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Barratt David Wilson Homes (Mercia)]

Hither Green Lane, Redditch

Transport Assessment Addendum

April 2023

Barratt David Wilson Homes (Mercia)]

Hither Green Lane, Redditch

Transport Assessment Addendum

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PROJECT NO: 325756

DATE: April 2023

REPORT No:	FILE NAME	PREPARED:	DATE OF ISSUE:	STATUS:	CHECKED:	AUTHORISED:
001	230421_325756_TAA 001.docx	JN	21 April 2023	Final	JN	BDF

CHANGE LOG

VERSION	DATE:	CHECKED BY:	REASON FOR CHANGE:
[Enter version no]	[Enter date date	[Enter initials]	Enter reason for change

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1. Introduction

1.1 Introduction

1.1.1 mode transport planning (mode) has been appointed by Barratt David Wilson Homes (Mercia) to provide highways and transport advice in relation to a live detailed planning application (ref: 21/01830/FUL) for land adjacent to Hither Green Lane in Redditch, Worcestershire.

1.1.2 The application was submitted to Redditch Borough Council (RBC) in 2021, following which a consultation response was provided by Worcestershire County Council (WCC) in their capacity as Local Highway Authority (LHA), recommending that the application be deferred.

1.1.3 Since the timing of WCC's initial comments, the applicant has been engaged in regular correspondence and MS Teams meetings with representatives from WCC in order to discuss and agree the concerns raised, and work collaboratively to agree a suitable way forward for the application.

1.1.4 A copy of the initial formal response received from WCC in February 2022 is included at Appendix A for reference. Following this several additional items have been raised through discussions with WCC; both through email correspondence and at MS Teams meetings. This report will address the various issues in turn and outline the amendments which have been made to the scheme since the initial submission. A summary of the main issues which have been addressed is provided below:

- Clarity on the methodology to utilise traffic distribution from the approved Brockhill Phase 3 application in the vicinity of the site;
- Updated LinSig modelling of Dagnell End Road / A441 signalised junction;
- Provision of a diverted bus service to serve the site and amendments to the internal layout to allow the bus to access and egress the site via the internal loop road;
- Amendments to internal site design in line with the requirements outlined in WCC's Streetscape Design Guide, including forward visibility and visibility splays for appropriate design speeds, suitable centreline radii and updated swept path analysis;
- Principle of access to and from the site via Hither Green Lane including swept-path analysis and the requirement for 85th percentile speed data to determine appropriate visibility requirements; and
- Removal of proposed secondary emergency access to the north of the site via Dagnell End Road.

1.1.5 This Transport Assessment Addendum (TAA) report should be read in conjunction with the latest Transport Assessment (TA) (ref: 220207_325756_TA 001) submitted as part of the application.

2. Traffic Impact

2.1 Overview

2.1.1 As part of the initial comments received from WCC, further clarification was requested regarding the methodology utilised to determine the distribution of traffic to and from the site, and the forecast impact on the Dagnell End Road / A441 junction.

2.1.2 In response to WCC's comments, mode prepared a detailed Technical Note (TN) (ref: 221212_325756_TN003) in December 2022, in order to provide the additional information relating to the traffic distribution associated with the development and the forecast impact at the Dagnell End Road / A441 junction. A copy of the technical note submitted to WCC is attached at **Appendix B**, for reference.

2.2 Traffic Distribution

2.2.1 The TN provided further detail on how the traffic distribution exercise had been undertaken based on the distribution profile for the Brockhill East residential development; which was historically deemed acceptable by WCC. This takes account of the distribution of traffic north and south along the Birmingham Road (A441) corridor from Brockhill East onto the Weights Lane roundabout, and its subsequent distribution onto the wider study network.

2.2.2 The TN also provides an overview of the traffic distribution and subsequent development trip movements at the Dagnell End Road / Birmingham Road junction for 2030 Base (Inc. Committed Development) and 2030 Base (Inc. Committed Development) + Development scenarios.

2.3 Dagnell End Road / A441 LinSig Capacity Assessment

Traffic Survey Data

2.3.1 An initial review of capacity at the junction was previously undertaken based on the previous data submitted as part of the Brockhill East Phase 3 (Ref: *19/00976/HYB*) application, which utilises survey data collected in November 2018. On account of the time since the collection of the survey data, it was considered that this may not provide an accurate indication of the current traffic profile at the junction.

2.3.2 Updated traffic surveys were therefore obtained along the local highway network in the vicinity of the junction. The updated traffic surveys provide a more accurate indication of current travel plans and take account of sustained changes in the type and scale of travel patterns which have occurred in the UK since the onset of the COVID-19 pandemic.

2.3.3 Turning counts surveys were undertaken at the Dagnell End Road / Birmingham Road junction on Tuesday 15th November 2022, covering the periods from 07:00 – 10:00 and 16:00 – 19:00.

2.3.4 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.

2.3.5 Further details in respect of the updated traffic survey data, along with background traffic growth and committed development trips are provided in the accompanying TN included at **Appendix B**. WCC have consented to the use of the updated survey data for the purpose of the updated LinSig junction, details of the relevant correspondence with WCC are included at **Appendix C**, for reference.

LinSig Model

2.3.6 The updated background traffic data has informed the basis of a revised LinSig model of the junction, which is discussed in detail in the accompanying TN included at **Appendix B**. The results of the LinSig modelling demonstrate that the proposed development will not have a severe impact on the operation of the Dagnell End Road / Birmingham Road junction.

2.3.7 The capacity assessment outlined within this TN demonstrates that junction will operate within acceptable capacity parameters following the introduction of the development proposals, and no further mitigation is therefore deemed necessary.

2.3.8 As outlined within the correspondence at **Appendix C**, this matter has been discussed and agreed with WCC, who have indicated that they are accepting of the development traffic impact at the junction and accordingly no mitigation, nor monies, towards mitigation have been requested to address capacity concerns.

3. Site Layout Amendments

3.1 Overview

3.1.1 WCC has provided a series of comments on the internal layout of the development. mode and the applicant have made a series of amendments to the layout in light of the comments provided, which have been discussed and agreed with WCC.

3.1.2 The provision of a diverted bus service into the site has also been discussed and agreed in principle with WCC, following engagement with Diamond bus, who operate a number of services in Redditch. The diversion of an existing bus service into the site has necessitated a number of additional layout amendments in order to satisfy the requirements of WCC's Streetscape Design Guide and accommodate the relevant design vehicle in the site.

3.1.3 A copy of the final site layout, taking into account the various comments raised by WCC and the requirement for bus accessibility, is included at Appendix D, for reference.

3.2 Bus Service

3.2.1 WCC determined that improvements to the bus services in the vicinity of the site would be required in order to promote opportunities for sustainable travel to and from the site.

3.2.2 Through ongoing correspondence following receipt of these comments, WCC stated that the existing bus stops and services along the A441 are too far from the site to be effective. It was therefore determined that a bus service would need to be diverted into the site, in order to provide an effective hourly service within an acceptable distance for prospective residents and visitors at the site. The service will provide connections between the site and Redditch Town Centre, as well as to several major employment hubs in the vicinity of the town centre.

3.2.3 The diversion of the bus service is to be delivered by WCC and the local operator (Diamond Bus), with an appropriate contribution to be provided by the developer, which will be secured by S106.

3.2.4 Initially a feasibility study was undertaken (including regular correspondence with WCC) to determine whether the bus could access the site via Hither Green Lane and depart via a shared bus / emergency access onto Dagnell End Road. The result of this study determined that visibility for buses utilising the proposed egress onto Dagnell End Road would be constrained by the presence of a number of mature trees, which are subject to protection orders which effectively stymied provision of a bus egress on this frontage.

3.2.5 An alternative strategy was therefore devised, through discussions with WCC, whereby bus access and egress will be provided via the vehicular access from Hither Green Lane. This strategy involves the routing of the bus service in a clockwise direction around the internal loop of the site, which has therefore been widened to include a minimum width of 6.1m, in accordance with WCC's Streetscape Design Guide. Through discussions with WCC, it has been determined that a Blue Bird Ultra LF 35 Bus (c. 10.95m) should be used as a representative design vehicle. Localised widening along the internal loop of the site has therefore been undertaken where necessary in order to accommodate the tracking of the relevant design vehicle in a clockwise direction.

3.2.6 Swept-path analysis shown in Drawing J32-5756-PS037, included at **Appendix E,** demonstrates that the design vehicle can access and egress the site via the access junction with Hither Green Lane, and route clockwise around the internal loop within the site.

3.2.7 As outlined within the email correspondence included at **Appendix C**, this matter has been discussed and agreed with WCC, who have indicated that they are accepting of the proposed bus route and strategy to serve the site.

3.3 Site Layout Amendments

3.3.1 As outlined above, WCC have provided a series of comments on the internal layout of the development, both as part of the initial formal response to the planning application, and as part of regular email correspondence and MS Teams meetings with representatives from WCC.

3.3.2 The applicant has worked collaboratively with WCC to discuss and agree a suitable way forward, which has resulted in a number of amendments to the site layout. This also includes a number of amendments made to accommodate the provision of a bus service within the internal loop of the site, as discussed above.

3.3.3 As outlined in the correspondence included at **Appendix C** the final set of highway comments regarding the proposed scheme were made on 13/04/2023, with mode providing a final response on 14/04/2023. Taking into account the various amendments made to the site layout since the initial submission, mode has undertaken a full review of visibility splays, forward visibility and tracking to ensure the final site layout accommodates the tracking of relevant design vehicles and complies with the relevant standards outlined in MfS and WCC's Streetscape Design Guide.

Visibility

3.3.4 In accordance with the requirements of the Streetscape Design Guide, appropriate visibility splays at junctions, and forward visibility along connecting streets, have been provided in accordance with the design speed of 20mph for 'primary residential streets', and 15mph for lower order 'local residential streets'.

3.3.5 In accordance with the requirements of MfS, 25m x 2.4m visibility splays and 25m forward visibility have been provided for streets with a 20mph design speed, whereas 2.4m x 17m visibility splays and 17m forward visibility have been provided for lower order streets with a 15mph design speed.

3.3.6 Drawings J32-5756-PS031 and J32-5756-PS032, attached at **Appendix E**, demonstrate that the junctions and highways links can achieve the required visibility splays and forward visibility, in accordance with the requirements set out within WCC's Streetscape Design Guide and MfS.

Swept-Path Analysis

3.3.7 All access junctions and the internal road network have been designed to facilitate the manoeuvrability and navigation of refuse vehicles and emergency service vehicles throughout the site.

3.3.8 A tracking assessment of the internal layout of the site and the site access has been undertaken using the following design vehicles:

- Phoenix 2-18W Refuse Vehicle (with Elite 2 6x4 chassis) (c. 9.62m) – Drawings J32-5756-PS033 / J32-5756-PS034; and,
- Fire Tender (c. 8.7m) – Drawings J32-5756-PS035 / J32-5756-PS036.

3.3.9 Confirmation has been sought from RBC – Environmental Services regarding the profile of the refuse vehicle used in Redditch, who have indicated that the largest refuse vehicle in the fleet is c. 9.19m in length. A copy of the relevant correspondence with RBC is attached at **Appendix F**, for reference.

3.3.10 As outlined above, tracking assessments have been undertaken using a larger refuse vehicle (c. 9.62m) which is considered to be the most comparable vehicle in the AutoCAD library. The vehicle which has been utilised for the tracking assessments is slightly larger than the vehicle specified by RBC, therefore the tracking assessments provided in Drawings J32-5756-PS033 and J32-5756-PS034 are considered to provide an overly robust representation of the vehicle's ability to access and egress the site.

3.3.11 The tracking assessments for the internal layout demonstrate that the design vehicles can access the various streets within the site, turn around in the appropriate designated turnings heads and egress in forward gear. The tracking assessments of the internal site layout are shown in **Appendix E**, for reference.

4. Principle of Access

4.1 Hither Green Lane

4.1.1 As outlined within the TA, vehicular access to the site will be provided via a new priority crossroads junction along the site's eastern frontage, formed with Hither Green Lane and the unnamed access road serving the golf range on the opposite side of the road. The connection between the site and Hither Green Lane has been designed in accordance with Manual for Streets (MfS) and WCC's Streetscape Design Guide (2020).

4.1.2 The site access will incorporate a 6.1m wide carriageway width, with 10m corner radii and 2m wide footways on both sides of the carriageway. Pedestrian access at the junction will be supported by the provision of an uncontrolled crossing facility, in the form of dropped kerbs/ tactile paving. This has been discussed and agreed with WCC.

4.1.3 A tracking assessment has also been undertaken for the site access, which demonstrates that a Phoenix 2-18W Refuse Vehicle (with Elite 2 6x4 chassis) (c. 9.62m) and Fire Tender (8.6m) can access and egress the site without conflict; as discussed in **Chapter 3**. The tracking of these design vehicles is outlined in Drawings J32-5756-PS033 and J32-5756-PS035, attached at **Appendix E**, for reference.

4.1.4 As outlined in **Chapter 3**, the site will be served by a diverted bus service, which is to access and egress the site via the new junction with Hither Green Lane. A tracking assessment has therefore been undertaken for a Blue Bird Ultra LF 35 Bus (c. 10.95m), which demonstrates that the vehicle can access and egress the site via the site access. The relevant tracking assessment is shown in Drawing J32-5756-PS037, provided at **Appendix E**, for reference.

4.1.5 At the request of WCC, in order to determine 85th percentile speeds along Hither Green Lane, an Automated Traffic Count (ATC) survey was undertaken on Hither Green Lane in the vicinity of the site access for a 7-day period between 1st March and 7th March 2022. Appropriate visibility splays have been provided at the site access in accordance with the recorded 85th percentile speed of 26.3mph; which in accordance with Manual for Streets (MfS) requires visibility splays of 2.4m x 36m. Visibility splays of 2.4m x 43m have also been shown in accordance with MfS and the posted speed limit of 30mph.

4.1.6 The access and visibility splays are shown in Drawing J32-5756-PS-030, attached at **Appendix E**, demonstrate that access junction for the site can achieve the required visibility splays, and therefore conforms with guidance set out within MfS.

4.2 Previously Proposed Emergency Access

4.2.1 As part of the initial submission, a proposed emergency access was included to the north of the site; which was understood to be a requirement of WCC. As part of detailed discussions on the scheme with WCC via MS Teams, it was understood that secondary point of emergency access was not required, owing to the scale of the development and the internal loop road format within the site.

4.2.2 Nonetheless, as outlined in **Chapter 3**, WCC have stipulated that a diverted bus service will be required in order to promote sustainable access to and from the site. Initially a feasibility study was undertaken (including regular correspondence with WCC) to determine whether the bus could access the site via Hither Green Lane and depart via the secondary point of access onto Dagnell End Road. The result of this study determined that visibility for buses utilising the egress onto Dagnell End Road would be constrained by the presence of a number of mature trees.

4.2.3 On account of the comments received from WCC indicating that a secondary emergency access was not necessarily required, and the visibility constraints at the egress onto Dagnell End Road, an alternative strategy for bus access has been devised, whereby the bus will access and egress the site via the primary access on Hither Green Lane; as discussed in greater detail in **Chapter 3**. In light of the above, the final layout (included at **Appendix D**) does not include a secondary point of access onto Dagnell End Road.

5. Summary and Conclusion

5.1 Summary

5.1.1 mode transport planning (mode) has been appointed by Barratt David Wilson Homes (Mercia) to provide highways and transport advice in relation to a live detailed planning application (ref: 21/01830/FUL) for land adjacent to Hither Green Lane in Redditch, Worcestershire.

5.1.2 The application was submitted to RBC in 2021, following which a consultation response was provided by WCC in their capacity as LHA, recommending that the application be deferred.

5.1.3 Since the timing of WCC's initial comments, the applicant has been engaged in regular correspondence and MS Teams meetings with representatives from WCC in order to discuss and agree the concerns raised, and work collaboratively to agree a suitable way forward for the application.

5.1.4 The development is to be served by a diverted bus service, which is to access and egress the site via the new junction with Hither Green Lane. A tracking assessment has therefore been undertaken for a Blue Bird Ultra LF 35 Bus (c. 10.95m), which demonstrates that the vehicle can access and egress the site via the site access and route around the internal loop within the site.

5.1.5 In accordance with the requirements of MfS, 25m x 2.4m visibility splays and 25m forward visibility have been provided for streets with a 20mph design speed, whereas 2.4m x 17m visibility splays and 17m forward visibility have been provided for lower order streets with a 15mph design speed. An updated highways drawings package has been provided for the final site layout, which demonstrates that the junctions and highways links can achieve the required visibility splays and forward visibility, in accordance with the requirements set out within WCC's Streetscape Design Guide and MfS.

5.1.6 The site layout and access junction have been designed to facilitate the manoeuvrability and navigation of refuse vehicles and emergency service vehicles throughout the site. Tracking assessments of the site access and internal layout have been undertaken using a Phoenix 2-18W Refuse Vehicle (with Elite 2 6x4 chassis) (c. 9.62m) and Fire Tender (c. 8.7m), which demonstrate that the design vehicles can access the various streets within the site, turn around in the appropriate designated turnings heads and egress in forward gear.

5.1.7 Vehicular access to the site will be provided via a new priority crossroads junction along the site's eastern frontage, formed with Hither Green Lane and the unnamed access road serving the golf range on the opposite side of the road. The connection between the site and Hither Green Lane has been designed in accordance with the requirements set out within MfS and WCC's Streetscape Design Guide (2020).

5.2 Conclusion

5.2.1 This TAA has provided an overview of the various additional workstreams and amendments to the proposed scheme which have been completed in order to satisfy the requirements of WCC, in their capacity as LHA.

5.2.2 On the basis of the information presented in this TAA, and the accompanying TA (ref: 220207_325756_TA 001) submitted as part of the application, it is considered that suitable evidence has been presented to allow WCC to provide a recommendation of no objection on transport and highway grounds.

5.2.3 It is therefore concluded that the proposed development will not have a significant adverse impact on the operation or safety of the surrounding highway network and therefore, in accordance with the NPPF and local planning policy, the proposal should be considered acceptable in terms of transport and highways.

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APPENDICES

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APPENDIX A

WCC Formal Response to Planning Application

Nigel Gorski
Economy and Infrastructure
Development Control Engineer

County Hall
Spetchley Road
Worcester
WR5 2NP

Paul Lester
Bromsgrove District Council
Parkside
Market Street
Bromsgrove
Worcestershire
B61 8DA

Date: 07 February 2022
Your ref: 21/01830/FUL
Ask for: Nigel Gorski

Dear Paul Lester,

TOWN AND COUNTRY PLANNING ACT 1990
(DEVELOPMENT MANAGEMENT PROCEDURE) (ENGLAND) ORDER 2015
ARTICLE 18 CONSULTATION WITH HIGHWAY AUTHORITY

PROPOSAL: 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
LOCATION: Land West of Hither Green Lane, Redditch, Worcestershire
APPLICANT: Mr. A. Rowan

Worcestershire County Council acting in its role as the Highway Authority has undertaken a full assessment of this planning application. Based on the appraisal of the development proposals. The Transport Planning and Development Management Team Leader on behalf of the County Council, under Article 18 of the Town and Country Planning (Development Management Procedure)(England) Order, 2015 recommends that this application be **deferred.**

The Highway Authority has undertaken a review of the Transport Assessment (TA) dated October 2021, as prepared on behalf of the applicant by Mode Transport Planning. Our comments are set out below.

Planning context

It is understood that this application site does not form a strategic allocation within the adopted Redditch Local Plan (2011-2030). The principle of development in this location is therefore not established and remains untested.

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Development proposals

The development proposals include for a residential site of 216 units comprising mix of private, social and affordable housing. The planning application form identifies the proposals to include no.81 x 3 bedroom private dwellings, no. 70 x 4 plus bedroom private dwellings, no. 26 x 2 bedroom social dwellings, no. 4 x 2 bedroom social flats, and no. 3 x 3 bedroom social dwellings. The site will also include no. 6 x 2 bedroom affordable dwellings and no. 17 x 3 bedroom affordable dwellings.

The proposals will replace the north-western parcel of the existing golf course located to the west of Hither Green Lane and include a new T junction access from Hither Green Lane.

Access

A single point of vehicular access is provided to the site as a new priority crossroads junction with Hither Green Lane. This junction also includes an unnamed access road serving the golf range on the opposite side of the carriageway. The TA intends the access to incorporate a 5.5m width carriageway, with 10m corner radii and 2m wide footways on either side.

For access visibility, this needs to be determined using 85th percentile speed data and not be based on the speed limit of the carriageway. Visibility should be measures from a distance of 2.4m (x) distance along the edge of the carriageway and include any tangents to the kerb line.

The swept paths provided for the access junction (with Hither Green Lane) show a refuse vehicle traversing over the centre site to turn in and out of the site. The access junction should be designed to accommodate these movements. The access design should be revisited.

Para. 4.3.1 of the TA states that *'on account of the scale of development proposed, an alternative point of access into the site will be provided for emergency vehicles'.* This to be provided on to Dagnell End Road at the western end of the site, with a 3.7m wide pedestrian link, with retractable bollards to prevent private vehicle access.

This access is however not shown on the 'proposed site layout' drawing prepared by Urban Design Ref: ME-24-21S. If proposed, the emergency access needs to be included on this drawing, with details shown of how it fits into the remainder of the site.

The TA states that a tracking assessment has been undertaken to show that a Fire Tender (8.6m) can access and egress the site via the emergency access point.

It is accepted that a fire tender could access via this route, but the access needs to be shown to a suitable level of design, complete with visibility information and details of how it could connect to the footway. Details of how the bollards could be lowered in an emergency also needs to be presented in the TA.

A TRO will also likely be required to facilitate the proposed emergency access.

Internal site design

Comments on the internal site design include:

- The site access onto Hither Green Lane proposes a visibility splay of 2.4 × 43m. This should be checked to ensure the splay is not compromised by the proposed entrance feature walls. In the southerly direction the splay should also be provided to the tangent of the nearside kerb on the curve in Hither Green Lane.
- The shared private drives indicated close to the site access create potential conflict points due to their proximity to the main access.
- All bends should have a minimum radius of 20m in accordance with the WCC Streetscape Design Guide. Suitable forward visibility should also be provided on all curves based on 20mph design speed (25m). A design speed of 15mph and 17 metre forward visibility may be acceptable on the shorter cul-de-sacs. If this extends beyond the adoptable footway or verge, then the back of footway/verge should be moved to define the visibility envelope. There are some locations where this will affect proposed plots.
- Two bends are indicated with 90-degree outer kerb lines. These serve no functional purpose and create a potential liability for the Highway Authority and the channels cannot be fully cleaned by mechanical road sweepers. These are not acceptable for adoption and should be converted to suitable radii.
- Build-outs / narrowing's appear to be proposed at three locations within the road network. These serve no functional purpose to maintain suitable vehicle speeds and are not considered necessary to aid pedestrians crossing the road. They are however a potential future maintenance and operational liability to the Highway Authority and should be removed from the design.
- All turning heads must comply with the minimum dimensions specified in WCC's Streetscape Design Guide. Some of the turning facilities are currently not compliant. However, the turning head adjacent to plots 107 to 113 exceeds the Council's requirements for adoption and should be reduced to 26m.
- A 2m wide footway should be provided at all locations where properties have direct pedestrian access to the roads. Some cul-de-sac roads appear to have

a hybrid design, which is neither traditional or shared space with 2m footways on one side and 1m service strips on the other side. There is no logic to the arrangement and only likely to raise questions/complaints from residents. 2m footways should be provided on both sides in suitable locations, or a level shared space provided in those cul-de-sac type areas.

- The road serving plots 180 – 189 and 171 – 179 appears to be a hybrid design between traditional road and shared surface. As a through route, it is unlikely to be suitable for shared use, and should have footways both sides as properties have direct frontage access. The road alignment is also unacceptable with the offset chicane effect. This serves no functional purpose and is likely to become a pinch point for refuse and delivery vehicles should parking take place nearby. The road should be realigned with a suitable constant width.
- One-metre-wide grass service strips are not considered viable as the grass rarely becomes established due to the kerb foundations/construction either side. These would need to be hard surfaced if offered for adoption.
- There appear to be short surface change features at a few locations, which again serve no functional purpose and should be removed.
- The internal swept path analysis should be based on the 11.7 metre refuse truck indicated within the supplied TA. No swept paths should overhang adoptable footways or service strips. Localised widening should also be provided on bends to allow a refuse truck and car to pass each other within the carriageway.
- The applicant should be aware of the maximum adoptable carriageway and footway gradients as detailed within WCC Highway Design Guide. Any block paved roads must have a minimum longitudinal gradient of 1 in 80 to reduce the risk of standing surface water. If this is not achievable then a tarmac surface will be required.
- Any private parking spaces abutting the back of adoptable footway or service strip should be a minimum of 6 metres deep.
- Tactile paving should be provided at junction crossing points. These should be placed on the pedestrian desire lines.
- Details of suitable surface water drainage arrangements for capture and discharge of water from the roads and footways would need to be provided before adoption of the roads was considered.

Street lighting

The street lighting team at WCC inform that a suitably qualified lighting engineer should be appointed to carry out an assessment for the proposed development in line with WCC's Street Lighting Design Guide (SLDG). Given the anticipated increase in usage

the assessment should also include the existing junction between Dagnell End Road and Hither Green Lane.

Should lighting be required consideration shall be given, in consultation with WCC, regarding the need for any proposed lighting to tie in with the existing decorative style currently used on Hither Green Lane.

It should also be noted that replacement lighting from Dagnell End Road to a suitable point beyond the proposed development access may be required in line with the guidance given in the SLDG with specific regard to WCC's ongoing energy, ecological and maintenance commitments. Please note it is a requirement to provide an environmental impact assessment of any lighting proposals and this shall be carried out by a qualified ecologist.

Any private lighting within the development shall need to be designed sympathetically to the surrounding environment and should include liaison with WCC's ecologist and the parish council to ensure the proposals are acceptable.

Trip generation

Mode have presented vehicle trip rates derived from TRICS and compared these to site surveys used in the Brockhill Phase 3 application. The TRICS results presented are not accepted by the Highway Authority for this site, as they reflect 'edge of town' sites with much greater sustainable transport connections. As the Hither Green Lane is more limited in its access to a good public transport network, rail, cycle and amenities in a close walking distance, the trip rates should reflect this. Especially as the proposals include some quite sizable dwellings. The trip rates presented for the Brockhill Phase 3 proposals are believed suitable for the site proposals.

The Highway Authority accepts the two-way vehicle trip rates of 0.706 (AM) and 0.750 (PM), generating 152 two-way trips (AM) and 162 two-way trips (PM).

Trip distribution / assignment

Para. 5.4.2 of the TA uses trip distribution information presented for the Brockhill Phase 3 proposals and '*the local road network has been analysed and traffic has been distributed to the zones'.* The Highway Authority requires greater clarity on how trip distribution / assignment has been calculated, as it is not clear from the information presented in the TA. This would utilise 'journey to work' census data and trips to other key destinations i.e. education, retail, etc.

Traffic figures in Appendix F are required to show the assignment of proposed development traffic separate from background and committed development trips. Traffic figures should show each traffic group separately included, so it is clear how the total traffic flows have been established. This information is requested.

Traffic Impact

Committed development traffic

In terms of committed development traffic, this should include the Brockhill Phase 3 proposals, including any dwellings of the previous Brockhill phases still be to fully be constructed. Consideration should also be given to the Foxlydiate site, given its proximity and size. The LPA should be consultant on what development should be included.

Capacity assessments - Dagnell End Road Signal Junction

Despite utilising information from the Brockhill Phase 3 application, the capacity results for the Dagnell End Road Signal Junction do not match those previously approved by the Highway Authority for the same modelling scenarios, built from a fully validated and calibrated junction model. From a review of the LinSig modelling results, it is apparent that the model itself and results are different.

The Mode LinSig model shows the nearside lane on the Birmingham Road (S) approach to be a short lane, whereas in the previously approved model, this is shown to be a 'long lane'. As the LinSig mode has not been provided, it is anticipated that further differences will also be apparent. The previously approved model should be used to assess capacity at this junction, otherwise a new model should be created, which would first require revalidation and calibration.

Adding vehicle trips to an already congested junction, increasing vehicles queues and delays in this location is not acceptable. This is a key junction provided along an arterial connecting Redditch to the M42 to the north and Birmingham beyond.

Other capacity assessments

For the Highway Authority to accept the junction capacity assessments presented, an AutoCAD drawing showing junction geometry measurements or a scaled drawing should be presented. Some form of base model validation should also be provided and be agreed, before forecast development scenarios are presented.

The Highway Authority does not accept percentage impact results or a 30 trip threshold for the purposes of identifying junctions requiring capacity assessment, and these will be determined by the volumes of development trips anticipated to travel through each junction, trips adding to sensitive movements, and the operation and safety of the junction. Junctions requiring capacity assessments will be fully determined when trip distribution / assignment information is agreed and evidence of model validation / calibration has been provided.

Sustainable transport links

Pedestrian access

The Highway Authority currently identifies the site to have limited accessibility by none car modes of transport. There are currently no pedestrian footway connections from this site to local amenities, including education, health, retail, etc. The Brockhill Phase 3 proposals (committed development) are to provide some pedestrian enhancements to the Dagnell End Road signal junction, with a short extension of the footway on the south side of the Dangell End Road carriageway. These are however shown not to reach the proposed Hither Green Lane site.

Para. 4.4.2 of the TA states that *'a new section of footway will also be provided on the southern side of Dagnell End Road, within the existing highway boundary. This will connect with the existing footway on the southern side of Dagnell End Road, providing a connection west towards the existing footway network along Birmingham Road (A441). This will be subject to confirmation of land ownership and discussions with WCC in order to agree an appropriate mechanism to tie this into the footway improvements associated with Brockhill East Phase 3'*

This connection is welcomed and further details regarding its form are requested. This should be shown on a drawing and take account of the committed improvements identified for the Dagnell End Road signal junction.

Pedestrian connections to the southwest are more important for this site, with this route providing connections to bus stops, the Abbey Stadium and a route to and from the town centre. Routes across fields are unattractive and will not be used at times in the winter when its wet and dark outside. Detailed information should be presented as to how the site will provide attractive pedestrian connections to / from the town centre, along pedestrian desire lines. Details regarding the footway surface, if lit, and crossing points are requested. Further information is requested.

Public transport access
Current Service

The nearest marked bus stops to the proposed development are on the A441 north of the Dagnell End Road junction, in excess of 700 metres away from the centre of the development. Parts of the development will be more than 800 metres away. The walking route to these bus stops does not include a footpath, although it is acknowledged that a part route is being provided as part of the Brockhill Phase 3 proposals.

The stop on the A441 is serviced by Diamond bus services 182 and 183. Only two bus services for each stop in this location, all during the day and not at a time suitable for typical 9-5 employment commuting.

In addition, two school services (S55 and S83) operate in the morning and afternoon to access Bromsgrove Schools. These services are unlikely to be suitable for adults due to the destination and the numbers of children using the service and there is unlikely to be space to take additional children.

Although Hither Green Lane is on the edge of Redditch, secondary schools for the catchment area are: North Bromsgrove High School (approx. 17km), South Bromsgrove High School (approx.. 13.5 km), Alvechurch Middle School (approx.4.9km). These distances necessitate the use of a vehicle as they are not within reach, nor are accessible via a safe route for active travel. The primary school within the catchment is Beoley First School which is approximately 2.5 km from Hither Green Lane. This is a long distance for primary age school children to walk plus there are no footways (at present) along much of Dagnall End Road leading to the school.

Future Service Requirements

In order to make this development acceptable in planning terms meeting the requirements of the 1985 Transport Act, WCC's LTP4 and the NPPF para 124 (c) a new bus or enhanced service will be required.

Due to the current uncertainties around commercial bus services and the complexities of conformance with public sector procurement regulations, Worcestershire County Council policy is to request contributions towards bus services associated with major developments on the basis of a stand-alone service. The envisaged service will provide an hourly frequency service running from Redditch bus station to the development covering working hours to allow access to Redditch for working and the train station for further afield employment opportunities. Without such a service this development would not be acceptable as it would be predominantly car dependent.

School / Community Transport

The statutory duty to provide free home to school transport is detailed in guidelines issued annually by DfE as required under the Education Act 1995. Worcestershire County Council puts these guidelines into effect through its Transport and Travel Policy again revised annually. This is a statutory provision related to the duty to provide school places and is required for the development to proceed as the development will cause the County Council to incur costs as a direct result of the distance between the proposed development and one or more designated schools.

Normally children living in Worcestershire are expected to attend the appropriate designated school for the children's age and address. Where places are not available in the designated school, the children may be assigned to another school or re-designated school. It is anticipated that school to travel and or community contributions may also be required for public transport. These will be identified as the planning application progresses.

Parking

Car and cycle parking is believed to be provided in accordance to standards set out in the WCC Streetscape Design Guide. Although it is noted in Para. 4.6.2 of the TA that the *'application is being submitted in outline form with all matters reserved apart from access, therefore the final quantum of parking will be determined at the Reserved Matters stage'.* A full application has been submitted for the proposals, so any amendments to car parking provision set out in the TA need to be identified and presented now.

Travel planning

The Highway Authority has undertaken a review of the Residential Travel Plan (RTP) and identified that the scope of external site measures put forward to encourage and promote sustainable journeys include:

- To the north of the site, a pedestrian route will link the site with Dagnell End Road and connect to a new section of footway that will be provided on the southern side of Dagnell End Road, connecting to the committed Brockhill Phase 3 proposals in this location,
- To the south and west pedestrian / cycle connections will be provided with the existing footway which runs alongside the River Arrow and connects with Birmingham Road immediately north of the river over-bridge.
- A Travel Information Pack will be produced and disseminated to residents, detailing the opportunities for sustainable travel to and from the site, including

a potential range of incentives and the promotion of regional and national car share websites

- Use of public transport will be with up-to-date public transport timetables, bus maps and ticket information disseminated to the residents. The possibility of offering residents with discounted bus vouchers/passes with local operators will also be investigated.
- Personalised Travel Planning (PTP) will allow residents to contact the TPC and arrange a meeting (either face-to-face or via email/telephone) to discuss their individual circumstances with the TPC who will assist in tailoring a travel plan specific to that resident, incorporating sustainable travel modes as much as possible.

The RTP seeks to achieve a mode shift reduction in single occupancy car trips of 5% (from baseline surveys) over a period of 5 years. Based on the trip generation results presented, the success of the RTP would reduce weekday peak hour car trips by 8 vehicles in the AM and PM peaks.

Based on the level of provision set out in the RTP, the Highway Authority does not believe this mode shift would be realised. The promotion of sustainable journeys is most successful when there are plentiful non-car opportunities in which to choose from. At present, the development site offers limited sustainable options in which to promote.

The Travel Welcome Pack should also be presented to the WCC travel plan officer for review and approval.

Summary

Unlike the Brockhill Phase 3 proposals, the proposals to the west of Hither Green Lane do not form an allocated site in the Redditch Local Plan. The site is more remote in terms of access to sustainable transport provision and amenities in the town centre.

The Highway Authority has undertaken a review of the Mode TA and has identified a series of points that require further consideration / information. The operation of the Dagnell End Road signal junction in particular is a primary concern, given that nearly all proposed development trips generated by this site would travel through it.

The Highway Authority therefore submits a response of deferral until the required information has been provided and considered.

Yours Sincerely

Nigel Gorski
Development Control Engineer
On behalf of Karen Hanchett, Transport Planning and Development Management Team Leader

APPENDIX B

Traffic Modelling Technical Note

TECHNICAL NOTE

Hither Green Lane, Redditch

LinSig Analysis – Response to Highways Comments

transport planning
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Client:	Barratt David Wilson Homes (Mercia)	Job No:	325756
Date:	12 December 2022	File Name:	221208_325756_TN003
Prepared by:	JFN	Approved by:	BDF

1. Introduction

1.1 Overview

1.1.1 This Technical Note (TN) has been prepared in response to post-application comments provided by Worcestershire County Council (WCC) in relation to the Full Planning Application (Ref: *21/01830/FUL*) for land to the west of Hither Green Lane in Redditch, Worcestershire. Specifically, this TN sets out mode's response to WCC comments regarding LinSig modelling of the Dagnell End Road / Birmingham Road (A441) junction.

1.1.2 The development proposals comprise the following:

"*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.*"

1.1.3 WCC provided comments in their role as Local Highway Authority (LHA) on 7th February 2022, in which they recommended that the application be deferred. WCC's comments are provided in **Appendix A**, for reference.

2. Background Information

2.1 Dagnell End Road / Birmingham Road - Mitigation Scheme

2.1.1 The Transport Assessment (Ref: *211015_325756_TA 001*), submitted as part of the planning application for the proposed development (Ref: *21/01830/FUL*) provides details of the mitigation scheme for the Dagnell End Road / Birmingham Road signalised junction, which is to be implemented as part of the adjacent Brockhill East Phase 3 application (Ref: *19/00976/HYB*).The mitigation scheme is outlined on drawing Ref: 2809-P-12-P4, which is attached as **Appendix B**, for reference.

2.1.2 This mitigation scheme was previously identified in the Redditch District Infrastructure Delivery Plan (IDP) (CDR51). As outlined in WCC's formal response to the Brockhill East Phase 3 (Ref: *19/00976/HYB*); this scheme has been considered acceptable in what is considered a "constrained location in terms of land ownership" and is to be delivered as part of a S278 Agreement.

2.2 Modelling Details – Brockhill East Application 19/00976/HYB

2.2.1 As set out in technical notes 'Dagnell End Road – Junction Design Note' (16/09/2020) and 'Dagnell End Road – Junction Design Modelling Update' (24/11/2020) submitted as part of the Brockhill East application (Ref: *19/00976/HYB*), peak hour pedestrian crossing demand at the new signalised crossing was forecast to be relatively low, and it was anticipated that the crossing would therefore be called infrequently.

2.2.2 In addition to the above, WCC raised concerns over the incorporation of the left turn filter arrow from Dagnell End Road, as a pedestrian wishing to cross over the A441 southbound may see a stationary vehicle in the offside lane of Dagnell End Road (controlled by Phase D), without seeing the filter arrow for Phase E.

2.2.3 WCC noted that this arrangement is provided at other junctions elsewhere, and that concerns were not raised within the RSA. WCC therefore suggested that a further stage sequence, excluding the left turn filter, should be included in the modelling. The matter would then be resolved at detailed design stage or following installation of the junction based on site observations.

2.2.4 In light of the above, the modelling submitted as part of the application for Brockhill East included 3 stage sequences. A summary of the stage sequences was provided in the TA prepared by mode (Ref: *211015_325756_TA 001*), along with reference to a stage sequence diagram for each; included at Appendix H of the TA.

- 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).

2.2.5 The A441 / Dagnell End Road junction was therefore modelled with consideration of each of the 3 Stage Sequences in mode's TA, to replicate the modelling scenarios used for the purpose of the Brockhill East Phase 3 application.

2.3 Planning Context

2.3.1 When the TA for Hither Green was produced, the application for Brockhill East Phase 3 was marked as 'awaiting decision'; however, it was noted that WCC, in their capacity as LHA, had already undertaken a full review of the planning application and subsequently raised no objections. Given the site's status as the final part of a strategic allocation in the Bromsgrove District Plan and Redditch Local Plan, and the approved position from the LHA, Brockhill East Phase 3 was considered as a committed development in the modelling section of the TA produced by mode.

2.3.2 Consideration was also made of the potential highway mitigation / improvement measures associated with Brockhill East Phase 3, to ensure the proposed development at Hither Green Lane takes account of any amendments to the surrounding highway network. The mitigation scheme for the Dagnell End Road / Birmingham Road junction had been designed on topographical survey data and was deemed acceptable by WCC for the purpose of granting planning permission and was therefore considered as the baseline position for the purpose of the detailed capacity assessment presented in mode's TA.

2.3.3 The application for Brockhill East Phase 3, with the inclusion of the mitigation scheme, has since received planning consent, therefore all of the assumptions above remain valid.

3. WCC Comments

3.1 Overview

3.1.1 As part of their response to the proposed development, WCC has stated the following, in relation to the detailed junction capacity assessment for the Dagnell End Road / Birmingham Road (A441) junction:

"*Despite utilising information from the Brockhill Phase 3 application, the capacity results for the Dagnell End Road Signal Junction do not match those previously approved by the Highway Authority for the same modelling scenarios, built from a fully validated and calibrated junction model. From a review of the LinSig modelling results, it is apparent that the model itself and results are different.*

The Mode LinSig model shows the nearside lane on the Birmingham Road (S) approach to be a short lane, whereas in the previously approved model, this is shown to be a 'long lane'. As the LinSig model has not been provided, it is anticipated that further differences will also be apparent. The previously approved model should be used to assess capacity at this junction, otherwise a new model should be created, which would first require revalidation and calibration.

Adding vehicle trips to an already congested junction, increasing vehicles queues and delays in this location is not acceptable. This is a key junction provided along an arterial connecting Redditch to the M42 to the north and Birmingham beyond."

4. Modelling Input Parameters

4.1 Comparison with Approved Model

4.1.1 As part of their consultation response to the application, WCC raised concerns regarding the modelling analysis presented as part of mode's Transport Assessment (Ref: *211015_325756_TA 001*), which was included as part of the planning application submission.

4.1.2 Specifically, concerns were raised over differences between the input parameters used within the approved LinSig model and the model prepared by mode. A copy of the approved model was subsequently requested by mode; however, WCC indicated that they did not have a copy of the model on file. WCC provided a contact within the delivery team for Brockhill East Phase 3, to approach for a copy of the LinSig model; however, this was considered unfeasible as the delivery team for Brockhill (or their client) would have no obligation to provide a copy of the model.

4.1.3 In the absence of an approved model file, mode endeavoured to replicate this using publicly available details/data from the summary output reports provided in the Brockhill East Phase 3 TN dated 24/11/2020, which was obtained from Redditch Borough Council's (RBC) Planning Portal. This was considered a suitable and feasible approach, and a copy of the subsequent LinSig model prepared by mode was provided to WCC for their consideration.

4.1.4 The model outputs in the Brockhill East Phase 3 TN include a range of options including no pedestrians, no filter arrow and pedestrians called every cycle, which have formed the basis of different modelling scenarios presented. mode took the same approach, to enable comparison with the results presented in TN for Brockhill East Phase 3.

4.1.5 In this regard, it should be noted that the Brockhill East Phase 3 TN, as obtained from RBC's planning portal, contains only the summary version of the model output report. Consideration was therefore also made of the detail in the approved mitigation scaled drawing (Ref: 2809-P-12-P4, attached at **Appendix B**), where specific details could not be obtained from the Brockhill East Phase 3 TN; however, variations in the exact results of the two models were to be expected; given the limited information regarding certain modelling parameters contained within the summary model output report.

4.1.6 With regard to the comments relating to the location of the long and short lanes on the Birmingham Road (S) approach, this was assumed to be a typing error. The location of the long and short lanes on the southern approach of the LinSig model prepared by mode are comparable to those contained within the Brockhill East Phase 3 model. Instead, it has been assumed that WCC was intending to query the alignment of the Birmingham Road (N) approach, as the nearside lane had previously been modelled so as to account for the diverge of the lanes and the primary movement through the junction.

4.1.7 The other item to note in this regard is the saturation flows assumed within the model. The Brockhill East Phase 3 TN provides reference to upstream lane widths, not stop line widths. This was not replicated within the LinSig model presented in mode's TA, as measurements had instead been taken from the scaled mitigation drawing (Ref: 2809-P-12-P4, at Appendix B) associated with Brockhill East Phase 3.

4.2 Revised mode LinSig File

4.2.1 The variations between the LinSig model presented within mode's TA, and the approved Brockhill East Phase 3 model were considered somewhat minor, and it was not envisaged that these would have a significant impact on the results of the modelling analysis.

4.2.2 Nonetheless, to address the concerns raised by highways, mode has produced a revised LinSig model (Ref: v2 Rev A), which was made available to WCC, for their detailed review. In summary, this included the following amendments:

- Saturation flows on Arm 1 (Birmingham Road (N)) were updated using upstream lane widths of 3m. Arm 2 (Dagnell End Road) was also updated to include upstream lane widths of 3.1m;
- The composition of short and long lane widths on Arm 1 (Birmingham Road (N)) were amended to align with the comments made by highways (assuming the comments were meant to refer to Birmingham Road (N) rather than Birmingham Road (S)); and,
- Intergreen from Phase 1 in the model was set to 8 seconds (mode had previously utilised 9 seconds, based on moderate use, crossing length and standard on-crossing direction).

4.3 Final WCC LinSig File

4.3.1 Following further discussions with WCC further concerns were raised over the parameters used within the updated model, and WCC requested that a copy of mode's LinSig model was provided to them. WCC indicated that they were now in a position to obtain a copy of the Brockhill East Phase 3 model and would therefore provide a subsequent comparison with mode's model.

4.3.2 mode submitted a copy of the latest LinSig model prepared, along with a new request to WCC to utilise a copy of the approved LinSig model, stating the following:

"It is noted that WCC are in possession of a copy of the approved model, however thus far a copy of this has not been provided to the design team. Given WCC's stance that the LinSig they have on file is the approved model, and that our results should mirror those of the approved model, it is our stance that we should be provided with a copy of the LinSig model, in order to allow us to run our additional traffic through the model and report back on the results as part of a post-application response. The model will only be utilised for the purpose of this task."

4.3.3 This request was refused by WCC, on the basis that the approved model is owned by the applicant for Brockhill East Phase 3 and therefore not available for issue. In an email dated 15th September WCC stated the following: "…*whilst WCC does hold the PJA LINSIG model, this model is owned by PJA. It is not our model to issue to you. We are only able to provide you with information that is publicly available on the planning website and unfortunately this final version of the model is not."*

4.3.4 In the interest of moving matters forward, WCC instead provided some minor amendments to the model, taking into account the parameters from the Brockhill East Phase 3 model they have on file. These included some minor amendments to intergreens, phase delays, saturation flows and lane lengths.

4.3.5 The latest model issued by WCC – hereby referred to as 'v2 Rev B' has been utilised by mode for the purpose of assessing the impacts of the proposed development at the junction. A review of the modelling outputs from the revised model is provided in Section 5, for reference. This model has been validated by WCC to get the same results which were presented as part of the Brockhill East Phase 3 application. The parameters used within the LinSig v2 Rev B model have therefore been accepted by WCC, and this is the baseline position utilised for the assessments undertaken within this TN.

5. Modelling Scenarios & Methodology

5.1 Existing Situation

5.1.1 The requirement for a comprehensive review of capacity, traffic flows, design and signalling apparatus at the Dagnell End / Birmingham Road signalised junction was previously identified in WCC's Local Transport Plan 4 (LTP4) in 2017.

5.1.2 As outlined within the subsequent Redditch District IDP (CDR51), background work was undertaken by WCC to consider the cumulative transport impacts arising from the development identified in both the Redditch and Bromsgrove Local Plans.

5.1.3 The IDP subsequently identified the potential for an additional approach lane on the eastern arm (Dagnell End Road) and the implementation of Microprocessor Optimised Vehicle Actuation (MOVA); to enable maximisation of the throughput at the junction under actual observed conditions. The IDP indicates that funding for this mitigation scheme would be secured from developer contributions, with a total cost in the order of £520,000.

5.1.4 An overview of the base model for the existing layout of the Dagnell End Road / Birmingham Road junction was presented in the Junction Design Modelling Update TN (24/11/2020) for the consented application at Brockhill East Phase 3. An overview of the base model (optimised) results for the junction, as taken from the Brockhill East Phase 3 TN for the consented application, is provided in **Table 5.1**, covering the following scenarios:

- Existing Layout Scenario 1 (**EL1**) - 2018 Base;
- **EL2** - 2030 Base + Committed; and
- **EL3** - 2030 Base + Committed + Brockhill East Phase 3.

Table 5.1 : Existing Situation

Arm	AM Peak Hour (0800 – 0900)			PM Peak Hour (1700 – 1800)		
	DoS (%)	MMQ (PCU)	Delay / PCU (s)	DoS (%)	MMQ (PCU)	Delay / PCU (s)
2018 Base Existing Layout (**EL1**)						
A441 (N)	93.5%	28	38	82.3%	24	33
Dagnell End Road	92.4%	12	78	106.3%	43	201
A441 (South)	81.7%	17	24	107.2%	85	182
PRC		-3.9%			-19.1%	
2030 Base + Committed (But Excluding Brockhill East Phase 3) & Existing Layout (**EL2**)						
A441 (N)	108.2%	86	183	94.8%	38	52
Dagnell End Road	104.9%	25	184	119.9%	80	400
A441 (South)	105.9%	43	72	120.9%	165	381
PRC		-20.2%			-34.4%	
2030 Base + Committed (Including Brockhill East Phase 3) & Existing Layout (**EL3**)						
A441 (N)	114.4%	123	274	110.4%	106	231
Dagnell End Road	110.9%	34	266	126.1%	97	482
A441 (South)	111.1%	115	224	128.8%	215	480
PRC		-27.1%			-43.2%	

5.1.5 As outlined in **Table 5.1**, in its existing format (prior to the implementation of the mitigation scheme) the junction is forecast to operate beyond its theoretical capacity prior to future year assessments and/or the introduction of the additional traffic associated with the Brockhill East Phase 3 development.

5.2 Committed Mitigation Scheme

5.2.1 The committed mitigation scheme at the junction is to be delivered as part of the Brockhill East Phase 3 scheme. As outlined in WCC's formal response to the Brockhill East Phase 3 (Ref: *19/00976/HYB*):

"*The junction scheme utilises land currently within the ownership of the Local Planning Authority for the sole purpose of delivering a junction improvement in this location, in what is a constrained location in terms of land ownership. Following the delivery of the junction scheme, the land will be dedicated highway land*".

Existing Assessments – 2018 Survey Data

5.2.2 An overview of the modelling results for the Committed Mitigation scheme using the previous 2018 survey data is presented within the accompanying TN 221011 – 325756-TN002-LinSig Review Rev C prepared by mode. The full model output report is attached at **Appendix C**, for reference. This scenario utilises the v2 Rev B LinSig model agreed with WCC, with the previous 2018 survey data.

- Committed Mitigation (CM) – *based upon 2018 survey data*
  - **CM3** - 2030 Base (Inc. Committed Development); and,
  - **CM4** - 2030 Base (Inc. Committed Development) + Proposed Development.

5.2.3 The results outlined in the accompanying TN show that the junction is predicted to operate above its theoretical capacity in the CM3 scenario prior to the additional traffic associated with the proposed development. The addition of traffic associated with the proposed development in the CM4 scenario does not typically result in a significant impact on the PRC at the junction.

5.2.4 The results also demonstrate that the level of operation forecast in the CM4 (Stage 1) scenario is comparable to that of the EL2 scenario, with PRC values of -21.5% and -32.7% during the respective AM and PM peaks of the CM4 scenario, compared with values of -20.2% and -34.4% during the corresponding peak periods in the EL2 scenario. This demonstrates that following the introduction of development traffic and the delivery of the committed mitigation, the junction operates at a comparable level to the existing situation; without the implementation of the committed mitigation scheme or additional trips associated with Brockhill East Phase 3.

5.2.5 Furthermore, it should be noted that the proposed scheme is forecast to generate approximately 152 additional two-way trips during the AM peak and 162 two-way trips during the PM peak. This equates to a c. 5% increase in development trips through this junction, when considered in context to the 2030 (effective base – including Brockhill East Phase 3) background traffic figures of 3,077 two-way trips during the AM peak and 3,172 two-way trips during the PM peak. As outlined within Section 6.4 of the accompanying TA, it is considered that this minor percentage increase would likely be accounted for within daily variations in background traffic.

5.3 Assessment Parameters

Existing Survey Data

5.3.1 As outlined above, an initial review of capacity at the Dagnell End Road / Birmingham Road junction has been undertaken based on the previous data submitted as part of the Brockhill East Phase 3 (Ref: *19/00976/HYB*) application, which utilises survey data collected in November 2018.

5.3.2 The existing survey data utilised as part of the previous assessment is now c. 4 years old, and therefore may not provide an accurate indication of the current traffic profile at the junction. Previous DfT 'Guidance on Transport Assessments' (2007), Paragraph 4.18 stipulated that assessments should "*include recent counts (normally surveyed within the last three years) for peak periods turning movements at critical junctions*".

5.3.3 Guidance on Transport Assessments was withdrawn in 2014, with alternative guidance in terms of highway assessments now provided by Planning Practice Guidance; specifically, 'Travel Plans, Transport Assessments and Statements in Decision Taking'. The updated documentation does not stipulate a specific timescale for which survey data can be considered representative, however the 3-year timescale outlined within the previous DfT guidance is still considered pertinent in this regard.

5.3.4 Given that the existing survey data is now c. 4 years old, updated traffic surveys have been obtained along the local highway network in the vicinity of the junction. The updated traffic surveys provide a more accurate indication of current travel plans and takes account of sustained changes in the type and scale of travel patterns which have occurred in the UK, since the onset of the COVID-19 pandemic.

5.3.5 Turning counts surveys were undertaken at the Dagnell End Road / Birmingham Road junction on Tuesday 15th November 2022, covering the periods from 07:00 – 10:00 and 16:00 – 19:00.

5.3.6 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.

Background Traffic Growth / Committed Development

5.3.7 Similar to the Brockhill East Phase 3 application, the capacity of the local network has been assessed for a forecast year of 2030, which represents the end of the current Redditch Local Plan Period.

5.3.8 Future year background growth has therefore been calculated using TEMPro, and adjusted using the study area for the Redditch (main) geographical area; which is consistent with the agreed approach presented as part of the Brockhill East Phase 3 application.

5.3.9 Once the factors had been calculated, an adjustment was applied to provide a local growth rate. A growth calculation factor for 'principal' roads was then applied to each TEMPro growth factor to reflect the specific characteristics of Birmingham Road. A summary of the TEMPro growth factors is provided in **Table 5.1**.

Table 5.2 : TEMPro Growth Factors

Growth Period	Weekday AM Peak	Weekday PM Peak
2022 - 2030	1.0524	1.0519

5.3.10 As part of the Brockhill East Phase 3 application, consideration was made of the additional traffic associated with the allocated sites at Webheath and Foxlydiate. The additional development trips were extracted from the respective TAs and manually assigned to the study network. These committed development trips have obtained directly from the LinSig model inputs for the Brockhill East Phase 3 TN, and included within the 2030 Base scenario for the purpose of the modelling work presented in this TN.

5.3.11 In the TA for Brockhill East Phase 3, in order to avoid 'double counting' of traffic, National Trip End Model (NTEM) data within TEMPro was adjusted to deduct the proposed development and committed development from the planning assumptions.

5.3.12 As part of the TEMPro growth factors presented in **Table 5.2**, no alternative assumptions have been applied to the 2022 – 2030 growth factors, this is considered to be 'overly robust', given that there is likely to be an element of double counting of committed development trips in the 2030 Base Scenario.

Assessment Years

5.3.13 A summary of the assessment years which have been considered when assessing the Dagnell End Road / Birmingham Road junction is provided below. In both scenarios we have assumed that the committed mitigation associated with Brockhill East Phase 3 has been fully implemented at the junction. The base traffic flows include 2030 survey data (growthed from 2022), along with committed development trips associated with Brockhill East Phase 3, Webheath and Foxlydiate.

- Committed Mitigation scenario 1 (CM1) - 2030 Base (Inc. Committed Development); and,
- CM2 - 2030 Base (Inc. Committed Development) + Proposed Development.

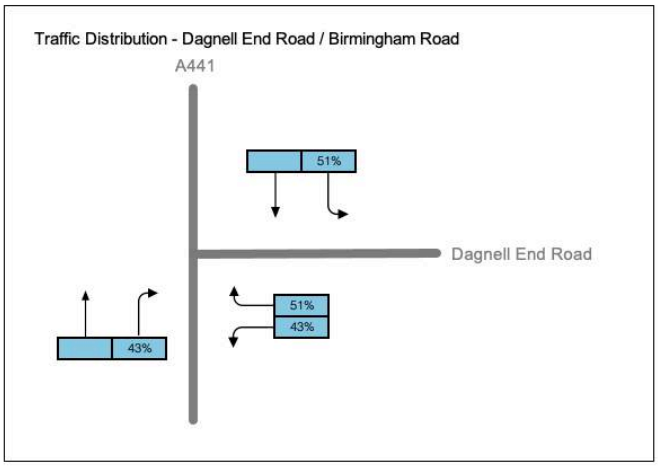
Traffic Distribution

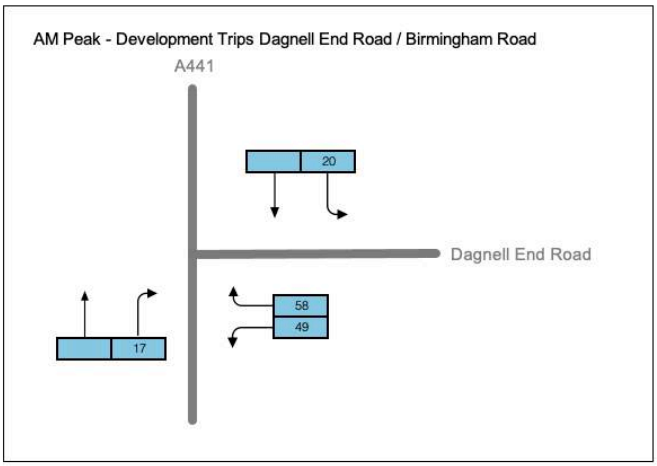
5.3.14 A summary of the trip distribution and resulting trip generation associated with the proposed development during the respective AM and PM peak periods is outlined in Section 5 of the TA, and is also shown diagrammatically in the traffic flow diagrams attached as Appendix F of the TA.

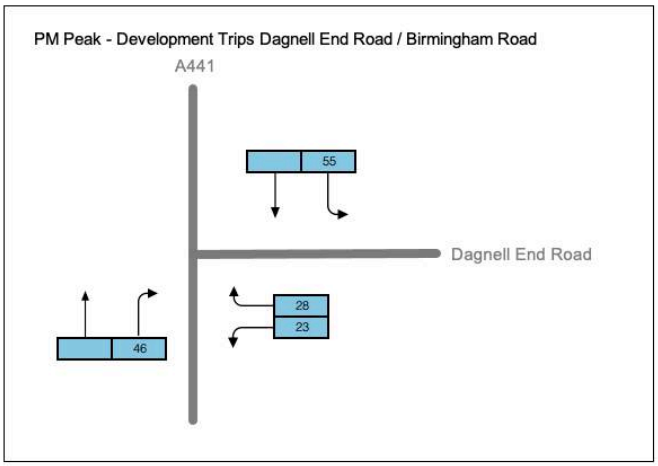
5.3.15 As detailed within the TA, the traffic distribution exercise has been undertaken based on the distribution profile for the Brockhill East residential development; which was deemed acceptable by WCC. This takes account of the distribution of traffic north and south along the Birmingham Road (A441) corridor from Brockhill East onto the Weights Lane roundabout, and the subsequent distribution onto the wider study network.

5.3.16 For the purpose of this TN, an overview of the traffic distribution and subsequent trip generation at the Dagnell End Road / Birmingham Road junction is provided in Figure 5.1 for reference. The remaining 6% of development traffic not accounted for in Figure 5.1 routes to the east of the Hither Green Lane / Dagnell End Road junction; based upon the distribution taken from the Brockhill East application.

Figure 5.1 : Traffic Distribution / Assignment – Dagnell End Road / Birmingham Road Junction

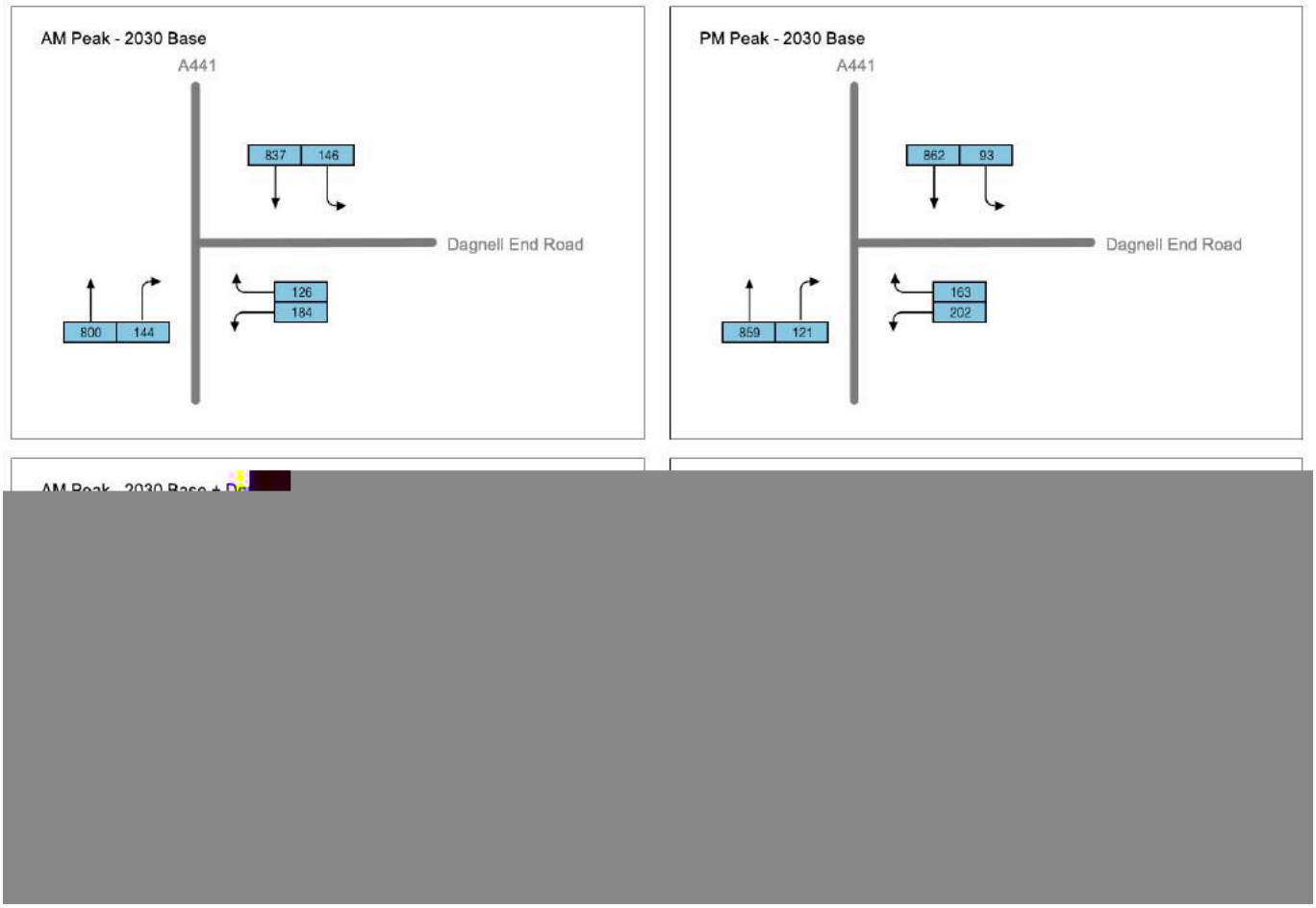






5.3.17 An overview of the resulting traffic flows forecast at the Dagnell End Road / Birmingham Road junction for a 2030 Base (Inc. Committed Development), and 2030 Base (Inc. Committed Development) + Development scenario are outlined in **Figure 5.2**, for reference.

Figure 5.2 : Modelled Traffic Flows – Dagnell End Road / Birmingham Road Junction



5.3.18 A summary of the results using the revised 'v2 Rev B' model issued to mode by WCC, and the updated traffic flows outlined above, is shown in **Table 5.3**, with the full output report attached at **Appendix D**, for reference.

5.3.19 As specified in **Section 2** of this TN, the mitigation scheme for the A441 / Dagnell End Road junction has been modelled with consideration of 3 x stage sequences to reflect the scenarios presented as part of the now consented Brockhill East Phase 3 application. It should be noted, however, that pedestrian demand at the junction is relatively low and therefore as specified in the PJA Junction Design Modelling Update TN (24/11/2020) submitted as part of the Brockhill East Phase 3 application, it is highly unlikely the crossing will be called every cycle.

5.3.20 In light of this, the results presented in **Table 5.3** for Stage Sequences 1 and 2 are considered to be the most representative of the typical day-to-day operations of the junction.

APPENDIX C

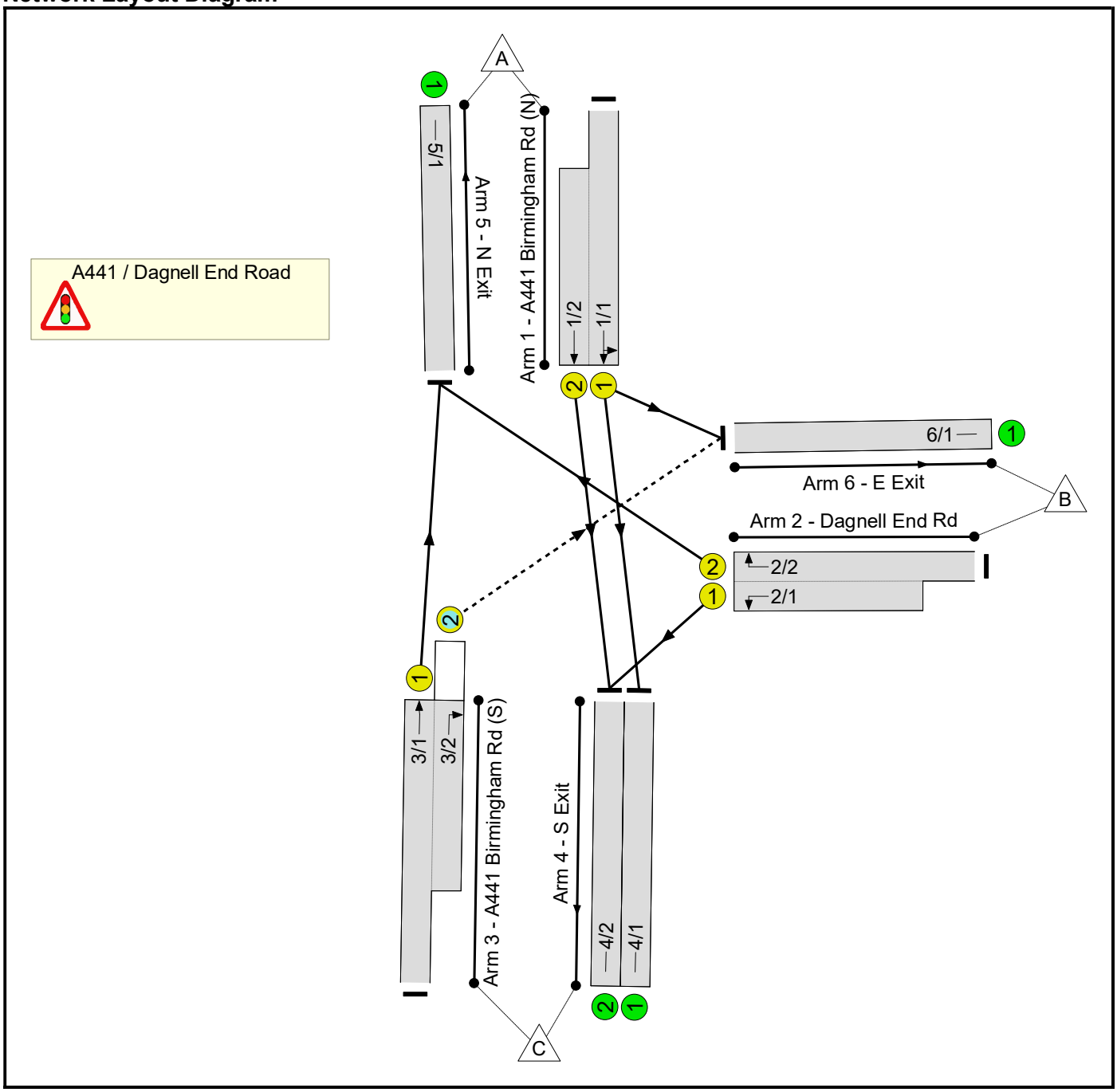
LinSig Model Output Report - Scenario CM3 & CM4

Full Input Data And Results

User and Project Details

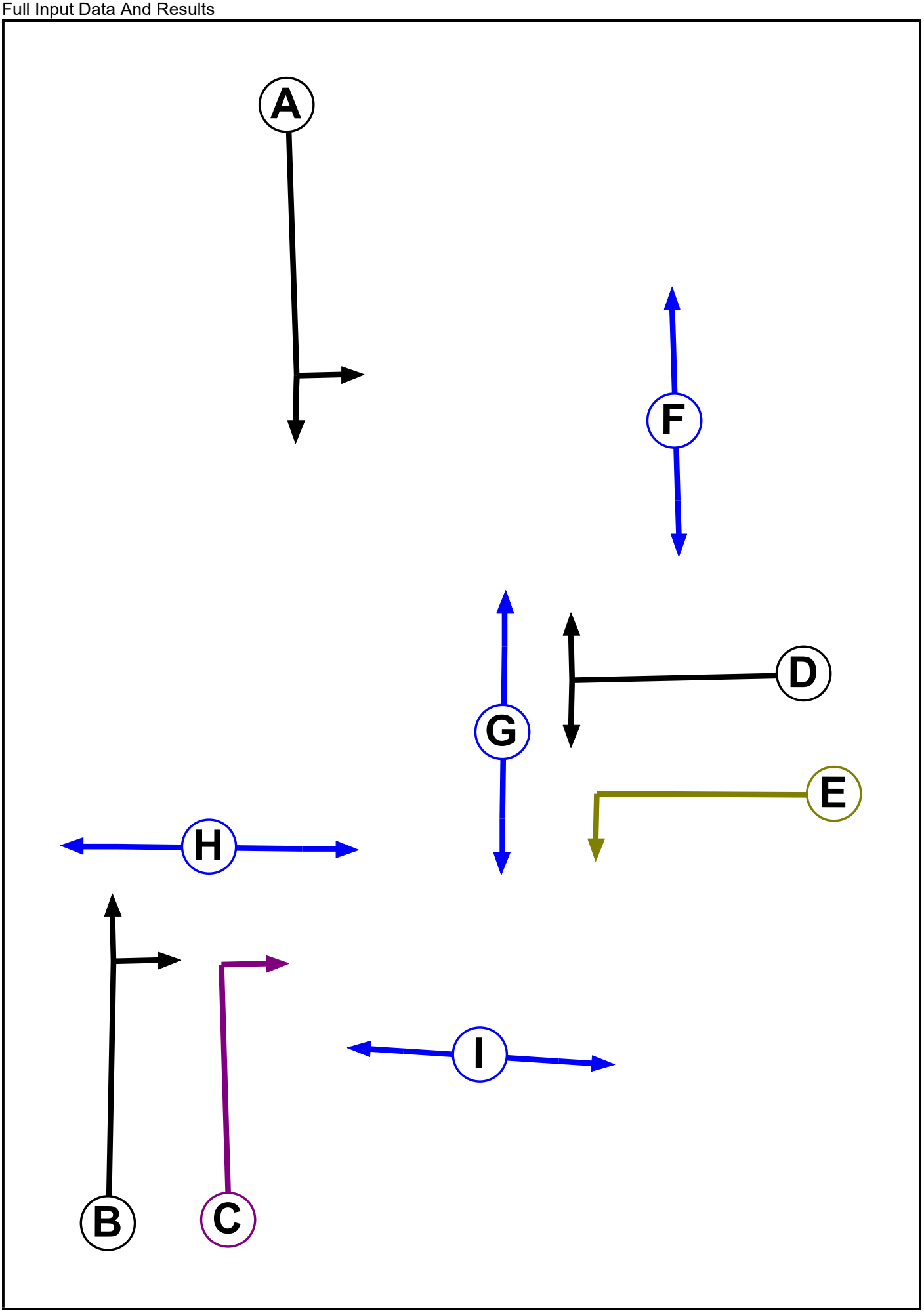
Project:	
Title:	**A441 / Dagnell End Road**
Location:	
Additional detail:	Proposed layout
File name:	A441_Dagnell End Rd v2 Rev B.lsg3x
Author:	al
Company:	
Address:	

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

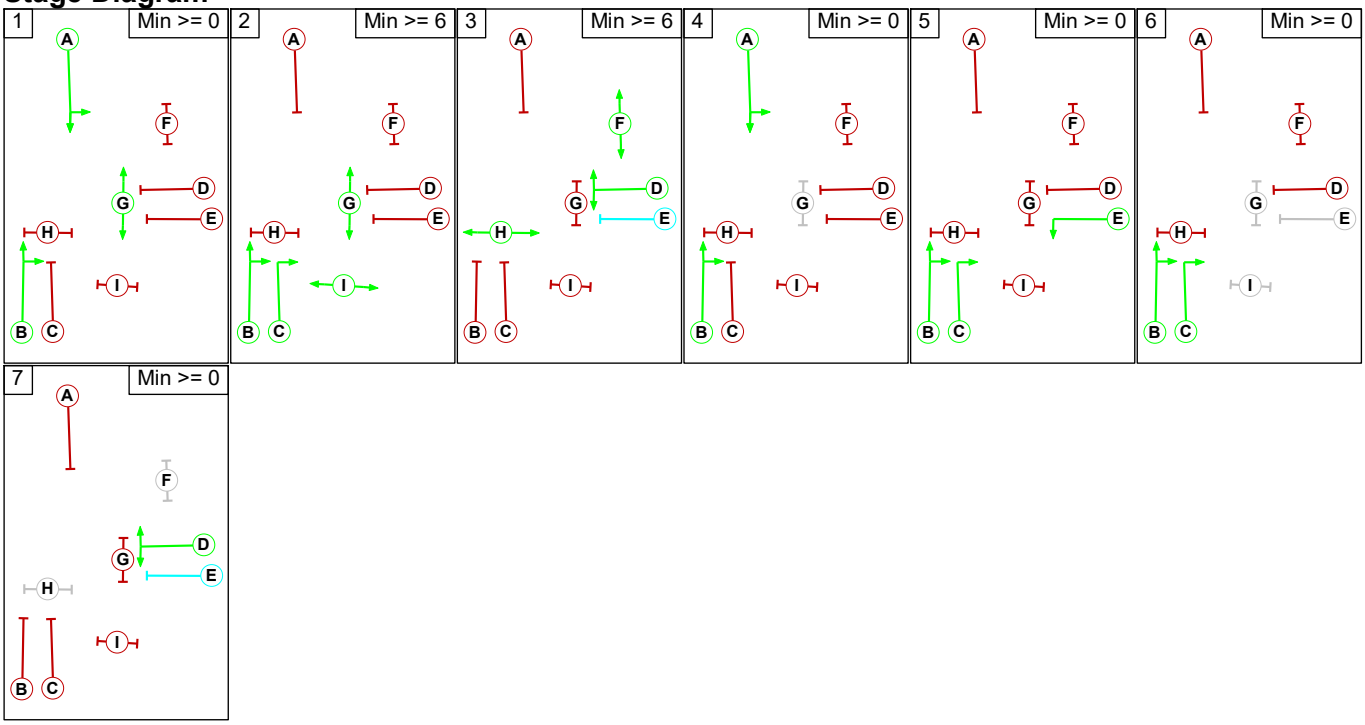
		Starting Phase								
		A	B	C	D	E	F	G	H	I
Terminating Phase	A		-	5	7	7	6	-	-	8
	B	-		-	7	-	8	-	5	-
	C	7	-		7	-	8	-	5	-
	D	7	7	7		-	-	5	-	7
	E	6	-	-	-		-	5	-	7
	F	8	8	8	-	-		-	-	-
	G	-	-	-	9	9	-		-	-
	H	-	8	8	-	-	-	-		-
	I	9	-	-	9	9	-	-	-	

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	206	1078	1284
	B	197	0	210	407
	C	1145	241	0	1386
	Tot.	1342	447	1288	3077

Traffic Lane Flows

Lane	Scenario 1: 1
Junction: A441 / Dagnell End Road	
1/1 (with short)	1284(In) 989(Out)
1/2 (short)	295
2/1 (short)	210
2/2 (with short)	407(In) 197(Out)
3/1 (with short)	1386(In) 1145(Out)
3/2 (short)	241
4/1	783
4/2	505
5/1	1342
6/1	447

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	79.2 %	1815	1815
				Arm 6 Left	10.00	20.8 %		
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	132	1043	1175
	B	379	0	255	634
	C	1188	175	0	1363
	Tot.	1567	307	1298	3172

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2
Junction: A441 / Dagnell End Road	
1/1 (with short)	1175(In) 905(Out)
1/2 (short)	270
2/1 (short)	255
2/2 (with short)	634(In) 379(Out)
3/1 (with short)	1363(In) 1188(Out)
3/2 (short)	175
4/1	773
4/2	525
5/1	1567
6/1	307

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	85.4 %	1828	1828
				Arm 6 Left	10.00	14.6 %		
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	226	1078	1304
	B	255	0	259	514
	C	1145	258	0	1403
	Tot.	1400	484	1337	3221

Traffic Lane Flows

Lane	Scenario 3: 3
Junction: A441 / Dagnell End Road	
1/1 (with short)	1304(In) 1004(Out)
1/2 (short)	300
2/1 (short)	259
2/2 (with short)	514(In) 255(Out)
3/1 (with short)	1403(In) 1145(Out)
3/2 (short)	258
4/1	778
4/2	559
5/1	1400
6/1	484

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	77.5 %	1812	1812
				Arm 6 Left	10.00	22.5 %		
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	187	1043	1230
	B	407	0	278	685
	C	1188	221	0	1409
	Tot.	1595	408	1321	3324

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 4: 4
Junction: A441 / Dagnell End Road	
1/1 (with short)	1230(In) 947(Out)
1/2 (short)	283
2/1 (short)	278
2/2 (with short)	685(In) 407(Out)
3/1 (with short)	1409(In) 1188(Out)
3/2 (short)	221
4/1	760
4/2	561
5/1	1595
6/1	408

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	80.3 %	1817	1817
				Arm 6 Left	10.00	19.7 %		
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	206	1078	1284
	B	197	0	210	407
	C	1145	241	0	1386
	Tot.	1342	447	1288	3077

Traffic Lane Flows

Lane	Scenario 5: 5
Junction: A441 / Dagnell End Road	
1/1 (with short)	1284(In) 989(Out)
1/2 (short)	295
2/1 (short)	210
2/2 (with short)	407(In) 197(Out)
3/1 (with short)	1386(In) 1145(Out)
3/2 (short)	241
4/1	783
4/2	505
5/1	1342
6/1	447

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	79.2 %	1815	1815
				Arm 6 Left	10.00	20.8 %		
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	132	1043	1175
	B	379	0	255	634
	C	1188	175	0	1363
	Tot.	1567	307	1298	3172

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 6: 6
Junction: A441 / Dagnell End Road	
1/1 (with short)	1175(In) 905(Out)
1/2 (short)	270
2/1 (short)	255
2/2 (with short)	634(In) 379(Out)
3/1 (with short)	1363(In) 1188(Out)
3/2 (short)	175
4/1	773
4/2	525
5/1	1567
6/1	307

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	85.4 %	1828	1828
				Arm 6 Left	10.00	14.6 %		
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	226	1078	1304
	B	255	0	259	514
	C	1145	258	0	1403
	Tot.	1400	484	1337	3221

Traffic Lane Flows

Lane	Scenario 7: 7
Junction: A441 / Dagnell End Road	
1/1 (with short)	1304(In) 1004(Out)
1/2 (short)	300
2/1 (short)	259
2/2 (with short)	514(In) 255(Out)
3/1 (with short)	1403(In) 1145(Out)
3/2 (short)	258
4/1	778
4/2	559
5/1	1400
6/1	484

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	77.5 %	1812	1812
				Arm 6 Left	10.00	22.5 %		
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	187	1043	1230
	B	407	0	278	685
	C	1188	221	0	1409
	Tot.	1595	408	1321	3324

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 8: 8
Junction: A441 / Dagnell End Road	
1/1 (with short)	1230(In) 947(Out)
1/2 (short)	283
2/1 (short)	278
2/2 (with short)	685(In) 407(Out)
3/1 (with short)	1409(In) 1188(Out)
3/2 (short)	221
4/1	760
4/2	561
5/1	1595
6/1	408

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	80.3 %	1817	1817
				Arm 6 Left	10.00	19.7 %		
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	206	1078	1284
	B	197	0	210	407
	C	1145	241	0	1386
	Tot.	1342	447	1288	3077

Traffic Lane Flows

Lane	Scenario 9: 9
Junction: A441 / Dagnell End Road	
1/1 (with short)	1284(In) 998(Out)
1/2 (short)	286
2/1 (short)	210
2/2 (with short)	407(In) 197(Out)
3/1 (with short)	1386(In) 1145(Out)
3/2 (short)	241
4/1	792
4/2	496
5/1	1342
6/1	447

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	79.4 %	1816	1816
				Arm 6 Left	10.00	20.6 %		
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	132	1043	1175
	B	379	0	255	634
	C	1188	175	0	1363
	Tot.	1567	307	1298	3172

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 10: 10
Junction: A441 / Dagnell End Road	
1/1 (with short)	1175(In) 899(Out)
1/2 (short)	276
2/1 (short)	255
2/2 (with short)	634(In) 379(Out)
3/1 (with short)	1363(In) 1188(Out)
3/2 (short)	175
4/1	767
4/2	531
5/1	1567
6/1	307

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	85.3 %	1828	1828
				Arm 6 Left	10.00	14.7 %		
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	226	1078	1304
	B	255	0	259	514
	C	1145	258	0	1403
	Tot.	1400	484	1337	3221

Traffic Lane Flows

Lane	Scenario 11: 11
Junction: A441 / Dagnell End Road	
1/1 (with short)	1304(In) 1004(Out)
1/2 (short)	300
2/1 (short)	259
2/2 (with short)	514(In) 255(Out)
3/1 (with short)	1403(In) 1145(Out)
3/2 (short)	258
4/1	778
4/2	559
5/1	1400
6/1	484

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	77.5 %	1812	1812
				Arm 6 Left	10.00	22.5 %		
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	187	1043	1230
	B	407	0	278	685
	C	1188	221	0	1409
	Tot.	1595	408	1321	3324

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 12: 12
Junction: A441 / Dagnell End Road	
1/1 (with short)	1230(In) 947(Out)
1/2 (short)	283
2/1 (short)	278
2/2 (with short)	685(In) 407(Out)
3/1 (with short)	1409(In) 1188(Out)
3/2 (short)	221
4/1	760
4/2	561
5/1	1595
6/1	408

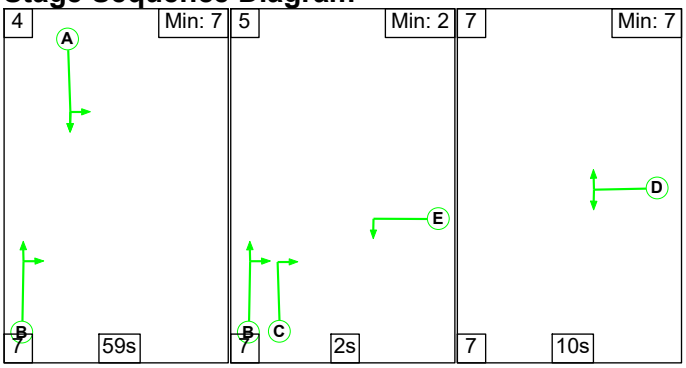
Lane Saturation Flows

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	80.3 %	1817	1817
				Arm 6 Left	10.00	19.7 %		
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)')

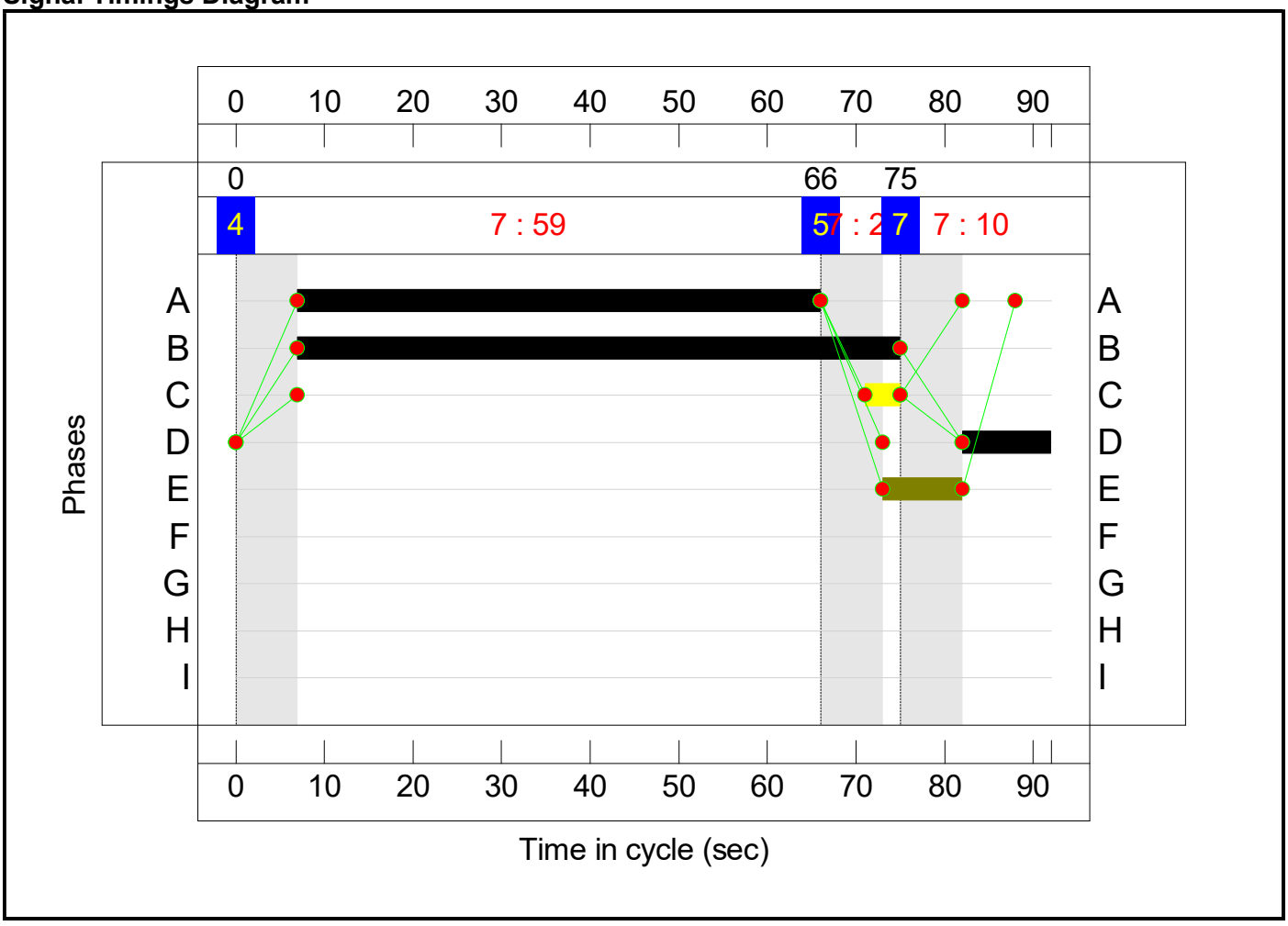
Stage Sequence Diagram



Stage Timings

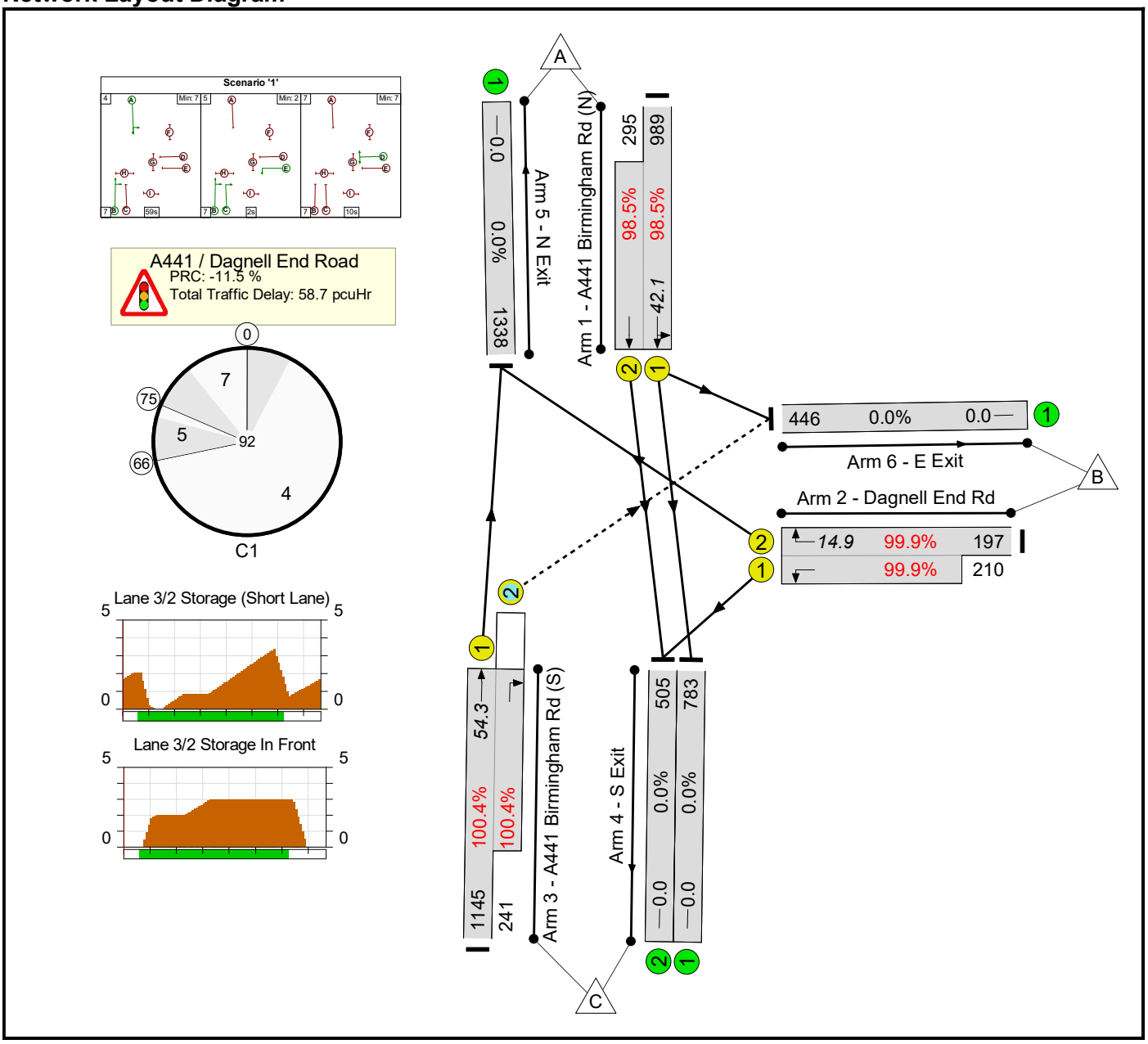
Stage	4	5	7
Duration	59	2	10
Change Point	0	66	75

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**	-	-		-	-	-	-	-	-	**100.4%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**100.4%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	59	-	1284	1815:1878	1004+299	98.5 : 98.5%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	10:19	9	407	1650:1852	197+210	99.9 : 99.9%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	68	4	1386	1726:1679	1141+240	100.4 : 100.4%
4/1	S Exit	U	N/A	N/A	-		-	-	-	783	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	505	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1342	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	447	Inf	Inf	0.0%

Full Input Data And Results

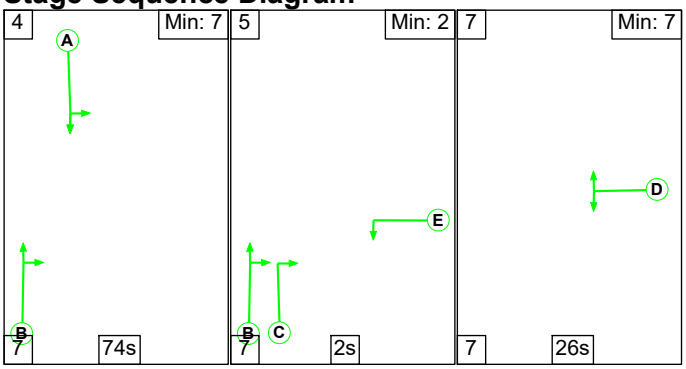
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**1**	**128**	**111**	**13.2**	**43.7**	**1.8**	**58.7**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**1**	**128**	**111**	**13.2**	**43.7**	**1.8**	**58.7**	**-**	**-**	**-**	**-**
1/1+1/2	1284	1284	-	-	-	4.7	13.7	-	18.4 (14.4+4.1)	51.7 (52.3:49.5)	28.4	13.7	42.1
2/2+2/1	407	407	-	-	-	4.1	9.9	-	14.0 (7.0+7.0)	123.9 (128.4:119.7)	5.0	9.9	14.9
3/1+3/2	1386	1381	1	128	111	4.4	20.0	1.8	26.2 (19.9+6.3)	68.1 (62.4:94.8)	34.3	20.0	54.3
4/1	783	783	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	505	505	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1338	1338	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	446	446	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -11.5 Total Delay for Signalled Lanes (pcuHr): 58.65 Cycle Time (s): 92
PRC Over All Lanes (%): -11.5 Total Delay Over All Lanes(pcuHr): 58.65

Full Input Data And Results

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

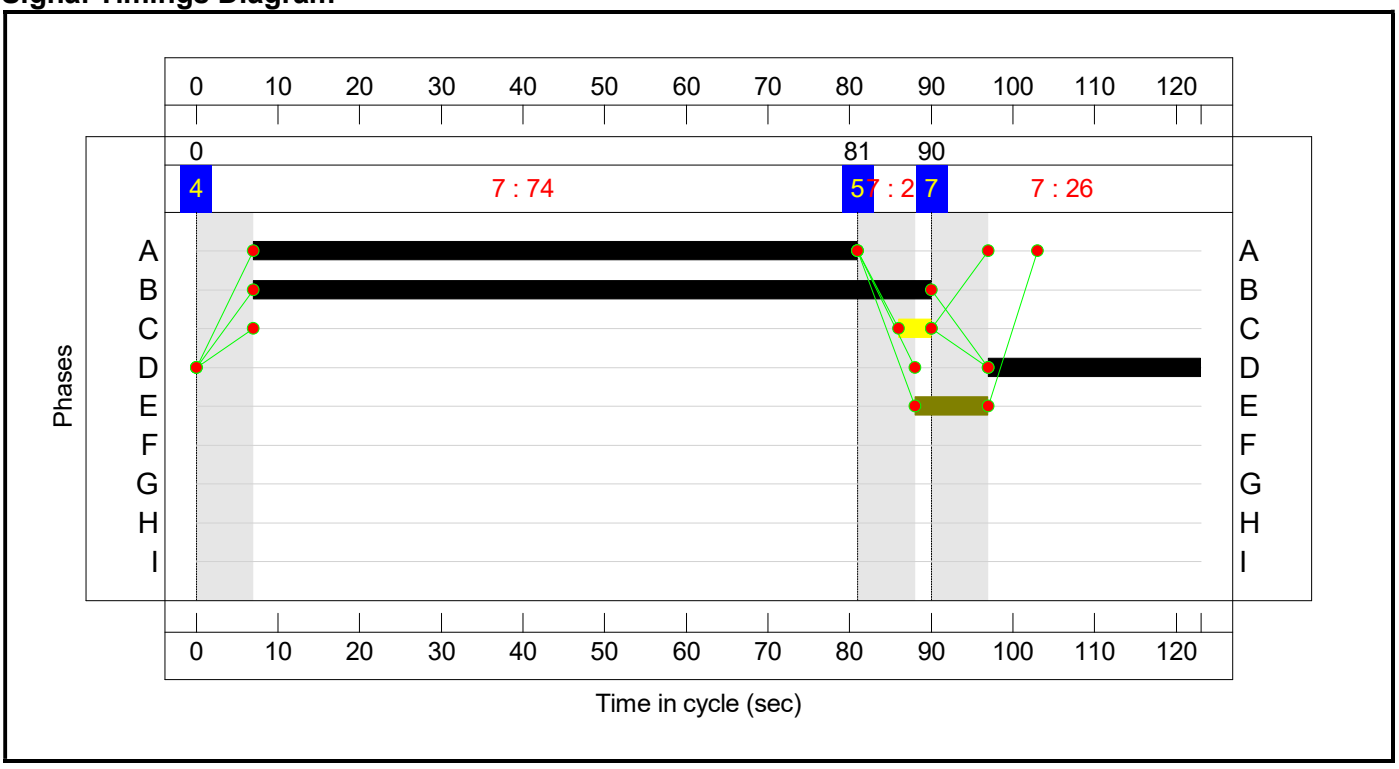
Stage Sequence Diagram



Stage Timings

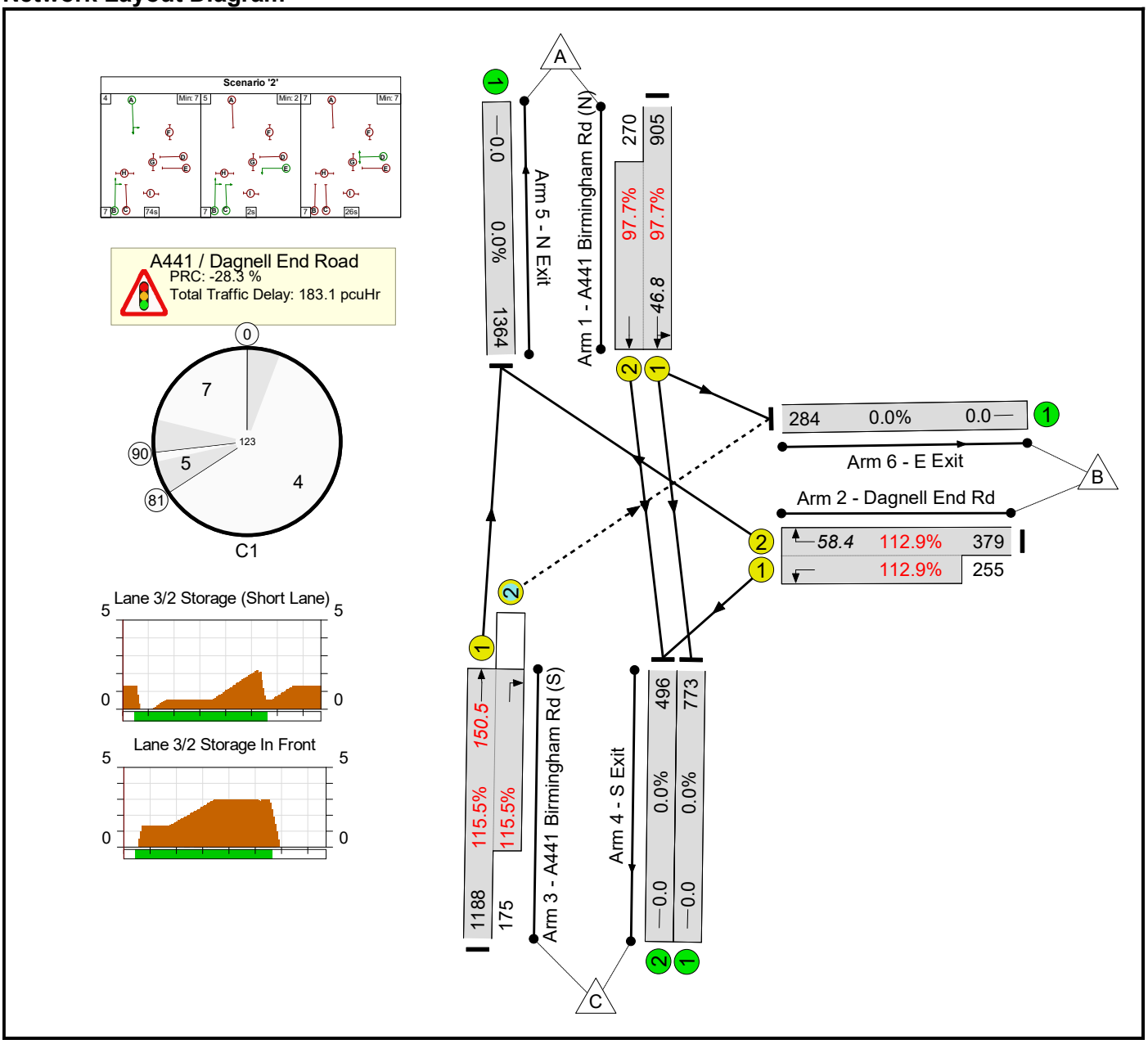
Stage	4	5	7
Duration	74	2	26
Change Point	0	81	90

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**	-	-		-	-	-	-	-	-	**115.5%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**115.5%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	74	-	1175	1828:1878	926+276	97.7 : 97.7%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	26:35	9	634	1650:1852	336+226	112.9 : 112.9%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	83	4	1363	1641:1800	1029+152	115.5 : 115.5%
4/1	S Exit	U	N/A	N/A	-		-	-	-	773	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	525	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1567	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	307	Inf	Inf	0.0%

Full Input Data And Results

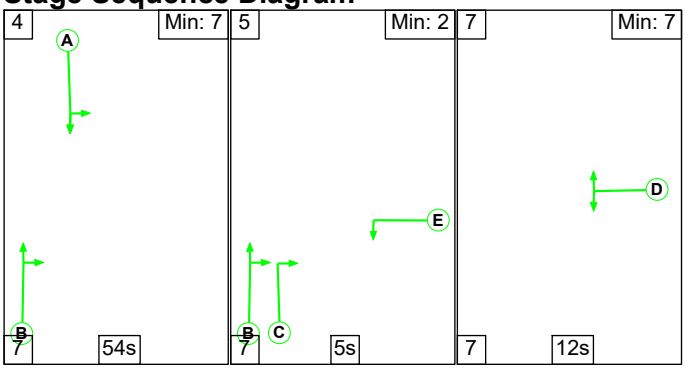
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**6**	**102**	**43**	**34.9**	**146.8**	**1.4**	**183.1**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**6**	**102**	**43**	**34.9**	**146.8**	**1.4**	**183.1**	**-**	**-**	**-**	**-**
1/1+1/2	1175	1175	-	-	-	6.8	11.6	-	18.4 (14.3+4.1)	56.2 (56.8:54.4)	35.2	11.6	46.8
2/2+2/1	634	561	-	-	-	11.1	40.2	-	51.3 (31.3+20.1)	291.4 (297.0:283.1)	18.2	40.2	58.4
3/1+3/2	1363	1180	6	102	43	17.0	94.9	1.4	113.4 (97.5+15.9)	299.6 (295.5:327.8)	55.5	94.9	150.5
4/1	773	773	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	496	496	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1364	1364	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	284	284	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -28.3 Total Delay for Signalled Lanes (pcuHr): 183.12 Cycle Time (s): 123
PRC Over All Lanes (%): -28.3 Total Delay Over All Lanes(pcuHr): 183.12

Full Input Data And Results

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

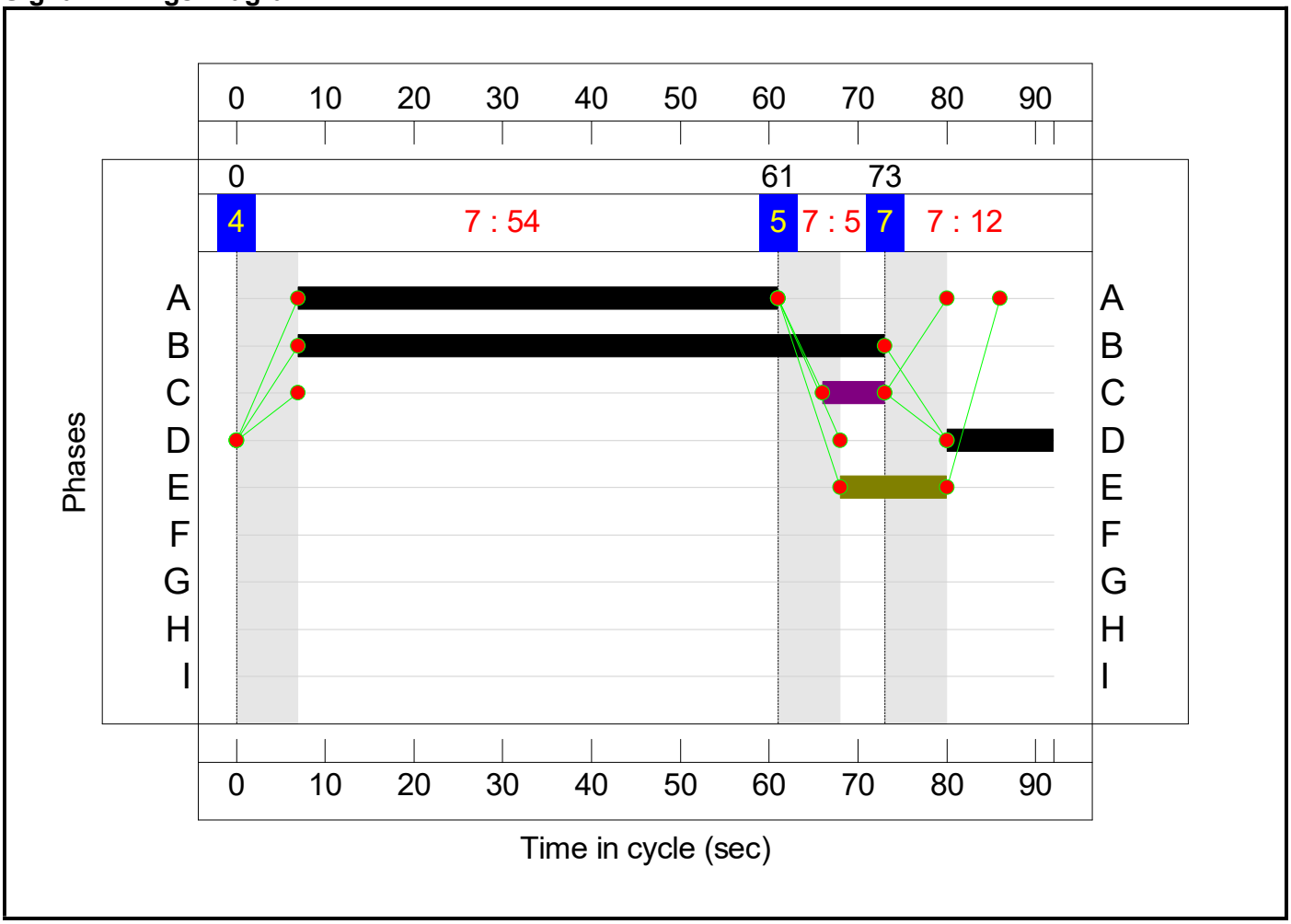
Stage Sequence Diagram



Stage Timings

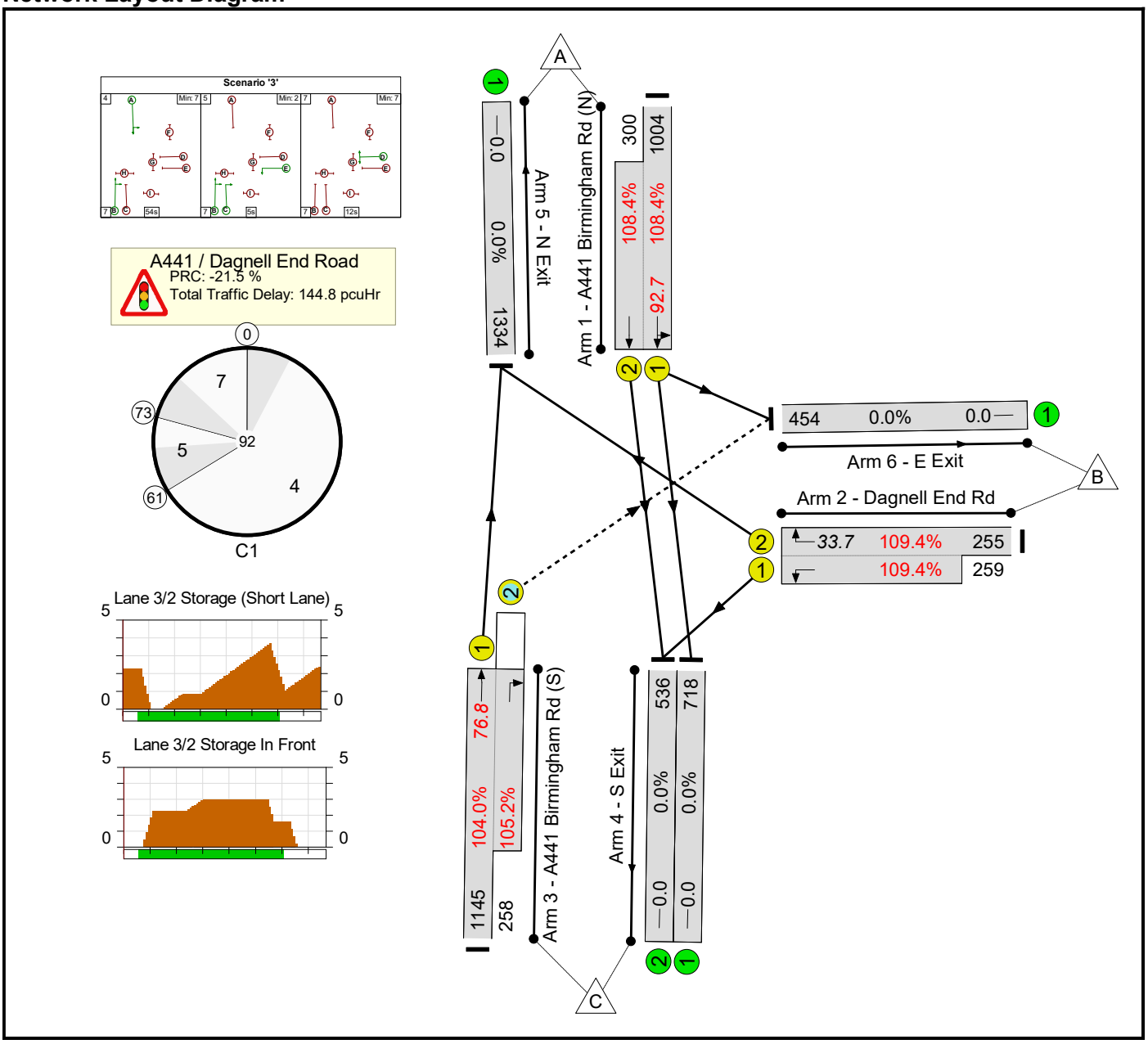
Stage	4	5	7
Duration	54	5	12
Change Point	0	61	73

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**	-	-		-	-	-	-	-	-	**109.4%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**109.4%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	54	-	1304	1812:1878	926+277	108.4 : 108.4%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	12:24	12	514	1650:1852	233+237	109.4 : 109.4%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	66	7	1403	1726:1679	1101+245	104.0 : 105.2%
4/1	S Exit	U	N/A	N/A	-		-	-	-	778	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	559	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1400	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	484	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**	**183**	**63**	**22.3**	**120.8**	**1.6**	**144.8**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**0**	**183**	**63**	**22.3**	**120.8**	**1.6**	**144.8**	**-**	**-**	**-**	**-**
1/1+1/2	1304	1203	-	-	-	10.1	56.2	-	66.3 (51.2+15.1)	182.9 (183.6:180.6)	36.5	56.2	92.7
2/2+2/1	514	492	-	-	-	5.4	26.8	-	32.2 (16.7+15.6)	225.8 (235.5:216.2)	6.9	26.8	33.7
3/1+3/2	1403	1346	0	183	63	6.9	37.8	1.6	46.3 (34.9+11.4)	118.8 (109.8:159.0)	39.0	37.8	76.8
4/1	718	718	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	536	536	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1334	1334	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	454	454	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1

PRC for Signalled Lanes (%): -21.5
PRC Over All Lanes (%): -21.5

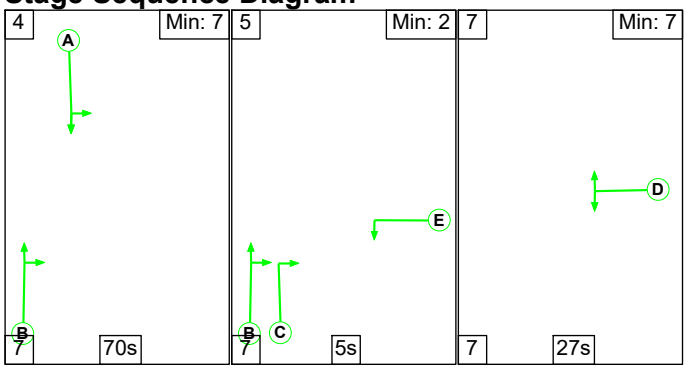
Total Delay for Signalled Lanes (pcuHr): 144.80
Total Delay Over All Lanes(pcuHr): 144.80

Cycle Time (s): 92

Full Input Data And Results

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

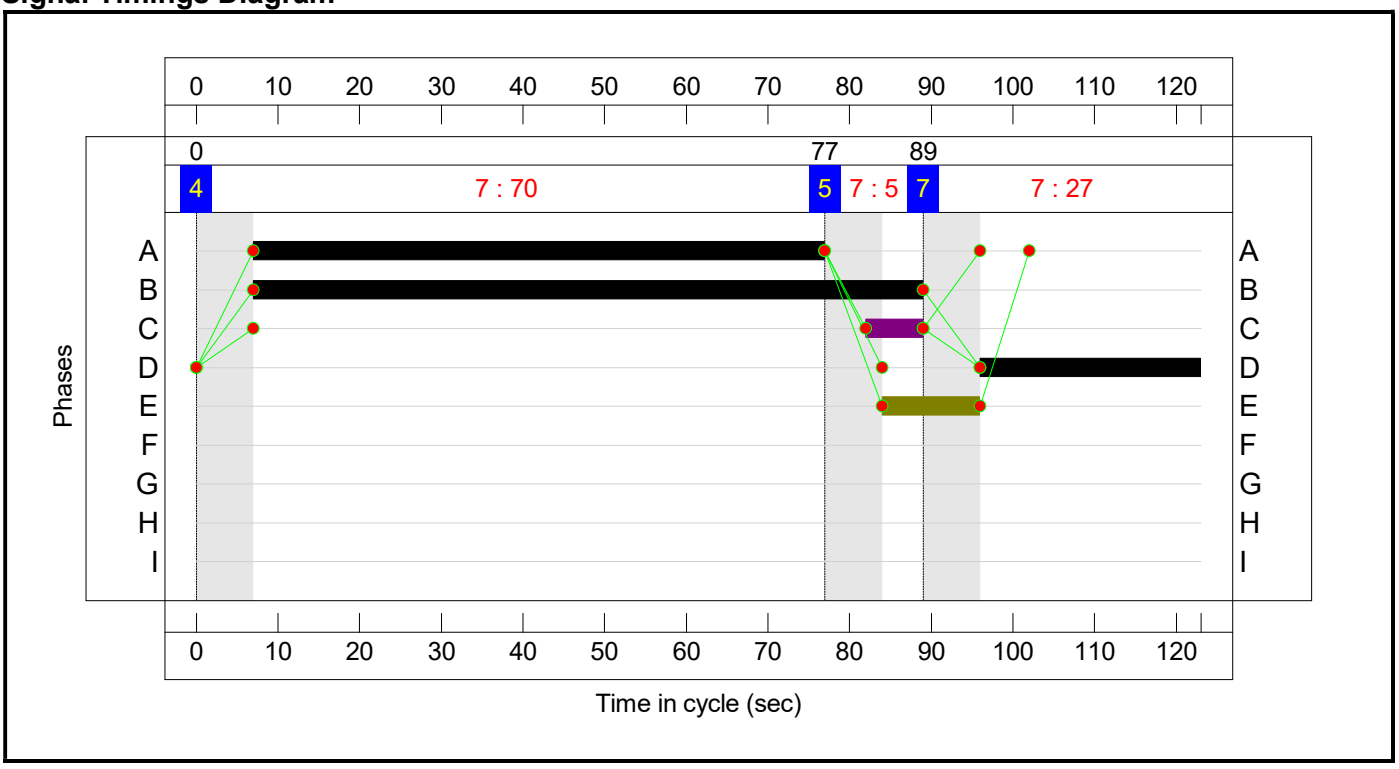
Stage Sequence Diagram



Stage Timings

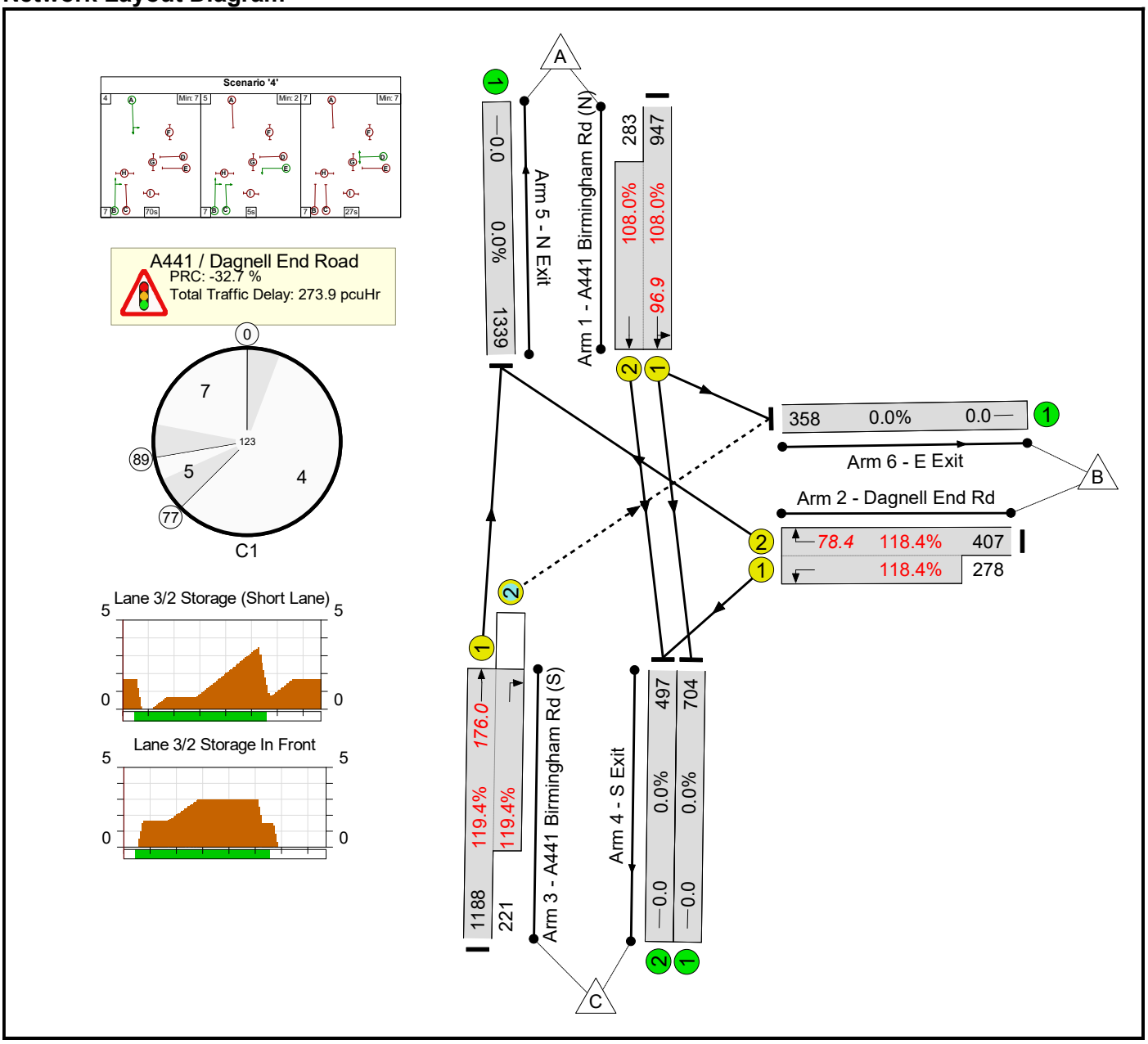
Stage	4	5	7
Duration	70	5	27
Change Point	0	77	89

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**	-	-		-	-	-	-	-	-	**119.4%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**119.4%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	70	-	1230	1817:1878	877+262	108.0 : 108.0%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	27:39	12	685	1650:1852	344+235	118.4 : 118.4%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	82	7	1409	1641:1800	995+185	119.4 : 119.4%
4/1	S Exit	U	N/A	N/A	-		-	-	-	760	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	561	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1595	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	408	Inf	Inf	0.0%

Full Input Data And Results

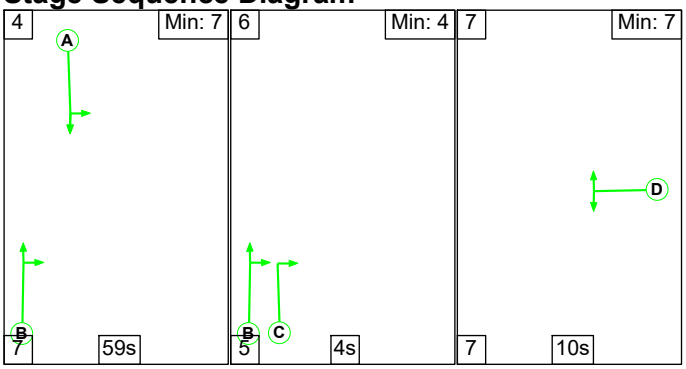
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**0**	**146**	**39**	**47.3**	**225.2**	**1.5**	**273.9**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**0**	**146**	**39**	**47.3**	**225.2**	**1.5**	**273.9**	**-**	**-**	**-**	**-**
1/1+1/2	1230	1139	-	-	-	13.2	51.4	-	64.6 (49.9+14.7)	189.0 (189.6:187.1)	45.6	51.4	96.9
2/2+2/1	685	578	-	-	-	13.9	56.3	-	70.2 (42.4+27.8)	368.9 (374.8:360.3)	22.0	56.3	78.4
3/1+3/2	1409	1180	0	146	39	20.2	117.5	1.5	139.2 (115.8+23.4)	355.6 (350.9:380.8)	58.5	117.5	176.0
4/1	704	704	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	497	497	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1339	1339	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	358	358	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -32.7 Total Delay for Signalled Lanes (pcuHr): 273.92 Cycle Time (s): 123
PRC Over All Lanes (%): -32.7 Total Delay Over All Lanes(pcuHr): 273.92

Full Input Data And Results

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

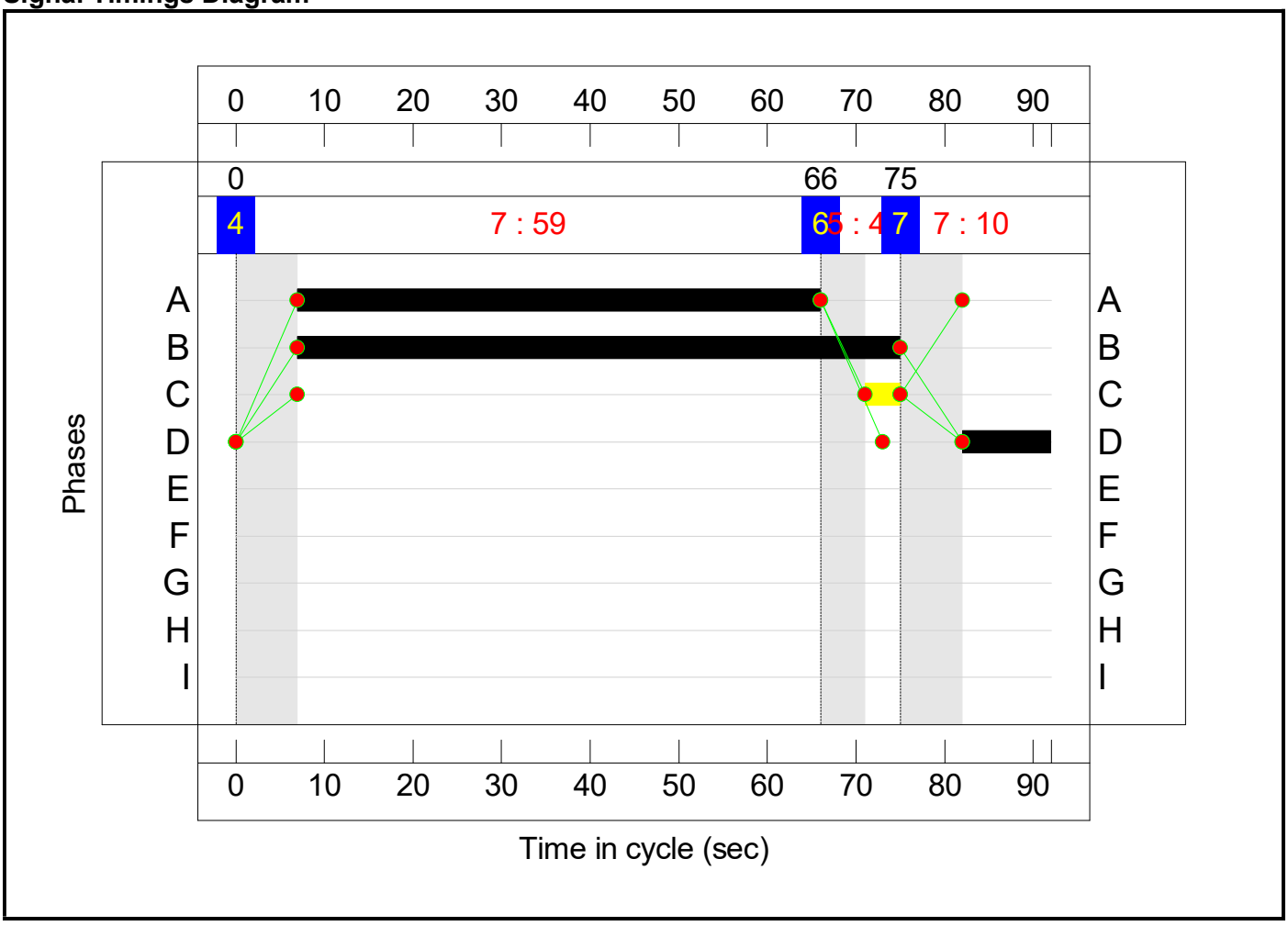
Stage Sequence Diagram



Stage Timings

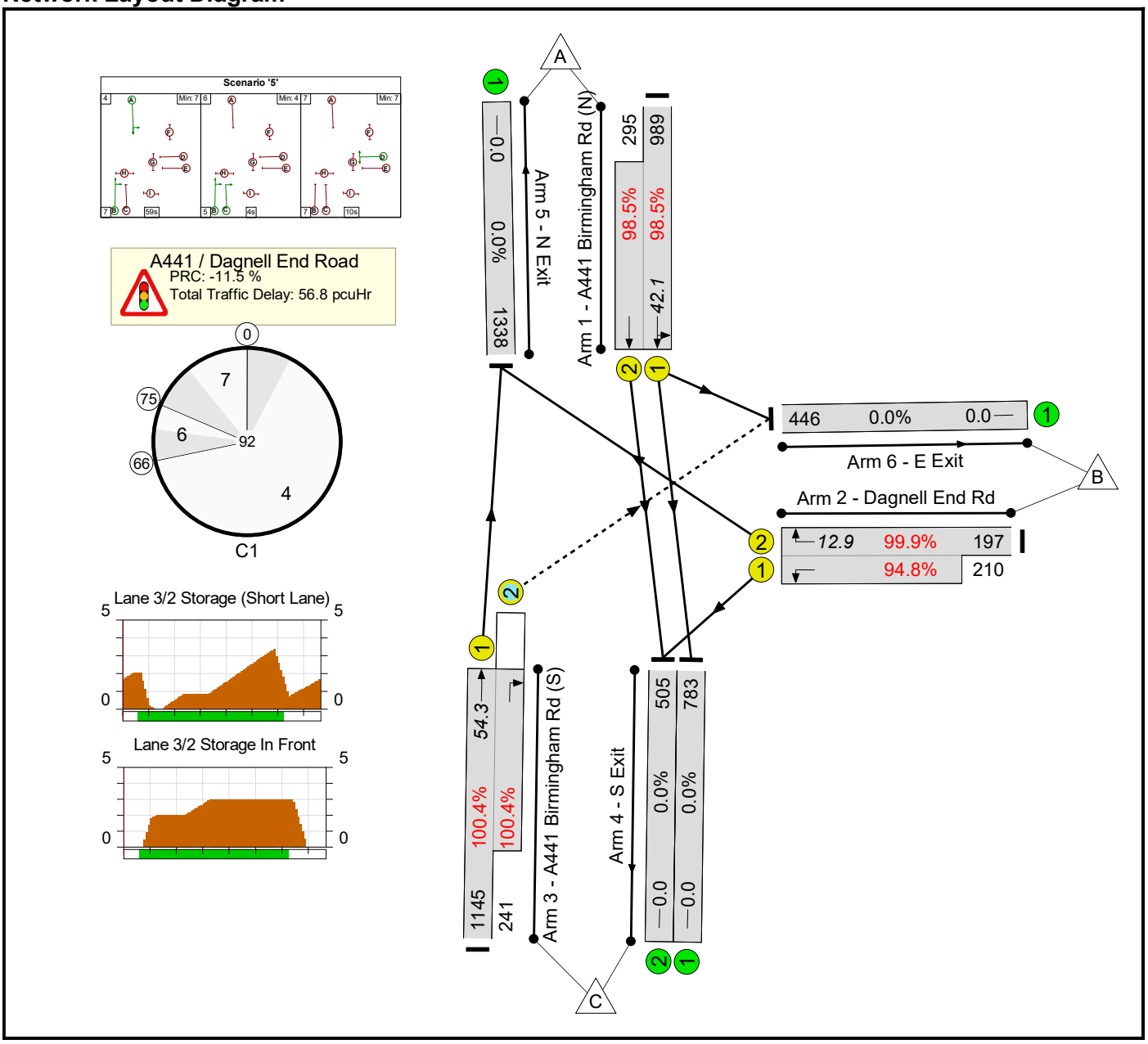
Stage	4	6	7
Duration	59	4	10
Change Point	0	66	75

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**	-	-		-	-	-	-	-	-	**100.4%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**100.4%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	59	-	1284	1815:1878	1004+299	98.5 : 98.5%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	10	0	407	1650:1852	197+221	99.9 : 94.8%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	68	4	1386	1726:1679	1141+240	100.4 : 100.4%
4/1	S Exit	U	N/A	N/A	-		-	-	-	783	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	505	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1342	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	447	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	**-**	**-**	**1**	**128**	**111**	**13.7**	**41.3**	**1.8**	**56.8**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**1**	**128**	**111**	**13.7**	**41.3**	**1.8**	**56.8**	**-**	**-**	**-**	**-**
1/1+1/2	1284	1284	-	-	-	4.7	13.7	-	18.4 (14.4+4.1)	51.7 (52.3:49.5)	28.4	13.7	42.1
2/2+2/1	407	407	-	-	-	4.6	7.6	-	12.1 (5.9+6.3)	107.4 (107.5:107.2)	5.3	7.6	12.9
3/1+3/2	1386	1381	1	128	111	4.4	20.0	1.8	26.2 (19.9+6.3)	68.1 (62.4:94.8)	34.3	20.0	54.3
4/1	783	783	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	505	505	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1338	1338	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	446	446	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

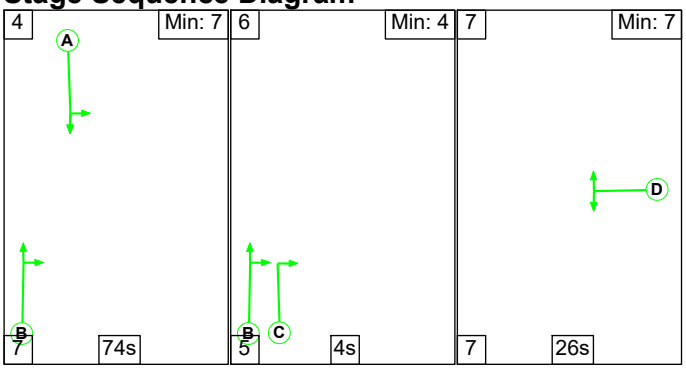
C1 PRC for Signalled Lanes (%): -11.5 Total Delay for Signalled Lanes (pcuHr): 56.78 Cycle Time (s): 92

PRC Over All Lanes (%): -11.5 Total Delay Over All Lanes(pcuHr): 56.78

Full Input Data And Results

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

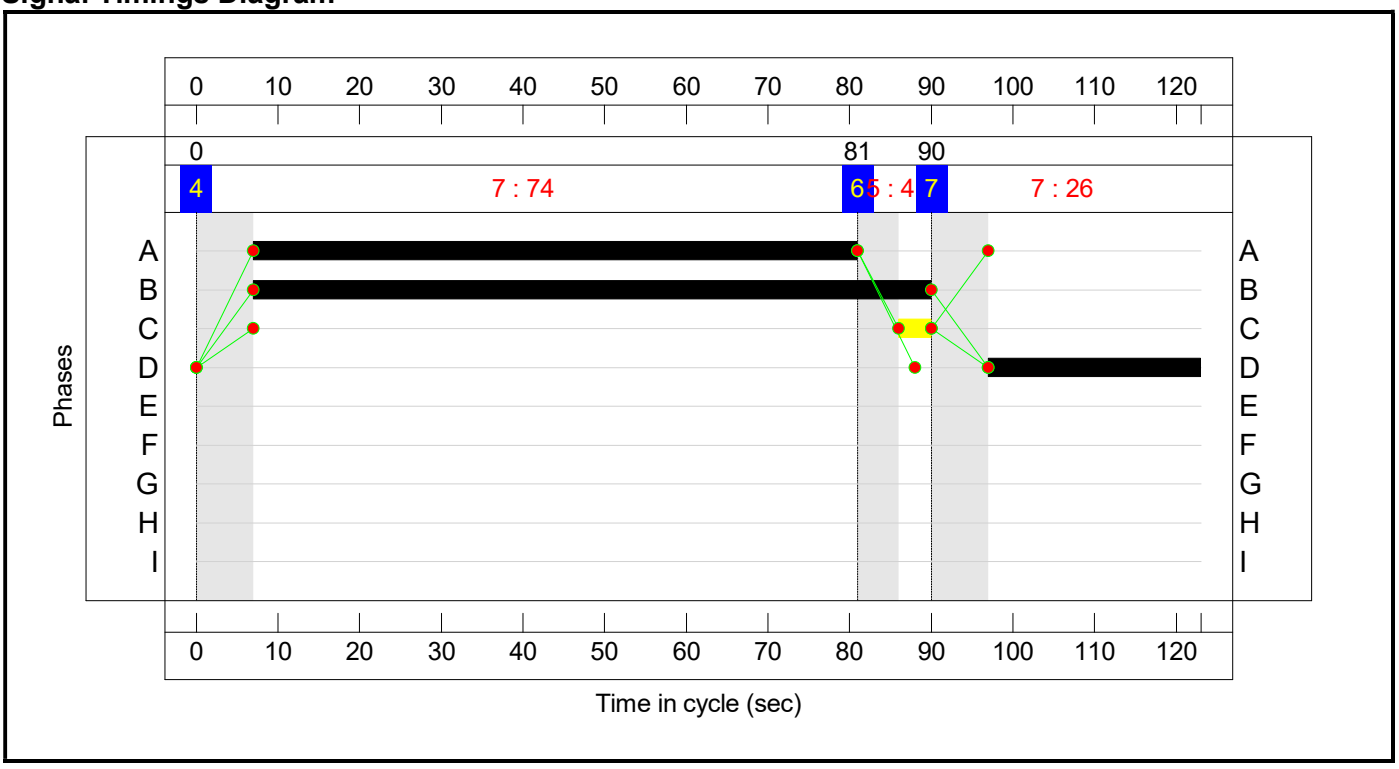
Stage Sequence Diagram



Stage Timings

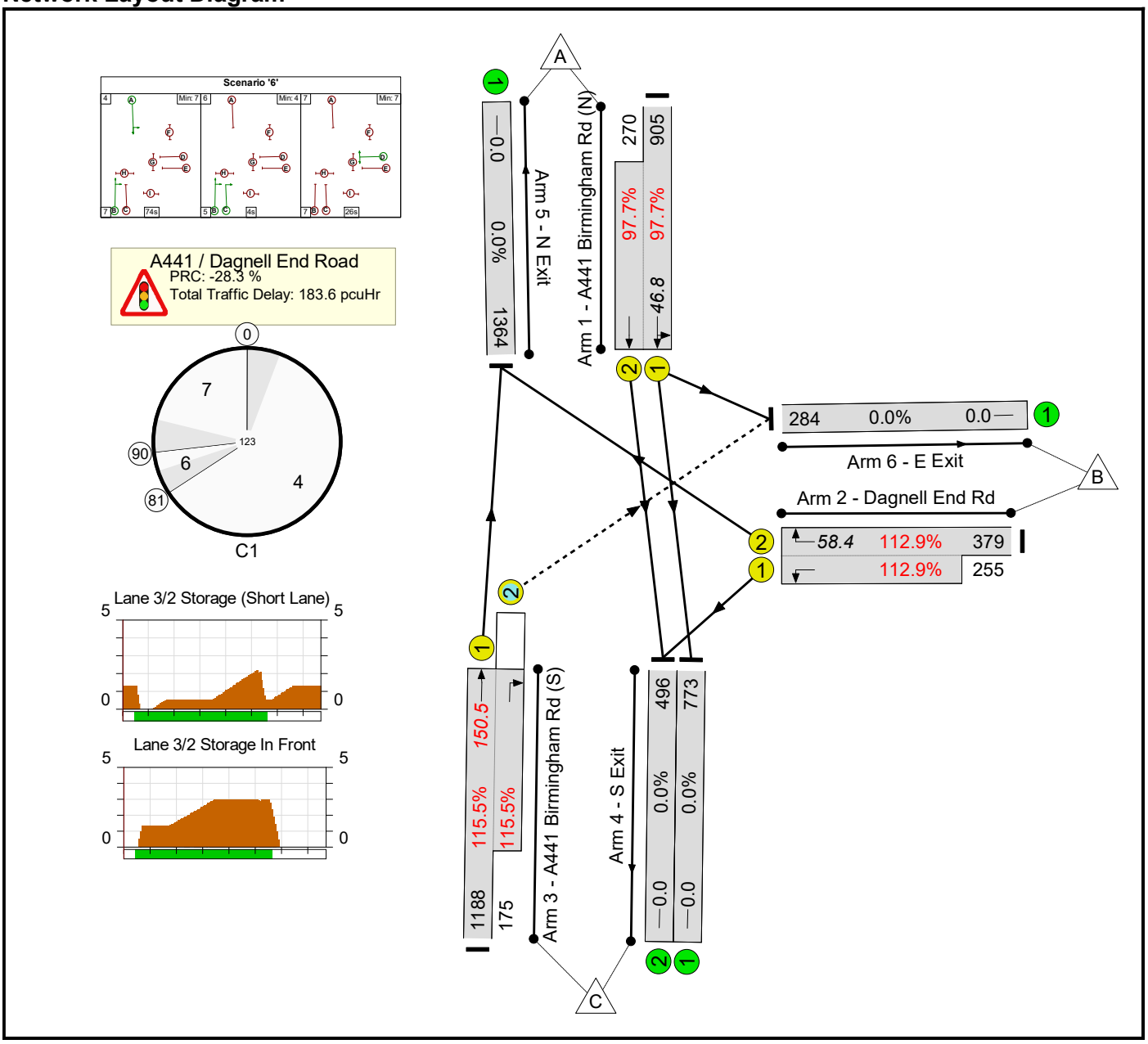
Stage	4	6	7
Duration	74	4	26
Change Point	0	81	90

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**	-	-		-	-	-	-	-	-	**115.5%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**115.5%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	74	-	1175	1828:1878	926+276	97.7 : 97.7%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	26	0	634	1650:1852	336+226	112.9 : 112.9%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	83	4	1363	1641:1800	1029+152	115.5 : 115.5%
4/1	S Exit	U	N/A	N/A	-		-	-	-	773	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	525	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1567	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	307	Inf	Inf	0.0%

Full Input Data And Results

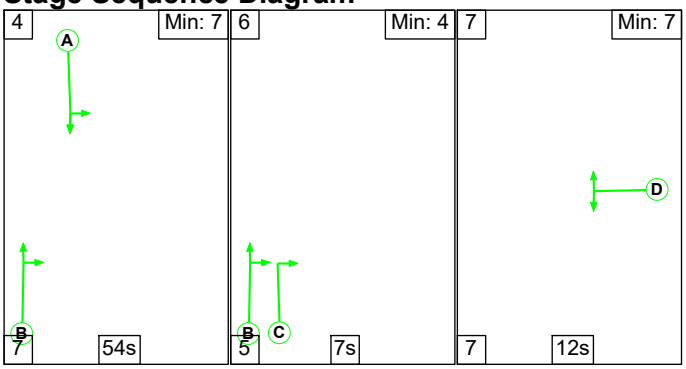
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**6**	**102**	**43**	**35.3**	**146.8**	**1.4**	**183.6**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**6**	**102**	**43**	**35.3**	**146.8**	**1.4**	**183.6**	**-**	**-**	**-**	**-**
1/1+1/2	1175	1175	-	-	-	6.8	11.6	-	18.4 (14.3+4.1)	56.2 (56.8:54.4)	35.2	11.6	46.8
2/2+2/1	634	561	-	-	-	11.5	40.2	-	51.8 (31.3+20.5)	293.9 (297.0:289.2)	18.2	40.2	58.4
3/1+3/2	1363	1180	6	102	43	17.0	94.9	1.4	113.4 (97.5+15.9)	299.6 (295.5:327.8)	55.5	94.9	150.5
4/1	773	773	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	496	496	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1364	1364	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	284	284	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -28.3 Total Delay for Signalled Lanes (pcuHr): 183.55 Cycle Time (s): 123
PRC Over All Lanes (%): -28.3 Total Delay Over All Lanes(pcuHr): 183.55

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)')

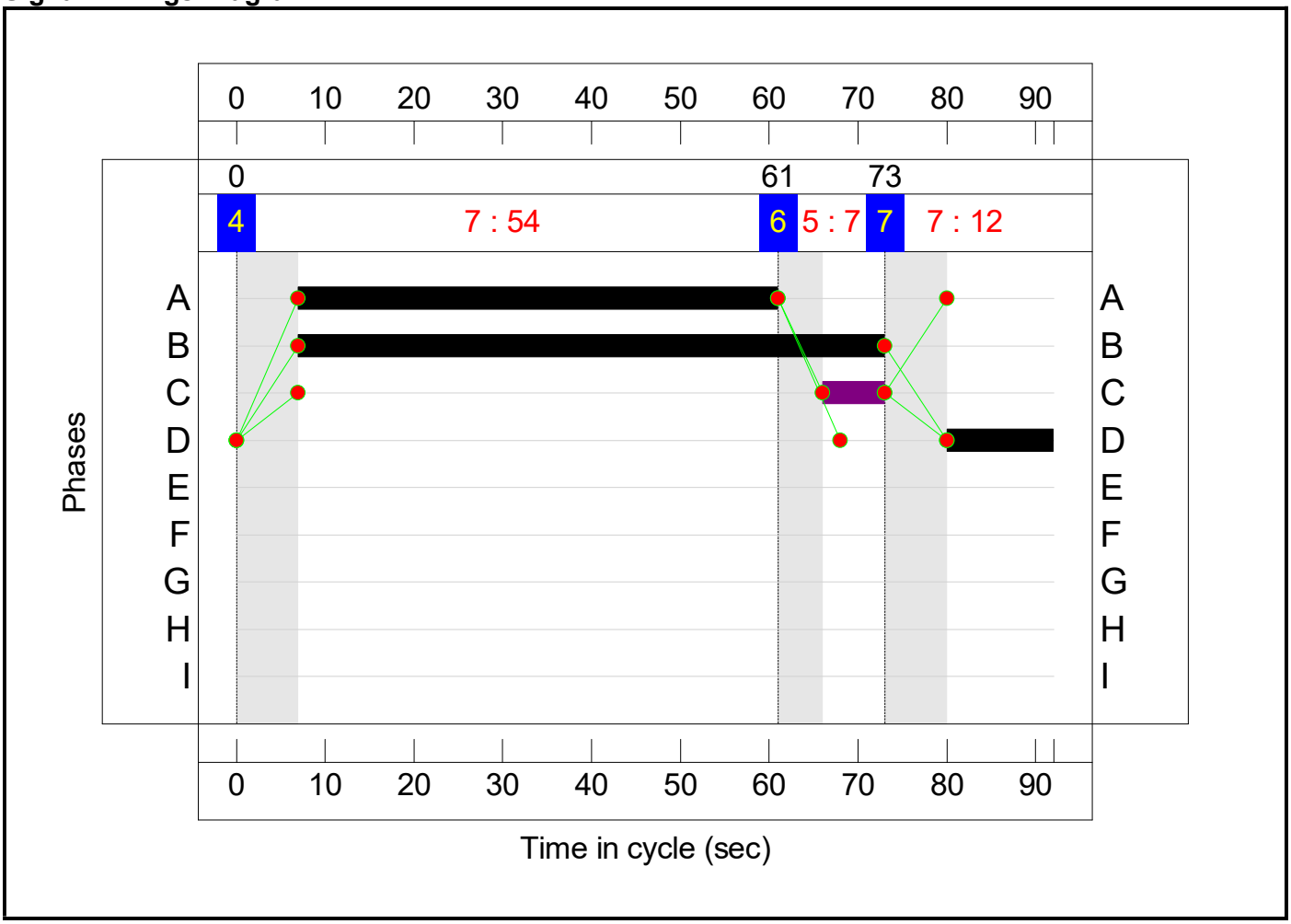
Stage Sequence Diagram



Stage Timings

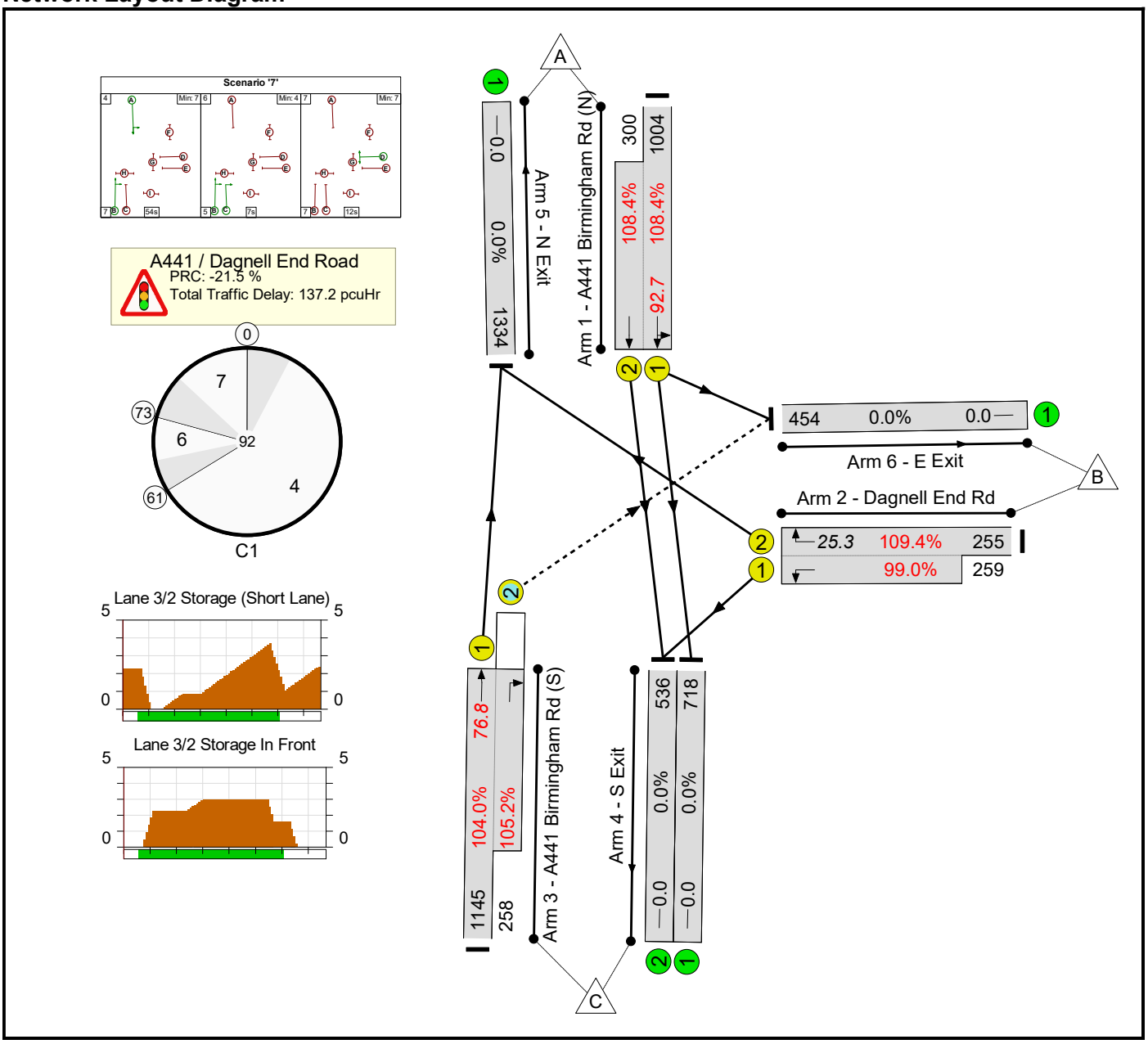
Stage	4	6	7
Duration	54	7	12
Change Point	0	61	73

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**	-	-		-	-	-	-	-	-	**109.4%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**109.4%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	54	-	1304	1812:1878	926+277	108.4 : 108.4%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	12	0	514	1650:1852	233+262	109.4 : 99.0%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	66	7	1403	1726:1679	1101+245	104.0 : 105.2%
4/1	S Exit	U	N/A	N/A	-		-	-	-	778	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	559	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1400	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	484	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**	**183**	**63**	**23.1**	**112.5**	**1.6**	**137.2**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**0**	**183**	**63**	**23.1**	**112.5**	**1.6**	**137.2**	**-**	**-**	**-**	**-**
1/1+1/2	1304	1203	-	-	-	10.1	56.2	-	66.3 (51.2+15.1)	182.9 (183.6:180.6)	36.5	56.2	92.7
2/2+2/1	514	492	-	-	-	6.2	18.4	-	24.7 (18.0+6.6)	172.7 (254.6:92.1)	6.9	18.4	25.3
3/1+3/2	1403	1346	0	183	63	6.9	37.8	1.6	46.3 (34.9+11.4)	118.8 (109.8:159.0)	39.0	37.8	76.8
4/1	718	718	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	536	536	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1334	1334	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	454	454	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1

PRC for Signalled Lanes (%): -21.5
PRC Over All Lanes (%): -21.5

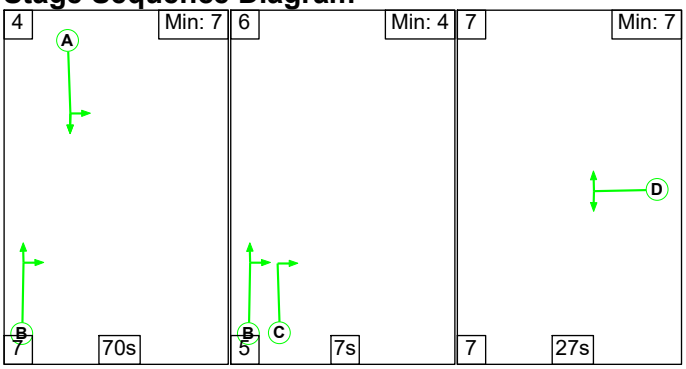
Total Delay for Signalled Lanes (pcuHr): 137.22
Total Delay Over All Lanes(pcuHr): 137.22

Cycle Time (s): 92

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)')

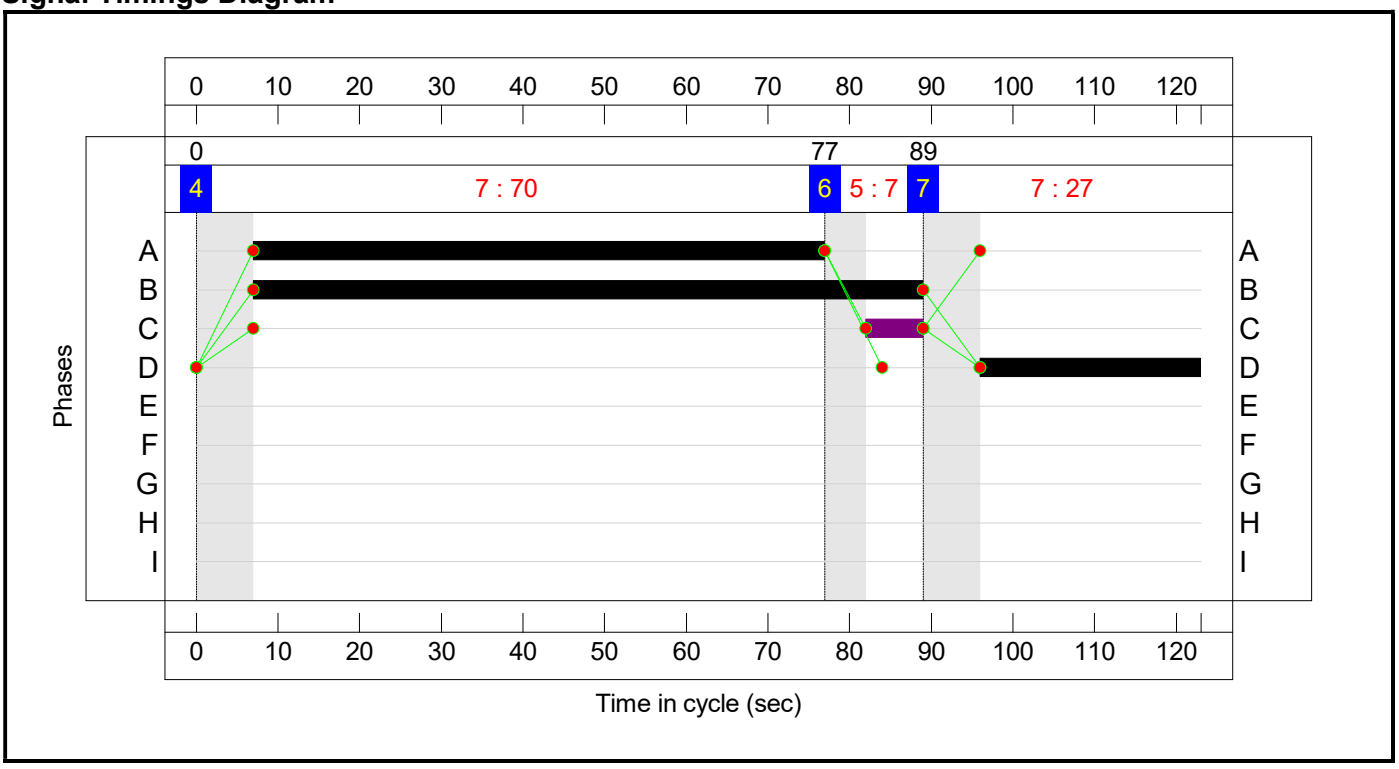
Stage Sequence Diagram



Stage Timings

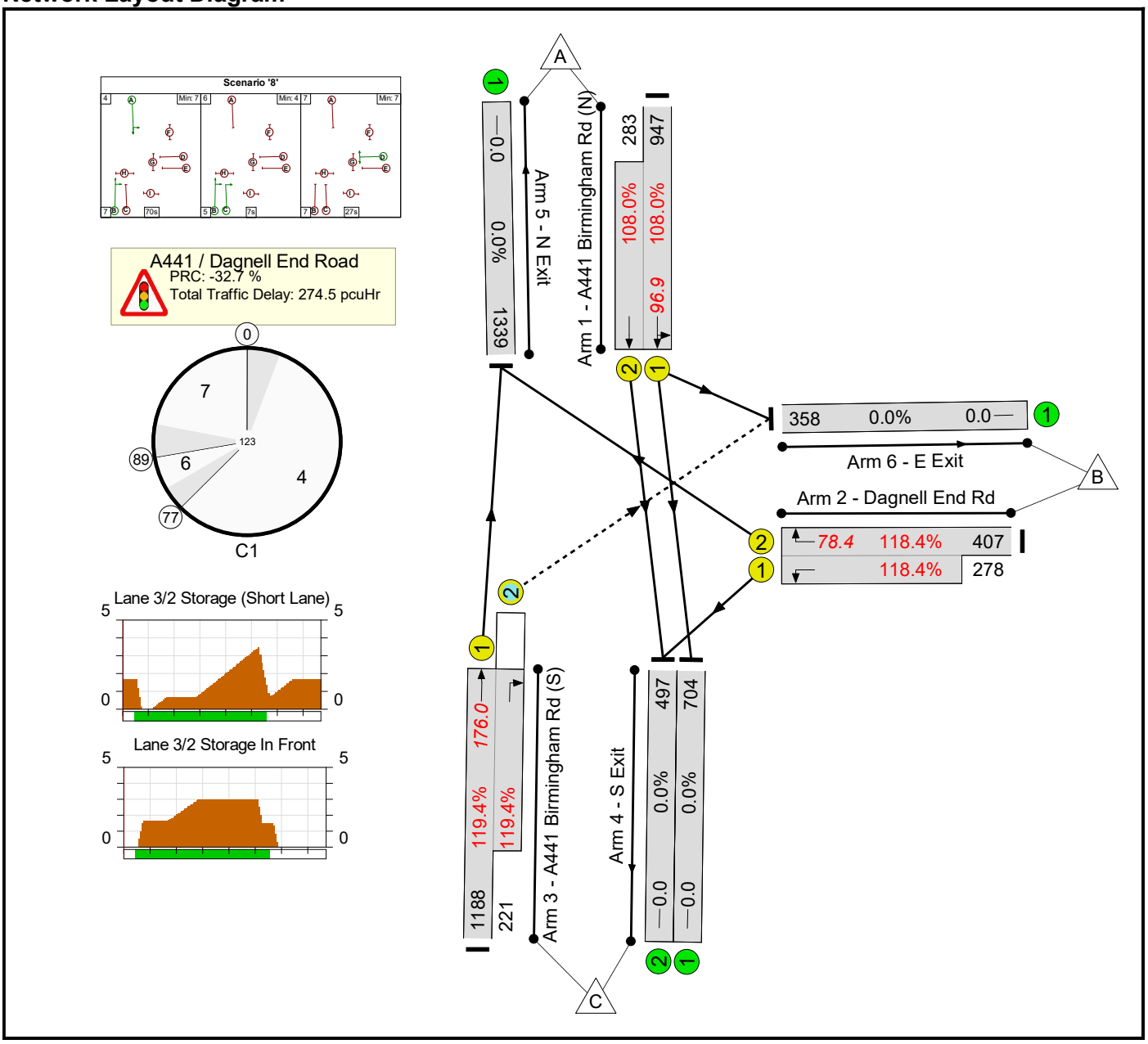
Stage	4	6	7
Duration	70	7	27
Change Point	0	77	89

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**	-	-		-	-	-	-	-	-	**119.4%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**119.4%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	70	-	1230	1817:1878	877+262	108.0 : 108.0%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	27	0	685	1650:1852	344+235	118.4 : 118.4%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	82	7	1409	1641:1800	995+185	119.4 : 119.4%
4/1	S Exit	U	N/A	N/A	-		-	-	-	760	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	561	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1595	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	408	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**	**146**	**39**	**47.8**	**225.2**	**1.5**	**274.5**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**0**	**146**	**39**	**47.8**	**225.2**	**1.5**	**274.5**	**-**	**-**	**-**	**-**
1/1+1/2	1230	1139	-	-	-	13.2	51.4	-	64.6 (49.9+14.7)	189.0 (189.6:187.1)	45.6	51.4	96.9
2/2+2/1	685	578	-	-	-	14.4	56.3	-	70.8 (42.4+28.4)	372.0 (374.8:367.8)	22.0	56.3	78.4
3/1+3/2	1409	1180	0	146	39	20.2	117.5	1.5	139.2 (115.8+23.4)	355.6 (350.9:380.8)	58.5	117.5	176.0
4/1	704	704	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	497	497	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1339	1339	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	358	358	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1

PRC for Signalled Lanes (%): -32.7
PRC Over All Lanes (%): -32.7

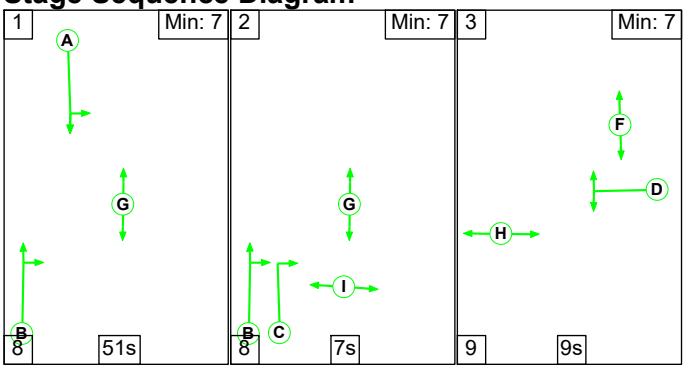
Total Delay for Signalled Lanes (pcuHr): 274.50
Total Delay Over All Lanes(pcuHr): 274.50

Cycle Time (s): 123

Full Input Data And Results

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

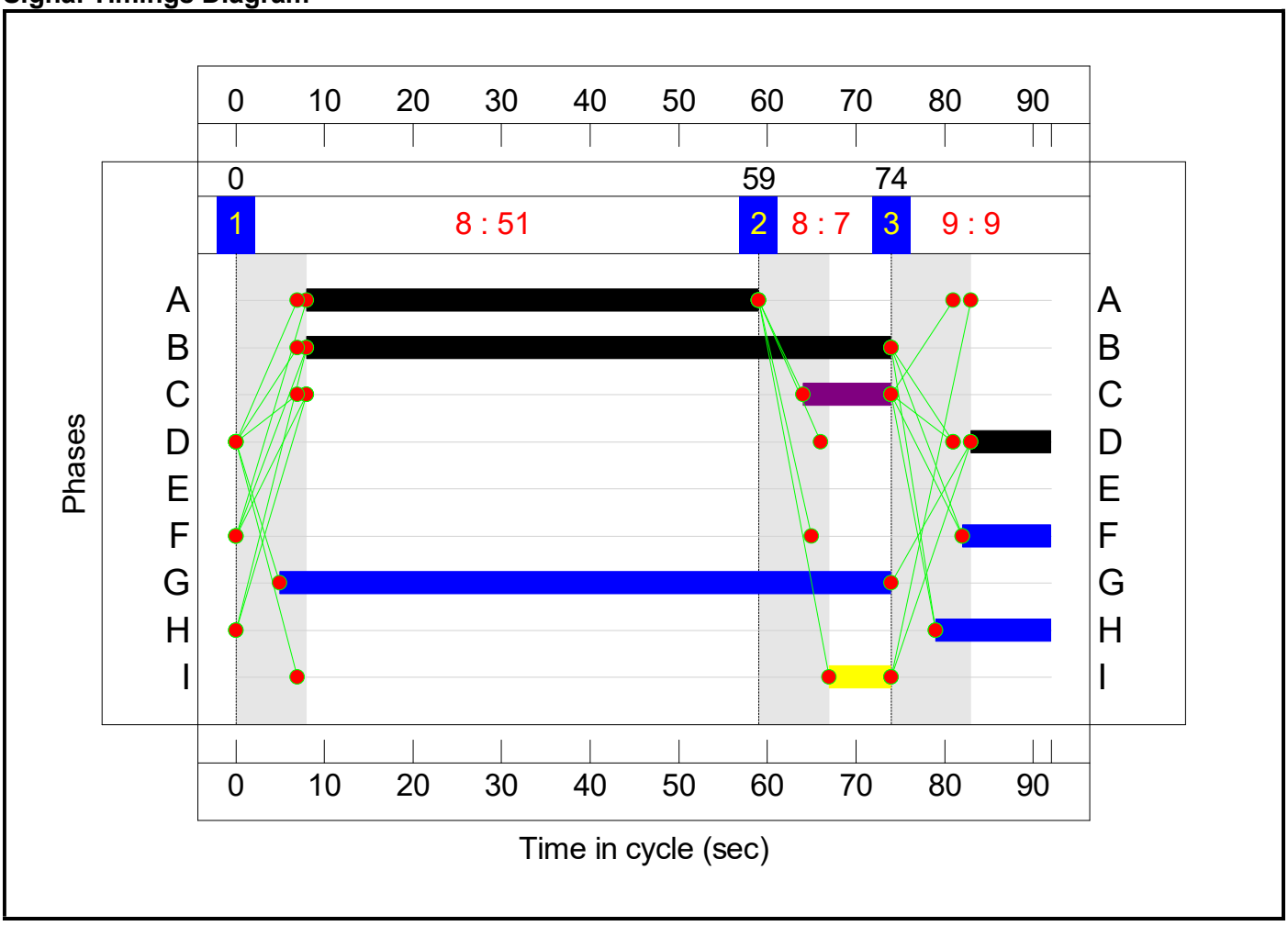
Stage Sequence Diagram



Stage Timings

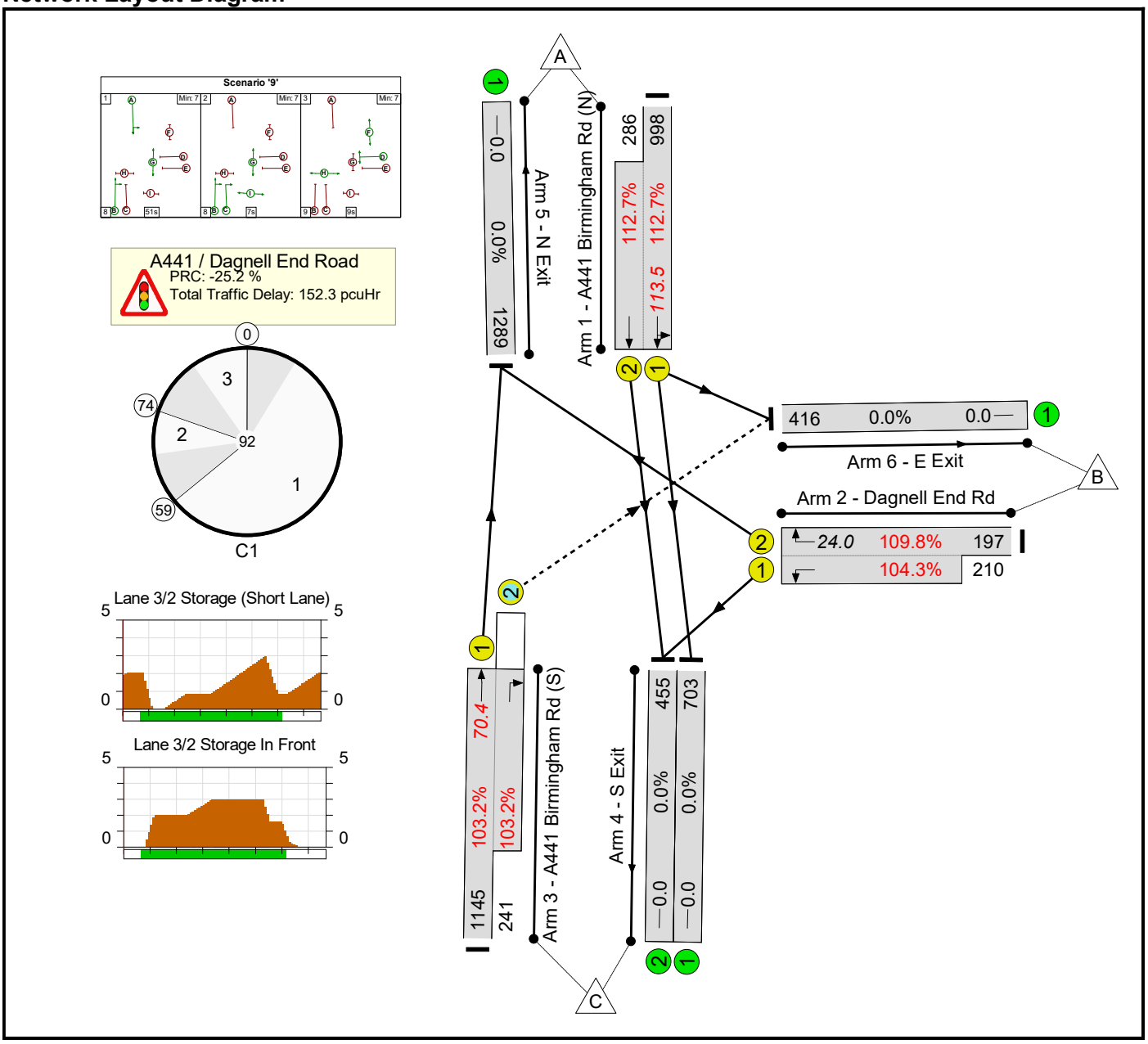
Stage	1	2	3
Duration	51	7	9
Change Point	0	59	74

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**	-	-		-	-	-	-	-	-	**112.7%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**112.7%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	51	-	1284	1816:1878	886+254	112.7 : 112.7%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	9	0	407	1650:1852	179+201	109.8 : 104.3%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	66	10	1386	1726:1679	1110+234	103.2 : 103.2%
4/1	S Exit	U	N/A	N/A	-		-	-	-	792	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	496	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1342	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	447	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**	**224**	**10**	**23.8**	**127.1**	**1.5**	**152.3**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**0**	**224**	**10**	**23.8**	**127.1**	**1.5**	**152.3**	**-**	**-**	**-**	**-**
1/1+1/2	1284	1140	-	-	-	12.4	76.3	-	88.7 (69.1+19.6)	248.6 (249.3:246.3)	37.2	76.3	113.5
2/2+2/1	407	381	-	-	-	5.3	18.6	-	24.0 (14.2+9.8)	212.1 (259.3:167.7)	5.4	18.6	24.0
3/1+3/2	1386	1343	0	224	10	6.1	32.1	1.5	39.7 (31.4+8.3)	103.1 (98.8:123.5)	38.3	32.1	70.4
4/1	703	703	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	455	455	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1289	1289	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	416	416	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1

PRC for Signalled Lanes (%): -25.2
PRC Over All Lanes (%): -25.2

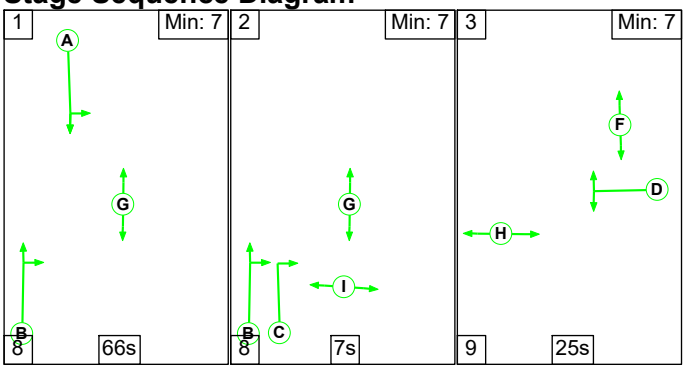
Total Delay for Signalled Lanes (pcuHr): 152.34
Total Delay Over All Lanes(pcuHr): 152.34

Cycle Time (s): 92

Full Input Data And Results

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

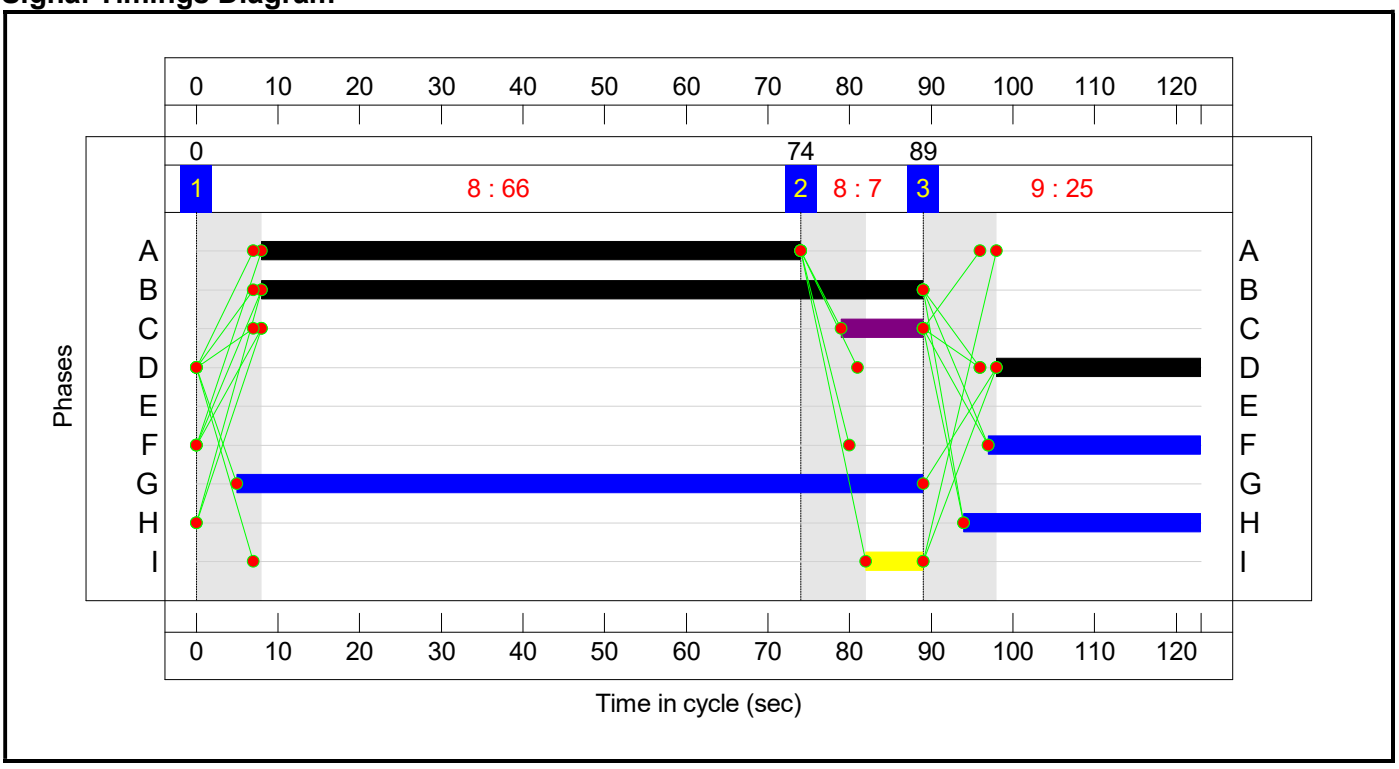
Stage Sequence Diagram



Stage Timings

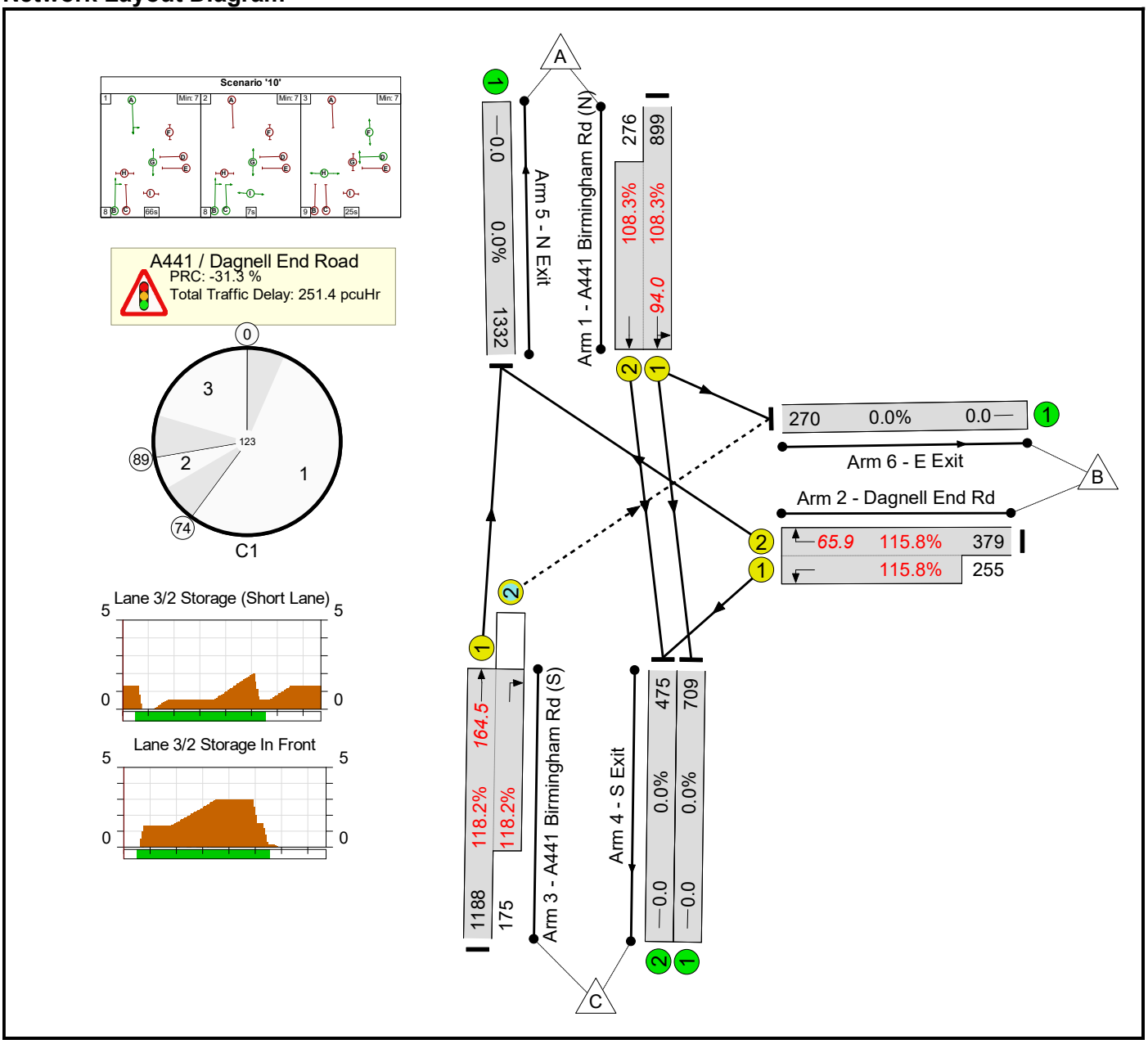
Stage	1	2	3
Duration	66	7	25
Change Point	0	74	89

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**	-	-		-	-	-	-	-	-	**118.2%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**118.2%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	66	-	1175	1828:1878	830+255	108.3 : 108.3%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	25	0	634	1650:1852	327+220	115.8 : 115.8%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	81	10	1363	1641:1800	1005+148	118.2 : 118.2%
4/1	S Exit	U	N/A	N/A	-		-	-	-	767	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	531	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1567	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	307	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**	**143**	**5**	**44.9**	**205.3**	**1.2**	**251.4**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**0**	**143**	**5**	**44.9**	**205.3**	**1.2**	**251.4**	**-**	**-**	**-**	**-**
1/1+1/2	1175	1085	-	-	-	13.4	50.6	-	64.0 (49.1+14.9)	196.1 (196.7:194.1)	43.4	50.6	94.0
2/2+2/1	634	547	-	-	-	12.6	46.7	-	59.3 (35.8+23.5)	336.9 (340.0:332.2)	19.2	46.7	65.9
3/1+3/2	1363	1153	0	143	5	18.8	108.0	1.2	128.1 (110.5+17.6)	338.2 (334.9:361.0)	56.5	108.0	164.5
4/1	709	709	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	475	475	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1332	1332	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	270	270	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1

PRC for Signalled Lanes (%): -31.3
PRC Over All Lanes (%): -31.3

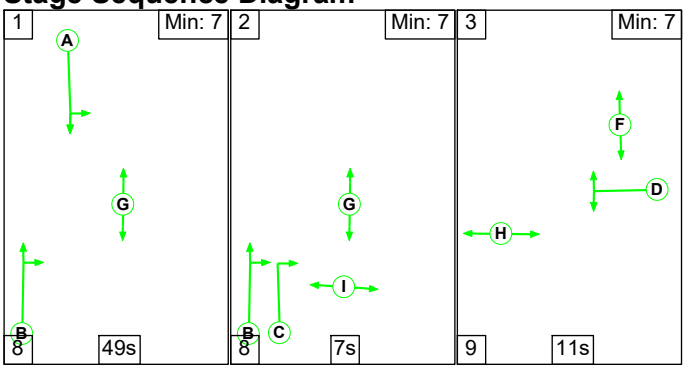
Total Delay for Signalled Lanes (pcuHr): 251.40
Total Delay Over All Lanes(pcuHr): 251.40

Cycle Time (s): 123

Full Input Data And Results

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

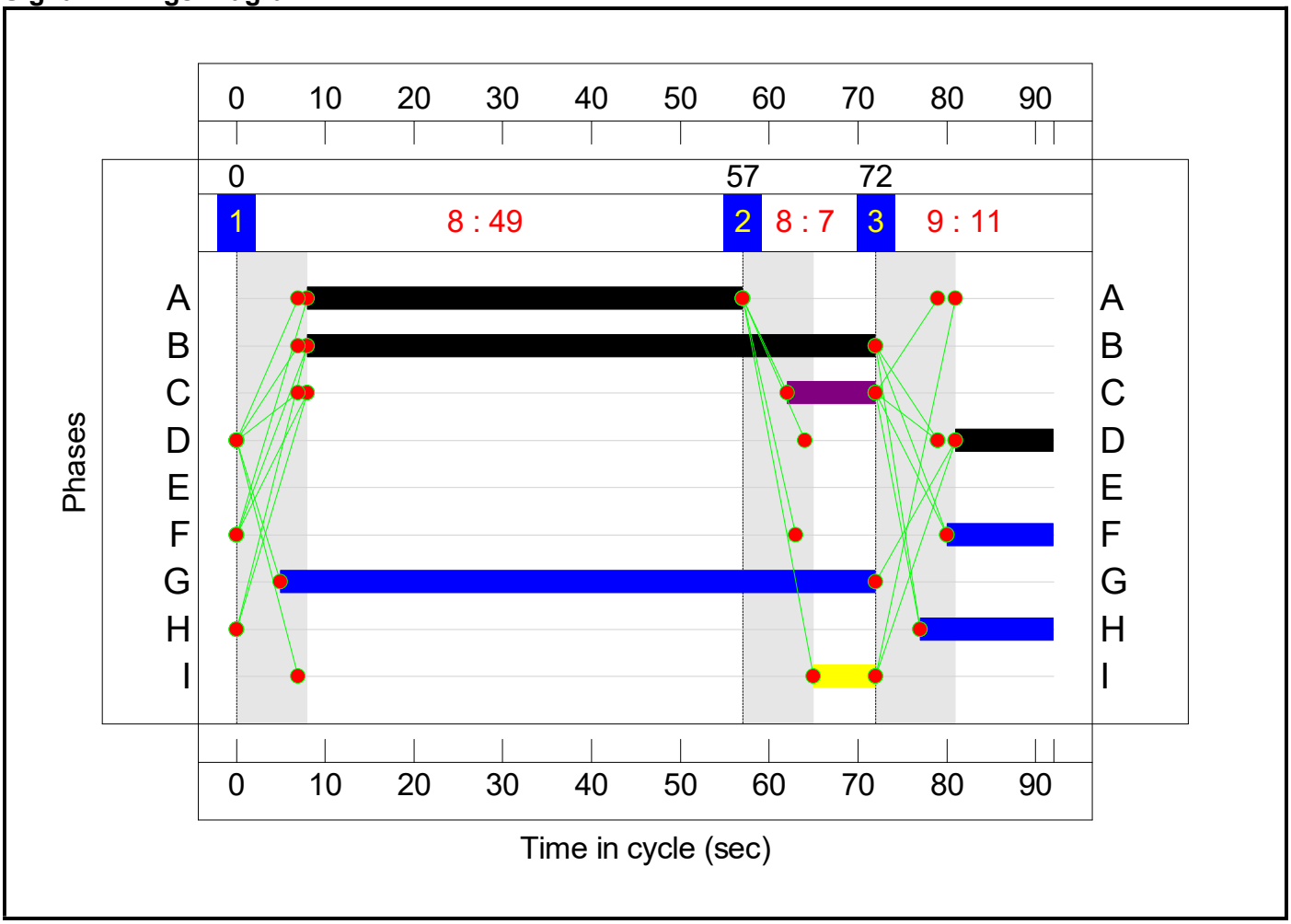
Stage Sequence Diagram



Stage Timings

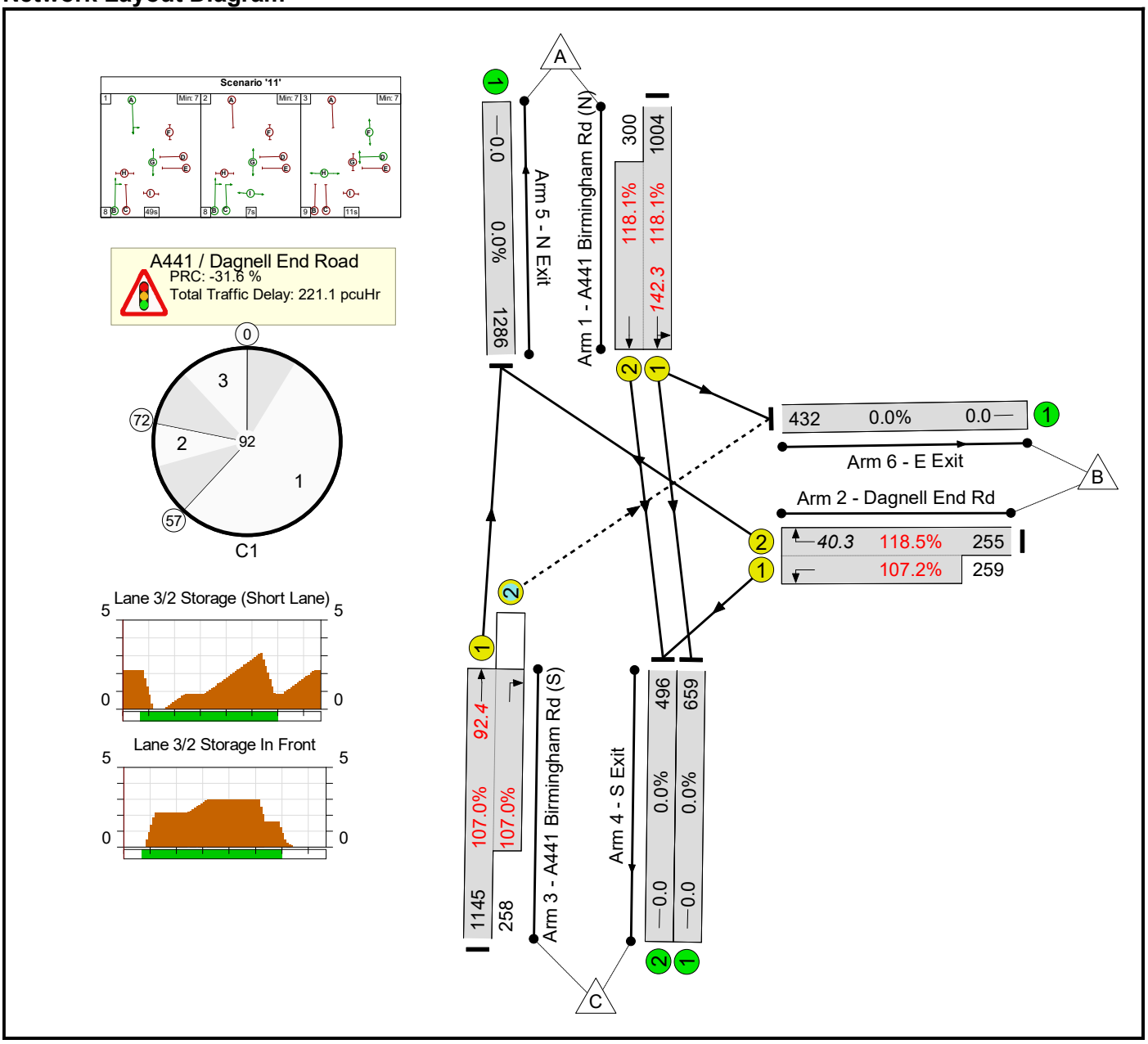
Stage	1	2	3
Duration	49	7	11
Change Point	0	57	72

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**	-	-		-	-	-	-	-	-	**118.5%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**118.5%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	49	-	1304	1812:1878	850+254	118.1 : 118.1%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	11	0	514	1650:1852	215+242	118.5 : 107.2%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	64	10	1403	1726:1679	1070+241	107.0 : 107.0%
4/1	S Exit	U	N/A	N/A	-		-	-	-	778	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	559	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1400	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	484	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**	**231**	**10**	**31.5**	**188.2**	**1.4**	**221.1**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**0**	**231**	**10**	**31.5**	**188.2**	**1.4**	**221.1**	**-**	**-**	**-**	**-**
1/1+1/2	1304	1104	-	-	-	15.2	103.2	-	118.4 (91.4+27.1)	326.9 (327.6:324.6)	39.1	103.2	142.3
2/2+2/1	514	457	-	-	-	7.8	32.6	-	40.3 (26.2+14.1)	282.4 (369.7:196.4)	7.8	32.6	40.3
3/1+3/2	1403	1311	0	231	10	8.5	52.5	1.4	62.4 (49.6+12.8)	160.1 (155.9:179.0)	39.9	52.5	92.4
4/1	659	659	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	496	496	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1286	1286	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	432	432	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1

PRC for Signalled Lanes (%): -31.6
PRC Over All Lanes (%): -31.6

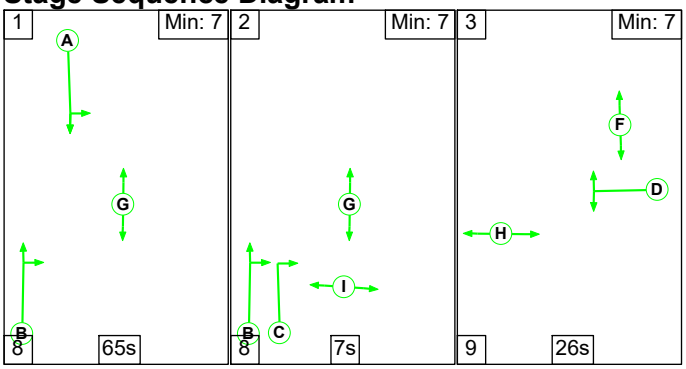
Total Delay for Signalled Lanes (pcuHr): 221.13
Total Delay Over All Lanes(pcuHr): 221.13

Cycle Time (s): 92

Full Input Data And Results

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

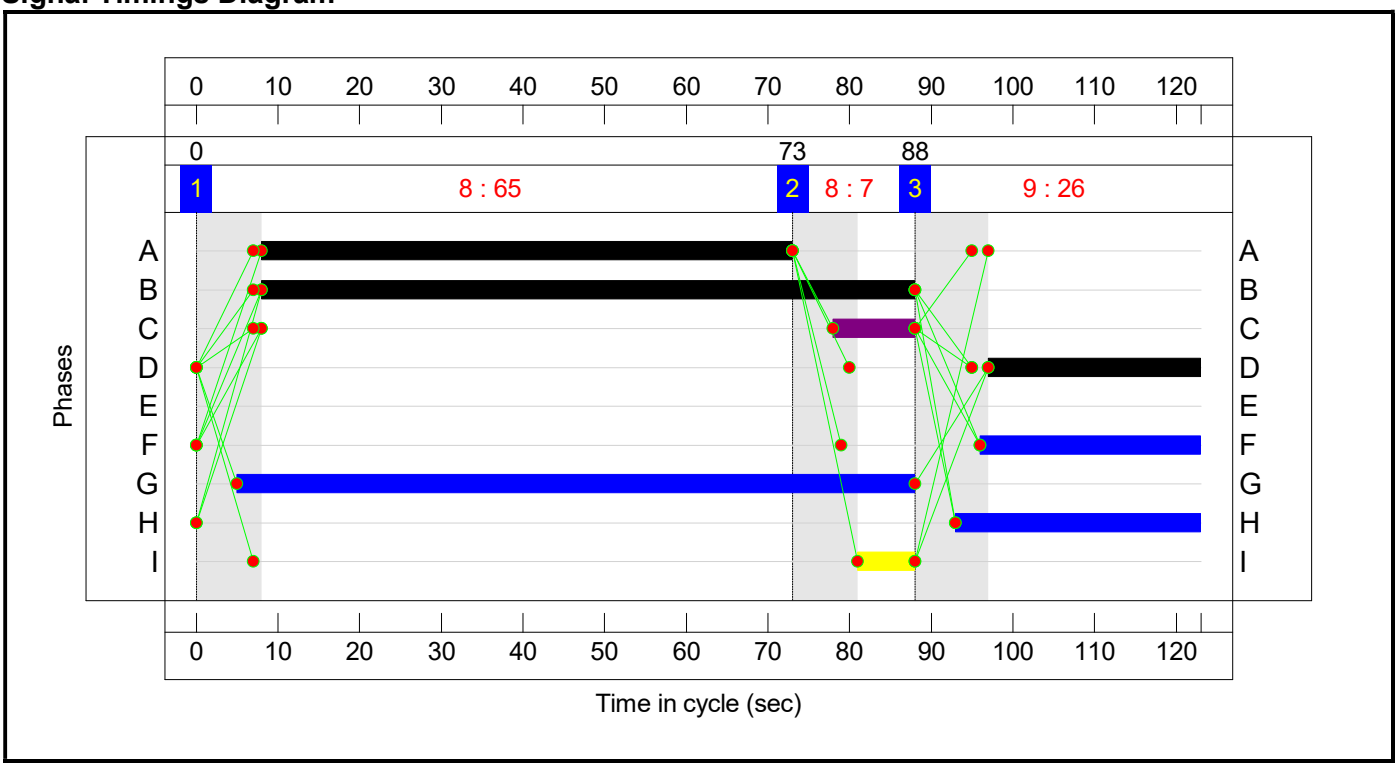
Stage Sequence Diagram



Stage Timings

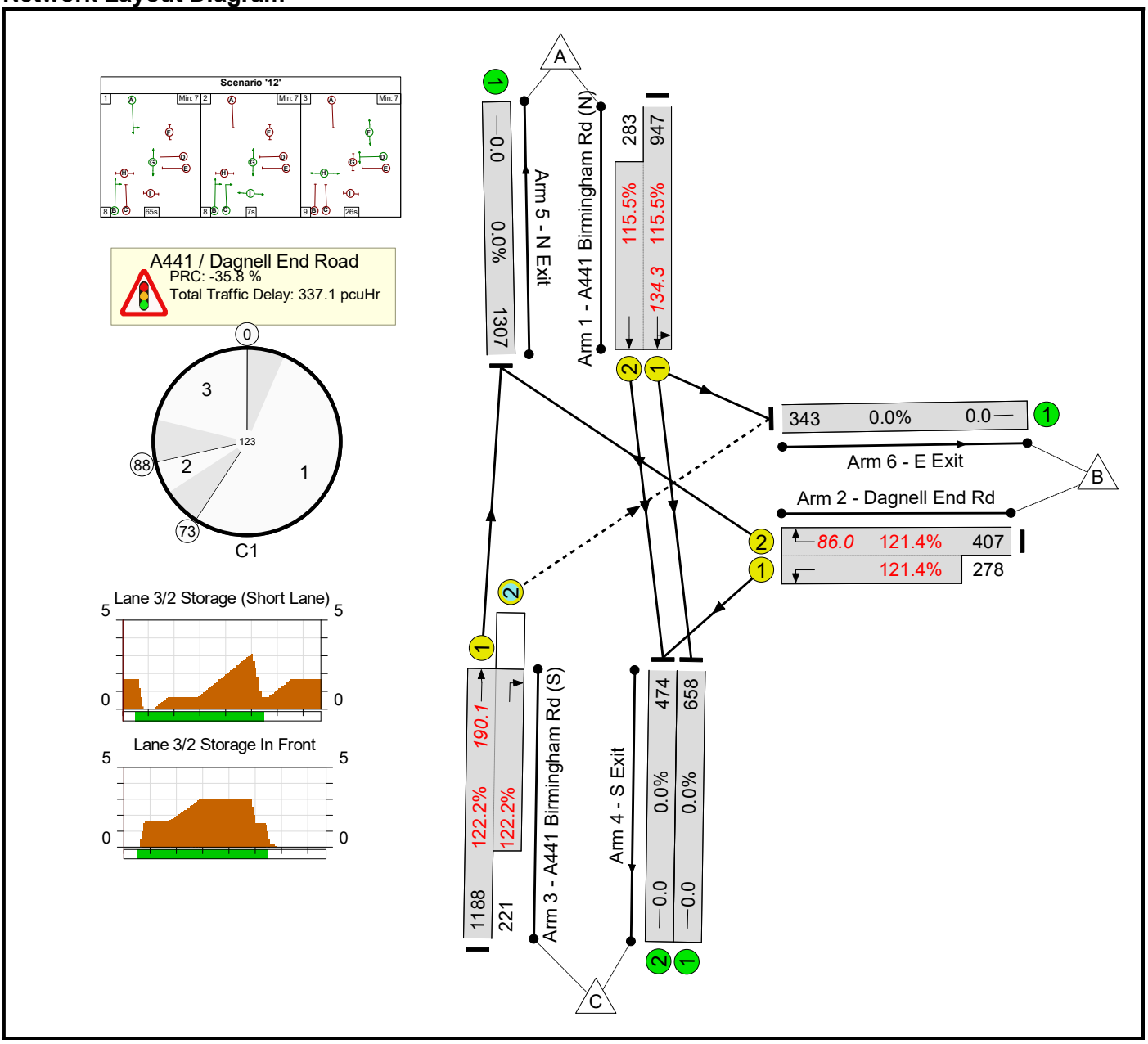
Stage	1	2	3
Duration	65	7	26
Change Point	0	73	88

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**	-	-		-	-	-	-	-	-	**122.2%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**122.2%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	65	-	1230	1817:1878	820+245	115.5 : 115.5%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	26	0	685	1650:1852	335+229	121.4 : 121.4%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	80	10	1409	1641:1800	972+181	122.2 : 122.2%
4/1	S Exit	U	N/A	N/A	-		-	-	-	760	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	561	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1595	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	408	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**	**174**	**6**	**55.9**	**279.9**	**1.3**	**337.1**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**0**	**174**	**6**	**55.9**	**279.9**	**1.3**	**337.1**	**-**	**-**	**-**	**-**
1/1+1/2	1230	1065	-	-	-	18.3	86.2	-	104.5 (80.6+23.9)	305.9 (306.5:304.0)	48.1	86.2	134.3
2/2+2/1	685	564	-	-	-	15.5	63.0	-	78.6 (47.0+31.6)	413.0 (415.8:408.8)	23.0	63.0	86.0
3/1+3/2	1409	1153	0	174	6	22.0	130.7	1.3	154.0 (128.5+25.5)	393.5 (389.4:415.4)	59.4	130.7	190.1
4/1	658	658	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	474	474	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1307	1307	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	343	343	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1

PRC for Signalled Lanes (%): -35.8
PRC Over All Lanes (%): -35.8

Total Delay for Signalled Lanes (pcuHr): 337.11
Total Delay Over All Lanes(pcuHr): 337.11

Cycle Time (s): 123

APPENDIX D

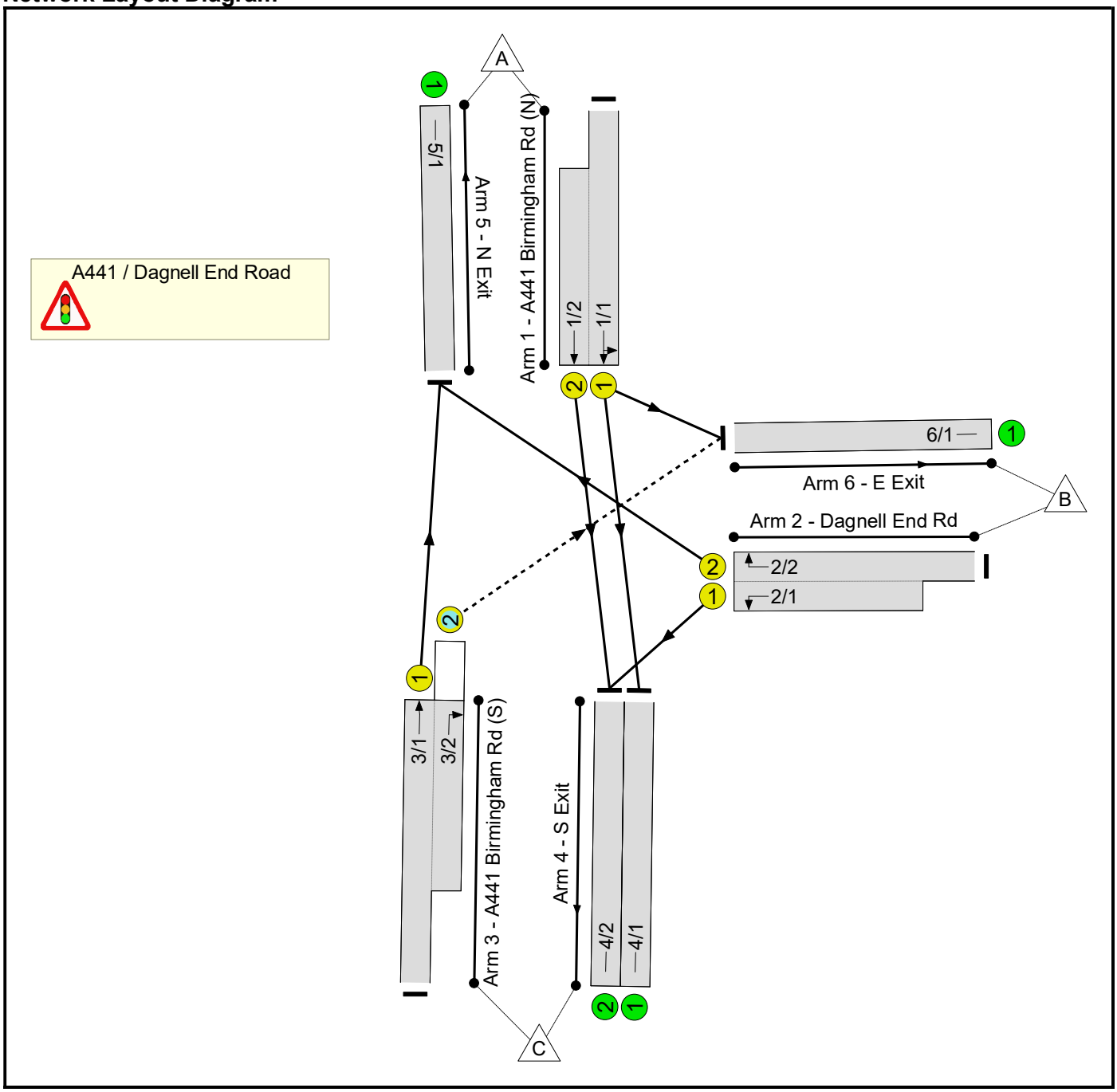
LinSig Model Output Report - Scenario CM1 & CM2

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:	

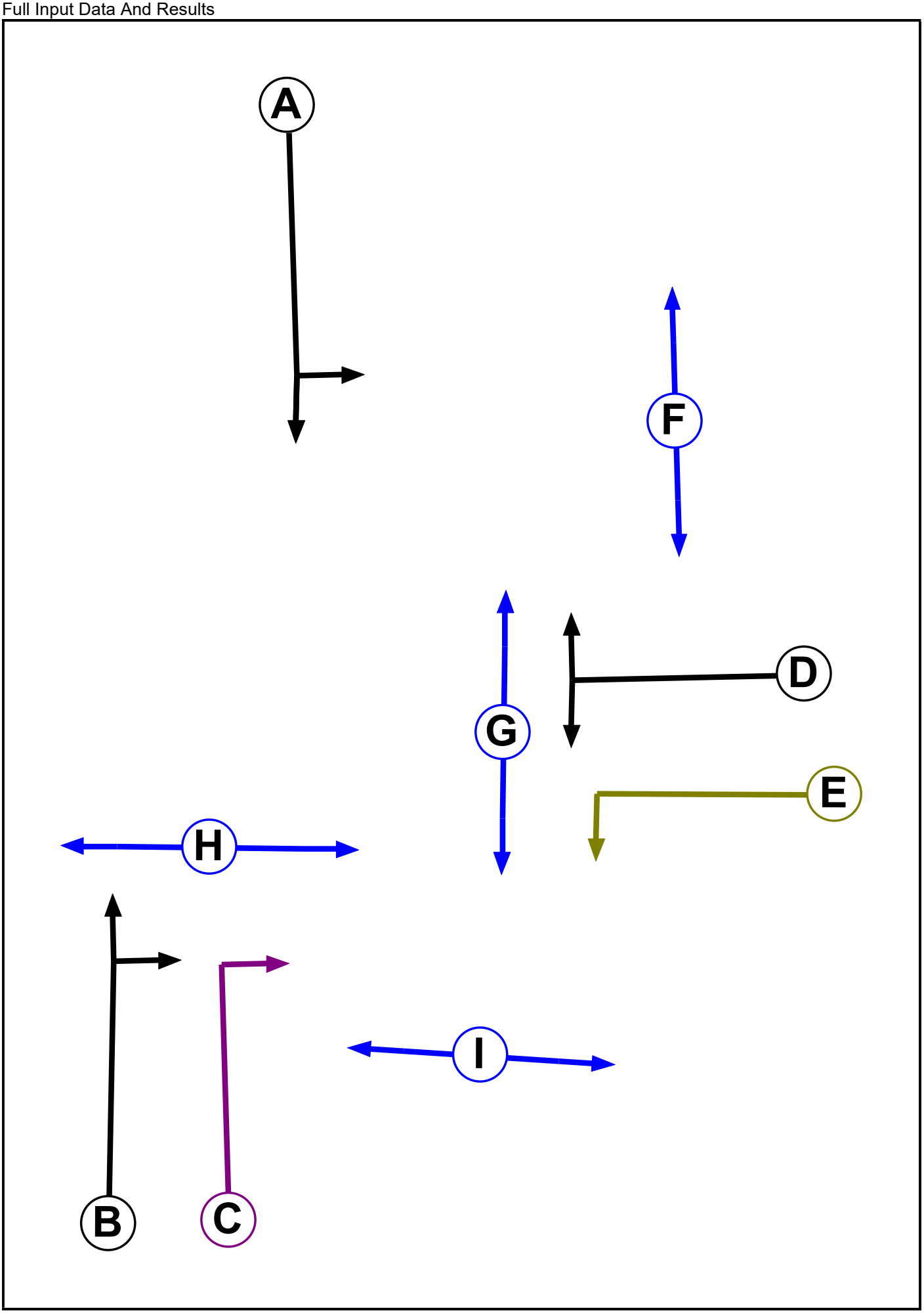
Network Layout Diagram



Full Input Data And Results

Phase Diagram

Full Input Data And Results



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

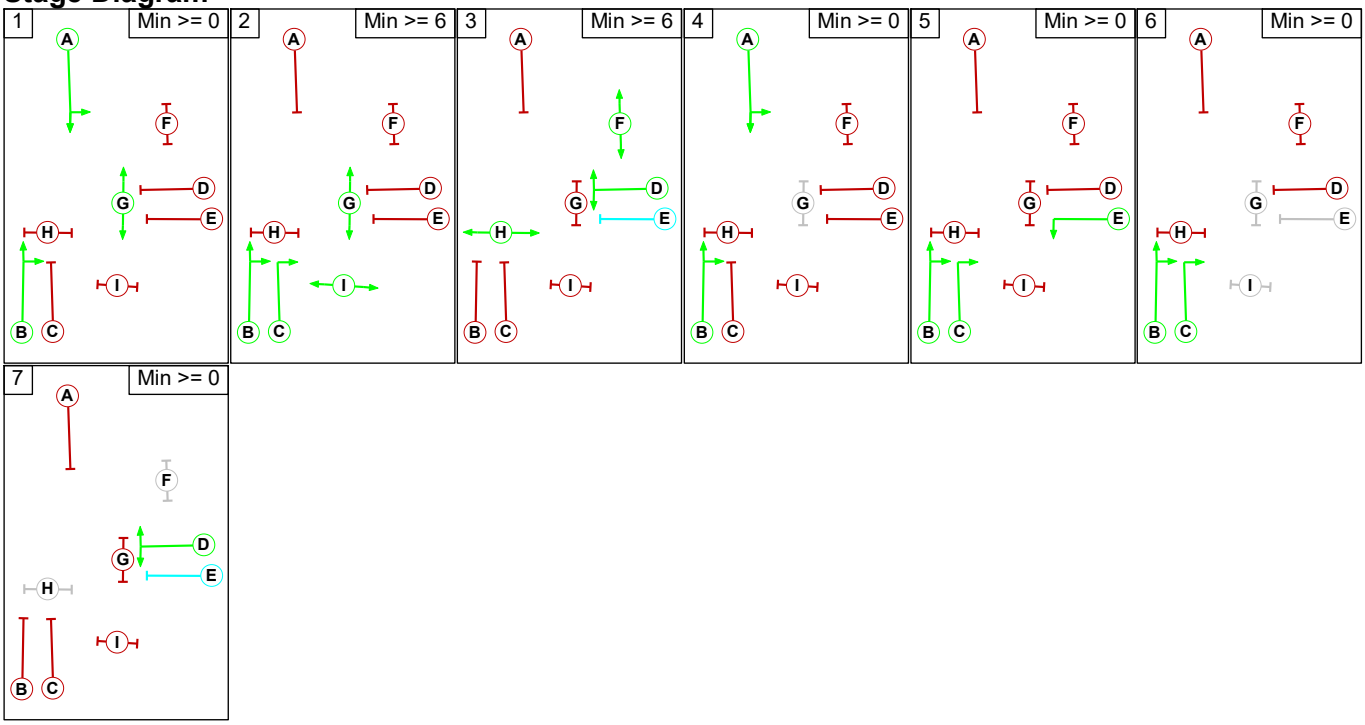
		Starting Phase								
		A	B	C	D	E	F	G	H	I
Terminating Phase	A		-	5	7	7	6	-	-	8
	B	-		-	7	-	8	-	5	-
	C	7	-		7	-	8	-	5	-
	D	7	7	7		-	-	5	-	7
	E	6	-	-	-		-	5	-	7
	F	8	8	8	-	-		-	-	-
	G	-	-	-	9	9	-		-	-
	H	-	8	8	-	-	-	-		-
	I	9	-	-	9	9	-	-	-	

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	146	837	983
	B	126	0	184	310
	C	800	144	0	944
	Tot.	926	290	1021	2237

Traffic Lane Flows

Lane	Scenario 1: 1
Junction: A441 / Dagnell End Road	
1/1 (with short)	983(In) 688(Out)
1/2 (short)	295
2/1 (short)	184
2/2 (with short)	310(In) 126(Out)
3/1 (with short)	944(In) 800(Out)
3/2 (short)	144
4/1	542
4/2	479
5/1	926
6/1	290

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	78.8 %	1814	1814
				Arm 6 Left	10.00	21.2 %		
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	93	862	955
	B	163	0	202	365
	C	859	121	0	980
	Tot.	1022	214	1064	2300

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2
Junction: A441 / Dagnell End Road	
1/1 (with short)	955(In) 685(Out)
1/2 (short)	270
2/1 (short)	202
2/2 (with short)	365(In) 163(Out)
3/1 (with short)	980(In) 859(Out)
3/2 (short)	121
4/1	592
4/2	472
5/1	1022
6/1	214

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	86.4 %	1830	1830
				Arm 6 Left	10.00	13.6 %		
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	166	837	1003
	B	184	0	233	417
	C	800	161	0	961
	Tot.	984	327	1070	2381

Traffic Lane Flows

Lane	Scenario 3: 3
Junction: A441 / Dagnell End Road	
1/1 (with short)	1003(In) 703(Out)
1/2 (short)	300
2/1 (short)	233
2/2 (with short)	417(In) 184(Out)
3/1 (with short)	961(In) 800(Out)
3/2 (short)	161
4/1	537
4/2	533
5/1	984
6/1	327

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	76.4 %	1809	1809
				Arm 6 Left	10.00	23.6 %		
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	148	862	1010
	B	191	0	225	416
	C	905	121	0	1026
	Tot.	1096	269	1087	2452

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 4: 4
Junction: A441 / Dagnell End Road	
1/1 (with short)	1010(In) 727(Out)
1/2 (short)	283
2/1 (short)	225
2/2 (with short)	416(In) 191(Out)
3/1 (with short)	1026(In) 905(Out)
3/2 (short)	121
4/1	579
4/2	508
5/1	1096
6/1	269

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	79.6 %	1816	1816
				Arm 6 Left	10.00	20.4 %		
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	146	837	983
	B	126	0	184	310
	C	800	144	0	944
	Tot.	926	290	1021	2237

Traffic Lane Flows

Lane	Scenario 5: 5
Junction: A441 / Dagnell End Road	
1/1 (with short)	983(In) 688(Out)
1/2 (short)	295
2/1 (short)	184
2/2 (with short)	310(In) 126(Out)
3/1 (with short)	944(In) 800(Out)
3/2 (short)	144
4/1	542
4/2	479
5/1	926
6/1	290

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	78.8 %	1814	1814
				Arm 6 Left	10.00	21.2 %		
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	93	862	955
	B	163	0	202	365
	C	859	121	0	980
	Tot.	1022	214	1064	2300

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 6: 6
Junction: A441 / Dagnell End Road	
1/1 (with short)	955(In) 685(Out)
1/2 (short)	270
2/1 (short)	202
2/2 (with short)	365(In) 163(Out)
3/1 (with short)	980(In) 859(Out)
3/2 (short)	121
4/1	592
4/2	472
5/1	1022
6/1	214

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	86.4 %	1830	1830
				Arm 6 Left	10.00	13.6 %		
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	166	837	1003
	B	184	0	233	417
	C	800	161	0	961
	Tot.	984	327	1070	2381

Traffic Lane Flows

Lane	Scenario 7: 7
Junction: A441 / Dagnell End Road	
1/1 (with short)	1003(In) 703(Out)
1/2 (short)	300
2/1 (short)	233
2/2 (with short)	417(In) 184(Out)
3/1 (with short)	961(In) 800(Out)
3/2 (short)	161
4/1	537
4/2	533
5/1	984
6/1	327

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	76.4 %	1809	1809
				Arm 6 Left	10.00	23.6 %		
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	148	862	1010
	B	191	0	225	416
	C	905	121	0	1026
	Tot.	1096	269	1087	2452

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 8: 8
Junction: A441 / Dagnell End Road	
1/1 (with short)	1010(In) 727(Out)
1/2 (short)	283
2/1 (short)	225
2/2 (with short)	416(In) 191(Out)
3/1 (with short)	1026(In) 905(Out)
3/2 (short)	121
4/1	579
4/2	508
5/1	1096
6/1	269

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	79.6 %	1816	1816
				Arm 6 Left	10.00	20.4 %		
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	146	837	983
	B	126	0	184	310
	C	800	144	0	944
	Tot.	926	290	1021	2237

Traffic Lane Flows

Lane	Scenario 9: 9
Junction: A441 / Dagnell End Road	
1/1 (with short)	983(In) 688(Out)
1/2 (short)	295
2/1 (short)	184
2/2 (with short)	310(In) 126(Out)
3/1 (with short)	944(In) 800(Out)
3/2 (short)	144
4/1	542
4/2	479
5/1	926
6/1	290

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	78.8 %	1814	1814
				Arm 6 Left	10.00	21.2 %		
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	93	862	955
	B	163	0	202	365
	C	859	121	0	980
	Tot.	1022	214	1064	2300

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 10: 10
Junction: A441 / Dagnell End Road	
1/1 (with short)	955(In) 860(Out)
1/2 (short)	95
2/1 (short)	202
2/2 (with short)	365(In) 163(Out)
3/1 (with short)	980(In) 859(Out)
3/2 (short)	121
4/1	767
4/2	297
5/1	1022
6/1	214

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	89.2 %	1836	1836
				Arm 6 Left	10.00	10.8 %		
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	166	837	1003
	B	184	0	233	417
	C	800	161	0	961
	Tot.	984	327	1070	2381

Traffic Lane Flows

Lane	Scenario 11: 11
Junction: A441 / Dagnell End Road	
1/1 (with short)	1003(In) 703(Out)
1/2 (short)	300
2/1 (short)	233
2/2 (with short)	417(In) 184(Out)
3/1 (with short)	961(In) 800(Out)
3/2 (short)	161
4/1	537
4/2	533
5/1	984
6/1	327

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	76.4 %	1809	1809
				Arm 6 Left	10.00	23.6 %		
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	148	862	1010
	B	191	0	225	416
	C	905	121	0	1026
	Tot.	1096	269	1087	2452

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 12: 12
Junction: A441 / Dagnell End Road	
1/1 (with short)	1010(In) 727(Out)
1/2 (short)	283
2/1 (short)	225
2/2 (with short)	416(In) 191(Out)
3/1 (with short)	1026(In) 905(Out)
3/2 (short)	121
4/1	579
4/2	508
5/1	1096
6/1	269

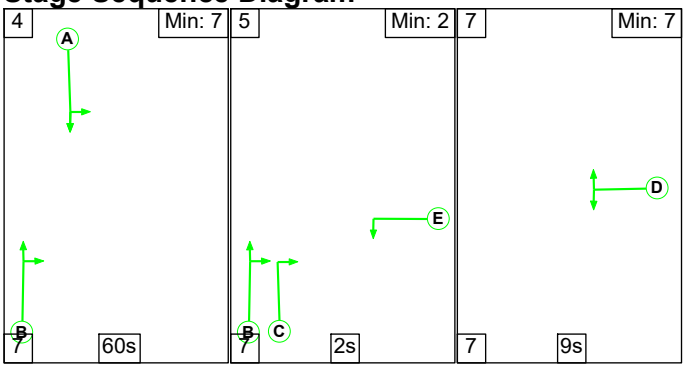
Lane Saturation Flows

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	79.6 %	1816	1816
				Arm 6 Left	10.00	20.4 %		
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)')

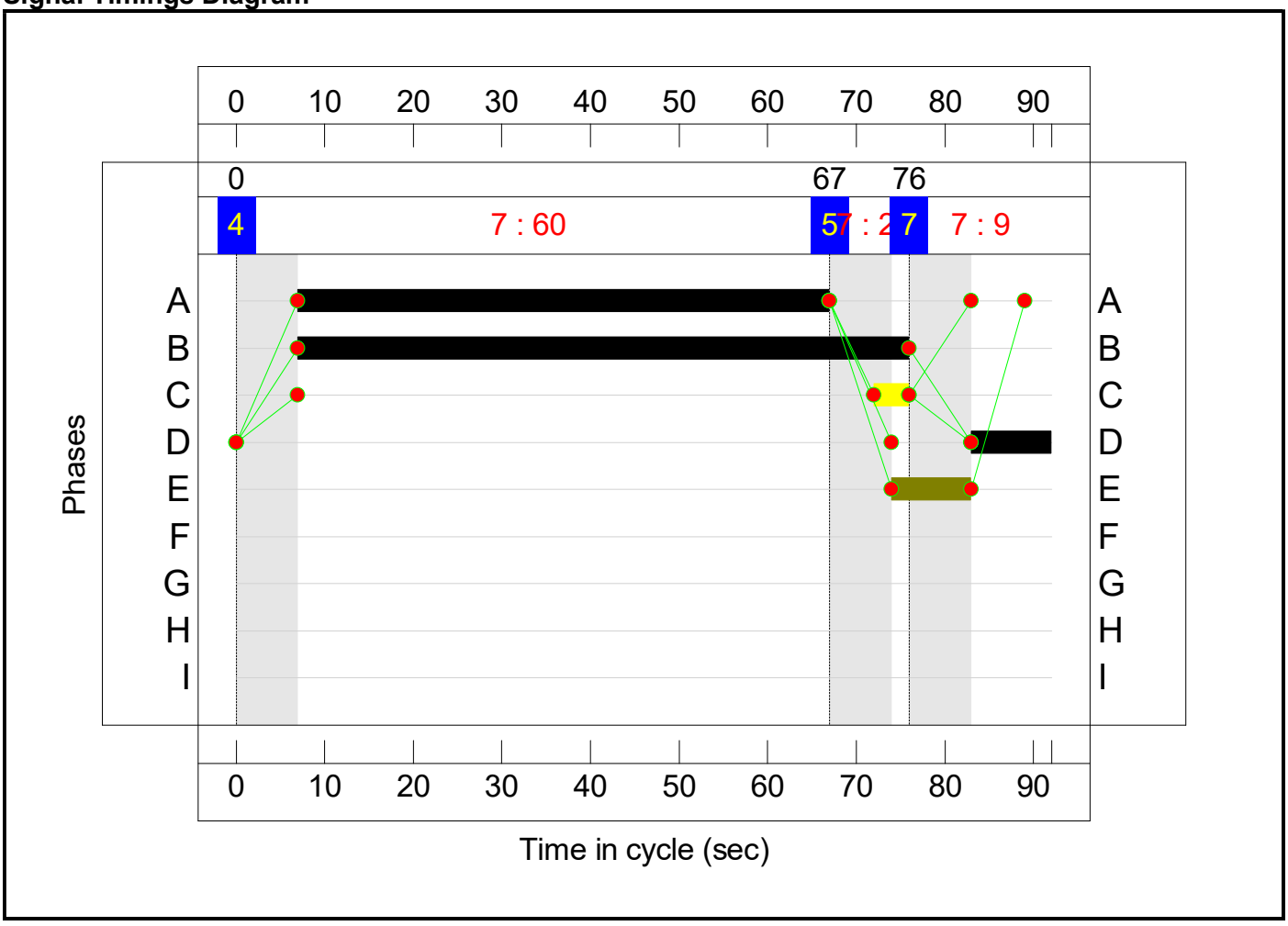
Stage Sequence Diagram



Stage Timings

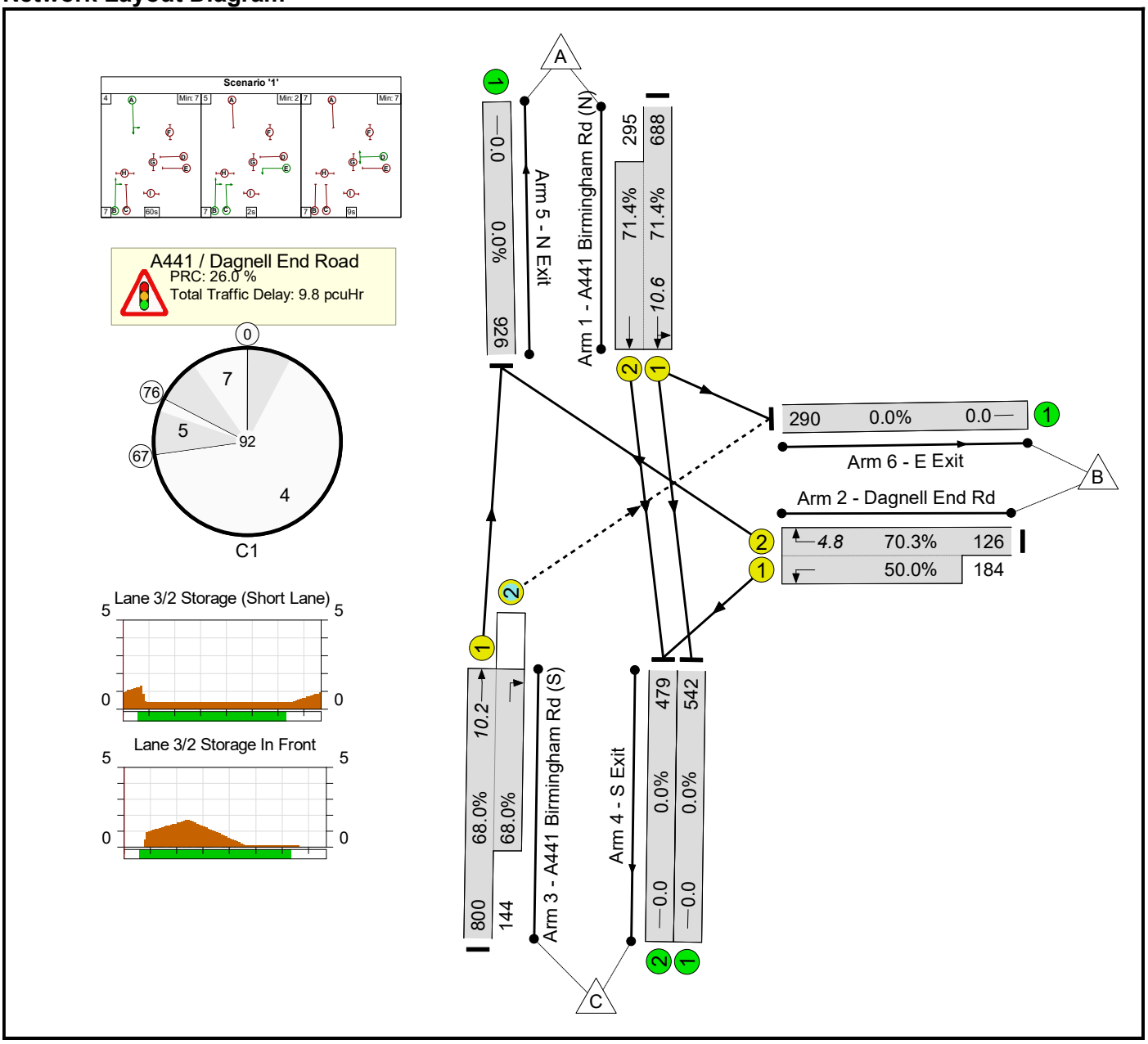
Stage	4	5	7
Duration	60	2	9
Change Point	0	67	76

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**	-	-		-	-	-	-	-	-	**71.4%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**71.4%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	60	-	983	1814:1878	963+413	71.4 : 71.4%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	9:18	9	310	1650:1852	179+368	70.3 : 50.0%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	69	4	944	1726:1679	1176+212	68.0 : 68.0%
4/1	S Exit	U	N/A	N/A	-		-	-	-	542	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	479	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	926	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	290	Inf	Inf	0.0%

Full Input Data And Results

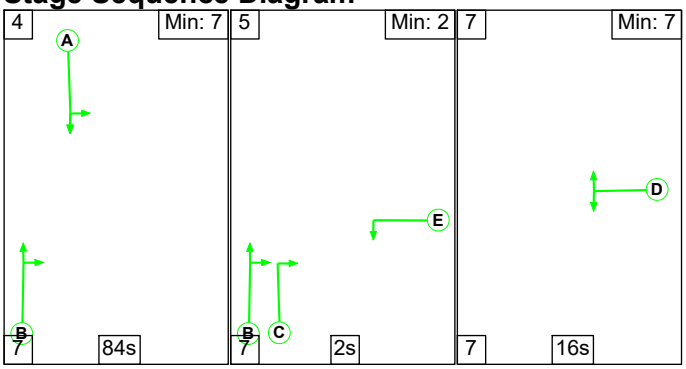
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**128**	**11**	**5**	**6.3**	**3.0**	**0.5**	**9.8**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**128**	**11**	**5**	**6.3**	**3.0**	**0.5**	**9.8**	**-**	**-**	**-**	**-**
1/1+1/2	983	983	-	-	-	2.1	1.2	-	3.4 (2.5+0.9)	12.3 (13.0:10.8)	9.4	1.2	10.6
2/2+2/1	310	310	-	-	-	3.0	0.6	-	3.7 (1.6+2.0)	42.7 (47.1:39.7)	4.1	0.6	4.8
3/1+3/2	944	944	128	11	5	1.2	1.1	0.5	2.7 (2.0+0.7)	10.4 (8.9:18.3)	9.1	1.1	10.2
4/1	542	542	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	479	479	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	926	926	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	290	290	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 26.0 Total Delay for Signalled Lanes (pcuHr): 9.76 Cycle Time (s): 92
PRC Over All Lanes (%): 26.0 Total Delay Over All Lanes(pcuHr): 9.76

Full Input Data And Results

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

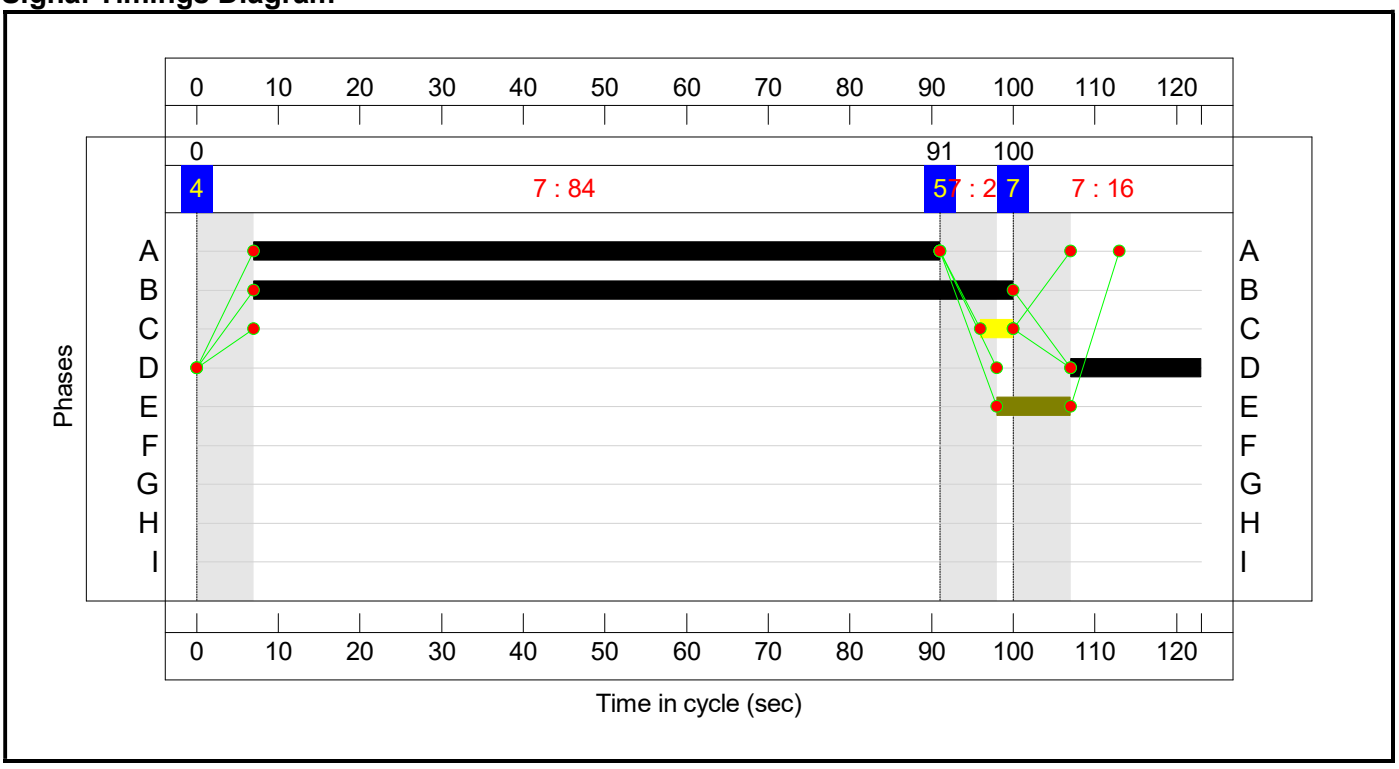
Stage Sequence Diagram



Stage Timings

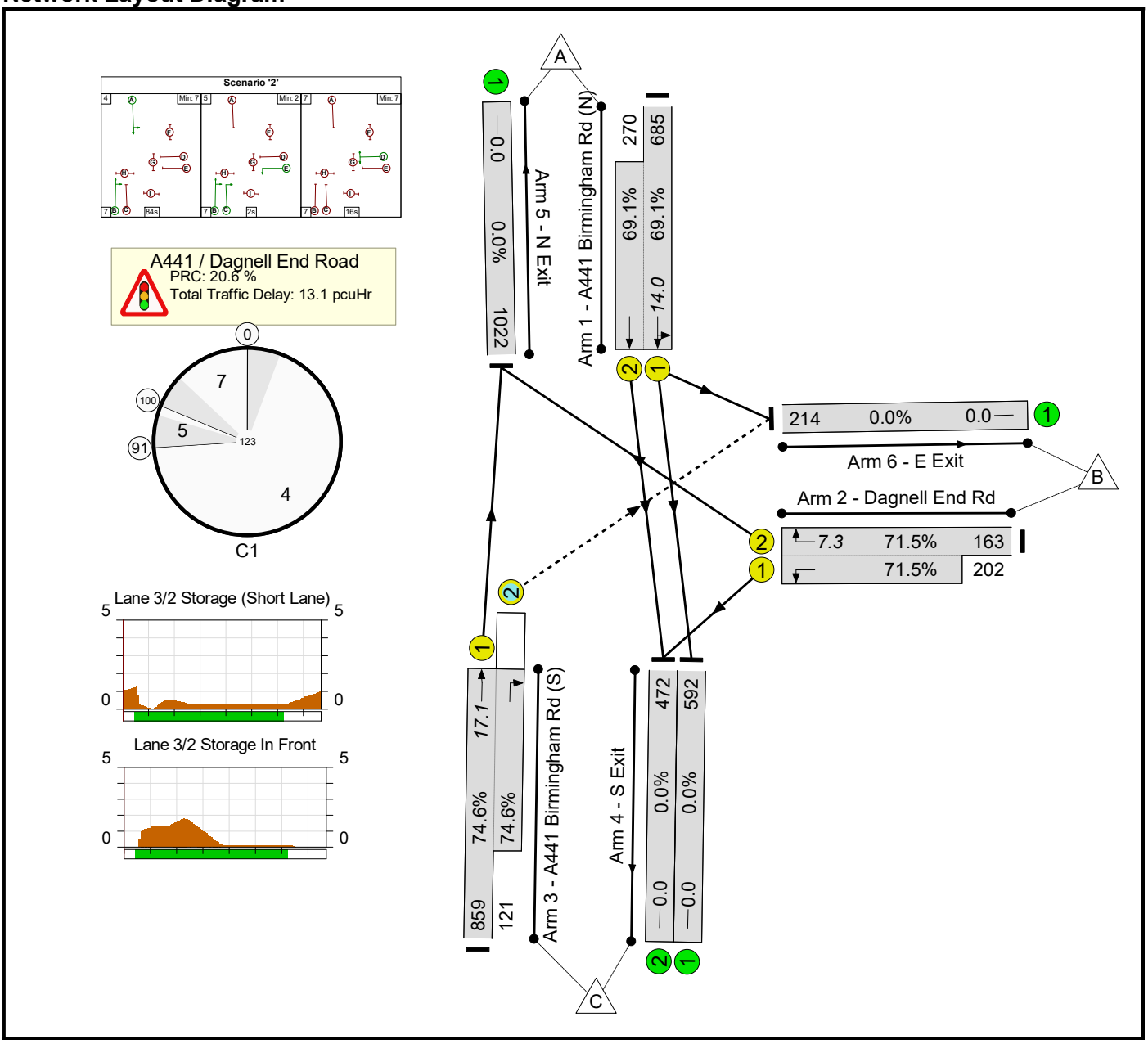
Stage	4	5	7
Duration	84	2	16
Change Point	0	91	100

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**	-	-		-	-	-	-	-	-	**74.6%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**74.6%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	84	-	955	1830:1878	991+391	69.1 : 69.1%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	16:25	9	365	1650:1852	228+283	71.5 : 71.5%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	93	4	980	1641:1800	1151+162	74.6 : 74.6%
4/1	S Exit	U	N/A	N/A	-		-	-	-	592	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	472	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1022	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	214	Inf	Inf	0.0%

Full Input Data And Results

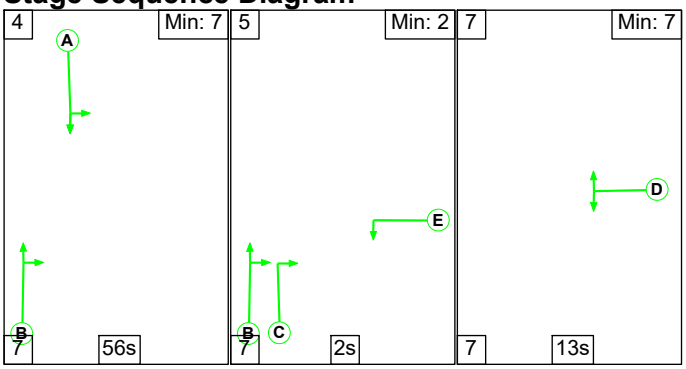
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**111**	**7**	**3**	**8.9**	**3.8**	**0.4**	**13.1**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**111**	**7**	**3**	**8.9**	**3.8**	**0.4**	**13.1**	**-**	**-**	**-**	**-**
1/1+1/2	955	955	-	-	-	2.3	1.1	-	3.4 (2.6+0.8)	13.0 (13.7:11.3)	12.9	1.1	14.0
2/2+2/1	365	365	-	-	-	4.7	1.2	-	5.9 (2.8+3.1)	58.5 (62.8:55.1)	6.1	1.2	7.3
3/1+3/2	980	980	111	7	3	1.9	1.5	0.4	3.8 (3.0+0.8)	13.8 (12.6:22.4)	15.7	1.5	17.1
4/1	592	592	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	472	472	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1022	1022	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	214	214	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 20.6 Total Delay for Signalled Lanes (pcuHr): 13.14 Cycle Time (s): 123
PRC Over All Lanes (%): 20.6 Total Delay Over All Lanes(pcuHr): 13.14

Full Input Data And Results

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

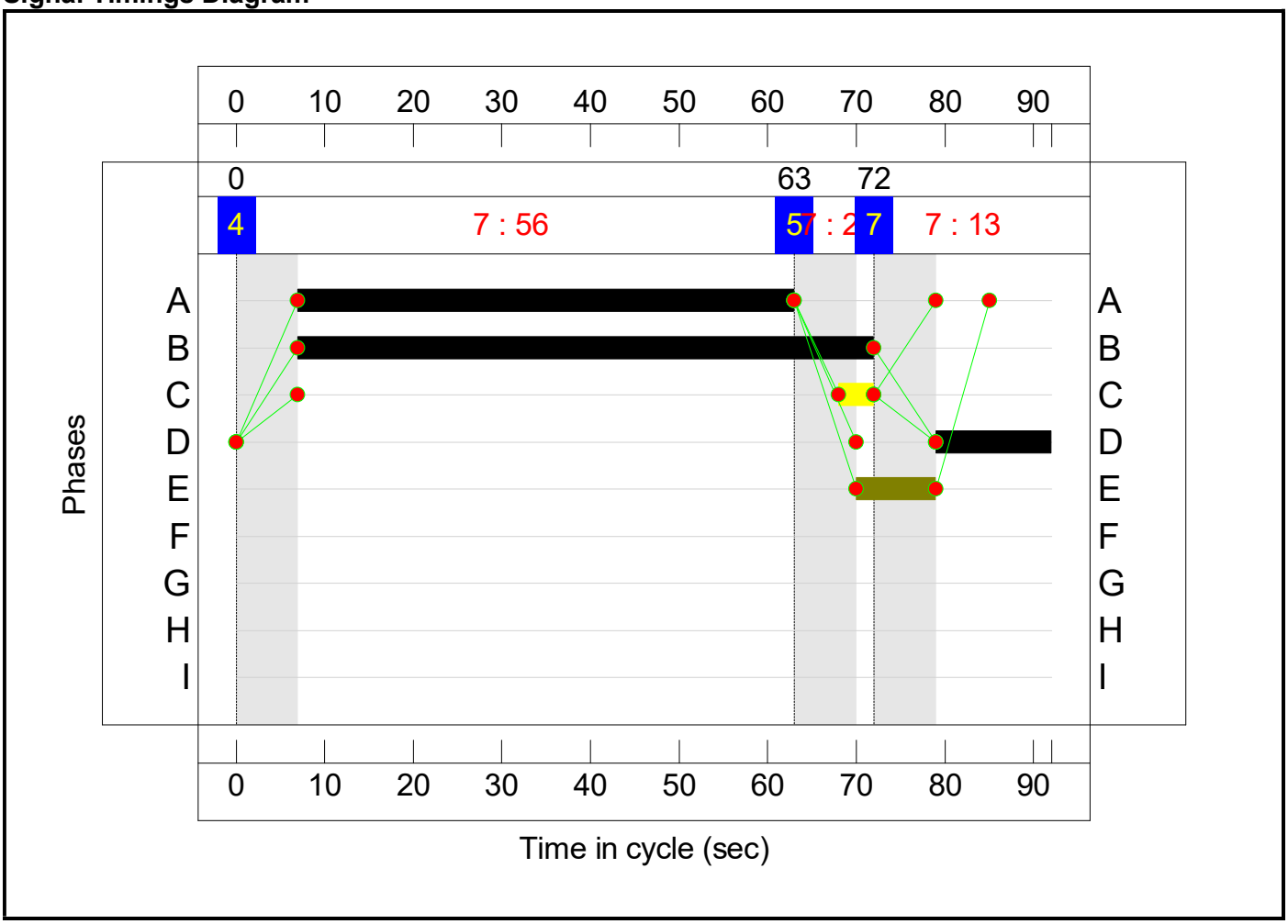
Stage Sequence Diagram



Stage Timings

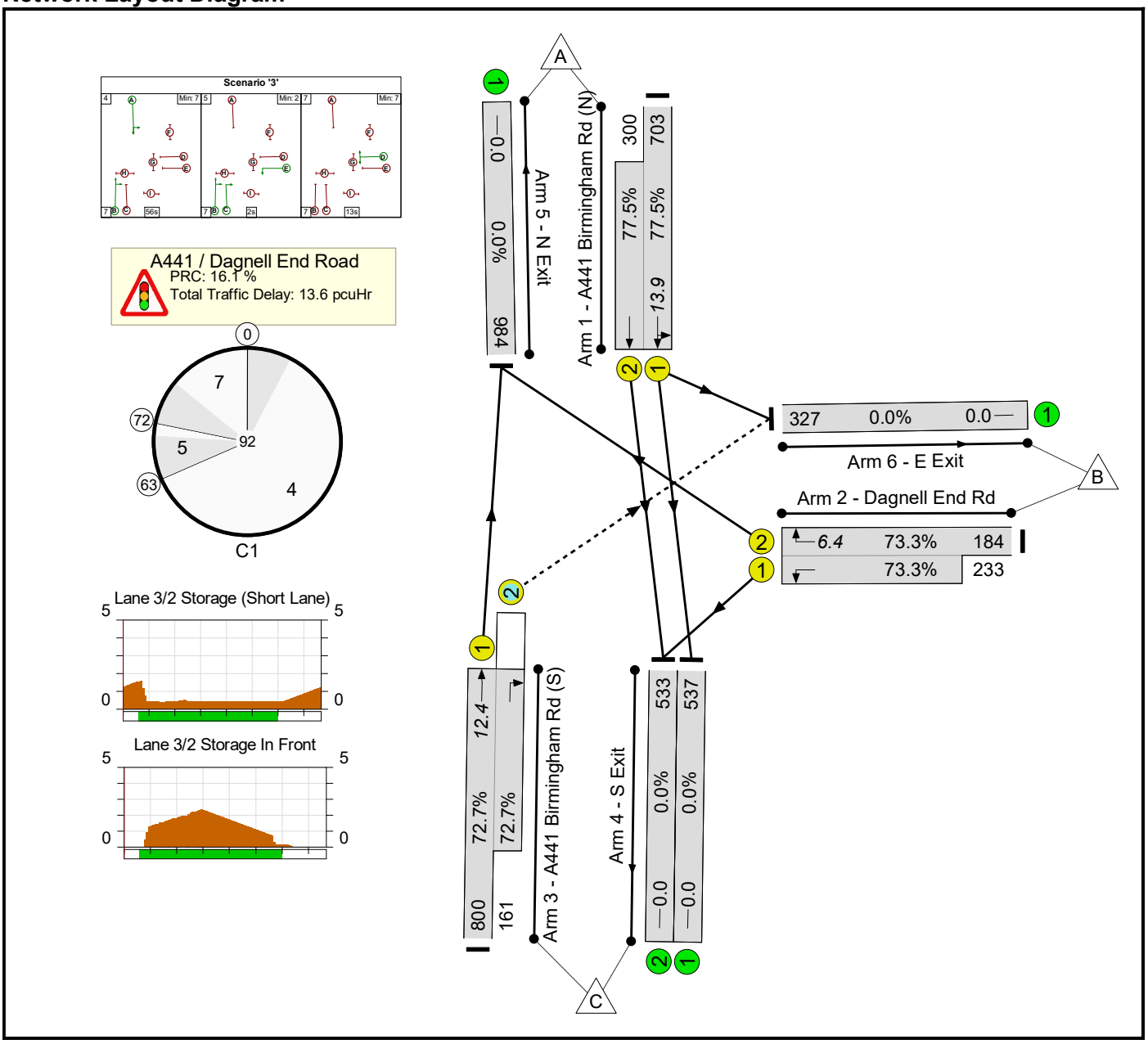
Stage	4	5	7
Duration	56	2	13
Change Point	0	63	72

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**	-	-		-	-	-	-	-	-	**77.5%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**77.5%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	56	-	1003	1809:1878	907+387	77.5 : 77.5%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	13:22	9	417	1650:1852	251+318	73.3 : 73.3%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	65	4	961	1726:1679	1100+221	72.7 : 72.7%
4/1	S Exit	U	N/A	N/A	-		-	-	-	537	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	533	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	984	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	327	Inf	Inf	0.0%

Full Input Data And Results

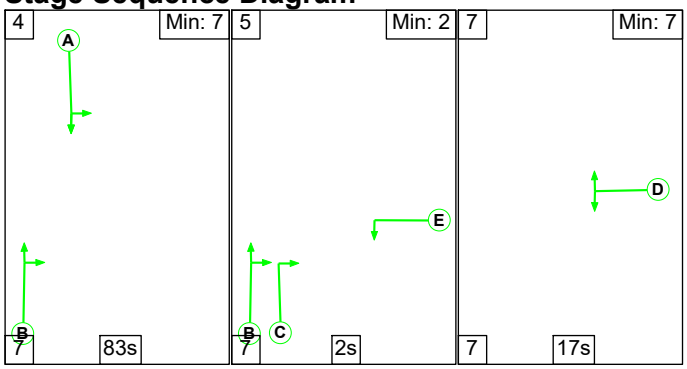
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**120**	**36**	**5**	**8.3**	**4.4**	**0.9**	**13.6**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**120**	**36**	**5**	**8.3**	**4.4**	**0.9**	**13.6**	**-**	**-**	**-**	**-**
1/1+1/2	1003	1003	-	-	-	2.8	1.7	-	4.5 (3.3+1.2)	16.2 (17.1:14.2)	12.2	1.7	13.9
2/2+2/1	417	417	-	-	-	3.8	1.3	-	5.2 (2.5+2.7)	44.6 (48.9:41.2)	5.0	1.3	6.4
3/1+3/2	961	961	120	36	5	1.7	1.3	0.9	4.0 (2.6+1.3)	14.8 (11.8:29.7)	11.0	1.3	12.4
4/1	537	537	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	533	533	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	984	984	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	327	327	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 16.1 Total Delay for Signalled Lanes (pcuHr): 13.63 Cycle Time (s): 92
PRC Over All Lanes (%): 16.1 Total Delay Over All Lanes(pcuHr): 13.63

Full Input Data And Results

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

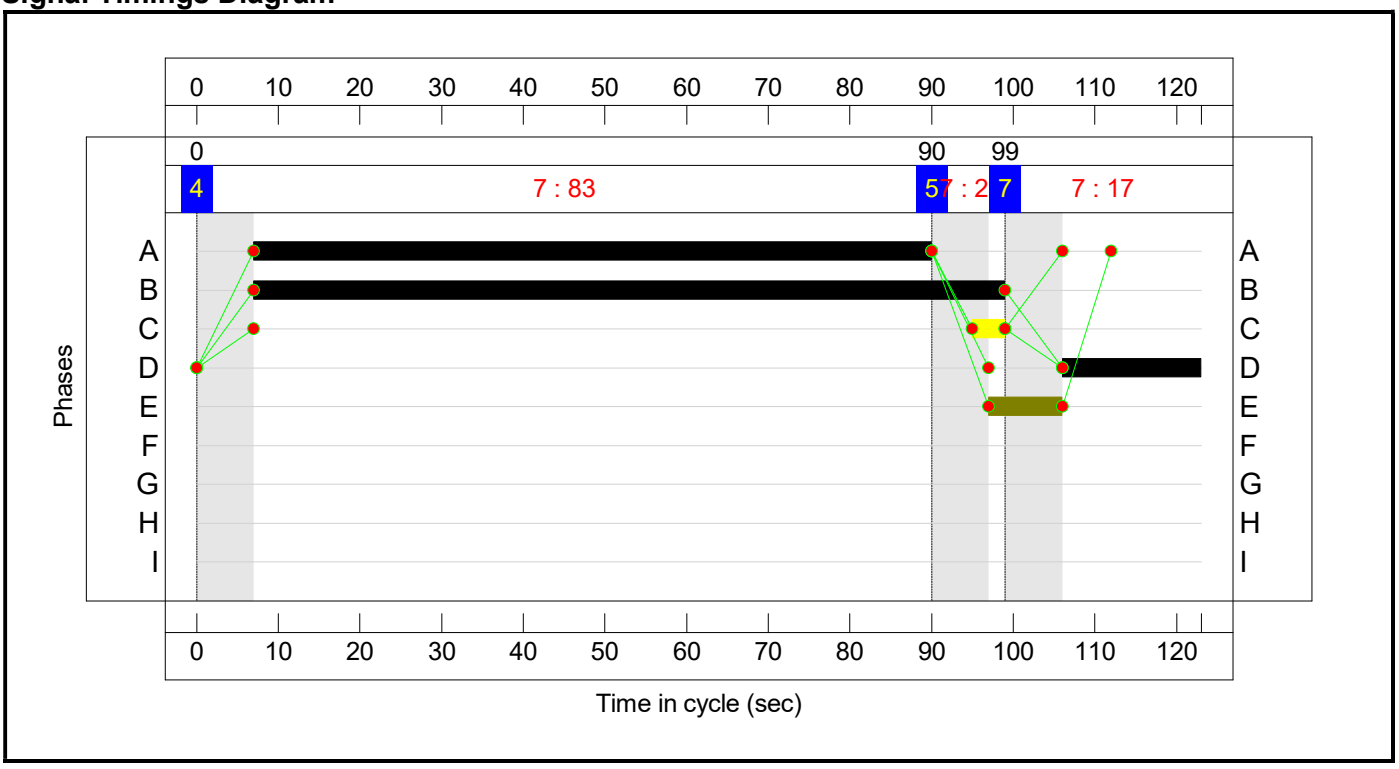
Stage Sequence Diagram



Stage Timings

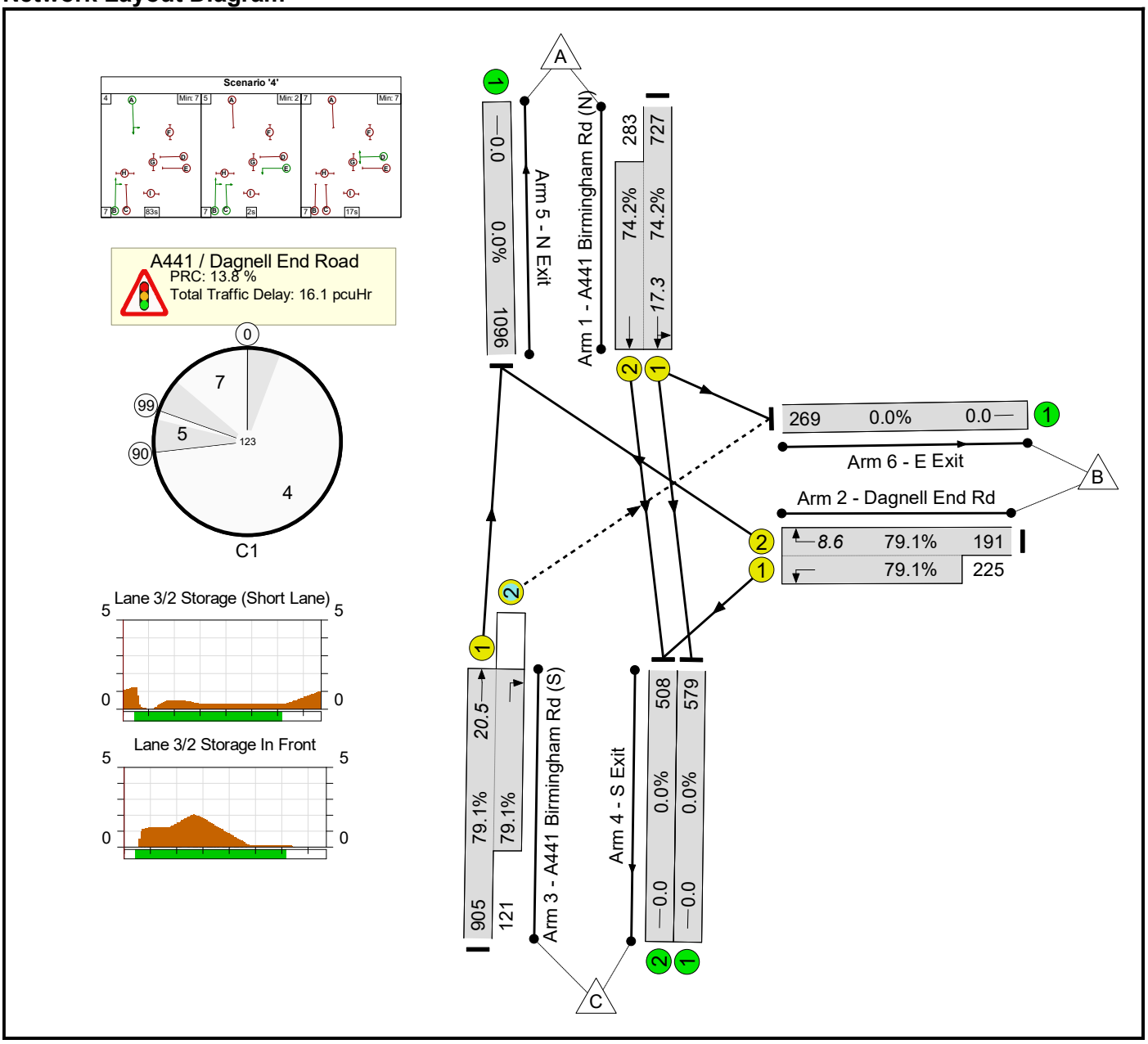
Stage	4	5	7
Duration	83	2	17
Change Point	0	90	99

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**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**79.1%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**79.1%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	83	-	1010	1816:1878	979+381	74.2 : 74.2%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	17:26	9	416	1650:1852	241+284	79.1 : 79.1%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	92	4	1026	1641:1800	1144+153	79.1 : 79.1%
4/1	S Exit	U	N/A	N/A	-		-	-	-	579	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	508	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1096	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	269	Inf	Inf	0.0%

Full Input Data And Results

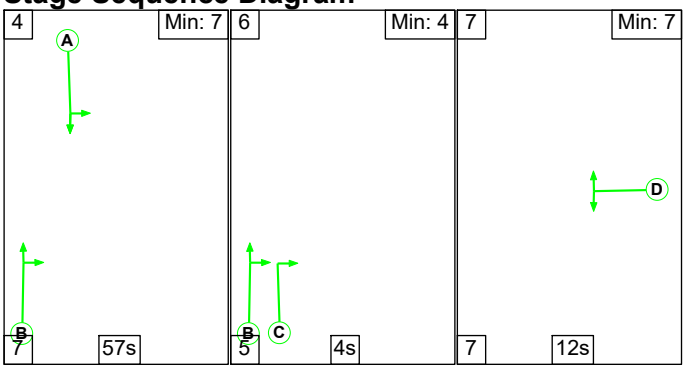
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**111**	**7**	**3**	**10.4**	**5.1**	**0.6**	**16.1**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**111**	**7**	**3**	**10.4**	**5.1**	**0.6**	**16.1**	**-**	**-**	**-**	**-**
1/1+1/2	1010	1010	-	-	-	2.8	1.4	-	4.2 (3.2+1.0)	15.0 (15.6:13.2)	15.9	1.4	17.3
2/2+2/1	416	416	-	-	-	5.4	1.8	-	7.2 (3.5+3.7)	62.2 (66.5:58.5)	6.8	1.8	8.6
3/1+3/2	1026	1026	111	7	3	2.3	1.9	0.6	4.7 (3.7+1.0)	16.6 (14.8:30.1)	18.7	1.9	20.5
4/1	579	579	-	-	-	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	1096	1096	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	269	269	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 13.8 Total Delay for Signalled Lanes (pcuHr): 16.12 Cycle Time (s): 123
PRC Over All Lanes (%): 13.8 Total Delay Over All Lanes(pcuHr): 16.12

Full Input Data And Results

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

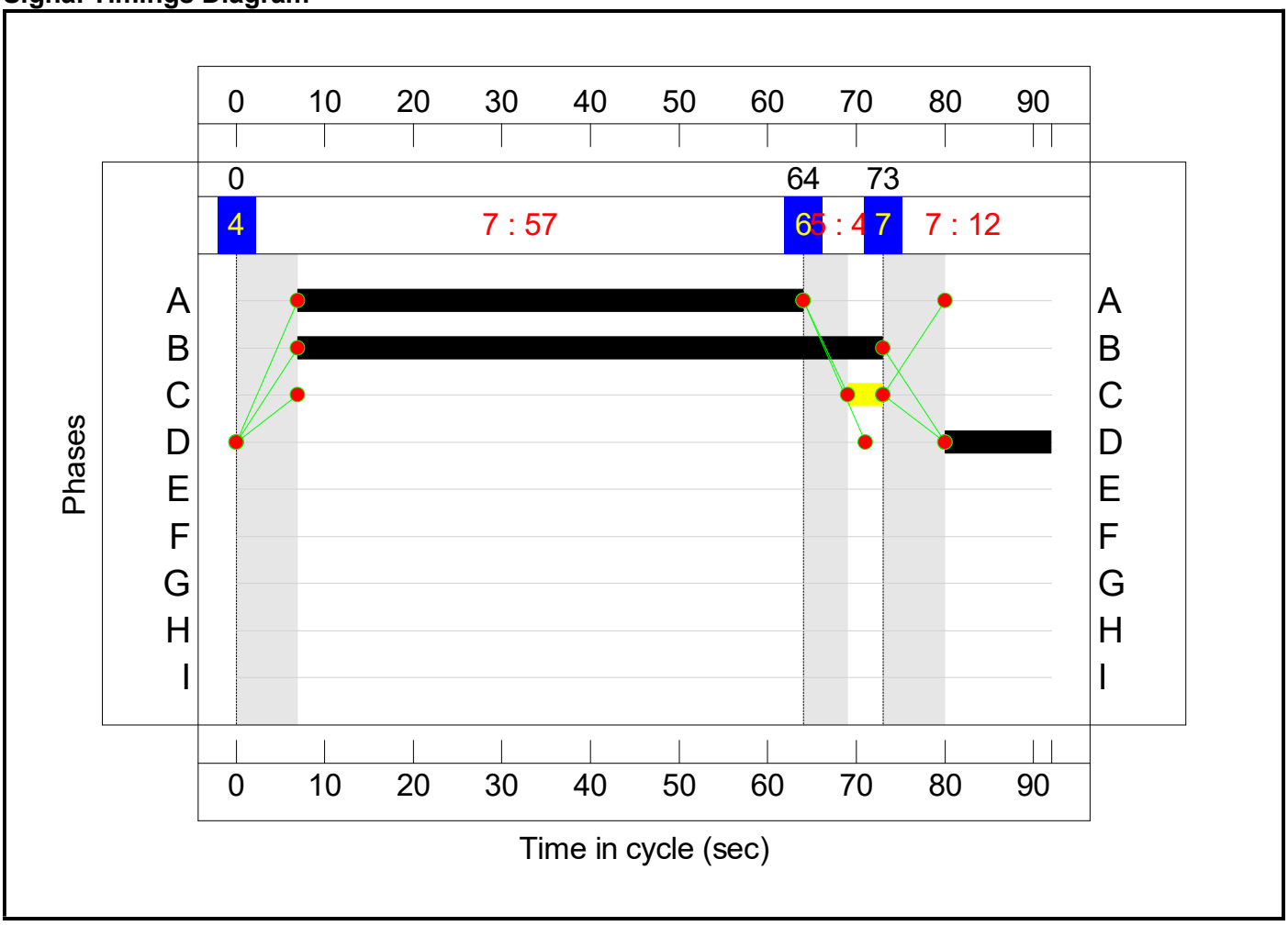
Stage Sequence Diagram



Stage Timings

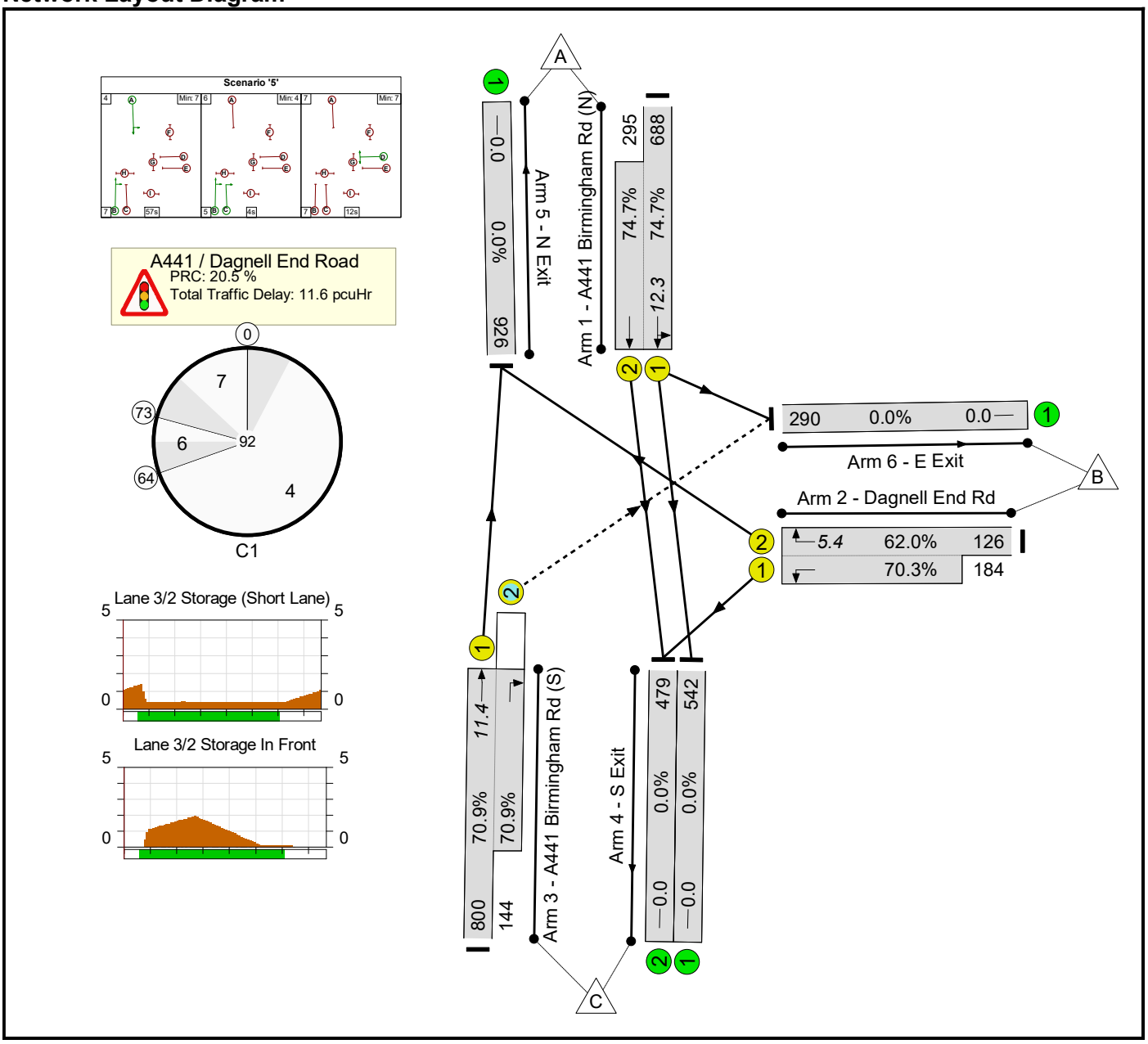
Stage	4	6	7
Duration	57	4	12
Change Point	0	64	73

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**	-	-		-	-	-	-	-	-	**74.7%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**74.7%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	57	-	983	1814:1878	921+395	74.7 : 74.7%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	12	0	310	1650:1852	203+262	62.0 : 70.3%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	66	4	944	1726:1679	1129+203	70.9 : 70.9%
4/1	S Exit	U	N/A	N/A	-		-	-	-	542	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	479	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	926	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	290	Inf	Inf	0.0%

Full Input Data And Results

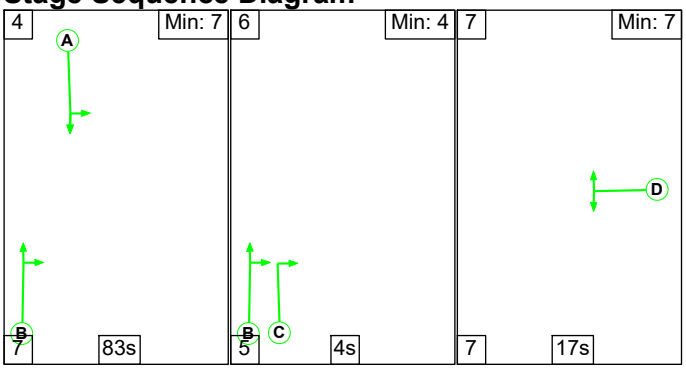
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**128**	**11**	**5**	**7.3**	**3.7**	**0.6**	**11.6**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**128**	**11**	**5**	**7.3**	**3.7**	**0.6**	**11.6**	**-**	**-**	**-**	**-**
1/1+1/2	983	983	-	-	-	2.6	1.5	-	4.0 (3.0+1.1)	14.7 (15.5:12.9)	10.8	1.5	12.3
2/2+2/1	310	310	-	-	-	3.2	1.0	-	4.2 (1.7+2.5)	48.8 (48.2:49.1)	4.4	1.0	5.4
3/1+3/2	944	944	128	11	5	1.6	1.2	0.6	3.4 (2.4+0.9)	12.9 (10.9:23.5)	10.2	1.2	11.4
4/1	542	542	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	479	479	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	926	926	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	290	290	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 20.5 Total Delay for Signalled Lanes (pcuHr): 11.59 Cycle Time (s): 92
PRC Over All Lanes (%): 20.5 Total Delay Over All Lanes(pcuHr): 11.59

Full Input Data And Results

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

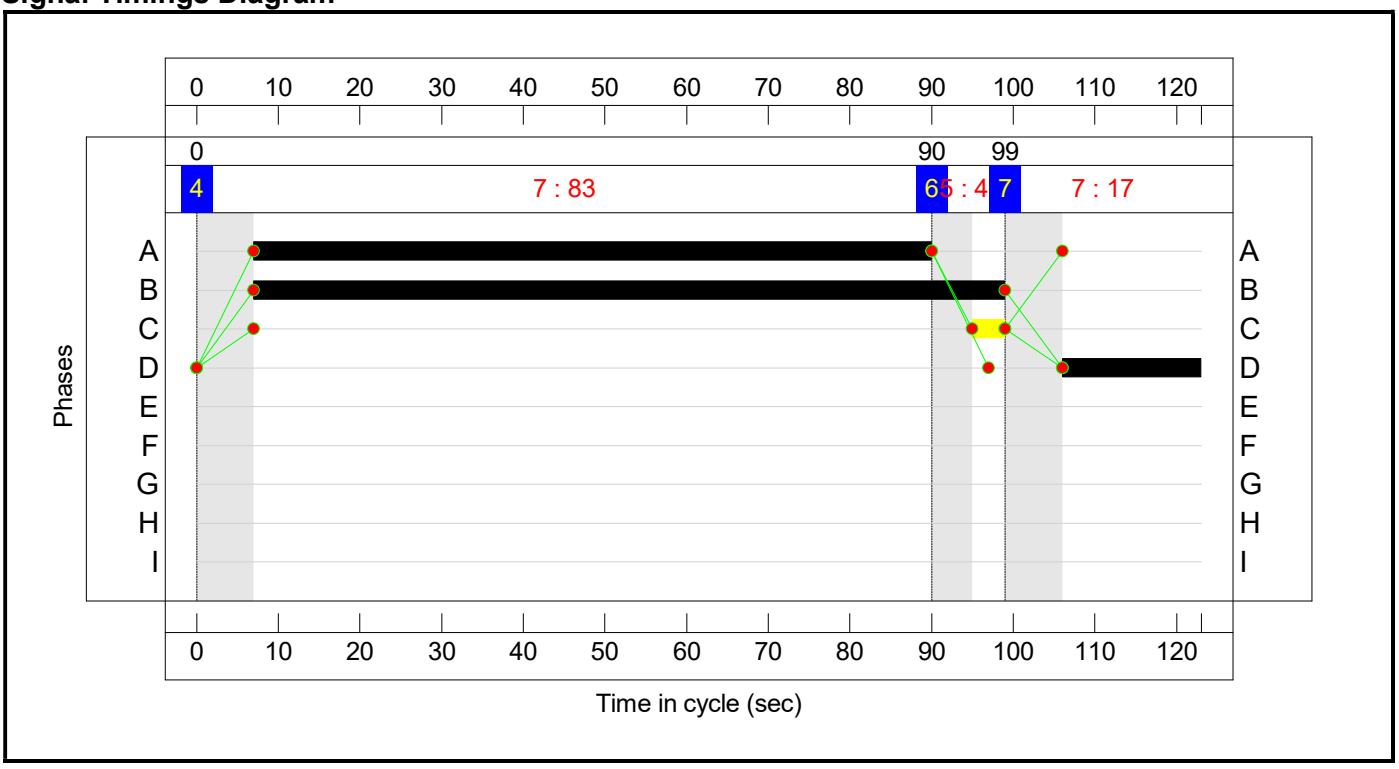
Stage Sequence Diagram



Stage Timings

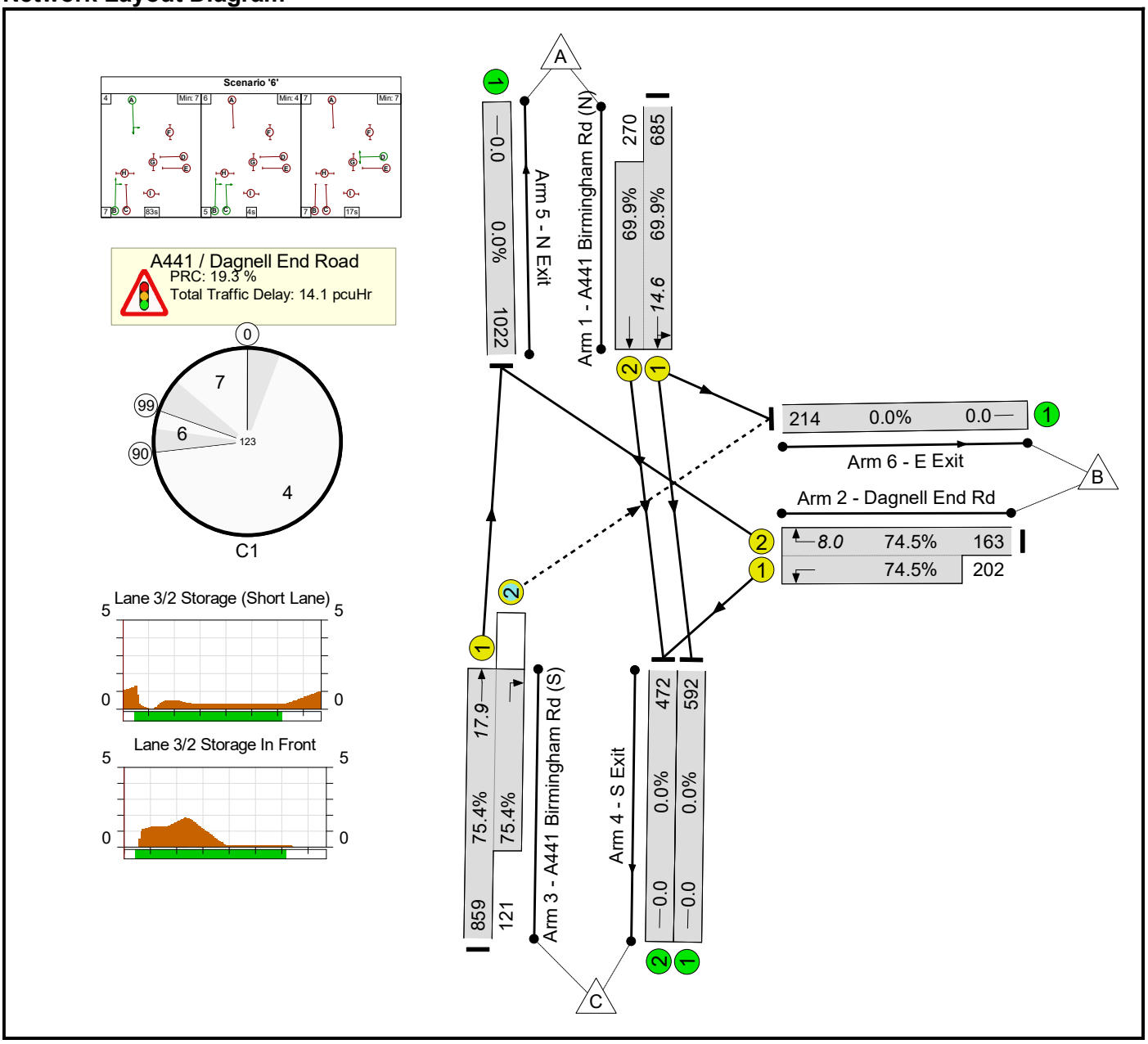
Stage	4	6	7
Duration	83	4	17
Change Point	0	90	99

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**	-	-		-	-	-	-	-	-	**75.4%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**75.4%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	83	-	955	1830:1878	981+387	69.9 : 69.9%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	17	0	365	1650:1852	219+271	74.5 : 74.5%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	92	4	980	1641:1800	1139+160	75.4 : 75.4%
4/1	S Exit	U	N/A	N/A	-		-	-	-	592	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	472	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1022	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	214	Inf	Inf	0.0%

Full Input Data And Results

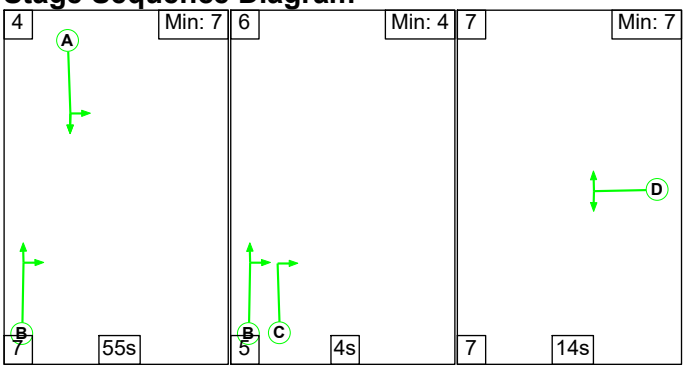
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**111**	**7**	**3**	**9.6**	**4.1**	**0.5**	**14.1**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**111**	**7**	**3**	**9.6**	**4.1**	**0.5**	**14.1**	**-**	**-**	**-**	**-**
1/1+1/2	955	955	-	-	-	2.5	1.2	-	3.6 (2.7+0.9)	13.7 (14.3:11.9)	13.4	1.2	14.6
2/2+2/1	365	365	-	-	-	5.1	1.4	-	6.5 (2.9+3.6)	64.2 (63.8:64.4)	6.6	1.4	8.0
3/1+3/2	980	980	111	7	3	2.0	1.5	0.5	4.0 (3.2+0.8)	14.6 (13.3:23.9)	16.3	1.5	17.9
4/1	592	592	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	472	472	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1022	1022	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	214	214	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 19.3 Total Delay for Signalled Lanes (pcuHr): 14.11 Cycle Time (s): 123
PRC Over All Lanes (%): 19.3 Total Delay Over All Lanes(pcuHr): 14.11

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)')

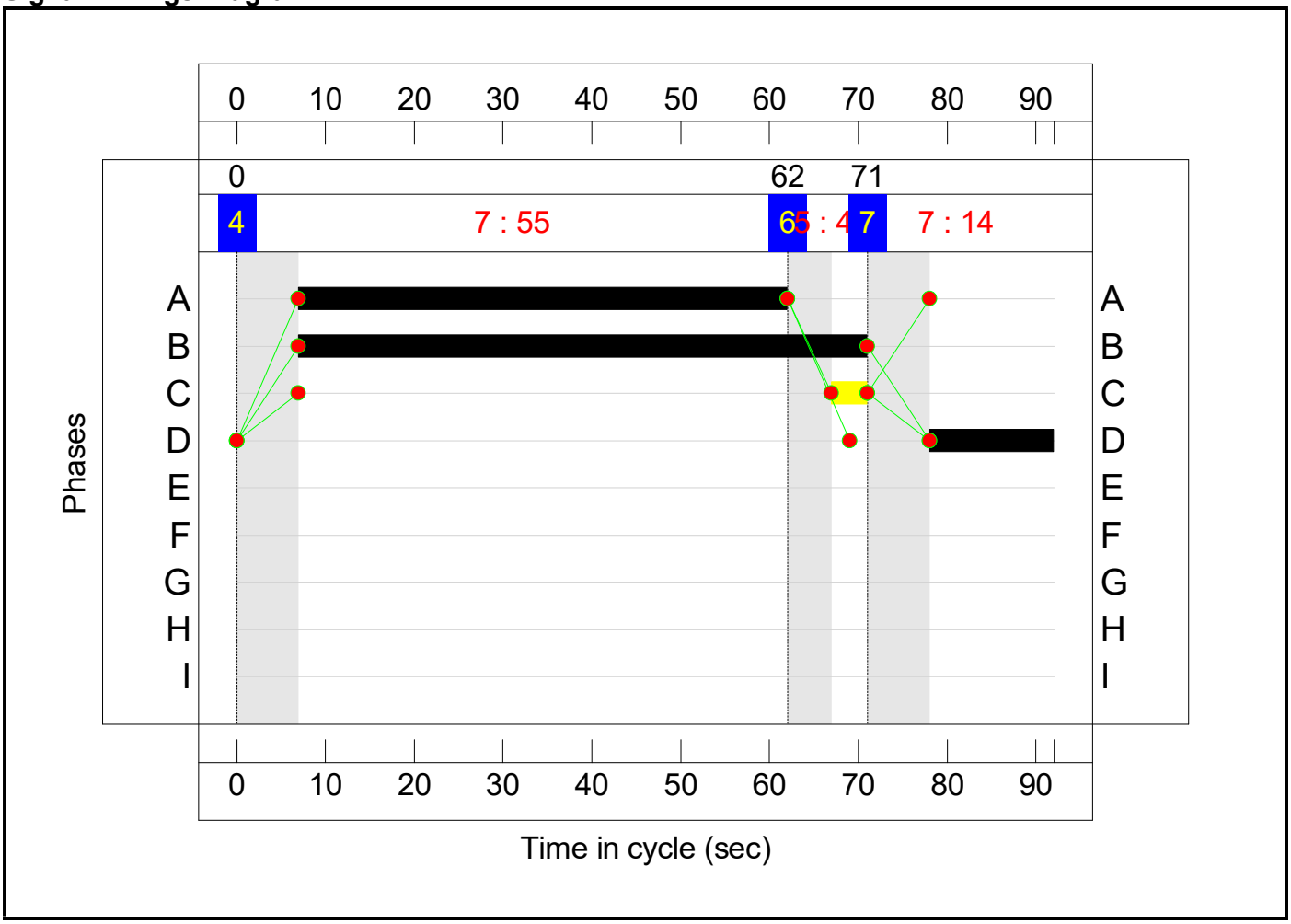
Stage Sequence Diagram



Stage Timings

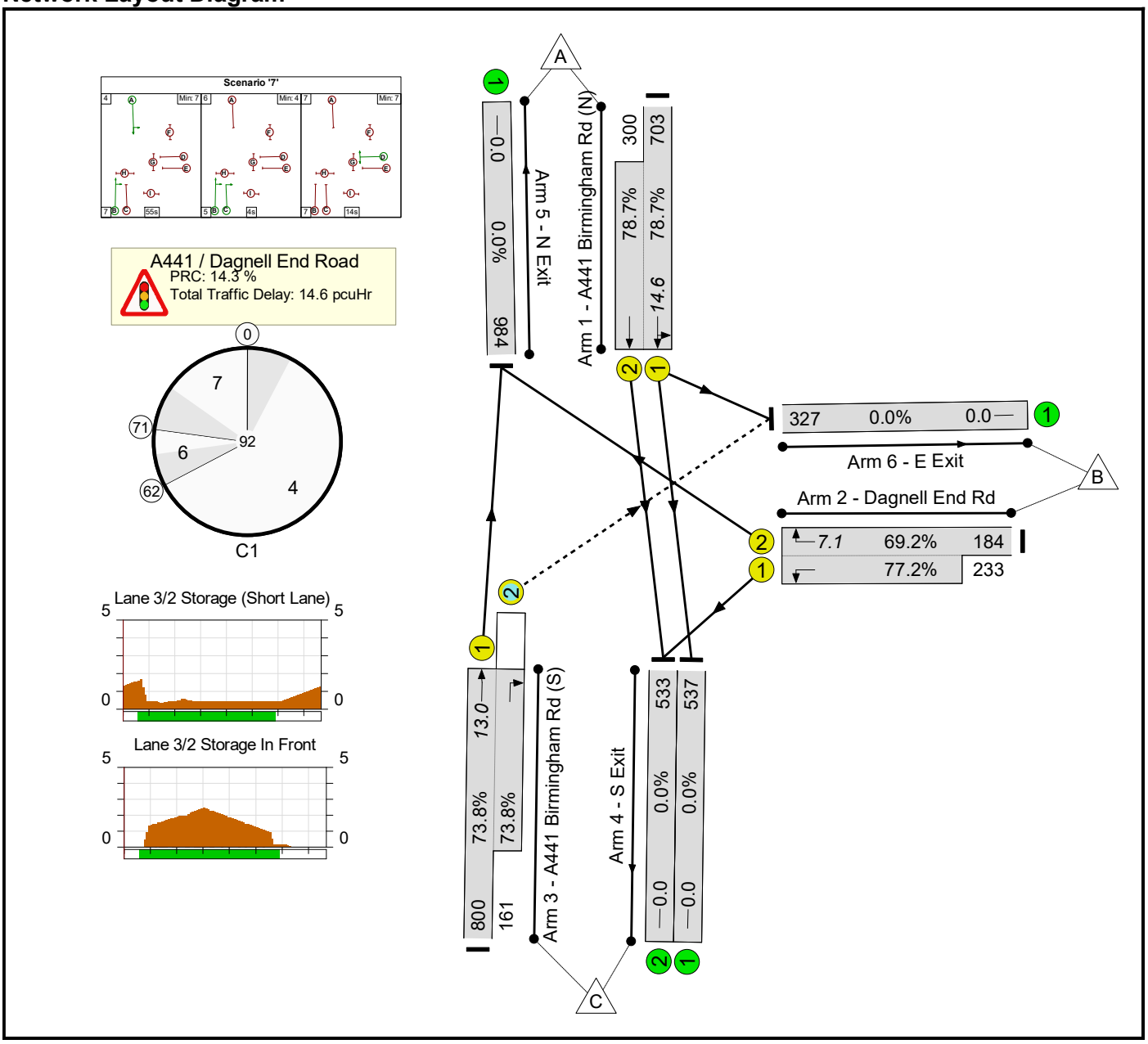
Stage	4	6	7
Duration	55	4	14
Change Point	0	62	71

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**	-	-		-	-	-	-	-	-	**78.7%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**78.7%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	55	-	1003	1809:1878	893+381	78.7 : 78.7%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	14	0	417	1650:1852	266+302	69.2 : 77.2%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	64	4	961	1726:1679	1084+218	73.8 : 73.8%
4/1	S Exit	U	N/A	N/A	-		-	-	-	537	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	533	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	984	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	327	Inf	Inf	0.0%

Full Input Data And Results

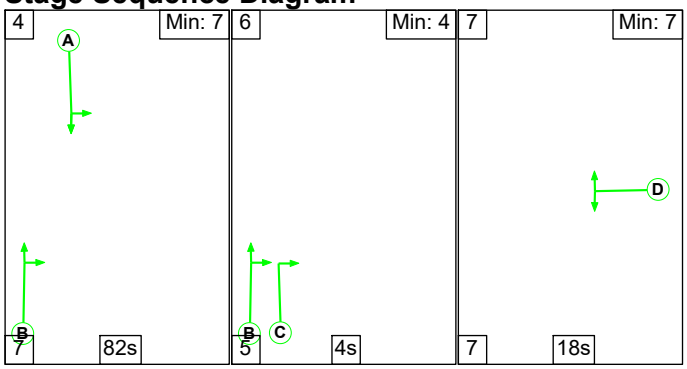
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**113**	**43**	**5**	**9.1**	**4.6**	**1.0**	**14.6**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**113**	**43**	**5**	**9.1**	**4.6**	**1.0**	**14.6**	**-**	**-**	**-**	**-**
1/1+1/2	1003	1003	-	-	-	3.0	1.8	-	4.8 (3.5+1.3)	17.3 (18.2:15.2)	12.8	1.8	14.6
2/2+2/1	417	417	-	-	-	4.2	1.4	-	5.6 (2.5+3.1)	48.3 (48.0:48.6)	5.7	1.4	7.1
3/1+3/2	961	961	113	43	5	1.8	1.4	1.0	4.2 (2.8+1.4)	15.8 (12.6:31.5)	11.6	1.4	13.0
4/1	537	537	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	533	533	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	984	984	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	327	327	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 14.3 Total Delay for Signalled Lanes (pcuHr): 14.62 Cycle Time (s): 92
PRC Over All Lanes (%): 14.3 Total Delay Over All Lanes(pcuHr): 14.62

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)')

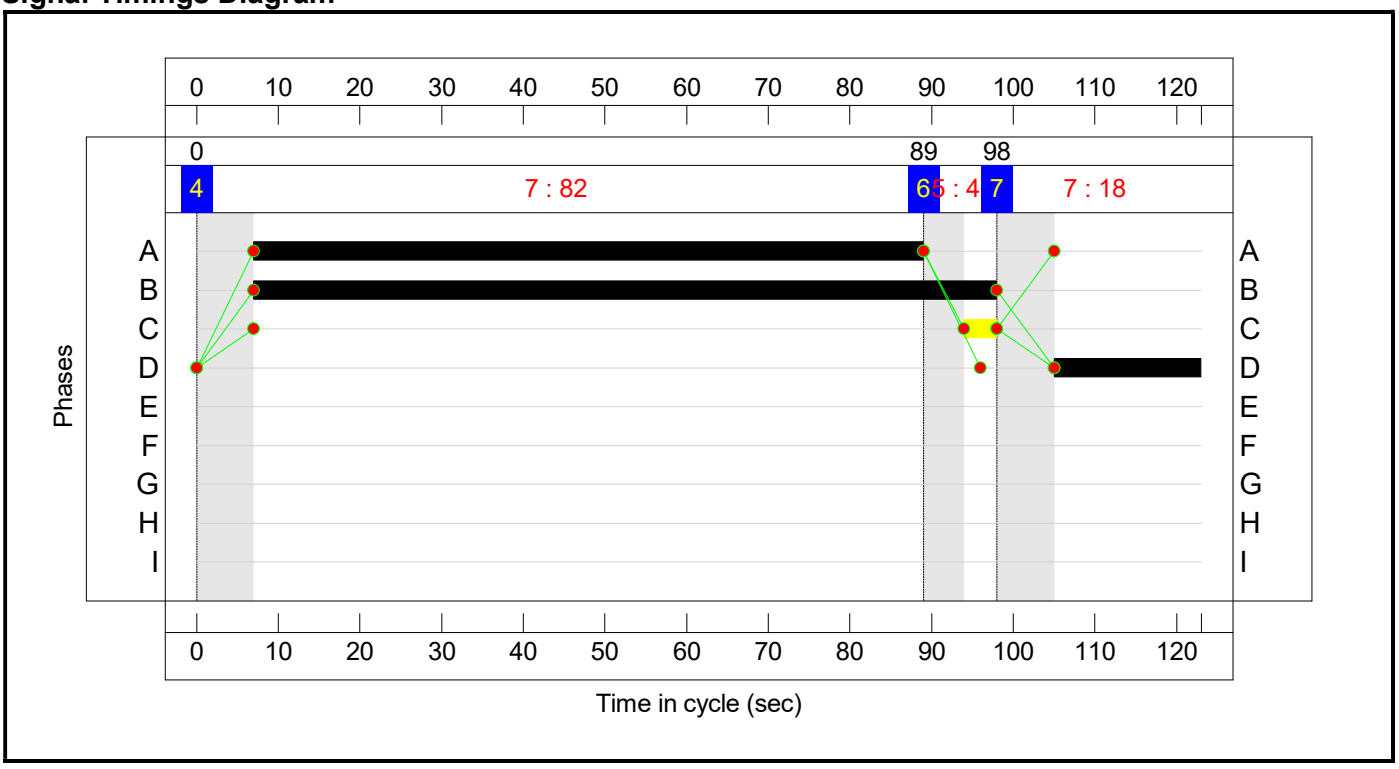
Stage Sequence Diagram



Stage Timings

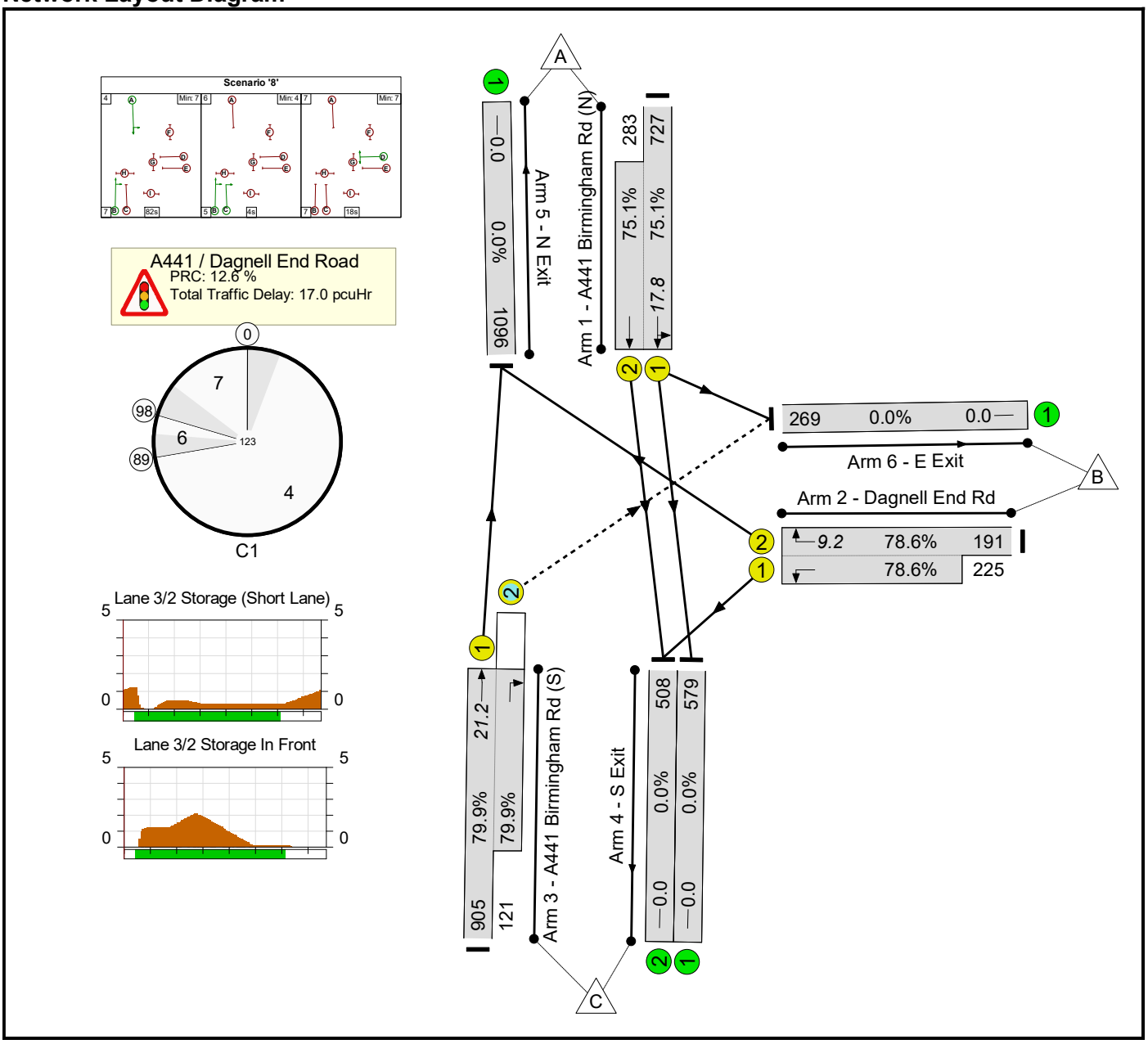
Stage	4	6	7
Duration	82	4	18
Change Point	0	89	98

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**	-	-		-	-	-	-	-	-	**79.9%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**79.9%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	82	-	1010	1816:1878	968+377	75.1 : 75.1%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	18	0	416	1650:1852	243+286	78.6 : 78.6%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	91	4	1026	1641:1800	1132+151	79.9 : 79.9%
4/1	S Exit	U	N/A	N/A	-		-	-	-	579	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	508	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1096	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	269	Inf	Inf	0.0%

Full Input Data And Results

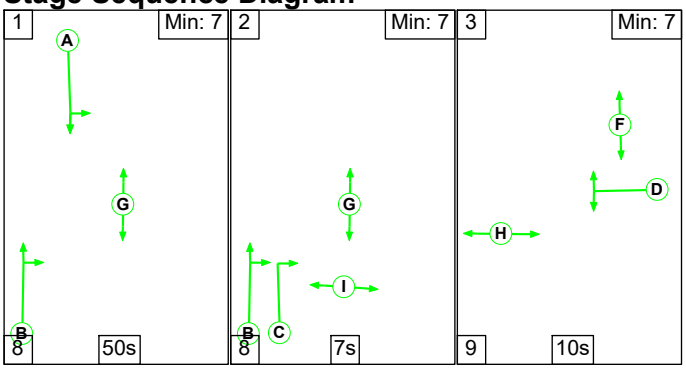
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**111**	**7**	**3**	**11.1**	**5.2**	**0.6**	**17.0**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**111**	**7**	**3**	**11.1**	**5.2**	**0.6**	**17.0**	**-**	**-**	**-**	**-**
1/1+1/2	1010	1010	-	-	-	2.9	1.5	-	4.4 (3.3+1.1)	15.8 (16.4:14.0)	16.3	1.5	17.8
2/2+2/1	416	416	-	-	-	5.8	1.8	-	7.6 (3.5+4.1)	65.4 (65.2:65.5)	7.4	1.8	9.2
3/1+3/2	1026	1026	111	7	3	2.4	2.0	0.6	5.0 (4.0+1.1)	17.7 (15.7:32.0)	19.2	2.0	21.2
4/1	579	579	-	-	-	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	1096	1096	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	269	269	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 12.6 Total Delay for Signalled Lanes (pcuHr): 17.01 Cycle Time (s): 123
PRC Over All Lanes (%): 12.6 Total Delay Over All Lanes(pcuHr): 17.01

Full Input Data And Results

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

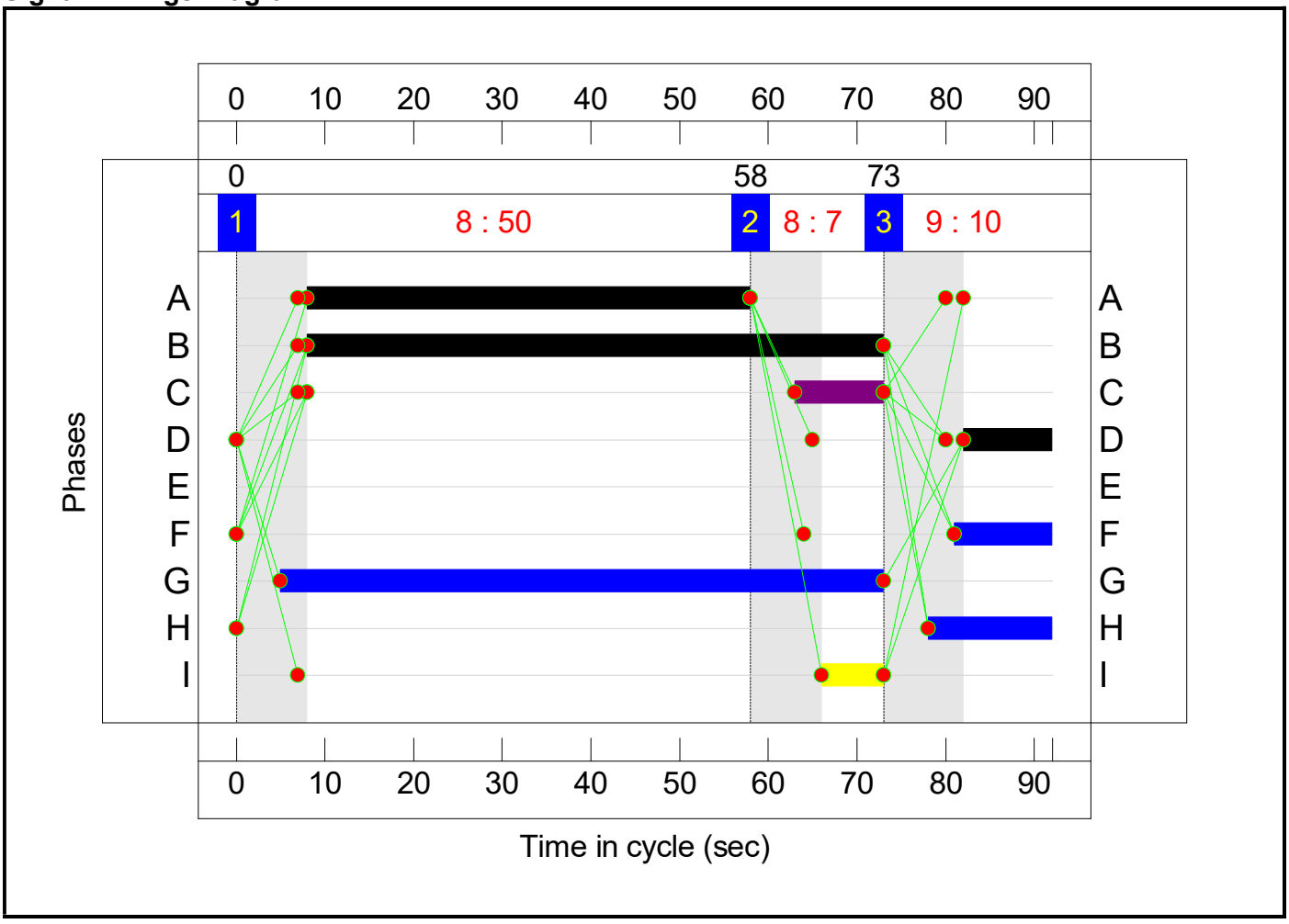
Stage Sequence Diagram



Stage Timings

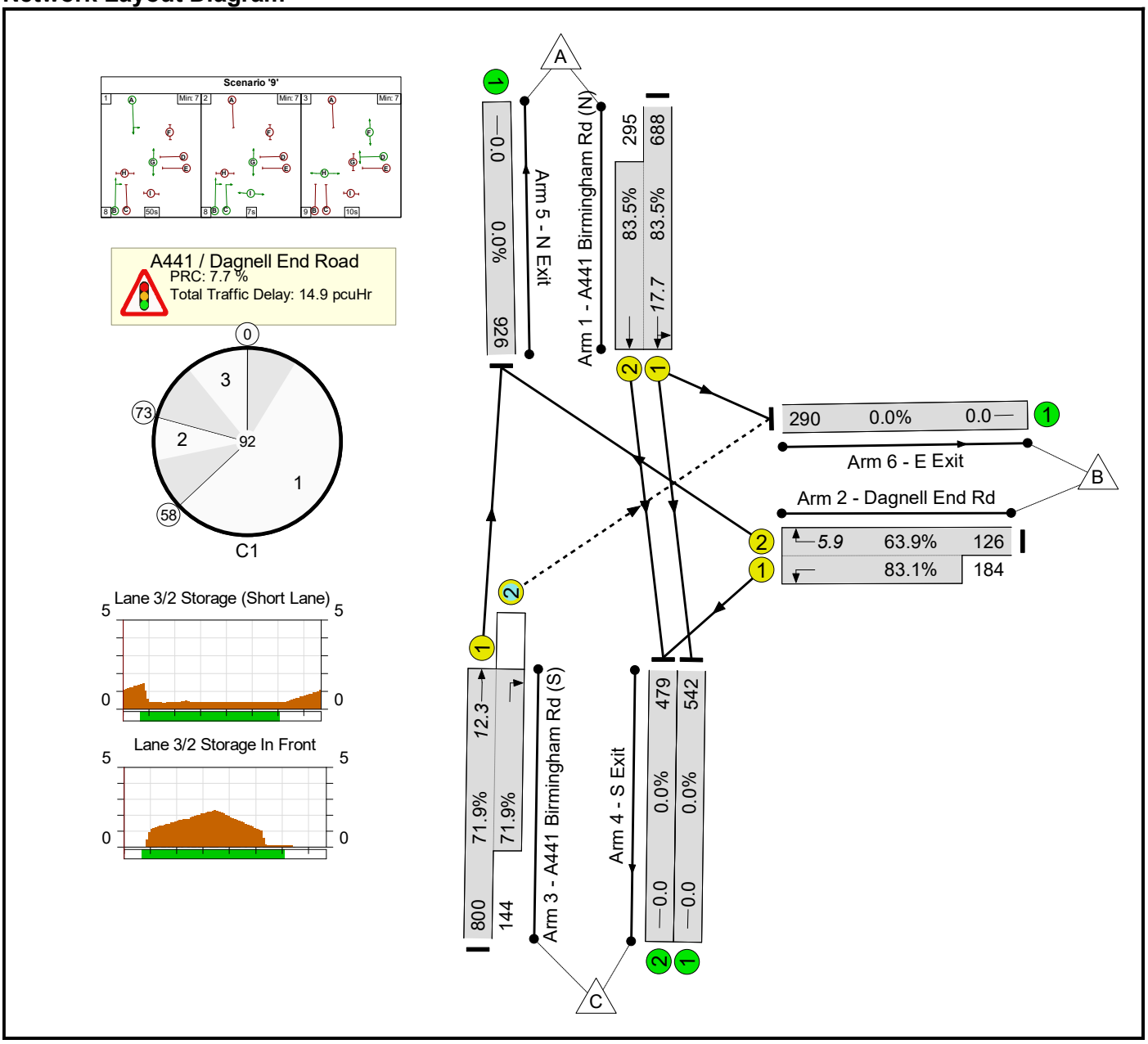
Stage	1	2	3
Duration	50	7	10
Change Point	0	58	73

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**	-	-		-	-	-	-	-	-	**83.5%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**83.5%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	50	-	983	1814:1878	824+353	83.5 : 83.5%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	10	0	310	1650:1852	197+221	63.9 : 83.1%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	65	10	944	1726:1679	1113+200	71.9 : 71.9%
4/1	S Exit	U	N/A	N/A	-		-	-	-	542	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	479	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	926	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	290	Inf	Inf	0.0%

Full Input Data And Results

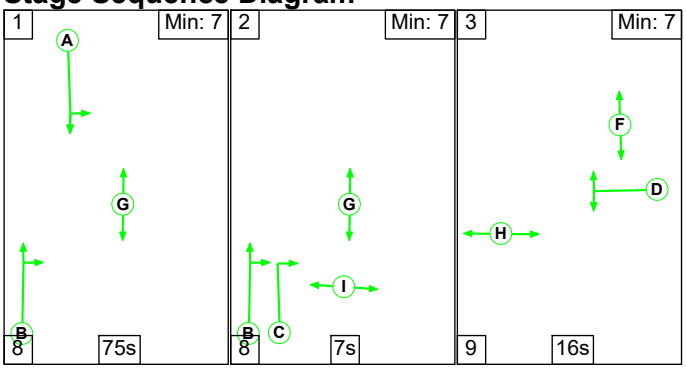
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**84**	**56**	**5**	**8.9**	**5.1**	**0.9**	**14.9**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**84**	**56**	**5**	**8.9**	**5.1**	**0.9**	**14.9**	**-**	**-**	**-**	**-**
1/1+1/2	983	983	-	-	-	3.8	2.5	-	6.3 (4.6+1.7)	23.1 (24.0:20.8)	15.2	2.5	17.7
2/2+2/1	310	310	-	-	-	3.4	1.4	-	4.8 (1.9+2.8)	55.3 (54.8:55.7)	4.5	1.4	5.9
3/1+3/2	944	944	84	56	5	1.7	1.3	0.9	3.8 (2.6+1.2)	14.5 (11.7:30.4)	11.0	1.3	12.3
4/1	542	542	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	479	479	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	926	926	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	290	290	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 7.7 Total Delay for Signalled Lanes (pcuHr): 14.88 Cycle Time (s): 92
PRC Over All Lanes (%): 7.7 Total Delay Over All Lanes(pcuHr): 14.88

Full Input Data And Results

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

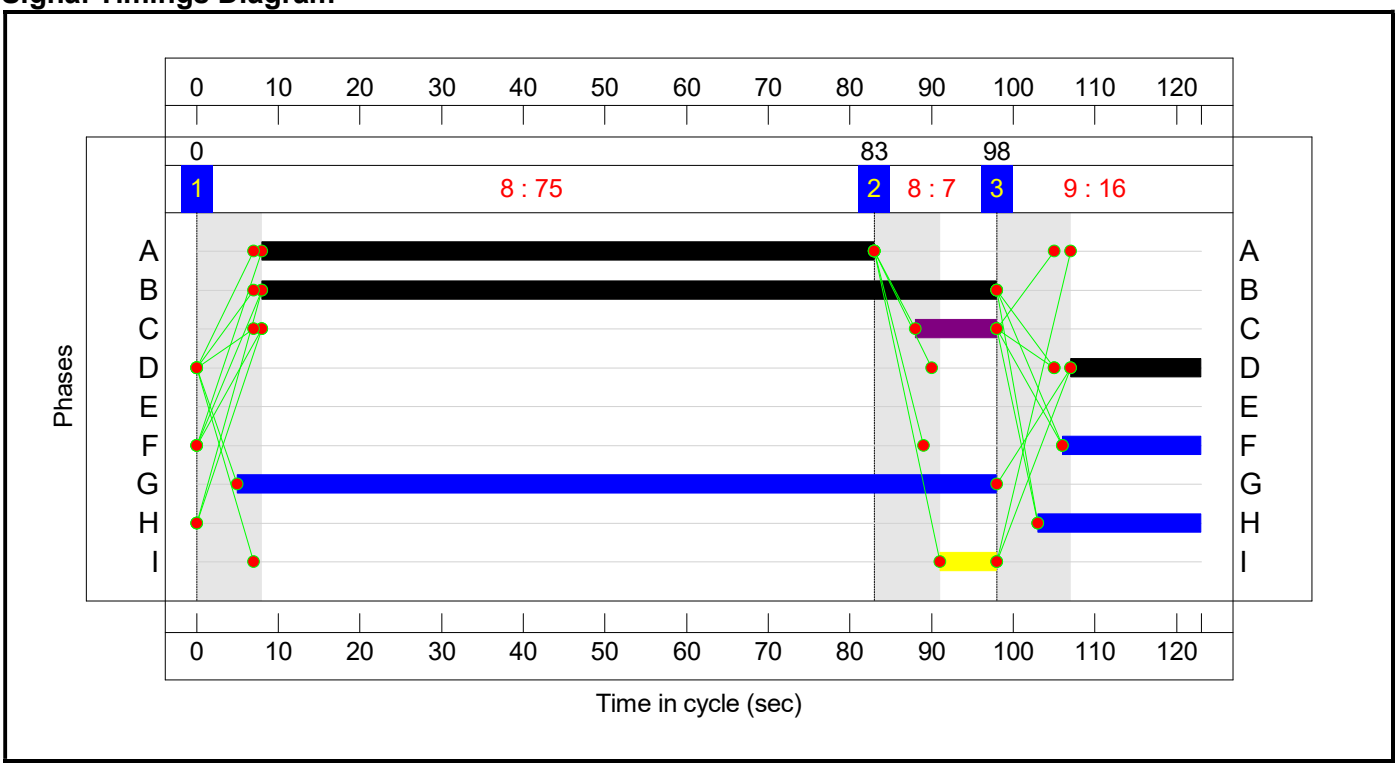
Stage Sequence Diagram



Stage Timings

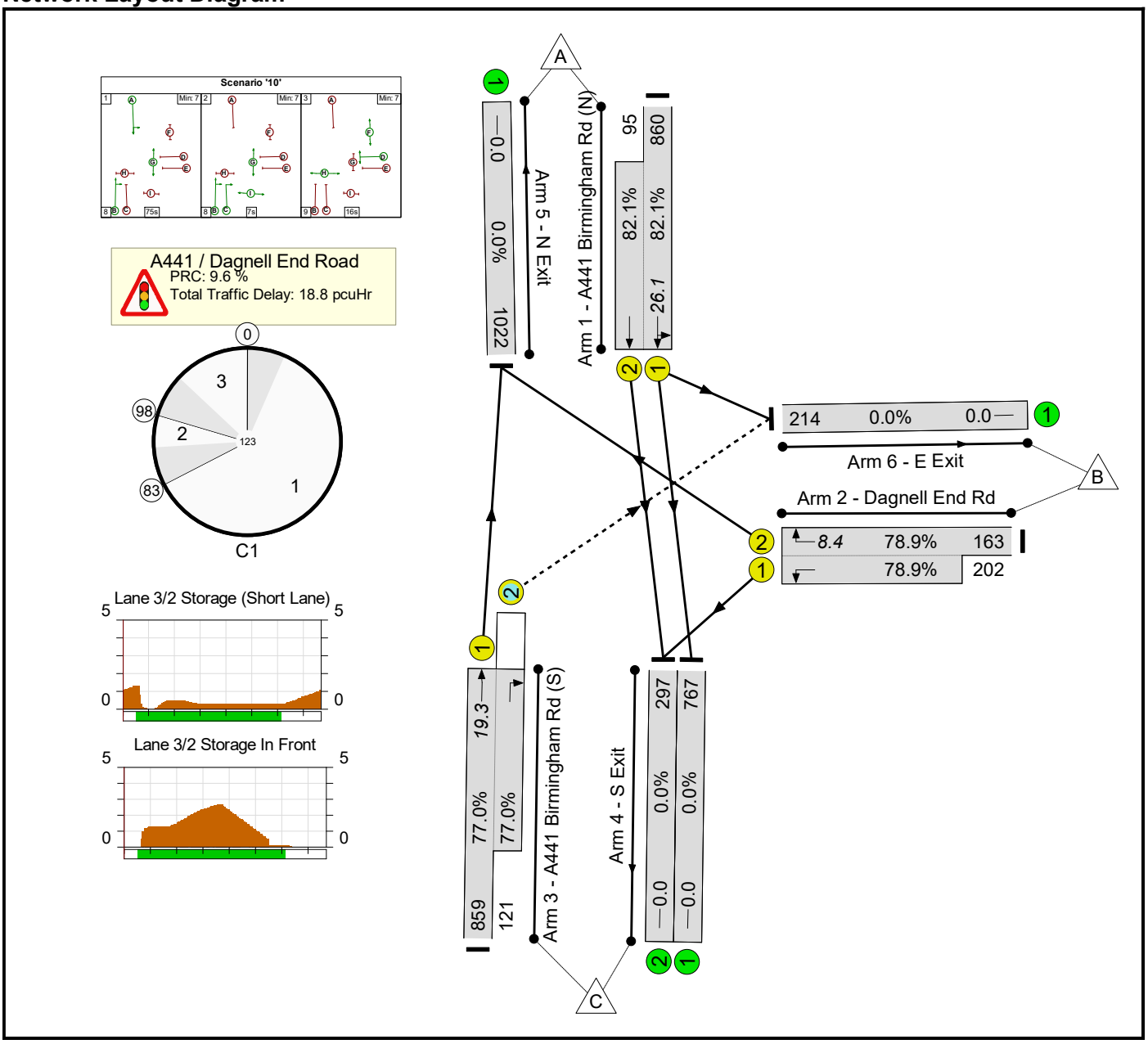
Stage	1	2	3
Duration	75	7	16
Change Point	0	83	98

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**	-	-		-	-	-	-	-	-	**82.1%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**82.1%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	75	-	955	1836:1878	1047+116	82.1 : 82.1%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	16	0	365	1650:1852	207+256	78.9 : 78.9%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	90	10	980	1641:1800	1115+157	77.0 : 77.0%
4/1	S Exit	U	N/A	N/A	-		-	-	-	767	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	297	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1022	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	214	Inf	Inf	0.0%

Full Input Data And Results

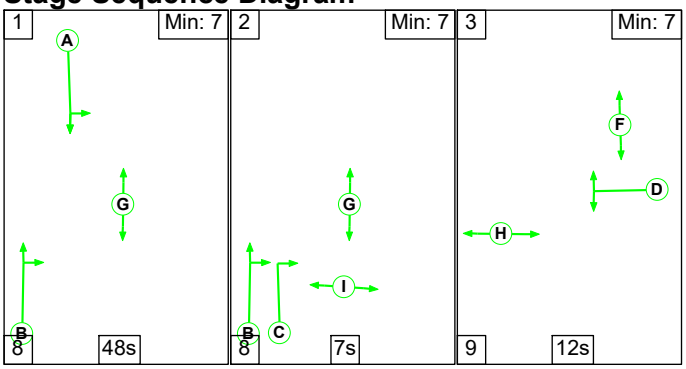
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**93**	**25**	**3**	**12.1**	**5.7**	**1.0**	**18.8**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**93**	**25**	**3**	**12.1**	**5.7**	**1.0**	**18.8**	**-**	**-**	**-**	**-**
1/1+1/2	955	955	-	-	-	4.6	2.2	-	6.8 (6.2+0.6)	25.7 (26.0:23.0)	23.8	2.2	26.1
2/2+2/1	365	365	-	-	-	5.2	1.8	-	7.0 (3.1+3.9)	68.8 (68.5:69.1)	6.6	1.8	8.4
3/1+3/2	980	980	93	25	3	2.3	1.7	1.0	5.0 (3.6+1.4)	18.2 (14.9:41.6)	17.7	1.7	19.3
4/1	767	767	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	297	297	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1022	1022	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	214	214	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 9.6 Total Delay for Signalled Lanes (pcuHr): 18.76 Cycle Time (s): 123
PRC Over All Lanes (%): 9.6 Total Delay Over All Lanes(pcuHr): 18.76

Full Input Data And Results

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

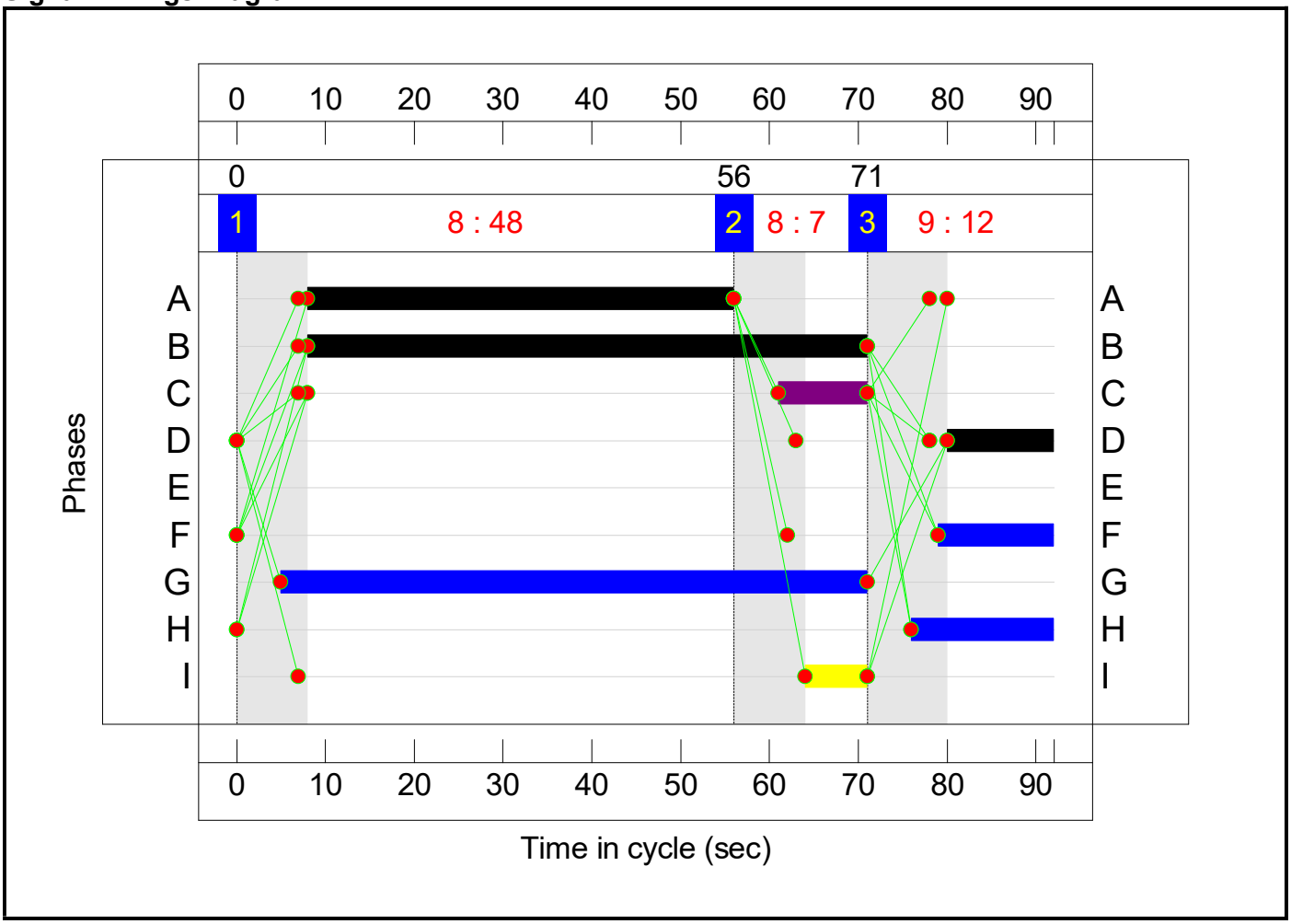
Stage Sequence Diagram



Stage Timings

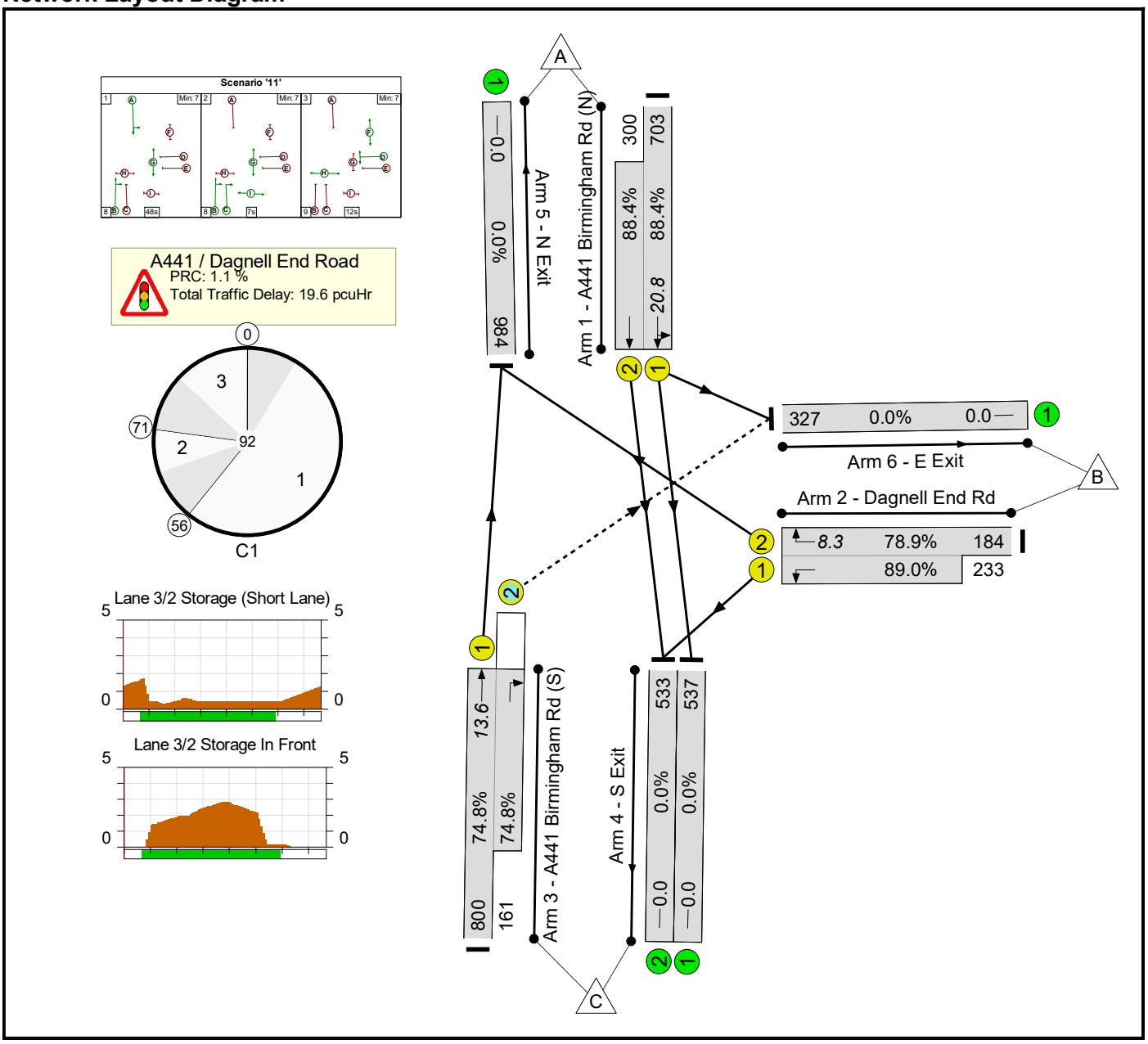
Stage	1	2	3
Duration	48	7	12
Change Point	0	56	71

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**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.0%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.0%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	48	-	1003	1809:1878	795+339	88.4 : 88.4%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	12	0	417	1650:1852	233+262	78.9 : 89.0%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	63	10	961	1726:1679	1069+215	74.8 : 74.8%
4/1	S Exit	U	N/A	N/A	-		-	-	-	537	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	533	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	984	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	327	Inf	Inf	0.0%

Full Input Data And Results

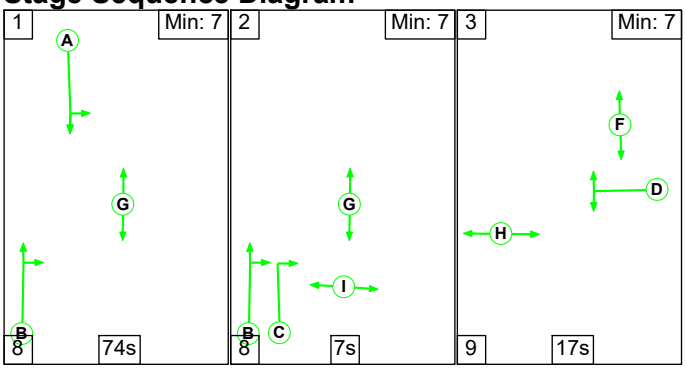
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**54**	**102**	**5**	**10.9**	**7.6**	**1.1**	**19.6**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**54**	**102**	**5**	**10.9**	**7.6**	**1.1**	**19.6**	**-**	**-**	**-**	**-**
1/1+1/2	1003	1003	-	-	-	4.4	3.6	-	8.0 (5.8+2.2)	28.9 (29.8:26.6)	17.2	3.6	20.8
2/2+2/1	417	417	-	-	-	4.5	2.5	-	7.0 (3.1+3.9)	60.2 (59.9:60.5)	5.8	2.5	8.3
3/1+3/2	961	961	54	102	5	2.0	1.5	1.1	4.6 (3.0+1.6)	17.2 (13.5:35.7)	12.1	1.5	13.6
4/1	537	537	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	533	533	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	984	984	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	327	327	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 1.1 Total Delay for Signalled Lanes (pcuHr): 19.61 Cycle Time (s): 92
PRC Over All Lanes (%): 1.1 Total Delay Over All Lanes(pcuHr): 19.61

Full Input Data And Results

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

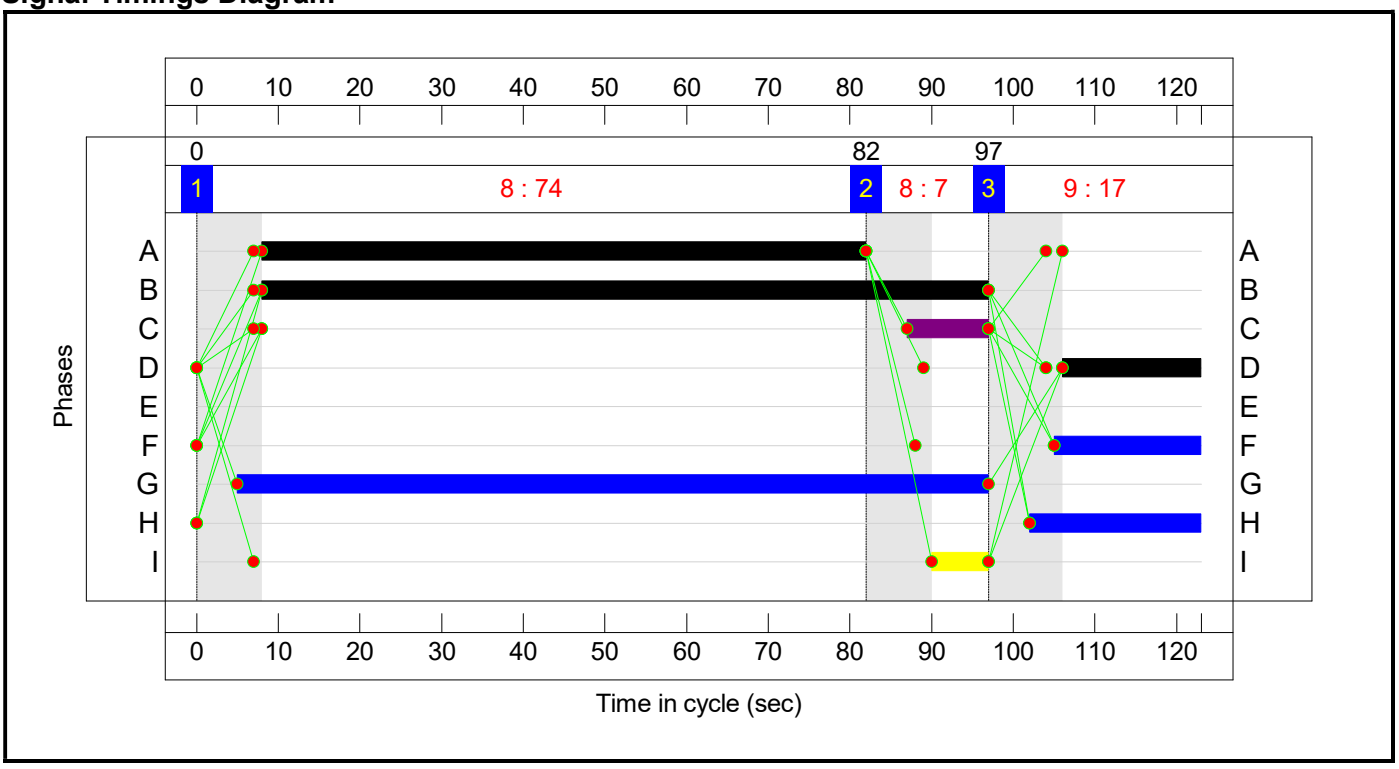
Stage Sequence Diagram



Stage Timings

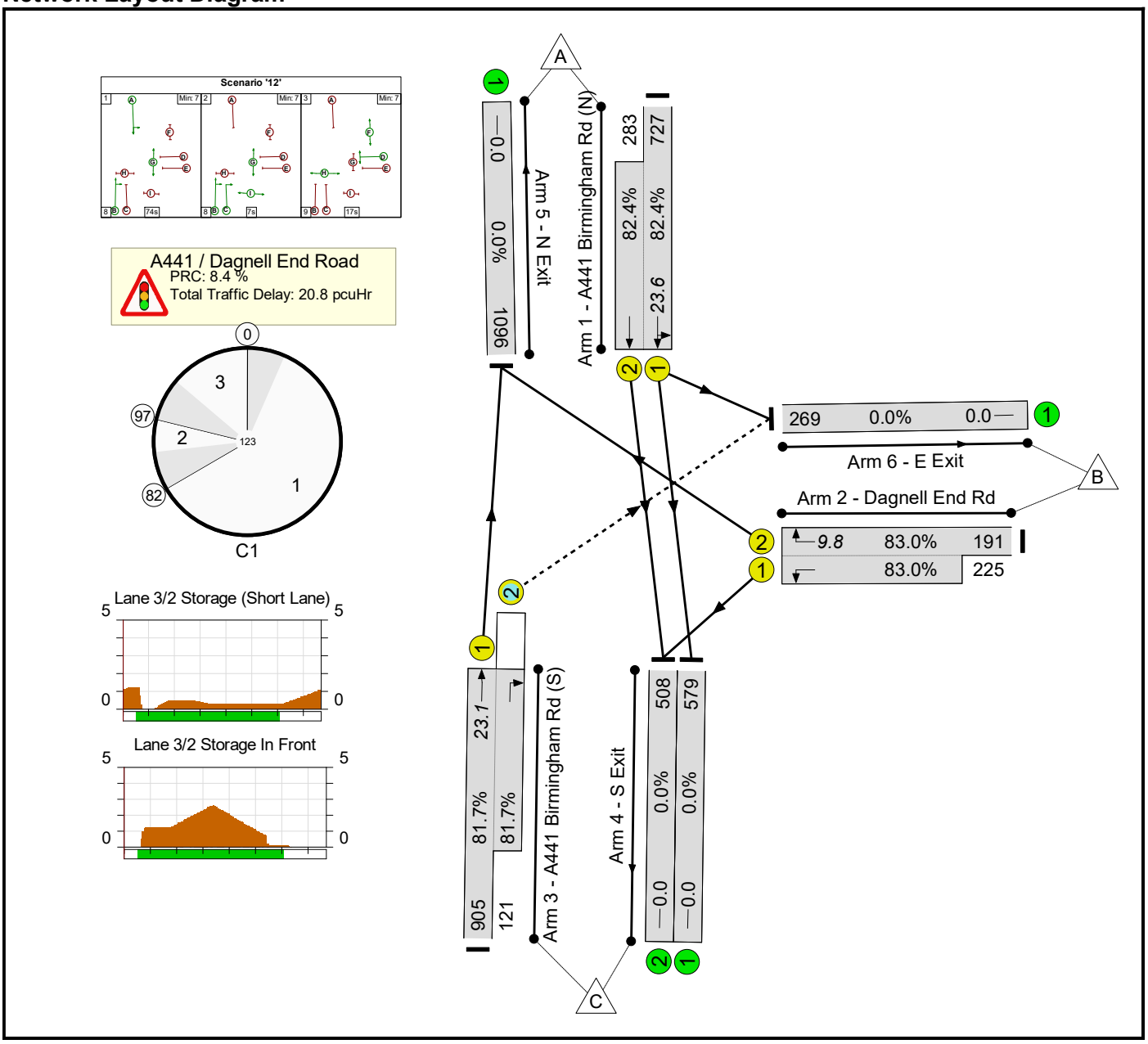
Stage	1	2	3
Duration	74	7	17
Change Point	0	82	97

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**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**83.0%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**83.0%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	74	-	1010	1816:1878	883+344	82.4 : 82.4%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	17	0	416	1650:1852	230+271	83.0 : 83.0%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	89	10	1026	1641:1800	1108+148	81.7 : 81.7%
4/1	S Exit	U	N/A	N/A	-		-	-	-	579	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	508	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1096	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	269	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	**-**	**-**	**88**	**30**	**3**	**13.1**	**6.8**	**0.9**	**20.8**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**88**	**30**	**3**	**13.1**	**6.8**	**0.9**	**20.8**	**-**	**-**	**-**	**-**
1/1+1/2	1010	1010	-	-	-	4.4	2.3	-	6.7 (5.0+1.7)	23.9 (24.6:22.1)	21.4	2.3	23.6
2/2+2/1	416	416	-	-	-	5.9	2.3	-	8.2 (3.8+4.4)	70.9 (70.8:71.1)	7.4	2.3	9.8
3/1+3/2	1026	1026	88	30	3	2.8	2.2	0.9	5.9 (4.5+1.4)	20.7 (17.8:42.7)	20.9	2.2	23.1
4/1	579	579	-	-	-	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	1096	1096	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	269	269	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 8.4 Total Delay for Signalled Lanes (pcuHr): 20.79 Cycle Time (s): 123
PRC Over All Lanes (%): 8.4 Total Delay Over All Lanes(pcuHr): 20.79

APPENDIX E

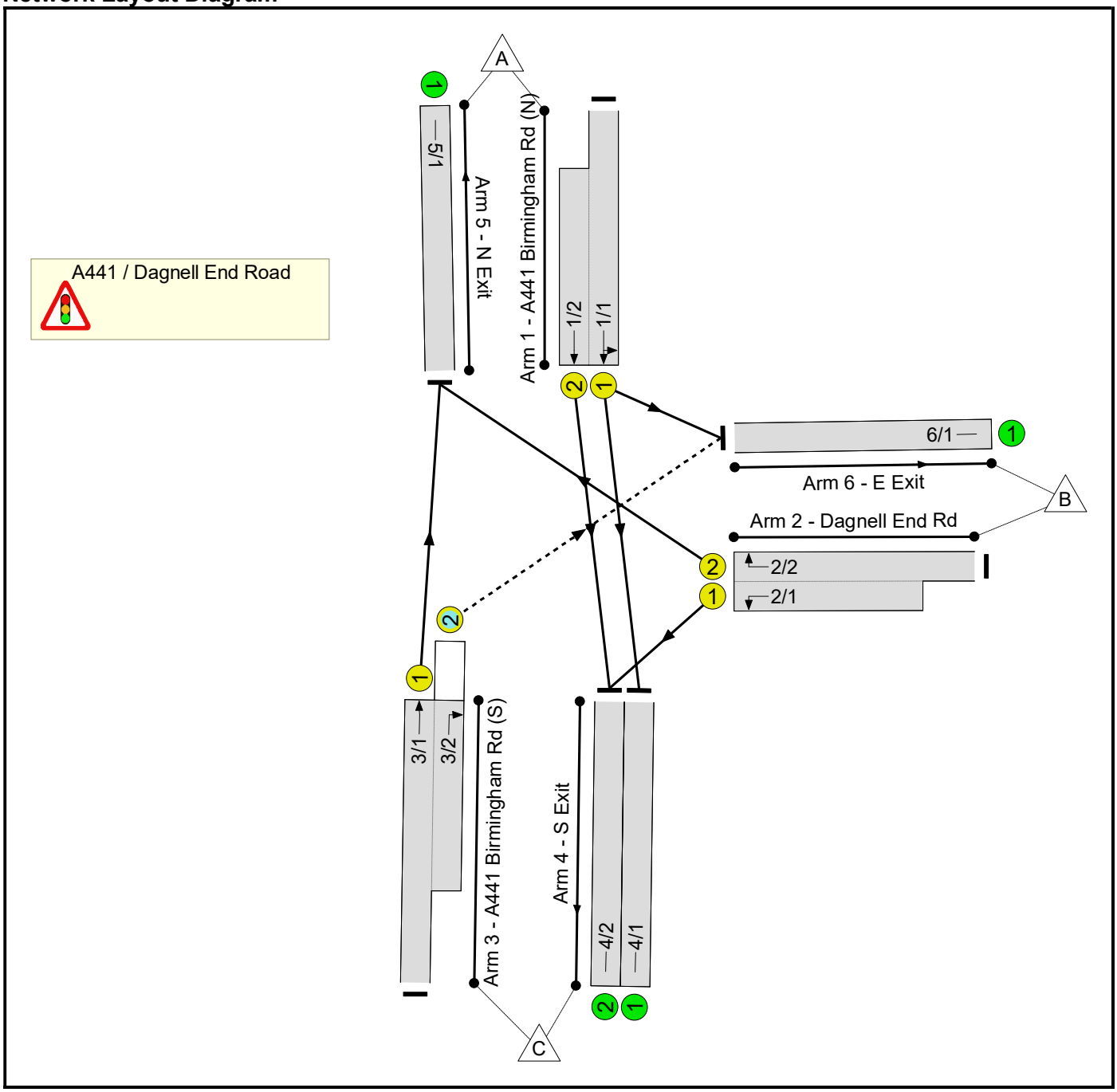
LinSig Model Output Report - Scenario SEN1 & SEN2

Full Input Data And Results

User and Project Details

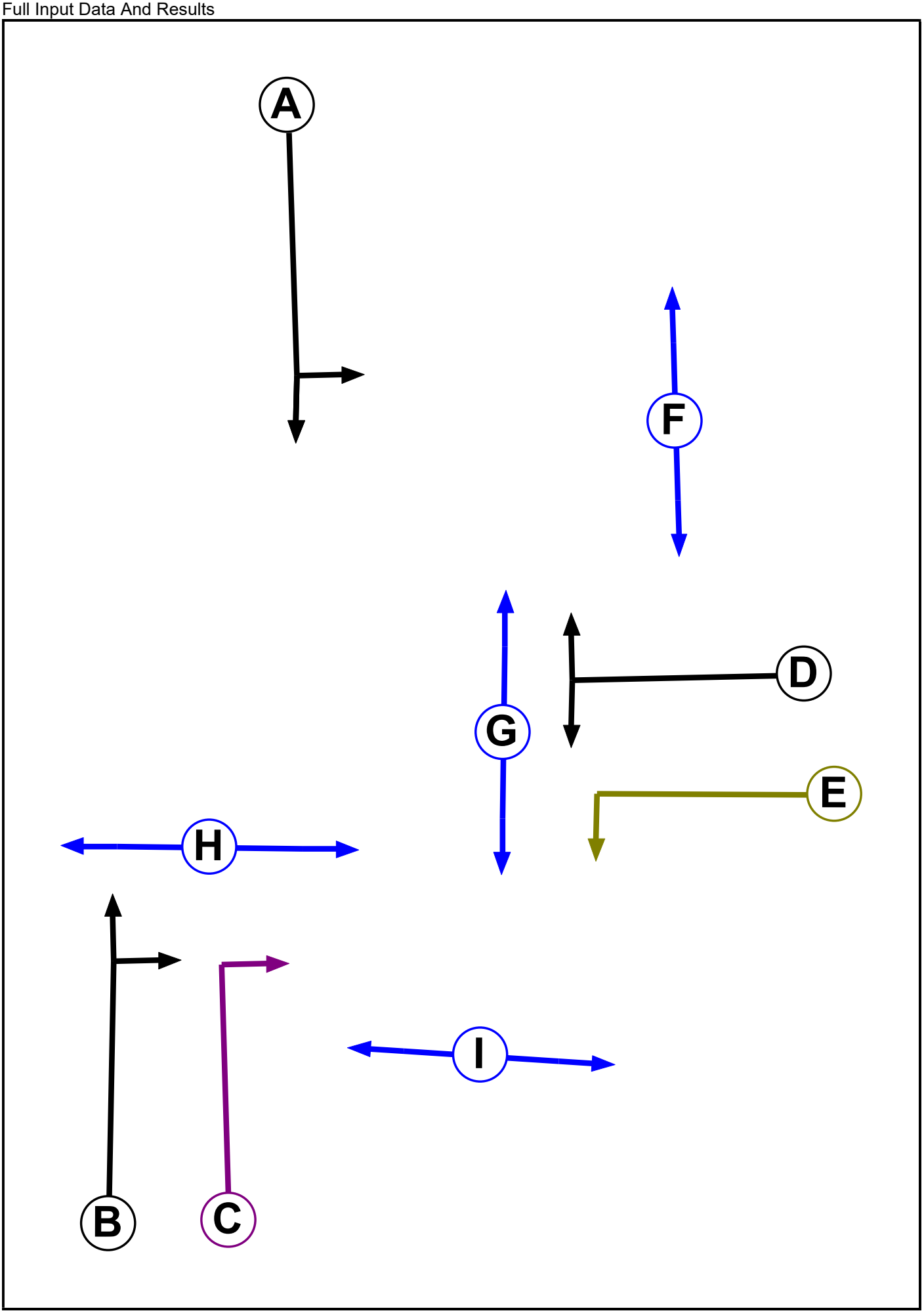
Project:	
Title:	**A441 / Dagnell End Road**
Location:	
Additional detail:	Proposed layout
File name:	A441_Dagnell End Rd v2 Rev B - Sens.lsg3x
Author:	al
Company:	
Address:	

Network Layout Diagram



Full Input Data And Results

Phase Diagram


A
F
G
D
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

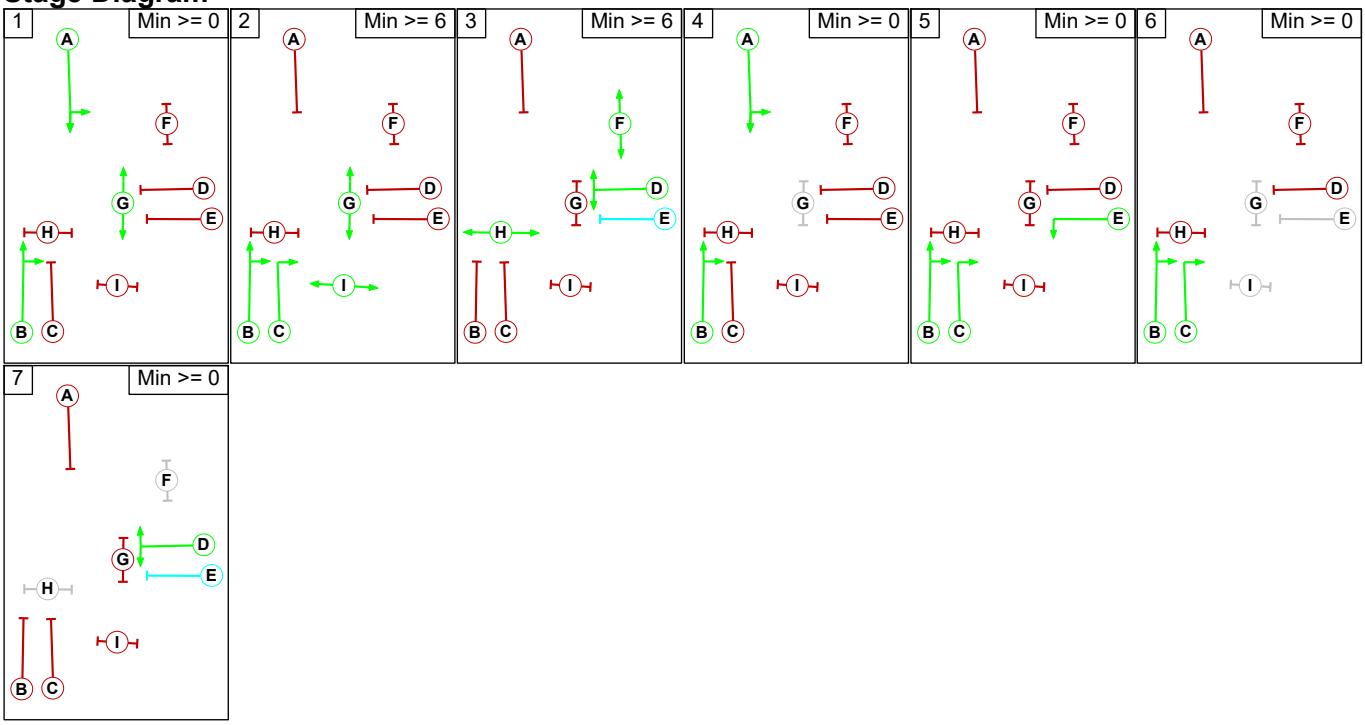
		Starting Phase								
		A	B	C	D	E	F	G	H	I
Terminating Phase	A		-	5	7	7	6	-	-	8
	B	-		-	7	-	8	-	5	-
	C	7	-		7	-	8	-	5	-
	D	7	7	7		-	-	5	-	7
	E	6	-	-	-		-	5	-	7
	F	8	8	8	-	-		-	-	-
	G	-	-	-	9	9	-		-	-
	H	-	8	8	-	-	-	-		-
	I	9	-	-	9	9	-	-	-	

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	152	897	1049
	B	132	0	193	325
	C	844	150	0	994
	Tot.	976	302	1090	2368

Traffic Lane Flows

Lane	Scenario 1: 1
Junction: A441 / Dagnell End Road	
1/1 (with short)	1049(In) 754(Out)
1/2 (short)	295
2/1 (short)	193
2/2 (with short)	325(In) 132(Out)
3/1 (with short)	994(In) 844(Out)
3/2 (short)	150
4/1	602
4/2	488
5/1	976
6/1	302

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	79.8 %	1817	1817
				Arm 6 Left	10.00	20.2 %		
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	103	990	1093
	B	180	0	220	400
	C	1005	132	0	1137
	Tot.	1185	235	1210	2630

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2
Junction: A441 / Dagnell End Road	
1/1 (with short)	1093(In) 823(Out)
1/2 (short)	270
2/1 (short)	220
2/2 (with short)	400(In) 180(Out)
3/1 (with short)	1137(In) 1005(Out)
3/2 (short)	132
4/1	720
4/2	490
5/1	1185
6/1	235

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	87.5 %	1833	1833
				Arm 6 Left	10.00	12.5 %		
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	172	897	1069
	B	190	0	242	432
	C	844	167	0	1011
	Tot.	1034	339	1139	2512

Traffic Lane Flows

Lane	Scenario 3: 3
Junction: A441 / Dagnell End Road	
1/1 (with short)	1069(In) 769(Out)
1/2 (short)	300
2/1 (short)	242
2/2 (with short)	432(In) 190(Out)
3/1 (with short)	1011(In) 844(Out)
3/2 (short)	167
4/1	597
4/2	542
5/1	1034
6/1	339

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	77.6 %	1812	1812
				Arm 6 Left	10.00	22.4 %		
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	158	990	1148
	B	208	0	243	451
	C	1051	132	0	1183
	Tot.	1259	290	1233	2782

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 4: 4
Junction: A441 / Dagnell End Road	
1/1 (with short)	1148(In) 878(Out)
1/2 (short)	270
2/1 (short)	243
2/2 (with short)	451(In) 208(Out)
3/1 (with short)	1183(In) 1051(Out)
3/2 (short)	132
4/1	720
4/2	513
5/1	1259
6/1	290

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	82.0 %	1821	1821
				Arm 6 Left	10.00	18.0 %		
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	152	897	1049
	B	132	0	193	325
	C	844	150	0	994
	Tot.	976	302	1090	2368

Traffic Lane Flows

Lane	Scenario 5: 5
Junction: A441 / Dagnell End Road	
1/1 (with short)	1049(In) 754(Out)
1/2 (short)	295
2/1 (short)	193
2/2 (with short)	325(In) 132(Out)
3/1 (with short)	994(In) 844(Out)
3/2 (short)	150
4/1	602
4/2	488
5/1	976
6/1	302

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	79.8 %	1817	1817
				Arm 6 Left	10.00	20.2 %		
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	103	990	1093
	B	180	0	220	400
	C	1005	132	0	1137
	Tot.	1185	235	1210	2630

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 6: 6
Junction: A441 / Dagnell End Road	
1/1 (with short)	1093(In) 823(Out)
1/2 (short)	270
2/1 (short)	220
2/2 (with short)	400(In) 180(Out)
3/1 (with short)	1137(In) 1005(Out)
3/2 (short)	132
4/1	720
4/2	490
5/1	1185
6/1	235

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	87.5 %	1833	1833
				Arm 6 Left	10.00	12.5 %		
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	172	897	1069
	B	190	0	242	432
	C	844	167	0	1011
	Tot.	1034	339	1139	2512

Traffic Lane Flows

Lane	Scenario 7: 7
Junction: A441 / Dagnell End Road	
1/1 (with short)	1069(In) 769(Out)
1/2 (short)	300
2/1 (short)	242
2/2 (with short)	432(In) 190(Out)
3/1 (with short)	1011(In) 844(Out)
3/2 (short)	167
4/1	597
4/2	542
5/1	1034
6/1	339

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	77.6 %	1812	1812
				Arm 6 Left	10.00	22.4 %		
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	158	990	1148
	B	208	0	243	451
	C	1051	132	0	1183
	Tot.	1259	290	1233	2782

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 8: 8
Junction: A441 / Dagnell End Road	
1/1 (with short)	1148(In) 878(Out)
1/2 (short)	270
2/1 (short)	243
2/2 (with short)	451(In) 208(Out)
3/1 (with short)	1183(In) 1051(Out)
3/2 (short)	132
4/1	720
4/2	513
5/1	1259
6/1	290

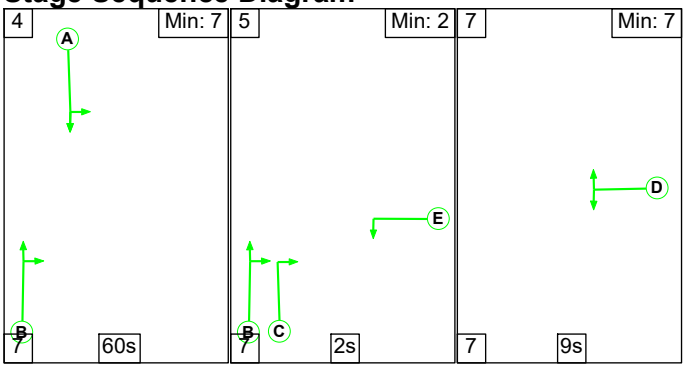
Lane Saturation Flows

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	82.0 %	1821	1821
				Arm 6 Left	10.00	18.0 %		
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)')

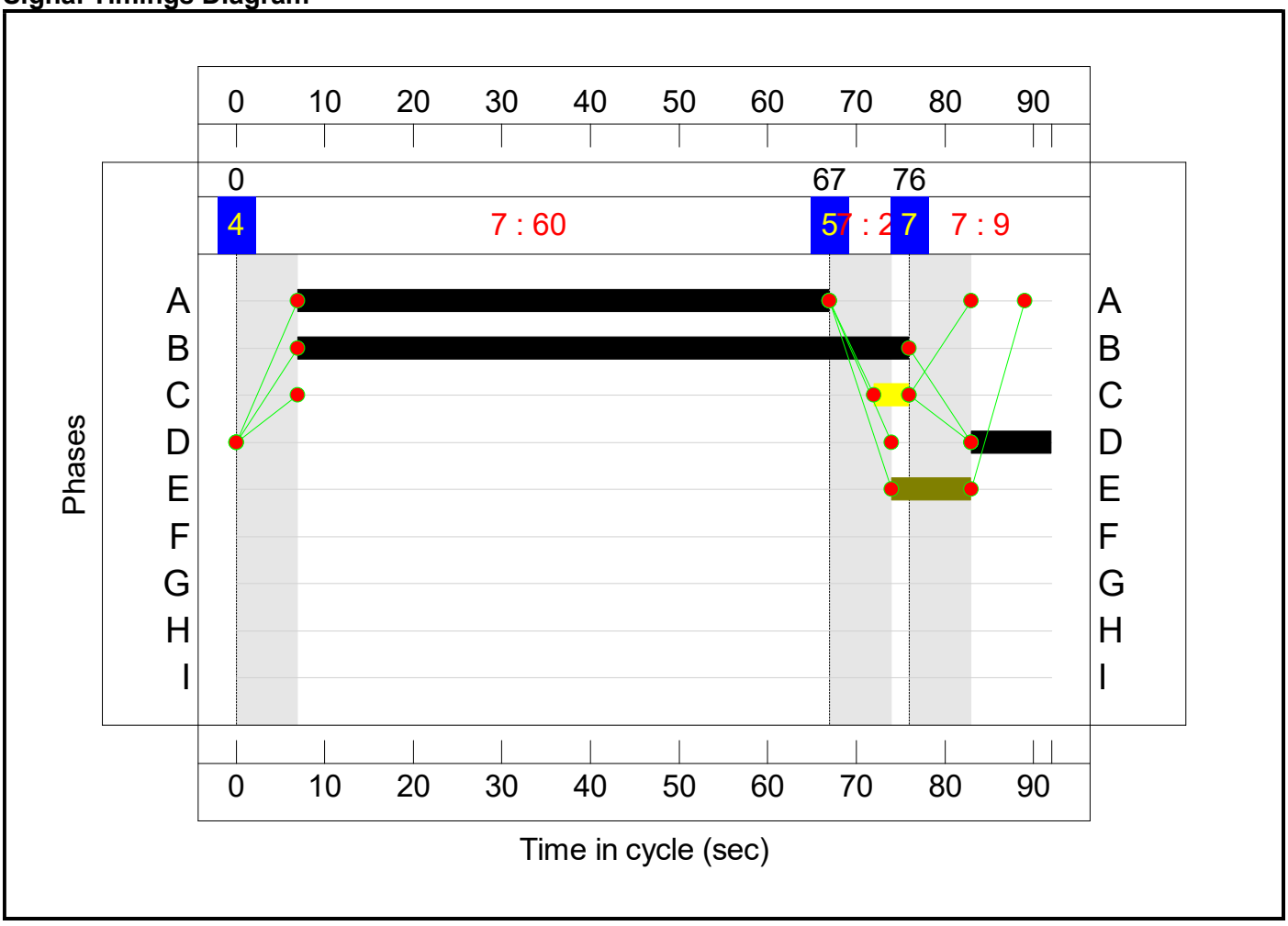
Stage Sequence Diagram



Stage Timings

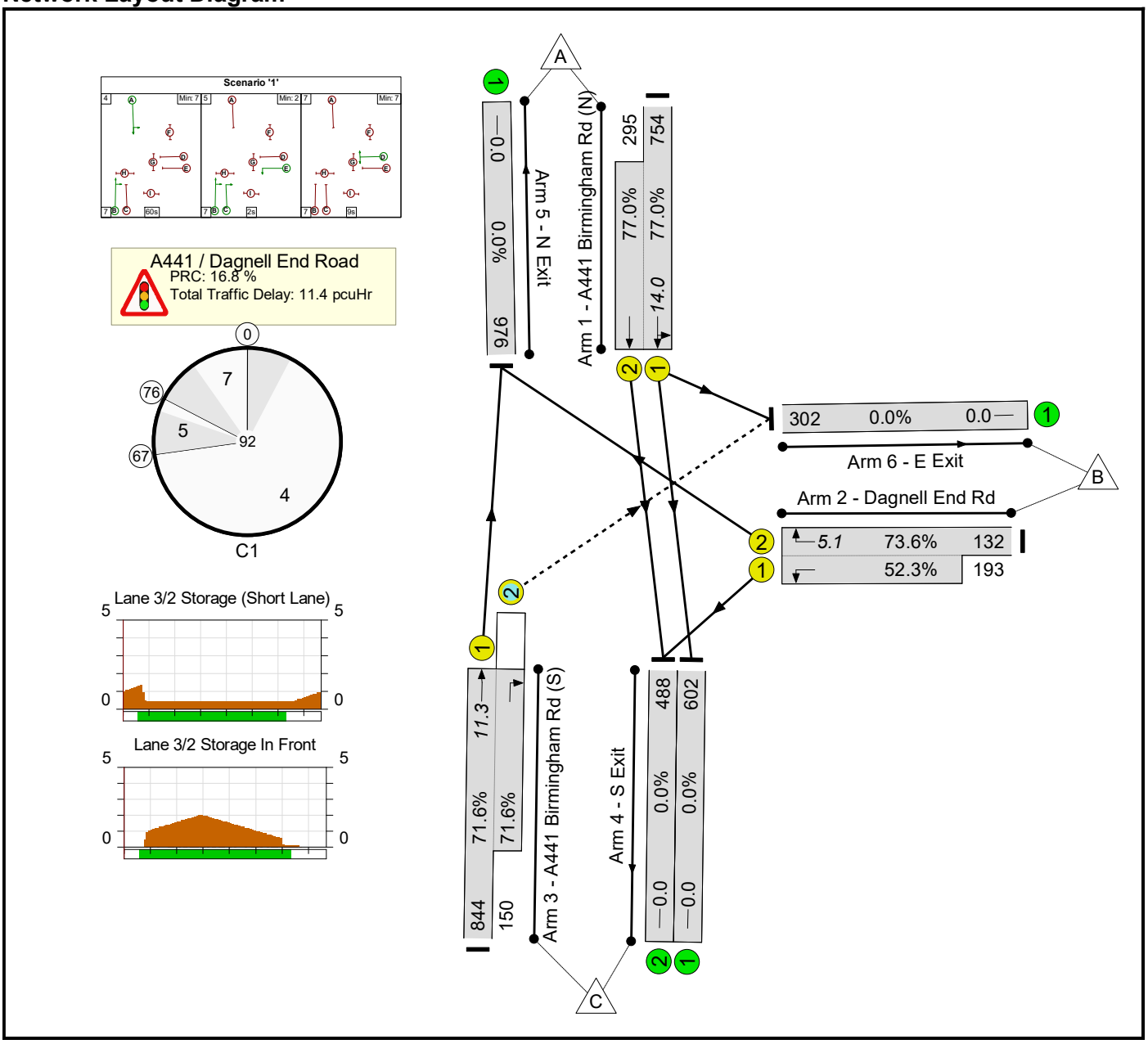
Stage	4	5	7
Duration	60	2	9
Change Point	0	67	76

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**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.0%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.0%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	60	-	1049	1817:1878	979+383	77.0 : 77.0%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	9:18	9	325	1650:1852	179+369	73.6 : 52.3%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	69	4	994	1726:1679	1178+209	71.6 : 71.6%
4/1	S Exit	U	N/A	N/A	-		-	-	-	602	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	488	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	976	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	302	Inf	Inf	0.0%

Full Input Data And Results

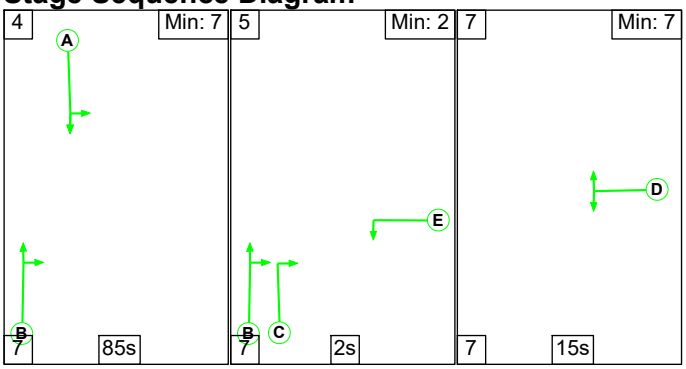
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**117**	**29**	**5**	**6.9**	**3.6**	**0.8**	**11.4**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**117**	**29**	**5**	**6.9**	**3.6**	**0.8**	**11.4**	**-**	**-**	**-**	**-**
1/1+1/2	1049	1049	-	-	-	2.4	1.7	-	4.1 (3.1+1.0)	13.9 (14.7:12.0)	12.3	1.7	14.0
2/2+2/1	325	325	-	-	-	3.2	0.7	-	3.9 (1.8+2.2)	43.3 (47.7:40.3)	4.3	0.7	5.1
3/1+3/2	994	994	117	29	5	1.3	1.3	0.8	3.4 (2.3+1.1)	12.3 (9.7:27.1)	10.1	1.3	11.3
4/1	602	602	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	488	488	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	976	976	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	302	302	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 16.8 Total Delay for Signalled Lanes (pcuHr): 11.37 Cycle Time (s): 92
PRC Over All Lanes (%): 16.8 Total Delay Over All Lanes(pcuHr): 11.37

Full Input Data And Results

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

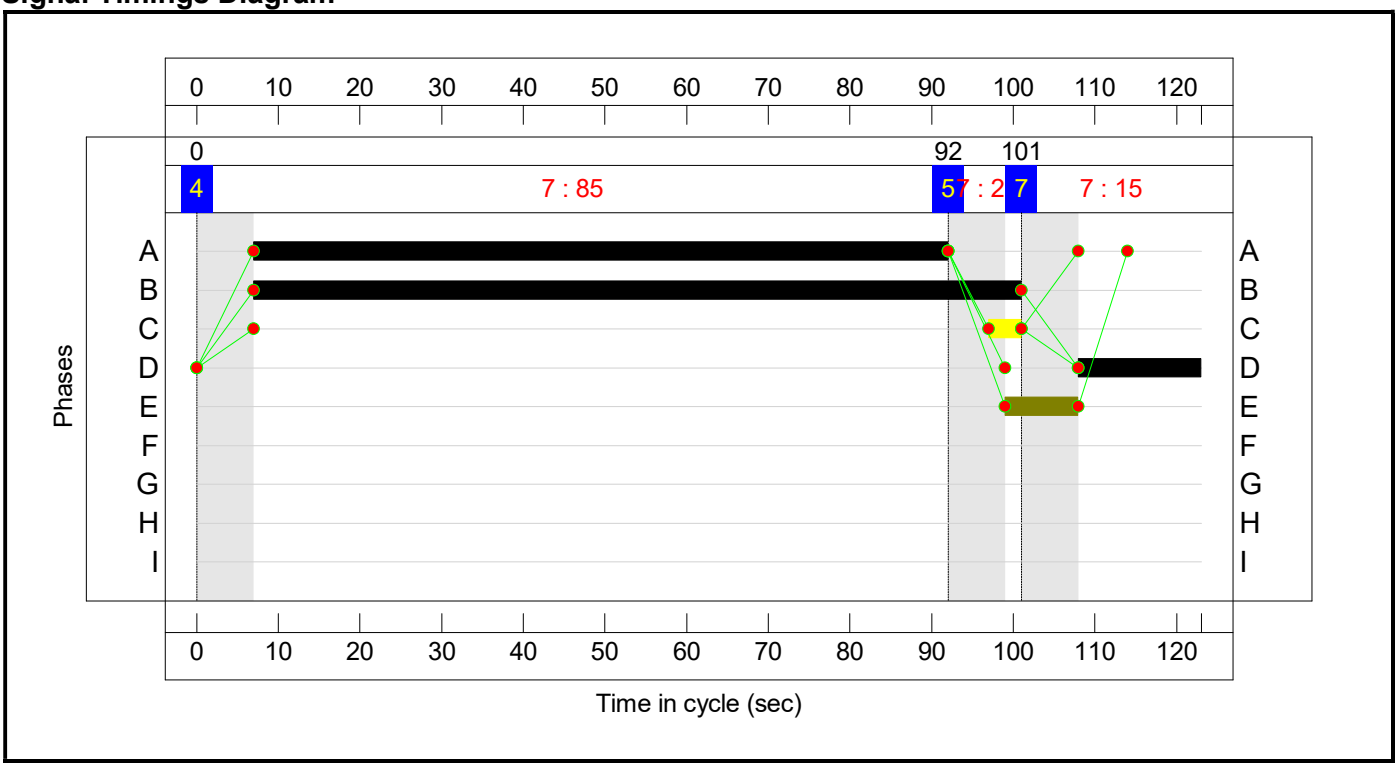
Stage Sequence Diagram



Stage Timings

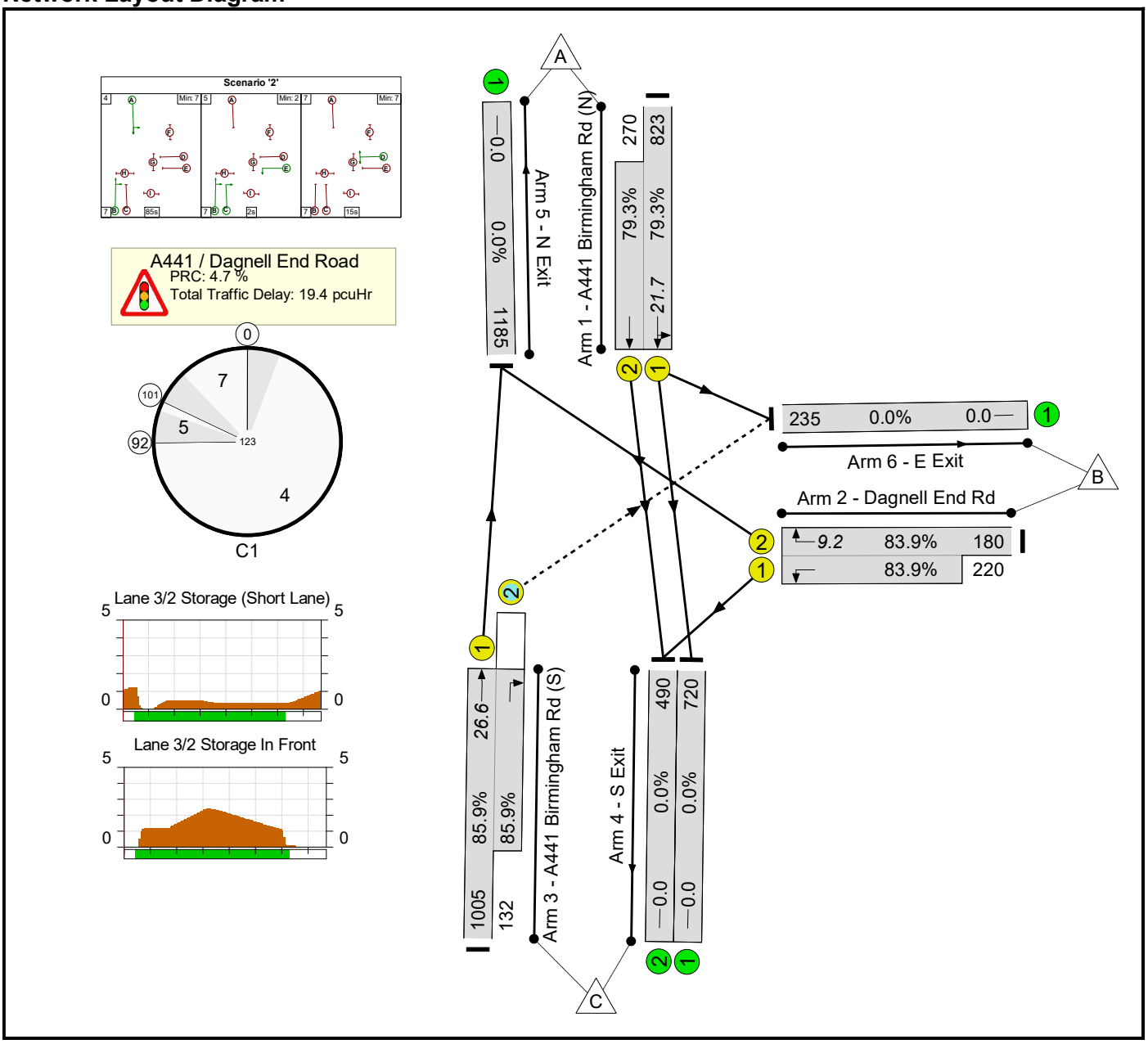
Stage	4	5	7
Duration	85	2	15
Change Point	0	92	101

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**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**85.9%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**85.9%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	85	-	1093	1833:1878	1038+340	79.3 : 79.3%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	15:24	9	400	1650:1852	215+262	83.9 : 83.9%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	94	4	1137	1641:1800	1169+154	85.9 : 85.9%
4/1	S Exit	U	N/A	N/A	-		-	-	-	720	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	490	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1185	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	235	Inf	Inf	0.0%

Full Input Data And Results

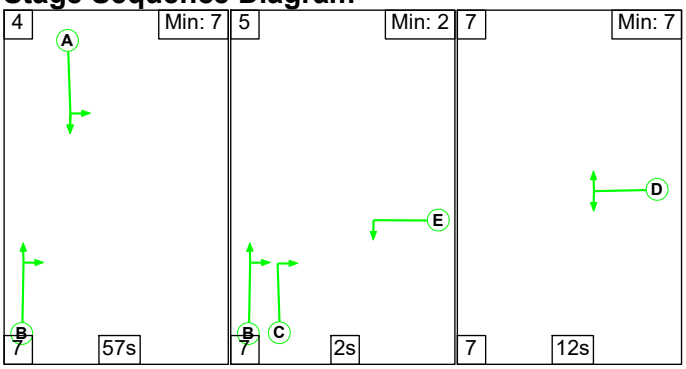
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**93**	**36**	**3**	**11.0**	**7.3**	**1.1**	**19.4**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**93**	**36**	**3**	**11.0**	**7.3**	**1.1**	**19.4**	**-**	**-**	**-**	**-**
1/1+1/2	1093	1093	-	-	-	3.0	1.9	-	4.9 (3.9+1.1)	16.3 (16.9:14.5)	19.8	1.9	21.7
2/2+2/1	400	400	-	-	-	5.3	2.4	-	7.8 (3.7+4.1)	69.9 (74.2:66.3)	6.8	2.4	9.2
3/1+3/2	1137	1137	93	36	3	2.6	3.0	1.1	6.7 (5.0+1.7)	21.1 (17.9:45.2)	23.7	3.0	26.6
4/1	720	720	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	490	490	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1185	1185	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	235	235	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 4.7 Total Delay for Signalled Lanes (pcuHr): 19.36 Cycle Time (s): 123
PRC Over All Lanes (%): 4.7 Total Delay Over All Lanes(pcuHr): 19.36

Full Input Data And Results

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

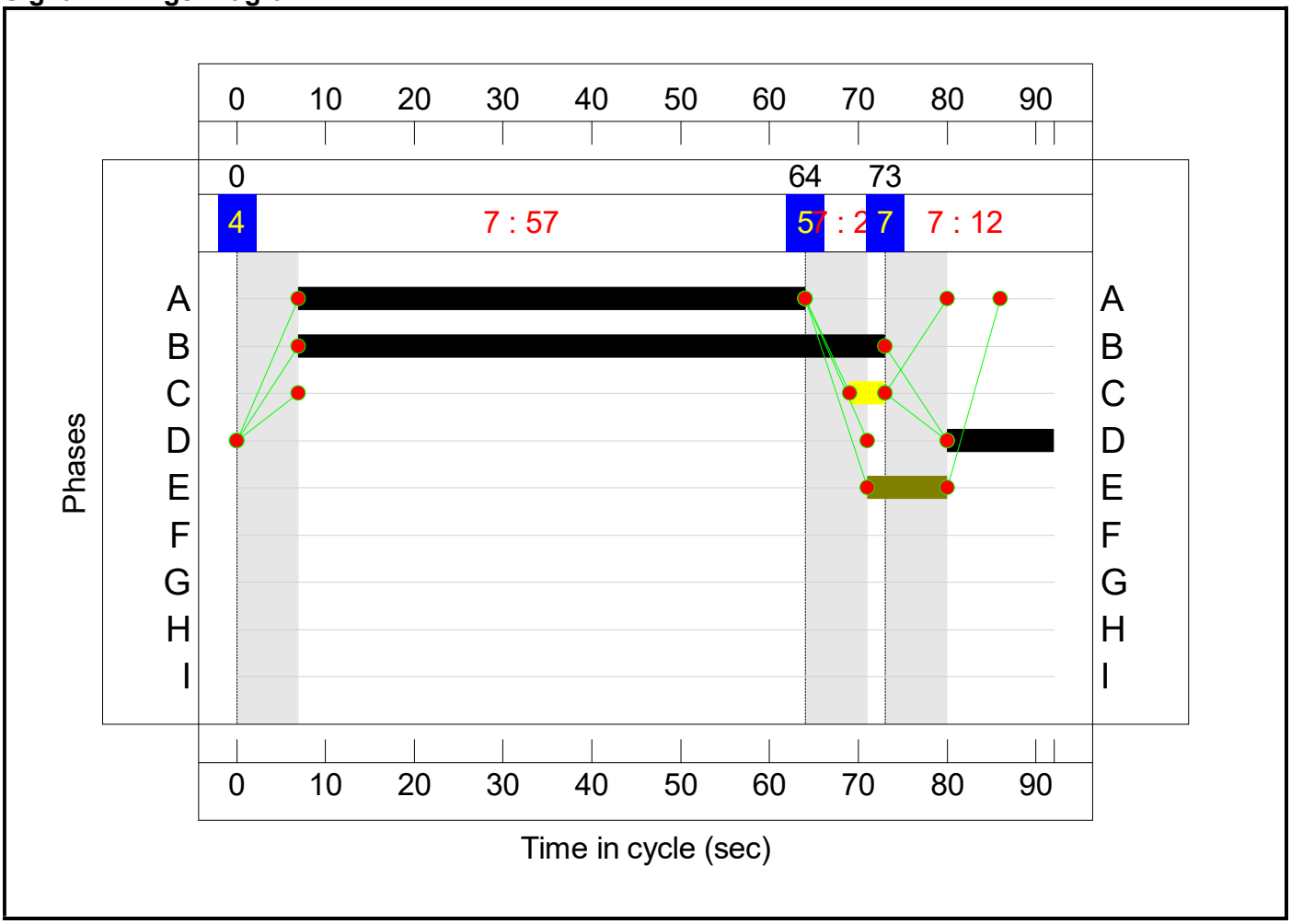
Stage Sequence Diagram



Stage Timings

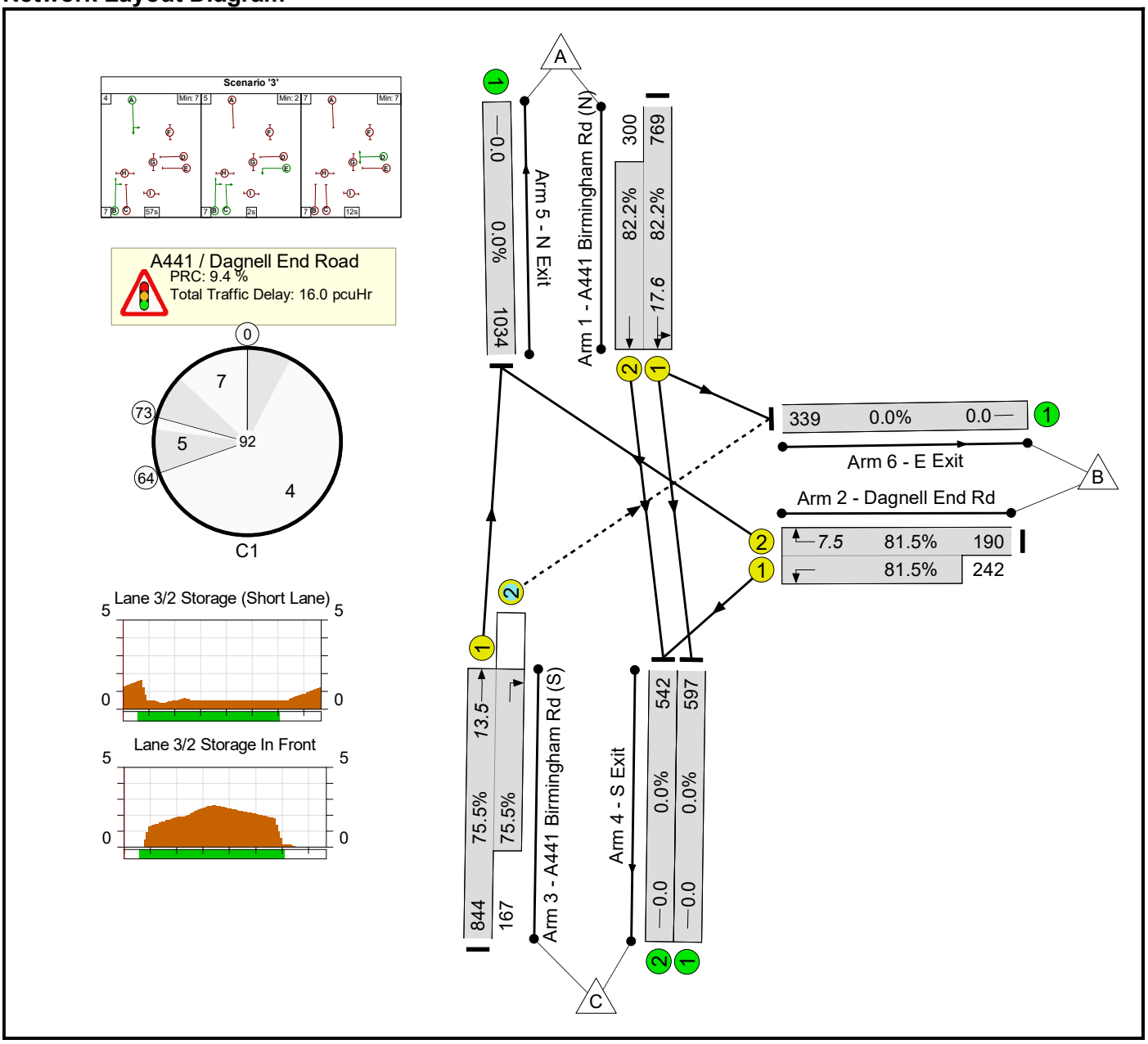
Stage	4	5	7
Duration	57	2	12
Change Point	0	64	73

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**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.2%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.2%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	57	-	1069	1812:1878	935+365	82.2 : 82.2%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	12:21	9	432	1650:1852	233+297	81.5 : 81.5%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	66	4	1011	1726:1679	1118+221	75.5 : 75.5%
4/1	S Exit	U	N/A	N/A	-		-	-	-	597	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	542	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1034	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	339	Inf	Inf	0.0%

Full Input Data And Results

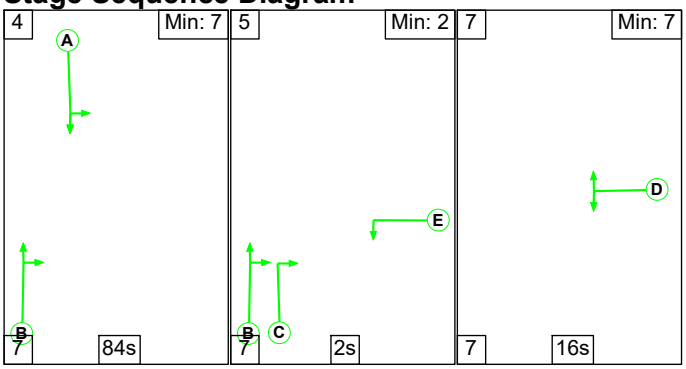
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**83**	**79**	**5**	**8.9**	**5.9**	**1.2**	**16.0**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**83**	**79**	**5**	**8.9**	**5.9**	**1.2**	**16.0**	**-**	**-**	**-**	**-**
1/1+1/2	1069	1069	-	-	-	3.1	2.3	-	5.3 (4.0+1.3)	17.9 (18.8:15.8)	15.3	2.3	17.6
2/2+2/1	432	432	-	-	-	4.1	2.1	-	6.2 (3.0+3.2)	51.6 (55.9:48.2)	5.4	2.1	7.5
3/1+3/2	1011	1011	83	79	5	1.7	1.5	1.2	4.5 (2.8+1.7)	16.0 (12.1:35.9)	11.9	1.5	13.5
4/1	597	597	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	542	542	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1034	1034	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	339	339	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 9.4 Total Delay for Signalled Lanes (pcuHr): 16.02 Cycle Time (s): 92
PRC Over All Lanes (%): 9.4 Total Delay Over All Lanes(pcuHr): 16.02

Full Input Data And Results

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

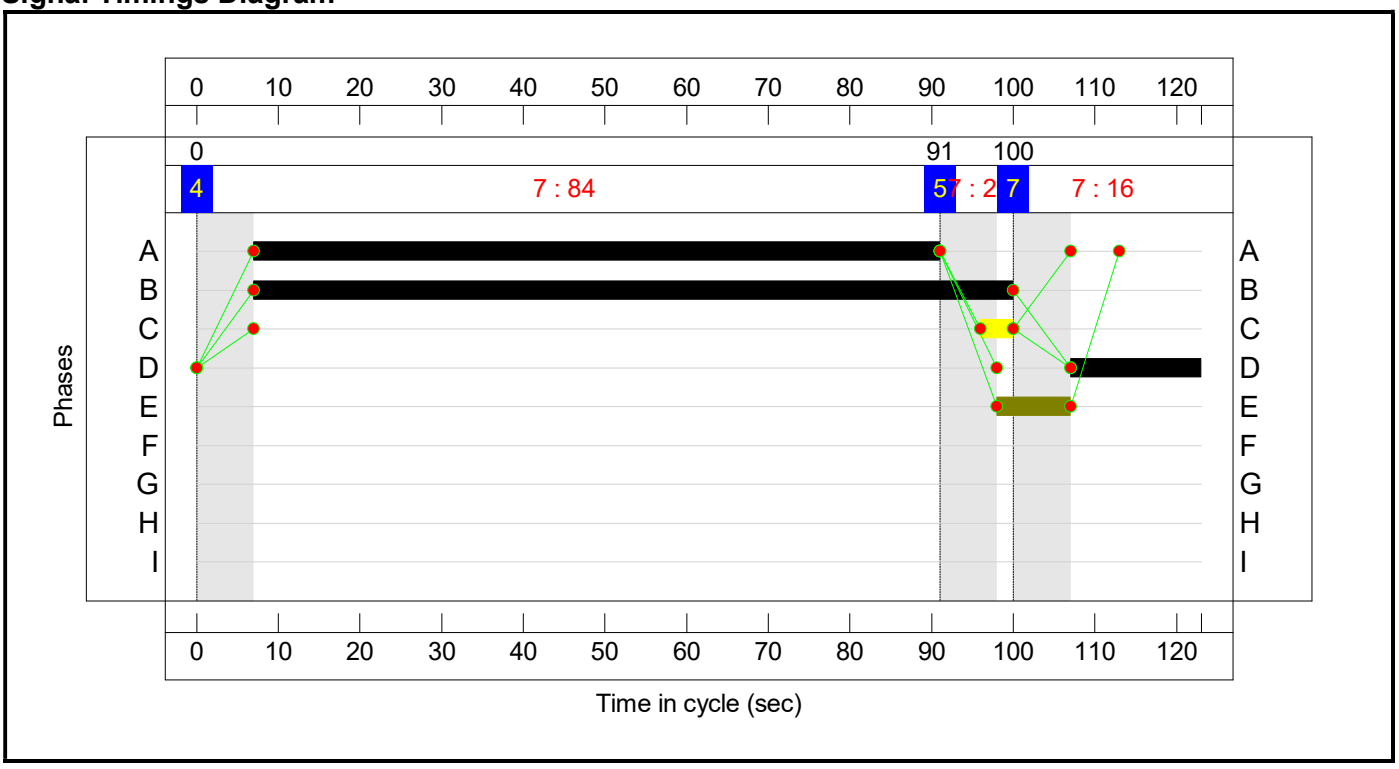
Stage Sequence Diagram



Stage Timings

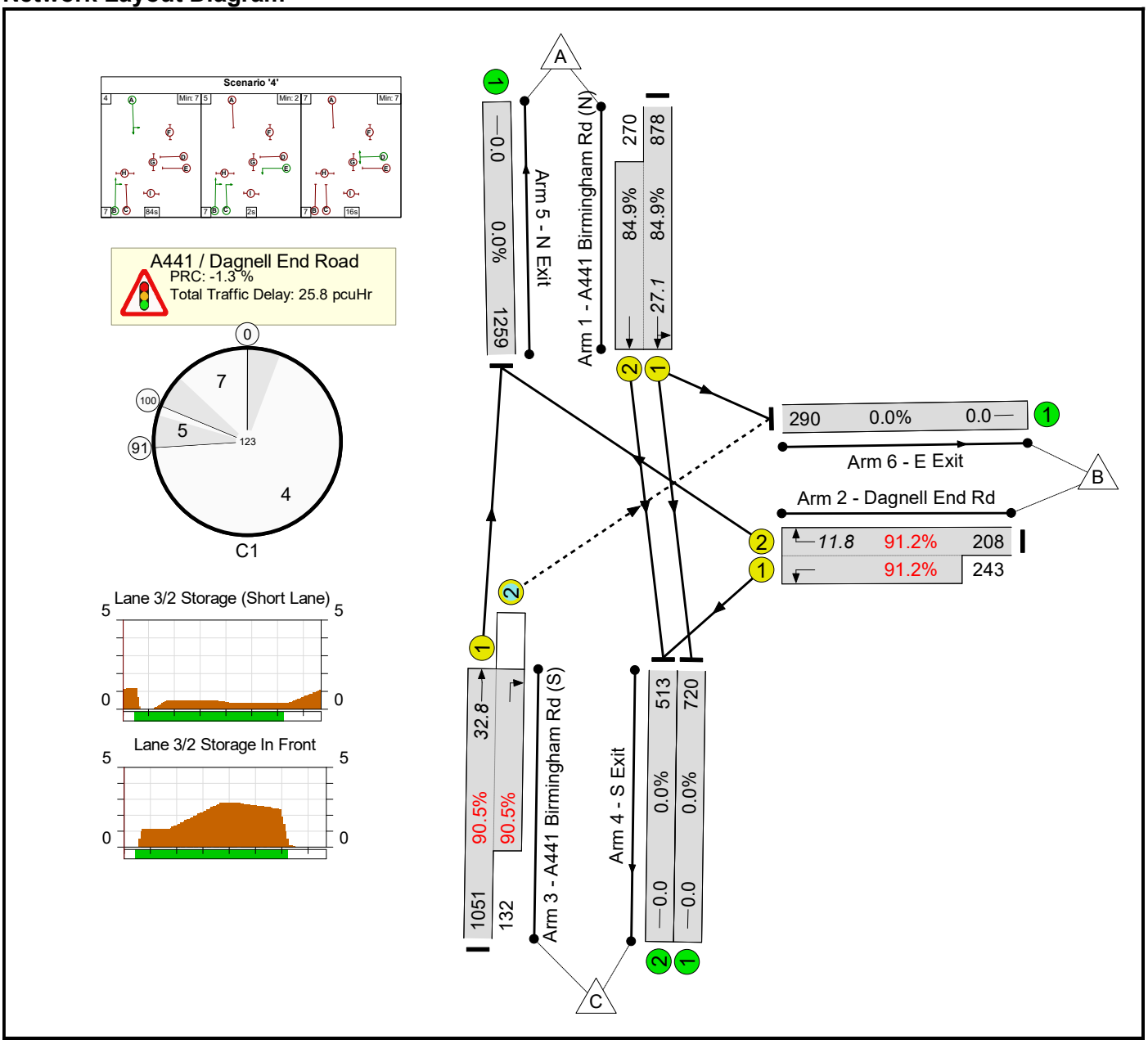
Stage	4	5	7
Duration	84	2	16
Change Point	0	91	100

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**	-	-		-	-	-	-	-	-	**91.2%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**91.2%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	84	-	1148	1821:1878	1034+318	84.9 : 84.9%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	16:25	9	451	1650:1852	228+266	91.2 : 91.2%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	93	4	1183	1641:1800	1162+146	90.5 : 90.5%
4/1	S Exit	U	N/A	N/A	-		-	-	-	720	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	513	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1259	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	290	Inf	Inf	0.0%

Full Input Data And Results

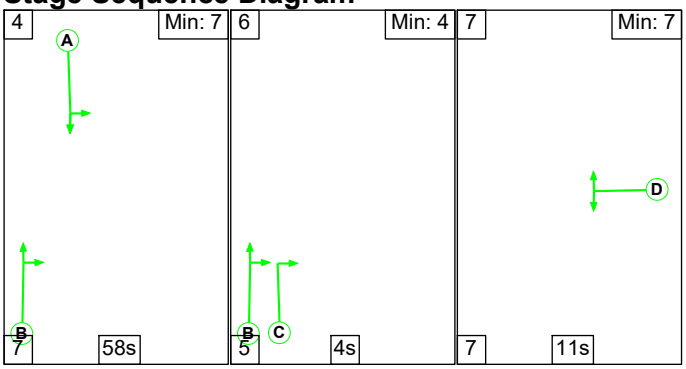
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**55**	**74**	**3**	**13.0**	**11.5**	**1.4**	**25.8**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**55**	**74**	**3**	**13.0**	**11.5**	**1.4**	**25.8**	**-**	**-**	**-**	**-**
1/1+1/2	1148	1148	-	-	-	3.7	2.7	-	6.5 (5.1+1.4)	20.3 (20.9:18.5)	24.3	2.7	27.1
2/2+2/1	451	451	-	-	-	6.0	4.3	-	10.3 (5.0+5.3)	82.4 (86.8:78.6)	7.5	4.3	11.8
3/1+3/2	1183	1183	55	74	3	3.2	4.4	1.4	9.1 (6.9+2.2)	27.5 (23.6:59.1)	28.4	4.4	32.8
4/1	720	720	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	513	513	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1259	1259	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	290	290	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -1.3 Total Delay for Signalled Lanes (pcuHr): 25.85 Cycle Time (s): 123
PRC Over All Lanes (%): -1.3 Total Delay Over All Lanes(pcuHr): 25.85

Full Input Data And Results

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

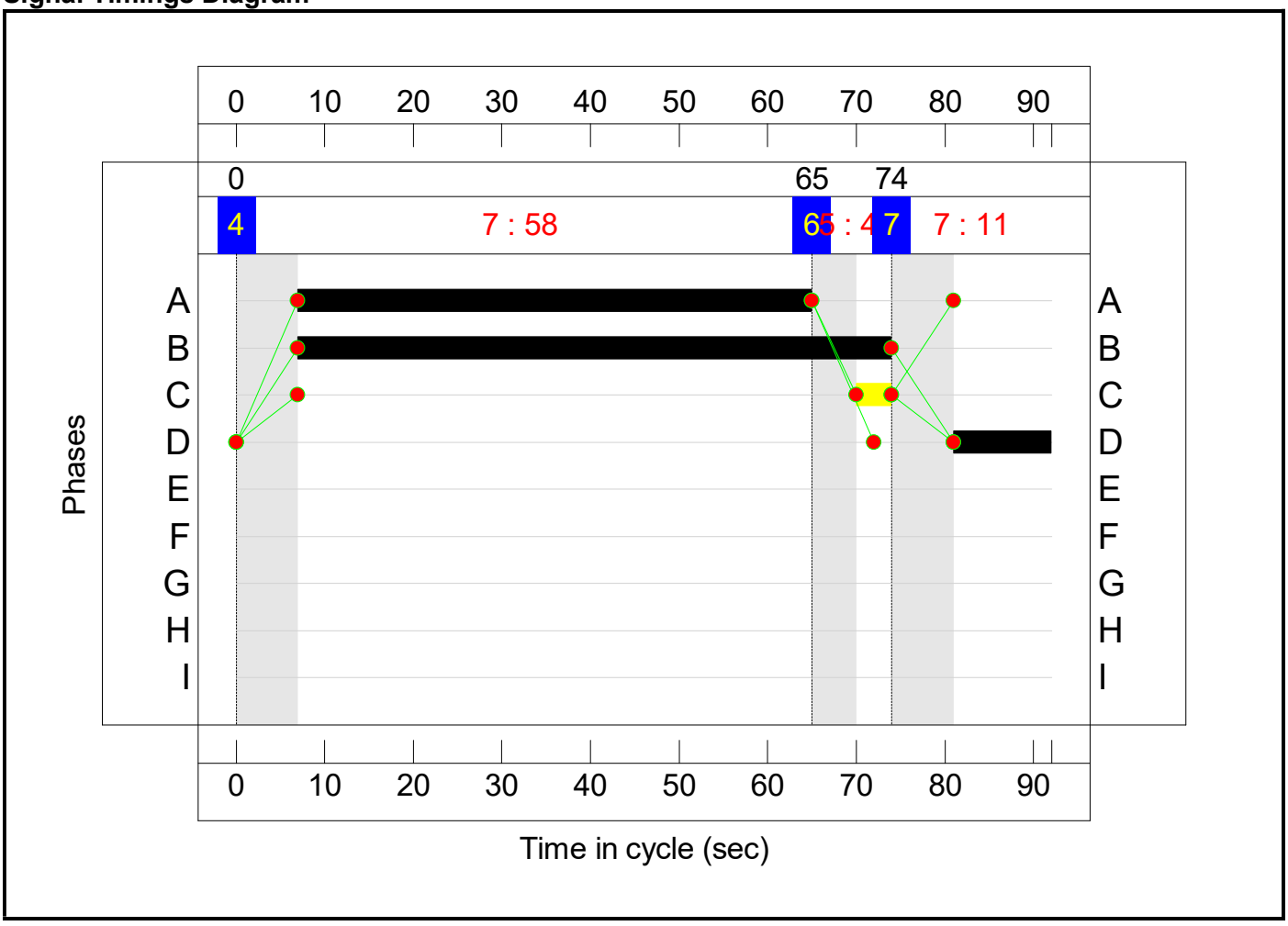
Stage Sequence Diagram



Stage Timings

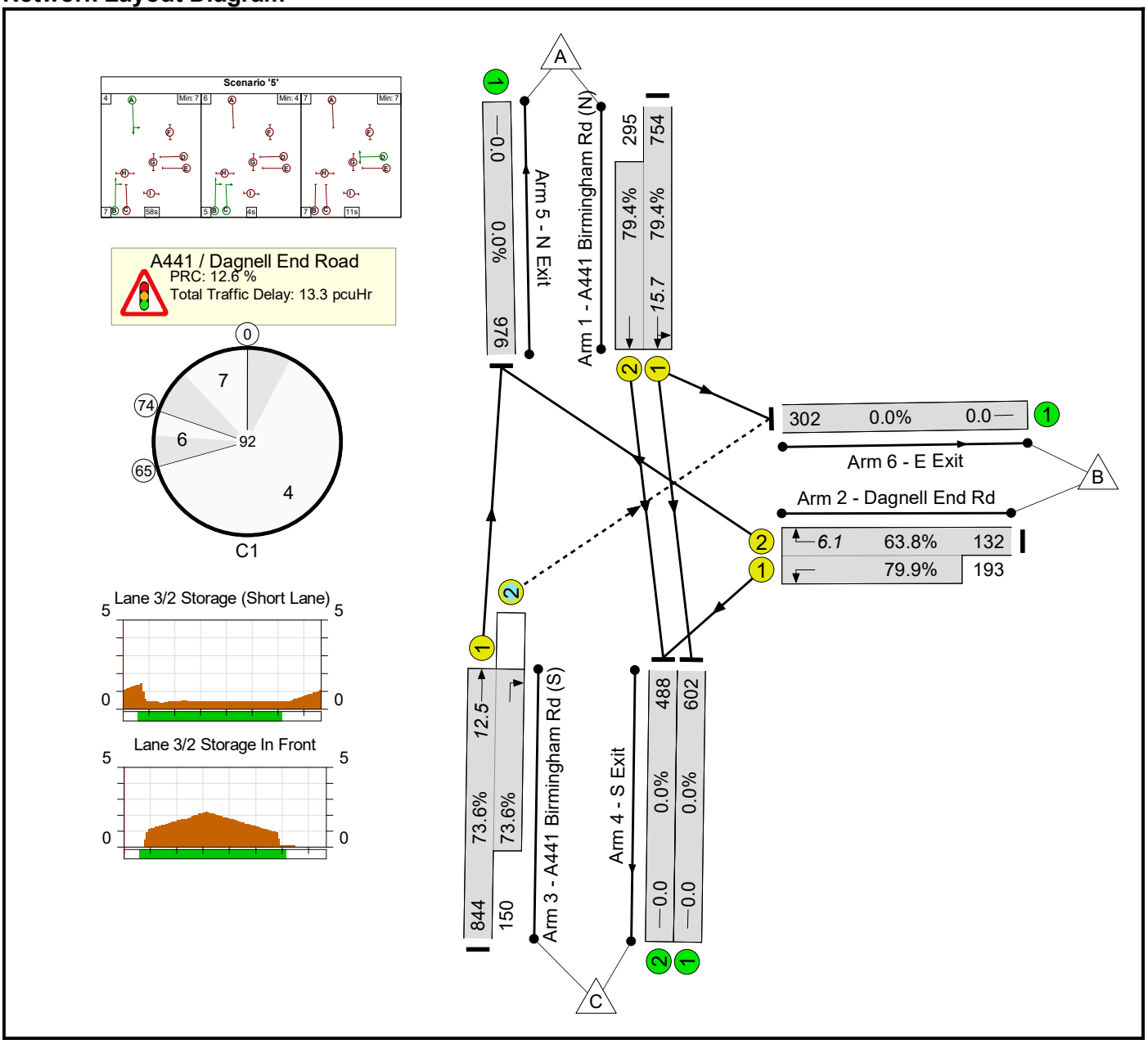
Stage	4	6	7
Duration	58	4	11
Change Point	0	65	74

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**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**79.9%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**79.9%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	58	-	1049	1817:1878	950+372	79.4 : 79.4%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	11	0	325	1650:1852	207+242	63.8 : 79.9%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	67	4	994	1726:1679	1146+204	73.6 : 73.6%
4/1	S Exit	U	N/A	N/A	-		-	-	-	602	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	488	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	976	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	302	Inf	Inf	0.0%

Full Input Data And Results

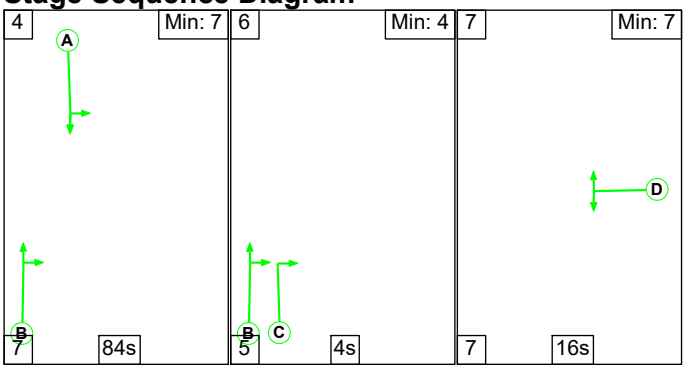
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**103**	**42**	**5**	**7.8**	**4.6**	**0.9**	**13.3**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**103**	**42**	**5**	**7.8**	**4.6**	**0.9**	**13.3**	**-**	**-**	**-**	**-**
1/1+1/2	1049	1049	-	-	-	2.7	1.9	-	4.6 (3.5+1.1)	15.9 (16.7:13.9)	13.8	1.9	15.7
2/2+2/1	325	325	-	-	-	3.5	1.3	-	4.8 (1.9+2.8)	52.7 (52.1:53.1)	4.8	1.3	6.1
3/1+3/2	994	994	103	42	5	1.6	1.4	0.9	3.9 (2.6+1.3)	14.1 (11.1:30.8)	11.1	1.4	12.5
4/1	602	602	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	488	488	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	976	976	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	302	302	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 12.6 Total Delay for Signalled Lanes (pcuHr): 13.30 Cycle Time (s): 92
PRC Over All Lanes (%): 12.6 Total Delay Over All Lanes(pcuHr): 13.30

Full Input Data And Results

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

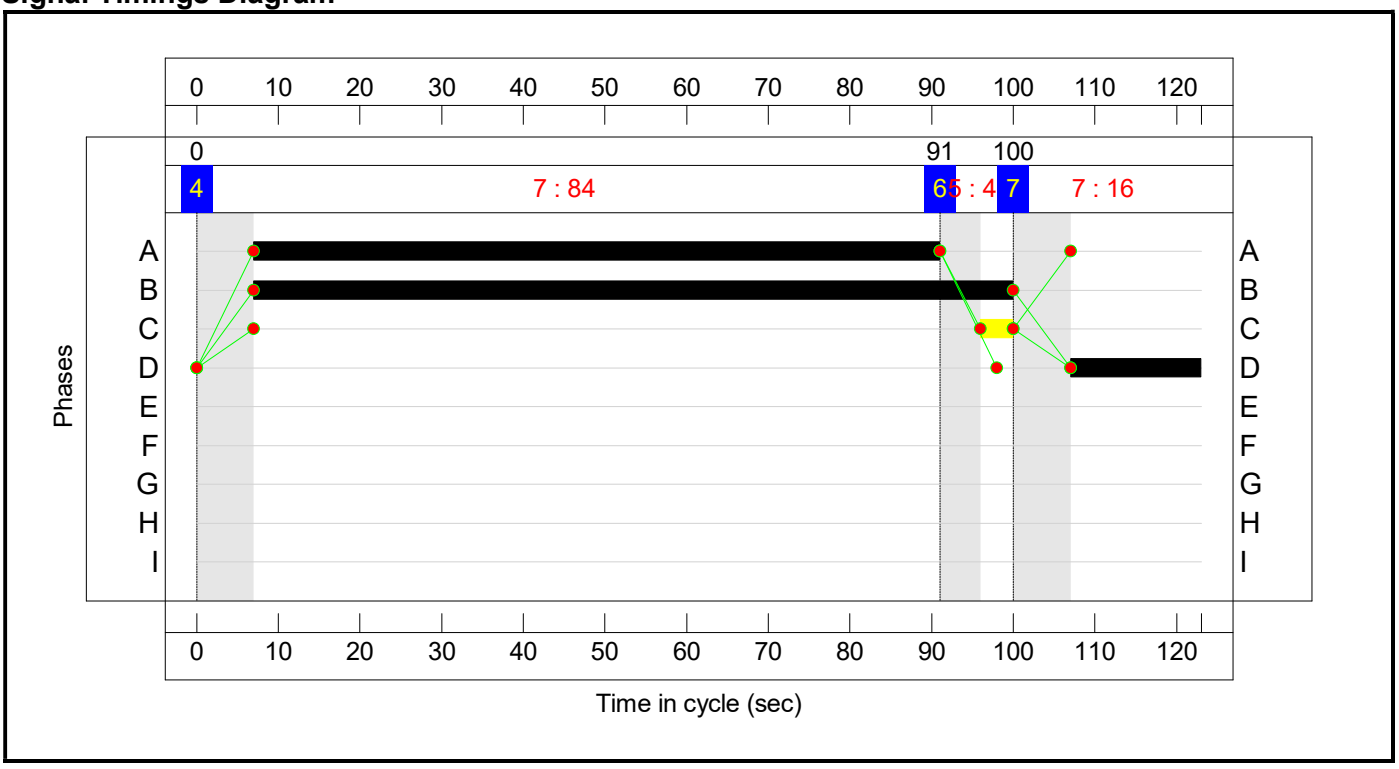
Stage Sequence Diagram



Stage Timings

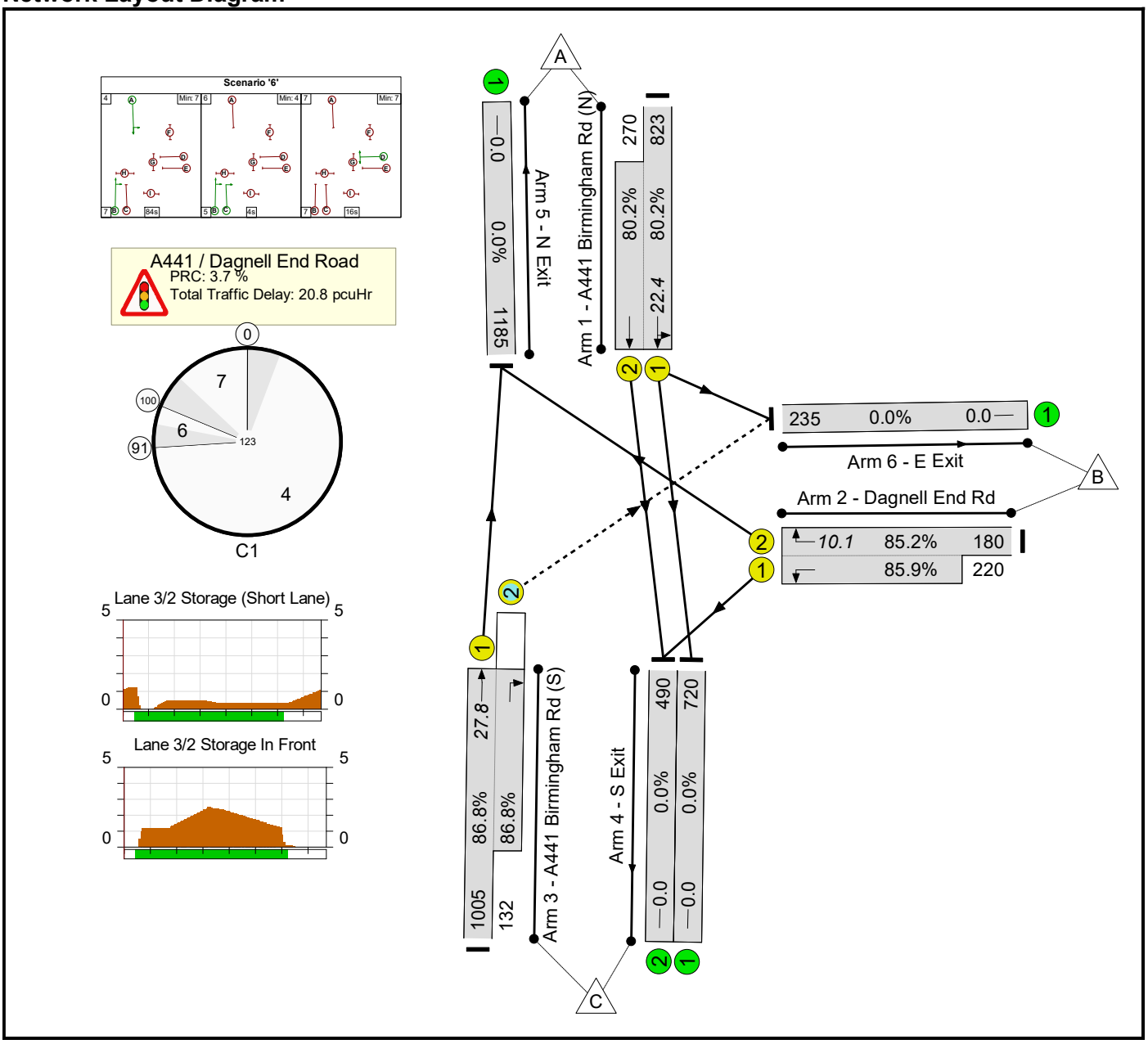
Stage	4	6	7
Duration	84	4	16
Change Point	0	91	100

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**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.8%**
A441 / Dagnell End Road	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.8%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	84	-	1093	1833:1878	1026+337	80.2 : 80.2%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	16	0	400	1650:1852	211+256	85.2 : 85.9%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	93	4	1137	1641:1800	1158+152	86.8 : 86.8%
4/1	S Exit	U	N/A	N/A	-		-	-	-	720	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	490	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1185	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	235	Inf	Inf	0.0%

Full Input Data And Results

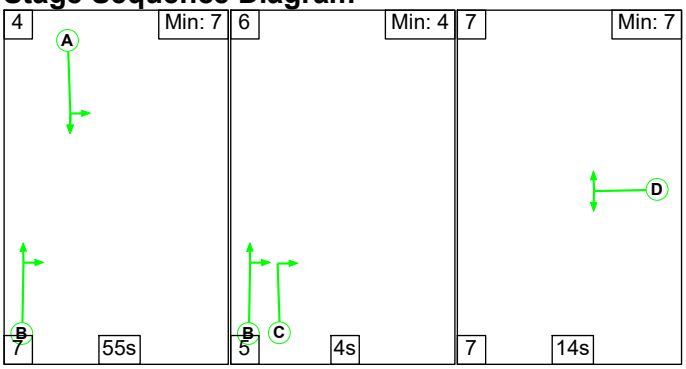
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**89**	**40**	**3**	**11.8**	**7.9**	**1.1**	**20.8**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**89**	**40**	**3**	**11.8**	**7.9**	**1.1**	**20.8**	**-**	**-**	**-**	**-**
1/1+1/2	1093	1093	-	-	-	3.2	2.0	-	5.2 (4.1+1.2)	17.2 (17.8:15.4)	20.4	2.0	22.4
2/2+2/1	400	400	-	-	-	5.7	2.7	-	8.5 (3.8+4.7)	76.3 (76.0:76.6)	7.3	2.7	10.1
3/1+3/2	1137	1137	89	40	3	2.8	3.2	1.1	7.1 (5.4+1.7)	22.5 (19.3:47.5)	24.6	3.2	27.8
4/1	720	720	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	490	490	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1185	1185	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	235	235	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 3.7 Total Delay for Signalled Lanes (pcuHr): 20.83 Cycle Time (s): 123
PRC Over All Lanes (%): 3.7 Total Delay Over All Lanes(pcuHr): 20.83

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)')

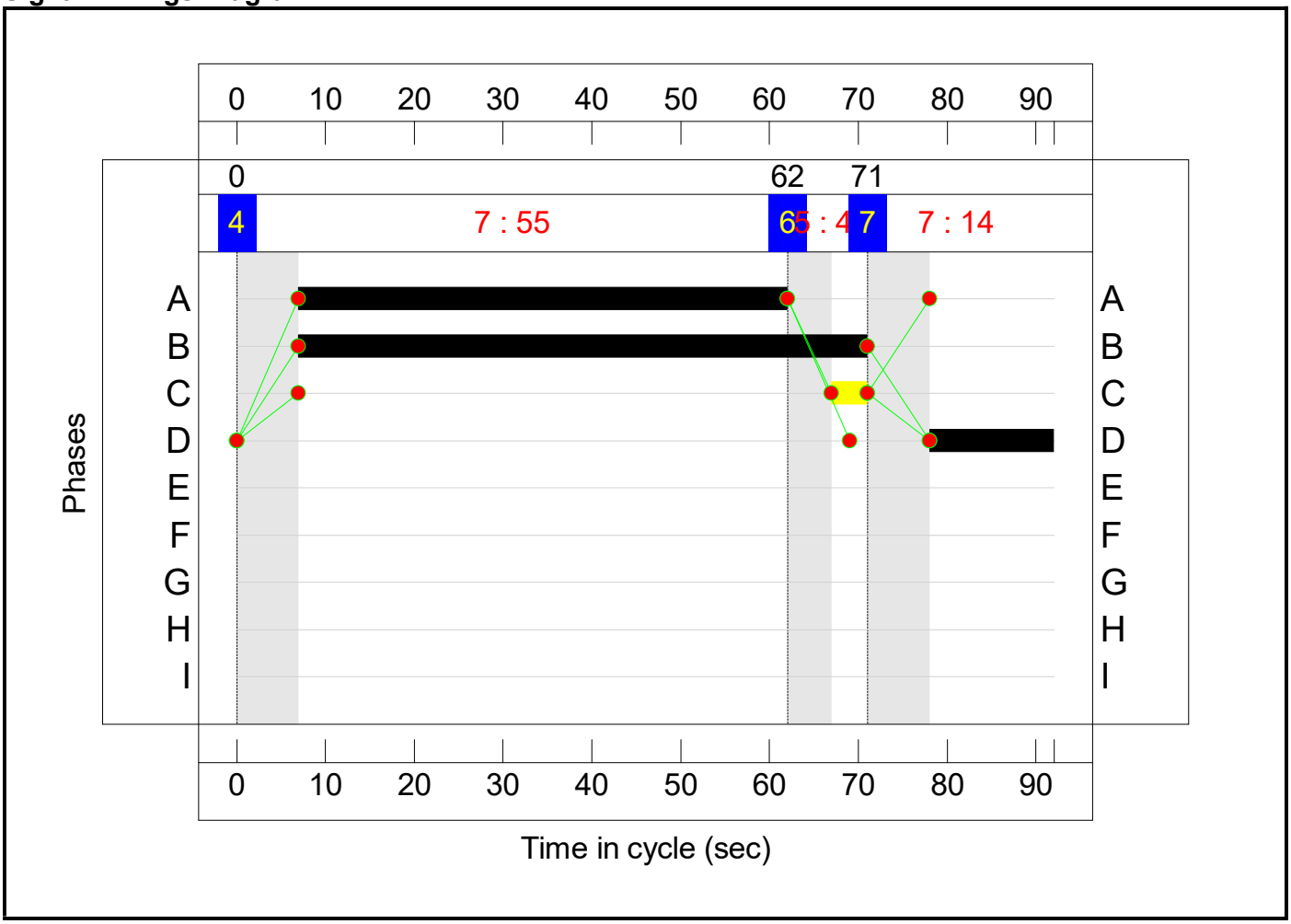
Stage Sequence Diagram



Stage Timings

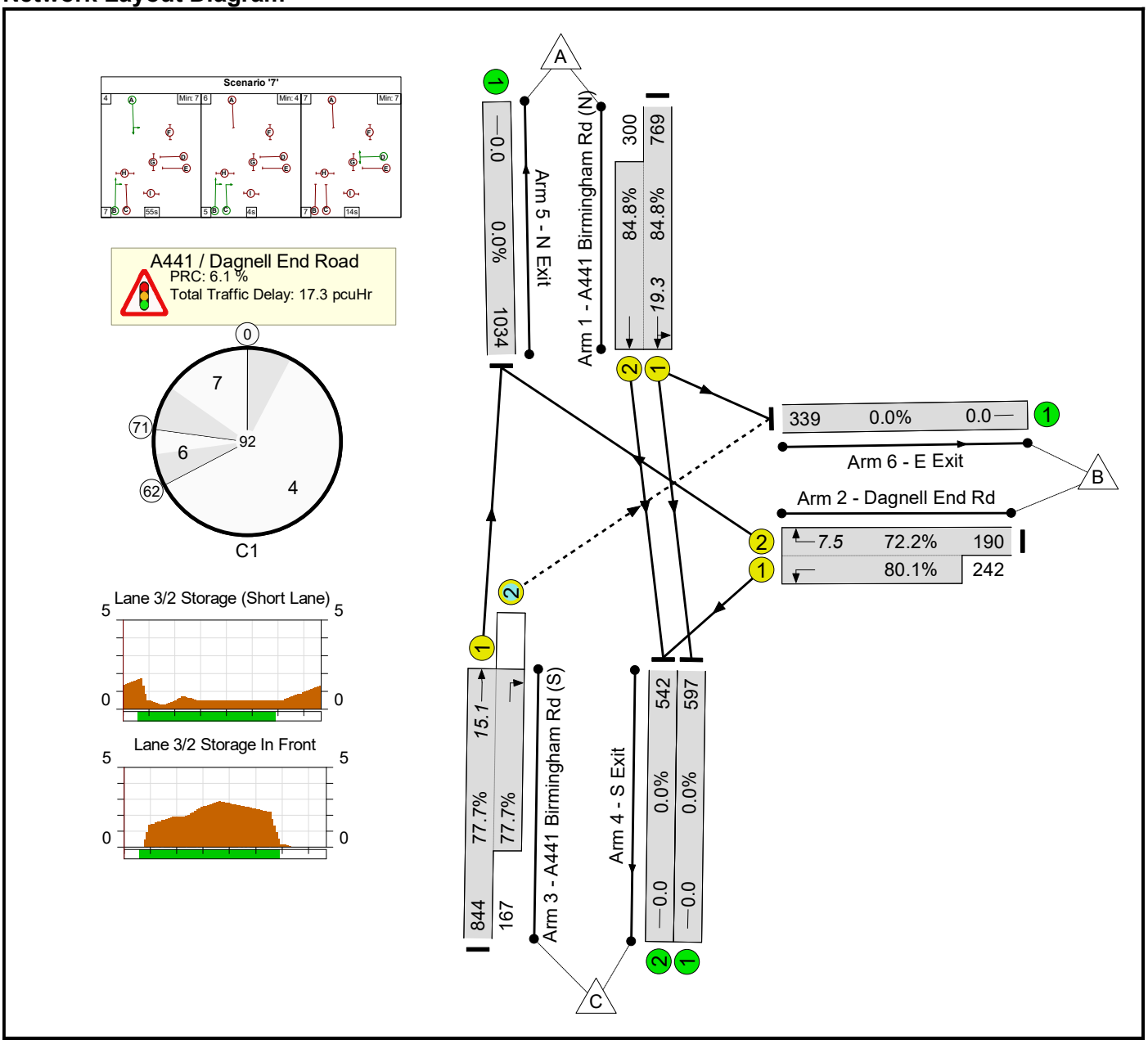
Stage	4	6	7
Duration	55	4	14
Change Point	0	62	71

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**	-	-		-	-	-	-	-	-	**84.8%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**84.8%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	55	-	1069	1812:1878	906+354	84.8 : 84.8%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	14	0	432	1650:1852	263+302	72.2 : 80.1%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	64	4	1011	1726:1679	1086+215	77.7 : 77.7%
4/1	S Exit	U	N/A	N/A	-		-	-	-	597	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	542	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1034	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	339	Inf	Inf	0.0%

Full Input Data And Results

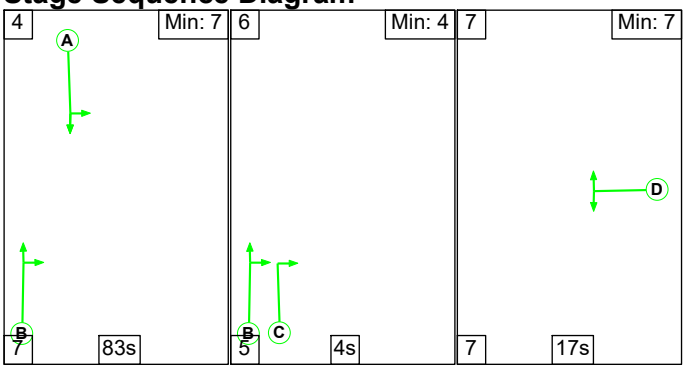
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: A441 / Dagnell End Road	**-**	**-**	**68**	**93**	**5**	**9.9**	**6.0**	**1.3**	**17.3**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**68**	**93**	**5**	**9.9**	**6.0**	**1.3**	**17.3**	**-**	**-**	**-**	**-**
1/1+1/2	1069	1069	-	-	-	3.5	2.7	-	6.2 (4.6+1.6)	20.9 (21.7:18.7)	16.5	2.7	19.3
2/2+2/1	432	432	-	-	-	4.4	1.6	-	6.0 (2.6+3.4)	50.0 (49.6:50.3)	5.9	1.6	7.5
3/1+3/2	1011	1011	68	93	5	2.0	1.7	1.3	5.1 (3.3+1.8)	18.1 (13.9:39.1)	13.4	1.7	15.1
4/1	597	597	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	542	542	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1034	1034	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	339	339	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 6.1 Total Delay for Signalled Lanes (pcuHr): 17.27 Cycle Time (s): 92
PRC Over All Lanes (%): 6.1 Total Delay Over All Lanes(pcuHr): 17.27

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)')

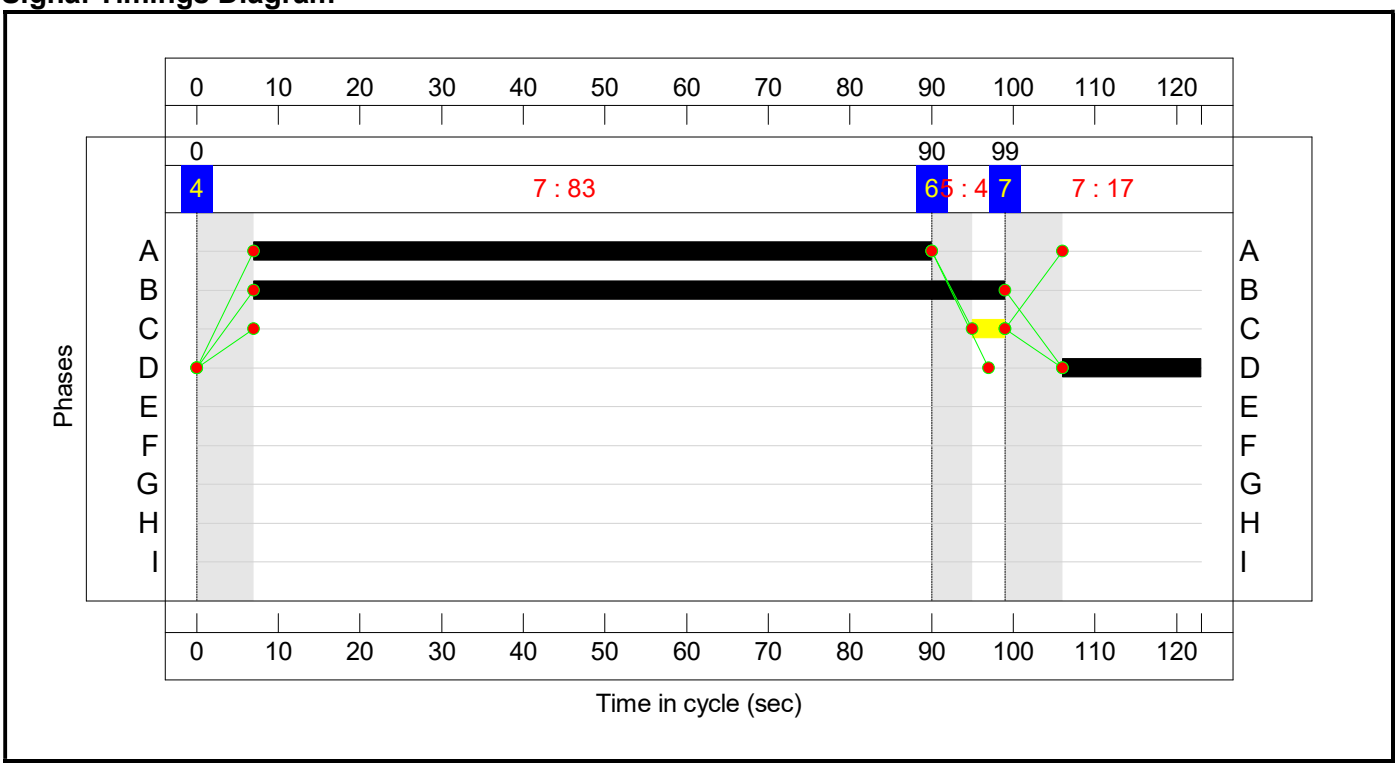
Stage Sequence Diagram



Stage Timings

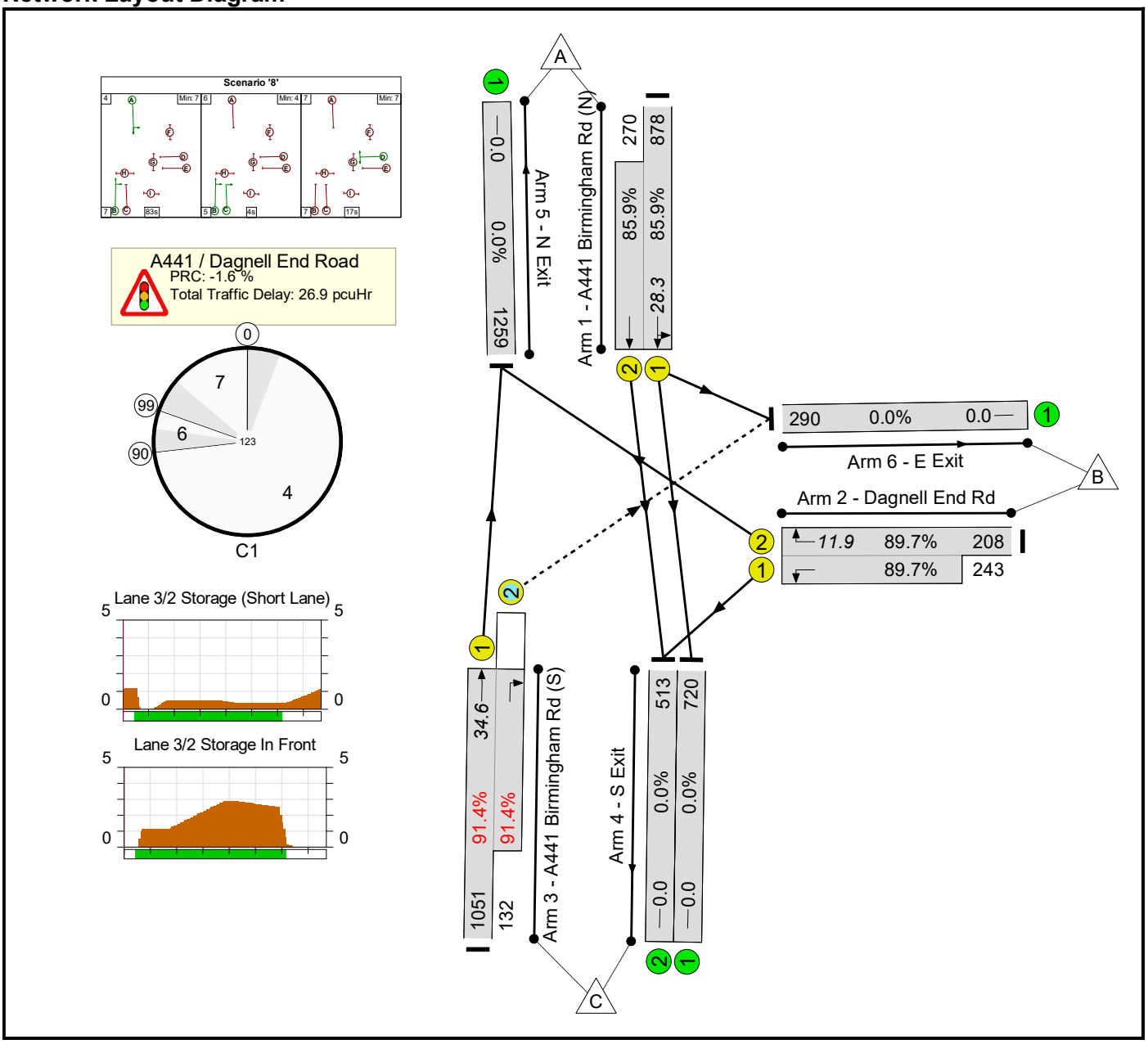
Stage	4	6	7
Duration	83	4	17
Change Point	0	90	99

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**	-	-		-	-	-	-	-	-	**91.4%**
A441 / Dagnell End Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**91.4%**
1/1+1/2	A441 Birmingham Rd (N) Ahead Left	U	N/A	N/A	A		1	83	-	1148	1821:1878	1023+314	85.9 : 85.9%
2/2+2/1	Dagnell End Rd Left Right	U	N/A	N/A	D	E	1	17	0	451	1650:1852	232+271	89.7 : 89.7%
3/1+3/2	A441 Birmingham Rd (S) Ahead Right	U+O	N/A	N/A	B	C	1	92	4	1183	1641:1800	1150+144	91.4 : 91.4%
4/1	S Exit	U	N/A	N/A	-		-	-	-	720	Inf	Inf	0.0%
4/2	S Exit	U	N/A	N/A	-		-	-	-	513	Inf	Inf	0.0%
5/1	N Exit	U	N/A	N/A	-		-	-	-	1259	Inf	Inf	0.0%
6/1	E Exit	U	N/A	N/A	-		-	-	-	290	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	**-**	**-**	**51**	**77**	**3**	**13.9**	**11.6**	**1.4**	**26.9**	**-**	**-**	**-**	**-**
A441 / Dagnell End Road	**-**	**-**	**51**	**77**	**3**	**13.9**	**11.6**	**1.4**	**26.9**	**-**	**-**	**-**	**-**
1/1+1/2	1148	1148	-	-	-	4.0	2.9	-	6.9 (5.4+1.5)	21.7 (22.2:19.9)	25.3	2.9	28.3
2/2+2/1	451	451	-	-	-	6.4	3.8	-	10.2 (4.7+5.5)	81.7 (81.5:81.8)	8.1	3.8	11.9
3/1+3/2	1183	1183	51	77	3	3.5	4.9	1.4	9.8 (7.5+2.3)	29.7 (25.7:61.6)	29.7	4.9	34.6
4/1	720	720	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	513	513	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1259	1259	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	290	290	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -1.6 Total Delay for Signalled Lanes (pcuHr): 26.91 Cycle Time (s): 123
PRC Over All Lanes (%): -1.6 Total Delay Over All Lanes(pcuHr): 26.91

mode

transport planning

keep up with mode:

Birmingham
0121 794 8390

London
020 7293 0217

Manchester
0161 464 9495

Reading
0118 211 8180

info@modetransport.co.uk modetransport.co.uk @mode_transport

APPENDIX C

WCC Email Correspondence

Subject:	FW: Land West of Hither Green Lane, Redditch, Worcestershire (21/01830/FUL)
Date:	Thursday, 26 January 2023 at 14:35:13 Greenwich Mean Time
From:	Gorski, Nigel
To:	Green, David (Mercia), Josh Norris
CC:	paul.lester@bromsgroveandredditch.gov.uk, Ben Fairgrieve, David Frisby, Smith, Paul A. (Technical), Solanki, Chetan, Matthew Shuttleworth
Attachments:	image002.jpg, image001.png, 21_01830_FUL-ME-24-21X_-_PROPOSED_SITE_LAYOUT-1036890 (003) - 1.pdf

David,

I have now received additional comments from internal colleagues regarding the internal design of the site. I have pasted the comments in blue below.
As I had thought, the majority of issues had previously been addressed, although there are some that remain outstanding. We would be looking for these to be addressed in a revised site masterplan drawing.

I've had a look at the revised plans, and the adoptable road layout appears to have taken into account most of my comments of 27.06.2022. However, there are a few items that might be an issue when it comes to the Section 38 approval process. See below:

- *The false T-junctions highlighted on the attached plan at two locations are not considered acceptable operationally and do not reflect the predominant vehicle movement. They also create surplus areas of highway not considered suitable or necessary for adoption. The junctions should be converted to bends with suitable radii and the minor arms converted to private shared drives.*
- *The junction visibility splay adjacent to plot 144 should be checked. The 25m Y distance may encroach into the plot 144 frontage, and the back of adoptable footway should be adjusted as necessary.*
- *Some of the visitor parking spaces appear to be poorly sited in relation to proximity to junctions and bends with the potential to create conflicts. These are adjacent to plots 206, 186 and 190. These should be amended or relocated.*
- *If a pedestrian footway is not being provided the full length of the site along Dagnel End Road, then an additional pedestrian 'cut through' route is requested east-west in the site, close to Dwelling no. 39. This will enable residents on Hither Green Lane to enter the site opposite the Abbey Hotel, and walk a direct line to gain access to bus stops on Dagnel End Road. At the moment, they would have to walk a considerable distance internal distance. A connection to the south of dwelling no.39 or close by is required.*
- *The pedestrian route at the south of the site says for 'cart-path' for use of the golf course only. This needs to be pedestrian route that site occupants and the general public can use, which connects the site to bus stops on the A441 and wider amenities in the town centre. This route needs to be provided in a bound material, lit and of sufficient width for both pedestrian / cycle joint use. At present, this looks to be quite narrow and its unclear what surface is applied and if lighting is being provided.*

I have also now obtained some additional traffic flows for the Dagnel End Lane junction, and this does confirm your findings that traffic volumes through the junction have reduced, compared to the surveys first undertaken by PJA. It does therefore appear that we are accepting of your traffic impact on this junction.

Additional to the changes to the site masterplan (mentioned above), I still need to provide you with comments from the public transport team, just to confirm that the public transport requirements are the same as they previously identified, and to understand if a bus layby / bus stop is required on Dagnel End Road. I have requested this information and I will forward on their comments when received early next week. Road Safety Audits will also be required before we can finalise our highways response, but these

too can only be undertaken once the site masterplan is finalised and I know if a bus stop / layby is required.

If you would like to discuss anything further, please do not hesitate to contact me.
Regards
Nigel

NIGEL GORSKI
Development Control Engineer

Development Management
Transport Planning Unit
Worcestershire County Council
County Hall, Spetchley Road, Worcester, WR5 2NP
Tel: 01905 845373
ngorski@worcestershire.gov.uk

Please note that I only work on Mondays and Thursdays, and therefore contactable on these days only.

Advice relating to the Pre Application process, the Streetscape Design Guide and the Construction Specification can be found on the Transport Guidance for Developers page on Worcestershire County Councils website which can be accessed here:
http://www.worcestershire.gov.uk/info/20007/travel_and_roads/284/transport_guidance_for_developers

worcestershire
county council

From: Green, David (Mercia) <david.green@barratthomes.co.uk>
Sent: 19 January 2023 11:44
To: Gorski, Nigel <NGorski@worcestershire.gov.uk>; Josh Norris <joshnorris@modetransport.co.uk>
Cc: paul.lester@bromsgroveandredditch.gov.uk; Ben Fairgrieve <benfairgrieve@modetransport.co.uk>; David Frisby <davidfrisby@modetransport.co.uk>; Smith, Paul A. (Technical) <paul.a.smith@barratthomes.co.uk>; Solanki, Chetan <chetan.solanki@barratthomes.co.uk>; Matthew Shuttleworth <matthewshuttleworth@modetransport.co.uk>
Subject: [EXTERNAL]RE: *EXTERNAL:FW: Hither Green, Redditch

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Thanks Nigel, how long will it take to obtain and assess the additional data as we are hopeful of getting on to the agenda for next month's planning committee subject to receiving your support for the scheme.

I attach the current site layout as requested. The footpath link to Dagnell End is the only sensible route and extending across the full length of the site would serve no purpose as the proposed link is the most direct route to the junction for the new properties.

The existing footpath to the A441 is macadam and is outside of our application.

Regards

David Green
Senior Technical Manager

BARRATT HOMES | DAVID WILSON HOMES
(trading names of BDW Trading Limited)
Mercia Division | Remus 2 | 2 Cranbrook Way | Solihull | B90 4GT
Tel 0121 713 7310 : DD 0121 713 7385 : M 07342 062783

From: Gorski, Nigel <NGorski@worcestershire.gov.uk>
Sent: 19 January 2023 11:15
To: Josh Norris <joshnorris@modetransport.co.uk>
Cc: paul.lester@bromsgroveandredditch.gov.uk; Ben Fairgrieve <benfairgrieve@modetransport.co.uk>; David Frisby <davidfrisby@modetransport.co.uk>; Smith, Paul A. (Technical) <paul.a.smith@barratthomes.co.uk>; Solanki, Chetan <chetan.solanki@barratthomes.co.uk>; Matthew Shuttleworth <matthewshuttleworth@modetransport.co.uk>; Green, David (Mercia) <david.green@barratthomes.co.uk>
Subject: *EXTERNAL:FW: Hither Green, Redditch

Josh,

In terms of 'the application has been live for some time, and we are keen to avoid any further delays in the determination process', this is not a result of the Highway Authority. There is no set timescale for determining an application and when we are content that all highways issues have been addressed, we shall make our recommendation to the LPA. The revised Dagnel End Road junction model was only been provided to us before Xmas.

I note your comments but am still seeking additional ATC data for the junction, noting that a significant number of residents, along with a resident action group, will no doubt also be obtaining their own data in seeking to stop this development. If we do agree to your modelling, which is now looking more likely, I would like to know it is robust and typical of traffic flows travelling through the junction, based on more than a weeks data. Should the data support your conclusions, this data will only help your case.

Please could we have a copy of the latest site masterplan. We have been back and forth providing comments on the sites internal site design, and I believe that the majority have now been incorporated into the site layout. It would be good just to undertake a final check on the masterplan to ensue all the changes were made. The last correspondence I have regarding the sites internal site design was back in July 2022. Should the Dagnel End Road junction modelling now be suitable, it would be good to be in the position of the masterplan layout having also been approved.

In terms of off-site improvements. We acknowledge that a 2m footway is to be to provided along Dagnel End Road fronting the site, but this should be extended across the full length of the site, connecting the improved Dagnel End Lane junction scheme to Hither Green Lane. This should allow connections to the footway from the residential proposals to the south. Whilst one connection is believed to be shown in the form of an emergency vehicle access, a few additional pedestrian cut throughs would be welcome, as bus services are provided on Dagnel End Lane.

I would also like to clarify the intentions for the footway connection to the A441. Discussions have focussed on the Dagnel End Road junction for so long, that I don't recall the intentions for this route. I can see from the latest masterplan I have, that the site will connect to the A441, but can you confirm the form of this route. The existing path is believed to be provided in a bound material and lit, but of limited width and prone to flooding. Are there intentions to upgrade this route, given that it's the most direct route for pedestrians to access to the town centre.

Regarding public transport, the Public Transport team have previously provided direct comments to the LPA, and I included text to the same affect in my original LPA highways response. The PT letter is attached. These points will need to be addressed.

If you would like to discuss anything further, please do not hesitate to contact me.
Regards
Nigel

NIGEL GORSKI
Development Control Engineer

****
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Subject: Re: *EXTERNAL:FW: Hither Green Lane - Bus Egress
Date: Friday, 14 April 2023 at 10:12:10 British Summer Time
From: Josh Norris
To: Gorski, Nigel
CC: Ben Fairgrieve, Green, David (Mercia), paul.lester@bromsgroveandredditch.gov.uk, Solanki, Chetan, Elliott Place, Godfrey, Ben
Attachments: image001.jpg, image002.png, image003.png, image004.png, image005.png, image006.png, image007.png, image008.png, image009.gif, image010.png, image011.png, image012.png, image013.png, image014.png, image015.png, image016.png, image017.gif, 230414_325756_PS001K-SK-024.pdf

Morning Nigel,

Thanks for your email.

Please find attached SK024 which demonstrates that the revised alignment of the road can still accommodate the required visibility splays (2.4m x 25m) for a 20mph design speed, in accordance with Manual for Streets.

With respect to the narrowing of the carriageway, this reflects the nature of the road to the south of the loop road. The road is lit, and subject to a 20mph design speed. Furthermore, it is not envisaged that a significant number of vehicles will be routing north to south at the junction, due to the alternative shorter route around the southern section of the bus loop.

Nonetheless, taking on board the comments raised, and as outlined on plan SK024 (attached above), road marking is to be implemented at the junction, which delineates the edge of the carriageway on the mainline (north to south) at the junction. Assuming a 1:20 taper (in accordance with the standards outlined in CD123 V2.1.0), a minimum taper length of 12m is required to account of the change in width of 0.6m between the 6.1m and 5.5m wide sections of carriageway. The give-way lane is c. 18m long and is therefore in accordance with the taper length requirements, as specified by CD 123. In light of the above it is considered that the give-way markings will provide suitable delineation to guide southbound vehicles between the two sections of carriageway.

Many thanks for your time and I look forward to your response.

Kind Regards,

Josh

Josh Norris BSc (Hons) MSc MCIHT
Principal Consultant

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07990 276 384
joshnorris@modetransport.co.uk
www.modetransport.co.uk

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Lombard House, 145 Great Charles Street, Birmingham B3 3LP

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From: Gorski, Nigel <NGorski@worcestershire.gov.uk>
Date: Thursday, 13 April 2023 at 16:20
To: Josh Norris <joshnorris@modetransport.co.uk>, Ben Fairgrieve <benfairgrieve@modetransport.co.uk>, Green, David (Mercia) <david.green@barratthomes.co.uk>
Subject: FW: *EXTERNAL:FW: Hither Green Lane - Bus Egress

FYI

Comments from WCC engineering team RE the internal site design.

--

We have looked at the revised internal layout plans attached with road widening to accommodate a bus loop and these appear to be generally acceptable.

They just need to make sure the internal junction visibility splays have not been compromised by the road widening, and will still be achievable within adoptable land.

The kerb line at the junction below would also need tweaking a bit to provide a smooth transition across the junction from the widened 6.1m carriageway to 5.5m carriageway. Otherwise there's a risk of drivers hitting the kerb when travelling in the direction below, particularly at night:

From: Green, David (Mercia) <david.green@barratthomes.co.uk>
Sent: 13 April 2023 10:48
To: Gorski, Nigel <NGorski@worcestershire.gov.uk>; Josh Norris <joshnorris@modetransport.co.uk>
Cc: Elliott Place <elliottplace@modetransport.co.uk>; Godfrey, Ben <ben.godfrey@barrattplc.co.uk>; Solanki, Chetan <chetan.solanki@barratthomes.co.uk>; Paul Lester <paul.lester@bromsgroveandredditch.gov.uk>; Ben Fairgrieve <benfairgrieve@modetransport.co.uk>
Subject: [EXTERNAL]RE: *EXTERNAL:FW: Hither Green Lane - Bus Egress

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Hi Nigel, site layout as requested. This has the 6.1m wide carriageway widened locally to accommodate the bus tracking.

Regards

David Green
Senior Technical Manager

BARRATT HOMES | DAVID WILSON HOMES
(trading names of BDW Trading Limited)
Mercia Division | Remus 2 | 2 Cranbrook Way | Solihull | B90 4GT
Tel 0121 713 7310 : DD 0121 713 7385 : M 07342 062783

From: Gorski, Nigel <NGorski@worcestershire.gov.uk>
Sent: 13 April 2023 10:30
To: Josh Norris <joshnorris@modetransport.co.uk>
Cc: Elliott Place <elliottplace@modetransport.co.uk>; Godfrey, Ben <ben.godfrey@barrattplc.co.uk>; Solanki, Chetan <chetan.solanki@barratthomes.co.uk>; Green, David (Mercia) <david.green@barratthomes.co.uk>; Paul Lester <paul.lester@bromsgroveandredditch.gov.uk>; Ben Fairgrieve <benfairgrieve@modetransport.co.uk>
Subject: *EXTERNAL:FW: Hither Green Lane - Bus Egress

Josh,

Our PT team are happy with the revised bus loop arrangement, and we shall send the revised arrangement to the bus operator - Diamond for them to update their contribution requirements accordingly. I don't think Diamond will have any concerns with this arrangement, but we shall just double check.

I will however also need to consult our engineering colleagues on the internal site changes, needed to accommodate a bus.. Could you provide a full site masterplan taking account of the new 6.1m carriageway width changes. Is this something you can provide?

Thanks
Nigel

From: Payne, Helena <HPayne@worcestershire.gov.uk>
Sent: 13 April 2023 09:41
To: Martin-White, Michael <MMartin-White@worcestershire.gov.uk>; Gorski, Nigel <NGorski@worcestershire.gov.uk>
Subject: RE: Hither Green Lane - Bus Egress

Hi Nigel,

Are you able to provide a map of the full site showing the required full bus routing – I can then send on to Diamond and carry out a further cost review.

I know Diamond will ask for this for mileage.

Thanks

Helena Payne
Transport Network Development & Planning Officer

Worcestershire County Council
Highways & Transport Control Centre

Pershore Lane
Worcester
WR4 0AA

Direct Tel: 01905 844392
Team email: TCLUTransportCommissioning@worcestershire.gov.uk

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From: Josh Norris <joshnorris@modetransport.co.uk>
Sent: 12 April 2023 11:52
To: Gorski, Nigel <NGorski@worcestershire.gov.uk>
Cc: Elliott Place <elliottplace@modetransport.co.uk>; Godfrey, Ben <ben.godfrey@barrattplc.co.uk>; Solanki, Chetan <chetan.solanki@barratthomes.co.uk>; Payne, Helena <HPayne@worcestershire.gov.uk>; Green, David (Mercia) <david.green@barratthomes.co.uk>; Paul Lester <paul.lester@bromsgroveandredditch.gov.uk>; Ben Fairgrieve <benfairgrieve@modetransport.co.uk>
Subject: [EXTERNAL]Re: Hither Green Lane - Bus Egress
Importance: High

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Morning Nigel,

Further to previous discussions with Ben, we have amended the site layout to allow the bus to access the site from Hither Green Lane, before routing around the internal route in a clockwise direction and egressing back onto Hither Green Lane, therefore removing the requirement for a bus egress junction directly onto Dagnell End Road.

I would be grateful if you could get back to me with any comments on the layout at your earliest convenience.

Many thanks in advance and I look forward to hearing from you.

Kind Regards,

Josh

Josh Norris BSc (Hons) MSc MCIHT
Principal Consultant

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From: Gorski, Nigel <NGorski@worcestershire.gov.uk>
Date: Monday, 3 April 2023 at 12:54
To: Ben Fairgrieve <benfairgrieve@modetransport.co.uk>
Cc: Elliott Place <elliottplace@modetransport.co.uk>, Godfrey, Ben <ben.godfrey@barrattplc.co.uk>, Solanki, Chetan <chetan.solanki@barratthomes.co.uk>, Payne, Helena <HPayne@worcestershire.gov.uk>, Josh Norris <joshnorris@modetransport.co.uk>, Green, David (Mercia) <david.green@barratthomes.co.uk>, Paul Lester <paul.lester@bromsgroveandredditch.gov.uk>
Subject: RE: Hither Green Lane - Bus Egress

Ben,

I have received comments back from WCC colleagues. I have just cut and paste these direct below.

The bus operators are largely in support of the route and access proposals.
RE WCC highways and Road Safety team, comments include:

--

- How will the bus egress proposal be self-enforcing to ensure bus only usage? Very short bus only lanes or gates such as indicated are notoriously difficult to enforce and tend to be used as a short cut by residents. Electronic forms of enforcement are not acceptable to W.C.C. i.e. rising bollards, electronic barriers, etc. as historically these have proven to be expensive to maintain and become an ongoing maintenance liability for the Highway Authority. The left turn only arrangement would require a traffic regulation order together with suitable regulatory signs to make the direction legally enforceable. If the egress is proposed as one way this would also require a traffic regulation order to make it enforceable, and to prohibit its usage by other vehicles, except possibly cyclists. All of the required traffic orders would require regulatory signs to enforce.
- In my opinion the visibility splays onto Dagnell End Road should be based on D.M.R.B. standards as outlined in CD109 and CD123. This is a B class road carrying significant traffic flows with 85th percentile speeds greater than 40mph. This would require a minimum “Y” distance of 120 metres to the nearside kerb line. Even if there is a proposal to reduce the speed limit in Dagnell End Road to 40mph as mentioned below, this is unlikely to have a significant impact on vehicle speeds, as to drivers the local environment will appear no different to existing. The large tree which sits within the indicated visibility splay looking to the right from the egress will form a risk to visibility as its trunk diameter appears to be greater than the accepted single obstacle diameter of 550mm as set out in paragraph 3.4 of CD109, and would likely require removal together with other vegetation to

ensure safe operation of the bus egress. I assume this point would be raised in a subsequent Stage 2 Road Safety Audit. I would also question the justification for reducing the "X" distance to 2 metres from 2.4 metres. Even if the egress itself will only be lightly trafficked, assuming only buses use the facility, Dagnell End Road carries a significant daily traffic flow as a link between the A441 and A435.

- The alignment of the bus egress exit radius would appear not to physically enforce the left turn only movement, and could be abused, creating potential road safety risks. It should also be designed to ensure that a bus turning left does not encroach into the eastbound carriageway of Dagnell End Road. The vehicle swept paths indicated on attached plans do not appear to be a true representation of a bus drivers manoeuvre.
- The bus egress proposal also appears to show an adjacent footway link from the development site which stops at the end of the radius. As there is currently no footway along the south side of Dagnell End Road at this location is a new footway proposed to provide a continuous sustainable link? I note that this connects to the existing committed Dagnel End Road scheme, so this point requires no further action.
- The plans supplied do not show the internal road alterations to incorporate bus usage. Any internal bus route would need to need to be a minimum 6.1 metres wide with localised widening on bends to allow a bus and car to pass in opposite directions.

Based on my previous experience of short bus only lanes or gates they are rarely self-enforcing and tend to become a long term operational and maintenance liability. The alternative option mentioned for an internal bus loop accessing the site from Hither Green Lane could be a more sustainable option, but this would require alterations to internal road widths and corner radii, etc. which could impact on the overall internal layout.

--

We shall need to work through the above points to see where solutions can be found. I think most points could potentially be overcome, although the tree in the visibility splay does appear to present a problem.
Regards
Nigel

From: Ben Fairgrieve <benfairgrieve@modetransport.co.uk>
Sent: 21 March 2023 14:09
To: Gorski, Nigel <NGorski@worcestershire.gov.uk>
Cc: Elliott Place <elliottplace@modetransport.co.uk>; Godfrey, Ben <ben.godfrey@barrattplc.co.uk>; Solanki, Chetan <chetan.solanki@barratthomes.co.uk>; Payne, Helena <HPayne@worcestershire.gov.uk>; Josh Norris <joshnorris@modetransport.co.uk>; Green, David (Mercia) <david.green@barratthomes.co.uk>
Subject: [EXTERNAL]Hither Green Lane - Bus Egress

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Dear Nigel,

As requested please find attached the supplementary information on visibility splays and tracking for the proposed bus egress from the site onto Dagnell End Road for you to forward to your road safety

colleagues.

Drawing J32-5756-PS-023 Rev A illustrates the following visibility splays:

- 2.4m x 120m to kerbline (both directions) – assuming proposed 40mph speed limit is introduced.
- 2.4m x 127.1m to kerbline (both directions) – based on 85%ile recorded speeds (posted speeds are NSL).
- I have also appended the ATC data and calculation sheet for the 85%ile speed splay dimension to supplement the drawing.

I have also reattached drawing J32-5756-PS-023 which summarises the best achievable visibility in line with the parameters I discussed in my email yesterday and reiterated below to present the range of options to your colleagues.

This drawing illustrates a best achievable splay of 2.0m x 96.5m to the right assuming it is plotted to an offset 1m from the kerbline. This option assumes the TPO tree is retained and demonstrates visibility assuming the splay avoids the obstruction.
The justification for the 2m 'X' distance is based on the access being lightly trafficked (MfS2 para 10.5.8) and the shorter bonnet profile typical of buses (this point is also demonstrated by the vehicle profiles illustrated on tracking drawings J32-5756-PS-028 & 029). For context the bus is anticipated to operate on an hourly frequency.

The offset of the visibility splay into the carriageway is a principle set out in both MfS 1 and 2 which is cited as a more accurate visibility measurement in MfS2 para 10.5.3.

Finally, drawings J32-5756-PS-028 & 029 illustrate vehicle tracking assuming a 9.46m and 10.94m length bus using the egress.

Helena – I have one of the team looking at the implications of turning the bus within the site as an alternative option that I intend to issue under separate cover. I am assuming a one-way loop within the site is acceptable in principle given we are looking at a diversion to an existing service operating on an hourly frequency?

Nigel, I appreciate that you are imminently going to be on annual leave; however, if I could be copied in when you forward to colleagues I can pick this up with them during your absence?

Kind regards,

Ben

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Ben Fairgrieve BA (Hons) MCIHT
Director
mode transport planning

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APPENDIX D

Site Layout

Disclaimer

Images, layouts and plans are intended for illustrative purposes only and should be treated as general guidance only.

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Schedule of Accommodation — ME-24-21Y — 07/02/2023

Private Houses	House / Flat	No. Beds / Persons	Total No.	Sq. Ft.	Total Sq. Ft.
H421–H7 [Winstone]	H	4B / 8P	7	1765	12355
H417–H7 [Bradgate]	H	4B / 8P	11	1434	15774
H432–H7 [Kirkdale]	H	4B / 8P	8	1354	10832
H486—7 [Hollinwood]	H	4B / 8P	8	1220	9760
T310–E-7 [Kennett]	H	3B / 6P	30	1089	32670
T310–E-7 [Kennett]	H	3B / 6P	1	1089	1089
P382–EH7 [Arncliffe]	H	3B / 5P	20	832	16640
P382–EO7 [Arncliffe]	H	3B / 5P	2	832	1664
P382–E-7 [Arncliffe]	H	3B / 5P	3	832	2496
P341–D7 [Hadley]	H	3B / 5P	6	1001	6006
P341–E-7 [Hadley]	H	3B / 5P	2	1001	2002
H406–H7 [Holden]	H	4B / 8P	5	1539	7695
H406–X7 [Avondale] (inc. 2x custom build units)	H	4B / 8P	18	1491	26838
Core: 92%			121		
H470—7 [Hertford]	H	4B / 7P	9	1364	12276
P470–E-7 [Hereford]	H	4B / 7P	2	1364	2728
P331–CH7 [Farne ay]	H	3B / 5P	7	1001	7007
P331–CK2' [Farne ay]	H	3B / 5P	3	1001	3003
P331–EH7' [Farne ay]	H	3B / 5P	2	1001	2002
H349–H7 [Abbeydale]	H	3B / 6P	2	1026	2052
P347VEH7 [Hadley Wide]	H	3B / 5P	2	1001	2002
Occasional: 8%			27		
Total			148		176991

Affordable 30%

Shared Ownership Types	House / Flat	No. Beds	Total No.	Sq. Ft.	Total Sq. Ft.
P204–EH7 [Milford]	H	2B / 4P	3	620	1860
P204–E7 [Milford]	H	2B / 4P	1	620	620
P382–EH7 [Arncliffe]	H	3B / 5P	9	832	7488
P382–E7 [Arncliffe]	H	3B / 5P	5	832	4160
P341–E-7 [Hadley]	H	3B / 5P	6	1001	6006
Total			24		20134

Social Rent Types	House / Flat	No. Beds	Total No.	Sq. Ft.	Total Sq. Ft.
SH75–E-7	H	1B / 2P	3	465	1395
SH80–E-7	H	2B / 4P	3	645	1935
SH95–E-7	H	3B / 5P	3	958	2874
SH50–EH7	H	2B / 4P	6	750	4500
SH50–I-7	H	2B / 4P	12	750	9000
SH54–EH7	H	4B / 6P	4	1163	4652
SH52–EH7	H	3B / 5P	8	920	7440
SH52–I-7	H	3B / 5P	3	930	2790
Total			42		34making
Totals			214		231371
Gross Area (acres)			24.33		
Nett site area (acres)			14.44		
Density / Acre			15		
Density / Hectare			37		
SQFT per acre					16022

Notes:

- Additional affordable provided over provision at divisions request.
- Plots 112 & 113 are to be custom build units.
- All frontage parking is 5.5m.
- All tandem parking is 6m (in front of garage).

Rev	Description	Date	Drawn	Chk'd
Z	Bus loop added within the site to accommodate a local bus service. Actioned following comments from the LPA.	13.04.23	BG	
Y	Bend outside of plots 13 - 14 adjusted to suit forward vis requirements. Visitor parking relocated away from junctions, sub-station relocated and a few plot subs to suit the above following comments from the LPA and division.	07.02.23	BG	
X	Area containing plots 136-143 replanned following comments from the tree officer. 3x units removed from scheme following discussions with the division. Affordable housing changed to suit NPPF 2021 Interim SHMA and schedule updated to suit.	25.09.22	BG	
W	Bend outside of plot 105 widened to 5.0m. Length of road from plots 103-106 widened to 5.5m resulting in the removal of the utility door for the P341 (group standard 2B4P). These changes were made at the request of the highways consultant.	11.08.22	BG	
V	All block paving removed from highway, all 1m verges replaced with 2m footpaths. Some minor cul-de-sacs changed to shared surface roads with a minimum 5.5m width. A few of plots have been handed to for design purposes these include 61, 62 & 187. These changes (except handings) were made at the request of highways.	08.08.22	BG / DG	
U	Plot substitutions on some shared ownership and Social Rent housetypes. Additional SUDs Ponds added.	08.07.22	SM	BG
T	Layout adjusted to suit comments from highways following a review of the layout by the highways consultant. These changes to the layout include but not limited to; all corner kite curves changed to 10m minimum, turning heads changed to suit WCC standards, shared surface areas changed to have 5x 2m footpaths + 1x 1m verge and plots adjusted to suit forward vis splays. The division also requested that all frontage parking was increased to 5.5m and all tandem parking increased to 6m long. Large garages changed to small for all 3 beds and any 4 beds where at least 3 parking spaces are be provided. Garages moved into garages where possible at divisions request.	20.05.22	BG	
S	Schedule of accommodation updated to include each housetypes individual 8 digit code at the divisions request.	03.12.21	BG	
R	Screen walls changed to remove timber-infill panels.	25.11.21	BG	
Q	Footpath to the South East of site that runs from Hither Green Lane to the POS adjacent to plot 181 added as it solely used and maintained by the golf course. Path delineated by a 450 high knee rail, footpaths in and around the POS adjusted to the revised arrangement at the request of the division.	19.08.21	BG	
P	Layout sense checked on a plot-by-plot basis, boundary treatments reviewed and updated, affordable tenures updated, bin collection points added and parking adjusted following an internal review by the LD team (BG). Rural Edge also adjusted following comments from the division which resulted in a re-plan of plots 1-3.	16.08.21	BG	
N	Plot no. 156 swapped to H417	14.07.21	SW	
M	Plot nos. 5,8,23,109,111,158 and 159 changed to H469 house type	13.07.21	SW	
K	Plot nos 86 and 93 amended	28.06.21	SW	
J	Site boundary amended, entrance gates and notes added	24.06.21	SW	
I	House types amended and additional hedging retained	23.06.21	SW	
H	Layout updated to improve BNG	23.06.21	SW	
G	Layout amended to improve BNG	15.06.21	SW	
F	Amended to division comments	27.05.21	SM	
E	Amended to division comments	26.05.21	SM	
D	Amended to division comments	25.05.21	SM	
C	Amended to division comments	21.05.21	SM	
B	Attenuation basin added to south of site.	14.05.21	SM	
A	Shared Ownership & Affordable Rent units indicated, paths, patios, drives, gates & boundary walls added.	11.05.21	LJN	

Legend

- Application boundary
- House type coding
- Plot handing (as or opposite)
- 124 Plot Number
- Social Rent Units
- Shared Ownership Units
- Timber Knee Rail
- Existing Trees
- Proposed Trees
- Proposed Hedgerows
- Proposed SUDs Basin
- BCP Bin Collection Point (Private Drives only)
- RPA
- VP Visitor Parking
- 1.8m high screen wall
- 1.8m High Fence between plots
- 1.2m High Timber Post and Rail Fence
- 0.9m High Timber Bollard
- 1100mm high entrance feature wall with 1500mm high piers

Scale Bar

0m 5m 10m 15m 20m 25m 30m 35m 40m 45m 50m 60m 70m 80m 90m 100m

Urban Design
Barratt House
Forest Business Park
Bardon Hill
Leicestershire
LE67 1UB

01530 276276

Project
Hither Green
Land off Hither Green Lane
Redditch

Drawing Title
Proposed Site Layout

Scale
1:500 @ A0

Date
20.04.2021

Drawn By
SW

Drawing Ref
ME-24-21Z

DAVID WILSON HOMES
WHERE QUALITY LIVES

When printing to scale, please ensure that your printer settings are set to Page Sizing > None. Do not allow any 'fit to page' settings as this will alter the scale of the drawing. You can use the scale bar to get the most accurate printout.

APPENDIX E

Highways Drawing Package

NOTE;

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

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

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

KEY:

- SITE BOUNDARY
- POSTED SPEED LIMIT - VISIBILITY SPLAY 2.4m x 43m (30mph) *(VISIBILITY SPLAYS ARE BASED UPON MfS STANDARDS)*
- RECORDED SPEEDS - VISIBILITY SPLAY 2.4m x 36m (26.3mph) *(VISIBILITY SPLAYS ARE BASED UPON MfS STANDARDS)*
- VISIBILITY TO TANGENT - VISIBILITY SPLAY 2.4m x 29.6m

-	-	-
-	20.04.2023	INITIAL ISSUE
REV	DATE	REMARKS

CLIENT

BARRATT DAVID WILSON HOMES
MERCIA DIVISION

JOB TITLE

HITHER GREEN LANE, REDDITCH

DRAWING TITLE

VISIBILITY SPLAYS

DRAWING NO.

J32-5756-PS-030

DRAWN: ESP	CHECKED: JN
CREATED: APR '23	SCALE: 1:500 @A3

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transport planning

File: C:\Users\Mode Transport\Desktop\mode Dropbox\Project\Birmingham\2. Projects\J325756_Hither Green Lane, Redditch\5. Graphics\2. CAD\2. Sheets\230420_325756_PS001L.dwg

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KEY:

SITE BOUNDARY

VISIBILITY SPLAY 2.4m x 25m (20mph)
(VISIBILITY SPLAYS ARE BASED UPON MFS STANDARDS)

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JOB TITLE

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DRAWING TITLE

INTERNAL JUNCTION VISIBILITY SPLAYS

DRAWING NO.

J32-5756-PS-031

DRAWN	CHECKED
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KEY:

- SITE BOUNDARY
- FORWARD VISIBILITY SPLAY - 25m (20mph) *(VISIBILITY SPLAYS ARE BASED UPON MFS STANDARDS)*
- FORWARD VISIBILITY SPLAY - 17m (15mph) *(VISIBILITY SPLAYS ARE BASED UPON MFS STANDARDS)*

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DRAWING TITLE

INTERNAL FORWARD VISIBILITY SPLAYS

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J32-5756-PS-032

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CREATED	SCALE
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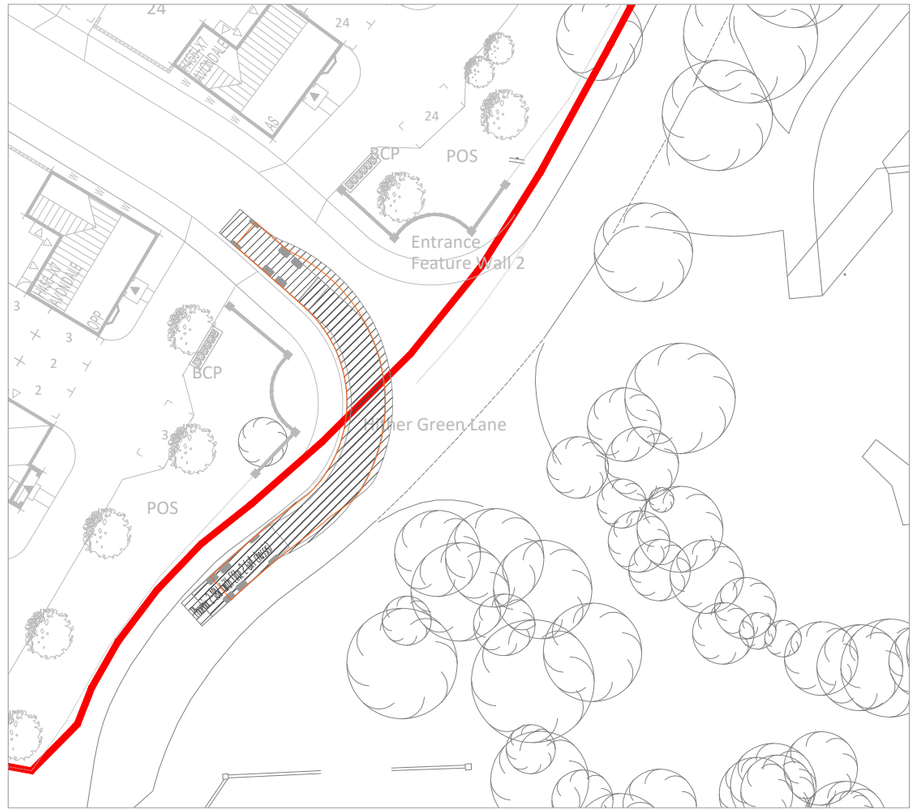

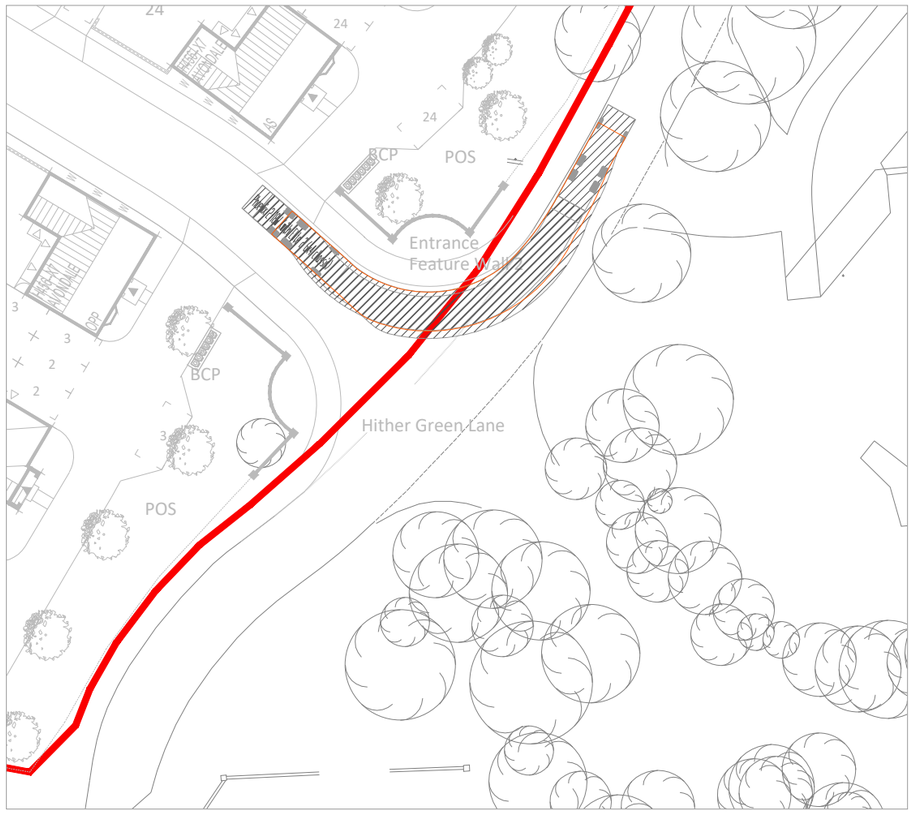

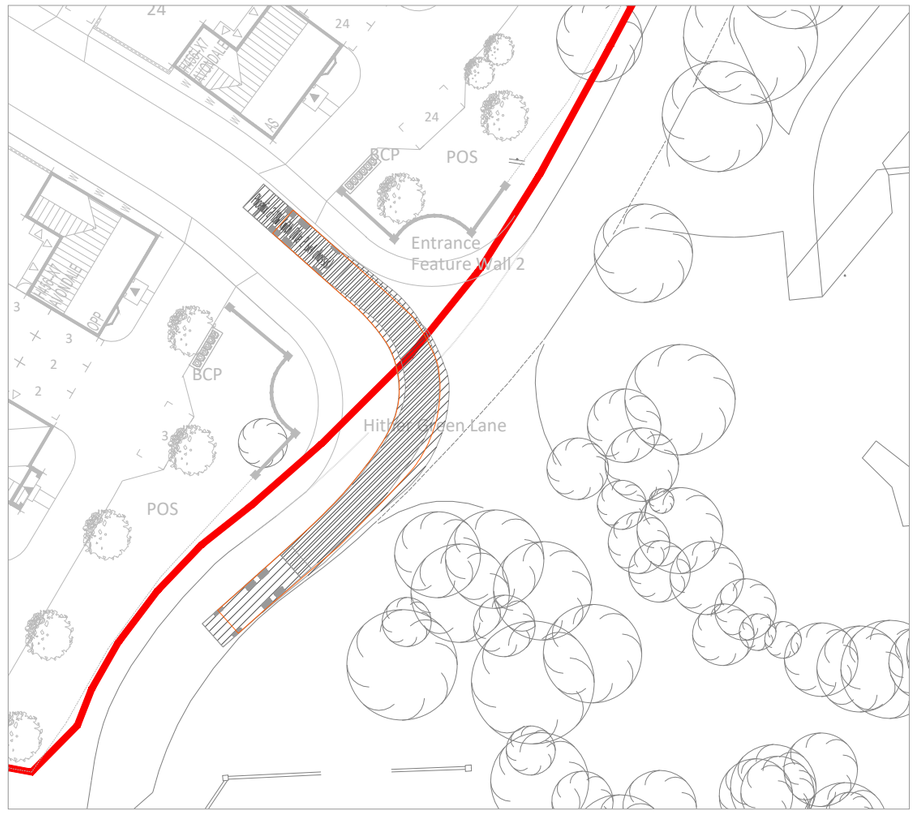

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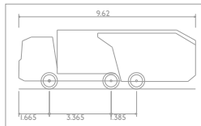

Phoenix 2-18W (with Elite 2 6x4 chassis)	
Overall Length	9.620m
Overall Width	2.530m
Overall Body Height	3.211m
Min Body Ground Clearance	0.416m
Track Width	2.530m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	8.250m

REV	DATE	REMARKS
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MERCIA DIVISION

JOB TITLE

HITHER GREEN LANE, REDDITCH

DRAWING TITLE

VEHICLE TRACKING
- REFUSE VEHICLE

DRAWING NO.

J32-5756-PS-033

DRAWN	CHECKED
ESP	JN
CREATED	SCALE
APR '23	1:500 @A3

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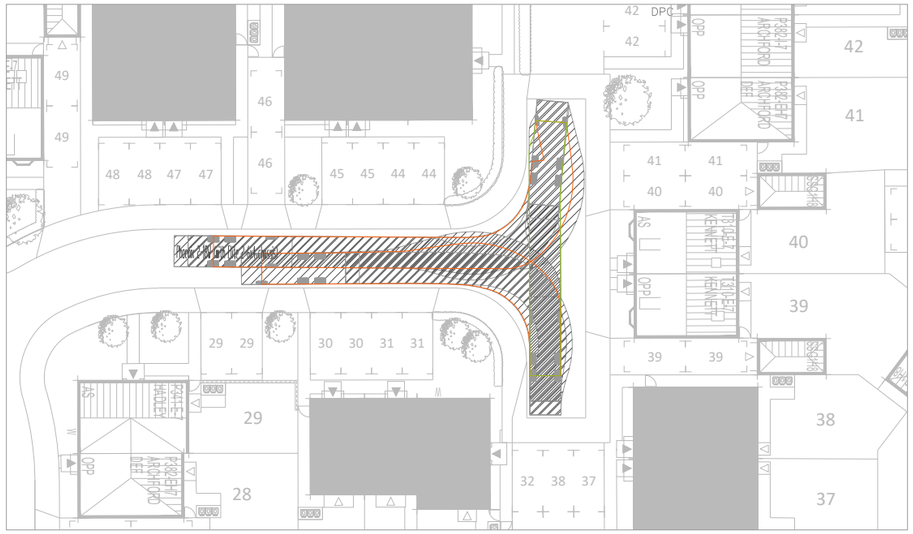

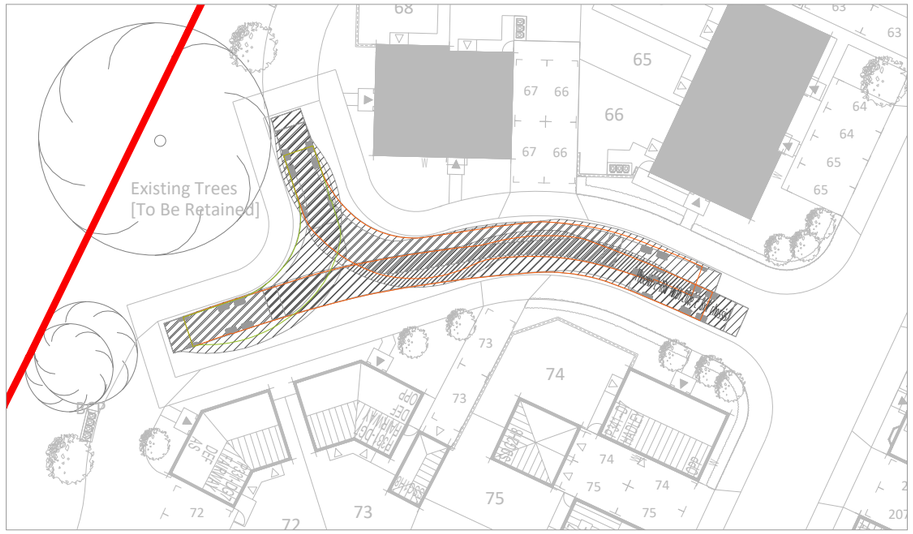

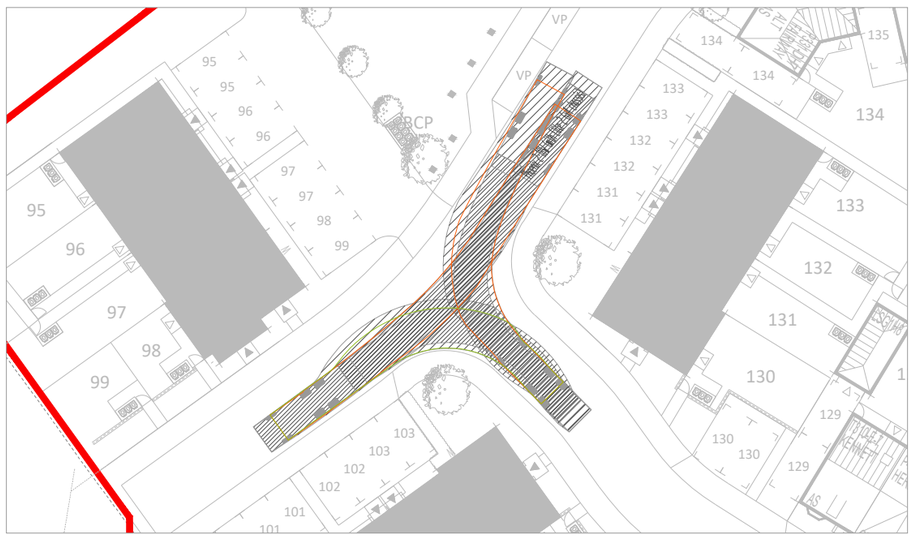

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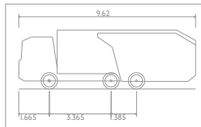

Phoenix 2-18W (with Elite 2 6x4 chassis)	
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Overall Width	2.530m
Overall Body Height	3.21lm
Min Body Ground Clearance	0.416m
Track Width	2.530m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	8.250m

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DRAWING TITLE

VEHICLE TRACKING
- REFUSE VEHICLE

DRAWING NO.

J32-5756-PS-034

DRAWN	CHECKED
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CREATED	SCALE
APR '23	1:500 @A3

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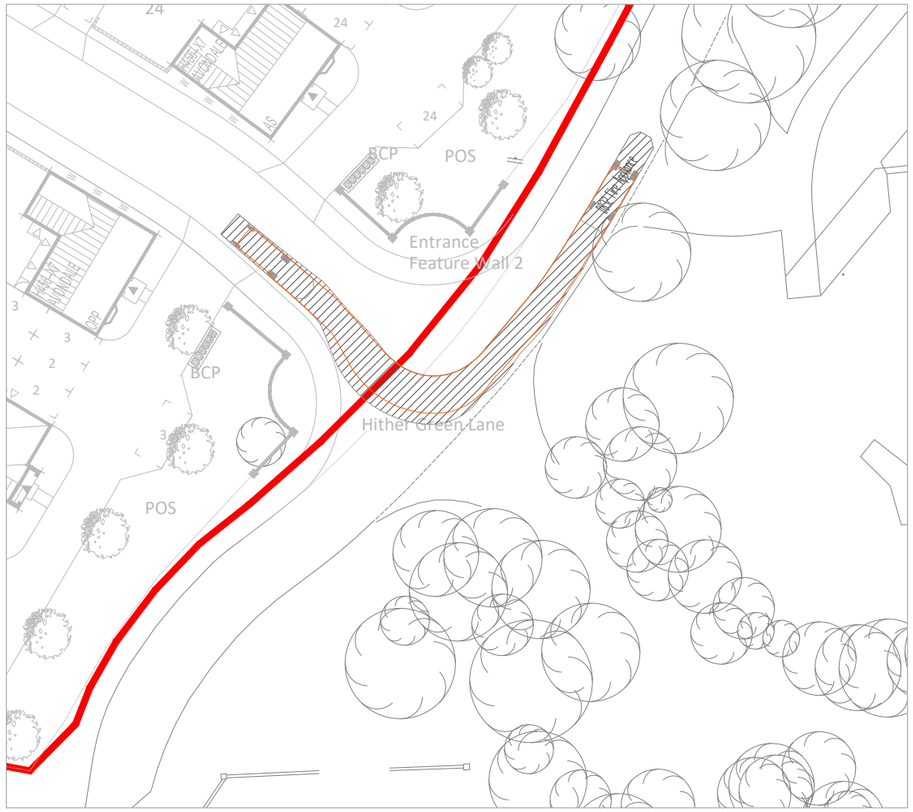

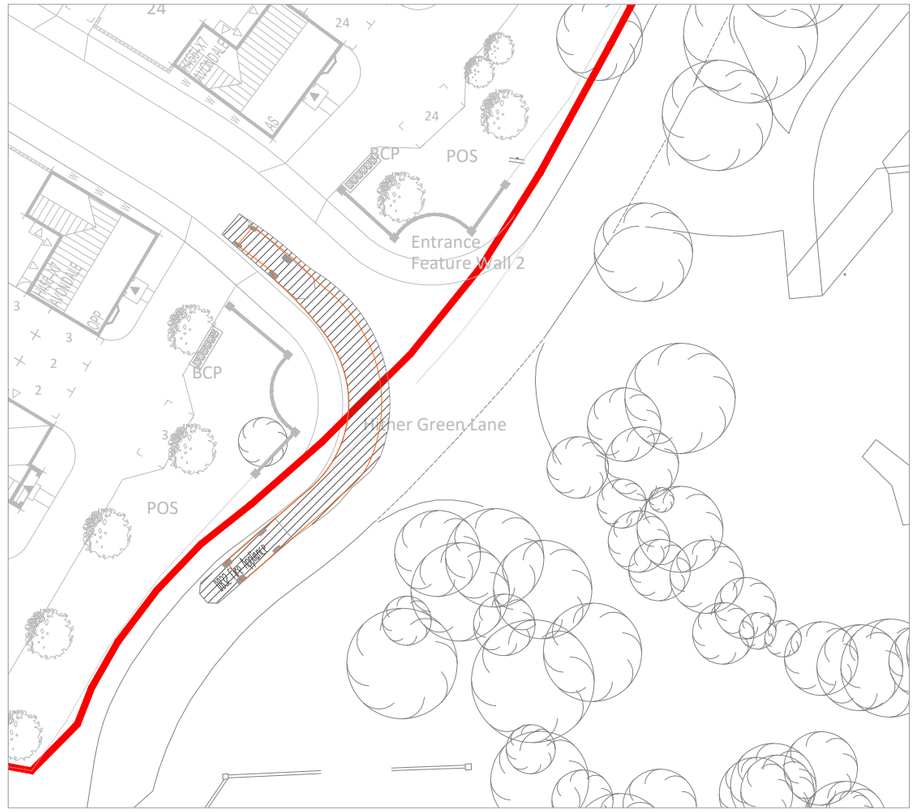

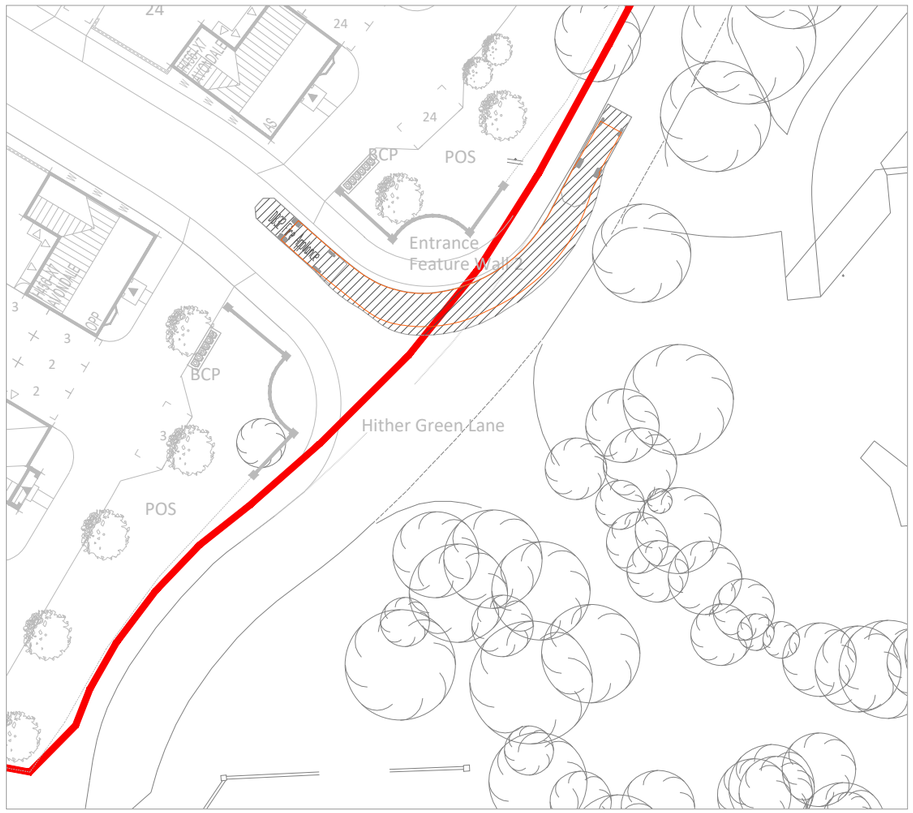

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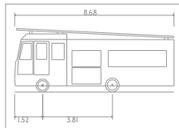

DB32 Fire Appliance	
Overall Length	8.680m
Overall Width	2.180m
Overall Body Height	3.452m
Min Body Ground Clearance	0.337m
Max Track Width	2.121m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	7.910m

REV	DATE	REMARKS
-	-	-
-	20.04.2023	INITIAL ISSUE

CLIENT

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MERCIA DIVISION

JOB TITLE

HITHER GREEN LANE, REDDITCH

DRAWING TITLE

VEHICLE TRACKING
- FIRE TENDER

DRAWING NO.

J32-5756-PS-035

DRAWN	CHECKED
ESP	JN
CREATED	SCALE
APR '23	1:500 @A3

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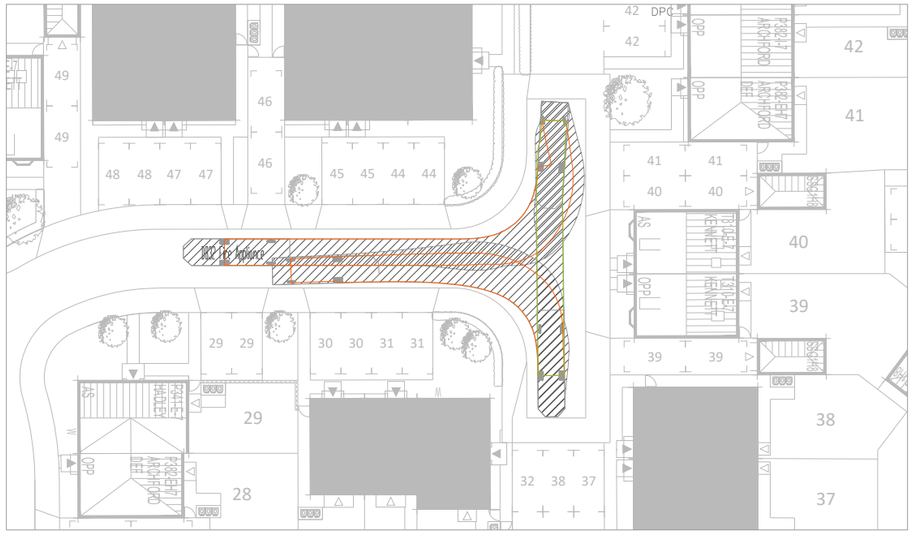

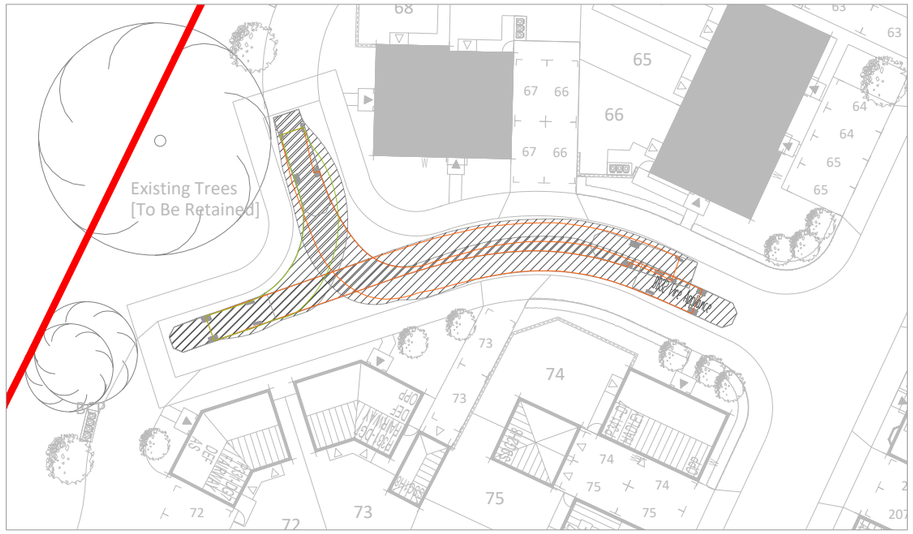

NOTE;

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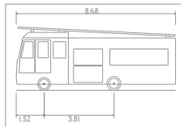

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MERCIA DIVISION

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DRAWING TITLE

VEHICLE TRACKING
- FIRE TENDER

DRAWING NO.

J32-5756-PS-036

DRAWN	CHECKED
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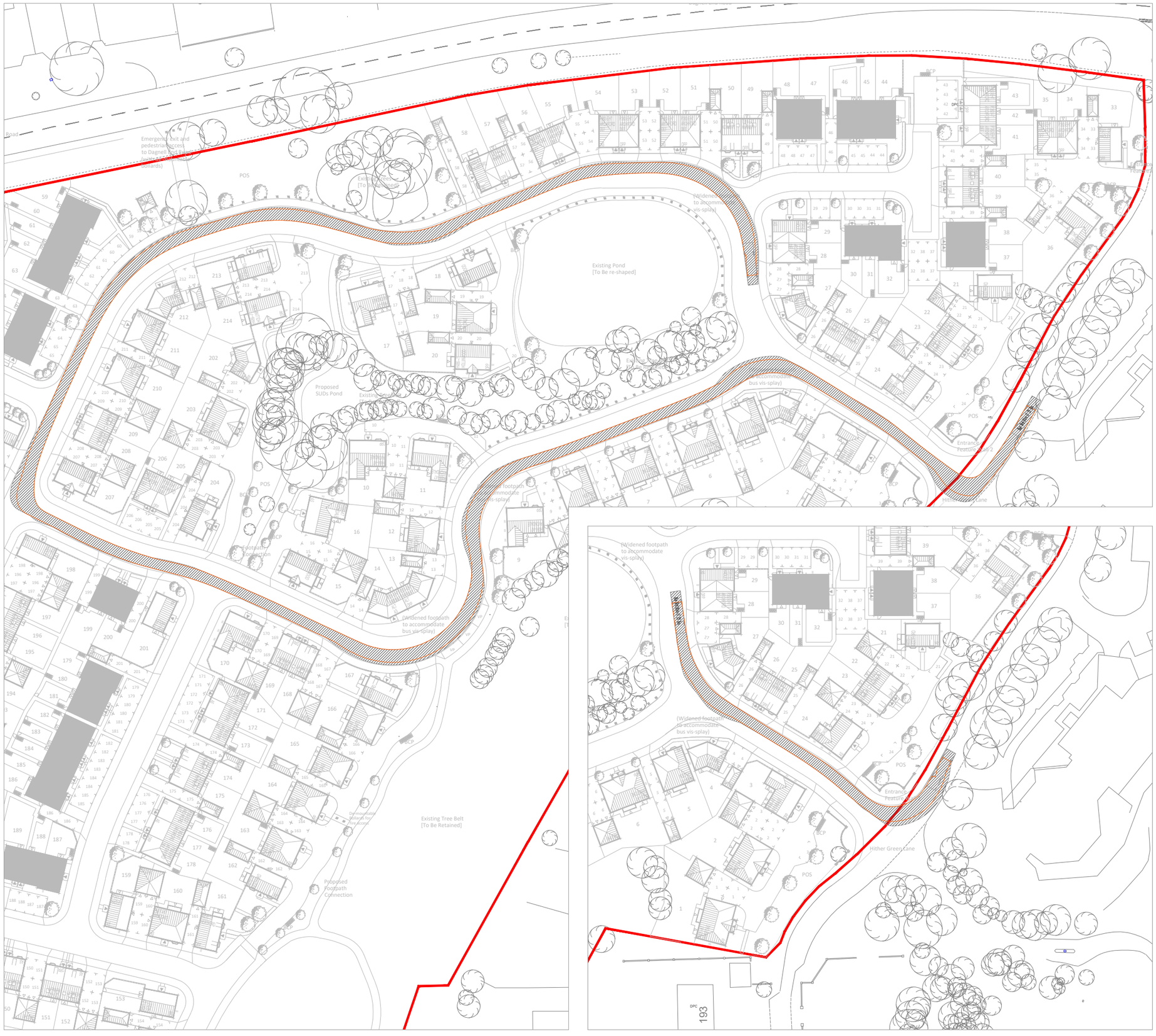


NOTE;

1. THIS DRAWING IS BASED UPON DRAWING NUMBER ME-24-21Z - Proposed Site Layout BY BARRATT DEVELOPMENTS PLC URBAN DESIGN DEPARTMENT.

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'

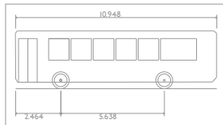
5. HIGHWAY BOUNDARY INFORMATION HAS BEEN PROVIDED BY WORCESTERSHIRE COUNTY COUNCIL (WCC 2022) AND HAS BEEN TRANSCRIBED BY MODE ONTO AN ORDNANCE SURVEY. MODE ACCEPTS NO LIABILITY FOR THE ACCURACY OF THE DATA PROVIDED AND THE HIGHWAY BOUNDARY INFORMATION SHOWN IS SUBJECT TO CHECKS BY A LICENSED CONVEYANCER.

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

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

KEY:

SITE BOUNDARY



Blue Bird Ultra LF 35' Bus	
Overall Length	10.948m
Overall Width	2.590m
Overall Body Height	3.149m
Min Body Ground Clearance	0.353m
Track Width	2.590m
Lock to lock time	6.00s
Wall to Wall Turning Radius	10.516m

REV	DATE	REMARKS
-	-	-
-	20.04.2023	INITIAL ISSUE

CLIENT

BARRATT DAVID WILSON HOMES
MERCIA DIVISION

JOB TITLE

HITHER GREEN LANE, REDDITCH

DRAWING TITLE

VEHICLE TRACKING
- BUS

DRAWING NO.

J32-5756-PS-037

DRAWN: ESP	CHECKED: JN
CREATED: APR '23	SCALE: 1:1000 @A3

mode transport planning
LOMBARD HOUSE
145 GREAT CHARLES STREET
BIRMINGHAM
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W WWW.MODETRANSPORT.CO.UK

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transport planning

File: C:\Users\Mode Transport\Desktop\mode Dropbox\Project\Birmingham\2. Projects\J325756_Hither Green Lane, Redditch\5. Graphics\2. CAD\2. Sheets\230420_325756_PS001L.dwg

APPENDIX F

RBC Email Correspondence

Subject: RE: Dimensions of Refuse Vehicles in Redditch
Date: Wednesday, 2 March 2022 at 07:30:18 Greenwich Mean Time
From: Christine Jenkinson
To: patrickmagner@modetransport.co.uk
CC: Matthew Austin - Environmental Services Manager
Attachments: Olympus Elite 6 Data Sheet 6x2RS Narrow DV-E6RN-OSX-GBUK-1303.pdf, image015.png, image014.png, image013.png, image012.png, image011.png, image010.png, image009.png, image008.jpg, image007.jpg

Good morning,
Please find attached the specifications for the Redditch Olympus Elite 6 vehicles as requested.

Kind Regards
Christine

Christine Jenkinson, Fleet & Logistics Technician
Transport, Bromsgrove District & Redditch Borough Councils
Tel: 01527 534094
Email: christine.jenkinson@bromsgroveandredditch.gov.uk

Bromsgrove District Council
Parkside
Market Street,
Bromsgrove,
Worcestershire
B61 8DA

www.bromsgrove.gov.uk

Redditch Borough Council
Town Hall
Walter Stranz Square
Redditch
Worcestershire
B98 8AH

www.redditchbc.gov.uk

From: Matthew Austin - Environmental Services Manager <matthew.austin@bromsgroveandredditch.gov.uk>

Sent: 28 February 2022 15:58
To: Christine Jenkinson <Christine.Jenkinson@bromsgroveandredditch.gov.uk>
Subject: RE: Dimensions of Refuse Vehicles in Redditch

Christine,

Would you be able to pull out the spec's for a 26ton RCV and send them across to Mr Magner for me please?

Thanks,

Matt

Matt Austin
Environmental Services Manager
Bromsgrove District & Redditch Borough Councils
Leisure, Environment & Community Services Directorate

Web: www.bromsgroveandredditch.gov.uk
Email: matthew.austin@bromsgroveandredditch.gov.uk

From: Patrick Magner <patrickmagner@modetransport.co.uk>
Sent: 24 February 2022 12:25
To: Household Recycling Centres <HRC@worcestershire.gov.uk>
Subject: Dimensions of Refuse Vehicles in Redditch

Good afternoon,

I hope you are well.

Are you please able to advise me of the dimensions of the refuse vehicle operating in Redditch? If you have an information sheet with the full dimensions it would be much appreciated, if not, the length of the vehicle would be fine?

Alternatively, is there a more appropriate email/ contact I should be sending this enquiry to.

Thanks very much in advance.

Kind regards,

Patrick Magner BA (Hons)
Graduate Transport Planner

0121 794 8389

patrickmagner@modetransport.co.uk
www.modetransport.co.uk

mode transport planning
Lombard House, 145 Great Charles Street, Birmingham B3 3LP

keep up with mode:

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be green, keep it on the screen!

****

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