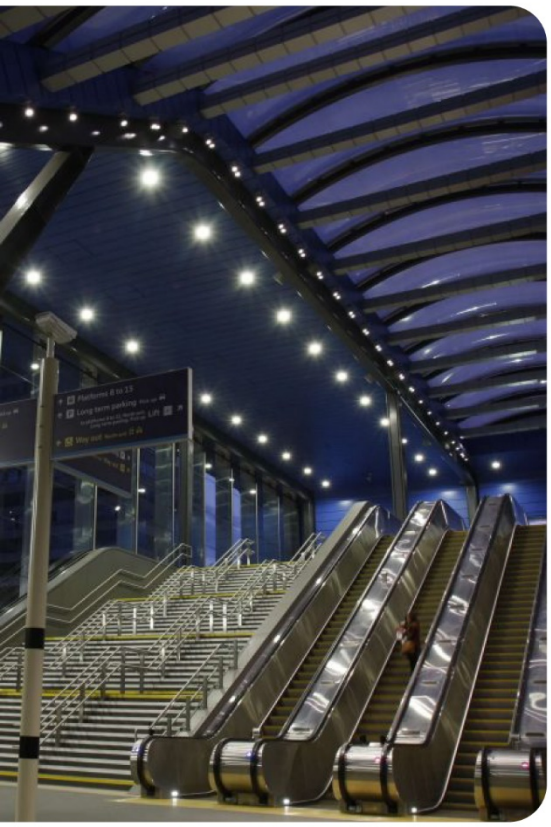

mode
transport planning

Barratt David Wilson Homes (Mercia)

Land off Hither Green Lane, Redditch

Proof of Evidence (PINS Ref: APP/Q1825/W/24/3350905)

January 2025

modetransport.co.uk

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1. Introduction

1.1 Personal Statement

1.1.1 My name is Ben Fairgrieve, and I am a Director at mode transport planning (mode), which is a transport planning consultancy that provides independent transport planning advice to developers, as well as Local Authorities.

1.1.2 I am a Bachelor of Arts Graduate (with Honours) in Geography from The University of Wales, Swansea, having gained this degree in 2003. I am also a Member of the Chartered Institution of Highways and Transportation (CIHT).

1.1.3 My professional experience has been gained entirely in the field of transportation and highways; the last eighteen years having been spent dealing with transport aspects of major planning applications.

1.1.4 My submission of this Proof of Evidence (PoE) to this inquiry is on behalf of Barratt David Wilson Homes (Mercia) and I present evidence on transportation matters. I have been involved in the project since May 2021 as the Project Director, responsible for the transportation assessment work on the appeal site, known as Hither Green Lane in Redditch, Worcestershire.

1.1.5 I have examined the site and its surroundings. I am familiar with the transport related documents that resulted in the highways proposals submitted as part of the planning application and that are therefore relevant to this Inquiry.

1.1.6 The evidence that I have prepared and provided for this Inquiry is true and has been prepared in accordance with the guidance of my professional institution, irrespective of by whom I am instructed.

2. Scope of Evidence

2.1 Background

2.1.1 The description of development has been taken from the application (Ref. 21/01830/FUL) and is as follows:

> *"Residential development (Class C3) with a vehicular access point onto Hither Green Lane, play areas, public open space including footways and cycleways, sustainable urban drainage systems and all other ancillary and enabling infrastructure".*

2.2 Preamble

2.2.1 mode was instructed by Barratt David Wilson Homes (Mercia) (the Appellant) to undertake the transportation and traffic assessment work required to accompany the planning application in relation to the proposals for the site, known as Hither Green Lane in Redditch, Worcestershire.

2.2.2 This initially involved the preparation of a Transport Assessment (TA) (Core Document (CD) A21) and Residential Travel Plan (RTP) (CD A20), which examined the transport implications of the proposed development. A revised TA (CD B1), containing additional information pertaining to the internal layout of the site was submitted in February 2022.

2.2.3 Worcestershire County Council (WCC); in their capacity as Local Highway Authority (LHA) provided comments in February 2022 (CD I6, Page 1), in which they recommended that the application be deferred, citing a requirement for further information relating to the Transport and Highways impacts of the proposed development.

2.2.4 Following this initial response, mode prepared two Technical Notes (CD I12 and CD I13) in October and December 2022 respectively, and a TA Addendum Report (CD B35) in April 2023, in order to address the outstanding points addressed WCC's formal response.

2.2.5 WCC subsequently submitted a revised officers response in June 2023 (CD I7, Page 1), which summarised a change of position by the LHA; to one of no objection, subject to conditions and financial obligations.

2.2.6 In February 2024, additional drawings were prepared by mode (CD I8, CD I9 and CD I10) and submitted to WCC to illustrate the proposed off-site improvement works to Dagnell End Road, the existing footpath along the River Arrow and the A441 Birmingham Road.

2.2.7 The final WCC officers response is dated February 2024 and reconfirmed no objection (CD I11, Page 1), subject to conditions and financial obligations. This position is echoed in the Redditch Borough Council (RBC) planning committee report (CD C1, Page 12).

2.2.8 As such, no highways related reason for refusal was provided following the planning committee and hence this PoE has been prepared at the request of the Inspectorate given local representations. This PoE therefore addresses the headline areas of sustainable accessibility of the site and the traffic impact of the proposals.

3. Sustainable Accessibility

3.1 Overview

3.1.1 The sustainability of the proposal was considered in the preparation of the planning application and in consultation with WCC prior to determination.

3.1.2 In line with Paragraph 110 of the National Planning Policy Framework (NPPF) (2024)(CD F1):

> *"Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes."*

3.1.3 The NPPF (2024) glossary definition of sustainable transport modes identifies sustainable transport modes as including walking, cycling, low and zero emission vehicles, car sharing and public transport.

3.2 Proposed Sustainable Access Strategy

Walking and Cycling

3.2.1 The proposals include for various off-site highway works to provide enhanced connections for pedestrians and cyclists towards local amenities and public transport. These proposals are summarised on drawings:

- (CD I8) Drawing J32-5756-PS-012 Rev A – Proposed Infrastructure Improvements to Dagnell End Road;
- (CD I9) Drawing J32-5756-PS-013 Rev A – Proposed Infrastructure Improvements to River Arrow Route; and,
- (CD I10) Drawing J32-5756-PS-014 Rev A - Proposed Infrastructure Improvements to A441 Birmingham Road.

3.2.2 The principle of these works has been discussed at length and agreed in consultation with WCC and will be delivered via suitably worded planning conditions. This proposed infrastructure will provide future residents with continuous links to existing amenities, existing footways, existing cycle routes and further public transport stops within Redditch.

3.2.3 In preparing my proof I have noted a discrepancy regarding the dimensioned shared pedestrian and cycle route (between the site and Abbey Stadium) illustrated on the drawings and the dimensions described in the latest WCC officers' response (CD I11). The drawings illustrating cycle route improvements were prepared and consulted upon assuming a 3m width shared use route be delivered. Subsequent correspondence with WCC, included in **Appendix A**, has confirmed that the provision of a 3m wide route is acceptable.

3.2.4 At the time of the planning committee further investigation of the highway boundary on the A441 Birmingham Road had not been completed by WCC. We are now in receipt of this information which has been plotted on revised drawings illustrating the shared use pedestrian/cycle route proposals and demonstrates that both a 3m width route can be accommodated within the highway boundary. The revised drawing (J32-5756-PS-014 Rev B) is included in **Appendix B**.

3.2.5 Secure and covered cycle parking will be provided for each dwelling in line with the council's adopted design guidance and this requirement will be secured via planning condition.

Public Transport

3.2.6 Planning obligations have been sought by WCC (and agreed to by the Appellant) to deliver the following:

- The Diamond bus 62/63 service to be diverted into the site to serve the wider area, terminating at Redditch Town Centre - £439,576.80 (to be paid in full prior to occupation of the first dwelling);
- Community transport - £22,037.00 (to be paid in full prior to occupation of the first dwelling);
- School transport - £644,261.94 (to be paid 50% prior to occupation of the first dwellings and 50% prior to the occupation of the 100th dwelling); and,
- Bus stop infrastructure - £10,000 (to be paid prior to commencement of development).

3.2.7 The total requested (and agreed) public transport obligation is therefore: £1,115,875.74, a significant sum of which will be forward loaded, to be paid prior to any occupations and hence potential users occupying the site.

3.2.8 These obligations and their reasoning are detailed in the most recent WCC officers response to the application (CD I11, Page 9) as well as in the planning committee report (CD C1, Pages 12-13), and on this basis I consider that sufficient information has been provided to decision makers as to the mitigation package offered.

3.2.9 In terms of longevity, the S106 obligations are intended to provide funding over a five year period to enable pump-priming of the various requested services. This is based upon the calculations completed by WCC in their determination of the application (and we understand in consultation with Diamond Buses on the relevant contribution elements).

3.2.10 The LHA will collect S106 monies enabling them to competitively tender the service at the point that it is required. WCC's process in this regard is detailed in their officer responses and in the planning committee report. This is considered to provide WCC with flexibility in terms of how they deliver the required service at the point of it being tendered. At the point of the subsidy period ceasing it is anticipated that a re-assessment of the service will be completed by WCC.

Ultra Low Emission Vehicles

3.2.11 Charging facilities for Electric Vehicles (EVs) will be provided for each dwelling in line with the requirements of Infrastructure for charging electric vehicles: Approved Document S (April 2023) (CD F5) of the Building Regulations, enabling future residents to more easily transition to sustainable motor vehicles. It is envisaged that these matters can be secured through the necessary building regulation compliance for each dwelling.

3.3 Residential Travel Plan

3.3.1 Furthermore, a RTP has been submitted as part of the planning application (CD A20).This has been agreed by WCC with a condition to secure its implementation also agreed, as outlined within the planning committee report (CD C1, Page 12). The RTP includes the following:

- Provision of information on walking and cycling routes and locations of local amenities (Chapter 3)

- Provision of residents with up-to-date public transport timetables, bus maps and ticket information (Chapter 7)

- The possibility of offering residents with discounted bus vouchers/passes with local operators will also be investigated and provided (Chapter 7)

- Information on car sharing and local car sharing forums (Chapter 7); and,

- Personalised travel planning to provide future residents with their travel options (Chapter 7).

3.4 Summary

3.4.1 I therefore conclude that the site is situated in a location that can be considered to be sustainable, there are multiple interventions that the Appellant is promoting that will improve access between the site and Redditch for pedestrians, cyclists and public transport users. Furthermore the proposals allow for accommodation of each user group within the site layout and through the provision of adequate parking for cycles and electric vehicles for each dwelling.

3.4.2 The various mitigation measures have been consulted on at length with WCC who have responded to the application positively; accordingly, I consider that access to the site by sustainable means can be adequately accommodated.

4. Traffic Impact

4.1 Overview

4.1.1 The likely traffic impact of the proposed development was also considered in the preparation of the planning application and in consultation with WCC prior to determination.

4.1.2 In line with paragraph 116 of the NPPF (2024) (CD F1):

> *"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network, following mitigation, would be severe, taking into account all reasonable future scenarios."*

4.1.3 The traffic impact of the site are summarised in Chapters 5 and 6 of the TA (CD B1, Pages 35 -49) submitted as part of the application, and as part of the TA Addendum Report (CD B35, Pages 4-5), TN002 (CD I12) and TN003 (CD I13) submitted during the determination period.

4.2 Development Traffic

Trip Generation

4.2.1 In order to provide an indication of the potential traffic impact of the proposed development, trip rates were taken from the approved development site at Brockhill East Phase 1 (obtained in 2018). As outlined within the TA submitted as part of the application (CD B1, Pages 36-37), these have been shown to be far greater than trip rates obtained for similar sites from the industry standard TRICS database (V7.8.1).

4.2.2 WCC have consented to the use of these trip rates for the purpose of the assessment work for the proposed development.

4.2.3 All assessment work has been based upon 100% of trip generation associated with the proposed development quantum at Hither Green Lane and does not take into account changes in working patterns (i.e., home / remote working) or other measures set out in the accompanying RTP (CD A20, Pages 25 - 28), which may reduce the impact of the proposed scheme further. It is therefore considered that the trip rates utilised as part of the modelling work are robust, and the actual trip generation associated with the proposed development could feasibly be lower than anticipated.

Trip Distribution

4.2.4 The traffic distribution exercise presented within the TA for the proposed development (CD B1, Pages 38-39), using the approved distribution profile from the TA for the adjacent Brockhill East development (CD I5). This methodology was agreed with WCC for the purpose of the assessment work.

4.2.5 Based upon the likely distribution of traffic on the local highway network, a study area was identified comprising the following junctions:

- A441 / Dagnell End Road (signal T junction);
- A441 / Weights Lane / Odell Street (roundabout);
- A441 / Retail Access / Middlehouse Lane (roundabout);
- A441 / Redditch Ringway (signal T junction);
- A441 / A4023 (roundabout); and,
- Hither Green Lane / Dagnell End Road (priority junction).

4.3 Traffic Flows

4.3.1 At the time the application was submitted (October 2021) the UK was still in a transitional period with respect to daily travel patterns on account of the impact of the COVID-19 Pandemic. In the absence of being able to conduct representative traffic surveys as a result of the COVID-19 Pandemic, traffic flows were obtained from the TA for the adjacent Brockhill East development (CD I5) for the following junctions:

- A441 / Dagnell End Road (signal T junction);
- A441 / Weights Lane / Odell Street (roundabout);
- A441 / Retail Access / Middlehouse Lane (roundabout);
- A441 / Redditch Ringway (signal T junction); and

- A441 / A4023 (roundabout).

4.3.2 For the Hither Green Lane / Dagnell End Road (priority junction) traffic flows were obtained from turning count surveys undertaken as part of feasibility work in relation to an earlier proposed development scheme for the site.

Traffic Growth / Committed Development Traffic

4.3.3 Background traffic growth has been calculated using TEMPro for a 2030 future year, consistent with the end of the current Redditch Local Plan period.

4.3.4 Committed development trips associated with Webheath and Foxlydiate have obtained from the Brockhill East Phase 3 modelling work and included within the 2030 future year assessments. In the TA for the approved Brockhill East Phase 3, in order to avoid 'double counting' of traffic, alternative assumptions were applied to the growth factors to deduct the committed development trips.

4.3.5 As part of the growth factors applied within the modelling work for the proposed development at Hither Green Lane, no alternative assumptions have been applied to the TEMPro growth factors used which is considered to be 'overly robust', given that there is likely to be an element of double counting of committed development trips.

4.3.6 This approach was discussed and agreed with WCC.

4.4 Two Stage Screening

4.4.1 A two-stage 'screening' approach was undertaken in order to validate which junctions should be included for detailed capacity assessment. This is outlined in the TA (CD B1, Pages 41-44) submitted as part of the application.

4.4.2 Stage 1 screening is based on the traditional 30 two-way development trip threshold outlined in Department for Transport (DfT) Guidance for Transport Assessment (GTA) approach to assessment. Despite the GTA guidance being replaced in 2014, its replacement Transport Evidence Bases in Plan Making is not a like-for-like document, providing no guidance on the production of TAs. It is commonly accepted by other practitioners that GTA still represents industry best-practice and remains relevant.

4.4.3 Junctions which demonstrate development flows exceeding 30 two-way trips were taken through to screening Stage 2. Proposed development flows were considered in context to the 2030 Base (effective) AM and PM Peak flows. The proportional impact has been assessed as follows:

- Less than 3% - This level of increase in traffic is well within the daily fluctuation levels (accepted to by 10%) and as such can be considered as a non-material impact. Consequently, no further assessments are considered necessary at these junctions;
- 3% - 10% - This level of increase is within the daily traffic fluctuations but may need to be considered for junction assessment subject to existing capacity/traffic levels; and,
- More than 10% - This level of increase in traffic is above the daily variation and junction assessment is required.

4.4.4 Based upon this approach, a refined study area was identified, including the proposed site access and the following junctions:

- Hither Green Lane / Dagnell End Road priority junction;
- A441 / Dagnell End Road traffic signals; and
- A441 / Odell Street/Weights Lane roundabout.

4.5 Junction Capacity Assessments

4.5.1 Junction capacity assessments of the above junctions were completed as part of the TA (CD B1, Pages 39 - 49). The results demonstrated that the proposed site access junction with Hither Green Lane will operate with sufficient reserve capacity, and is therefore considered acceptable in order to serve the proposed development.

4.5.2 The results also demonstrated that the Hither Green Lane / Dagnell End Road and A441 / Odell Street/Weights Lane junctions would both operate with significant reserve capacity in the 2030 future year scenario following the introduction of development.

4.5.3 Modelling was also undertaken for the A441 / Dagnell End Road signalised junction, which is discussed in greater detail in the following chapter.

5. A441 / Dagnell End Road

5.1 Overview

5.1.1 Following completion of the modelling within the TA (CD B1, Pages 39 - 49), the A441 / Dagnell End Road signalised junction was subject to a series of discussions with WCC, as outlined in TN002 (CD I12, Pages 3-6) and TN003 (CD I13, Pages 3-6), in order to discuss and agree the LinSig model to be used to assess the impact of the proposed development.

5.2 Mitigation

5.2.1 During the course of discussions with WCC Highways, it was noted that a mitigation scheme was to be delivered at the A441 / Dagnell End Road as part of the Brockhill East Phase 3 scheme. The mitigation scheme was previously identified the Redditch Infrastructure Delivery Plan (IDP) (CD E10). An overview of the mitigation scheme is outlined in PJA drawing 2809-P-12-P4 (CD I4).

5.2.2 As set out in technical notes 'Dagnell End Road – Junction Design Note' (CD I3, Pages 5-6) and 'Dagnell End Road – Junction Design Modelling Update' (CD I2, Page 6) submitted as part of the Brockhill East application, peak hour pedestrian crossing demand at the new signalised crossing was forecast to be low, and it was anticipated that the crossing would therefore be called infrequently.

5.2.3 In light of the above, the modelling submitted as part of the approved application for Brockhill East included 3 stage sequences. This approach has also been undertaken as part of the modelling for the proposed development. These are as follows:

- Staging Sequence 1 – Pedestrian Crossing Not Called;
- Staging Sequence 2 – Pedestrian Crossing Not Called, No Filter Arrow; and,
- Staging Sequence 3 – Pedestrian Crossing Called Every Cycle (Sensitivity Test).

5.2.4 Pedestrian demand at the junction is relatively low and therefore as specified in the PJA Junction Design Modelling Update TN (CD I2, Page 6) submitted as part of the approved Brockhill East Phase 3 application, it is highly unlikely the crossing will be called every cycle. The results presented for stage sequences 1 and 2 are considered to be the most representative of the typical day-to-day operations of the junction.

5.3 Background Traffic Data

5.3.1 Following discussions with WCC through the determination period, updated turning counts surveys were undertaken at the Dagnell End Road / Birmingham Road junction on Tuesday 15th November 2022, owing to the time which had elapsed since the collection of the 2018 survey data obtained from the Brockhill East application.

5.3.2 The turning counts covered the periods from 07:00 – 10:00 and 16:00 – 19:00. In addition to this two Automated Traffic Counts (ATCs) were undertaken on Dagnell End Road and the Birmingham Road link south of the junction for a 7 day, between 15th November and 22nd November 2022, to validate the turning count data (CD I1).

5.3.3 The traffic survey was obtained via an independent third-party survey company, who specialise in the collection of traffic survey data, and was undertaken during a period of free-flowing traffic, with no roadworks at the junction.

5.3.4 The resultant traffic survey data for both the AM and PM peak periods has been provided to WCC Highways, who have validated the surveys using their own data collected over multiple days, and confirmed that background traffic data on the local highway network has indeed, reduced, when compared to the surveys undertaken as part of the previous application at Brockhill East Phase 3. WCC have therefore confirmed that the background survey data is valid for use as part of the junction capacity assessment. As part of WCC revised officers response in June 2023 (CD I7, Page 4) the following comments were provided in relation to the traffic data.

> *"Compared to the background traffic flows surveyed and used in the LinSig model for the Brockhill Phase 3, traffic flows have since slightly reduced post-covid and this has been confirmed by the Highway Authority's own permanent traffic counter, which is positioned on the A441 to the north of the Dagnell End Road junction (the northern arm of the junction). Several months' worth of data was obtained to verify this."*

5.4 Results

5.4.1 A summary of the results of the junction capacity assessment for the committed mitigation scheme at the Dagnell End Road / Birmingham Road junction is provided in **Table 5.1**, and discussed in greater detail within TN 003 (CD I13, Pages 14 - 16).

Table 5.1 A441 / Dagnell End Road – Committed Mitigation Scheme

Arm	AM Peak Hour (0800 – 0900)			PM Peak Hour (1700 – 1800)		
	DoS (%)	MMQ (PCU)	Delay / PCU (s)	DoS (%)	MMQ (PCU)	Delay / PCU (s)
2030 Base (Stage Sequence 1 – No Peds) (**CM1 – Stage 1**)						
A441 (N)	71.4%	11	12	69.1%	14	13
Dagnell End Road	70.3	5	43	71.5%	7	59
A441 (South)	68%	10	10	74.6%	17	14
PRC		26%			20.6%	
2030 Base + Development (Stage Sequence 1 – No Peds) (**CM2 – Stage 1**)						
A441 (N)	77.5%	14	16	74.2%	17	15
Dagnell End Road	73%	6	45	79.1%	9	62
A441 (South)	72.2%	12	15	79.1%	21	17
PRC		16.1%			13.8%	
2030 Base (Stage Sequence 2 – No Peds & No Left Filter) (**CM1 – Stage 2**)						
A441 (N)	74.7%	12	15	69.9%	15	14
Dagnell End Road	70.3%	5	49	74.5%	8	64
A441 (South)	70.9%	11	13	75.4%	18	15
PRC		20.5%			19.3%	
2030 Base + Development (Stage Sequence 2 – No Peds & No Left Filter) (**CM2 – Stage 2**)						
A441 (N)	78.7%	15	17	75.1%	18	16
Dagnell End Road	77.2%	7	48	78.6%	9	66
A441 (South)	73.8%	13	16	79.9%	21	18
PRC		14.3%			12.6%	
2030 Base (Stage Sequence 3 – Peds & Left Filter) (**CM1 – Stage 3**)						
A441 (N)	83.5%	18	23	82.1%	26	26
Dagnell End Road	83.1%	6	55	78.9%	8	69
A441 (South)	71.9%	12	15	77%	19	18
PRC		7.7%			9.6%	
2030 Base + Development (Stage Sequence 3 – Peds & Left Filter) (**CM2 – Stage 3**)						
A441 (N)	88.4%	21	29	82.4%	24	24
Dagnell End Road	89%	8	60	83%	10	71
A441 (South)	74.8%	14	17	81.7%	23	21
PRC		1.1%			8.4%	

5.4.2 As outlined in Paragraph 5.2.4, the results presented for stage sequences 1 and 2 are considered to be the most representative of the typical day-to-day operations of the junction.

5.4.3 The results of the junction capacity assessment demonstrate that the proposed development will have a minor impact on the operation of the Dagnell End Road / Birmingham Road junction, and that no further mitigation is therefore deemed necessary.

5.4.4 This matter has been discussed and agreed with WCC Highways.

5.4.5 All assessment work has been based upon 100% of trip generation associated with the proposed development quantum at Hither Green Lane and does not take into account changes in working patterns (i.e., home / remote working) or other measures set out in the accompanying RTP (CD A20, Pages 25 - 28), which may reduce the impact of the proposed scheme further. It is therefore considered that the trip rates utilised as part of the modelling work are robust, and the actual trip generation associated with the proposed development could feasibly be lower than anticipated.

5.4.6 It is also understood that the mitigation scheme for the junction is to include MOVA (Microprocessor Optimised Vehicle Actuation) control; the suitability of which was previously identified through the Redditch District IDP (CD E10).

5.4.7 MOVA can be connected to the Urban Traffic Control (UTC) to enable monitoring and help maximise efficiency / operation of the junction. MOVA is considered to be the most efficient method of signal control, using a series of detectors that allow signal timings and cycle times to respond to changes in local traffic patterns and conditions.

5.4.8 As outlined in Department for Transport Traffic - TAL 03/97 'The MOVA signal control system', TRL/Department for Transport research indicates that through the implementation of a MOVA system, the efficiency and operation of signalised junctions can be improved, and that up to an average 13% delay reduction may be achievable. However, it should be noted, that the effects of these optimisation improvements cannot be simulated within the LinSig model.

5.4.9 It is therefore noted that the junction may have capability to run more efficiently than is demonstrated in the above modelling analysis and results, and that the junction could potentially operate with a greater level of capacity than indicated above. The assessment results which have been reported are therefore considered to be robust.

Summary

5.4.10 Taking into account all of the above, it is considered that the proposed development scheme will have a relatively minor impact on the overall operation of the junction. In this regard, WCC have noted the following in their revised officers response in June 2023 (CD I7, Page 8):

> *"The Highway Authority concludes that there would not be a severe impact and therefore there are no justifiable grounds on which an objection could be maintained".*

5.4.11 It is therefore concluded that the additional trips associated with the proposed development can be accommodated at the junction. Taking into account the current level of operation, and the projected growth in background traffic by the end of the current Redditch Local Plan Period, it is not considered that any further mitigation is required at the Dagnell End Road / Birmingham Road junction.

5.5 Sensitivity Modelling

5.5.1 Notwithstanding the position of WCC in their consideration of the planning application, I note the concerns raised by the North Redditch Communities Alliance (NoRCA) in relation to the baseline traffic data used to inform the detailed capacity assessment of the Birmingham Road/Dagnell End Road signalised junction.

5.5.2 I note that NoRCA has presented their own traffic survey data for the AM peak hour; however, for completeness I have obtained a further traffic turning count on Thursday 25th April 2024 covering both the AM and PM peak periods. The traffic data has been collected by an independent third party data collection company and is included in **Appendix C**.

5.5.3 I have used this traffic data to present further scenarios of the capacity assessment completed at the Dagnell End Road / Birmingham Road junction; replicating the analysis already submitted for every parameter with the exception of the baseline count data. Traffic turning flow diagrams which show the revised junction movements for these scenarios are included at **Appendix D**.

5.5.4 This analysis is considered to be worse than the reasonable worst-case scenario as as there is further risk of double counting of traffic as there will have been occupations at committed development sites between 2022 and 2024 and I have not adjusted the committed development assumptions to account for this. Nor have I adjusted the planning data assumptions in the TEMPRO data forecasts when accounting for background traffic growth.

5.5.5 Furthermore the committed developments, and proposed development, will be required to encourage modal shift through the provision of sustainable transport infrastructure and travel planning techniques. There has been no account of the positive influence that this could have on trip forecasts in any of the modelling completed adding another layer of robustness to the analysis completed.

5.5.6 The results of this analysis are summarised in **Table 5.2** assuming a horizon year (2030) base inclusive of all committed developments and a horizon year base plus development proposals for each variant of traffic signal staging sequence previously presented as part of the planning application. LINSIG outputs are included in **Appendix E** of this proof.

Table 5.2 A441 / Dagnell End Road – Committed Mitigation Scheme (Sensitivity Modelling)

Arm	AM Peak Hour (0800 – 0900)			PM Peak Hour (1700 – 1800)		
	DoS (%)	MMQ (PCU)	Delay / PCU (s)	DoS (%)	MMQ (PCU)	Delay / PCU (s)
2030 Base (Stage Sequence 1 – No Peds) (**CM1 – Stage 1**)						
A441 (N)	84%	19	17	92.3%	37	32
Dagnell End Road	82.5%	6	61	89.8%	12	74
A441 (South)	83.2%	18	18	88.6%	30	29
PRC		7.1%			-2.6%	
2030 Base + Development (Stage Sequence 1 – No Peds) (**CM2 – Stage 1**)						
A441 (N)	89.6%	24	24	98%	51	53
Dagnell End Road	88.4%	9	63	95.5%	16	91
A441 (South)	87.6%	22	23	93.4%	38	38
PRC		0.5%			-8.9%	
2030 Base (Stage Sequence 2 – No Peds & No Left Filter) (**CM1 – Stage 2**)						
A441 (N)	84%	19	17	92.3%	37	32
Dagnell End Road	82.5%	6	66	89.8%	13	76
A441 (South)	83.2%	18	18	88.6%	30	29
PRC		7.1%			-2.6%	
2030 Base + Development (Stage Sequence 2 – No Peds & No Left Filter) (**CM2 – Stage 2**)						
A441 (N)	89.6%	24	24	98%	51	53
Dagnell End Road	88.4%	8	61	95.5%	16	93
A441 (South)	87.6%	22	23	93.4%	38	38
PRC		0.5%			-8.9%	
2030 Base (Stage Sequence 3 – Peds & Left Filter) (**CM1 – Stage 3**)						
A441 (N)	95.3%	31	41	99.1%	52	65
Dagnell End Road	91.7%	8	90	99.8%	19	122
A441 (South)	85.5%	21	20	89.6%	31	30
PRC		-5.9%			-10.9%	
2030 Base + Development (Stage Sequence 3 – Peds & Left Filter) (**CM2 – Stage 3**)						
A441 (N)	102.2%	53	98	106.6%	92	166
Dagnell End Road	95.7%	10	80	105.5%	27	162
A441 (South)	90.1%	25	27	94.4%	40	40
PRC		-13.6%			-18.5%	

5.5.7 A comparison of the outputs of the baseline and baseline plus development scenarios in each staging sequence scenario is subsequently provided in **Table 5.3**.

Table 5.3 Comparison of Modelling Output

Arm	AM Peak Hour		PM Peak Hour	
	Queue (PCU)	Delay (S)	Queue (PCU)	Delay (S)
2030 Base vs. 2030 Base + Development (Stage Sequence 1)				
A441 (N)	+5	+7	+14	+21
Dagnell End Road	+3	+2	+4	+17
A441 (South)	4	+5	+8	+9
2030 Base vs. 2030 Base + Development (Stage Sequence 2)				
A441 (N)	+5	+7	+14	+21
Dagnell End Road	+2	-5	+3	+17
A441 (South)	+4	+5	+8	9
2030 Base vs. 2030 Base + Development (Stage Sequence 3)				
A441 (N)	+22	+57	+40	+101
Dagnell End Road	+2	-10	+8	+40
A441 (South)	+4	+7	+9	+10

5.5.8 It is clear that the impacts of the development vary when considered across the range of scenarios presented and that even without the introduction of the development proposals that the practical reserve capacity of the junction is anticipated to be breached.

5.5.9 The magnitude of impact in the most affected scenario (Stage sequence 3) equates to an increase in delay on the worst affected arm (A441) of 57 seconds in the AM peak hour and 101 seconds in the PM peak hour.

5.5.10 Pedestrian demand at the junction is relatively low and therefore as specified in the PJA Junction Design Modelling Update TN (CD I2, Page 6) submitted as part of the approved Brockhill East Phase 3 application, it is highly unlikely the crossing will be called every cycle. The results presented for Stage Sequences 1 and 2 are therefore considered to be the most representative of the typical day-to-day operation of the junction.

5.5.11 The level of change forecast for the scenarios where Stage Sequences 1 and 2 are called are much more benign with the most affected arm (A441 North) subject to an increase in queueing of 5 vehicles with an associated increase of delay of 7 seconds per PCU in the AM peak hour. In the PM peak hour the most affected arm is again the A441 North where an increase in queue of 14 vehicles is forecast alongside an increase in delay of 21 seconds per PCU.

5.5.12 I have considered these results relative to previously issued appeal decisions vs. the 'severe' benchmark. At Land South of Green Lane in Yarm (CD G2) (PINS Reference: APP/H0738/W/21/3279168) the Inspector concluded:

"Much residential development has taken place at Yarm in the past few years, all of which would have had a cumulative impact on local traffic conditions and led to increasing congestion. The modelling indicates that the same would occur as a result of both the extant and proposed development on the site. Considering the other traffic mitigation measures proposed, the Leven Road impact would be the largest. However, the increase within the zero mitigation scheme of around three minutes – or roughly the time it would take a driver to listen to one song in the car, as I heard at the Inquiry – in one localised area, would result in an significant impact but this could not be defined as severe."

5.5.13 Similarly, and more recently, at Great Chart, Ashford (CD G1) (PINS Reference: APP/E2205/W/24/3345454), paragraphs 38 and 39, the Inspector concluded that a forecast increase in delay of circa 3 minutes in one peak hour, whilst material, falls short of the severity threshold.

5.5.14 In the worst affected scenario the greatest magnitude of delay reported is therefore some way below the metric identified by the Inspectorate in defining 'severe'. In all other scenarios considered the magnitude of delay is less again.

5.5.15 It is also worth dwelling upon a point raised by the Inspector at Land South of Green Lane, Yarm whereby the level of severity was also judged based not only the delay but also the fact that the impact was recorded in a single localised area. The focus of the debate has been on the Dagnell End Road/Birmingham Road junction; however, it is worthwhile recapping how the development has been considered in relation to a much larger area as reported in the TA. No material impacts have been reported elsewhere in the area considered and accordingly this adds weight to my view that the severe benchmark is not breached in any scenario considered.

5.5.16 The 'sensitivity' scenarios now presented provide a robust analysis of the situation. Under the assumption that the identified double counting of committed development traffic is removed and account is made of the sustainable travel measures and travel plans that will be required to be delivered for the committed developments and the proposals, if granted permission, the results can only improve from the robust positions reported.

5.5.17 I therefore conclude that none of the results are of a magnitude that can be considered to be severe and accordingly and in line with paragraph 116 of the NPPF (CD F1) the severe benchmark is not breached in any reasonable scenario considered.

6. Summary and Conclusions

6.1 Summary

6.1.1 This PoE has been prepared by mode, on behalf of Barratt David Wilson Homes (Mercia) (the Appellant), to present evidence on transportation matters relating to the planning appeal (Ref. APP/Q1825/W/24/3350905) for the proposed development of land off Hither Green Lane in Redditch, Worcestershire.

6.1.2 As part of the evidence base for the planning application, mode prepared a TA (CD B1) and TP (CD A20), examining the transport implications of the proposals. WCC in their capacity as LHA provided comments in February 2022 (CD I6, Page 1), in which they recommended that the application be deferred, citing a requirement for further information pertaining to the Transport and Highways impacts of the proposals.

6.1.3 Following this initial response, mode prepared two Technical Notes; TN 002 (CD I12) and TN 003 (CD I13) in October and December 2022 respectively, and a TA Addendum Report (CD B35) in April 2023, in order to address the outstanding points addressed WCC's formal response. WCC subsequently submitted a revised officers response in June 2023 (CD I7, Page 1) which summarised a change of position by the LHA; to one of no objection subject to conditions and financial obligations.

6.1.4 In February 2024, additional drawings were prepared by mode (CD I8, CD I9 and CD I10) and submitted to WCC to illustrate the proposed off-site improvement works to Dagnell End Road, the existing footpath along the River Arrow and the A441 Birmingham Road.

6.1.5 The final WCC officers response is dated February 2024 and reconfirmed no objection (CD I11, Page 1), subject to conditions and financial obligations. This position is echoed in the Redditch Borough Council (RBC) planning committee report (CD C1, Page 12).

6.1.6 No highways related reason for refusal was provided following the planning committee and hence this PoE has been prepared at the request of the Inspectorate given local representations. This PoE therefore addresses the headline areas of sustainable accessibility of the site and the traffic impact of the proposals.

6.1.7 Notwithstanding the position of WCC in their consideration of the planning application, it is noted that concerns have been raised by NoRCA in relation to the baseline traffic data used to inform the detailed capacity assessment of the Birmingham Road / Dagnell End Road signalised junction.

6.1.8 For completeness, additional traffic counts for the junction were obtained by an independent third party data collection company on Thursday 25th April 2024. This data has been used to present sensitivity modelling of the capacity assessment for the Dagnell End Road / Birmingham Road junction; replicating the analysis already submitted for every parameter with the exception of the baseline count data.

6.1.9 The results of the sensitivity modelling demonstrate that the impact of the proposed development is not of a magnitude which can be considered to be severe across any of the modelled scenarios; and accordingly and in line with paragraph 116 of the NPPF (CD F1) the severe benchmark is not breached in any reasonable scenario considered.

6.2 Conclusions

6.2.1 The development proposals have obtained the support of the LHA, who have raised no objection to the application on highway grounds, subject to the sustainable transport interventions already raised.

6.2.2 In light of the information presented during the course of the applications determination, and the as summarised in this PoE, it can be concluded that the proposed development provides access to sustainable modes of transport, and will not have a severe impact on the operation or safety of the surrounding highway network and therefore, in accordance with the NPPF (CD F1), the proposal should be considered acceptable in terms of transport and highways. On this basis, I consider that the appeal should be allowed.

APPENDIX A

WCC – Additional Correspondence (Post Planning Committee)

Subject:	RE: Land at Hither Green Lane, Redditch
Date:	Thursday, 2 January 2025 at 10:47:12 Greenwich Mean Time
From:	Hanchett, Karen
To:	Ben Fairgrieve
CC:	Josh Norris
Attachments:	image001.png, image002.png, image003.png, image004.png, image005.png, image006.png, image007.gif

Hi Ben

Happy New Year to you too!

I'm a little snowed under at the moment preparing for my departure from WCC but I can confirm the 3m path as shown on the submitted drawings is correct and the reference to 3.5m was a mistake.

Kind regards

Karen

From: Ben Fairgrieve <benfairgrieve@modetransport.co.uk>
Sent: 02 January 2025 10:41
To: Hanchett, Karen <khanchett@worcestershire.gov.uk>
Cc: Josh Norris <joshnorris@modetransport.co.uk>
Subject: [WCC EXTERNAL]Land at Hither Green Lane, Redditch

Morning Karen,

Happy New Year and I hope you had a relaxing Christmas break.

Sorry to jump straight into it on the first day back but I could do with a quick conversation with you on the BDWH site on Hither Green Lane, Redditch.

The site is off to appeal imminently, proofs are being submitted Monday, and whilst there are no highways points of contention I have been dragged in by interested parties.

One point that I have noticed in pulling the proof together is that there is a discrepancy between the requested width of the cycle route between the site and Abbey Stadium between the 3m shown on the drawings that were consulted upon and 3.5m described in your officer response. I have attached both documents for easy reference.

I was hoping we could smooth this point out between us as I believe the answer to be the 3m route as shown is acceptable if you can spare a little time on the phone?

Kind Regards,

Ben Fairgrieve BA (Hons) MCIHT
Director

0121 794 8390
07957 374 465
benfairgrieve@modetransport.co.uk
www.modetransport.co.uk

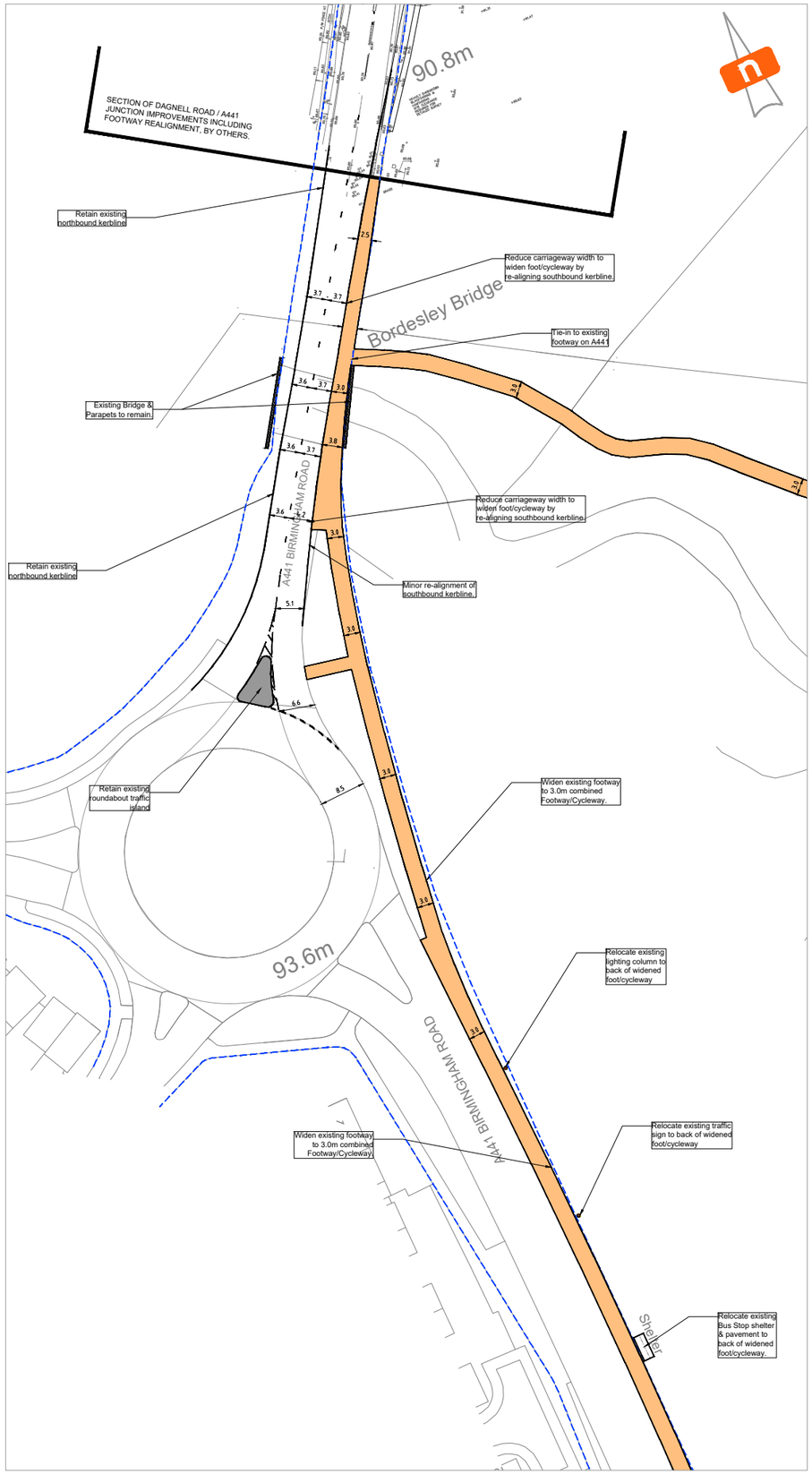
mode transport planning
Griffin House, 18-19 Ludgate Hill, Birmingham, B3 1DW

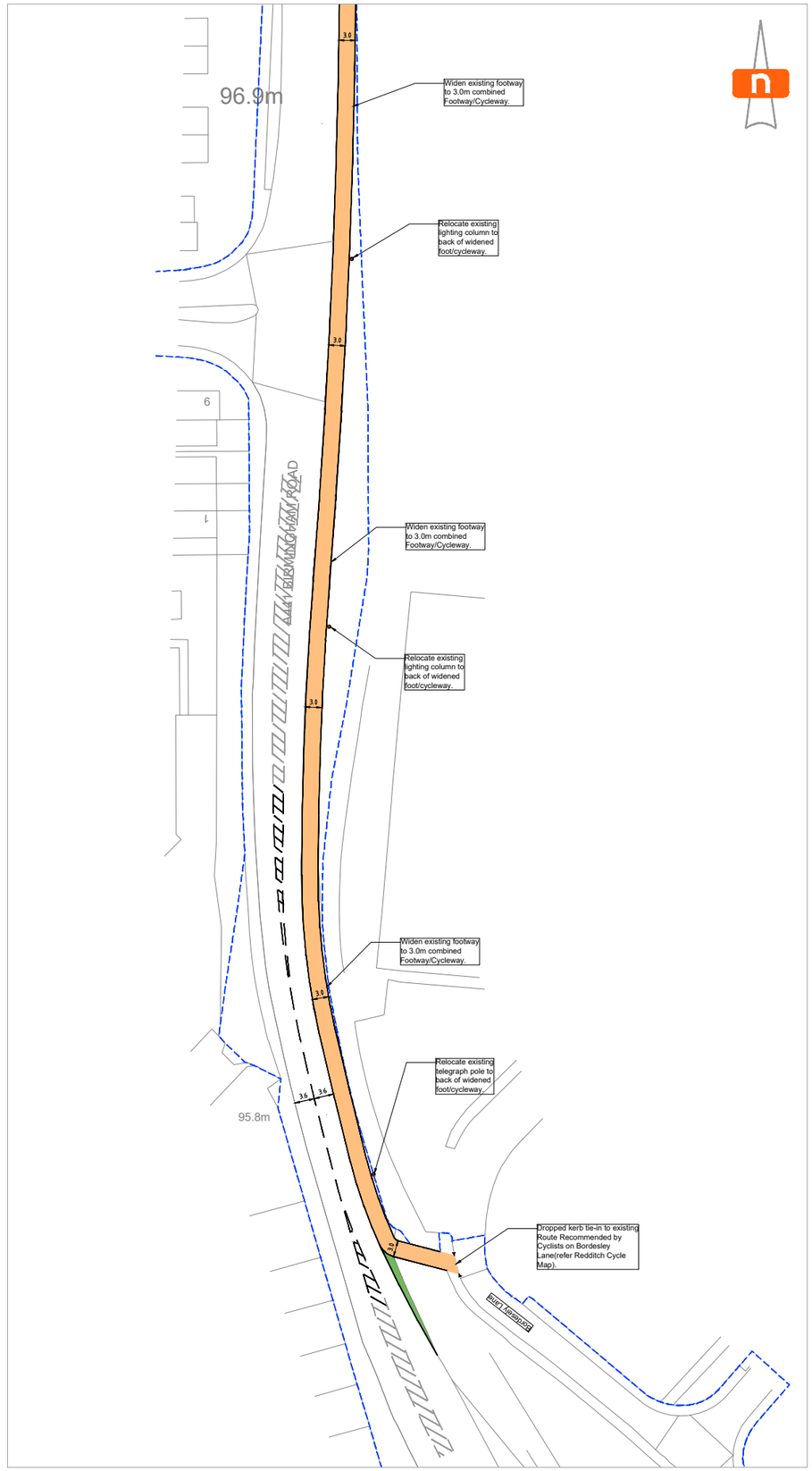
keep up with mode:

****

APPENDIX B

Updated Highway Drawings





NOTE;

1. THIS DRAWING IS BASED UPON DRAWING NUMBER 220520 me–24–21t – proposed site layout 200522 (additional schedule info) BY Urban Design.

2. THIS DRAWING IS BASED UPON THE ORDNANCE SURVEY'S (1:1250) MAP WITH PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE, CROWN COPYRIGHT RESERVED.

3. THIS DRAWING IS INDICATIVE AND SUBJECT TO DISCUSSIONS WITH LOCAL & NATIONAL HIGHWAY AUTHORITIES. THIS DESIGN IS ALSO SUBJECT TO CONFIRMATION OF LAND OWNERSHIP,TOPOGRAPHY, LOCATION OF STATUTORY SERVICES, DETAILED DESIGN AND TRAFFIC MODELLING.

4. ROAD MARKINGS & TRAFFIC SIGNS ARE TO BE IN ACCORDANCE WITH 'THE TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS 2016'

5. DO NOT SCALE FROM THIS DRAWING WORK FROM FIGURED DIMENSIONS ONLY.

6. ALL DIMENSIONS ARE SHOWN IN METRES UNLESS NOTED OTHERWISE.

7. HIGHWAY BOUNDARY INFORMATION HAS BEEN PROVIDED BY WORCESTERSHIRE COUNTY COUNCIL (2024) AND HAS BEEN TRANSCRIBED BY MODE ONTO AN ORDNANCE SURVEY. MODE ACCEPTS NO LIABILITY FOR THE ACCURACY OF THE DATA PROVIDED AND THE HIGHWAY BOUNDARY INFORMATION SHOWN IS SUBJECT TO CHECKS BY A LICENSED CONVEYANCER.

KEY

- PAVED AREAS - FOOTWAYS, SHARED FOOT CYCLEWAYS & TRAFFIC ISLANDS
- VERGE AREAS
- SITE BOUNDARY
- HIGHWAY BOUNDARY

REV	DATE	REMARKS
B	02.01.2025	WCC HIGHWAY BOUNDARY INCORPORATED
A	15.02.2024	CLIENT COMMENTS
–	09.01.2024	INITIAL ISSUE

CLIENT

DAVID WILSON HOMES (MERCIA)

JOB TITLE

HITHER GREEN LANE, REDDITCH

DRAWING TITLE

ALTERNATIVE POTENTIAL IMPROVEMENT OPTION

DRAWING NO.

J32–5756–PS–014

DRAWN	CHECKED
JSJ	KTY
CREATED	SCALE
JAN '24	1:1000 @A3

mode transport planning
LOMBARD HOUSE
145 GREAT CHARLES STREET
BIRMINGHAM
B3 3LP

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W WWW.MODETRANSPORT.CO.UK

mode transport planning

APPENDIX C

Additional Traffic Survey Data

MANUAL CLASSIFIED COUNTS

JOB REF: 13311

JOB NAME: REDDITCH

SITE: 1

LOCATION: A441 BIRMINGHAM ROAD (N) / DAGNELL END ROAD / A441 BIRMINGHAM ROAD (S)

DATE: 25/04/2024

DAY: THURSDAY

MANUAL CLASSIFIED COUNTS

JOB REF: 13311

JOB NAME: REDDITCH

SITE: 1

LOCATION: A441 BIRMINGHAM ROAD (N) / DAGNELL END ROAD / A441 BIRMINGHAM R

TIME	ATOB FROM A441 BIRMINGHAM ROAD (N) TO DAGNELL END ROAD								ATOC FROM A441 BIRMINGHAM ROAD (N) TO A441 BIRMINGHAM ROAD (S)								TIME	BTOA FROM DAGNELL END ROAD TO A441 BIRMINGHAM ROAD (N)						
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT		CAR	LGV	OGV1	OGV2	PSV	MCL	PCL
07:00	14	6	0	0	0	0	0	20	90	24	3	0	0	0	0	117	07:00	19	2	1	0	0	0	0
07:15	31	3	0	1	0	0	0	35	136	28	8	2	0	0	1	175	07:15	25	4	1	0	0	0	0
07:30	36	4	0	0	0	1	0	41	117	32	4	5	0	0	1	159	07:30	23	2	2	0	1	0	0
07:45	54	9	1	0	0	0	0	64	164	34	5	3	0	1	0	207	07:45	26	2	3	1	0	0	0
H/TOT	135	22	1	1	0	1	0	160	507	118	20	10	0	1	2	658	**H/TOT**	93	10	7	1	1	0	0
08:00	30	7	1	1	0	0	0	39	145	44	4	1	2	1	0	197	08:00	24	4	1	0	1	0	0
08:15	56	2	2	0	0	0	0	60	154	26	6	0	0	0	0	186	08:15	45	1	1	0	0	0	0
08:30	34	3	1	0	0	0	0	38	143	18	7	4	4	1	0	177	08:30	25	4	0	0	0	1	1
08:45	31	3	0	0	0	0	0	34	149	17	5	2	1	0	0	174	08:45	25	4	0	1	0	0	0
H/TOT	151	15	4	1	0	0	0	171	591	105	22	7	7	2	0	734	**H/TOT**	119	13	2	1	1	1	1
09:00	27	2	1	0	0	0	0	30	159	23	4	0	0	0	0	186	09:00	22	0	4	0	0	0	0
09:15	23	0	2	0	0	0	0	25	117	31	6	0	0	0	0	154	09:15	22	0	4	0	0	0	0
09:30	22	5	0	0	0	0	2	29	122	23	14	3	0	0	0	162	09:30	12	3	0	0	0	0	0
09:45	19	7	1	2	0	1	0	30	102	26	11	1	0	0	0	140	09:45	19	1	0	0	0	0	0
H/TOT	91	14	4	2	0	1	2	114	500	103	35	4	0	0	0	642	**H/TOT**	75	4	8	0	0	0	0
P/TOT	377	51	9	4	0	2	2	445	1598	326	77	21	7	3	2	2034	**P/TOT**	287	27	17	2	2	1	1

TIME	ATOB FROM A441 BIRMINGHAM ROAD (N) TO DAGNELL END ROAD								ATOC FROM A441 BIRMINGHAM ROAD (N) TO A441 BIRMINGHAM ROAD (S)								TIME	BTOA FROM DAGNELL END ROAD TO A441 BIRMINGHAM ROAD (N)						
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT		CAR	LGV	OGV1	OGV2	PSV	MCL	PCL
16:00	13	5	2	0	0	0	0	20	111	19	6	0	0	1	0	137	16:00	35	2	0	0	0	0	0
16:15	21	8	0	0	1	0	0	30	143	19	3	3	2	0	0	170	16:15	30	2	2	0	0	0	0
16:30	20	2	0	0	0	0	0	22	126	25	3	2	0	0	0	156	16:30	63	4	0	0	0	0	0
16:45	23	1	1	0	0	0	0	25	151	20	4	0	0	0	0	175	16:45	57	11	3	0	0	0	0
H/TOT	77	16	3	0	1	0	0	97	531	83	16	5	2	1	0	638	**H/TOT**	185	19	5	0	0	0	0
17:00	24	3	1	0	0	0	0	28	142	18	3	0	1	1	0	165	17:00	75	4	3	0	0	2	0
17:15	23	3	0	0	0	0	0	26	171	20	1	0	0	0	1	193	17:15	62	0	0	0	0	1	0
17:30	30	3	0	0	0	0	0	33	205	19	2	0	0	5	0	231	17:30	38	6	0	0	0	0	0
17:45	27	8	1	0	0	0	0	36	155	16	2	1	1	0	0	175	17:45	35	4	0	0	0	0	0
H/TOT	104	17	2	0	0	0	0	123	673	73	8	1	2	6	1	764	**H/TOT**	210	14	3	0	0	3	0
18:00	25	1	0	0	0	0	0	26	146	16	4	0	0	2	0	168	18:00	25	1	0	0	0	0	0
18:15	15	0	1	0	0	0	0	16	152	7	2	0	2	0	1	164	18:15	26	0	0	0	0	0	0
18:30	19	2	0	0	0	0	0	21	105	13	0	0	0	0	0	118	18:30	12	2	0	0	0	0	0
18:45	24	2	0	0	0	0	0	26	101	7	0	0	1	2	0	111	18:45	15	1	0	0	0	0	0
H/TOT	83	5	1	0	0	0	0	89	504	43	6	0	3	4	1	561	**H/TOT**	78	4	0	0	0	0	0
P/TOT	264	38	6	0	1	0	0	309	1708	199	30	6	7	11	2	1963	**P/TOT**	473	37	8	0	0	3	0

MANUAL CLASSIFIED COUNTS

JOB REF: 13311

JOB NAME: REDDITCH

SITE: 1

LOCATION: A441 BIRMINGHAM ROAD (N) / DAGNELL END ROAD / A441 BIRMINGHAM ROAD (S)

DATE: 25/04/2024

DAY: THURSDAY

DATE: 25/04/2024

DAY: THURSDAY

ROAD (S)

	BTOC FROM DAGNELL END ROAD TO A441 BIRMINGHAM ROAD (S)								TIME	CTOA FROM A441 BIRMINGHAM ROAD (S) TO A441 BIRMINGHAM ROAD (N)								CTOB FROM A441 BIRMINGHAM ROAD (S) TO DAGNELL END ROAD							
TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT		CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
22	7	4	0	0	0	0	0	11	07:00	124	27	3	0	0	0	0	154	15	2	1	0	0	0	0	18
30	13	0	1	0	0	0	0	14	07:15	132	31	8	0	1	0	1	173	31	0	1	0	0	1	0	33
28	16	4	4	0	0	0	0	24	07:30	152	32	12	0	3	0	0	199	30	6	0	0	0	1	0	37
32	33	2	2	0	0	0	0	37	07:45	134	22	6	2	1	0	0	165	34	10	0	0	0	0	0	44
112	69	10	7	0	0	0	0	86	H/TOT	542	112	29	2	5	0	1	691	110	18	2	0	0	2	0	132
30	32	1	0	0	0	0	0	33	08:00	135	25	12	2	0	0	0	174	34	3	0	0	0	0	0	37
47	31	6	0	0	0	0	0	37	08:15	132	22	5	3	0	1	0	163	39	3	1	0	0	0	0	43
31	32	0	0	0	0	0	0	32	08:30	122	16	6	0	0	1	0	145	28	5	0	0	0	0	0	33
30	41	4	0	0	0	0	0	45	08:45	109	21	10	1	1	0	0	142	25	3	2	0	0	0	0	30
138	136	11	0	0	0	0	0	147	H/TOT	498	84	33	6	1	2	0	624	126	14	3	0	0	0	0	143
26	22	6	0	0	0	0	0	28	09:00	99	9	5	0	2	1	0	116	20	3	0	0	0	0	0	23
26	22	3	0	0	0	0	0	25	09:15	98	17	8	1	0	0	0	124	20	3	0	0	0	0	0	23
15	23	2	0	0	0	0	0	25	09:30	101	15	6	2	0	0	0	124	23	4	0	0	0	0	0	27
20	24	3	0	1	0	0	0	28	09:45	91	9	9	0	1	0	0	110	14	3	4	0	0	0	0	21
87	91	14	0	1	0	0	0	106	H/TOT	389	50	28	3	3	1	0	474	77	13	4	0	0	0	0	94
337	296	35	7	1	0	0	0	339	P/TOT	1429	246	90	11	9	3	1	1789	313	45	9	0	0	2	0	369

	BTOC FROM DAGNELL END ROAD TO A441 BIRMINGHAM ROAD (S)								TIME	CTOA FROM A441 BIRMINGHAM ROAD (S) TO A441 BIRMINGHAM ROAD (N)								CTOB FROM A441 BIRMINGHAM ROAD (S) TO DAGNELL END ROAD							
TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT		CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
37	40	6	4	0	0	0	0	50	16:00	169	27	4	1	1	0	0	202	27	5	1	0	0	0	0	33
34	43	7	3	0	0	1	0	54	16:15	174	35	5	1	5	2	1	223	28	4	2	0	0	1	0	35
67	42	2	0	0	0	0	0	44	16:30	181	22	4	2	0	1	0	210	28	6	0	0	0	0	0	34
71	38	3	2	0	0	1	0	44	16:45	192	20	3	0	1	0	0	216	28	0	0	0	0	0	0	28
209	163	18	9	0	0	2	0	192	H/TOT	716	104	16	4	7	3	1	851	111	15	3	0	0	1	0	130
84	56	4	2	0	0	0	0	62	17:00	197	15	3	0	0	3	0	218	26	3	0	0	0	0	0	29
63	58	5	2	0	0	0	0	65	17:15	179	16	2	0	0	0	1	198	40	3	0	1	0	0	0	44
44	41	3	0	0	0	1	0	45	17:30	179	15	3	0	1	1	0	199	32	2	1	0	0	0	0	35
39	48	4	1	1	0	0	0	54	17:45	125	9	0	1	0	1	0	136	33	3	1	0	0	0	0	37
230	203	16	5	1	0	1	0	226	H/TOT	680	55	8	1	1	5	1	751	131	11	2	1	0	0	0	145
26	37	3	0	0	0	0	0	40	18:00	147	4	4	0	0	0	0	155	44	4	0	0	0	0	0	48
26	31	0	0	0	0	0	0	31	18:15	99	6	2	0	0	0	0	107	21	2	0	0	0	0	0	23
14	31	1	0	0	0	0	0	32	18:30	86	6	0	0	0	0	0	92	12	1	0	0	0	1	0	14
16	29	1	1	0	0	0	0	31	18:45	103	5	2	0	0	0	0	110	20	0	0	0	0	1	0	21
82	128	5	1	0	0	0	0	134	H/TOT	435	21	8	0	0	0	0	464	97	7	0	0	0	2	0	106
521	494	39	15	1	0	3	0	552	P/TOT	1831	180	32	5	8	8	2	2066	339	33	5	1	0	3	0	381

MANUAL CLASSIFIED COUNTS

JOB REF: 13311

JOB NAME: REDDITCH

SITE: 1

LOCATION: A441 BIRMINGHAM ROAD (N) / DAGNELL END ROAD / A441 BIRMINGHAM ROAD (S)

DATE: 25/04/2024

DAY: THURSDAY

MANUAL CLASSIFIED COUNTS

JOB REF: 13311

JOB NAME: REDDITCH

SITE: 1

LOCATION: A441 BIRMINGHAM ROAD (N) / DAGNELL END ROAD / A441 BIRMINGHAM R

TIME	TO ARM A A441 BIRMINGHAM ROAD (N)								FROM ARM A A441 BIRMINGHAM ROAD (N)								TIME	TO ARM B DAGNELL END ROAD						
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT		CAR	LGV	OGV1	OGV2	PSV	MCL	PCL
07:00	143	29	4	0	0	0	0	176	104	30	3	0	0	0	0	137	07:00	29	8	1	0	0	0	0
07:15	157	35	9	0	1	0	1	203	167	31	8	3	0	0	1	210	07:15	62	3	1	1	0	1	0
07:30	175	34	14	0	4	0	0	227	153	36	4	5	0	1	1	200	07:30	66	10	0	0	0	2	0
07:45	160	24	9	3	1	0	0	197	218	43	6	3	0	1	0	271	07:45	88	19	1	0	0	0	0
H/TOT	635	122	36	3	6	0	1	803	642	140	21	11	0	2	2	818	**H/TOT**	245	40	3	1	0	3	0
08:00	159	29	13	2	1	0	0	204	175	51	5	2	2	1	0	236	08:00	64	10	1	1	0	0	0
08:15	177	23	6	3	0	1	0	210	210	28	8	0	0	0	0	246	08:15	95	5	3	0	0	0	0
08:30	147	20	6	0	0	2	1	176	177	21	8	4	4	1	0	215	08:30	62	8	1	0	0	0	0
08:45	134	25	10	2	1	0	0	172	180	20	5	2	1	0	0	208	08:45	56	6	2	0	0	0	0
H/TOT	617	97	35	7	2	3	1	762	742	120	26	8	7	2	0	905	**H/TOT**	277	29	7	1	0	0	0
09:00	121	9	9	0	2	1	0	142	186	25	5	0	0	0	0	216	09:00	47	5	1	0	0	0	0
09:15	120	17	12	1	0	0	0	150	140	31	8	0	0	0	0	179	09:15	43	3	2	0	0	0	0
09:30	113	18	6	2	0	0	0	139	144	28	14	3	0	0	2	191	09:30	45	9	0	0	0	0	2
09:45	110	10	9	0	1	0	0	130	121	33	12	3	0	1	0	170	09:45	33	10	5	2	0	1	0
H/TOT	464	54	36	3	3	1	0	561	591	117	39	6	0	1	2	756	**H/TOT**	168	27	8	2	0	1	2
P/TOT	1716	273	107	13	11	4	2	2126	1975	377	86	25	7	5	4	2479	**P/TOT**	690	96	18	4	0	4	2

TIME	TO ARM A A441 BIRMINGHAM ROAD (N)								FROM ARM A A441 BIRMINGHAM ROAD (N)								TIME	TO ARM B DAGNELL END ROAD						
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT		CAR	LGV	OGV1	OGV2	PSV	MCL	PCL
16:00	204	29	4	1	1	0	0	239	124	24	8	0	0	1	0	157	16:00	40	10	3	0	0	0	0
16:15	204	37	7	1	5	2	1	257	164	27	3	3	3	0	0	200	16:15	49	12	2	0	1	1	0
16:30	244	26	4	2	0	1	0	277	146	27	3	2	0	0	0	178	16:30	48	8	0	0	0	0	0
16:45	249	31	6	0	1	0	0	287	174	21	5	0	0	0	0	200	16:45	51	1	1	0	0	0	0
H/TOT	901	123	21	4	7	3	1	1060	608	99	19	5	3	1	0	735	**H/TOT**	188	31	6	0	1	1	0
17:00	272	19	6	0	0	5	0	302	166	21	4	0	1	1	0	193	17:00	50	6	1	0	0	0	0
17:15	241	16	2	0	0	1	1	261	194	23	1	0	0	0	1	219	17:15	63	6	0	1	0	0	0
17:30	217	21	3	0	1	1	0	243	235	22	2	0	0	5	0	264	17:30	62	5	1	0	0	0	0
17:45	160	13	0	1	0	1	0	175	182	24	3	1	1	0	0	211	17:45	60	11	2	0	0	0	0
H/TOT	890	69	11	1	1	8	1	981	777	90	10	1	2	6	1	887	**H/TOT**	235	28	4	1	0	0	0
18:00	172	5	4	0	0	0	0	181	171	17	4	0	0	2	0	194	18:00	69	5	0	0	0	0	0
18:15	125	6	2	0	0	0	0	133	167	7	3	0	2	0	1	180	18:15	36	2	1	0	0	0	0
18:30	98	8	0	0	0	0	0	106	124	15	0	0	0	0	0	139	18:30	31	3	0	0	0	1	0
18:45	118	6	2	0	0	0	0	126	125	9	0	0	1	2	0	137	18:45	44	2	0	0	0	1	0
H/TOT	513	25	8	0	0	0	0	546	587	48	7	0	3	4	1	650	**H/TOT**	180	12	1	0	0	2	0
P/TOT	2304	217	40	5	8	11	2	2587	1972	237	36	6	8	11	2	2272	**P/TOT**	603	71	11	1	1	3	0

MANUAL CLASSIFIED COUNTS

AUTO SURVEYS LTD
TRAFFIC DATA COLLECTION

JOB REF: 13311

JOB NAME: REDDITCH

SITE: 1

LOCATION: A441 BIRMINGHAM ROAD (N) / DAGNELL END ROAD / A441 BIRMINGHAM ROAD (S)

DATE: 25/04/2024

DAY: THURSDAY

AUTO SURVEYS LTD
TRAFFIC DATA COLLECTION

DATE: 25/04/2024

DAY: THURSDAY

ROAD (S)

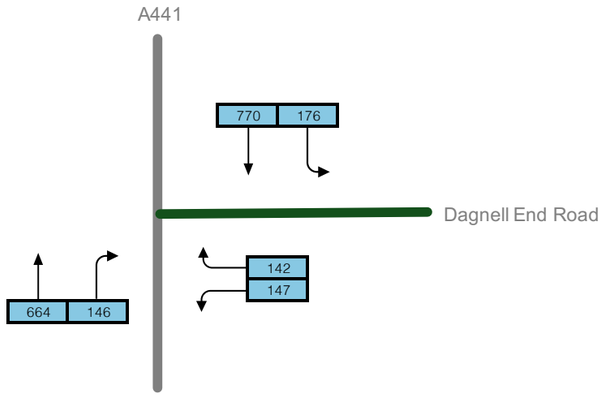
	FROM ARM B DAGNELL END ROAD								TIME	TO ARM C A441 BIRMINGHAM ROAD (S)								FROM ARM C A441 BIRMINGHAM ROAD (S)							
TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT		CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
38	26	6	1	0	0	0	0	33	07:00	97	28	3	0	0	0	0	128	139	29	4	0	0	0	0	172
68	38	4	2	0	0	0	0	44	07:15	149	28	9	2	0	0	1	189	163	31	9	0	1	1	1	206
78	39	6	6	0	1	0	0	52	07:30	133	36	8	5	0	0	1	183	182	38	12	0	3	1	0	236
108	59	4	5	1	0	0	0	69	07:45	197	36	7	3	0	1	0	244	168	32	6	2	1	0	0	209
292	162	20	14	1	1	0	0	198	H/TOT	576	128	27	10	0	1	2	744	652	130	31	2	5	2	1	823
76	56	5	1	0	1	0	0	63	08:00	177	45	4	1	2	1	0	230	169	28	12	2	0	0	0	211
103	76	7	1	0	0	0	0	84	08:15	185	32	6	0	0	0	0	223	171	25	6	3	0	1	0	206
71	57	4	0	0	0	1	1	63	08:30	175	18	7	4	4	1	0	209	150	21	6	0	0	1	0	178
64	66	8	0	1	0	0	0	75	08:45	190	21	5	2	1	0	0	219	134	24	12	1	1	0	0	172
314	255	24	2	1	1	1	1	285	H/TOT	727	116	22	7	7	2	0	881	624	98	36	6	1	2	0	767
53	44	6	4	0	0	0	0	54	09:00	181	29	4	0	0	0	0	214	119	12	5	0	2	1	0	139
48	44	3	4	0	0	0	0	51	09:15	139	34	6	0	0	0	0	179	118	20	8	1	0	0	0	147
56	35	5	0	0	0	0	0	40	09:30	145	25	14	3	0	0	0	187	124	19	6	2	0	0	0	151
51	43	4	0	1	0	0	0	48	09:45	126	29	11	2	0	0	0	168	105	12	13	0	1	0	0	131
208	166	18	8	1	0	0	0	193	H/TOT	591	117	35	5	0	0	0	748	466	63	32	3	3	1	0	568
814	583	62	24	3	2	1	1	676	P/TOT	1894	361	84	22	7	3	2	2373	1742	291	99	11	9	5	1	2158

	FROM ARM B DAGNELL END ROAD								TIME	TO ARM C A441 BIRMINGHAM ROAD (S)								FROM ARM C A441 BIRMINGHAM ROAD (S)							
TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT		CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
53	75	8	4	0	0	0	0	87	16:00	151	25	10	0	0	1	0	187	196	32	5	1	1	0	0	235
65	73	9	5	0	0	1	0	88	16:15	186	26	6	3	2	1	0	224	202	39	7	1	5	3	1	258
56	105	6	0	0	0	0	0	111	16:30	168	27	3	2	0	0	0	200	209	28	4	2	0	1	0	244
53	95	14	5	0	0	1	0	115	16:45	189	23	6	0	0	1	0	219	220	20	3	0	1	0	0	244
227	348	37	14	0	0	2	0	401	H/TOT	694	101	25	5	2	3	0	830	827	119	19	4	7	4	1	981
57	131	8	5	0	0	2	0	146	17:00	198	22	5	0	1	1	0	227	223	18	3	0	0	3	0	247
70	120	5	2	0	0	1	0	128	17:15	229	25	3	0	0	0	1	258	219	19	2	1	0	0	1	242
68	79	9	0	0	0	1	0	89	17:30	246	22	2	0	0	6	0	276	211	17	4	0	1	1	0	234
73	83	8	1	1	0	0	0	93	17:45	203	20	3	2	1	0	0	229	158	12	1	1	0	1	0	173
268	413	30	8	1	0	4	0	456	H/TOT	876	89	13	2	2	7	1	990	811	66	10	2	1	5	1	896
74	62	4	0	0	0	0	0	66	18:00	183	19	4	0	0	2	0	208	191	8	4	0	0	0	0	203
39	57	0	0	0	0	0	0	57	18:15	183	7	2	0	2	0	1	195	120	8	2	0	0	0	0	130
35	43	3	0	0	0	0	0	46	18:30	136	14	0	0	0	0	0	150	98	7	0	0	0	1	0	106
47	44	2	1	0	0	0	0	47	18:45	130	8	1	0	1	2	0	142	123	5	2	0	0	1	0	131
195	206	9	1	0	0	0	0	216	H/TOT	632	48	7	0	3	4	1	695	532	28	8	0	0	2	0	570
690	967	76	23	1	0	6	0	1073	P/TOT	2202	238	45	7	7	14	2	2515	2170	213	37	6	8	11	2	2447

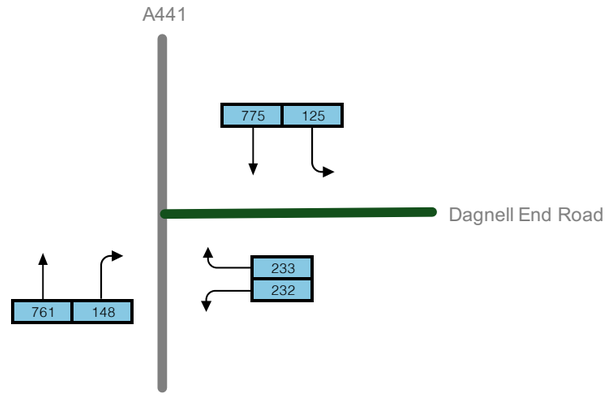
APPENDIX D

Additional Traffic Flow Diagrams

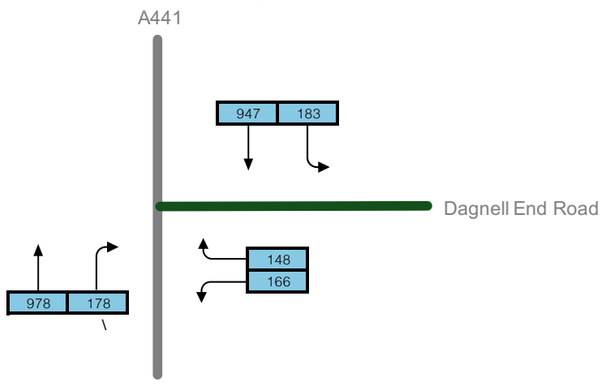
AM Peak - 2024 Base (Sensitivity)



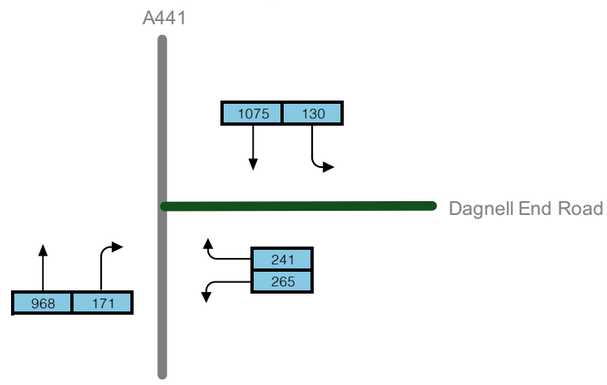
PM Peak - 2024 Base (Sensitivity)



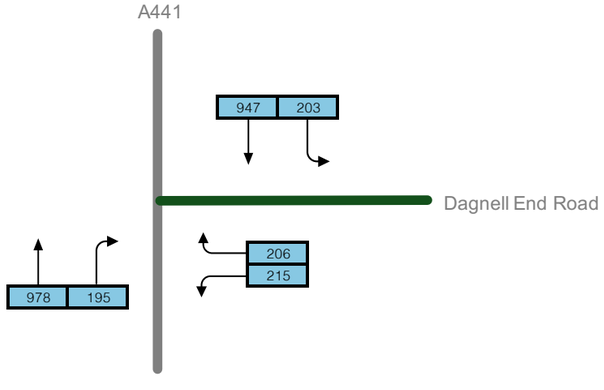
AM Peak - 2030 Base (Sensitivity)



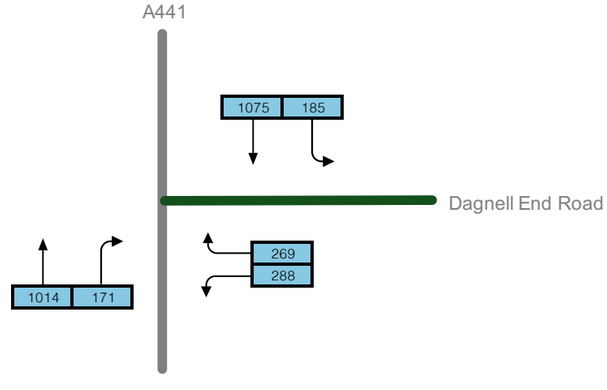
PM Peak - 2030 Base (Sensitivity)



AM Peak - 2030 Base (Sensitivity) + Development



PM Peak - 2030 Base (Sensitivity) + Development



All figures shown are PCUs

APPENDIX E

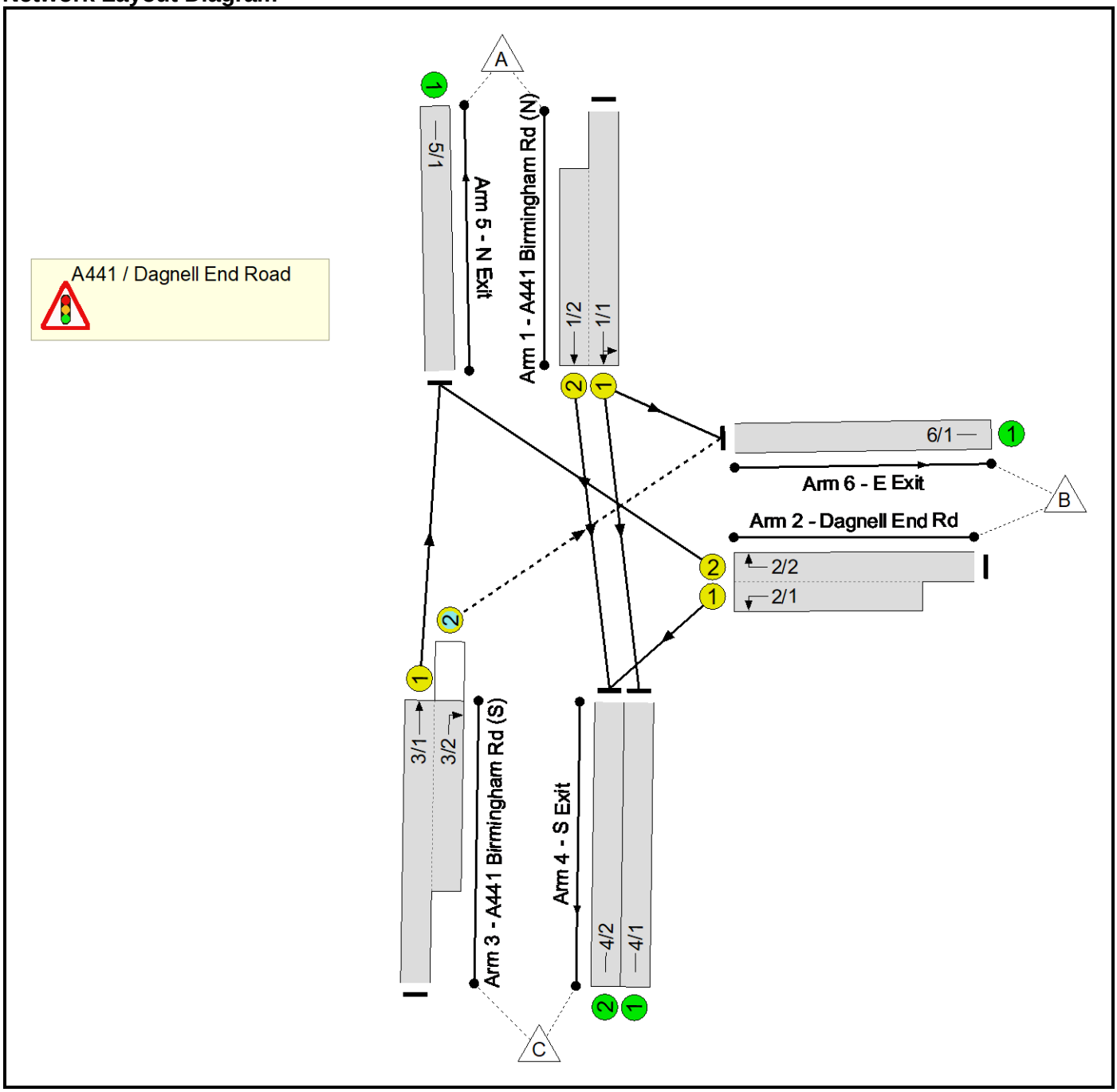
LinSig Modelling Outputs (Sensitivity Scenarios)

Full Input Data And Results

User and Project Details

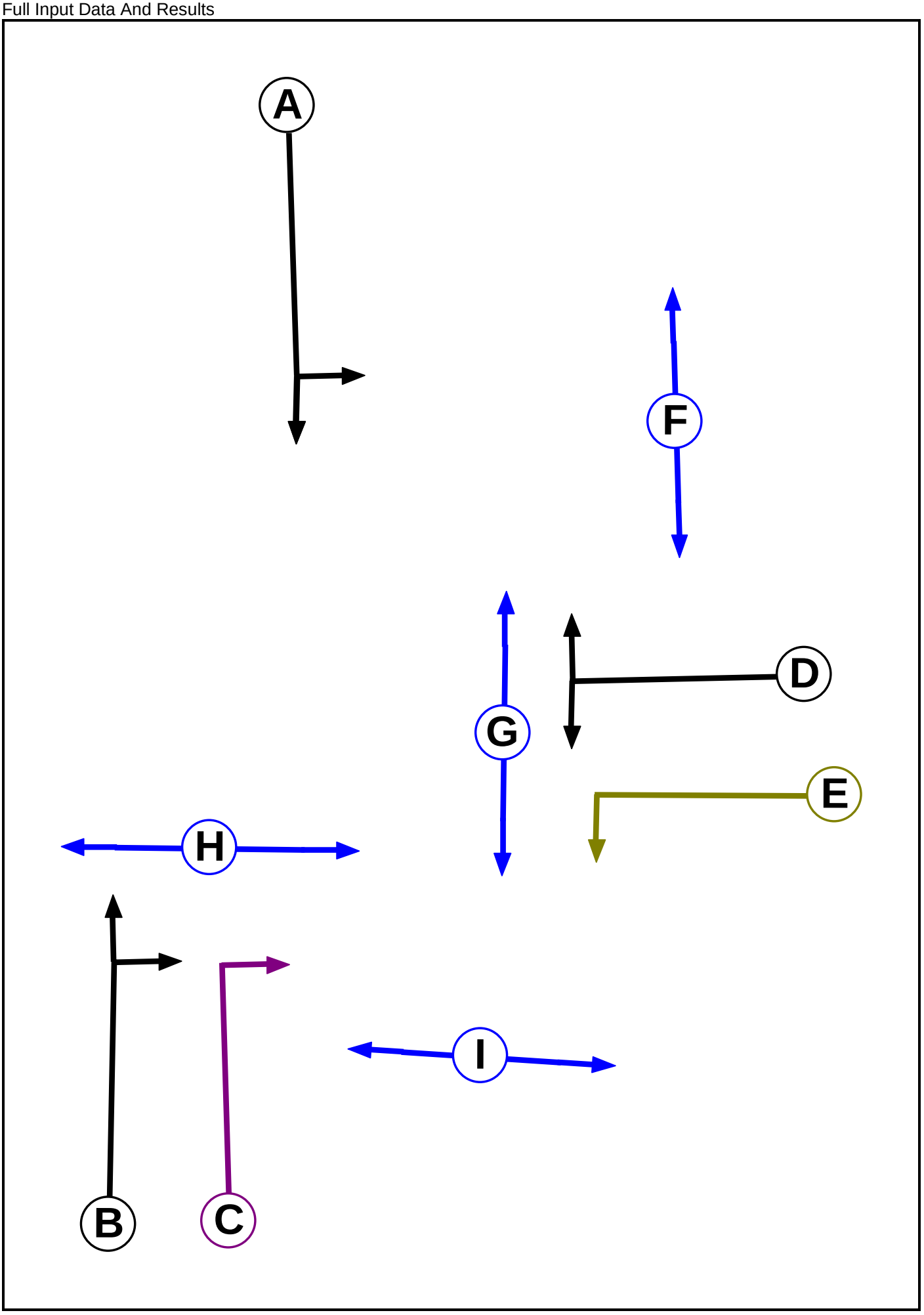
Project:	
Title:	**A441 / Dagnell End Road**
Location:	
Additional detail:	Proposed layout
File name:	A441_Dagnell End Rd v2 Rev B.lsg3x
Author:	al
Company:	
Address:	

Network Layout Diagram



Full Input Data And Results

Phase Diagram


A
F
D
G
E
H
I
B
C

Full Input Data And Results

Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Ind. Arrow	B	4	4
D	Traffic		7	7
E	Filter	D	4	0
F	Pedestrian		7	7
G	Pedestrian		7	7
H	Pedestrian		7	7
I	Pedestrian		7	7

Phase Intergreens Matrix

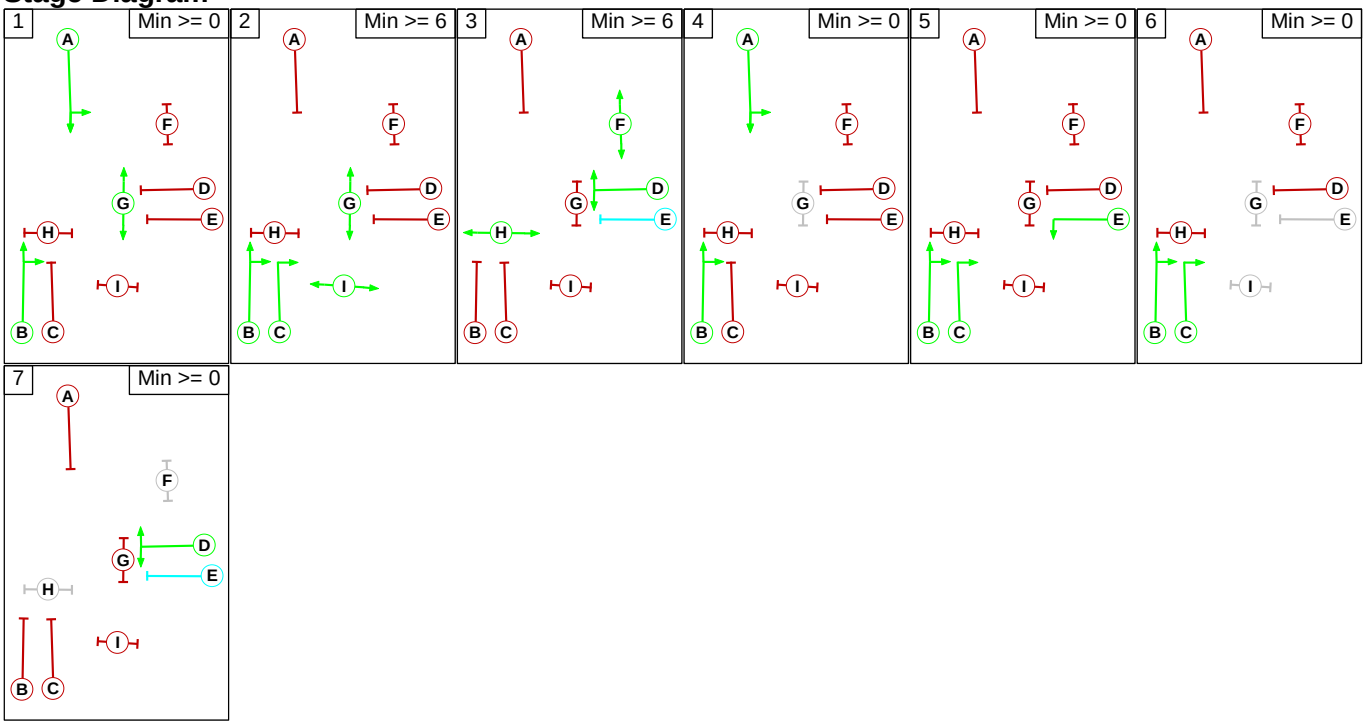
		Starting Phase								
		A	B	C	D	E	F	G	H	I
Terminating Phase	A		-	5	7	7	6	-	-	8
	B	-		-	7	-	8	-	5	-
	C	7	-		7	-	8	-	5	-
	D	7	7	7		-	-	5	-	7
	E	6	-	-	-		-	5	-	7
	F	8	8	8	-	-		-	-	-
	G	-	-	-	9	9	-		-	-
	H	-	8	8	-	-	-	-		-
	I	9	-	-	9	9	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A B G
2	B C G I
3	D F H
4	A B
5	B C E
6	B C
7	D

Full Input Data And Results

Stage Diagram



Phase Delays

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

Prohibited Stage Change

From Stage \ To Stage	1	2	3	4	5	6	7
1		8	9	0	9	5	9
2	9		9	9	9	0	9
3	8	8		8	8	8	0
4	0	8	8		7	5	7
5	X	X	8	X		X	7
6	7	0	8	7	0		7
7	7	7	0	7	7	7	

Full Input Data And Results

Give-Way Lane Input Data

Junction: A441 / Dagnell End Road											
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)**
3/2 (A441 Birmingham Rd (S))	6/1 (Right)	1439	0	1/1	1.09	All	3.00	-	0.50	3	3.00
				1/2	1.09	All					

Full Input Data And Results

Lane Input Data

Junction: A441 / Dagnell End Road												
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 (A441 Birmingham Rd (N))	U	A	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 4 Ahead	50.00
											Arm 6 Left	10.00
1/2 (A441 Birmingham Rd (N))	U	A	2	3	10.0	Geom	-	3.00	0.00	Y	Arm 4 Ahead	77.00
2/1 (Dagnell End Rd)	U	D E	2	3	9.6	Geom	-	3.10	0.00	Y	Arm 4 Left	38.00
2/2 (Dagnell End Rd)	U	D	2	3	60.0	Geom	-	3.10	0.00	Y	Arm 5 Right	9.00
3/1 (A441 Birmingham Rd (S))	U	B	2	3	60.0	User	1800	-	-	-	-	-
3/2 (A441 Birmingham Rd (S))	O	B C	2	3	9.7	User	1800	-	-	-	-	-
4/1 (S Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
4/2 (S Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (N Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (E Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2030 AM Effective Base'	08:00	09:00	01:00	
2: '2030 PM Effective Base'	17:00	18:00	01:00	
3: '2030 AM Effective Base + Dev'	08:00	09:00	01:00	
4: '2030 PM Effective Base + Dev'	17:00	18:00	01:00	

Scenario 1: '1' (FG1: '2030 AM Effective Base', Plan 1: 'Network Control Plan 1 (no Peds)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	183	947	1130
	B	148	0	166	314
	C	978	178	0	1156
	Tot.	1126	361	1113	2600

Traffic Lane Flows

Lane	Scenario 1: 1
Junction: A441 / Dagnell End Road	
1/1 (with short)	1130(In) 835(Out)
1/2 (short)	295
2/1 (short)	166
2/2 (with short)	314(In) 148(Out)
3/1 (with short)	1156(In) 978(Out)
3/2 (short)	178
4/1	652
4/2	461
5/1	1126
6/1	361

Full Input Data And Results

Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	50.00	78.1 %	1813	1813
				Arm 6 Left	10.00	21.9 %		
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1726	1726
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1679	1679
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 2: '2' (FG2: '2030 PM Effective Base', Plan 1: 'Network Control Plan 1 (no Peds)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	130	1075	1205
	B	241	0	265	506
	C	968	171	0	1139
	Tot.	1209	301	1340	2850

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2
Junction: A441 / Dagnell End Road	
1/1 (with short)	1205(In) 935(Out)
1/2 (short)	270
2/1 (short)	265
2/2 (with short)	506(In) 241(Out)
3/1 (with short)	1139(In) 968(Out)
3/2 (short)	171
4/1	805
4/2	535
5/1	1209
6/1	301

Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	50.00	86.1 %	1830	1830
				Arm 6 Left	10.00	13.9 %		
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1641	1641
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1800	1800
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 3: '3' (FG3: '2030 AM Effective Base + Dev', Plan 1: 'Network Control Plan 1 (no Peds)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	203	947	1150
	B	206	0	215	421
	C	978	195	0	1173
	Tot.	1184	398	1162	2744

Traffic Lane Flows

Lane	Scenario 3: 3
Junction: A441 / Dagnell End Road	
1/1 (with short)	1150(In) 850(Out)
1/2 (short)	300
2/1 (short)	215
2/2 (with short)	421(In) 206(Out)
3/1 (with short)	1173(In) 978(Out)
3/2 (short)	195
4/1	647
4/2	515
5/1	1184
6/1	398

Full Input Data And Results

Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	50.00	76.1 %	1809	1809
				Arm 6 Left	10.00	23.9 %		
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1726	1726
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1679	1679
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 4: '4' (FG4: '2030 PM Effective Base + Dev', Plan 1: 'Network Control Plan 1 (no Peds)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	185	1075	1260
	B	269	0	288	557
	C	1014	171	0	1185
	Tot.	1283	356	1363	3002

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 4: 4
Junction: A441 / Dagnell End Road	
1/1 (with short)	1260(In) 977(Out)
1/2 (short)	283
2/1 (short)	288
2/2 (with short)	557(In) 269(Out)
3/1 (with short)	1185(In) 1014(Out)
3/2 (short)	171
4/1	792
4/2	571
5/1	1283
6/1	356

Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	50.00	81.1 %	1819	1819
				Arm 6 Left	10.00	18.9 %		
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1641	1641
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1800	1800
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 5: '5' (FG1: '2030 AM Effective Base', Plan 2: 'Network Control Plan 2 (no Peds, no left filter)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	183	947	1130
	B	148	0	166	314
	C	978	178	0	1156
	Tot.	1126	361	1113	2600

Traffic Lane Flows

Lane	Scenario 5: 5
Junction: A441 / Dagnell End Road	
1/1 (with short)	1130(In) 835(Out)
1/2 (short)	295
2/1 (short)	166
2/2 (with short)	314(In) 148(Out)
3/1 (with short)	1156(In) 978(Out)
3/2 (short)	178
4/1	652
4/2	461
5/1	1126
6/1	361

Full Input Data And Results

Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	50.00	78.1 %	1813	1813
				Arm 6 Left	10.00	21.9 %		
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1726	1726
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1679	1679
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 6: '6' (FG2: '2030 PM Effective Base', Plan 2: 'Network Control Plan 2 (no Peds, no left filter)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	130	1075	1205
	B	241	0	265	506
	C	968	171	0	1139
	Tot.	1209	301	1340	2850

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 6: 6
Junction: A441 / Dagnell End Road	
1/1 (with short)	1205(In) 935(Out)
1/2 (short)	270
2/1 (short)	265
2/2 (with short)	506(In) 241(Out)
3/1 (with short)	1139(In) 968(Out)
3/2 (short)	171
4/1	805
4/2	535
5/1	1209
6/1	301

Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	50.00	86.1 %	1830	1830
				Arm 6 Left	10.00	13.9 %		
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1641	1641
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1800	1800
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 7: '7' (FG3: '2030 AM Effective Base + Dev', Plan 2: 'Network Control Plan 2 (no Peds, no left filter)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	203	947	1150
	B	206	0	215	421
	C	978	195	0	1173
	Tot.	1184	398	1162	2744

Traffic Lane Flows

Lane	Scenario 7: 7
Junction: A441 / Dagnell End Road	
1/1 (with short)	1150(In) 850(Out)
1/2 (short)	300
2/1 (short)	215
2/2 (with short)	421(In) 206(Out)
3/1 (with short)	1173(In) 978(Out)
3/2 (short)	195
4/1	647
4/2	515
5/1	1184
6/1	398

Full Input Data And Results

Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	50.00	76.1 %	1809	1809
				Arm 6 Left	10.00	23.9 %		
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1726	1726
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1679	1679
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 8: '8' (FG4: '2030 PM Effective Base + Dev', Plan 2: 'Network Control Plan 2 (no Peds, no left filter)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	185	1075	1260
	B	269	0	288	557
	C	1014	171	0	1185
	Tot.	1283	356	1363	3002

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 8: 8
Junction: A441 / Dagnell End Road	
1/1 (with short)	1260(In) 977(Out)
1/2 (short)	283
2/1 (short)	288
2/2 (with short)	557(In) 269(Out)
3/1 (with short)	1185(In) 1014(Out)
3/2 (short)	171
4/1	792
4/2	571
5/1	1283
6/1	356

Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	50.00	81.1 %	1819	1819
				Arm 6 Left	10.00	18.9 %		
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1641	1641
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1800	1800
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 9: '9' (FG1: '2030 AM Effective Base', Plan 3: 'Network Control Plan 3 (Peds)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	183	947	1130
	B	148	0	166	314
	C	978	178	0	1156
	Tot.	1126	361	1113	2600

Traffic Lane Flows

Lane	Scenario 9: 9
Junction: A441 / Dagnell End Road	
1/1 (with short)	1130(In) 835(Out)
1/2 (short)	295
2/1 (short)	166
2/2 (with short)	314(In) 148(Out)
3/1 (with short)	1156(In) 978(Out)
3/2 (short)	178
4/1	652
4/2	461
5/1	1126
6/1	361

Full Input Data And Results

Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	50.00	78.1 %	1813	1813
				Arm 6 Left	10.00	21.9 %		
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1726	1726
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1679	1679
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 10: '10' (FG2: '2030 PM Effective Base', Plan 3: 'Network Control Plan 3 (Peds)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	130	1075	1205
	B	241	0	265	506
	C	968	171	0	1139
	Tot.	1209	301	1340	2850

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 10: 10
Junction: A441 / Dagnell End Road	
1/1 (with short)	1205(In) 897(Out)
1/2 (short)	308
2/1 (short)	265
2/2 (with short)	506(In) 241(Out)
3/1 (with short)	1139(In) 968(Out)
3/2 (short)	171
4/1	767
4/2	573
5/1	1209
6/1	301

Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead Arm 6 Left	50.00 10.00	85.5 % 14.5 %	1828	1828
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1641	1641
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1800	1800
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 11: '11' (FG3: '2030 AM Effective Base + Dev', Plan 3: 'Network Control Plan 3 (Peds)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	203	947	1150
	B	206	0	215	421
	C	978	195	0	1173
	Tot.	1184	398	1162	2744

Traffic Lane Flows

Lane	Scenario 11: 11
Junction: A441 / Dagnell End Road	
1/1 (with short)	1150(In) 850(Out)
1/2 (short)	300
2/1 (short)	215
2/2 (with short)	421(In) 206(Out)
3/1 (with short)	1173(In) 978(Out)
3/2 (short)	195
4/1	647
4/2	515
5/1	1184
6/1	398

Full Input Data And Results

Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	50.00	76.1 %	1809	1809
				Arm 6 Left	10.00	23.9 %		
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1726	1726
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1679	1679
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 12: '12' (FG4: '2030 PM Effective Base + Dev', Plan 3: 'Network Control Plan 3 (Peds)')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	185	1075	1260
	B	269	0	288	557
	C	1014	171	0	1185
	Tot.	1283	356	1363	3002

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 12: 12
Junction: A441 / Dagnell End Road	
1/1 (with short)	1260(In) 977(Out)
1/2 (short)	283
2/1 (short)	288
2/2 (with short)	557(In) 269(Out)
3/1 (with short)	1185(In) 1014(Out)
3/2 (short)	171
4/1	792
4/2	571
5/1	1283
6/1	356

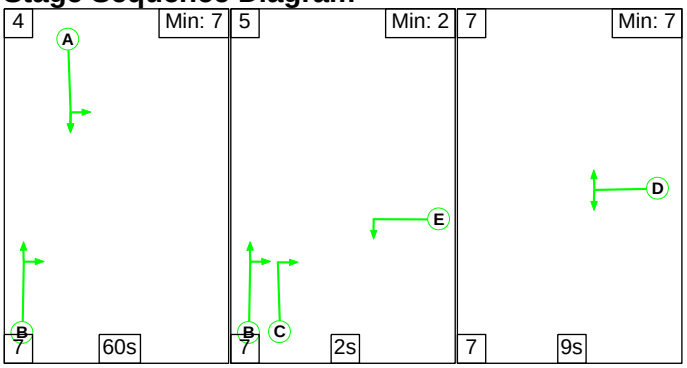
Lane Saturation Flows

Junction: A441 / Dagnell End Road								
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 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead Arm 6 Left	50.00 10.00	81.1 % 18.9 %	1819	1819
1/2 (A441 Birmingham Rd (N))	3.00	0.00	Y	Arm 4 Ahead	77.00	100.0 %	1878	1878
2/1 (Dagnell End Rd)	3.10	0.00	Y	Arm 4 Left	38.00	100.0 %	1852	1852
2/2 (Dagnell End Rd)	3.10	0.00	Y	Arm 5 Right	9.00	100.0 %	1650	1650
3/1 (A441 Birmingham Rd (S) Lane 1)	This lane uses a directly entered Saturation Flow						1641	1641
3/2 (A441 Birmingham Rd (S) Lane 2)	This lane uses a directly entered Saturation Flow						1800	1800
4/1 (S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (E Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 1: '1' (FG1: '2030 AM Effective Base', Plan 1: 'Network Control Plan 1 (no Peds)')

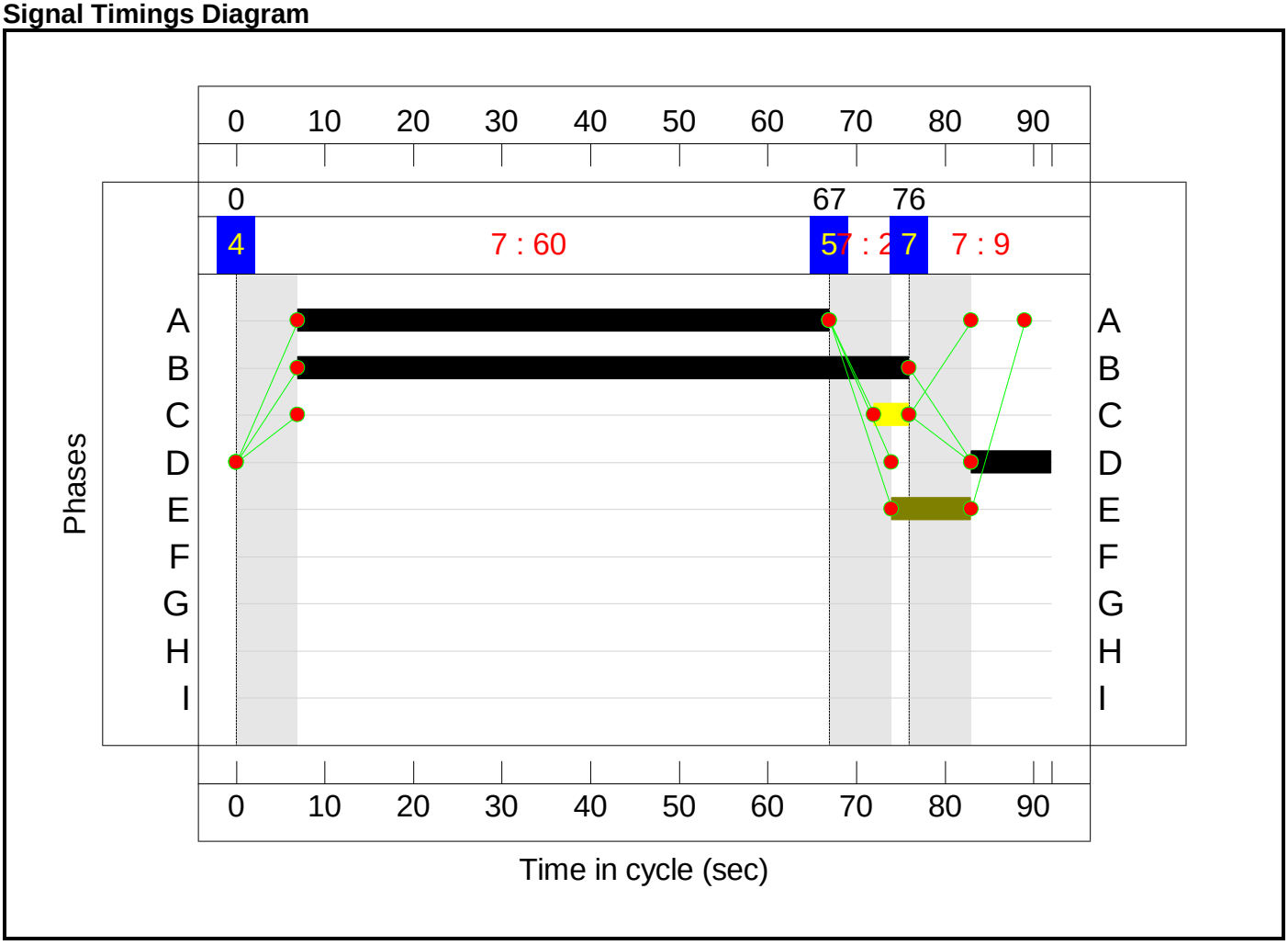
Stage Sequence Diagram



Stage Timings

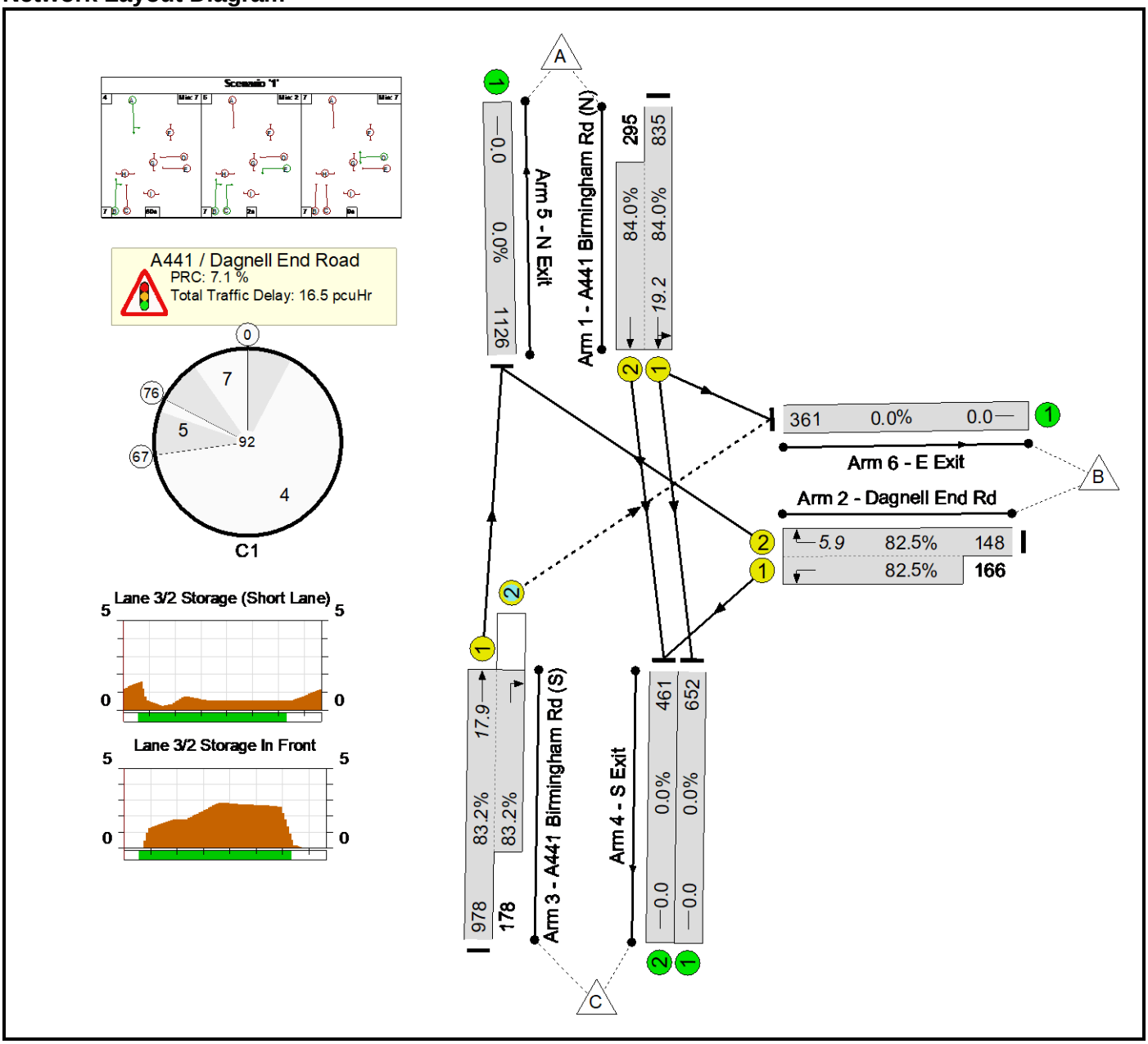
Stage	4	5	7
Duration	60	2	9
Change Point	0	67	76

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**84.0%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**84.0%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	60	-	1130	1813:1878	994+351	84.0 : 84.0%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	9:18	9	314	1650:1852	179+201	82.5 : 82.5%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	69	4	1156	1726:1679	1175+214	83.2 : 83.2%
4/1	S Exit	U	N/A	N/A	-		-	-	-	652	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	461	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1126	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	361	Inf	Inf	0.0%

Full Input Data And Results

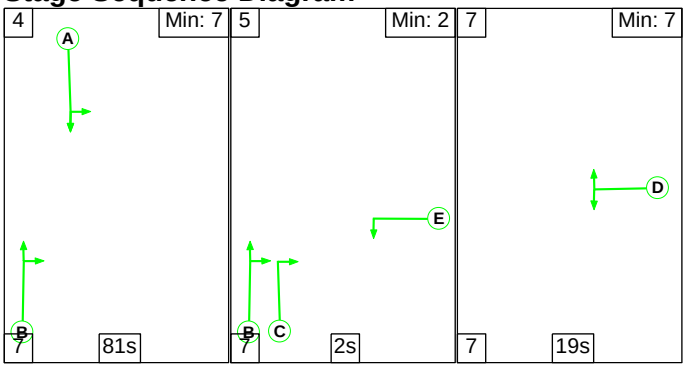
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**63**	**109**	**6**	**7.9**	**7.2**	**1.5**	**16.5**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**63**	**109**	**6**	**7.9**	**7.2**	**1.5**	**16.5**	**-**	**-**	**-**	**-**
1/1+1/2	1130	1130	-	-	-	2.9	2.6	-	5.5 (4.2+1.3)	17.4 (18.1:15.3)	16.6	2.6	19.2
2/2+2/1	314	314	-	-	-	3.1	2.2	-	5.3 (2.7+2.6)	61.1 (65.5:57.2)	3.7	2.2	5.9
3/1+3/2	1156	1156	63	109	6	1.8	2.4	1.5	5.7 (3.7+2.0)	17.9 (13.7:40.7)	15.5	2.4	17.9
4/1	652	652	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	461	461	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1126	1126	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	361	361	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 7.1 Total Delay for Signalled Lanes (pcuHr): 16.53 Cycle Time (s): 92
PRC Over All Lanes (%): 7.1 Total Delay Over All Lanes(pcuHr): 16.53

Full Input Data And Results

Scenario 2: '2' (FG2: '2030 PM Effective Base', Plan 1: 'Network Control Plan 1 (no Peds)')

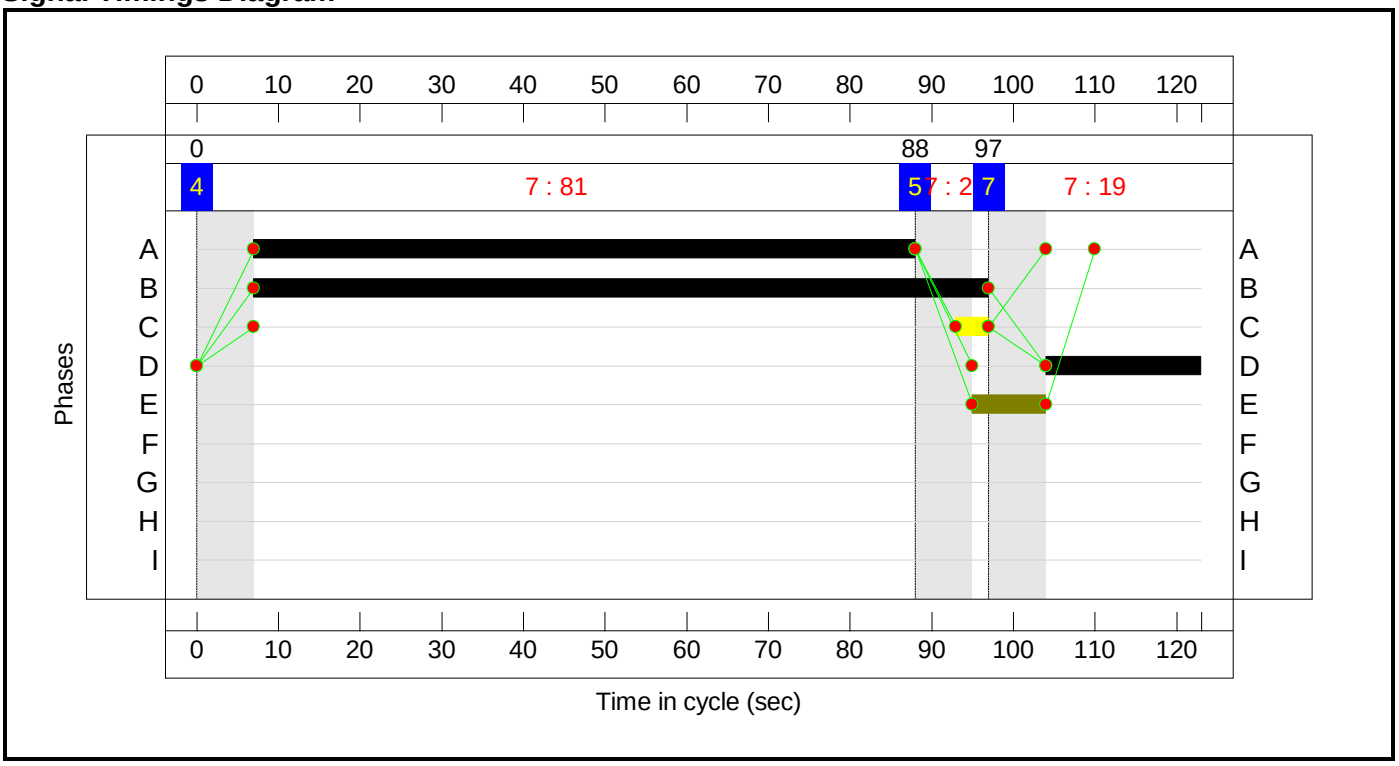
Stage Sequence Diagram



Stage Timings

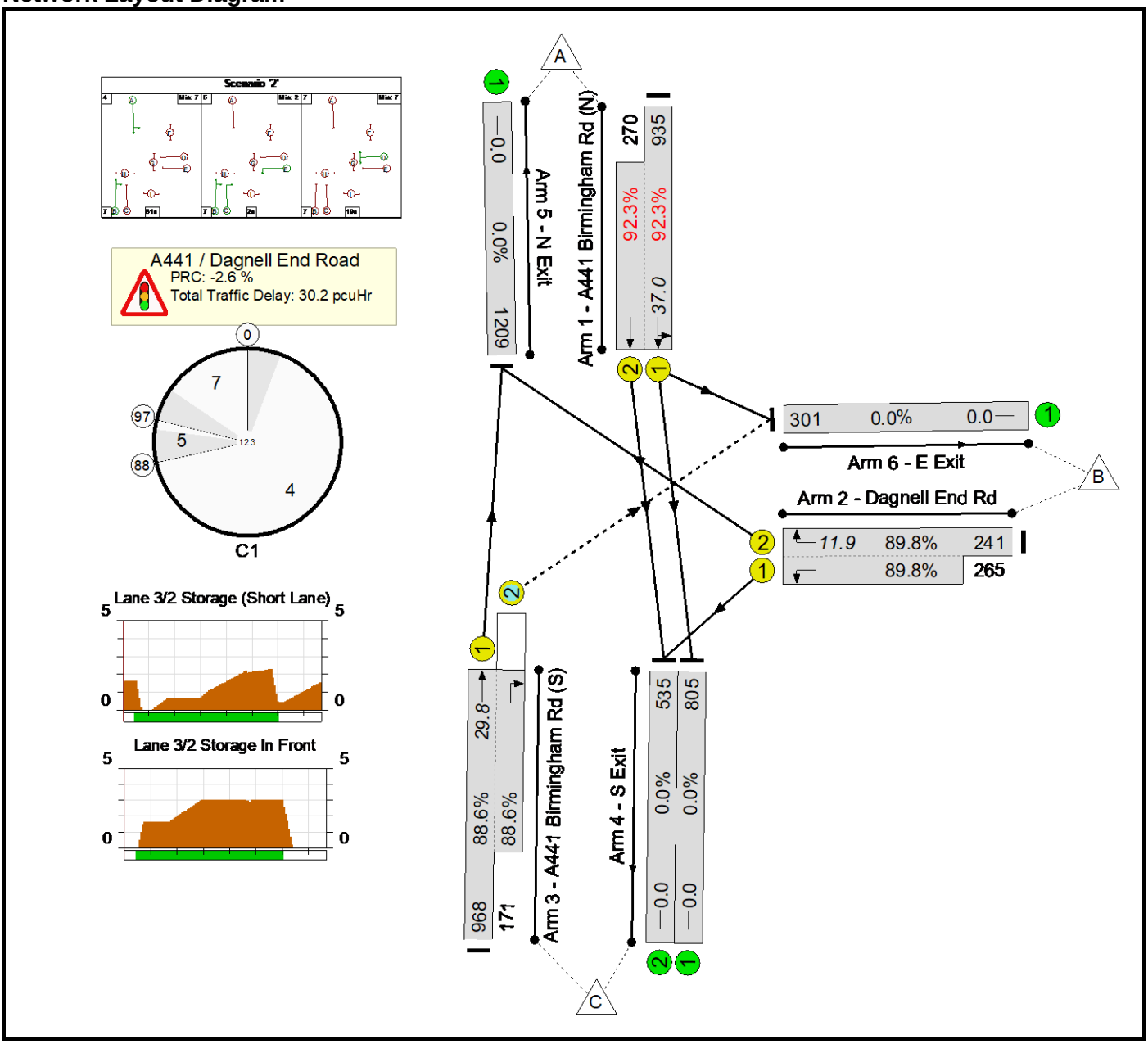
Stage	4	5	7
Duration	81	2	19
Change Point	0	88	97

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**92.3%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**92.3%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	81	-	1205	1830:1878	1013+292	92.3 : 92.3%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	19:28	9	506	1650:1852	268+295	89.8 : 89.8%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	90	4	1139	1641:1800	1092+193	88.6 : 88.6%
4/1	S Exit	U	N/A	N/A	-		-	-	-	805	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	535	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1209	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	301	Inf	Inf	0.0%

Full Input Data And Results

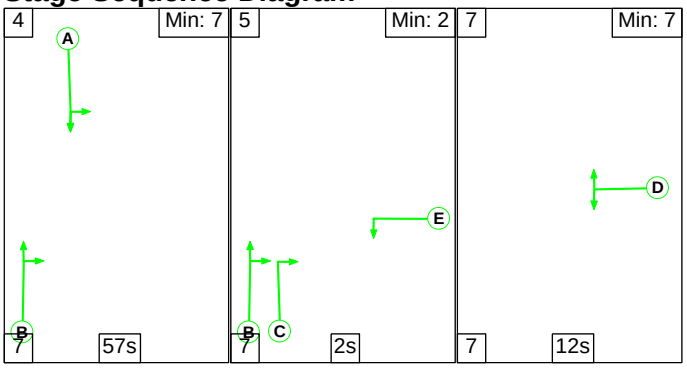
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**19**	**102**	**49**	**15.4**	**13.0**	**1.7**	**30.2**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**19**	**102**	**49**	**15.4**	**13.0**	**1.7**	**30.2**	**-**	**-**	**-**	**-**
1/1+1/2	1205	1205	-	-	-	5.1	5.4	-	10.6 (8.3+2.2)	31.6 (32.1:29.8)	31.6	5.4	37.0
2/2+2/1	506	506	-	-	-	6.5	3.9	-	10.4 (5.2+5.1)	73.7 (78.2:69.6)	8.0	3.9	11.9
3/1+3/2	1139	1139	19	102	49	3.8	3.7	1.7	9.2 (6.1+3.2)	29.2 (22.5:66.8)	26.1	3.7	29.8
4/1	805	805	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	535	535	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1209	1209	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	301	301	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -2.6 Total Delay for Signalled Lanes (pcuHr): 30.15 Cycle Time (s): 123
PRC Over All Lanes (%): -2.6 Total Delay Over All Lanes(pcuHr): 30.15

Full Input Data And Results

Scenario 3: '3' (FG3: '2030 AM Effective Base + Dev', Plan 1: 'Network Control Plan 1 (no Peds)')

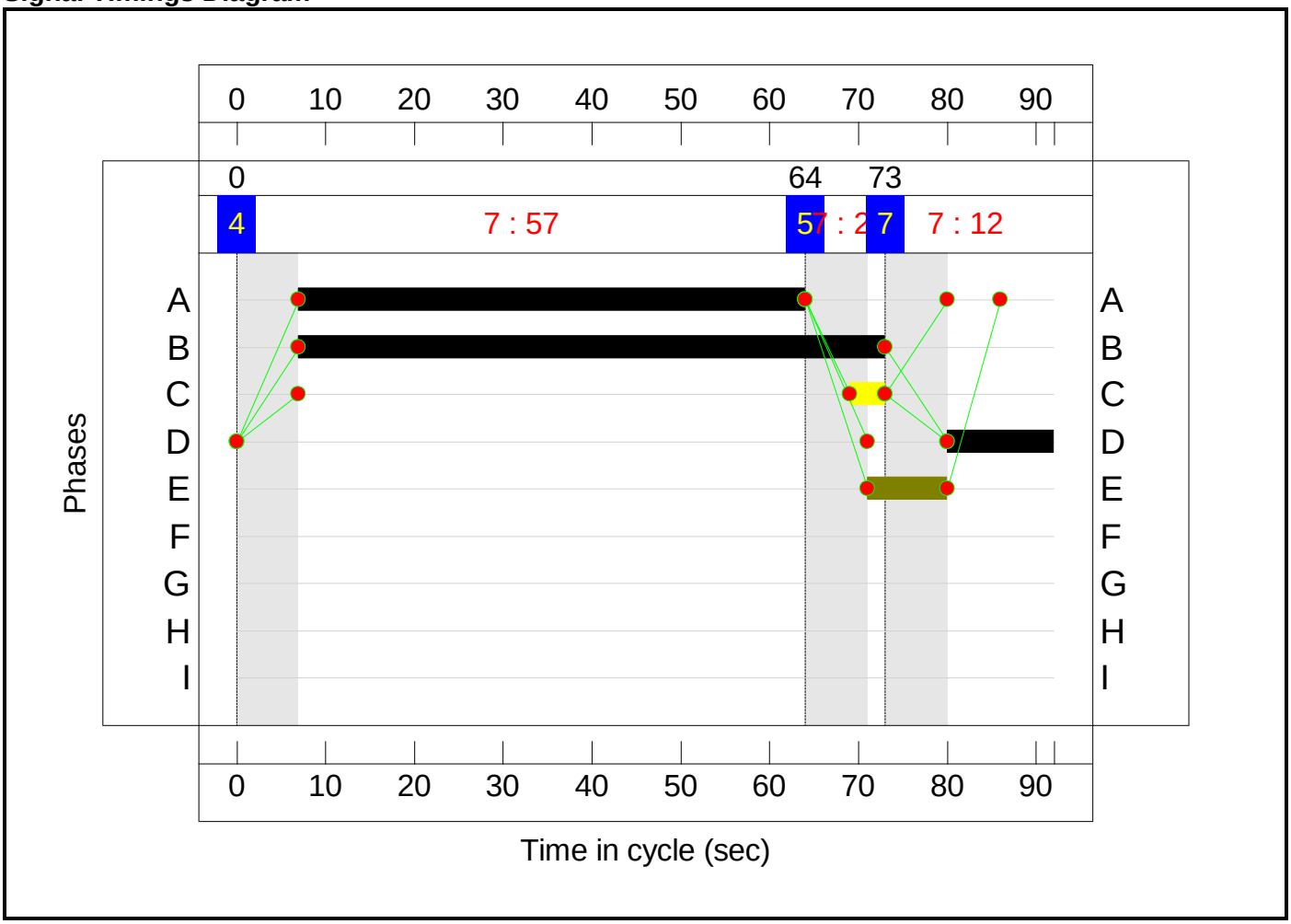
Stage Sequence Diagram



Stage Timings

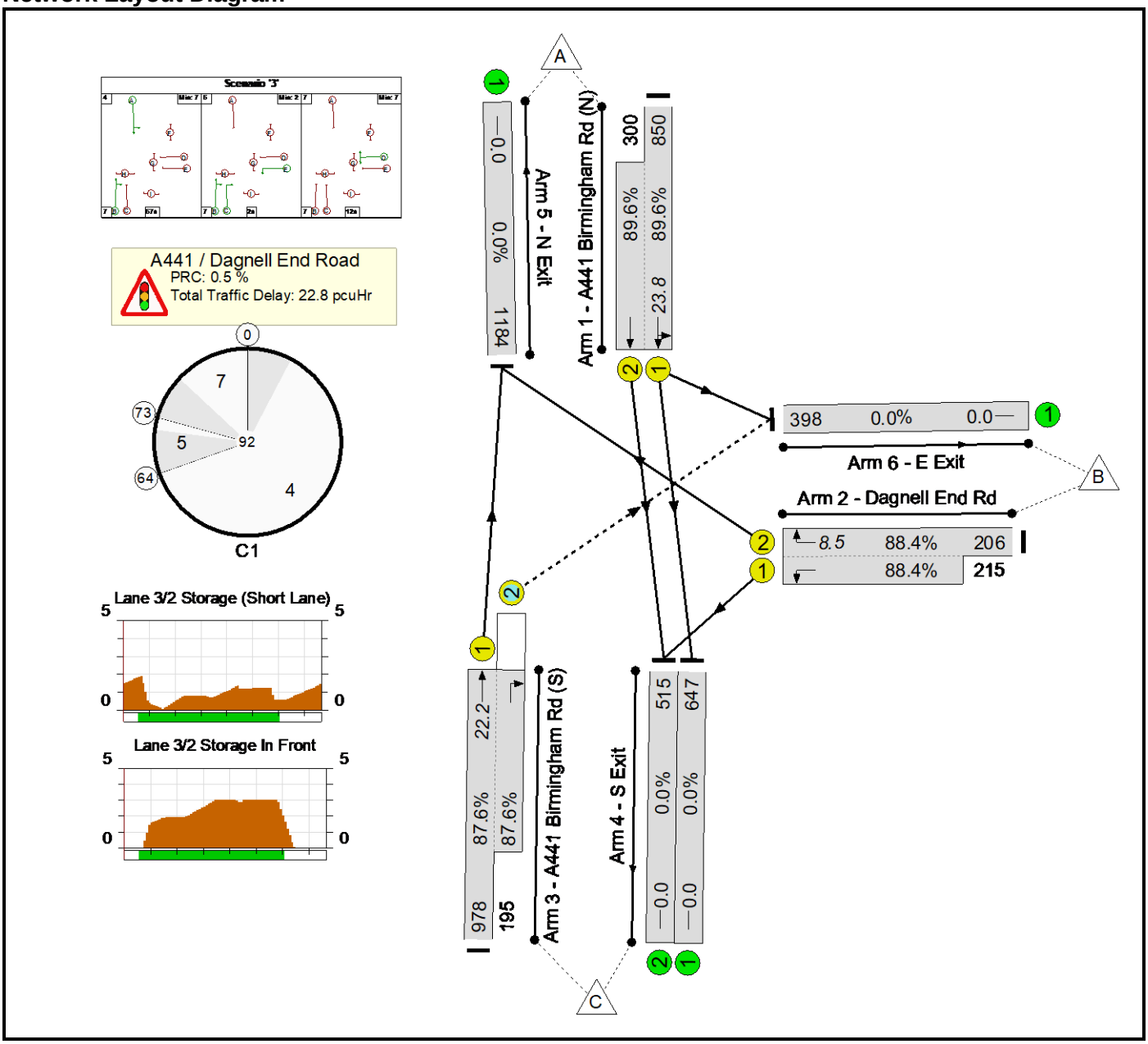
Stage	4	5	7
Duration	57	2	12
Change Point	0	64	73

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.6%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.6%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	57	-	1150	1809:1878	949+335	89.6 : 89.6%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	12:21	9	421	1650:1852	233+243	88.4 : 88.4%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	66	4	1173	1726:1679	1117+223	87.6 : 87.6%
4/1	S Exit	U	N/A	N/A	-		-	-	-	647	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	515	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1184	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	398	Inf	Inf	0.0%

Full Input Data And Results

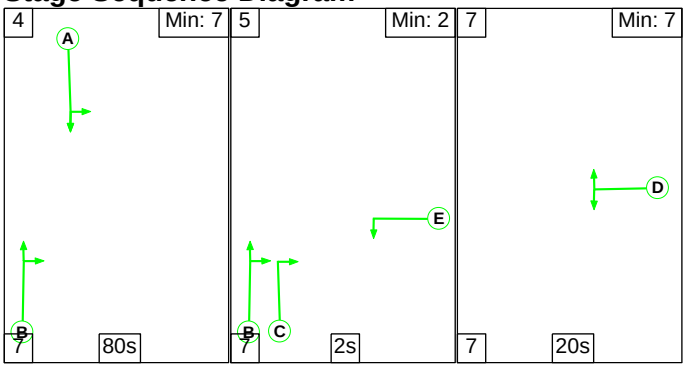
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**36**	**128**	**31**	**10.4**	**10.8**	**1.6**	**22.8**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**36**	**128**	**31**	**10.4**	**10.8**	**1.6**	**22.8**	**-**	**-**	**-**	**-**
1/1+1/2	1150	1150	-	-	-	3.7	4.1	-	7.8 (5.9+1.8)	24.4 (25.2:22.2)	19.8	4.1	23.8
2/2+2/1	421	421	-	-	-	4.0	3.4	-	7.4 (3.9+3.5)	63.3 (67.7:59.0)	5.1	3.4	8.5
3/1+3/2	1173	1173	36	128	31	2.7	3.4	1.6	7.6 (5.0+2.6)	23.4 (18.5:48.3)	18.8	3.4	22.2
4/1	647	647	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	515	515	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1184	1184	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	398	398	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 0.5 Total Delay for Signalled Lanes (pcuHr): 22.82 Cycle Time (s): 92
PRC Over All Lanes (%): 0.5 Total Delay Over All Lanes(pcuHr): 22.82

Full Input Data And Results

Scenario 4: '4' (FG4: '2030 PM Effective Base + Dev', Plan 1: 'Network Control Plan 1 (no Peds)')

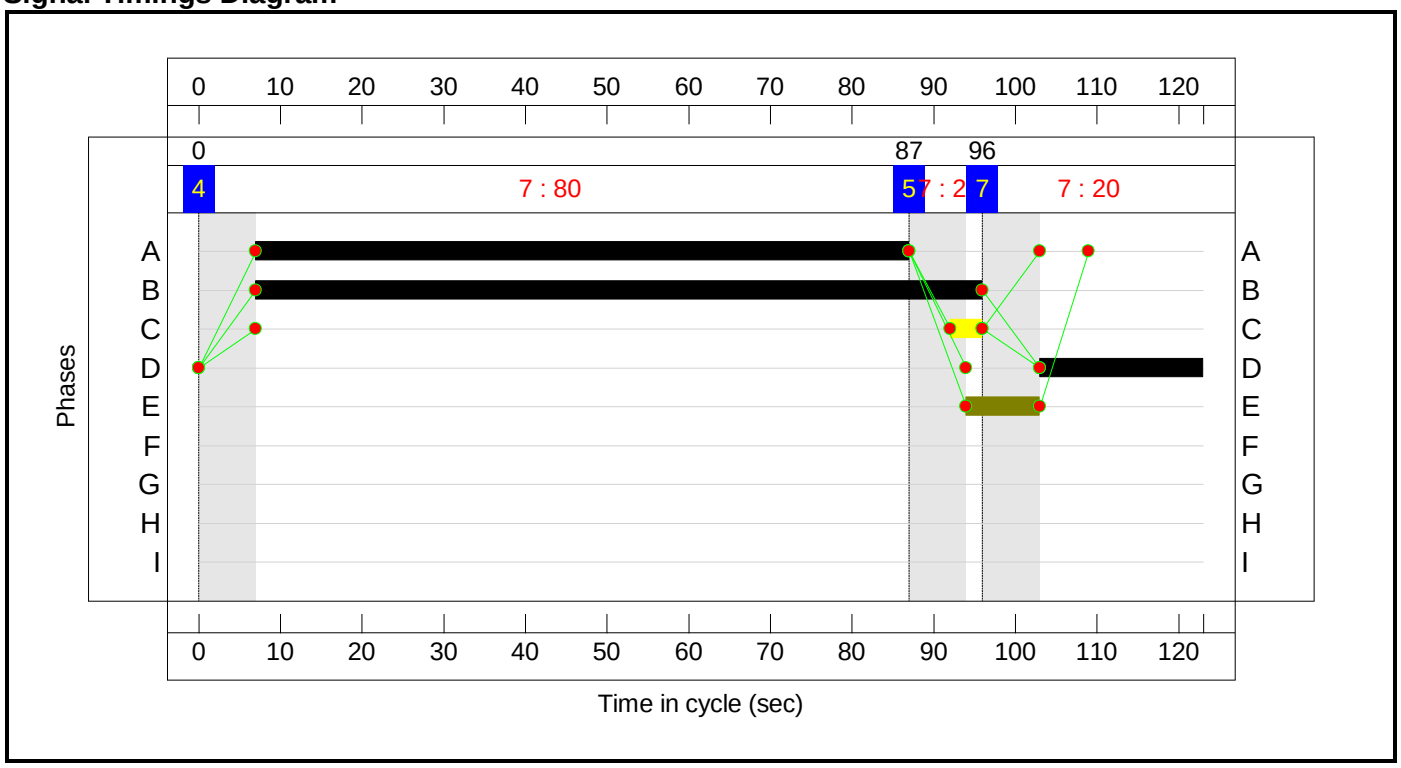
Stage Sequence Diagram



Stage Timings

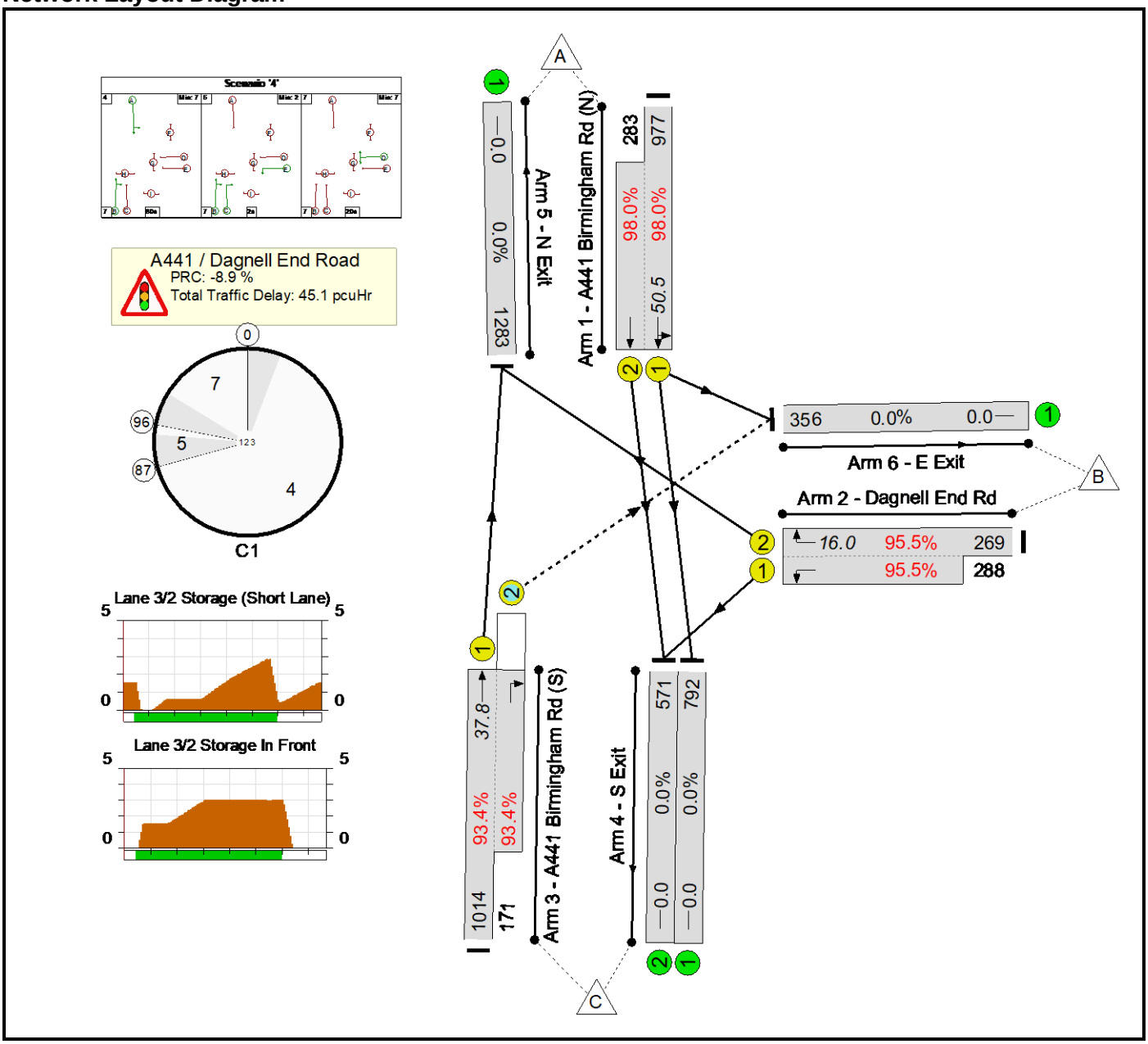
Stage	4	5	7
Duration	80	2	20
Change Point	0	87	96

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**98.0%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**98.0%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	80	-	1260	1819:1878	997+289	98.0 : 98.0%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	20:29	9	557	1650:1852	282+302	95.5 : 95.5%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	89	4	1185	1641:1800	1086+183	93.4 : 93.4%
4/1	S Exit	U	N/A	N/A	-		-	-	-	792	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	571	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1283	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	356	Inf	Inf	0.0%

Full Input Data And Results

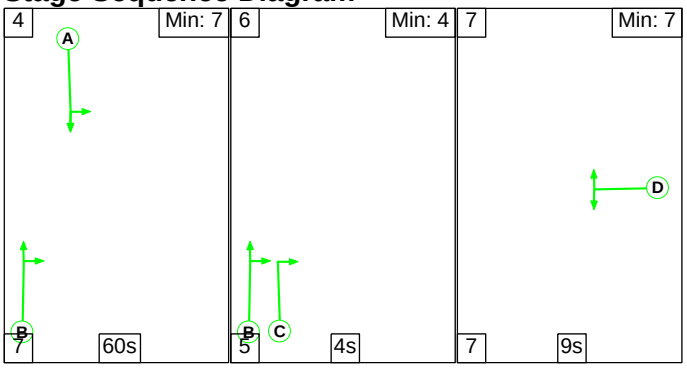
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**3**	**102**	**66**	**17.9**	**25.5**	**1.7**	**45.1**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**3**	**102**	**66**	**17.9**	**25.5**	**1.7**	**45.1**	**-**	**-**	**-**	**-**
1/1+1/2	1260	1260	-	-	-	6.2	12.4	-	18.6 (14.6+4.0)	53.2 (53.7:51.5)	38.1	12.4	50.5
2/2+2/1	557	557	-	-	-	7.1	6.9	-	14.0 (7.1+6.9)	90.7 (95.3:86.4)	9.0	6.9	16.0
3/1+3/2	1185	1185	3	102	66	4.6	6.2	1.7	12.4 (8.8+3.6)	37.8 (31.4:75.9)	31.6	6.2	37.8
4/1	792	792	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	571	571	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1283	1283	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	356	356	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -8.9 Total Delay for Signalled Lanes (pcuHr): 45.11 Cycle Time (s): 123
PRC Over All Lanes (%): -8.9 Total Delay Over All Lanes(pcuHr): 45.11

Full Input Data And Results

Scenario 5: '5' (FG1: '2030 AM Effective Base', Plan 2: 'Network Control Plan 2 (no Peds, no left filter)')

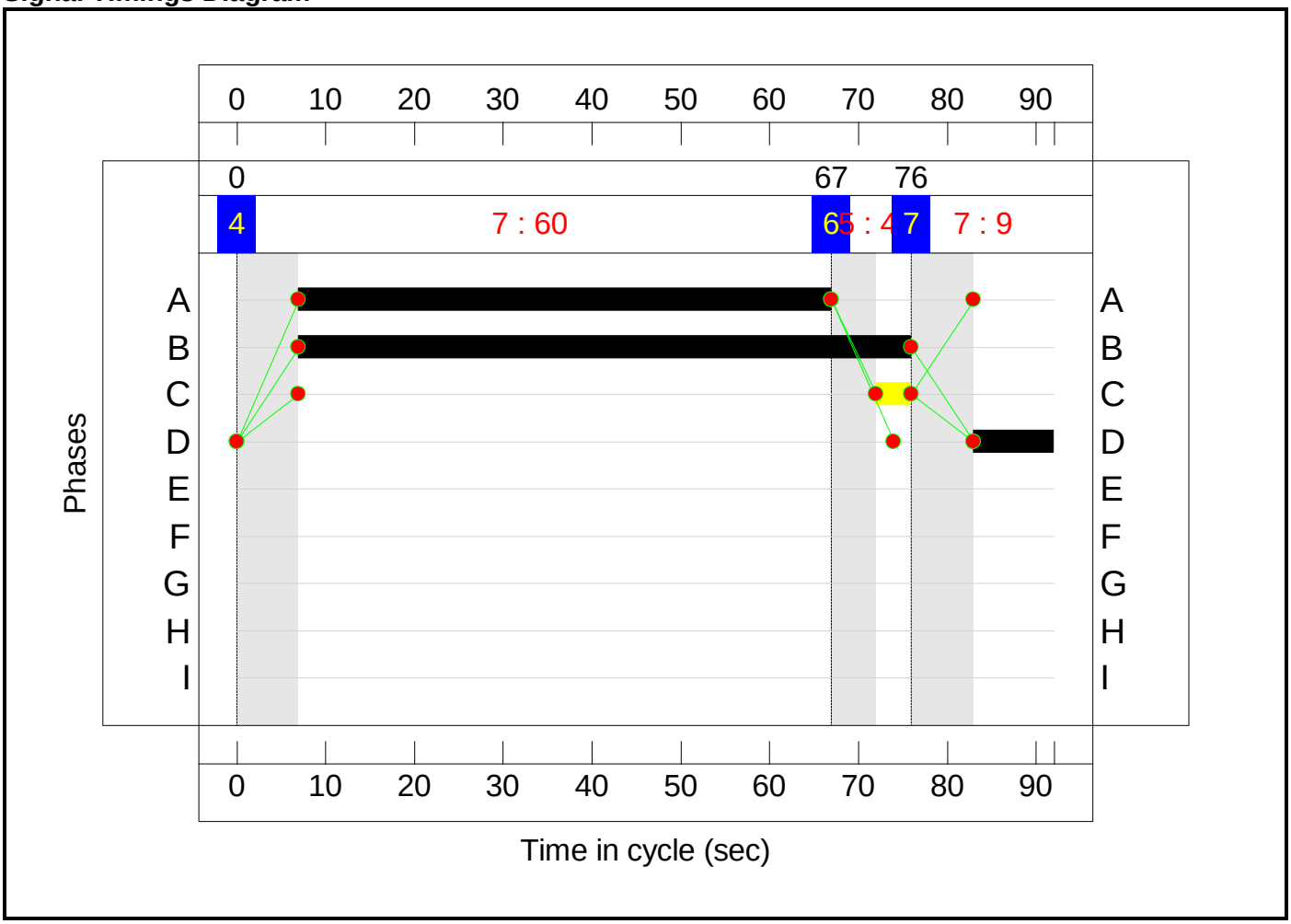
Stage Sequence Diagram



Stage Timings

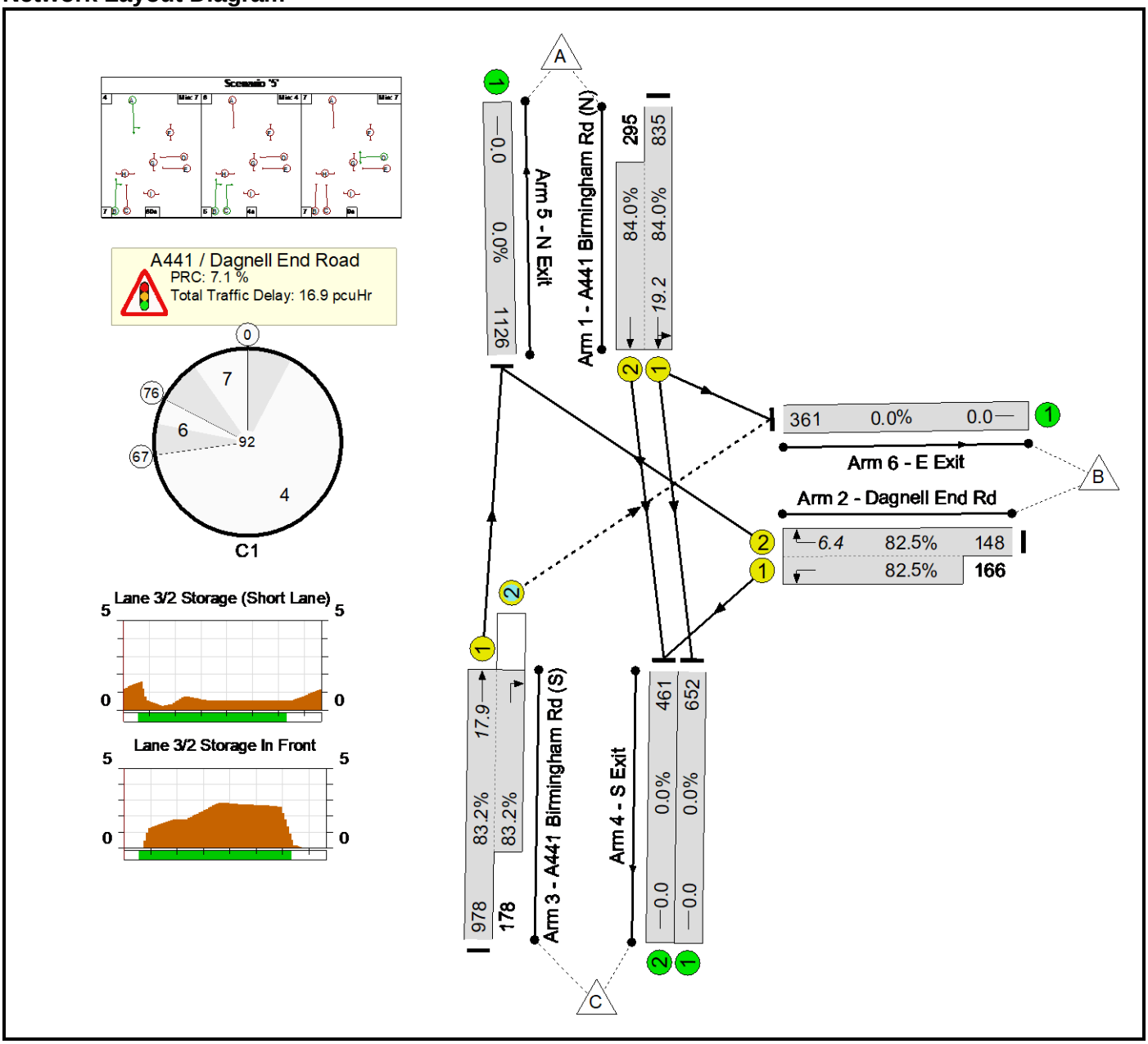
Stage	4	6	7
Duration	60	4	9
Change Point	0	67	76

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**84.0%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**84.0%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	60	-	1130	1813:1878	994+351	84.0 : 84.0%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	9	0	314	1650:1852	179+201	82.5 : 82.5%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	69	4	1156	1726:1679	1175+214	83.2 : 83.2%
4/1	S Exit	U	N/A	N/A	-		-	-	-	652	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	461	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1126	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	361	Inf	Inf	0.0%

Full Input Data And Results

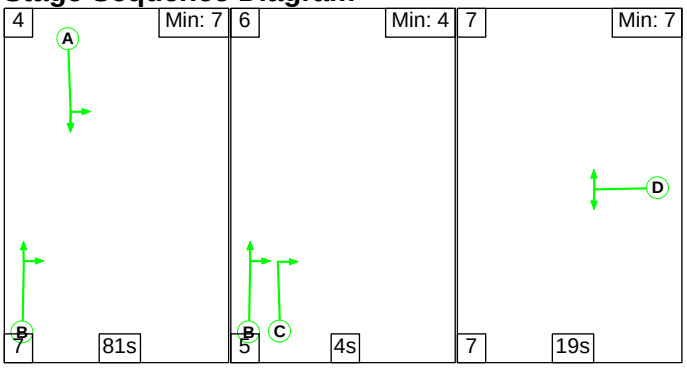
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**63**	**109**	**6**	**8.2**	**7.2**	**1.5**	**16.9**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**63**	**109**	**6**	**8.2**	**7.2**	**1.5**	**16.9**	**-**	**-**	**-**	**-**
1/1+1/2	1130	1130	-	-	-	2.9	2.6	-	5.5 (4.2+1.3)	17.4 (18.1:15.3)	16.6	2.6	19.2
2/2+2/1	314	314	-	-	-	3.5	2.2	-	5.7 (2.7+3.0)	65.5 (65.5:65.5)	4.1	2.2	6.4
3/1+3/2	1156	1156	63	109	6	1.8	2.4	1.5	5.7 (3.7+2.0)	17.9 (13.7:40.7)	15.5	2.4	17.9
4/1	652	652	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	461	461	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1126	1126	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	361	361	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 7.1 Total Delay for Signalled Lanes (pcuHr): 16.91 Cycle Time (s): 92
PRC Over All Lanes (%): 7.1 Total Delay Over All Lanes(pcuHr): 16.91

Full Input Data And Results

Scenario 6: '6' (FG2: '2030 PM Effective Base', Plan 2: 'Network Control Plan 2 (no Peds, no left filter)')

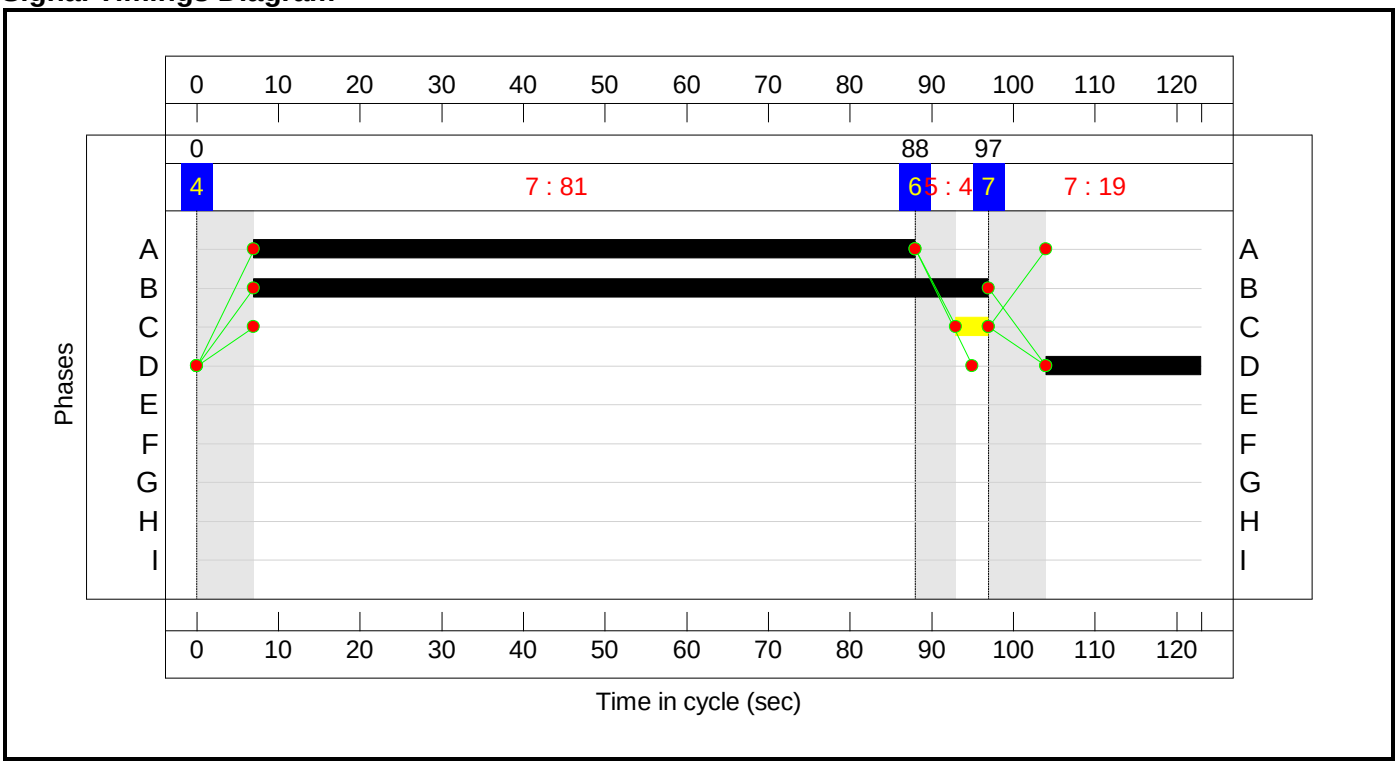
Stage Sequence Diagram



Stage Timings

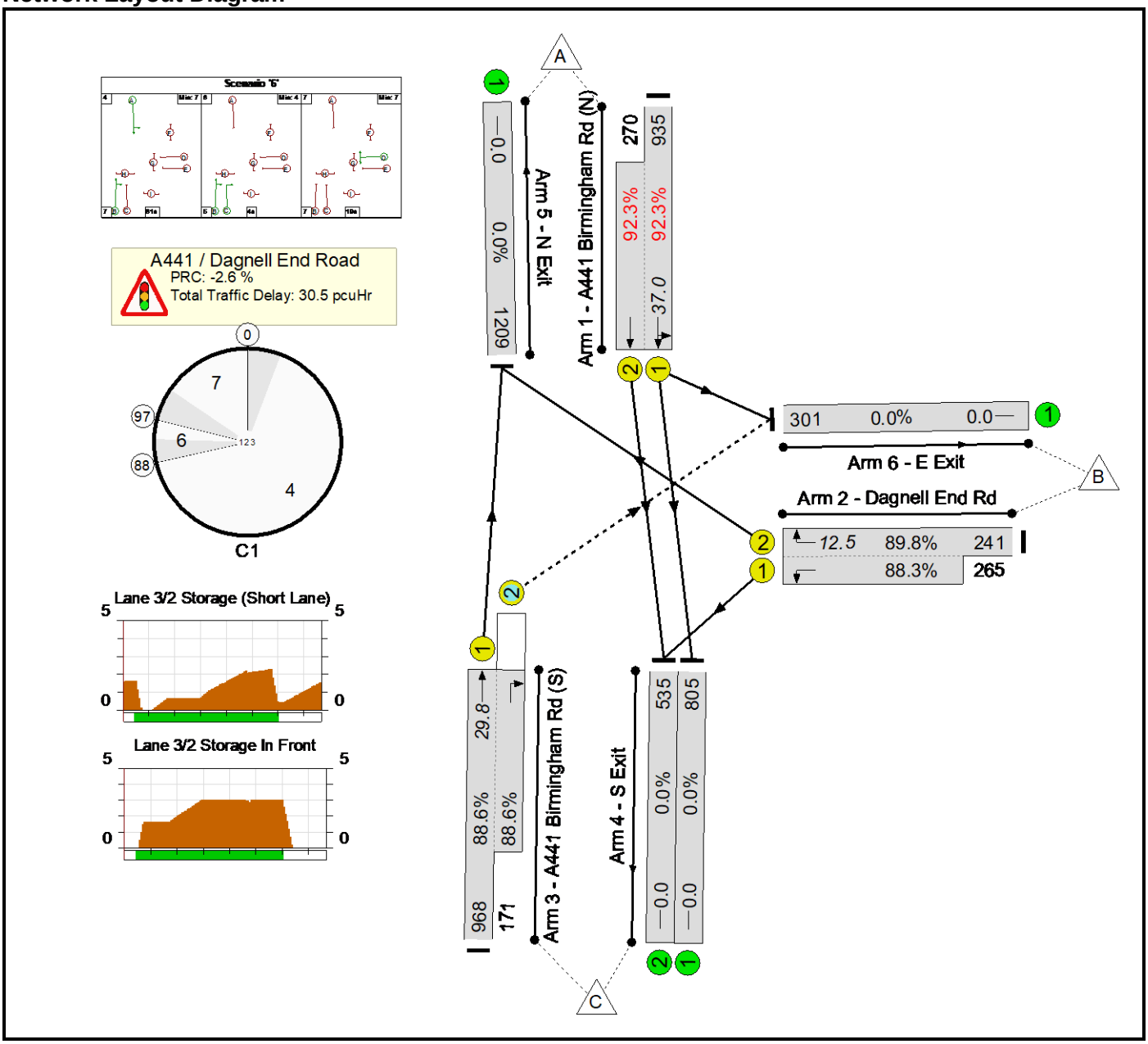
Stage	4	6	7
Duration	81	4	19
Change Point	0	88	97

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**92.3%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**92.3%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	81	-	1205	1830:1878	1013+292	92.3 : 92.3%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	19	0	506	1650:1852	268+300	89.8 : 88.3%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	90	4	1139	1641:1800	1092+193	88.6 : 88.6%
4/1	S Exit	U	N/A	N/A	-		-	-	-	805	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	535	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1209	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	301	Inf	Inf	0.0%

Full Input Data And Results

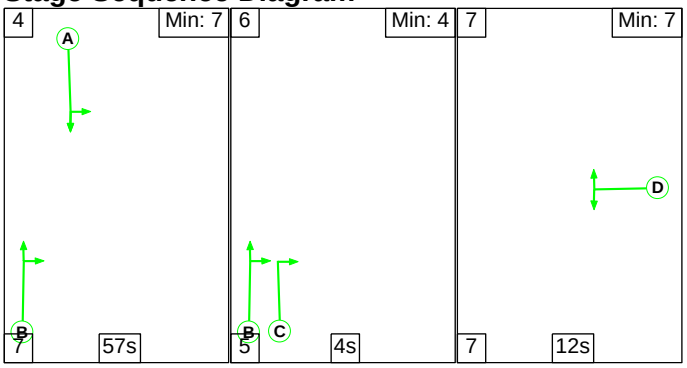
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**19**	**102**	**49**	**16.0**	**12.8**	**1.7**	**30.5**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**19**	**102**	**49**	**16.0**	**12.8**	**1.7**	**30.5**	**-**	**-**	**-**	**-**
1/1+1/2	1205	1205	-	-	-	5.1	5.4	-	10.6 (8.3+2.2)	31.6 (32.1:29.8)	31.6	5.4	37.0
2/2+2/1	506	506	-	-	-	7.1	3.6	-	10.7 (5.1+5.6)	76.2 (76.3:76.2)	8.8	3.6	12.5
3/1+3/2	1139	1139	19	102	49	3.8	3.7	1.7	9.2 (6.1+3.2)	29.2 (22.5:66.8)	26.1	3.7	29.8
4/1	805	805	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	535	535	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1209	1209	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	301	301	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -2.6 Total Delay for Signalled Lanes (pcuHr): 30.51 Cycle Time (s): 123
PRC Over All Lanes (%): -2.6 Total Delay Over All Lanes(pcuHr): 30.51

Full Input Data And Results

Scenario 7: '7' (FG3: '2030 AM Effective Base + Dev', Plan 2: 'Network Control Plan 2 (no Peds, no left filter)')

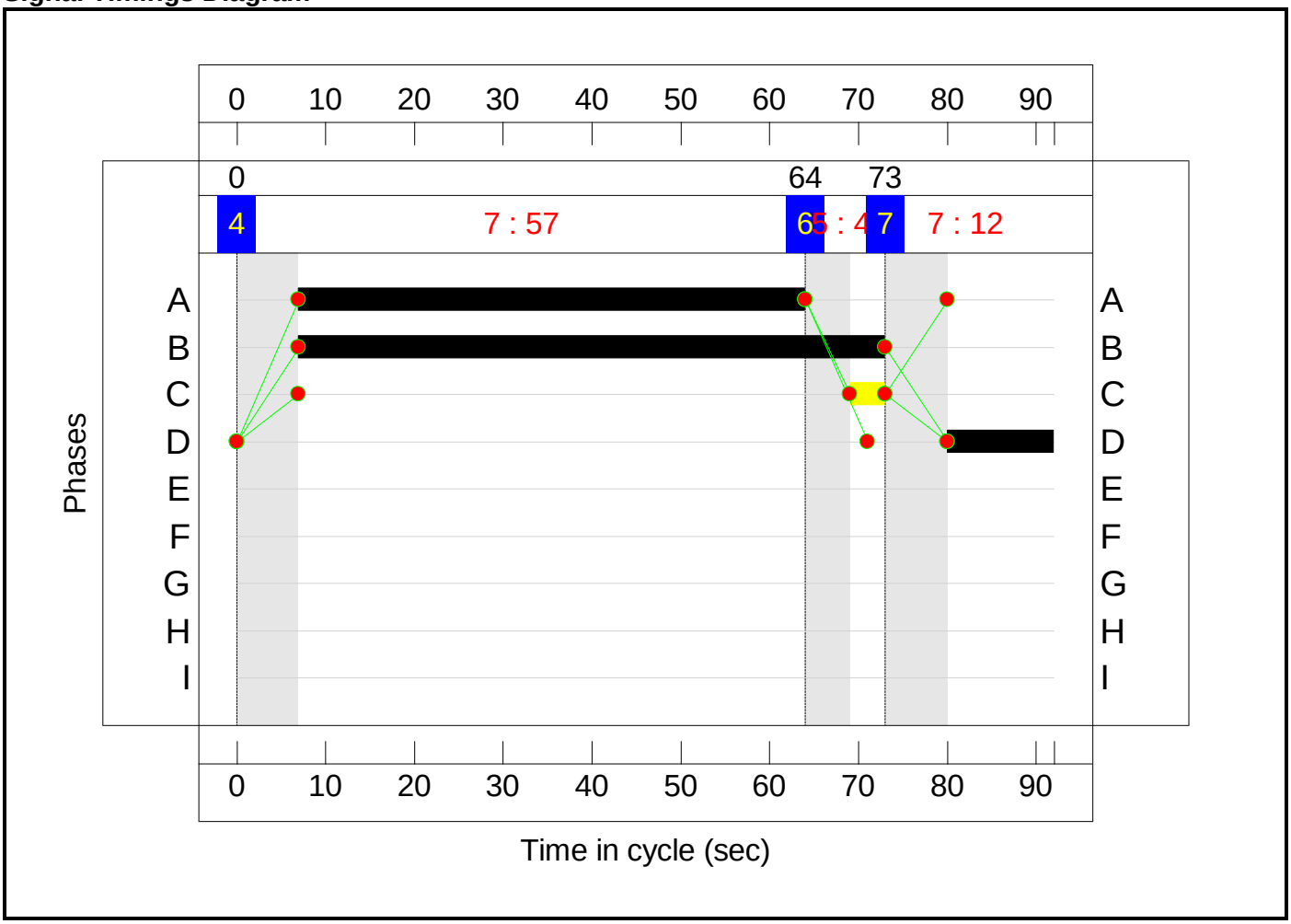
Stage Sequence Diagram



Stage Timings

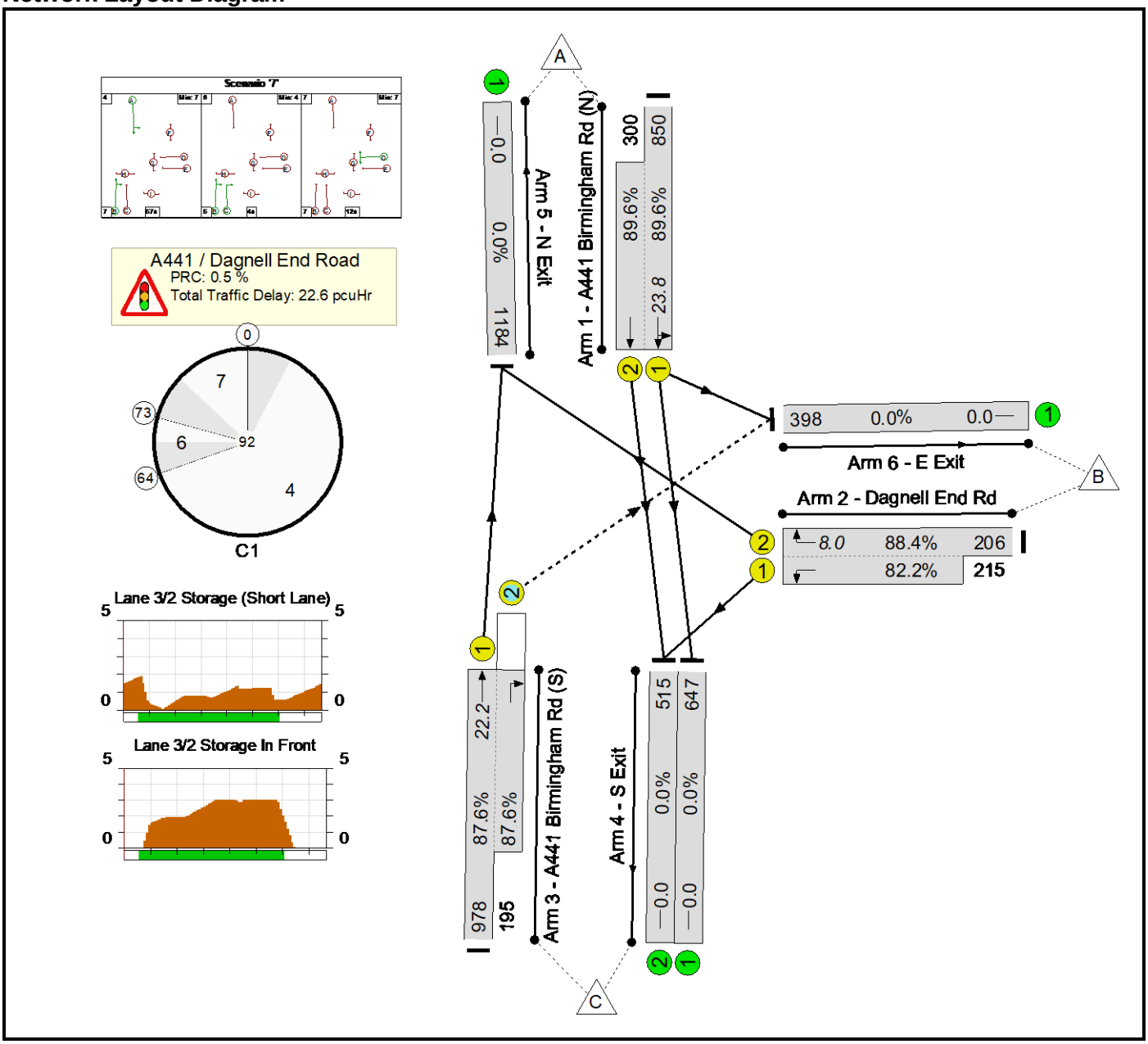
Stage	4	6	7
Duration	57	4	12
Change Point	0	64	73

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.6%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.6%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	57	-	1150	1809:1878	949+335	89.6 : 89.6%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	12	0	421	1650:1852	233+262	88.4 : 82.2%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	66	4	1173	1726:1679	1117+223	87.6 : 87.6%
4/1	S Exit	U	N/A	N/A	-		-	-	-	647	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	515	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1184	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	398	Inf	Inf	0.0%

Full Input Data And Results

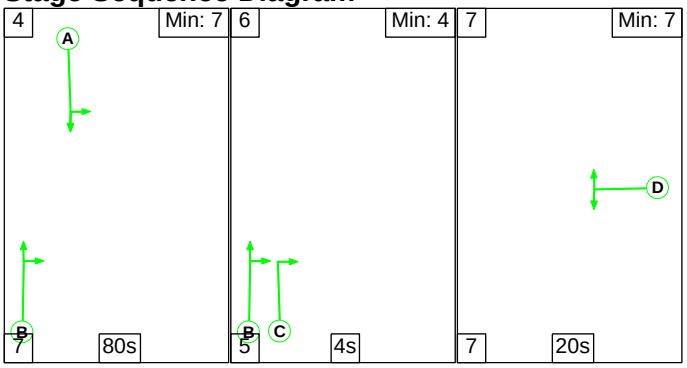
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**36**	**128**	**31**	**10.9**	**10.1**	**1.6**	**22.6**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**36**	**128**	**31**	**10.9**	**10.1**	**1.6**	**22.6**	**-**	**-**	**-**	**-**
1/1+1/2	1150	1150	-	-	-	3.7	4.1	-	7.8 (5.9+1.8)	24.4 (25.2:22.2)	19.8	4.1	23.8
2/2+2/1	421	421	-	-	-	4.5	2.7	-	7.2 (3.5+3.7)	61.3 (61.5:61.1)	5.3	2.7	8.0
3/1+3/2	1173	1173	36	128	31	2.7	3.4	1.6	7.6 (5.0+2.6)	23.4 (18.5:48.3)	18.8	3.4	22.2
4/1	647	647	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	515	515	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1184	1184	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	398	398	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 0.5 Total Delay for Signalled Lanes (pcuHr): 22.59 Cycle Time (s): 92
PRC Over All Lanes (%): 0.5 Total Delay Over All Lanes(pcuHr): 22.59

Full Input Data And Results

Scenario 8: '8' (FG4: '2030 PM Effective Base + Dev', Plan 2: 'Network Control Plan 2 (no Peds, no left filter)')

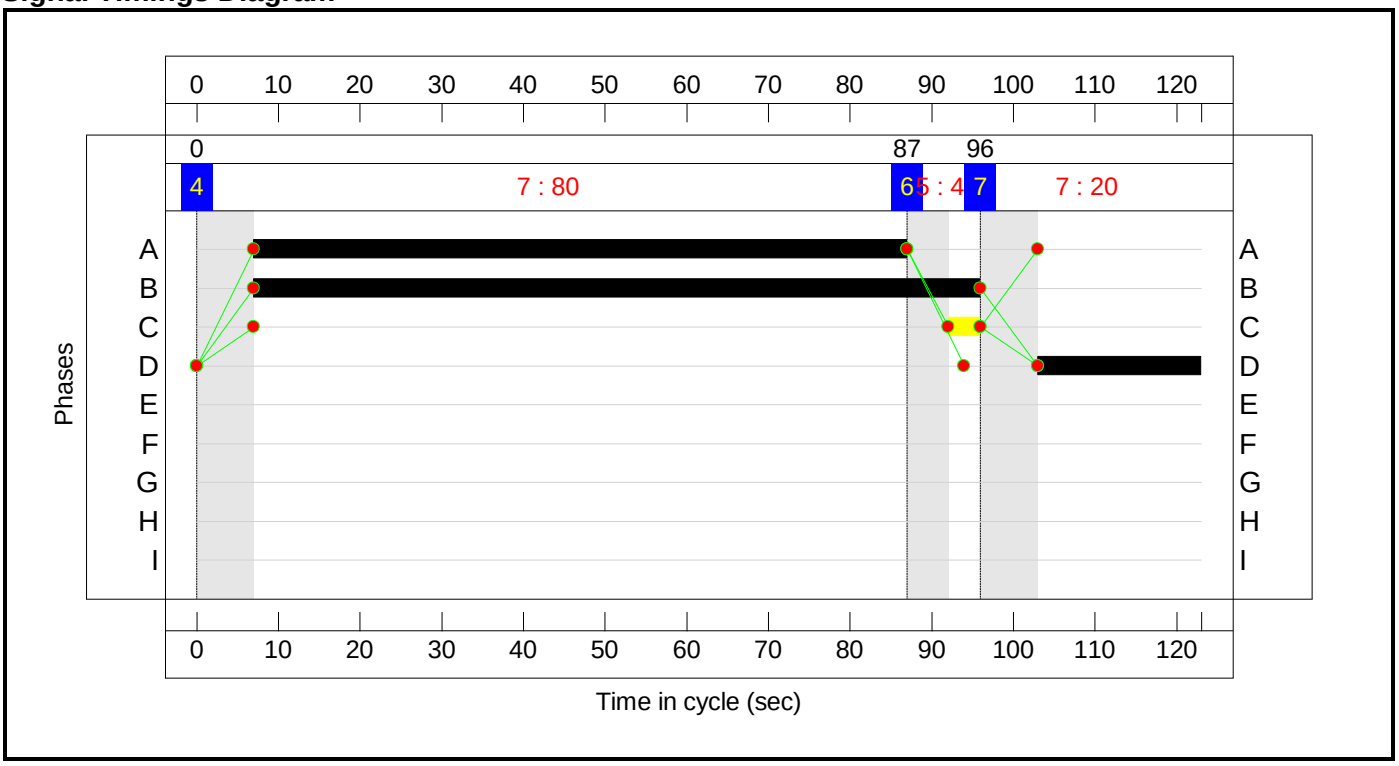
Stage Sequence Diagram



Stage Timings

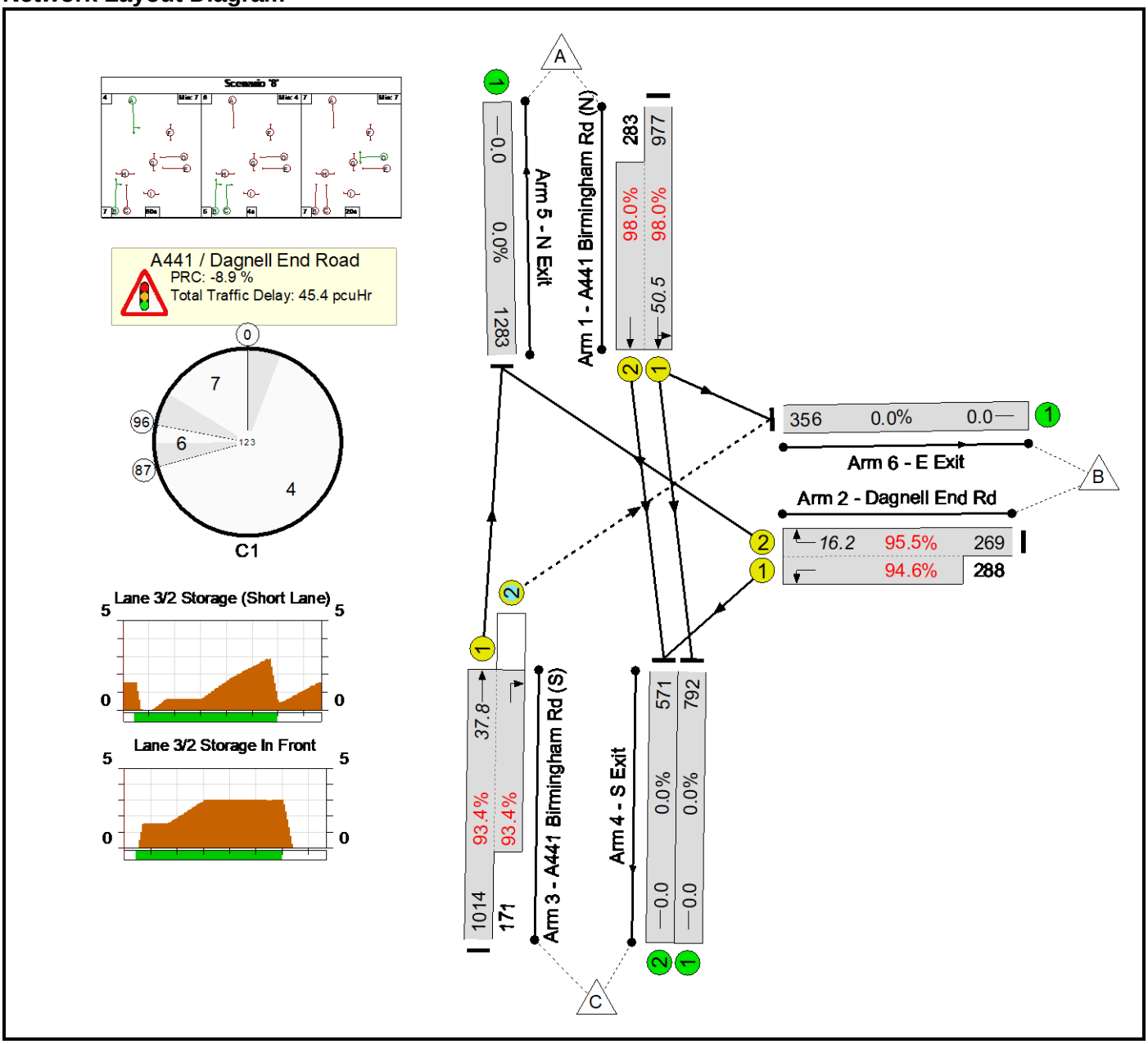
Stage	4	6	7
Duration	80	4	20
Change Point	0	87	96

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**98.0%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**98.0%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	80	-	1260	1819:1878	997+289	98.0 : 98.0%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	20	0	557	1650:1852	282+304	95.5 : 94.6%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	89	4	1185	1641:1800	1086+183	93.4 : 93.4%
4/1	S Exit	U	N/A	N/A	-		-	-	-	792	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	571	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1283	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	356	Inf	Inf	0.0%

Full Input Data And Results

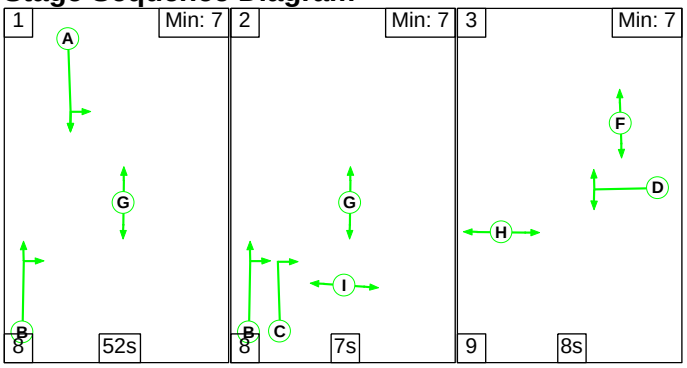
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**3**	**102**	**66**	**18.6**	**25.2**	**1.7**	**45.4**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**3**	**102**	**66**	**18.6**	**25.2**	**1.7**	**45.4**	**-**	**-**	**-**	**-**
1/1+1/2	1260	1260	-	-	-	6.2	12.4	-	18.6 (14.6+4.0)	53.2 (53.7:51.5)	38.1	12.4	50.5
2/2+2/1	557	557	-	-	-	7.8	6.6	-	14.4 (7.0+7.4)	92.9 (93.1:92.7)	9.6	6.6	16.2
3/1+3/2	1185	1185	3	102	66	4.6	6.2	1.7	12.4 (8.8+3.6)	37.8 (31.4:75.9)	31.6	6.2	37.8
4/1	792	792	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	571	571	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1283	1283	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	356	356	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -8.9 Total Delay for Signalled Lanes (pcuHr): 45.44 Cycle Time (s): 123
PRC Over All Lanes (%): -8.9 Total Delay Over All Lanes(pcuHr): 45.44

Full Input Data And Results

Scenario 9: '9' (FG1: '2030 AM Effective Base', Plan 3: 'Network Control Plan 3 (Peds)')

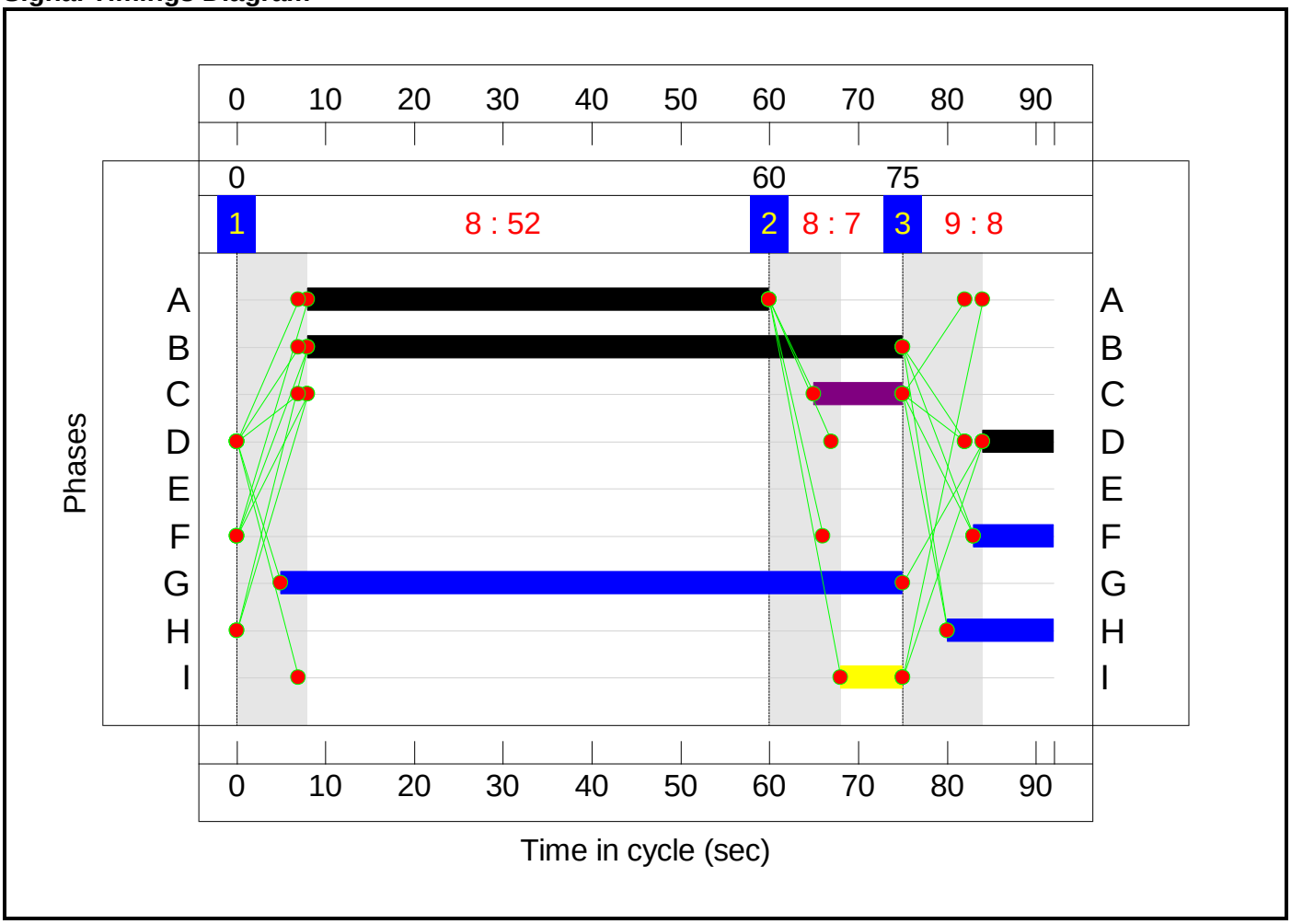
Stage Sequence Diagram



Stage Timings

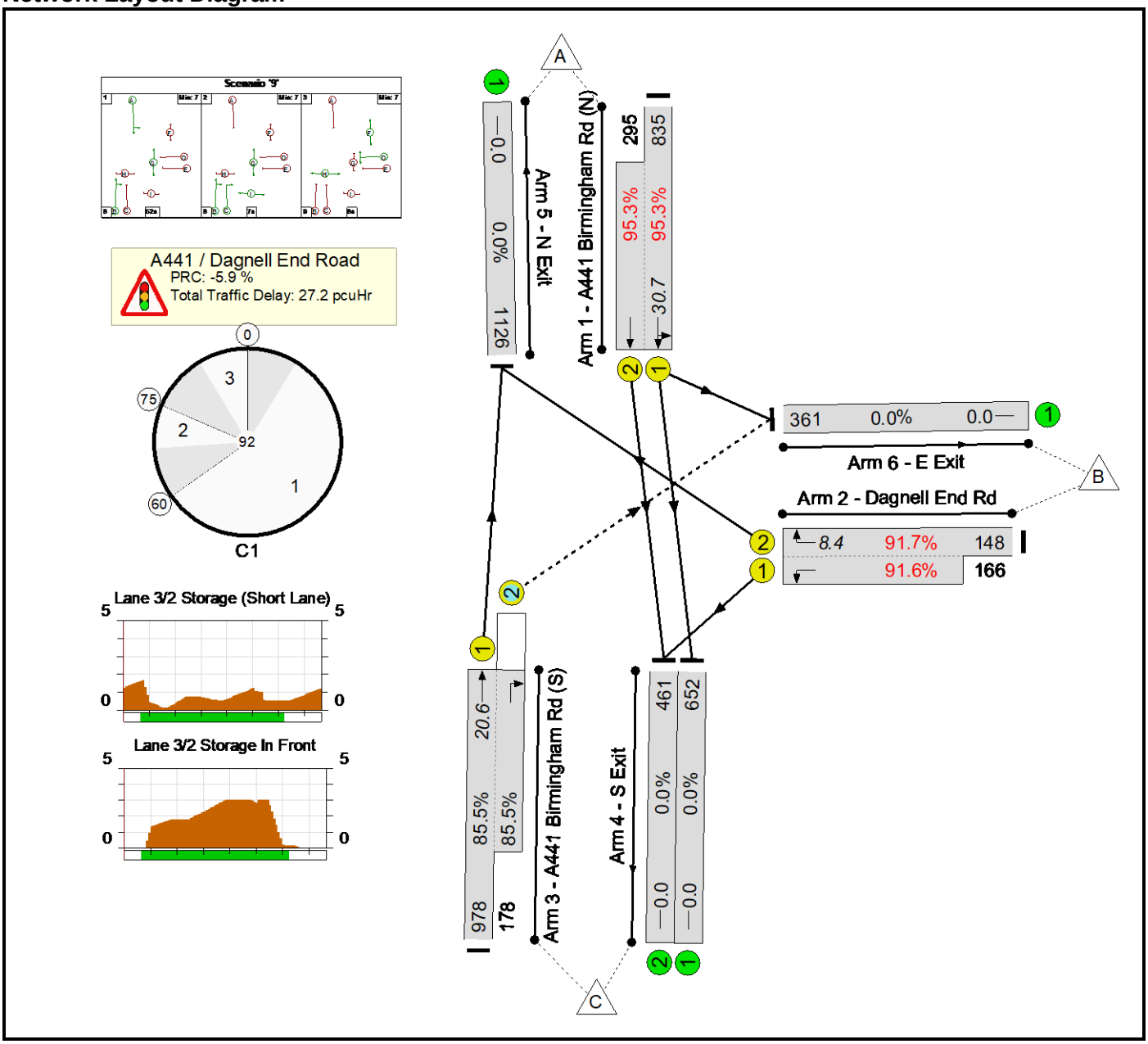
Stage	1	2	3
Duration	52	7	8
Change Point	0	60	75

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**95.3%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**95.3%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	52	-	1130	1813:1878	876+310	95.3 : 95.3%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	8	0	314	1650:1852	161+181	91.7 : 91.6%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	67	10	1156	1726:1679	1143+208	85.5 : 85.5%
4/1	S Exit	U	N/A	N/A	-		-	-	-	652	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	461	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1126	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	361	Inf	Inf	0.0%

Full Input Data And Results

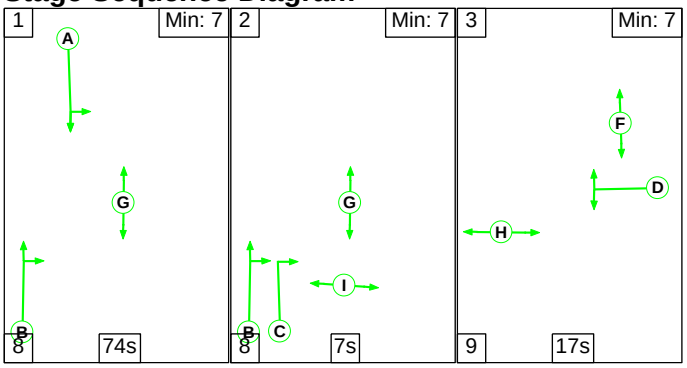
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**16**	**156**	**6**	**10.8**	**15.0**	**1.4**	**27.2**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**16**	**156**	**6**	**10.8**	**15.0**	**1.4**	**27.2**	**-**	**-**	**-**	**-**
1/1+1/2	1130	1130	-	-	-	4.9	7.9	-	12.8 (9.6+3.2)	40.8 (41.6:38.5)	22.8	7.9	30.7
2/2+2/1	314	314	-	-	-	3.6	4.2	-	7.8 (3.7+4.1)	89.7 (89.7:89.7)	4.2	4.2	8.4
3/1+3/2	1156	1156	16	156	6	2.3	2.9	1.4	6.6 (4.4+2.1)	20.4 (16.3:43.0)	17.7	2.9	20.6
4/1	652	652	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	461	461	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1126	1126	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	361	361	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -5.9 Total Delay for Signalled Lanes (pcuHr): 27.18 Cycle Time (s): 92
PRC Over All Lanes (%): -5.9 Total Delay Over All Lanes(pcuHr): 27.18

Full Input Data And Results

Scenario 10: '10' (FG2: '2030 PM Effective Base', Plan 3: 'Network Control Plan 3 (Peds)')

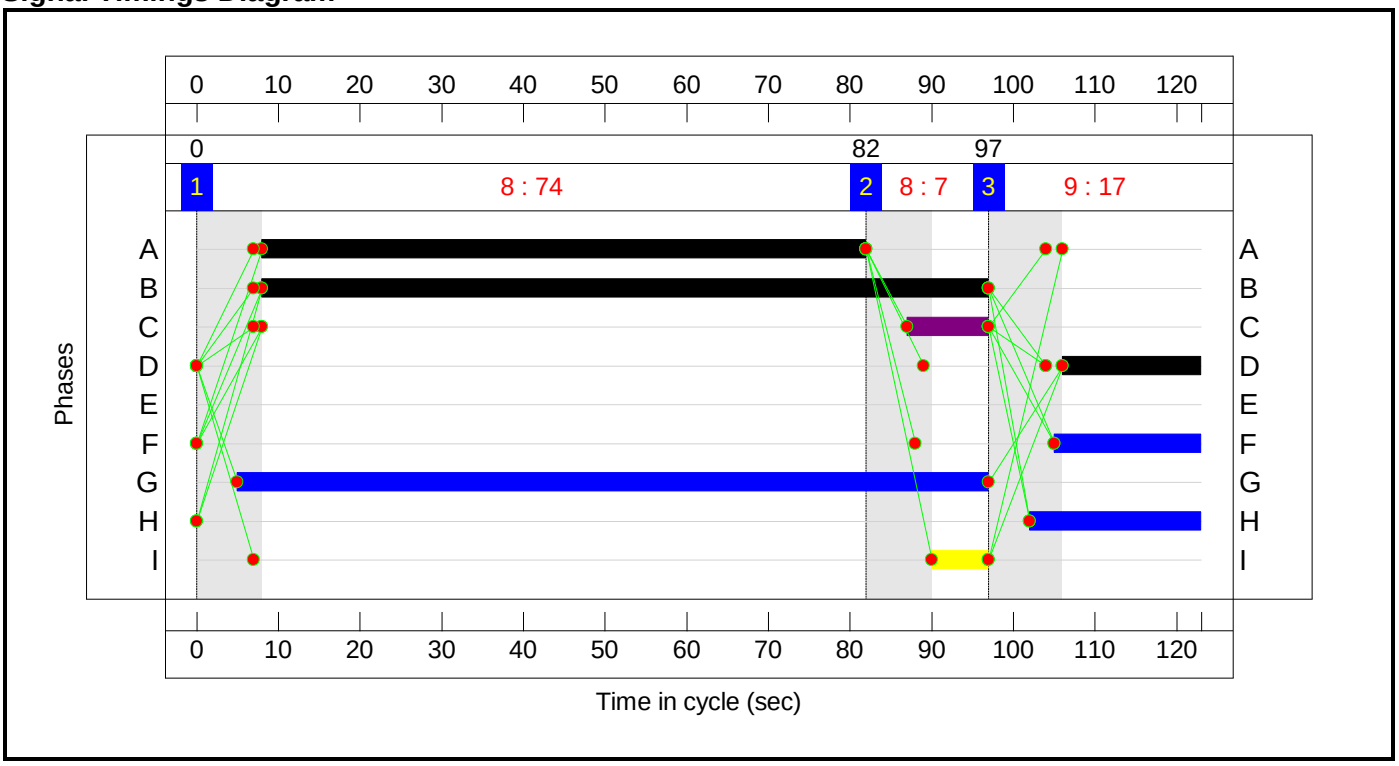
Stage Sequence Diagram



Stage Timings

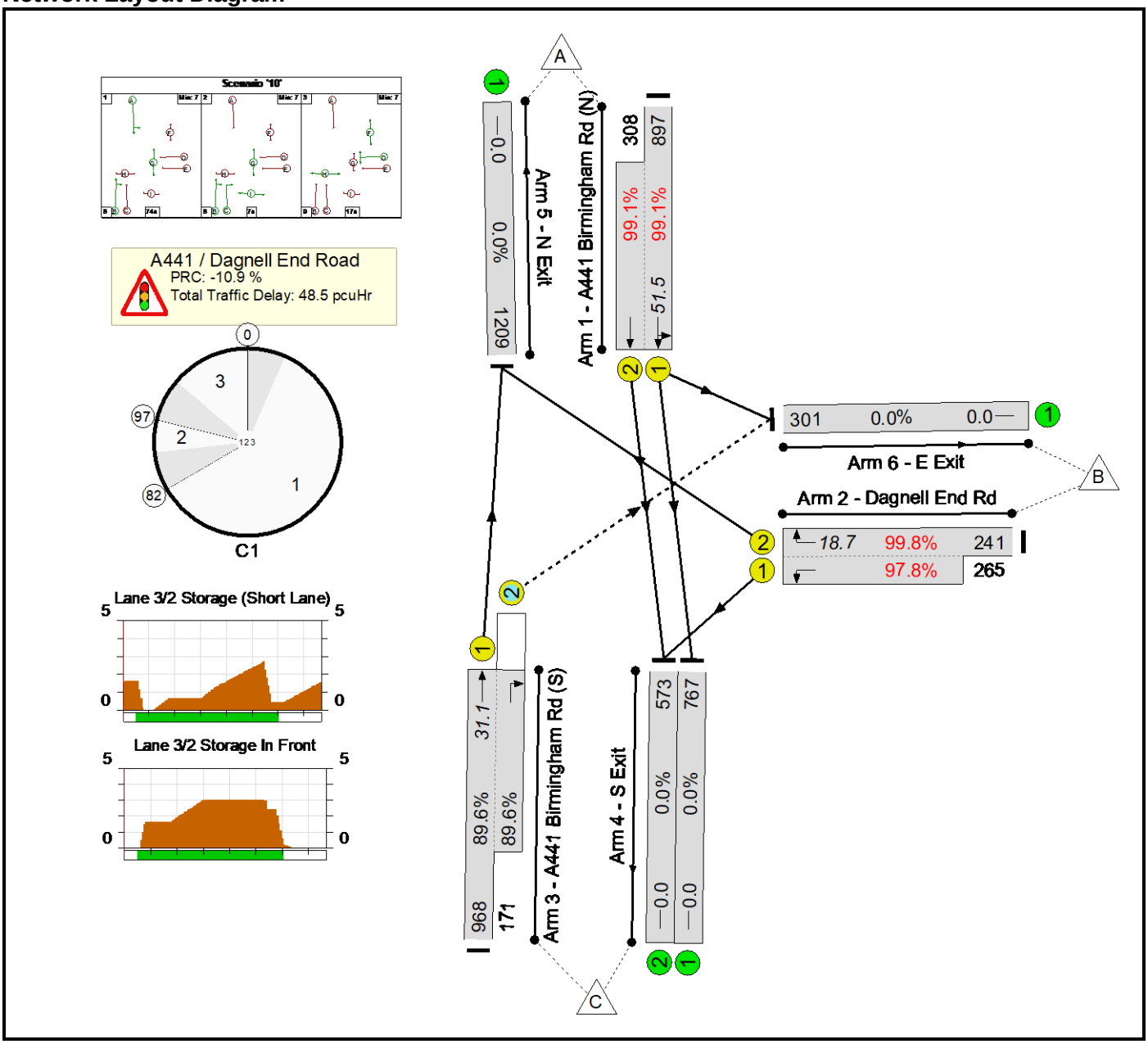
Stage	1	2	3
Duration	74	7	17
Change Point	0	82	97

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**99.8%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**99.8%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	74	-	1205	1828:1878	905+311	99.1 : 99.1%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	17	0	506	1650:1852	241+271	99.8 : 97.8%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	89	10	1139	1641:1800	1081+191	89.6 : 89.6%
4/1	S Exit	U	N/A	N/A	-		-	-	-	767	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	573	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1209	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	301	Inf	Inf	0.0%

Full Input Data And Results

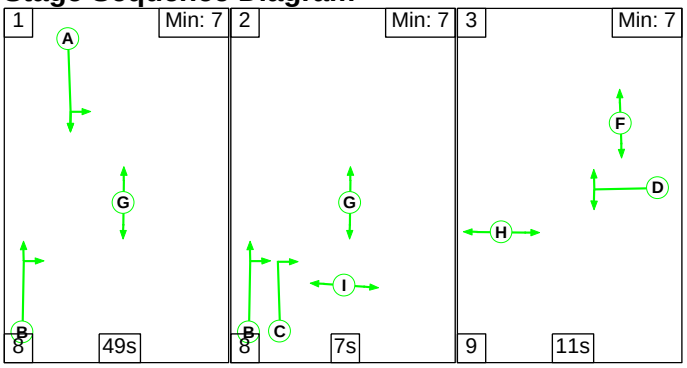
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**2**	**165**	**4**	**18.3**	**28.6**	**1.6**	**48.5**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**2**	**165**	**4**	**18.3**	**28.6**	**1.6**	**48.5**	**-**	**-**	**-**	**-**
1/1+1/2	1205	1205	-	-	-	7.0	14.8	-	21.8 (16.4+5.4)	65.1 (65.6:63.4)	36.7	14.8	51.5
2/2+2/1	506	506	-	-	-	7.4	9.7	-	17.1 (8.2+9.0)	121.7 (121.8:121.6)	9.0	9.7	18.7
3/1+3/2	1139	1139	2	165	4	4.0	4.1	1.6	9.6 (6.5+3.0)	30.3 (24.3:64.1)	27.1	4.1	31.1
4/1	767	767	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	573	573	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1209	1209	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	301	301	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -10.9 Total Delay for Signalled Lanes (pcuHr): 48.47 Cycle Time (s): 123
PRC Over All Lanes (%): -10.9 Total Delay Over All Lanes(pcuHr): 48.47

Full Input Data And Results

Scenario 11: '11' (FG3: '2030 AM Effective Base + Dev', Plan 3: 'Network Control Plan 3 (Peds)')

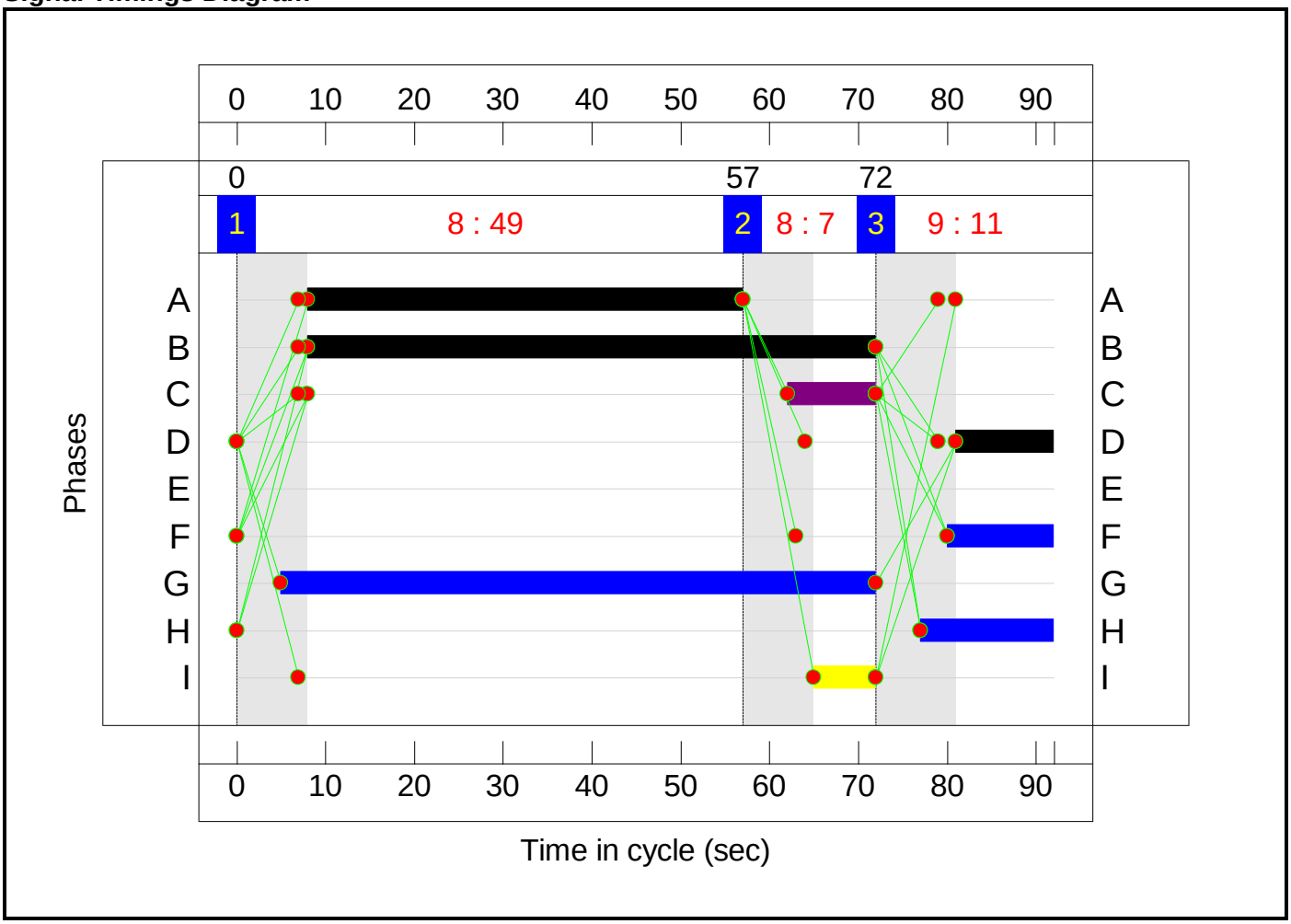
Stage Sequence Diagram



Stage Timings

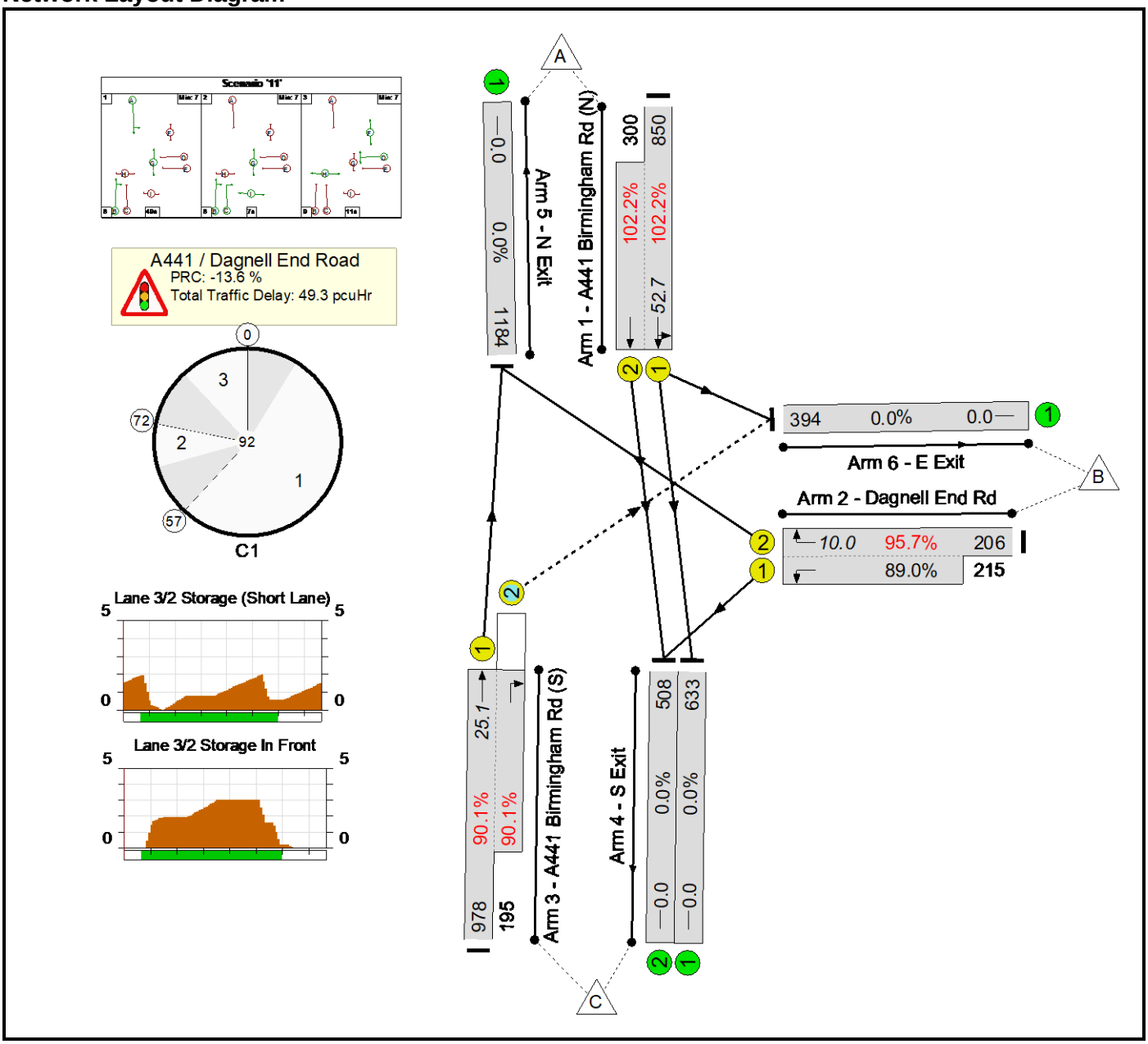
Stage	1	2	3
Duration	49	7	11
Change Point	0	57	72

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**102.2%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**102.2%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	49	-	1150	1809:1878	832+293	102.2 : 102.2%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	11	0	421	1650:1852	215+242	95.7 : 89.0%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	64	10	1173	1726:1679	1085+216	90.1 : 90.1%
4/1	S Exit	U	N/A	N/A	-		-	-	-	647	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	515	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1184	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	398	Inf	Inf	0.0%

Full Input Data And Results

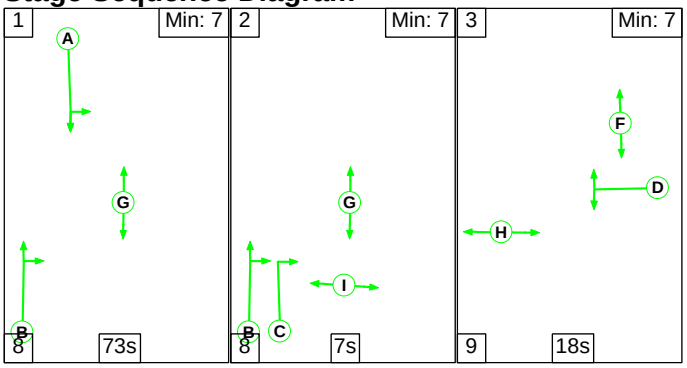
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**0**	**189**	**6**	**14.7**	**33.2**	**1.4**	**49.3**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**0**	**189**	**6**	**14.7**	**33.2**	**1.4**	**49.3**	**-**	**-**	**-**	**-**
1/1+1/2	1150	1125	-	-	-	6.9	24.3	-	31.2 (23.3+7.9)	97.7 (98.6:95.2)	28.4	24.3	52.7
2/2+2/1	421	421	-	-	-	4.6	4.7	-	9.3 (4.6+4.7)	79.5 (79.7:79.3)	5.4	4.7	10.0
3/1+3/2	1173	1173	0	189	6	3.2	4.3	1.4	8.8 (6.2+2.6)	27.0 (22.6:48.6)	20.9	4.3	25.1
4/1	633	633	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	508	508	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1184	1184	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	394	394	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -13.6 Total Delay for Signalled Lanes (pcuHr): 49.30 Cycle Time (s): 92
PRC Over All Lanes (%): -13.6 Total Delay Over All Lanes(pcuHr): 49.30

Full Input Data And Results

Scenario 12: '12' (FG4: '2030 PM Effective Base + Dev', Plan 3: 'Network Control Plan 3 (Peds)')

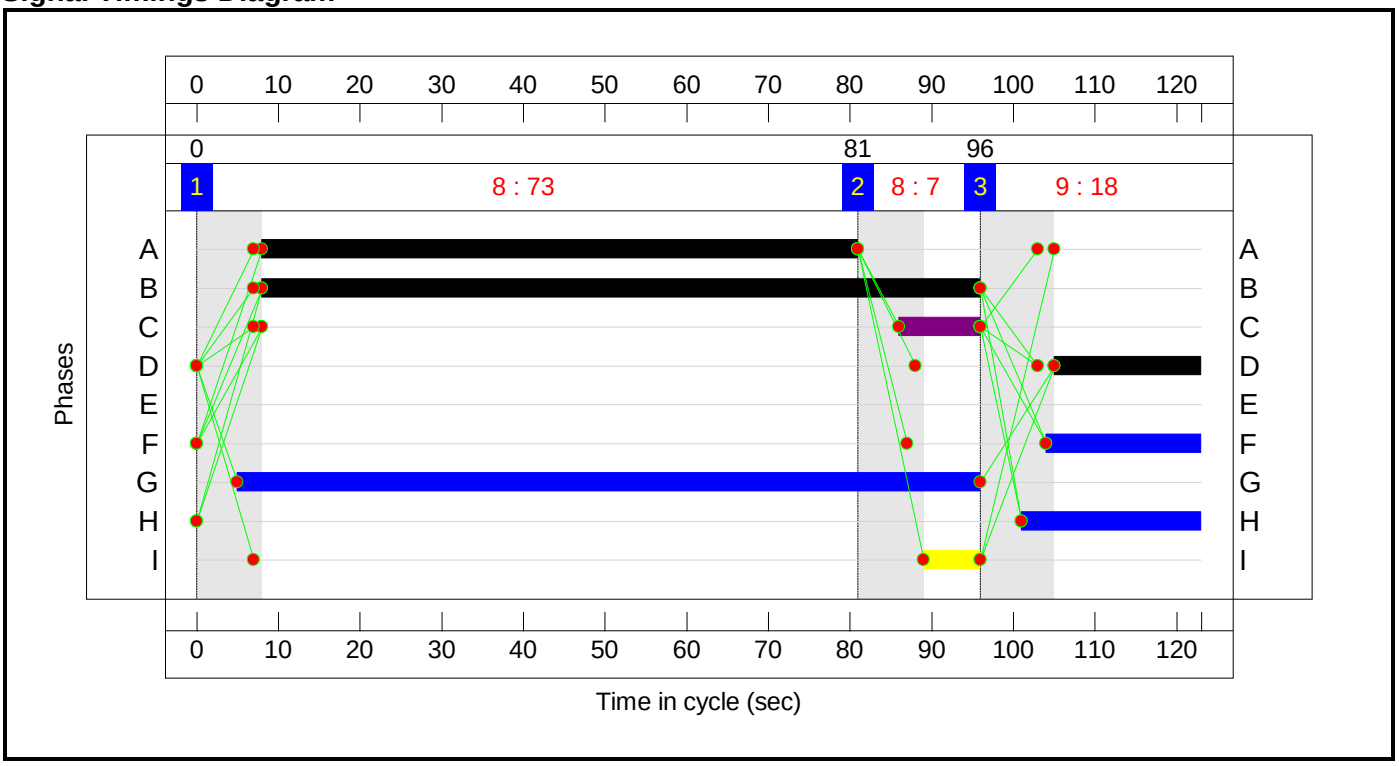
Stage Sequence Diagram



Stage Timings

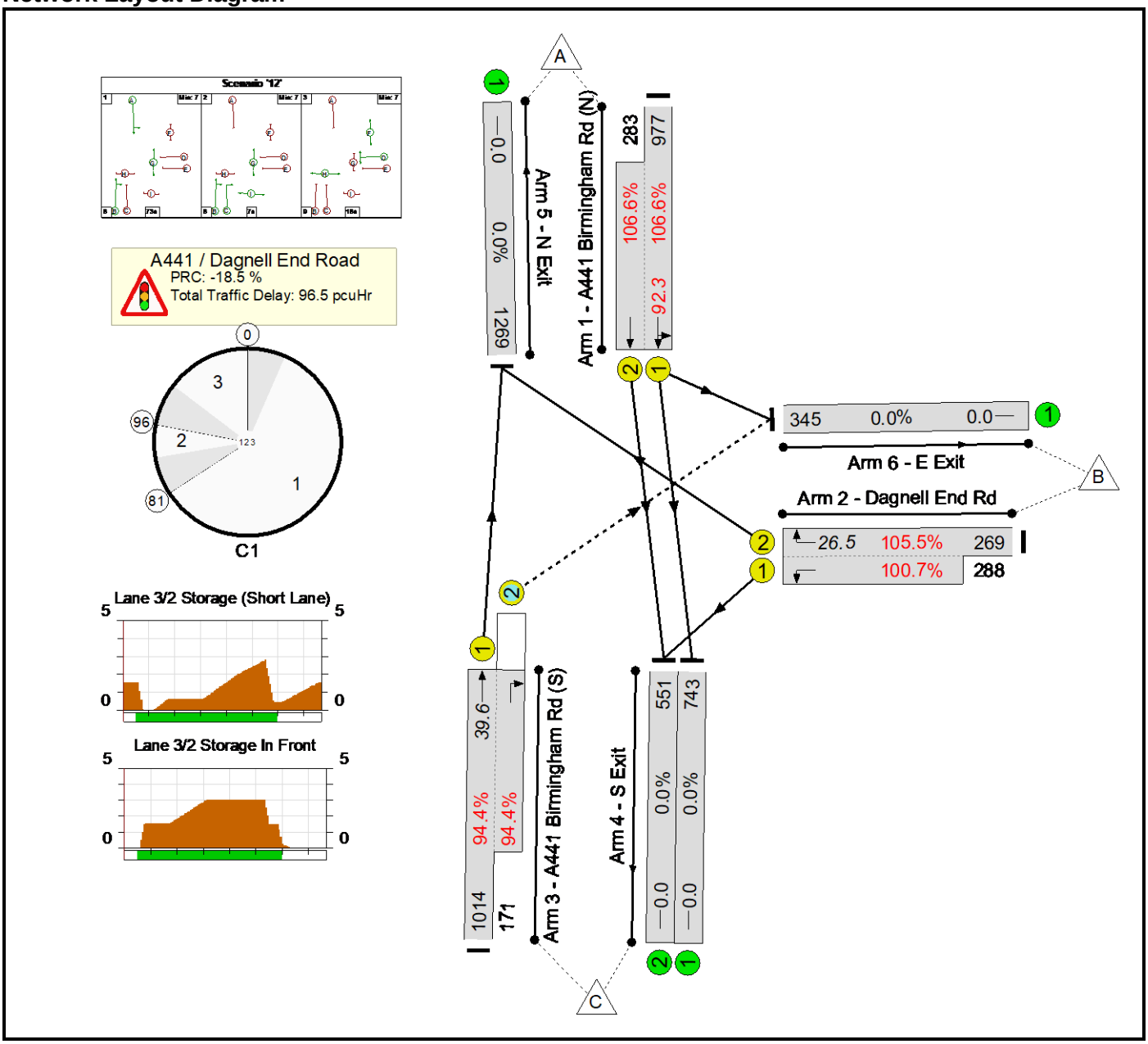
Stage	1	2	3
Duration	73	7	18
Change Point	0	81	96

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**106.6%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**106.6%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	73	-	1260	1819:1878	916+265	106.6 : 106.6%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	18	0	557	1650:1852	255+286	105.5 : 100.7%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	88	10	1185	1641:1800	1074+181	94.4 : 94.4%
4/1	S Exit	U	N/A	N/A	-		-	-	-	792	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	571	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1283	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	356	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: A441 / Dagnell End Road	**-**	**-**	**0**	**167**	**4**	**25.5**	**69.5**	**1.5**	**96.5**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**0**	**167**	**4**	**25.5**	**69.5**	**1.5**	**96.5**	**-**	**-**	**-**	**-**
1/1+1/2	1260	1182	-	-	-	12.1	46.0	-	58.1 (45.2+12.9)	166.0 (166.6:164.1)	46.3	46.0	92.3
2/2+2/1	557	541	-	-	-	8.6	16.5	-	25.1 (15.5+9.6)	162.2 (208.0:119.5)	10.1	16.5	26.5
3/1+3/2	1185	1185	0	167	4	4.8	7.0	1.5	13.3 (9.8+3.5)	40.3 (34.9:72.8)	32.6	7.0	39.6
4/1	743	743	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	551	551	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1269	1269	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	345	345	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -18.5 Total Delay for Signalled Lanes (pcuHr): 96.48 Cycle Time (s): 123
PRC Over All Lanes (%): -18.5 Total Delay Over All Lanes(pcuHr): 96.48