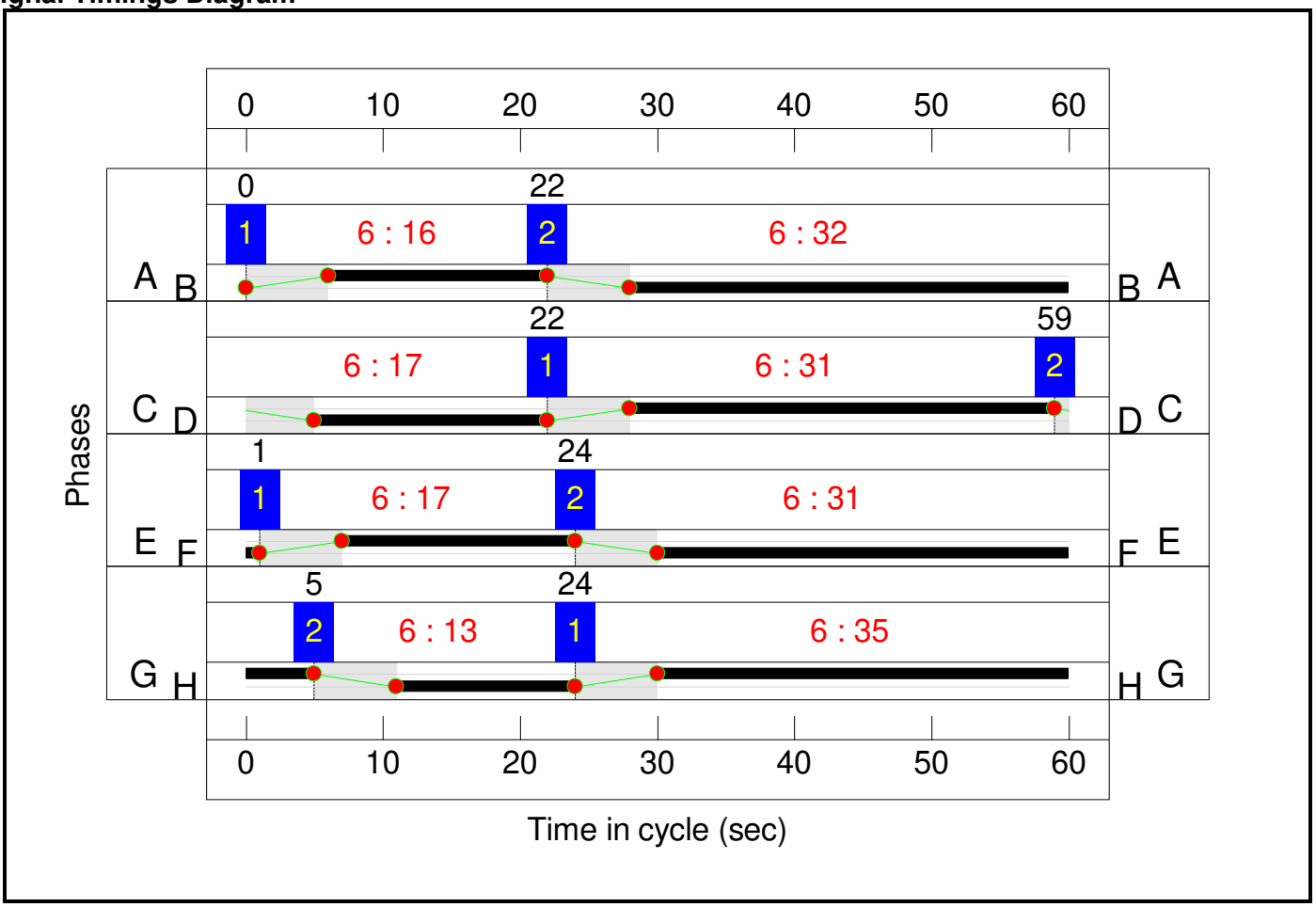
Stage Stream: 3

Stage	1	2
Duration	17	31
Change Point	1	24

Stage Stream: 4

Stage	1	2
Duration	35	13
Change Point	24	5

Signal Timings Diagram



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 (%)
Network: Baynards Green Mitigation scheme	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.4%**
Baynards Green	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.4%**
1/2+1/1	A43 North Ahead Left	U	1	N/A	B		1	32	-	1338	2068:1932	1137+578	78.4 : 77.1%
1/3+1/4	A43 North Ahead	U	1	N/A	B		1	32	-	1694	2068:2068	1133+935	81.9 : 81.9%
2/1	Ahead	U	2	N/A	C		1	31	-	933	1980	1056	88.4%
2/2	Ahead	U	2	N/A	C		1	31	-	977	2120	1131	86.4%
2/3	Ahead Right	U	2	N/A	C		1	31	-	800	2120	1131	70.8%
4/1	B4100 East Left Ahead	U	2	N/A	D		1	17	-	518	1931	579	89.4%
4/2+4/3	B4100 East Ahead	U	2	N/A	D		1	17	-	350	1965:2044	590+153	47.2 : 47.2%
5/3		U	N/A	N/A	-		-	-	-	729	2000	2000	36.5%
6/1	Right	U	3	N/A	E		1	17	-	377	1965	590	64.0%
6/2	Right	U	3	N/A	E		1	17	-	278	2120	636	43.7%
6/3	Right	U	3	N/A	E		1	17	-	72	2120	636	11.3%
7/2+7/1	A43 South Ahead Ahead2	U	3	N/A	F		1	31	-	690	1932:1932	991+219	57.0 : 57.0%
7/3+7/4	A43 South Ahead	U	3	N/A	F		1	31	-	1309	2068:2068	1103+907	66.6 : 63.3%
8/1	Ahead	U	4	N/A	G		1	35	-	701	1980	1188	59.0%
8/2	Ahead	U	4	N/A	G		1	35	-	877	2120	1272	68.9%
8/3	Ahead Right	U	4	N/A	G		1	35	-	646	2120	1272	50.8%
10/1+10/2	B4100 West Left Ahead	U	4	N/A	H		1	13	-	492	1887:2029	440+473	53.8 : 53.9%
11/3		U	N/A	N/A	-		-	-	-	359	2000	2000	18.0%
12/1	Right	U	1	N/A	A		1	16	-	312	1980	561	55.6%
12/2	Right Right2	U	1	N/A	A		1	16	-	395	2120	601	65.8%

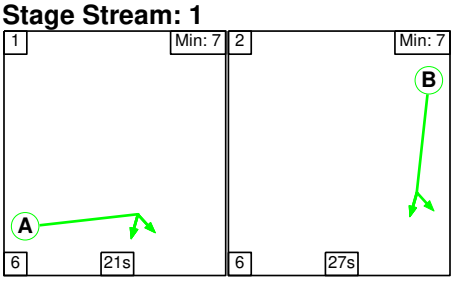
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Baynards Green Mitigation scheme	**-**	**-**	**0**	**0**	**0**	**27.1**	**10.8**	**0.0**	**37.9**	**-**	**-**	**-**	**-**
Baynards Green	**-**	**-**	**0**	**0**	**0**	**27.1**	**10.8**	**0.0**	**37.9**	**-**	**-**	**-**	**-**
1/2+1/1	1338	1338	-	-	-	3.6	1.8	-	5.4	14.5	11.6	1.8	13.4
1/3+1/4	1694	1694	-	-	-	4.9	2.2	-	7.1	15.2	12.4	2.2	14.6
2/1	933	933	-	-	-	0.8	0.0	-	0.8	2.9	1.9	0.0	1.9
2/2	977	977	-	-	-	0.7	0.0	-	0.7	2.6	2.1	0.0	2.1
2/3	800	800	-	-	-	0.6	0.0	-	0.6	2.5	1.6	0.0	1.6
4/1	518	518	-	-	-	2.9	3.8	-	6.7	46.2	8.2	3.8	12.0
4/2+4/3	350	350	-	-	-	1.6	0.4	-	2.1	21.3	3.7	0.4	4.2
5/3	729	729	-	-	-	0.0	0.3	-	0.3	1.4	0.0	0.3	0.3
6/1	377	377	-	-	-	0.5	0.0	-	0.5	5.2	1.7	0.0	1.7
6/2	278	278	-	-	-	0.1	0.0	-	0.1	1.4	0.2	0.0	0.2
6/3	72	72	-	-	-	0.0	0.0	-	0.0	1.4	0.0	0.0	0.0
7/2+7/1	690	690	-	-	-	1.7	0.7	-	2.4	12.3	6.1	0.7	6.8
7/3+7/4	1309	1309	-	-	-	3.5	0.9	-	4.4	12.2	8.8	0.9	9.7
8/1	701	701	-	-	-	0.5	0.0	-	0.5	2.8	2.4	0.0	2.4
8/2	877	877	-	-	-	0.6	0.0	-	0.6	2.4	2.6	0.0	2.6
8/3	646	646	-	-	-	0.4	0.0	-	0.4	2.0	1.4	0.0	1.4
10/1+10/2	492	492	-	-	-	2.8	0.6	-	3.3	24.4	3.7	0.6	4.3
11/3	359	359	-	-	-	0.0	0.1	-	0.1	1.1	0.6	0.1	0.7
12/1	312	312	-	-	-	0.9	0.0	-	0.9	10.7	2.7	0.0	2.7
12/2	395	395	-	-	-	1.0	0.0	-	1.0	9.1	2.7	0.0	2.7

C1	Stream: 1	PRC for Signalled Lanes (%):	9.9	Total Delay for Signalled Lanes (pcuHr):	14.44	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	0.7	Total Delay for Signalled Lanes (pcuHr):	10.74	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	35.1	Total Delay for Signalled Lanes (pcuHr):	7.48	Cycle Time (s):	60
C1	Stream: 4	PRC for Signalled Lanes (%):	30.5	Total Delay for Signalled Lanes (pcuHr):	4.83	Cycle Time (s):	60
		PRC Over All Lanes (%):	0.7	Total Delay Over All Lanes(pcuHr):	37.89		

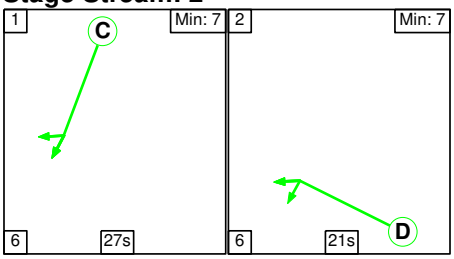
Scenario 2: '2031 Do Something - PM Peak' (FG3: 'Baynards1_PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

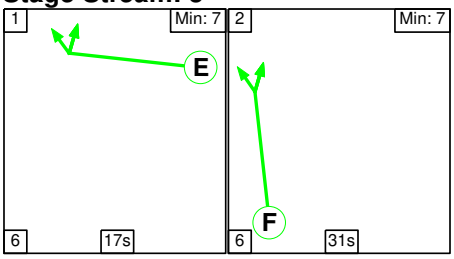
Stage Stream: 1



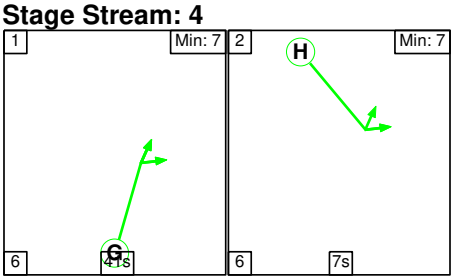
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	21	27
Change Point	0	27

Stage Stream: 2

Stage	1	2
Duration	27	21
Change Point	20	53

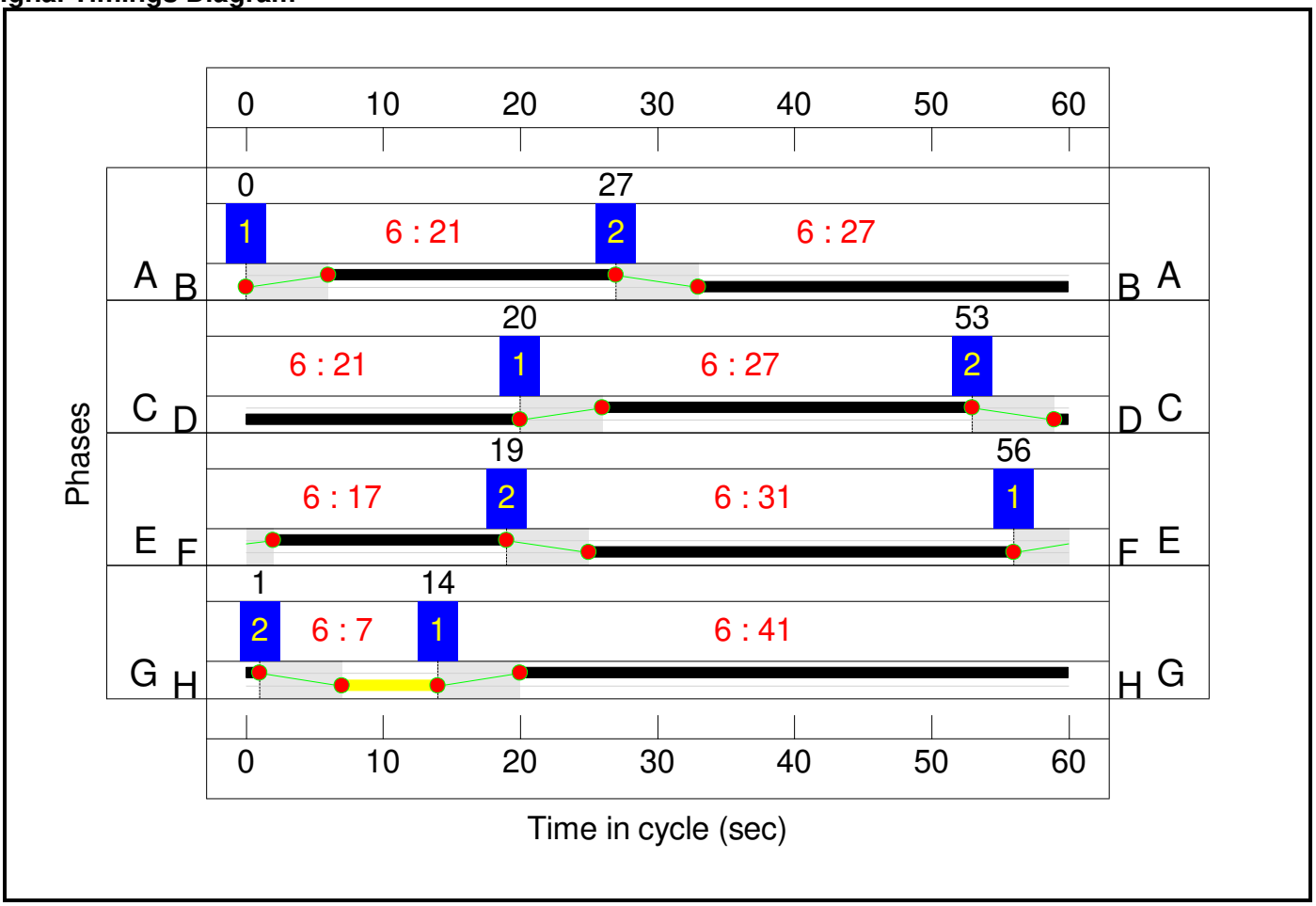
Stage Stream: 3

Stage	1	2
Duration	17	31
Change Point	56	19

Stage Stream: 4

Stage	1	2
Duration	41	7
Change Point	14	1

Signal Timings Diagram



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 (%)
Network: Baynards Green Mitigation scheme	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**88.7%**
Baynards Green	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**88.7%**
1/2+1/1	A43 North Ahead Left	U	1	N/A	B		1	27	-	989	2068:1932	965+902	54.1 : 51.8%
1/3+1/4	A43 North Ahead	U	1	N/A	B		1	27	-	958	2068:2068	965+813	58.5 : 48.3%
2/1	Ahead	U	2	N/A	C		1	27	-	542	1980	924	58.7%
2/2	Ahead	U	2	N/A	C		1	27	-	580	2120	989	58.6%
2/3	Ahead Right	U	2	N/A	C		1	27	-	408	2120	989	41.2%
4/1	B4100 East Left Ahead	U	2	N/A	D		1	21	-	612	1933	709	86.3%
4/2+4/3	B4100 East Ahead	U	2	N/A	D		1	21	-	637	1965:2044	718+210	68.7 : 68.7%
5/3		U	N/A	N/A	-		-	-	-	360	2000	2000	18.0%
6/1	Right	U	3	N/A	E		1	17	-	420	1965	590	71.2%
6/2	Right	U	3	N/A	E		1	17	-	493	2120	636	77.5%
6/3	Right	U	3	N/A	E		1	17	-	144	2120	636	22.6%
7/2+7/1	A43 South Ahead Ahead2	U	3	N/A	F		1	31	-	994	1932:1932	1019+101	88.7 : 88.7%
7/3+7/4	A43 South Ahead	U	3	N/A	F		1	31	-	1799	2068:2068	1081+987	87.0 : 87.0%
8/1	Ahead	U	4	N/A	G		1	41	-	1142	1980	1386	82.4%
8/2	Ahead	U	4	N/A	G		1	41	-	1195	2120	1484	80.5%
8/3	Ahead Right	U	4	N/A	G		1	41	-	1003	2120	1484	67.6%
10/1+10/2	B4100 West Left Ahead	U	4	N/A	H		1	7	-	331	1889:2029	252+271	65.5 : 61.4%
11/3		U	N/A	N/A	-		-	-	-	773	2000	2000	38.7%
12/1	Right	U	1	N/A	A		1	21	-	243	1980	726	33.5%
12/2	Right Right2	U	1	N/A	A		1	21	-	281	2120	777	36.1%

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)
Network: Baynards Green Mitigation scheme	**-**	**-**	**0**	**0**	**0**	**29.5**	**13.5**	**0.0**	**43.0**	**-**	**-**	**-**	**-**
Baynards Green	**-**	**-**	**0**	**0**	**0**	**29.5**	**13.5**	**0.0**	**43.0**	**-**	**-**	**-**	**-**
1/2+1/1	989	989	-	-	-	3.1	0.6	-	3.7	13.4	6.1	0.6	6.7
1/3+1/4	958	958	-	-	-	3.0	0.6	-	3.6	13.4	6.9	0.6	7.5
2/1	542	542	-	-	-	0.8	0.0	-	0.8	5.5	1.9	0.0	1.9
2/2	580	580	-	-	-	0.9	0.0	-	0.9	5.3	2.0	0.0	2.0
2/3	408	408	-	-	-	0.6	0.0	-	0.6	5.3	1.5	0.0	1.5
4/1	612	612	-	-	-	3.0	3.0	-	6.0	35.1	9.4	3.0	12.3
4/2+4/3	637	637	-	-	-	2.7	1.1	-	3.8	21.5	6.8	1.1	7.9
5/3	360	360	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1
6/1	420	420	-	-	-	0.7	0.0	-	0.7	6.2	2.8	0.0	2.8
6/2	493	493	-	-	-	0.5	0.0	-	0.5	3.4	1.8	0.0	1.8
6/3	144	144	-	-	-	0.1	0.0	-	0.1	3.3	0.2	0.0	0.2
7/2+7/1	994	994	-	-	-	3.3	3.7	-	7.0	25.2	13.1	3.7	16.8
7/3+7/4	1799	1799	-	-	-	5.8	3.3	-	9.1	18.1	13.3	3.3	16.6
8/1	1142	1142	-	-	-	0.5	0.0	-	0.5	1.7	4.0	0.0	4.0
8/2	1195	1195	-	-	-	0.6	0.0	-	0.6	1.7	4.2	0.0	4.2
8/3	1003	1003	-	-	-	0.4	0.0	-	0.4	1.5	2.4	0.0	2.4
10/1+10/2	331	331	-	-	-	2.3	0.9	-	3.1	33.9	2.6	0.9	3.4
11/3	773	773	-	-	-	0.0	0.3	-	0.3	1.5	2.4	0.3	2.7
12/1	243	243	-	-	-	0.6	0.0	-	0.6	9.3	1.9	0.0	1.9
12/2	281	281	-	-	-	0.6	0.0	-	0.6	8.0	1.9	0.0	1.9

C1	Stream: 1	PRC for Signalled Lanes (%):	53.7	Total Delay for Signalled Lanes (pcuHr):	8.50	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	4.2	Total Delay for Signalled Lanes (pcuHr):	12.07	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	1.5	Total Delay for Signalled Lanes (pcuHr):	17.34	Cycle Time (s):	60
C1	Stream: 4	PRC for Signalled Lanes (%):	9.2	Total Delay for Signalled Lanes (pcuHr):	4.67	Cycle Time (s):	60
		PRC Over All Lanes (%):	1.5	Total Delay Over All Lanes(pcuHr):	43.01		

APPENDIX D

PADBURY COMMITTED SCHEME LINSIG MODEL AUDIT AND REVISED RESULTS

LINSIG V3 Model Checking Report

AECOM

Project:	**OXFORDSHIRE SRFI-M40 Junction 10**	Job No:	**xxxxx**
Model:	**210407 Padbury - committed scheme.lsg3x**	Model Submitted:	**08/08/2021**
		Corrections Submitted:	**Date Submitted**

Modelled By: ADC Infrastructure **Checked by: Weiping Guo** **Approved by:**

This note is to document the checks made to LINSIG models. Once completed this should be filed with the model, or model outputs for future reference.

Results Key

× - Changes required before work is signed off
? – Changes may be required before work is signed off, further work required
✓ - No further changes required before work is signed off

File Checked: Hyperlink to model

Network Information

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Scenario title(s) entered	✓			
08/08/21	Project name entered	✓			
08/08/21	Modeller details recorded	✓			
08/08/21	Network location details entered	✓			
08/08/21	File name is logical	✓			

Network Setup

Junction Drawings: In report 'OxSRFI-ADC1794-RP-M-V3 'TN5 M40 Junction 10 Options Report' – appendices' Page no.4
Sat Flow Measurements / Calculations: Hyperlink to Sat Flow Measurements

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	Junctions				
08/08/21	Appropriate junctions setup	✓			
08/08/21	Junction info/ signal controllers complete	✓			
08/08/21	Logical arm structure setup	✓			
	Lanes				
08/08/21	Lane setup reflects junction drawings	X	Arm5- Junction 10 sbound offslip lane 1 flare length does not match the measuring from the drawing.	Junction 10 sbound offslip lane 1 flare length increased to 60m as per the drawing.	
08/08/21	Check each lane that is signal controlled	✓			
08/08/21	Lanes matched to controller and phase	✓	.		
08/08/21	Lane length appropriate	X	Arm5- Junction 10 sbound offslip lane 1 flare length does not match the measuring from the drawing.	Junction 10 sbound offslip lane 1 flare length increased to 60m as per the drawing.	
08/08/21	Custom occupancy (if req)	N/A			
	Saturation Flows				
08/08/21	Justified method to derive saturation flows				
08/08/21	Check observed sat flows (if used)	N/A			
08/08/21	Check RR67 sat flows calculations (if used)	x	1. All the entry arm lanes saturation flows were calculated by RR67 methods, however all the lanes were treated as the 'nearside lane'. And the turning radius seemingly are too low that affect the lanes sat flow calculation. Please double check. 2. All the circulatory lanes Sat flow are directly entered. As all the entry arms are using RR67, we recommend the circulatory lanes adopt the same method of calculations. Also the direct entered Sat flow are lower than the entry arms Sat flow which can cause the issues. In general, the downstream lanes sat flow should be equal or greater than the entry lanes Sat flows, unless there is evidence supporting there is 'bottle neck' issues at the downstream. 3. As this is the existing signalisation junction, please refer to the existing MOVA datasets for the actual individual lane saturation flows if possible.	1. Central lanes and offside lanes have 'nearside lane' de-selected. All turning radii checked and increased where applicable. 2. All circulating lanes have RR67 parameters applied such that all circulating saturation flows are equal or greater than the entry lanes.	
08/08/21	Check external sat flows calculations (if used)				
08/08/21	Check sat flows for any bottleneck links	N/A			
	Advanced Lane Settings				
08/08/21	Use of start / end green displacements (if req)	✓			
08/08/21	Use of queue limits on short links (if req)	✓			
08/08/21	Use of weightings for optimiser constraints (if req)	✓			
08/08/21	Use of random delay or queue de-sliver (if req)	✓			
	Give Ways				
08/08/21	Check each lane that is priority controlled	N/A			

08/08/21	Measurement of max/min flow when giving way	N/A			
08/08/21	Flow when opposing traffic stopped reasonable	N/A			
08/08/21	Measurement of give-way co-efficient	N/A			
08/08/21	Measurement of clear conflict time of opposing traffic	N/A			
08/08/21	Check all controlling movements identified	N/A			
08/08/21	Measurement of storage in front of stop-line	N/A			
08/08/21	Max turns in inter-green reasonable	N/A			
08/08/21	Measurement of non-blocking storage	N/A			
	Lane Connectors				
08/08/21	Lane connectors provided reasonable	✓	Arm3 Lane 2 should connect the Arm 6 lane 1 and lane 2 to match the drawing, however this may not affect the overall junction capacity.		
08/08/21	Cruise time reasonable	✓	45km/hr cruise speed is applied for all the link connectors.		
08/08/21	Default platoon dispersion used unless observed	X	The platoon dispersion should be switched off due to the short circulatory lanes.	Platoon dispersion has been switched off.	
	Zones				
08/08/21	Zones match O-D matrix	✓	PadburyRef1_AM flow matches the flow report page 26; PadburyRef1_PM flow matches the flow report page 27; Padbury1_AM flow matches the flow report page 40; Padbury1_PM flow matches the flow report page 41.		

	Pedestrians				
08/08/21	Ped crossings represented by ped links (if req)	N/A			
08/08/21	Ped link data correct (if req)	N/A			
08/08/21	Ped connector walk times reasonable (if req)	N/A			
08/08/21	Ped links matched to appropriate phases (if req)	N/A			
08/08/21	Ped zones match ped O-D matrix (if req)	N/A			

Controllers

Controller Specifications: Hyperlink to Controller Specification (if req)
Intergreen Calculations: Hyperlink to Intergreen Calculations (if req)

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	General Controller Set-up				
08/08/21	Sufficient controllers setup	✓			
08/08/21	Multiple stage streams setup correctly (if req)	✓			
08/08/21	Non-standard filters setup correctly (if req)	N/A			
	Signal Settings				
08/08/21	Check phases for each controller	✓			
08/08/21	Check phase mins/type reasonable	✓			
08/08/21	Check inter-greens calculations/coding	?	There is no existing signal information provided for check, and 6s inter-green is used for all conflict phases.		
08/08/21	Stages reasonable	✓			
08/08/21	Phase delays reasonable (if req)	N/A			

Stage Sequences

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Check stage sequences observed / optimised	✓			
08/08/21	Check stage timings observed / optimised	N/A			

Traffic Counts and Calculations

Traffic Flow Data: Hyperlink to Traffic Flow Data – in report 'OXSRFI-ADC1794-RP-N-V2 'TN6 - M40 J10 OR Traffic Flow Derivation' – bound'
Matrix Calculations: Hyperlink to Matrix Calculations (if required)
Lane Balancing Calculations: Hyperlink to Lane Balancing Calculations (if required)
Site Observations: Hyperlink to Site Flows Observations

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Suitability of traffic surveys undertaken	N/A			
08/08/21	Are there sufficient site observations	N/A			
08/08/21	Check O-D matrix calculations	✓			
08/08/21	Are lane balancing calculations sufficient / consistent	?	To be checked after the above lanes and sat flow update.		
08/08/21	Does lane balancing match lining	?	To be checked after the above lanes and sat flow update.		
08/08/21	Does lane balancing match matrices	?	To be checked after the above lanes and sat flow update.		

Traffic Flows

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Traffic & ped flow (if req) groups setup	✓	Multi flow groups setup in the model. Only four flows matrix are used.		

08/08/21	Desired flows match O-D matrices	✓			
08/08/21	Actual flows match desired flows	✓			
08/08/21	Inappropriate routes closed	✓			
08/08/21	Route flows match lane balancing	✓			

Modelling

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Scenario set up with correct options	✓			
08/08/21	Cycle time appropriate for network control	✓			
08/08/21	Cycle time optimised (if req)	N/A			

Results

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	Are all values as expected (Demand Flows, Green Times etc)		To be checked after above changes.		
	Deg Sat >100% for existing situation with no modelled suppressed demand?		To be checked after above changes.		
	Deg Sat appropriate? Validated?		To be checked after above changes.		
	Capacity conclusions		To be checked after above changes.		
	If suppressed demand has been modelled, do queues validate?		To be checked after above changes.		
	Queues appropriate?		To be checked after above changes.		
	Queue limits exceeded?		To be checked after above changes.		
	Queuing conclusions (will exit blocking modify these?)		To be checked after above changes.		
	If suppressed demand has been modelled do journey times validate?		To be checked after above changes.		
	Journey time conclusions?		To be checked after above changes.		

Conclusions and Recommendations

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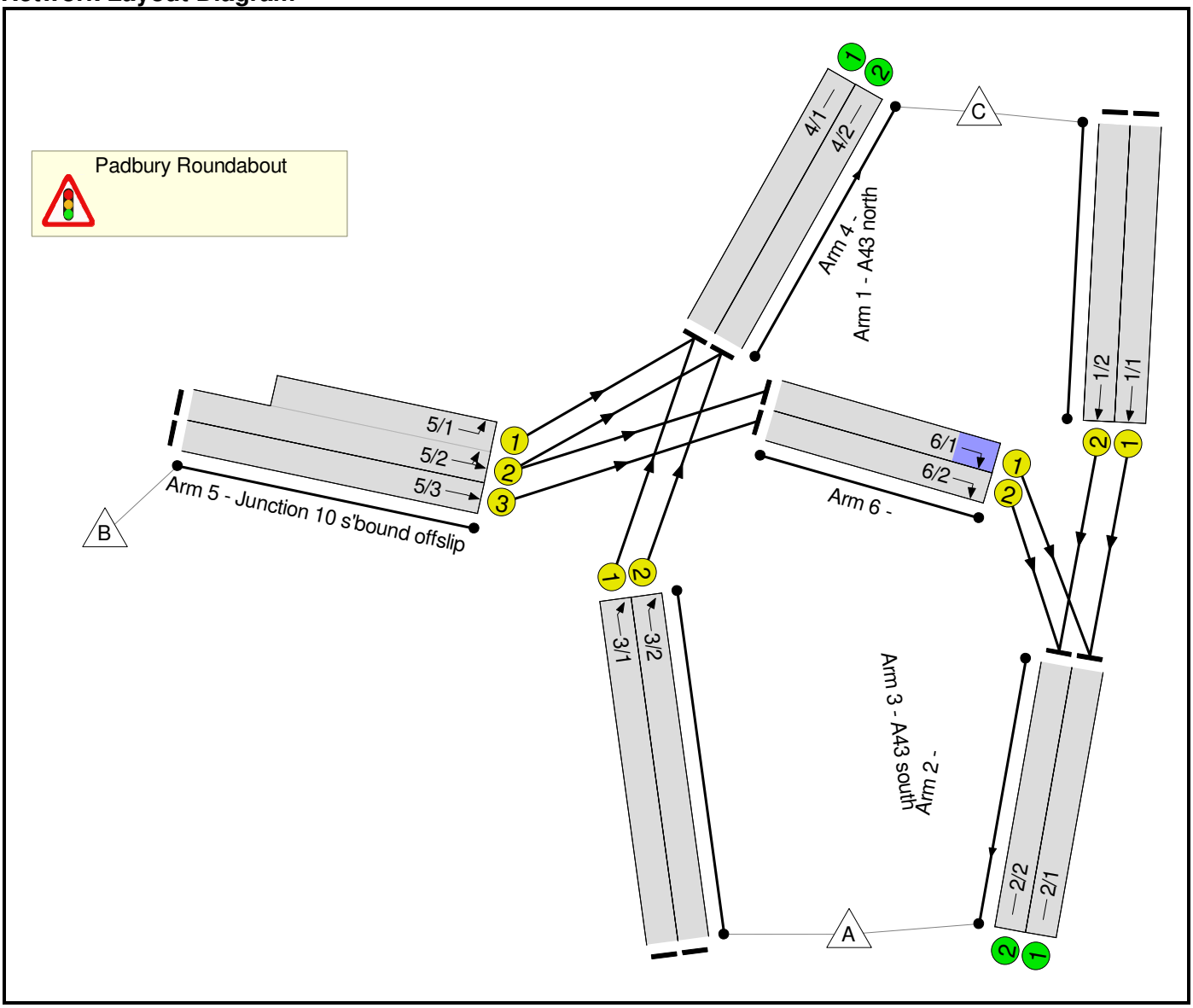
Full Input Data And Results

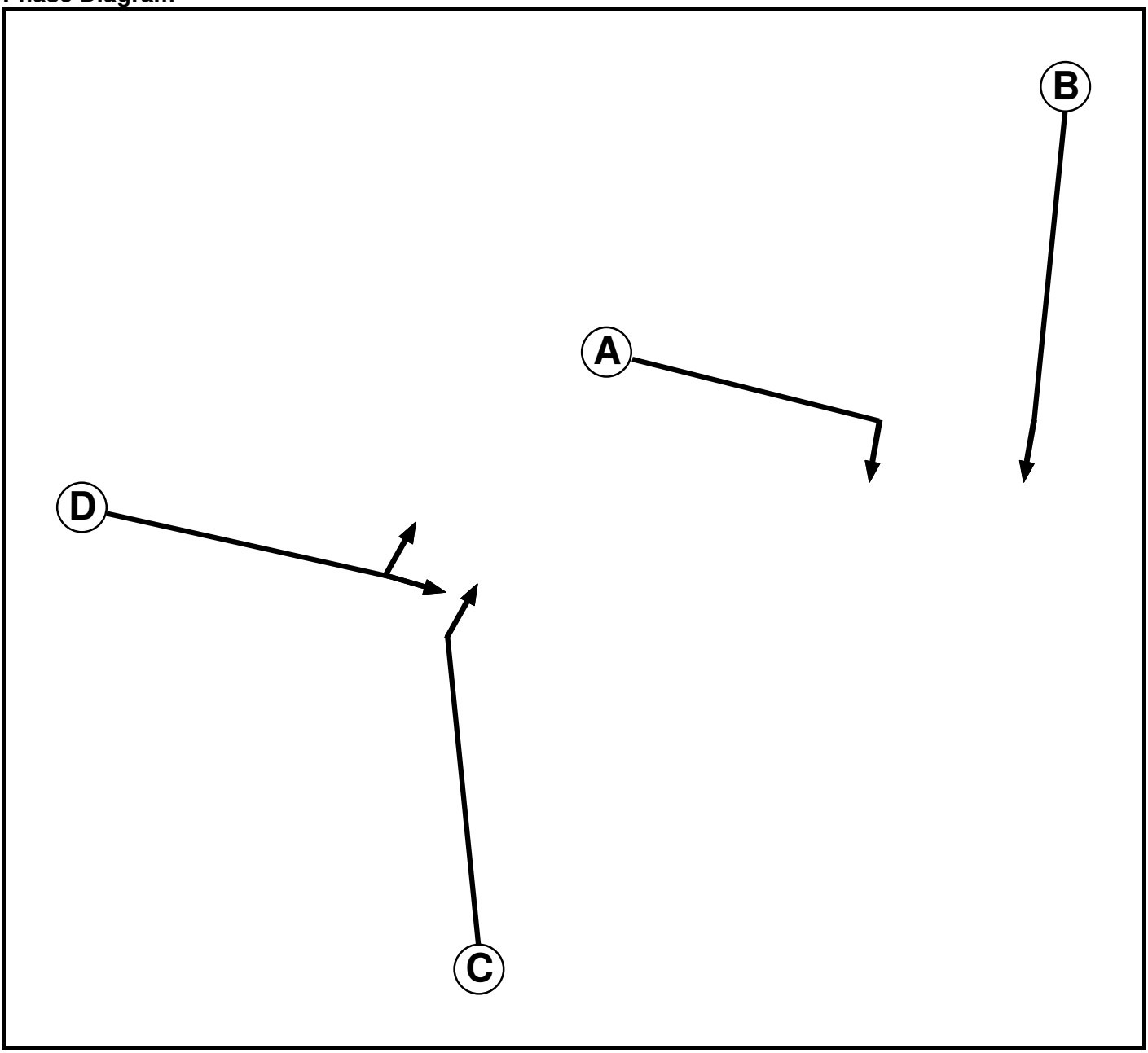
User and Project Details

Project:	**Oxfordshire SRFI**
Title:	**Padbury HE scheme**
Location:	
Additional detail:	Amended following Aecom comments
File name:	211006 Padbury - committed scheme.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7

Phase Intergreens Matrix

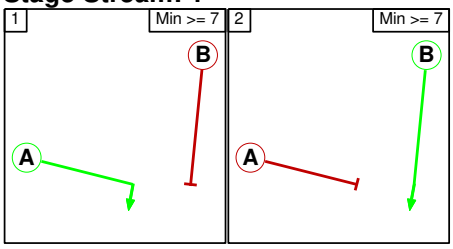
	Starting Phase				
Terminating Phase		A	B	C	D
	A		6	-	-
	B	6		-	-
	C	-	-		6
	D	-	-	6	

Phases in Stage

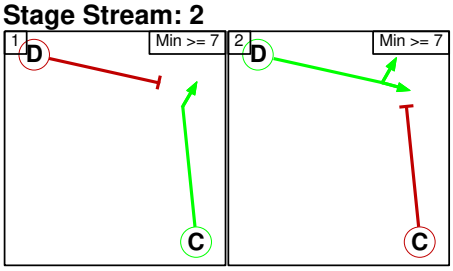
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D

Stage Diagram

Stage Stream: 1



Stage Stream: 2



Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		6
	2	6	

Lane Input Data

Junction: Padbury Roundabout												
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 (A43 north)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 2 Ahead	50.00
1/2 (A43 north)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm 2 Ahead	50.00
2/1	U		2	3	60.0	Inf	-	-	-	-	-	-
2/2	U		2	3	60.0	Inf	-	-	-	-	-	-
3/1 (A43 south)	U	C	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 4 Ahead	30.00
3/2 (A43 south)	U	C	2	3	60.0	Geom	-	3.65	0.00	N	Arm 4 Ahead	30.00
4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
4/2	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (Junction 10 s'bound offslip)	U	D	2	3	10.8	Geom	-	3.65	0.00	Y	Arm 4 Left	45.00
5/2 (Junction 10 s'bound offslip)	U	D	2	3	60.0	Geom	-	3.65	0.00	N	Arm 4 Left Arm 6 Ahead	50.00 50.00
5/3 (Junction 10 s'bound offslip)	U	D	2	3	60.0	Geom	-	3.65	0.00	N	Arm 6 Ahead	40.00
6/1	U	A	2	3	8.7	Geom	-	3.65	0.00	Y	Arm 2 Right	Inf
6/2	U	A	2	3	8.7	Geom	-	3.65	0.00	N	Arm 2 Right	Inf

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'PadburyRef1_AM'	07:45	08:45	01:00	
3: 'PadburyRef1_PM'	16:30	17:30	01:00	
5: 'Padbury1_AM'	07:45	08:45	01:00	
7: 'Padbury1_PM'	16:30	17:30	01:00	

Scenario 1: '2031 Reference Case - AM Peak' (FG1: 'PadburyRef1_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	0	1543	1543
	B	535	0	337	872
	C	2582	0	0	2582
	Tot.	3117	0	1880	4997

Traffic Lane Flows

Lane	Scenario 1: 2031 Reference Case - AM Peak
Junction: Padbury Roundabout	
1/1	1245
1/2	1337
2/1	1554
2/2	1563
3/1	737
3/2	806
4/1	1048
4/2	832
5/1 (short)	311
5/2 (with short)	646(In) 335(Out)
5/3	226
6/1	309
6/2	226

Lane Saturation Flows

Junction: Padbury Roundabout								
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 (A43 north)	3.65	0.00	Y	Arm 2 Ahead	50.00	100.0 %	1922	1922
1/2 (A43 north)	3.65	0.00	N	Arm 2 Ahead	50.00	100.0 %	2058	2058
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1 (A43 south)	3.65	0.00	Y	Arm 4 Ahead	30.00	100.0 %	1886	1886
3/2 (A43 south)	3.65	0.00	N	Arm 4 Ahead	30.00	100.0 %	2019	2019
4/1	Infinite Saturation Flow						Inf	Inf
4/2	Infinite Saturation Flow						Inf	Inf
5/1 (Junction 10 s'bound offslip)	3.65	0.00	Y	Arm 4 Left	45.00	100.0 %	1916	1916
5/2 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm 4 Left	50.00	7.8 %	2058	2058
				Arm 6 Ahead	50.00	92.2 %		
5/3 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm 6 Ahead	40.00	100.0 %	2043	2043
6/1	3.65	0.00	Y	Arm 2 Right	Inf	100.0 %	1980	1980
6/2	3.65	0.00	N	Arm 2 Right	Inf	100.0 %	2120	2120

Scenario 2: '2031 Do Something - AM Peak' (FG5: 'Padbury1_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	0	1662	1662
	B	738	0	337	1075
	C	2851	0	0	2851
	Tot.	3589	0	1999	5588

Traffic Lane Flows

Lane	Scenario 2: 2031 Do Something - AM Peak
Junction: Padbury Roundabout	
1/1	1377
1/2	1474
2/1	1796
2/2	1793
3/1	796
3/2	866
4/1	1133
4/2	866
5/1 (short)	337
5/2 (with short)	756(In) 419(Out)
5/3	319
6/1	419
6/2	319

Lane Saturation Flows

Junction: Padbury Roundabout								
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 (A43 north)	3.65	0.00	Y	Arm 2 Ahead	50.00	100.0 %	1922	1922
1/2 (A43 north)	3.65	0.00	N	Arm 2 Ahead	50.00	100.0 %	2058	2058
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1 (A43 south)	3.65	0.00	Y	Arm 4 Ahead	30.00	100.0 %	1886	1886
3/2 (A43 south)	3.65	0.00	N	Arm 4 Ahead	30.00	100.0 %	2019	2019
4/1	Infinite Saturation Flow						Inf	Inf
4/2	Infinite Saturation Flow						Inf	Inf
5/1 (Junction 10 s'bound offslip)	3.65	0.00	Y	Arm 4 Left	45.00	100.0 %	1916	1916
5/2 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm 4 Left	50.00	0.0 %	2058	2058
				Arm 6 Ahead	50.00	100.0 %		
5/3 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm 6 Ahead	40.00	100.0 %	2043	2043
6/1	3.65	0.00	Y	Arm 2 Right	Inf	100.0 %	1980	1980
6/2	3.65	0.00	N	Arm 2 Right	Inf	100.0 %	2120	2120

Scenario 3: '2031 Reference Case - PM Peak' (FG3: 'PadburyRef1_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	0	2200	2200
	B	505	0	318	823
	C	1570	0	0	1570
	Tot.	2075	0	2518	4593

Traffic Lane Flows

Lane	Scenario 3: 2031 Reference Case - PM Peak
Junction: Padbury Roundabout	
1/1	748
1/2	822
2/1	1003
2/2	1072
3/1	1057
3/2	1143
4/1	1333
4/2	1185
5/1 (short)	276
5/2 (with short)	573(In) 297(Out)
5/3	250
6/1	255
6/2	250

Lane Saturation Flows

Junction: Padbury Roundabout								
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 (A43 north)	3.65	0.00	Y	Arm 2 Ahead	50.00	100.0 %	1922	1922
1/2 (A43 north)	3.65	0.00	N	Arm 2 Ahead	50.00	100.0 %	2058	2058
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1 (A43 south)	3.65	0.00	Y	Arm 4 Ahead	30.00	100.0 %	1886	1886
3/2 (A43 south)	3.65	0.00	N	Arm 4 Ahead	30.00	100.0 %	2019	2019
4/1	Infinite Saturation Flow						Inf	Inf
4/2	Infinite Saturation Flow						Inf	Inf
5/1 (Junction 10 s'bound offslip)	3.65	0.00	Y	Arm 4 Left	45.00	100.0 %	1916	1916
5/2 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm 4 Left	50.00	14.1 %	2058	2058
				Arm 6 Ahead	50.00	85.9 %		
5/3 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm 6 Ahead	40.00	100.0 %	2043	2043
6/1	3.65	0.00	Y	Arm 2 Right	Inf	100.0 %	1980	1980
6/2	3.65	0.00	N	Arm 2 Right	Inf	100.0 %	2120	2120

Scenario 4: '2031 Do Something - PM Peak' (FG7: 'Padbury1_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	0	2475	2475
	B	609	0	318	927
	C	1722	0	0	1722
	Tot.	2331	0	2793	5124

Traffic Lane Flows

Lane	Scenario 4: 2031 Do Something - PM Peak
Junction: Padbury Roundabout	
1/1	822
1/2	900
2/1	1132
2/2	1199
3/1	1193
3/2	1282
4/1	1496
4/2	1297
5/1 (short)	303
5/2 (with short)	628(In) 325(Out)
5/3	299
6/1	310
6/2	299

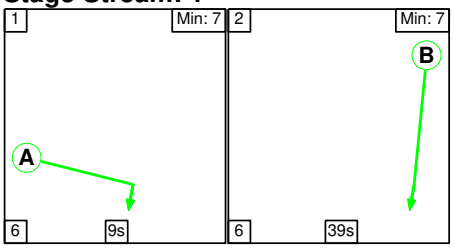
Lane Saturation Flows

Junction: Padbury Roundabout								
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 (A43 north)	3.65	0.00	Y	Arm 2 Ahead	50.00	100.0 %	1922	1922
1/2 (A43 north)	3.65	0.00	N	Arm 2 Ahead	50.00	100.0 %	2058	2058
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1 (A43 south)	3.65	0.00	Y	Arm 4 Ahead	30.00	100.0 %	1886	1886
3/2 (A43 south)	3.65	0.00	N	Arm 4 Ahead	30.00	100.0 %	2019	2019
4/1	Infinite Saturation Flow						Inf	Inf
4/2	Infinite Saturation Flow						Inf	Inf
5/1 (Junction 10 s'bound offslip)	3.65	0.00	Y	Arm 4 Left	45.00	100.0 %	1916	1916
5/2 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm 4 Left	50.00	4.6 %	2058	2058
				Arm 6 Ahead	50.00	95.4 %		
5/3 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm 6 Ahead	40.00	100.0 %	2043	2043
6/1	3.65	0.00	Y	Arm 2 Right	Inf	100.0 %	1980	1980
6/2	3.65	0.00	N	Arm 2 Right	Inf	100.0 %	2120	2120

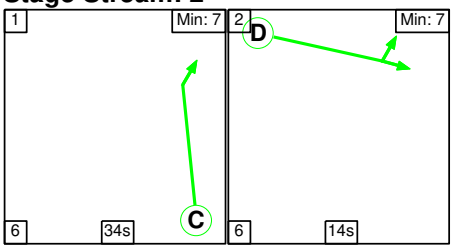
Scenario 1: '2031 Reference Case - AM Peak' (FG1: 'PadburyRef1_AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

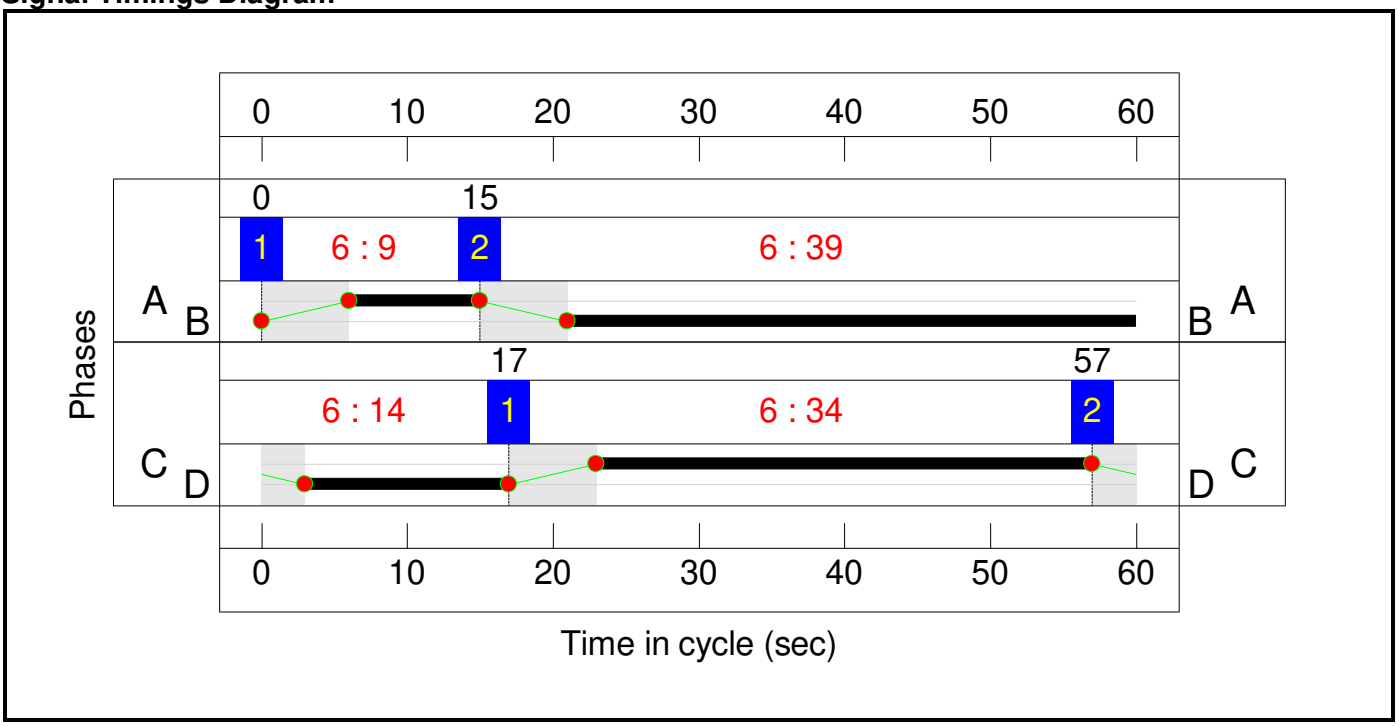
Stage Stream: 1

Stage	1	2
Duration	9	39
Change Point	0	15

Stage Stream: 2

Stage	1	2
Duration	34	14
Change Point	17	57

Signal Timings Diagram



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 (%)
Network: Padbury HE scheme	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**97.4%**
Padbury Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**97.4%**
1/1	A43 north Ahead	U	1	N/A	B		1	39	-	1245	1922	1281	97.2%
1/2	A43 north Ahead	U	1	N/A	B		1	39	-	1337	2058	1372	97.4%
3/1	A43 south Ahead	U	2	N/A	C		1	34	-	737	1886	1100	67.0%
3/2	A43 south Ahead	U	2	N/A	C		1	34	-	806	2019	1178	68.4%
5/2+5/1	Junction 10 s'bound offslip Left Ahead	U	2	N/A	D		1	14	-	646	2058:1916	515+479	65.1 : 64.9%
5/3	Junction 10 s'bound offslip Ahead	U	2	N/A	D		1	14	-	226	2043	511	44.2%
6/1	Right	U	1	N/A	A		1	9	-	309	1980	330	93.6%
6/2	Right	U	1	N/A	A		1	9	-	226	2120	353	64.0%

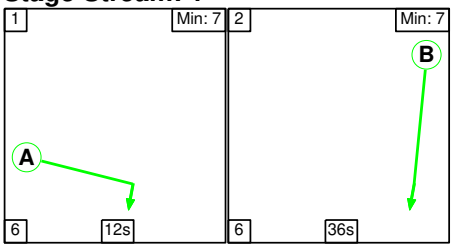
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Padbury HE scheme	**-**	**-**	**0**	**0**	**0**	**16.0**	**25.7**	**0.0**	**41.7**	**-**	**-**	**-**	**-**
Padbury Roundabout	**-**	**-**	**0**	**0**	**0**	**16.0**	**25.7**	**0.0**	**41.7**	**-**	**-**	**-**	**-**
1/1	1245	1245	-	-	-	3.3	10.8	-	14.0	40.6	19.4	10.8	30.1
1/2	1337	1337	-	-	-	3.5	11.5	-	15.1	40.5	21.2	11.5	32.7
3/1	737	737	-	-	-	1.8	1.0	-	2.8	13.5	8.4	1.0	9.4
3/2	806	806	-	-	-	1.9	1.1	-	3.0	13.5	9.2	1.1	10.3
5/2+5/1	646	646	-	-	-	3.6	0.9	-	4.5	25.3	4.9	0.9	5.9
5/3	226	226	-	-	-	1.2	0.4	-	1.6	25.3	3.1	0.4	3.5
6/1	309	309	-	-	-	0.4	0.0	-	0.4	4.8	0.5	0.0	0.5
6/2	226	226	-	-	-	0.3	0.0	-	0.3	4.7	0.4	0.0	0.4

C1	Stream: 1	PRC for Signalled Lanes (%):	-8.3	Total Delay for Signalled Lanes (pcuHr):	29.79	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	31.5	Total Delay for Signalled Lanes (pcuHr):	11.91	Cycle Time (s):	60
		PRC Over All Lanes (%):	-8.3	Total Delay Over All Lanes(pcuHr):	41.70		

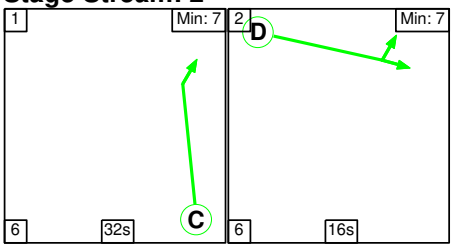
Scenario 2: '2031 Do Something - AM Peak' (FG5: 'Padbury1_AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

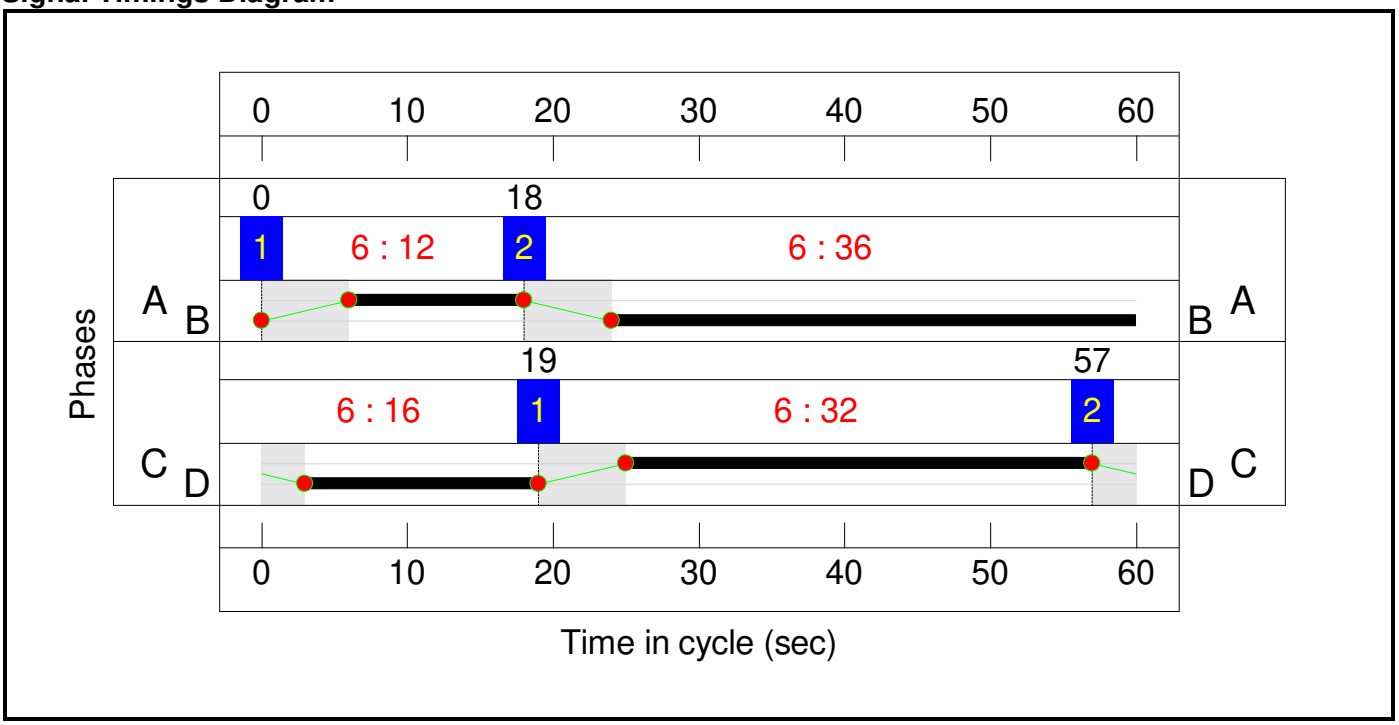
Stage Stream: 1

Stage	1	2
Duration	12	36
Change Point	0	18

Stage Stream: 2

Stage	1	2
Duration	32	16
Change Point	19	57

Signal Timings Diagram



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 (%)
Network: Padbury HE scheme	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**116.2%**
Padbury Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**116.2%**
1/1	A43 north Ahead	U	1	N/A	B		1	36	-	1377	1922	1185	116.2%
1/2	A43 north Ahead	U	1	N/A	B		1	36	-	1474	2058	1269	116.1%
3/1	A43 south Ahead	U	2	N/A	C		1	32	-	796	1886	1037	76.7%
3/2	A43 south Ahead	U	2	N/A	C		1	32	-	866	2019	1110	78.0%
5/2+5/1	Junction 10 s'bound offslip Left Ahead	U	2	N/A	D		1	16	-	756	2058:1916	583+477	71.9 : 70.7%
5/3	Junction 10 s'bound offslip Ahead	U	2	N/A	D		1	16	-	319	2043	579	55.1%
6/1	Right	U	1	N/A	A		1	12	-	419	1980	429	97.7%
6/2	Right	U	1	N/A	A		1	12	-	319	2120	459	69.4%

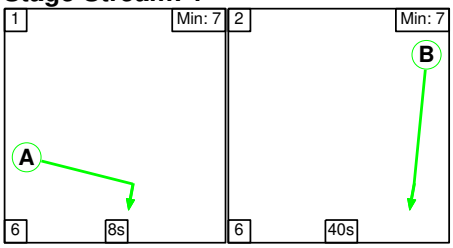
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Padbury HE scheme	**-**	**-**	**0**	**0**	**0**	**35.4**	**210.5**	**0.0**	**245.9**	**-**	**-**	**-**	**-**
Padbury Roundabout	**-**	**-**	**0**	**0**	**0**	**35.4**	**210.5**	**0.0**	**245.9**	**-**	**-**	**-**	**-**
1/1	1377	1185	-	-	-	11.6	99.3	-	111.0	290.2	28.2	99.3	127.5
1/2	1474	1269	-	-	-	12.4	105.9	-	118.4	289.1	30.2	105.9	136.1
3/1	796	796	-	-	-	2.3	1.6	-	4.0	17.9	10.2	1.6	11.8
3/2	866	866	-	-	-	2.6	1.7	-	4.3	17.9	11.3	1.7	13.1
5/2+5/1	756	756	-	-	-	4.0	1.2	-	5.2	24.9	6.2	1.2	7.4
5/3	319	319	-	-	-	1.6	0.6	-	2.2	25.2	4.4	0.6	5.0
6/1	419	419	-	-	-	0.5	0.0	-	0.5	4.0	1.2	0.0	1.2
6/2	319	319	-	-	-	0.3	0.0	-	0.3	3.7	0.4	0.0	0.4

C1 Stream: 1 PRC for Signalled Lanes (%): -29.1 Total Delay for Signalled Lanes (pcuHr): 230.17 Cycle Time (s): 60
C1 Stream: 2 PRC for Signalled Lanes (%): 15.4 Total Delay for Signalled Lanes (pcuHr): 15.72 Cycle Time (s): 60
PRC Over All Lanes (%): -29.1 Total Delay Over All Lanes(pcuHr): 245.89

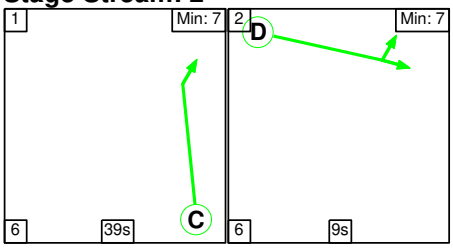
Scenario 3: '2031 Reference Case - PM Peak' (FG3: 'PadburyRef1_PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

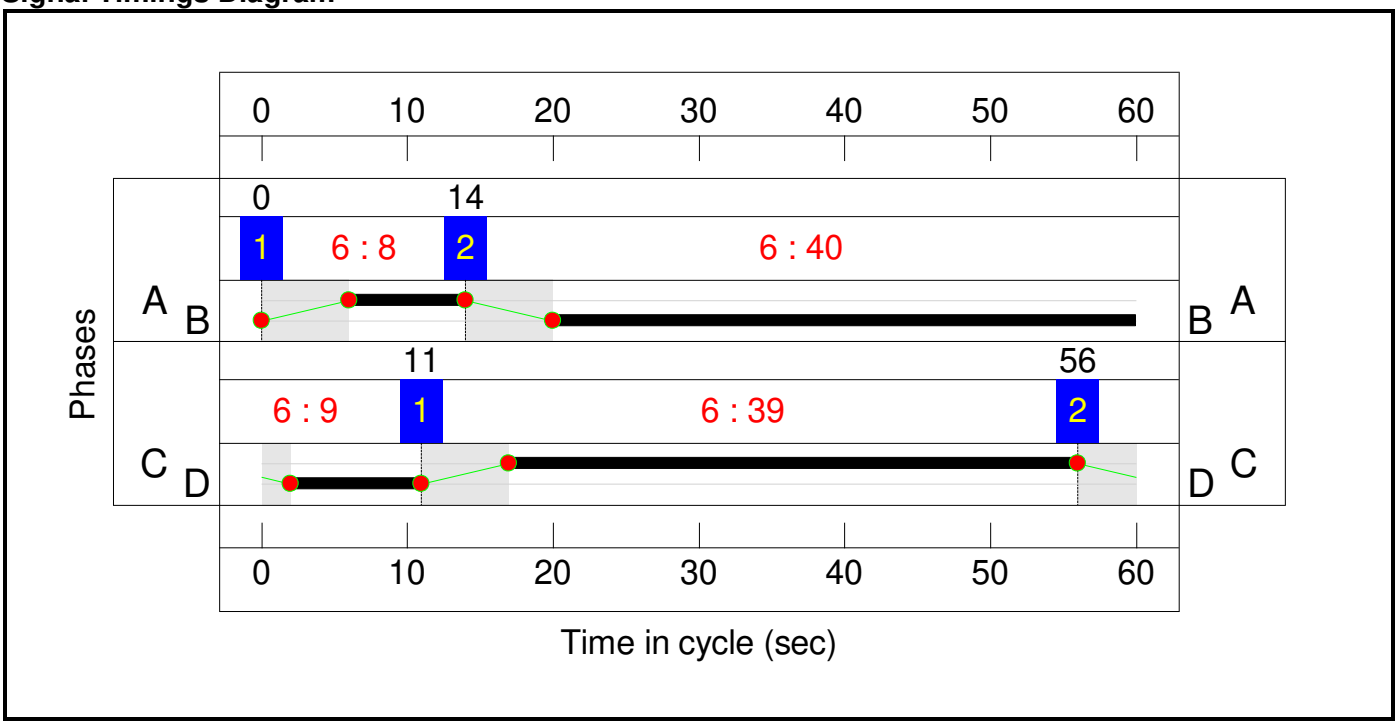
Stage Stream: 1

Stage	1	2
Duration	8	40
Change Point	0	14

Stage Stream: 2

Stage	1	2
Duration	39	9
Change Point	11	56

Signal Timings Diagram



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 (%)
Network: Padbury HE scheme	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.6%**
Padbury Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.6%**
1/1	A43 north Ahead	U	1	N/A	B		1	40	-	748	1922	1313	57.0%
1/2	A43 north Ahead	U	1	N/A	B		1	40	-	822	2058	1406	58.5%
3/1	A43 south Ahead	U	2	N/A	C		1	39	-	1057	1886	1257	84.1%
3/2	A43 south Ahead	U	2	N/A	C		1	39	-	1143	2019	1346	84.9%
5/2+5/1	Junction 10 s'bound offslip Left Ahead	U	2	N/A	D		1	9	-	573	2058:1916	343+319	86.6 : 86.4%
5/3	Junction 10 s'bound offslip Ahead	U	2	N/A	D		1	9	-	250	2043	340	73.4%
6/1	Right	U	1	N/A	A		1	8	-	255	1980	297	85.9%
6/2	Right	U	1	N/A	A		1	8	-	250	2120	318	78.6%

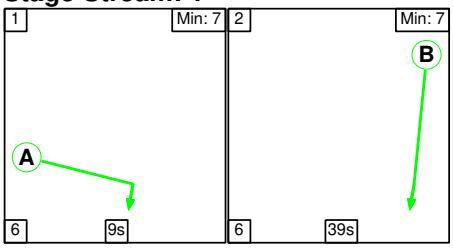
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Padbury HE scheme	**-**	**-**	**0**	**0**	**0**	**12.5**	**11.0**	**0.0**	**23.5**	**-**	**-**	**-**	**-**
Padbury Roundabout	**-**	**-**	**0**	**0**	**0**	**12.5**	**11.0**	**0.0**	**23.5**	**-**	**-**	**-**	**-**
1/1	748	748	-	-	-	1.0	0.7	-	1.7	8.1	6.4	0.7	7.1
1/2	822	822	-	-	-	1.1	0.7	-	1.8	8.1	7.1	0.7	7.8
3/1	1057	1057	-	-	-	2.2	2.6	-	4.8	16.3	13.2	2.6	15.8
3/2	1143	1143	-	-	-	2.4	2.7	-	5.2	16.3	14.6	2.7	17.3
5/2+5/1	573	573	-	-	-	3.9	3.0	-	6.9	43.2	4.8	3.0	7.8
5/3	250	250	-	-	-	1.6	1.3	-	3.0	43.1	3.9	1.3	5.2
6/1	255	255	-	-	-	0.1	0.0	-	0.1	0.9	0.1	0.0	0.1
6/2	250	250	-	-	-	0.1	0.0	-	0.1	0.9	1.8	0.0	1.8

C1	Stream: 1	PRC for Signalled Lanes (%):	4.8	Total Delay for Signalled Lanes (pcuHr):	3.65	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	3.9	Total Delay for Signalled Lanes (pcuHr):	19.85	Cycle Time (s):	60
		PRC Over All Lanes (%):	3.9	Total Delay Over All Lanes(pcuHr):	23.50		

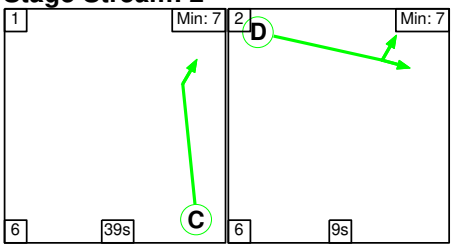
Scenario 4: '2031 Do Something - PM Peak' (FG7: 'Padbury1_PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

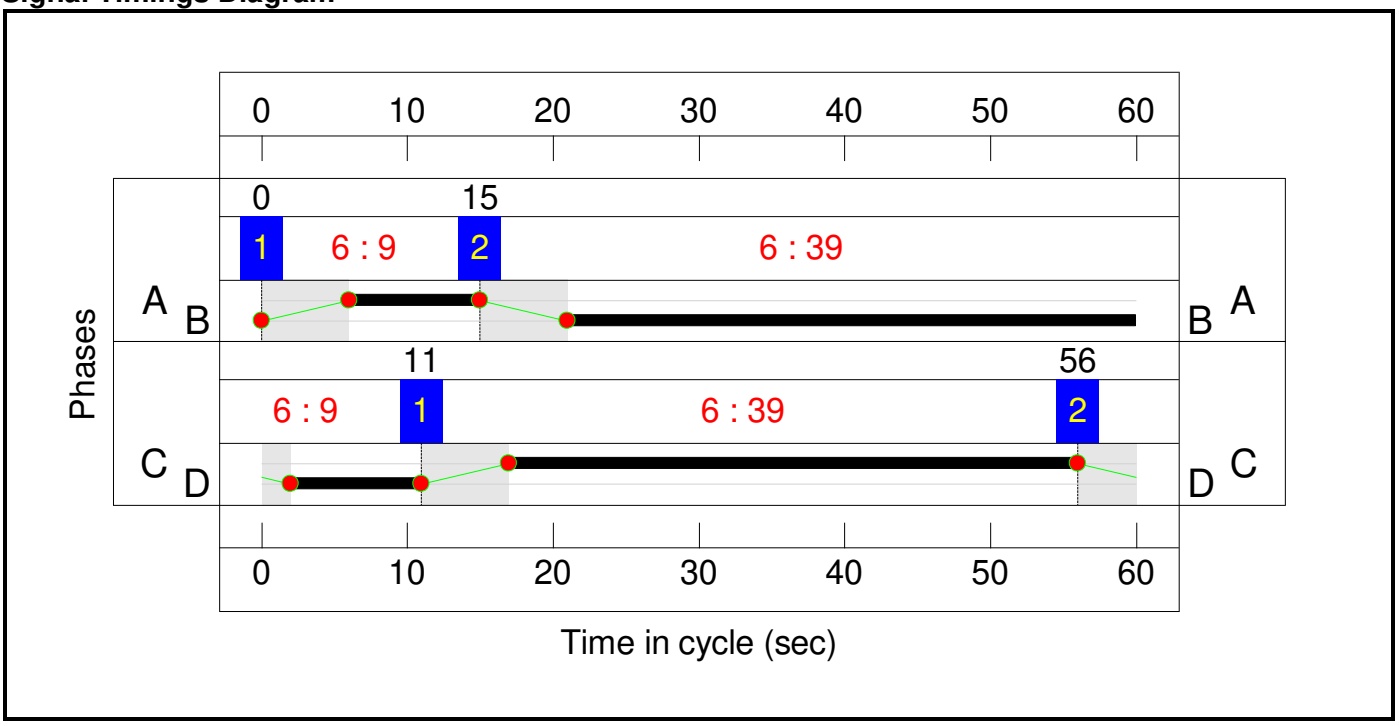
Stage Stream: 1

Stage	1	2
Duration	9	39
Change Point	0	15

Stage Stream: 2

Stage	1	2
Duration	39	9
Change Point	11	56

Signal Timings Diagram



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 (%)
Network: Padbury HE scheme	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**95.2%**
Padbury Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**95.2%**
1/1	A43 north Ahead	U	1	N/A	B		1	39	-	822	1922	1281	64.2%
1/2	A43 north Ahead	U	1	N/A	B		1	39	-	900	2058	1372	65.6%
3/1	A43 south Ahead	U	2	N/A	C		1	39	-	1193	1886	1257	94.9%
3/2	A43 south Ahead	U	2	N/A	C		1	39	-	1282	2019	1346	95.2%
5/2+5/1	Junction 10 s'bound offslip Left Ahead	U	2	N/A	D		1	9	-	628	2058:1916	343+319	94.8 : 94.9%
5/3	Junction 10 s'bound offslip Ahead	U	2	N/A	D		1	9	-	299	2043	340	87.8%
6/1	Right	U	1	N/A	A		1	9	-	310	1980	330	93.9%
6/2	Right	U	1	N/A	A		1	9	-	299	2120	353	84.6%

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)
Network: Padbury HE scheme	**-**	**-**	**0**	**0**	**0**	**15.4**	**27.1**	**0.0**	**42.5**	**-**	**-**	**-**	**-**
Padbury Roundabout	**-**	**-**	**0**	**0**	**0**	**15.4**	**27.1**	**0.0**	**42.5**	**-**	**-**	**-**	**-**
1/1	822	822	-	-	-	1.3	0.9	-	2.2	9.7	7.8	0.9	8.7
1/2	900	900	-	-	-	1.5	0.9	-	2.4	9.7	8.8	0.9	9.7
3/1	1193	1193	-	-	-	3.0	7.5	-	10.5	31.8	17.9	7.5	25.4
3/2	1282	1282	-	-	-	3.3	8.0	-	11.3	31.6	19.2	8.0	27.2
5/2+5/1	628	628	-	-	-	4.3	6.6	-	10.9	62.6	5.3	6.6	11.9
5/3	299	299	-	-	-	2.0	3.1	-	5.2	62.1	4.8	3.1	7.9
6/1	310	310	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	299	299	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1	Stream: 1	PRC for Signalled Lanes (%):	-4.4	Total Delay for Signalled Lanes (pcuHr):	4.65	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	-5.8	Total Delay for Signalled Lanes (pcuHr):	37.87	Cycle Time (s):	60
		PRC Over All Lanes (%):	-5.8	Total Delay Over All Lanes(pcuHr):	42.52		

APPENDIX E

PADBURY T-JUNCTION MITIGATION SCHEME LINSIG MODEL AUDIT AND REVISED RESULTS

LINSIG V3 Model Checking Report

AECOM

Project:	**OXFORDSHIRE SRFI-M40 Junction 10**	Job No:	**xxxxx**
Model:	**210407 Padbury - P-4 T-junction option.lsg3x**	Model Submitted:	**16/07/2021**
		Corrections Submitted:	**Date Submitted**

Modelled By: ADC Infrastructure **Checked by: Weiping Guo** **Approved by:**

This note is to document the checks made to LINSIG models. Once completed this should be filed with the model, or model outputs for future reference.

Results Key

× - Changes required before work is signed off
? – Changes may be required before work is signed off, further work required
✓ - No further changes required before work is signed off

File Checked: Hyperlink to model

Network Information

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Scenario title(s) entered	✓			
26/07/21	Project name entered	✓			
26/07/21	Modeller details recorded	✓			
26/07/21	Network location details entered	✓			
26/07/21	File name is logical	✓			

Network Setup

Junction Drawings: In report 'OxSRFI-ADC1794-RP-M-V3 'TN5 M40 Junction 10 Options Report' – appendices' Page no.54
Sat Flow Measurements / Calculations: Hyperlink to Sat Flow Measurements

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	Junctions				
26/07/21	Appropriate junctions setup	✓			
26/07/21	Junction info/ signal controllers complete	✓			
26/07/21	Logical arm structure setup	✓			
	Lanes				
26/07/21	Lane setup reflects junction drawings	✓			
26/07/21	Check each lane that is signal controlled	✓			
26/07/21	Lanes matched to controller and phase	✓	.		
26/07/21	Lane length appropriate	✓			
26/07/21	Custom occupancy (if req)	N/A			
	Saturation Flows				
26/07/21	Justified method to derive saturation flows				
26/07/21	Check observed sat flows (if used)	N/A			
26/07/21	Check RR67 sat flows calculations (if used)	x	1. All the entry arm lanes saturation flows were calculated by RR67 methods, however all the lanes were treated as the 'nearside lane'. 2. Arm1 left turn and right turn radius are set 20mtr in the model, however after exam the drawing, 20mtr is not accurate and too low. Please double check.	1. Central lanes and offside lanes have 'nearside lane' de-selected. All turning radii checked and increased where applicable. 2. Arm1 left turn and right turn radii increased to 30m and 35m respectively to reflect the drawing.	
26/07/21	Check external sat flows calculations (if used)				
26/07/21	Check sat flows for any bottleneck links	x	Please check the Arm5. After exam the drawing Arm 5 lane 3 will be merging into lane 2 after 100mtr. Hence, lane sat flow should be coded on Arm 5 to limit the flow distribution on lane 3 to reflect the realist driving behaviours.	Saturation flow applied to Arm 5 lane 3 to alter traffic assignment in the merging lane.	
	Advanced Lane Settings				
26/07/21	Use of start / end green displacements (if req)	✓	Default values used.		
26/07/21	Use of queue limits on short links (if req)	N/A			
26/07/21	Use of weightings for optimiser constraints (if req)	N/A			
26/07/21	Use of random delay or queue de-sliver (if req)	N/A			
	Give Ways				
26/07/21	Check each lane that is priority controlled	N/A			
26/07/21	Measurement of max/min flow when giving way	N/A			
26/07/21	Flow when opposing traffic stopped reasonable	N/A			
26/07/21	Measurement of give-way co-efficient	N/A			
26/07/21	Measurement of clear conflict time of opposing traffic	N/A			
26/07/21	Check all controlling movements identified	N/A			
26/07/21	Measurement of storage in front of stop-line	N/A			
26/07/21	Max turns in inter-green reasonable	N/A			
26/07/21	Measurement of non-blocking storage	N/A			

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	Lane Connectors				
26/07/21	Lane connectors provided reasonable	✓			
26/07/21	Cruise time reasonable	N/A			
26/07/21	Default platoon dispersion used unless observed	✓			
	Zones				
26/07/21	Zones match O-D matrix	✓	Padbury2_AM flow matches the flow report page 42; Padbury2_PM flow matches the flow report page 43;		

	Pedestrians				
26/07/21	Ped crossings represented by ped links (if req)	N/A			
26/07/21	Ped link data correct (if req)	N/A			
26/07/21	Ped connector walk times reasonable (if req)	N/A			
26/07/21	Ped links matched to appropriate phases (if req)	N/A			
26/07/21	Ped zones match ped O-D matrix (if req)	N/A			

Controllers

Controller Specifications: Hyperlink to Controller Specification (if req)
Intergreen Calculations: Hyperlink to Intergreen Calculations (if req)

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	General Controller Set-up				
26/07/21	Sufficient controllers setup	✓			
26/07/21	Multiple stage streams setup correctly (if req)	N/A			
26/07/21	Non-standard filters setup correctly (if req)	N/A			
	Signal Settings				
26/07/21	Check phases for each controller	✓			
26/07/21	Check phase mins/type reasonable	✓			
26/07/21	Check inter-greens calculations/coding	X	1. Phase B-C inter-green is 6s in the model, however after exam the drawing, this is possible too low. Please use the Traffic Sign Manual Chapter 6 calculation method. 2. Phase C-A inter-green is 6s in the model, however after exam the drawing, this is possible too low. Please use the Traffic Sign Manual Chapter 6 calculation method.	Intergreens B-C and C-A increased to 9 seconds as per Traffic Signs Chapter 6 methodology.	
26/07/21	Stages reasonable	✓			
26/07/21	Phase delays reasonable (if req)	?	Phase delays might be required after the above inter-green amendment.	3 second losing phase delay added to phase A on stage change 1-2.	

Stage Sequences

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Check stage sequences observed / optimised	✓			
26/07/21	Check stage timings observed / optimised	N/A			

Traffic Counts and Calculations

Traffic Flow Data: Hyperlink to Traffic Flow Data – in report 'OXSRFI-ADC1794-RP-N-V2 'TN6 - M40 J10 OR Traffic Flow Derivation' – bound'
Matrix Calculations: Hyperlink to Matrix Calculations (if required)
Lane Balancing Calculations: Hyperlink to Lane Balancing Calculations (if required)
Site Observations: Hyperlink to Site Flows Observations

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Suitability of traffic surveys undertaken	N/A			
26/07/21	Are there sufficient site observations	N/A			
26/07/21	Check O-D matrix calculations	✓			
26/07/21	Are lane balancing calculations sufficient / consistent	x	Please check the Arm5, as lane 3 will be merging to lane 2 in 100mtr, the traffic distribution on lane 3 should be restricted especially during the PM period, it is not expecting same 789pcus to be distributed equally on lane 2 and lane 3.	Saturation flow applied to Arm 5 lane 3 to alter traffic assignment in the merging lane.	
26/07/21	Does lane balancing match lining	✓			
26/07/21	Does lane balancing match matrices	✓			

Traffic Flows

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Traffic & ped flow (if req) groups setup	✓			
26/07/21	Desired flows match O-D matrices	✓			
26/07/21	Actual flows match desired flows	✓			
26/07/21	Inappropriate routes closed	✓			
26/07/21	Route flows match lane balancing	✓			

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Modelling					
Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Scenario set up with correct options	✓			
26/07/21	Cycle time appropriate for network control	✓			
26/07/21	Cycle time optimised (if req)	N/A			

Results					
Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	Are all values as expected (Demand Flows, Green Times etc)		To be checked after above changes.		
	Deg Sat >100% for existing situation with no modelled suppressed demand?		To be checked after above changes.		
	Deg Sat appropriate? Validated?		To be checked after above changes.		
	Capacity conclusions		To be checked after above changes.		
	If suppressed demand has been modelled, do queues validate?		To be checked after above changes.		
	Queues appropriate?		To be checked after above changes.		
	Queue limits exceeded?		To be checked after above changes.		
	Queuing conclusions (will exit blocking modify these?)		To be checked after above changes.		
	If suppressed demand has been modelled do journey times validate?		To be checked after above changes.		
	Journey time conclusions?		To be checked after above changes.		

Conclusions and Recommendations

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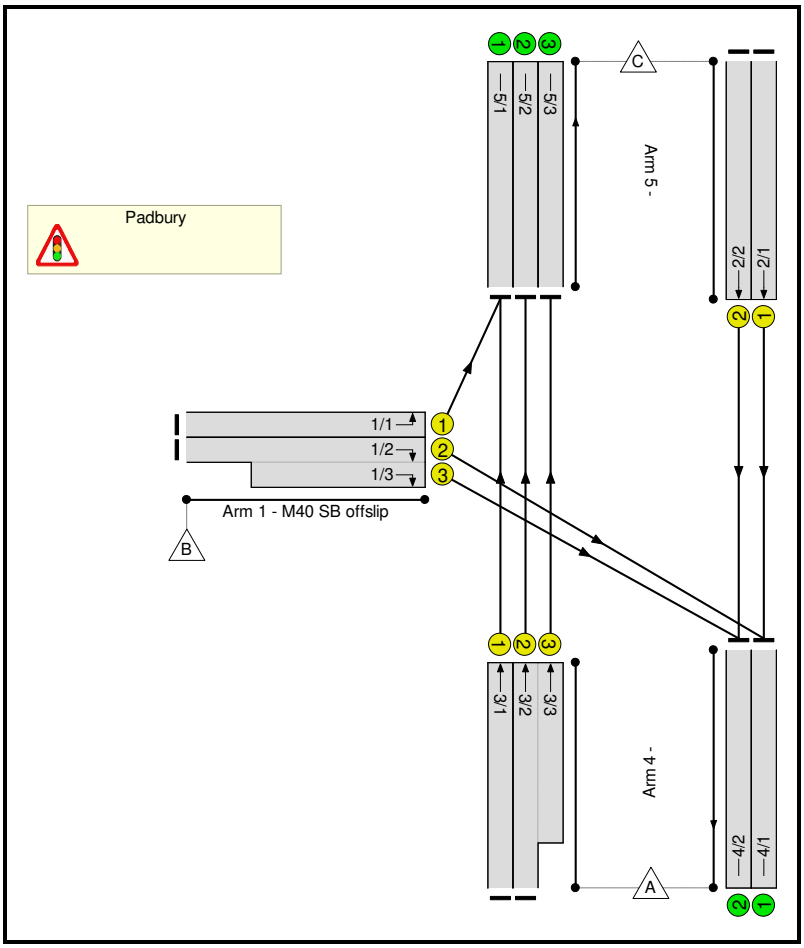
Full Input Data And Results

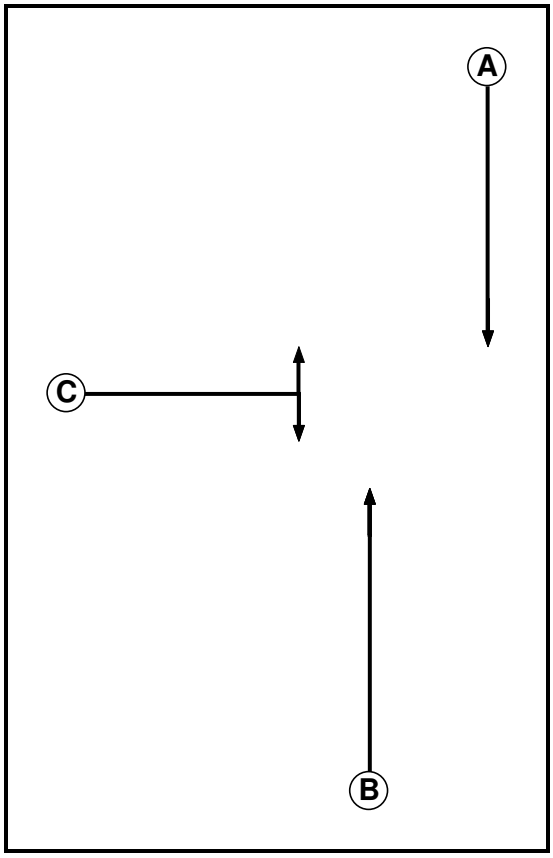
User and Project Details

Project:	**Oxfordshire SRFI**
Title:	**Padbury T-junction option**
Location:	
Additional detail:	Amended following Aecom comments
File name:	211006 Padbury - P-4 T-junction option.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	4
B	Traffic		7	7
C	Traffic		7	7

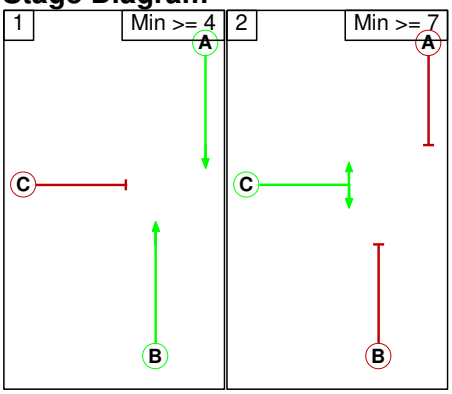
Phase Intergreens Matrix

	Starting Phase			
Terminating Phase		A	B	C
	A		-	6
	B	-		9
	C	9	6	

Phases in Stage

Stage No.	Phases in Stage
1	A B
2	C

Stage Diagram



Prohibited Stage Change

	To Stage		
From Stage		1	2
	1		9
	2	9	

Lane Input Data

Junction: Padbury

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 (M40 SB offslip)	U	C	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 5 Left	30.00
1/2 (M40 SB offslip)	U	C	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 4 Right	35.00
1/3 (M40 SB offslip)	U	C	2	3	10.4	Geom	-	3.65	0.00	N	Arm 4 Right	35.00
2/1 (A43 north)	U	A	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 4 Ahead	Inf
2/2 (A43 north)	U	A	2	3	60.0	Geom	-	3.65	0.00	N	Arm 4 Ahead	Inf
3/1 (A43 south)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 5 Ahead	Inf
3/2 (A43 south)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm 5 Ahead	Inf
3/3 (A43 south)	U	B	2	3	13.0	Geom	-	3.65	0.00	N	Arm 5 Ahead	Inf
4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
4/2	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
5/2	U		2	3	60.0	Inf	-	-	-	-	-	-
5/3	U		2	3	60.0	User	2120	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'Padbury2_AM'	07:45	08:45	01:00	
2: 'Padbury2_PM'	16:30	17:30	01:00	

Scenario 1: '2031 do some 11,13,15,18,19 - AM Peak' (FG1: 'Padbury2_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	0	1662	1662
	B	738	0	337	1075
	C	1246	0	0	1246
	Tot.	1984	0	1999	3983

Traffic Lane Flows

Lane	Scenario 1: 2031 do some 11,13,15,18,19 - AM Peak
Junction: Padbury	
1/1	337
1/2 (with short)	738(In) 356(Out)
1/3 (short)	382
2/1	594
2/2	652
3/1	548
3/2 (with short)	1114(In) 648(Out)
3/3 (short)	466
4/1	950
4/2	1034
5/1	885
5/2	648
5/3	466

Lane Saturation Flows

Junction: Padbury								
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 (M40 SB offslip)	3.65	0.00	Y	Arm 5 Left	30.00	100.0 %	1886	1886
1/2 (M40 SB offslip)	3.65	0.00	Y	Arm 4 Right	35.00	100.0 %	1899	1899
1/3 (M40 SB offslip)	3.65	0.00	N	Arm 4 Right	35.00	100.0 %	2033	2033
2/1 (A43 north)	3.65	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1980	1980
2/2 (A43 north)	3.65	0.00	N	Arm 4 Ahead	Inf	100.0 %	2120	2120
3/1 (A43 south)	3.65	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1980	1980
3/2 (A43 south)	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
3/3 (A43 south)	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
4/1	Infinite Saturation Flow						Inf	Inf
4/2	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
5/3	This lane uses a directly entered Saturation Flow						2120	2120

Scenario 2: '2031 do some 11,13,15,18,19 - PM Peak' (FG2: 'Padbury2_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	0	2475	2475
	B	609	0	318	927
	C	783	0	0	783
	Tot.	1392	0	2793	4185

Traffic Lane Flows

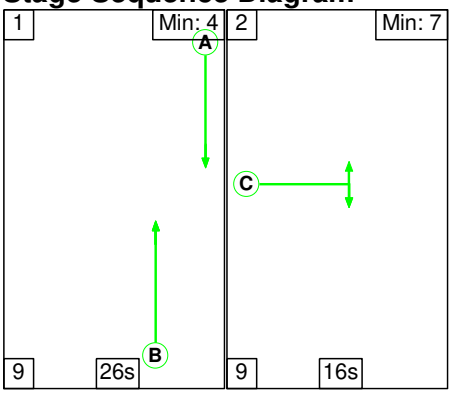
Lane	Scenario 2: 2031 do some 11,13,15,18,19 - PM Peak
Junction: Padbury	
1/1	318
1/2 (with short)	609(In) 294(Out)
1/3 (short)	315
2/1	366
2/2	417
3/1	883
3/2 (with short)	1592(In) 896(Out)
3/3 (short)	696
4/1	660
4/2	732
5/1	1201
5/2	896
5/3	696

Lane Saturation Flows

Junction: Padbury								
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 (M40 SB offslip)	3.65	0.00	Y	Arm 5 Left	30.00	100.0 %	1886	1886
1/2 (M40 SB offslip)	3.65	0.00	Y	Arm 4 Right	35.00	100.0 %	1899	1899
1/3 (M40 SB offslip)	3.65	0.00	N	Arm 4 Right	35.00	100.0 %	2033	2033
2/1 (A43 north)	3.65	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1980	1980
2/2 (A43 north)	3.65	0.00	N	Arm 4 Ahead	Inf	100.0 %	2120	2120
3/1 (A43 south)	3.65	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1980	1980
3/2 (A43 south)	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
3/3 (A43 south)	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
4/1	Infinite Saturation Flow						Inf	Inf
4/2	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
5/3	This lane uses a directly entered Saturation Flow						2120	2120

Scenario 1: '2031 do some 11,13,15,18,19 - AM Peak' (FG1: 'Padbury2_AM', Plan 1: 'Network Control Plan 1')

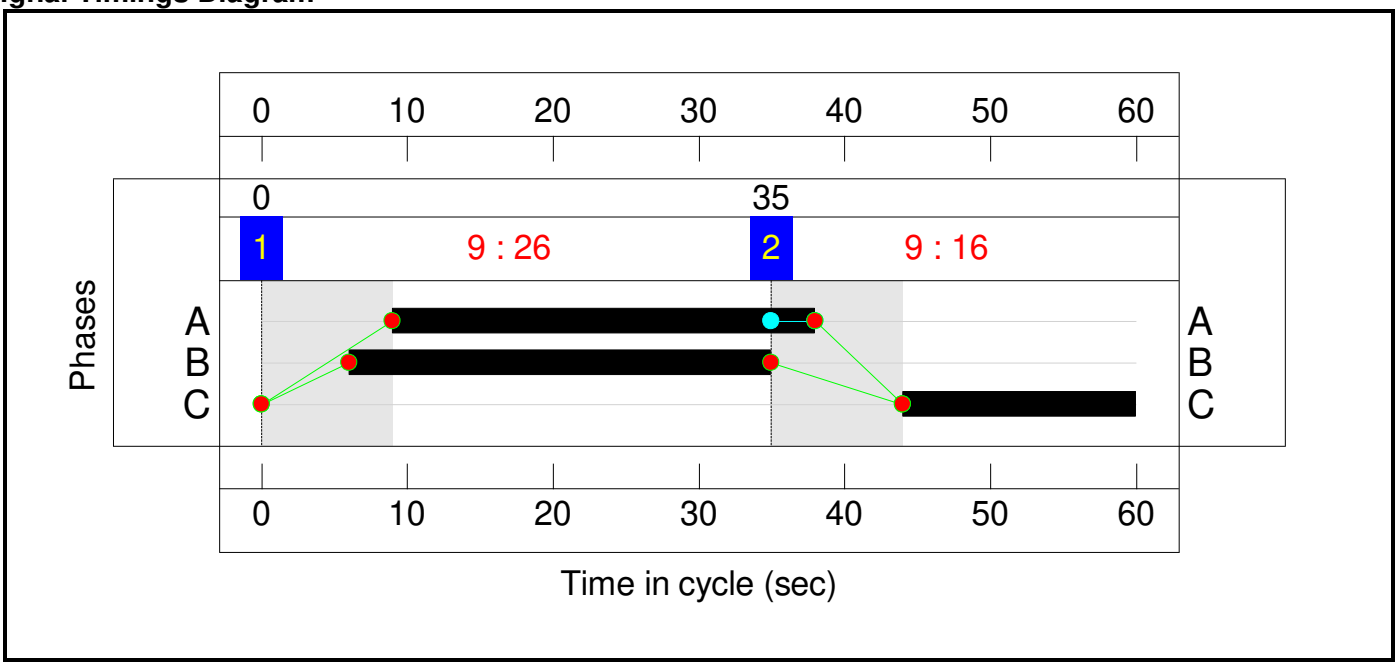
Stage Sequence Diagram



Stage Timings

Stage	1	2
Duration	26	16
Change Point	0	35

Signal Timings Diagram



Network Results

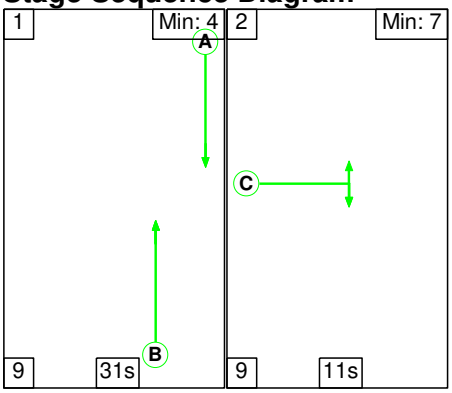
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Padbury T-junction option	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**68.6%**
Padbury	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**68.6%**
1/1	M40 SB offslip Left	U	N/A	N/A	C		1	16	-	337	1886	534	63.1%
1/2+1/3	M40 SB offslip Right	U	N/A	N/A	C		1	16	-	738	1899:2033	538+576	66.2 : 66.3%
2/1	A43 north Ahead	U	N/A	N/A	A		1	29	-	594	1980	990	60.0%
2/2	A43 north Ahead	U	N/A	N/A	A		1	29	-	652	2120	1060	61.5%
3/1	A43 south Ahead	U	N/A	N/A	B		1	29	-	548	1980	990	55.4%
3/2+3/3	A43 south Ahead	U	N/A	N/A	B		1	29	-	1114	2120:2120	944+679	68.6 : 68.6%
5/3		U	N/A	N/A	-		-	-	-	466	2120	2120	22.0%

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)
Network: Padbury T-junction option	**-**	**-**	**0**	**0**	**0**	**14.1**	**5.2**	**0.0**	**19.4**	**-**	**-**	**-**	**-**
Padbury	**-**	**-**	**0**	**0**	**0**	**14.1**	**5.2**	**0.0**	**19.4**	**-**	**-**	**-**	**-**
1/1	337	337	-	-	-	1.8	0.8	-	2.6	27.8	4.9	0.8	5.7
1/2+1/3	738	738	-	-	-	3.9	1.0	-	4.9	23.7	5.5	1.0	6.5
2/1	594	594	-	-	-	1.8	0.7	-	2.5	15.2	6.9	0.7	7.7
2/2	652	652	-	-	-	2.0	0.8	-	2.8	15.2	7.8	0.8	8.6
3/1	548	548	-	-	-	1.6	0.6	-	2.2	14.4	6.2	0.6	6.9
3/2+3/3	1114	1114	-	-	-	3.2	1.1	-	4.3	13.8	7.7	1.1	8.8
5/3	466	466	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1

C1 PRC for Signalled Lanes (%): 31.2 Total Delay for Signalled Lanes (pcuHr): 19.22 Cycle Time (s): 60
PRC Over All Lanes (%): 31.2 Total Delay Over All Lanes(pcuHr): 19.36

Scenario 2: '2031 do some 11,13,15,18,19 - PM Peak' (FG2: 'Padbury2_PM', Plan 1: 'Network Control Plan 1')

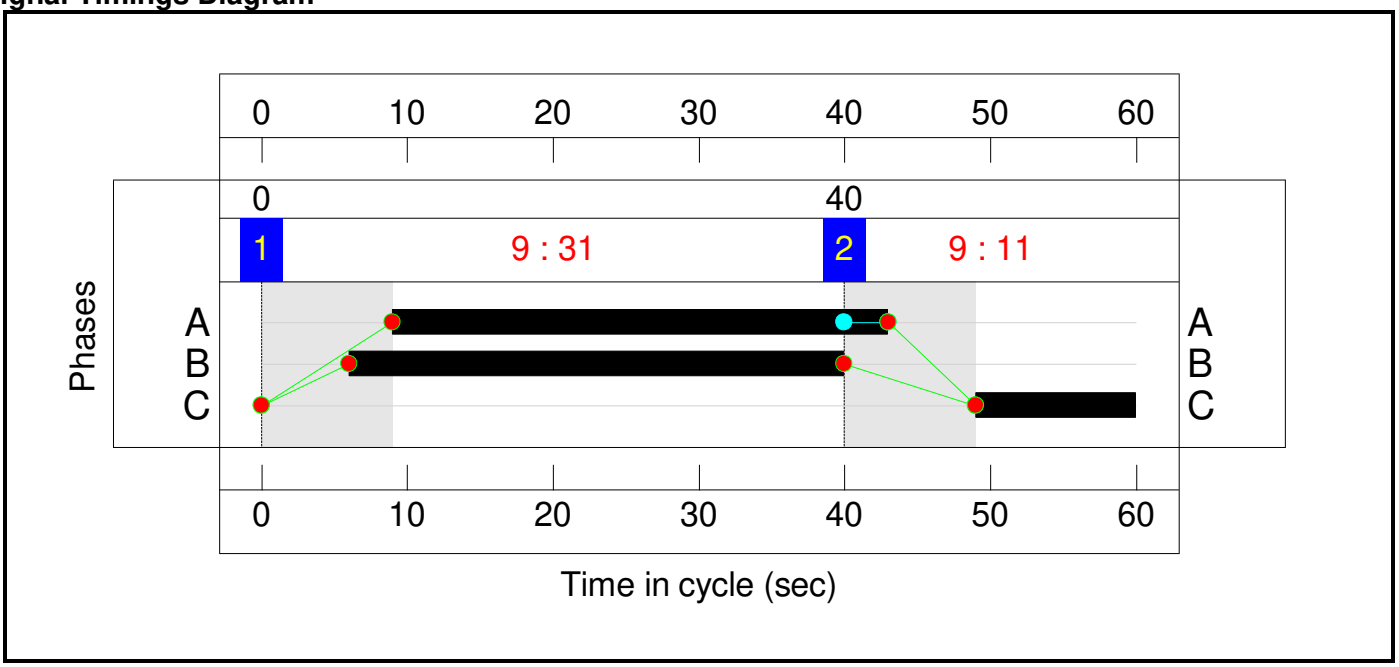
Stage Sequence Diagram



Stage Timings

Stage	1	2
Duration	31	11
Change Point	0	40

Signal Timings Diagram



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 (%)
Network: Padbury T-junction option	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.3%**
Padbury	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.3%**
1/1	M40 SB offslip Left	U	N/A	N/A	C		1	11	-	318	1886	377	84.3%
1/2+1/3	M40 SB offslip Right	U	N/A	N/A	C		1	11	-	609	1899:2033	380+407	77.4 : 77.5%
2/1	A43 north Ahead	U	N/A	N/A	A		1	34	-	366	1980	1155	31.7%
2/2	A43 north Ahead	U	N/A	N/A	A		1	34	-	417	2120	1237	33.7%
3/1	A43 south Ahead	U	N/A	N/A	B		1	34	-	883	1980	1155	76.5%
3/2+3/3	A43 south Ahead	U	N/A	N/A	B		1	34	-	1592	2120:2120	1039+807	86.3 : 86.3%
5/3		U	N/A	N/A	-		-	-	-	696	2120	2120	32.8%

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)
Network: Padbury T-junction option	**-**	**-**	**0**	**0**	**0**	**13.3**	**9.6**	**0.0**	**22.9**	**-**	**-**	**-**	**-**
Padbury	**-**	**-**	**0**	**0**	**0**	**13.3**	**9.6**	**0.0**	**22.9**	**-**	**-**	**-**	**-**
1/1	318	318	-	-	-	2.0	2.5	-	4.5	51.2	5.0	2.5	7.5
1/2+1/3	609	609	-	-	-	3.8	1.7	-	5.5	32.7	4.9	1.7	6.6
2/1	366	366	-	-	-	0.7	0.2	-	0.9	8.7	3.1	0.2	3.3
2/2	417	417	-	-	-	0.8	0.3	-	1.0	8.7	3.6	0.3	3.8
3/1	883	883	-	-	-	2.3	1.6	-	3.9	15.9	11.0	1.6	12.6
3/2+3/3	1592	1592	-	-	-	3.7	3.1	-	6.8	15.4	10.7	3.1	13.8
5/3	696	696	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2

C1 PRC for Signalled Lanes (%): 4.3 Total Delay for Signalled Lanes (pcuHr): 22.66 Cycle Time (s): 60
PRC Over All Lanes (%): 4.3 Total Delay Over All Lanes(pcuHr): 22.90

APPENDIX F

CHERWELL ROUNDABOUT REFERENCE CASE LINSIG MODEL AUDIT AND REVISED RESULTS

LINSIG V3 Model Checking Report

AECOM

Project:	**OXFORDSHIRE SRFI-M40 Junction 10**	Job No:	**xxxxx**
Model:	**2031_DS_M40J10_Cherwell_reference case.lsg3x**	Model Submitted:	**16/07/2021**
		Corrections Submitted:	**Date Submitted**

Modelled By: ADC Infrastructure **Checked by: Weiping Guo** **Approved by:**

This note is to document the checks made to LINSIG models. Once completed this should be filed with the model, or model outputs for future reference.

Results Key

× - Changes required before work is signed off
? – Changes may be required before work is signed off, further work required
✓ - No further changes required before work is signed off

File Checked: Hyperlink to model

Network Information					
Checked by/date	**Checks Made**	**Result**	**Comments**	**Action taken after Audit**	**Checked by/date**
08/08/21	Scenario title(s) entered	✓			
08/08/21	Project name entered	✓			
08/08/21	Modeller details recorded	✓			
08/08/21	Network location details entered	✓			
08/08/21	File name is logical	✓			

Network Setup **Junction Drawings: In report 'OxSRFI-ADC1794-RP-M-V3 'TN5 M40 Junction 10 Options Report' – appendices' Page no.4** **Sat Flow Measurements / Calculations: Hyperlink to Sat Flow Measurements**					
Checked by/date	**Checks Made**	**Result**	**Comments**	**Action taken after Audit**	**Checked by/date**
	Junctions				
08/08/21	Appropriate junctions setup	✓			
08/08/21	Junction info/ signal controllers complete	✓			
08/08/21	Logical arm structure setup	✓			
	Lanes				
08/08/21	Lane setup reflects junction drawings	X	Arm1 lane 1 should be a long lane, and lane 2/3 should be a long lane with a short lane setup according to the google maps.	Arm 1 lane 1 converted to a long lane with Arm 1 lane 3converted to a short lane, 70m long.	
08/08/21	Check each lane that is signal controlled	✓			
08/08/21	Lanes matched to controller and phase	✓	.No existing signal controller information is provided. However considering the assessment is for the 2031, the current setup in the model is acceptable.		
08/08/21	Lane length appropriate	X	Arm1 lane 1 should be a long lane, and lane 2/3 should be a long lane with a short lane setup according to the google maps.	Arm 1 lane 1 converted to a long lane with Arm 1 lane 3converted to a short lane, 70m long.	
08/08/21	Custom occupancy (if req)	N/A			
	Saturation Flows				
08/08/21	Justified method to derive saturation flows				
08/08/21	Check observed sat flows (if used)	N/A			
08/08/21	Check RR67 sat flows calculations (if used)	x	1. All the entry arm lanes saturation flows were calculated by RR67 methods, however all the lanes were treated as the 'nearside lane'. And some lanes turning radius are missing that affect the lanes sat flow calculation. Please double check. 2. The north circulatory lane Sat flow are directly entered. As all the entry arms are using RR67, we recommend the circulatory lane adopt the same method of calculations. Also the direct entered Sat flow are lower than the entry arms Sat flow which can cause the issues. In general, the downstream lanes sat flow should be equal or greater than the entry lanes Sat flows, unless there is evidence supporting there is 'bottle neck' issues at the downstream. 3. Arm 2 lane 2 is the priority controlled lane but with no Sat flow setup.	1. Central lanes and offside lanes have 'nearside lane' de-selected. All turning radii checked and increased where applicable 2. All circulating lanes have RR67 parameters applied such that all circulating saturation flows are equal or greater than the entry lanes.	
08/08/21	Check external sat flows calculations (if used)				
08/08/21	Check sat flows for any bottleneck links	X	Arm11 lane 2 is the short merging exit lane, and the should be treated as the bottleneck lane with the sat flow setup to restrict the flows distribution. I.e in 2031 do something PM scenario, there are 1122 pcus are using arm 10 lane 2 to the Arm 11 lane 2 but only 289pcus are using the arm 10 lane 1 to the Arm 11 lane 1 which does not reflect the real	Saturation flow applied to Arm 11 lane 2 to alter traffic assignment in the merging lane.	

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			world situation considering the Arm 11 lane 2 is a merging lane.		
	Advanced Lane Settings				
08/08/21	Use of start / end green displacements (if req)	✓			
08/08/21	Use of queue limits on short links (if req)	X	Arm8 queue limit is setup to 2pcus. It is a quite short lane, however, it may not be realistic to set this queue limit too low as considering the feeding Arm 2 lane 2 is the priority control. The reality is to setup this lane's queue can not over to the Arm 9 and make sure when Arm 5 is on green, Arm8 will be on green.	The model shows that the queue limit of 2 pcu is exceeded in 3 out of 4 scenarios, with the queue effectively reaching the arm 2 give-way line in the 2031 do something PM scenario. The queue limit has been increased to 3 pcu, however, any further increases are not possible as they would result in the queue extending beyond the arm 2 give-way line.	
08/08/21	Use of weightings for optimiser constraints (if req)	✓			
08/08/21	Use of random delay or queue de-sliver (if req)	X	1. Arm 10 lane 2 and 3 are ticking off the 'ignore random Delay' but not Lane 1. 2. Arm 9 should not setup the queue limit and random delay as it is the 'unconstrained' lane in the model.	1. Arm 10 lane 1 now has 'ignore random delay' ticked. 2. Arm 9 queue limit removed and 'ignore random delay' unticked.	
	Give Ways				
08/08/21	Check each lane that is priority controlled	✓			
08/08/21	Measurement of max/min flow when giving way	✓	1000 pcus is used as recommended by JCT.		
08/08/21	Flow when opposing traffic stopped reasonable	✓	Maxi flow is used.		
08/08/21	Measurement of give-way co-efficient	✓	0.33 is used as recommended by JCT.		
08/08/21	Measurement of clear conflict time of opposing traffic	✓	2s default is used.		
08/08/21	Check all controlling movements identified	✓			
08/08/21	Measurement of storage in front of stop-line	N/A			
08/08/21	Max turns in inter-green reasonable	N/A			
08/08/21	Measurement of non-blocking storage	N/A			
	Lane Connectors				
08/08/21	Lane connectors provided reasonable	X	There are a lot of demand from B-C, but Arm 8 lane 1 is only connected to Arm10 lane 2.	Arm 8 lane 1 now connected Arm10 lanes 1 and 2.	
08/08/21	Cruise time reasonable	✓	45km/hr cruise speed is applied for all the link connectors.		
08/08/21	Default platoon dispersion used unless observed	✓	The platoon dispersion are switched off due to the short circulatory lanes.		
	Zones				
08/08/21	Zones match O-D matrix	✓	1. Cherwell1Ref1_AM flow matches the flow report 'OXSRFI-ADC1794-RP-N-V2 'TN6 - M40 J10 OR Traffic Flow Derivation' – bound' page 28; 2. Cherwell1Ref1_PM flow matches the flow report 'OXSRFI-ADC1794-RP-N-V2 'TN6 - M40 J10 OR Traffic Flow Derivation' – bound' 'page 29; ========== 3. Cherwell1_AM flow matches the flow report 'OXSRFI-ADC1794-RP-N-V2 'TN6 - M40 J10 OR Traffic Flow Derivation' – bound' page 44 4. Cherwell1_PM flow matches the flow report 'OXSRFI-ADC1794-RP-N-V2 'TN6 - M40 J10 OR Traffic Flow Derivation' – bound' page 45.		

	Pedestrians				
08/08/21	Ped crossings represented by ped links (if req)	N/A			
08/08/21	Ped link data correct (if req)	N/A			
08/08/21	Ped connector walk times reasonable (if req)	N/A			
08/08/21	Ped links matched to appropriate phases (if req)	N/A			
08/08/21	Ped zones match ped O-D matrix (if req)	N/A			

Controllers

Controller Specifications: Hyperlink to Controller Specification (if req)
Intergreen Calculations: Hyperlink to Intergreen Calculations (if req)

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	General Controller Set-up				
08/08/21	Sufficient controllers setup	✓			
08/08/21	Multiple stage streams setup correctly (if req)	✓			
08/08/21	Non-standard filters setup correctly (if req)	N/A			
	Signal Settings				
08/08/21	Check phases for each controller	✓			
08/08/21	Check phase mins/type reasonable	✓			
08/08/21	Check inter-greens calculations/coding	?	6s inter-green is used for all conflict phases. 6s maybe too low for Phase C and Phase D inter-green. Please double check.	Intergreens C-D and D-C increased to 7 AND 8 seconds respectively, as per Traffic Signs Chapter 6 methodology.	
08/08/21	Stages reasonable	✓			

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08/08/21	Phase delays reasonable (if req)	N/A			

Stage Sequences

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Check stage sequences observed / optimised	✓			
08/08/21	Check stage timings observed / optimised	X	No existing signal information (i.e controller config and/or MOVA datasets)		

Traffic Counts and Calculations

Traffic Flow Data: Hyperlink to Traffic Flow Data – in report 'OXSRFI-ADC1794-RP-N-V2 'TN6 - M40 J10 OR Traffic Flow Derivation' – bound'
Matrix Calculations: Hyperlink to Matrix Calculations (if required)
Lane Balancing Calculations: Hyperlink to Lane Balancing Calculations (if required)
Site Observations: Hyperlink to Site Flows Observations

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Suitability of traffic surveys undertaken	N/A			
08/08/21	Are there sufficient site observations	N/A			
08/08/21	Check O-D matrix calculations	✓			
08/08/21	Are lane balancing calculations sufficient / consistent	?	To be checked after the above lanes and sat flow update.		
08/08/21	Does lane balancing match lining	?	To be checked after the above lanes and sat flow update.		
08/08/21	Does lane balancing match matrices	?	To be checked after the above lanes and sat flow update.		

Traffic Flows

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Traffic & ped flow (if req) groups setup	✓	Multi flow groups setup in the model. Only four flows matrix are used.		
08/08/21	Desired flows match O-D matrices	✓			
08/08/21	Actual flows match desired flows	✓			
08/08/21	Inappropriate routes closed	✓			
08/08/21	Route flows match lane balancing	✓			

Modelling

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Scenario set up with correct options	✓			
08/08/21	Cycle time appropriate for network control	✓			
08/08/21	Cycle time optimised (if req)	N/A			

Results

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	Are all values as expected (Demand Flows, Green Times etc)		To be checked after above changes.		
	Deg Sat >100% for existing situation with no modelled suppressed demand?		To be checked after above changes.		
	Deg Sat appropriate? Validated?		To be checked after above changes.		
	Capacity conclusions		To be checked after above changes.		
	If suppressed demand has been modelled, do queues validate?		To be checked after above changes.		
	Queues appropriate?		To be checked after above changes.		
	Queue limits exceeded?		To be checked after above changes.		
	Queuing conclusions (will exit blocking modify these?)		To be checked after above changes.		
	If suppressed demand has been modelled do journey times validate?		To be checked after above changes.		
	Journey time conclusions?		To be checked after above changes.		

Conclusions and Recommendations

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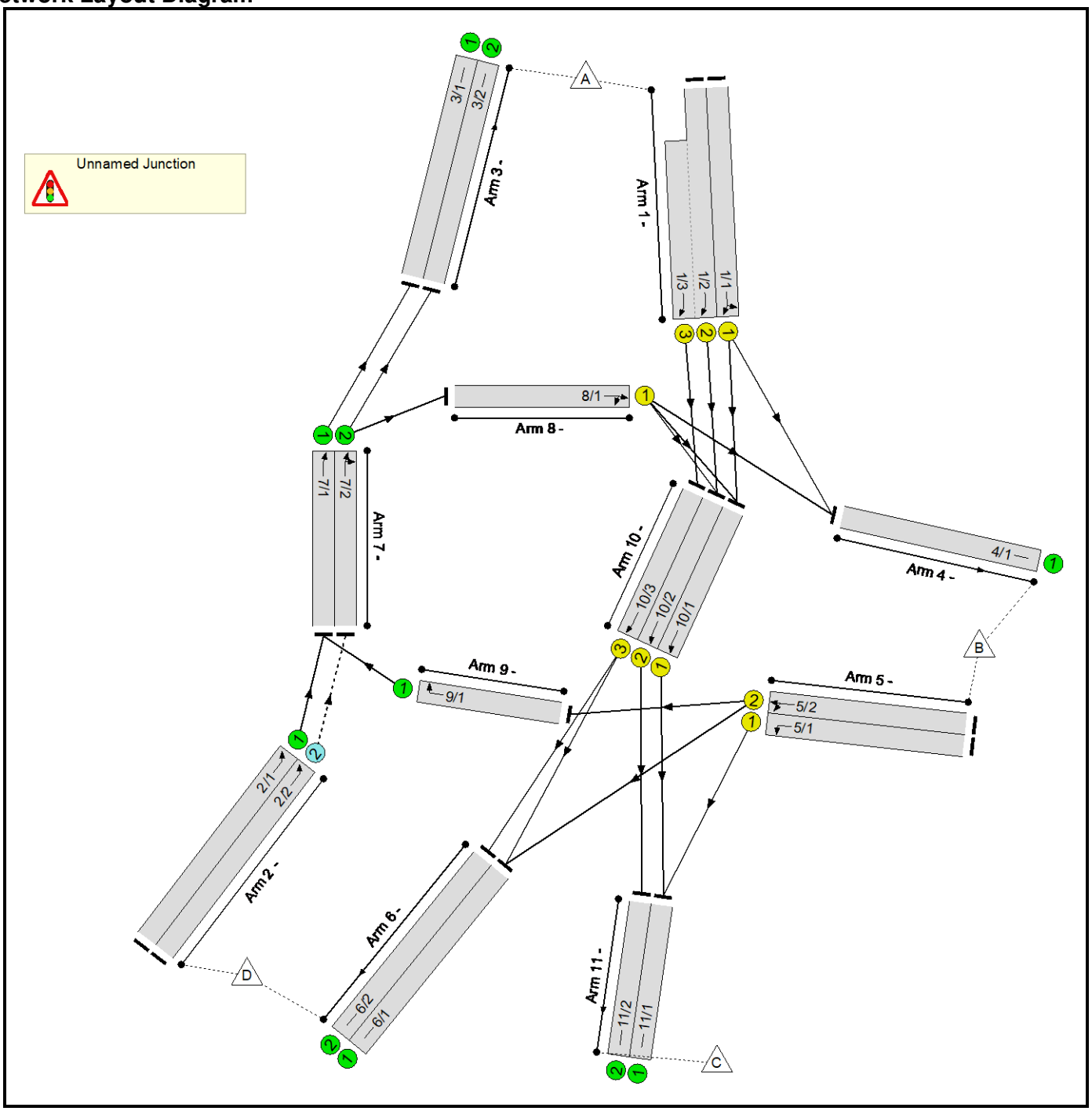
Full Input Data And Results

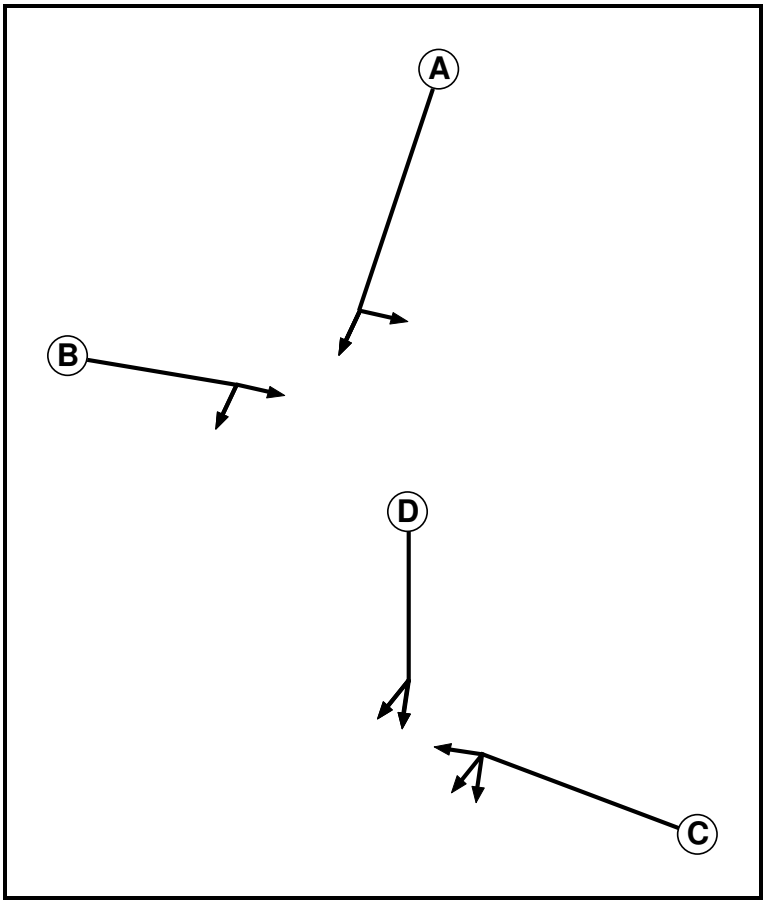
User and Project Details

Project:	**Oxfordshire SRFI**
Title:	**Existing Cherwell Roundabout**
Location:	
Additional detail:	Amended to include Aecom comments
File name:	2031_DS_M40J10_Cherwell_reference case.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7

Phase Intergreens Matrix

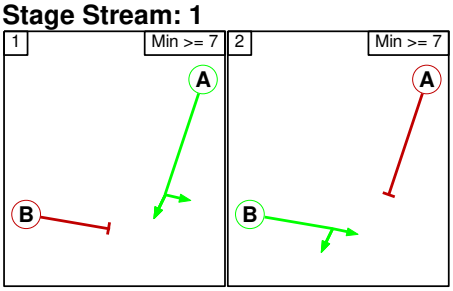
		Starting Phase			
		A	B	C	D
Terminating Phase	A		6	-	-
	B	6		-	-
	C	-	-		7
	D	-	-	8	

Phases in Stage

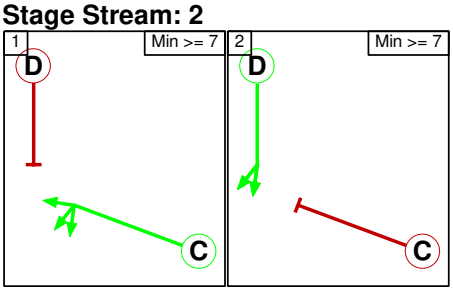
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D

Stage Diagram

Stage Stream: 1



Stage Stream: 2



Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		7
	2	8	

Lane Input Data

Junction: Unnamed Junction												
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	U	A	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 4 Left	20.00
											Arm 10 Ahead	Inf
1/2	U	A	2	3	60.0	Geom	-	3.65	0.00	N	Arm 10 Ahead	Inf
1/3	U	A	2	3	12.2	Geom	-	3.65	0.00	N	Arm 10 Ahead	Inf
2/1	U		2	3	60.0	Inf	-	-	-	-	-	-
2/2	O		2	3	60.0	User	1800	-	-	-	-	-
3/1	U		2	3	60.0	Inf	-	-	-	-	-	-
3/2	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1	U	C	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 11 Left	30.00
5/2	U	C	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 6 Left	40.00
											Arm 9 Ahead	Inf
6/1	U		2	3	60.0	Inf	-	-	-	-	-	-
6/2	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1	U		2	3	7.0	Inf	-	-	-	-	-	-
7/2	U		2	3	7.0	Inf	-	-	-	-	-	-
8/1	U	B	2	3	5.2	Geom	-	3.65	0.00	Y	Arm 4 Ahead	40.00
											Arm 10 Right	40.00
9/1	U		2	3	7.8	Inf	-	-	-	-	-	-
10/1	U	D	2	3	8.7	Geom	-	3.65	0.00	Y	Arm 11 Ahead	Inf
10/2	U	D	2	3	8.7	Geom	-	3.65	0.00	N	Arm 11 Ahead	Inf
10/3	U	D	2	3	8.7	Geom	-	3.65	0.00	N	Arm 6 Ahead	Inf
11/1	U		2	3	60.0	Inf	-	-	-	-	-	-
11/2	U		2	3	60.0	User	2120	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'Cherwell1_AM'	07:45	08:45	01:00	
2: 'Cherwell1_PM'	16:30	17:30	01:00	
3: 'CherwellRef1_AM'	07:45	08:45	01:00	
4: 'CherwellRef1_PM'	16:30	17:30	01:00	

Scenario 1: '2031 Reference Case - AM Peak' (FG3: 'CherwellRef1_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	343	1605	1169	3117
	B	85	0	295	202	582
	C	0	0	0	0	0
	D	1458	239	101	0	1798
	Tot.	1543	582	2001	1371	5497

Traffic Lane Flows

Lane	Scenario 1: 2031 Reference Case - AM Peak
Junction: Unnamed Junction	
1/1	1195
1/2 (with short)	1922(In) 753(Out)
1/3 (short)	1169
2/1	1458
2/2	340
3/1	1543
3/2	0
4/1	582
5/1	295
5/2	287
6/1	787
6/2	584
7/1	1543
7/2	340
8/1	340
9/1	85
10/1	899
10/2	807
10/3	1169
11/1	1194
11/2	807

Lane Saturation Flows

Junction: Unnamed Junction								
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	3.65	0.00	Y	Arm 4 Left	20.00	28.7 %	1938	1938
				Arm 10 Ahead	Inf	71.3 %		
1/2	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
1/3	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
2/1	Infinite Saturation Flow						Inf	Inf
2/2	This lane uses a directly entered Saturation Flow						1800	1800
3/1	Infinite Saturation Flow						Inf	Inf
3/2	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf
5/1	3.50	0.00	Y	Arm 11 Left	30.00	100.0 %	1871	1871
5/2	3.50	0.00	Y	Arm 6 Left	40.00	70.4 %	1914	1914
				Arm 9 Ahead	Inf	29.6 %		
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
7/1	Infinite Saturation Flow						Inf	Inf
7/2	Infinite Saturation Flow						Inf	Inf
8/1	3.65	0.00	Y	Arm 4 Ahead	40.00	70.3 %	1908	1908
				Arm 10 Right	40.00	29.7 %		
9/1	Infinite Saturation Flow						Inf	Inf
10/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
10/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
10/3	3.65	0.00	N	Arm 6 Ahead	Inf	100.0 %	2120	2120
11/1	Infinite Saturation Flow						Inf	Inf
11/2	This lane uses a directly entered Saturation Flow						2120	2120

Scenario 2: '2031 Do Something - AM Peak' (FG1: 'Cherwell1_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	343	1605	1641	3589
	B	85	0	295	202	582
	C	0	0	0	0	0
	D	1577	239	282	0	2098
	Tot.	1662	582	2182	1843	6269

Traffic Lane Flows

Lane	Scenario 2: 2031 Do Something - AM Peak
Junction: Unnamed Junction	
1/1	1527
1/2 (with short)	2062(In) 421(Out)
1/3 (short)	1641
2/1	1577
2/2	521
3/1	1662
3/2	0
4/1	582
5/1	295
5/2	287
6/1	1023
6/2	820
7/1	1662
7/2	521
8/1	521
9/1	85
10/1	1355
10/2	532
10/3	1641
11/1	1650
11/2	532

Lane Saturation Flows

Junction: Unnamed Junction								
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	3.65	0.00	Y	Arm 4 Left	20.00	22.5 %	1947	1947
				Arm 10 Ahead	Inf	77.5 %		
1/2	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
1/3	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
2/1	Infinite Saturation Flow						Inf	Inf
2/2	This lane uses a directly entered Saturation Flow						1800	1800
3/1	Infinite Saturation Flow						Inf	Inf
3/2	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf
5/1	3.50	0.00	Y	Arm 11 Left	30.00	100.0 %	1871	1871
5/2	3.50	0.00	Y	Arm 6 Left	40.00	70.4 %	1914	1914
				Arm 9 Ahead	Inf	29.6 %		
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
7/1	Infinite Saturation Flow						Inf	Inf
7/2	Infinite Saturation Flow						Inf	Inf
8/1	3.65	0.00	Y	Arm 4 Ahead	40.00	45.9 %	1908	1908
				Arm 10 Right	40.00	54.1 %		
9/1	Infinite Saturation Flow						Inf	Inf
10/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
10/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
10/3	3.65	0.00	N	Arm 6 Ahead	Inf	100.0 %	2120	2120
11/1	Infinite Saturation Flow						Inf	Inf
11/2	This lane uses a directly entered Saturation Flow						2120	2120

Scenario 3: '2031 Reference Case - PM Peak' (FG4: 'CherwellRef1_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	336	939	800	2075
	B	129	0	258	213	600
	C	0	0	0	0	0
	D	2071	268	88	0	2427
	Tot.	2200	604	1285	1013	5102

Traffic Lane Flows

Lane	Scenario 3: 2031 Reference Case - PM Peak
Junction: Unnamed Junction	
1/1	716
1/2 (with short)	1359(In) 559(Out)
1/3 (short)	800
2/1	2071
2/2	356
3/1	2200
3/2	0
4/1	604
5/1	258
5/2	342
6/1	613
6/2	400
7/1	2200
7/2	356
8/1	356
9/1	129
10/1	463
10/2	564
10/3	800
11/1	721
11/2	564

Lane Saturation Flows

Junction: Unnamed Junction								
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	3.65	0.00	Y	Arm 4 Left	20.00	46.9 %	1913	1913
				Arm 10 Ahead	Inf	53.1 %		
1/2	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
1/3	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
2/1	Infinite Saturation Flow						Inf	Inf
2/2	This lane uses a directly entered Saturation Flow						1800	1800
3/1	Infinite Saturation Flow						Inf	Inf
3/2	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf
5/1	3.50	0.00	Y	Arm 11 Left	30.00	100.0 %	1871	1871
5/2	3.50	0.00	Y	Arm 6 Left	40.00	62.3 %	1920	1920
				Arm 9 Ahead	Inf	37.7 %		
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
7/1	Infinite Saturation Flow						Inf	Inf
7/2	Infinite Saturation Flow						Inf	Inf
8/1	3.65	0.00	Y	Arm 4 Ahead	40.00	75.3 %	1908	1908
				Arm 10 Right	40.00	24.7 %		
9/1	Infinite Saturation Flow						Inf	Inf
10/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
10/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
10/3	3.65	0.00	N	Arm 6 Ahead	Inf	100.0 %	2120	2120
11/1	Infinite Saturation Flow						Inf	Inf
11/2	This lane uses a directly entered Saturation Flow						2120	2120

Scenario 4: '2031 Do something - PM Peak' (FG2: 'Cherwell1_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	336	939	1056	2331
	B	129	0	258	213	600
	C	0	0	0	0	0
	D	2346	268	472	0	3086
	Tot.	2475	604	1669	1269	6017

Traffic Lane Flows

Lane	Scenario 4: 2031 Do something - PM Peak
Junction: Unnamed Junction	
1/1	947
1/2 (with short)	1384(In) 328(Out)
1/3 (short)	1056
2/1	2346
2/2	740
3/1	2475
3/2	0
4/1	604
5/1	258
5/2	342
6/1	741
6/2	528
7/1	2475
7/2	740
8/1	740
9/1	129
10/1	874
10/2	537
10/3	1056
11/1	1132
11/2	537

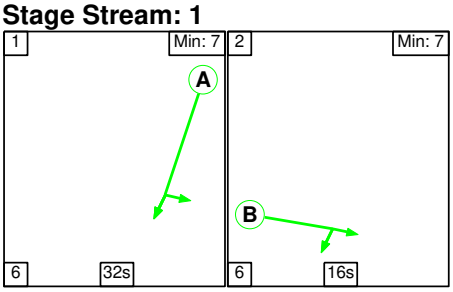
Lane Saturation Flows

Junction: Unnamed Junction								
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	3.65	0.00	Y	Arm 4 Left	20.00	35.5 %	1929	1929
				Arm 10 Ahead	Inf	64.5 %		
1/2	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
1/3	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
2/1	Infinite Saturation Flow						Inf	Inf
2/2	This lane uses a directly entered Saturation Flow						1800	1800
3/1	Infinite Saturation Flow						Inf	Inf
3/2	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf
5/1	3.50	0.00	Y	Arm 11 Left	30.00	100.0 %	1871	1871
5/2	3.50	0.00	Y	Arm 6 Left	40.00	62.3 %	1920	1920
				Arm 9 Ahead	Inf	37.7 %		
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
7/1	Infinite Saturation Flow						Inf	Inf
7/2	Infinite Saturation Flow						Inf	Inf
8/1	3.65	0.00	Y	Arm 4 Ahead	40.00	36.2 %	1908	1908
				Arm 10 Right	40.00	63.8 %		
9/1	Infinite Saturation Flow						Inf	Inf
10/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
10/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
10/3	3.65	0.00	N	Arm 6 Ahead	Inf	100.0 %	2120	2120
11/1	Infinite Saturation Flow						Inf	Inf
11/2	This lane uses a directly entered Saturation Flow						2120	2120

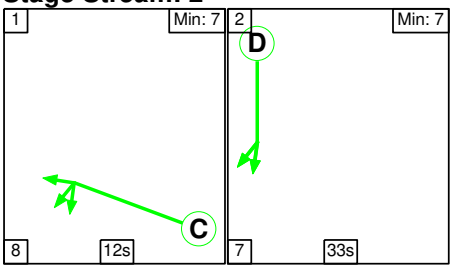
Scenario 1: '2031 Reference Case - AM Peak' (FG3: 'CherwellRef1_AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

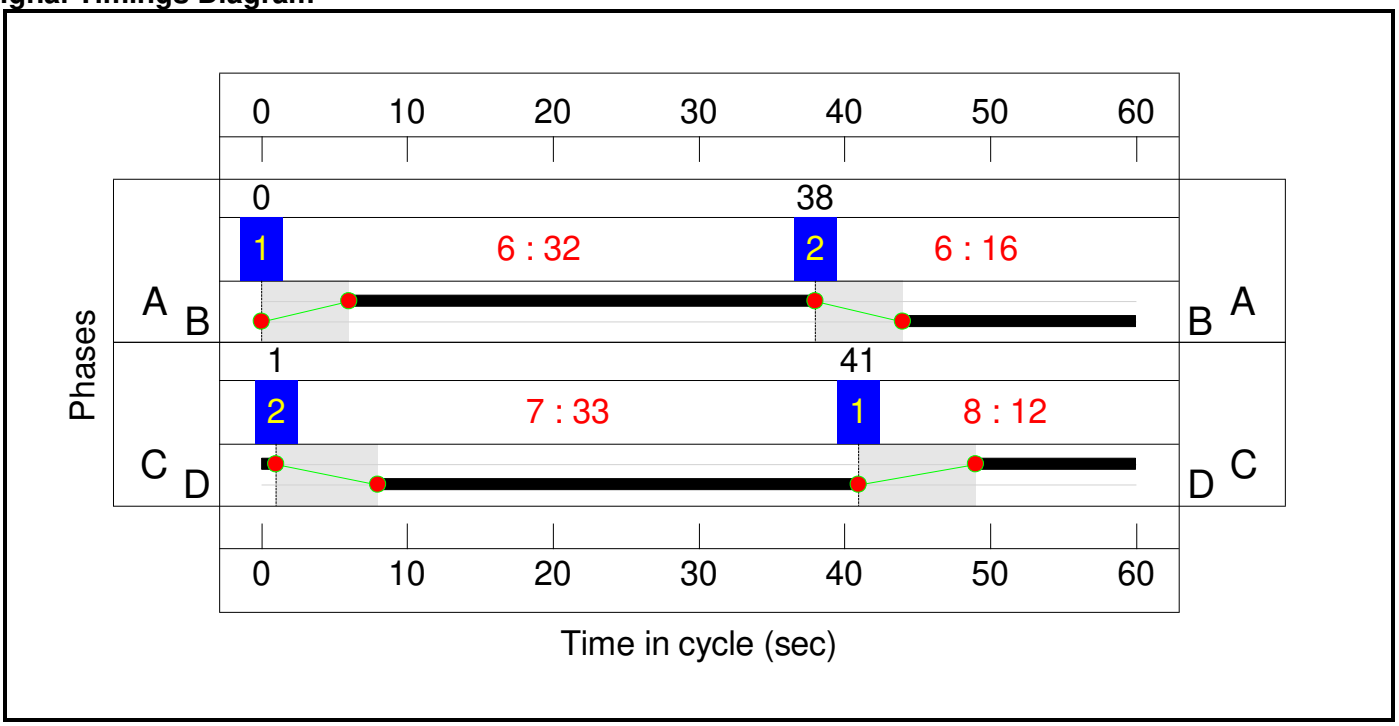
Stage Stream: 1

Stage	1	2
Duration	32	16
Change Point	0	38

Stage Stream: 2

Stage	1	2
Duration	12	33
Change Point	41	1

Signal Timings Diagram



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 (%)
Network: Existing Cherwell Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**115.9%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**115.9%**
1/1	Left Ahead	U	1	N/A	A		1	32	-	1195	1938	1066	112.1%
1/2+1/3	Ahead	U	1	N/A	A		1	32	-	1922	2120:2120	650+1009	115.9 : 115.9%
2/2	Ahead	O	N/A	N/A	-		-	-	-	340	1800	972	35.0%
5/1	Left	U	2	N/A	C		1	12	-	295	1871	405	72.8%
5/2	Left Ahead	U	2	N/A	C		1	12	-	287	1914	415	69.2%
8/1	Ahead Right	U	1	N/A	B		1	16	-	340	1908	541	62.9%
10/1	Ahead	U	2	N/A	D		1	33	-	899	1980	1122	71.9%
10/2	Ahead	U	2	N/A	D		1	33	-	807	2120	1201	58.6%
10/3	Ahead	U	2	N/A	D		1	33	-	1169	2120	1201	84.0%
11/2		U	N/A	N/A	-		-	-	-	807	2120	2120	33.2%

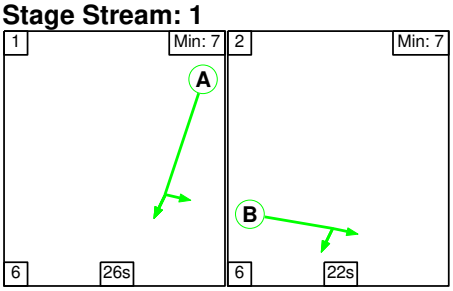
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Existing Cherwell Roundabout	**-**	**-**	**340**	**0**	**0**	**27.1**	**208.1**	**0.0**	**235.2**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**340**	**0**	**0**	**27.1**	**208.1**	**0.0**	**235.2**	**-**	**-**	**-**	**-**
1/1	1195	1066	-	-	-	7.9	68.9	-	76.8	231.4	22.1	68.9	91.0
1/2+1/3	1922	1658	-	-	-	13.0	135.5	-	148.4	278.0	32.9	135.5	168.3
2/2	340	340	340	0	0	0.0	0.3	-	0.3	2.8	0.0	0.3	0.3
5/1	295	295	-	-	-	1.8	1.3	-	3.1	37.8	4.5	1.3	5.8
5/2	287	287	-	-	-	1.7	1.1	-	2.8	35.5	4.4	1.1	5.5
8/1	340	340	-	-	-	1.8	0.8	-	2.6	27.7	4.9	0.8	5.8
10/1	807	807	-	-	-	0.4	0.0	-	0.4	1.7	1.2	0.0	1.2
10/2	704	704	-	-	-	0.3	0.0	-	0.3	1.7	1.1	0.0	1.1
10/3	1009	1009	-	-	-	0.2	0.0	-	0.2	0.6	0.4	0.0	0.4
11/2	704	704	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2

C1 Stream: 1 PRC for Signalled Lanes (%): -28.8 Total Delay for Signalled Lanes (pcuHr): 227.86 Cycle Time (s): 60
C1 Stream: 2 PRC for Signalled Lanes (%): 7.2 Total Delay for Signalled Lanes (pcuHr): 6.78 Cycle Time (s): 60
PRC Over All Lanes (%): -28.8 Total Delay Over All Lanes(pcuHr): 235.16

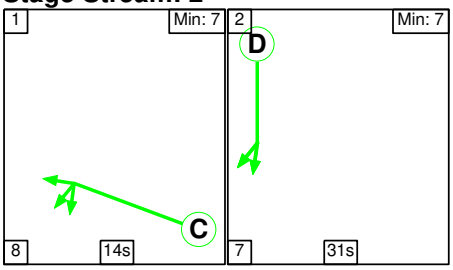
Scenario 2: '2031 Do Something - AM Peak' (FG1: 'Cherwell1_AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

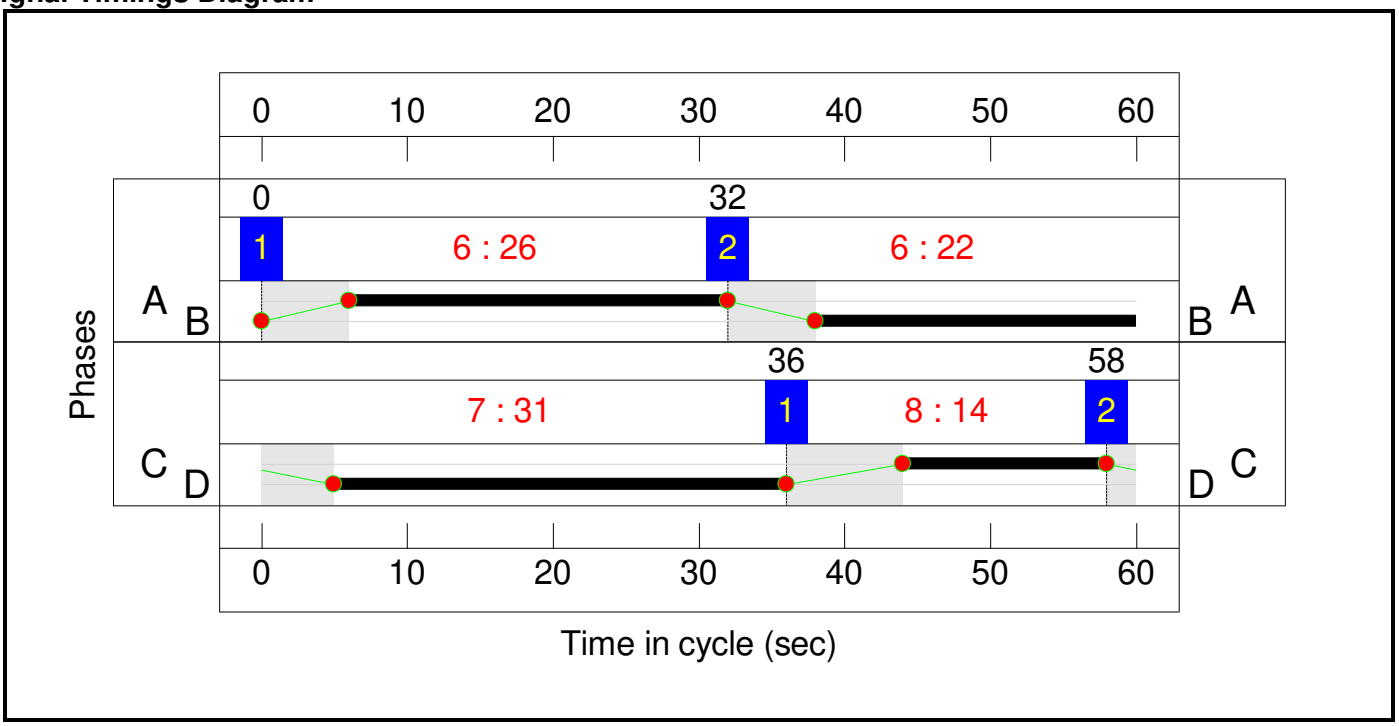
Stage Stream: 1

Stage	1	2
Duration	26	22
Change Point	0	32

Stage Stream: 2

Stage	1	2
Duration	14	31
Change Point	36	58

Signal Timings Diagram



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 (%)
Network: Existing Cherwell Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**177.6%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**177.6%**
1/1	Left Ahead	U	1	N/A	A		1	26	-	1527	1947	876	174.3%
1/2+1/3	Ahead	U	1	N/A	A		1	26	-	2062	2120:2120	237+924	177.6 : 177.6%
2/2	Ahead	O	N/A	N/A	-		-	-	-	521	1800	972	53.6%
5/1	Left	U	2	N/A	C		1	14	-	295	1871	468	63.1%
5/2	Left Ahead	U	2	N/A	C		1	14	-	287	1914	479	60.0%
8/1	Ahead Right	U	1	N/A	B		1	22	-	521	1908	731	71.2%
10/1	Ahead	U	2	N/A	D		1	31	-	1355	1980	1056	80.5%
10/2	Ahead	U	2	N/A	D		1	31	-	532	2120	1131	30.8%
10/3	Ahead	U	2	N/A	D		1	31	-	1641	2120	1131	81.7%
11/2		U	N/A	N/A	-		-	-	-	532	2120	2120	16.4%

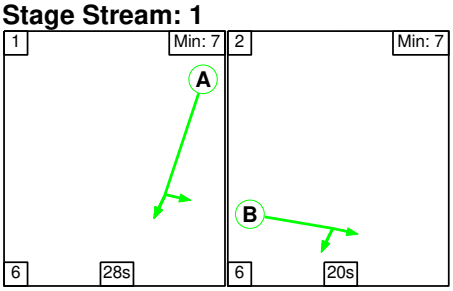
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Existing Cherwell Roundabout	**-**	**-**	**521**	**0**	**0**	**65.6**	**781.6**	**0.0**	**847.2**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**521**	**0**	**0**	**65.6**	**781.6**	**0.0**	**847.2**	**-**	**-**	**-**	**-**
1/1	1527	876	-	-	-	25.1	326.6	-	351.7	829.2	36.5	326.6	363.1
1/2+1/3	2062	1161	-	-	-	33.7	451.5	-	485.2	847.1	50.8	451.5	502.3
2/2	521	521	521	0	0	0.0	0.6	-	0.6	4.0	0.0	0.6	0.6
5/1	295	295	-	-	-	1.6	0.8	-	2.5	30.4	4.3	0.8	5.2
5/2	287	287	-	-	-	1.6	0.7	-	2.3	29.2	4.1	0.7	4.9
8/1	521	521	-	-	-	2.3	1.2	-	3.5	24.2	7.2	1.2	8.5
10/1	850	850	-	-	-	0.8	0.0	-	0.8	3.4	2.9	0.0	2.9
10/2	348	348	-	-	-	0.5	0.0	-	0.5	5.1	1.8	0.0	1.8
10/3	924	924	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	348	348	-	-	-	0.0	0.1	-	0.1	1.0	0.0	0.1	0.1

C1 Stream: 1 PRC for Signalled Lanes (%): -97.3 Total Delay for Signalled Lanes (pcuHr): 840.44 Cycle Time (s): 60
C1 Stream: 2 PRC for Signalled Lanes (%): 10.1 Total Delay for Signalled Lanes (pcuHr): 6.11 Cycle Time (s): 60
PRC Over All Lanes (%): -97.3 Total Delay Over All Lanes(pcuHr): 847.22

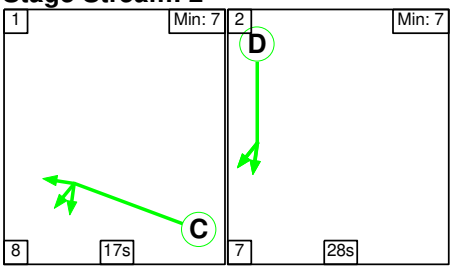
Scenario 3: '2031 Reference Case - PM Peak' (FG4: 'CherwellRef1_PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

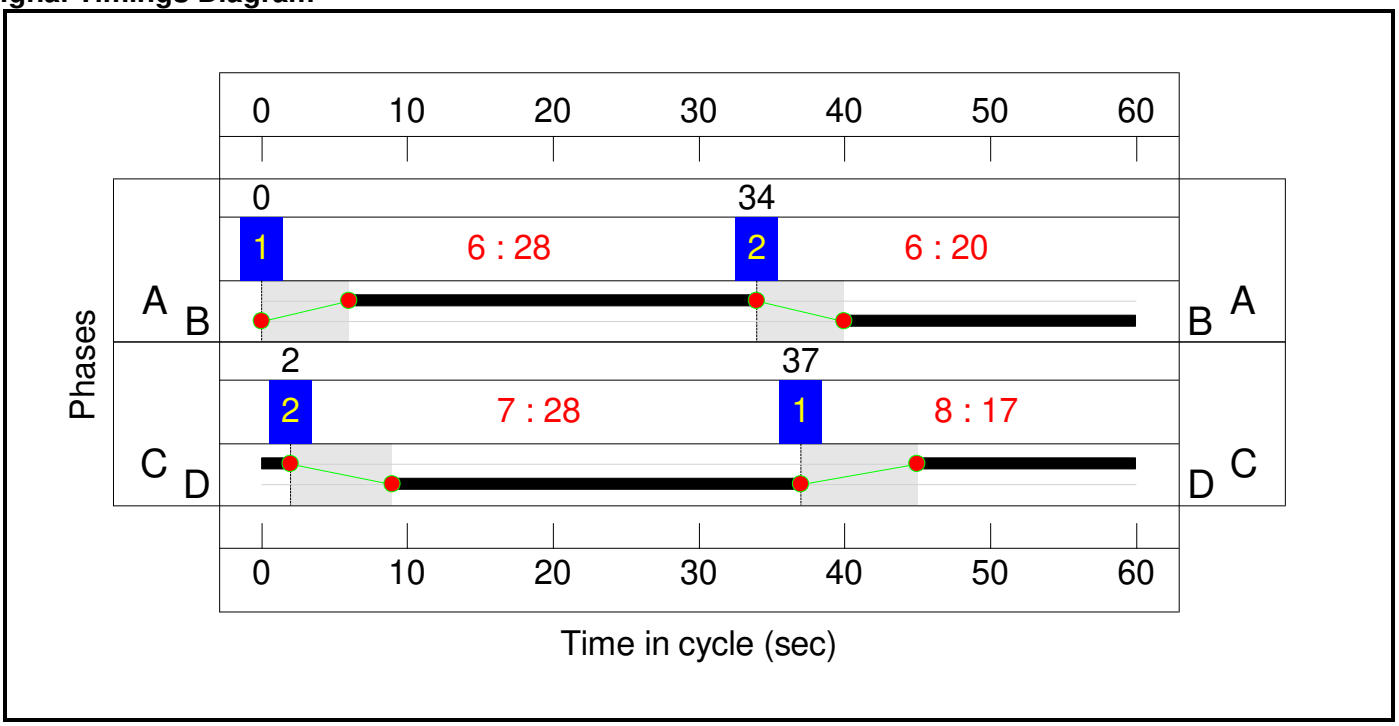
Stage Stream: 1

Stage	1	2
Duration	28	20
Change Point	0	34

Stage Stream: 2

Stage	1	2
Duration	17	28
Change Point	37	2

Signal Timings Diagram



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 (%)
Network: Existing Cherwell Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.3%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.3%**
1/1	Left Ahead	U	1	N/A	A		1	28	-	716	1913	925	77.4%
1/2+1/3	Ahead	U	1	N/A	A		1	28	-	1359	2120:2120	640+917	87.3 : 87.3%
2/2	Ahead	O	N/A	N/A	-		-	-	-	356	1800	957	37.2%
5/1	Left	U	2	N/A	C		1	17	-	258	1871	561	46.0%
5/2	Left Ahead	U	2	N/A	C		1	17	-	342	1920	576	59.4%
8/1	Ahead Right	U	1	N/A	B		1	20	-	356	1908	668	53.3%
10/1	Ahead	U	2	N/A	D		1	28	-	463	1980	957	48.4%
10/2	Ahead	U	2	N/A	D		1	28	-	564	2120	1025	55.0%
10/3	Ahead	U	2	N/A	D		1	28	-	800	2120	1025	78.1%
11/2		U	N/A	N/A	-		-	-	-	564	2120	2120	26.6%

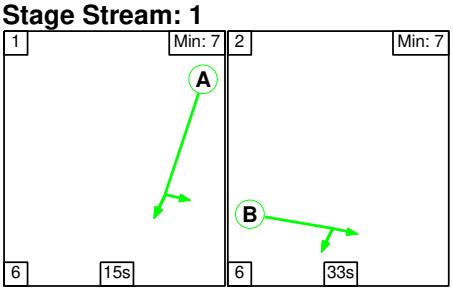
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Existing Cherwell Roundabout	**-**	**-**	**356**	**0**	**0**	**12.3**	**7.2**	**0.0**	**19.5**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**356**	**0**	**0**	**12.3**	**7.2**	**0.0**	**19.5**	**-**	**-**	**-**	**-**
1/1	716	716	-	-	-	2.5	1.7	-	4.2	21.3	9.7	1.7	11.4
1/2+1/3	1359	1359	-	-	-	4.5	3.3	-	7.9	20.8	10.9	3.3	14.2
2/2	356	356	356	0	0	0.0	0.3	-	0.3	3.0	0.0	0.3	0.3
5/1	258	258	-	-	-	1.2	0.4	-	1.6	23.0	3.4	0.4	3.9
5/2	342	342	-	-	-	1.7	0.7	-	2.4	25.5	4.8	0.7	5.6
8/1	356	356	-	-	-	1.5	0.6	-	2.1	21.3	4.6	0.6	5.2
10/1	463	463	-	-	-	0.5	0.0	-	0.5	4.1	2.3	0.0	2.3
10/2	564	564	-	-	-	0.1	0.0	-	0.1	0.7	0.2	0.0	0.2
10/3	800	800	-	-	-	0.1	0.0	-	0.1	0.5	0.2	0.0	0.2
11/2	564	564	-	-	-	0.0	0.2	-	0.2	1.2	0.0	0.2	0.2

C1 Stream: 1 PRC for Signalled Lanes (%): 3.1 Total Delay for Signalled Lanes (pcuHr): 14.21 Cycle Time (s): 60
C1 Stream: 2 PRC for Signalled Lanes (%): 15.3 Total Delay for Signalled Lanes (pcuHr): 4.82 Cycle Time (s): 60
PRC Over All Lanes (%): 3.1 Total Delay Over All Lanes(pcuHr): 19.51

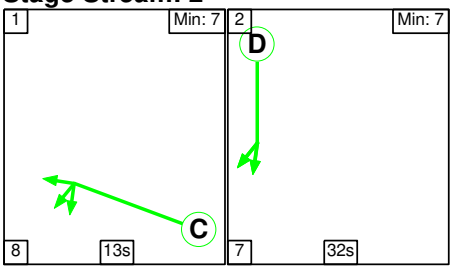
Scenario 4: '2031 Do something - PM Peak' (FG2: 'Cherwell1_PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

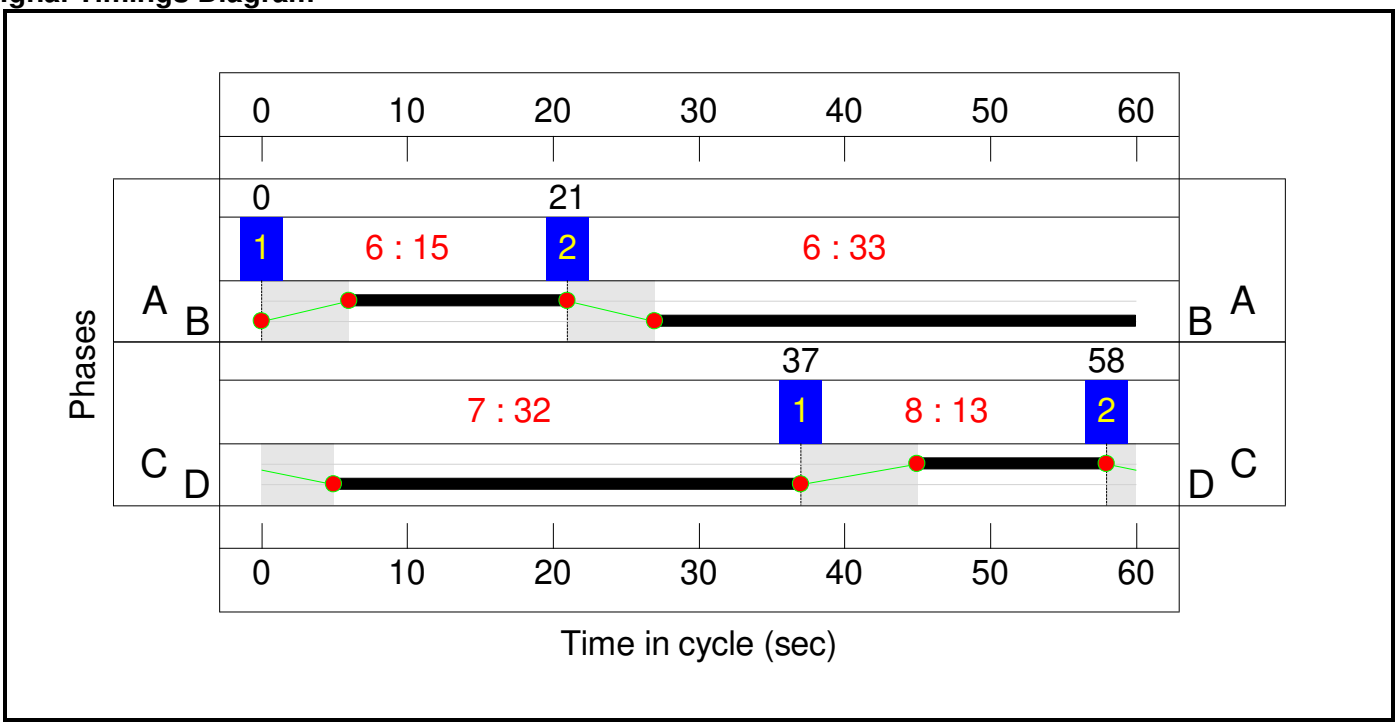
Stage Stream: 1

Stage	1	2
Duration	15	33
Change Point	0	21

Stage Stream: 2

Stage	1	2
Duration	13	32
Change Point	37	58

Signal Timings Diagram



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 (%)
Network: Existing Cherwell Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**186.8%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**186.8%**
1/1	Left Ahead	U	1	N/A	A		1	15	-	947	1929	514	184.1%
1/2+1/3	Ahead	U	1	N/A	A		1	15	-	1384	2120:2120	176+565	186.8 : 186.8%
2/2	Ahead	O	N/A	N/A	-		-	-	-	740	1800	957	77.3%
5/1	Left	U	2	N/A	C		1	13	-	258	1871	437	59.1%
5/2	Left Ahead	U	2	N/A	C		1	13	-	342	1920	448	76.3%
8/1	Ahead Right	U	1	N/A	B		1	33	-	740	1908	1081	68.4%
10/1	Ahead	U	2	N/A	D		1	32	-	874	1980	1089	54.6%
10/2	Ahead	U	2	N/A	D		1	32	-	537	2120	1166	33.0%
10/3	Ahead	U	2	N/A	D		1	32	-	1056	2120	1166	48.5%
11/2		U	N/A	N/A	-		-	-	-	537	2120	2120	18.1%

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)
Network: Existing Cherwell Roundabout	**-**	**-**	**740**	**0**	**0**	**51.5**	**545.1**	**0.0**	**596.6**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**740**	**0**	**0**	**51.5**	**545.1**	**0.0**	**596.6**	**-**	**-**	**-**	**-**
1/1	947	514	-	-	-	18.3	217.4	-	235.7	896.1	23.9	217.4	241.3
1/2+1/3	1384	741	-	-	-	26.0	322.6	-	348.6	906.8	33.1	322.6	355.7
2/2	740	740	740	0	0	0.0	1.7	-	1.7	8.2	0.0	1.7	1.7
5/1	258	258	-	-	-	1.5	0.7	-	2.2	30.5	3.8	0.7	4.5
5/2	342	342	-	-	-	2.0	1.6	-	3.6	37.9	5.2	1.6	6.8
8/1	740	740	-	-	-	1.9	1.1	-	3.0	14.4	8.6	1.1	9.7
10/1	595	595	-	-	-	1.0	0.0	-	1.0	6.0	3.4	0.0	3.4
10/2	385	385	-	-	-	0.8	0.0	-	0.8	7.1	2.4	0.0	2.4
10/3	565	565	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	385	385	-	-	-	0.0	0.1	-	0.1	1.0	0.0	0.1	0.1

C1 Stream: 1 PRC for Signalled Lanes (%): -107.5 Total Delay for Signalled Lanes (pcuHr): 587.30 Cycle Time (s): 60
C1 Stream: 2 PRC for Signalled Lanes (%): 17.9 Total Delay for Signalled Lanes (pcuHr): 7.54 Cycle Time (s): 60
PRC Over All Lanes (%): -107.5 Total Delay Over All Lanes(pcuHr): 596.64

APPENDIX G

CHERWELL ROUNDABOUT MITIGATION (C-5) LINSIG MODEL AUDIT AND REVISED RESULTS

LINSIG V3 Model Checking Report

AECOM

Project:	**OXFORDSHIRE SRFI-M40 Junction 10**	Job No:	**xxxxx**
Model:	**2031_DS_M40J10_Cherwell - Junction option C-5.lsg3x**	Model Submitted:	**16/07/2021**
		Corrections Submitted:	**Date Submitted**

Modelled By: ADC Infrastructure **Checked by: Weiping Guo** **Approved by:**

This note is to document the checks made to LINSIG models. Once completed this should be filed with the model, or model outputs for future reference.

Results Key

× - Changes required before work is signed off
? – Changes may be required before work is signed off, further work required
✓ - No further changes required before work is signed off

File Checked: Hyperlink to model

Network Information					
Checked by/date	**Checks Made**	**Result**	**Comments**	**Action taken after Audit**	**Checked by/date**
26/07/21	Scenario title(s) entered	✓			
26/07/21	Project name entered	✓			
26/07/21	Modeller details recorded	✓			
26/07/21	Network location details entered	✓			
26/07/21	File name is logical	✓			

Network Setup					
Junction Drawings: In report 'OxSRFI-ADC1794-RP-M-V3 'TN5 M40 Junction 10 Options Report' – appendices' Page no.53					
Sat Flow Measurements / Calculations: Hyperlink to Sat Flow Measurements					
Checked by/date	**Checks Made**	**Result**	**Comments**	**Action taken after Audit**	**Checked by/date**
	Junctions				
26/07/21	Appropriate junctions setup	✓			
26/07/21	Junction info/ signal controllers complete	✓			
26/07/21	Logical arm structure setup	✓			
	Lanes				
26/07/21	Lane setup reflects junction drawings	✓			
26/07/21	Check each lane that is signal controlled	✓			
26/07/21	Lanes matched to controller and phase	✓	.		
26/07/21	Lane length appropriate	X	Arm1 Lane 1 flare length is measured 105mtr from drawing, but 80mtr setup in the model.	Flare length amended to 105m.	
26/07/21	Custom occupancy (if req)	N/A			
	Saturation Flows				
26/07/21	Justified method to derive saturation flows				
26/07/21	Check observed sat flows (if used)	N/A			
26/07/21	Check RR67 sat flows calculations (if used)	x	1. Most lanes saturation flows were calculated by RR67 methods, however all the lanes were treated as the 'nearside lane'. 2. Arm7 lane 1 has direct entered sat flow, please use RR67 to make sure the model consistence.	1. All lanes have RR67 sat flows, with 'nearside lane' de-selected where appropriate. All turning radii checked and increased where applicable 2. All circulating lanes have RR67 parameters applied such that all circulating saturation flows are equal or greater than the entry lanes.	
26/07/21	Check external sat flows calculations (if used)	N/A			
26/07/21	Check sat flows for any bottleneck links	✓			
	Advanced Lane Settings				
26/07/21	Use of start / end green displacements (if req)	✓	Default values used.		
26/07/21	Use of queue limits on short links (if req)	✓			
26/07/21	Use of weightings for optimiser constraints (if req)	✓			
26/07/21	Use of random delay or queue de-sliver (if req)	✓	Selected for all short circulatory lanes.		
	Give Ways				
26/07/21	Check each lane that is priority controlled	N/A			
26/07/21	Measurement of max/min flow when giving way	N/A			
26/07/21	Flow when opposing traffic stopped reasonable	N/A			
26/07/21	Measurement of give-way co-efficient	N/A			
26/07/21	Measurement of clear conflict time of opposing traffic	N/A			
26/07/21	Check all controlling movements identified	N/A			
26/07/21	Measurement of storage in front of stop-line	N/A			
26/07/21	Max turns in inter-green reasonable	N/A			

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26/07/21	Measurement of non-blocking storage	N/A			
	Lane Connectors				
26/07/21	Lane connectors provided reasonable	✓			
26/07/21	Cruise time reasonable	✓	45Km/hr cruise speed is used for all internal links		
26/07/21	Default platoon dispersion used unless observed	✓			
	Zones				
26/07/21	Zones match O-D matrix	✓	Cherwell6_AM flow matches the flow report page 54; Cherwell6_PM flow matches the flow report page 55;		

	Pedestrians				
26/07/21	Ped crossings represented by ped links (if req)	N/A			
26/07/21	Ped link data correct (if req)	N/A			
26/07/21	Ped connector walk times reasonable (if req)	N/A			
26/07/21	Ped links matched to appropriate phases (if req)	N/A			
26/07/21	Ped zones match ped O-D matrix (if req)	N/A			

Controllers

Controller Specifications: Hyperlink to Controller Specification (if req)
Intergreen Calculations: Hyperlink to Intergreen Calculations (if req)

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	General Controller Set-up				
26/07/21	Sufficient controllers setup	✓			
26/07/21	Multiple stage streams setup correctly (if req)	N/A			
26/07/21	Non-standard filters setup correctly (if req)	N/A			
	Signal Settings				
26/07/21	Check phases for each controller	✓			
26/07/21	Check phase mins/type reasonable	✓			
26/07/21	Check inter-greens calculations/coding	✓			
26/07/21	Stages reasonable	✓			
26/07/21	Phase delays reasonable (if req)	N/A			

Stage Sequences

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Check stage sequences observed / optimised	✓			
26/07/21	Check stage timings observed / optimised	N/A			

Traffic Counts and Calculations

Traffic Flow Data: Hyperlink to Traffic Flow Data – in report 'OXSRFI-ADC1794-RP-N-V2 'TN6 - M40 J10 OR Traffic Flow Derivation' – bound'
Matrix Calculations: Hyperlink to Matrix Calculations (if required)
Lane Balancing Calculations: Hyperlink to Lane Balancing Calculations (if required)
Site Observations: Hyperlink to Site Flows Observations

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Suitability of traffic surveys undertaken	N/A			
26/07/21	Are there sufficient site observations	N/A			
26/07/21	Check O-D matrix calculations	✓			
26/07/21	Are lane balancing calculations sufficient / consistent	✓			
26/07/21	Does lane balancing match lining	✓			
26/07/21	Does lane balancing match matrices	✓			

Traffic Flows

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Traffic & ped flow (if req) groups setup	✓			
26/07/21	Desired flows match O-D matrices	✓			
26/07/21	Actual flows match desired flows	✓			
26/07/21	Inappropriate routes closed	✓			
26/07/21	Route flows match lane balancing	✓			

Modelling

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Scenario set up with correct options	✓			
26/07/21	Cycle time appropriate for network control	✓			
26/07/21	Cycle time optimised (if req)	✓			

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Results					
Checked by/date	**Checks Made**	**Result**	**Comments**	**Action taken after Audit**	**Checked by/date**
	Are all values as expected (Demand Flows, Green Times etc)		To be checked after above changes.		
	Deg Sat >100% for existing situation with no modelled suppressed demand?		To be checked after above changes.		
	Deg Sat appropriate? Validated?		To be checked after above changes.		
	Capacity conclusions		To be checked after above changes.		
	If suppressed demand has been modelled, do queues validate?		To be checked after above changes.		
	Queues appropriate?		To be checked after above changes.		
	Queue limits exceeded?		To be checked after above changes.		
	Queuing conclusions (will exit blocking modify these?)		To be checked after above changes.		
	If suppressed demand has been modelled do journey times validate?		To be checked after above changes.		
	Journey time conclusions?		To be checked after above changes.		

Conclusions and Recommendations

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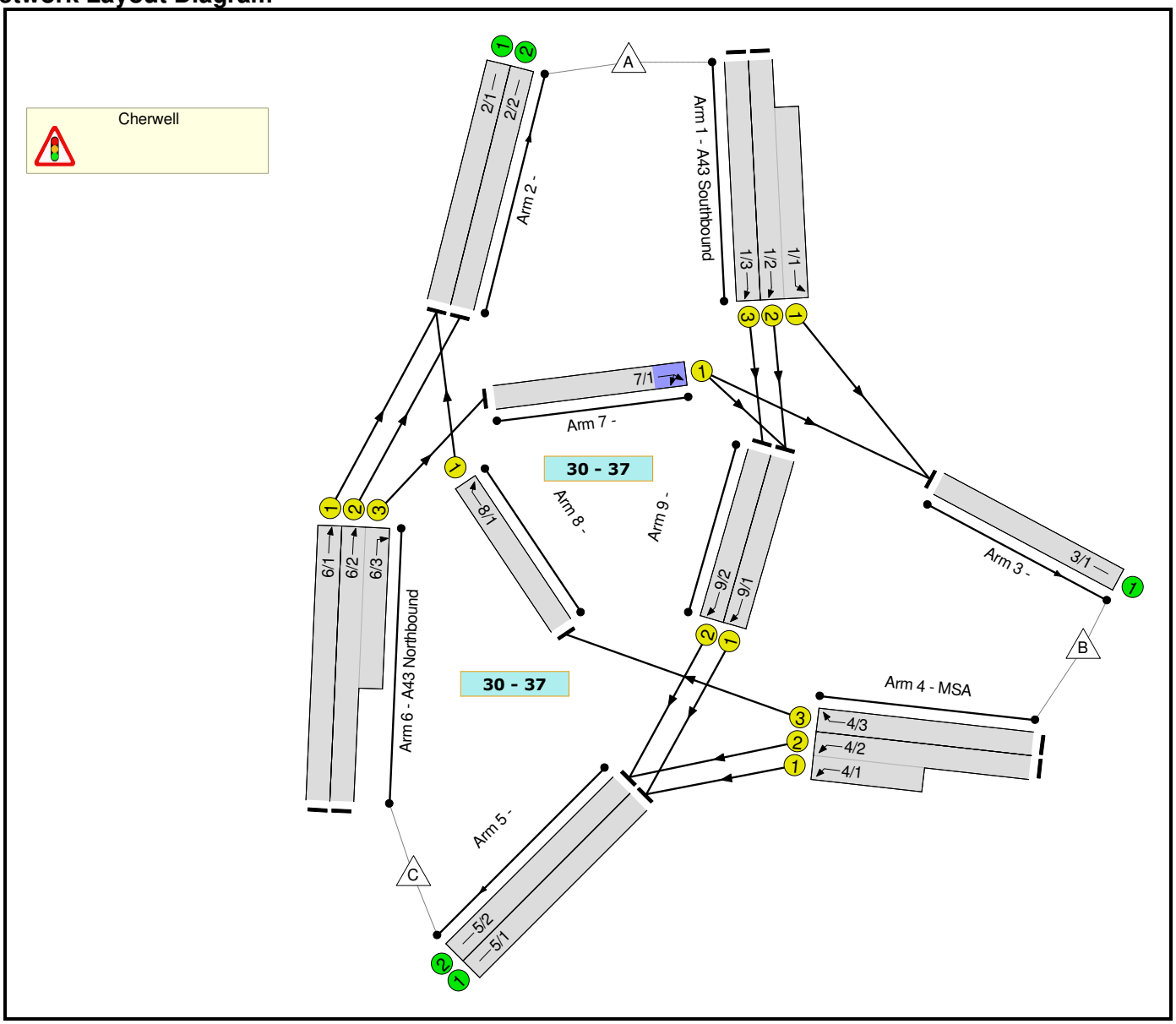
Full Input Data And Results

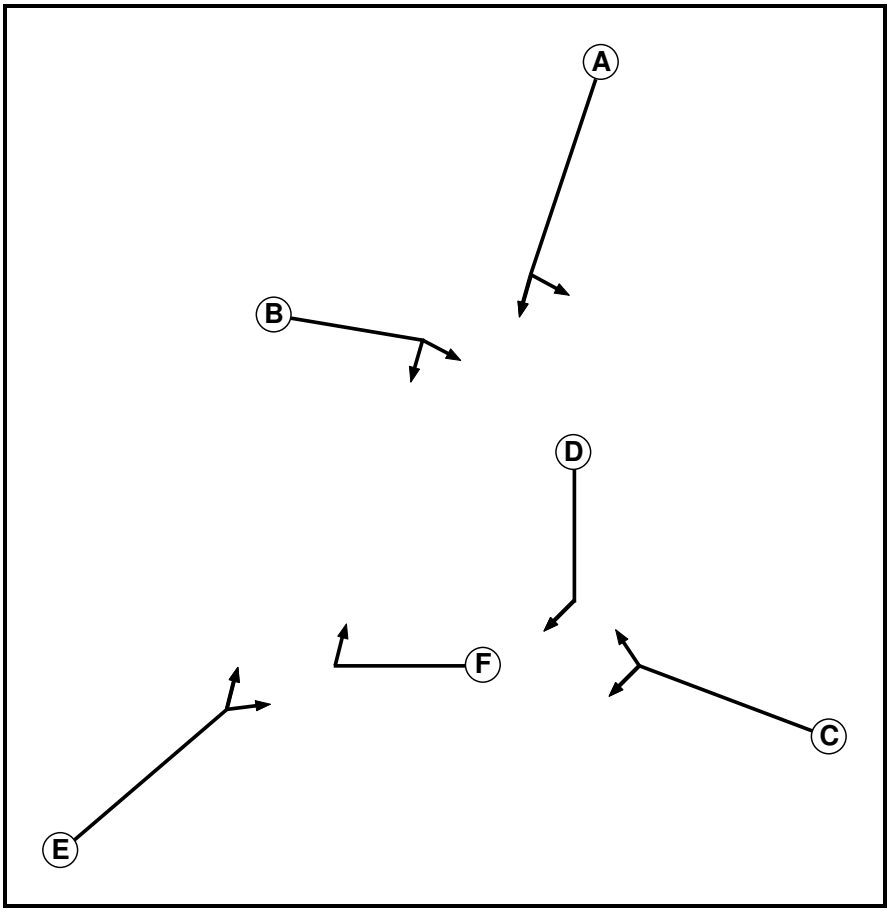
User and Project Details

Project:	**Oxfordshire SRFI**
Title:	**Cherwell hamburger gyratory - Junction options C-5**
Location:	
Additional detail:	Amended following Aecom comments
File name:	2031_DS_M40J10_Cherwell - Junction option C-5.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7
E	Traffic	3		7	7
F	Traffic	3		7	7

Phase Intergreens Matrix

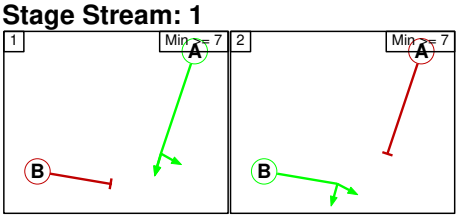
		Starting Phase					
		A	B	C	D	E	F
Terminating Phase	A		6	-	-	-	-
	B	6		-	-	-	-
	C	-	-		6	-	-
	D	-	-	6		-	-
	E	-	-	-	-		6
	F	-	-	-	-	6	

Phases in Stage

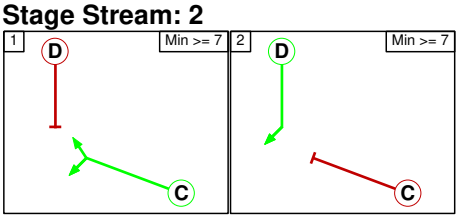
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D
3	1	E
3	2	F

Stage Diagram

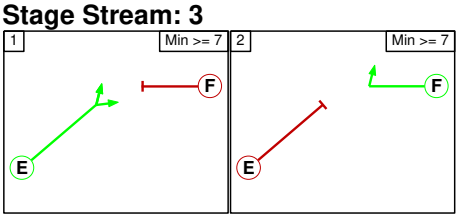
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		6
	2	6	

Stage Stream: 2

	To Stage		
		1	2
From Stage	1		6
	2	6	

Stage Stream: 3

	To Stage		
		1	2
From Stage	1		6
	2	6	

Lane Input Data

Junction: Cherwell												
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 (A43 Southbound)	U	A	2	3	18.3	Geom	-	3.65	0.00	Y	Arm 3 Left	Inf
1/2 (A43 Southbound)	U	A	2	3	60.0	Geom	-	3.65	0.00	N	Arm 9 Ahead	Inf
1/3 (A43 Southbound)	U	A	2	3	60.0	Geom	-	3.65	0.00	N	Arm 9 Ahead	Inf
2/1	U		2	3	60.0	Inf	-	-	-	-	-	-
2/2	U		2	3	60.0	Inf	-	-	-	-	-	-
3/1	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1 (MSA)	U	C	2	3	7.0	Geom	-	3.50	0.00	Y	Arm 5 Left	30.00
4/2 (MSA)	U	C	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 5 Left	30.00
4/3 (MSA)	U	C	2	3	60.0	Geom	-	3.65	0.00	N	Arm 8 Right	Inf
5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
5/2	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (A43 Northbound)	U	E	2	3	62.6	Geom	-	3.65	0.00	Y	Arm 2 Ahead	40.00
6/2 (A43 Northbound)	U	E	2	3	62.6	Geom	-	3.65	0.00	N	Arm 2 Ahead	45.00
6/3 (A43 Northbound)	U	E	2	3	10.1	Geom	-	3.65	0.00	N	Arm 7 Right	30.00
7/1	U	B	2	3	6.1	Geom	-	3.65	0.00	Y	Arm 3 Ahead	Inf
											Arm 9 Right	Inf
8/1	U	F	2	3	10.4	Geom	-	3.65	0.00	Y	Arm 2 Right	40.00
9/1	U	D	2	3	9.0	Geom	-	3.65	0.00	N	Arm 5 Ahead	Inf
9/2	U	D	2	3	8.7	Geom	-	3.65	0.00	N	Arm 5 Ahead	Inf

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'Cherwell6_AM'	07:45	08:45	01:00	
2: 'Cherwell6_PM'	16:30	17:30	01:00	

Scenario 1: '2031 Cherwell10, 11, 13, 18, 19 AM' (FG1: 'Cherwell6_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	343	1641	1984
	B	85	0	497	582
	C	1577	239	0	1816
	Tot.	1662	582	2138	4382

Traffic Lane Flows

Lane	Scenario 1: 2031 Cherwell10, 11, 13, 18, 19 AM
Junction: Cherwell	
1/1 (short)	343
1/2 (with short)	1188(In) 845(Out)
1/3	796
2/1	855
2/2	807
3/1	582
4/1 (short)	249
4/2 (with short)	497(In) 248(Out)
4/3	85
5/1	1094
5/2	1044
6/1	770
6/2 (with short)	1046(In) 807(Out)
6/3 (short)	239
7/1	239
8/1	85
9/1	845
9/2	796

Lane Saturation Flows

Junction: Cherwell								
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 (A43 Southbound)	3.65	0.00	Y	Arm 3 Left	Inf	100.0 %	1980	1980
1/2 (A43 Southbound)	3.65	0.00	N	Arm 9 Ahead	Inf	100.0 %	2120	2120
1/3 (A43 Southbound)	3.65	0.00	N	Arm 9 Ahead	Inf	100.0 %	2120	2120
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1	Infinite Saturation Flow						Inf	Inf
4/1 (MSA)	3.50	0.00	Y	Arm 5 Left	30.00	100.0 %	1871	1871
4/2 (MSA)	3.50	0.00	Y	Arm 5 Left	30.00	100.0 %	1871	1871
4/3 (MSA)	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
6/1 (A43 Northbound)	3.65	0.00	Y	Arm 2 Ahead	40.00	100.0 %	1908	1908
6/2 (A43 Northbound)	3.65	0.00	N	Arm 2 Ahead	45.00	100.0 %	2052	2052
6/3 (A43 Northbound)	3.65	0.00	N	Arm 7 Right	30.00	100.0 %	2019	2019
7/1	3.65	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1980	1980
				Arm 9 Right	Inf	0.0 %		
8/1	3.65	0.00	Y	Arm 2 Right	40.00	100.0 %	1908	1908
9/1	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
9/2	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120

Scenario 2: '2031 Cherwell10, 11, 13, 18, 19 PM' (FG2: 'Cherwell6_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	336	1056	1392
	B	129	0	471	600
	C	2346	268	0	2614
	Tot.	2475	604	1527	4606

Traffic Lane Flows

Lane	Scenario 2: 2031 Cherwell10, 11, 13, 18, 19 PM
Junction: Cherwell	
1/1 (short)	336
1/2 (with short)	894(In) 558(Out)
1/3	498
2/1	1324
2/2	1151
3/1	604
4/1 (short)	236
4/2 (with short)	471(In) 235(Out)
4/3	129
5/1	794
5/2	733
6/1	1195
6/2 (with short)	1419(In) 1151(Out)
6/3 (short)	268
7/1	268
8/1	129
9/1	558
9/2	498

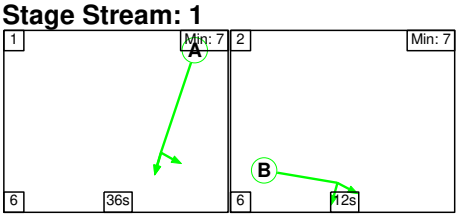
Lane Saturation Flows

Junction: Cherwell								
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 (A43 Southbound)	3.65	0.00	Y	Arm 3 Left	Inf	100.0 %	1980	1980
1/2 (A43 Southbound)	3.65	0.00	N	Arm 9 Ahead	Inf	100.0 %	2120	2120
1/3 (A43 Southbound)	3.65	0.00	N	Arm 9 Ahead	Inf	100.0 %	2120	2120
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1	Infinite Saturation Flow						Inf	Inf
4/1 (MSA)	3.50	0.00	Y	Arm 5 Left	30.00	100.0 %	1871	1871
4/2 (MSA)	3.50	0.00	Y	Arm 5 Left	30.00	100.0 %	1871	1871
4/3 (MSA)	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
6/1 (A43 Northbound)	3.65	0.00	Y	Arm 2 Ahead	40.00	100.0 %	1908	1908
6/2 (A43 Northbound)	3.65	0.00	N	Arm 2 Ahead	45.00	100.0 %	2052	2052
6/3 (A43 Northbound)	3.65	0.00	N	Arm 7 Right	30.00	100.0 %	2019	2019
7/1	3.65	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1980	1980
				Arm 9 Right	Inf	0.0 %		
8/1	3.65	0.00	Y	Arm 2 Right	40.00	100.0 %	1908	1908
9/1	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120
9/2	3.65	0.00	N	Arm 5 Ahead	Inf	100.0 %	2120	2120

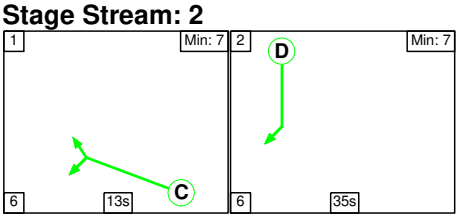
Scenario 1: '2031 Cherwell10, 11, 13, 18, 19 AM' (FG1: 'Cherwell6_AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

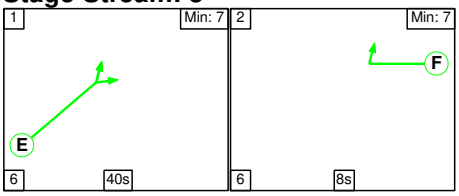
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	36	12
Change Point	0	42

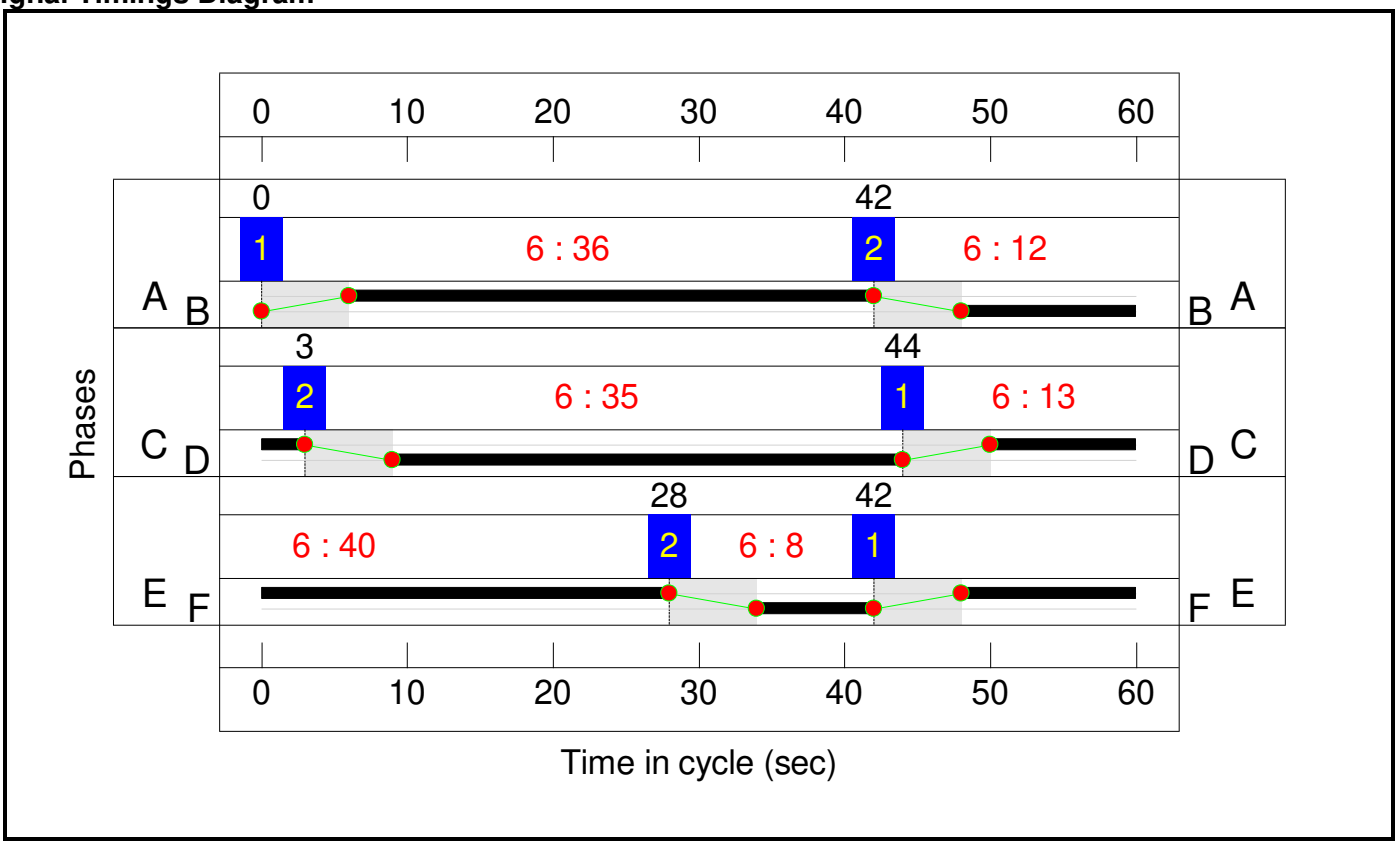
Stage Stream: 2

Stage	1	2
Duration	13	35
Change Point	44	3

Stage Stream: 3

Stage	1	2
Duration	40	8
Change Point	42	28

Signal Timings Diagram



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 (%)
Network: Cherwell hamburger gyratory - Junction options C-5	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**68.1%**
Cherwell	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**68.1%**
1/2+1/1	A43 Southbound Left Ahead	U	1	N/A	A		1	36	-	1188	2120:1980	1240+503	68.1 : 68.1%
1/3	A43 Southbound Ahead	U	1	N/A	A		1	36	-	796	2120	1307	60.9%
4/2+4/1	MSA Left	U	2	N/A	C		1	13	-	497	1871:1871	434+436	57.2 : 57.2%
4/3	MSA Right	U	2	N/A	C		1	13	-	85	2120	495	17.2%
6/1	A43 Northbound Ahead	U	3	N/A	E		1	40	-	770	1908	1304	59.1%
6/2+6/3	A43 Northbound Ahead Right	U	3	N/A	E		1	40	-	1046	2052:2019	1209+358	66.8 : 66.8%
7/1	Ahead Right	U	1	N/A	B		1	12	-	239	1980	429	55.7%
8/1	Right	U	3	N/A	F		1	8	-	85	1908	286	29.7%
9/1	Ahead	U	2	N/A	D		1	35	-	845	2120	1272	66.4%
9/2	Ahead	U	2	N/A	D		1	35	-	796	2120	1272	62.6%

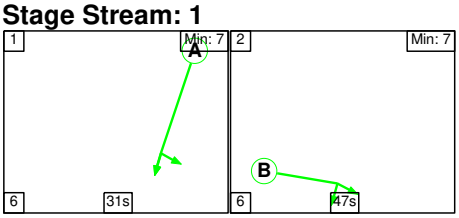
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Cherwell hamburger gyratory - Junction options C-5	**-**	**-**	**0**	**0**	**0**	**11.9**	**4.3**	**0.0**	**16.2**	**-**	**-**	**-**	**-**
Cherwell	**-**	**-**	**0**	**0**	**0**	**11.9**	**4.3**	**0.0**	**16.2**	**-**	**-**	**-**	**-**
1/2+1/1	1188	1188	-	-	-	2.2	1.1	-	3.3	10.0	8.9	1.1	10.0
1/3	796	796	-	-	-	1.6	0.8	-	2.3	10.6	8.0	0.8	8.7
4/2+4/1	497	497	-	-	-	2.8	0.7	-	3.5	25.2	3.7	0.7	4.3
4/3	85	85	-	-	-	0.4	0.1	-	0.5	22.8	1.1	0.1	1.2
6/1	770	770	-	-	-	1.1	0.7	-	1.8	8.4	6.6	0.7	7.3
6/2+6/3	1046	1046	-	-	-	1.3	1.0	-	2.3	8.1	6.9	1.0	8.0
7/1	239	239	-	-	-	1.2	0.0	-	1.2	17.5	2.6	0.0	2.6
8/1	85	85	-	-	-	0.9	0.0	-	0.9	38.0	1.4	0.0	1.4
9/1	845	845	-	-	-	0.2	0.0	-	0.2	0.8	0.5	0.0	0.5
9/2	796	796	-	-	-	0.2	0.0	-	0.2	0.8	0.4	0.0	0.4

C1	Stream: 1	PRC for Signalled Lanes (%):	32.1	Total Delay for Signalled Lanes (pcuHr):	6.80	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	35.5	Total Delay for Signalled Lanes (pcuHr):	4.37	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	34.8	Total Delay for Signalled Lanes (pcuHr):	5.04	Cycle Time (s):	60
		PRC Over All Lanes (%):	32.1	Total Delay Over All Lanes(pcuHr):	16.20		

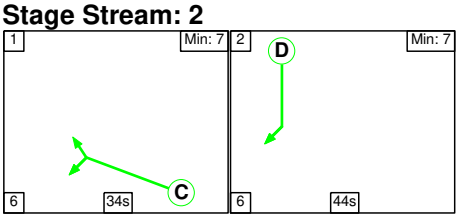
Scenario 2: '2031 Cherwell10, 11, 13, 18, 19 PM' (FG2: 'Cherwell6_PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

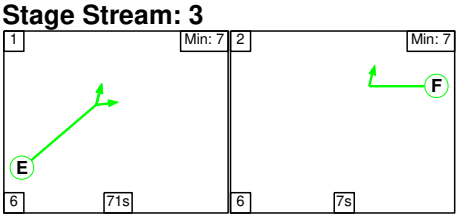
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	31	47
Change Point	0	37

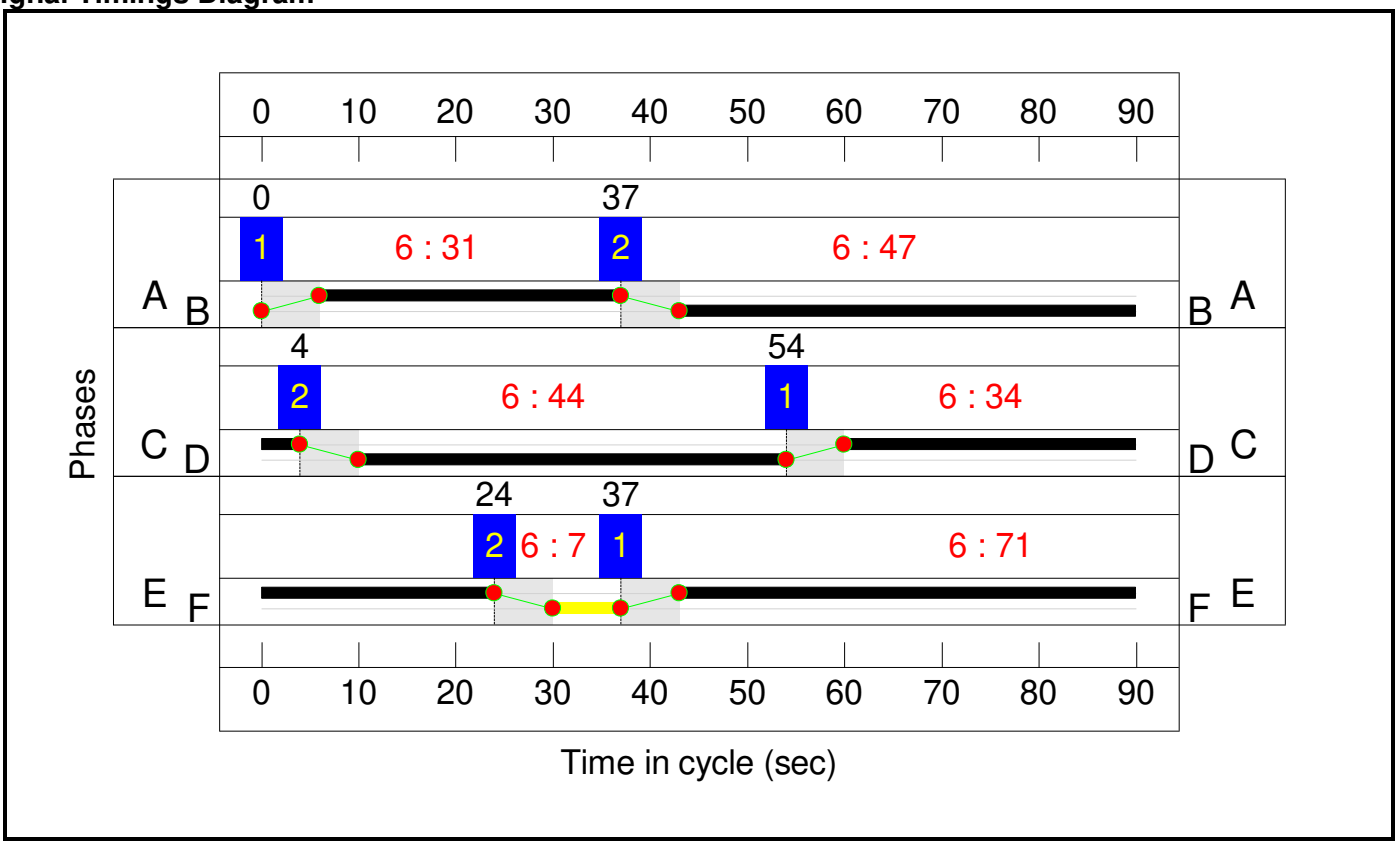
Stage Stream: 2

Stage	1	2
Duration	34	44
Change Point	54	4

Stage Stream: 3

Stage	1	2
Duration	71	7
Change Point	37	24

Signal Timings Diagram



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 (%)
Network: Cherwell hamburger gyratory - Junction options C-5	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.3%**
Cherwell	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.3%**
1/2+1/1	A43 Southbound Left Ahead	U	1	N/A	A		1	31	-	894	2120:1980	743+448	75.1 : 75.1%
1/3	A43 Southbound Ahead	U	1	N/A	A		1	31	-	498	2120	754	66.1%
4/2+4/1	MSA Left	U	2	N/A	C		1	34	-	471	1871:1871	507+509	46.4 : 46.4%
4/3	MSA Right	U	2	N/A	C		1	34	-	129	2120	824	15.6%
6/1	A43 Northbound Ahead	U	3	N/A	E		1	71	-	1195	1908	1526	78.3%
6/2+6/3	A43 Northbound Ahead Right	U	3	N/A	E		1	71	-	1419	2052:2019	1398+326	82.3 : 82.3%
7/1	Ahead Right	U	1	N/A	B		1	47	-	268	1980	1056	25.4%
8/1	Right	U	3	N/A	F		1	7	-	129	1908	170	76.1%
9/1	Ahead	U	2	N/A	D		1	44	-	558	2120	1060	52.6%
9/2	Ahead	U	2	N/A	D		1	44	-	498	2120	1060	47.0%

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)
Network: Cherwell hamburger gyratory - Junction options C-5	**-**	**-**	**0**	**0**	**0**	**18.2**	**7.1**	**0.0**	**25.3**	**-**	**-**	**-**	**-**
Cherwell	**-**	**-**	**0**	**0**	**0**	**18.2**	**7.1**	**0.0**	**25.3**	**-**	**-**	**-**	**-**
1/2+1/1	894	894	-	-	-	6.0	1.5	-	7.5	30.3	12.1	1.5	13.6
1/3	498	498	-	-	-	3.4	1.0	-	4.3	31.4	10.4	1.0	11.3
4/2+4/1	471	471	-	-	-	2.5	0.4	-	2.9	22.5	4.1	0.4	4.5
4/3	129	129	-	-	-	0.6	0.1	-	0.7	20.5	2.1	0.1	2.2
6/1	1195	1195	-	-	-	1.6	1.8	-	3.4	10.2	15.9	1.8	17.7
6/2+6/3	1419	1419	-	-	-	1.5	2.3	-	3.8	9.7	16.0	2.3	18.3
7/1	268	268	-	-	-	0.7	0.0	-	0.7	9.3	2.6	0.0	2.6
8/1	129	129	-	-	-	1.8	0.0	-	1.8	50.1	3.2	0.0	3.2
9/1	558	558	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	498	498	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1	Stream: 1	PRC for Signalled Lanes (%):	19.9	Total Delay for Signalled Lanes (pcuHr):	12.56	Cycle Time (s):	90
C1	Stream: 2	PRC for Signalled Lanes (%):	71.0	Total Delay for Signalled Lanes (pcuHr):	3.68	Cycle Time (s):	90
C1	Stream: 3	PRC for Signalled Lanes (%):	9.3	Total Delay for Signalled Lanes (pcuHr):	9.02	Cycle Time (s):	90
		PRC Over All Lanes (%):	9.3	Total Delay Over All Lanes(pcuHr):	25.26		

APPENDIX H

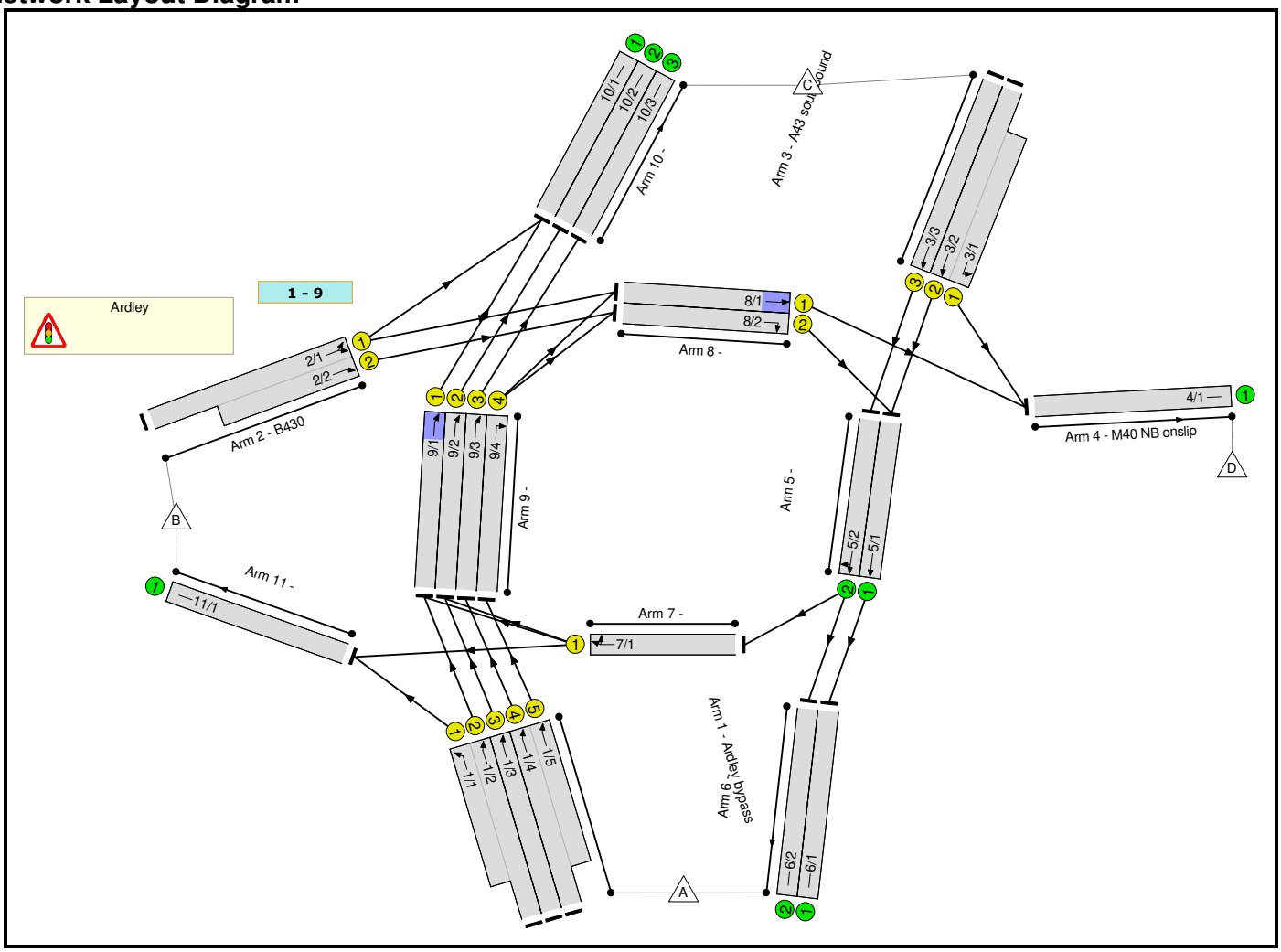
ARDLEY ROUNDABOUT MITIGATION (A-2) REVISED RESULTS

Full Input Data And Results

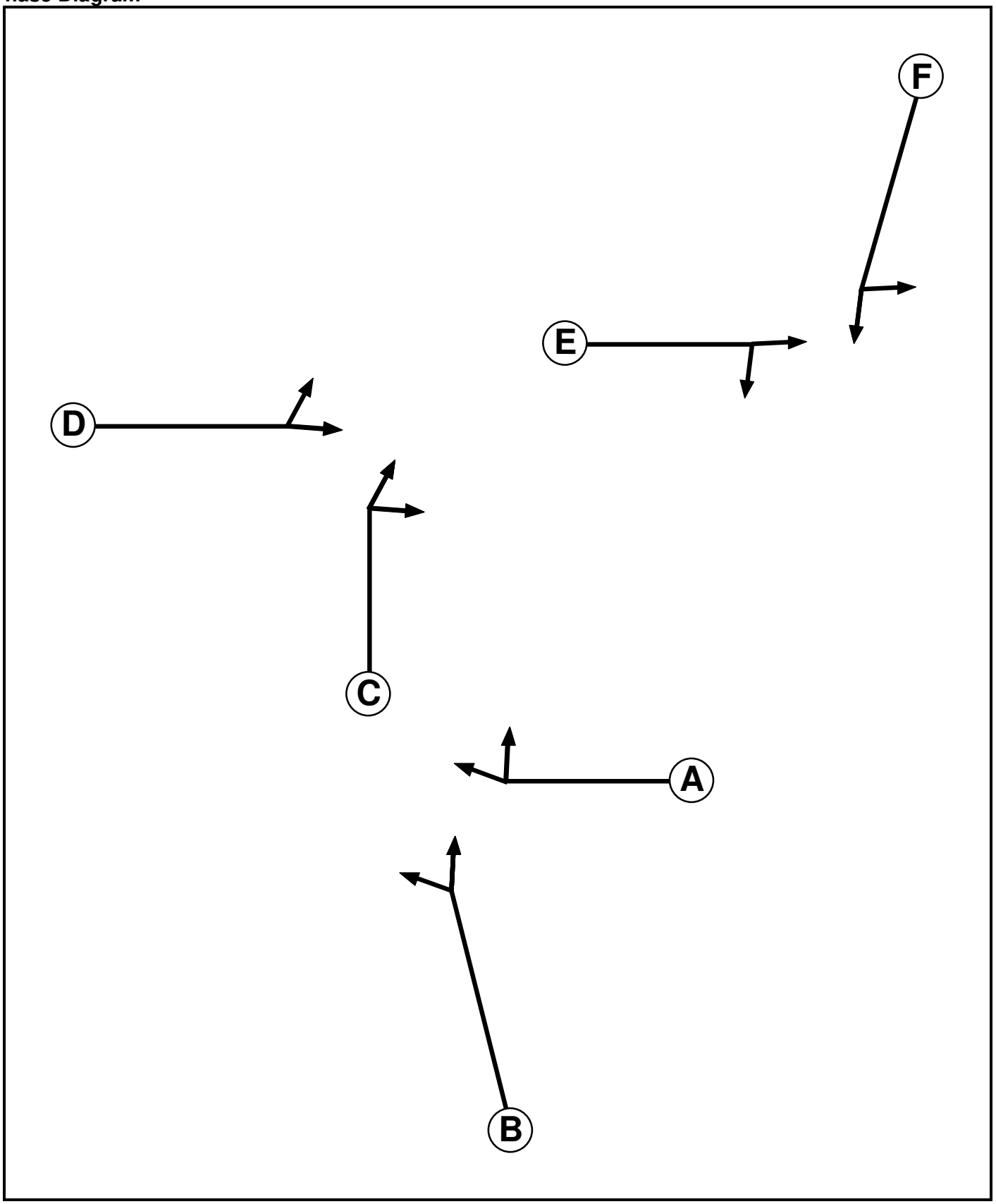
User and Project Details

Project:	**Oxfordshire SRFI**
Title:	**Ardley improvements - 4-arm signalised roundabout A-2**
Location:	
Additional detail:	Amended following Aecom comments
File name:	2031_DS_M40J10_Ardley - 4-arm signalised roundabout A-2.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7
E	Traffic	3		7	7
F	Traffic	3		7	7

Phase Intergreens Matrix

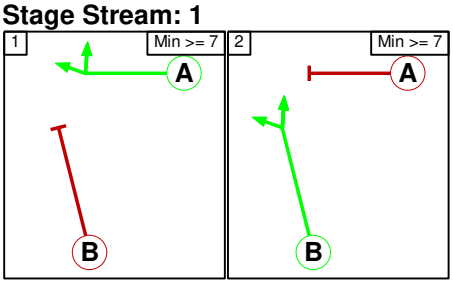
		Starting Phase					
		A	B	C	D	E	F
Terminating Phase	A		6	-	-	-	-
	B	6		-	-	-	-
	C	-	-		6	-	-
	D	-	-	6		-	-
	E	-	-	-	-		6
	F	-	-	-	-	6	

Phases in Stage

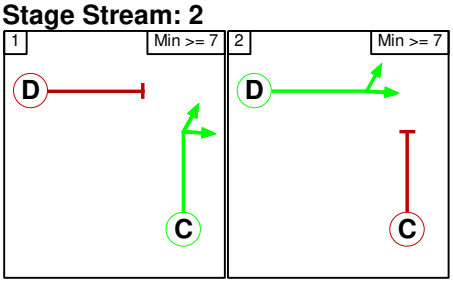
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D
3	1	E
3	2	F

Stage Diagram

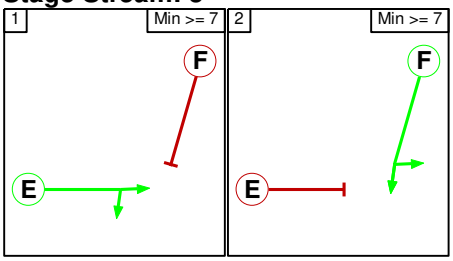
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 3

	To Stage		
From Stage		1	2
	1		6
	2	6	

Lane Input Data

Junction: Ardley												
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 (Ardley bypass)	U	B	2	3	10.4	Geom	-	3.65	0.00	Y	Arm 11 Left	40.00
1/2 (Ardley bypass)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm 9 Ahead	50.00
1/3 (Ardley bypass)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm 9 Ahead	50.00
1/4 (Ardley bypass)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm 9 Ahead	50.00
1/5 (Ardley bypass)	U	B	2	3	20.9	Geom	-	3.65	0.00	N	Arm 9 Ahead	50.00
2/1 (B430)	U	D	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 8 Ahead	50.00
											Arm 10 Ahead	50.00
2/2 (B430)	U	D	2	3	10.4	Geom	-	3.62	0.00	N	Arm 8 Ahead	50.00
3/1 (A43 southbound)	U	F	2	3	17.4	Geom	-	3.65	0.00	Y	Arm 4 Left	40.00
3/2 (A43 southbound)	U	F	2	3	60.0	Geom	-	3.65	0.00	N	Arm 5 Ahead	54.00
3/3 (A43 southbound)	U	F	2	3	60.0	Geom	-	3.65	0.00	N	Arm 5 Ahead	54.00
4/1 (M40 NB onslip)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1	U		2	3	10.4	Inf	-	-	-	-	-	-
5/2	U		2	3	10.4	Inf	-	-	-	-	-	-
6/1	U		2	3	60.0	Inf	-	-	-	-	-	-
6/2	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1	U	A	2	3	5.2	Geom	-	3.65	0.00	Y	Arm 9 Right	Inf
											Arm 11 Ahead	Inf
8/1	U	E	2	3	10.4	Geom	-	3.65	0.00	Y	Arm 4 Ahead	Inf
8/2	U	E	2	3	10.4	Geom	-	3.65	0.00	N	Arm 5 Right	Inf
9/1	U	C	2	3	7.8	Geom	-	3.65	0.00	Y	Arm 10 Ahead	Inf
9/2	U	C	2	3	7.8	Geom	-	3.65	0.00	N	Arm 10 Ahead	Inf

9/3	U	C	2	3	7.8	Geom	-	3.65	0.00	N	Arm 10 Ahead	Inf
9/4	U	C	2	3	7.8	Geom	-	3.65	0.00	N	Arm 8 Right	Inf
10/1	U		2	3	60.0	Inf	-	-	-	-	-	-
10/2	U		2	3	60.0	Inf	-	-	-	-	-	-
10/3	U		2	3	60.0	User	2120	-	-	-	-	-
11/1	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'Ardley4_AM'	07:45	08:45	01:00	
2: 'Ardley4_PM'	16:30	17:30	01:00	

Scenario 1: '2031 Ardley13, 19 AM' (FG1: 'Ardley4_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	68	1799	372	2239
	B	218	0	17	19	254
	C	1700	16	0	422	2138
	D	0	0	0	0	0
	Tot.	1918	84	1816	813	4631

Traffic Lane Flows

Lane	Scenario 1: 2031 Ardley13, 19 AM
Junction: Ardley	
1/1 (short)	68
1/2 (with short)	706(In) 638(Out)
1/3	644
1/4 (with short)	889(In) 517(Out)
1/5 (short)	372
2/1 (with short)	254(In) 36(Out)
2/2 (short)	218
3/1 (short)	422
3/2 (with short)	1307(In) 885(Out)
3/3	831
4/1	813
5/1	1103
5/2	831
6/1	1103
6/2	815
7/1	16
8/1	391
8/2	218
9/1	638
9/2	644
9/3	517
9/4	372
10/1	655
10/2	644
10/3	517
11/1	84

Lane Saturation Flows

Junction: Ardley								
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 (Ardley bypass)	3.65	0.00	Y	Arm 11 Left	40.00	100.0 %	1908	1908
1/2 (Ardley bypass)	3.65	0.00	N	Arm 9 Ahead	50.00	100.0 %	2058	2058
1/3 (Ardley bypass)	3.65	0.00	N	Arm 9 Ahead	50.00	100.0 %	2058	2058
1/4 (Ardley bypass)	3.65	0.00	N	Arm 9 Ahead	50.00	100.0 %	2058	2058
1/5 (Ardley bypass)	3.65	0.00	N	Arm 9 Ahead	50.00	100.0 %	2058	2058
2/1 (B430)	3.65	0.00	Y	Arm 8 Ahead	50.00	52.8 %	1922	1922
				Arm 10 Ahead	50.00	47.2 %		
2/2 (B430)	3.62	0.00	N	Arm 8 Ahead	50.00	100.0 %	2055	2055
3/1 (A43 southbound)	3.65	0.00	Y	Arm 4 Left	40.00	100.0 %	1908	1908
3/2 (A43 southbound)	3.65	0.00	N	Arm 5 Ahead	54.00	100.0 %	2063	2063
3/3 (A43 southbound)	3.65	0.00	N	Arm 5 Ahead	54.00	100.0 %	2063	2063
4/1 (M40 NB onslip Lane 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
6/2	Infinite Saturation Flow						Inf	Inf
7/1	3.65	0.00	Y	Arm 9 Right	Inf	0.0 %	1980	1980
				Arm 11 Ahead	Inf	100.0 %		
8/1	3.65	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 5 Right	Inf	100.0 %	2120	2120
9/1	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
9/2	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
9/3	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
9/4	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
10/1	Infinite Saturation Flow						Inf	Inf
10/2	Infinite Saturation Flow						Inf	Inf
10/3	This lane uses a directly entered Saturation Flow						2120	2120
11/1	Infinite Saturation Flow						Inf	Inf

Scenario 2: '2031 Ardley13, 19 PM' (FG2: 'Ardley4_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	136	2599	420	3155
	B	178	0	15	7	200
	C	1018	24	0	485	1527
	D	0	0	0	0	0
	Tot.	1196	160	2614	912	4882

Traffic Lane Flows

Lane	Scenario 2: 2031 Ardley13, 19 PM
Junction: Ardley	
1/1 (short)	136
1/2 (with short)	1009(In) 873(Out)
1/3	899
1/4 (with short)	1247(In) 827(Out)
1/5 (short)	420
2/1 (with short)	200(In) 22(Out)
2/2 (short)	178
3/1 (short)	485
3/2 (with short)	1075(In) 590(Out)
3/3	452
4/1	912
5/1	768
5/2	452
6/1	768
6/2	428
7/1	24
8/1	427
8/2	178
9/1	873
9/2	899
9/3	827
9/4	420
10/1	888
10/2	899
10/3	827
11/1	160

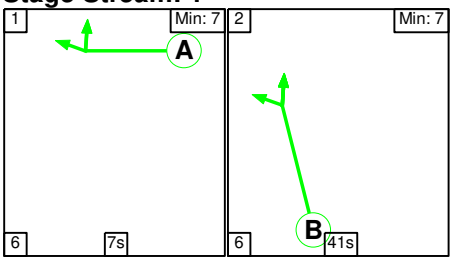
Lane Saturation Flows

Junction: Ardley								
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 (Ardley bypass)	3.65	0.00	Y	Arm 11 Left	40.00	100.0 %	1908	1908
1/2 (Ardley bypass)	3.65	0.00	N	Arm 9 Ahead	50.00	100.0 %	2058	2058
1/3 (Ardley bypass)	3.65	0.00	N	Arm 9 Ahead	50.00	100.0 %	2058	2058
1/4 (Ardley bypass)	3.65	0.00	N	Arm 9 Ahead	50.00	100.0 %	2058	2058
1/5 (Ardley bypass)	3.65	0.00	N	Arm 9 Ahead	50.00	100.0 %	2058	2058
2/1 (B430)	3.65	0.00	Y	Arm 8 Ahead	50.00	31.8 %	1922	1922
				Arm 10 Ahead	50.00	68.2 %		
2/2 (B430)	3.62	0.00	N	Arm 8 Ahead	50.00	100.0 %	2055	2055
3/1 (A43 southbound)	3.65	0.00	Y	Arm 4 Left	40.00	100.0 %	1908	1908
3/2 (A43 southbound)	3.65	0.00	N	Arm 5 Ahead	54.00	100.0 %	2063	2063
3/3 (A43 southbound)	3.65	0.00	N	Arm 5 Ahead	54.00	100.0 %	2063	2063
4/1 (M40 NB onslip Lane 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
6/2	Infinite Saturation Flow						Inf	Inf
7/1	3.65	0.00	Y	Arm 9 Right	Inf	0.0 %	1980	1980
				Arm 11 Ahead	Inf	100.0 %		
8/1	3.65	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 5 Right	Inf	100.0 %	2120	2120
9/1	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
9/2	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
9/3	3.65	0.00	N	Arm 10 Ahead	Inf	100.0 %	2120	2120
9/4	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
10/1	Infinite Saturation Flow						Inf	Inf
10/2	Infinite Saturation Flow						Inf	Inf
10/3	This lane uses a directly entered Saturation Flow						2120	2120
11/1	Infinite Saturation Flow						Inf	Inf

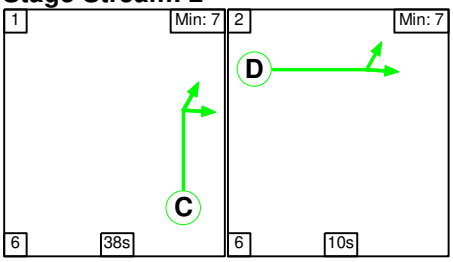
Scenario 1: '2031 Ardley13, 19 AM' (FG1: 'Ardley4_AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

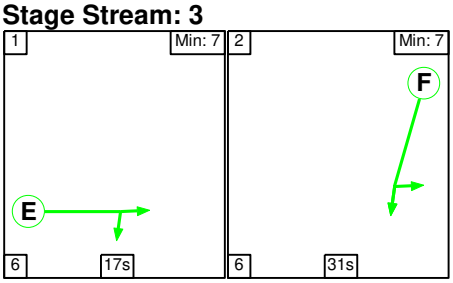
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	7	41
Change Point	0	13

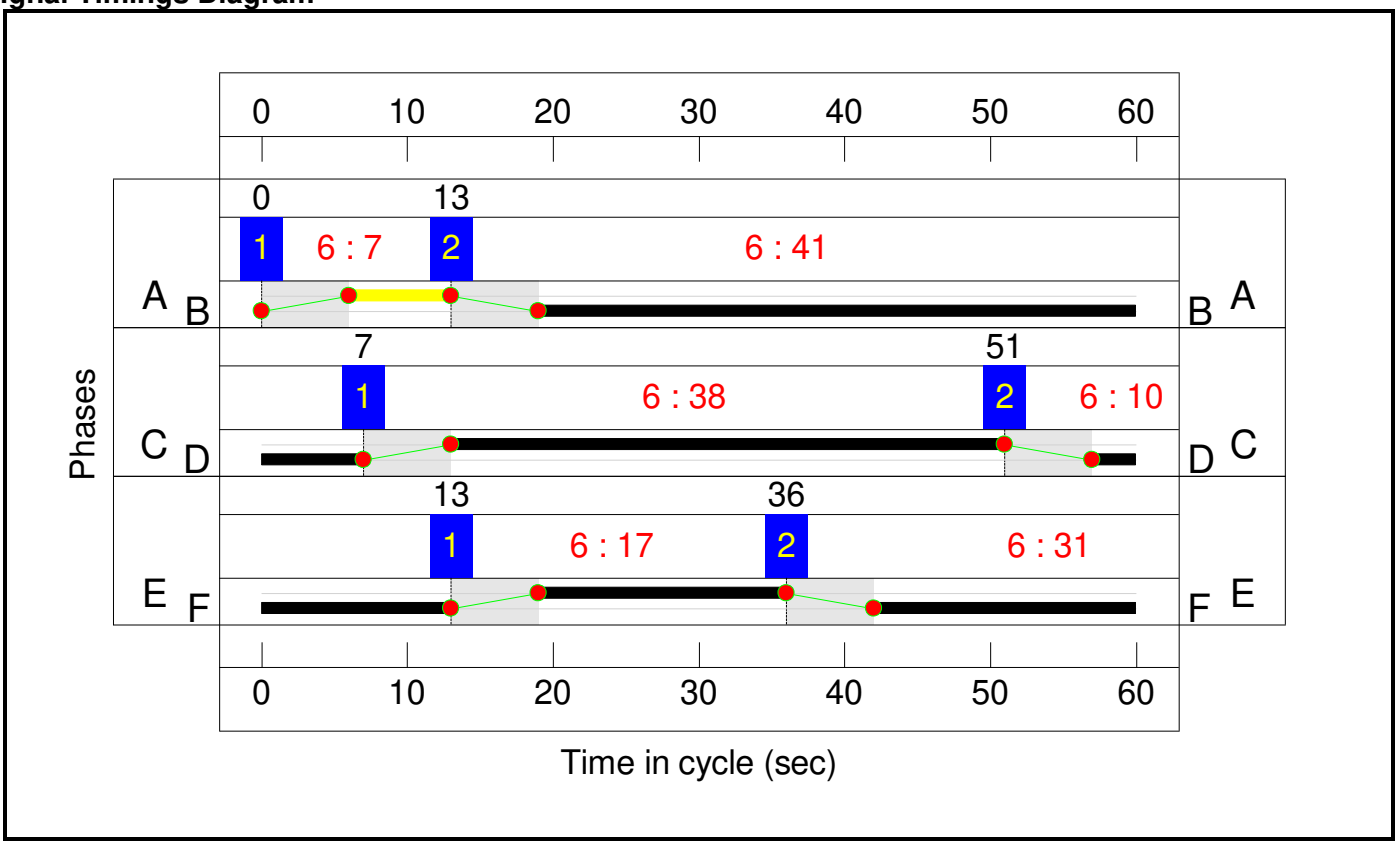
Stage Stream: 2

Stage	1	2
Duration	38	10
Change Point	7	51

Stage Stream: 3

Stage	1	2
Duration	17	31
Change Point	13	36

Signal Timings Diagram



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 (%)
Network: Ardley improvements - 4-arm signalised roundabout A-2	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.8%**
Ardley	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.8%**
1/2+1/1	Ardley bypass Ahead Left	U	1	N/A	B		1	41	-	706	2058:1908	1382+147	46.2 : 46.2%
1/3	Ardley bypass Ahead	U	1	N/A	B		1	41	-	644	2058	1441	44.7%
1/4+1/5	Ardley bypass Ahead	U	1	N/A	B		1	41	-	889	2058:2058	1197+861	43.2 : 43.2%
2/1+2/2	B430 Ahead Ahead2	U	2	N/A	D		1	10	-	254	1922:2055	62+377	57.9 : 57.9%
3/2+3/1	A43 southbound Left Ahead	U	3	N/A	F		1	31	-	1307	2063:1908	1082+516	81.8 : 81.8%
3/3	A43 southbound Ahead	U	3	N/A	F		1	31	-	831	2063	1100	75.5%
7/1	Right Ahead	U	1	N/A	A		1	7	-	16	1980	264	6.1%
8/1	Ahead	U	3	N/A	E		1	17	-	391	1980	594	65.8%
8/2	Right	U	3	N/A	E		1	17	-	218	2120	636	34.3%
9/1	Ahead	U	2	N/A	C		1	38	-	638	1980	1287	49.6%
9/2	Ahead	U	2	N/A	C		1	38	-	644	2120	1378	46.7%
9/3	Ahead	U	2	N/A	C		1	38	-	517	2120	1378	37.5%
9/4	Right	U	2	N/A	C		1	38	-	372	2120	1378	27.0%
10/3		U	N/A	N/A	-		-	-	-	517	2120	2120	24.4%

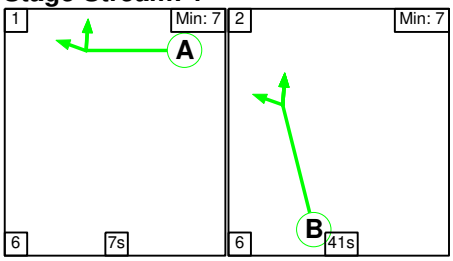
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ardley improvements - 4-arm signalised roundabout A-2	**-**	**-**	**0**	**0**	**0**	**14.7**	**5.8**	**0.0**	**20.5**	**-**	**-**	**-**	**-**
Ardley	**-**	**-**	**0**	**0**	**0**	**14.7**	**5.8**	**0.0**	**20.5**	**-**	**-**	**-**	**-**
1/2+1/1	706	706	-	-	-	0.7	0.4	-	1.2	6.0	4.6	0.4	5.0
1/3	644	644	-	-	-	0.7	0.4	-	1.1	6.2	4.7	0.4	5.1
1/4+1/5	889	889	-	-	-	0.9	0.4	-	1.2	5.0	3.4	0.4	3.8
2/1+2/2	254	254	-	-	-	1.6	0.7	-	2.2	31.8	3.3	0.7	4.0
3/2+3/1	1307	1307	-	-	-	3.8	2.2	-	6.0	16.5	12.0	2.2	14.3
3/3	831	831	-	-	-	2.5	1.5	-	4.1	17.6	10.6	1.5	12.1
7/1	16	16	-	-	-	0.1	0.0	-	0.1	19.3	0.2	0.0	0.3
8/1	391	391	-	-	-	1.4	0.0	-	1.4	12.5	3.5	0.0	3.5
8/2	218	218	-	-	-	1.1	0.0	-	1.1	17.7	3.6	0.0	3.6
9/1	638	638	-	-	-	0.6	0.0	-	0.6	3.5	2.1	0.0	2.1
9/2	644	644	-	-	-	0.6	0.0	-	0.6	3.4	2.1	0.0	2.1
9/3	517	517	-	-	-	0.5	0.0	-	0.5	3.3	1.7	0.0	1.7
9/4	372	372	-	-	-	0.3	0.0	-	0.3	3.2	1.2	0.0	1.2
10/3	517	517	-	-	-	0.0	0.2	-	0.2	1.1	0.0	0.2	0.2

C1	Stream: 1	PRC for Signalled Lanes (%):	94.9	Total Delay for Signalled Lanes (pcuHr):	3.61	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	55.5	Total Delay for Signalled Lanes (pcuHr):	4.26	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	10.1	Total Delay for Signalled Lanes (pcuHr):	12.49	Cycle Time (s):	60
		PRC Over All Lanes (%):	10.1	Total Delay Over All Lanes(pcuHr):	20.52		

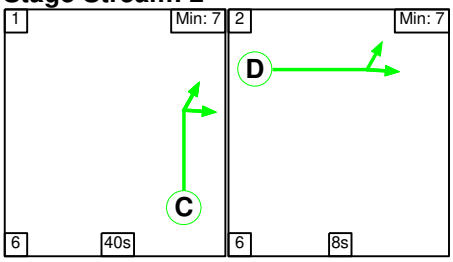
Scenario 2: '2031 Ardley13, 19 PM' (FG2: 'Ardley4_PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

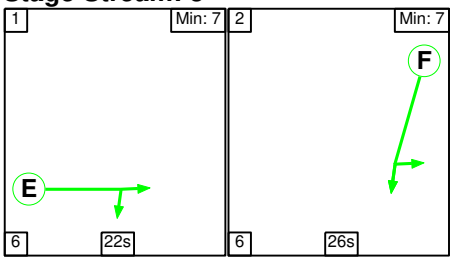
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	7	41
Change Point	0	13

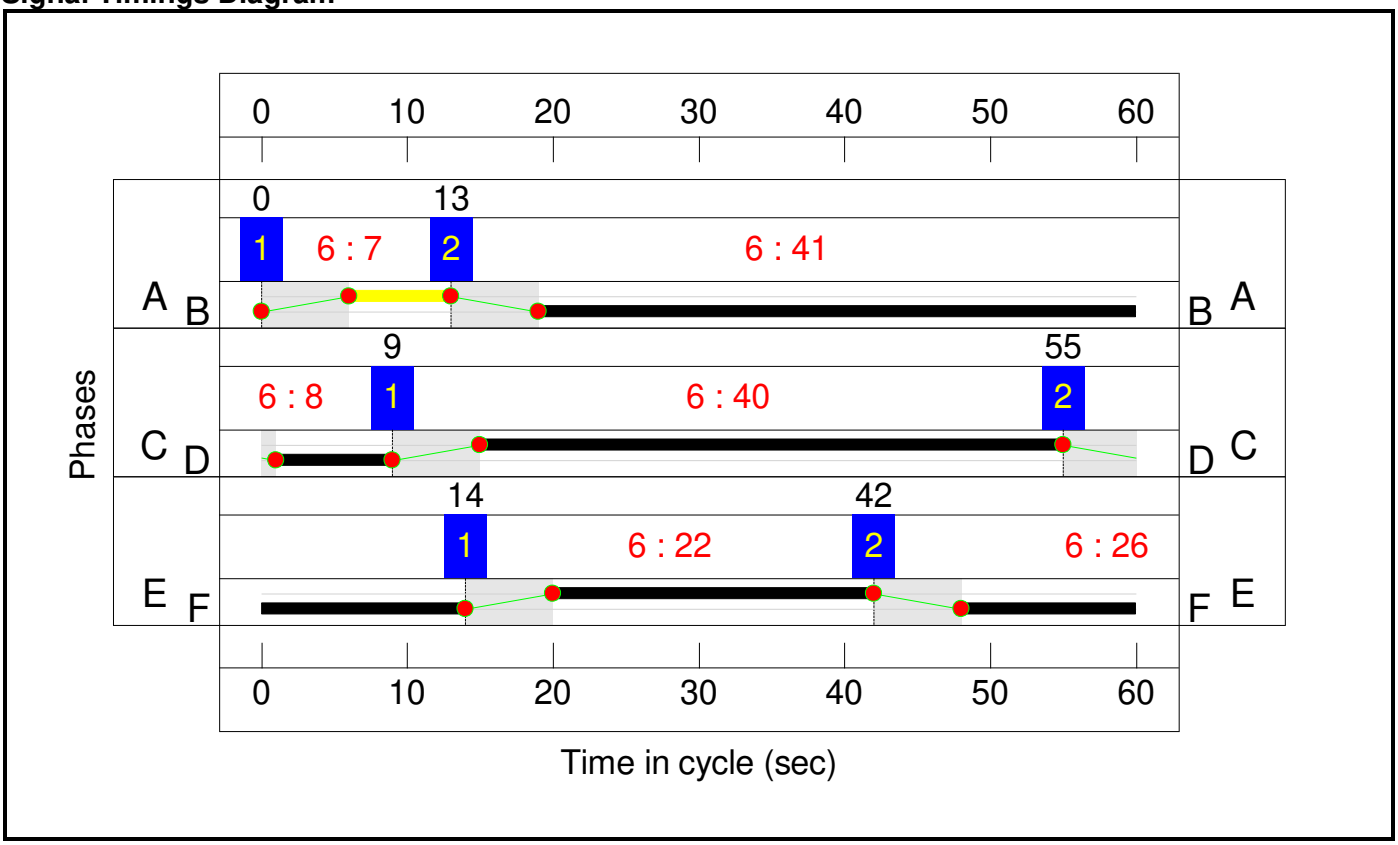
Stage Stream: 2

Stage	1	2
Duration	40	8
Change Point	9	55

Stage Stream: 3

Stage	1	2
Duration	22	26
Change Point	14	42

Signal Timings Diagram



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 (%)
Network: Ardley improvements - 4-arm signalised roundabout A-2	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**64.8%**
Ardley	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**64.8%**
1/2+1/1	Ardley bypass Ahead Left	U	1	N/A	B		1	41	-	1009	2058:1908	1347+210	64.8 : 64.8%
1/3	Ardley bypass Ahead	U	1	N/A	B		1	41	-	899	2058	1441	62.4%
1/4+1/5	Ardley bypass Ahead	U	1	N/A	B		1	41	-	1247	2058:2058	1365+693	60.6 : 60.6%
2/1+2/2	B430 Ahead Ahead2	U	2	N/A	D		1	8	-	200	1922:2055	38+308	57.7 : 57.7%
3/2+3/1	A43 southbound Left Ahead	U	3	N/A	F		1	26	-	1075	2063:1908	928+793	63.6 : 61.2%
3/3	A43 southbound Ahead	U	3	N/A	F		1	26	-	452	2063	928	48.7%
7/1	Right Ahead	U	1	N/A	A		1	7	-	24	1980	264	9.1%
8/1	Ahead	U	3	N/A	E		1	22	-	427	1980	759	56.3%
8/2	Right	U	3	N/A	E		1	22	-	178	2120	813	21.9%
9/1	Ahead	U	2	N/A	C		1	40	-	873	1980	1353	64.5%
9/2	Ahead	U	2	N/A	C		1	40	-	899	2120	1449	62.1%
9/3	Ahead	U	2	N/A	C		1	40	-	827	2120	1449	57.1%
9/4	Right	U	2	N/A	C		1	40	-	420	2120	1449	29.0%
10/3		U	N/A	N/A	-		-	-	-	827	2120	2120	39.0%

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)
Network: Ardley improvements - 4-arm signalised roundabout A-2	**-**	**-**	**0**	**0**	**0**	**14.2**	**4.9**	**0.0**	**19.0**	**-**	**-**	**-**	**-**
Ardley	**-**	**-**	**0**	**0**	**0**	**14.2**	**4.9**	**0.0**	**19.0**	**-**	**-**	**-**	**-**
1/2+1/1	1009	1009	-	-	-	1.2	0.9	-	2.2	7.7	7.5	0.9	8.4
1/3	899	899	-	-	-	1.2	0.8	-	2.0	8.1	7.7	0.8	8.6
1/4+1/5	1247	1247	-	-	-	1.4	0.8	-	2.2	6.4	6.9	0.8	7.7
2/1+2/2	200	200	-	-	-	1.3	0.7	-	2.0	35.7	2.7	0.7	3.4
3/2+3/1	1075	1075	-	-	-	3.7	0.8	-	4.6	15.2	7.5	0.8	8.4
3/3	452	452	-	-	-	1.5	0.5	-	1.9	15.4	5.3	0.5	5.7
7/1	24	24	-	-	-	0.1	0.0	-	0.1	18.8	0.3	0.0	0.4
8/1	427	427	-	-	-	1.1	0.0	-	1.1	9.4	3.0	0.0	3.0
8/2	178	178	-	-	-	0.7	0.0	-	0.7	14.8	3.0	0.0	3.0
9/1	873	873	-	-	-	0.6	0.0	-	0.6	2.4	1.9	0.0	1.9
9/2	899	899	-	-	-	0.6	0.0	-	0.6	2.2	2.0	0.0	2.0
9/3	827	827	-	-	-	0.5	0.0	-	0.5	2.2	1.8	0.0	1.8
9/4	420	420	-	-	-	0.2	0.0	-	0.2	2.1	0.9	0.0	0.9
10/3	827	827	-	-	-	0.0	0.3	-	0.3	1.4	0.0	0.3	0.3

C1	Stream: 1	PRC for Signalled Lanes (%):	38.9	Total Delay for Signalled Lanes (pcuHr):	6.52	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	39.5	Total Delay for Signalled Lanes (pcuHr):	3.87	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	41.6	Total Delay for Signalled Lanes (pcuHr):	8.33	Cycle Time (s):	60
		PRC Over All Lanes (%):	38.9	Total Delay Over All Lanes(pcuHr):	19.04		

APPENDIX I

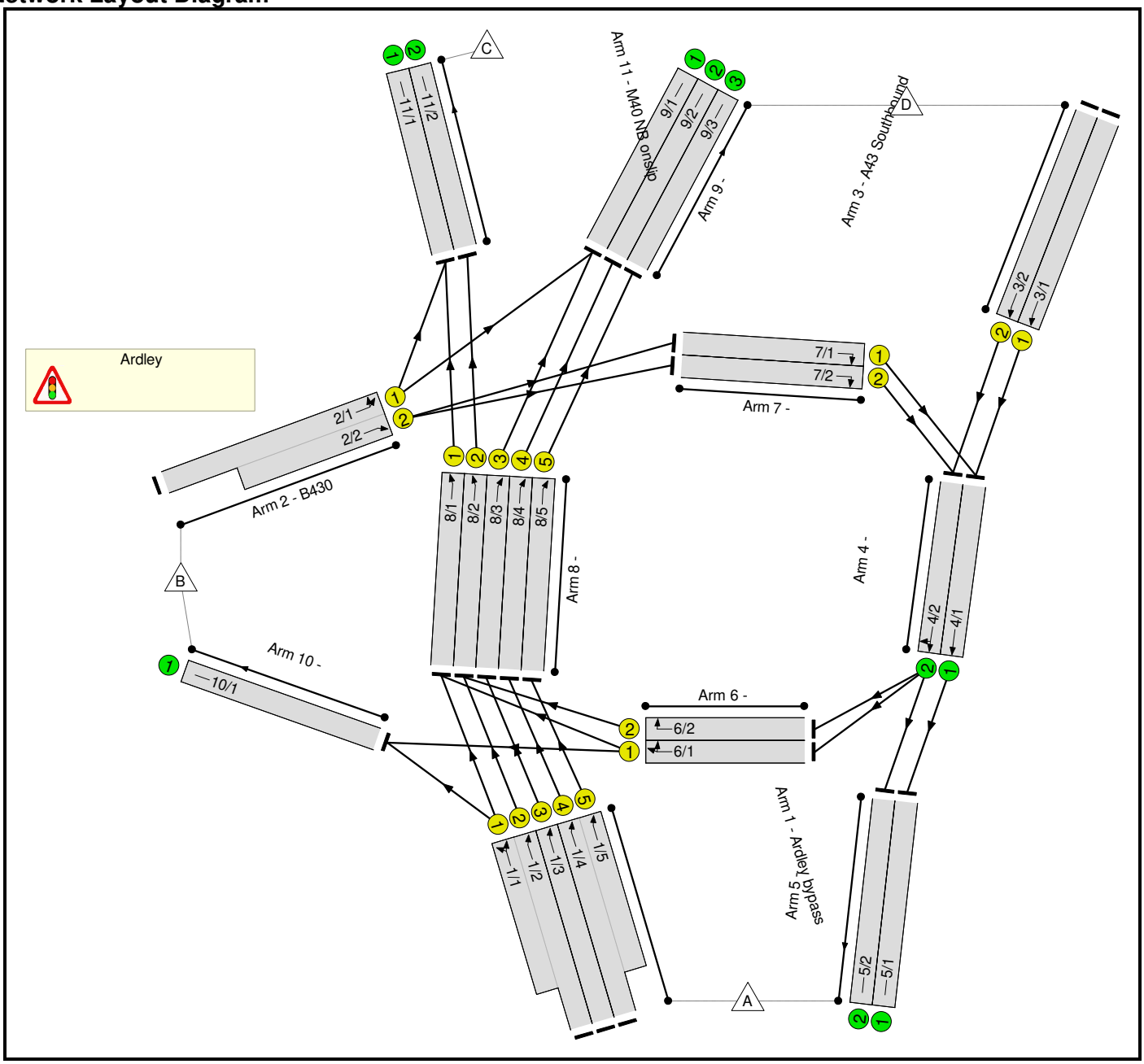
ARDLEY ROUNDABOUT MITIGATION (A-3) REVISED RESULTS

Full Input Data And Results

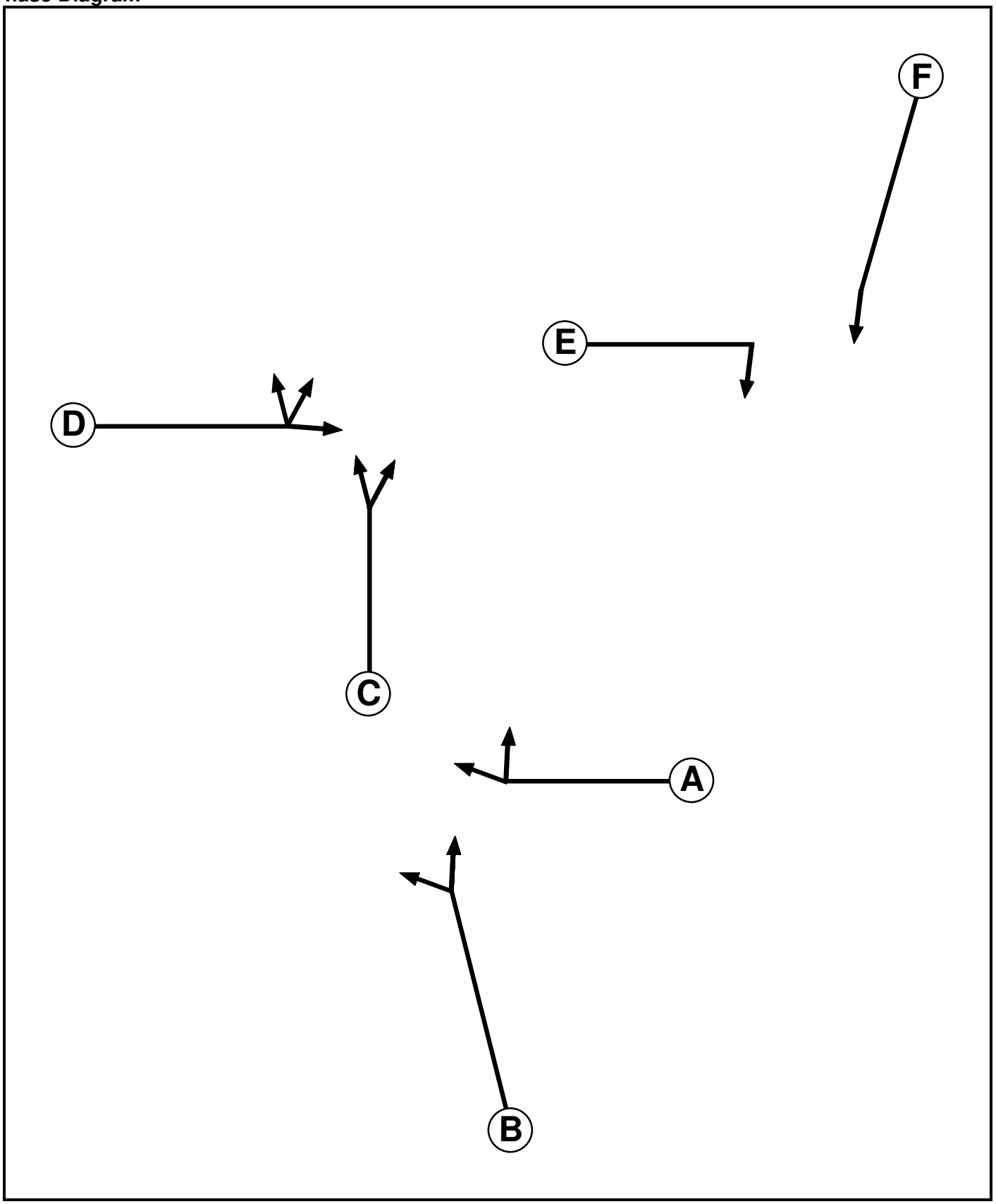
User and Project Details

Project:	**Oxfordshire SRFI**
Title:	**Ardley roundabout - 4-arm signalised roundabout A-3**
Location:	
Additional detail:	Amended following Aecom comments
File name:	2031_DS_M40J10_Ardley - 4-arm signalised roundabout A-3.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7
E	Traffic	3		7	7
F	Traffic	3		7	7

Phase Intergreens Matrix

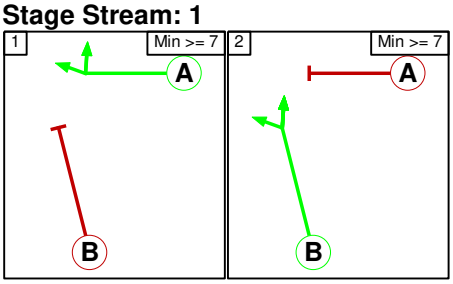
		Starting Phase					
		A	B	C	D	E	F
Terminating Phase	A		6	-	-	-	-
	B	6		-	-	-	-
	C	-	-		6	-	-
	D	-	-	6		-	-
	E	-	-	-	-		6
	F	-	-	-	-	6	

Phases in Stage

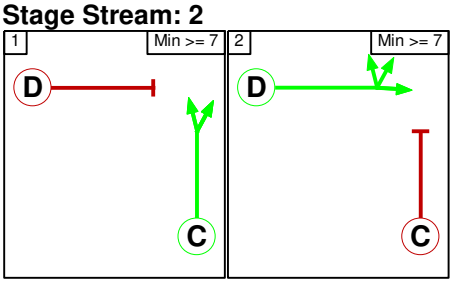
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D
3	1	E
3	2	F

Stage Diagram

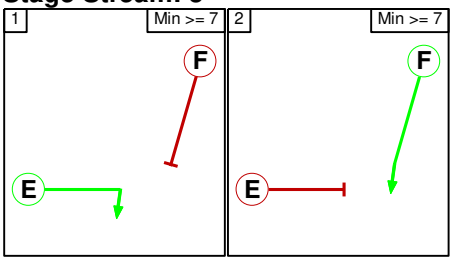
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 3

	To Stage		
From Stage		1	2
	1		6
	2	6	

Lane Input Data

Junction: Ardley												
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 (Ardley bypass)	U	B	2	3	10.4	Geom	-	3.65	0.00	Y	Arm 8 Ahead	Inf
											Arm 10 Left	40.00
1/2 (Ardley bypass)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm 8 Ahead	50.00
1/3 (Ardley bypass)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm 8 Ahead	50.00
1/4 (Ardley bypass)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm 8 Ahead	50.00
1/5 (Ardley bypass)	U	B	2	3	27.8	Geom	-	3.65	0.00	N	Arm 8 Ahead	50.00
2/1 (B430)	U	D	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 9 Ahead	50.00
											Arm 11 Left	Inf
2/2 (B430)	U	D	2	3	10.4	Geom	-	3.50	0.00	N	Arm 7 Ahead	50.00
3/1 (A43 Southbound)	U	F	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 4 Ahead	50.00
3/2 (A43 Southbound)	U	F	2	3	60.0	Geom	-	3.65	0.00	N	Arm 4 Ahead	50.00
4/1	U		2	3	7.0	Inf	-	-	-	-	-	-
4/2	U		2	3	7.0	Inf	-	-	-	-	-	-
5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
5/2	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1	U	A	2	3	8.7	Geom	-	3.65	0.00	Y	Arm 8 Right	Inf
											Arm 10 Ahead	Inf
6/2	U	A	2	3	8.7	Geom	-	3.65	0.00	N	Arm 8 Right	Inf
7/1	U	E	2	3	8.7	Geom	-	3.65	0.00	Y	Arm 4 Right	Inf
7/2	U	E	2	3	8.7	Geom	-	3.65	0.00	N	Arm 4 Right	Inf
8/1	U	C	2	3	8.7	Geom	-	3.65	0.00	Y	Arm 11 Ahead	Inf
8/2	U	C	2	3	8.7	Geom	-	3.65	0.00	N	Arm 11 Ahead	Inf
8/3	U	C	2	3	8.7	Geom	-	3.65	0.00	N	Arm 9 Ahead	Inf

8/4	U	C	2	3	10.4	Geom	-	3.65	0.00	N	Arm 9 Ahead	Inf
8/5	U	C	2	3	10.4	Geom	-	3.65	0.00	N	Arm 9 Ahead	Inf
9/1	U		2	3	60.0	Inf	-	-	-	-	-	-
9/2	U		2	3	60.0	Inf	-	-	-	-	-	-
9/3	U		2	3	60.0	User	2120	-	-	-	-	-
10/1	U		2	3	60.0	Inf	-	-	-	-	-	-
11/1 (M40 NB onslip)	U		2	3	60.0	Inf	-	-	-	-	-	-
11/2 (M40 NB onslip)	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'Ardley6_AM'	07:45	08:45	01:00	
2: 'Ardley6_PM'	16:30	17:30	01:00	

Scenario 1: '2031 Ardley11, 18 AM' (FG1: 'Ardley6_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	68	372	1799	2239
	B	218	0	19	17	254
	C	0	0	0	0	0
	D	1700	16	422	0	2138
	Tot.	1918	84	813	1816	4631

Traffic Lane Flows

Lane	Scenario 1: 2031 Ardley11, 18 AM
Junction: Ardley	
1/1 (short)	215
1/2 (with short)	440(In) 225(Out)
1/3	680
1/4 (with short)	1119(In) 679(Out)
1/5 (short)	440
2/1 (with short)	254(In) 36(Out)
2/2 (short)	218
3/1	1024
3/2	1114
4/1	1129
4/2	1227
5/1	1129
5/2	789
6/1	210
6/2	228
7/1	105
7/2	113
8/1	341
8/2	453
8/3	680
8/4	679
8/5	440
9/1	697
9/2	679
9/3	440
10/1	84
11/1	360
11/2	453

Lane Saturation Flows

Junction: Ardley								
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 (Ardley bypass)	3.65	0.00	Y	Arm 8 Ahead	Inf	68.4 %	1957	1957
				Arm 10 Left	40.00	31.6 %		
1/2 (Ardley bypass)	3.65	0.00	N	Arm 8 Ahead	50.00	100.0 %	2058	2058
1/3 (Ardley bypass)	3.65	0.00	N	Arm 8 Ahead	50.00	100.0 %	2058	2058
1/4 (Ardley bypass)	3.65	0.00	N	Arm 8 Ahead	50.00	100.0 %	2058	2058
1/5 (Ardley bypass)	3.65	0.00	N	Arm 8 Ahead	50.00	100.0 %	2058	2058
2/1 (B430)	3.50	0.00	Y	Arm 9 Ahead	50.00	47.2 %	1938	1938
				Arm 11 Left	Inf	52.8 %		
2/2 (B430)	3.50	0.00	N	Arm 7 Ahead	50.00	100.0 %	2044	2044
3/1 (A43 Southbound)	3.65	0.00	Y	Arm 4 Ahead	50.00	100.0 %	1922	1922
3/2 (A43 Southbound)	3.65	0.00	N	Arm 4 Ahead	50.00	100.0 %	2058	2058
4/1	Infinite Saturation Flow						Inf	Inf
4/2	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
6/1	3.65	0.00	Y	Arm 8 Right	Inf	92.4 %	1980	1980
				Arm 10 Ahead	Inf	7.6 %		
6/2	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
7/1	3.65	0.00	Y	Arm 4 Right	Inf	100.0 %	1980	1980
7/2	3.65	0.00	N	Arm 4 Right	Inf	100.0 %	2120	2120
8/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
8/3	3.65	0.00	N	Arm 9 Ahead	Inf	100.0 %	2120	2120
8/4	3.65	0.00	N	Arm 9 Ahead	Inf	100.0 %	2120	2120
8/5	3.65	0.00	N	Arm 9 Ahead	Inf	100.0 %	2120	2120
9/1	Infinite Saturation Flow						Inf	Inf
9/2	Infinite Saturation Flow						Inf	Inf
9/3	This lane uses a directly entered Saturation Flow						2120	2120
10/1	Infinite Saturation Flow						Inf	Inf
11/1 (M40 NB onslip Lane 1)	Infinite Saturation Flow						Inf	Inf
11/2 (M40 NB onslip Lane 2)	Infinite Saturation Flow						Inf	Inf

Scenario 2: '2031 Ardley11, 18 PM' (FG2: 'Ardley6_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	136	420	2599	3155
	B	178	0	7	15	200
	C	0	0	0	0	0
	D	1018	24	485	0	1527
	Tot.	1196	160	912	2614	4882

Traffic Lane Flows

Lane	Scenario 2: 2031 Ardley11, 18 PM
Junction: Ardley	
1/1 (short)	270
1/2 (with short)	556(In) 286(Out)
1/3	881
1/4 (with short)	1718(In) 936(Out)
1/5 (short)	782
2/1 (with short)	200(In) 22(Out)
2/2 (short)	178
3/1	726
3/2	801
4/1	812
4/2	893
5/1	812
5/2	384
6/1	246
6/2	263
7/1	86
7/2	92
8/1	356
8/2	549
8/3	881
8/4	936
8/5	782
9/1	896
9/2	936
9/3	782
10/1	160
11/1	363
11/2	549

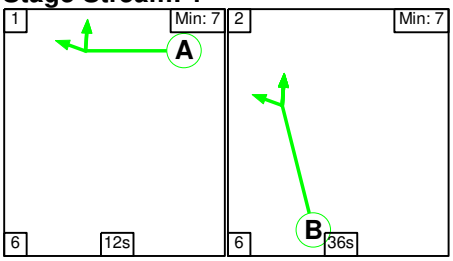
Lane Saturation Flows

Junction: Ardley								
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 (Ardley bypass)	3.65	0.00	Y	Arm 8 Ahead	Inf	49.6 %	1943	1943
				Arm 10 Left	40.00	50.4 %		
1/2 (Ardley bypass)	3.65	0.00	N	Arm 8 Ahead	50.00	100.0 %	2058	2058
1/3 (Ardley bypass)	3.65	0.00	N	Arm 8 Ahead	50.00	100.0 %	2058	2058
1/4 (Ardley bypass)	3.65	0.00	N	Arm 8 Ahead	50.00	100.0 %	2058	2058
1/5 (Ardley bypass)	3.65	0.00	N	Arm 8 Ahead	50.00	100.0 %	2058	2058
2/1 (B430)	3.50	0.00	Y	Arm 9 Ahead	50.00	68.2 %	1926	1926
				Arm 11 Left	Inf	31.8 %		
2/2 (B430)	3.50	0.00	N	Arm 7 Ahead	50.00	100.0 %	2044	2044
3/1 (A43 Southbound)	3.65	0.00	Y	Arm 4 Ahead	50.00	100.0 %	1922	1922
3/2 (A43 Southbound)	3.65	0.00	N	Arm 4 Ahead	50.00	100.0 %	2058	2058
4/1	Infinite Saturation Flow						Inf	Inf
4/2	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
6/1	3.65	0.00	Y	Arm 8 Right	Inf	90.2 %	1980	1980
				Arm 10 Ahead	Inf	9.8 %		
6/2	3.65	0.00	N	Arm 8 Right	Inf	100.0 %	2120	2120
7/1	3.65	0.00	Y	Arm 4 Right	Inf	100.0 %	1980	1980
7/2	3.65	0.00	N	Arm 4 Right	Inf	100.0 %	2120	2120
8/1	3.65	0.00	Y	Arm 11 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 11 Ahead	Inf	100.0 %	2120	2120
8/3	3.65	0.00	N	Arm 9 Ahead	Inf	100.0 %	2120	2120
8/4	3.65	0.00	N	Arm 9 Ahead	Inf	100.0 %	2120	2120
8/5	3.65	0.00	N	Arm 9 Ahead	Inf	100.0 %	2120	2120
9/1	Infinite Saturation Flow						Inf	Inf
9/2	Infinite Saturation Flow						Inf	Inf
9/3	This lane uses a directly entered Saturation Flow						2120	2120
10/1	Infinite Saturation Flow						Inf	Inf
11/1 (M40 NB onslip Lane 1)	Infinite Saturation Flow						Inf	Inf
11/2 (M40 NB onslip Lane 2)	Infinite Saturation Flow						Inf	Inf

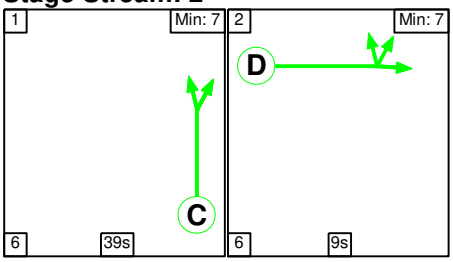
Scenario 1: '2031 Ardley11, 18 AM' (FG1: 'Ardley6_AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

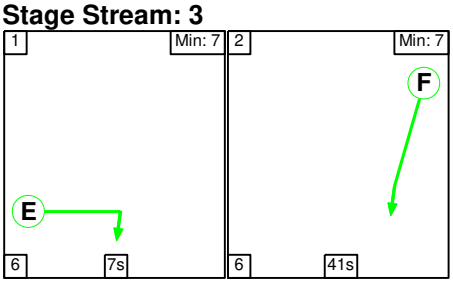
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	12	36
Change Point	0	18

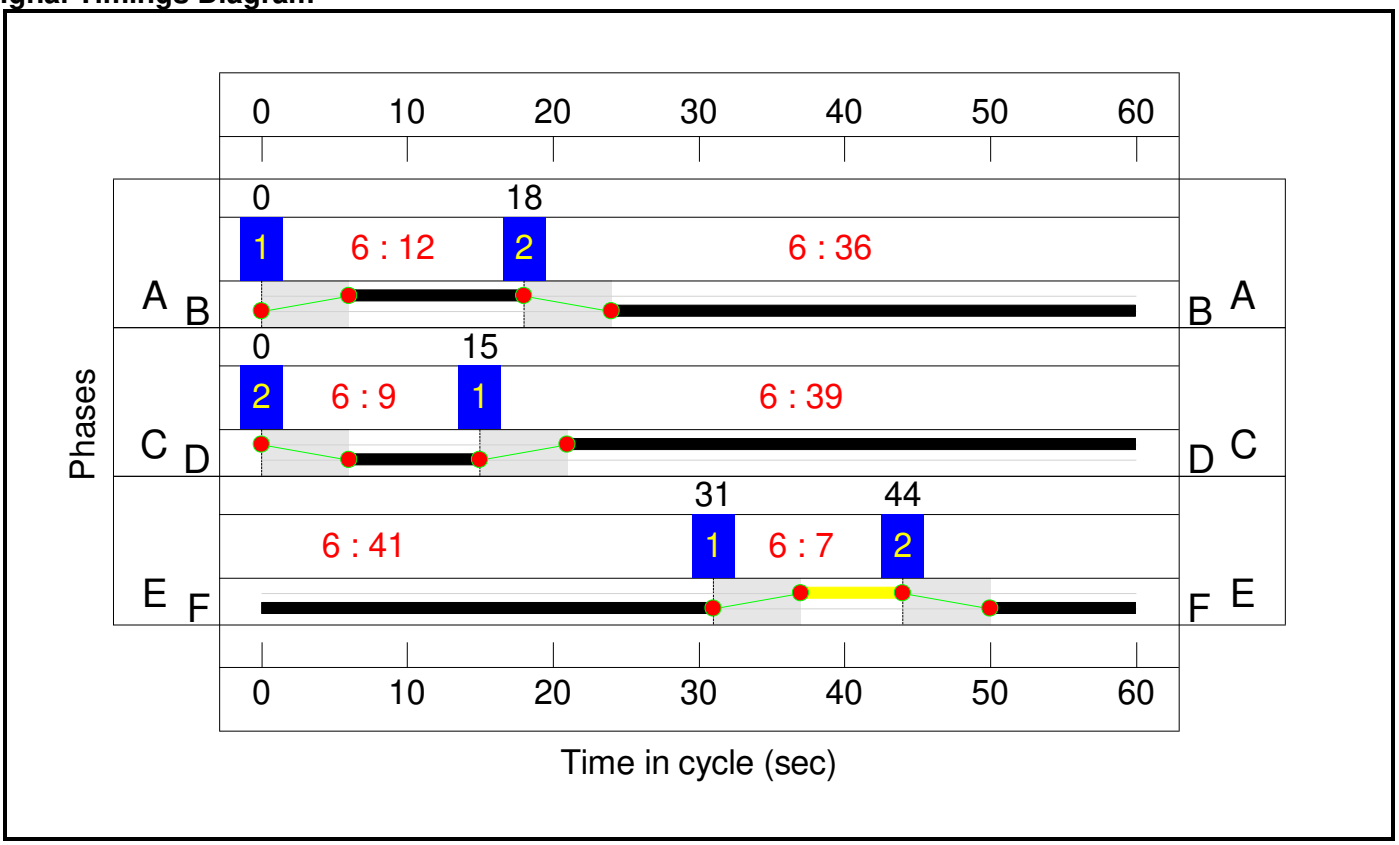
Stage Stream: 2

Stage	1	2
Duration	39	9
Change Point	15	0

Stage Stream: 3

Stage	1	2
Duration	7	41
Change Point	31	44

Signal Timings Diagram



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 (%)
Network: Ardley roundabout - 4-arm signalised roundabout A-3	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.3%**
Ardley	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.3%**
1/2+1/1	Ardley bypass Ahead Left	U	1	N/A	B		1	36	-	440	2058:1957	962+919	23.4 : 23.4%
1/3	Ardley bypass Ahead	U	1	N/A	B		1	36	-	680	2058	1269	53.6%
1/4+1/5	Ardley bypass Ahead	U	1	N/A	B		1	36	-	1119	2058:2058	1249+809	54.4 : 54.4%
2/1+2/2	B430 Ahead Ahead2 Left	U	2	N/A	D		1	9	-	254	1938:2044	56+341	64.0 : 64.0%
3/1	A43 Southbound Ahead	U	3	N/A	F		1	41	-	1024	1922	1345	76.1%
3/2	A43 Southbound Ahead	U	3	N/A	F		1	41	-	1114	2058	1441	77.3%
6/1	Right Ahead	U	1	N/A	A		1	12	-	210	1980	429	49.0%
6/2	Right	U	1	N/A	A		1	12	-	228	2120	459	49.6%
7/1	Right	U	3	N/A	E		1	7	-	105	1980	264	39.8%
7/2	Right	U	3	N/A	E		1	7	-	113	2120	283	40.0%
8/1	Ahead	U	2	N/A	C		1	39	-	341	1980	1320	25.8%
8/2	Ahead	U	2	N/A	C		1	39	-	453	2120	1413	32.1%
8/3	Ahead	U	2	N/A	C		1	39	-	680	2120	1413	48.1%
8/4	Ahead	U	2	N/A	C		1	39	-	679	2120	1413	48.0%
8/5	Ahead	U	2	N/A	C		1	39	-	440	2120	1413	31.1%
9/3		U	N/A	N/A	-		-	-	-	440	2120	2120	20.8%

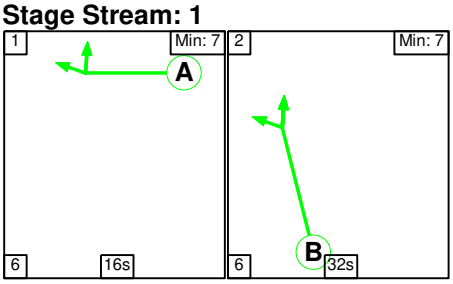
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ardley roundabout - 4-arm signalised roundabout A-3	**-**	**-**	**0**	**0**	**0**	**14.3**	**6.6**	**0.0**	**20.9**	**-**	**-**	**-**	**-**
Ardley	**-**	**-**	**0**	**0**	**0**	**14.3**	**6.6**	**0.0**	**20.9**	**-**	**-**	**-**	**-**
1/2+1/1	440	440	-	-	-	0.6	0.2	-	0.8	6.2	1.6	0.2	1.7
1/3	680	680	-	-	-	1.2	0.6	-	1.8	9.6	6.4	0.6	7.0
1/4+1/5	1119	1119	-	-	-	1.9	0.6	-	2.5	8.1	6.4	0.6	7.0
2/1+2/2	254	254	-	-	-	1.6	0.9	-	2.5	35.5	3.3	0.9	4.2
3/1	1024	1024	-	-	-	1.6	1.6	-	3.2	11.3	10.8	1.6	12.4
3/2	1114	1114	-	-	-	1.8	1.7	-	3.5	11.3	12.1	1.7	13.8
6/1	210	210	-	-	-	0.9	0.5	-	1.4	23.2	2.6	0.5	3.0
6/2	228	228	-	-	-	1.0	0.5	-	1.4	22.8	2.8	0.5	3.3
7/1	105	105	-	-	-	0.7	0.0	-	0.7	25.3	1.8	0.0	1.8
7/2	113	113	-	-	-	0.8	0.0	-	0.8	25.3	1.9	0.0	1.9
8/1	341	341	-	-	-	0.6	0.0	-	0.6	6.4	3.4	0.0	3.4
8/2	453	453	-	-	-	0.8	0.0	-	0.8	6.0	4.0	0.0	4.0
8/3	680	680	-	-	-	0.2	0.0	-	0.2	1.2	0.8	0.0	0.8
8/4	679	679	-	-	-	0.3	0.0	-	0.3	1.5	0.9	0.0	0.9
8/5	440	440	-	-	-	0.2	0.0	-	0.2	1.5	0.6	0.0	0.6
9/3	440	440	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1

C1	Stream: 1	PRC for Signalled Lanes (%):	65.5	Total Delay for Signalled Lanes (pcuHr):	7.90	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	40.6	Total Delay for Signalled Lanes (pcuHr):	4.57	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	16.4	Total Delay for Signalled Lanes (pcuHr):	8.26	Cycle Time (s):	60
		PRC Over All Lanes (%):	16.4	Total Delay Over All Lanes(pcuHr):	20.87		

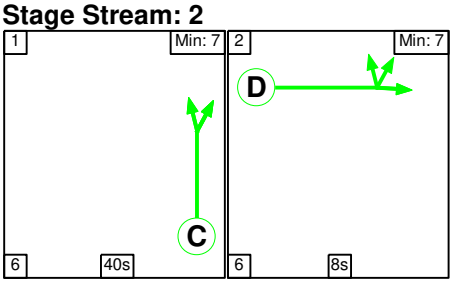
Scenario 2: '2031 Ardley11, 18 PM' (FG2: 'Ardley6_PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

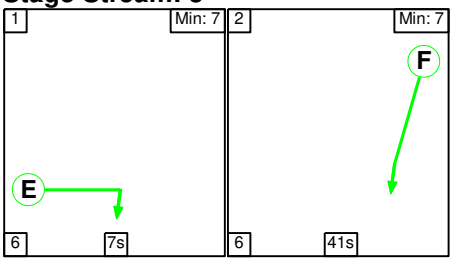
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	16	32
Change Point	0	22

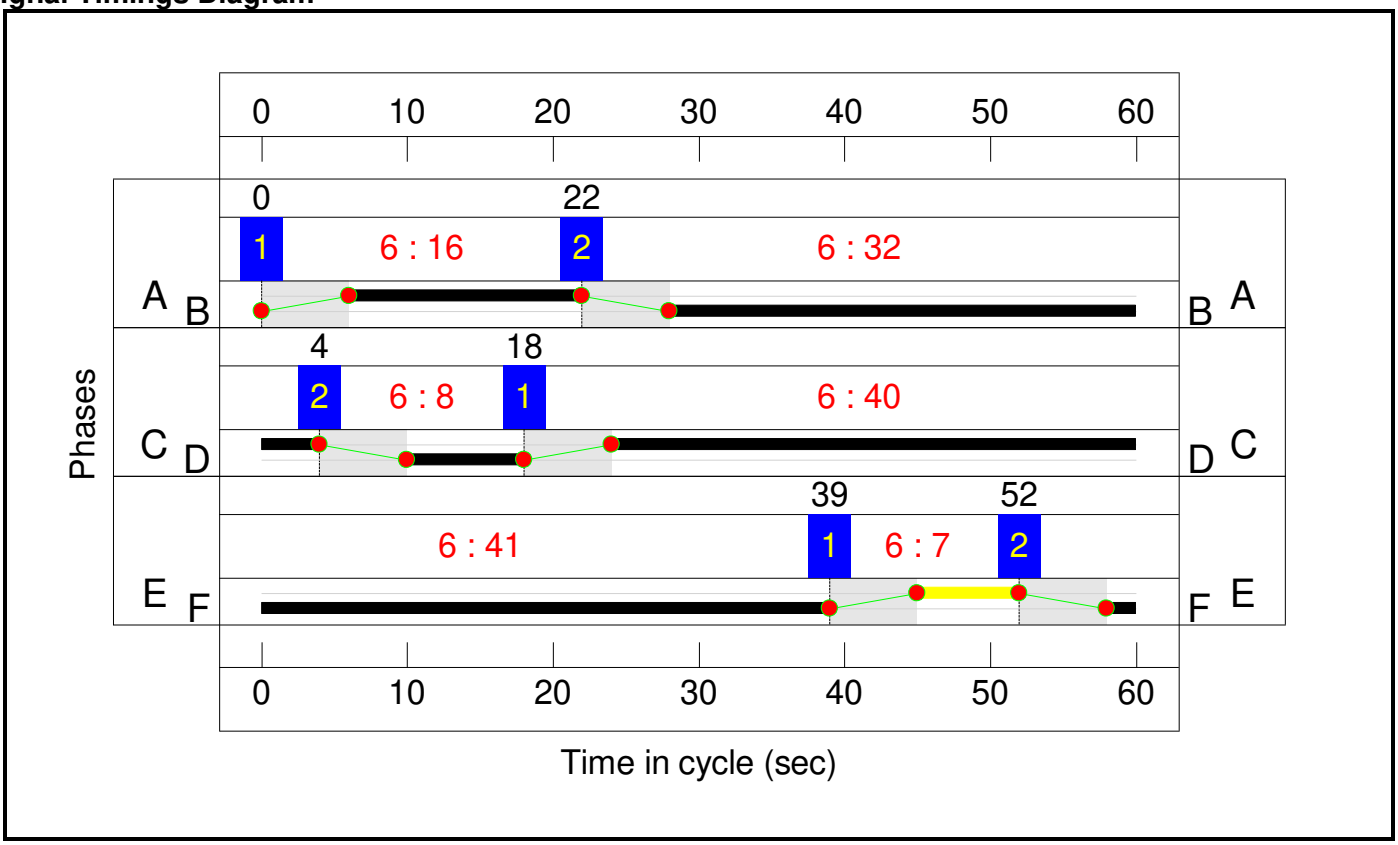
Stage Stream: 2

Stage	1	2
Duration	40	8
Change Point	18	4

Stage Stream: 3

Stage	1	2
Duration	7	41
Change Point	39	52

Signal Timings Diagram



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 (%)
Network: Ardley roundabout - 4-arm signalised roundabout A-3	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**83.5%**
Ardley	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**83.5%**
1/2+1/1	Ardley bypass Ahead Left	U	1	N/A	B		1	32	-	556	2058:1943	892+843	32.0 : 32.0%
1/3	Ardley bypass Ahead	U	1	N/A	B		1	32	-	881	2058	1132	77.8%
1/4+1/5	Ardley bypass Ahead	U	1	N/A	B		1	32	-	1718	2058:2058	1121+937	83.5 : 83.5%
2/1+2/2	B430 Ahead Ahead2 Left	U	2	N/A	D		1	8	-	200	1926:2044	38+307	58.1 : 58.1%
3/1	A43 Southbound Ahead	U	3	N/A	F		1	41	-	726	1922	1345	54.0%
3/2	A43 Southbound Ahead	U	3	N/A	F		1	41	-	801	2058	1441	55.6%
6/1	Right Ahead	U	1	N/A	A		1	16	-	246	1980	561	43.9%
6/2	Right	U	1	N/A	A		1	16	-	263	2120	601	43.8%
7/1	Right	U	3	N/A	E		1	7	-	86	1980	264	32.6%
7/2	Right	U	3	N/A	E		1	7	-	92	2120	283	32.5%
8/1	Ahead	U	2	N/A	C		1	40	-	356	1980	1353	26.3%
8/2	Ahead	U	2	N/A	C		1	40	-	549	2120	1449	37.9%
8/3	Ahead	U	2	N/A	C		1	40	-	881	2120	1449	60.8%
8/4	Ahead	U	2	N/A	C		1	40	-	936	2120	1449	64.6%
8/5	Ahead	U	2	N/A	C		1	40	-	782	2120	1449	54.0%
9/3		U	N/A	N/A	-		-	-	-	782	2120	2120	36.9%

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)
Network: Ardley roundabout - 4-arm signalised roundabout A-3	**-**	**-**	**0**	**0**	**0**	**17.1**	**7.4**	**0.0**	**24.5**	**-**	**-**	**-**	**-**
Ardley	**-**	**-**	**0**	**0**	**0**	**17.1**	**7.4**	**0.0**	**24.5**	**-**	**-**	**-**	**-**
1/2+1/1	556	556	-	-	-	1.1	0.2	-	1.3	8.6	2.5	0.2	2.7
1/3	881	881	-	-	-	2.6	1.7	-	4.3	17.7	11.5	1.7	13.2
1/4+1/5	1718	1718	-	-	-	5.0	2.5	-	7.5	15.8	12.7	2.5	15.2
2/1+2/2	200	200	-	-	-	1.3	0.7	-	2.0	35.9	2.7	0.7	3.4
3/1	726	726	-	-	-	0.9	0.6	-	1.5	7.2	5.6	0.6	6.2
3/2	801	801	-	-	-	1.0	0.6	-	1.6	7.2	6.5	0.6	7.1
6/1	246	246	-	-	-	0.9	0.4	-	1.3	19.2	2.5	0.4	2.9
6/2	263	263	-	-	-	1.0	0.4	-	1.4	18.8	2.7	0.4	3.1
7/1	86	86	-	-	-	0.7	0.0	-	0.7	29.6	1.4	0.0	1.4
7/2	92	92	-	-	-	0.8	0.0	-	0.8	29.6	1.5	0.0	1.5
8/1	356	356	-	-	-	0.8	0.0	-	0.8	7.8	3.7	0.0	3.7
8/2	549	549	-	-	-	0.9	0.0	-	0.9	6.1	4.4	0.0	4.4
8/3	881	881	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/4	936	936	-	-	-	0.1	0.0	-	0.1	0.3	0.3	0.0	0.3
8/5	782	782	-	-	-	0.1	0.0	-	0.1	0.3	0.2	0.0	0.2
9/3	782	782	-	-	-	0.0	0.3	-	0.3	1.3	0.0	0.3	0.3

C1	Stream: 1	PRC for Signalled Lanes (%):	7.8	Total Delay for Signalled Lanes (pcuHr):	15.86	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	39.3	Total Delay for Signalled Lanes (pcuHr):	3.85	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	61.9	Total Delay for Signalled Lanes (pcuHr):	4.53	Cycle Time (s):	60
		PRC Over All Lanes (%):	7.8	Total Delay Over All Lanes(pcuHr):	24.54		

APPENDIX J

ARDLEY EAST ROUNDABOUT OPTION AE-6 LINSIG MODEL AUDIT AND REVISED RESULTS

LINSIG V3 Model Checking Report

AECOM

Project:	**OXFORDSHIRE SRFI-M40 Junction 10**	Job No:	**xxxxx**
Model:	**2031_DS_M40J10_ArdleyEast_AE6_ArdleyEast6 (Signals Option).lsg3x**	Model Submitted:	**16/07/2021**
		Corrections Submitted:	**Date Submitted**

Modelled By: ADC Infrastructure **Checked by: Weiping Guo** **Approved by:**

This note is to document the checks made to LINSIG models. Once completed this should be filed with the model, or model outputs for future reference.

Results Key

× - Changes required before work is signed off
? – Changes may be required before work is signed off, further work required
✓ - No further changes required before work is signed off

File Checked: Hyperlink to model

Network Information

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Scenario title(s) entered	✓			
26/07/21	Project name entered	✓			
26/07/21	Modeller details recorded	X		Modeller added	
26/07/21	Network location details entered	✓			
26/07/21	File name is logical	✓	The file name is not very clear to reflect the options		

Network Setup

Junction Drawings: In report 'OxSRFI-ADC1794-RP-M-V3 'TN5 M40 Junction 10 Options Report' – appendices' Page no.54
Sat Flow Measurements / Calculations: Hyperlink to Sat Flow Measurements

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	Junctions				
26/07/21	Appropriate junctions setup	✓			
26/07/21	Junction info/ signal controllers complete	✓			
26/07/21	Logical arm structure setup	✓			
	Lanes				
26/07/21	Lane setup reflects junction drawings	X	In the model, Arm2 has four lanes with lane 1 left turn flare, however, after exam the drawing provided, this is not reflecting the drawing.	Left-turn flared lane removed from the model.	
26/07/21	Check each lane that is signal controlled	✓			
26/07/21	Lanes matched to controller and phase	✓	.		
26/07/21	Lane length appropriate	✓			
26/07/21	Custom occupancy (if req)	N/A			
	Saturation Flows				
26/07/21	Justified method to derive saturation flows				
26/07/21	Check observed sat flows (if used)	N/A			
26/07/21	Check RR67 sat flows calculations (if used)	x	1. Some lanes saturation flows were calculated by RR67 methods, and some have the radius setup but some don't. And all the lanes were treated as the 'nearside lane'. 2. Some other lanes have direct entered sat flows, please use RR67 to make sure the model consistence.	1. Central lanes and offside lanes have 'nearside lane' de-selected. All turning radii checked. 2. All lanes have RR67 parameters applied. Sat flows for circulating lanes are set so that they are equal or greater than the entry lanes.	
26/07/21	Check external sat flows calculations (if used)	N/A			
26/07/21	Check sat flows for any bottleneck links	✓			
	Advanced Lane Settings				
26/07/21	Use of start / end green displacements (if req)	✓	Default values used.		
26/07/21	Use of queue limits on short links (if req)	✓	1. 1pcu limit setup for Arm5 all lanes, seemingly too low. 2. 2pcus limit setup for Arm8 all lanes, seemingly too low. 3. 2pcus limit setup for Arm 10 all lanes, seemingly too low, especially for lane 2.	Queue limits amended.	
26/07/21	Use of weightings for optimiser constraints (if req)	✓			
26/07/21	Use of random delay or queue de-sliver (if req)	X	1. All the short circulatory lanes have 'ignore random delay' selected, except Arm8 lane 2. 2. 1pcu De-sliver is selected. We don't recommend to use the de-sliver if possible, please review the offset between the signals. If have to, please use 0.5pcu if possible.	1. All short circulatory lanes have 'ignore random delay' selected. 2. De-sliver factors removed where possible, set to 0.5 pcus where still needed.	
	Give Ways				
26/07/21	Check each lane that is priority controlled	✓			
26/07/21	Measurement of max/min flow when giving way	✓	1000pcus max flow is used		
26/07/21	Flow when opposing traffic stopped reasonable	✓			

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United Kingdom

26/07/21	Measurement of give-way co-efficient	✓	0.33 is used as suggested by JCT.		
26/07/21	Measurement of clear conflict time of opposing traffic	✓	Default 2s used.		
26/07/21	Check all controlling movements identified	X	1. Movement to 11/1 should conflict with lane 13/2 left turn as well. 2. Movement 10/1 should conflict with lane 13/3 as well due to the high speed traveling traffic and short distance stop ahead.	Both of these additional conflicts included in the model.	
26/07/21	Measurement of storage in front of stop-line	N/A			
26/07/21	Max turns in inter-green reasonable	N/A			
26/07/21	Measurement of non-blocking storage	N/A			
	Lane Connectors				
26/07/21	Lane connectors provided reasonable	✓			
26/07/21	Cruise time reasonable	✓	45Km/hr cruise speed is used for all internal links		
26/07/21	Default platoon dispersion used unless observed	X	Default platoon dispersion is selected for all links, however the short circulatory links should not be selected.	Default platoon dispersion has been de-selected.	
	Zones				
26/07/21	Zones match O-D matrix	?	ArdleyEast6_AM flow matches the flow report page 90; ArdleyEast6_PM flow matches the flow report page 91; Not sure what is ArdleyEast6AM(Shoulder) flow for, please clarify. ========== The flow sets in report 'OXSRFI-ADC1794-RP-N-V2'TN6-M40J10 OR Traffic Flow Derivation' – bound file page 90 and 91 stated for Strategic option 10,11,12. And the flow sets in page 86 and 87 is for Strategic option 13, 19. We assume this model is for strategic option 11 and 13 test? Can you please clarify?	The ArdleyEast6AM(Shoulder) flow set is not required for this assessment and has been removed. Flow sets and scenarios are for strategic options 11 and 13.	
	Pedestrians				
26/07/21	Ped crossings represented by ped links (if req)	N/A			
26/07/21	Ped link data correct (if req)	N/A			
26/07/21	Ped connector walk times reasonable (if req)	N/A			
26/07/21	Ped links matched to appropriate phases (if req)	N/A			
26/07/21	Ped zones match ped O-D matrix (if req)	N/A			

Controllers

Controller Specifications: Hyperlink to Controller Specification (if req)
Intergreen Calculations: Hyperlink to Intergreen Calculations (if req)

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	General Controller Set-up				
26/07/21	Sufficient controllers setup	✓			
26/07/21	Multiple stage streams setup correctly (if req)	✓			
26/07/21	Non-standard filters setup correctly (if req)	N/A			
	Signal Settings				
26/07/21	Check phases for each controller	?	What is Phase E for? Seeming is not in use. Please clarify.		
26/07/21	Check phase mins/type reasonable	✓			
26/07/21	Check inter-greens calculations/coding	X	1. The nature of this roundabout should be the same as others as high speed trunk road, so the inter-green is to be set 6s between the phases. 2. What is Phase E for? Seeming is not in use. Please clarify.	1. Intergreens increased to 6 sec. 2. Phase E removed.	
26/07/21	Stages reasonable	✓			
26/07/21	Phase delays reasonable (if req)	N/A			

Stage Sequences

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Check stage sequences observed / optimised	✓			
26/07/21	Check stage timings observed / optimised	N/A			

Traffic Counts and Calculations

Traffic Flow Data: Hyperlink to Traffic Flow Data – in report 'OXSRFI-ADC1794-RP-N-V2 'TN6 - M40 J10 OR Traffic Flow Derivation' – bound'
Matrix Calculations: Hyperlink to Matrix Calculations (if required)
Lane Balancing Calculations: Hyperlink to Lane Balancing Calculations (if required)
Site Observations: Hyperlink to Site Flows Observations

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Suitability of traffic surveys undertaken	N/A			
26/07/21	Are there sufficient site observations	N/A			
26/07/21	Check O-D matrix calculations	✓			
26/07/21	Are lane balancing calculations sufficient / consistent	✓			
26/07/21	Does lane balancing match lining	✓			

26/07/21	Does lane balancing match matrices	✓			

Traffic Flows

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Traffic & ped flow (if req) groups setup	✓			
26/07/21	Desired flows match O-D matrices	✓			
26/07/21	Actual flows match desired flows	✓			
26/07/21	Inappropriate routes closed	✓			
26/07/21	Route flows match lane balancing	✓			

Modelling

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
26/07/21	Scenario set up with correct options	✓			
26/07/21	Cycle time appropriate for network control	✓			
26/07/21	Cycle time optimised (if req)	✓			

Results

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	Are all values as expected (Demand Flows, Green Times etc)		To be checked after above changes.		
	Deg Sat >100% for existing situation with no modelled suppressed demand?		To be checked after above changes.		
	Deg Sat appropriate? Validated?		To be checked after above changes.		
	Capacity conclusions		To be checked after above changes.		
	If suppressed demand has been modelled, do queues validate?		To be checked after above changes.		
	Queues appropriate?		To be checked after above changes.		
	Queue limits exceeded?		To be checked after above changes.		
	Queuing conclusions (will exit blocking modify these?)		To be checked after above changes.		
	If suppressed demand has been modelled do journey times validate?		To be checked after above changes.		
	Journey time conclusions?		To be checked after above changes.		

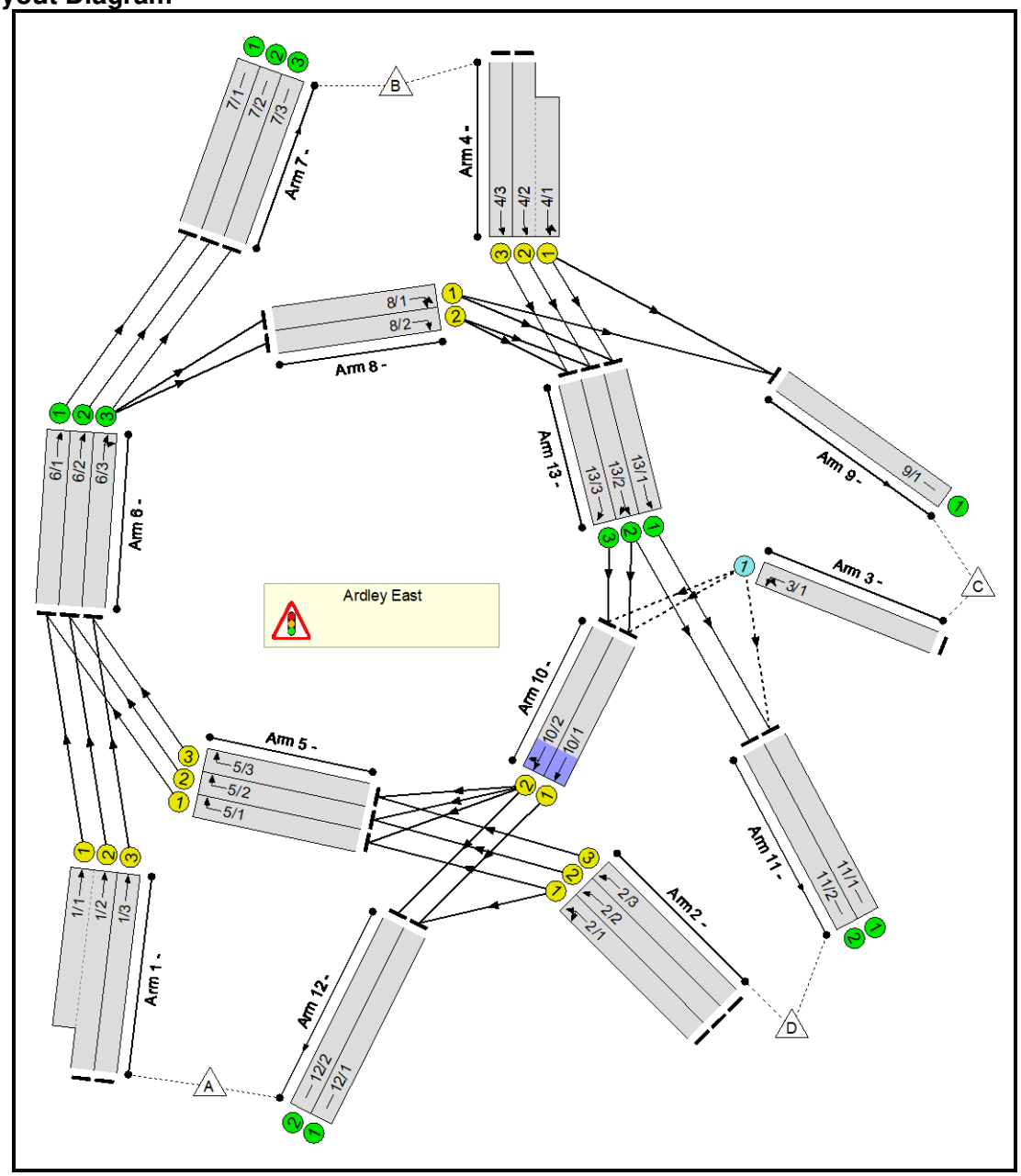
Conclusions and Recommendations

Full Input Data And Results

User and Project Details

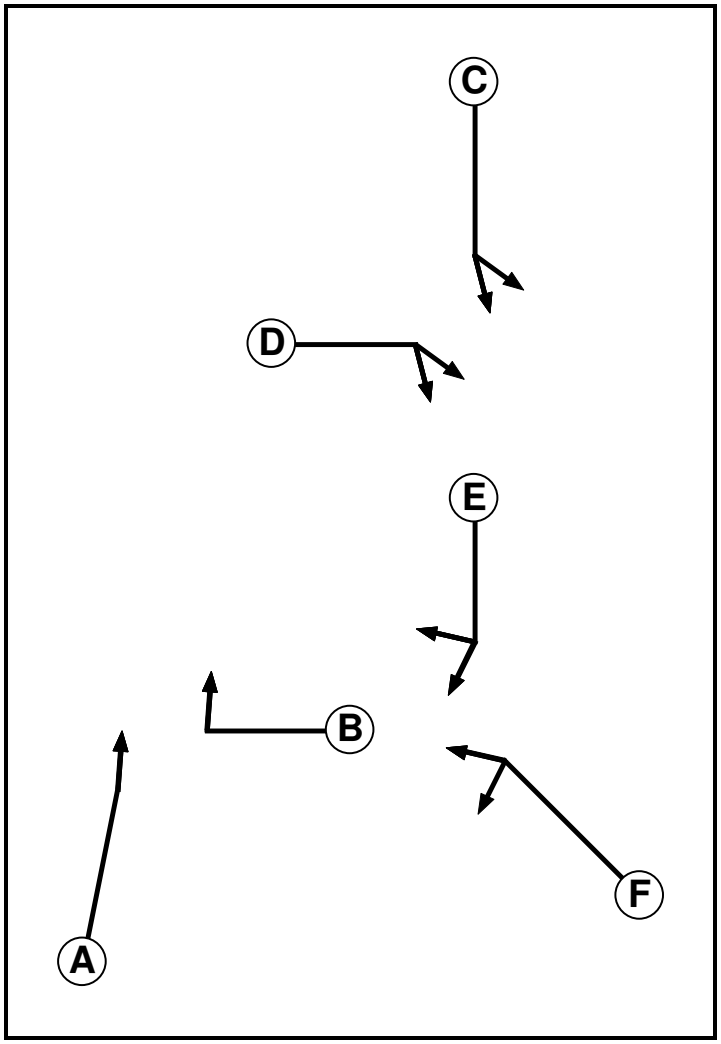
Project:	**OxSRFI**
Title:	**Ardley East Roundabout**
Location:	
Design Layout Ref:	AE-6
Flow Details:	ArdleyEast6_AM ArdleyEast6_PM
Additional detail:	Amended following Aecom comments
File name:	2031_DS_M40J10_ArdleyEast_AE6_ArdleyEast6 (Signals Option).lsg3x
Author:	Matt Tatler
Company:	ADC Infrastructure Limited
Address:	King Edward Court, Nottingham NG1 3EW

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7
E	Traffic	3		7	7
F	Traffic	3		7	7

Full Input Data And Results

Phase Intergreens Matrix

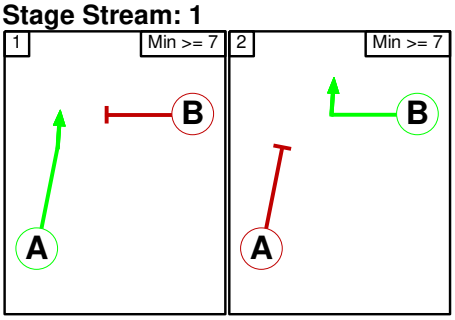
Terminating Phase	Starting Phase					
	A	B	C	D	E	F
A		6	-	-	-	-
B	6		-	-	-	-
C	-	-		6	-	-
D	-	-	6		-	-
E	-	-	-	-		6
F	-	-	-	-	6	

Phases in Stage

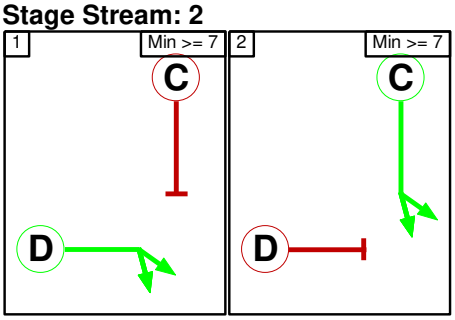
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	D
2	2	C
3	1	F
3	2	E

Stage Diagram

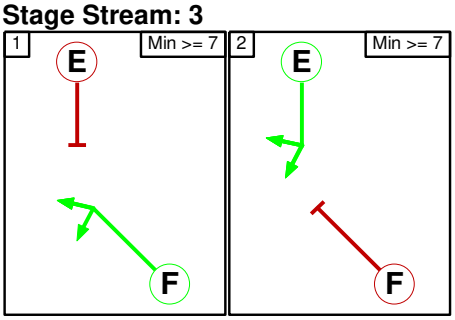
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Full Input Data And Results

Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 2

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 3

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 3

	To Stage		
From Stage		1	2
	1		6
	2	6	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Ardley East											
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)**
3/1	10/1 (Left)	1000	0	13/1	0.33	All	-	-	-	-	-
				13/2	0.33	All					
				13/3	0.33	All					
	10/2 (Left)	1000	0	13/1	0.33	All					
				13/2	0.33	All					
				13/3	0.33	All					
	11/1 (U-Turn)	1000	0	13/1	0.33	All					
				13/2	0.33	All					

Full Input Data And Results

Lane Input Data

Junction: Ardley East												
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	U	A	2	3	20.9	Geom	-	3.65	0.00	Y	Arm 6 Ahead	30.00
1/2	U	A	2	3	60.0	Geom	-	3.65	0.00	N	Arm 6 Ahead	30.00
1/3	U	A	2	3	60.0	Geom	-	3.65	0.00	N	Arm 6 Ahead	30.00
2/1	U	F	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 5 Ahead	45.00
											Arm 12 Left	45.00
2/2	U	F	2	3	60.0	Geom	-	3.65	0.00	N	Arm 5 Ahead	45.00
2/3	U	F	2	3	60.0	Geom	-	3.65	0.00	N	Arm 5 Ahead	45.00
3/1	O		2	3	60.0	User	1900	-	-	-	-	-
4/1	U	C	2	3	17.4	Geom	-	3.65	0.00	Y	Arm 9 Left	30.00
											Arm 13 Ahead	30.00
4/2	U	C	2	3	60.0	Geom	-	3.65	0.00	N	Arm 13 Ahead	30.00
4/3	U	C	2	3	60.0	Geom	-	3.65	0.00	N	Arm 13 Ahead	30.00
5/1	U	B	2	3	9.6	Geom	-	3.65	0.00	Y	Arm 6 Right	Inf
5/2	U	B	2	3	9.6	Geom	-	3.65	0.00	N	Arm 6 Right	Inf
5/3	U	B	2	3	9.6	Geom	-	3.65	0.00	N	Arm 6 Right	Inf
6/1	U		2	3	10.4	Inf	-	-	-	-	-	-
6/2	U		2	3	10.4	Inf	-	-	-	-	-	-
6/3	U		2	3	10.4	Inf	-	-	-	-	-	-
7/1	U		2	3	60.0	Inf	-	-	-	-	-	-
7/2	U		2	3	60.0	Inf	-	-	-	-	-	-
7/3	U		2	3	60.0	Inf	-	-	-	-	-	-
8/1	U	D	2	3	5.2	Geom	-	3.65	0.00	Y	Arm 9 Ahead	Inf
											Arm 13 Right	Inf
8/2	U	D	2	3	5.2	Geom	-	3.65	0.00	N	Arm 13 Right	Inf
9/1	U		2	3	60.0	Inf	-	-	-	-	-	-
10/1	U	E	2	3	7.0	Geom	-	3.65	0.00	Y	Arm 12 Ahead	Inf
10/2	U	E	2	3	7.0	Geom	-	3.65	0.00	N	Arm 5 Right	Inf
											Arm 12 Ahead	Inf
11/1	U		2	3	60.0	Inf	-	-	-	-	-	-
11/2	U		2	3	60.0	Inf	-	-	-	-	-	-
12/1	U		2	3	60.0	Inf	-	-	-	-	-	-
12/2	U		2	3	60.0	Inf	-	-	-	-	-	-
13/1	U		2	3	8.7	Inf	-	-	-	-	-	-
13/2	U		2	3	8.7	Inf	-	-	-	-	-	-
13/3	U		2	3	8.7	Inf	-	-	-	-	-	-

Full Input Data And Results

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'ArdleyEast6 AM'	07:45	08:45	01:00	
2: 'ArdleyEast6 PM'	16:30	17:30	01:00	

Scenario 1: '2031 ArdleyEast11, 13 AM' (FG1: 'ArdleyEast6 AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	754	151	232	1137
	B	1300	0	320	298	1918
	C	10	104	0	7	121
	D	437	1381	8	40	1866
	Tot.	1747	2239	479	577	5042

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: 2031 ArdleyEast11, 13 AM
Junction: Ardley East	
1/1 (short)	363
1/2 (with short)	753(In) 390(Out)
1/3	384
2/1	602
2/2	632
2/3	632
3/1	121
4/1 (short)	591
4/2 (with short)	1317(In) 726(Out)
4/3	601
5/1	223
5/2	657
5/3	653
6/1	586
6/2	1047
6/3	1037
7/1	586
7/2	1047
7/3	606
8/1	212
8/2	219
9/1	479
10/1	709
10/2	705
11/1	331
11/2	246
12/1	1146
12/2	601
13/1	324
13/2	945
13/3	601

Full Input Data And Results

Lane Saturation Flows

Junction: Ardley East								
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	3.65	0.00	Y	Arm 6 Ahead	30.00	100.0 %	1886	1886
1/2	3.65	0.00	N	Arm 6 Ahead	30.00	100.0 %	2019	2019
1/3	3.65	0.00	N	Arm 6 Ahead	30.00	100.0 %	2019	2019
2/1	3.65	0.00	Y	Arm 5 Ahead	45.00	27.4 %	1916	1916
				Arm 12 Left	45.00	72.6 %		
2/2	3.65	0.00	N	Arm 5 Ahead	45.00	100.0 %	2052	2052
2/3	3.65	0.00	N	Arm 5 Ahead	45.00	100.0 %	2052	2052
3/1	This lane uses a directly entered Saturation Flow						1900	1900
4/1	3.65	0.00	Y	Arm 9 Left	30.00	54.1 %	1886	1886
				Arm 13 Ahead	30.00	45.9 %		
4/2	3.65	0.00	N	Arm 13 Ahead	30.00	100.0 %	2019	2019
4/3	3.65	0.00	N	Arm 13 Ahead	30.00	100.0 %	2019	2019
5/1	3.65	0.00	Y	Arm 6 Right	Inf	100.0 %	1980	1980
5/2	3.65	0.00	N	Arm 6 Right	Inf	100.0 %	2120	2120
5/3	3.65	0.00	N	Arm 6 Right	Inf	100.0 %	2120	2120
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
6/3	Infinite Saturation Flow						Inf	Inf
7/1	Infinite Saturation Flow						Inf	Inf
7/2	Infinite Saturation Flow						Inf	Inf
7/3	Infinite Saturation Flow						Inf	Inf
8/1	3.65	0.00	Y	Arm 9 Ahead	Inf	75.0 %	1980	1980
				Arm 13 Right	Inf	25.0 %		
8/2	3.65	0.00	N	Arm 13 Right	Inf	100.0 %	2120	2120
9/1	Infinite Saturation Flow						Inf	Inf
10/1	3.65	0.00	Y	Arm 12 Ahead	Inf	100.0 %	1980	1980
10/2	3.65	0.00	N	Arm 5 Right	Inf	14.8 %	2120	2120
				Arm 12 Ahead	Inf	85.2 %		
11/1	Infinite Saturation Flow						Inf	Inf
11/2	Infinite Saturation Flow						Inf	Inf
12/1	Infinite Saturation Flow						Inf	Inf
12/2	Infinite Saturation Flow						Inf	Inf
13/1	Infinite Saturation Flow						Inf	Inf
13/2	Infinite Saturation Flow						Inf	Inf
13/3	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 2: '2031 ArdleyEast11, 13 PM' (FG2: 'ArdleyEast6 PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	1141	136	401	1678
	B	840	0	97	259	1196
	C	88	106	0	3	197
	D	291	1908	7	67	2273
	Tot.	1219	3155	240	730	5344

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2031 ArdleyEast11, 13 PM
Junction: Ardley East	
1/1 (short)	551
1/2 (with short)	1141(In) 590(Out)
1/3	537
2/1	725
2/2	774
2/3	774
3/1	197
4/1 (short)	350
4/2 (with short)	839(In) 489(Out)
4/3	357
5/1	475
5/2	811
5/3	802
6/1	1026
6/2	1401
6/3	1339
7/1	1026
7/2	1401
7/3	728
8/1	292
8/2	319
9/1	240
10/1	571
10/2	463
11/1	405
11/2	325
12/1	862
12/2	357
13/1	402
13/2	808
13/3	357

Full Input Data And Results

Lane Saturation Flows

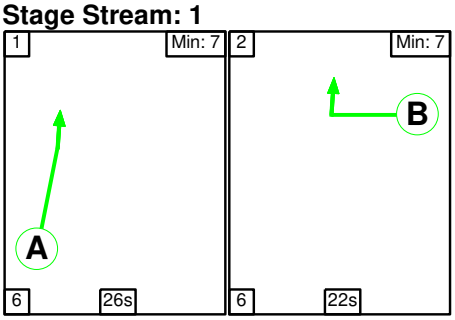
Junction: Ardley East								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1	3.65	0.00	Y	Arm 6 Ahead	30.00	100.0 %	1886	1886
1/2	3.65	0.00	N	Arm 6 Ahead	30.00	100.0 %	2019	2019
1/3	3.65	0.00	N	Arm 6 Ahead	30.00	100.0 %	2019	2019
2/1	3.65	0.00	Y	Arm 5 Ahead	45.00	59.9 %	1916	1916
				Arm 12 Left	45.00	40.1 %		
2/2	3.65	0.00	N	Arm 5 Ahead	45.00	100.0 %	2052	2052
2/3	3.65	0.00	N	Arm 5 Ahead	45.00	100.0 %	2052	2052
3/1	This lane uses a directly entered Saturation Flow						1900	1900
4/1	3.65	0.00	Y	Arm 9 Left	30.00	27.7 %	1886	1886
				Arm 13 Ahead	30.00	72.3 %		
4/2	3.65	0.00	N	Arm 13 Ahead	30.00	100.0 %	2019	2019
4/3	3.65	0.00	N	Arm 13 Ahead	30.00	100.0 %	2019	2019
5/1	3.65	0.00	Y	Arm 6 Right	Inf	100.0 %	1980	1980
5/2	3.65	0.00	N	Arm 6 Right	Inf	100.0 %	2120	2120
5/3	3.65	0.00	N	Arm 6 Right	Inf	100.0 %	2120	2120
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
6/3	Infinite Saturation Flow						Inf	Inf
7/1	Infinite Saturation Flow						Inf	Inf
7/2	Infinite Saturation Flow						Inf	Inf
7/3	Infinite Saturation Flow						Inf	Inf
8/1	3.65	0.00	Y	Arm 9 Ahead	Inf	49.0 %	1980	1980
				Arm 13 Right	Inf	51.0 %		
8/2	3.65	0.00	N	Arm 13 Right	Inf	100.0 %	2120	2120
9/1	Infinite Saturation Flow						Inf	Inf
10/1	3.65	0.00	Y	Arm 12 Ahead	Inf	100.0 %	1980	1980
10/2	3.65	0.00	N	Arm 5 Right	Inf	22.9 %	2120	2120
				Arm 12 Ahead	Inf	77.1 %		
11/1	Infinite Saturation Flow						Inf	Inf
11/2	Infinite Saturation Flow						Inf	Inf
12/1	Infinite Saturation Flow						Inf	Inf
12/2	Infinite Saturation Flow						Inf	Inf
13/1	Infinite Saturation Flow						Inf	Inf
13/2	Infinite Saturation Flow						Inf	Inf
13/3	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

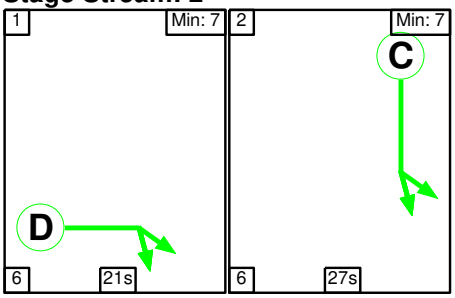
Scenario 1: '2031 ArdleyEast11, 13 AM' (FG1: 'ArdleyEast6 AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

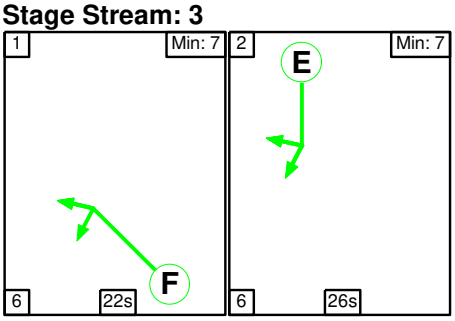
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	26	22
Change Point	0	32

Stage Stream: 2

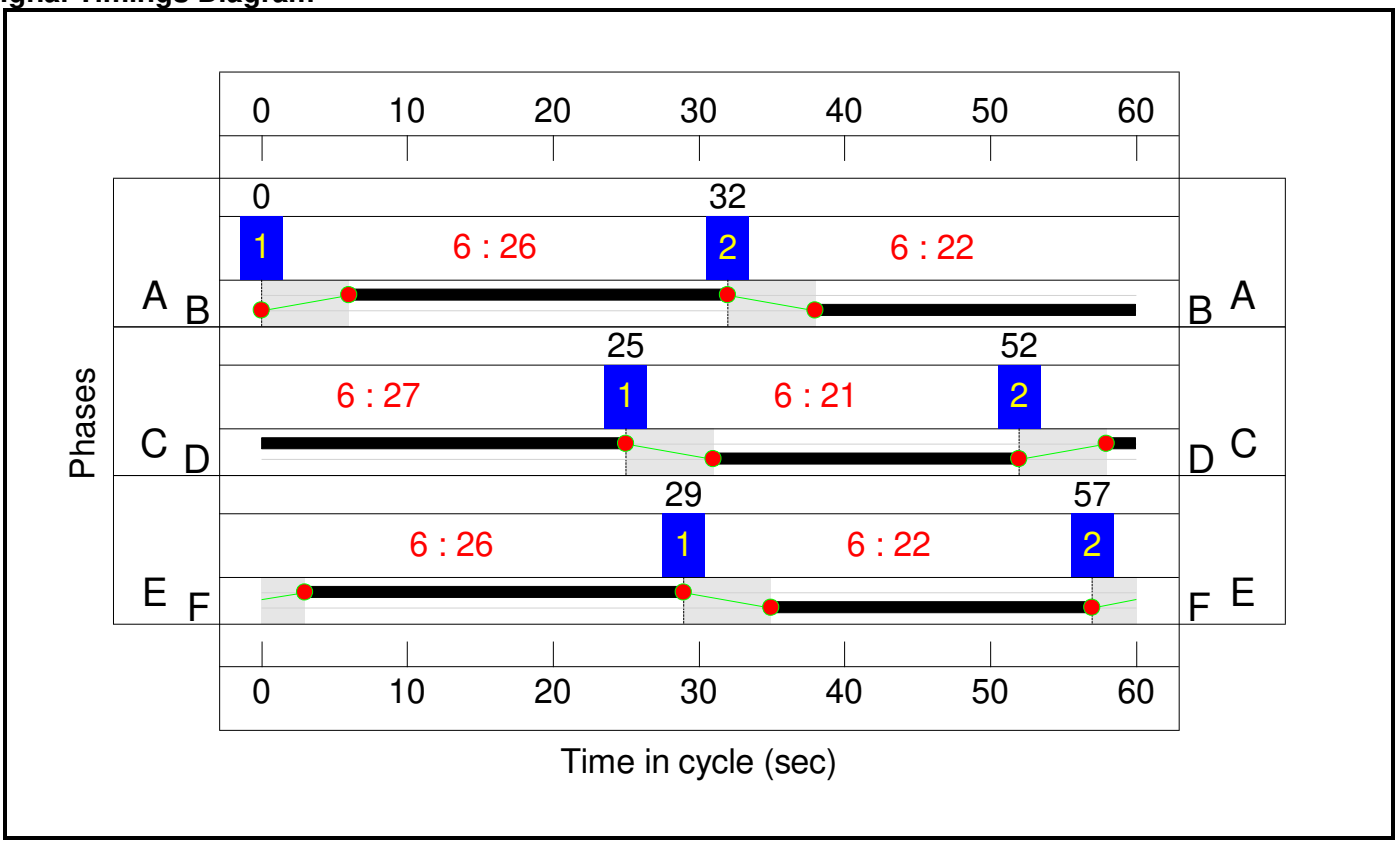
Stage	1	2
Duration	21	27
Change Point	25	52

Stage Stream: 3

Stage	1	2
Duration	22	26
Change Point	29	57

Full Input Data And Results

Signal Timings 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 (%)
Network: Ardley East Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.0%**
Ardley East	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.0%**
1/2+1/1	Ahead	U	1	N/A	A		1	26	-	753	2019:1886	909+849	42.9 : 42.8%
1/3	Ahead	U	1	N/A	A		1	26	-	384	2019	909	42.3%
2/1	Ahead Left	U	3	N/A	F		1	22	-	602	1916	734	82.0%
2/2	Ahead	U	3	N/A	F		1	22	-	632	2052	787	80.3%
2/3	Ahead	U	3	N/A	F		1	22	-	632	2052	787	80.3%
3/1	Left U-Turn	O	N/A	N/A	-		-	-	-	121	1900	526	23.0%
4/2+4/1	Left Ahead	U	2	N/A	C		1	27	-	1317	2019:1886	942+772	77.1 : 76.5%
4/3	Ahead	U	2	N/A	C		1	27	-	601	2019	942	63.8%
5/1	Right	U	1	N/A	B		1	22	-	223	1980	759	29.4%
5/2	Right	U	1	N/A	B		1	22	-	657	2120	813	80.8%
5/3	Right	U	1	N/A	B		1	22	-	653	2120	813	80.4%
6/1	Ahead	U	N/A	N/A	-		-	-	-	586	Inf	Inf	0.0%
6/2	Ahead	U	N/A	N/A	-		-	-	-	1047	Inf	Inf	0.0%
6/3	Ahead Right	U	N/A	N/A	-		-	-	-	1037	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	586	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	1047	Inf	Inf	0.0%
7/3		U	N/A	N/A	-		-	-	-	606	Inf	Inf	0.0%
8/1	Ahead Right	U	2	N/A	D		1	21	-	212	1980	726	29.2%
8/2	Right	U	2	N/A	D		1	21	-	219	2120	777	28.2%
9/1		U	N/A	N/A	-		-	-	-	479	Inf	Inf	0.0%
10/1	Ahead	U	3	N/A	E		1	26	-	709	1980	891	79.6%
10/2	Right Ahead	U	3	N/A	E		1	26	-	705	2120	954	73.9%
11/1		U	N/A	N/A	-		-	-	-	331	Inf	Inf	0.0%

Full Input Data And Results

11/2		U	N/A	N/A	-		-	-	-	246	Inf	Inf	0.0%
12/1		U	N/A	N/A	-		-	-	-	1146	Inf	Inf	0.0%
12/2		U	N/A	N/A	-		-	-	-	601	Inf	Inf	0.0%
13/1	Ahead	U	N/A	N/A	-		-	-	-	324	Inf	Inf	0.0%
13/2	Ahead Ahead2	U	N/A	N/A	-		-	-	-	945	Inf	Inf	0.0%
13/3	Ahead	U	N/A	N/A	-		-	-	-	601	Inf	Inf	0.0%

Full Input Data And Results

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)
Network: Ardley East Roundabout	**-**	**-**	**121**	**0**	**0**	**22.5**	**9.6**	**0.0**	**32.1**	**-**	**-**	**-**	**-**
Ardley East	**-**	**-**	**121**	**0**	**0**	**22.5**	**9.6**	**0.0**	**32.1**	**-**	**-**	**-**	**-**
1/2+1/1	753	753	-	-	-	2.4	0.4	-	2.7 (1.4+1.3)	13.0 (13.0:13.0)	4.3	0.4	4.7
1/3	384	384	-	-	-	1.2	0.4	-	1.6	14.6	4.3	0.4	4.6
2/1	602	602	-	-	-	2.8	2.2	-	5.0	29.8	8.9	2.2	11.1
2/2	632	632	-	-	-	2.9	2.0	-	4.9	27.8	9.3	2.0	11.3
2/3	632	632	-	-	-	2.9	2.0	-	4.9	27.8	9.3	2.0	11.3
3/1	121	121	121	0	0	0.1	0.1	-	0.3	7.9	0.8	0.1	0.9
4/2+4/1	1317	1317	-	-	-	4.7	1.6	-	6.4 (3.6+2.8)	17.4 (17.8:16.9)	9.9	1.6	11.5
4/3	601	601	-	-	-	2.0	0.9	-	2.9	17.4	7.5	0.9	8.4
5/1	223	223	-	-	-	0.4	0.0	-	0.4	6.3	1.2	0.0	1.2
5/2	657	657	-	-	-	0.3	0.0	-	0.3	1.4	0.6	0.0	0.6
5/3	653	653	-	-	-	0.2	0.0	-	0.2	1.3	0.5	0.0	0.5
6/1	586	586	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1047	1047	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/3	1037	1037	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	586	586	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	1047	1047	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/3	606	606	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	212	212	-	-	-	0.8	0.0	-	0.8	13.4	3.2	0.0	3.2
8/2	219	219	-	-	-	0.9	0.0	-	0.9	14.2	3.2	0.0	3.2
9/1	479	479	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	709	709	-	-	-	0.3	0.0	-	0.3	1.7	0.7	0.0	0.7
10/2	705	705	-	-	-	0.6	0.0	-	0.6	3.3	2.2	0.0	2.2
11/1	331	331	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

11/2	246	246	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	1146	1146	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/2	601	601	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
13/1	324	324	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
13/2	945	945	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
13/3	601	601	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

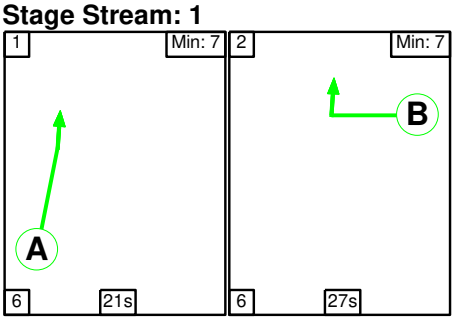
C1	Stream: 1	PRC for Signalled Lanes (%):	11.3	Total Delay for Signalled Lanes (pcuHr):	5.17	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	16.8	Total Delay for Signalled Lanes (pcuHr):	10.93	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	9.8	Total Delay for Signalled Lanes (pcuHr):	15.74	Cycle Time (s):	60
		PRC Over All Lanes (%):	9.8	Total Delay Over All Lanes(pcuHr):	32.11		

Full Input Data And Results

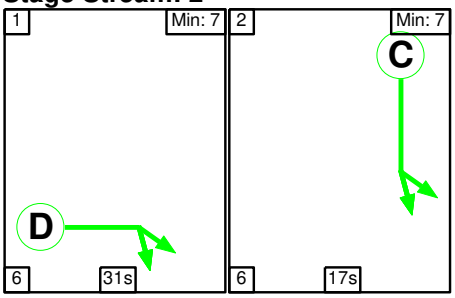
Scenario 2: '2031 ArdleyEast11, 13 PM' (FG2: 'ArdleyEast6 PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

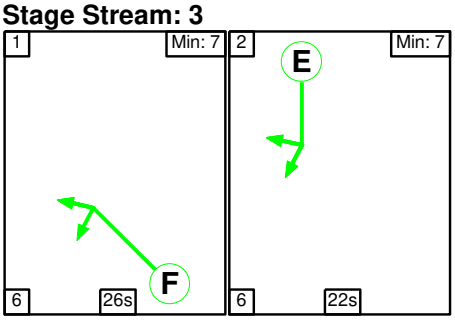
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	21	27
Change Point	0	27

Stage Stream: 2

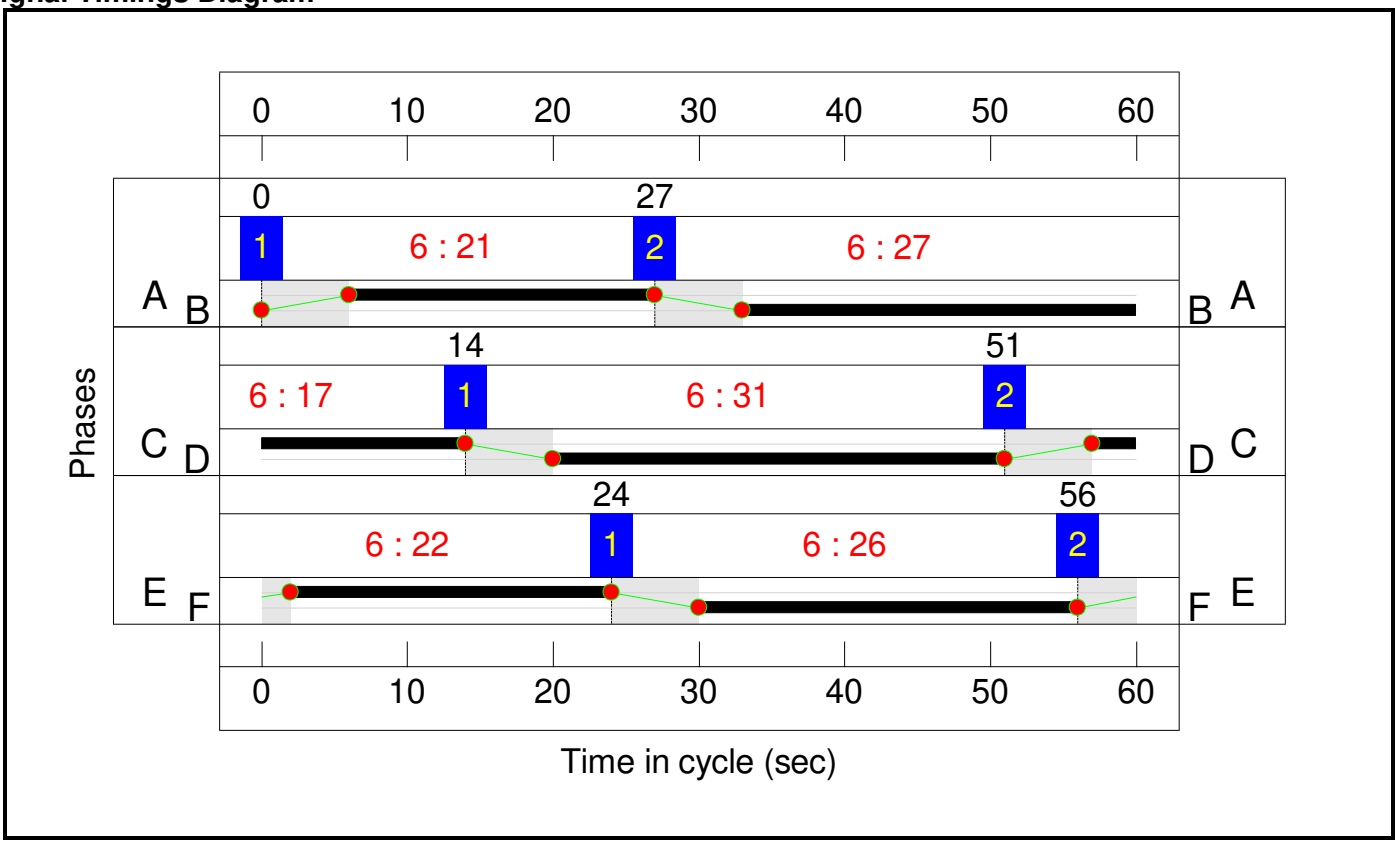
Stage	1	2
Duration	31	17
Change Point	14	51

Stage Stream: 3

Stage	1	2
Duration	26	22
Change Point	24	56

Full Input Data And Results

Signal Timings 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 (%)
Network: Ardley East Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**84.1%**
Ardley East	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**84.1%**
1/2+1/1	Ahead	U	1	N/A	A		1	21	-	1141	2019:1886	740+692	79.7 : 79.7%
1/3	Ahead	U	1	N/A	A		1	21	-	537	2019	740	72.5%
2/1	Ahead Left	U	3	N/A	F		1	26	-	725	1916	862	84.1%
2/2	Ahead	U	3	N/A	F		1	26	-	774	2052	923	83.8%
2/3	Ahead	U	3	N/A	F		1	26	-	774	2052	923	83.8%
3/1	Left U-Turn	O	N/A	N/A	-		-	-	-	197	1900	605	32.5%
4/2+4/1	Left Ahead	U	2	N/A	C		1	17	-	839	2019:1886	606+566	80.7 : 61.9%
4/3	Ahead	U	2	N/A	C		1	17	-	357	2019	606	58.9%
5/1	Right	U	1	N/A	B		1	27	-	475	1980	924	51.4%
5/2	Right	U	1	N/A	B		1	27	-	811	2120	989	82.0%
5/3	Right	U	1	N/A	B		1	27	-	802	2120	989	81.1%
6/1	Ahead	U	N/A	N/A	-		-	-	-	1026	Inf	Inf	0.0%
6/2	Ahead	U	N/A	N/A	-		-	-	-	1401	Inf	Inf	0.0%
6/3	Ahead Right	U	N/A	N/A	-		-	-	-	1339	Inf	Inf	0.0%
7/1		U	N/A	N/A	-		-	-	-	1026	Inf	Inf	0.0%
7/2		U	N/A	N/A	-		-	-	-	1401	Inf	Inf	0.0%
7/3		U	N/A	N/A	-		-	-	-	728	Inf	Inf	0.0%
8/1	Ahead Right	U	2	N/A	D		1	31	-	292	1980	1056	27.7%
8/2	Right	U	2	N/A	D		1	31	-	319	2120	1131	28.2%
9/1		U	N/A	N/A	-		-	-	-	240	Inf	Inf	0.0%
10/1	Ahead	U	3	N/A	E		1	22	-	571	1980	759	75.2%
10/2	Right Ahead	U	3	N/A	E		1	22	-	463	2120	813	57.0%
11/1		U	N/A	N/A	-		-	-	-	405	Inf	Inf	0.0%

Full Input Data And Results

11/2		U	N/A	N/A	-		-	-	-	325	Inf	Inf	0.0%
12/1		U	N/A	N/A	-		-	-	-	862	Inf	Inf	0.0%
12/2		U	N/A	N/A	-		-	-	-	357	Inf	Inf	0.0%
13/1	Ahead	U	N/A	N/A	-		-	-	-	402	Inf	Inf	0.0%
13/2	Ahead Ahead2	U	N/A	N/A	-		-	-	-	808	Inf	Inf	0.0%
13/3	Ahead	U	N/A	N/A	-		-	-	-	357	Inf	Inf	0.0%

Full Input Data And Results

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)
Network: Ardley East Roundabout	**-**	**-**	**197**	**0**	**0**	**25.3**	**13.0**	**0.0**	**38.3**	**-**	**-**	**-**	**-**
Ardley East	**-**	**-**	**197**	**0**	**0**	**25.3**	**13.0**	**0.0**	**38.3**	**-**	**-**	**-**	**-**
1/2+1/1	1141	1141	-	-	-	5.4	1.9	-	7.3 (3.8+3.5)	23.1 (23.1:23.1)	8.7	1.9	10.6
1/3	537	537	-	-	-	2.4	1.3	-	3.7	25.1	7.6	1.3	8.9
2/1	725	725	-	-	-	2.9	2.5	-	5.5	27.3	10.7	2.5	13.2
2/2	774	774	-	-	-	3.1	2.5	-	5.6	26.2	11.2	2.5	13.7
2/3	774	774	-	-	-	3.1	2.5	-	5.6	26.2	11.2	2.5	13.7
3/1	197	197	197	0	0	0.1	0.2	-	0.4	6.9	1.0	0.2	1.2
4/2+4/1	839	839	-	-	-	4.4	1.3	-	5.6 (3.4+2.3)	24.2 (24.8:23.4)	7.5	1.3	8.7
4/3	357	357	-	-	-	1.8	0.7	-	2.5	25.1	5.1	0.7	5.8
5/1	475	475	-	-	-	0.2	0.0	-	0.2	1.8	0.7	0.0	0.7
5/2	811	811	-	-	-	0.2	0.0	-	0.2	0.9	1.2	0.0	1.2
5/3	802	802	-	-	-	0.2	0.0	-	0.2	0.7	0.5	0.0	0.5
6/1	1026	1026	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1401	1401	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/3	1339	1339	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	1026	1026	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	1401	1401	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/3	728	728	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	292	292	-	-	-	0.4	0.0	-	0.4	4.9	3.9	0.0	3.9
8/2	319	319	-	-	-	0.4	0.0	-	0.4	4.0	4.5	0.0	4.5
9/1	240	240	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	571	571	-	-	-	0.3	0.0	-	0.3	1.9	0.9	0.0	0.9
10/2	463	463	-	-	-	0.3	0.0	-	0.3	2.6	1.1	0.0	1.1
11/1	405	405	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

11/2	325	325	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	862	862	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/2	357	357	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
13/1	402	402	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
13/2	808	808	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
13/3	357	357	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1	Stream: 1	PRC for Signalled Lanes (%):	9.8	Total Delay for Signalled Lanes (pcuHr):	11.68	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	11.5	Total Delay for Signalled Lanes (pcuHr):	8.89	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	7.0	Total Delay for Signalled Lanes (pcuHr):	17.40	Cycle Time (s):	60
		PRC Over All Lanes (%):	7.0	Total Delay Over All Lanes(pcuHr):	38.34		

APPENDIX K

ARDLEY EAST ROUNDABOUT OPTION AE-8 LINSIG MODEL AUDIT AND REVISED RESULTS

LINSIG V3 Model Checking Report

AECOM

Project:	**OXFORDSHIRE SRFI-M40 Junction 10**	Job No:	**xxxxx**
Model:	**2031_DS_M40J10_ArdleyEast_AE8_ArdleyEast9 (Signals Option) - No Ardley Rd Link.lsg3x**	Model Submitted:	**16/07/2021**
		Corrections Submitted:	**Date Submitted**

Modelled By: ADC Infrastructure **Checked by: Weiping Guo** **Approved by:**

This note is to document the checks made to LINSIG models. Once completed this should be filed with the model, or model outputs for future reference.

Results Key

× - Changes required before work is signed off
? – Changes may be required before work is signed off, further work required
✓ - No further changes required before work is signed off

File Checked: Hyperlink to model

Network Information

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Scenario title(s) entered	✓			
08/08/21	Project name entered	✓			
08/08/21	Modeller details recorded	✓			
08/08/21	Network location details entered	✓			
08/08/21	File name is logical	✓			

Network Setup

Junction Drawings: In report 'OxSRFI-ADC1794-RP-M-V3 'TN5 M40 Junction 10 Options Report' – appendices' Page no.54
Sat Flow Measurements / Calculations: Hyperlink to Sat Flow Measurements

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	Junctions				
08/08/21	Appropriate junctions setup	✓			
08/08/21	Junction info/ signal controllers complete	✓			
08/08/21	Logical arm structure setup	✓			
	Lanes				
08/08/21	Lane setup reflects junction drawings	X	Arm3 lane 1 is showing long lane from the drawing but it is short lane in the model.	Arm 3 lane 1 converted to a 'long lane'.	
08/08/21	Check each lane that is signal controlled	✓	Phase E is not in use, could be deleted.	Phase E removed.	
08/08/21	Lanes matched to controller and phase	✓	.		
08/08/21	Lane length appropriate	X	Arm3 lane 1 is showing long lane from the drawing but it is short lane in the model.	Arm 3 lane 1 converted to a 'long lane'.	
08/08/21	Custom occupancy (if req)	N/A			
	Saturation Flows				
08/08/21	Justified method to derive saturation flows				
08/08/21	Check observed sat flows (if used)	N/A			
08/08/21	Check RR67 sat flows calculations (if used)	x	1. Entry Arms 1 and 2 lanes saturation flows were calculated by RR67 methods, however all the lanes were treated as the 'nearside lane'. And the turning radius seemingly are randomly setup that affects the lanes sat flow calculation. Please double check. 2. Entry Arm 3 lanes saturation flows are directly entered, can you please explain why? 3. All the circulatory lanes Sat flow are directly entered. As all the entry arms are using RR67, we recommend the circulatory lanes adopt the same method of calculations. Also the direct entered Sat flow are lower than the entry arms Sat flow which can cause the issues. In general, the downstream lanes sat flow should be equal or greater than the entry lanes Sat flows, unless there is evidence supporting there is 'bottle neck' issues at the downstream.	1. Central lanes and offside lanes have 'nearside lane' de-selected. All turning radii checked and increased where applicable 2. Arm 3 sat flows changed to RR67. 3. All circulating lanes have RR67 parameters applied such that all circulating saturation flows are equal or greater than the entry lanes.	
08/08/21	Check external sat flows calculations (if used)				
08/08/21	Check sat flows for any bottleneck links	N/A			
	Advanced Lane Settings				
08/08/21	Use of start / end green displacements (if req)	✓			
08/08/21	Use of queue limits on short links (if req)	X	1. Arm 4 all lanes queue limits are set to 1pcu which seemingly is too low according to the drawing measure. 2. Arm 7 all lanes queue limits are set to 2pcus which seemingly is too low according to the drawing measure.	1. Queue limit on Arm 4 increased to 2 pcus. 2. Queue limit on Arm 7 increased to 3 pcus. 3. Queue limit on arm 8 increased to 4 pcus.	

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United Kingdom

			3. Arm 8 all lanes queue limits are set to 2pcus which seemingly is too low according to the drawing measure.		
08/08/21	Use of weightings for optimiser constraints (if req)	✓			
08/08/21	Use of random delay or queue de-sliver (if req)	X	1. Arm 4 Lane 1 de-sliver is set to 1pcu and this is not necessary. 2. Arm 8 lane 1 and 2 de-sliver is set to 1pcu, after check the queue profile, this may not be realistic. We recommend to avoid using the de-sliver if possible and this could be achieved by setting up the signals coordination between the nodes, and if necessary, use 0.5pcu instead. 3. Arm8 lane 1 selected 'ignore random delay' but not lane 2?	1. Arm 4 de-sliver factors removed. 2. Arm 8 lane 1 de-sliver factor reduced to 0.5. Arm 8 lane 2 de-sliver factor removed. 3. 'Ignore random delay' selected for Arm 8 lane 2.	
	Give Ways				
08/08/21	Check each lane that is priority controlled	N/A			
08/08/21	Measurement of max/min flow when giving way	N/A			
08/08/21	Flow when opposing traffic stopped reasonable	N/A			
08/08/21	Measurement of give-way co-efficient	N/A			
08/08/21	Measurement of clear conflict time of opposing traffic	N/A			
08/08/21	Check all controlling movements identified	N/A			
08/08/21	Measurement of storage in front of stop-line	N/A			
08/08/21	Max turns in inter-green reasonable	N/A			
08/08/21	Measurement of non-blocking storage	N/A			
	Lane Connectors				
08/08/21	Lane connectors provided reasonable	X	According to the provided drawing, Arm 7 lane 1 should connect Arm 11 lane 1 and lane 2, and Arm 7 lane 2 should connect Arm 11 lane 3.	Lane allocation in the model is correct. The drawing will be updated in due course.	
08/08/21	Cruise time reasonable	✓	45km/hr cruise speed is applied for all the link connectors.		
08/08/21	Default platoon dispersion used unless observed	X	The platoon dispersion on the short links should be switched off.	Platoon dispersion switched off.	
	Zones				
08/08/21	Zones match O-D matrix	?	ArdleyEast6_AM flow matches flow set ArdleyEast9_AM in the report page 96, and the name is very confusing; ArdleyEast6_PM flow matches flow set ArdleyEast9_PM in the report page 97, and the name is very confusing; It is very confusing in the report 'OXSRFI-ADC1794-RP-N-V2'TN6-M40J10 OR Traffic Flow Derivation' – bound file regarding the flow sets name. As the flow set ArdleyEast6 is for the strategic Options: 10,11,12 stated in the report, and the matches ArdleyEast9 flow sets are referring to strategic options 11,13,18 and 19, and there is overlap of strategic option 11 for both flow sets. Can you please clarify?	ArdleyEast9 flow sets are used in this model to test strategic options 18 and 19.	

	Pedestrians				
08/08/21	Ped crossings represented by ped links (if req)	N/A			
08/08/21	Ped link data correct (if req)	N/A			
08/08/21	Ped connector walk times reasonable (if req)	N/A			
08/08/21	Ped links matched to appropriate phases (if req)	N/A			
08/08/21	Ped zones match ped O-D matrix (if req)	N/A			

Controllers

Controller Specifications: Hyperlink to Controller Specification (if req)
Intergreen Calculations: Hyperlink to Intergreen Calculations (if req)

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	General Controller Set-up				
08/08/21	Sufficient controllers setup	✓			
08/08/21	Multiple stage streams setup correctly (if req)	✓			
08/08/21	Non-standard filters setup correctly (if req)	N/A			
	Signal Settings				
08/08/21	Check phases for each controller	✓			
08/08/21	Check phase mins/type reasonable	✓			
08/08/21	Check inter-greens calculations/coding	?	5s inter-green is used for all conflict phases? All other sites are using 6s due to the high speed roads.	All intergreens increased to 6 seconds.	
08/08/21	Stages reasonable	✓			
08/08/21	Phase delays reasonable (if req)	N/A			

Stage Sequences

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date

08/08/21	Check stage sequences observed / optimised	✓			
08/08/21	Check stage timings observed / optimised	N/A			

Traffic Counts and Calculations

Traffic Flow Data: Hyperlink to Traffic Flow Data – in report 'OXSRFI-ADC1794-RP-N-V2 'TN6 - M40 J10 OR Traffic Flow Derivation' – bound'
Matrix Calculations: Hyperlink to Matrix Calculations (if required)
Lane Balancing Calculations: Hyperlink to Lane Balancing Calculations (if required)
Site Observations: Hyperlink to Site Flows Observations

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Suitability of traffic surveys undertaken	N/A			
08/08/21	Are there sufficient site observations	N/A			
08/08/21	Check O-D matrix calculations	X	As stated above, could not find the flow sets from the report that match the model sets.		
08/08/21	Are lane balancing calculations sufficient / consistent	?	To be checked after the above update.		
08/08/21	Does lane balancing match lining	?	To be checked after the above update.		
08/08/21	Does lane balancing match matrices	?	To be checked after the above update.		

Traffic Flows

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Traffic & ped flow (if req) groups setup	?	To be checked after the above update.		
08/08/21	Desired flows match O-D matrices	?	To be checked after the above update.		
08/08/21	Actual flows match desired flows	?	To be checked after the above update.		
08/08/21	Inappropriate routes closed	?	To be checked after the above update.		
08/08/21	Route flows match lane balancing	?	To be checked after the above update.		

Modelling

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
08/08/21	Scenario set up with correct options	✓			
08/08/21	Cycle time appropriate for network control	?	90s cycle time in the 2031 AM is too high for this roundabout, especially considering the short circulatory lanes.		
08/08/21	Cycle time optimised (if req)	N/A			

Results

Checked by/date	Checks Made	Result	Comments	Action taken after Audit	Checked by/date
	Are all values as expected (Demand Flows, Green Times etc)		To be checked after above changes.		
	Deg Sat >100% for existing situation with no modelled suppressed demand?		To be checked after above changes.		
	Deg Sat appropriate? Validated?		To be checked after above changes.		
	Capacity conclusions		To be checked after above changes.		
	If suppressed demand has been modelled, do queues validate?		To be checked after above changes.		
	Queues appropriate?		To be checked after above changes.		
	Queue limits exceeded?		To be checked after above changes.		
	Queuing conclusions (will exit blocking modify these?)		To be checked after above changes.		
	If suppressed demand has been modelled do journey times validate?		To be checked after above changes.		
	Journey time conclusions?		To be checked after above changes.		

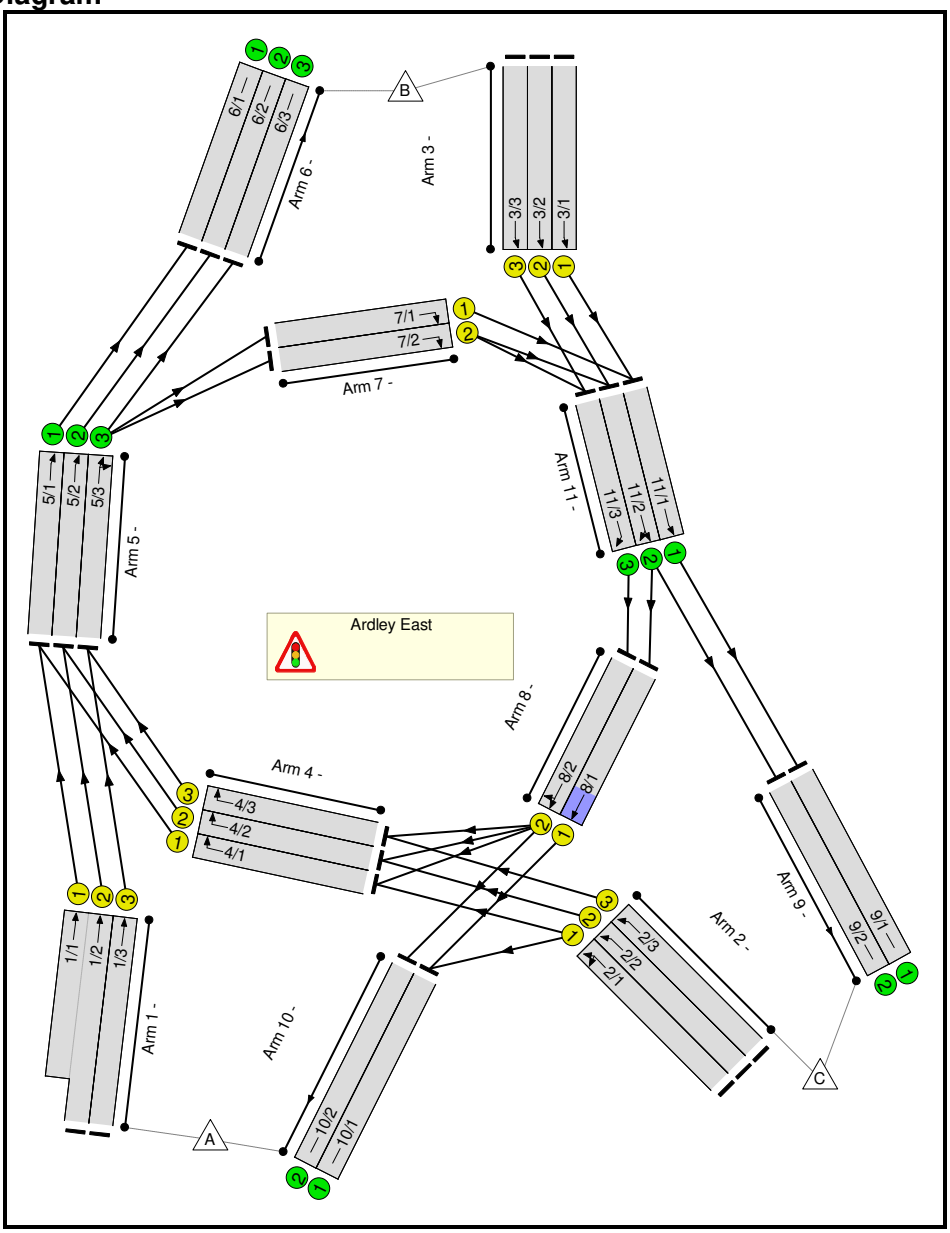
Conclusions and Recommendations

Full Input Data And Results

User and Project Details

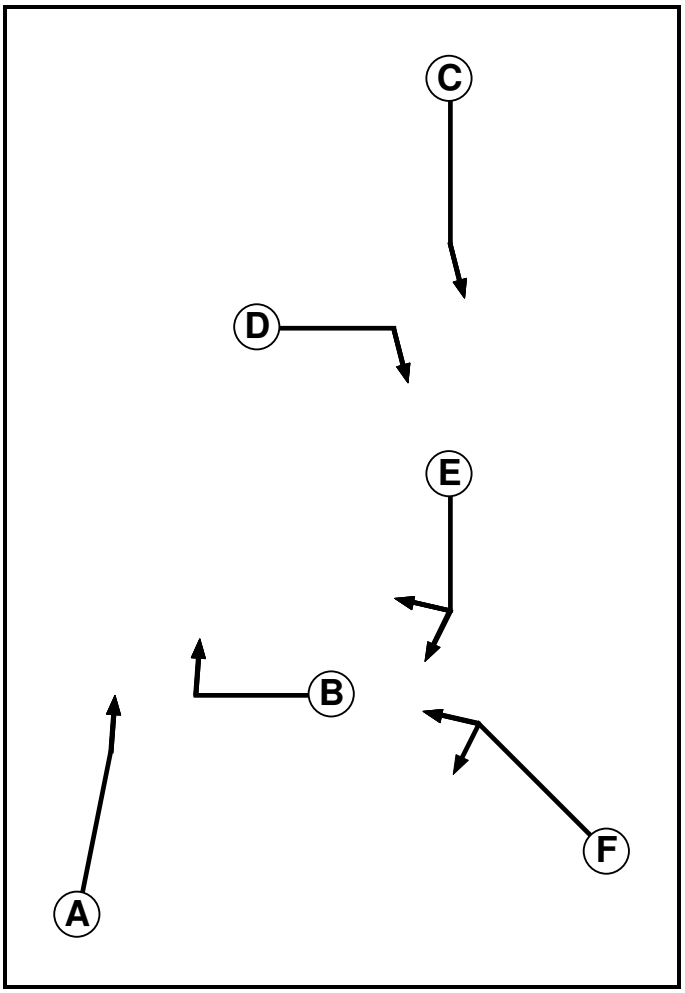
Project:	**OxSRFI**
Title:	**Ardley East Roundabout**
Location:	
Design Layout Ref:	AE-8
Flow Details:	ArdleyEast9_AM ArdleyEast9_PM
Additional detail:	Amended following Aecom comments
File name:	2031_DS_M40J10_ArdleyEast_AE8_ArdleyEast9 (Signals Option).lsg3x
Author:	Matt Tatler
Company:	ADC Infrastructure Limited
Address:	King Edward Court, Nottingham NG1 3EW

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7
E	Traffic	3		7	7
F	Traffic	3		7	7

Full Input Data And Results

Phase Intergreens Matrix

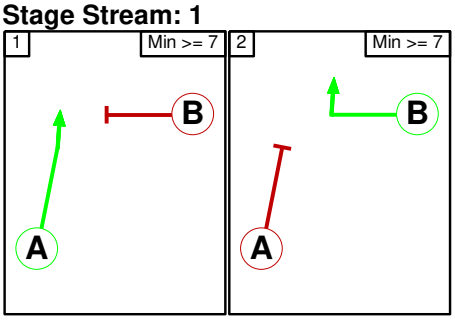
Terminating Phase	Starting Phase					
	A	B	C	D	E	F
A		6	-	-	-	-
B	6		-	-	-	-
C	-	-		6	-	-
D	-	-	6		-	-
E	-	-	-	-		6
F	-	-	-	-	6	

Phases in Stage

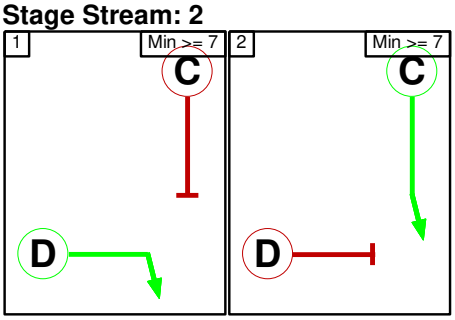
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	D
2	2	C
3	1	F
3	2	E

Stage Diagram

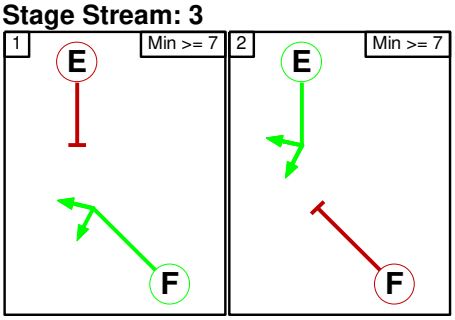
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Full Input Data And Results

Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 2

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 3

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 3

	To Stage		
From Stage		1	2
	1		6
	2	6	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Ardley East
There are no Opposed Lanes in this Junction

Full Input Data And Results

Lane Input Data

Junction: Ardley East												
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	U	A	2	3	20.9	Geom	-	3.65	0.00	Y	Arm 5 Ahead	30.00
1/2	U	A	2	3	60.0	Geom	-	3.65	0.00	N	Arm 5 Ahead	30.00
1/3	U	A	2	3	60.0	Geom	-	3.65	0.00	N	Arm 5 Ahead	30.00
2/1	U	F	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 4 Ahead	50.00
											Arm 10 Left	50.00
2/2	U	F	2	3	60.0	Geom	-	3.65	0.00	N	Arm 4 Ahead	50.00
2/3	U	F	2	3	60.0	Geom	-	3.65	0.00	N	Arm 4 Ahead	50.00
3/1	U	C	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 11 Ahead	30.00
3/2	U	C	2	3	60.0	Geom	-	3.65	0.00	N	Arm 11 Ahead	30.00
3/3	U	C	2	3	60.0	Geom	-	3.65	0.00	N	Arm 11 Ahead	30.00
4/1	U	B	2	3	9.6	Geom	-	3.65	0.00	Y	Arm 5 Right	Inf
4/2	U	B	2	3	9.6	Geom	-	3.65	0.00	N	Arm 5 Right	Inf
4/3	U	B	2	3	9.6	Geom	-	3.65	0.00	N	Arm 5 Right	Inf
5/1	U		2	3	10.4	Inf	-	-	-	-	-	-
5/2	U		2	3	10.4	Inf	-	-	-	-	-	-
5/3	U		2	3	10.4	Inf	-	-	-	-	-	-
6/1	U		2	3	60.0	Inf	-	-	-	-	-	-
6/2	U		2	3	60.0	Inf	-	-	-	-	-	-
6/3	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1	U	D	2	3	5.2	Geom	-	3.65	0.00	Y	Arm 11 Right	Inf
7/2	U	D	2	3	5.2	Geom	-	3.65	0.00	N	Arm 11 Right	Inf
8/1	U	E	2	3	7.0	Geom	-	3.65	0.00	Y	Arm 10 Ahead	Inf
8/2	U	E	2	3	7.0	Geom	-	3.65	0.00	N	Arm 4 Right	Inf
											Arm 10 Ahead	Inf
9/1	U		2	3	60.0	Inf	-	-	-	-	-	-
9/2	U		2	3	60.0	Inf	-	-	-	-	-	-
10/1	U		2	3	60.0	Inf	-	-	-	-	-	-
10/2	U		2	3	60.0	Inf	-	-	-	-	-	-
11/1	U		2	3	8.7	Inf	-	-	-	-	-	-
11/2	U		2	3	8.7	Inf	-	-	-	-	-	-
11/3	U		2	3	8.7	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'ArdleyEast9_AM'	07:45	08:45	01:00	
2: 'ArdleyEast9_PM'	16:30	17:30	01:00	

Full Input Data And Results

Scenario 1: '2031 ArdleyEast18, 19 AM' (FG1: 'ArdleyEast9_AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	754	232	986
	B	1300	0	298	1598
	C	437	1381	40	1858
	Tot.	1737	2135	570	4442

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: 2031 ArdleyEast18, 19 AM
Junction: Ardley East	
1/1 (short)	353
1/2 (with short)	731(In) 378(Out)
1/3	255
2/1	588
2/2	635
2/3	635
3/1	298
3/2	646
3/3	654
4/1	151
4/2	635
4/3	635
5/1	504
5/2	1013
5/3	890
6/1	504
6/2	1013
6/3	618
7/1	133
7/2	139
8/1	646
8/2	654
9/1	431
9/2	139
10/1	1083
10/2	654
11/1	431
11/2	785
11/3	654

Full Input Data And Results

Lane Saturation Flows

Junction: Ardley East								
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	3.65	0.00	Y	Arm 5 Ahead	30.00	100.0 %	1886	1886
1/2	3.65	0.00	N	Arm 5 Ahead	30.00	100.0 %	2019	2019
1/3	3.65	0.00	N	Arm 5 Ahead	30.00	100.0 %	2019	2019
2/1	3.65	0.00	Y	Arm 4 Ahead	50.00	25.7 %	1922	1922
				Arm 10 Left	50.00	74.3 %		
2/2	3.65	0.00	N	Arm 4 Ahead	50.00	100.0 %	2058	2058
2/3	3.65	0.00	N	Arm 4 Ahead	50.00	100.0 %	2058	2058
3/1	3.65	0.00	Y	Arm 11 Ahead	30.00	100.0 %	1886	1886
3/2	3.65	0.00	N	Arm 11 Ahead	30.00	100.0 %	2019	2019
3/3	3.65	0.00	N	Arm 11 Ahead	30.00	100.0 %	2019	2019
4/1	3.65	0.00	Y	Arm 5 Right	Inf	100.0 %	1980	1980
4/2	3.65	0.00	N	Arm 5 Right	Inf	100.0 %	2120	2120
4/3	3.65	0.00	N	Arm 5 Right	Inf	100.0 %	2120	2120
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
5/3	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
6/3	Infinite Saturation Flow						Inf	Inf
7/1	3.65	0.00	Y	Arm 11 Right	Inf	100.0 %	1980	1980
7/2	3.65	0.00	N	Arm 11 Right	Inf	100.0 %	2120	2120
8/1	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 4 Right	Inf	0.0 %	2120	2120
				Arm 10 Ahead	Inf	100.0 %		
9/1	Infinite Saturation Flow						Inf	Inf
9/2	Infinite Saturation Flow						Inf	Inf
10/1	Infinite Saturation Flow						Inf	Inf
10/2	Infinite Saturation Flow						Inf	Inf
11/1	Infinite Saturation Flow						Inf	Inf
11/2	Infinite Saturation Flow						Inf	Inf
11/3	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 2: '2031 ArdleyEast18, 19 PM' (FG2: 'ArdleyEast9_PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	1141	401	1542
	B	840	0	259	1099
	C	291	1908	67	2266
	Tot.	1131	3049	727	4907

Traffic Lane Flows

Lane	Scenario 2: 2031 ArdleyEast18, 19 PM
Junction: Ardley East	
1/1 (short)	527
1/2 (with short)	1091(In) 564(Out)
1/3	451
2/1	716
2/2	775
2/3	775
3/1	259
3/2	418
3/3	422
4/1	425
4/2	775
4/3	775
5/1	952
5/2	1339
5/3	1226
6/1	952
6/2	1339
6/3	758
7/1	223
7/2	245
8/1	418
8/2	422
9/1	482
9/2	245
10/1	709
10/2	422
11/1	482
11/2	663
11/3	422

Full Input Data And Results

Lane Saturation Flows

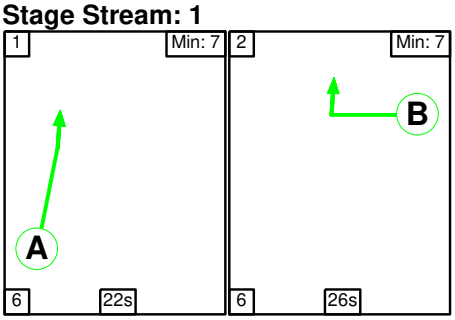
Junction: Ardley East								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1	3.65	0.00	Y	Arm 5 Ahead	30.00	100.0 %	1886	1886
1/2	3.65	0.00	N	Arm 5 Ahead	30.00	100.0 %	2019	2019
1/3	3.65	0.00	N	Arm 5 Ahead	30.00	100.0 %	2019	2019
2/1	3.65	0.00	Y	Arm 4 Ahead	50.00	59.4 %	1922	1922
				Arm 10 Left	50.00	40.6 %		
2/2	3.65	0.00	N	Arm 4 Ahead	50.00	100.0 %	2058	2058
2/3	3.65	0.00	N	Arm 4 Ahead	50.00	100.0 %	2058	2058
3/1	3.65	0.00	Y	Arm 11 Ahead	30.00	100.0 %	1886	1886
3/2	3.65	0.00	N	Arm 11 Ahead	30.00	100.0 %	2019	2019
3/3	3.65	0.00	N	Arm 11 Ahead	30.00	100.0 %	2019	2019
4/1	3.65	0.00	Y	Arm 5 Right	Inf	100.0 %	1980	1980
4/2	3.65	0.00	N	Arm 5 Right	Inf	100.0 %	2120	2120
4/3	3.65	0.00	N	Arm 5 Right	Inf	100.0 %	2120	2120
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
5/3	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
6/3	Infinite Saturation Flow						Inf	Inf
7/1	3.65	0.00	Y	Arm 11 Right	Inf	100.0 %	1980	1980
7/2	3.65	0.00	N	Arm 11 Right	Inf	100.0 %	2120	2120
8/1	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
8/2	3.65	0.00	N	Arm 4 Right	Inf	0.0 %	2120	2120
				Arm 10 Ahead	Inf	100.0 %		
9/1	Infinite Saturation Flow						Inf	Inf
9/2	Infinite Saturation Flow						Inf	Inf
10/1	Infinite Saturation Flow						Inf	Inf
10/2	Infinite Saturation Flow						Inf	Inf
11/1	Infinite Saturation Flow						Inf	Inf
11/2	Infinite Saturation Flow						Inf	Inf
11/3	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

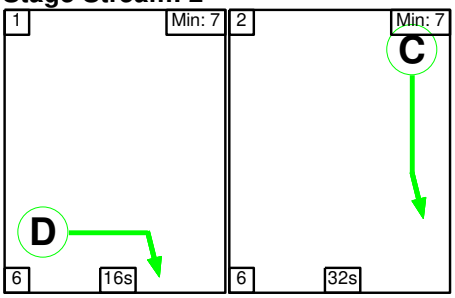
Scenario 1: '2031 ArdleyEast18, 19 AM' (FG1: 'ArdleyEast9_AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

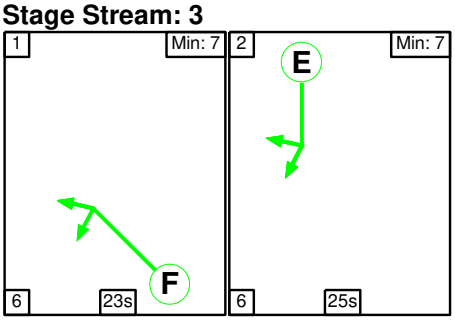
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	22	26
Change Point	0	28

Stage Stream: 2

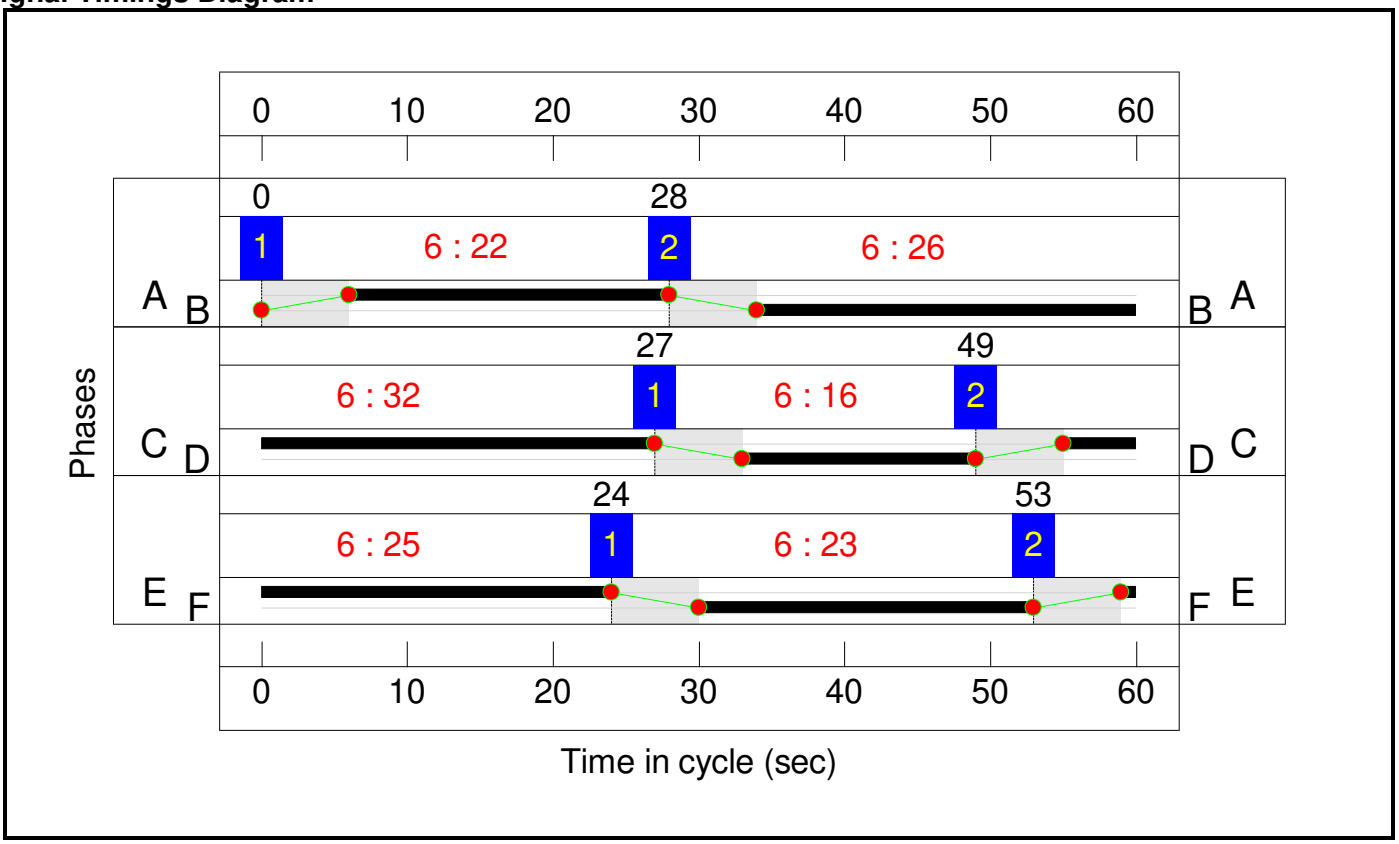
Stage	1	2
Duration	16	32
Change Point	27	49

Stage Stream: 3

Stage	1	2
Duration	23	25
Change Point	24	53

Full Input Data And Results

Signal Timings 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 (%)
Network: Ardley East Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.1%**
Ardley East	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.1%**
1/2+1/1	Ahead	U	1	N/A	A		1	22	-	731	2019:1886	774+723	48.8 : 48.8%
1/3	Ahead	U	1	N/A	A		1	22	-	255	2019	774	32.9%
2/1	Ahead Left	U	3	N/A	F		1	23	-	588	1922	769	76.5%
2/2	Ahead	U	3	N/A	F		1	23	-	635	2058	823	77.1%
2/3	Ahead	U	3	N/A	F		1	23	-	635	2058	823	77.1%
3/1	Ahead	U	2	N/A	C		1	32	-	298	1886	1037	28.7%
3/2	Ahead	U	2	N/A	C		1	32	-	646	2019	1110	58.2%
3/3	Ahead	U	2	N/A	C		1	32	-	654	2019	1110	58.9%
4/1	Right	U	1	N/A	B		1	26	-	151	1980	891	16.9%
4/2	Right	U	1	N/A	B		1	26	-	635	2120	954	66.6%
4/3	Right	U	1	N/A	B		1	26	-	635	2120	954	66.6%
5/1	Ahead	U	N/A	N/A	-		-	-	-	504	Inf	Inf	0.0%
5/2	Ahead	U	N/A	N/A	-		-	-	-	1013	Inf	Inf	0.0%
5/3	Ahead Right	U	N/A	N/A	-		-	-	-	890	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	504	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1013	Inf	Inf	0.0%
6/3		U	N/A	N/A	-		-	-	-	618	Inf	Inf	0.0%
7/1	Right	U	2	N/A	D		1	16	-	133	1980	561	23.7%
7/2	Right	U	2	N/A	D		1	16	-	139	2120	601	23.1%
8/1	Ahead	U	3	N/A	E		1	25	-	646	1980	858	75.3%
8/2	Right Ahead	U	3	N/A	E		1	25	-	654	2120	919	71.2%
9/1		U	N/A	N/A	-		-	-	-	431	Inf	Inf	0.0%
9/2		U	N/A	N/A	-		-	-	-	139	Inf	Inf	0.0%

Full Input Data And Results

10/1		U	N/A	N/A	-		-	-	-	1083	Inf	Inf	0.0%
10/2		U	N/A	N/A	-		-	-	-	654	Inf	Inf	0.0%
11/1	Ahead	U	N/A	N/A	-		-	-	-	431	Inf	Inf	0.0%
11/2	Ahead Ahead2	U	N/A	N/A	-		-	-	-	785	Inf	Inf	0.0%
11/3	Ahead	U	N/A	N/A	-		-	-	-	654	Inf	Inf	0.0%

Full Input Data And Results

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)
Network: Ardley East Roundabout	**-**	**-**	**0**	**0**	**0**	**18.8**	**7.2**	**0.0**	**26.0**	**-**	**-**	**-**	**-**
Ardley East	**-**	**-**	**0**	**0**	**0**	**18.8**	**7.2**	**0.0**	**26.0**	**-**	**-**	**-**	**-**
1/2+1/1	731	731	-	-	-	2.9	0.5	-	3.3 (1.7+1.6)	16.4 (16.4:16.4)	4.7	0.5	5.2
1/3	255	255	-	-	-	0.9	0.2	-	1.2	16.5	3.0	0.2	3.2
2/1	588	588	-	-	-	2.5	1.6	-	4.1	25.3	8.3	1.6	9.9
2/2	635	635	-	-	-	2.8	1.7	-	4.4	25.0	9.2	1.7	10.8
2/3	635	635	-	-	-	2.8	1.7	-	4.4	25.0	9.2	1.7	10.8
3/1	298	298	-	-	-	0.6	0.2	-	0.8	9.7	2.6	0.2	2.9
3/2	646	646	-	-	-	1.6	0.7	-	2.3	12.8	7.0	0.7	7.7
3/3	654	654	-	-	-	1.6	0.7	-	2.3	12.9	7.1	0.7	7.8
4/1	151	151	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	635	635	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/3	635	635	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	504	504	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	1013	1013	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/3	890	890	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	504	504	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1013	1013	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/3	618	618	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	133	133	-	-	-	0.6	0.0	-	0.6	16.3	2.1	0.0	2.1
7/2	139	139	-	-	-	0.6	0.0	-	0.6	16.6	2.1	0.0	2.1
8/1	646	646	-	-	-	1.0	0.0	-	1.0	5.4	2.4	0.0	2.4
8/2	654	654	-	-	-	0.9	0.0	-	0.9	5.1	2.4	0.0	2.4
9/1	431	431	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	139	139	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	1083	1083	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

10/2	654	654	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/1	431	431	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	785	785	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/3	654	654	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

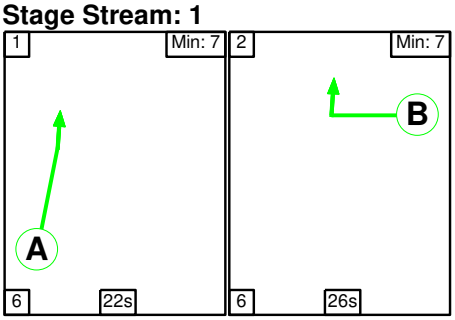
C1	Stream: 1	PRC for Signalled Lanes (%):	35.2	Total Delay for Signalled Lanes (pcuHr):	4.50	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	52.8	Total Delay for Signalled Lanes (pcuHr):	6.69	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	16.7	Total Delay for Signalled Lanes (pcuHr):	14.85	Cycle Time (s):	60
		PRC Over All Lanes (%):	16.7	Total Delay Over All Lanes(pcuHr):	26.04		

Full Input Data And Results

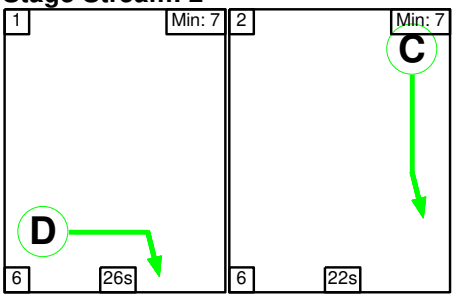
Scenario 2: '2031 ArdleyEast18, 19 PM' (FG2: 'ArdleyEast9_PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

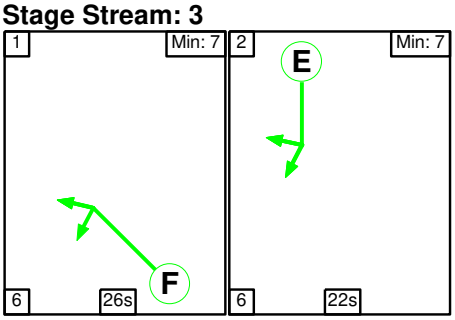
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	22	26
Change Point	0	28

Stage Stream: 2

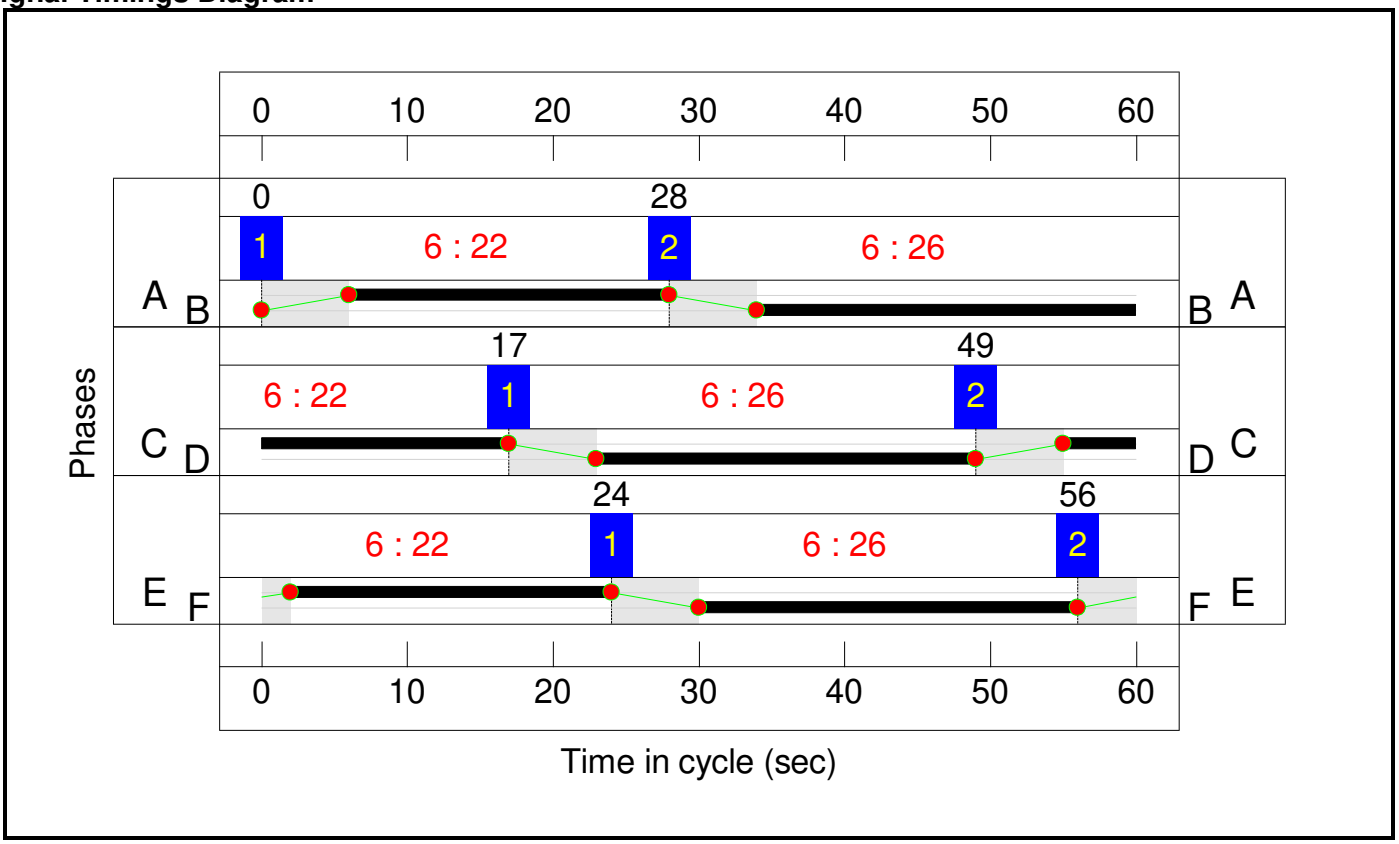
Stage	1	2
Duration	26	22
Change Point	17	49

Stage Stream: 3

Stage	1	2
Duration	26	22
Change Point	24	56

Full Input Data And Results

Signal Timings 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 (%)
Network: Ardley East Roundabout	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**83.7%**
Ardley East	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**83.7%**
1/2+1/1	Ahead	U	1	N/A	A		1	22	-	1091	2019:1886	774+723	72.9 : 72.9%
1/3	Ahead	U	1	N/A	A		1	22	-	451	2019	774	58.3%
2/1	Ahead Left	U	3	N/A	F		1	26	-	716	1922	865	82.8%
2/2	Ahead	U	3	N/A	F		1	26	-	775	2058	926	83.7%
2/3	Ahead	U	3	N/A	F		1	26	-	775	2058	926	83.7%
3/1	Ahead	U	2	N/A	C		1	22	-	259	1886	723	35.8%
3/2	Ahead	U	2	N/A	C		1	22	-	418	2019	774	54.0%
3/3	Ahead	U	2	N/A	C		1	22	-	422	2019	774	54.5%
4/1	Right	U	1	N/A	B		1	26	-	425	1980	891	47.7%
4/2	Right	U	1	N/A	B		1	26	-	775	2120	954	81.2%
4/3	Right	U	1	N/A	B		1	26	-	775	2120	954	81.2%
5/1	Ahead	U	N/A	N/A	-		-	-	-	952	Inf	Inf	0.0%
5/2	Ahead	U	N/A	N/A	-		-	-	-	1339	Inf	Inf	0.0%
5/3	Ahead Right	U	N/A	N/A	-		-	-	-	1226	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	952	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1339	Inf	Inf	0.0%
6/3		U	N/A	N/A	-		-	-	-	758	Inf	Inf	0.0%
7/1	Right	U	2	N/A	D		1	26	-	223	1980	891	25.0%
7/2	Right	U	2	N/A	D		1	26	-	245	2120	954	25.7%
8/1	Ahead	U	3	N/A	E		1	22	-	418	1980	759	55.1%
8/2	Right Ahead	U	3	N/A	E		1	22	-	422	2120	813	51.9%
9/1		U	N/A	N/A	-		-	-	-	482	Inf	Inf	0.0%
9/2		U	N/A	N/A	-		-	-	-	245	Inf	Inf	0.0%

Full Input Data And Results

10/1		U	N/A	N/A	-		-	-	-	709	Inf	Inf	0.0%
10/2		U	N/A	N/A	-		-	-	-	422	Inf	Inf	0.0%
11/1	Ahead	U	N/A	N/A	-		-	-	-	482	Inf	Inf	0.0%
11/2	Ahead Ahead2	U	N/A	N/A	-		-	-	-	663	Inf	Inf	0.0%
11/3	Ahead	U	N/A	N/A	-		-	-	-	422	Inf	Inf	0.0%

Full Input Data And Results

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)
Network: Ardley East Roundabout	**-**	**-**	**0**	**0**	**0**	**21.1**	**10.8**	**0.0**	**31.9**	**-**	**-**	**-**	**-**
Ardley East	**-**	**-**	**0**	**0**	**0**	**21.1**	**10.8**	**0.0**	**31.9**	**-**	**-**	**-**	**-**
1/2+1/1	1091	1091	-	-	-	4.8	1.3	-	6.1 (3.2+3.0)	20.2 (20.2:20.2)	8.0	1.3	9.3
1/3	451	451	-	-	-	1.8	0.7	-	2.5	20.2	5.9	0.7	6.6
2/1	716	716	-	-	-	2.9	2.3	-	5.2	26.2	10.3	2.3	12.7
2/2	775	775	-	-	-	3.1	2.5	-	5.6	26.1	11.2	2.5	13.7
2/3	775	775	-	-	-	3.1	2.5	-	5.6	26.1	11.2	2.5	13.7
3/1	259	259	-	-	-	1.0	0.3	-	1.2	17.1	3.0	0.3	3.3
3/2	418	418	-	-	-	1.7	0.6	-	2.3	19.4	5.3	0.6	5.9
3/3	422	422	-	-	-	1.7	0.6	-	2.3	19.5	5.4	0.6	6.0
4/1	425	425	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	775	775	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/3	775	775	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	952	952	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	1339	1339	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/3	1226	1226	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	952	952	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1339	1339	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/3	758	758	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	223	223	-	-	-	0.5	0.0	-	0.5	8.3	3.0	0.0	3.0
7/2	245	245	-	-	-	0.5	0.0	-	0.5	6.9	3.5	0.0	3.5
8/1	418	418	-	-	-	0.0	0.0	-	0.0	0.1	0.1	0.0	0.1
8/2	422	422	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	482	482	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	245	245	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	709	709	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

10/2	422	422	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/1	482	482	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	663	663	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/3	422	422	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1	Stream: 1	PRC for Signalled Lanes (%):	10.8	Total Delay for Signalled Lanes (pcuHr):	8.67	Cycle Time (s):	60
C1	Stream: 2	PRC for Signalled Lanes (%):	65.1	Total Delay for Signalled Lanes (pcuHr):	6.76	Cycle Time (s):	60
C1	Stream: 3	PRC for Signalled Lanes (%):	7.5	Total Delay for Signalled Lanes (pcuHr):	16.45	Cycle Time (s):	60
		PRC Over All Lanes (%):	7.5	Total Delay Over All Lanes(pcuHr):	31.88		