OXFORDSHIRE
STRATEGIC RAIL FREIGHT INTERCHANGE

DCO Submission

Environmental Statement

Chapter 3: Transport
Appendix 3.1: Transport Assessment Part 09 of 11 – Appendices 27 to 34

Document 6.3A.09
Rev v2

On behalf of
Oxfordshire Railfreight Limited

Prepared by ADC Infrastructure Ltd
March 2026

PINS REF:	TR050008
Document Reference	6.3A.09
APFP Regulation	5(2)(a)
Author	ADC
Date	March 2026
Revision	V2

APPENDIX 27

STAGE 2 TRANSPORT MODELLING

STAGE 2 TRANSPORT MODELLING

OXFORDSHIRE SRFI

ADC Infrastructure Limited, City Buildings, 34-36 Carrington Street, Nottingham, NG1 7FG
tel. 0115 941 4817, www.ADCinfrastructure.com

DOCUMENT CONTROL

project number: ADC1794			report reference: ADC1794-RP-AN	
version	date	author	reviewer	comments
1		M. Higgins	S. Dunhill	internal draft
2	04/09/2025	M. Higgins	S. Dunhill	first issue to the client team
3	18/09/2025	M. Higgins	S. Dunhill	draft issued for Stage 2 consultation

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1.0 INTRODUCTION

1.1 ADC Infrastructure Limited are commissioned by Oxfordshire Railfreight Limited to assess the transport and infrastructure requirements of a proposed Strategic Rail Freight Interchange (SRFI) in Oxfordshire; the subject of a Development Consent Order (DCO) application for a Nationally Significant Infrastructure Project (NSIP), to be known as OxSRFI.

1.2 The proposals also include various highway improvements, including alterations to Junction 10 of the M40 motorway and to the A43, both of which meet thresholds for nationally significant highway works and the application will therefore also include two highway NSIPs as part of the DCO.

Site location

1.3 The OxSRFI site is in Cherwell District, within northern Oxfordshire. It is located to the southwest of the M40 Junction 10, to the northwest of Bicester. The site location is shown in **Figure 1**.

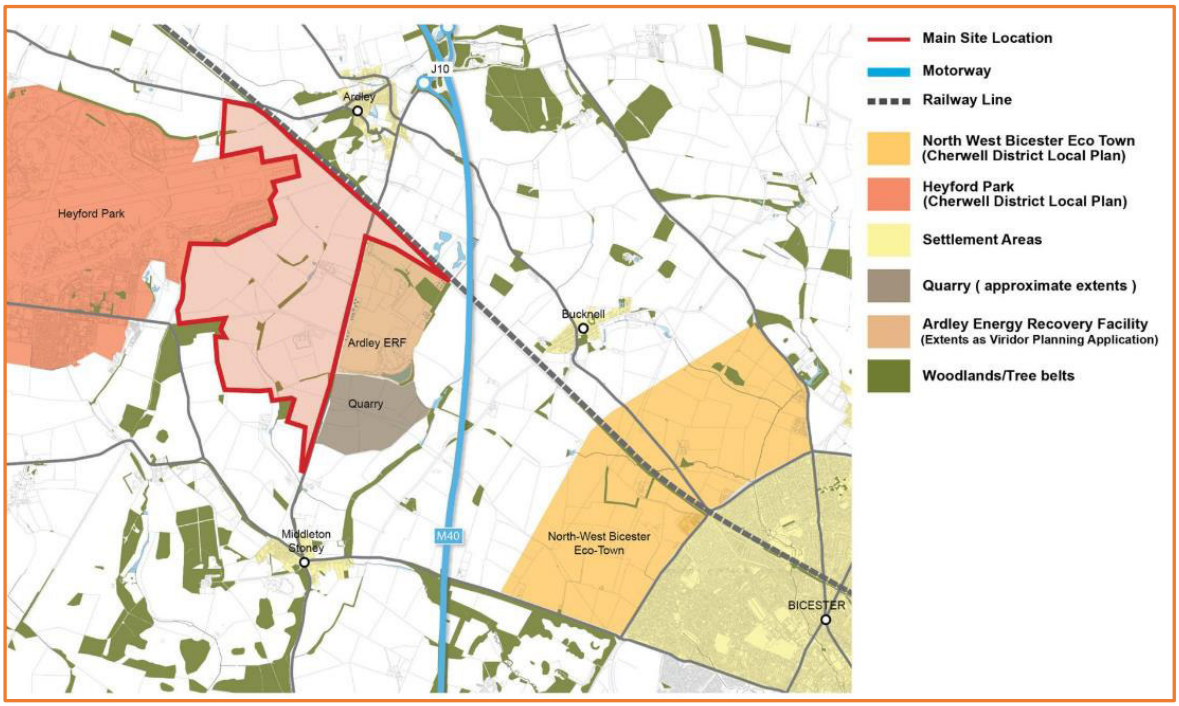


Figure 1: detailed site location showing approx. Main Site area (edged red)

1.4 The Main Site area is shown edged in red at **Figure 1**. It is bound to the north by the Chiltern Main Line Railway, part of the strategic rail network operated by Network Rail, to the east by the B430 and the Viridor 'Ardley Energy from Waste' facility, to the south by farmland, and to the west by the Heyford Park development, which is located on the former RAF Upper Heyford site. The village of Ardley is approximately 1km to the north of the site. The village of Middleton Stoney is approximately 2km to the south of the site, and the market town of Bicester is located approximately 6km to the southeast.

Transport Working Group and transport modelling strategy

1.5 A Transport Working Group comprising representatives from National Highways (who have responsibility for the Strategic Road Network (SRN)), Aecom (National Highways' term consultant), and Oxfordshire County Council (OCC), who have responsibility for the local highway

network, was established in November 2020. In addition, Cherwell District Council, the local planning authority, contribute to and attend the Transport Working Group meetings.

1.6 To ensure that the potential transport impacts of the Proposed Development are fully considered, and to confirm that the proposed embedded Highway Works are appropriate in scale and function, a three-stage transport modelling approach is being followed as follows:

- Stage 1 comprised the options assessment and preliminary design of the embedded Highway Works.
- Stage 2 comprises strategic transport modelling using the Bicester Transport Model (BTM).
- Stage 3 will comprise detailed assessment of the study area using industry standard assessment tools.

1.7 The Stage 1 modelling and design work has been completed, and the embedded highway mitigation proposals are agreed in principle with the Transport Working Group. The Stage 2 BTM modelling work is ongoing, though the 2034 (Completion Year) Reference Case and Do-Something case scenarios have been completed. The Do-Something scenario used in this Stage 2 assessment work is without the effect of the Travel Plan and therefore represents an appropriate (worst-case) assessment for the purposes of defining the study area.

1.8 The Completion Year scenarios are of key importance to understanding what the impacts of OxSRFI are likely to be when the Proposed Development with the embedded Highway Works are fully built out and operational.

1.9 Hence, this Technical Note considers the impact of the Proposed Development on the highway network in the 2034 Completion Year without the effects of the Travel Plan. This is undertaken by comparing the outputs of the Stage 2 transport modelling scenarios for the 2034 Reference Case (scenario RC3A) and the 2034 Do-Something Case (scenario DS3A). This analysis concludes by establishing the study area to be taken forward into the Stage 3 transport modelling.

Report structure

1.10 The report is structured as follows:

- Section 2 summarises the agreed transport modelling methodology, including the agreed modelling scenarios, assessment years and Uncertainty Log.
- Section 3 sets out the development proposals, including a summary of how the agreed embedded Highway Works were established, describing the proposals and presenting the embedded Highway Works overview plan which has been included in the BTM.
- Section 4 summarises the Proposed Development traffic generation and details how this traffic is distributed and assigned to the highway network.
- Section 5 details the traffic volume and capacity changes across the highway network due to the Proposed Development and the embedded Highway Works in the 2034 DS3A scenario, when compared to the 2034 RC3A scenario.
- Section 6 summarises the analysis of the Stage 2 BTM outcomes and presents the study area for detailed assessment in the Stage 3 transport modelling.

2.0 TRANSPORT MODELLING METHODOLOGY

2.1 It was established and agreed with the Transport Working Group that the BTM is the appropriate strategic transport model to use to assess the traffic impacts of the Proposed Development, including the embedded Highway Works.

Summary of the agreed modelling methodology

2.2 The transport modelling methodology was discussed and agreed with the Transport Working Group, as set out in Technical Note 2 (ref. ADC1794-RP-H-V3). Given the scale and complexity of the project, the modelling scope is broken down into three stages, as summarised below:

- Stage 1 - the options assessment has been completed and the form and preliminary design of the embedded Highway Works required to provide access to the Proposed Development are agreed in principle with the Transport Working Group. The objective of Stage 1 was to develop the highway layouts to a preliminary stage sufficient for coding into the BTM.

- Stage 2 - the BTM is used to assess the traffic impacts of the OxSRFI in the agreed scenarios as the second stage of work. This will provide traffic data for the second design review of the embedded Highway Works and access strategy and allow a study area to be identified and agreed with the Transport Working Group. The Stage 2 BTM work is being undertaken by Tetra Tech (who operate the BTM on the behalf of OCC) in collaboration with ADC Infrastructure Ltd.

- Stage 3 - The third stage of work will then comprise more detailed assessment of the study area using industry standard assessment tools (VISSIM, Junctions 9, LinSig etc).

2.3 The Stage 1 work has been completed and is summarised in the table at paragraph 3.6 in Section 3 of this technical note. The extensive work undertaken during Stage 1 has enabled the embedded Highway Works proposals that form the comprehensive access strategy for the Proposed Development to be identified and agreed in principle with the Transport Working Group, such that the proposals can be tested as part of Stages 2 and 3 of the agreed transport modelling methodology.

Assessment years and scenarios, and the Uncertainty Log

2.4 Technical Note 2 sets out the originally agreed assessment scenarios to be tested using the BTM in Stage 2. However, the project was publicly paused by the Applicant between April 2023 and August 2024 so that a review of the scale and complexity of transport infrastructure works could be undertaken. Hence, upon the restarting of the project, the passing of time required a review of the assessment years and scenarios. Further, during the project pause OCC had developed an Uncertainty Log for the 2031 and 2042 future years for the draft Cherwell Local Plan 2042.

2.5 Therefore, following the restart of the project in late 2024, discussions were held with the Transport Working Group regarding the assessment years, the Stage 2 modelling scenarios and the Uncertainty Log. The outcomes of those discussions are summarised in Technical Note AB (ref. ADC1794-RP-AB-V9), which sets out the agreements reached between OCC, National Highways, and the Applicant regarding the transport modelling scenarios to be examined to support the DCO application for the proposed OxSRFI development. A copy of that technical note is provided at **Appendix A**.

Agreed assessment years and scenarios

2.6 As detailed in the technical note in **Appendix A**, the agreed assessment years and scenarios to be tested in the BTM are as follows:

1. **DfT Circular 01/2022 Compliant Scenario**: used for assessment of the impact on the SRN (in the year of opening with 100% of the Proposed Development and all embedded Highway Works).

2. **2031 Opening Year**: the opening year assessment, with the first phase of the Proposed Development and the first phase of the embedded Highway Works, used to demonstrate the suitability of proposed first phase of development on both SRN and local road network, and for use in the ES.

3. **2034 Completion Year**: the completion year assessment, with all of the Proposed Development and all of the embedded Highway Works, used for ES year of completion assessment, and assessment of impacts on the local road network in year of completion.

4. **2042 Future Year (Sensitivity Test)**: end of Local Plan period, for information only.

2.7 It is agreed with the TWG that Scenarios 2, 3 and 4 will be assessed with and without the Framework Travel Plan. For each scenario there is Reference Case (without OxSRFI) and Do-Something Case (with OxSRFI) as summarised in the table below.

Scenario name	Year	Scenario ID			
		Baseline	Reference Case	Do Something	Do-Something with Travel Plan
Baseline	2023	B2023	-	-	-
Baseline	2024	B2024	-	-	-
1: DfT Circular 01/2022	2031	-	RC1 SRN	DS1 SRN	-
2: Opening Year	2031	-	RC2	DS2	DS2wTP
3: Completion Year	2034	-	RC3	DS3	DS3wTP
4: Local Plan (Sensitivity)	2042	-	RC4	DS4	DS4wTP

2.8 The Albion Land scheme[1] received a resolution to grant planning permission at the 3 July 2025 CDC planning committee meeting. Up to that point the Stage 2 transport modelling was proceeding without the inclusion of this scheme as it was a speculative planning application with no planning status and did not form part of the agreed Uncertainty Log for the modelling scenarios. However, following the resolution to grant planning permission for the Albion Land development at the July planning committee meeting, the TWG requested that the Albion Land scheme be included in the Reference Case Stage 2 transport modelling scenarios, because the scheme includes a requirement to upgrade the A43 Baynard's Green to a signal controlled roundabout and due to the proximity of the scheme site access junctions on the B4100 to the Baynard's Green junction. Accordingly, the Stage 2 transport modelling has been updated to include the Albion Land scheme in the Reference Case. That means that the highway improvement at Baynard's Green that is required to be implemented by the Albion Land scheme prior to occupation is also included in the future Reference Case scenarios.

[1] Albion Land scheme (planning applications references 21/03268/OUT, 21/03267/OUT, and 21/03266/F)

2.9 The updated assessment scenarios use the same naming convention as given in the above table, but with a 'A' suffix, to denote that they include the Albion land scheme and that scheme's highway works, as set out in the table below.

Scenario name	Year	Scenario ID (with Albion Land scheme)			
		Baseline	Reference Case	Do Something	Do-Something with Travel Plan
Baseline	2023	B2023	-	-	-
Baseline	2024	B2024	-	-	-
1: DfT Circular 01/2022	2031	-	RC1A SRN	DS1A SRN	-
2: Opening Year	2031	-	RC2A	DS2A	DS2AwTP
3: Completion Year	2034	-	RC3A	DS3A	DS3AwTP
4: Local Plan (Sensitivity)	2042	-	RC4A	DS4A	DS4AwTP

2.10 Tables 1 to 3 that are provided at the rear of the modelling scenario technical note in **Appendix A** set out further details of the scenario testing that will be undertaken to support the Transport Assessment and ES for OxSRFI.

2.11 It has been agreed with the TWG that these assessment scenarios are those on which the assessment of the transport effects of the Proposed Development will be examined. However, the Albion Land scheme does not yet have a decision notice, and therefore, until and unless, planning permission pursuant to that scheme is obtained, it is also appropriate with regards to the layout and operation of the A43 Baynard's Green junction to also consider the relevant scenario from the table at paragraph 2.7. That being the RC1 SRN and DS1 SRN scenarios. In this way, the DCO will include for a range of options at the A43 Baynard's Green to allow for the following situations:

- The Albion Land scheme does not receive planning permission.
- The Albion Land scheme does receive planning permission(s) but has not yet commenced construction of the works at the A43 Baynard's Green junction in accordance with the planning permission(s) for that scheme.
- The works at the A43 Baynard's Green junction in accordance with the planning permission(s) for the Albion Land scheme have been completed or have commenced construction.

2.12 To assess the impact of the Proposed Development on the existing and future baseline transport infrastructure, consideration of all relevant scenarios will be necessary, and the TA will consider and set out alternative options for the A43 Baynard's Green junction to account for the above situations.

2.13 However, with respect to defining a study area for the Stage 3 transport modelling, it is Scenario 3 (the Completion Year) that is of key importance to understanding what the worst-case impacts are likely to be when OxSRFI is fully built out and operational (and without taking into account the beneficial effect of the Travel Plan).

2.14 Therefore, this Technical Note considers the impact of the Proposed Development on the highway network in the 2034 Completion Year without the effect of the Travel Plan. This is undertaken by comparing the outputs of the Stage 2 transport modelling scenarios for the 2034 Reference Case (scenario RC3A) and the 2034 Do-Something Case (scenario DS3A). This analysis

is presented in Section 5 of this report and concludes in Section 6 by establishing the study area to be taken forward into the Stage 3 transport modelling.

Uncertainty Logs

2.15 The committed and planned development and infrastructure schemes to be included in the strategic transport modelling are provided in the form of an Uncertainty Log. As mentioned above, OCC developed an Uncertainty Log for the 2031 and 2042 future years as part of their work on the draft Cherwell Local Plan 2042 and these are therefore used for Scenarios 2 and 4. Further, it was agreed with the Transport Working Group that the 2034 Uncertainty Log should be based on a linear interpolation between the 2031 and 2042 logs.

2.16 Hence, appropriate Uncertainty Logs for each of the assessment scenarios have been agreed with the Transport Working Group and these are coded in the respective BTM Reference Case models. In that way, the future baseline (Reference Case) position includes for all committed and planned development and infrastructure schemes, ensuring that the cumulative impacts of the Proposed Development in conjunction with committed and planned development is fully assessed.

2.17 Following the agreement of the Uncertainty Logs, at the 3 July 2025 Cherwell District Council planning committee, the Albion Land[2] scheme received a resolution to grant planning permission. Whilst the Albion Land development is not yet a commitment, as planning permission is subject to the S106 Agreement and JR period, following advice from the Transport Working Group, the Albion Land scheme, including their proposed improvement at A43 Baynard's Green roundabout, is included in the BTM strategic transport modelling (Reference Case and Do-Something scenarios) as a commitment.

2.18 To distinguish the modelling scenario with the Albion Land scheme from earlier BTM modelling that was undertaken prior to that scheme receiving a resolution to grant planning permission, a suffix 'A' has been added to the modelling scenarios (i.e. RC3A instead of RC3).

[2] Albion Land planning application references 21/03268/OUT, 21/03267/OUT, and 21/03266/F

3.0 PROPOSED DEVELOPMENT

3.1 The Proposed Development comprises a strategic rail freight interchange and associated works, as summarised below.

Development proposals

3.2 OxSRFI will provide large scale B8 warehousing and distribution space. An extract of the masterplan is also shown in **Figure 2**. The maximum floor space for the warehousing and distribution (B8) use is set by the Parameters Plan at 6.5 million sqft (603,850 sqm). The warehousing will include ancillary office space, and an allowance is made within the Parameters for up to 201,283 sqm (one third of the warehouses space) of B8 mezzanine floor space use.

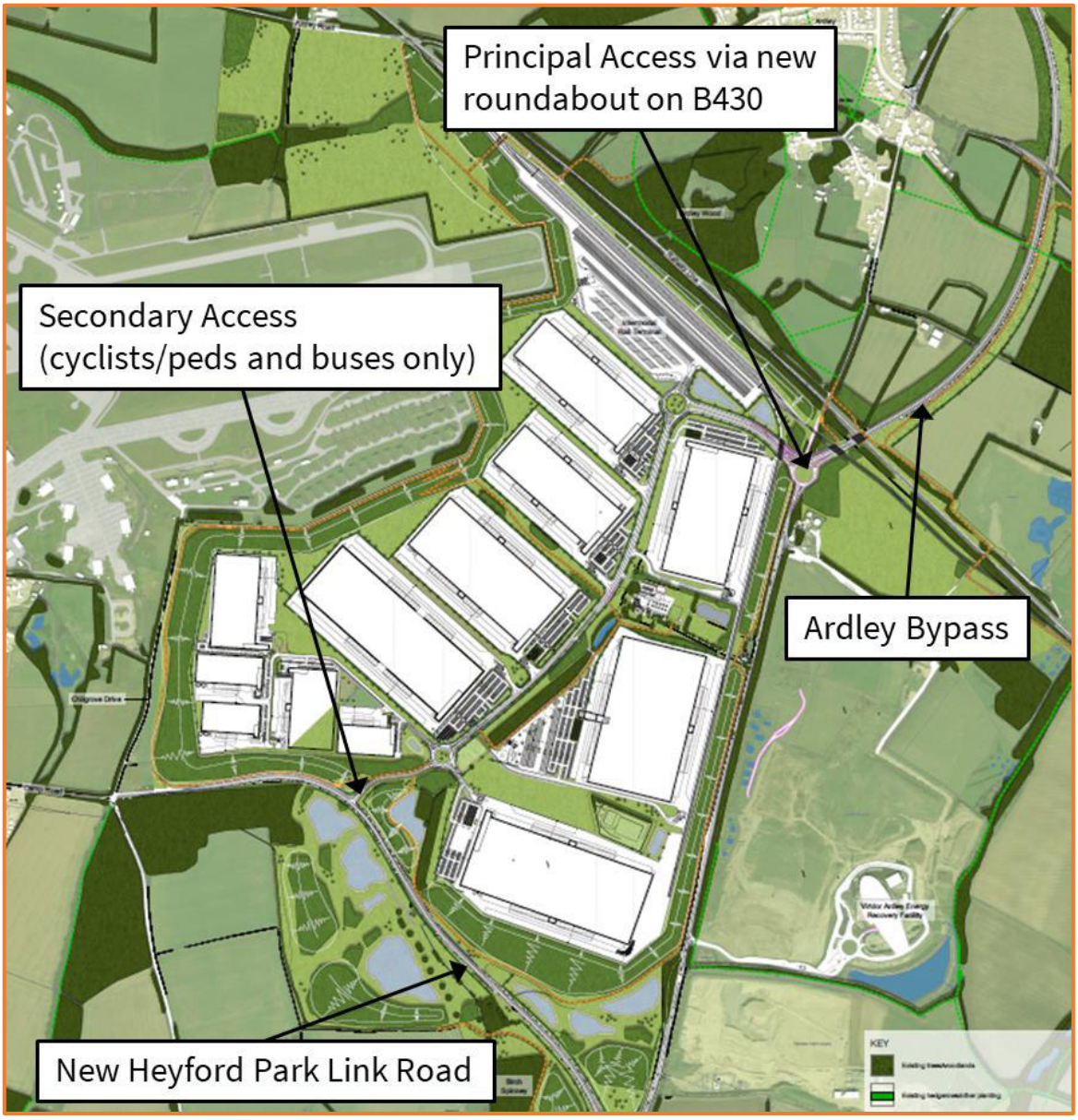


Figure 2: extract of the draft Illustrative Masterplan

3.3 OxSRFI will provide a Rail Terminal accommodating up to 12 freight trains per day, and include container storage and HGV parking, with rail sidings within the site with the potential to directly connect to some of the individual warehouses.

Establishing the embedded transport infrastructure

3.4 Ensuring good access to the SRN is a prerequisite for the proposed OxSRFI development. Hence, the objectives of the access strategy are to accommodate the required access to the SRN, whilst delivering appropriate new site access infrastructure to reduce potential adverse impacts to acceptable levels, along with aiding the delivery of planned growth and development across the wider area.

3.5 Since it was established in November 2020, the Applicant has worked closely with the Transport Working Group to agree key components of the transport measures required to support an application for OxSRFI via the DCO process. This has included significant work on the form and layout of the highway access strategy for the site, determining that it should be centred on provision of significant improvements to Junction 10 of the M40 motorway, in combination with the provision of a new bypass for the village of Ardley, a new relief road around the north-east quadrant of the village of Middleton Stoney, and a new Heyford Park Link Road to replace Upper Heyford Road that passes through the Main Site area.

3.6 The table below summarises the Stage 1 transport modelling and design work undertaken and submitted to the Transport Working Group to agree in principle the access strategy and ahead of the Stage 2 transport modelling.

Technical Note	Issued	Summary
TN5 – M40 Junction 10 Options Report (ref. ADC1794-RP-M -V3)	Jun 21	Identified and assessed a long list of potential interventions at M40 J10 that could be implemented by OxSRFI to mitigate the development impact. A short list of options was identified for further consideration.
TN6 – M40 Junction 10 Options Report – Traffic Flow Derivation (ref. ADC1794-RP-N-V2)	Jun 21	Calculate of traffic flow demands used in the Stage 1 transport modelling
TN5 Addendum - Response to National Highways Comments (ref. ADC1794-RP-M1-V2)	Oct 21	A response to the initial National Highways feedback on TN5 provided by email in September 2021.
TN7 – Scope of Highway Design Prior to DCO application (ref. OxSRFI-BWB-GEN-XX-RP-CH-001-S4-P05)	Jul 21	Specifies the level to which the highway design will be developed prior to and for submission with the DCO application. Version P05 was agreed with the TWG in January 2025
TN8 - M40 Junction 10 Options 3a and 3b (ref. ADC1794-RP-Q-V4)	Oct 21	At the request of National Highways, TN8 considers in greater detail the opportunity to provide a large single grade-separated gyratory at M40 J10. TN8 concluded that Options 11, 13, 18 and 19 offer long-term benefit over a large signal-controlled roundabout. In January 2022, National Highways and OCC confirmed that Options 18 and 19 were the preferred options
TN9 - M40 Junction 10 Option 25 (ref. ADC1974-RP-T-V3)	Apr 22	At the request of National Highways, TN9 considered the options to achieve a northbound free-flow link between the M40 northbound and the A43 northbound and proposes that Option 25 be taken forward.
Middleton Stoney Relief Road and Heyford Park Link Road Junctions Options Report	Apr 22	Presents the case for the HPLR and MSRR and provides the background and design development of the junction options considered.
TN9 Addendum - M40 Junction 10 Option 25a (ref. ADC1794-RP-T1 V2)	Jan 23	Addressed concerns regarding the form of the M40 J10 Option 25 solution at Baynard's Green, proposing that

		Option 25a (thereafter referred to as Option 26) should be taken forward as the preferred option.
HGV Routing Strategy (ref. OxSRFI-BWB-GEN-XX-RP-CH-005-SO-P05)	Jan 23	The HGV Routing Strategy for the Proposed Development that requires all HGV traffic to arrive and depart the Main Site by M40 Junction 10 and the Ardley Bypass. Version P05 was agreed by the TWG in July 2025.
TN10 - M40 Junction 10 Highway Improvements (ref. ADC1794-RP-U-V2)	Mar 23	TN10 addresses Transport Working Group comments on Option 26 and presented the M40 Junction 10 highway improvements to be tested in the BTM. TN10 also proposed a phasing strategy for the implementation of the M40 Junction 10 highway works.
TN11 – Highway Works Phasing (ref. ADC1794-RP-AF-v4)	Mar 23	Proposed phasing of the embedded Highway Works, this report was updated in February 2025 to reflect Option 28 following the agreed in principle with the Transport Working Group (see TN13 below)
TN13– M40 Junction 10 Option 28 (ref. ADC1794-RP-AI-V4)	Nov 24	In April 2023, the Applicant took the decision to pause work on the OxSRFI project pending a review of the highway access strategy. TN13 reports on the outcome of that review. That work has resulted in strategic highway Option 28 becoming the preferred option. Option 28 was agreed in principle with the Transport Working Group in January 2025.

3.7 Further to the above, the initial 'Do-Something' runs of the BTM undertaken before the project was publicly paused by the Applicant suggested that a capacity constraint at the A34 approach to M40 Junction 9 in the evening peak hour had potential to cause undesirable reassignment of traffic from the SRN to the B430 northbound towards M40 Junction 10. The effects of the Proposed Development and the proposed access strategy highway works (M40 Junction 10, the Ardley Bypass, the HPLR and the MSRR) on the highway network in the vicinity of M40 Junction 9 was examined in detail in Technical Note 12 (ref. ADC1794-RP-AG-V2).

3.8 Technical Note 12 concluded that in the evening peak hour, congestion on the A34 eastbound approach to M40 Junction 9 would prevent traffic from reaching the M40 northbound. Consequently, some background traffic on the A34 wishing to travel north was shown to reassigns away from the SRN and uses the B430, through Weston-on-the-Green and Middleton Stoney towards M40 Junction 10. Whilst residual impacts due to this reassignment would not negate the positive effects of the MSRR and HPLR in reducing overall traffic volumes in Middleton Stoney, it is appropriate to keep this longer distance through traffic on the SRN.

3.9 To reduce congestion on the A34 approach to M40 Junction 9, a proposed improvement scheme which would provide a third left-turn lane between the A34 and the M40 was designed. The results of BTM modelling showed that the proposed improvement would remove the delay on the A34 approach to M40 Junction 9 in the evening peak hour and therefore, the reassignment of traffic from the A34 to the B430 northbound would not occur. Therefore, it was concluded that the proposed mitigation at M40 Junction 9 would help facilitate the positive effects of the works at M40 Junction 10, the Ardley Bypass, the HPLR and the MSRR and has since been included in the package of embedded Highway Works.

3.10 As discussed in Section 2, following the resolution to grant planning permission for the Albion Land development, it was agreed with the TWG that the Albion Land scheme be included in the Stage 2 strategic transport modelling. Accordingly, the Albion Land scheme is included in the Reference Case and Do-Something scenarios. That means that the highway improvement at

Baynard's Green that is required to be implemented by the Albion Land scheme prior to occupation is included in the future Reference Case scenarios.

3.11 However, as part of the modelling and preliminary design work undertaken in Stage 1 of the transport modelling methodology, it was established that the Albion Land improvement scheme at Baynard's Green would not be sufficient to accommodate the traffic due to the OxSRFI development. Hence, alterations to the Albion Land scheme were designed to provide three northbound lanes to the A43 and increased right-turn storage capacity for right-turn movement from the A43 south to the B4100 east. That scheme is included at **Appendix B**, and is the scheme modelled at Baynard's Green in the DS3A Do-Something scenario. This approach was agreed with the TWG.

3.12 Notwithstanding the above, and as discussed in Section 2, the DCO will need to provide flexibility at the A43 Baynard's Green junction, to allow the Proposed Development to proceed without being dependent on the Albion Land highway improvement at the junction. Accordingly, there is potential for the OxSRFI development to implement the entire works at Baynard's Green if the third-party scheme is not implemented prior to OxSRFI coming forward, or for the OxSRFI development to implement an alternative scheme, should the Albion Land development not received formal planning permission. This will be examined in more detail in the TA.

Embedded Highway Works

3.13 The Highway Works Overview Plan for the proposed embedded highway mitigation is shown at **Appendix C**.

3.14 The embedded Highway Works are coded into the DS3A scenario, and are summarised as follows:

- The Ardley Bypass removes B430 through traffic from the village and links with the proposed Principal OxSRFI site access junction. The Bypass would be a Single 2 + 1 arrangement (two lanes northbound and one lane southbound).
- The Principal Site Access junction to the Main Site from the Ardley Bypass and the B430 with provisions to enforce the HGV Routing Strategy. The proposed access is a partially signalised roundabout.
- A section of the existing B430 to the north of the Principal Site Access junction into the southern end of Ardley village would be stopped up and replaced with a footway/cycleway.
- The Ardley roundabout at M40 Junction 10 would be enlarged and signalised to accommodate the Ardley Bypass and provide additional capacity. The M40 northbound merge would be relocated to the north of the roundabout, to allow the new northbound link to be provided.
- The M40 to A43 northbound traffic is provided with a new northbound link with a new bridge over the M40, connecting with the Padbury junction, which would be reconfigured as a three-stage traffic signal-controlled junction.
- The northbound M40-A43 link significantly reduces traffic flows through the M40 Junction 10 complex providing capacity to accommodate the OxSRFI traffic, and improving journey times for existing M40 to A43 northbound traffic.

- Under the proposed arrangement, traffic exiting the Cherwell Services wishing to travel north of the A43 will do so via Ardley Roundabout. This allows the A43 northbound movement to operate as free-flow, whilst providing increased right turn storage for the M40 southbound movement.

- Online improvements by means of an additional lane southbound on the A43 between Baynard's Green and the Cherwell Roundabout, combined with improvements to the M40 southbound merge to provide a two-lane merge arrangement negates the requirement for the A43 to M40 southbound free flow slip road that was included in previous options.

- An additional lane northbound on the A43 between Cherwell Roundabout and Baynard's Green would also be provided, such that this section of the A43 would be three lanes in both directions.

- Further works to the Albion Land improved Baynard's Green Roundabout to provide three northbound lanes to the A43 and increased right-turn storage capacity for the A43 south to B4100 east. The Middleton Stoney Relief Road (MSRR) would be constructed around the northeast quadrant of the village, significantly reducing traffic flows through the village by providing a direct, high-quality link between Bicester and the M40 Junction 10, via the Ardley Bypass, and Heyford Park and Upper Heyford via the Heyford Park Link Road (HPLR).

- The HPLR replaces the existing Upper Heyford Road (sometimes referred to as the unnamed road) to connect Heyford Park and Upper Heyford with the B430.

- Improvement to the A34 approach to M40 Junction 9 to increase the capacity for traffic travelling northbound on the M40.

3.15 The embedded Highway Works also include associated works to provide new and amended footways/cycleways and other associated minor works to the local road network. These are discussed in more detailed in the Sustainable Transport Strategy report.

4.0 DEVELOPMENT TRAFFIC

Forecast traffic generation

4.1 Technical Note 3 (ref: ADC1794-RP-J) sets out the methodology for forecasting the traffic generation of the proposed OxSRFI development for use in the agreed traffic modelling Stages 1, 2 and 3. The Technical Note was agreed with the Transport Working Group.

4.2 The table below presents the agreed morning and evening peak hour traffic generation of the Proposed Development without the effect of the Travel Plan, showing the forecast generations for light vehicles, HGVs and total vehicles. The table also shows the forecast daily flows.

total development peak hour, and daily vehicle trips (no Travel Plan)									
period	light vehicles			heavy vehicles			total vehicles		
	arrive	depart	2-way	arrive	depart	2-way	arrive	depart	2-way
AM peak	903	97	1,000	172	159	331	1,075	256	1,331
PM peak	298	1,038	1,336	157	143	300	455	1,181	1,636
daily	7,929	7,801	15,730	2,459	2,461	4,920	10,388	10,262	20,650

Development traffic distribution

4.4 It was agreed with the Transport Working Group that the development light vehicle traffic shown in the table above be distributed onto the highway network using the BTM gravity model. The gravity model distributes traffic between zones based on the travel costs between zones, with a different trip-cost profile for each trip purpose.

4.5 To appropriately represent the movement of HGVs associated with the OxSRFI development within the BTM, it is necessary to determine a bespoke HGV trip distribution, as set out in Technical Note 4 (ref: ADC1794-RP-K). Various methodologies for deriving a suitable HGV distribution were considered, including the approach used at the consented Northampton Gateway SRFI, the GB Freight Model and the methodology applied at the most recently consented SRFI scheme, the West Midlands Interchange (WMI) SRFI. Following consultation with Natonal Highway and OCC, a bespoke methodology using the WMI approach, but also incorporating the port-based distribution share identified from the GB Freight Model, was agreed.

4.6 The agreed HGV distribution shown in Technical Note 4 was provided to Tetra Tech and coded into the BTM.

Traffic modelling

4.7 The Stage 2 BTM forecast modelling for the RC3A and DS3A scenarios has been completed. To enable the effects of the development traffic and the embedded Highway Works to be understood, various datasets and comparisons between the modelled scenarios have been provided by Tetra Tech for the 2034 RC3A and DS3A scenarios. Tetra Tech have also provide HTML plots to geographically display the traffic volumes for both the RC3A and DS3A scenarios, the OxSRFI development traffic flows, and the volume over capacity percentages for each link in the modelled area. The HTML files show traffic flows in terms of passenger car units (PCUs).

4.8 The HTML plot showing the development traffic inbound and outbound trips for the DS3A scenario (in passenger car units (PCUs)) have been interrogated to confirm that the total amount of development traffic in the model matches the agreed forecast development traffic shown above. The comparison is shown in the table below.

2034 DS3A development traffic (PCUs)	morning peak hour			evening peak hour		
	Arrive	Depart	2-way	Arrive	Depart	2-way
Agreed external traffic generation	1,245	413	1,658	610	1,323	1,933
PRTM development traffic	1,195	413	1,608	590	1,323	1,913
Difference	-50	0	-50	-20	0	-20

4.9 The table shows that in both the morning and evening peak hours for the 2034 DS3A scenario, all forecast development vehicle trips have departed the site and entered the network. The table also shows that in the morning and evening peak hours the number of arrivals at the site is slightly lower than the forecast number of arrivals.

4.10 Hence, whilst the correct number of vehicle trips to the Proposed Development site have been released into the model, a relatively small number have not arrived at the site by the end of the modelled peak hour, which could be due to the time that it takes for them to complete their journeys, but could also suggest that there is congestion within the network. Nevertheless, the differences are small, and the model results are suitable for use.

Development traffic assignment

4.11 The BTM Saturn plots showing the morning peak hour 2034 DS3A OxSRFI traffic flows for total vehicle movements, lights and HGVs, are provided at **Appendix D**. An extract of the main modelled area is provided at **Figure 3**. It shows the routes taken by development traffic (total traffic flows in PCUs) in the 2034 DS3A assessment year scenario, for the morning peak hour.

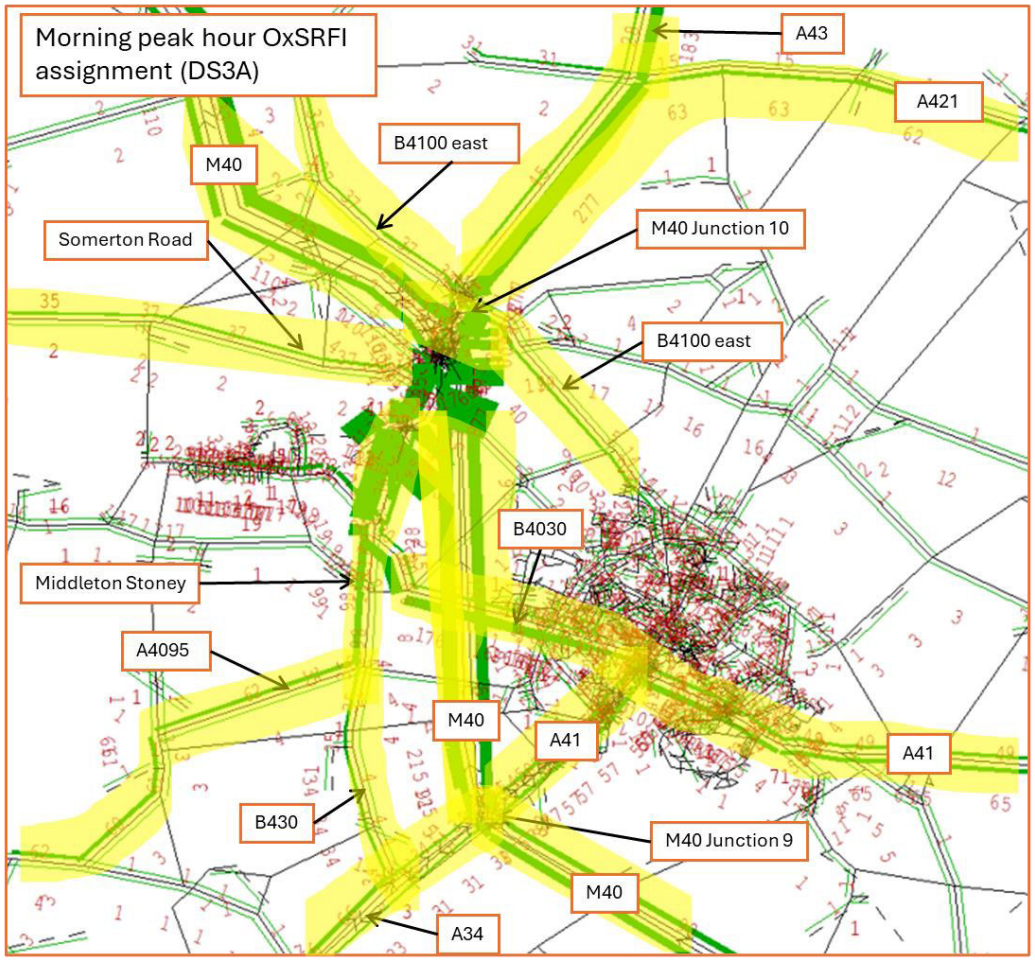


Figure 3: 2034 DS3A morning peak hour total OxSRFI traffic assignment (yellow highlights added)

4.12 To give more context to the morning peak hour development traffic routing shown on **Figure 3**, the table below quantifies the number of total development vehicle trips (lights plus HGVs expressed as PCUs) using the major routes highlighted in yellow.

2034 DS3A development traffic assignment - morning peak hour (in pcus)				
SRN link	Inbound	Outbound	Two-way	Proportion
M40 north of M40J10	233	110	343	21%
A43 between Baynards Green and Barley Mow	277	45	322	19%
B4100 west of Baynards Green	37	2	39	2%
B4100 east of Baynards Green	62	7	69	4%
A43 north of Barley Mow	183	28	211	13%
A421 east of Barley Mow	63	15	78	5%
A41 east of Bicester	65	49	114	7%
A41 east of M40 Junction 9	57	55	112	7%
B4030 Middleton Stoney Road east of the MSRR	176	30	206	12%
M40 south of M40 Junction 9	125	90	215	13%
A34 west of B430	66	33	99	6%
B430 NB at Western on the Green	34	4	38	2%
Somerton Road between Ardley and the A4260	37	2	39	2%
A4095 East between the B430 and the west	62	3	65	4%

4.13 The table details the morning peak hour OxSRFI traffic routing for the 2034 DS3A scenario as follows:

- 21% of development traffic routes to/from the north on the M40.
- 19% of development traffic routes on the A43 between the Baynard's Green and Barley Mow roundabouts. At the Barley Mow roundabout, development traffic splits with 13% remaining on the A43, and 5% routing on the A421 to/from Buckingham and the east.
- Development traffic flows on the B4100 are relatively low, with 2% of development trips routeing on the B4100 west of Baynard's green, and 4% routing on the B4100 east of Baynard's Green towards Bicester.
- To the south and east of Bicester, 7% of development vehicle trips use the A41 and 13% use the M40 south of Junction 9.
- 12% of development vehicle trips route to/from Bicester on Middleton Stoney Road, routing via the MSRR and the B430.
- 6% of development trips route on the A34 to the west of the B430 junction, where traffic splits. From here, 2% of development trips route to/from the site on the B430 through Western on the Green.
- 4% of development trips use the A4095 route between the B430 and Kidlington/areas to the west.
- 2% of development trips use Somerton Road between the A4260 and Ardley.

4.14 Saturn plots showing the evening peak hour 2034 DS3A OxSRFI traffic flows for total vehicle movements, lights and HGVs, are provided at **Appendix E**. An extract of the main modelled area is provided at **Figure 4**. It shows the routes taken by development traffic (total traffic flows in PCUs) in the 2034 DS3A assessment year scenario, for the evening peak hour. Further, the table below quantifies the number of total development vehicle trips (lights plus HGVs expressed as PCUs) using the major routes highlighted in yellow.

2034 DS3A development traffic assignment - evening peak hour (in pcus)				
SRN link	Inbound	Outbound	Two-way	Proportion
M40 north of M40J10	130	235	365	22%
A43 between Baynards Green and Barley Mow	105	318	423	26%
B4100 west of Baynards Green	7	2	9	1%
B4100 east of Baynards Green	27	30	57	3%
A43 north of Barley Mow	64	209	273	17%
A421 east of Barley Mow	30	74	104	6%
A41 east of Bicester	49	57	106	6%
A41 east of M40 Junction 9	50	49	99	6%
B4030 Middleton Stoney Road east of the MSRR	91	189	280	17%
M40 south of M40 Junction 9	91	111	202	12%
A34 west of B430	42	62	104	6%
B430 NB at Western on the Green	11	40	51	3%
Somerton Road between Ardley and the A4260	10	47	57	3%
A4095 East between the B430 and the west	12	73	85	5%

4.15 The above table and **Figure 4** show that the OxSRFI development traffic routing in the evening peak hour follows a very similar pattern to the morning peak hour. The major difference between the morning peak hour and the evening peak is a higher proportion of development trips on the A43 north of Baynard's Green and on the B4030 Middleton Stoney Road corridors in the evening peak, with lower proportions of development vehicle trips on the B4100 east and west of Baynard's Green, and on the A41.

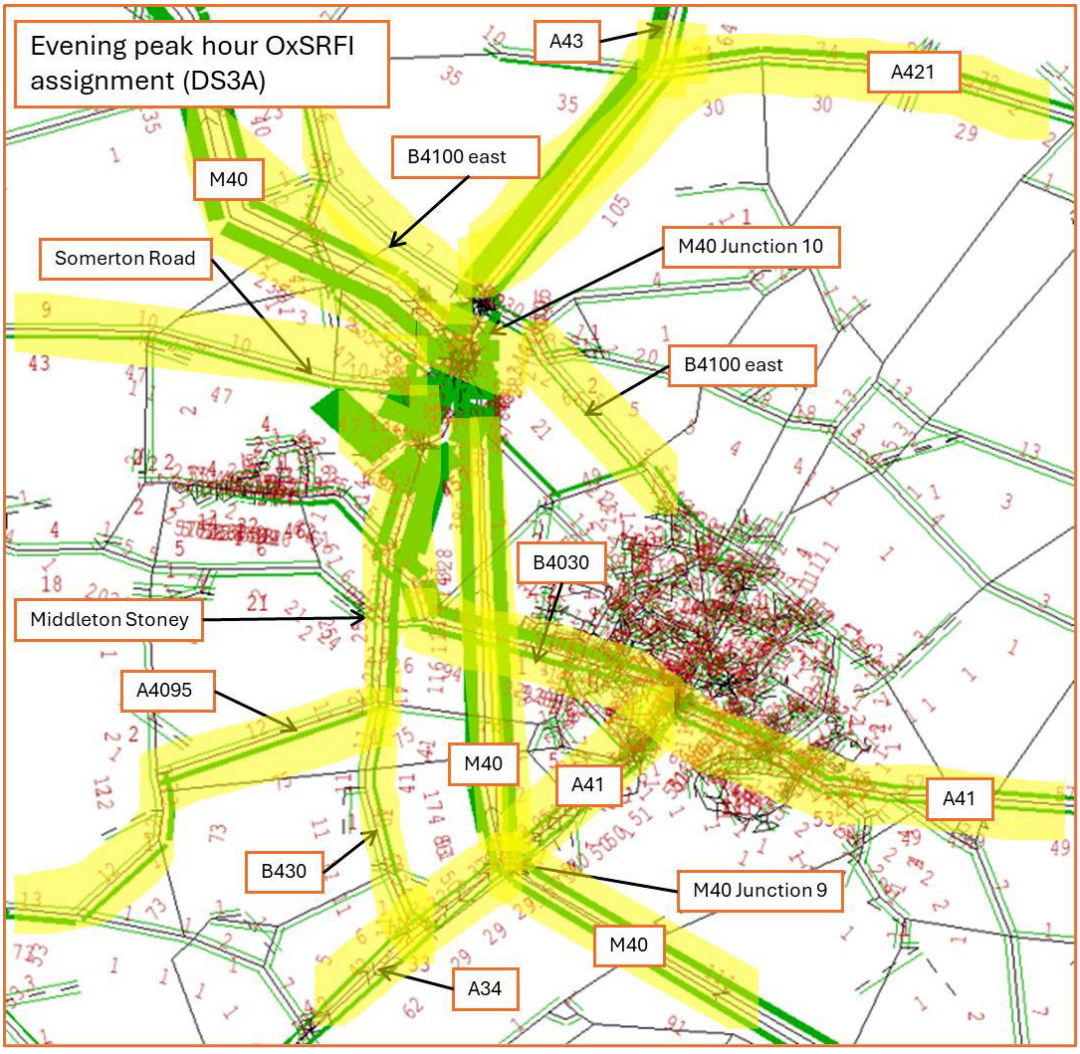


Figure 4: 2034 DS3A evening peak hour total OxSRFI traffic assignment (yellow highlights added)

5.0 TRAFFIC FORECAST ANALYSIS (SCENARIOS RC3A AND DS3A)

5.1 The development traffic routing is detailed in Section 4. However, the future year traffic volumes on the highway network are comprised of two elements. Firstly, the development traffic, but also background traffic that may reassign because a) the changes to infrastructure and highway conditions mean that alternative routes become quicker and/or more attractive, or b) existing trips on the network reassign due to changes in the demand model i.e. employment trips to/from OxSRFI replacing trips to/from other employment zones in the model. The impact of the development is a combination of these effects, where traffic volumes before and after the development must be compared.

5.2 This Section therefore details the changes across the highway network due to the Proposed Development and the embedded highway mitigation in the 2034 DS3A scenario, when compared to the 2034 RC3A scenario. This is achieved through analysis of the following:

- total flow difference due to the Proposed Development and the embedded Highway Works
- changes to the volume to capacity (V/C) ratios at links and nodes.

5.3 This analysis will provide a deeper understanding of the impact of the Proposed Development such that a study area for detailed assessment can be identified and any additional mitigation measures beyond the embedded highway mitigation can be appropriately targeted.

Change in traffic flows

5.4 To more thoroughly understand the likely traffic impacts due to the Proposed Development, identify an appropriate study area and consider where the priorities are with respect to the requirement for any additional mitigation, Tetra Tech have provided graphical Saturn plots showing the change in total traffic flow (in PCUs) between the RC3A and DS3A scenarios. The plots showing the total change in traffic flow for each scenario are provided at **Appendix F and G** for the morning and evening peak hours respectively, with extracts of these 'flow difference plots' provided within the analysis provided later in this section.

5.5 Green lines on the flow difference plots indicate traffic increases in the DS3A scenario compared to the RC3A scenario[3], and blue lines represent traffic reductions. The thicker the line, the greater the increase or decrease. The lighter, thinner lines, particularly those within Bicester and at the edges of the modelled area, show minor changes in traffic flow due to low volumes of development traffic, small amounts of background traffic reassignment or general noise in the model. These effects are not material and do not require further consideration.

5.6 HTML outputs displaying the traffic volumes for both the RC3A and DS3A scenarios alongside the OxSRFI traffic have also been interrogated.

2034 DS3A vs RC3A - morning peak hour

5.7 Shown below at **Figure 5** is an extract of the 2034 morning peak hour flow difference plot for the main part of the modelled network, including M40 Junction 10, M40 Junction 9, Ardley, Middleton Stoney, Heyford Park and Bicester (**Appendix F**). With the Proposed Development and the embedded mitigation in place, **Figure 5** shows that there would be material traffic increases on the M40, particularly southbound between Junctions 10 and 9, but also north of M40 Junction 10 and on the southbound diverge at Junction 10 itself. There are large traffic increases on the B4030 Middleton Stoney Road between the MSRR and central Bicester in both directions. Ther

[3] Note that no flow difference is shown on the new highway links as they are not present in the Reference Case.

are more modest traffic increased on Oxford Road northbound to the south of Middleton Stoney Road (within Bicester), the A4095 between the B430 and Port Way, Vendee Drive between the A41 and the B4030 Middleton Stoney Road, and Somerton Road between Ardley and the A4260. There are also traffic increases on the A43 in both directions north of Baynard's Green roundabout.

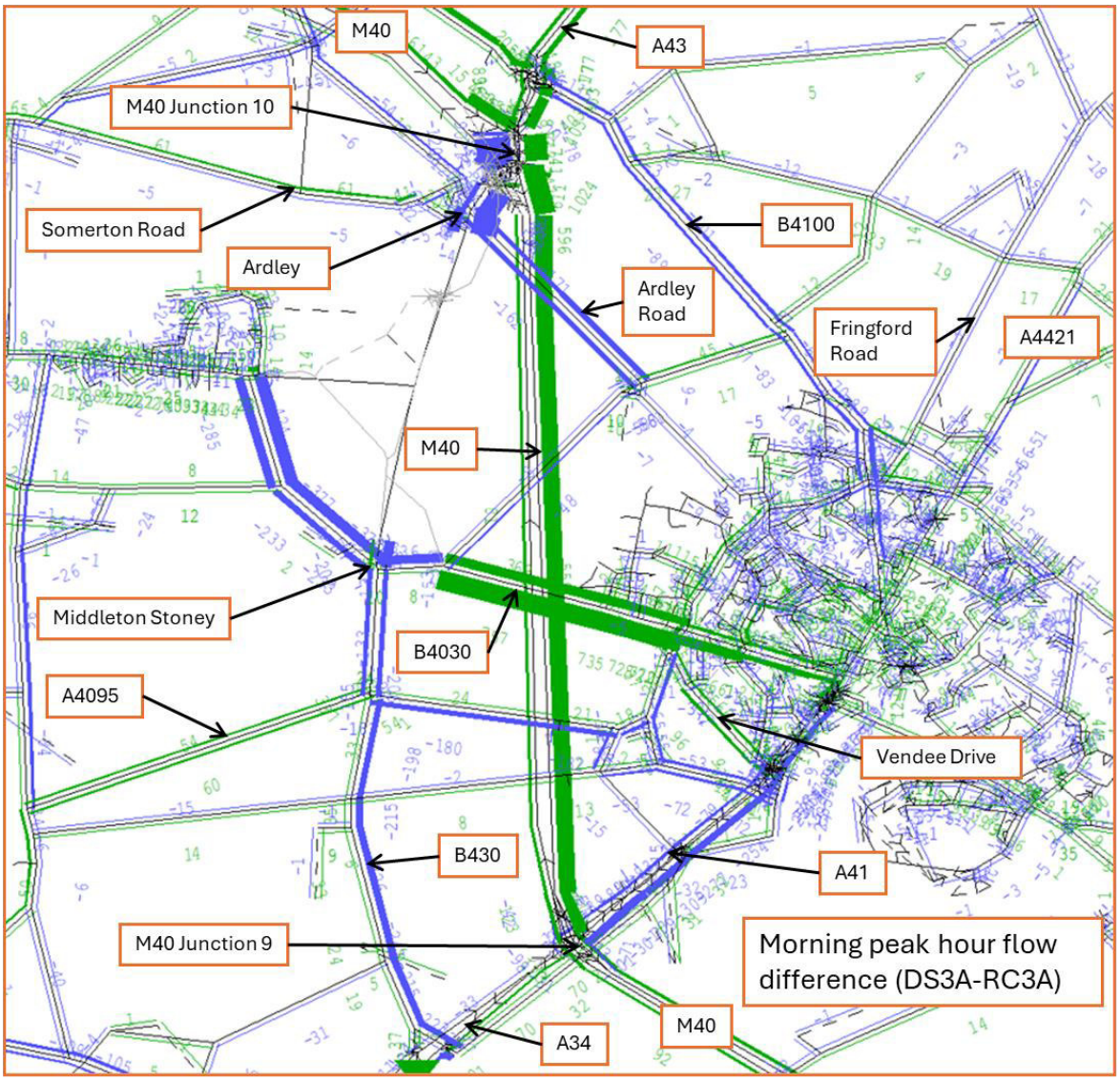


Figure 5: extract of the morning peak hour flow difference plot for the main part of the modelled network

5.8 **Figure 5** also shows that there would be material traffic reductions on the B430 through Ardley, Ardley Road between Ardley and Bucknell, Camp Road and the B4030 east and west of Middleton Stoney, the B430 south of Middleton Stoney, the A4095 between the B430 and Chesterton, the A41 between M40 Junction 9 and central Bicester, the A4421 between Caversfield and the A421, Fringford Road, and the B4100 between Baynard's Green and the A4095.

5.9 To illustrate the traffic flow changes between the 2034 RC3A and DS3A scenarios in the morning peak hour in more detail, **Figure 6** below shows extracts of the flow difference plots (**Appendix F**) for the villages of Middleton Stoney, Ardley, Heyford Park and Upper Heyford.

5.10 At the B430/B4030 crossroads in Middleton Stoney, **Figure 6** shows that due to the MSRR providing a more direct and improved route between Bicester and Heyford Park, Ardley, and M40 Junction 10, there would be significant two-way traffic reductions on all arms of the crossroads, with only minor increases on the B430 northbound exit and the B4030 westbound approach. Compared to the RC3A Reference Case, traffic (in pcus) is forecast to reduce by 39% across the

junction in the morning peak hour with the Proposed Development and the embedded Highway Works in place.

5.11 **Figure 6** shows that there would be significant reductions in traffic flow on the B430 through Ardley with the development in place due to B430 through traffic using to the Ardley Bypass. South of the junction with Ardley Road, traffic flows reduce by more c.1,300 two-way pcu movements. There is also a significant reduction forecast on Ardley Road. AS discussed above, this is because, traffic between Bicester and M40 Junction 10 reassigns to the B4030 Middleton Stoney Road, MSRR and Ardley Bypass route instead of using Ardley Road and passing through Bucknell to access M40 Junction 10.

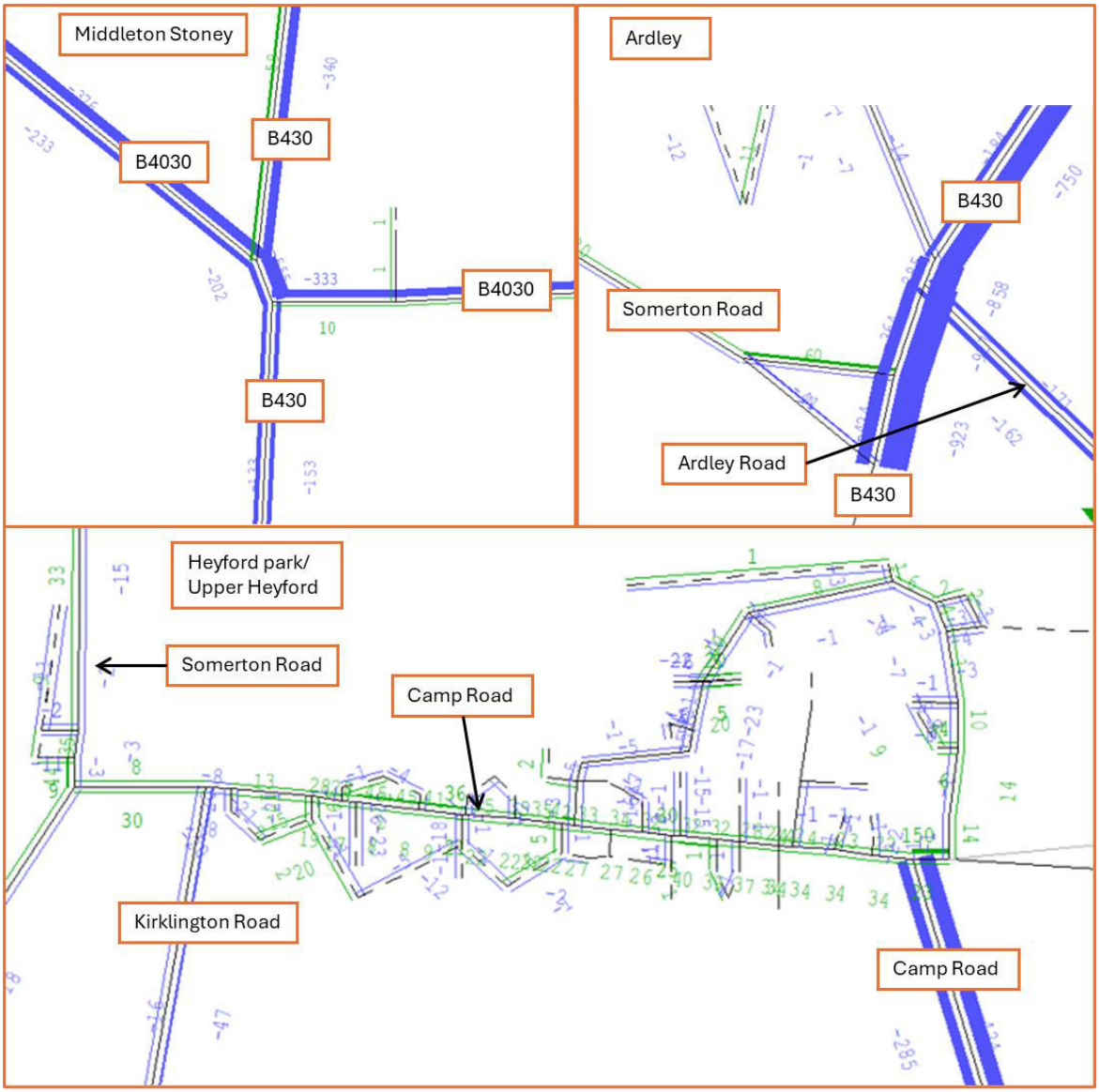


Figure 6: extract of the morning peak hour flow difference plots showing Middleton Stoney, Ardley and Heyford Park/Upper Heyford

5.12 At Heyford Park and Upper Heyford, **Figure 6** shows that whilst there are changes to traffic flows within these villages, the changes are not material. **Figure 6** does show a significant two-way reduction in traffic flow on Camp Road between Heyford Park and Middleton Stoney, which is due to traffic reassigning to the MSRR and HPLR.

5.13 To the south of Middleton Stoney, **Figure 7** below shows a material traffic reduction southbound on the B430 of over 200 pcus in the DS3A morning peak hour scenario, with a minor northbound

increase. There would be a moderate increase in traffic flow on the A4095 between the B430 and Port Way in both directions, with the eastbound increase of 54 pcus largely due to development traffic and the westbound increase of 60 pcus due to route switching, with corresponding reductions on the B4027 Islip Road. There is a significant reduction in traffic of -180 pcus on the A4095 between the B430 and Chesterton, with this background traffic reassigning to the B4030 Middleton Stoney Road and MSRR.

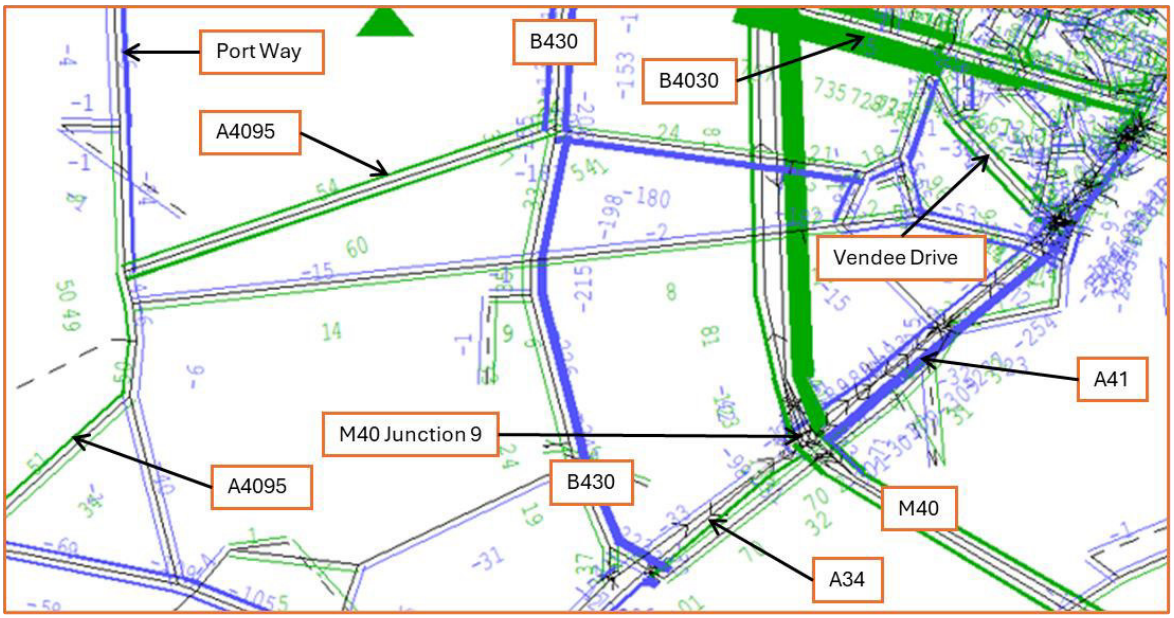


Figure 7: extract of the morning peak hour flow difference plot south of Middleton Stoney

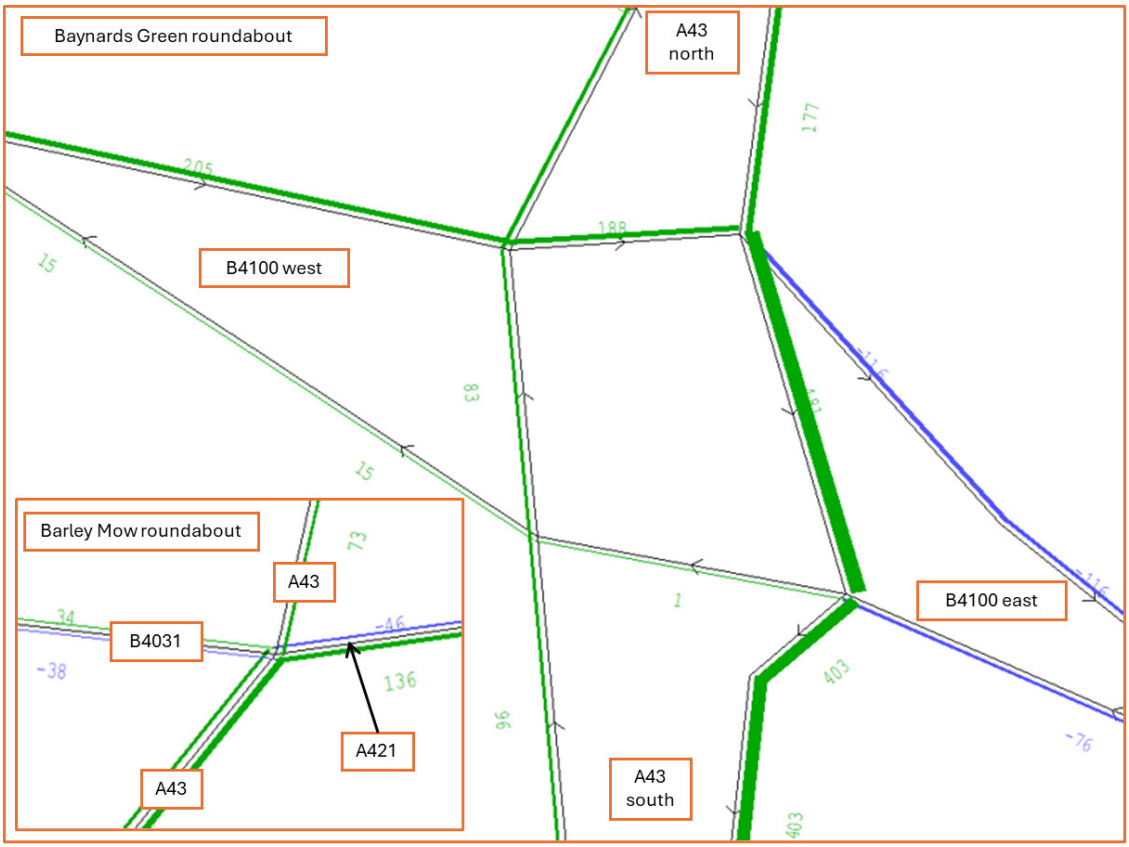


Figure 8: extract of the morning peak hour flow difference plots at Baynard's Green and Barley Mow

5.14 **Figure 7** and **Appendix F** also shows that there would be no material change in traffic flow on the A34 due to the Proposed Development in the morning peak hour, with a slight reduction

eastbound towards M40 Junction 9 and a modest increase westbound between M40 Junction 9 and the B430. As discussed above, there would be a material two-way reduction (around 400 pcus) in traffic flow on the A41 in the morning peak hour with the development in place, with corresponding increases on the B4030 Middleton Stoney Road indicating that background traffic is switching to that route to travel to/from M40 Junction 10 via the MSRR and Ardley Bypass.

5.15 To the north of M40 Junction 10 is the Baynard's Green roundabout. **Figure 8** above shows that in the DS3A morning peak hour there would be material traffic increases on the A43 north, A43 south and B4100 west arms of the junction, with a reduction on the B4100 east arm. Further to the north, **Figure 8** shows that there would also be traffic increases on the A43 north, A43 south and A421 arms of the Barley Mow roundabout.

5.16 To help quantify the traffic flow changes across the modelled highway network discussed above, the tables below summarises the total change in traffic flow, the volume of development vehicle trips and the change in background traffic flows on the SRN routes discussed above in the morning peak hour for the 2034 DS3A scenario as compared to the RC3A scenario.

2034 DS3A vs RC3A SRN flow analysis - morning peak hour (in pcus)					
SRN link	RC3A	DS3A	Flow difference	OxSRFI	Background traffic change
M40 SB north of M40J10	5,136	5,279	143	233	-90
M40 NB north of M40J10	4,008	4,020	12	110	-98
M40 SB offslip at Cherwell	758	1,211	453	233	220
M40 SB onslip at M40J10	1,836	2,576	740	173	567
M40 SB between M40J10 and M40J9	6,048	6,644	596	173	423
M40 NB between M40J10 and M40J9	4,934	5,015	81	214	-133
M40 SB offslip at M40J9	2,498	2,839	341	80	261
M40 NB onslip at M40J9	2,494	2,452	-42	90	-132
A34 EB between B430 and M40J9	4,321	4,288	-33	34	-67
A34 WB between B430 and M40J9	3,636	3,706	70	27	43
A43 SB north of Barley Mow	2,124	2,197	73	181	-108
A43 NB north of Barley Mow	1,373	1,374	1	28	-27
A43 SB between Baynards Green and Barley Mow	2,628	2,805	177	234	-57
A43 NB between Baynards Green and Barley Mow	1,781	1,881	100	45	55
A43 NB between Padbury and Baynards Green	1,818	1,914	96	54	42
A43 SB between Padbury and Baynards Green	2,368	2,771	403	333	70

5.17 The table above summarises the traffic changes (DS3A – RC3A) on the SRN in the morning peak:

- The increases in traffic flow on the M40 north of Junction 10 are less than the OxSRFI development traffic on this part of the network, with relatively small reductions in background traffic flow both northbound and southbound. This could be due to changes to the demand model, i.e. employment trips to/from OxSRFI replacing some trips using these routes to/from other employment centres.

- The traffic increase on the M40 southbound offslip at Junction 10 is almost double the development traffic using the slip road. This increase in background traffic is due to the embedded highway mitigation, including the Ardley Bypass and the MSRR, providing a significantly improved route to Bicester.

- The traffic increases on the M40 southbound on-slip at Junction 10, the M40 southbound between M40 Junctions 10 and 9 and the M40 southbound off-slip at M40 Junction 9 are significantly higher than the OxSRFI development traffic on these routes. This is mostly due to the significant upgrade of M40 Junction 10, and in particular the improvements to

Cherwell roundabout and the southbound M40 merge which release a known bottleneck, allowing more traffic onto this part of the network.

- The increases in traffic flow on the M40 northbound on-slip at Junction 9 and the M40 northbound between Junctions 9 and 10 are less than the development traffic on this part of the network, with reductions in background traffic flow both northbound and southbound, which could be due to changes to the demand model, as explained above.

- There is no material change in traffic flow on the A34, with a slight reduction in background traffic eastbound towards M40 Junction 9 and a slight increase westbound.

- The traffic flow increases on the A43 from north of the Barley Mow roundabout to the Baynard's Green roundabout in both directions are lower than the OxSRFI traffic on these routes, with the exception of the A43 northbound between the Baynard's Green and Barley Mow roundabouts. To the south of Baynard's Green, traffic increases are shown to be higher than the OxSRFI traffic flows. Hence, north of Baynard's Green a relatively small volume of background traffic is being displaced by development traffic travelling southbound towards the site. This is likely to be due to changes to the demand model and capacity issues at the Barley Mow roundabout, as discussed later in this section.

5.18 The table below summarises the traffic flow changes (DS3A – RC3A) on the local road network in the morning peak hour:

- There would be an increase in traffic flow on the A421 westbound towards the A43 southbound which is more than double the development traffic using that route, with a significant amount of background traffic reassignment. This is likely to be due to the to the embedded highway mitigation improving journey times to the M40 southbound and Bicester via the Ardley Bypass and the MSRR.

- The traffic increase on the B4100 eastbound approach to Baynard's Green is significantly higher than the amount of development traffic on this route, which could be due to a combination of existing congestion on the A43 north of Baynard's Green and the embedded highway mitigation improving journey times to the M40 southbound, and Bicester via the Ardley Bypass and the MSRR.

- There is a two-way reduction in traffic flow of 191 pcus on the B4100 eastern arm of the Baynard's Green roundabout, despite there being 69 two-way development trips on this part of the B4100. These decreases are likely to be due to traffic to/from Bicester reassigning to the Middleton Stoney Road-MSRR-Ardley Bypass route.

- Similarly, there are significant reductions in the northbound and southbound traffic flow on Ardley Road between Ardley and Bucknell, with traffic reassigning to the Middleton Stoney Road-MSRR-Ardley Bypass route.

- Somerton Road is very lightly trafficked and the eastbound increase of 62 pcus (all light vehicle trips) would not be a severe impact.

- There would be significant reductions in traffic flow on the B430 through Ardley due to B430 traffic reassigning to the Ardley Bypass.

- There is a significant two-way traffic flow reduction of 285 pcus on the B430 south of Middleton Stoney, despite there being 97 northbound development trips on this part of the

B430. This traffic flow reduction is likely due to a combination of background traffic reassigning to the M40 southbound due to the improvements at M40 Junction 10, and changes to the demand model.

- Traffic decreases on the B4030 east and west of Middleton Stoney are significant and occur as a result of the MSRR and HPLR providing a superior route between Heyford Park and Bicester. There would be little development traffic on the B4030 west of Middleton Stoney, and no development traffic on the B4030 between Middleton Stoney and the MSRR.

- East of the MSRR, there are significant traffic increases on the B4030 Middleton Stoney Road, far greater than the OxSRFI traffic on this route. There is a similar be lesser effect on Middleton Stoney Road east of Vendee Drive. This is caused by background traffic reassigning to this route instead of using the A41, Ardley Road and B4100 corridors due to the positive impact of the MSRR, Ardley Bypass and M40 Junction 10 upgrades. Minor routes north such as Fringford Road and the A4421 also see traffic reductions due to reassignment to this route.

- The moderate eastbound increase in traffic flow on the A4095 between the B430 and Port Way is largely due to development traffic and the westbound increase is due to route switching, with corresponding reductions on the B4027 Islip Road. However, there is a significant traffic reduction of -180 pcus on the A4095 between the B430 and Chesterton with traffic switching to the Middleton Stoney Road-MSRR-Ardley Bypass route.

- There are reductions in traffic in both directions on the A41 between Bicester and M40 Junction 9, particularly in the westbound direction where traffic reduces by 301 pcus and reassigns to the Middleton Stoney Road-MSRR-Ardley Bypass route.

- There are two-way traffic increases on Vendee Drive and northbound on Oxford Road (south of Middleton Stoney Road). The increases are greater than the development traffic using these routes. This is due to traffic switching from the A41 to the Middleton Stoney Road-MSRR-Ardley Bypass route as discussed above.

2034 DS3A vs RC3A local highway network flow analysis - morning peak hour (in pcus)					
Local Highway Network Link	RC3A	DS3A	Flow difference	OxSRFI	Background traffic change
A421 EB east of Barley Mow	679	633	-46	15	-61
A421 WB east of Barley Mow	769	906	137	63	74
B4100 EB west of Baynards Green	517	722	205	36	169
B4100 WB west of Baynards Green	489	504	15	2	13
B4100 EB east of Baynards Green	1,018	904	-114	7	-121
B4100 WB east of Baynards Green	756	679	-77	62	-139
A4421 NB north of Caversfield	601	609	8	0	8
A4421 SB north of Caversfield	1,164	1,106	-58	0	-58
Fringford Road NB	41	38	-3	0	-3
Fringford Road SB	94	87	-7	0	-7
Ardley Road NB between Ardley and Bucknell	370	208	-162	8	-170
Ardley Road SB between Ardley and Bucknell	246	75	-171	11	-182
Somerton Road EB between Ardley and the A4260	2	63	61	34	27
Somerton Road WB between Ardley and the A4260	22	17	-5	2	-7
B430 NB south of Ardley Road	426	62	-364	34	-398
B430 SB south of Ardley Road	940	13	-927	2	-929
B430 NB between the Principal Site Access and the MSRR	425	789	364	365	-1
B430 SB between the Principal Site Access and the MSRR	961	785	-176	57	-233
B430 NB south of Middleton Stoney	364	231	-133	97	-230
B430 SB south of Middleton Stoney	638	485	-153	8	-161
B430 NB at Western on the Green	122	141	19	34	-15
B430 SB at Western on the Green	443	228	-215	4	-219
B4030 WB west of Middleton Stoney	497	264	-233	1	-234
B4030 EB west of Middleton Stoney	865	490	-375	19	-394
B4030 WB between Middleton Stoney and the MSRR	270	277	7	0	7
B4030 EB between Middleton Stoney and the MSRR	630	294	-336	0	-336
B4030 WB east of the MSRR	292	1,049	757	175	582
B4030 EB east of the MSRR	733	1,102	369	30	339
MSRR NWB	n/a	936	936	177	759
MSRR SEB	n/a	932	932	30	902
HPLR NWB (comparsion with Upper Heyford Road)	484	722	238	19	219
HPLR SEB (comparsion with Upper Heyford Road)	358	788	430	73	357
Middleton Stoney Road WB east of Vendee Drive	551	945	394	126	268
Middleton Stoney Road EB east of Vendee Drive	835	949	114	24	90
The A4095 EB between the B430 and Port Way	221	275	54	62	-8
The A4095 WB between the B430 and Port Way	198	258	60	4	56
The A4095 EB between the B430 and Chesterton	252	276	24	0	24
The A4095 WB between the B430 and Chesterton	350	170	-180	1	-181
Vendee Drive NB	305	401	96	22	74
Vendee Drive SB	512	577	65	5	60
Oxford Road NB south of Middleton Stoney Road	1,085	1,222	137	55	82
Oxford Road SB south of Middleton Stoney Road	1,494	1,491	-3	9	-12
The A41 EB between M40 Junction 9 and Tritax Park	2,084	1,994	-90	51	-141
The A41 WB between M40 Junction 9 and Tritaxm Park	1,666	1,365	-301	57	-358

2034 DS3A vs RC3A - evening peak hour

5.19 **Figure 9** shows an extract of the 2034 evening peak hour flow difference plot for the central modelled network (**Appendix G**). With the Proposed Development and the embedded mitigation in place, **Figure 9** shows that there would be material traffic increases on the M40 in both directions between Junctions 10 and 9. There are also northbound and southbound traffic increases north of M40 Junction 10 and on the southbound diverge at Junction 10 itself, though the increase on the slip road is considerably less than in the morning peak hour.

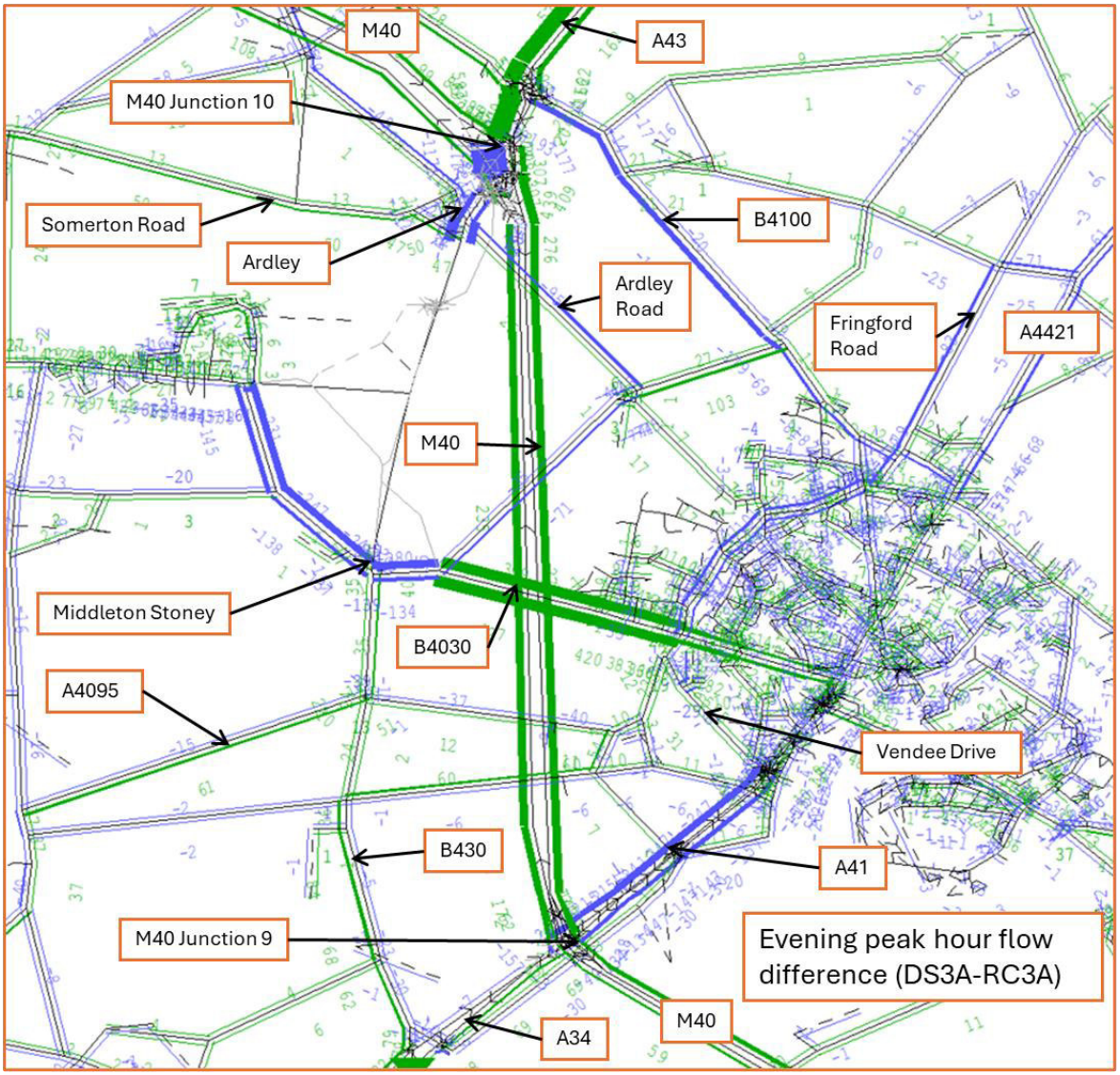


Figure 9: extract of the evening peak hour flow difference plot for the central network

5.20 The modelling forecasts large traffic increases on the A43 northbound through M40 Junction 10 and to the north of Baynard's Green, with a more modest increase southbound. **Figure 9** shows large traffic increases on the B4030 Middleton Stoney Road between the MSRR and central Bicester in both directions. There are also relatively modest traffic increases on the A4095 westbound between the B430 and Port Way, the B430 south of Middleton Stoney, Vendee Drive between the A41 and the B4030 Middleton Stoney Road, Oxford Road in both directions south of Middleton Stoney Road, and Somerton Road between Ardley and the A4260 Oxford Road.

5.21 **Figure 9** also shows that there would be traffic reductions on the B430 through Ardley, southbound on Ardley Road between Ardley and Bucknell, Camp Road and the B4030 east and west of Middleton Stoney, the A41 between M40 Junction 9 and Bicester, the A4095 Howes Lane, the A4421, Fringford Road and the B4100 east of Baynard's Green.

5.22 To illustrate the traffic flow changes between the 2034 RC3A and DS3A scenarios in the evening peak hour in more detail, **Figure 10** below shows extracts of the flow difference plots (**Appendix G**) for the villages of Middleton Stoney, Ardley, Heyford Park and Upper Heyford.

5.23 At the B430/B4030 crossroads junction in Middleton Stoney, **Figure 10** shows that as a result of the MSRR providing a faster route between Bicester and Heyford Park, Ardley and M40Junction 10, there would be significant two-way traffic reductions on the B4030 east and west arms, with

a minor increase on the B430 northbound exit and a two-way increase of 75 pcus on the B430 to the south of the junction. Overall, pcu traffic flows reduce by 23% across the junction in the evening peak hour with the Proposed Development and the embedded mitigation in place.

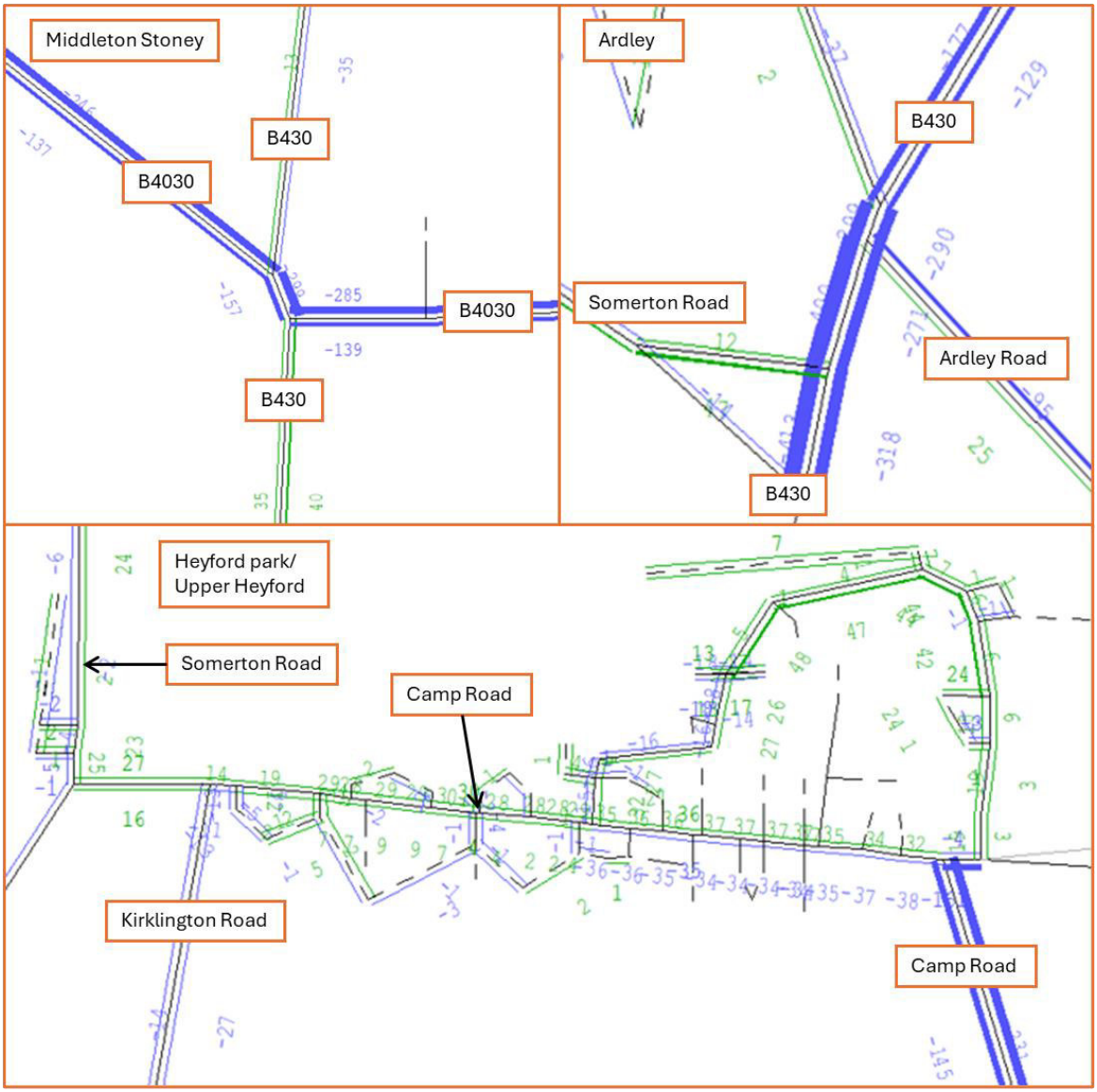


Figure 10: extract of the evening peak hour flow difference plots showing Middleton Stoney, Ardley and Heyford Park/Upper Heyford

5.24 **Figure 10** shows that there would be significant reductions in traffic flow on the B430 through Ardley with the development in place due to B430 traffic reassigning to the Ardley Bypass. South of the junction with Ardley Road, flows reduce by around 671 pcus two-way movements. There is also a reduction on Ardley Road of 95 pcus, as discussed above, as traffic between Bicester and M40 Junction 10 reassigns to the B4030 Middleton Stoney Road-MSRR-Ardley Bypass.

5.25 At Heyford Park and Upper Heyford, **Figure 10** shows that whilst there are changes to traffic flows within these villages, the changes are not material. **Figure 10** does show a significant two-way reduction in traffic flow on Camp Road between Heyford Park and Middleton Stoney, which is due to traffic reassigning to the MSRR and HPLR.

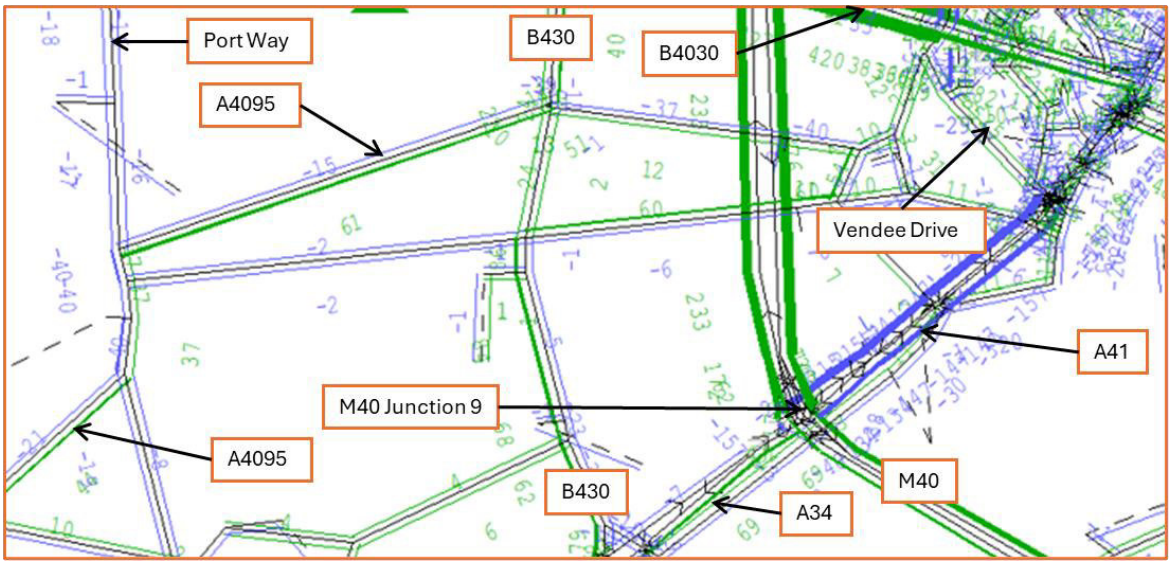


Figure 11: extract of the evening peak hour flow difference plot south of Middleton Stoney

5.26 To the south of Middleton Stoney, **Figure 11** above shows a northbound traffic increase on the B430 of 89 pcus in the DS3A evening peak hour scenario, with a minor southbound decrease. There would be an increase eastbound on Green Lane between the B430 and Chesterton, which is due to background traffic reassignment. There would be a moderate increase in traffic flow westbound on the A4095 between the B430 and Port Way, which is largely due to development traffic. **Figure 11** also shows two-way reduction on Port Way.

5.27 **Figure 11** also shows that there would be an increase of 69 pcus on the A34 westbound between M40 Junction 9 and the B430 due to the Proposed Development in the evening peak hour. As discussed above, and as per the effects of the Proposed Development identified in the morning peak hour, there would be a material two-way traffic reduction on the A41 in the evening peak, with corresponding increases on the B4030 Middleton Stoney Road indicating that traffic is switching to that route to travel to/from M40 Junction 10 via the MSRR and Ardley Bypass.

5.28 **Figure 12** below shows that in the DS3A evening peak hour there would be material traffic increases on the A43 north, A43 south and B4100 west arms of the A43 Baynard's Green junction, with a reduction on the B4100 east arm. The northbound traffic increase on the A43 is significant. Further to the north, **Figure 12** shows that there would also be traffic increases on the A43 north, A43 south and A421 arms of the Barley Mow roundabout.

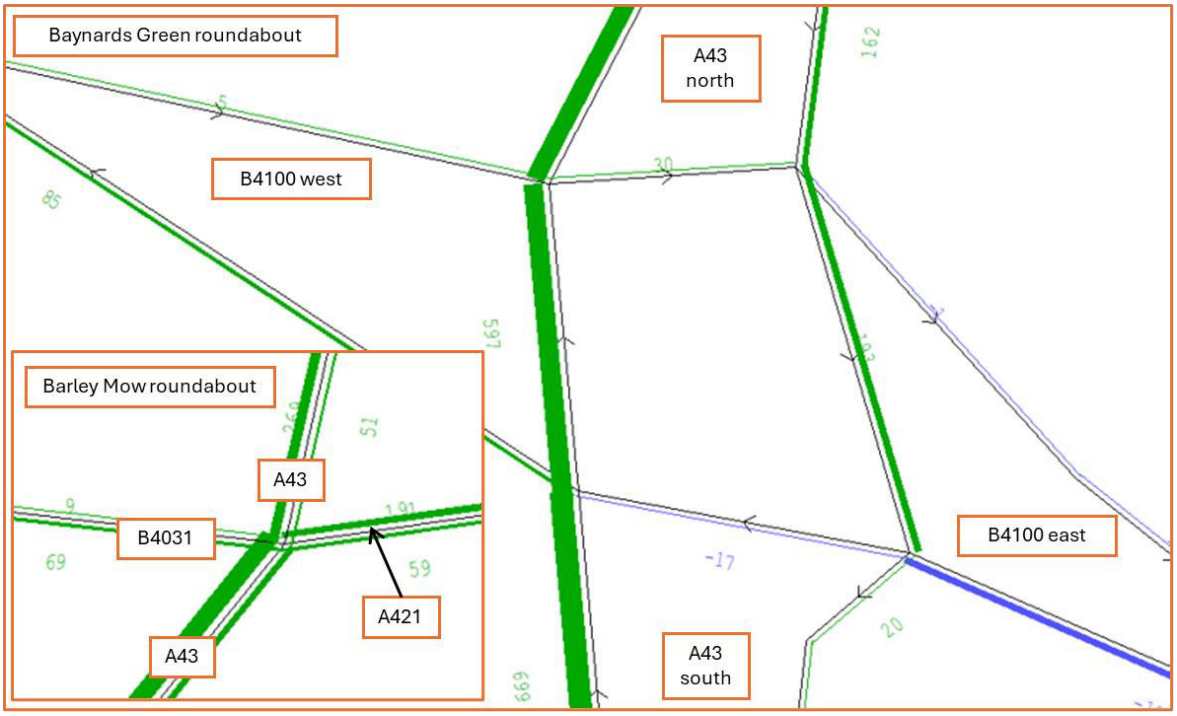


Figure 12: extract of the evening peak hour flow difference plots at Baynard's Green and Barley Mow

5.29 To help quantify the traffic flow changes across the modelled highway network discussed above, the tables below summarise the number of the total change in traffic flow, the development vehicle trips and the change in background traffic flows on the SRN routes highlighted above in the evening peak hour for the 2034 DS3A scenario.

2034 DS3A vs RC3A SRN flow analysis - evening peak hour (in pcus)					
SRN link	RC3A	DS3A	Flow difference	OxSRFI	Background traffic change
M40 SB north of M40J10	4,476	4,576	100	130	-30
M40 NB north of M40J10	5,165	5,273	108	235	-127
M40 SB offslip at Cherwell	697	843	146	130	16
M40 SB onslip at M40J10	1,684	1,992	308	188	120
M40 SB between M40J10 and M40J9	5,449	5,724	275	188	87
M40 NB between M40J10 and M40J9	6,554	6,788	234	171	63
M40 SB offslip at M40J9	2,701	2,835	134	77	57
M40 NB onslip at M40J9	2,941	3,112	171	80	91
A34 EB between B430 and M40J9	4,063	4,056	-7	32	-39
A34 WB between B430 and M40J9	3,953	4,022	69	27	42
A43 SB north of Barley Mow	1,594	1,646	52	64	-12
A43 NB north of Barley Mow	1,972	2,241	269	209	60
A43 SB between Baynards Green and Barley Mow	2,007	2,169	162	105	57
A43 NB between Baynards Green and Barley Mow	2,419	2,991	572	318	254
A43 NB between Padbury and Baynards Green	2,223	2,922	699	350	349
A43 SB between Padbury and Baynards Green	2,014	2,034	20	139	-119

5.30 The table summarises the traffic changes (DS3A – RC3A) on the SRN in the evening peak:

- The increases in traffic flow on the M40 north of Junction 10 are less than the OxSRFI development traffic on this part of the network, with relatively small reductions in background traffic flow both northbound and southbound. This could be due to changes to the demand model, i.e. employment trips to/from OxSRFI replacing some trips using this these routes to/from other employment centres.

- The traffic increase on the M40 southbound offslip at Junction 10 is mostly due to OxSRFI development traffic.

- The traffic increases on the M40 southbound on-slip at Junction 10, the M40 southbound between M40 Junctions 10 and 9 and the M40 southbound off-slip at M40 Junction 9 are higher than the OxSRFI development traffic on these routes. This is mostly due to the significant upgrade of M40 Junction 10, and in particular the improvements to Cherwell roundabout and the southbound M40 merge which release a known bottleneck, allowing more traffic onto this part of the network.

- The increases in traffic flow on the M40 northbound on-slip at Junction 9 and the M40 northbound between Junctions 9 and 10 are also higher than the OxSRFI development traffic on these routes, likely due to the new M40 to A43 link to the Padbury junction improving journey times and allowing traffic to reassign to the higher category route.

- There would be an increase in traffic flow on the A34 westbound between M40 Junction 9 and the B430 due to the Proposed Development in the evening peak hour.

- There is a significant increase in traffic northbound on the A43 from the Padbury junction to the Barley Mow roundabout. This increase is significantly higher than the development traffic on this route and hence there is a significant amount of background traffic reassigning onto this route, which is likely to be due to the to the significant upgrade of M40 Junction 10, and in particular the new M40 to A43 link to the Padbury junction improving journey times.

- The southbound traffic flow increase on the A43 north of the Barley Mow roundabout is relatively modest and is largely due to development traffic. Between the Barley Mow and Baynard's Green roundabouts the difference between the southbound RC3A and DS3A scenario is greater, largely due to increases in development traffic, with some further background traffic reassignment.

5.31 The table show on page 31 summarises the traffic flow changes (DS3A – RC3A) on the local road network in the evening peak hour:

- There would be an increase in traffic flow on the A421 eastbound from the A43 northbound which is more than double the development traffic using that route, with a significant amount of background traffic reassignment. This is likely to be due to the to the embedded highway mitigation improving journey times from the M40 northbound. There is also a more modest increase in the westbound flow.

- The traffic increase on the B4100 westbound exit from Baynard's Green is almost entirely due to background traffic reassignment.

- There is a two-way reduction in traffic flow of 198 pcus on the B4100 eastern arm of the Baynard's Green roundabout, despite there being 57 two-way development trips on this part of the B4100. These decreases are likely to be due to traffic to/from Bicester reassigning to the Middleton Stoney Road-MSRR-Ardley Bypass route.

- Similarly, there are significant reductions in the southbound traffic flow on Ardley Road between Ardley and Bucknell, with traffic reassigning to the Middleton Stoney Road-MSRR-Ardley Bypass route.

- Somerton Road is very lightly trafficked and the westbound increase of 50 pcus (all light vehicles) would not be a severe impact.

- There would be significant reductions in traffic flow on the B430 through Ardley due to B430 traffic using the Ardley Bypass.

- There is a modest two-way traffic flow increase of 74 pcus on the B430 south of Middleton Stoney. However, this increase is significant less than the 141 pcus two-way development trips (116 pcus southbound) on this part of the B430. This change is likely due to a combination of background traffic reassigning to the M40 southbound due to the improvements at M40 Junction 10, and changes to the demand model.

- The traffic decreases on the B4030 both east and west of Middleton Stoney are significant and occur as a result of the MSRR and HPLR providing a superior route between Heyford Park and Bicester. There would be very little development traffic on the B4030 west of Middleton Stoney, and no development traffic on the B4100 between Middleton Stoney and the MSRR.

- East of the MSRR, there are significant traffic increases on the B4030 Middleton Stoney Road, far greater than the OxSRFI traffic using this route. Although to a lesser extent, this is also true of Middleton Stoney Road east of the roundabout with Vendee Drive. This is caused by background traffic reassigning to use this route instead of the A41, Ardley Road and B4100 corridors due to the positive impact of the MSRR, Ardley Bypass and M40 Junction 10 upgrades. Minor routes north such as the A4095 Howes Lane, Fringford Road and the A4421 also see traffic reductions due to reassignment to this route, as discussed above.

- The moderate westbound increase in traffic flow on the A4095 between the B430 and Port Way is due to development traffic and there is an element of route switching the A4095 between the B430 and Chesterton and Green Lane.

- There are reductions in traffic in both directions on the A41 between Bicester and M40 Junction 9, particularly in the eastbound direction where traffic reduces by 215 pcus and reassigns to use the Middleton Stoney Road-MSRR-Ardley Bypass route. This reassignment can be traced to Vendee Drive and Oxford Road (south of Middleton Stoney Road) where there are two-way traffic increases.

Traffic flow change summary

5.32 Overall, the analysis above shows that in both the morning and evening peak hours, there are traffic increases on the modelled SRN corridors in the DS3A scenario, particularly the M40 and the A43. Whilst the development traffic assigned to the M40 and A43 corridors is material, as detailed in Section 4, the total traffic increase is also made up of a significant amount of background traffic. This indicates that the effect of the embedded highway mitigation is to return background traffic to the higher category roads and away from the local road network, which is a positive effect.

5.33 Notwithstanding the above, the impact of the Proposed Development on the SRN will be assessed using the 2031 RC1A and DS1A scenarios which are the DfT Circular 01/2022 compliant scenarios for the Reference and Do-Something Cases. These scenarios will have less background traffic growth and therefore, it would be expected that they would experience reduced levels of congestion.

5.34 The above analysis also shows that in the morning and evening peak hours, with the OxSRFI development and the embedded Highway Works in place, background traffic reassigns away from the A41, B4100, the B430, Ardley Road and the A4421 and instead routes between Bicester, Heyford Park and M40 Junction 10 via the B4030 Middleton Stoney Road, MSRR and Ardley Bypass route. The effect of this reassignment is to significantly decrease traffic in the villages of Ardley, Middleton Stoney and Bucknell. There would be no material changes in Heyford Park or Upper Heyford.

2034 DS3A vs RC3A local highway network flow analysis - evening peak hour (in pcus)					
Local Highway Network Link	RC3A	DS3A	Flow difference	OxSRFI	Background traffic change
A421 EB east of Barley Mow	651	843	192	74	118
A421 WB east of Barley Mow	657	716	59	30	29
B4100 EB west of Baynards Green	434	440	6	7	-1
B4100 WB west of Baynards Green	387	472	85	2	83
B4100 EB east of Baynards Green	813	808	-5	30	-35
B4100 WB east of Baynards Green	894	701	-193	27	-220
A4421 NB between Caversfield and the A421	1,062	1,049	-13	0	-13
A4421 SB between Caversfield and the A421	657	590	-67	0	-67
Fringford Road NB	194	111	-83	0	-83
Fringford Road SB	30	25	-5	0	-5
Ardley Road NB between Ardley and Bucknell	163	188	25	0	25
Ardley Road SB between Ardley and Bucknell	212	117	-95	64	-159
Somerton Road EB between Ardley and the A4260	8	21	13	10	3
Somerton Road WB between Ardley and the A4260	20	70	50	47	3
B430 NB south of Ardley Road	418	18	-400	10	-410
B430 SB south of Ardley Road	336	65	-271	47	-318
B430 NB between the Principal Site Access and the MSRR	413	902	489	148	341
B430 SB between the Principal Site Access and the MSRR	334	787	453	388	65
B430 NB south of Middleton Stoney	188	222	34	25	9
B430 SB south of Middleton Stoney	301	341	40	116	-76
B430 NB at Western on the Green	188	250	62	11	51
B430 SB at Western on the Green	191	161	-30	34	-64
B4030 WB west of Middleton Stoney	692	555	-137	24	-161
B4030 EB west of Middleton Stoney	530	284	-246	8	-254
B4030 WB between Middleton Stoney and the MSRR	717	215	-502	0	-502
B4030 EB between Middleton Stoney and the MSRR	499	578	79	25	54
B4030 WB east of the MSRR	748	1,175	427	91	336
B4030 EB east of the MSRR	574	973	399	189	210
MSRR NWB	n/a	720	720	94	626
MSRR SEB	n/a	873	873	214	659
HPLR NWB (comparsion with Upper Heyford Road)	192	341	149	61	88
HPLR SEB (comparsion with Upper Heyford Road)	365	654	289	25	264
Middleton Stoney Road WB east of Vendee Drive	632	799	167	52	115
Middleton Stoney Road EB east of Vendee Drive	847	1,021	174	149	25
The A4095 EB between the B430 and Port Way	283	268	-15	12	-27
The A4095 WB between the B430 and Port Way	264	325	61	75	-14
The A4095 EB between the B430 and Chesterton	323	286	-37	0	-37
The A4095 WB between the B430 and Chesterton	212	224	12	1	11
Vendee Drive NB	669	701	32	28	4
Vendee Drive SB	452	476	24	9	15
Oxford Road NB south of Middleton Stoney Road	1,579	1,657	78	22	56
Oxford Road SB south of Middleton Stoney Road	1,195	1,252	57	68	-11
The A41 EB between M40 Junction 9 and Tritax Land	1,668	1,453	-215	49	-264
The A41 WB between M40 Junction 9 and Tritax Land	1,389	1,255	-134	50	-184

Volume-capacity analysis

5.35 The above analysis considers the change in traffic flows across the network due to the Proposed Development traffic detailed in Section 4 and the effects of the embedded mitigation proposals

detailed in Section 3. The analysis has highlighted the routes and junctions where material traffic changes would occur in the DS3A morning and evening peak hours.

5.36 To further understand the likely impact of these traffic flow changes, it is necessary to consider the locations and levels of congestion across the network in the RC3A scenario and understand how congestion levels change with the Proposed Development in place. This can be achieved by calculating the ratio of traffic volumes against the theoretical capacity on links and nodes throughout the network. Link/node volume to capacity (V/C) ratios exceeding 85% indicate that the link/node is under stress which may result in increases in delay and, therefore, journey time.

2034 DS3A vs RC3A - morning peak hour

5.37 **Figure 13**[4] below compares the link and node V/C ratios for the 2034 RC3A morning peak hour scenario (left-hand side) and the 2034 DS3A morning peak hour scenario (right-hand side). The following observations can be made:

- Much of the highway network is green (below 85% capacity both scenarios).
- The V/C on the M40 Junction 10 northbound diverge and southbound merge are above 100% in the RC3A scenario, dropping below 85% with the embedded Highway Works in place in the DS3A scenario.
- As described earlier in this section, the significant upgrade of M40 Junction 10, and in particular the improvements to Cherwell roundabout and the southbound M40 merge, release a known bottleneck, allowing more traffic onto the M40 southbound between Junctions 10 and 9. As a result, the V/C on the M40 southbound switches from yellow to red in the DS3A scenario. Whilst a V/C above 100% is not desirable, in this instance it is largely due to an increase in background traffic returning to the preferred route. Further, the impact of the Proposed Development on the SRN will be assessed using the 2031 DS1A scenario which is the DfT Circular 01/2022 compliant scenario, as described above. This scenario will have less background traffic growth and therefore the V/C on the M40 southbound would be expected to be lower than shown.
- The V/C on the A43 southbound approach to the Barley Mow roundabout would be above 100% in both the RC3A and DS3A scenarios. The A43 is part of the SRN so the impact on this part of the network would also be considered in the 2031 DS1A scenario. Also shown is that the V/C on the A421 westbound approaches would switch from yellow to red with the OxSRFI in place.
- The V/C on the A34 west of the junction with the B430 reduces with the development in place, switching from red to yellow.
- There are reductions in V/C on the A4421 corridor between Bicester and the A421 in the DS3A scenario as background traffic reassigns away from this route, as described above.
- The V/C on Ardley Road between Ardley and Bucknell drops below 85% with the development in place, removing congestion from this route.
- There are no significant changes in V/C in the centre of Bicester with the OxSRFI in place.

[4] Green indicates a V/C ratio below 85%, yellow indicates a V/C ratio between 85% and 100%, red indicates a V/C above 100%

- In the RC3A scenario there is significant congestion shown at Middleton Stoney, with the B430 north and B4030 west links shown to be over 100% V/C. In the DS3A scenario, this congestion is removed with links shown to be below 85% V/C.

- On the B4030 Middleton Stoney Road link between the junction with Vendee Drive and the MSRR the V/C would be between 85% and 100% in the DS3A scenario. This is due to 17% of OxSRFI traffic using this route along with the significant background traffic reassignment to the Middleton Stoney Road, MSRR and Ardley Bypass route between Bicester and M40 Junction 10, as described earlier in this Section.

- On the A4260 corridor there is an increase in congestion southbound at the junction with the B4031 at Deddington (a switch of green to yellow) and westbound on the B4030 approach to the A4260 junction at Hopcrofts Holt (a switch from yellow to red). There is also congestion shown at the A4260/B4027 and A4260/A4095 junctions in both the RC3A and DS3A scenarios.

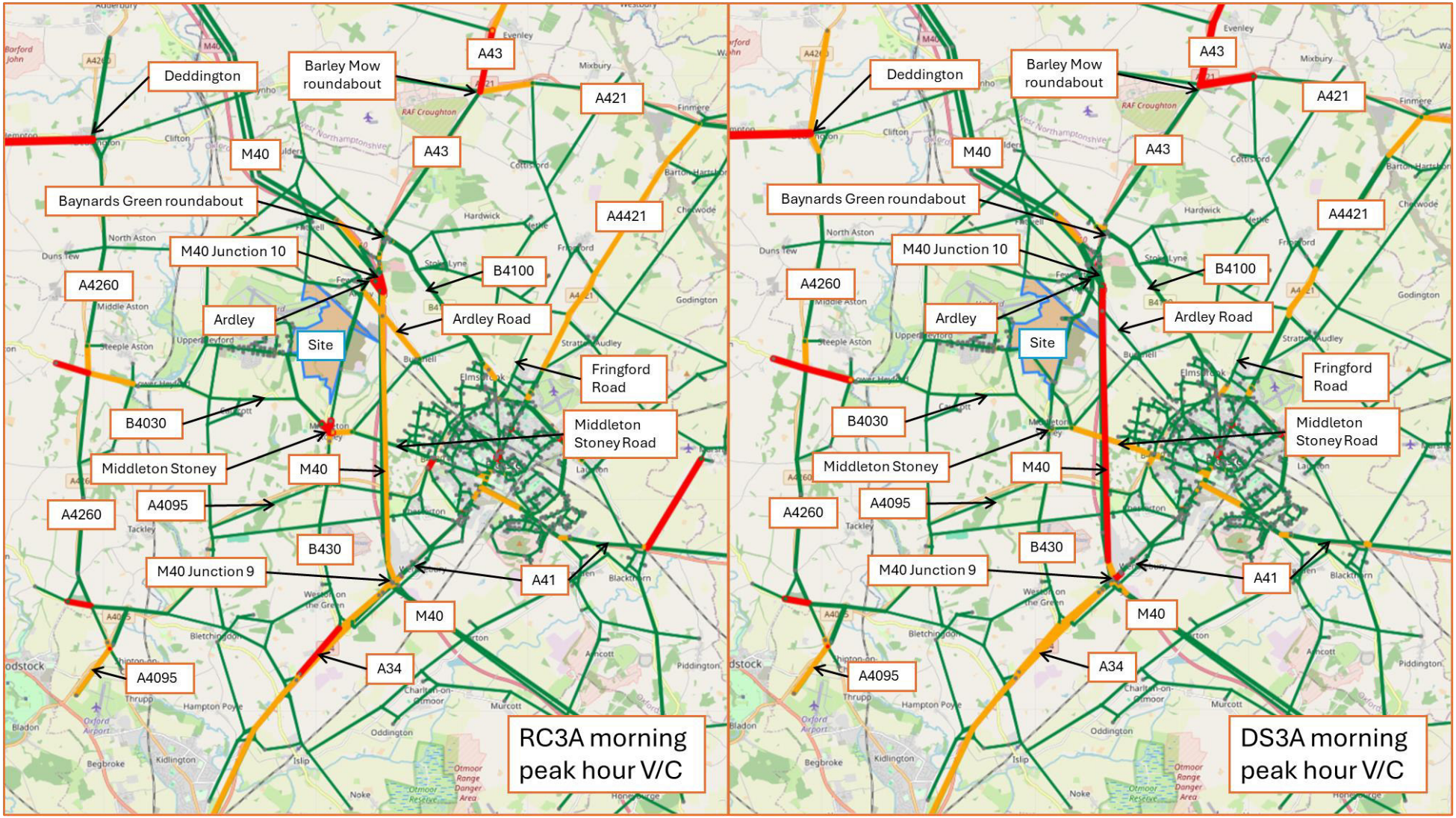


Figure 13: DS3A vs RC3A morning peak hour V/C comparison

2034 DS3A vs RC3A - evening peak hour

5.38 **Figure 14** below compares the link and node V/C ratios for the 2034 RC3A evening peak hour scenario (left-hand side) and the 2034 DS3A morning peak hour scenario (right-hand side). The following observations can be made:

- Much of the highway network is green (below 85% capacity both scenarios)
- The V/C on the M40 Junction 10 northbound diverge and southbound merge are above 100% in the RC3A scenario, dropping below 85% with the embedded highway mitigation in place. There is also congestion on the B430 eastbound approach to Ardley roundabout (above 100%) and the eastbound approach to Cherwell roundabout (yellow, between 85% and 100%) in the RC3A scenario, with no congestion shown in the DS3A scenario.
- As described earlier in this Section, the significant upgrade of M40 Junction 10 releases a known bottleneck, allowing more traffic onto the M40 southbound between Junctions 10 and 9. As a result, the V/C on the M40 southbound switches from green to yellow in the DS3A scenario. As discussed above, the impact of the Proposed Development on the SRN will be assessed using the 2031 DS1A scenario which is the DfT Circular 01/2022 compliant scenario, as described above. This scenario will have less background traffic growth and therefore the V/C on the M40 southbound would be expected to be lower than shown.
- The V/C on the M40 northbound route between Junction 9 and 10 is shown to switch from yellow to red in the DS3A scenario. This is due to development traffic and the proposed improvement to M40 Junction 9, which provides increased capacity for the left-turn from the A34 to the M40 northbound. This prevents traffic increases on the B430 and is therefore a positive effect, with the impact on the SRN to be assessed in the 2031 DS1A scenario.
- The V/C on the A43 northbound and southbound approaches to the Barley Mow roundabout would switch from green to yellow in the DS3A scenario. Further, the A43 northbound to the north of the Barley Mow roundabout would switch from yellow to red in the DS3A scenario. The A43 is part of the SRN so the impact on this part of the network would also be considered in the 2031 DS1A scenario.
- There are no material changes to the V/C on the A34 corridor due to the Proposed Development in the evening peak hour.
- There are reductions in V/C on the A4421 corridor between Bicester and the A421 in the DS3A scenario as background traffic reassigns away from this route, as described above. However, there is an increase in V/C (green to yellow) on the A421 eastbound approach to the A421/A4421 roundabout.
- There are no significant changes in V/C in the centre of Bicester with the OxSRFI in place, with the exception of the Buckingham Road northbound approach to the junction with the A4095 Southwold Lane, where congestions drops below 100% in the DS3A scenario due to traffic reassigning to the Middleton Stoney Road, MSRR, Ardley Bypass route.
- There is increased congestion on the A41 northbound approach to the gyratory with Oxford Road, with the V/C switching from green to yellow in the DS3A scenario.

- In the RC3A scenario there is significant congestion shown at Middleton Stoney, with the B430 south and B4030 east and west links shown to be over 100% V/C. In the DS3A scenario, this congestion is significantly reduced across the junction.

- On the B4030 Middleton Stoney Road link between the junction with Vendee Drive and the MSRR the V/C would switch from green to yellow across most of the link in the DS3A scenario, with the eastbound approach to the roundabout with Vendee Drive having a V/C above 100% and increased congestion also on the Vendee Drive approach (green to yellow). This is due to OxSRFI traffic and the significant background traffic reassignment to the Middleton Stoney Road, MSRR and Ardley Bypass route described earlier in this Section.

- On the A4260 corridor there are no material changes in congestion, with the exception of the A4260/B4027 junction where the V/C drops below 100% in the DS3A scenario.

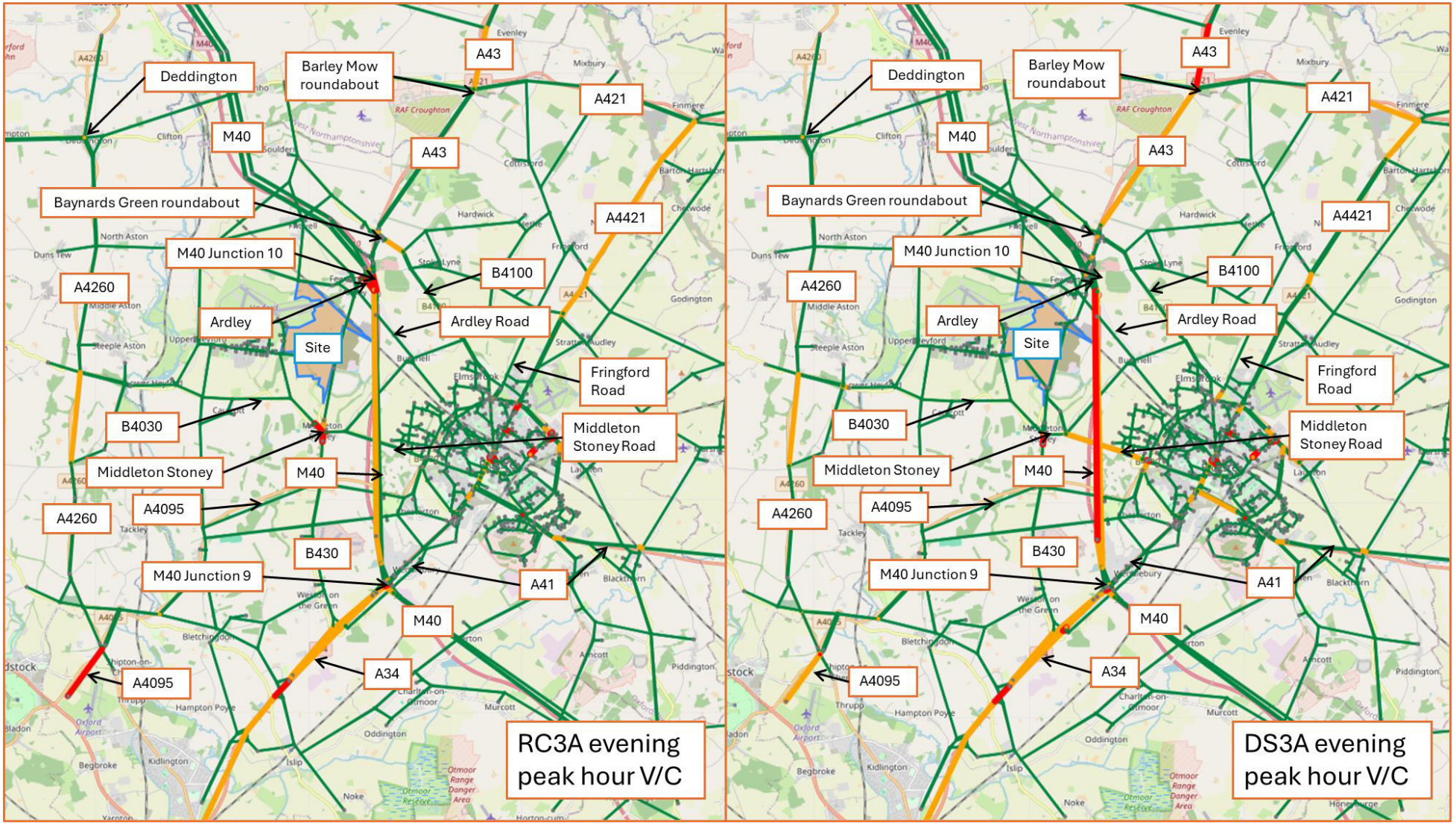


Figure 14: DS3A vs RC3A evening peak hour V/C comparison

6.0 TRAFFIC IMPACT SUMMARY AND STUDY AREA

Traffic impact summary

6.1 The Stage 2 traffic modelling has been completed for the 2034 RC3A and DS3A scenarios, assessing the impacts of the OxSRFI Proposed Development and the embedded Highway Works in the 2034 Completion Year.

6.2 The Proposed Development would add a large number of vehicle trips to the road network. The largest increases in traffic flow due to OxSRFI development vehicles are forecast along the M40 to the north and south of Junction 10, the A43 between the M40 Junction 10 and the Barley Mow roundabout and the Ardley Bypass, MSRR and B4030 Middleton Stoney Road route between the site and Bicester.

6.3 Inspection of the traffic flow changes on these routes shows that the increases are not solely due to the addition of development traffic, with a significant amount of background traffic reassignment occurring across the network. For the M40 and A43 corridors, this indicates that the effect of the embedded Highway Works is to help return background traffic to the higher category roads and away from the local road network, which is a positive effect.

6.4 However, the background traffic reassignment effect is most prominent on the B4030 Middleton Stoney Road east of the MSRR where traffic increases are materially greater than the development traffic using the route. The analysis shows that this is due to background traffic reassigning away from the A41, B4100, the B430, Ardley Road and the A4421 and instead uses the B4030 Middleton Stoney Road, MSRR, Ardley Bypass and HPLR route between Bicester, the site, Heyford Park and M40 Junction 10. The effect of this reassignment is to significantly decrease traffic in the villages of Ardley, Middleton Stoney and Bucknell. There would be no material changes in Heyford Park or Upper Heyford.

6.5 Therefore, it can be concluded that the significant upgrades to M40 Junction 10, including further works at Baynard's Green, and the improvement scheme at M40 Junction 9, help to release congestion and allow long distance traffic to use the SRN. The Ardley Bypass, MSRR and HPLR creates an improved, more direct route between Bicester, Heyford Park, the Proposed Development, and M40 Junction 10, which draws traffic away from lower category or congested routes through local population centres. Hence, the embedded mitigation strategy has a positive effect on traffic flow change.

6.6 To further understand the likely impact of the OxSRFI Proposed Development, the locations and levels of congestion across the network in the RC3A and DS3A scenarios has been considered by comparing changes to the link/node V/C ratios across the network.

6.7 In both the morning and evening peak hours, the general trend is for increased V/C ratios across the SRN with the development and the embedded Highway Works in place, including the M40 and A43. Whilst these routes are included in this assessment, it is agreed with the Transport Working Group that the impact on the SRN will be assessed using the 2031 RC1A SRN and DS1A SRN scenarios which are the DfT Circular 01/2022 compliant scenarios.

6.8 There would also be increased V/C ratios on the B4030 Middleton Stoney Road east of the MSRR due to the large volumes of reassigning traffic. There are some more remote hotspots for increased V/C ratios on the A4260 corridor in the morning peak hour. There would also be reduced V/C ratios on the B4100, the B430 south of Middleton Stoney, the B4030 east and west of

Middleton Stoney, Ardley Road between Bucknell and Ardley, and the A4421 between Bicester and the A421.

Study area

6.9 The analysis presented in this technical note illustrates the likely changes to the highway network due to the OxSRFI Proposed Development in the 2034 DS3A scenario, indicating where changes to traffic volumes and congestion are likely to occur. This analysis has been used to help identify a study area for the Stage 3 detailed transport modelling.

6.10 The study area will include the junctions that form the embedded Highway Works and access strategy. Beyond the embedded Highway Works, to identify which junctions should be included in the study area, further analysis of the highway routes and corridors highlighted in the analysis presented in Section 5 has been undertaken.

6.11 The tables presented in **Appendices H and I** for the respective morning and evening peak hours compare the changes to the traffic flows and V/C ratios on the approaches to junctions on these corridors. Junctions highlighted with red text have been included within the study area due to either a material increase in traffic flow or V/C or both, with commentary provided to explain each decision. In addition, although demonstrated in the BTM to operate within capacity, the Upper Heyford Road/Chilgrove Drive/Camp Road junction is included in the study area, in order that the interface with the committed improvements works at that junction can be examined.

6.12 The resulting study area for the Stage 3 transport modelling is shown at **Figure 15** on the next page.

Proposed study area junctions	
No.	Junction
1	Baynards Green roundabout
2	M40 Junction 10
3	Site access
4	HPLR/B430 T-junction
5	B430/MSRR T-junction
6	MSRR/B4030 roundabout
7	M40 Junction 9
8	B430/B4030 Middleton Stoney crossroads
9	Upper Heyford/Chilgrove Drive/Camp Road junction
10	Middleton Stoney Road/Empire Road
11	B4030 Middleton Stoney Road/Howes Lane roundabout
12	Middleton Stoney Road/Shakespeare Drive roundabout
13	Middleton Stoney Road/Kings End/Oxford Road
14	A41 Oxford Road/Vendee Drive roundabout
15	A41 Oxford Road/Oxford Road/A41 east
16	A4095 Southwolds Lane/Fringford Road
17	A4260 Oxford Road/B4030 signal controlled crossroads
18	Banbury Road/B4027 T-junction
19	Banbury Road/Upper Campsfield Road T-junction
20	A4095 Bunkers Hill/Lince Lane T-junction
21	Barley Mow roundabout
22	A43/Brackley Road roundabout
23	A43/Brackley Bypass roundabout
24	A421/Buckingham Road roundabout

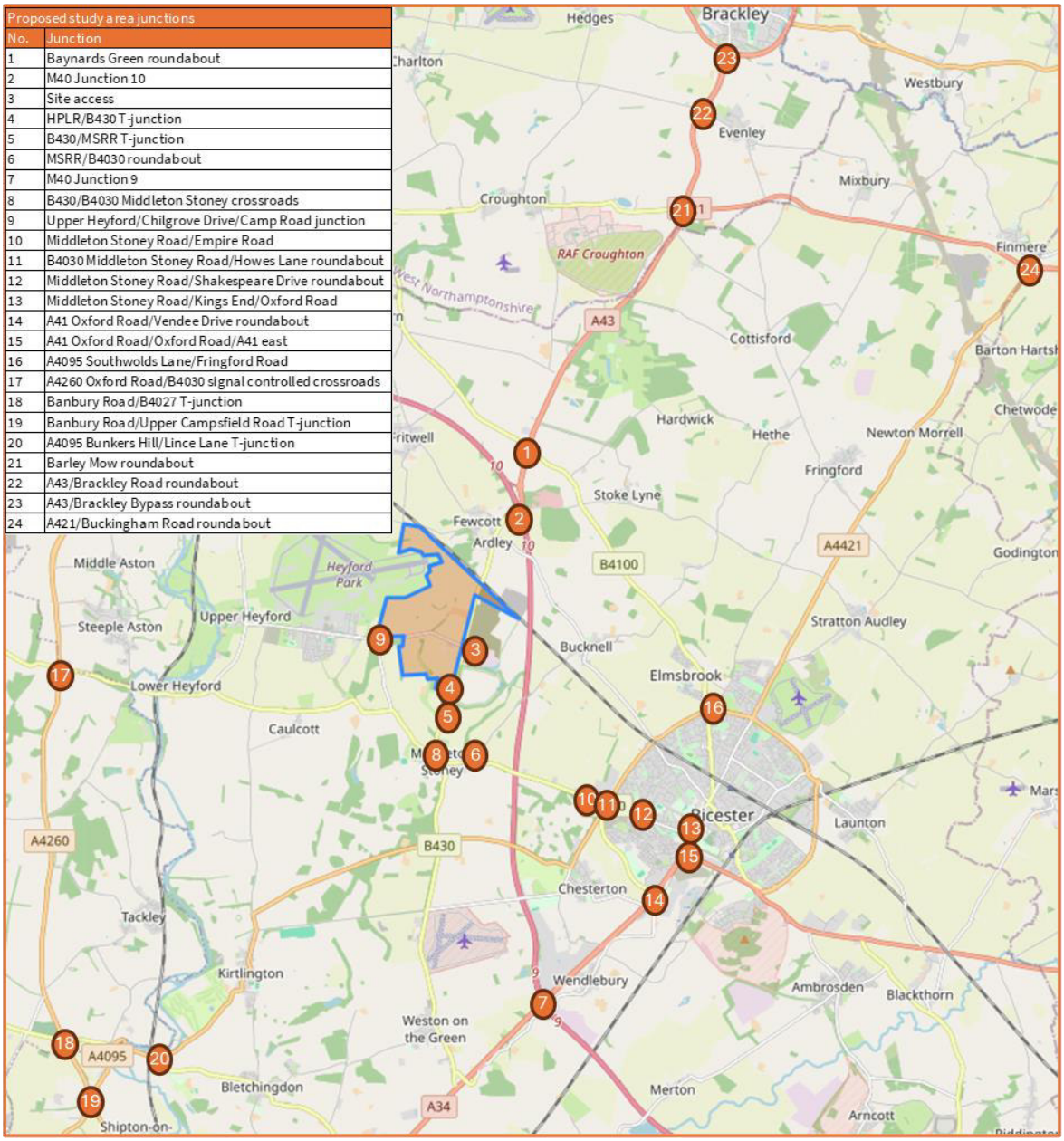


Figure 15: study area for Stage 3 detailed transport modelling

APPENDIX A

TECHNICAL NOTE ADC1794-RP-AB-V9

SUMMARY OF AGREED TRANSPORT MODELLING SCENARIOS

Background

1. This technical note summarises the agreements between the local highway authority, Oxfordshire County Council (OCC), National Highways, and the Applicant regarding the transport modelling scenarios to be examined to support the DCO application for the proposed OxSRFI development.

2. This version of the technical note supersedes the previous versions and agreements. It sets out the position agreed with OCC and National Highways following the project pause and following initial BTM modelling in May 2025. The version of the note captures the agreements following the resolution to grant planning permission that was received for the Albion Land scheme adjacent to M40 J10[1].

Assessment Years

3. The key years for the OxSRFI development are as follows:
   - 2031 year of opening.
   - 2034 completion year.

4. In addition, OCC and Cherwell District Council (CDC) wish to understand the cumulative effects of the OxSRFI scheme with the proposed Local Plan 2042 growth.

Assessment requirements

5. There are different assessment requirements to satisfy as part of the DCO application. These are as follows:
   - the requirements in DfT Circular 01/2022 for assessment of the Strategic Road Network (SRN)
   - ensuring a robust assessment for the Environmental Impact Assessment (EIA) and associated Environmental Statement (ES)
   - OCC's and CDC's request for assessment at the end of the proposed Cherwell Local Plan 2042 period, which it is agreed is to be considered as a sensitivity test.

6. These are discussed in further detail below.

DfT Circular 01/2022 compliant scenario

7. DfT Circular 01/2022 sets out the requirements for the assessment of the SRN. Paragraph 50 of the Circular details the requirement for an opening year assessment including the trips generated by the proposed development. National Highways have confirmed that an opening year assessment should always be undertaken for 100% of the development being in place and is to be based on the year of first occupation (regardless of when the site will be fully occupied). Accordingly, this is 2031.

8. Paragraph 49 explains the requirements for the assumptions underpinning projected levels of traffic to be included in the assessment, including committed development as defined in Footnote 21.

[1] Albion Land planning application references 21/03268/OUT, 21/03267/OUT, and 21/03266/F

9. Footnote 21 states "*Where development proposals are consistent with an up-to-date plan or strategy (or where there is no up-to-date plan or strategy), this should include all relevant development that is consented or allocated where there is a reasonable degree of certainty* [it] *will proceed within the next 3 years and include the full amount of development to be built. Where development proposals are not consistent with an up-to-date plan or strategy, this should include all relevant development that is consented or allocated over the entirety of the plan period. In some instances, due regard should be had to permissions and allocations in neighbouring authorities. The inclusion or exclusion of specific developments should be agreed with the local planning authority at pre-application stage".*

10. CDC have consulted on their proposed Cherwell Local Plan 2042, but it is not adopted and therefore there is no certainty that it will be taken forward as proposed. In accordance with Footnote 21, the DfT Circular compliant scenario should therefore include development "…*that is consented or allocated where there is a reasonable degree of certainty* [it] *will proceed within the next 3 years and include the full amount of development to be built*". This is agreed by National Highways.

11. The impact of the OxSRFI scheme on the SRN will be assessed against the DfT 01/2022 Circular compliant assessment scenario.

Scenarios for assessment of environmental impacts

12. The EIA assessment scenarios need to ensure a realistic and robust assessment. A longer design horizon does not necessarily provide a more robust assessment. This is because the additional traffic growth dilutes the development impacts as compared to an assessment in the year of completion. This is relevant to the assessment of the potential environmental impacts that will be considered in the Transport, Air Quality and Noise chapters of the ES. For Air Quality, vehicle emissions, and therefore pollutant concentrations, are expected to decrease year on year. The worst case for the assessment of Air Quality and Noise environmental impacts is therefore likely to be when the development traffic is at the greatest proportion of the background traffic. This is taken to be the year that the scheme would be built out, which is 2034. Hence, to be robust the assessment in the ES needs to consider the year of completion.

13. For the reasons given above, the 2034 Completion Year assessment includes only those consented or allocated development and infrastructure schemes that are forecast to be built out by 2034. It has been agreed that the 2034 Completion Year include for some of the proposed Cherwell Local Plan 2042 growth, calculated on a pro-rata basis. This is discussed in the Uncertainty Log section below.

14. It is also necessary as part of the ES to assess the impacts of the first phase of the OxSRFI development and embedded highway mitigation in the Opening Year, which is 2031. Again, for the reasons given above, the 2031 Opening Year assessment includes only those consented or allocated development and infrastructure schemes that are forecast to be built out by 2031. This scenario will also provide traffic flow data to demonstrate the satisfactory operation of the first phase of embedded highway mitigation.

15. The final scenario is the 2042 Future Year, to coincide with the end of the Local Plan period and to include the growth that is proposed as part of the proposed Cherwell Local Plan 2042. The 2042 scenario includes for the full amount of Local Plan growth that has been proposed in the Cherwell Local Plan 2042, but without the infrastructure changes that would be required to accommodate that growth (as these have not yet been determined). Such an unmitigated scenario results in an unrepresentative future baseline position meaning it is difficult to isolate

the impacts of the proposed OxSRFI development. It has therefore been agreed that this scenario will be included as a sensitivity test to assist OCC's forward planning and would be for information only.

16. The 2031 Opening Year and 2034 Completion Year scenarios will therefore be the future year scenario for the ES assessment and the future year scenarios used to identify the need for any additional mitigation measures on OCC's highway network. The 2042 Future Year scenario will be included as a sensitivity test to assist OCC's forward planning and will be for information only.

Uncertainty log

17. OCC have developed an Uncertainty Log for the 2031 and 2042 future years as part of their work on the proposed Cherwell Local Plan. It is agreed that the 2034 Uncertainty Log is based on a linear interpolation between the 2031 and 2042 logs.

18. There is a live planning application (25-00284-F) submitted in relation to the draft employment allocation site BIC E1. There is a requirement via draft policy BIC E1 for the associated development to provide a highway improvement at M40 J9. CDC have advised that that site is likely to come forward early. Hence, it has been agreed that assessment scenarios that include draft allocation BIC E1 should include the M40 J9 improvement scheme submitted as part of the planning application for that site. This is relevant to the 2042 Future Year assessment and the 2034 Completion Year. The 2031 Opening Year and the DfT 01/2022 Circular assessment scenarios do not include the draft allocation and hence are not affected.

19. In addition, it has been agreed with OCC, for the purposes of assessment of the OxSRFI scheme, that the mitigation scheme at Middleton Stoney crossroads (Inf148 in the Uncertainty Logs) associated with the Heyford Park planning permission should not be included in any of the reference case or do-something modelling scenarios, as it is now considered unlikely to be implemented. Further, whilst the improvement to provide traffic signal control at the B430/Ardley Road staggered crossroads in Ardley village is a committed scheme included in the reference case scenarios, it would be unlikely to be implemented should OxSRFI proceed as the Ardley Bypass would negate the need for the signal control scheme. Accordingly, this infrastructure scheme (Inf149 in the Uncertainty Logs) is not included in any of the do-something scenarios that include the Ardley Bypass.

20. The previous base year scenarios have been updated due to the passage of time since the scheme pause. Base years are now provided for 2023 and 2024.

21. At the 3 July 2025 Cherwell District Council planning committee, the Albion Land scheme (3 planning applications) received a resolution to grant planning permission, and the Tritax Big Box development received a resolution to refuse planning permission.

22. The Albion Land development (3 planning applications) is not yet a commitment, as planning permission is subject to the S106 Agreement and JR period. However, the Applicant has taken the advice of the Transport Working Gorup that the Albion Land scheme be included in the BTM strategic transport modelling as a commitment. Accordingly, the Applicant on this occasion, was willing to include the Albion Land scheme in the Reference Case and Do-Something scenarios.

23. That means that the highway improvement at Baynard's Green, as shown drawing on '216285-A-14A A43 Baynard's Green Roundabout – GA' that is required to be implemented by the Albion Land scheme prior to occupation of that development, will be included in the future Reference Case scenarios.

24. The inclusion of the Albion Land scheme in the Reference Case presupposes that that scheme will be in place prior to the OxSRFI scheme. It follows that the future position at Baynard's Green will be with the Albion Land highway improvement in place.

25. Accordingly, the Do-Something scenarios considers the 'Scenario 3' OxSRFI improvements at Baynard's Green, which will build upon the improvement works provided by the Albion Land scheme. The 'Scenario 3' OxSRFI improvement scheme at Baynard's Green is shown on drawing OxSRFI-BWB-GEN-XX-SK-CH-SK097-S1-P02 at **Appendix A.**

26. The DCO for OxSRFI will include provisions for OxSRFI to implement an alternative highway improvement for Baynard's Green should OxSRFI come forward ahead of the Albion Land scheme, or the Albion Land scheme is not progressed.

27. Following advice from CDC, a single sensitivity test will also be undertaken (Scenario DS5A) in which the Tritax scheme will be included in the 2034 Do-Something scenario. This will provide a cumulative assessment with the Albion Land, Tritax and OxSRFI schemes in place.

Agreed assessment scenarios

28. Based on the above requirements it has been agreed with OCC and National Highways that the following scenarios will be assessed:
    1. **DfT Circular 01/2022 Compliant Scenario**: used for assessment of the impact on the SRN (in the opening year with 100% of the development and all embedded highway mitigation).
    2. **2031 Opening Year Scenario**: opening year assessment for the ES, with first phase of the development and first phase of embedded mitigation works, used to demonstrate the suitability of proposed first phase of development on both SRN and OCC network, and for use in the ES.
    3. **2034 Completion Year Scenario**: completion year assessment for the ES, with all development and all embedded mitigation works, used for ES year of completion assessment (worst case for air quality and noise assessment), and assessment of impacts on OCC's network in year of completion.
    4. **2042 Future Year (Sensitivity Test) Scenario**: end of Local Plan period, for information only.

29. Scenarios 2, 3 and 4, will be assessed with and without the impact of the Travel Plan.

30. Notwithstanding the guidance in DfT 01/2022 Circular that allows for the effects of the Travel Plan to be taken in to account, National Highways have requested that reductions in vehicle trips associated with the Travel Plan are not applied to the vehicle traffic generation for assessment of impacts on the SRN (scenario 1). This is because they expect that the impact on the Travel Plan will be limited on the SRN.

31. With the above as context, **Tables 1 to 3** that are provided at the rear of this technical note set out the scenario testing that will be undertaken to support the Transport Assessment and ES for OxSRFI. The scenarios have been agreed with OCC and National Highways.

32. **Table 1** details the Core Scenarios. It includes:
    - the 2023 and 2024 *Base year* scenarios
    - the three core *Reference Case* scenarios (future baseline without OxSRFI)
    - the *Do-minimum scenario* (future baseline with OxSRFI but without the associated embedded highway mitigation)

- the three core *Do-something scenarios* (future baseline with OxSRFI with the associated embedded highway mitigation).

33. **Table 2** details the three core with Travel Plan Do-something scenarios.

34. **Table 3** details the three sensitivity test scenarios. These are;
    - RC4A = the 2042 Reference Case scenario to coincide with the end of the Local Plan period.
    - DS4A = the 2042 Do-Something scenario to coincide with the end of the Local Plan period.
    - DS5AS = 2034 sensitivity test with the Tritax[2] planning application.

35. The sensitivity test scenarios are provided for information only, for the reason explained at paragraphs 15 and 16.

OCC's Implementing 'Decide and Provide: Requirements for Transport Assessments guidance

36. It has been agreed with OCC that any 'low growth' sensitivity testing to consider a reduction in background traffic compared to the core growth scenario, will be considered outside of the strategic traffic modelling, on a specific junction by junction basis. This would only be required for OCC study area junctions, and likely only those in more urban areas. The parameters for that work will be agreed with OCC at the appropriate time.

ADC Infrastructure Ltd
31/07/2025

[2] Tritax planning application reference 22/01340/OUT.

Table 1: Core scenarios

	ID	year	scenario name	reference case parameter	development case and embedded highway mitigation parameters	to be used for
Base	B-2023	2023	baseline year	development and infrastructure in place by 2023	n/a	base year traffic flows for Air Quality model verification
	B-2024	2024	baseline year	development and infrastructure in place by 2024	n/a	base year traffic flows
Reference Case	RC1A SRN	2031	DfT Circular 01/2022 compliant scenario	committed and allocated development and infrastructure (as per definition given at Footnote 21 of the Circular)	n/a	reference case traffic flows for the DfT Circular 01/2022 compliant assessment scenario for assessment of the strategic road network
	RC2A	2031	Reference case opening year	committed and allocated development and infrastructure in place by 2031 (in accordance with the proposed Cherwell Local Plan 2042 consultation)	n/a	reference case traffic flows in opening year for assessment of environmental effects reference case opening year for assessment of local highway network and strategic road network
	RC3A	2034	Reference case completion year	committed and allocated development and infrastructure in place by 2034 (in accordance with the proposed Cherwell Local Plan 2042) and including M40 J9 improvement scheme associated with live planning application 25-00284-F)	n/a	reference case traffic flows for assessment of environmental effects in year of completion reference case completion year for assessment of local highway network

	ID	year	scenario name	reference case parameter	development case and embedded highway mitigation parameters	to be used for
Development case Do minimum	DMA	2034	Do minimum completion year (with OxSRFI, without embedded highway mitigation)	as RC3A	100% of OxSRFI, no embedded highway mitigation (other than site access) – no Travel Plan	assessment of development impacts without interventions
Development case Do Something	DS1A SRN	2031	Do Something DfT Circular 01/2022 compliant scenario	as RC1A	100% of OxSRFI, with all embedded highway mitigation, no Travel Plan	assessment of development in the DfT Circular 01/2022 compliant assessment scenario for assessment of the strategic road network
	DS2A	2031	Do Something opening year	as RC2A	first phase of OxSRFI with embedded mitigation for first phase, no Travel Plan	assessment of first phase of development environmental effects in year of opening assessment of first phase of development in opening year for assessment of local highway network and strategic road network
	DS3A	2034	Do Something completion year	as RC3A	100% of OxSRFI, with all embedded highway mitigation, no Travel Plan	assessment of development environmental effects in year of completion assessment of development in opening year for assessment of local highway network

Table 2: With Travel Plan

	ID	year	scenario name	reference case parameter	development case and embedded highway mitigation parameters	to be used for
Development Case – with Travel Plan	DS2AwTP	2031	Do Something opening year, with Travel Plan	as RC2A	first phase of OxSRFI with embedded mitigation for first phase, with Travel Plan	test for DS2A with Travel Plan
	DS3AwTP	2034	Do Something completion year, with Travel Plan	as RC3A	100% of OxSRFI, with all embedded highway mitigation, with Travel Plan	test for DS3A with Travel Plan
	DS4AwTP	2042	Do Something future year sensitivity test, with Travel Plan	as RC4A	100% of OxSRFI, with all embedded highway mitigation, with Travel Plan	test for DS4A with Travel Plan

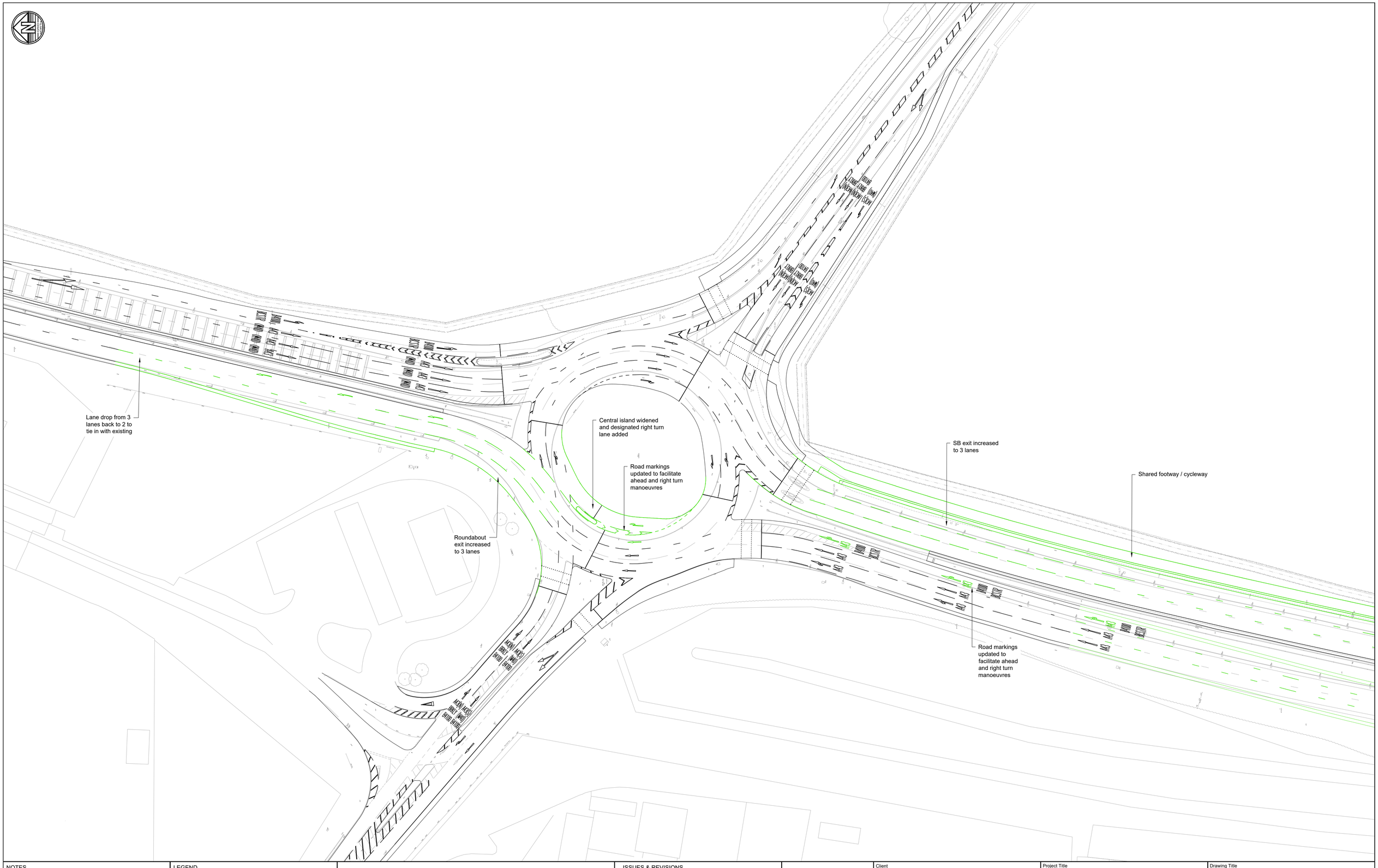
Table 3: Sensitivity test BTM scenarios

	ID	year	scenario name	reference case parameter	development case and embedded highway mitigation parameters	to be used for
Development Case – Sensitivity Test	RC4A	2042	Reference case future year sensitivity test	committed and allocated development and infrastructure within Local Plan period up to 2042 (as per the proposed Cherwell Local Plan 2042) and including M40 J9 improvement scheme associated with live planning application 25-00284-F)	n/a	reference case traffic flows for sensitivity test, provided for information
	DS4A	2042	Do Something future year sensitivity test	as RC4A	100% of OxSRFI, with all embedded highway mitigation, no Travel Plan	provided for information
	DS5AS	2034	Do Something future year sensitivity test, with Tritax planning application in place*	as RC3A + Tritax development proposals	As per DS3A for OxSRFI.	With development traffic flows for 'with Tritax sensitivity test'

*Tritax planning application reference 22/01340/OUT

APPENDIX A

A43 Baynard's Green improvement scheme general arrangement



NOTES

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

LEGEND

- Additional works
- Albion / Tritax proposal

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ISSUES & REVISIONS

Rev	Date	Details of issue / revision	Drw	Rev
P01	06.11.24	Preliminary Issue	SB	SRH
P02	06.02.25	A43 NB approach amended to 3 lanes	SRH	SRH

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Project Title
OxSRFI OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title
BAYNARDS GREEN GENERAL ARRANGEMENT OPTION 28A ALTERNATIVE SCHEME

Drawn:	S. Birchall	Reviewed:	S. Hilditch	
BWB Ref:	NTH2479	Date:	06.11.24	Scale@A1: 1:500

Drawing Status
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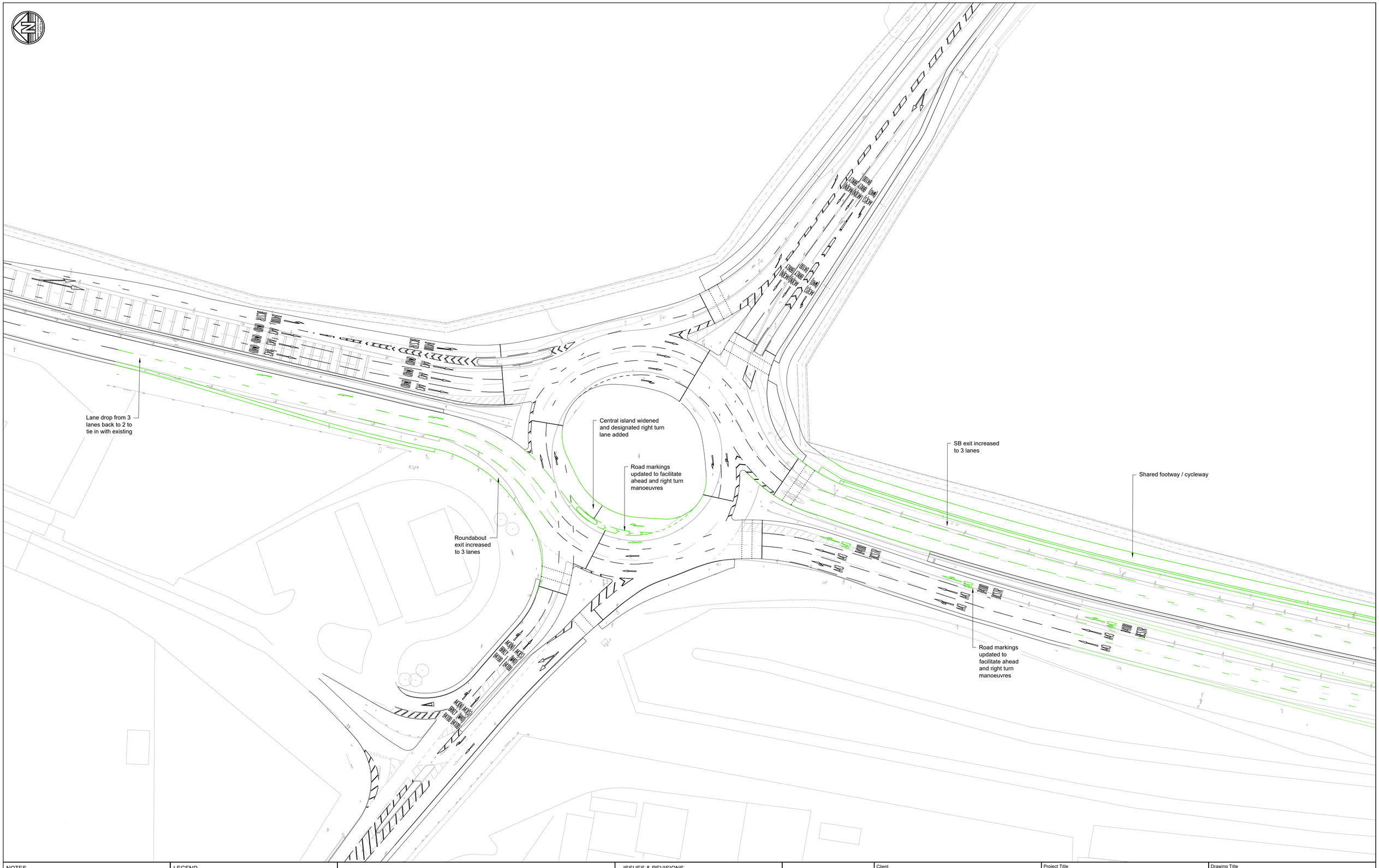
Project - Originator - Zone - Level - Type - Role - Number
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Status: **S1** Rev: **P02**

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APPENDIX B

A43 BAYNARD'S GREEN GENERAL ARRANGEMENT ALTERNATIVE SCHEME



NOTES

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
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4. Any discrepancies noted on site are to be reported to the engineer immediately.

LEGEND

- Additional works
- Albion / Tritax proposal

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ISSUES & REVISIONS

Rev	Date	Details of issue / revision	Drw	Rev
P01	06.11.24	Preliminary Issue	SB	SRH
P02	06.02.25	A43 NB approach amended to 3 lanes	SRH	SRH

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Project Title
OxSRFI OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title
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Drawing Status
PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number
OxSRFI-BWB-GEN-XX-SK-CH-SK097

Status: **S1** Rev: **P02**

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APPENDIX C

HIGHWAY WORKS OVERVIEW PLAN

7.5T environmental weight restriction implemented within the Ardley & Fewcott area

Except for access

Fewcott

Right turn out of services stopped up and replaced by right-turn cut-through at Ardley roundabout

M40 J10

Amendments to Cherwell roundabout

Minor amendments to services entry and exit

Ardley roundabout enlarged

Existing J10 northbound entry slip stopped up

Existing J10 northbound exit slip realigned

Turning head

Aves Ditch (north) minor works

Ardley

See inset for M40 J10

Quarry cottages lane stopped up over railway, replaced by bridleway

Ardley Road diverted over new bypass

Existing J10 southbound entry slip widened and lengthened to a 2-lane merge

Turning head

Upper Heyford Former Airfield

Existing B430 between turning head and rail bridge to have a no motor vehicle except for access restriction

Except for access

B430 Ardley bypass and OxSRFI link road (Single 2+1)

Segregated left turn lane on exit to direct all HGVs to J10

Principal OxSRFI access

Bridge over Chiltern Mainline

Bridge over new rail sidings

Roundabout on existing B430 (partially signalised)

Existing B430 stopped up and replaced with cycle track over the rail bridge (and Ardley Bypass for traffic)

Chilgrove Drive realignment as part of Heyford Park scheme

Existing road to Heyford Park stopped up, replaced by the Heyford Park Link Road

Heyford Park

B4030

Secondary OxSRFI access (buses, pedestrians cyclists and emergency access)

Camp Road / Chilgrove Drive priority amendment by OxSRFI (only required if the Heyford Park works to the junction are not completed prior to OxSRFI works being needed)

Equestrian crossing

Junction closed and removed

Heyford Park Link Road

B430 Toucan crossing

Existing B430 stopped up

Signal junctions with existing B430

No right turn from Middleton Stoney onto Relief Road

No left turn from Relief Road into Middleton Stoney

B4030

Middleton Road walking, cycling and horse-riding enhancement

Bridleway underpass

Gagle brook crossing

M40

B4030

Bus stops and zebra crossing

Village gateway

Middleton Road roundabout

Middleton Stoney

Middleton Stoney crossroads pedestrian crossing improvements

7.5T environmental weight restriction implemented within the Bucknell area

Except for access

Bucknell

B4030 Middleton Stoney Road speed limit reduced to 50mph

50

B4030

A4095

Empire Road

Bicester

Potential improvements to the B4030/A4095 roundabout and potential alterations to the access to Empire Road

B4030

0 250 500 750 1000

SCALE: METRES

M40 J10

B4100

A43

M40

Further enhancement of a third party scheme to enlarge A43 Baynard's Green roundabout. Note: there is potential for OxSRFI to implement entire works if the third party scheme is not implemented prior to OxSRFI.

A43 widened to 3 lanes northbound and southbound

Relocated J10 northbound entry slip road

Padbury amended to signalised junction

New bridge over M40 mainline (and new loop lower level)

B4100

A43 southbound widened to 4 lanes

Cherwell Valley Services

M40 northbound to A43 northbound loop

Amendments to Cherwell roundabout

Right turn out of services stopped up and replaced by right-turn cut-through at Ardley roundabout

M40 J10

Minor amendments to services entry and exit

Fewcott

Ardley roundabout enlarged

Existing J10 northbound entry slip stopped up

Existing J10 northbound exit slip realigned

Ardley

M40 J9

M40 J9

A34 to M40 North capacity improvement at J9

Legend

- Upgraded / new motorway (National Highways)
- Upgraded / new all-purpose trunk road (National Highways)
- Upgraded / new local roads (OCC)
- Private access roads
- Existing highway stopped up
- Third party scheme as described

Rev	Date	Details of issue / revision	Drw	Rev
P13	09.09.25	B4030/A4095 junction added	SRH	SRH
P12	02.09.25	Weight limits amended	SRH	SRH
P11	28.08.25	Minor presentational update	SRH	SRH
P10	31.07.25	Minor presentational update	SRH	SRH
P09	30.07.25	Scheme updates	SRH	SRH
P08	27.01.25	Principal access and J10 works amended	SRH	SRH
P07	05.12.24	Updated to M40 J10 Option 28	SRH	SRH
P06	10.03.23	Scheme updates	SRH	SRH
P05	15.12.22	J10 amendments	SRH	SRH
P04	04.10.22	Updates following Stage 1 consultation	SRH	SRH
P03	30.03.22	Minor text amendment	SRH	SRH
P02	29.03.22	Updated following comments	SRH	SRH
P01	22.03.22	Preliminary Issue	SRH	SRH

Issues & Revisions

BWB CONSULTANCY | ENVIRONMENT INFRASTRUCTURE | BUILDINGS

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www.bwbconsulting.com

Client

OXFORDSHIRE RAILFREIGHT LTD.

Project Title

OxSRFI OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title

HIGHWAY WORKS OVERVIEW (PHASES 1 & 2)

Drawn:	S. Hilditch		Reviewed:	S. Hilditch	
BWB Ref:	NTH2479	Date:	22.03.22	Scale@A1:	1:10,000

Drawing Status

PRELIMINARY

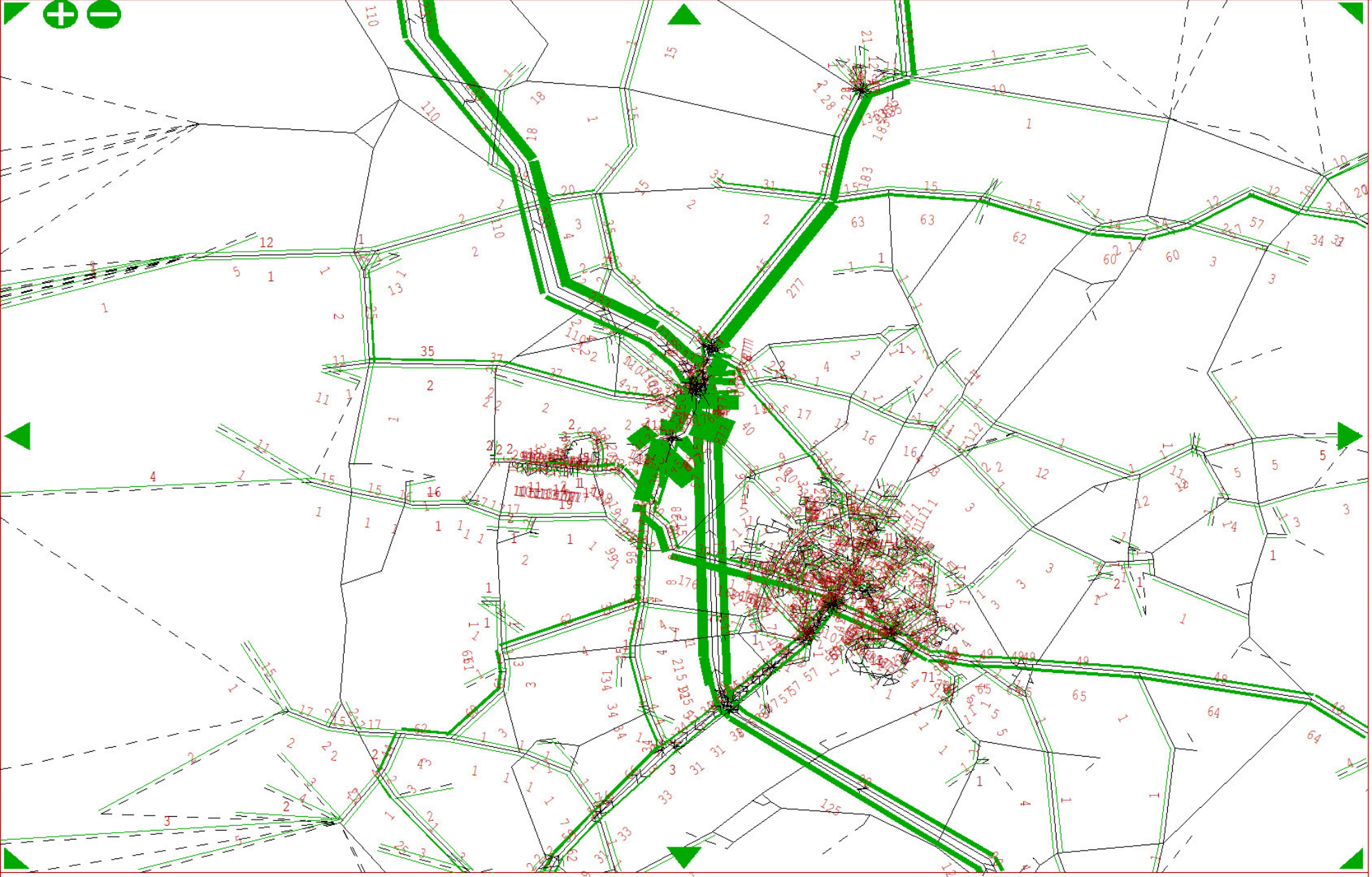
Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSRFI-BWB-GEN-ZZ-SK-CH-SK041	S1	P13

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APPENDIX D

OXSRFI TRAFFIC ASSIGNMENT PLOTS MORNING PEAK HOUR

Total flow in PCUS



Link Annotation Bandwith Options:

Units = 100.00 /mm ?

miN 0 mm ?
maX 0 mm ?
fIx 0 mm ?

SEt Back: 0 ?

Fill Band-widths? YES

Overprint numbers ... ... insiDe bandwidths

Select-only numbers? NO

seLect Menu

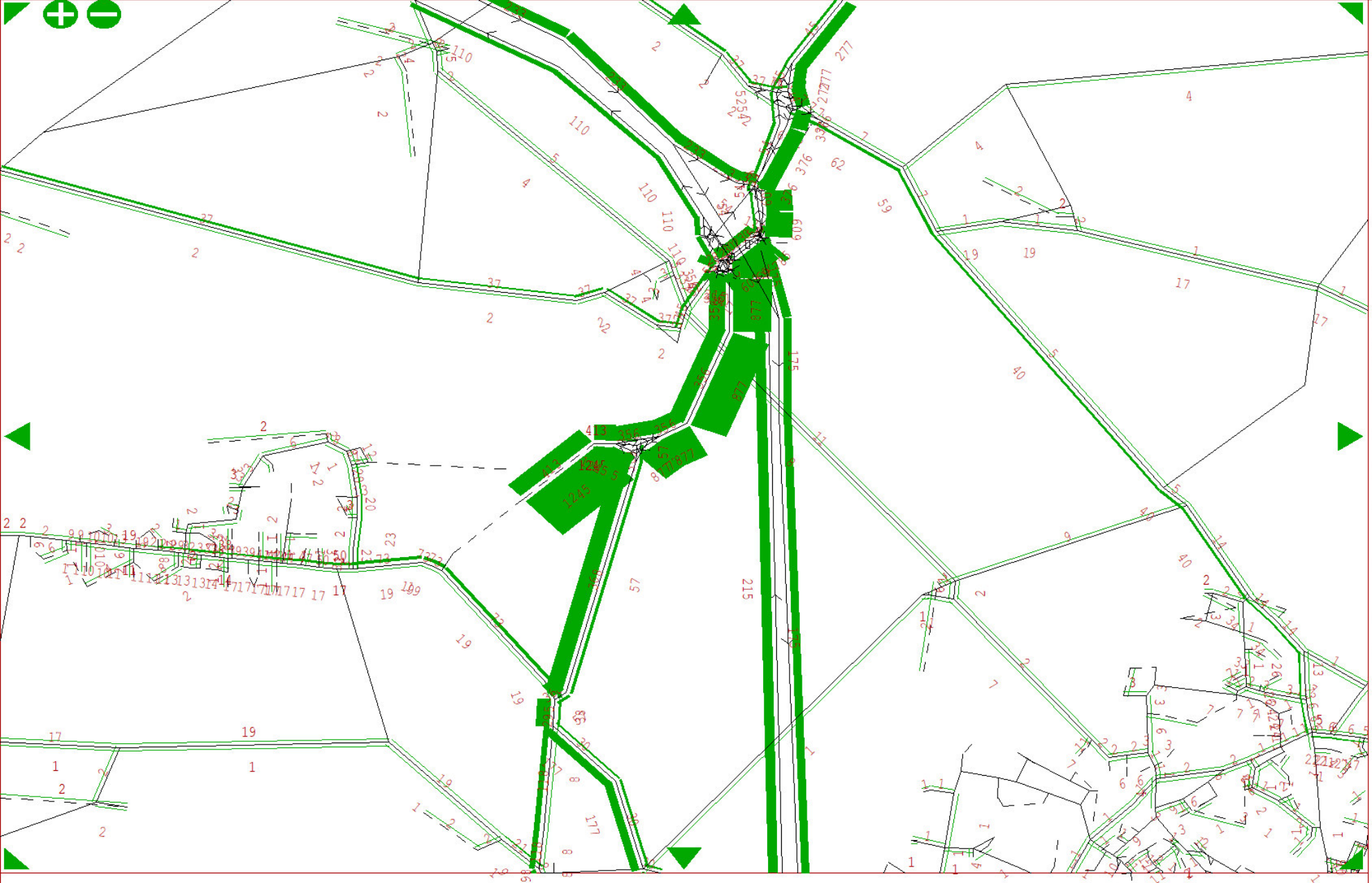
Multiple data entries split along the line

offset Gap = 1.0 mm ?

Q - Return

+ Menu bar!

Bicester Network - 2034_OxSRFI_DS3A AM Peak 22- 8-25



Link Annotation Display Options:

Display Mode >
Bandwidths ...with...
Units = ?
100.00 /mm

Toggle numer / geometric

Annotate as space permit

Numerical selection/truncation menu >

2-way link annotation: Directional s

Bandwdth par >

Pen and/or range defs >

offset Gap = ?
1.0 mm

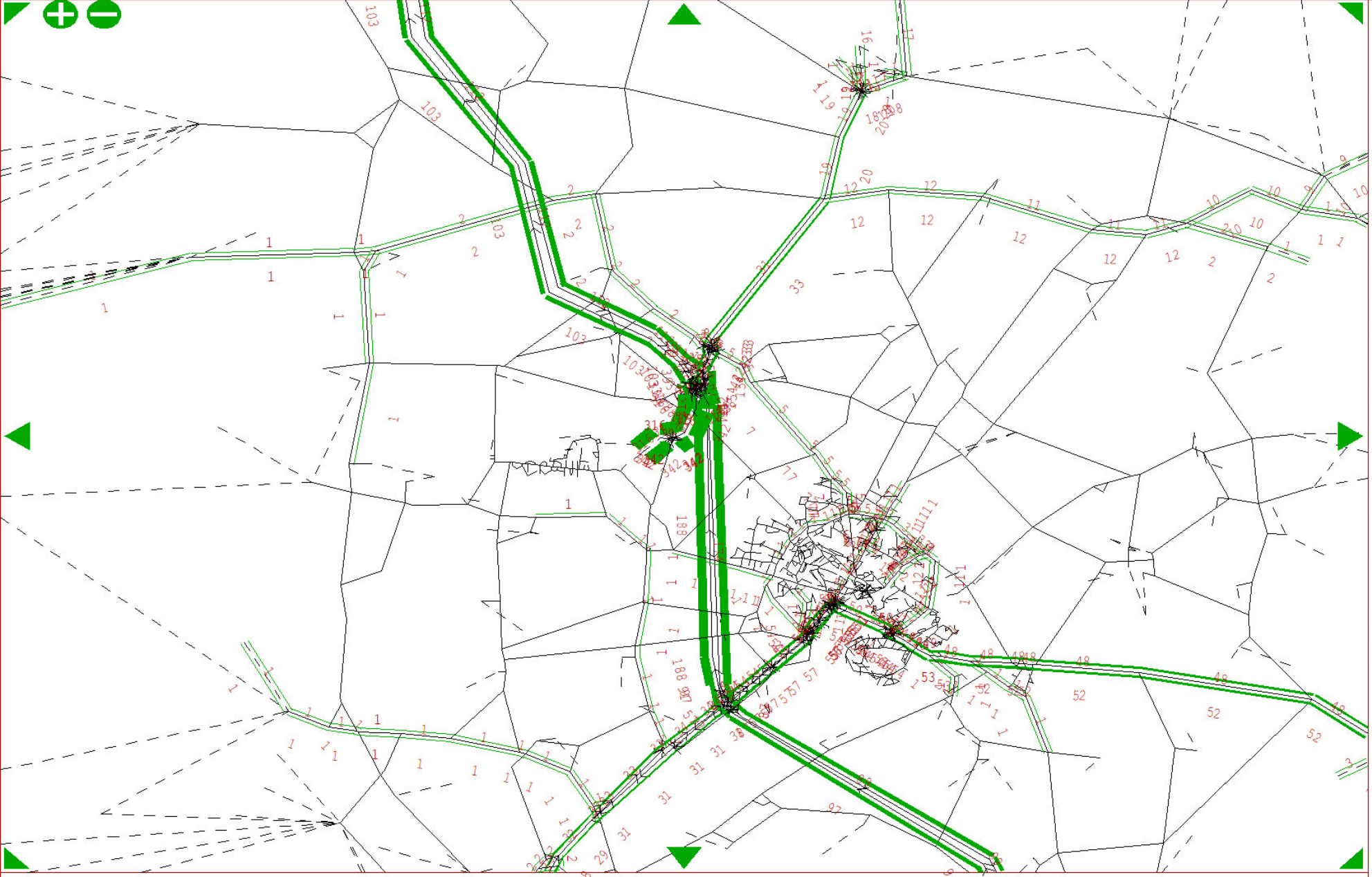
housekeeping >

Q - Return

+ Menu bar!

Bicester Network - 2034_OxSRFI_DS3A AM Peak 22- 8-25

HGV flows in PCUS



Link Annotation Display Options:

Display Mode >
Bandwidths ...with...
Units = ?
100.00 /mm

Toggle numer / geometric

Annotate as space permit

Numerical se lection/trun cation menu >

2-way link annotation: Directional s

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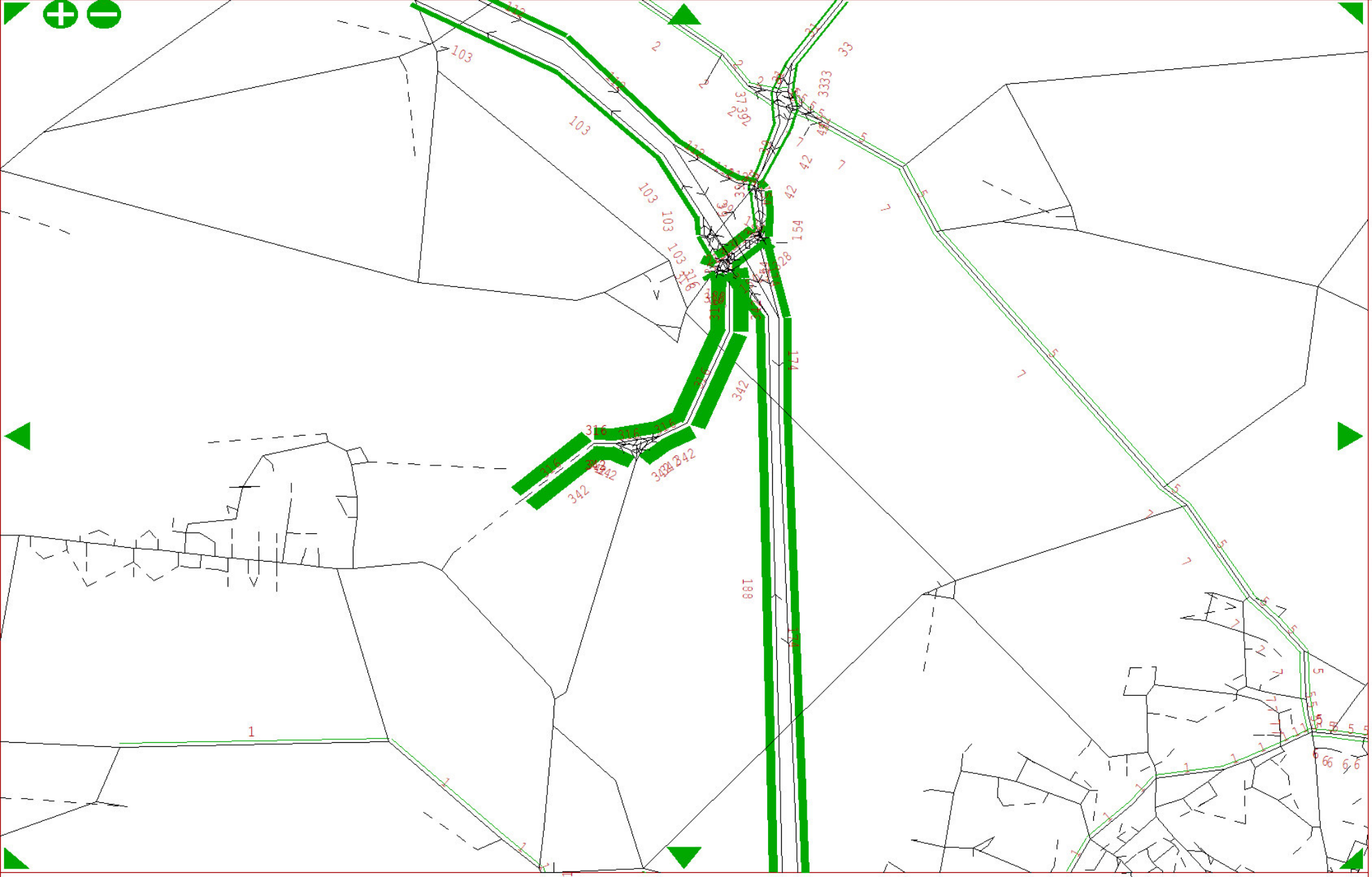
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1.0 mm

houSekeeping >

Q - Return

+ Menu bar!

Bicester Network - 2034_OxSRFI_DS3A AM Peak 22- 8-25



Link Annotation Display Options:

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Toggle numer / geometric

Annotate as space permit

Numerical se lection/trun cation menu >

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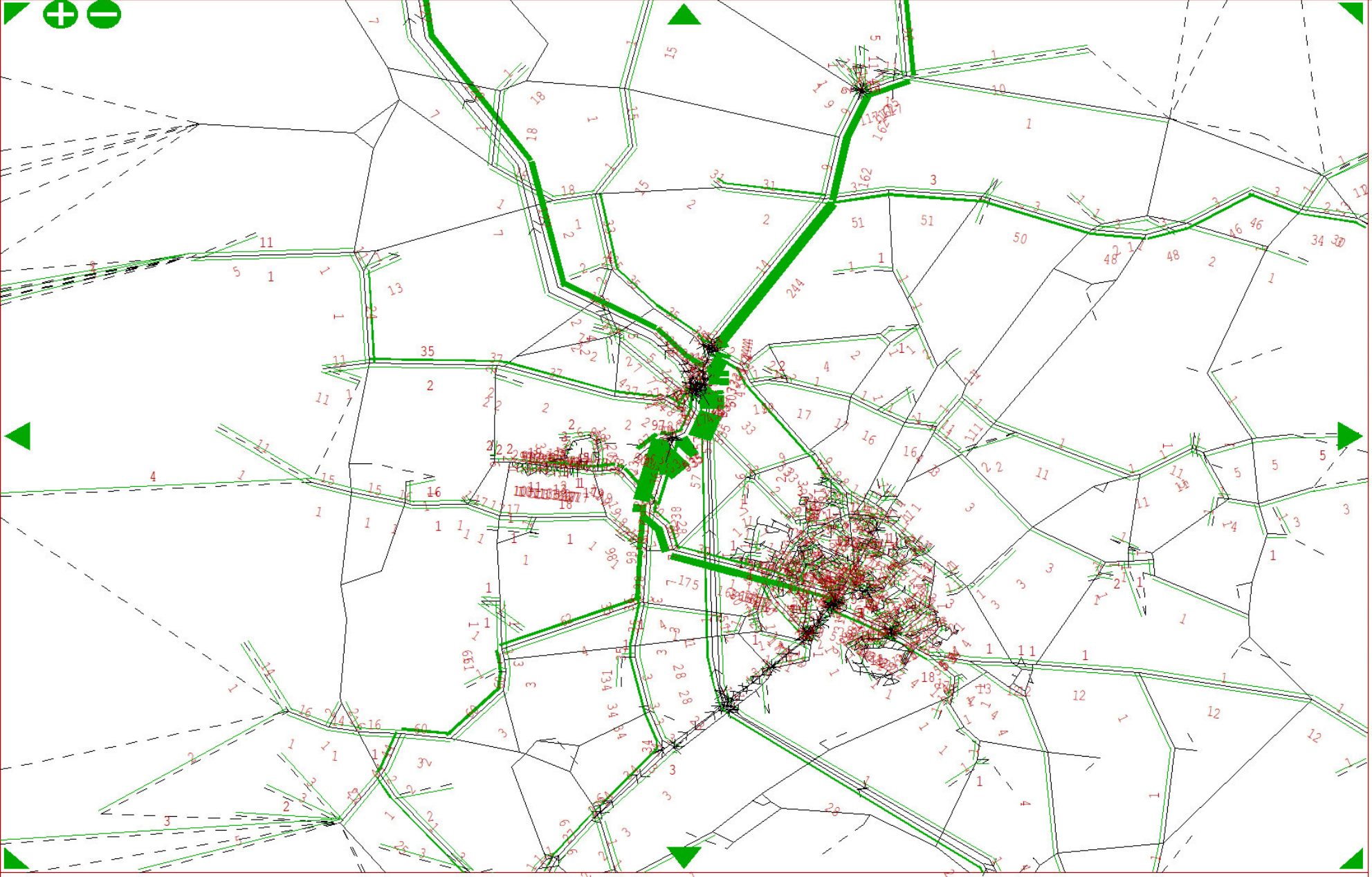
offset Gap = ?
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houSekeeping >

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+ Menu bar!

Light vehicle flows in PCUS



Link Annotation Display Options:

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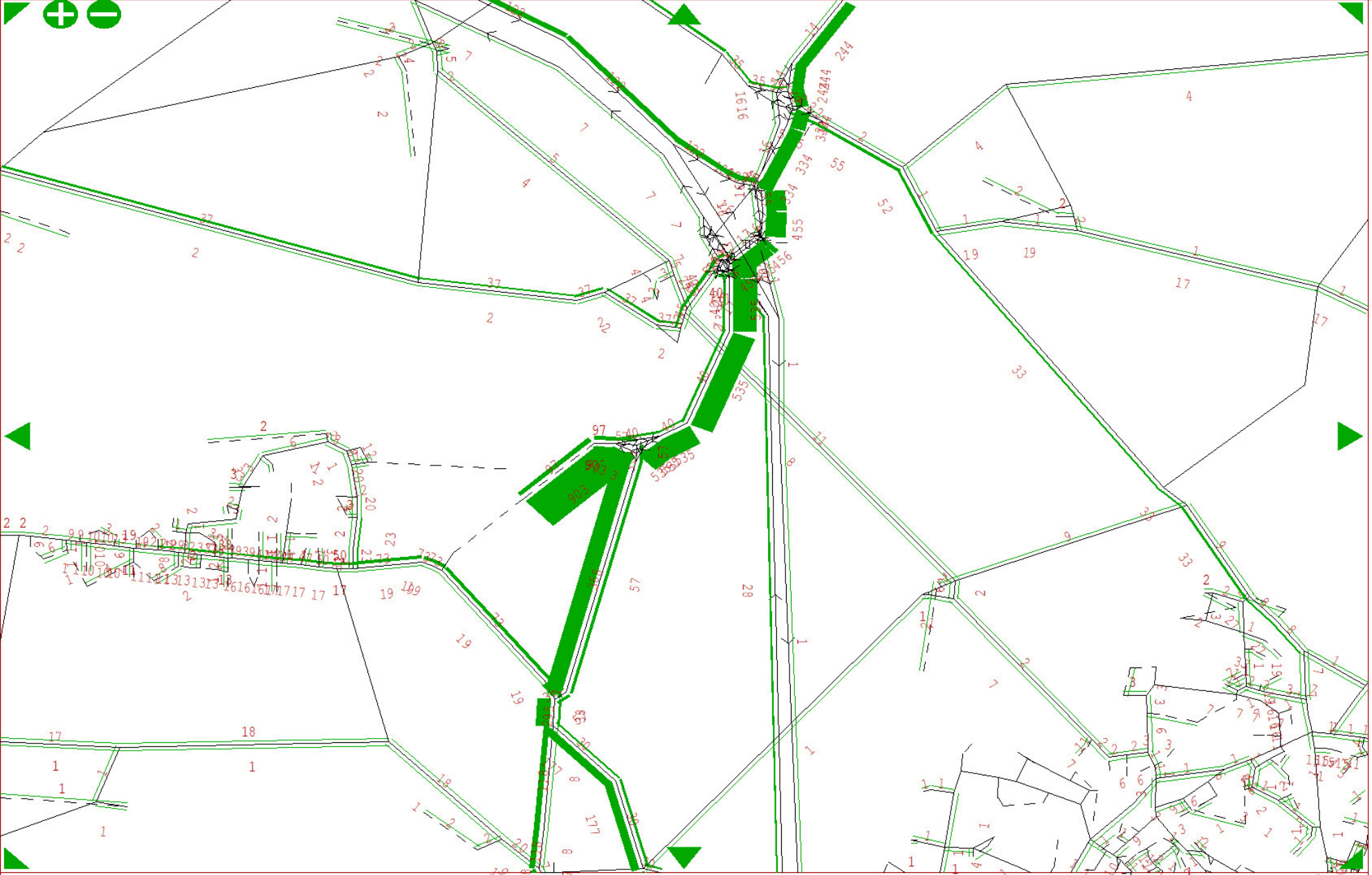
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1.0 mm

houSekeeping >

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+ Menu bar!

Bicester Network - 2034_OxSRFI_DS3A AM Peak 22- 8-25



Link Annotation Display Options:

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Bandwidths ...with...
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Annotate as space permit

Numerical selection/truncation menu >

2-way link annotation: Directional s

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offset Gap = ?
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housekeeping >

Q - Return

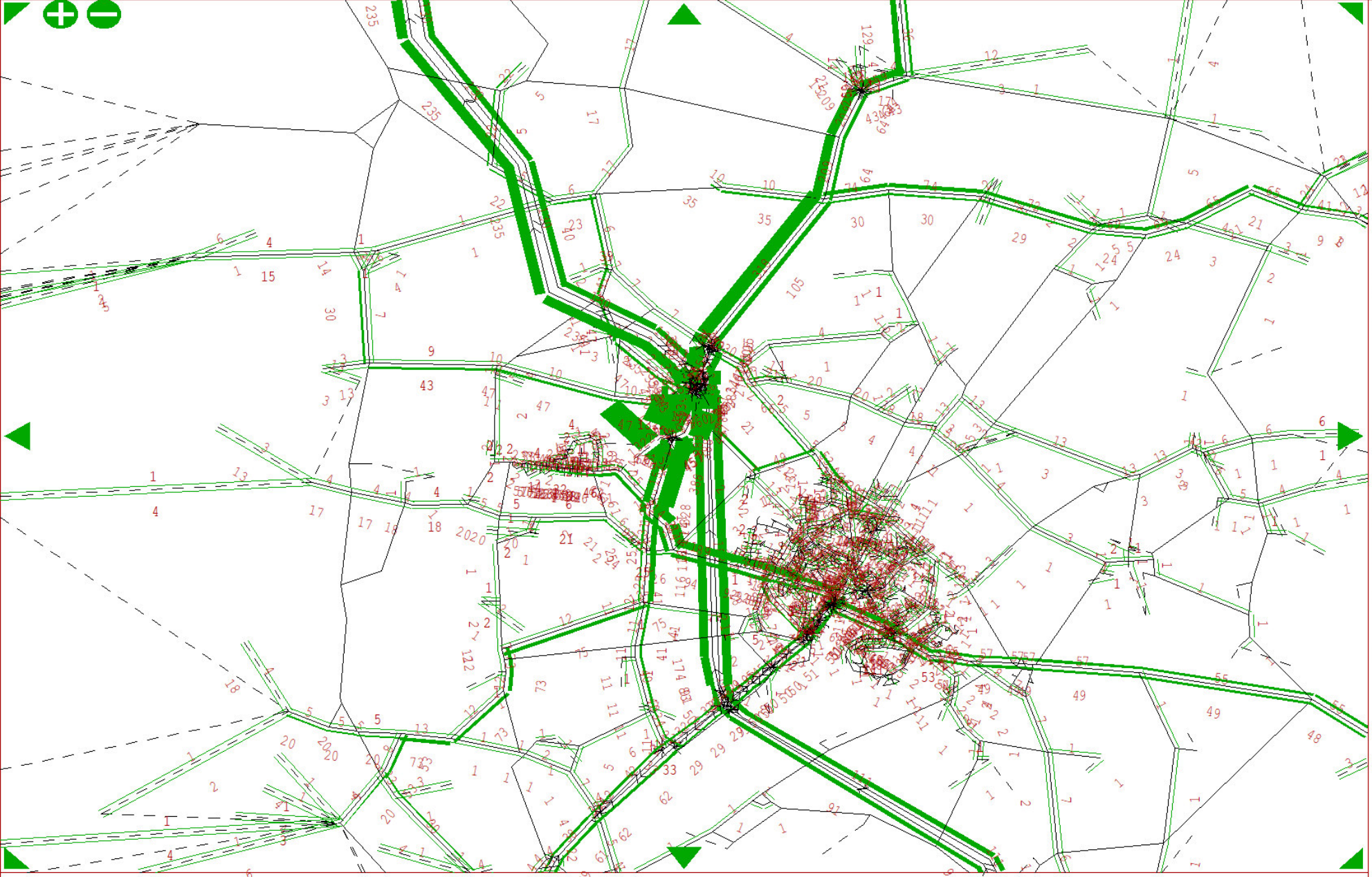
+ Menu bar!

Bicester Network - 2034_OxSRFI_DS3A AM Peak 22- 8-25

APPENDIX E

OXSRFI TRAFFIC ASSIGNMENT PLOTS EVENING PEAK HOUR

Total flow in PCUS



Link Annotation Bandwith Options:

Units = 100.00 /mm ?

miN 0 mm ?
maX 0 mm ?
fIx 0 mm ?

SEt Back: 0 ?

Fill Band-widths? YES

Overprint numbers ... ... insiDe bandwidths

Select-only numbers? NO

seLect Menu

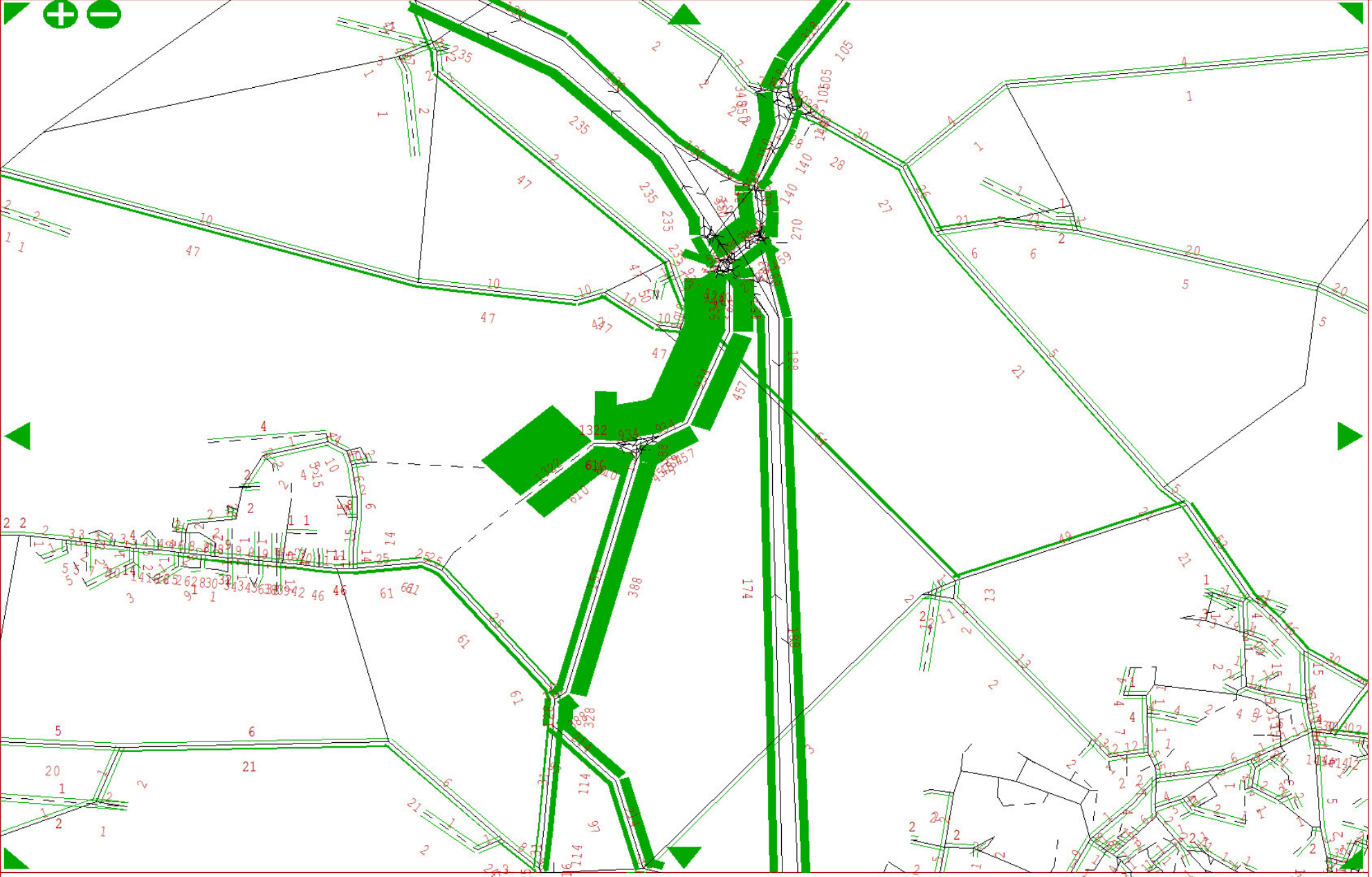
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offset Gap = 1.0 mm ?

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+ Menu bar!

Bicester Network - 2034_OxSRFI_DS3A PM Peak 22- 8-25



Link Annotation Display Options:

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Annotate as space permit

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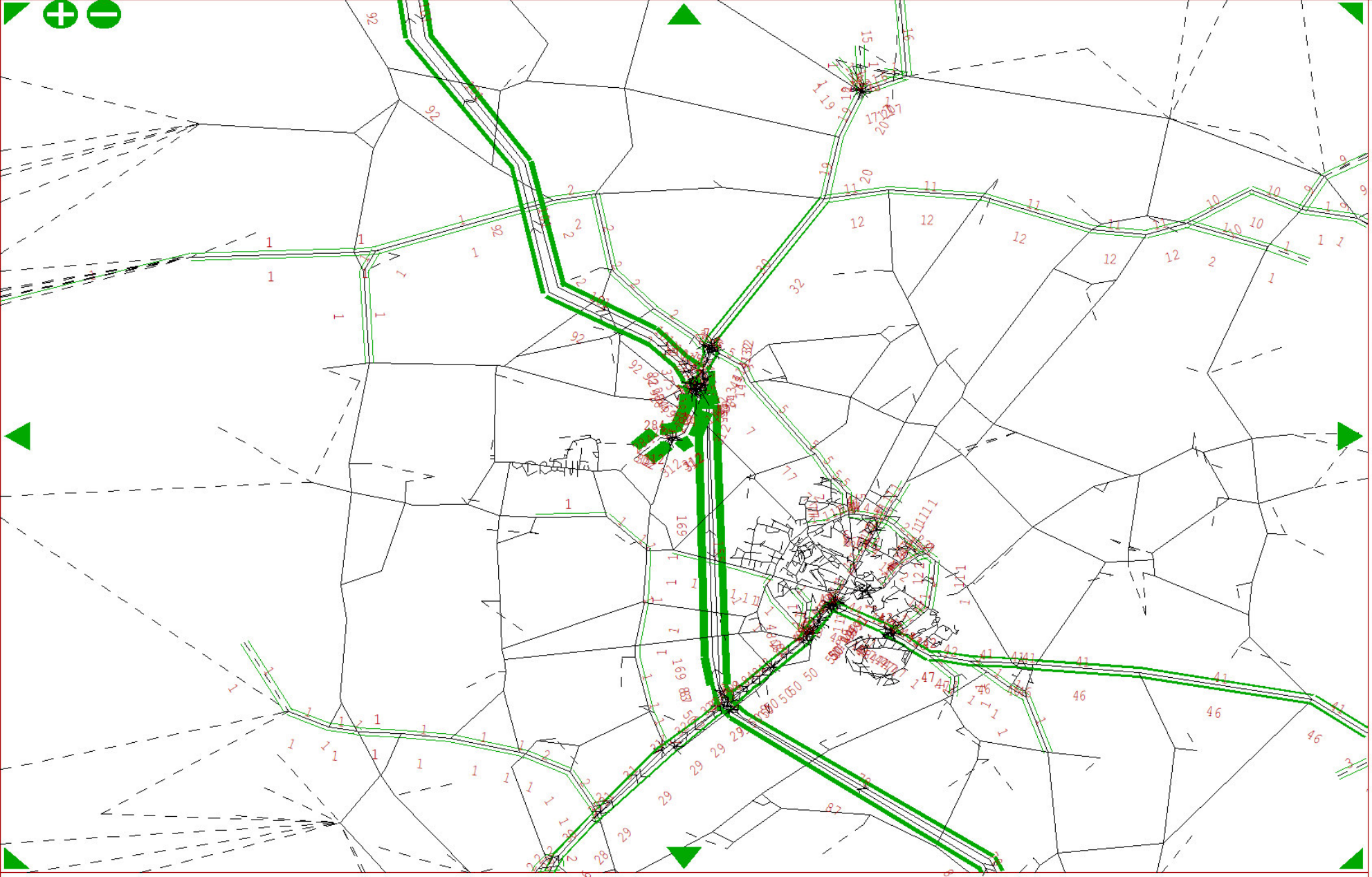
housekeeping >

Q - Return

+ Menu bar!

Bicester Network - 2034_OxSRFI_DS3A PM Peak 22- 8-25

HGV flows in PCUS



Link Annotation Display Options:

Display Mode >
Bandwidths
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Units = ?
100.00 /mm

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Annotate as space permit

Numerical se lection/trun cation menu >

2-way link annotation: Directional s

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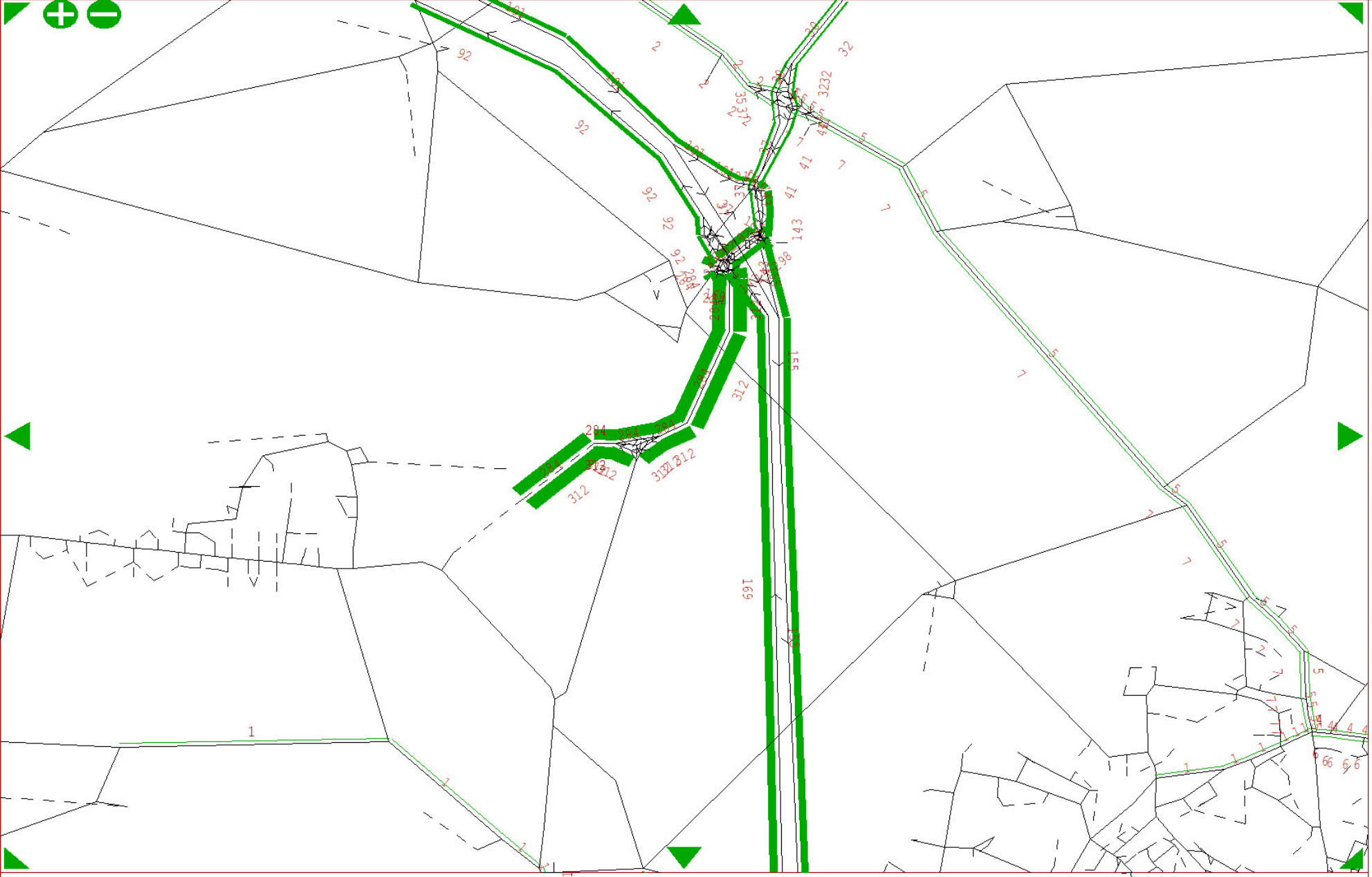
offset Gap = ?
1.0 mm

houSekeeping >

Q - Return

+ Menu bar!

Bicester Network - 2034_OxSRFI_DS3A PM Peak 22- 8-25



Link Annotation Display Options:

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Toggle numer / geometric

Annotate as space permit

Numerical se lection/trun cation menu >

2-way link annotation: Directional s

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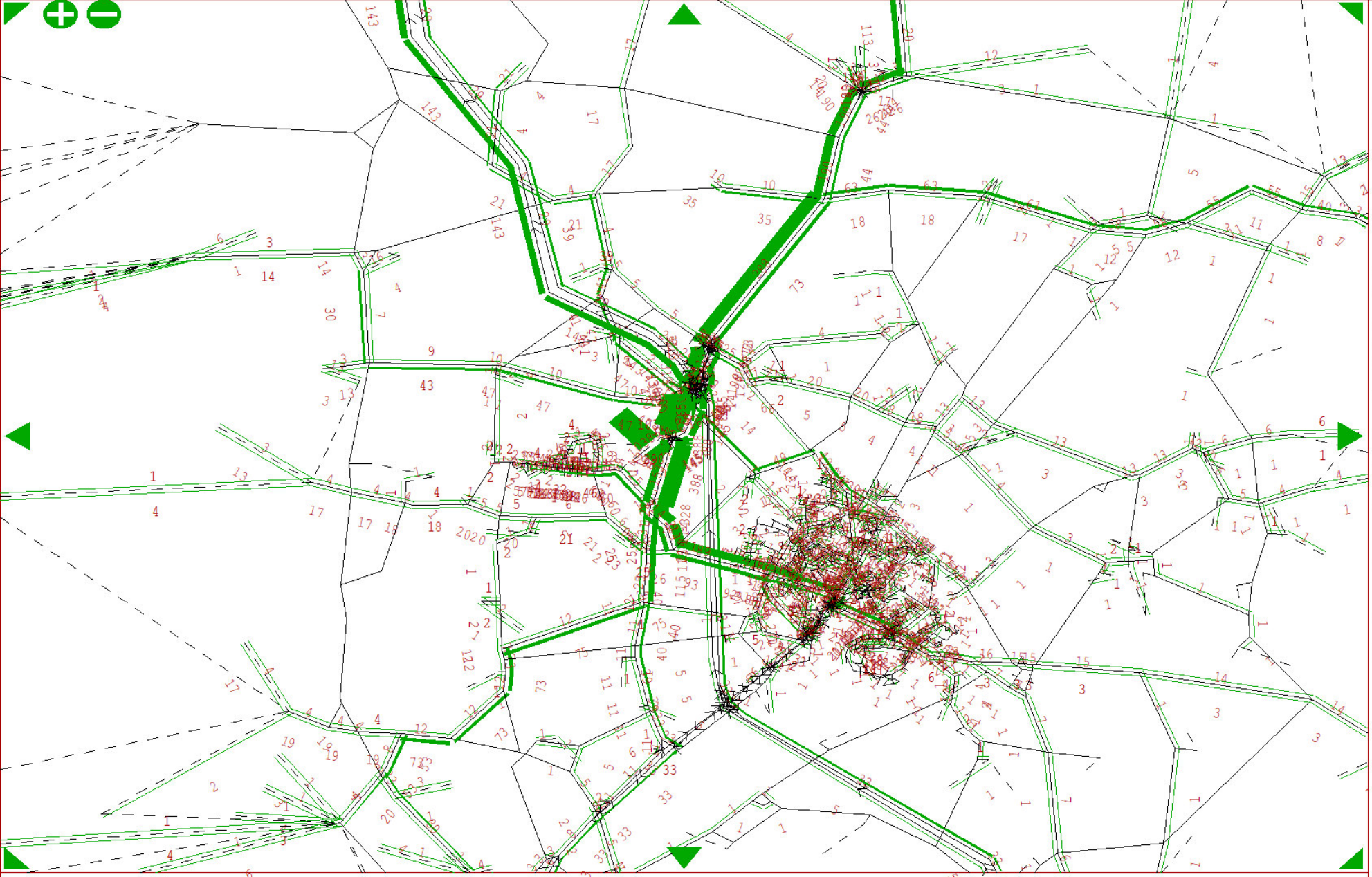
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houSekeeping >

Q - Return

+ Menu bar!

Light vehicle flows in PCUS



Link Annotation Display Options:

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Bandwidths ...with...
Units = ?
100.00 /mm

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Numerical se lection/trun cation menu >

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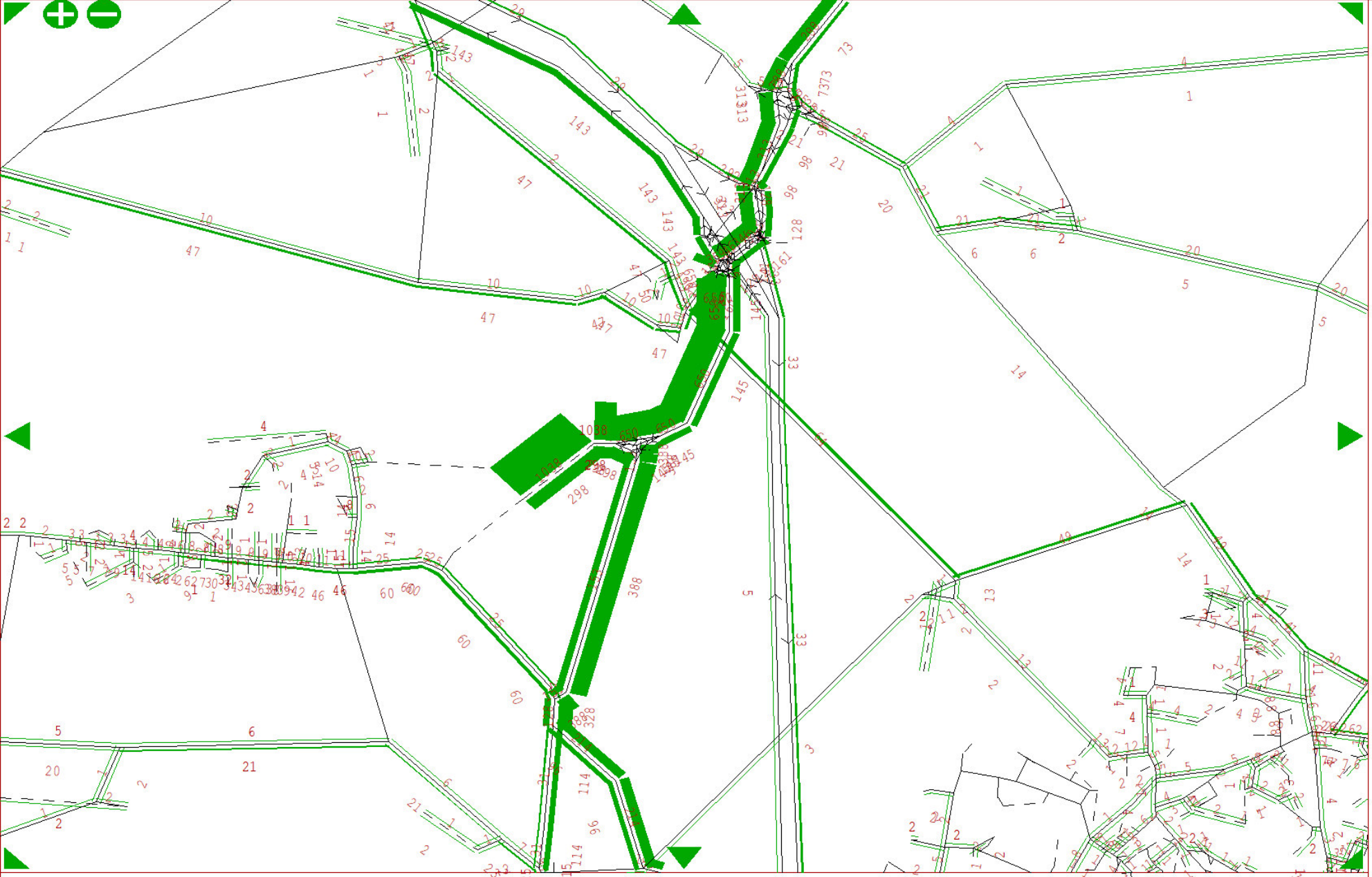
offset Gap = ?
1.0 mm

housekeeping >

Q - Return

+ Menu bar!

Bicester Network - 2034_OxSRFI_DS3A PM Peak 22- 8-25



Link Annotation Display Options:

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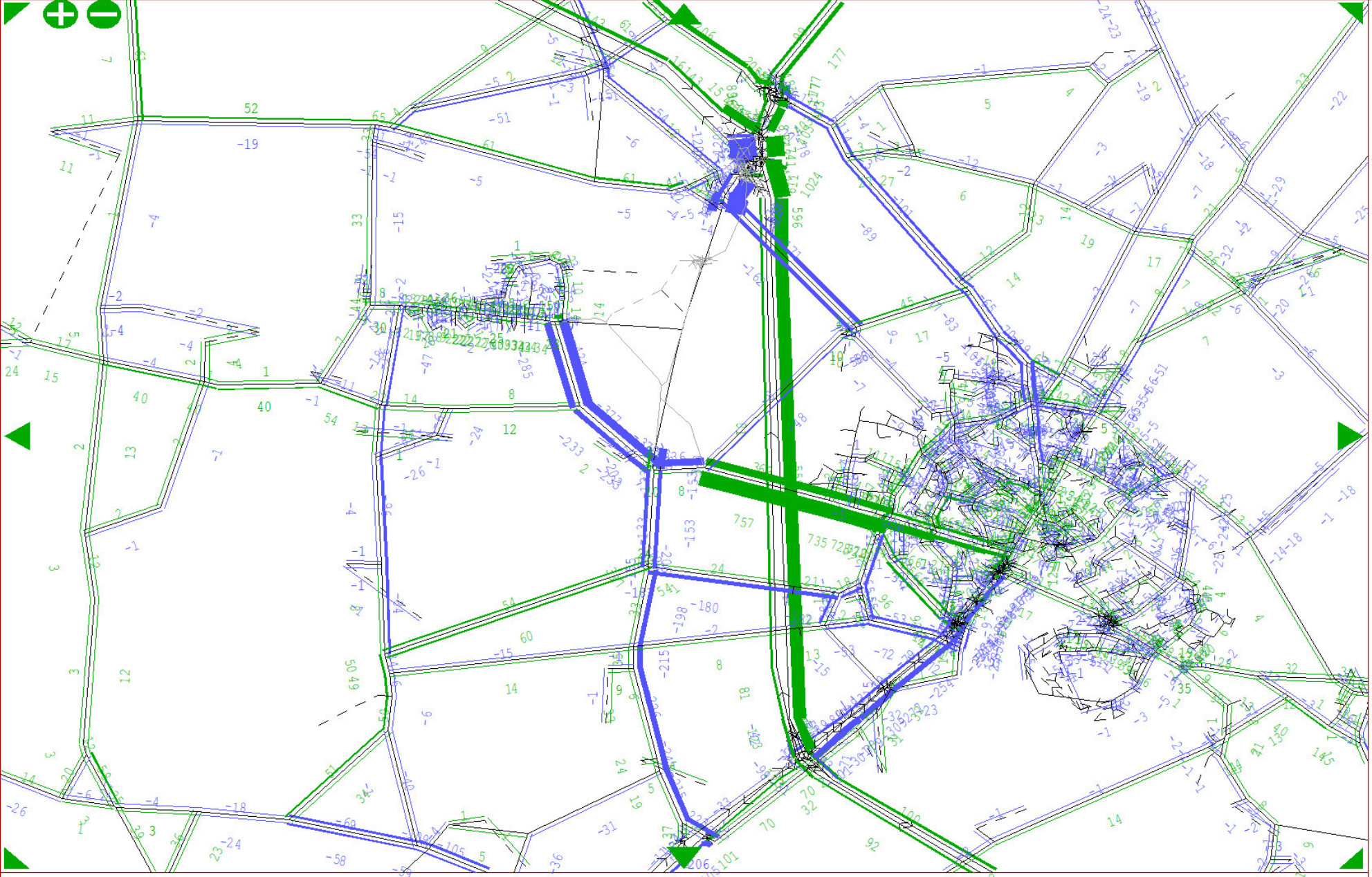
housekeeping >

Q - Return

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APPENDIX F

FLOW DIFFERENCE PLOTS MORNING PEAK HOUR



Link Annotation Display Options:

Display Mode >
Bandwidths ...with...
Units = ?
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Annotate as space permit

Numerical se lection/trun cation menu >

2-way link annotation: Directional s

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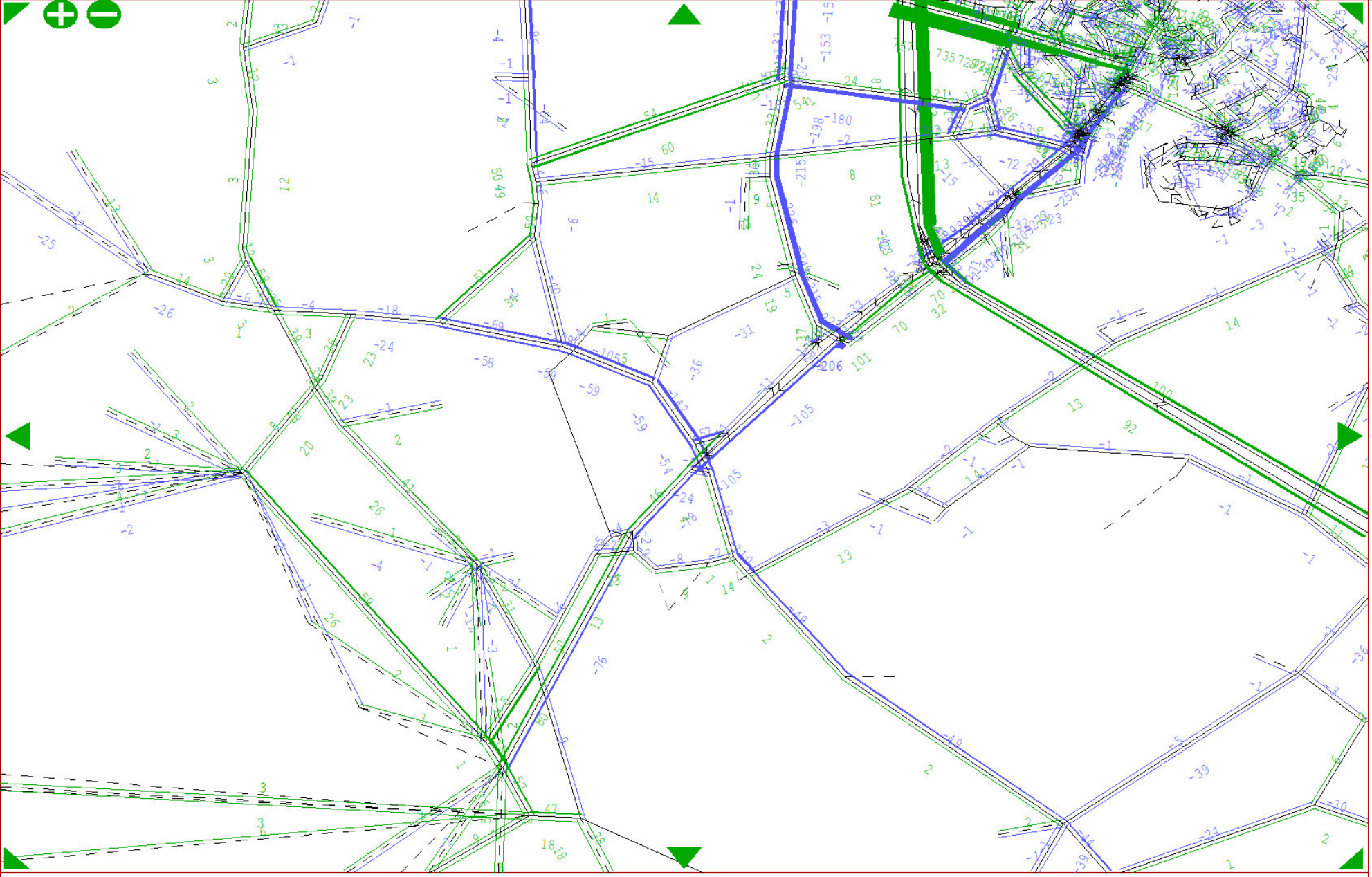
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offset Gap = ?
1.0 mm

Q - Return

+ Menu bar!

Bicester Network - 2034 Reference Case 3A AM Peak 11- 8-25



Link Annotation Display Options:

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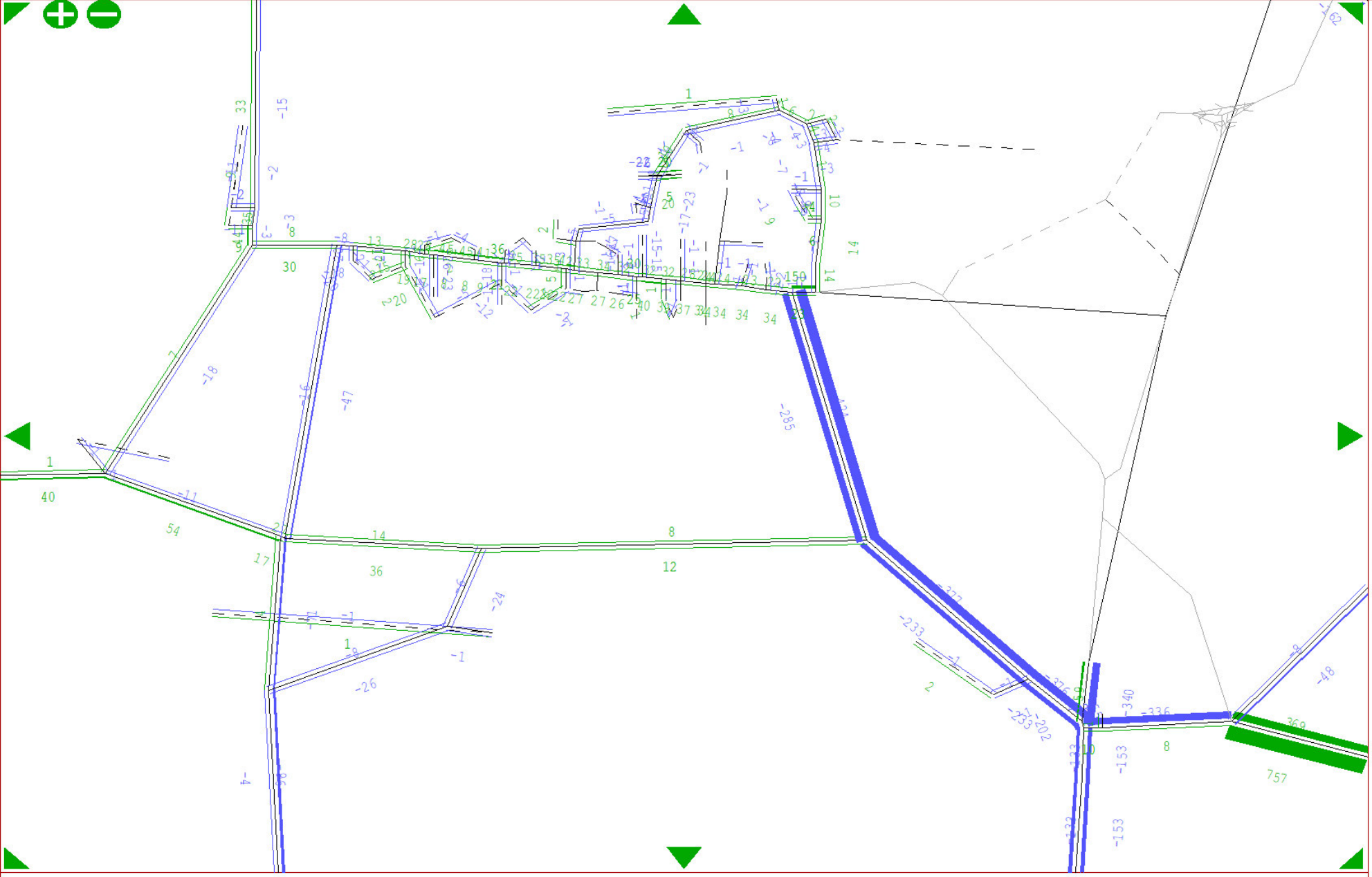
Pen and/or >
range defs

offset Gap = ?
1.0 mm

Q - Return

+ Menu bar!

Bicester Network - 2034 Reference Case 3A AM Peak 11- 8-25



Link Annotation Display Options:

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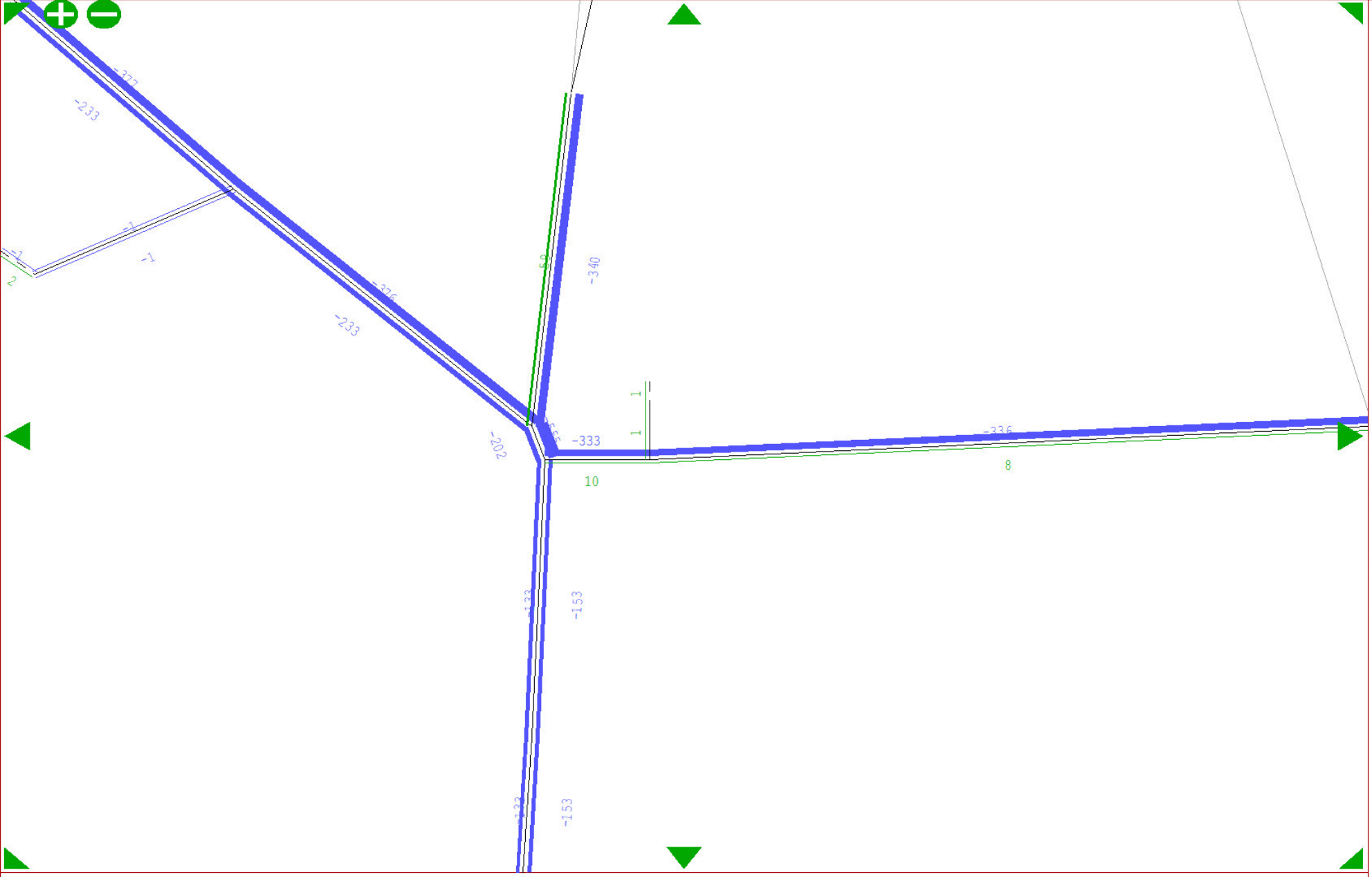
Bandwdth par >

Pen and/or range defs >

offset Gap = ?
1.0 mm

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+ Menu bar!



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Options:

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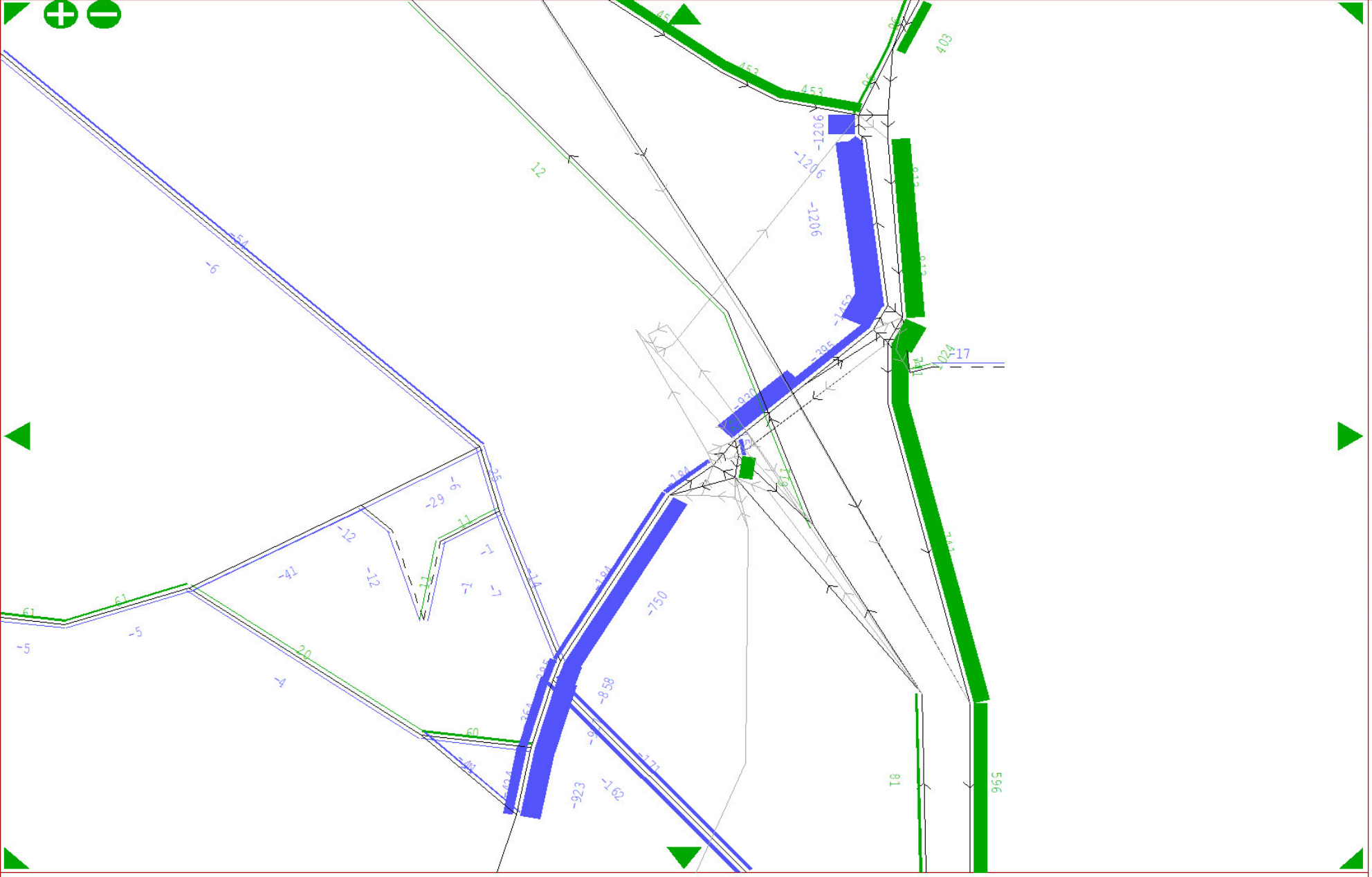
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1.0 mm

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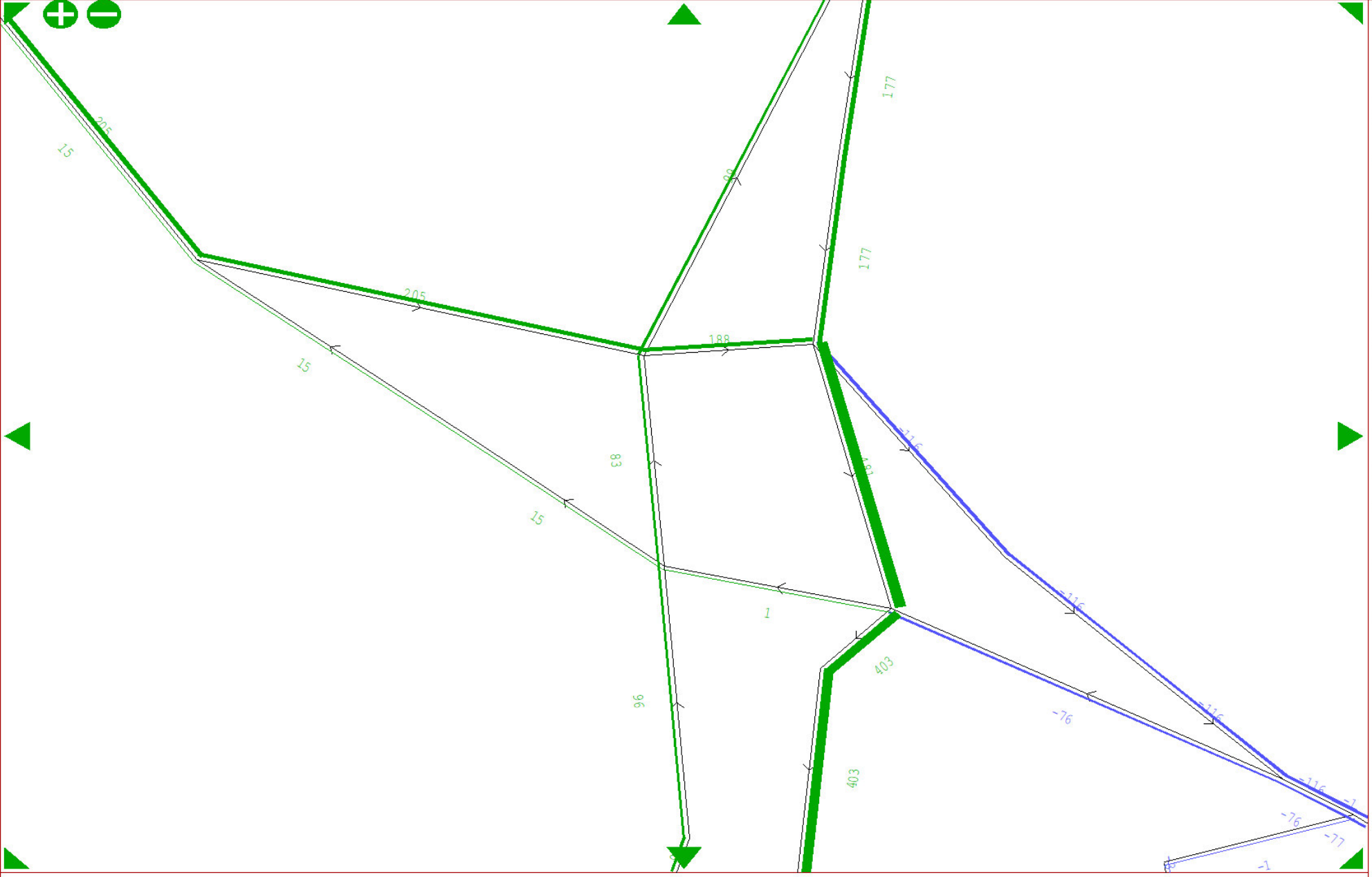
Bandwdth par >

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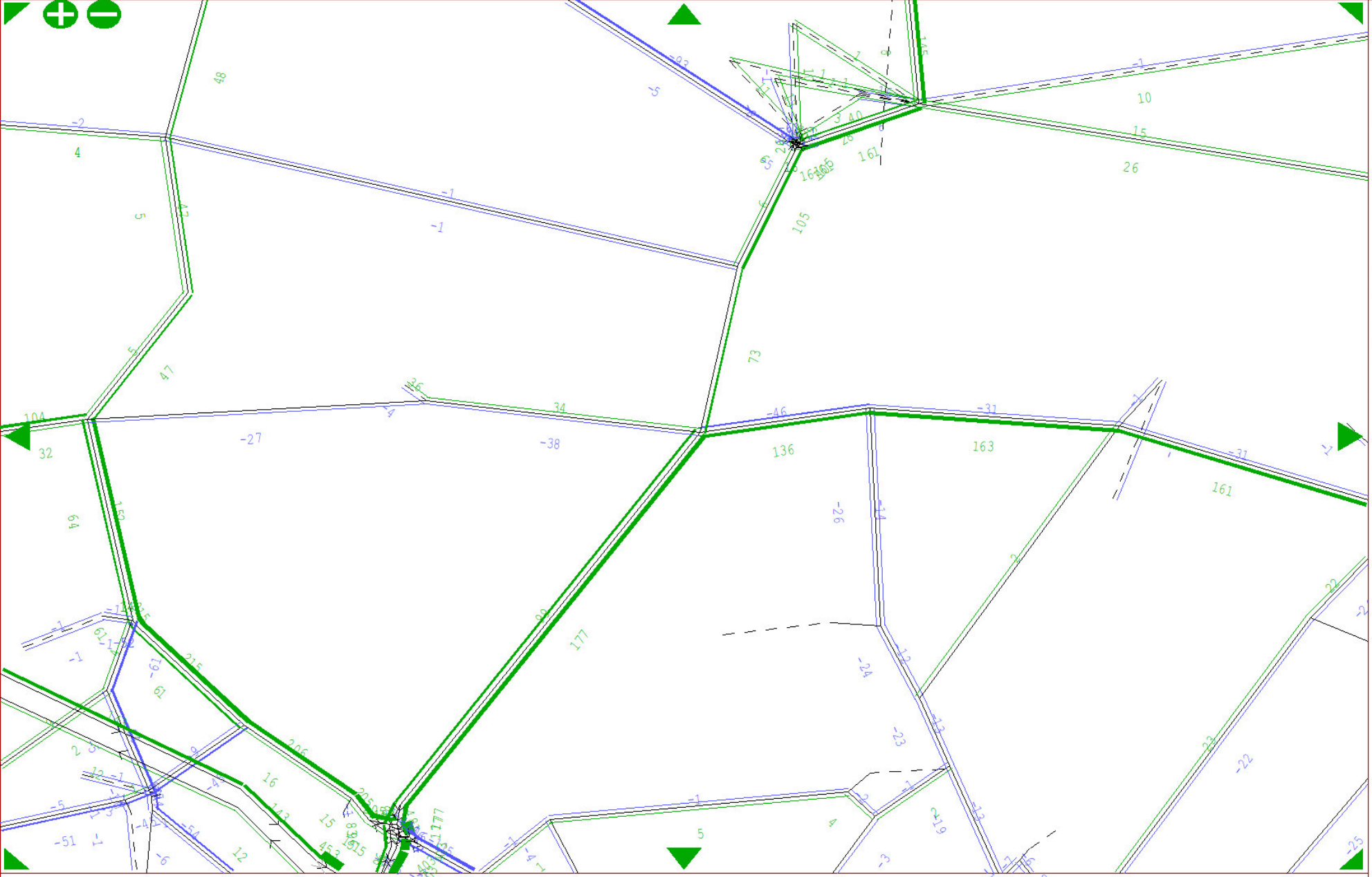
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Link Annotation Display Options:

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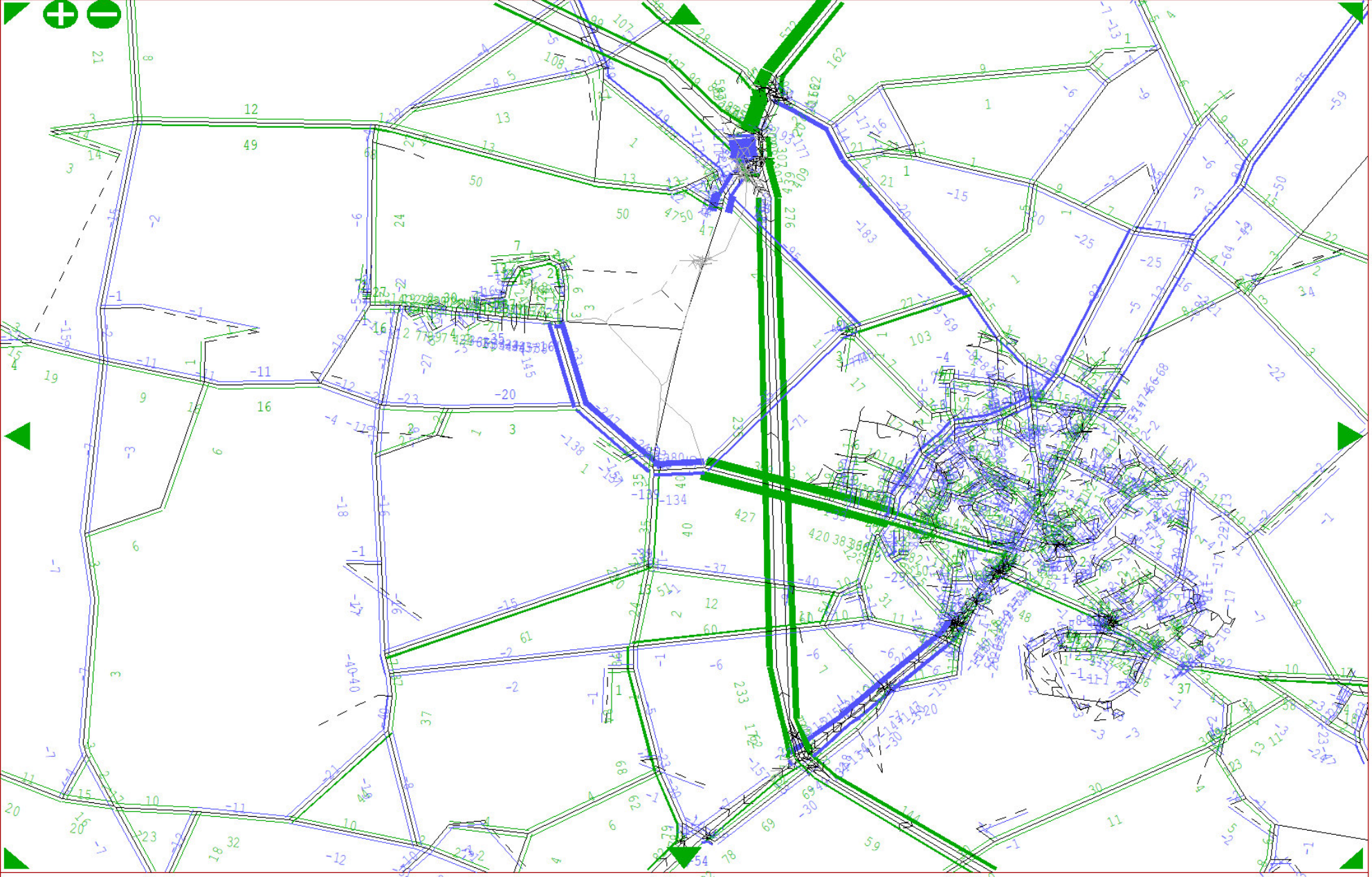
offset Gap = ?
1.0 mm

Q - Return

+ Menu bar!

Bicester Network - 2034 Reference Case 3A AM Peak 11- 8-25

APPENDIX G
FLOW DIFFERENCE PLOTS
EVENING PEAK HOUR



Link Annotation Display Options:

Display Mode >
Bandwidths ...with...
Units = ?
200.00 /mm

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Annotate as space permit

Numerical se lection/trun cation menu >

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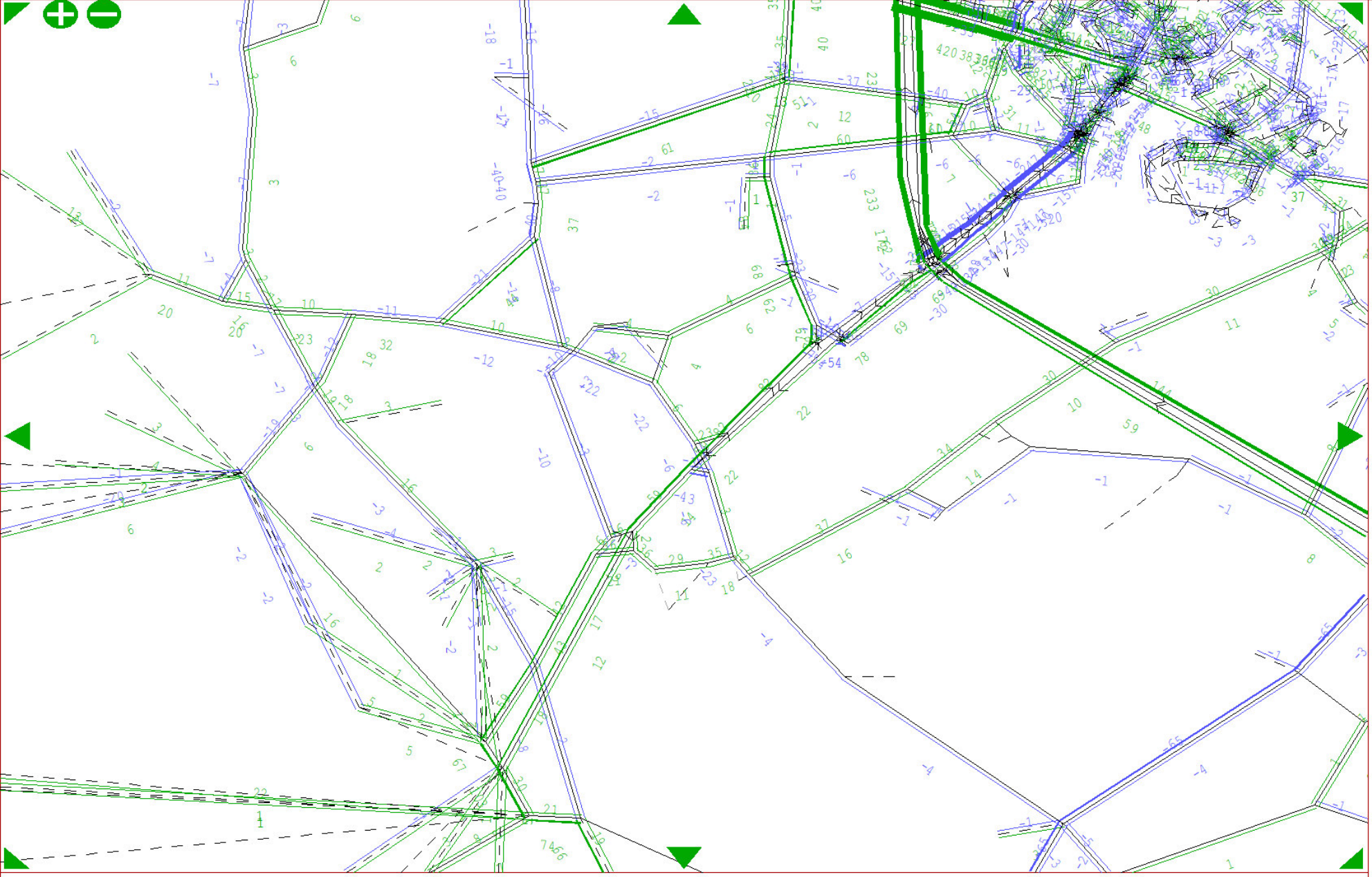
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Bicester Network - 2034 Reference Case 3A PM Peak 11- 8-25



Link Annotation Display Options:

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Numerical se lection/trun cation menu >

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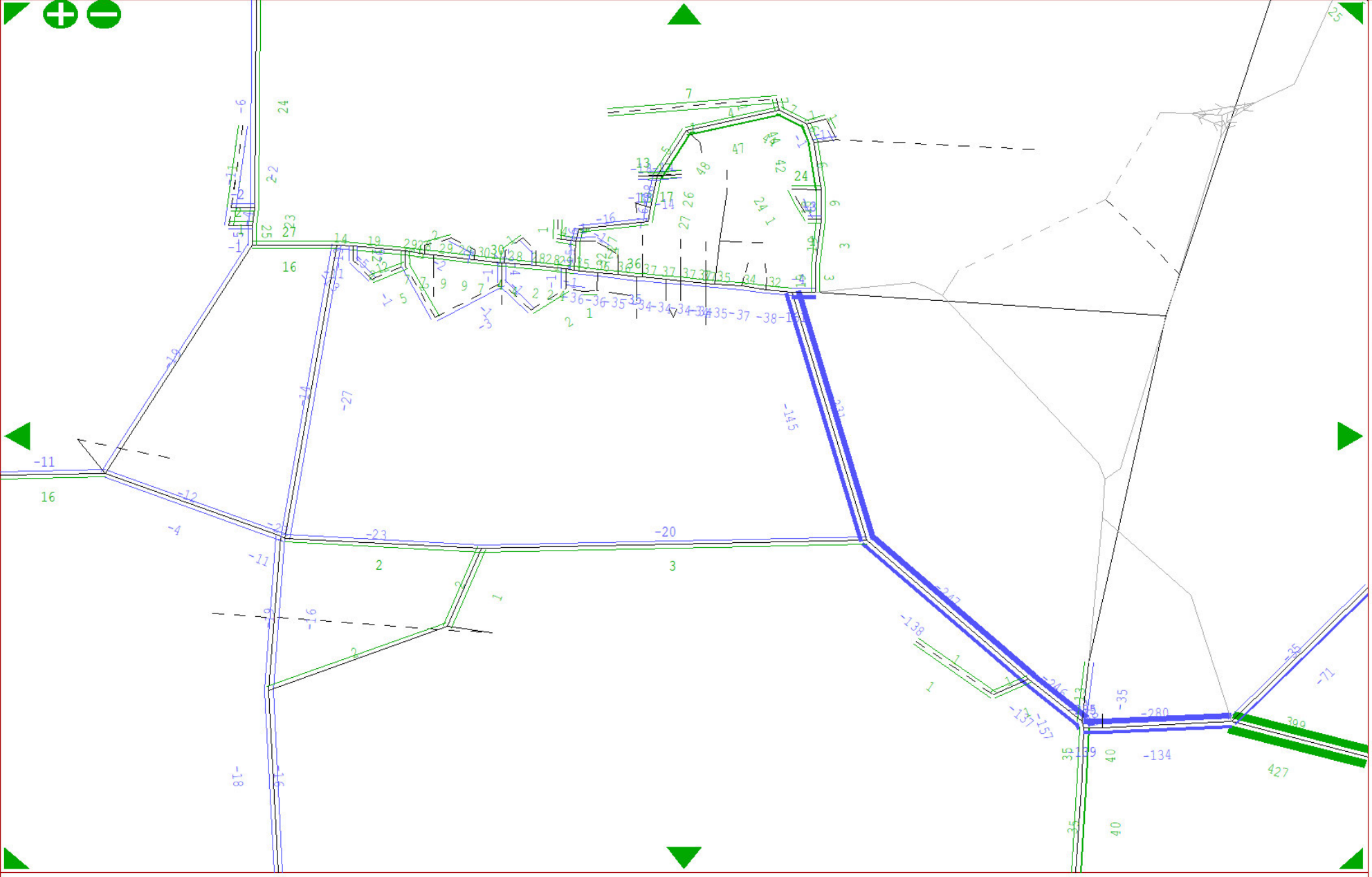
Pen and/or range defs >

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Bicester Network - 2034 Reference Case 3A PM Peak 11- 8-25



Link Annotation Display Options:

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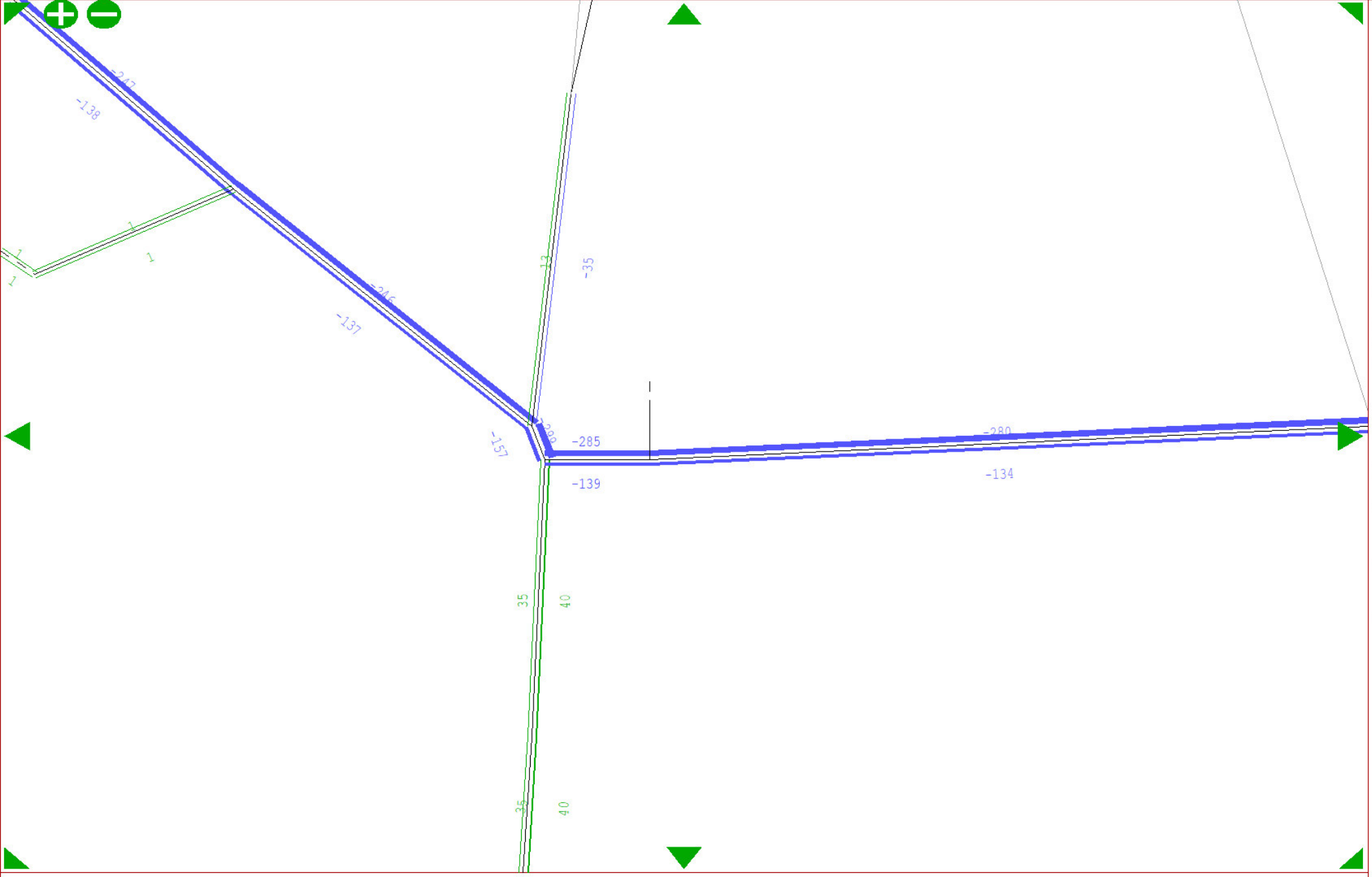
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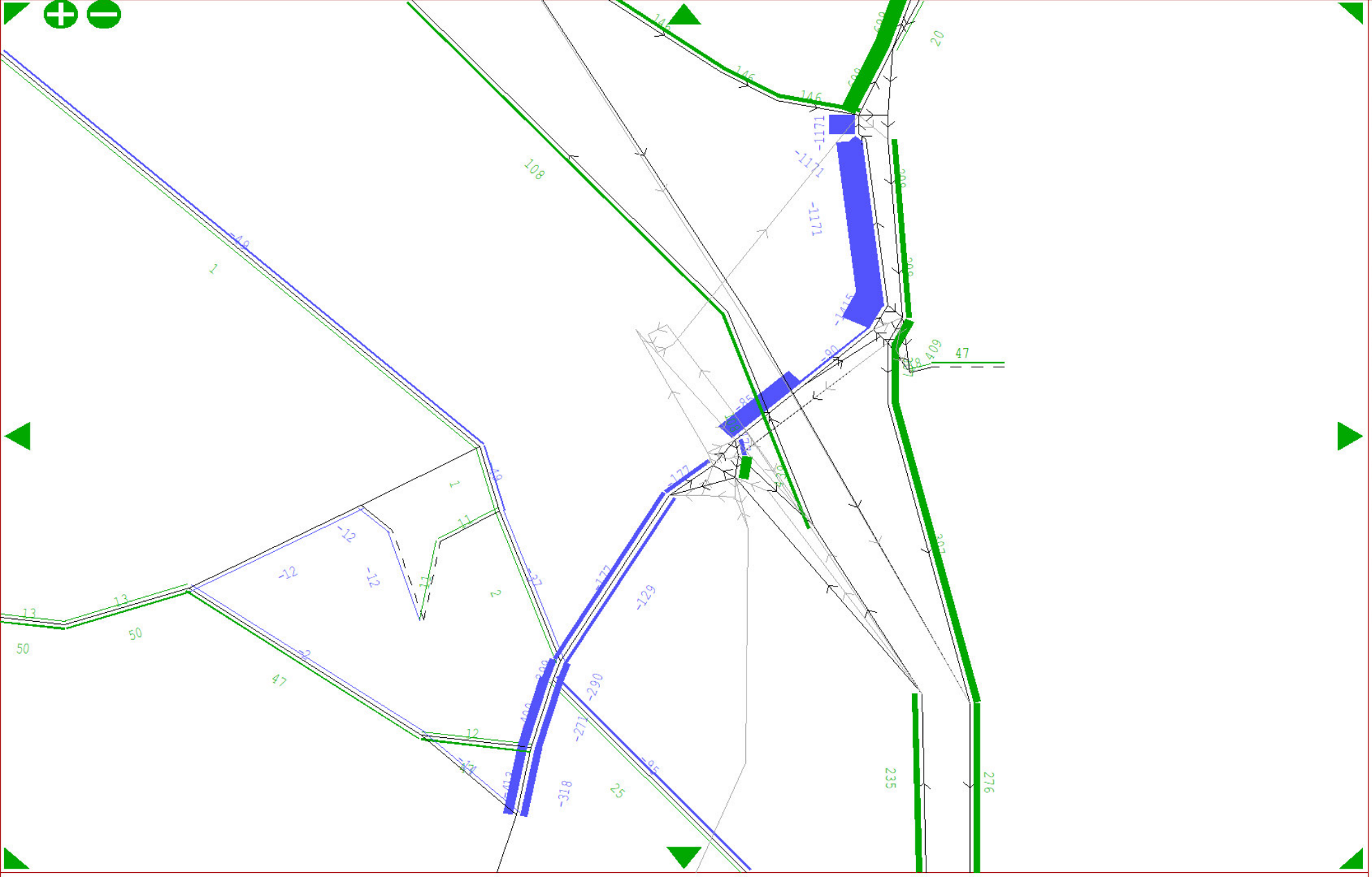
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range defs

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Options:

Display Mode >
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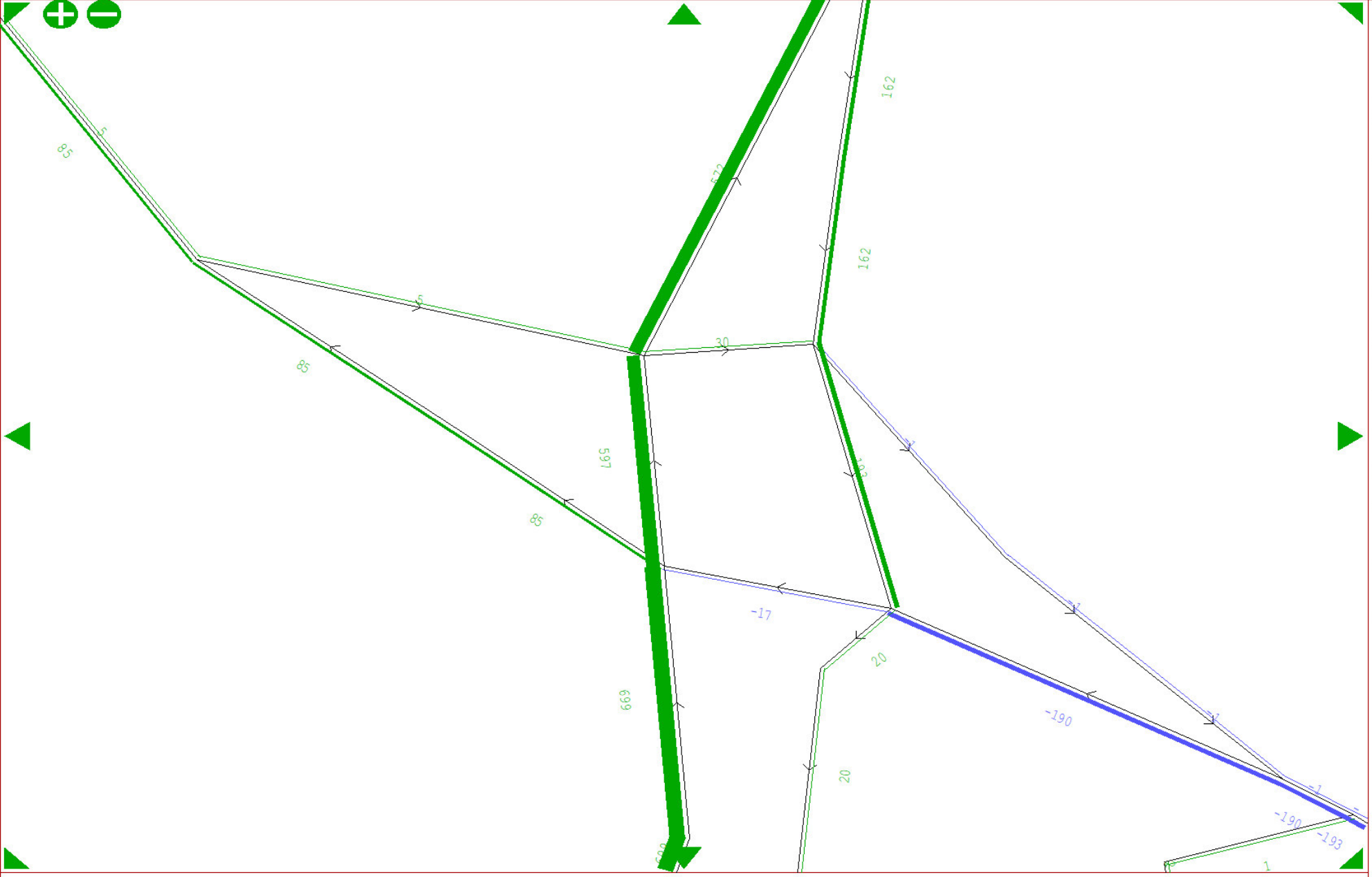
Bandwdth par >

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range defs

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Q - Return

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Link
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Options:

Display Mode >
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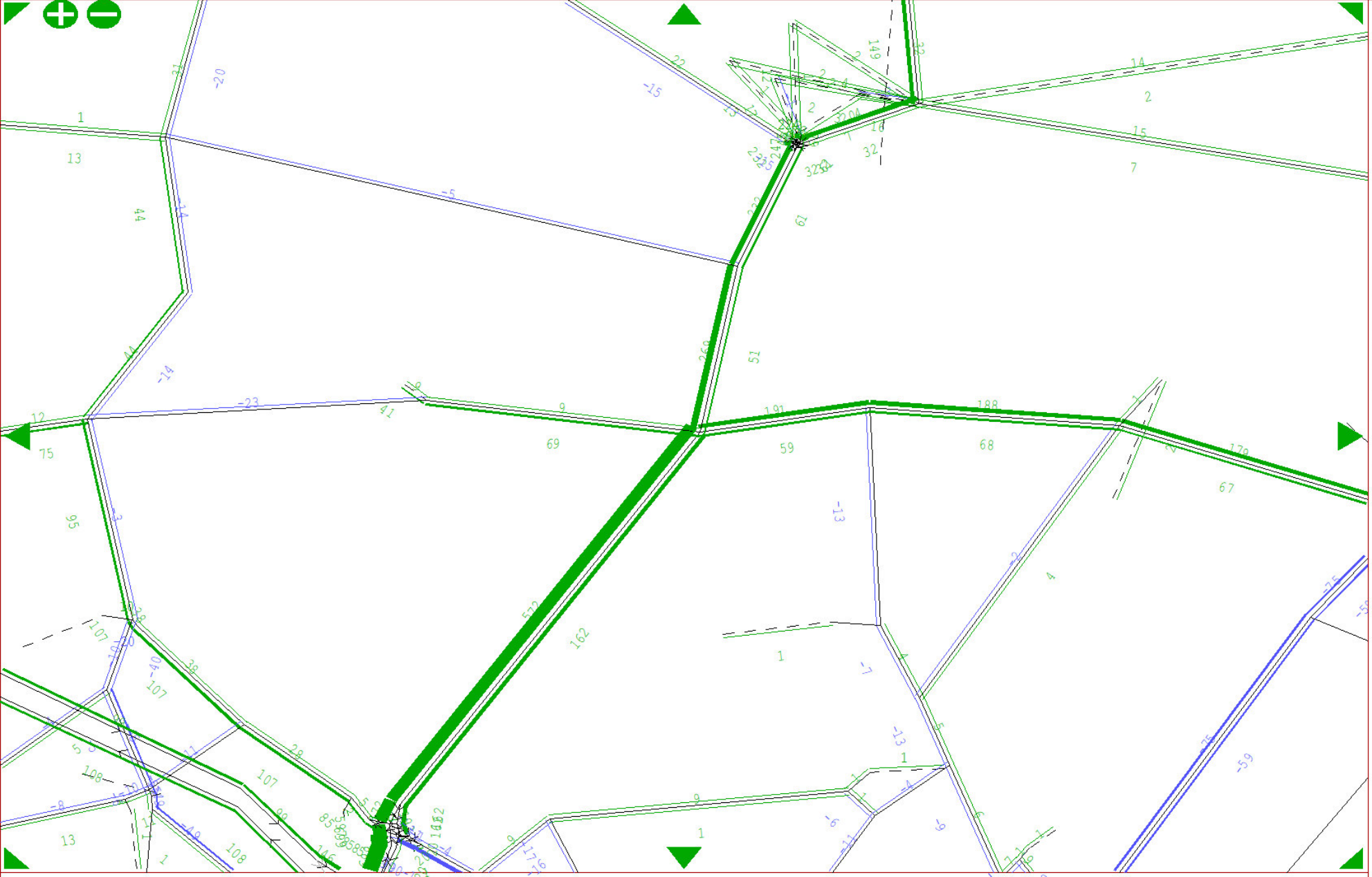
Bandwdth par >

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Link Annotation Display Options:

Display Mode >
Bandwidths ...with...
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Annotate as space permit

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offset Gap = ?
1.0 mm

Q - Return

+ Menu bar!

Bicester Network - 2034 Reference Case 3A PM Peak 11- 8-25

APPENDIX H

V/C AND FLOW COMPARISON TABLE MORNING PEAK HOUR

Route	Junction	Approach	OxSRFI Flow	Total entry flow			V/C			Commentary
				DS3A	RC3A	Change	DS3A	RC3A	Change	
Middleton Stoney Road	Middleton Stoney crossroads	B430 north	8	182	521	-339	38%	122%	-84%	Material reductions in flow and V/C with OxSRFI in place. However, proposed improvements to crossing infrastructure so junction to be included in the study area.
		B4030 Bicester Road	0	272	263	9	100%	116%	-16%	
		B430 south	97	231	364	-133	50%	86%	-36%	
		B4030 Heyford Road	19	490	865	-375	63%	112%	-49%	
		Total	124	1,175	2,013	-838				
	Middleton Stoney Road/Empire Road	Middleton Stoney Road west	30	1,184	854	330	90%	65%	25%	There are material increases in traffic flow and V/C due to effects of OxSRFI so the junction is incuded in the study area.
		Empire Road	2	92	92	0	20%	11%	9%	
		Middleton Stoney Road east	165	1,158	439	719	66%	23%	43%	
		Total	197	2,434	1,385	1,049				
	B4030 Middleton Stoney Road/Howes Lane/Vendee Drive roundabout	Howes Lane	11	614	600	14	52%	44%	8%	There are material increases in traffic flow and the V/C increases above 85% on two arms due to effects of OxSRFI so the junction is incuded in the study area.
		Middleton Stoney Road	126	945	551	394	87%	47%	40%	
		Vendee Drive	27	673	527	146	47%	28%	19%	
		B4030 Middleton Stoney Road	30	1,196	877	319	87%	65%	22%	
		Total	194	3,428	2,555	873				
	Middleton Stoney Road/Shakespeare Drive/Whitleands Way roundabout	Shakespeare Drive	33	629	569	60	63%	53%	10%	Whilst Saturn suggests there is no congestion in the AM peak, the traffic increases are significant with OxSRFI in place and therefore the junction is included in the study area.
		Middleton Stoney Road west	71	580	368	212	46%	28%	18%	
		Whitelands Way	17	382	313	69	53%	39%	14%	
		Middleton Stoney Road east	23	924	831	93	63%	57%	6%	
		Total	144	2,515	2,081	434				
	Vendee Drive/A4095 T-junction	Vendee Drive north	5	924	932	-8	98%	102%	-4%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Vendee Drive south	21	395	358	37	24%	25%	-1%	
		A4095	6	383	362	21	31%	27%	4%	
		Total	32	1702	1652	50				
	Middleton Stoney Road/Kings End/Oxford Road	Kings End	12	1,031	1,056	-25	80%	77%	3%	There are material increases in traffic flow and the V/C increases above 85% on the Middleton Stoney Road arm due to effects of OxSRFI so the junction is incuded in the study area.
		Oxford Road	55	1,222	1,085	137	66%	56%	10%	
		Middleton Stoney Road	17	976	929	47	91%	85%	6%	
		Total	84	3,229	3,070	159				
A41	A41/Tritax access	A41 north	57	1,648	1,957	-309	44%	52%	-8%	There are no material increases in traffic or congestion due to the effects of OxSRFI so the junction is excluded from the study area.
		A41 south	51	1,994	2,084	-90	38%	41%	-3%	
		Tritax access	3	228	230	-2	11%	12%	-1%	
		Total	111	3,870	4,271	-401				
	A41 Oxford Road/Vendee Drive roundabout	A41 Oxford Road north	64	1,487	1,680	-193	50%	55%	-5%	Whilst there are material traffic reductions at the junction, reassignment effects due to OxSRFI see an increase in V/C on the A41 Oxford Road south approach and the junction is therefore included in the study area.
		Charles Shouler Way	5	434	360	74	95%	103%	-8%	
		A41 Oxford Road south	55	1,860	1,939	-79	93%	88%	5%	
		Vendee Drive	2	666	593	73	107%	110%	-3%	
		Total	126	4,447	4,572	-125				
	A41 Oxford Road/Pioneer Way	A41 Oxford Road north	63	1,727	1,854	-127	83%	87%	-4%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		A41 Oxford Road south	49	2,029	2,032	-3	66%	66%	0%	
		Pioneer Way	0	358	420	-62	70%	88%	-18%	
		Total	112	4,114	4,306	-192				
	A41 Oxford Road/Lakeview Drive	A41 Oxford Road north	56	2,103	2,281	-178	84%	92%	-8%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Lakeview Drive	8	661	660	1	73%	75%	-2%	
		A41 Oxford Road south	49	2,198	2,198	0	95%	93%	2%	
		Total	113	4,962	5,139	-177				
	A41 Oxford Road/Oxford Road/A41 east	Oxford Road	7	1,422	1,444	-22	99%	93%	6%	Whilst there are no material traffic increases at the junction, reassignment effects due to OxSRFI see an increase in V/C on the Oxford Road approach and the junction is therefore included in the study area.
		A41 east	107	1,654	1,637	17	87%	90%	-3%	
		A41 Oxford Road	48	1,840	1,869	-29	90%	91%	-1%	
		Total	162	4,916	4,950	-34				
	Oxford Road/Pingle Drive roundabout	Oxford Road north	9	1,491	1,494	-3	77%	78%	-1%	There are modest traffic increases at the junction due to OxSRFI, but there is no congestion indicated at the junction, which is therefore excluded from the study area.
		Pingle Drive	0	148	146	2	26%	24%	2%	
		Oxford Road south	54	1,328	1,197	131	49%	44%	5%	
		Total	63	2,967	2,837	130				
	A41/London Road/Neunkirchen Way/Graven Hill Road roundabout	London Road	6	176	175	1	33%	32%	1%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Neunkirchen Way	11	665	694	-29	82%	86%	-4%	
		A41 Aylesbury Road	81	952	913	39	51%	49%	2%	
		Graven Hill Road	9	371	370	1	33%	33%	0%	
		A41	53	1,500	1,488	12	49%	49%	0%	
		Total	160	3,664	3,640	24				
	A41/Ploughley Road T-junction	A41 east	71	964	929	35	89%	86%	3%	Whilst there is a modest increases in traffic at the junction, there is no material increase in V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Ploughley Road	4	325	324	1	59%	58%	1%	
		A41 west	48	1,330	1,302	28	60%	59%	1%	
		Total	123	2,619	2,555	64				
	A41/Station Road T-junction	A41 east	65	1,215	1,214	1	96%	96%	0%	There are no material increases in traffic or congestion due to the effects of OxSRFI so the junction is excluded from the study area.
		Station Road	0	107	107	0	11%	11%	0%	
		A41 west	44	589	554	35	36%	34%	2%	
		Total	109	1,911	1,875	36				
	A41/Unnamed Road T-junction	A41 east	65	968	954	14	67%	66%	1%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		A41 west	46	696	661	35	55%	53%	2%	
		Unnamed Road	0	253	292	-39	98%	108%	-10%	
		Total	111	1917	1907	10				
Kings End/Queens Avenue/Field Street corridor	Queens Avenue/Kings End T-junction	Queens Avenue	11	1,114	1,111	3	76%	76%	0%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Kings End east	1	87	114	-27	14%	18%	-4%	
		Kings End south	9	1,178	1,190	-12	90%	91%	-1%	
		Total	21	2,379	2,415	-36				
	Field Street/St Johns Street mini-roundabout	Field Street	0	804	780	24	105%	105%	0%	Whilst there is a modest increases in traffic at the junction, there is no material increase in V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		St John's Street	11	714	689	25	106%	105%	1%	
		Queens Avenue	5	865	846	19	76%	75%	1%	
		Total	16	2,383	2,315	68				
	Field Street/Bucknell Road mini-roundabout	Field Street north	0	784	792	-8	106%	111%	-5%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Field Street south	4	761	747	14	45%	44%	1%	
		Bucknell Road	0	120	121	-1	34%	35%	-1%	
		Total	4	1,665	1,660	5				
	Buckingham Road/Churchill Road/Brashfield Road double mini-roundabout	Buckingham Road north	1	673	643	30	48%	47%	1%	Whilst there is a modest increases in traffic at the junction, there is no material increase in V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		SB internal link	1	741	743	-2	102%	101%	1%	
		Churchill Road	8	372	340	32	56%	50%	6%	
		Buckingham Road south	4	607	598	9	50%	48%	2%	
		NB internal link	8	526	495	31	52%	49%	3%	
		Brashfield Road	0	183	209	-26	26%	30%	-4%	
		Total	22	3,102	3,028	74				
Northern ring-road	A4095 Lords Lane/Banbury Road roundabout	Banbury Road north	6	532	704	-172	49%	66%	-17%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		A4095 Southwold Lane	22	1,048	1,114	-66	78%	87%	-9%	
		Banbury Way south	1	270	294	-24	40%	49%	-9%	
		A4095 Lords Lane	1	741	735	6	39%	39%	0%	
		Total	30	2,591	2,847	-256				
	A4095 Southwolds Lane/Fringford Road	A4095 Southwold Lane east	27	975	1,022	-47	27%	28%	-1%	Whilst there are no material traffic increases across the junction, an increase in traffic on the Fringford Road arm causes an increase in V/C and the junction is therefore included in the study area.
		A4095 Southwold Lane west	5	704	730	-26	20%	21%	-1%	
		Fringford Road	1	458	409	49	93%	87%	6%	
		Total	33	2,137	2,161	-24				
	A4095 Southwold Lane/Buckingham Road roundabout	Buckingham Road north	1	1,276	1,335	-59	82%	85%	-3%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Skimmingdish Lane	13	936	964	-28	53%	56%	-3%	
		Buckingham Road south	3	459	464	-5	68%	76%	-8%	
		A4095 Southwold Lane	5	1,068	1,029	39	77%	78%	-1%	
		Total	22	3,739	3,792	-53				
	Skimmingdish Lane/Bicester Road/Launton Road roundabout	Skimmingdish Lane	4	1,369	1,366	3	102%	102%	0%	There are no material increases in traffic orV/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Private access	0	16	16	0	3%	3%	0%	
		Bicester Road	6	1,383	1,388	-5	58%	58%	0%	
		Launton Road	5	736	787	-51	65%	69%	-4%	
		Total	15	3,504	3,557	-53				
A4260/Banbury Road corridor	A4260 Banbury Road/Hempton Road signal controlled crossroads	A4260 Banbury Road	0	1,045	915	130	92%	78%	14%	Whilst there is a modest increases in traffic at the junction, there is no material increase in V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Horse Fair	1	34	36	-2	24%	26%	-2%	
		A4260 High Street	1	384	373	11	33%	32%	1%	
		Hempton Road	12	155	158	-3	132%	135%	-3%	
		Total	14	1,618	1,482	136				
	A4260 Oxford Road/B4030 signal controlled crossroads	A4260 Oxford Road north	0	1,161	1,164	-3	98%	96%	2%	There are increases in V/C on the B4030 east and west arms of the junction, which is therefore included in the study area.
		B4030 east	1	159	119	40	107%	49%	58%	
		A4260 Oxford Road south	0	387	386	1	23%	22%	1%	
		B4030 west	15	211	194	17	110%	101%	9%	
		Total	16	1,918	1,863	55				
	Banbury Road/B4027 T-junction	Banbury Road north	2	1,097	1,039	58	66%	62%	4%	There is an increase in V/C on the B4027 west arm and the junction is therefore included in the study area.
		Banbury Road south	2	459	456	3	17%	17%	0%	
		B4027 east	2	147	144	3	25%	24%	1%	
		B4027 west	15	299	305	-6	106%	100%	6%	
		Total	21	2,002	1,944	58				
	Banbury Road/Bunkers Hill/Upper Campsfield Road T-junction	Banbury Road north	0	704	665	39	107%	106%	1%	There are modest traffic flow increases and V/C on the Bunkers Hill arm increases with OxsSRFI in place and therefore the junction is included in the study area.
		Bunkers Hill	3	557	534	23	99%	95%	4%	
		Banbury Road south	27	117	89	28	19%	14%	5%	
		Upper Campsfield Road	17	618	610	8	96%	96%	0%	
		Total	47	1,996	1,898	98				
A43	Barley Mow roundabout	A43 north	181	2,197	2,124	73	117%	105%	12%	There are material increases in traffic flow and V/C due to effects of OxSRFI so the junction is incuded in the study area.
		A421	63	906	769	137	129%	96%	33%	
		A42 south	45	1,881	1,781	100	59%	57%	2%	
		B4031	31	316	282	34	36%	31%	5%	
		Total	320	4,956	4,956	344				
	A43/Brackley Road roundabout	A43 north	183	2,222	2,117	105	101%	97%	4%	There are material increases in traffic flow and V/C on the A43 north arm due to effects of OxSRFI so the junction is incuded in the study area.
		A43 south	28	1,374	1,373	1	63%	62%	1%	
		Brackley Road	15	11	12	-1	2%	3%	-1%	
		Total	226	3,607	3,502	105				
	A43/Brackley Bypass roundabout	Oxford Road	47	331	270	61	27%	23%	4%	There are material increases in traffic flow and V/C on the A43 Brackley Bypass arm due to effects of OxSRFI so the junction is incuded in the study area.
		A43 Brackley Bypass	135	2,201	2,040	161	98%	90%	8%	
		A43	28	1,377	1,372	5	67%	67%	0%	
		A422 Brackley Bypass	0	218	311	-93	19%	27%	-8%	
		Total	210	3,993	3,993	134				
A421	A421/Buckingham Road roundabout	Sandpit Hill	2	712	710	2	67%	67%	0%	There are material increases in traffic flow and V/C on the A421 west arm due to effects of OxSRFI so the junction is incuded in the study area.
		A421 east	60	1,341	1,202	139	87%	78%	9%	
		Buckingham Road	0	624	602	22	61%	53%	8%	
		A421 west	15	580	611	-31	48%	50%	-2%	
		Total	77	3,125	3,125	132				

APPENDIX I

V/C AND FLOW COMPARISON TABLE EVENING PEAK HOUR

Route	Junction	Approach	OxSRFI Flow	Total entry flow			V/C			Commentary
				DS3A	RC3A	Change	DS3A	RC3A	Change	
Middleton Stoney Road	Middleton Stoney crossroads	B430 north	114	196	231	-35	84%	89%	-5%	Material reductions in flow and V/C with OxSRFI in place. However, proposed improvements to crossing infrastructure so junction to be included in the study area.
		B4030 Bicester Road	25	578	717	-139	81%	101%	-20%	
		B430 south	25	222	188	34	109%	113%	-4%	
		B4030 Heyford Road	8	284	530	-246	55%	103%	-48%	
		Total	172	1,280	1,666	-386				
	Middleton Stoney Road/Empire Road	Middleton Stoney Road west	178	973	607	366	74%	46%	28%	Whilst Saturn suggests there is no V/C in the PM peak, the traffic increases are significant with OxSRFI in place and therefore the junction is included in the study area.
		Empire Road	4	243	245	-2	45%	28%	17%	
		Middleton Stoney Road east	86	1,232	866	366	64%	42%	22%	
		Total	268	2,448	1,718	730				
	B4030 Middleton Stoney Road/Howes Lane/Vendee Drive roundabout	Howes Lane	4	394	440	-46	35%	33%	2%	There are material increases in traffic flow and V/C due to effects of OxSRFI so the junction is incuded in the study area.
		Middleton Stoney Road	52	799	632	167	65%	51%	14%	
		Vendee Drive	30	1,306	1,286	20	86%	76%	10%	
		B4030 Middleton Stoney Road	178	1,124	778	346	102%	77%	25%	
		Total	264	3,623	3,136	487				
	Middleton Stoney Road/Shakespeare Drive/Whitleands Way roundabout	Shakespeare Drive	14	448	430	18	40%	36%	4%	Whilst Saturn suggests there is no V/C in the PM peak, the traffic increases are significant with OxSRFI in place and therefore the junction is included in the study area.
		Middleton Stoney Road west	29	798	683	115	60%	51%	9%	
		Whitelands Way	7	331	284	47	47%	36%	11%	
		Middleton Stoney Road east	142	967	849	118	69%	60%	9%	
		Total	192	2,544	2,246	298				
	Vendee Drive/A4095 T-junction	Vendee Drive north	15	668	685	-17	78%	77%	1%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Vendee Drive south	27	672	660	12	40%	38%	2%	
		A4095	3	782	758	24	87%	83%	4%	
		Total	45	2122	2103	19				
	Middleton Stoney Road/Kings End/Oxford Road	Kings End	6	1,011	1,029	-18	69%	66%	3%	There are modest traffic increases at the junctin and V/C increases on the Oxford road approach with OxSRFI in place and therefore the junction is included in the study area.
		Oxford Road	22	1,657	1,579	78	93%	89%	4%	
		Middleton Stoney Road	78	673	603	70	70%	63%	7%	
		Total	106	3,341	3,211	130				
A41	A41/Tritax access	A41 north	50	1,272	1,419	-147	34%	37%	-3%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		A41 south	49	1,453	1,668	-215	26%	32%	-6%	
		Tritax access	6	623	637	-14	31%	32%	-1%	
		Total	105	3,348	3,724	-376				
	A41 Oxford Road/Vendee Drive roundabout	A41 Oxford Road north	68	1,732	1,713	19	80%	80%	0%	Whilst there are material traffic reductions at the junction, reassignment effects due to OxSRFI see an increase in V/C on the A41 Oxford Road south approach and the junction is therefore included in the study area.
		Charles Shouler Way	1	490	498	-8	104%	105%	-1%	
		A41 Oxford Road south	54	1,703	1,950	-247	115%	112%	3%	
		Vendee Drive	6	637	636	1	88%	93%	-5%	
		Total	129	4,562	4,797	-235				
	A41 Oxford Road/Pioneer Way	A41 Oxford Road north	64	1,981	2,008	-27	93%	94%	-1%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		A41 Oxford Road south	47	1,729	1,740	-11	58%	59%	-1%	
		Pioneer Way	0	178	181	-3	56%	57%	-1%	
		Total	111	3,888	3,929	-41				
	A41 Oxford Road/Lakeview Drive	A41 Oxford Road north	51	1,779	1,833	-54	88%	91%	-3%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Lakeview Drive	15	1449	1466	-17	95%	100%	-5%	
		A41 Oxford Road south	40	1,833	1,840	-7	85%	82%	3%	
		Total	106	5,061	5,139	-78				
	A41 Oxford Road/Oxford Road/A41 east	Oxford Road	65	1,543	1,499	44	95%	89%	6%	Whilst there are no material traffic increases at the junction, reassignment effects due to OxSRFI see an increase in V/C on the Oxford Road approach and the junction is therefore included in the study area.
		A41 east	68	1,555	1,507	48	88%	83%	5%	
		A41 Oxford Road	39	2,082	2,138	-56	94%	95%	-1%	
		Total	172	5,180	5,144	36				
	Oxford Road/Pingle Drive roundabout	Oxford Road north	68	1,252	1,195	57	48%	46%	2%	There are modest traffic increases due to the proposed development, but there is no congestion indicated at the junction, which is therefore excluded from the study area.
		Pingle Drive	1	497	497	0	55%	54%	1%	
		Oxford Road south	22	1,732	1,658	74	55%	52%	3%	
		Total	91	3,481	3,350	131				
	A41/London Road/Neunkirchen Way/Graven Hill Road roundabout	London Road	3	298	292	6	38%	37%	1%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Neunkirchen Way	3	452	464	-12	35%	36%	-1%	
		A41 Aylesbury Road	60	1,045	1,003	42	44%	42%	2%	
		Graven Hill Road	3	386	392	-6	102%	103%	-1%	
		A41	99	1,684	1,669	15	67%	67%	0%	
		Total	168	3,865	3,820	45				
	A41/Ploughley Road T-junction	A41 east	53	972	935	37	90%	86%	4%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Ploughley Road	2	348	349	-1	63%	63%	0%	
		A41 west	64	1,338	1,356	-18	61%	61%	0%	
		Total	119	2,658	2,640	18				
	A41/Station Road T-junction	A41 east	49	807	771	36	64%	61%	3%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Station Road	0	260	300	-40	92%	100%	-8%	
		A41 west	51	898	880	18	71%	70%	1%	
		Total	100	1,965	1,951	14				
	A41/Unnamed Road T-junction	A41 east	49	646	606	40	41%	38%	3%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		A41 west	51	1,157	1,181	-24	92%	94%	-2%	
		Unnamed Road	0	173	179	-6	68%	64%	4%	
		Total	100	1976	1966	10				
Kings End/Queens Avenue/Field Street corridor	Queens Avenue/Kings End T-junction	Queens Avenue	5	1,002	1,021	-19	68%	69%	-1%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Kings End east	1	130	132	-2	19%	20%	-1%	
		Kings End south	11	1,144	1,158	-14	86%	87%	-1%	
		Total	17	2,276	2,311	-35				
	Field Street/St Johns Street mini-roundabout	Field Street	0	822	821	1	104%	104%	0%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		St John's Street	6	706	702	4	140%	142%	-2%	
		Queens Avenue	12	1,019	1,042	-23	93%	95%	-2%	
		Total	18	2,547	2,565	-18				
	Field Street/Bucknell Road mini-roundabout	Field Street north	5	860	847	13	85%	95%	-10%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Field Street south	5	1,010	1,022	-12	60%	60%	0%	
		Bucknell Road	3	126	98	28	30%	27%	3%	
		Total	13	1,996	1,967	29				
	Buckingham Road/Churchill Road/Brashfield Road double mini-roundabout	Buckingham Road north	1	479	485	-6	32%	32%	0%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		SB internal link	2	455	462	-7	55%	55%	0%	
		Churchill Road	5	851	854	-3	104%	105%	-1%	
		Buckingham Road south	7	668	645	23	66%	64%	2%	
		NB internal link	1	825	818	7	84%	83%	1%	
		Brashfield Road	1	125	126	-1	27%	27%	0%	
		Total	17	3,403	3,390	13				
Northern ring-road	A4095 Lords Lane/Banbury Road roundabout	Banbury Road north	10	468	485	-17	69%	85%	-16%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		A4095 Southwold Lane	13	1,146	1,149	-3	79%	79%	0%	
		Banbury Way south	0	259	295	-36	48%	55%	-7%	
		A4095 Lords Lane	1	743	861	-118	35%	41%	-6%	
		Total	24	2,616	2,790	-174				
	A4095 Southwolds Lane/Fringford Road	A4095 Southwold Lane east	13	1,105	1,100	5	31%	31%	0%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		A4095 Southwold Lane west	4	784	853	-69	24%	27%	-3%	
		Fringford Road	26	456	459	-3	92%	90%	2%	
		Total	43	2,345	2,412	-67				
	A4095 Southwold Lane/Buckingham Road roundabout	Buckingham Road north	1	807	882	-75	47%	51%	-4%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Skimmingdish Lane	8	1,407	1,424	-17	73%	77%	-4%	
		Buckingham Road south	2	442	422	20	99%	102%	-3%	
		A4095 Southwold Lane	21	971	960	11	86%	88%	-2%	
		Total	32	3,627	3,688	-61				
	Skimmingdish Lane/Longlands Road	Skimmingdish Lane north	17	1,061	1,060	1	48%	48%	0%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Longlands Road	1	168	171	-3	99%	105%	-6%	
		Skimmingdish Lane south	8	1,424	1,444	-20	81%	82%	-1%	
		Total	26	2,653	2,675	-22				
	Skimmingdish Lane/Bicester Road/Launton Road roundabout	Skimmingdish Lane	17	1,104	1,102	2	86%	85%	1%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Private access	0	28	28	0	5%	5%	0%	
		Bicester Road	4	1,421	1,449	-28	56%	56%	0%	
		Launton Road	3	1,113	1,112	1	107%	109%	-2%	
		Total	24	3,666	3,691	-25				
	A4421 Bicester Road/Charbridge Lane roundbaout	A4421 Bicester Road	7	1,302	1,298	4	83%	83%	0%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Bicester Road	1	343	348	-5	38%	39%	-1%	
		Charbridge Lane	2	1,225	1,254	-29	87%	89%	-2%	
		Total	10	2,870	2,900	-30				
A4260/Banbury Road corridor	A4260 Banbury Road/Hempton Road signal controlled crossroads	A4260 Banbury Road	0	379	393	-14	32%	32%	0%	There are no material increases in traffic orV/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Horse Fair	1	70	65	5	50%	47%	3%	
		A4260 High Street	14	985	973	12	90%	89%	1%	
		Hempton Road	4	106	104	2	81%	79%	2%	
		Total	19	1,540	1,535	5				
	A4260 Oxford Road/B4030 signal controlled crossroads	A4260 Oxford Road north	0	446	449	-3	30%	30%	0%	Whilst there are no material traffic increases at the junction, there is an increase in V/C on the B4030 east arm and the junction is therefore included in the study area.
		B4030 east	17	219	210	9	94%	90%	4%	
		A4260 Oxford Road south	0	1,016	1,024	-8	95%	95%	0%	
		B4030 west	4	142	151	-9	44%	47%	-3%	
		Total	21	1,823	1,834	-11				
	Banbury Road/B4027 T-junction	Banbury Road north	0	382	379	3	23%	23%	0%	V/C on the B4028 east arm increases above 85% with the development in place and therefore the junction is included in the study area.
		Banbury Road south	0	642	649	-7	38%	39%	-1%	
		B4027 east	20	505	481	24	86%	82%	4%	
		B4027 west	5	227	213	14	68%	64%	4%	
		Total	25	1,756	1,722	34				
	Banbury Road/Upper Campsfield Road T-junction	Banbury Road north	0	382	348	34	91%	84%	7%	V/C on the Banbury Road north and Bunkers Hill arms increases above 85% with the development in place and therefore the junction is included in the study area.
		Bunkers Hill	53	451	433	18	86%	84%	2%	
		Banbury Road south	4	291	294	-3	39%	39%	0%	
		Upper Campsfield Road	4	976	995	-19	105%	106%	-1%	
		Total	61	2,100	2,070	30				
A43	Barley Mow roundabout	A43 north	64	1,646	1,594	52	86%	77%	9%	There are material increases in traffic flow and V/C due to effects of OxSRFI so the junction is incuded in the study area.
		A421	30	716	657	59	76%	67%	9%	
		A42 south	318	2,991	2,419	572	97%	79%	18%	
		B4031	10	214	205	9	41%	30%	11%	
		Total	422	4,875	4,875	692				
	A43/Brackley Road roundabout	A43 north	64	1,646	1,585	61	75%	72%	3%	There are material increases in traffic flow and V/C due to effects of OxSRFI so the junction is incuded in the study area.
		A43 south	209	2,241	1,972	269	102%	90%	12%	
		Brackley Road	0	5	10	-5	16%	7%	9%	
		Total	273	3,892	3,567	325				
	A43/Brackley Bypass roundabout	Oxford Road	17	204	195	9	29%	25%	4%	There are material increases in traffic flow due to effects of OxSRFI and since the A41 Brackley Bypass arm is showing some congestion the junction is incuded in the study area.
		A43 Brackley Bypass	43	1,486	1,454	32	87%	85%	2%	
		A43	205	2,194	1,962	232	55%	60%	-5%	
		A422 Brackley Bypass	4	448	425	23	67%	64%	3%	
		Total	269	4,036	4,036	296				
A421	A421/Buckingham Road roundabout	Sandpit Hill	5	427	437	-10	56%	67%	-11%	V/C on the A421 west arm increases above 85% with the development in place and therefore the junction is included in the study area.
		A421 east	24	807	785	22	45%	44%	1%	
		Buckingham Road	0	1,111	1,187	-76	92%	94%	-2%	
		A421 west	72	776	597	179	89%	73%	16%	
		Total	101	3,006	3,006	115				
A4095	A4095 Bunkers Hill/Lince Lane T-junction	A4095 Bunkers Hill	13	618	629	-11	49%	50%	-1%	V/C on the Lince Lane arm increases above 85% with the development in place and therefore the junction is included in the study area.
		Lince Lane	73	471	427	44	94%	85%	9%	
		B4027 Station Road	1	199	211	-12	16%	17%	-1%	
		Total	87	1,288	1,267	21				
Launton Road	Launton Road/Granville Way T-junction	Launton Road north	0	439	452	-13	24%	25%	-1%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Granville Way	2	609	613	-4	89%	91%	-2%	
		Launton Road south	4	556	561	-5	25%	25%	0%	
		Total	6	1,604	1,626	-22				
	Launton Road/Churchill Road mini-roundabout	Launton Road north	0	677	682	-5	67%	68%	-1%	There are no material increases in traffic or V/C due to the effects of OxSRFI so the junction is excluded from the study area.
		Launton Road south	1	927	937	-10	113%	114%	-1%	
		Churchill Road	0	305	313	-8	44%	45%	-1%	
		Total	1	1,909	1,932	-23				

APPENDIX 28

STAGE 3 TRANSPORT MODELLING (INTERIM REPORT)

STAGE 3 TRANSPORT MODELLING (INTERIM REPORT)

OXFORDSHIRE SRFI

ADC Infrastructure Limited, City Buildings, 34-36 Carrington Street, Nottingham, NG1 7FG
tel. 0115 941 4817, www.ADCinfrastructure.com

DOCUMENT CONTROL

project number: ADC1794			report reference: ADC1794-RP-AO	
version	date	author	reviewer	comments
1		M. Higgins	S Dunhill	internal draft
2	15/09/2025	M. Higgins	S Dunhill	first issue to the client team
3	18/09/2025	M. Higgins	S Dunhill	draft issued for Stage 2 consultation

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Appendix M	B4030 Middleton Stoney Road/Empire Road Junction 9 Picady report
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1.0 INTRODUCTION

1.1 ADC Infrastructure Limited are commissioned by Oxfordshire Railfreight Limited to assess the transport and infrastructure requirements of a proposed Strategic Rail Freight Interchange (SRFI) in Oxfordshire; the subject of a Development Consent Order (DCO) application for a Nationally Significant Infrastructure Project (NSIP), to be known as OxSRFI.

1.2 The proposals also include various highway improvements, including alterations to Junction 10 of the M40 motorway and to the A43, both of which meet thresholds for nationally significant highway works and the application will therefore also include two highway NSIPs as part of the DCO.

Transport Working Group and transport modelling strategy

1.3 A Transport Working Group (TWG) comprising representatives from National Highways (who have responsibility for the Strategic Road Network (SRN)), Aecom (National Highways' term consultant), and Oxfordshire County Council (OCC), who have responsibility for the local highway network, was established in November 2020. In addition, Cherwell District Council, the local planning authority, contribute to and attend the Transport Working Group meetings.

1.4 To ensure that the potential transport impacts of the Proposed Development are fully considered, and to confirm that the proposed embedded highway mitigation works are appropriate in scale and function, a three-stage transport modelling approach is being followed:

- Stage 1 comprised the options assessment and preliminary design of the embedded highway works.
- Stage 2 comprises strategic transport modelling using the Bicester Transport Model (BTM).
- Stage 3 comprises detailed assessment of the study area using industry standard assessment tools, including micro-simulation (VISSIM) modelling of the M40 Junction 10 complex.

1.5 The Stage 1 modelling and design work has been completed, and the embedded highway mitigation proposals are agreed in principle with the TWG. The stage 2 BTM modelling work is ongoing, though the 2034 (Completion Year) Reference Case (RC3A) and Do-Something case (DS3A) scenarios have been completed. These scenarios are of key importance to understanding what the worst-case traffic impacts of OxSRFI could be when the Proposed Development with the embedded highway works are fully built-out and operational. This is because they do not consider the impact of the Sustainable Transport Strategy (STS) and associated modal shift away from single occupancy car trips, and the increase in travel by more sustainable modes of transport.

1.6 Technical Note AN (ref. ADC1794-RP-AN) presents the analysis of the Stage 2 Transport Modelling for the RC3A and DS3A scenarios, establishing the impacts of the Proposed Development in the 2034 Completion Year without the effects of the STS and Framework Travel Plan. The Stage 2 Transport Modelling analysis concludes by establishing the study area to be taken forward into the Stage 3 Transport Modelling.

1.7 The DCO statutory (Stage 2) consultation is due to commence on 23 September 2025. Due to time constraints, it has not been possible to complete the micro-simulation (VISSIM) modelling, or the detailed modelling of the full extent of the identified study area junctions for the completed transport modelling scenarios. However, all of the embedded mitigation junctions have been modelled in detail with the DS3A traffic flows, along with key junctions on the B4030 Middleton

Stoney Road corridor from the wider study area, where it is concluded that additional mitigation measures may be appropriate.

1.8 Therefore, this Stage 3 Transport Modelling Interim Report presents the outcomes of the detailed assessment of the study area junctions completed to date, using industry standard assessment tools in the 2034 Completion Year (DS3A scenario). The impact of the STS and Framework Travel Plan will be to reduce single occupancy vehicle (SOV) trips associated with the Proposed Development, and therefore residual traffic impact will be reduced from those present in this report. That impact will be assessed, and work is ongoing and will be reported in the final Transport Assessment.

Report structure

1.9 The report is structured as follows:

- Section 2 presents the study area for detailed assessment and discusses the traffic flows for detailed assessment.
- Section 3 presents the results of the detailed modelling to confirm that the embedded Highway Works would operate acceptably and that they provide the required access to the Proposed Development.
- Section 4 presents the interim results of the detailed modelling of the wider study area and identifies the potential for additional mitigation works on the B4030 Middleton Stoney Road corridor.

2.0 STAGE 3 TRANSPORT MODELLING

Approach to the Stage 3 transport modelling

2.1 The Stage 3 Transport Modelling will involve detailed junction modelling of the study area junctions using industry standard software. The detailed junction modelling will use the peak hour traffic flows output from the Stage 2 Transport Modelling (the BTM strategic modelling).

2.2 The agreed assessment years and scenarios to be tested in the BTM are as follows:

1. **DfT Circular 01/2022 Compliant Scenario**: used for assessment of the impact on the SRN (in the opening year with 100% of the development and all embedded highway mitigation).
2. **2031 Opening Year**: opening year assessment for the ES, with first phase of the development and first phase of embedded mitigation works, used to demonstrate the suitability of proposed first phase of development on both the SRN and OCC network, and for use in the ES.
3. **2034 Completion Year**: completion year assessment for the ES, with all development and all embedded mitigation works, used for ES year of completion assessment (worst case for air quality and noise assessment), and assessment of impacts on OCC's network in year of completion.
4. **2042 Future Year (Sensitivity Test)**: end of Local Plan period, for information only.

2.3 It is agreed with the TWG that scenarios 2, 3 and 4 will be assessed with and without the Framework Travel Plan.

2.4 To date, the Stage 2 BTM modelling for the 2034 Completion Year scenarios for the Reference Case (RC3A) and Do Something case (DS3A) without the effects of the Travel Plan have been completed, and the detailed modelling presented in this technical note is based on the morning and evening peak hour traffic flows from the BTM for these scenarios.

2.5 However, once the Stage 2 BTM modelling for the full suite of agreed scenarios is complete, the detailed modelling will be updated to include all relevant scenarios with and without the impact of the modal shift targets and taking account of the DfT Circular 01/2022 Compliant scenario being the applicable scenario for assessment of the SRN junctions.

2.6 Assessment of the M40 Junction 10 junction complex, including the A43 Baynard's Green junction, the Ardley Bypass and the Principal Site Access junction, will be undertaken using micro-simulation (VISSIM). Work to complete the 2034 RC3A and 2034 DS3A VISSIM modelling is well progressed, though it will not be available in time for the statutory consultation.

Study area

2.7 As presented in in the Stage 2 Transport Modelling report, the study area proposed for the Stage 3 traffic modelling is reproduced at **Figure 1**.

2.8 There are 24 junctions in total, with junctions 1 to 7 encompassing the embedded highway mitigation and access strategy. The remaining junctions make up the wider study area and are to be assessed so that any residual impacts due to the Proposed Development and the embedded mitigation are understood.

Proposed study area junctions	
No.	Junction
1	Baynards Green roundabout
2	M40 Junction 10
3	Site access
4	HPLR/B430 T-junction
5	B430/MSRR T-junction
6	MSRR/B4030 roundabout
7	M40 Junction 9
8	B430/B4030 Middleton Stoney crossroads
9	Upper Heyford/Chilgrove Drive/Camp Road junction
10	Middleton Stoney Road/Empire Road
11	B4030 Middleton Stoney Road/Howes Lane roundabout
12	Middleton Stoney Road/Shakespeare Drive roundabout
13	Middleton Stoney Road/Kings End/Oxford Road
14	A41 Oxford Road/Vendee Drive roundabout
15	A41 Oxford Road/Oxford Road/A41 east
16	A4095 Southwolds Lane/Fringford Road
17	A4260 Oxford Road/B4030 signal controlled crossroads
18	Banbury Road/B4027 T-junction
19	Banbury Road/Upper Campsfield Road T-junction
20	A4095 Bunkers Hill/Lince Lane T-junction
21	Barley Mow roundabout
22	A43/Brackley Road roundabout
23	A43/Brackley Bypass roundabout
24	A421/Buckingham Road roundabout

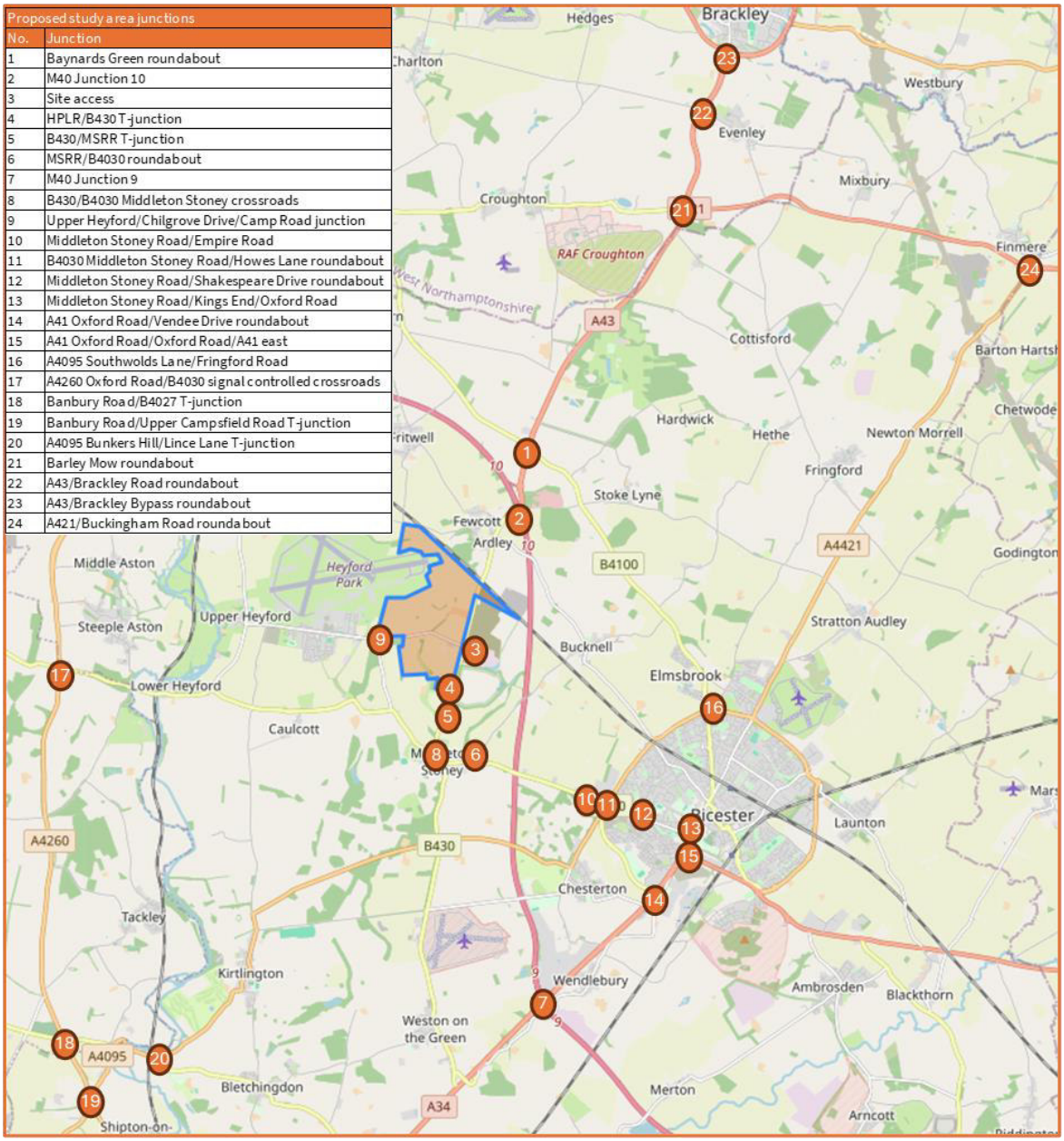


Figure 1: study area for Stage 3 Transport Modelling

Establishing the embedded transport infrastructure

2.9 Junctions 1 to 7 of the study area make up what is termed the embedded Highway Works. The extensive work undertaken during Stage 1 of the agreed transport modelling methodology enabled the embedded Highway Works proposals that form the comprehensive access strategy for the Proposed Development to be identified and agreed in principle with the TWG.

2.10 Section 3 of the Stage 2 Transport Modelling report provides a comprehensive synopsis of how the embedded Highway Works and access strategy has been identified and agreed. That detail will not be reproduced here.

2.11 The proposed Highway Works are illustrated on the Highway Works Overview Plan provided at **Appendix A** and the Highway Plans General Arrangement (**DCO Documents 2.7A to 2.7E**).

Traffic flows for detailed assessment

2.12 The morning and evening peak hour traffic flows for detailed modelling of the study area junctions in the RC3A and DS3A scenarios have been extracted from the BTM by Tetra Tech.

2.13 The peak hour traffic flows for the micro-simulation (VISSIM) modelling of the Baynard's Green, M40 Junction 10, Ardley Bypass and Principal Site Access network have been provided in matrix format, and these are provided at **Appendix B**. These peak hour flow matrices provide the traffic flow data used in the LinSig modelling of the A43 Baynard's Green junction and M40 Junction 10 network included in this interim report.

2.14 BTM morning and evening peak hour traffic flows for the RC3A and DS3A scenarios for the wider study area junctions have been provided by Tetra Tech in HTML format.

3.0 DETAILED JUNCTION MODELLING – EMBEDDED HIGHWAY WORKS

A43 Baynard's Green and M40 Junction 10 (junctions 1 and 2)

3.1 Ensuring good access to the SRN is a prerequisite for the proposed OxSRFI development. Since it was established in November 2020, the Applicant has worked closely with the TWG to agree key components of the transport measures required to support an application for OxSRFI via the Development Consent Order process. This included significant work on the form and layout of the highway access strategy for the site, identifying that the provision of significant improvements to M40 Junction 10, including the A43 Baynard's Green junction, would be required to accommodate the traffic from the Proposed Development.

3.2 As discussed in the Stage 2 Transport Modelling report, it has been agreed with the TWG that the assessment scenarios on which the assessment of the transport effects of the Proposed Development will be examined should include the Albion Land[1] development and the associated highway works at A43 Baynard's Green junction. However, the Albion Land scheme does not yet have a decision notice, and therefore, until and unless, planning permission pursuant to that scheme is obtained, it is also appropriate with regards to the layout and operation of the A43 Baynard's Green junction to also consider the relevant scenario without the Albion Land development. In this way, the DCO will include for a range of options at the A43 Baynard's Green to allow for the following situations:

- The Albion Land scheme does not receive planning permission.
- The Albion Land scheme does receive planning permission(s) but has not yet commenced construction of the works at the A43 Baynard's Green junction in accordance with the planning permission(s) for that scheme.
- The works at the A43 Baynard's Green junction in accordance with the planning permission(s) for the Albion Land scheme have been completed or have commenced construction.

3.3 The proposed upgrades to the A43 Baynard's Green junction and M40 Junction 10 are detailed within the preliminary design pack prepared by BWB and issued to National Highways in August 2025. A copy of the Design Strategy Record (DSR) is provided at **Appendix C**. Note that the proposed arrangement for the A43 Baynard's Green junction included in the DSR and on the Highway Plans General Arrangement drawings reflects the layout for that junction that is proposed should the Albion Land scheme not receive formal planning permission.

3.4 However, the Stage 2 BTM modelling that has been completed is the RC3A and DS3A scenarios, includes the Albion Land scheme at the A43 Baynard's Green junction in the RC3A scenario, and the proposed 'Baynard's Green GA Option 28A Alternative Scheme' (**Appendix D**) in the DS3A scenario.

3.5 The RC3A and DS3A Stage 2 BTM modelling work is complete, with modelling of the remaining scenarios ongoing. The RC3A and DS3A modelling outputs, which are the 2034 Completion Year, assess the impact of the completed development and associated embedded Highway Works including for the Albion Land scheme and the highway works at the A43 Baynard's Green junction that are associated with that scheme. The TA will consider and set out alternative options for the A43 Baynard's Green junction to account for the above situations, as is relevant.

[1] Albion Land scheme (planning applications references 21/03268/OUT, 21/03267/OUT, and 21/03266/F)

3.6 As part of the Stage 1 Transport Modelling process, work was undertaken to prepare network models in LinSig such that the model could be used as a design tool to assist the evolution of the proposals and also enable an assessment of the proposals in terms of journey times through M40 Junction 10 and the A43 Baynard's Green junction, and examine the operation of the junction.

3.7 The network LinSig models were prepared for the Reference Case and the Do-Something scenarios as they emerged, including the Baynard's Green roundabout and the full complex of junctions that make up M40 Junction 10 (Padbury roundabout, Cherwell roundabout and Ardley roundabout). The Reference Case and Do-Something models includes the committed Growth Deal improvement scheme at the Padbury junction and has subsequently been updated to include the Albion Land improvement scheme at Baynard's Green and the eastern Albion Land site access junction[2].

3.8 Both the Reference Case and Do-Something models are built on agreed principles regarding saturation flows, phase/stage structures and intergreens. These models have been audited on multiple occasions by Aecom on behalf of National Highways and are suitable to be used in this interim Stage 3 transport modelling report.

3.9 Assessment of the M40 Junction 10 junction complex, including Baynards Green, the Principal Site Access and the Ardley Bypass, will ultimately be undertaken using micro-simulation (VISSIM) and the appropriate DfT Circular 01/2022 compliant modelling scenarios. However, that work is ongoing – and is dependent on the availability of the Circular 01/2022 compliant modelling - and hence is not yet complete.

3.10 Therefore, to further the Stage 3 Transport Modelling in advance of the VISSIM modelling, the performance of the M40 Junction 10 and Baynard's Green network completion year Reference Case and Do-Something scenarios have been assessed using the above described LinSig models, with the 2034 RC3A and DS3A morning and evening peak hour traffic flows provided at **Appendix B**. The 2034 RC3A LinSig model report is provided at **Appendix E**, and the 2034 DS3A LinSig model report is provided at **Appendix F**.

3.11 As previously agreed with the TWG, the assessment of the performance of M40 Junction 10 and Baynard's Green has been undertaken and considers journey time and operational capacity. Further to the above, a merge/diverge assessment at M40 Junction 10 has been undertaken.

Journey time

3.12 In reaching agreement in principle on the embedded highway works at Baynard's Green and M40 Junction 10, an analysis of journey times across these junctions was undertaken using outputs from the agreed LinSig models. Journey times on key routes across the SRN and Oxfordshire highway networks for the Reference Case scenario were compared against the Do-Something scenario. Tables were provided to show the comparative differences in terms of average journey time per pcu in seconds. A second metric for total journey in pcuHr, which is the aggregate time taken by traffic travelling on each route, was also used on routes where no changes in traffic flow were anticipated.

3.13 The same methodology is adopted for assessing the change in journey times due to the agreed Baynard's Green and M40 Junction 10 proposals in the 2034 RC3A and DS3A scenarios. However, the total journey in pcuHr metric is no longer provided as the traffic flow changes from the BTM

[2] The eastern site access junction is included as it is a signal-controlled T-junction and it location means there is potential for interaction with the operation of the A43 Baynard's Green junction.

RC3A and DS3A scenarios includes background traffic reassignment, rendering this metric unsuitable as a method for fairly comparing changes in journey time. Journey times will however be considered further as part of the VISSIM assessment.

3.14 The tables below compare journey times across the network in the 2034 RC3A and DS3A scenarios for the respective morning peak and evening peak hours.

Key route journey time comparison for 2034 DS3A vs RC3A - morning peak				
From	To	DS3A average journey (s)	RC3A average journey (s)	Difference (s)
A43 north of Baynards Green	M40 south	169	198	-29
M40 south	A43 north of Baynards green	181	181	0
A43 north of Baynards Green	B430 (or Ardley Bypass)	173	275	-102
B430 (or Ardley Bypass)	A43 north of Baynards green	210	226	-16
M40 south	B430 (or Ardley Bypass)	116	147	-31
B430 (or Ardley Bypass)	M40 south	160	231	-71
M40 north	B430 (or Ardley Bypass)	144	235	-92
B430 (or Ardley Bypass)	M40 north	78	143	-65
M40 north	MSA	81	124	-42
M40 south	MSA	122	133	-12
MSA	M40 south	104	84	20
MSA	M40 north	112	92	20
MSA	A43 north of Baynards green	250	138	113
B4100 east	B4100 west	96	96	0
B4100 west	B4100 east	71	61	10
		Net change		**-296**

Key route journey time comparison for 2034 DS3A vs RC3A - evening peak				
From	To	DS3A average journey (s)	RC3A average journey (s)	Difference (s)
A43 north of Baynards Green	M40 south	161	179	-18
M40 south	A43 north of Baynards green	184	218	-34
A43 north of Baynards Green	B430 (or Ardley Bypass)	178	240	-63
B430 (or Ardley Bypass)	A43 north of Baynards green	205	245	-40
M40 south	B430 (or Ardley Bypass)	101	166	-65
B430 (or Ardley Bypass)	M40 south	145	230	-86
M40 north	B430 (or Ardley Bypass)	147	193	-46
B430 (or Ardley Bypass)	M40 north	79	143	-65
M40 north	MSA	79	97	-18
M40 south	MSA	118	148	-30
MSA	M40 south	82	83	0
MSA	M40 north	87	86	1
MSA	A43 north of Baynards green	221	151	69
B4100 east	B4100 west	102	118	-17
B4100 west	B4100 east	69	83	-14
		Net change		**-423**

3.15 The tables below provide an overall summary of the total average journey time on all assessed routes and compares this sum of the average journey times across the assessed routes for the RC3A and DS3A scenarios.

Period	Average journey time (sum of all routes)					
	DS3A		RC3A		Difference (DS3A - RC3A)	
	seconds	minutes	seconds	minutes	seconds	minutes
AM Peak	2,066	34	2,362	39	-296	-5
PM Peak	1,957	33	2,380	40	-423	-7

3.16 The journey time comparison above shows that in the 2034 DS3A Completion Year, the embedded highway mitigation works would reduce journey times across the assessed network when compared to the 2034 RC3A scenario.

3.17 As shown, there would be some increases in journey times for drivers leaving the Cherwell Valley Motorway Service Area (MSA) during morning and evening peak hours. This is principally due to the introduction of additional signal control stop lines, and for the MSA to A43 northbound movement, the requirement for traffic to travel via Ardley Roundabout. Further, journey times for vehicles arriving at the MSA from the M40 north and south of Junction 10 are improved with the embedded highway works in place.

Operational capacity

3.18 The tables below provide a comparison between the forecast capacity at the future baseline 2034 RC3A at M40 Junction 10 and the A43 Baynard's Green junction (with Padbury Roundabout Housing Growth Deal improvements and Albion Land, no OxSRFI development), with the forecast operating capacity at the junctions in the 2034 DS3A scenario (with the OxSRFI development and embedded Highway Works).

3.19 As shown, the A43 Baynard's Green, Cherwell and Ardley junctions would be over capacity in the 2034 future baseline (RC3A) scenario in at least one of the peak hour periods. These junctions would therefore require improvement to facilitate background growth to 2034 and to accommodate the proposed OxSRFI development.

3.20 The 2034 RC3A scenario includes the committed Housing Growth Deal improvement scheme at the Padbury Roundabout, and hence this junction is shown to operate within capacity in the 2034 Reference Case assessment year.

3.21 The tables demonstrate that the embedded Highway Works in the 2034 DS3A scenario offer sufficient capacity enhancements to accommodate background traffic growth up to 2034 and the OxSRFI development traffic. Additionally, there would be improvement in operating capacity at all three M40 J10 junctions, particularly at the Ardley roundabout, and at the A43 Baynard's Green junction.

Baynards Green Roundabout Capacity Results				
Scenario	Peak hour	Cycle time	Practical Reserve Capacity	Total delay (PCUhr)
2034 RC3A	AM	N/A	-1.2%	37.7
	PM	N/A	-6.1%	50.8
2034 DS3A	AM	60	0.3%	45.4
	PM	60	3.1%	47.4

Albion Land Eastern Access Capacity Results				
Scenario	Peak hour	Cycle time	Practical Reserve Capacity	Total delay (PCUhr)
2034 RC3A	AM	60	21.8%	6.3
	PM	60	6.1%	7.8
2034 DS3A	AM	60	51.4%	4.8
	PM	60	35.9%	4.8

Padbury Roundabout Capacity Results				
Scenario	Peak hour	Cycle time	Practical Reserve Capacity	Total delay (PCUhr)
2034 RC3A	AM	60	2.6%	20
	PM	60	9.1%	22.5
2034 DS3A	AM	60	12.5%	38.5
	PM	60	8.8%	43.0

Cherwell Roundabout Capacity Results				
Scenario	Peak hour	Cycle time	Practical Reserve Capacity	Total delay (PCUhr)
2034 RC3A	AM	60	-10.4%	47.6
	PM	60	2.8%	23.9
2034 DS3A	AM	60	1.4%	27.9
	PM	60	19.7%	17.0

Ardley Roundabout Capacity Results				
Scenario	Peak hour	Cycle time	Practical Reserve Capacity	Total delay (PCUhr)
2034 RC3A*	AM	N/A	1.7%	7.8
	PM	N/A	-7.7%	18.5
2034 DS3A	AM	60	54.3%	13.3
	PM	60	25.8%	15.4

* priority controlled roundabout

Merge and diverge assessment

3.22 Merge and diverge assessments in accordance with DMRB CD 122 have been undertaken for each of the merges and diverges at M40 Junction 10 including the new free-flow link connection from the M40 to Padbury (referred to as J10A). This is reported at Sections 4 to 8 of the DSR at **Appendix C**. This assessment in the DSR is based on the Circular 01/2022 compliant scenario in the 2031 design year but uses the DS1 SRN traffic flows (i.e. without the Albion Land development). The findings are therefore preliminary and will be updated in due course to use the 2031 DS1A SRN scenario (with Albion Land).

3.23 A summary of the findings and proposed layouts are given in the table below.

Merge/Diverge	Proposed layout	Compliant with standards?	Commentary
NB Ardley diverge	A1 (taper)	Yes	The existing Layout A option 1, 2-lane taper layout is to be retained
NB diverge (J10A) to Padbury	A1 (taper)	No	A lane drop is not proposed as 4 lanes are not proposed upstream. Due to the bridges only four lanes can be provided at this point. A Layout A option 1, 2-lane taper is to be provided. This could be adapted into a Layout C in future should a fourth lane be added to the M40.
NB merge	B (auxiliary lane)	Yes	The J10 northbound merge is to be relocated, and a Layout B auxiliary lane merge provided
SB diverge	A1 (taper)	Yes	The existing Layout A option 1, layout is to be retained
SB merge	Layout E Option 3 (auxiliary lane)	See commentary	A lane gain on motorway is not proposed as part of this scheme. As this is an existing slip road and not a new element, the relaxations under CD 122 section E/1 apply and a Layout E option 3 would be provided. A departure from standard is however needed for the cross-section at the end of the merge taper to provide a discontinuous hard shoulder under the Ardley Road bridge.

3.24 It is considered that the departure from standard needed for the northbound (J10A) diverge to Padbury and the southbound merge are justifiable for the following reasons:

- An additional lane between M40 Junctions 9 and 10 cannot be provided as part of the scheme; and
- Retention of the Ardley Road bridge.

Principal Site Access gyratory (junction 3)

3.25 The proposed Principal Site Access junction is shown on the Highway Plans General Arrangement **Document 2.7C**, with an extract of the general arrangement provided at **Figure 2** below. The junction is a partially traffic signal controlled gyratory, with the OxSRFI site access and Ardley Bypass approaches to operate under traffic signal control in simple two-stage nodes. The B430 northbound approach would operate under priority control. The left-turn from the site would be provided via a free-flow link, as part of the agreed access strategy, with a height restriction on the right turn movement from the site access preventing HGVs from travelling south on the B430.

3.26 The design also provides improve connectivity for pedestrians and cyclists as part of the Sustainable Transport Strategy, with a staggered Toucan crossing on the site access arm.

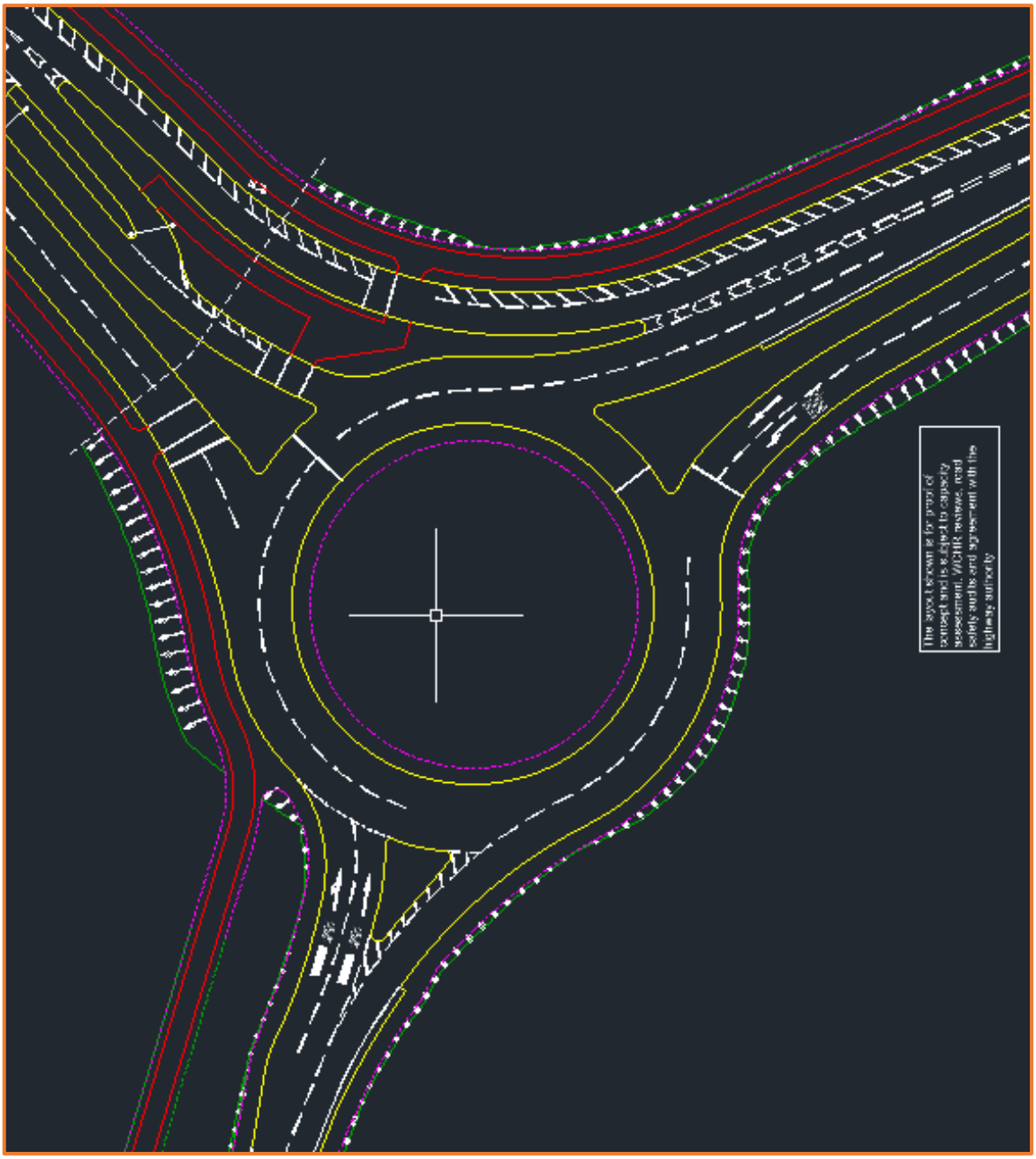


Figure 2: the Principal Site Access gyratory

3.27 The junction has been modelled in LinSig using the 2034 DS3A traffic flows for the morning and evening peak hours. The table below provides a summary of the results and a copy of the LinSig assessment is provided at **Appendix G**.

Site access				
Scenario	Peak hour	Cycle time	Practical Reserve Capacity	Total delay (PCUhr)
2034 DS3A	AM	40	15.0%	7.3
	PM	40	58.7%	7.3

3.28 As shown, the practical reserve capacity (PRC) is positive indicating that all links are operating less than 90% saturated and therefore the proposed site access arrangement would satisfactorily accommodate the 2034 DS3A traffic flows.

B430/HPLR and B430/MSRR junctions (junctions 4 and 5)

B430/HPLR traffic signal controlled T-junction

3.29 The design evolution of the B430/HPLR junction is set out in the Middleton Stoney Relief Road and Heyford Park Link Road Junction Options Report (ref. OxSRFI-ADC1794-RP-R-V3 'MSRR HPLR JOR').

3.30 The agreed form of the B430/HPLR junction would be a traffic signal controlled T-junction. One of the major influences on the design process was the alignment of the HPLR approach and the requirement to reduce the distance between the B430/HPLR and B430/MSRR junctions as much as possible to enable good co-ordination and limit queue lengths. The optimum solution was to change the priority of the B430 (north) and HPLR approaches such that the B430 (north) forms the minor arm at the T-junction, as shown on the Highway Plans General Arrangement **Document 2.7D**. An extract of the general arrangement is provided at **Figure 3** below.

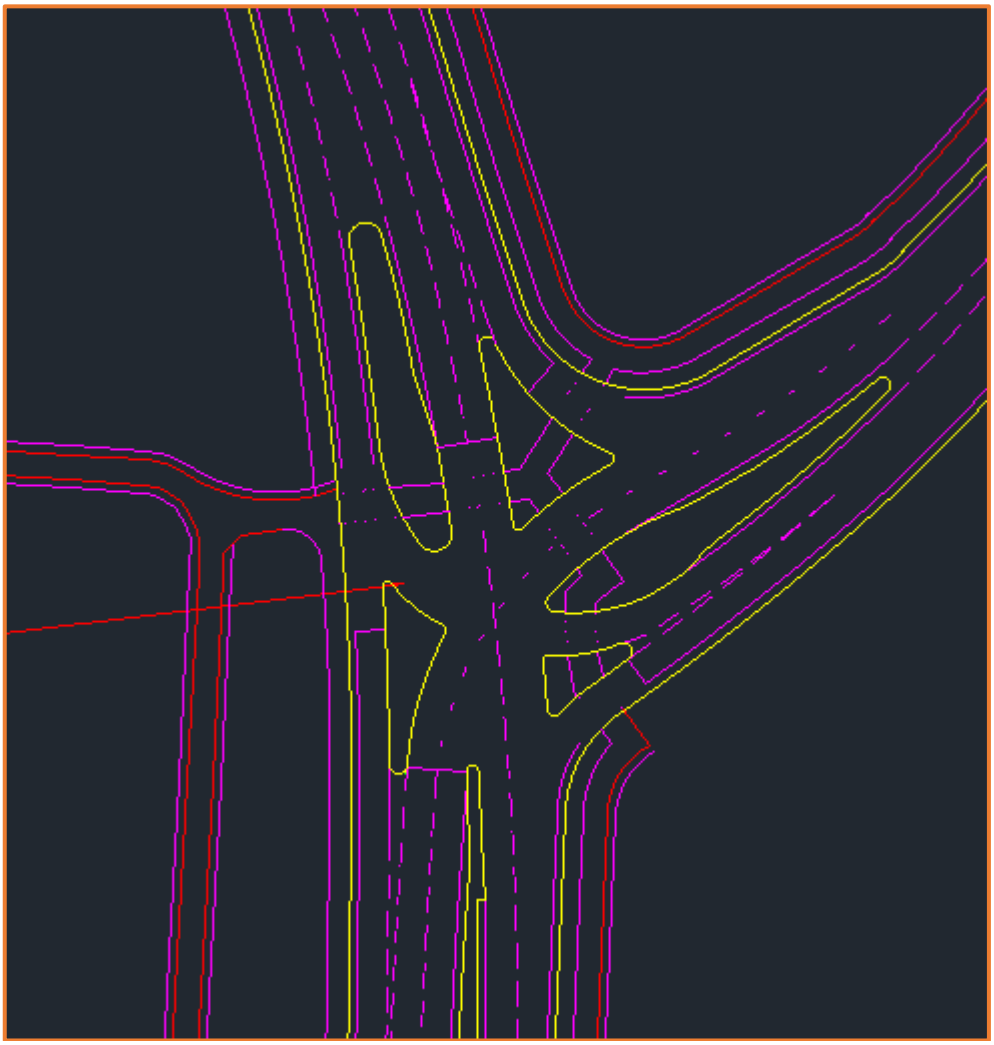


Figure 3: B430/HPLR traffic signal controlled T-junction

3.31 The proposed junction has been designed to efficiently facilitate movements between the B430 south (and therefore the MSRR) and both the B430 north and the HPLR. The design also improves connectivity for pedestrians and cyclists as part of the wider strategy for sustainable transport provision, with Toucan crossings on the HPLR north and B430 east arms. The junction would have four stages as shown in **Figure 4** below.

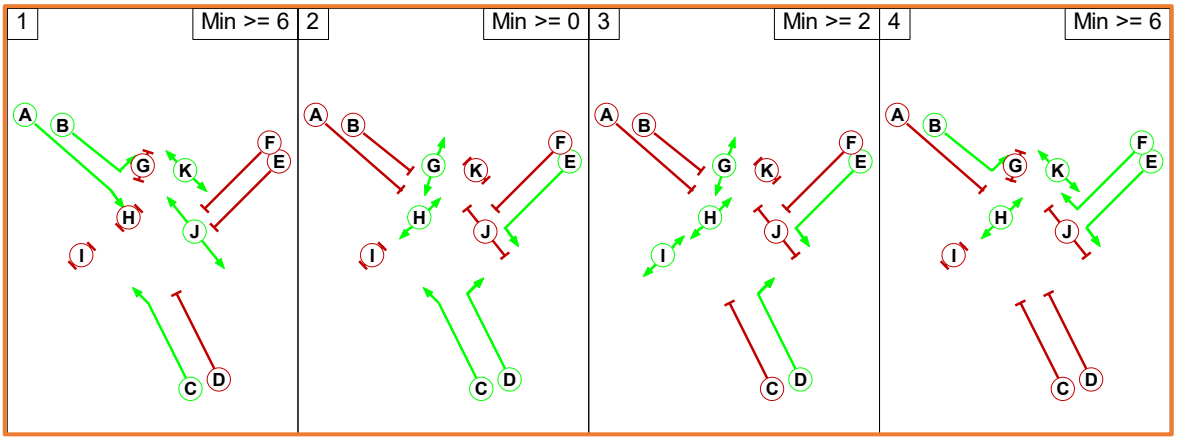


Figure 4: proposed B430/HPLR stage arrangement

3.32 The main traffic movements are provided for in a standard three stage sequence, with pedestrian/cycle crossings provided for as 'walk with traffic'. An additional demand-dependant stage (stage 3) is provided to facilitate pedestrian movements on the HPLR northbound exit. Additional left-turn filter phases are provided within the phase/stage strategy to increase efficiency. The stages are described as follows:

- Stage 1: B430 south ahead and HPLR ahead and left
- Stage 2: B430 south ahead and right-turn, B430 north left-turn filter
- Stage 3: a demand-dependant alternate stage to stage 2 that would only be called by the Toucan crossing phase I.
- Stage 4: B430 north left and right turns, HPLR left-turn filter.

B430/MSRR traffic signal controlled T-junction

3.33 The development of the B430/HPLR junction is set out in the *Middleton Stoney Relief Road and Heyford Park Link Road Junction Options Report* (ref. OxSRFI-ADC1794-RP-R-V3 'MSRR HPLR JOR').

3.34 The proposed form of the B430/MSRR junction would be a traffic signal-controlled T-junction with a Toucan crossing facility across the southern B430 arm, as shown on the Highway Plans General Arrangement **Document 2.7E**. An extract of the general arrangement is provided at **Figure 5**.

3.35 The proposed junction has been designed to maximise the effectiveness of the MSRR in reducing traffic volumes through the centre of Middleton Stoney. To achieve this, the junction has been designed to prevent the right-turn from the B430 south to the MSRR and the left-turn from the MSRR to the B430 south. Consequently, banning these movements allows the left-turn from the B430 north to the MSRR to be free-flow and the junction would operate in two simple stages, significantly minimising delay for traffic using the MSRR.

3.36 The design also improves connectivity for pedestrians and cyclists as part of the wider strategy for sustainable transport provision, with Toucan crossings provided on the B430 southern arm and an equestrian crossing on the southern B430 southern arm.

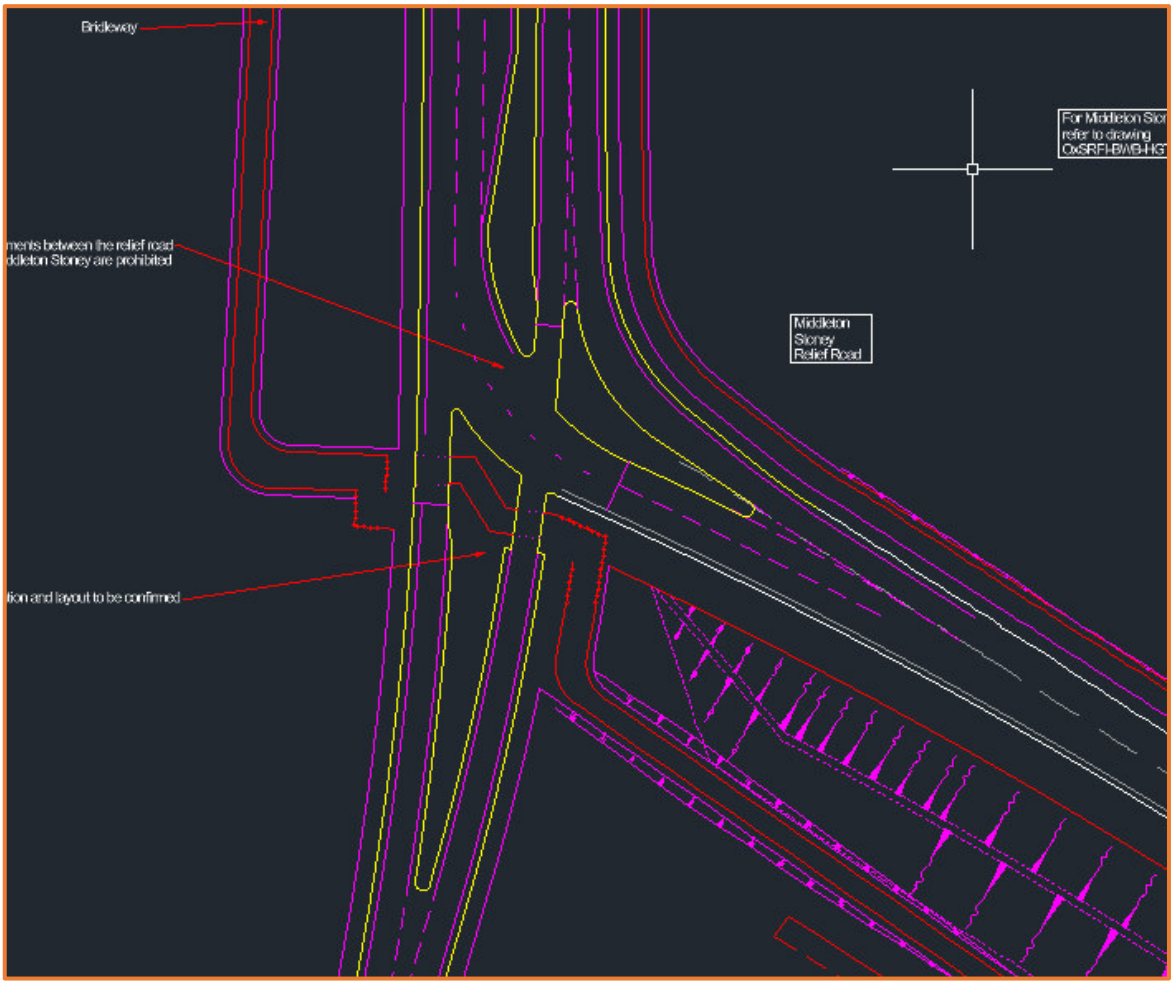


Figure 5: B430/MSRR traffic signal controlled T-junction

3.37 The stage arrangement is shown at **Figure 6** below, and is described as follows:

- Stage 1: B430 north (phase A) and B430 south (phase C) ahead.
- Stage 2: MSRR right-turn (phase B), B430 south Toucan crossings (phases D and E).

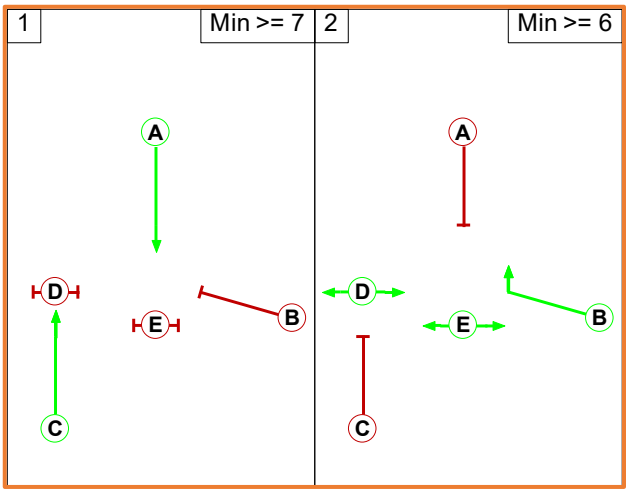


Figure 6: proposed B430/MSRR junction stage arrangement

B430/HPLR junction and B430/MSRR network LinSig model

3.38 To demonstrate that the proposed B430/MSRR and B430/HPLR junctions would operate acceptably together with no adverse issues due to exit blocking, a network model has been

created in LinSig. The network model has been tested with the 2034 DS3A traffic flow scenario for the morning and evening peak hours. The network model runs a 60 second cycle time in both morning and evening peak hours and the stage sequences described above are retained. The LinSig model report is provided at **Appendix H** and the results are summarised below.

B430/Heyford Park Link Road/Middleton Stoney Relief Road Network Results				
Scenario	Peak hour	Cycle time	Practical Reserve Capacity	Total delay (PCUhr)
2034 DS3A	AM	60	22.0%	20.11
	PM	60	7.7%	22.51

3.39 As shown, the PRC is positive indicating that all links are operating less than 90% saturated and therefore the proposed site access arrangement would satisfactorily accommodate the 2034 DS3A traffic flows. In terms of internal mean maximum queueing between the two junctions, the detailed results provided at **Appendix H** show that the longest northbound queue (on approach to the B430/HPLR junction) would be 7.8 pcus (c. 48m) and the longest southbound queue (on approach to the B430/MSRR junction) would be 2.6 pcus (c. 16m). There is approximately 200m between the two junctions (which could accommodate circa 33 pcus) and therefore the queuing could be satisfactorily accommodated without negatively effecting overall performance.

B4030/MSRR roundabout (junction 6)

3.40 To provide a junction which can accommodate both the new MSRR and the existing Middleton Road, a four-arm roundabout option is proposed as shown the Highway Plans General Arrangement **Document 2.7E**. An extract of the general arrangement is provided at **Figure 7**.

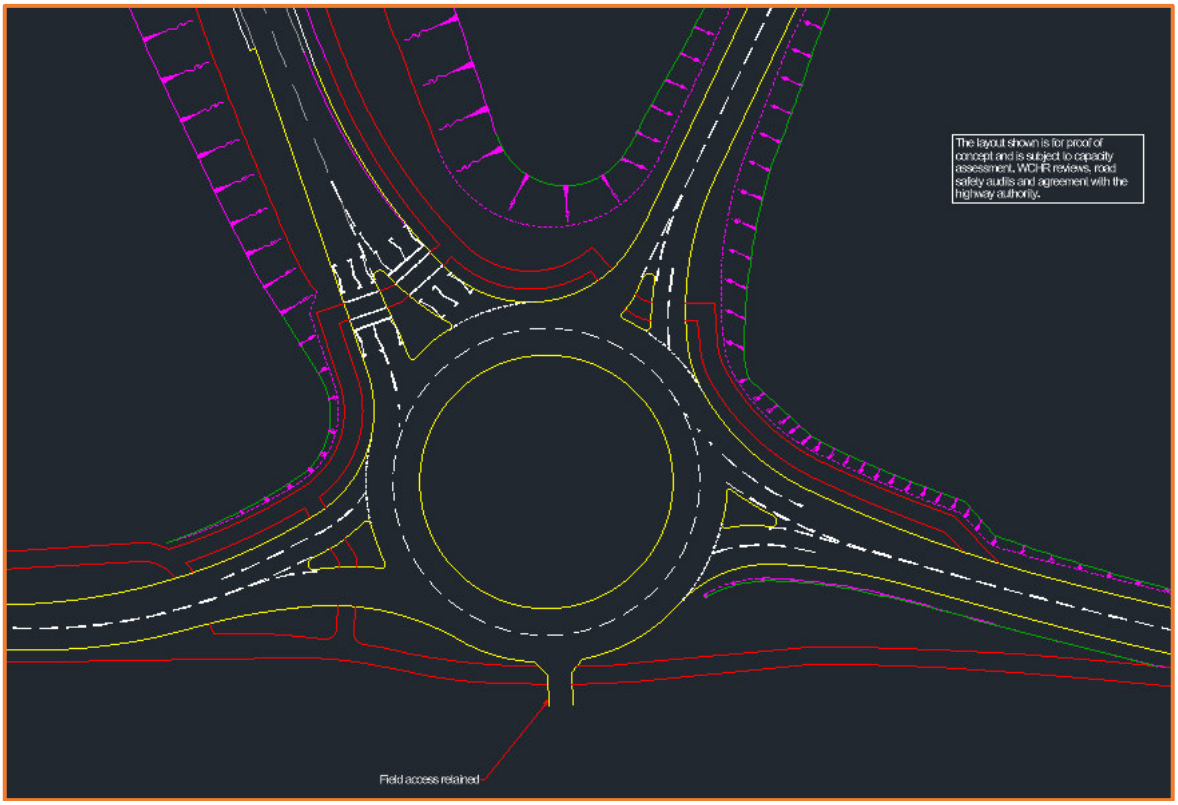


Figure 7: B4030/MSRR 4-arm roundabout

3.41 The roundabout has an inscribed circle diameter (ICD) of 60 metres. All approaches to the junction flare to two lanes, and there are two circulating lanes. There are two exit lanes on the

B4030 east and MSRR arms. The existing field access located opposite the existing B4030/Middelton Road T-junction is provided for via a private access to the south of the roundabout.

3.42 The design improves connectivity for pedestrians and cyclists as part of the wider strategy for sustainable transport provision, with Toucan crossings provided on the MSRR arm and uncontrolled crossings on the B4030 west and the Middleton Road arms.

3.43 The operation of the roundabout was modelled in the ARCADY module of Junctions 9 using the morning and evening peak hour traffic flows for the DS3A scenario. A summary of the ARCADY results is shown below, with the full results provided at **Appendix I**.

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	proposed roundabout layout - DS3A							
1 - B4030 (W)	0.4	4.60	0.29	A	0.3	3.79	0.20	A
2 - MSRR	1.4	5.06	0.58	A	1.1	4.47	0.53	A
3 - Middleton Road	0.2	4.65	0.16	A	0.1	4.08	0.09	A
4 - B4030 (E)	3.0	9.85	0.75	A	4.9	14.50	0.84	B

3.44 The modelling demonstrates that in the 2034 DS3A morning and evening peak hour scenarios, the roundabout is forecast to operate acceptably, with a ratio of flow to capacity (RFC) below 85% for all movements.

M40 Junction 9 (junction 7)

3.45 The improvement scheme at M40 Junction 9 is shown at the Highway Plans General Arrangement **Document 2.7D**. An extract is shown on **Figure 8** on the next page.

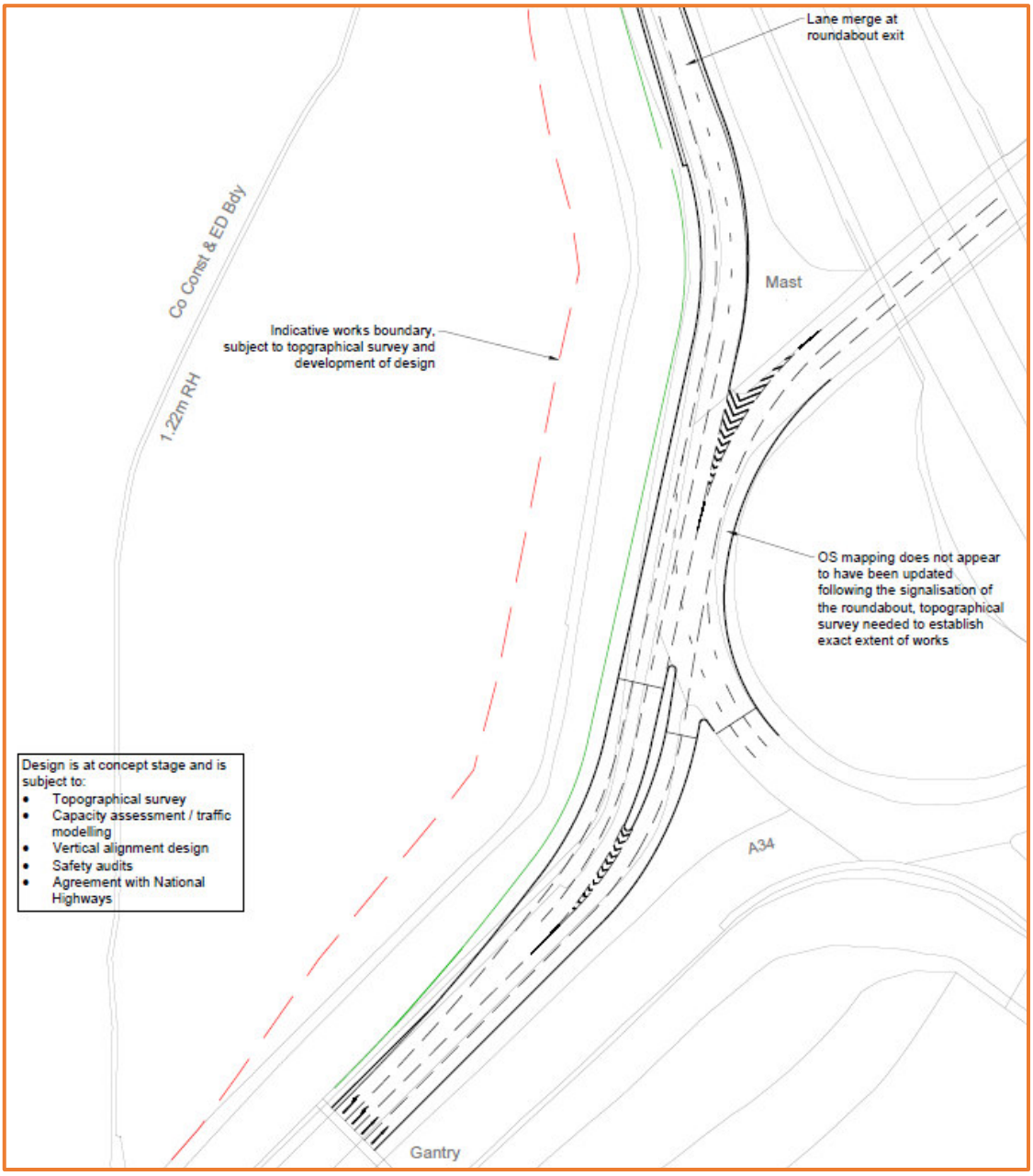


Figure 8: proposed M40 Junction 9 improvement scheme

M40 Junction 9 third-party proposed improvement scheme

3.46 Planning application (ref. 25/00284/F) is for the erection of 9 additional employment units located to the north, east and west of the consented Siemens Healthineers development, north of the A41, east of M40 Junction 9. This site forms part of the employment allocation in the draft Cherwell Local Plan 2042.

3.47 Included with the planning application is a proposed improvement scheme at M40 Junction 9. That scheme includes additional left-turn lanes at the M40 Junction 9 SB and A41 approaches, as shown on the drawing provided at **Appendix J**. The mitigation scheme (developed by SLR) has been developed with input from National Highways and is agreed in principle, subject to review of the detailed modelling presented in the Transport Assessment and RSA for that application.

3.48 The draft Cherwell Local Plan 20432 also sets out a requirement as part of the draft allocation for a mitigation scheme at M40 Junction 9. Therefore, given the in-principle support for the scheme from National Highways, it was agreed with the TWG that there is strong enough certainty of the

improvement scheme at M40 Junction 9 becoming committed that it should be included within the 2034 RC3A model runs, and therefore it is also included in the DS3A scenario.

3.49 As part of the Transport Assessment work undertaken to support the planning application, SLR prepared a LinSig model of the existing layout of M40 Junction 9. As reported in that work, the LinSig model was calibrated and validated using survey data and on-site measurements of saturation flows, green-times. The LinSig model was adapted to represent the proposed mitigation scheme shown at **Appendix J**.

LinSig modelling results

3.50 The SLR LinSig model of the future baseline junction arrangement at M40 Junction 9 has been recreated and run with traffic flows extracted from the BTM for the 2034 RC3A scenario.

3.51 The cycle times from the SLR model have been retained and only minor changes to the green times have been made to account for variance in the traffic data. The LinSig model results for the future baseline junction with the RC3A traffic flows are provided in **Appendix K** and summarised in the table below.

Metric	2034 RC3A		2034 DS3A	
	AM Peak	PM Peak	AM Peak	PM Peak
PRC	-14.1%	-16.7%	-17.7%	-14.2%
Total delay (pcuHr)	176.29	157.72	168.34	116.12
A34 Degree of Saturation	102.7%	100.0%	97.7%	92.6%
A34 MMQ (pcu)	91.4	45.4	31.4	19.2
M40 SB MMQ (pcu)	27.6	19.8	58.8	23.3
A41 MMQ (pcu)	21.0	11.5	12.8	12.1
M40 NB MMQ (pcu)	7.1	31.9	7.1	26.8

* MMQ – mean maximum queue
* DoS – degree of saturation

3.52 The RC3A LinSig model for M40 Junction 9 has been modified to represent the proposed OxSRFI embedded Highway Works at M40 Junction 9 and modelled with the DS3A traffic flows. The LinSig model results for the proposed improvement scheme are provided in **Appendix L** and also summarised in the table above.

3.53 As shown in the table above, the PRC is negative in all modelled scenarios indicating that one or more links are operating above 90% saturated.

3.54 Comparing the 2034 RC3A and DS3A scenarios shows that the PRC reduces by 3.6% in the morning peak hour, due to increased congestion on the M40 southbound diverge, though the total delay at the junction reduces slightly. The volume of traffic on this approach increases materially in the DS3A scenario. This is mostly due to the significant upgrade of M40 Junction 10, and in particular the improvements to Cherwell roundabout and the southbound M40 merge, which release a known bottleneck, allowing more traffic onto the M40 southbound.

3.55 However, the results show that the performance of the A34 approach to the junction improves significantly in the DS3A morning peak hour, with a large reduction in queue length. The queue length also reduces on the A41 approach, as background traffic reassigns away from the A41 in the DS3A scenario.

3.56 In the evening peak hour, the overall performance of the junction is improved by 2.5% in the DS3A scenario when compared to the RC3A scenario in terms of both PRC and total delay. Importantly, there are material improvements to the degree of saturation and MMQ on the A34 approach.

3.57 Therefore, the performance of the M40 southbound diverge approach deteriorates in the morning peak hour due to the effects of the embedded mitigation proposals at M40 Junction 10 releasing a known bottleneck, allowing more traffic onto the M40 southbound. However, overall, there is no material change in the performance of Junction 9 in the DS3A scenario in the morning peak hour, with the mitigation proposals on the A34 helping to reduce congestion and queuing. In the evening peak hour, the overall performance of Junction 9 improves in the DS3A scenario, with reduced congestion and queue lengths on the A34 approach. Hence, the proposed embedded highway works mitigate the impact of the Proposed Development at the junction.

4.0 DETAILED JUNCTION MODELLING - WIDER STUDY AREA JUNCTIONS

Introduction

4.1 Work to model the wider study area is ongoing and will be reported in full in the TA.

4.2 However, the analysis of the DS3A scenario in the Stage 2 Transport Modelling report highlighted large traffic flows increases on the B4030 Middleton Stoney Road corridor between Vendee Drive and the MSRR. This is due to the Ardley Bypass, MSRR and HPLR aspects of the embedded Highway Works creating a faster, more direct route between Bicester, Heyford Park, the Proposed Development and M40 Junction 10 that draws traffic away from lower category or congested routes through local population centres, which is a positive effect of the embedded Highway Works.

4.3 However, this traffic reassignment increases traffic on the B4030 Middleton Stoney Road, and in turn, the roundabout with Vendee Drive is most significantly impacted, along with the Empire Road T-junction. The Stage 2 transport modelling showed material increases in the ratio of volume to capacity at these junctions (study area junctions 10 and 11). Hence, detailed assessment of these junctions has been undertaken.

4.4 The analysis in the Stage 2 Transport Modelling report also highlighted capacity issues on the A43 corridor north of the Baynard's Green junction in both the RC3A and the DS3A scenarios. However, understanding the issues on the A43 corridor is complex as the BTM modelling undertaken to date suggest that there is supressed demand for traffic to use this route. Therefore, assessment of the A43 corridor requires further analysis including the full suite of strategic modelling scenarios (including the relevant DfT Circular 01/2022 compliant scenarios). The effects of the OxSRFI development and the embedded Highway Works on the A43 will be considered separately in a future technical note.

B4030 Middleton Stoney Road/Empire Road (junction 10)

4.5 The B4030 Middleton Stoney Road/Empire Road junction is a priority-controlled T-junction with a right-turn ghost island facility for right-turning traffic, as shown on **Figure 9** below. The junction provides access into an employment development. To the west of the junction on the B4030 Middleton Stoney Road is an uncontrolled pedestrian crossing with a refuge island, providing pedestrian access to a bus stop on the southern side of the carriageway.



Figure 9: B4030 Middleton Stoney Road/Empire Road T-junction

4.6 A model of the junction was created using Junctions 9 PICADY software and was tested with the 2034 RC3A and DS3A traffic forecasts from the BTM. The results are provided at **Appendix M** and summarised below.

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	2034 RC3A							
Stream B-C	0.2	8.23	0.17	A	0.6	10.14	0.38	B
Stream B-A	0.1	17.38	0.07	C	0.3	21.83	0.25	C
Stream C-AB	0.5	10.41	0.35	B	0.2	7.14	0.18	A
	2034 DS3A							
Stream B-C	22.0	1601.86	2.09	F	24.1	381.46	1.28	F
Stream B-A	5.1	2035.01	1.96	F	9.3	452.22	1.23	F
Stream C-AB	0.7	14.98	0.43	B	0.3	9.36	0.22	A

Where: Arm A is the B4030 west, Arm B is Empire Road, and Arm C is the B4030 east

4.7 The results show the junction will operate within capacity during the morning and evening peak hours in the RC3A scenario, with the RFC across the junction below 85%. However, in the DS3A scenario the junction would be significantly over capacity in both peak hours, with Empire Road (Arm B) having a RFC above 100% in both peak hours, and Empire Road traffic experiencing queueing and delay. This deterioration in capacity on the Empire Road arm is due to the significant increases in traffic that is forecast in the BTM to use the B4030 Middleton Stoney Road corridor with the Proposed Development and embedded Highway Works in place.

4.8 This junction provides the only vehicular access to the employment site. However, as part of the wider access strategy for the North-West Bicester development, the northern part of the site will ultimately be served via a new access onto the Strategic Link Road. When that takes place, the existing road link between the southern and northern parts of the employment site will be closed and converted to landscaping. The southern part of the employment site would continue to be accessed from Empire Road.

4.9 Nevertheless, given the scale of the impact due to the Proposed Development, it is appropriate to consider a mitigation strategy to address this potential adverse impact.

4.10 Four options to provide additional mitigation to address the impact of the Proposed Development and embedded Highway Works at this junction are currently under consideration, as summarised below:

- **Option 1**: Upgrade the existing uncontrolled crossing on the B4030 to a traffic signal-controlled crossing and provide vehicle detection on Empire Road to call the crossing if a vehicle is stationary on the detector for a pre-determined amount of time. Calling a red signal on the crossing will stop the B4030 traffic and allow vehicles to exit Empire Road. This solution is low impact as it would leave the junction footprint untouched, other than changing the crossing to traffic signal-controlled and providing the vehicle detection. It therefore involves no new carriageway building. The detection would likely only be triggered at peak times when traffic flows on the B4030 were greatest, and the signal crossing would also improve the connectivity to the bus stop on the southern side of the road.
- **Option 2**: Upgrade the junction to traffic signal control with restricted movements. Preventing vehicles from turning right out of Empire Road would allow a traffic signalled controlled junction to operate with just two traffic light stages. Therefore, it would be

possible to upgrade the junction to a traffic signal controlled junction with a much smaller footprint as only one ahead lane in each direction on the B4030 Middleton Stoney Road would be required. It is understood that the employment site is already subject to a HGV routing strategy, which requires HGV traffic to turn right out the site. Any car drivers wishing to travel west from Empire Road could still do so by U-turning at the neighbouring roundabout, which is just 170m to the east. It is likely that some minor widening would be required to the B4030 and on Empire Road to facilitate the required splitter islands necessary to enforce the banned movement.

- **Option 3:** Upgrade the junction to an all-movement traffic signal-controlled T-junction. This would likely require two ahead lanes in each direction on the B4030 Middleton Stoney Road, with a right-turn lane and associated splitter islands, requiring more significant carriageway widening to accommodate the required junction footprint. The two ahead lanes would be necessary to ensure queues do not reach back to the neighbouring roundabout with Howes Lane.
- **Option 4:** the access strategy for the employment site is amended, such that the second point of access to the Strategic Link Road is retained for the southern section of the site. That way, development users exiting the site could do so via the Strategic Link Road.

4.11 At this stage Option 1 or Option 2 are the Applicant's preferred options. They will be considered in further detail, and discussed with OCC and the TWG, so that appropriate consideration can be given and a preferred solution agreed.

B4030 Middleton Stoney Road/Howes Lane roundabout (junction 11)

4.12 The B4030 Middleton Stoney Road/Howes Lane/Vendee Drive roundabout has four-arms, each with a single approach lane, flaring at the entry. There are uncontrolled crossings on all arms of the roundabout. The Howes Lane approach is to be realigned to provide the Strategic Link Road as part of the North-West Bicester committed development. The existing roundabout is shown at **Figure 10** below, with the consented Howes Lane realignment as part of the Strategic Link Road shown as an inset.

4.13 A model of the junction, with the Howes Lane realignment in place, was created using Junctions 9 ARCADY software with geometries measured from OS mapping. The model was tested with the 2034 RC3A and DS3A traffic forecasts from the BTM. The results are provided at **Appendix N** and summarised below.

	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
	2034 RC3A					
Arm 1	7.5	30.78	0.90	19.8	87.79	1.00
Arm 2	3.9	23.25	0.81	1.4	10.90	0.59
Arm 3	1.6	9.72	0.62	1.9	10.13	0.66
Arm 4	0.8	5.09	0.45	132.4	365.93	1.21
	2034 DS3A					
Arm 1	121.4	388.88	1.21	170.2	652.44	1.28
Arm 2	5.7	33.40	0.87	1.2	10.07	0.54
Arm 3	65.9	213.71	1.13	4.4	18.84	0.82
Arm 4	2.6	13.65	0.73	226.3	709.01	1.38

Arms

Arm	Name
1	B4030 Middleton Stoney Road
2	Howes Lane
3	Middleton Stoney Road
4	Vendee Drive

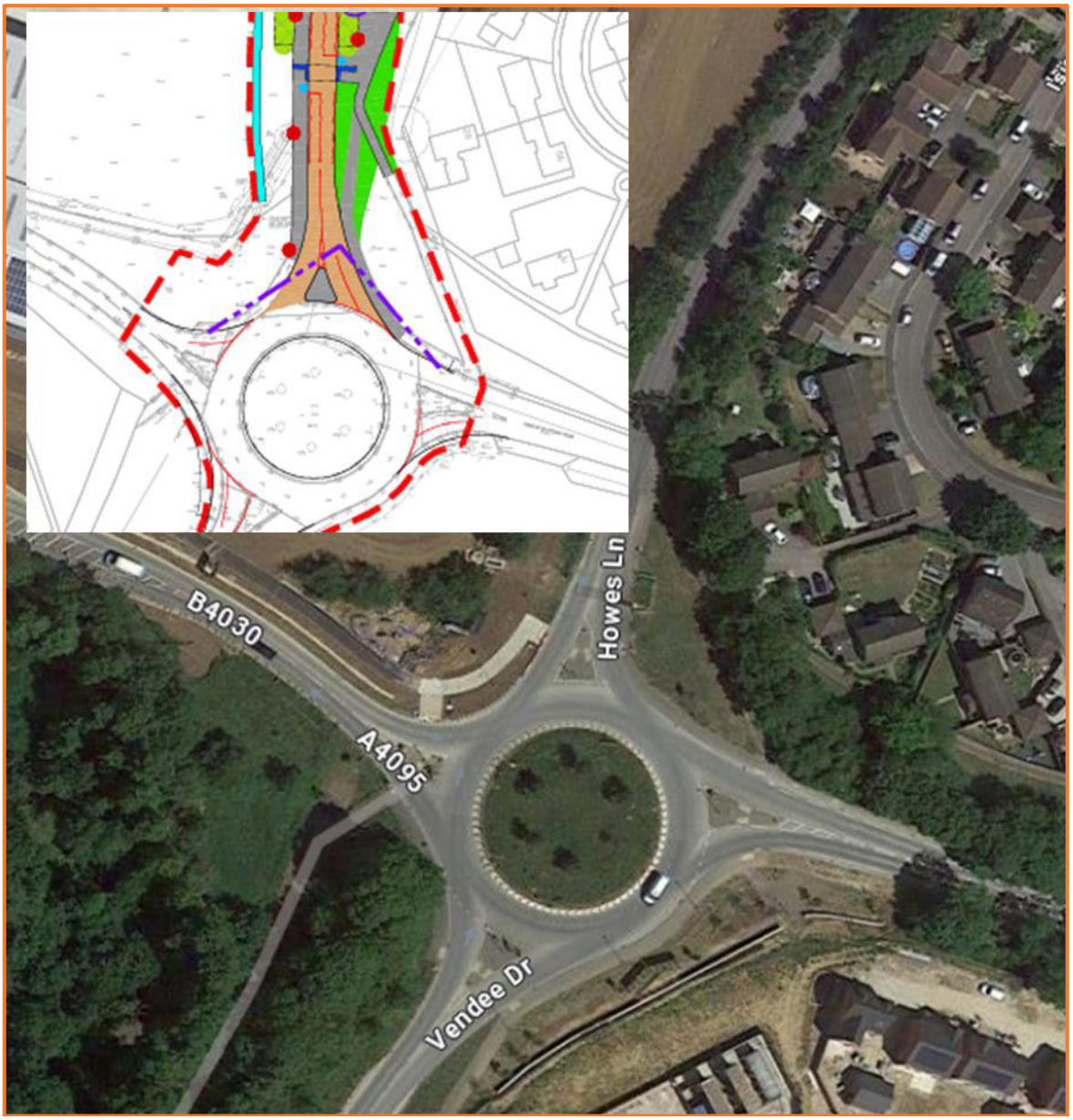


Figure 10: B4030 Middleton Stoney Road/Howes Lane/Vendee Drive roundabout

4.14 The results show that in the RC3A morning peak hour the roundabout would operate reasonably well, with only the B4030 Middleton Stoney Road approach operating with an RFC above 85%. However, in the RC3A evening peak hour, the results show that the B4030 Middleton Stoney Road and the Vendee Drive approaches would be congested, particularly the Vendee Drive arm which would be operating at 121% of its capacity.

4.15 However, the Arcady results show that in the DS3A morning and evening peak hours, the performance of the roundabout would deteriorate significantly when compared to the RC3A scenario. In the DS3A morning peak hour, the B4030 Middleton Stoney Road eastbound and westbound approaches would have an RFC above 100%, with the B4030 Middleton Stoney Road and Vendee Drive arms operating above 100% in the DS3A evening peak hour.

4.16 The Applicant considers the overall impact of the embedded Highway Works are positive in terms of accommodating the OxSRFI traffic flows and engendering positive background traffic reassignment away from lower category or congested routes. Key to facilitating these positive effects is the performance of the B4030 Middleton Stoney Road/Howes Lane/Vendee Drive

roundabout, and therefore, given the detailed junction assessment results presented above, it is appropriate to consider the requirement for additional mitigation measures at the junction.

4.17 Based on the form and scale of the existing roundabout, the emerging solution is for the roundabout to be upgraded to a traffic signal controlled gyratory, with two lanes on each approach and two lanes on the circulating carriageway. Initial high-level appraisals suggest that this form of junction could be achieved within the available highway boundary and would deliver a material improvement in performance.

4.18 An advantage of this upgrade would be the provision of Toucan crossings on the Vendee Drive and both B4030 Middleton Stoney Road arms. This would provide enhancements to the walking and cycling infrastructure, better connecting the existing cycle route west of Vendee Drive with Howes Lane and the proposed segregated cycle route along Middleton Stoney Road to the east of the roundabout that is being promoted by OCC.

4.19 This mitigation option will be considered in further detail, with a layout drawing and LinSig model prepared for discussion with OCC and the TWG.

APPENDIX A

HIGHWAY WORKS OVERVIEW PLAN

7.5T environmental weight restriction implemented within the Ardley & Fewcott area

Except for access

Fewcott

Right turn out of services stopped up and replaced by right-turn cut-through at Ardley roundabout

M40 J10

Amendments to Cherwell roundabout

Minor amendments to services entry and exit

Ardley roundabout enlarged

Existing J10 northbound entry slip stopped up

Existing J10 northbound exit slip realigned

Turning head

Aves Ditch (north) minor works

Ardley

See inset for M40 J10

Quarry cottages lane stopped up over railway, replaced by bridleway

Ardley Road diverted over new bypass

Existing J10 southbound entry slip widened and lengthened to a 2-lane merge

Turning head

Upper Heyford Former Airfield

Existing B430 between turning head and rail bridge to have a no motor vehicle except for access restriction

Except for access

B430 Ardley bypass and OxSRFI link road (Single 2+1)

Segregated left turn lane on exit to direct all HGVs to J10

Principal OxSRFI access

Bridge over Chiltern Mainline

Bridge over new rail sidings

Roundabout on existing B430 (partially signalised)

Existing B430 stopped up and replaced with cycle track over the rail bridge (and Ardley Bypass for traffic)

Chilgrove Drive realignment as part of Heyford Park scheme

Existing road to Heyford Park stopped up, replaced by the Heyford Park Link Road

Heyford Park

B4030

Secondary OxSRFI access (buses, pedestrians cyclists and emergency access)

Camp Road / Chilgrove Drive priority amendment by OxSRFI (only required if the Heyford Park works to the junction are not completed prior to OxSRFI works being needed)

Equestrian crossing

Junction closed and removed

Heyford Park Link Road

B430 Toucan crossing

Existing B430 stopped up

Signal junctions with existing B430

No right turn from Middleton Stoney onto Relief Road

No left turn from Relief Road into Middleton Stoney

B4030

Middleton Road walking, cycling and horse-riding enhancement

Bridleway underpass

Gagle brook crossing

M40

B4030

Bus stops and zebra crossing

Village gateway

Middleton Road roundabout

Middleton Stoney

Middleton Stoney crossroads pedestrian crossing improvements

7.5T environmental weight restriction implemented within the Bucknell area

Except for access

Bucknell

B4030 Middleton Stoney Road speed limit reduced to 50mph

50

B4030

A4095

Empire Road

Bicester

Potential improvements to the B4030/A4095 roundabout and potential alterations to the access to Empire Road

B4030

0 250 500 750 1000

SCALE: METRES

M40 J10

B4100

A43

M40

Further enhancement of a third party scheme to enlarge A43 Baynard's Green roundabout. Note: there is potential for OxSRFI to implement entire works if the third party scheme is not implemented prior to OxSRFI.

A43 widened to 3 lanes northbound and southbound

Relocated J10 northbound entry slip road

Padbury amended to signalised junction

New bridge over M40 mainline (and new loop lower level)

B4100

A43 southbound widened to 4 lanes

Cherwell Valley Services

M40 northbound to A43 northbound loop

Amendments to Cherwell roundabout

Right turn out of services stopped up and replaced by right-turn cut-through at Ardley roundabout

M40 J10

Minor amendments to services entry and exit

Fewcott

Ardley roundabout enlarged

Existing J10 northbound entry slip stopped up

Existing J10 northbound exit slip realigned

Ardley

M40 J9

M40 J9

A34 to M40 North capacity improvement at J9

Legend

- Upgraded / new motorway (National Highways)
- Upgraded / new all-purpose trunk road (National Highways)
- Upgraded / new local roads (OCC)
- Private access roads
- Existing highway stopped up
- Third party scheme as described

Rev	Date	Details of issue / revision	Drw	Rev
P13	09.09.25	B4030/A4095 junction added	SRH	SRH
P12	02.09.25	Weight limits amended	SRH	SRH
P11	28.08.25	Minor presentational update	SRH	SRH
P10	31.07.25	Minor presentational update	SRH	SRH
P09	30.07.25	Scheme updates	SRH	SRH
P08	27.01.25	Principal access and J10 works amended	SRH	SRH
P07	05.12.24	Updated to M40 J10 Option 28	SRH	SRH
P06	10.03.23	Scheme updates	SRH	SRH
P05	15.12.22	J10 amendments	SRH	SRH
P04	04.10.22	Updates following Stage 1 consultation	SRH	SRH
P03	30.03.22	Minor text amendment	SRH	SRH
P02	29.03.22	Updated following comments	SRH	SRH
P01	22.03.22	Preliminary Issue	SRH	SRH

Issues & Revisions

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Client

OXFORDSHIRE RAILFREIGHT LTD.

Project Title

OxSRFI OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title

HIGHWAY WORKS OVERVIEW (PHASES 1 & 2)

Drawn:	S. Hilditch		Reviewed:	S. Hilditch	
BWB Ref:	NTH2479	Date:	22.03.22	Scale@A1:	1:10,000

Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSRFI-BWB-GEN-ZZ-SK-CH-SK041	S1	P13

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APPENDIX B

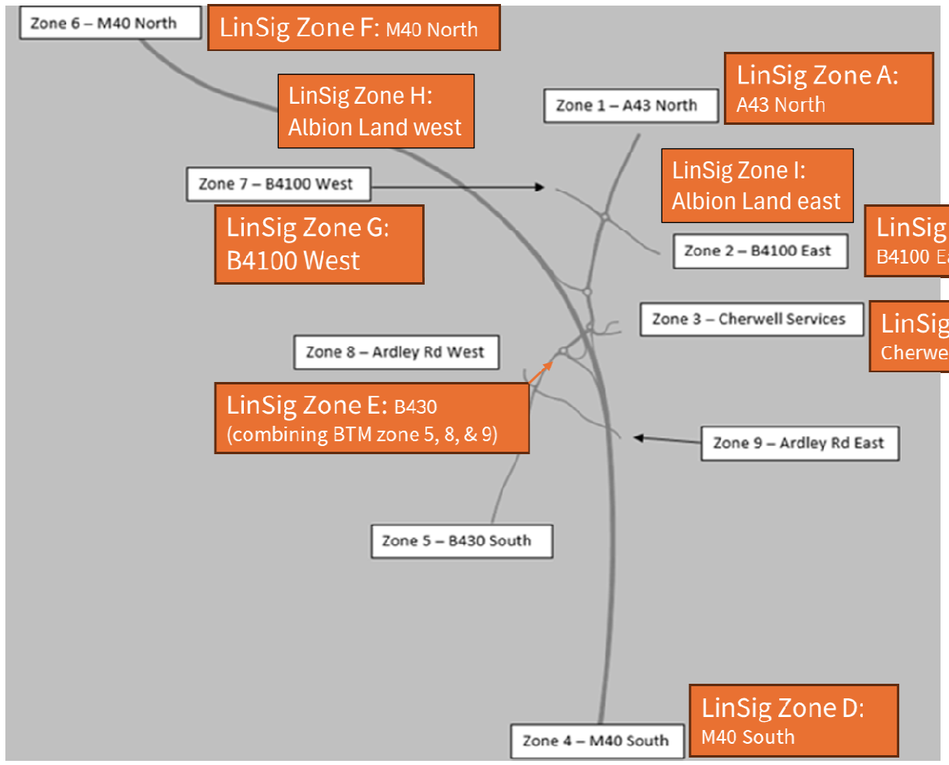
RC3A AND DS3A TRAFFIC FLOW MATRICES FOR THE M40 JUNCTION 10 COMPLEX

2034 AM Peak Reference Case (RC3A) LIGHT VEHICLES (in vehs)													
		To Zone (Destination)											
		1	2	3	4	5	6	7	8	9	10	11	Total
From Zone (Origin)	1	0	395	60	1060	467	0	43	2	39	49	27	**2144**
	2	212	0	0	1	9	195	207	0	0	42	29	**696**
	3	53	0	0	157	82	107	0	0	0	0	0	**399**
	4	965	2	216	0	3	2723	7	15	5	13	6	**3955**
	5	175	9	0	0	0	107	0	31	80	11	7	**420**
	6	0	230	132	3370	148	0	3	12	55	19	10	**3979**
	7	61	307	0	16	0	0	0	0	0	26	11	**420**
	8	4	1	0	14	5	11	0	0	64	1	0	**99**
	9	19	0	0	0	180	136	0	24	0	3	0	**363**
	10	5	21	0	2	7	1	8	0	4	0	0	**49**
	11	3	14	0	1	4	1	3	0	1	0	0	**27**
	Total	**1498**	**980**	**409**	**4621**	**905**	**3281**	**272**	**84**	**248**	**164**	**91**	**12552**

2034 AM Peak Reference Case (RC3A) HEAVY VEHICLES (in pcus)													
		To Zone (Destination)											
		1	2	3	4	5	6	7	8	9	10	11	Total
From Zone (Origin)	1	0	0	4	427	9	0	0	0	0	27	15	**481**
	2	29	0	0	0	0	0	22	0	0	4	2	**57**
	3	23	0	0	103	0	83	0	0	0	0	0	**208**
	4	254	0	30	0	0	652	0	0	0	28	16	**979**
	5	0	0	0	3	0	1	0	0	0	1	1	**6**
	6	0	28	109	1009	0	0	0	0	0	7	4	**1157**
	7	0	13	0	0	0	0	0	0	0	0	0	**13**
	8	0	0	0	0	14	0	0	0	0	0	0	**14**
	9	0	0	0	0	8	0	0	0	0	0	0	**8**
	10	28	4	0	28	1	7	0	0	0	0	0	**68**
	11	16	2	0	15	1	4	0	0	0	0	0	**38**
	Total	**350**	**48**	**142**	**1584**	**33**	**746**	**22**	**0**	**0**	**67**	**37**	**3030**

2034 AM Peak Reference Case (RC3A) TOTAL TRAFFIC (in pcus)													
		To Zone (Destination)											
		1	2	3	4	5	6	7	8	9	10	11	Total
From Zone (Origin)	1	0	395	64	1487	476	0	43	2	39	76	42	**2625**
	2	241	0	0	1	9	195	230	0	0	46	31	**754**
	3	76	0	0	260	82	190	0	0	0	0	0	**607**
	4	1220	2	246	0	3	3375	7	15	5	40	22	**4935**
	5	175	9	0	3	0	108	0	31	80	12	8	**426**
	6	0	259	241	4378	148	0	3	12	55	26	14	**5136**
	7	61	320	0	16	0	0	0	0	0	26	11	**433**
	8	4	1	0	14	19	11	0	0	64	1	0	**114**
	9	19	0	0	0	188	136	0	24	0	3	0	**371**
	10	33	25	0	30	9	8	8	0	4	0	0	**117**
	11	18	16	0	17	5	5	3	0	1	0	0	**65**
	Total	**1848**	**1027**	**551**	**6205**	**938**	**4027**	**294**	**84**	**248**	**231**	**128**	**15582**

BTM Reference Case traffic flow data cordon to LinSig network



LinSig Network (see above)

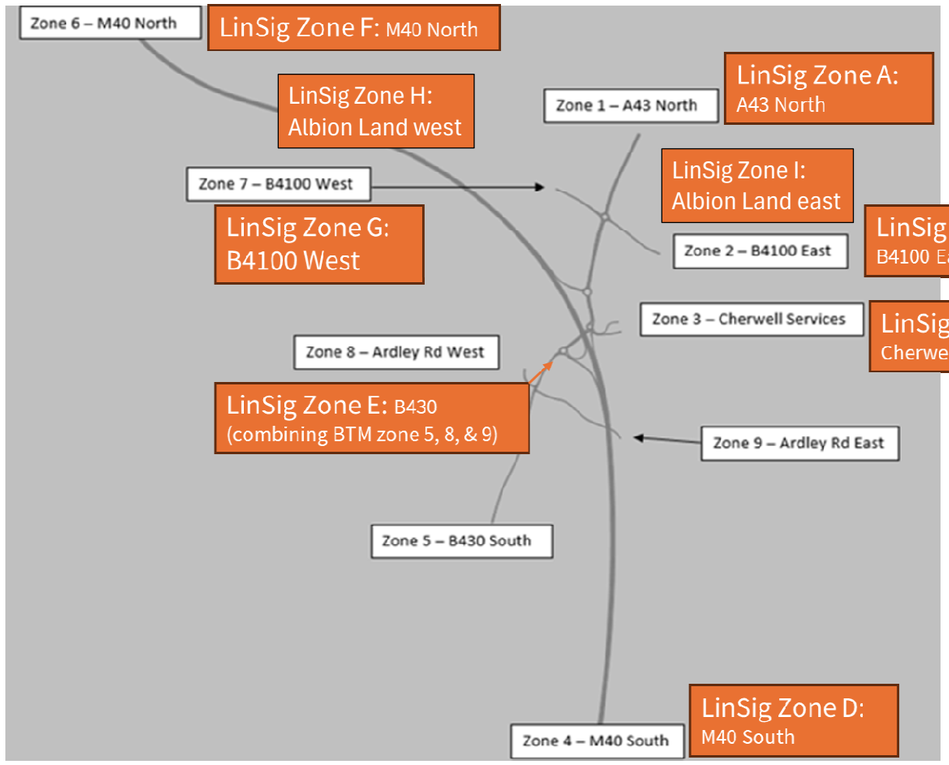
2034 AM Peak Reference Case (RC3A) TOTAL TRAFFIC (in pcus)										
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**Total**
A	0	395	64	1,487	517	0	43	76	42	**2,625**
B	241	0	0	1	9	195	230	46	31	**754**
C	76	0	0	260	82	190	0	0	0	**607**
D	1,220	2	246	0	23	0	7	40	22	**1,560**
E	199	10	0	16	0	254	0	16	8	**503**
F	0	259	241	0	214	0	3	26	14	**758**
G	61	320	0	16	0	0	0	26	11	**433**
H	33	25	0	30	13	8	8	0	0	**117**
I	18	16	0	17	6	5	3	0	0	**65**
Total	**1,848**	**1,027**	**551**	**1,827**	**864**	**652**	**294**	**231**	**128**	**7,423**

2034 PM Peak Reference Case (RC3) LIGHT VEHICLES (in vehs)													
		To Zone (Destination)											
		1	2	3	4	5	6	7	8	9	10	11	Total
From Zone (Origin)	1	0	274	109	1108	158	0	42	2	55	12	7	**1767**
	2	374	0	0	3	2	240	229	4	0	17	11	**879**
	3	77	0	0	221	0	146	0	0	0	0	0	**444**
	4	1488	1	173	0	14	3731	1	61	0	2	1	**5472**
	5	154	2	0	0	0	113	0	64	71	3	2	**409**
	6	0	292	148	3182	91	0	7	15	35	3	2	**3775**
	7	50	143	0	34	0	0	0	0	0	6	2	**235**
	8	8	0	0	2	37	9	0	0	47	0	0	**103**
	9	15	0	0	0	18	87	0	43	0	1	0	**163**
	10	50	50	0	10	11	13	37	1	8	0	0	**179**
	11	27	34	0	6	9	8	14	0	1	0	0	**99**
	Total	**2242**	**798**	**429**	**4565**	**340**	**4346**	**330**	**191**	**216**	**43**	**24**	**13525**

2034 PM Peak Reference Case (RC3) HEAVY VEHICLES (in pcus)													
		To Zone (Destination)											
		1	2	3	4	5	6	7	8	9	10	11	Total
From Zone (Origin)	1	0	18	3	180	0	0	0	0	0	24	13	**238**
	2	0	0	0	0	0	8	1	0	0	3	2	**13**
	3	24	0	0	87	0	70	0	0	0	0	0	**181**
	4	225	0	82	0	0	756	0	0	0	24	13	**1099**
	5	5	0	0	0	0	0	0	2	0	1	1	**9**
	6	0	0	95	597	0	0	0	0	0	6	3	**702**
	7	0	9	0	0	0	0	0	0	0	0	0	**9**
	8	0	0	0	0	0	0	0	0	0	0	0	**0**
	9	0	0	0	0	0	0	0	0	0	0	0	**0**
	10	22	3	0	22	1	6	0	0	0	0	0	**54**
	11	12	2	0	12	1	3	0	0	0	0	0	**30**
	Total	**289**	**31**	**180**	**899**	**2**	**842**	**1**	**2**	**0**	**58**	**32**	2336

2034 PM Peak Reference Case (RC3) TOTAL TRAFFIC (in pcus)													
		To Zone (Destination)											
		1	2	3	4	5	6	7	8	9	10	11	Total
From Zone (Origin)	1	0	292	112	1288	158	0	42	2	55	36	20	**2005**
	2	374	0	0	3	2	248	230	4	0	20	12	**893**
	3	101	0	0	308	0	216	0	0	0	0	0	**625**
	4	1713	1	254	0	14	4486	1	61	0	26	14	**6572**
	5	159	2	0	0	0	113	0	66	71	4	2	**418**
	6	0	292	243	3779	91	0	7	15	35	9	5	**4476**
	7	50	153	0	34	0	0	0	0	0	6	2	**245**
	8	8	0	0	2	37	9	0	0	47	0	0	**103**
	9	15	0	0	0	18	87	0	43	0	1	0	**163**
	10	72	53	0	32	12	19	37	1	8	0	0	**233**
	11	39	36	0	18	9	11	14	0	1	0	0	**129**
	Total	**2531**	**829**	**609**	**5464**	**342**	**5188**	**331**	**193**	**216**	**101**	**56**	15861

BTM Reference Case traffic flow data cordon to LinSig network



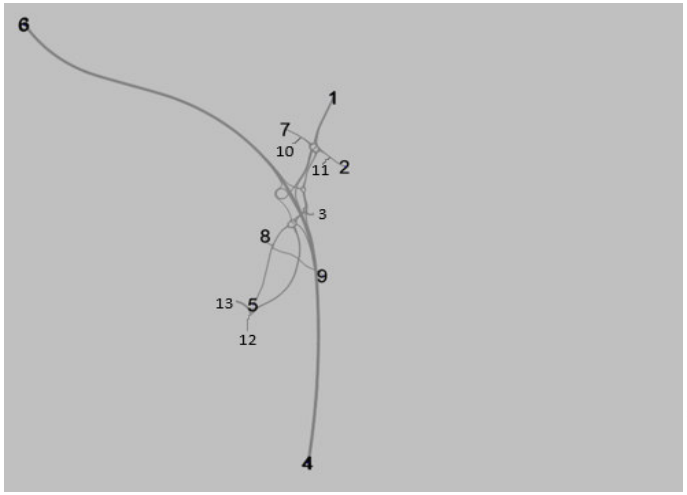
LinSig Network (see above)

2034 PM Peak Reference Case (RC3) TOTAL TRAFFIC (in pcus)										
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**Total**
A	0	292	112	1,288	216	0	42	36	20	**2,005**
B	374	0	0	3	7	248	230	20	12	**893**
C	101	0	0	308	0	216	0	0	0	**625**
D	1,713	1	254	0	76	0	1	26	14	**2,086**
E	182	2	0	3	0	209	0	5	2	**403**
F	0	292	243	0	142	0	7	9	5	**697**
G	50	153	0	34	0	0	0	6	2	**245**
H	72	53	0	32	20	19	37	0	0	**233**
I	39	36	0	18	11	11	14	0	0	**129**
Total	**2,531**	**829**	**609**	**1,686**	**470**	**702**	**331**	**101**	**56**	7,315

LIGHT VEHICLES (PCUs)															
		To Zone (Destination)													
		1	2	3	4	5	6	7	8	9	10	11	12	13	Total
From Zone (Origin)	1	0	290	56	1412	0	0	34	1	3	44	25	262	216	**2344**
	2	209	0	0	4	0	42	229	0	0	42	30	2	55	**612**
	3	53	0	0	239	0	107	0	0	0	0	0	0	0	**399**
	4	963	1	216	0	3	2667	6	13	5	12	6	0	28	**3919**
	5	0	0	0	6	0	0	0	0	19	0	0	0	37	**62**
	6	0	217	132	3061	0	0	0	12	23	19	10	355	122	**3950**
	7	73	310	0	121	0	0	0	0	0	27	12	47	35	**624**
	8	4	1	0	23	0	10	0	0	14	1	0	26	7	**85**
	9	6	0	0	0	8	176	0	11	0	1	0	0	7	**208**
	10	5	19	0	4	0	1	7	0	0	0	0	12	0	**49**
	11	3	13	0	2	0	1	3	0	0	0	0	6	0	**27**
	12	114	1	0	0	0	179	5	35	0	14	6	0	365	**719**
	13	14	2	0	1	2	7	0	4	11	0	0	57	0	**97**
	Total	**1442**	**854**	**404**	**4872**	**13**	**3189**	**284**	**76**	**75**	**160**	**89**	**768**	**871**	**13096**

HEAVY VEHICLES (PCUs)															
		To Zone (Destination)													
		1	2	3	4	5	6	7	8	9	10	11	12	13	Total
From Zone (Origin)	1	0	0	4	408	0	0	0	0	0	26	14	8	30	**490**
	2	29	0	0	0	0	0	22	0	0	4	2	0	7	**65**
	3	23	0	0	103	0	83	0	0	0	0	0	0	0	**208**
	4	225	0	30	0	0	607	0	0	0	29	16	0	188	**1094**
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	6	60	28	109	1007	0	0	0	0	0	7	4	1	112	**1329**
	7	0	13	0	0	0	0	0	0	0	0	0	0	2	**15**
	8	0	0	0	0	0	0	0	0	0	0	0	14	0	**14**
	9	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	10	28	4	0	28	0	7	0	0	0	0	0	1	0	**68**
	11	16	2	0	15	0	4	0	0	0	0	0	1	0	**38**
	12	28	0	0	0	0	41	0	0	0	0	0	0	0	**69**
	13	31	5	0	174	0	103	2	0	0	0	0	0	0	**316**
	Total	**440**	**53**	**142**	**1735**	**0**	**845**	**25**	**0**	**0**	**66**	**37**	**26**	**339**	**3707**

TOTAL VEHICLES (PCUs)															
		To Zone (Destination)													
		1	2	3	4	5	6	7	8	9	10	11	12	13	Total
From Zone (Origin)	1	0	290	60	1820	0	0	34	1	3	70	39	270	246	**2835**
	2	238	0	0	4	0	42	251	0	0	45	32	2	62	**677**
	3	76	0	0	342	0	190	0	0	0	0	0	0	0	**607**
	4	1188	1	245	0	3	3273	6	13	5	41	22	0	215	**5012**
	5	0	0	0	6	0	0	0	0	19	0	0	0	37	**62**
	6	60	245	241	4068	0	0	0	12	23	26	14	356	233	**5279**
	7	73	323	0	121	0	0	0	0	0	27	12	47	37	**640**
	8	4	1	0	23	0	10	0	0	14	1	0	41	7	**100**
	9	6	0	0	0	8	176	0	11	0	1	0	0	7	**208**
	10	33	23	0	31	0	8	7	0	0	0	0	14	0	**117**
	11	18	15	0	18	0	5	3	0	0	0	0	7	0	**65**
	12	143	1	0	0	0	220	5	35	0	14	6	0	365	**789**
	13	45	7	0	175	2	110	2	4	11	0	0	57	0	**413**
	Total	**1882**	**907**	**546**	**6608**	**13**	**4034**	**308**	**77**	**75**	**225**	**125**	**793**	**1209**	**16803**



1 A
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8 E
9 E
10 H
11 I
12 J
13 J

TOTAL VEHICLES (PCUs)													
		To Zone (Destination)											
		A	B	C	D	E	F	G	H	I	J	Total
From Zone	A	0	290	60	1820	5	0	34	70	39	517	**2835**
	B	238	0	0	4	0	42	251	45	32	64	**677**
	C	76	0	0	342	0	190	0	0	0	0	**607**
	D	1188	1	245	0	21	0	6	41	22	215	**1739**
	E	9	1	0	29	0	186	0	1	0	92	**319**
	F	60	245	241	0	35	0	0	26	14	589	**1211**
	G	73	323	0	121	0	0	0	27	12	83	**640**
	H	33	23	0	31	0	8	7	0	0	14	**117**
	I	18	15	0	18	0	5	3	0	0	7	**65**
	J	188	9	0	175	52	330	7	14	6	0	**780**
	Total	**1882**	**907**	**546**	**2540**	**113**	**760**	**308**	**225**	**125**	**1582**	**8989**

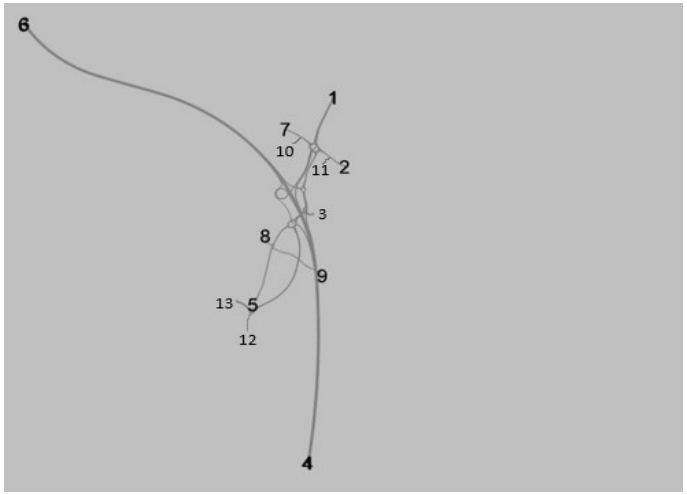
1211

Site Access				
	A	B	C	Total
A	0	365	424	789
B	57	0	356	413
C	737	845	0	1582
Total	793	1209	780	2783

M40 Junction 10 Trip Matrices - 2034 OxSRFI DS3A Scenario - AM Peak Hour

LIGHT VEHICLES (PCUs)															
		To Zone (Destination)													
		1	2	3	4	5	6	7	8	9	10	11	12	13	Total
From Zone (Origin)	1	0	267	109	1197	0	0	48	2	8	9	6	178	72	**1897**
	2	308	0	0	7	0	41	277	4	0	13	11	1	20	**682**
	3	77	0	0	221	0	146	0	0	0	0	0	0	0	**444**
	4	1661	8	175	0	12	3619	39	43	0	2	1	0	5	**5565**
	5	0	0	0	2	0	0	0	0	5	0	0	0	10	**18**
	6	0	256	148	3136	0	0	0	15	16	2	2	168	29	**3773**
	7	46	140	0	37	0	0	0	0	0	8	2	23	5	**261**
	8	8	0	0	20	0	9	0	0	23	0	0	3	3	**66**
	9	11	0	0	0	7	160	0	10	0	0	0	0	0	**188**
	10	43	47	0	12	0	0	57	1	1	0	0	18	0	**179**
	11	27	31	0	8	0	7	15	0	0	0	0	10	0	**99**
	12	260	2	0	0	0	358	0	68	0	8	2	0	150	**847**
	13	288	25	0	33	47	143	0	50	64	0	0	388	0	**1038**
	Total	**2730**	**776**	**432**	**4674**	**66**	**4482**	**436**	**193**	**118**	**43**	**24**	**788**	**294**	**15056**

HEAVY VEHICLES (PCUs)															
		To Zone (Destination)													
		1	2	3	4	5	6	7	8	9	10	11	12	13	Total
From Zone (Origin)	1	0	18	3	180	0	0	0	0	0	24	13	0	32	**270**
	2	0	0	0	0	0	5	1	0	0	3	2	0	7	**17**
	3	24	0	0	87	0	70	0	0	0	0	0	0	0	**181**
	4	230	0	82	0	0	705	0	0	0	25	14	0	169	**1225**
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	6	0	0	95	597	0	0	0	0	0	6	3	0	101	**803**
	7	0	9	0	0	0	0	0	0	0	0	0	0	2	**11**
	8	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	9	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	10	22	3	0	22	0	6	0	0	0	0	0	1	0	**54**
	11	12	2	0	12	0	3	0	0	0	0	0	1	0	**30**
	12	0	0	0	0	0	53	0	2	0	0	0	0	0	**55**
	13	30	5	0	155	0	92	2	0	0	0	0	0	0	**284**
	Total	**319**	**36**	**180**	**1054**	**0**	**934**	**3**	**2**	**0**	**58**	**32**	**2**	**312**	**2931**



1 A
2 B
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7 G
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9 E
10 H
11 I
12 J
13 J

TOTAL VEHICLES (PCUs)															
		To Zone (Destination)													
		1	2	3	4	5	6	7	8	9	10	11	12	13	Total
From Zone (Origin)	1	0	285	112	1378	0	0	48	2	8	33	20	178	105	**2167**
	2	308	0	0	7	0	46	277	4	0	16	12	1	27	**699**
	3	101	0	0	308	0	216	0	0	0	0	0	0	0	**625**
	4	1892	8	257	0	12	4324	39	43	0	27	15	0	174	**6790**
	5	0	0	0	2	0	0	0	0	5	0	0	0	10	**18**
	6	0	256	243	3733	0	0	0	15	16	8	5	168	130	**4576**
	7	46	149	0	37	0	0	0	0	0	8	2	23	7	**272**
	8	8	0	0	20	0	9	0	0	23	0	0	3	3	**66**
	9	11	0	0	0	7	160	0	10	0	0	0	0	0	**188**
	10	65	50	0	34	0	6	57	1	1	0	0	19	0	**233**
	11	39	33	0	20	0	10	15	0	0	0	0	11	0	**129**
	12	260	2	0	0	0	411	0	71	0	8	2	0	150	**902**
	13	318	30	0	188	47	235	2	50	64	0	0	388	0	**1322**
	Total	**3049**	**813**	**611**	**5727**	**66**	**5416**	**438**	**195**	**118**	**101**	**56**	**790**	**605**	**17987**

TOTAL VEHICLES (PCUs)													
		To Zone (Destination)											
		A	B	C	D	E	F	G	H	I	J	Total
From Zone	A	0	285	112	1378	10	0	48	33	20	283	**2167**
	B	308	0	0	7	4	46	277	16	12	28	**699**
	C	101	0	0	308	0	216	0	0	0	0	**625**
	D	1892	8	257	0	55	0	39	27	15	174	**2466**
	E	19	0	0	23	0	169	0	0	0	16	**227**
	F	0	256	243	0	32	0	0	8	5	299	**843**
	G	46	149	0	37	0	0	0	8	2	30	**272**
	H	65	50	0	34	2	6	57	0	0	19	**233**
	I	39	33	0	20	1	10	15	0	0	11	**129**
	J	578	31	0	188	231	646	2	8	2	0	**1687**
	Total	**3049**	**813**	**611**	**1994**	**334**	**1092**	**438**	**101**	**56**	**858**	**9348**

Site Access				
	A	B	C	Total
A	0	150	753	902
B	388	0	934	1322
C	402	456	0	858
Total	790	605	1687	3083

843

M40 Junction 10 Trip Matrices - 2034 OxSRFI DS3A Scenario - PM Peak Hour

APPENDIX C

M40 JUNCTION 10 DESIGN STRATEGY RECORD

BWB
A CAF GROUP COMPANY

TRANSPORT AND INFRASTRUCTURE

Oxfordshire Strategic Railfreight Interchange (OxSRFI) M40 J10 Improvements Design Strategy Record

DOCUMENT ISSUE RECORD

Document Number:	OxSRFI-BWB-GEN-XX-RP-CH-0007
BWB Reference:	NTH2479

Revision	Date of Issue	Status	Author:	Checked:	Approved:
P01	31.07.2025	S3	Stephen Birchall BSc (Hons)	Simon Hilditch MEng (Hons) CEng MICE MCIHT	Simon Hilditch MEng (Hons) CEng MICE MCIHT

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1. INTRODUCTION

Instruction

1.1 The Oxfordshire Strategic Rail Freight Interchange (OxSRFI) requires substantial improvements to the strategic road network (SRN) and local road network (LRN), adding new links as well as upgrading existing infrastructure.

1.2 BWB Consulting (BWB) has been instructed by Mountpark (the Client) to develop the highway design for the works on the SRN and LRN, which includes the preparation of this Design Strategy Record (DSR). This report is for the works at M40 J10 including the A43 corridor north of J10.

Purpose and scope of this report

1.3 The objective of this DSR report, is to record the key decisions made during design.

1.4 The report will record the relaxations and departures from standards contained within the highway design. A detailed narrative for the justification, including a safety risk assessment, is to be submitted separately for approval for each departure.

1.5 The DSR is also used to record how the scheme complies with the principles of good road design set out in GG 103.

1.6 This version of the report provides the geometrical design and signage strategy. The following items are to be added:

- Motorway communications; and
- Road Lighting strategy.

1.7 The following reports and documents are to be provided separately to this DSR:

- Transport assessment and modelling;
- Geotechnical reporting to CD 622;
- Structures AIPs (where required) to CG 300;
- Maintenance and repair statement to GD 304;
- WCHAR assessment and review to GG 142; and
- Stage 1 road safety audit to GG 119.

1.8 The location of the Scheme is shown on **Figure 1.1** below.

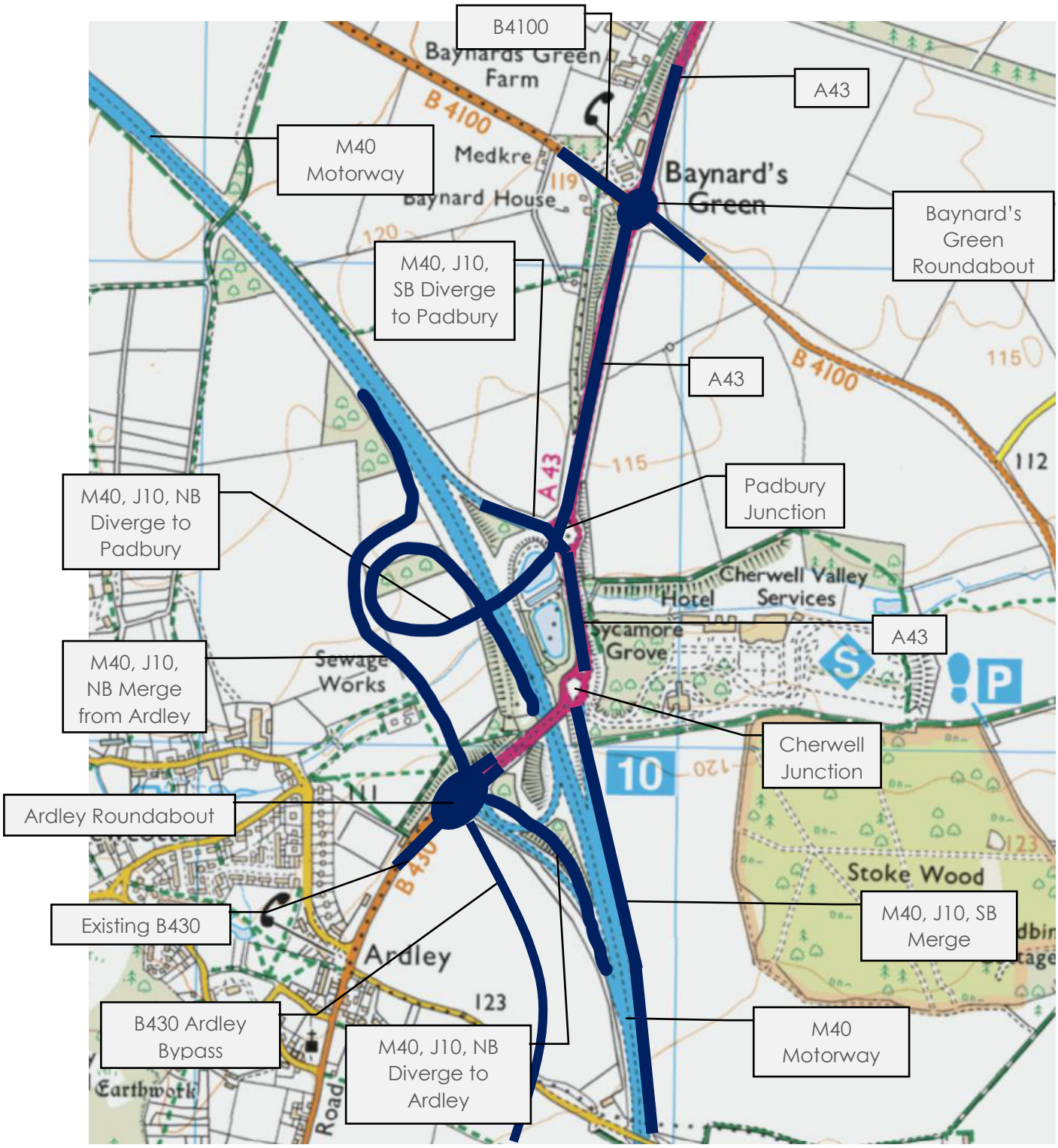


Figure 1.1: Scheme location and overview

Acronyms and Abbreviations

DMRB	Design Manual for Roads and Bridges
DSR	Design Strategy Record

HPLR	Heyford Park Link Road
MSRR	Middleton Stoney Relief Road
LRN	Local Road Network
OxSRFI	Oxfordshire Strategic Rail Freight Interchange
OCC	Oxfordshire County Council
NH	National Highways
SRN	Strategic Road Network

List of drawings

1.9 The tables below set out the scheme design drawings that are to be read in conjunction with this report. They are provided separately and are not appended to this report.

1.10 The detailed general arrangement and geometric layout design, and long sections, are depicted on the following design drawings:

Location code	Section of scheme	General arrangement and geometry layout drawing	Long-section drawing
01	A43 North of Baynard's Green	OxSRFI-BWB-HGN-01-DR-CH-0105	OxSRFI-BWB-HGN-01-DR-CH-0110
02	B4100 West	OxSRFI-BWB-HGN-02-DR-CH-0105	OxSRFI-BWB-HGN-01-DR-CH-0110
03	B4100 East	OxSRFI-BWB-HGN-03-DR-CH-0105	OxSRFI-BWB-HGN-01-DR-CH-0110
04	A43 Baynard's Green to Padbury	OxSRFI-BWB-HGN-04-DR-CH-0105	OxSRFI-BWB-HGN-02-DR-CH-0111
05	A43 Baynard's Green to Padbury M40, J10, SB Diverge to Padbury	OxSRFI-BWB-HGN-05-DR-CH-0105	OxSRFI-BWB-HGN-02-DR-CH-0111
06	A43 Padbury to Cherwell	OxSRFI-BWB-HGN-06-DR-CH-0105	OxSRFI-BWB-HGN-02-DR-CH-0111
07	M40, J10, SB Merge from Cherwell	OxSRFI-BWB-HGN-07-DR-CH-0105	OxSRFI-BWB-HGN-05-DR-CH-0114
	M40, J10, NB Diverge to Ardley		OxSRFI-BWB-HGN-04-DR-CH-0113
08	M40, J10, SB Merge from Cherwell	OxSRFI-BWB-HGN-08-DR-CH-0105	OxSRFI-BWB-HGN-05-DR-CH-0114
	M40, J10, NB Diverge to Ardley		OxSRFI-BWB-HGN-04-DR-CH-0113
12	Ardley Roundabout	OxSRFI-BWB-HGN-12-DR-CH-0105	n/a
13	M40, J10, NB Merge from Ardley M40, J10A, NB Diverge to Padbury	OxSRFI-BWB-HGN-13-DR-CH-0105	OxSRFI-BWB-HGN-03-DR-CH-0112
14	M40, J10, NB Merge from Ardley M40, J10,A NB Diverge to Padbury	OxSRFI-BWB-HGN-14-DR-CH-0105	OxSRFI-BWB-HGN-03-DR-CH-0112
15	M40, J10, NB Merge from Ardley	OxSRFI-BWB-HGN-15-DR-CH-0105	OxSRFI-BWB-HGN-03-DR-CH-0112

1.11 The following drawings have been prepared to demonstrate vehicle tracking:

Section of scheme	Vehicle tracking
Baynard's Green	OxSRFI-BWB-GEN-XX-DR-CH-0008
Padbury	OxSRFI-BWB-GEN-XX-DR-CH-0006
Cherwell	OxSRFI-BWB-GEN-XX-DR-CH-0007
Ardley Roundabout	OxSRFI-BWB-GEN-XX-DR-CH-0007

1.12 The signalling and signage strategy is depicted on the following design drawings:

Location code	Section of scheme	Signalling and signage layout drawing
	[To be added]	

1.13 The following drawings show the proposed signage strategy:

Direction	Junctions	Drawing
n/a	Entire J10 scheme	OxSRFI-BWB-GEN-XX-SK-CH-SK058

Traffic data

1.14 The traffic data used in this report is preliminary and subject to verification of the outputs from the Bicester Transport Model. The data used is the Circular 01/2022 compliant scenario for the design year of 2031.

Collision history

1.15 Refer to ADC report

2. SCHEME OVERVIEW AND DESIGN STANDARDS

Overview of Standards

2.1 The M40 J10 Improvements scheme will be designed in accordance with the Design Manual for Roads and Bridges (DMRB) standards, based on the versions of the standards that are in place at the time of the Development Consent Order (DCO) submission.

Use of enhanced all-purpose dual carriageway and Smart Motorway standards

2.2 The A43 is not an enhanced all-purpose dual carriageway and therefore GD 300[1] does not apply to this scheme.

2.3 GD 301[2] defines a Smart Motorway as "*Motorways that use variable mandatory speed limits to increase capacity and smooth the flow of traffic*." The M40 at J9 and J10 does not have and is not proposed to have variable mandatory speed limits. By definition, within GD 301, the M40 J9 and J10 schemes are not a Smart Motorway and does not interface with a Smart Motorway.

2.4 In relation to the works on the M40 the scheme design standards for the scheme are, therefore, those for a conventional urban motorway and GD 301, and the Smart Motorway standards found in the England National Application Annexes to the main DMRB standards, do not apply to this scheme.

Safety risk assessment

2.5 Safety risk assessments are to be undertaken for departures from standard.

Highway authority, road class, design speed and speed limit

2.6 The road classes and design speeds for each section of the scheme are listed below, these have been determined in accordance with CD 109[3] table 2.5 and CD 122[4] table 5.4.

Section of scheme	Highway Authority	Road Class	Design Speed (kph)	Existing signed Speed limit (mph)	Proposed speed limit (mph) where different
M40 Mainline	NH	Rural motorway	120B*	National speed limit	As existing
M40 J10 northbound diverge slip road	NH	Rural motorway connector road: slip road	70B*	National speed limit	As existing
M40 J10 northbound merge slip road	NH	Rural motorway connector road: slip road designed as interchange link as >750m	85A	National speed limit	40 due to proposed loop, then national speed limit onto M40

[1] DMRB GD 300 Enhanced all-purpose dual carriageways, Revision 2.1.0
[2] DMRB GD 301 Smart motorways, Revision 0.0.1
[3] DMRB CD 109 Highway link design, Revision 1
[4] DMRB CD 122 Geometric design of grade separated junctions, Revision 1.1.1

Section of scheme	Highway Authority	Road Class	Design Speed (kph)	Existing signed Speed limit (mph)	Proposed speed limit (mph) where different
M40 J10A northbound to A43 northbound free-flow link	NH	Rural motorway connector road: slip road designed as interchange link as >750m	85A	n/a	40 due to proposed loop, then 50 at Padbury junction
M40 J10 southbound diverge slip road	NH	Rural motorway connector road: slip road	70B*	National speed limit	As existing
M40 J10 southbound merge slip road	NH	Rural motorway connector road: slip road	70B*	National speed limit	As existing
A43 between Ardley and Cherwell junctions	NH	Dumb-bell connector	70	50	As existing
A43 between Cherwell and Padbury junctions	NH	Rural all-purpose	120	50	As existing
A43 between Padbury and Baynard's Green junctions	NH	Rural all-purpose	120	50	As existing
A43 north of Baynard's Green	NH	Rural all-purpose	120	National speed limit	50 at immediate area of junction, then national speed limit

* On existing motorways and in accordance with CD 109 para E/1.3, for existing features that are to be retained, design speeds can be classified as band B.

Summary of departures from standard

2.7 The departures from standard listed below are a summary of those described in detail in this report.

Location	Type	Reason	Prepared for departure(s)	Highway Authority
M40 Mainline	Cross-section	Hard shoulder not provided under bridge at NB diverge	G1	NH
M40 Mainline	Cross-section	Hard shoulder not provided under bridge at SB merge	G2	NH
M40 J10 NB Diverge to Ardley	Cross-section	Required lane width to standard not provided at tie-in to existing	G3	NH
M40 J10A NB Diverge to Padbury	Diverge layout	Lane-drop and ghost-island layout not provided	G4	NH
M40 J10A NB Diverge to Padbury	Link geometry	Use of relaxations given in CD 109 on a connector road	G5	NH

Location	Type	Reason	Prepared for departure(s)	Highway Authority
M40 J10A NB Diverge to Padbury	Visibility / SSD	Visibility of full loop not achieved	G6	NH
M40 J10 NB Merge from Ardley	Link geometry	Use of relaxations given in CD 109 on a connector road	G7	NH
M40 J10 SB Diverge to Padbury	Cross-section	Use of single lane cross-section and connecting to narrow hard shoulder	G8	NH
Baynard's Green B4100 east	Link geometry	1 step below desirable minimum crest K on immediate approach to the junction	G9	OCC
Baynard's Green B4100 west	Cross-section	Lack of hard-strips	G10	OCC
Baynard's Green B4100 east	Cross-section	Lack of hard-strips	G11	OCC
Baynard's Green B4100 east	Roundabout geometry	Entry path radius >100m	G12	NH
Baynard's Green – A43 south	Roundabout geometry	Entry path radius >100m	G13	NH
Padbury – A43	Link geometry	Two step below sag K value within immediate approach to junction	G14	NH
Padbury – A43	Link geometry	Two step below crest K value within immediate approach to junction	G15	NH
Cherwell – A43	Link geometry	Three step below crest K value within immediate approach to junction	G16	NH
Cherwell – A43	Link geometry	SSD below desirable minimum within immediate approach to junction	G17	NH

3. M40 MAINLINE (JUNCTION 10)

3.1 The M40 mainline through Junction 10 is on a gentle radius of approximately 3000m radius and there are no significant vertical alignment features. Therefore, the desirable minimum SSD of 295m is achieved in both directions through the junction. The radius does, however, affect the sighting of successive VMS.

3.2 Except at the merges and diverges no changes to the existing cross-section are proposed, the existing cross-section generally complies with CD 127 standard section D3M.

3.3 At the existing J10 overbridges there is an existing hard-shoulder discontinuity in the northbound direction. This dates from the early 2000s when the northbound merge was realigned into a loop – prior to this the merge was located north of the junction. The auxiliary lane merge provided at the end of the loop was installed in place of the hard shoulder under the two bridges within J10.

3.4 In the proposed scheme layout the northbound merge is moved farther north, to make space for the J10A diverge and loop. The start of the J10A diverge taper is to the south of the overbridges which means that a hard shoulder cannot be provided under the bridges without reconstruction of the bridges being undertaken. This would be significantly disruptive, and it is therefore proposed to retain the hard shoulder discontinuity. The hard shoulder discontinuity is therefore a **departure from standard** reference **G1**.

3.5 On the M40 southbound the proposed extended auxiliary lane merge will result in a hard shoulder discontinuity at the Ardley Road bridge. Further details of the merge are provided at section 8 below. This discontinuity is **departure from standard** reference **G2.**

Weaving

3.6 There are no weaving sections within the proposals for J10 improvements.

3.7 The distance between the amended J10 and both existing junctions J9 and J11 exceeds 3km and hence no further assessment of weaving is required under CD 122.

Decision / Outcome 3-1: A weaving assessment is not required for the scheme.

Spacing of successive merges and diverges

3.8 Based on the merge and diverge layout types set out above an assessment has been made of the spacing of the successive merges and diverges on the M40 though J10 and J10A northbound.

3.9 As set out in CD 122 para 3.36 the minimum spacing between successive merges and diverges, measured between the tips of the diverge and merge noses, is in metres, 3.75 times the design speed. The M40 design speed is 120kph and hence the minimum spacing is 3.75 x 120 = 450m.

3.10 The following table provides an assessment of the merge and diverge spacing against this minimum distance.

Upstream diverge/merge	Downstream diverge / merge	Weaving section?	Distance between tip of noses (m)	Exceeds minimum 450m distance?
M40 J10 northbound diverge	M40 J10A northbound diverge	No	705	Yes
M40 J10A northbound diverge	M40 J10 northbound merge	No	625	Yes

Decision / Outcome 3-2: The minimum spacing requirements for successive merges and diverges are met and there are no weaving sections within J10.

4. M40 J10 NORTHBOUND DIVERGE TO ARDLEY JUNCTION

Layout

4.1 The J10 northbound diverge is an existing Layout A option 1 diverge (2-lane taper diverge), the scheme does not propose to amend the diverge layout.

4.2 The design year traffic data for the diverge is as follows:

Location	AM Peak		PM Peak	
	Total Vehicles	%HGV	Total Vehicles	%HGV
M40 downstream of J10 NB diverge	3948	11.4	5516	9.2
J10 NB Diverge	354	n/a	338	n/a

4.3 The mainline gradient is <2% and based on the above no adjustments to the flows are required in accordance with CD 122 paragraph 3.9.

4.4 The traffic data has been inserted into CD 122 Figure 3.26b, motorway diverging diagram, and this confirms that a Layout A diverge is required. This is shown on **Figure 4.1** below.

4.5 The criteria for providing a layout A option 2 (auxiliary lane) diverge, as set out at CD 122 paragraph 3.28, are not met.

4.6 This assessment has confirmed that the existing layout A option 1 diverge layout is appropriate for the scheme and hence it is not proposed to undertake any works to the diverge. This means that the exit datum point for the diverge will remain as the existing location.

4.7 As the scheme does not amend the diverge layout a detailed assessment of the diverge parameters has not been undertaken.

Decision / Outcome 4-1: The existing Layout A option 1, 2-lane taper, J10 northbound diverge layout is to be retained.

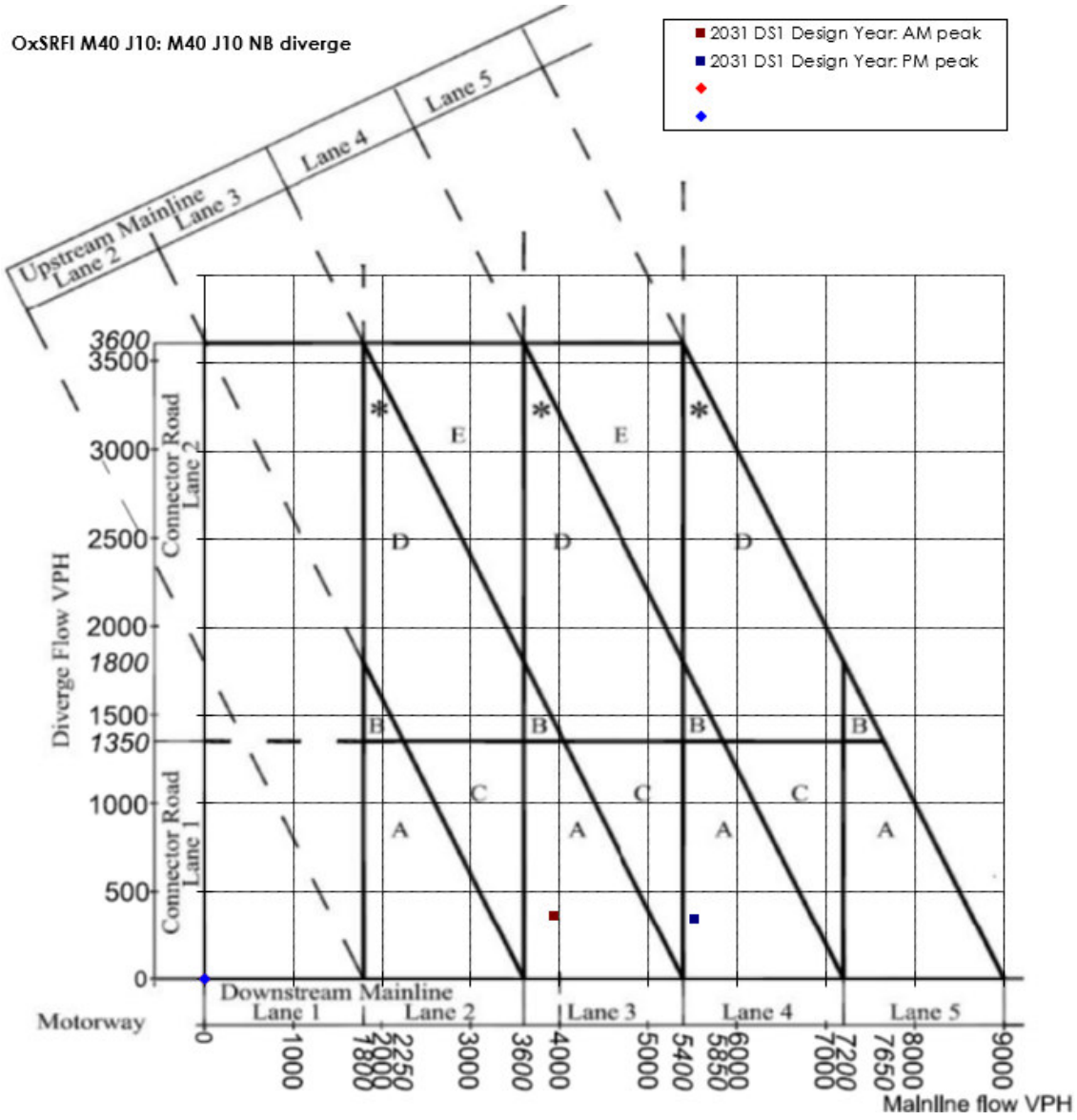


Figure 4.1 M40 J10 northbound diverge layout to Ardley requirement using traffic data

Design Speed and Geometry

4.8 In accordance with CD 122, para 5.4 and Table 5.4, the minimum design speed for a slip road connector shall be 70kph where the mainline design speed is 120kph.

4.9 The geometry of the J10 northbound diverge slip road is shown on **drawings OxSRFI-BWB-HGN-07-DR-CH-0105 & OxSRFI-BWB-HGN-08-DR-CH-0105**.

Horizontal alignment

4.10 The horizontal alignment is summarised as follows:

J10 NB diverge to Ardley	Horizontal Design Parameters
Description	• Straight as design transitions from link design to CD 109, into grade separated junction design to CD 122 • Left hand radius 2080m • Straight • Right hand radius 510m (minimum R with 3.5% superelevation) • Straight • Left hand radius 866m (minimum R with 2.5% superelevation) • Left hand radius 2880 • Left hand radius 854m (minimum R with 2.5% superelevation) • Right hand radius 1020m • Left hand radius 2036m • Left hand radius 360mm (minimum R with 5.0% superelevation) • Left hand radius 120m as design transitions from CD 122 grade separated junction design, into roundabout design to CD 116
Compliance with DMRB	**Compliant**

Vertical alignment

4.11 The vertical alignment is summarised as follows:

J10 NB diverge to Ardley	Vertical Design Parameters
Description	• Existing geometry retained until connector road realignment begins • Grade 0.9% uphill • Sag K 20 • Grade 2.4% uphill • Crest K 30 • Grade 0.5% downhill • Sag K 20 • 1.3% uphill as design transitions from CD122 grade separated junction design, into roundabout design to CD 116
Compliance with DMRB	**Compliant**

Stopping Sight Distance / Visibility

4.12 As stated within CD 122, para 3.34 mainline SSD shall be provided along the diverge and into the connector road up to the back of the nose. CD 109, Table 2.10, states that the desirable SSD for a 120kph design speed is 295m.

4.13 From the back of the nose the SSD reduces to the slip road design SSD of 120m.

4.14 The SSD has been assessed as follows:

J10 NB diverge to Ardley	Visibility Parameters
Description	• Minimum SSD of 295m achieved to back of nose • Minimum SSD of 120m achieved to junction
Compliance with DMRB	**Compliant**

Cross-section (Connector Road – Slip Road)

4.15 The traffic data above has been inserted into CD 122 table 5.17b and this confirms that the minimum slip road cross-section is DG1A (single lane diverge slip road with hard shoulder). However, based on the upstream diverge layout and the downstream junction layout a two lane diverge slip road to cross-section DG2A is proposed.

4.16 In accordance with CD 127, para 2.1, Figure 2.1.1N1b provides the required cross-sectional dimensions for a rural motorway connector road.

Lane Widths

4.17 The cross-section of the length of revised slip road is two no. 3.65m wide traffic lanes. However, at the tie-in to the existing slip road which is beyond the back of the diverge nose, the existing lane widths are 3.0m. As the scheme connects into this non-standard cross-section this is a **departure from standard** reference **G3.**

Hard Shoulders / Hard Strips / Verges

4.18 Connector road type DG2A states that a 1.0m hard strip and 2.5m verge shall be provided on the nearside, and a 1.0m hard strip and 2.0m verge on the offside. These widths are provided along the length of the realigned slip road.

4.19 The minimum verge width will be widened as necessary to accommodate relevant assets e.g. motorway communications ducting, lighting, signage, VRS and the like.

5. M40 J10A NORTHBOUND DIVERGE TO PADBURY JUNCTION

Layout

5.1 The J10A northbound diverge is the proposed diverge to provide the M40 northbound to A43 northbound link, connecting to the Padbury junction.

5.2 The design year traffic data for the diverge is as follows:

Location	AM Peak		PM Peak	
	Total Vehicles	%HGV	Total Vehicles	%HGV
M40 downstream of J10A NB diverge	2891	11.5	3787	10.1
J10A NB Diverge	1058	n/a	1729	n/a

5.3 The mainline gradient is <2% and based on the above no adjustments to the flows are required in accordance with CD 122 paragraph 3.9.

5.4 The traffic data has been inserted into CD 122 Figure 3.26b, motorway diverging diagram. This shows that a Layout D diverge (two lane diverge with lane drop) is required. This is shown on **Figure 5.1** below.

5.5 The M40 currently has three lanes in each direction between J9 and J10 and this scheme does not include for providing additional capacity on this overall link. Therefore, a lane drop (from four lanes to three lanes) cannot be provided. Ideally a Layout B diverge would be provided (and the figure does show that it is close to the boundary). However, the presence of the existing bridges which take the A43 over the M40 within J10 constrain the cross-section to around a 15m paved width which can only accommodate 4 lanes in total.

5.6 To provide a Layout B option 1 diverge without replacing the bridges would move the nose around 290m downstream, and this would be around 150m for a Layout B option 2 diverge. Both of these layouts would mean the overall junction solution could not be provided, or a departure for reduced SSD into the diverge loop would be needed.

5.7 Therefore, a Layout A option 1 diverge is proposed but this requires a **departure from standard** reference **G4**. VISSIM modelling will be undertaken to assess the operation of this proposal

Decision / Outcome 5-1: A Layout A option 1, 2-lane taper, J10A northbound diverge layout is to be provided. This could be adapted into a Layout C in future should a fourth lane be added to the M40.

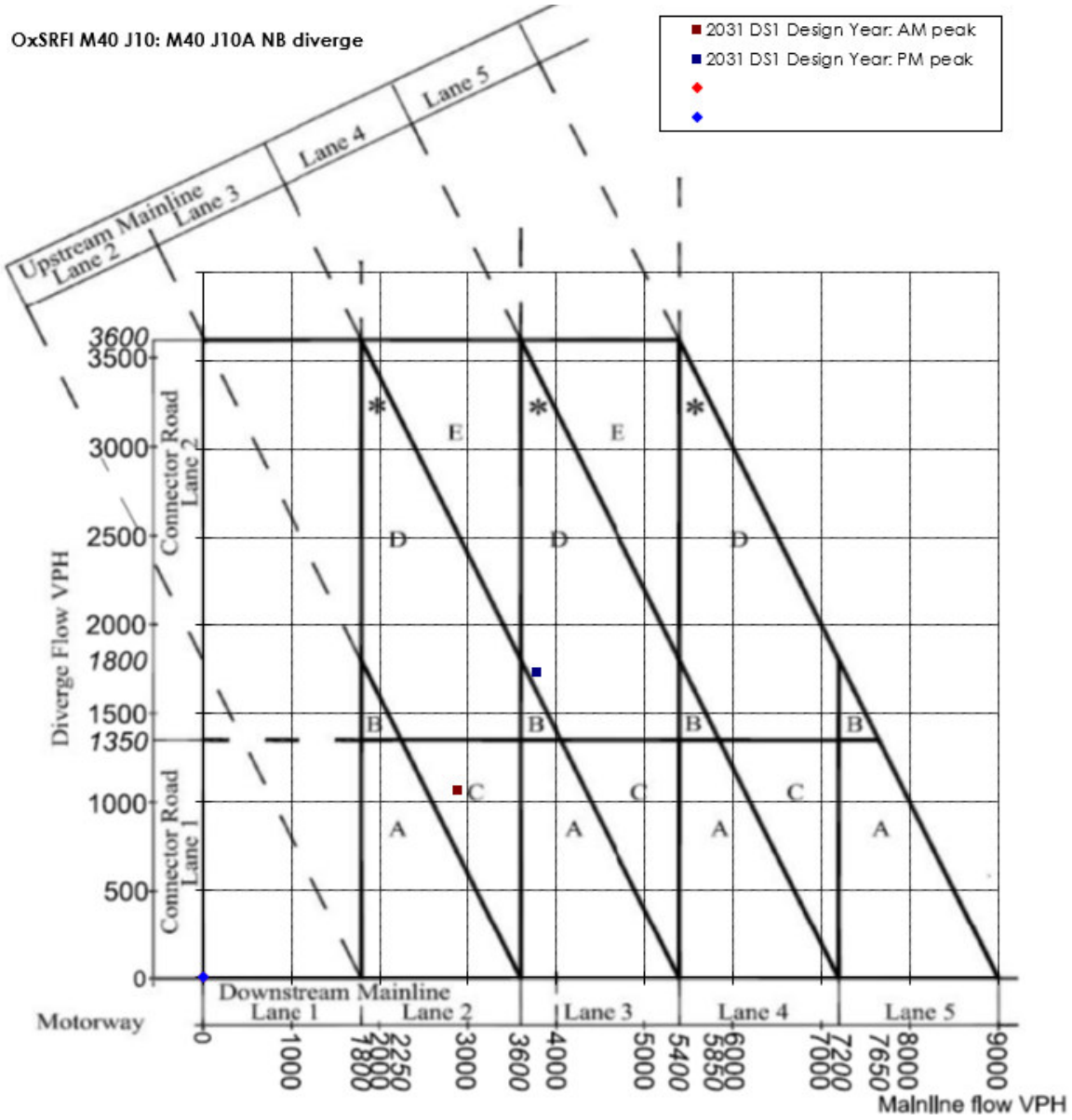


Figure 5.1 M40 J10A northbound diverge layout to Padbury requirement using traffic data

5.8 The following table summarises the geometric parameters for the Layout A option 1 diverge:

Element	Standard (CD 122) dimensions	Proposed Design	
		Details	Comments including Relaxations / Departures
Exit datum point	At start of taper	At start of taper	None
Taper	185m	185m	Taper for 2-lane slip road is provided
Nose length	80m	80m	None
Nose ratio	1:15	1:15	Compliant as nose ratio is minimum value
Near straight	510m min radius for 80m	Straight for for > 80m	None

Design Speed and Geometry

5.9 In accordance with CD 122, para 5.4 and Table 5.4, the minimum design speed for a slip road connector shall be 70kph where the mainline design speed is 120kph. However, the J10A slip road is over 0.75km long (it is 0.9km long) and is therefore to be designed as an interchange link and will therefore have a design speed of 85kph.

5.10 The geometry of the J10 northbound diverge slip road is shown on **drawings OxSRFI-BWB-HGN-05-DR-CH-0105, OxSRFI-BWB-HGN-06-DR-CH-0105, OxSRFI-BWB-HGN-07-DR-CH-0105, OxSRFI-BWB-HGN-13-DR-CH-0105 & OxSRFI-BWB-HGN-14-DR-CH-0105**.

Horizontal alignment

5.11 The horizontal alignment is summarised as follows:

J10 NB diverge to Padbury	Horizontal Design Parameters
Description	• Straight connecting to back of diverge nose (CD 122 compliant near straight) • Left hand radius 2080m • Left hand radius 75m (loop) • Left hand radius 510m (minimum R with 5.0% superelevation) • Straight • Left hand radius 87m as design transitions from CD 122 grade separated junction design, into at-grade priority and signal-controlled junction design to CD 123
Compliance with DMRB	**Compliant**

Vertical alignment

5.12 The vertical alignment is summarised as follows:

J10 NB diverge to Padbury	Vertical Design Parameters
Description	• Grade 1.1% downhill as design transitions from link design to CD 109, into grade separated junction design to CD 122 • Sag K 276 • Grade 0.6% downhill • Sag K 100 • Grade 0.5% downhill • Sag K 180 • Grade 0.6% downhill • Crest k 55 • Grade 0.5% downhill • Sag K 13 (two steps below desirable minimum) – **departure** • Grade 7.0% uphill • Crest K 17 (two steps below desirable minimum) – **departure**

J10 NB diverge to Padbury	Vertical Design Parameters
	• Grade 7.0% downhill as design transitions from CD 122 grade separated junction design, into at-grade priority and signal-controlled junction design to CD 123
Compliance with DMRB	CD 122 para 1.3 does not permit the use of relaxations given in CD 109. The Crest and Sag curves highlighted above are two steps below desirable minimum, for a design speed of 85kph. A **departure** is required, reference **G5.** Due to the loop element speeds will be reduced and a 40mph speed limit will be in place. As the link connects from a motorway (and not to a motorway), CD 122 para 5.7, then an increased gradient of 7% is permitted.

Stopping Sight Distance / Visibility

5.13 As stated within CD 122, para 3.34 mainline SSD shall be provided along the diverge and into the connector road up to the back of the nose. CD 109, Table 2.10, states that the desirable SSD for a 120kph design speed is 295m.

5.14 From the back of the nose the SSD reduces to the slip road design SSD of 160m.

5.15 The SSD has been assessed as follows:

J10 NB diverge to Padbury	Visibility Parameters
Description	• Minimum SSD of 295m achieved to back of nose • One step below desirable minimum SSD of 120m achieved on the loop - **Departure** • Two steps below desirable minimum SSD of 90m achieved over the M40 overbridge - **Departure**
Compliance with DMRB	CD 122 does not permit obscured visibility across the loop. Due to the retention of the woodland a minimum SSD of 120m is proposed. On this basis a **departure** is required, reference **G6.** The reduction in SSD over the bridge is dealt with as part of departure **G5.**

Loop visibility

5.16 The M40NB to A43 interchange link at J10A will include a loop element designed to CD 122 para 5.10. The loop will take the interchange link through a total angle of 270 degrees and it has a radius of 75m.

5.17 Transition curves into and out of the loop are not proposed as per CD 122 para 5.9. This is because on the entry to a loop a transition curve can present to the driver a false sense of the tightness of the geometry leading to high entry speeds. As there is 295m visibility provided from the diverge to the start of the loop the start of the loop will be clearly visible to drivers and it is in fact this criteria that has been used to determine the location of the loop.

5.18 CD 122 para 5.14 requires that within a loop, full visibility of the entire loop is required. However, within the location of the loop there is a block of established woodland. It is clearly not possible for a driver to be able to see the entire loop when on any part of it (i.e. a driver cannot see behind them to a different part of the loop) and we therefore propose to retain an element of this woodland, which will have clear environmental benefits.

5.19 Due to the radius of the loop a speed limit of 40mph is proposed and is to be incorporated into the speed limit provisions of the Development Consent Order (DCO) for the scheme. Use of a 40mph speed limit is in keeping with similar radius loops on other parts of the motorway network (for example on the M1 J24A southbound link to the A50 eastbound). Based on providing a 40mph speed limit we therefore propose to provide a stopping sight distance of 120m around the inside of the loop, 120m being determined from CD 109 table 2.10 for a 70kph design speed (which is appropriate for a 40mph road). This is however a departure from standard and is **departure from standard** reference **G6**.

Cross-section (Connector Road – Interchange Link)

5.20 The traffic data above has been inserted into CD 122 table 5.17b and this confirms that the minimum slip road cross-section is DG2A (two lane diverge slip road with hard strip).

5.21 However, the J10A slip road is over 0.75km long (it is 0.9km long) and is therefore to be designed as an interchange link. As it is longer than 1km the required cross-section is IL2A (2-lane interchange link with hard shoulder).

5.22 In accordance with CD 127, para 2.1, Figure 2.1.1N1b provides the required cross-sectional dimensions for a rural motorway connector road.

Lane Widths

5.23 The cross-section of the length of the merge slip road is two no. 3.65m wide traffic lanes. This widens to two no. 4m wide traffic lanes to accommodate the loop, due to the geometry consisting of a minimum radius of 75m, in accordance with CD 123.

Hard Shoulders / Hard Strips / Verges

5.24 Connector road type IL2A states that a 3.3m hard shoulder and 1.5m verge shall be provided on the nearside, and a 0.7m hard strip and 2.3m verge on the offside.

5.25 The minimum verge width will be widened as necessary to accommodate relevant assets e.g. motorway communications ducting, lighting, signage, VRS and the like.

6. M40 J10 NORTHBOUND MERGE FROM ARDLEY JUNCTION

Layout

6.1 The existing J10 northbound merge is a Layout B auxiliary lane merge. Due to the construction of the J10A northbound diverge, the existing merge has to be relocated.

6.2 The design year traffic data for the merge is as follows:

Location	AM Peak		PM Peak	
	Total Vehicles	%HGV	Total Vehicles	%HGV
M40 upstream of J10 NB merge	2891	11.4	3787	10.1
J10 NB Merge	575	20.6	860	13.5

6.3 The mainline gradient is <2% and based on the above no adjustments to the mainline flows are required in accordance with CD 122 para 3.9.

6.4 The merge gradient for the full length of the slip road and nose is <2% but the merge flows have been increased using factors derived from CD 122 para 3.9 due to the %HGV.

6.5 The traffic data has been inserted into CD 122 Figure 3.12b, motorway merging diagram, and this confirms that a Layout B merge is required. This is shown on **Figure 6.1** below.

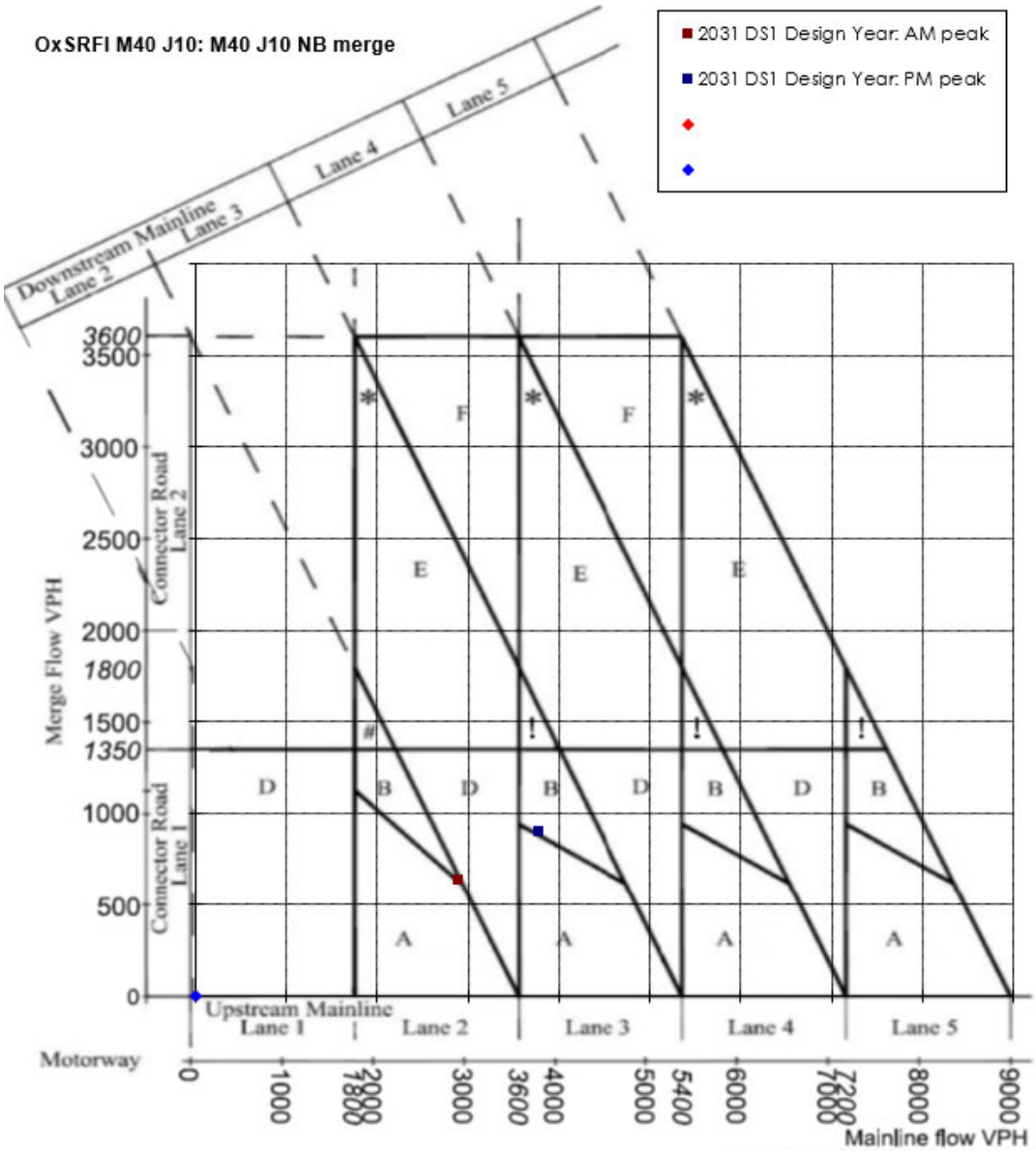


Figure 6.1 M40 J10 northbound merge layout from Ardley requirement using traffic data

6.6 The following table summarises the geometric parameters for the proposed Layout B merge:

Element	Standard (CD 122) dimensions	Proposed Design	
		Details	Comments including Relaxations / Departures
Nose length	115m	115m	None
Nose ratio	1:40	1:23	Compliant as nose ratio is minimum value
Auxiliary lane length	230m	230m	None
End Taper length	75m	75m	None
Entry datum point	At end of taper	At end of taper	None

Decision / Outcome 6-1: The J10 northbound merge is to be relocated and a Layout B auxiliary lane merge provided.

Loop

6.7 The relocated J10 northbound merge slip road is to be provided in the form of a low-radius loop as it will closely follow the geometric alignment of the M40NB to A43NB interchange link. A loop is defined by CD 122 as having an angle of around 180 degrees or more. The proposed loop element will turn through two radii of 90 degrees and will resemble that shown on CD 122 Figure 5.10.

Design Speed and Geometry

6.8 In accordance with CD 122, para 5.4 and Table 5.4, the minimum design speed for an interchange link connector shall be 85kph where the mainline design speed is 120kph.

6.9 The geometry of the J10 northbound merge slip road is shown on **drawings OxSRFI-BWB-HGN-13-DR-CH-0105, OxSRFI-BWB-HGN-14-DR-CH-0105 & OxSRFI-BWB-HGN-15-DR-CH-0105**.

Horizontal alignment

6.10 The horizontal alignment is summarised as follows:

J10 NB Merge from Ardley	Horizontal Design Parameters
Description	• Left hand radius 60m as design transitions from roundabout design to CD 116, into grade separated junction design to CD 122 • Left hand radius 360m (one step below desirable minimum) – **departure** • Left hand radius 510m (minimum R with 5.0% superelevation) • Left hand radius 92m (loop) • Straight • Left hand radius 75m (loop) • Left hand radius 1020m (minimum R with 2.5% superelevation) – CD 122 near straight connecting into back of nose
Compliance with DMRB	As the connector roads begins when leaving Ardley the 360m radius is one step below desirable minimum allowed for a design speed of 85kph. As the loop ends and transitions into the slip providing entry on to the mainline the radii is also 360m. CD 122 does not permit the use of relaxations given in CD 109. On this basis a **departure** is required, reference **G7.**

Vertical alignment

6.11 The vertical alignment is summarised as follows:

J10 NB Merge from Ardley	Vertical Design Parameters
Description	• Grade 0.8% downhill and crest K10 as design transitions from roundabout design to CD 116, into grade separation junction design to CD 122 • Grade 4.5% downhill

J10 NB Merge from Ardley	Vertical Design Parameters
	• Sag K 20 • Grade 1.7% uphill • Crest K 30 (one step below desirable minimum) – **departure** • Grade 2.7% downhill • Sag k 20 • Grade 0.7% downhill • Sag K 20 • Grade 2.4% uphill • Crest K 20 (two steps below desirable minimum) – **departure** • Grade 0.7% uphill • Sag K 20 • Grade 1.1% uphill • Grade 1.0% uphill as design transitions from CD 122 grade separated junction design, into link design to CD 109
Compliance with DMRB	As there are two loops running adjacent, similar geometry (30 K) is used to ensure similar levels are maintained to aid in achieving stopping site distance and avoid uneven earthworks. As the loop transitions from design levels to existing to match the mainline a crest of 20 K is utilised. CD 122 does not permit the use of relaxations given in CD 109. This is dealt with under departure **G7.**

Stopping Sight Distance / Visibility

6.12 As stated within CD 122, para 3.23 & 3.24, SSD shall be provided along the connector road and up to the back of the nose. Mainline SSD shall be provided from the back of the nose. CD 109, Table 2.10, states that the desirable SSD for a 85kph design speed is 160m.

6.13 From the back of the nose the SSD increases to mainline design speed SSD of 295m.

6.14 The SSD has been assessed as follows:

J10 NB Merge from Ardley	Visibility Parameters
Description	• Minimum SSD of 160m achieved on Ardley roundabout exit • Two steps below desirable minimum SSD of 90m before the start of the northbound loops – **departure** • Minimum SSD of 160m achieved across the loops (1.05 to 1.05) • Minimum SSD of 160m achieved from loop to back of nose • Mainline SSD of 295m achieve from back of nose
Compliance with DMRB	Due to providing similar vertical geometry for the northbound and southbound loops as well as tieing back into existing mainline for the northbound merge, this has influenced the SSD. At two steps below desirable minimum and that CD 122 does not permit the use of relaxations given in CD 109. This is dealt with under departure **G7.**

Cross-section (Connector Road – Interchange Link)

6.15 The traffic data above has been inserted into CD 122 table 5.17b and this confirms that the minimum slip road cross-section is MG1A (single lane merge slip road with hard shoulder). The J10 northbound merge slip road 815m long which means, being longer that 750m, it is to be designed as an interchange link as required by CD 122 para 5.5. However, as it is shorter than 1km and is not on an average uphill gradient of more than 3% it can be a single lane (CD 122 para 5.3). The required cross-section is therefore IL1A (single lane interchange link with hard shoulder).

6.16 In accordance with CD 127, para 2.1, Figure 2.1.1N1b provides the required cross-sectional dimensions for a rural motorway connector road.

Lane Widths

6.17 The cross-section of the length of the merge slip road (interchange link IL1A) is one no. 3.7m wide traffic lane. This widens to one 4m wide traffic lane to accommodate the loops due to the geometry consisting of a minimum radius of 75m, in accordance with CD 123 Table 5.10 (which is referenced from CD 122 para 5.18 Note 2).

Hard Shoulders / Hard Strips / Verges

6.18 Connector road type IL1A states that a 3.3m hard shoulder and 1.5m verge shall be provided on the nearside, and a 0.7m hard strip and 2.3m verge on the offside along the length of the realigned slip road.

6.19 The minimum verge width will be widened as necessary to accommodate relevant assets e.g. motorway communications ducting, lighting, signage, VRS and the like.

7. M40 J10 SOUTHBOUND DIVERGE TO PADBURY JUNCTION

Layout

7.1 The J10 southbound diverge is an existing Layout A option 1 diverge (1-lane taper diverge), the scheme does not propose to amend the diverge layout.

7.2 The design year traffic data for the diverge is as follows:

Location	AM Peak		PM Peak	
	Total Vehicles	%HGV	Total Vehicles	%HGV
M40 downstream of J10 SB diverge	3420	16.0	3348	9.8
J10 SB Diverge	918	n/a	650	n/a

7.3 The mainline gradient is <2% and based on the above no adjustments to the flows are required in accordance with CD 122 paragraph 3.9.

7.4 The traffic data has been inserted into CD 122 Figure 3.26b, motorway diverging diagram, and this confirms that a Layout A diverge is required. This is shown on **Figure 7.1** below.

7.5 This assessment has confirmed that the existing diverge layout is appropriate for the scheme and hence it is not proposed to undertake any works to the diverge. This means that the exit datum point for the diverge will remain as the existing location.

7.6 As the scheme does not amend the diverge layout a detailed assessment of the diverge parameters has not been undertaken.

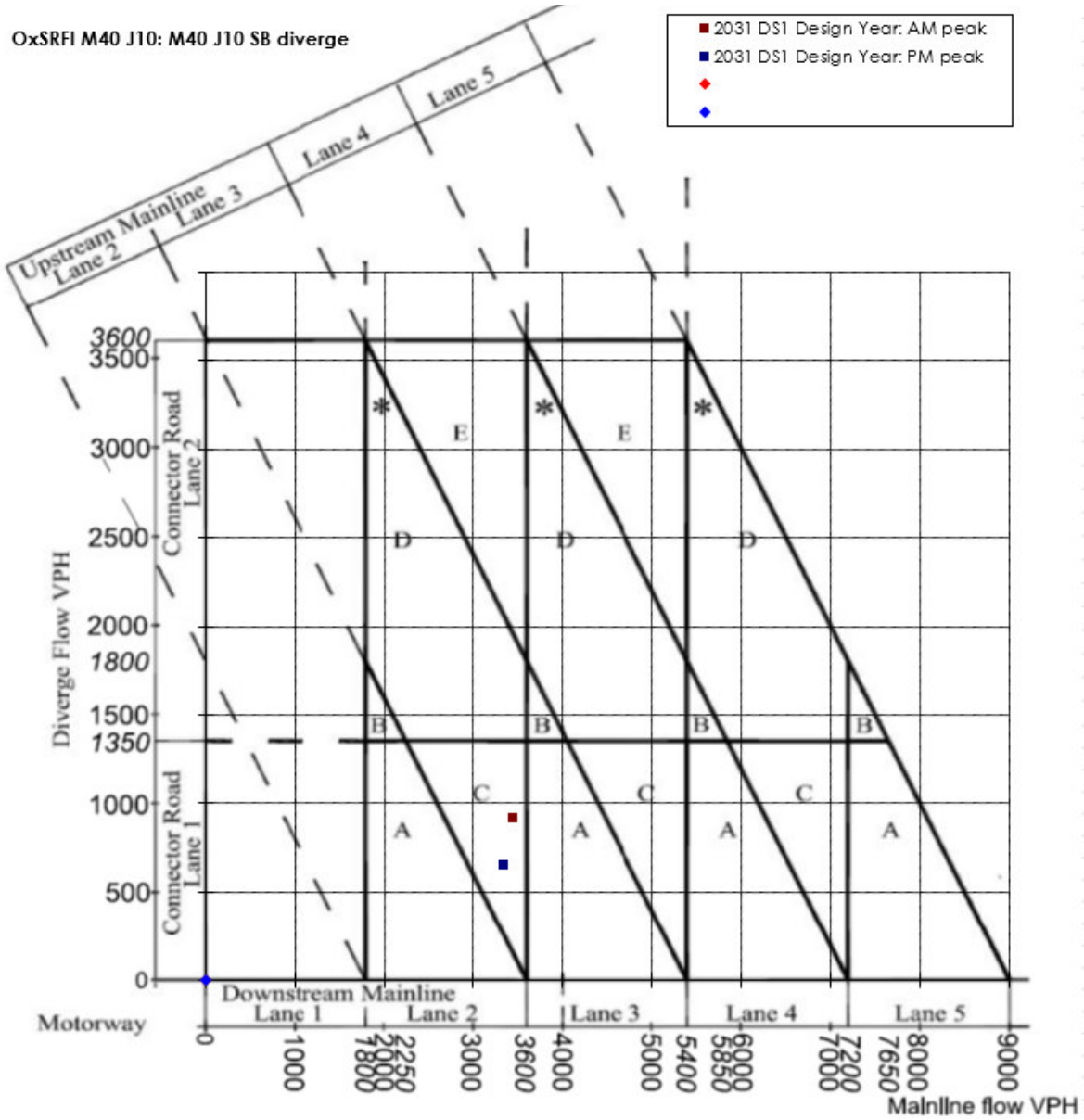


Figure 7.1 M40 J10 southbound diverge layout to Padbury requirement using traffic data

Decision / Outcome 7-1: The existing Layout A option 1, J10 southbound diverge layout is to be retained.

Design Speed and Geometry

7.7 In accordance with CD 122, para 5.4 and Table 5.4, the minimum design speed for a slip road connector shall be 70kph where the mainline design speed is 120kph.

7.8 The geometry of the J10 southbound diverge slip road is shown on **drawing OxSRFI-BWB-HGN-05-DR-CH-0105.**

Horizontal alignment

7.9 The horizontal alignment is summarised as follows:

J10 SB Diverge to Padbury	Horizontal Design Parameters
Description	• Left hand radius 345m (one step below desirable minimum) as design transitions from CD 122 grade separated junction design, into link design to CD 109 – **existing departure** • Left hand radius 300m as design transitions from CD 122 grade separated junction design, into at-grade priority and signal-controlled junction design to CD 123
Compliance with DMRB	**One existing departure**

Vertical alignment

7.10 The vertical alignment is summarised as follows:

J10 SB Diverge to Padbury	Vertical Design Parameters
Description	• Existing geometry retained until connector road realignment begins • Grade 1.6% downhill • Crest K 272 • Grade 1.8% downhill • Sag K 20 • Grade 3.3% uphill • Crest K 30 • Grade 1.8% uphill as design transitions from CD122 grade separated junction design, into at-grade priority and signal-controlled junction design to CD 123
Compliance with DMRB	**Compliant**

Stopping Sight Distance / Visibility

7.11 As stated within CD 122, para 3.34 mainline SSD shall be provided along the diverge and into the connector road up to the back of the nose. CD 109, Table 2.10, states that the desirable SSD for a 120kph design speed is 295m. The works covered in this section however do no conflict with mainline SSD as widening begins over 160m from the back of the nose.

7.12 From the back of the nose the SSD reduces to the slip road design SSD of 120m.

7.13 The SSD has been assessed as follows:

J10 SB Diverge to Padbury	Visibility Parameters
Description	• Minimum SSD of 120m achieved
Compliance with DMRB	**Compliant**

Cross-section (Connector Road – Slip Road)

7.14 The traffic data above has been inserted into CD 122 table 5.17b and this confirms that the minimum slip road cross-section is DG2A (two lane slip diverge road with hard strip). The existing slip road is to cross-section DG1A (single lane diverge slip road with hard shoulder). The threshold for the change is 900vph but this is not related to the link capacity which is taken to be 1350vph. As the downstream end of the slip road the number of lanes increases based on the capacity of Padbury junction. However, the retention of the existing slip road cross-section, which has a non-standard hard shoulder width, is **departure from standard** reference **G8.**

7.15 In accordance with CD 127, para 2.1, Figure 2.1.1N1b provides the required cross-sectional dimensions for a rural motorway connector road.

Lane Widths

7.16 The cross-section of the length of revised slip road is three no. 4m wide traffic lanes and one 4.5m lane. The 4.5m left-turn only lane has been retained, albeit realigned as part of the works. On approach to the signal-controlled junction the carriageway widens to accommodate three 4m right-turn only lanes.

Hard Shoulders / Hard Strips / Verges

7.17 Connector road type DG2A states that a 1.0m hard strip and 2.5m verge shall be provided on the nearside, and a 1.0m hard strip and 2.0m verge on the offside. These widths are provided along the length of the realigned slip road with hard-strips tapering out as the junction develops.

7.18 The minimum verge width will be widened as necessary to accommodate relevant assets e.g. motorway communications ducting, lighting, signage, VRS and the like.

8. M40 J10 SOUTHBOUND MERGE FROM CHERWELL JUNCTION

Layout

8.1 The existing J10 northbound merge is a Layout A taper lane merge. The existing merge has an excessively long nose of around 450m which is a legacy from previous layouts for this junction.

8.2 The design year traffic data for the merge is as follows:

Location	AM Peak		PM Peak	
	Total Vehicles	%HGV	Total Vehicles	%HGV
M40 upstream of J10 SB diverge	3420	16.0	3348	9.8
J10 SB Merge	1960	18.7	1658	13.5

8.3 The mainline gradient is <2% and based on the above a minor adjustment to the mainline flows is required in the AM peak hour in accordance with CD 122 para 3.9.

8.4 The merge gradient for the full length of the slip road is <2% but the merge flows have been increased using factors derived from CD 122 para 3.9 due to the %HGV.

8.5 The adjusted traffic data has been inserted into CD 122 Figure 3.12b, motorway merging diagram. This is shown on **Figure 8.1** below.

8.6 The required merge type would require a lane gain to be provided on the M40 northbound. However, it is not within the scope of the scheme to provide a fourth lane on the M40. As this is an existing slip road and not a new element, the relaxations under CD 122 section E/1 apply. Therefore, as per para E/1.3.3b, a "*Layout C or Layout E3 (see Figure E/1.3) can be used instead of Layout E1 and E2*."

8.7 Layout E option 3 provides an auxiliary lane for the second merge instead of a taper. There is no guidance in this section as to when a layout E option 3 should be used instead of Layout C. To determine this an assessment has been made using the likely amount of traffic using lane 1 on the slip road, which feeds into the second merge point.

8.8 As a reasonable worst-case approach for assessment 100% of the HGV traffic and 50% of other vehicles is assigned to lane 1 (for the second merge point) and the remaining traffic is assigned to lane 2 (for the first merge point). A further version of the motorway merging diagram has then been developed to review the second merge point in isolation. This is shown on **Figure 8.2** below. This assessment shows that a layout B merge would be appropriate which has an auxiliary lane.

8.9 On this basis it is therefore appropriate to use the layout E option 3 merge.

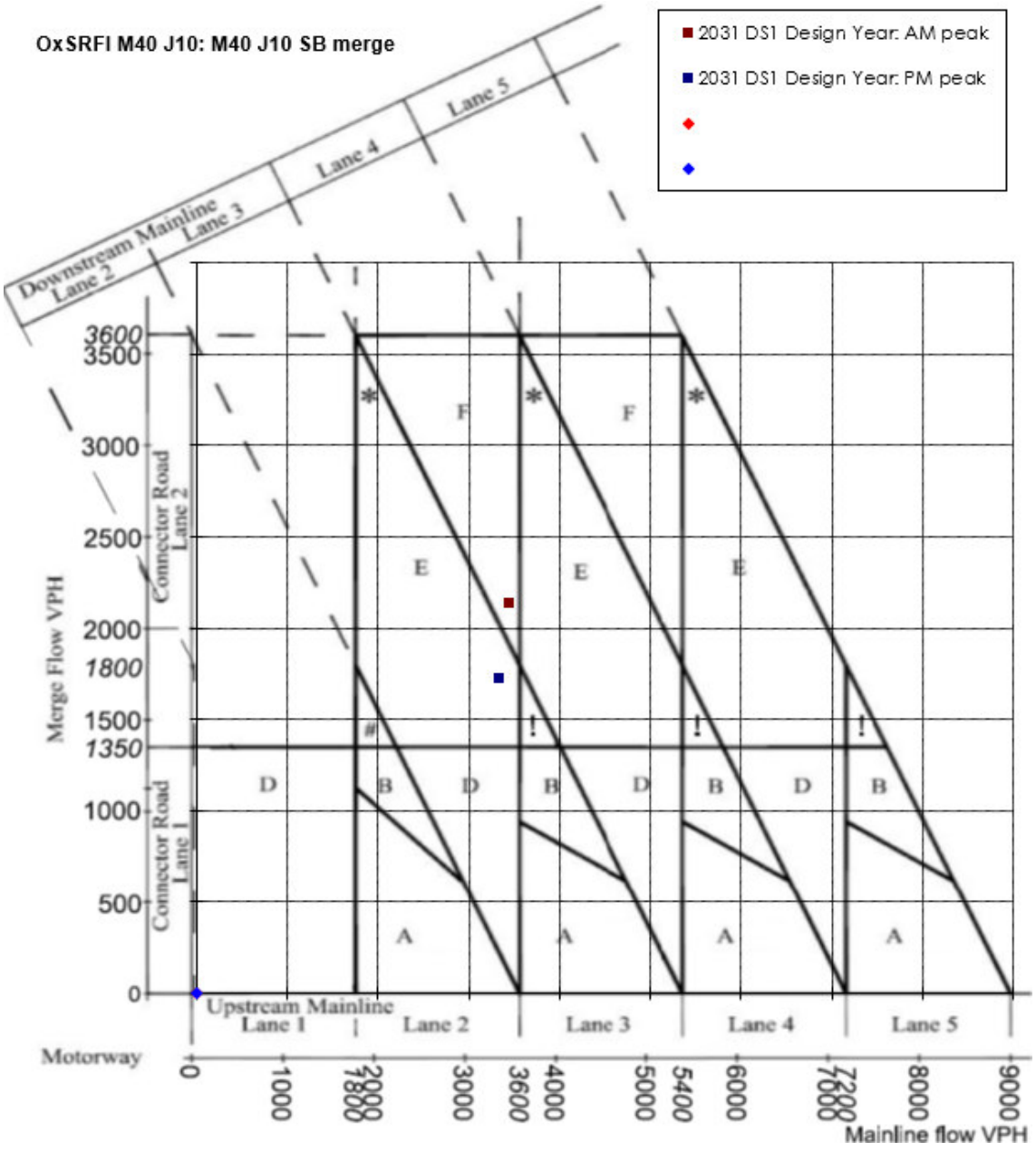


Figure 8.1 M40 J10 southbound merge layout from Cherwell requirement using traffic data

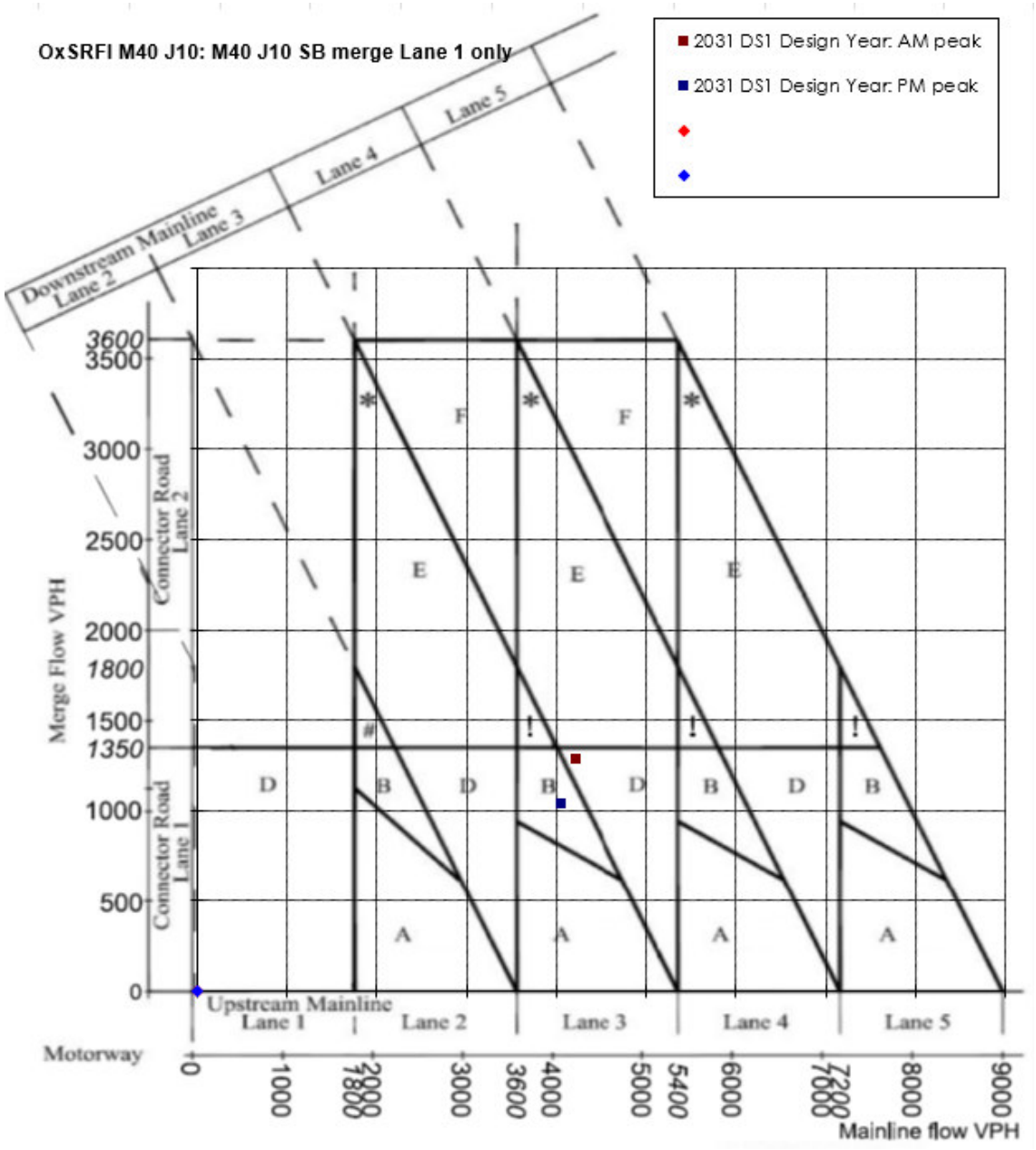


Figure 8.2 M40 J10 southbound merge layout – 2nd merge in isolation

8.10 The following table summarises the geometric parameters for the proposed Layout E3 merge:

Element	Standard (CD 122) dimensions	Proposed Design	
		Details	Comments including Relaxations / Departures
Nose length	115m	115m	None
Nose ratio	1:40	1:23	Compliant as nose ratio is minimum value
Taper (merge lane 2)	205m	180m	None
Ghost Island Tail	180m	180m	None
Auxiliary lane length	230m	230m	None
End Taper length	75m	75m	None
Entry datum point	At end of taper	At end of taper	None

Decision / Outcome 8-1: The J10 southbound merge is to be upgraded to a layout E option 3 merge.

Design Speed and Geometry

8.11 In accordance with CD 122, para 5.4 and Table 5.4, the minimum design speed for a slip road connector shall be 70kph where the mainline design speed is 120kph.

8.12 The geometry of the J10 southbound merge slip road is shown on **drawings OxSRFI-BWB-HGN-06-DR-CH-0105, OxSRFI-BWB-HGN-07-DR-CH-0105 & OxSRFI-BWB-HGN-08-DR-CH-0105**.

Horizontal alignment

8.13 The horizontal alignment is summarised as follows:

J10 SB Merge from Cherwell	Horizontal Design Parameters
Description	• Straight as design transitions from signal-controlled junction design to CD 123, into grade separated junction design to CD 122 • Transition • Left hand radius 720m (minimum R with 2.5% superelevation) • Left hand radius 1020m (CD 122 near straight) into back of nose
Compliance with DMRB	**Compliant**

Vertical alignment

8.14 The vertical alignment is summarised as follows:

J10 SB Merge from Cherwell	Vertical Design Parameters
Description	• Crest k 30 • Grade 3.1% downhill • Sag K 20 • Grade 0.7% uphill • Crest K 298 • Grade 1.4% downhill
Compliance with DMRB	**Compliant**

Stopping Sight Distance / Visibility

8.15 As stated, CD 122, para 3.23 & 3.24, SSD shall be provided along the connector road and up to the back of the nose. Mainline SSD shall be provided from the back of the nose. CD 109, Table 2.10, states that the desirable SSD for a 70kph design speed is 120m.

8.16 From the back of the nose the SSD increases to mainline design speed SSD of 295m.

8.17 The SSD has been assessed as follows:

J10 SB Merge from Cherwell	Visibility Parameters
Description	• Minimum SSD of 120m achieved to back of nose • Minimum mainline SSD of 295m achieved Southbound to mainline from back of nose
Compliance with DMRB	**Compliant**

Cross-section (Connector Road – Interchange Link)

8.18 The traffic data above has been inserted into CD 122 table 5.17b and this confirms that the minimum Slip road cross-section is MG2C (two lane merge slip road without hard shoulder).

8.19 The existing slip road is a single lane with a hard shoulder and this will be widened to cross-section MG2C as part of this scheme.

8.20 In accordance with CD 127, para 2.1, Figure 2.1.1N1b provides the required cross-sectional dimensions for a rural motorway connector road.

Lane Widths

8.21 The cross-section of the length of the merge slip road is two no. 3.65m wide traffic lane.

Hard Shoulders / Hard Strips / Verges

8.22 Connector road type MG2C states that a 3.3m hard shoulder and 1.5m verge shall be provided on the nearside, and a 0.7m hard strip and 2.3m verge on the offside. These widths are provided along the length of the slip road.

8.23 The minimum verge width will be widened as necessary to accommodate relevant assets e.g. motorway communications ducting, lighting, signage, VRS and the like.

9. BAYNARDS GREEN ROUNDABOUT (A43 NORTH & B4100)

Layout

9.1 The works at Baynard's Green looks to upgrade the existing roundabout to accommodate the improvements works for the A43 and B4100.

9.2 A43 north of Baynard's Green retains the dual cross-section which gradually widens to three lanes, providing an additional 160m capacity, southbound, on the approach to the roundabout. The northbound roundabout exit features an extra lane also, that gradually tapers to two lanes in-keeping with the existing cross-section.

9.3 The A43 mainline, south of Baynard's Green is discussed in section 10.

9.4 B4100 east increases to two lanes on the exit of the roundabout which gradually transitions back to one, in-keeping with the existing cross-section. The approach to the roundabout increases from two lanes on entry only, at the flare, to two lanes with the addition of a left turn only lane, increasing capacity up to 120m further.

9.5 B4100 west retains single lane dualling, providing a right turn lane into Ambury Road and preventing a right turn on to the B4100. This has however been realigned slightly to the south.

Design Speed and Geometry

9.6 A43 north is a D2AP, dual carriageway, all-purpose, rural route, with a design speed of 120kph and the national speed limit applies.

9.7 B4100 east is an S2, single carriageway, all-purpose, rural route, with a design speed of 100kph and the national speed limit applies.

9.8 B4100 west is an S2, single carriageway, all-purpose, rural route, with a design speed of 100kph and the national speed limit applies.

Horizontal alignment

9.9 The horizontal alignment is summarised as follows:

Horizontal Design Parameters	A43 North	B4100 East	B4100 West
Description	• Left hand radius 2880m as design transitions from CD 116 roundabout design into link design to CD 109 • Right hand radius 1086m as design ties into existing - (minimum R with 5.0% superelevation)	• Straight as design transitions from CD 116 roundabout design into link design to CD 109 • Right hand radius 2040m • Straight as design ties into existing	• Left hand radius 929m as design transitions from CD 116 roundabout design into link design to CD 109 - (minimum R with 5.0% superelevation) • Straight • Left hand radius 665m - (one step below desirable minimum) – **relaxation** • Straight as design ties into existing
Compliance with DMRB	**Compliant**	**Compliant**	One **relaxation**

Vertical alignment

9.10 The vertical alignment is summarised as follows:

Vertical Design Parameters	A43 North	B4100 East	B4100 West
Description	• Crest K 30 as design transitions from CD 116 roundabout design into link design to CD 109 • Grade 0.6% uphill • Crest K 182 • Grade 0.3% uphill as design ties into existing	• Grade 2.0% downhill as design transitions from CD 116 roundabout design into link design to CD 109 • Sag K 26 • Grade 0.5% downhill • Crest K 55 - (one step below desirable minimum) – **departure** • Grade 1.6% downhill • Sag K 42 • Grade 0.3% downhill as design ties into existing	• Grade 1.3% uphill as design transitions from CD 116 roundabout design into link design to CD 109 • Sag K 26 • Grade 1.8% uphill • Crest K 100 • Grade 1.6% uphill as design ties into existing
Compliance with DMRB	**Compliant**	CD 109 does not allow relaxations on the immediate approach to a junction. On this basis a	**Compliant**

Vertical Design Parameters	A43 North	B4100 East	B4100 West
		departure is required, reference **G9**.	

Stopping Sight Distance / Visibility

9.11 Stopping Site Distance has been assessed, in accordance with CD 109, Table 2.10 and paragraph 3.

9.12 The SSD has been assessed as follows:

Visibility Parameters	A43 North	B4100 East	B4100 West
Description	• Minimum SSD northbound of 295m achieved • Minimum SSD southbound of 295m achieved	• Minimum SSD northbound of 215m achieved Minimum SSD southbound of 215m achieved	• Minimum SSD northbound of 215m achieved • Minimum SSD southbound of 215m achieved
Compliance with DMRB	**Compliant**	**Compliant**	**Compliant**

Cross-section

9.13 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a dual two lane carriageway, all-purpose, rural road for the A43 north.

9.14 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road for the B4100 east.

9.15 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road for the B4100 west.

Lane Widths

9.16 Lane width of 3.65m as required by CD 127.

Hard Shoulders / Hard Strips / Verges

9.17 Hard strips have been provided for the A43 north, compliant with CD 127. Hard strips have not been included for B4100 west due to the short lengths of new carriageway and as the existing cross-section does not feature hard strips, this is in-keeping with the existing route, but this is a **departure**, reference **G10**. The B4100 east design does feature hard strips that are in-keeping with the existing cross-section, these have been provided at a width of 300mm, however this does deviate from standard, therefore a **departure** is required, reference **G11**.

9.18 The following are provided in accordance with CD 127:

- 2.5m minimum verge

Swept Paths & Entry Path Radius (Deflection)

9.19 All directions of travel have been assessed using the maximum legal European, 16.5m long, articulated heavy goods vehicle, in accordance with CD 116.

9.20 A43 north, southbound direction of travel achieves and entry path radius of 99m which is complaint under CD 116.

9.21 B4100 east, westbound direction of travel achieves and entry path radius of 150m which is requires a **departure** from standard, reference **G12.**

9.22 B4100 West, eastbound direction of travel achieves and entry path radius of 99m which is complaint under CD 116.

9.23 A43 mainline, northbound direction of travel achieves and entry path radius of 259m which is requires a **departure** from standard, reference **G13.**

10. PADBURY JUNCTION (A43 MAINLINE)

Layout

10.1 The works at Padbury looks to replace the existing free flow roundabout with a signalised junction to accommodate the improvements works for M40, J10, NB Diverge; M40, J10, EB Diverge, as well as the upgrades to the A43.

10.2 A43 mainline between Baynard's Green and Padbury (as highlighted in section 9) increases from two lanes to three lanes northbound and southbound directions of travel.

10.3 A43 mainline between Padbury and Cherwell also increases from two lanes to four, southbound, as well as introducing a dedicated left turn lane on the approach to Cherwell signalised junction. The northbound link between Padbury and Cherwell has been discussed in section 11.

10.4 M40 Northbound and Southbound Diverges that lead to Padbury have been discussed in sections 5 and 7.

Design Speed and Geometry

10.5 A43 north of Padbury is a D2AP, dual carriageway, all-purpose, rural route, with a design speed of 120kph and a speed limit of 50mph.

10.6 A43 south of Padbury to Cherwell is an all-purpose dual carriageway, rural route, with a design speed of 120kph and a speed limit of 50mph. Four lanes are proposed southbound with the existing two retained northbound.

Horizontal alignment

10.7 The horizontal alignment is summarised as follows:

Horizontal Design Parameters	A43 Mainline (north of Padbury)	A43 Mainline (south of Padbury)
Description	• Left hand radius 2040m as design transitions from CD 116 roundabout design into link design to CD 109 - (minimum R with 2.5% superelevation) • Transition • Straight • Transition • Left hand radius 720m as design transitions from CD 109 link design to CD 123 at-grade priority and signal-controlled junction design - (minimum R with 5.0% superelevation)	• Left hand radius 720m as design transitions from CD 123 at-grade priority and signal-controlled junction design to CD 109 link design - (minimum R with 5.0% superelevation) • Transition • Straight • Transition • Right hand radius 90m as design transitions from CD 116 roundabout design into link design to CD 109
Compliance with DMRB	**Compliant**	**Compliant**

Vertical alignment

10.8 The vertical alignment is summarised as follows:

Vertical Design Parameters	A43 Mainline (north of and within Padbury)	A43 Mainline (south of Padbury)
Description	• Grade 1.8% downhill as design transitions from CD 116 roundabout design into link design to CD 109 • Sag K 37 • Grade 0.1% uphill • Crest K 182 • Grade 0.6% downhill • Grade 0.5% downhill • Sag K 20 - (two step below desirable minimum) – **departure** • Grade 2.0% uphill • Crest K 55 as design transitions from CD 109 link design to CD 123 at-grade priority and signal-controlled junction design – **departure**	• Crest K 55 - as design transitions from CD 123 at-grade priority and signal-controlled junction design to CD 109 link design (one step below desirable minimum) – **departure** • Grade 1.1% downhill • Sag K 20 • Grade 4.7% downhill as design transitions from CD 109 link design to CD 116 roundabout design
Compliance with DMRB	CD 109 does not allow relaxations on the immediate approach to a junction. On this basis a **departure** is required, references **G14** and **G15**.	CD 109 does not allow relaxations on the immediate approach to a junction. On this basis a **departure** is required, reference **G15** (as it is the same crest).

Stopping Sight Distance / Visibility

10.9 Stopping Site Distance has been assessed, in accordance with CD 109, Table 2.10 and paragraph 3.

10.10 The SSD has been assessed as follows:

Visibility Parameters	A43 Mainline (north of Padbury)	A43 Mainline (south of Padbury)
Description	• Minimum SSD of 295m achieved northbound to Baynards Green • Minimum SSD of 295m achieved southbound to Padbury	• Minimum SSD of 295m achieved southbound to Cherwell
Compliance with DMRB	**Compliant**	**Compliant**

Cross-section

10.11 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a dual three lane carriageway, all-purpose, rural road for the A43 mainline northbound and southbound between Baynard's Green and Padbury.

10.12 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a dual three lane carriageway, all-purpose, rural road for the A43 mainline southbound from Padbury to Cherwell. Although this link is four lanes the same principles have been applied with wider middle lanes to accommodate road markings without a reduction in active lane width.

Lane Widths

10.13 Lane width of 3.65m except for cross-sections of three lanes and wider which provide middle lane widths of 3.7m as required by CD 127.

Hard Shoulders / Hard Strips / Verges

10.14 Hard strips and verge widths have been provided compliant with CD127.

Swept Paths

10.15 All directions of travel have been assessed using the maximum legal, European, 16.5m long, articulated heavy goods vehicle, in accordance with CD 123.

11. CHERWELL JUNCTION (A43 MAINLINE)

Layout

11.1 The works at Cherwell looks to replace the existing signalised roundabout with a signalised junction to accommodate the improvement works for M40, J10, SB Merge; as well as the upgrades to the A43.

11.2 A43 mainline, northbound between Cherwell and Padbury remains as two lanes, however it has been realigned slightly to accommodate the changes at Padbury.

Design Speed and Geometry

11.3 A43 northbound from Cherwell to Padbury is a D2AP, dual carriageway, all-purpose, rural route, with a design speed of 120kph and a speed limit of 50mph.

Horizontal alignment

11.4 The horizontal alignment is summarised as follows:

Horizontal Design Parameters	A43 Northbound (Cherwell to Padbury)
Description	• Straight as design transitions from CD 116 roundabout design into link design to CD 109 • Left hand radius 1449m (minimum R with 3.5% superelevation) • Straight • Right hand radius of 184m as design transitions from CD 109 link design to CD 123 at-grade priority and signal-controlled junction design
Compliance with DMRB	**Compliant**

Vertical alignment

11.5 The vertical alignment is summarised as follows:

Vertical Design Parameters	A43 Mainline (Cherwell to Padbury)
Description	• Grade 5.9% downhill and Sag K13 as design transitions from CD 116 roundabout design into link design to CD 109 • Grade 1.2% uphill • Crest K 30 as design transitions from CD 109 link design to CD 123 grade separated junction design (3 steps below desirable minimum SSD) - **departure**
Compliance with DMRB	CD 109 does not allow relaxations on the immediate approach to a junction. On this basis a **departure** is required, reference **G16**.

Stopping Sight Distance / Visibility

11.6 Stopping Site Distance has been assessed, in accordance with CD 109, Table 2.10 and paragraph 3.

11.7 The SSD has been assessed as follows:

Visibility Parameters	A43 Mainline (Cherwell to Padbury)
Description	• Three steps below desirable minimum SSD where it fails to achieve 295m northbound to Padbury
Compliance with DMRB	CD 109 does not permit relaxations on the approach to a junction. Visibility ranges between 127m to 273m over 120m (12 intervals). Visibility of 127m gradually increases until it reaches full SSD of 295m. This does however classify as four steps below desirable minimum stopping site distance. On this basis a **departure** is required, reference **G17.**

Cross-section

11.8 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a dual, two lane carriageway, all-purpose, rural road for the A43 north to Padbury.

Lane Widths

11.9 Lane width of 3.65m as required by CD 127.

Hard Shoulders / Hard Strips / Verges

11.10 Hard strips and verge widths have been provided, compliant with CD127.

Swept Paths

11.11 All directions of travel have been assessed using the maximum legal European, 16.5m long, articulated heavy goods vehicle, in accordance with CD 123.

12. ARDLEY ROUNDABOUT (B430 & A43 EAST)

Layout

12.1 The works north of Ardley looks to upgrade the existing roundabout to accommodate the improvements works for J10, M40, NB diverge / Merge, existing B430, A43 and B430 Ardley Bypass.

12.2 A43 east of Ardley roundabout retains the dual cross-section, however the entry and exit has been re-designed to align with the elongated circulatory.

12.3 B430 provides two lanes northbound in-keeping with the existing cross-section, however the revised design extends this for a further 50m, as well as adding an additional left turn lane for the M40, J10, northbound merge.

12.4 Ardley Bypass has been discussed in **report OxSFRI-BWB-GEN-XX-RP-CH-0011.**

12.5 M40, J10, Northbound Diverge to Ardley has been discussed in section 4.

12.6 M40, J10, Northbound Merge from Ardley has been discussed in section 6.

Design Speed and Geometry

12.7 A43 east is a D2AP, dual carriageway, all-purpose, rural route, with a design speed of 70kph to Cherwell junction as it is a dumb-bell link road, it has a speed limit of 50mph.

12.8 The existing B430 west is an S2, single carriageway, all-purpose, rural route, and following the construction of the B430 Ardley Bypass it will have a design speed of 70kph and a speed limit of 40mph

Horizontal alignment

12.9 The horizontal alignment is summarised as follows:

Horizontal Design Parameters	A43 East	B430 West
Description	• Mainline horizontal geometry unchanged	• Straight as design ties into existing • Right hand radius 360m - (minimum R with 5.0% superelevation) as design transitions from link design to CD 109 to CD 116 roundabout design
Compliance with DMRB	N/A	**Compliant**

Vertical alignment

12.10 The vertical alignment is summarised as follows:

Vertical Design Parameters	A43 East	B430 West
Description	• Mainline vertical geometry unchanged	• Grade 0.3% downhill as design ties in with existing • Crest K 103 • Grade 1.0% downhill • Sag K 20 • Grade 1.0% uphill as design transitions from link design to CD 109 to CD 116 roundabout design
Compliance with DMRB	N/A	**Compliant**

Stopping Sight Distance / Visibility

12.11 Stopping Site Distance has been assessed, in accordance with CD 109, Table 2.10 and paragraph 3.

12.12 The SSD has been assessed as follows:

Visibility Parameters	A43 East	B430 West
Description	• Minimum SSD northbound of 120m achieved • Minimum SSD southbound of 120m achieved to central signal	• Minimum SSD northbound of 120m achieved • Minimum SSD southbound of 120m achieved
Compliance with DMRB	**Compliant**	**Compliant**

Cross-section

12.13 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a dual, two lane carriageway, all-purpose, rural road for the A43 east.

12.14 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road for B430 West.

Lane Widths

12.15 Lane widths of 3.65m in accordance with by CD 127.

Hard Shoulders / Hard Strips / Verges

12.16 Hard strips have not been included in the design for A43 east as the existing cross-section does not feature hard strips, this is in-keeping with the existing route. CD 122 does not give a cross-sectional requirement for a dumb-bell link road. B430 northbound existing cross-section does feature reduced width (non-compliant) hard strips, however the revised design does not include hard strips as this is in-keeping with CD 116 to terminate hard strips as widening begins.

12.17 The following are provided in accordance with CD 127:

- 2.5m nearside verge
- 2.5m offside verge

Swept Paths & Entry Path Radius (Deflection)

12.18 Articulated combination heavy good vehicle with a single rear axle has been used on all single lanes constrained by kerbs. All other directions of travel have been assessed using the maximum legal European, 16.5m long, articulated heavy goods vehicle, in accordance with CD 116.

12.19 A43 east, southbound direction of travel achieves and entry path radius of 97m which is complaint under CD 116.

12.20 M40, J10, Northbound Diverge to Ardley, achieves and entry path radius of 59m which is complaint under CD 116.

12.21 Ardley Bypass, northbound direction of travel achieves and entry path radius of 88m which is complaint under CD 116.

12.22 Existing B430, northbound direction of travel achieves and entry path radius of 109m which is requires a **departure** from standard. However, there is scope for design development to design this out. The same applies to the lane widths on entry.

13. M40 MAINLINE SIGNAGE PROVISION

13.1 The locations for the directional signage for the M40 for Junctions 10 and 10A, have been reviewed against the requirements of CD 146.

13.2 The signage strategy is shown on **drawing OxSRFI-BWB-GEN-XX-SK-CH-SK058**.

Use of gantry signs

13.3 CD 146 para 3.9 sets out a clear list of criteria, one of which is to be met, before gantry signs can be considered. The following table provides an assessment of the M40 in each direction on the approach to J10/10A.

Criteria	Met?
the carriageway has or will have 4 or more running lanes;	No
the carriageway has 3 running lanes and carries (or will carry within 15 years of opening) 33,000 vehicles per day (1-way) (high growth estimate) and the proportion of HGVs is greater than 20%;	No Whilst the 1-way AADT is over 58,000 vehicles, the proportion of HGVs is 18%
the number of lanes available to a driver going ahead reduces after the junction;	No
a series of junctions are (an average of) less than 3km apart measured between centres of junctions;	No The junction spacing point from mid link J8-9 to mid link J10-11 is 27.5km and there are currently 2 junctions in this gap (9 and 10) giving a spacing of 9km (27.5/(2+1)); with the new J10A this reduces to 6.9km, still well above the 3km threshold.
the road is on a structure but does not have a hard shoulder;	No
the road is on a steep embankment or in a deep cutting;	No
an assessment of the cost has confirmed that it is cheaper to provide gantry mounted signs rather than mounting direction signs on the left-hand side of the road	No (a detailed assessment has not been undertaken but it stands to reason that verge signs are cheaper as there is sufficient space in the verge to provide them)

13.4 As can be seen none of the criteria are met and hence gantry signing is not to be considered.

Decision 13-1: Verge mounted direction signs are to be provided at all exits for J10 & 10A.

M40 northbound

13.5 Due to the provision of the new junction 10A there would be two closely-spaced exits. The following table assesses whether or not the signs on the approach to both exits can be spaced in accordance with CD 146 table 3.3.2.

Northbound	Final DS	Secondary ADS	Primary ADS
J10 exit sequence	27m before exit datum (within permitted 50m tolerance)	**½-mile** 863m before exit datum (which is within ½ mile +10%) New verge-mounted sign to replace existing but in a compliant location as existing does not comply as it is 907m before exit datum (>+10%)	**1-mile** 1596m before exit datum (which is within 1 mile -20m)
J10A exit sequence	At exit datum	**½-mile** 785m before exit datum (which is ½ mile -20m) This should be co-located with the J10 final DS. However, see discussion below.	**1-mile** 1620m before exit datum (which is within 1 mile +10%), co-located with J10 secondary ADS **Additional 1⅓-mile** 2353m before exit datum (which is within 1⅓-mile +10%), co-located with J10 primary ADS

13.6 As noted above there is a contradiction between the requirements of CD 146 table 3.3.2 which require a secondary ADS to be located at either ½ or ⅓ mile, and the advise of TSM Ch 7 para 10.3.5 which states "*The final advance direction sign at the first junction should be to the standard design with the second exit destinations being included with the forward destinations. The junction number for the first exit only should appear on this sign and should be placed in the bottom left hand corner.*"

13.7 Liaison with NH is required to agree the most suitable signage layout for the two diverges.

Decision / Outcome 13-2: The J10 and J10A northbound exit signage should be co-located at the distances set out above but further liaison is needed on the J10A ½ mile secondary ADS.

M40 southbound

13.8 The existing diverge for J10 is to be retained and there is only one exit for southbound traffic. The following table assesses whether or not the signs on the approach to the exit can be spaced in accordance with CD 146 table 3.3.2.

Northbound	Final DS	Secondary ADS	Primary ADS
J10 exit sequence	22m before exit datum (within permitted 50m tolerance)	**½-mile** 845m before exit datum (which is within ½ mile +10%)	**1-mile** 1601m before exit datum (which is within 1 mile -20m)

Decision / Outcome 13-3: The signage for the J10 southbound diverge is compliant to CD 146.

14. MOTORWAY COMMUNICATIONS

14.1 To be added

15. GANTRY DESIGN: ACCESS AND SIGNAL POSITION

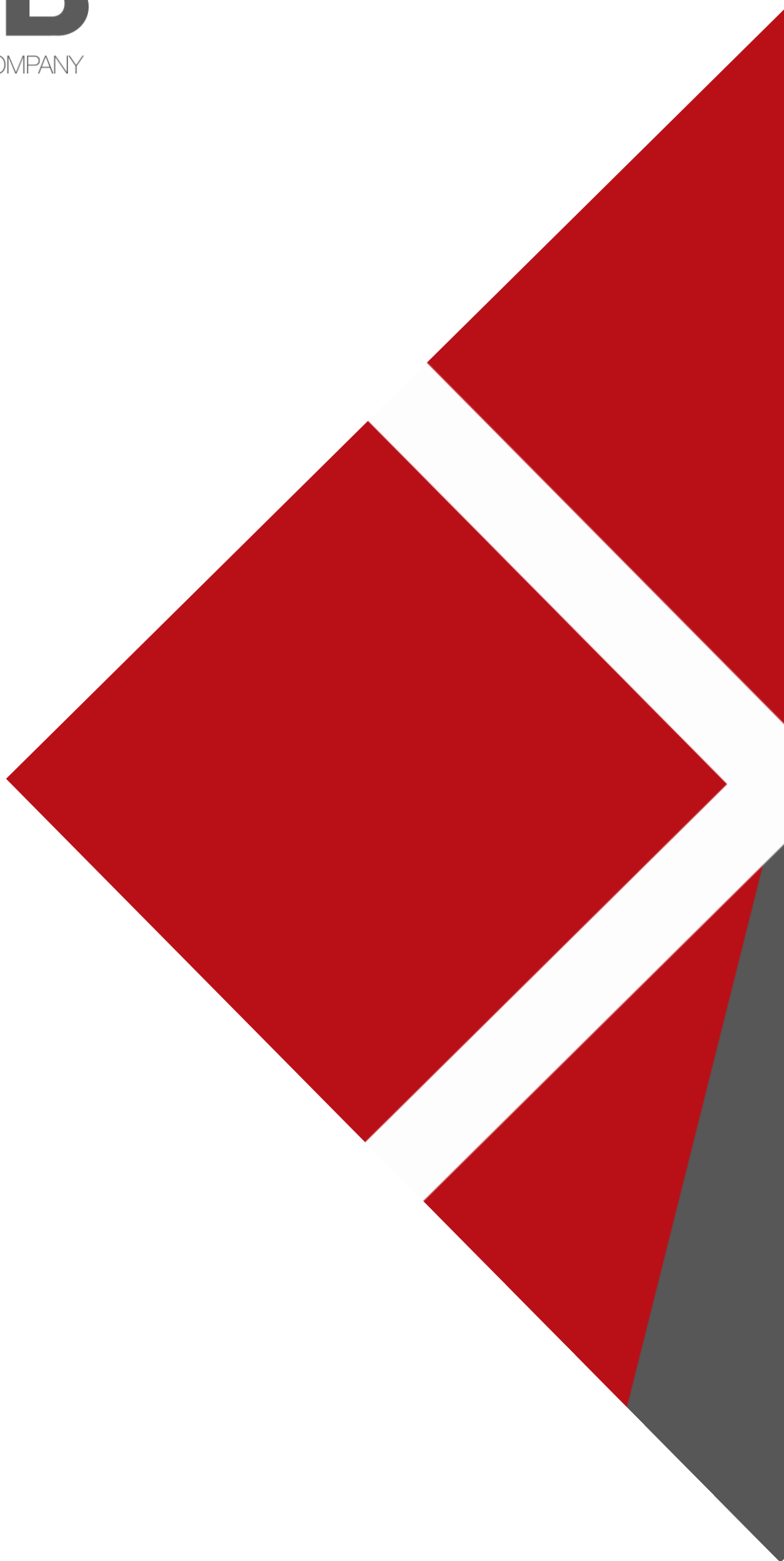
15.1 To be added

16. ROAD LIGHTING

16.1 To be added

BWB

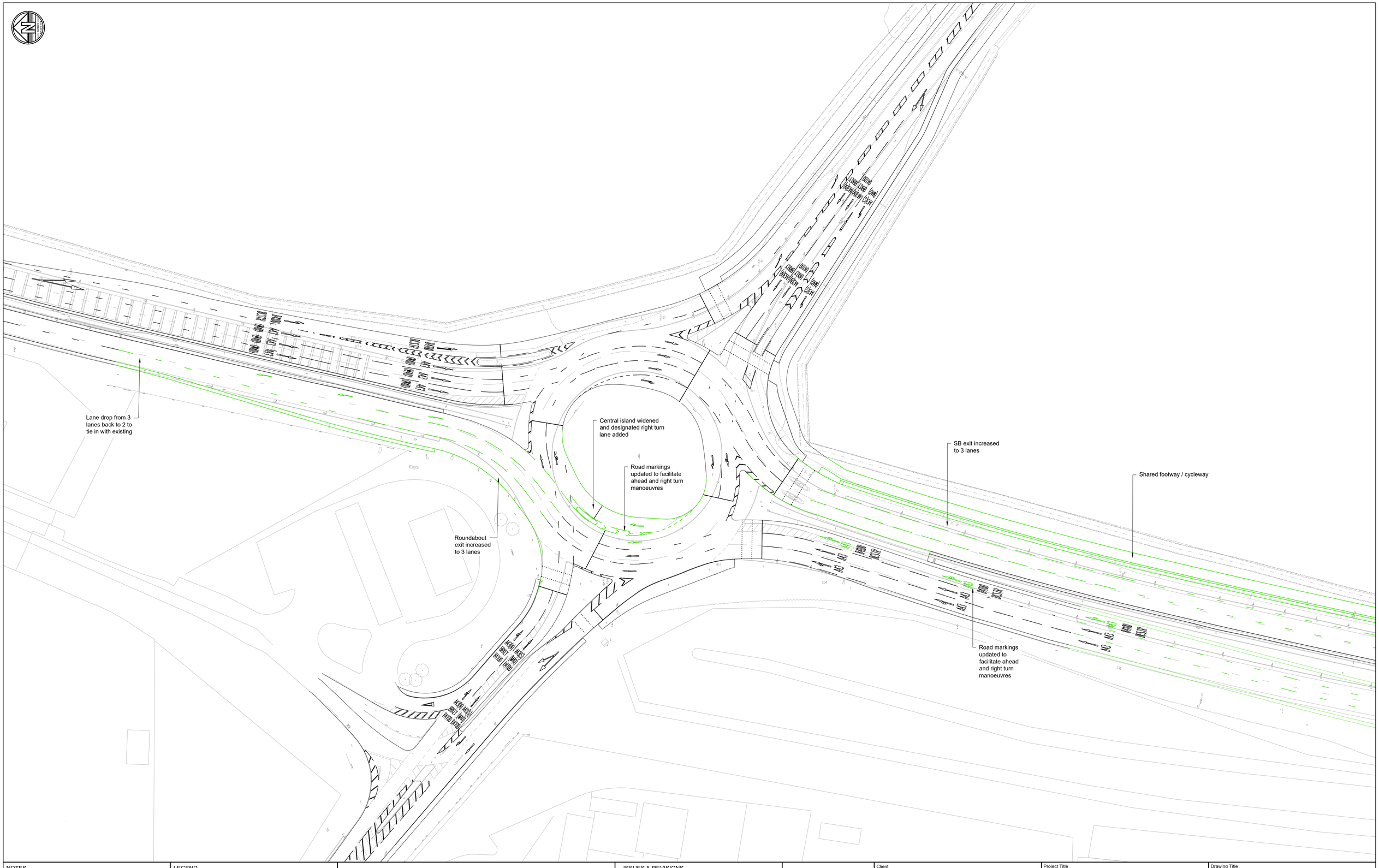
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APPENDIX D

BAYNARD'S GREEN GA OPTION 28A ALTERNATIVE SCHEME



NOTES

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

LEGEND

- Additional works
- Albion / Tritax proposal

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ISSUES & REVISIONS

Rev	Date	Details of issue / revision	Drw	Rev
P01	06.11.24	Preliminary Issue	SB	SRH
P02	06.02.25	A43 NB approach amended to 3 lanes	SRH	SRH

BWB
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- ■ Leeds | 0113 233 8000
- ☐ London | 020 7234 9122
- ☐ Manchester | 0161 233 4260
- ☐ Nottingham | 0115 924 1100

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Client
OXFORDSHIRE RAILFREIGHT LTD.

Project Title
OxSRFI OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title
BAYNARDS GREEN GENERAL ARRANGEMENT OPTION 28A ALTERNATIVE SCHEME

Drawn:	S. Birchall	Reviewed:	S. Hilditch	
BWB Ref:	NTH2479	Date:	06.11.24	Scale@A1: 1:500

Drawing Status
PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number
OxSRFI-BWB-GEN-XX-SK-CH-SK097

Status: **S1** Rev: **P02**

Y:\NTH\NTH2479_Oxfordshire RFI\02. Project Delivery\01. WIP\Sketches\OxSRFI-BWB-GEN-XX-SK-CH-SK097_Baynards Green General Arrangement Option 28A Alternative Scheme.dwg

APPENDIX E

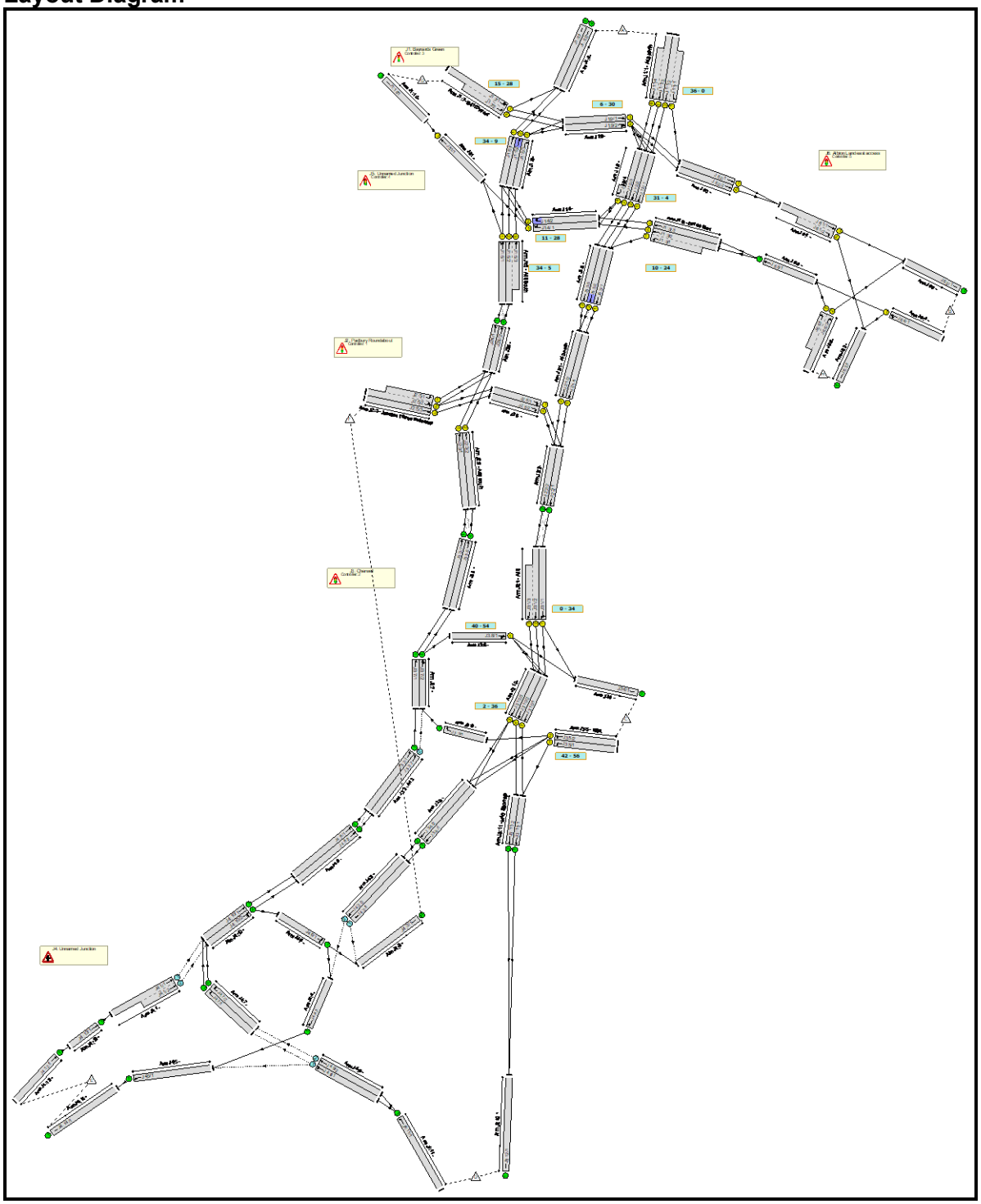
BAYNARD'S GREEN AND M40 JUNCTION 10 RC3A LINSIG REPORT

Full Input Data And Results

User and Project Details

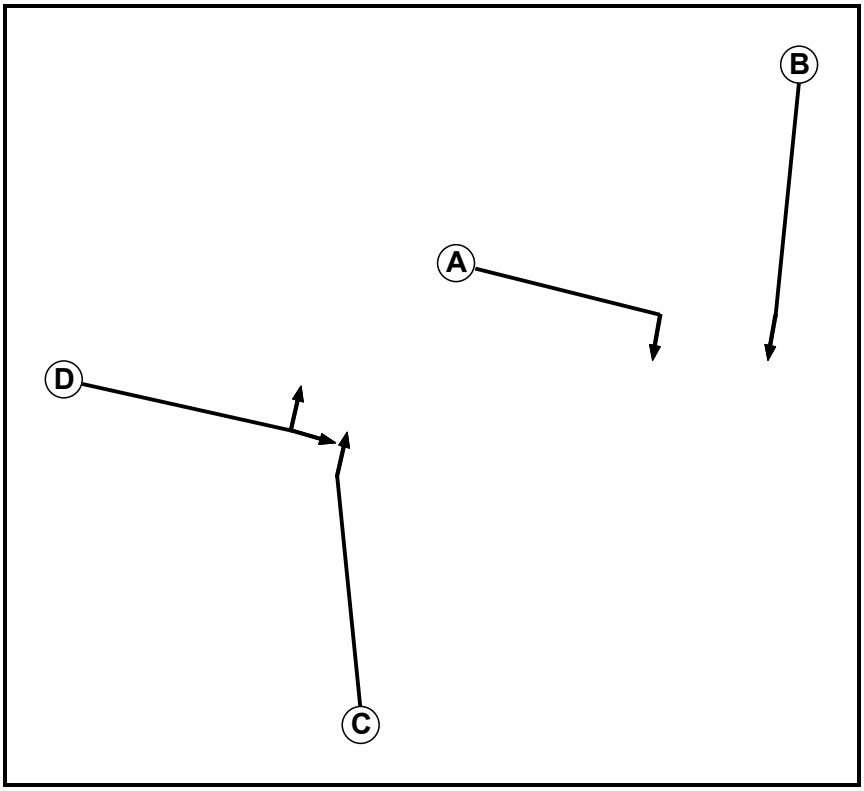
Project:	**Oxfordshire SRFI**
Title:	**Reference Case Network Model**
Location:	
Additional detail:	
File name:	250902 M40 J10 - Reference Case.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



C1 - Padbury

Phase Diagram



Phase Input Data

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

Phase Intergreens Matrix

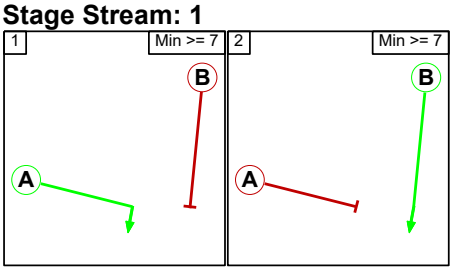
		Starting Phase			
		A	B	C	D
Terminating Phase	A		6	-	-
	B	6		-	-
	C	-	-		6
	D	-	-	6	

Phases in Stage

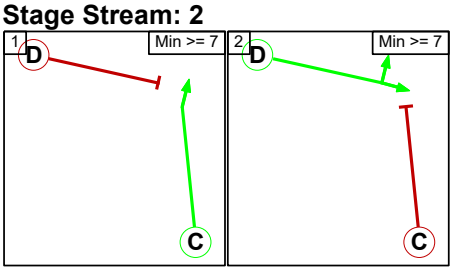
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D

Stage Diagram

Stage Stream: 1



Stage Stream: 2



Phase Delays

Stage Stream: 1

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

Stage Stream: 2

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

Prohibited Stage Change

Stage Stream: 1

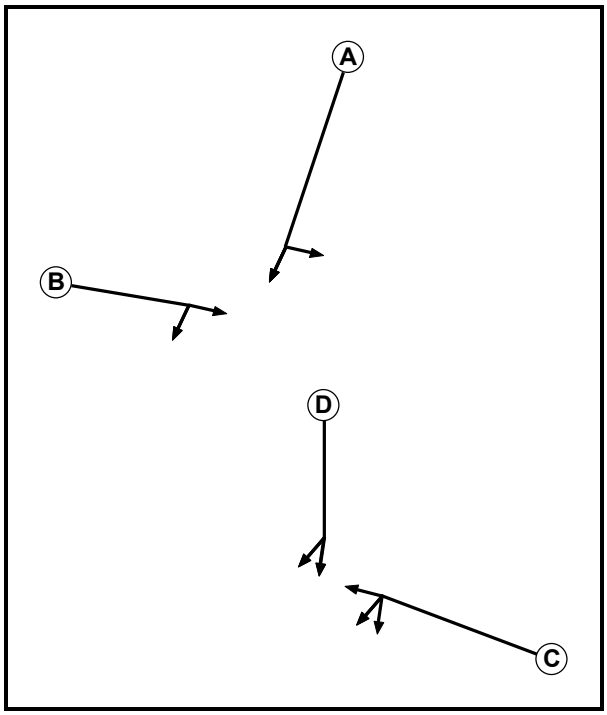
		To Stage	
		1	2
From Stage	1		6
	2	6	

Stage Stream: 2

		To Stage	
		1	2
From Stage	1		6
	2	6	

C2 - Cherwell

Phase Diagram



Phase Input Data

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

Phase Intergreens Matrix

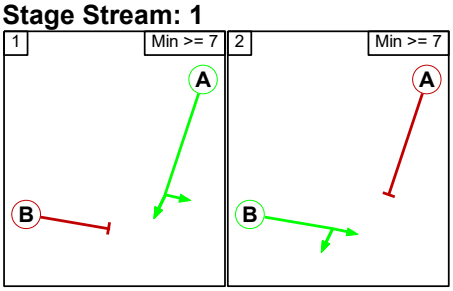
		Starting Phase			
		A	B	C	D
Terminating Phase	A		6	-	-
	B	6		-	-
	C	-	-		6
	D	-	-	6	

Phases in Stage

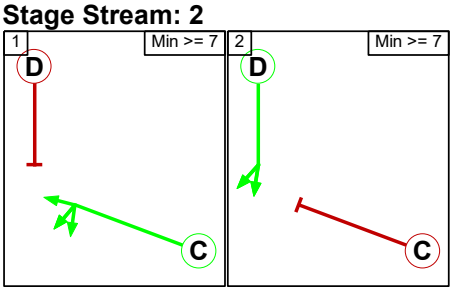
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D

Stage Diagram

Stage Stream: 1



Stage Stream: 2



Phase Delays

Stage Stream: 1

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

Stage Stream: 2

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

Prohibited Stage Change

Stage Stream: 1

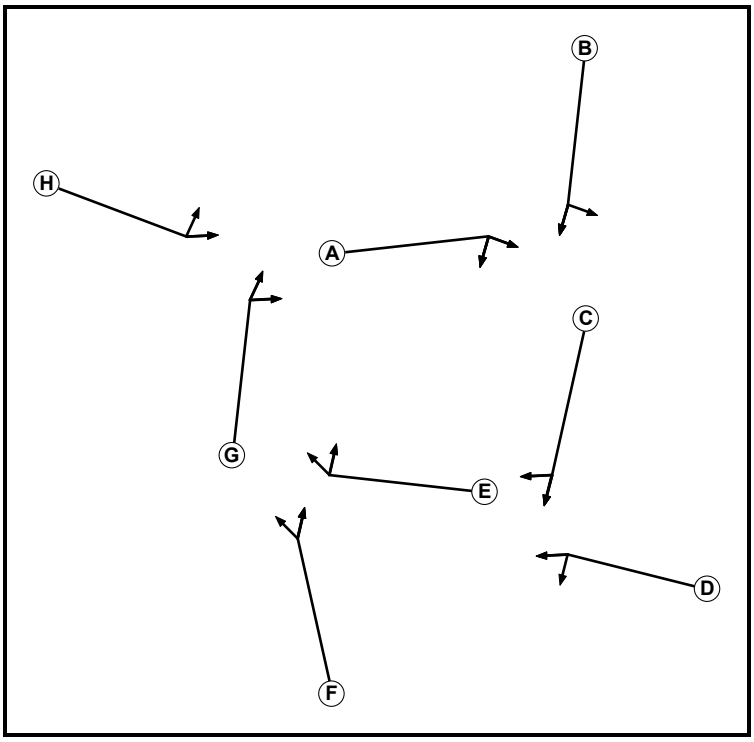
		To Stage	
		1	2
From Stage	1		6
	2	6	

Stage Stream: 2

		To Stage	
		1	2
From Stage	1		6
	2	6	

C3 - Baynards Green

Phase Diagram



Phase Input Data

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

Phase Intergreens Matrix

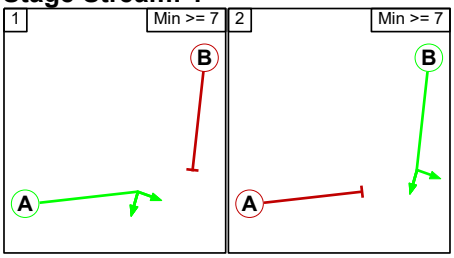
		Starting Phase							
		A	B	C	D	E	F	G	H
Terminating Phase	A		6	-	-	-	-	-	-
	B	6		-	-	-	-	-	-
	C	-	-		6	-	-	-	-
	D	-	-	7		-	-	-	-
	E	-	-	-	-		6	-	-
	F	-	-	-	-	6		-	-
	G	-	-	-	-	-	-		6
	H	-	-	-	-	-	-	6	

Phases in Stage

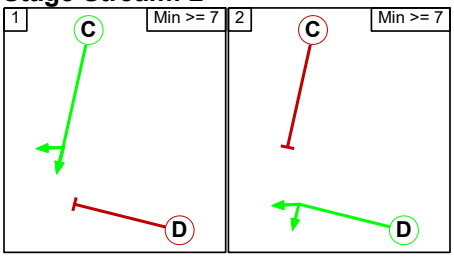
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D
3	1	E
3	2	F
4	1	G
4	2	H

Stage Diagram

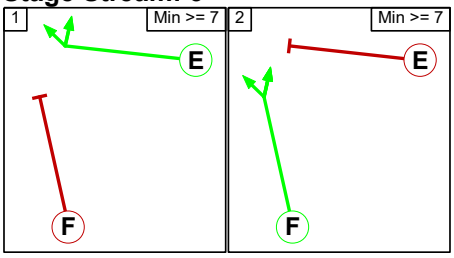
Stage Stream: 1



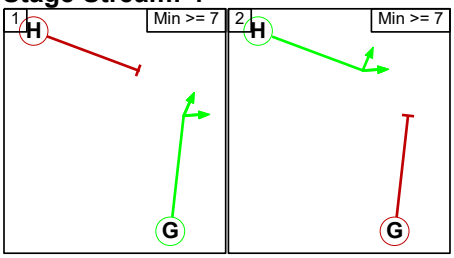
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Phase Delays

Stage Stream: 1

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

Stage Stream: 2

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

Stage Stream: 3

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

Stage Stream: 4

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

Prohibited Stage Change

Stage Stream: 1

	To Stage		
		1	2
From Stage	1		6
	2	6	

Stage Stream: 2

	To Stage		
		1	2
From Stage	1		6
	2	7	

Stage Stream: 3

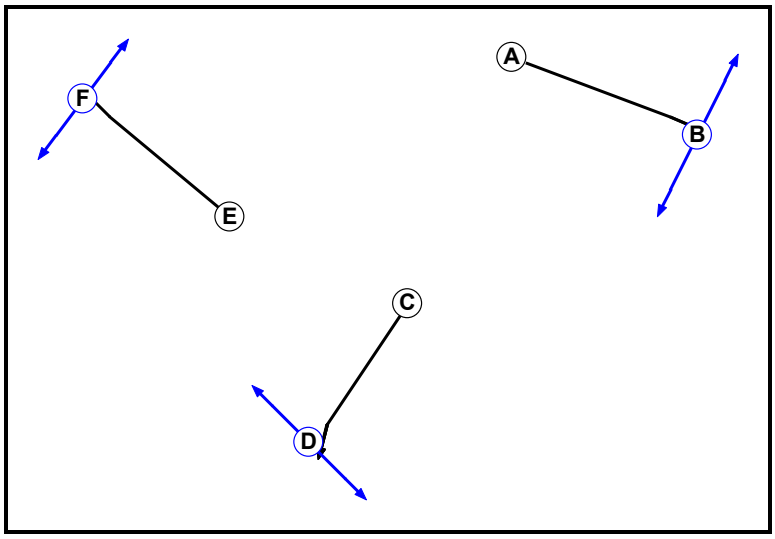
	To Stage		
		1	2
From Stage	1		6
	2	6	

Stage Stream: 4

		To Stage	
		1	2
From Stage	1		6
	2	6	

C4 - BG exit crossings

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Pedestrian	1		5	5
C	Traffic	2		7	7
D	Pedestrian	2		7	7
E	Traffic	3		7	7
F	Pedestrian	3		5	5

Phase Intergreens Matrix

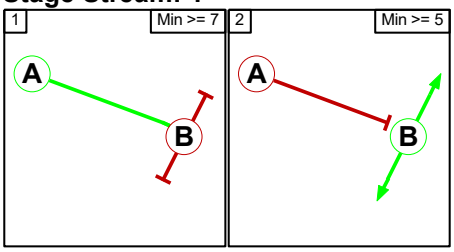
		Starting Phase					
		A	B	C	D	E	F
Terminating Phase	A		5	-	-	-	-
	B	6		-	-	-	-
	C	-	-		5	-	-
	D	-	-	7		-	-
	E	-	-	-	-		5
	F	-	-	-	-	5	

Phases in Stage

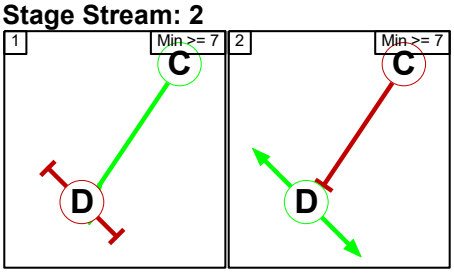
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D
3	1	E
3	2	F

Stage Diagram

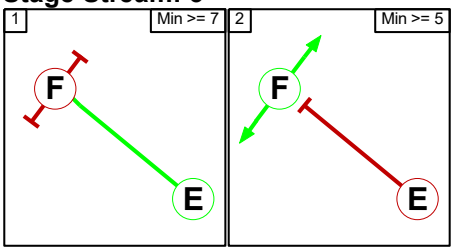
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Phase Delays

Stage Stream: 1

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

Stage Stream: 2

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

Stage Stream: 3

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

Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		5
	2	6	

Stage Stream: 2

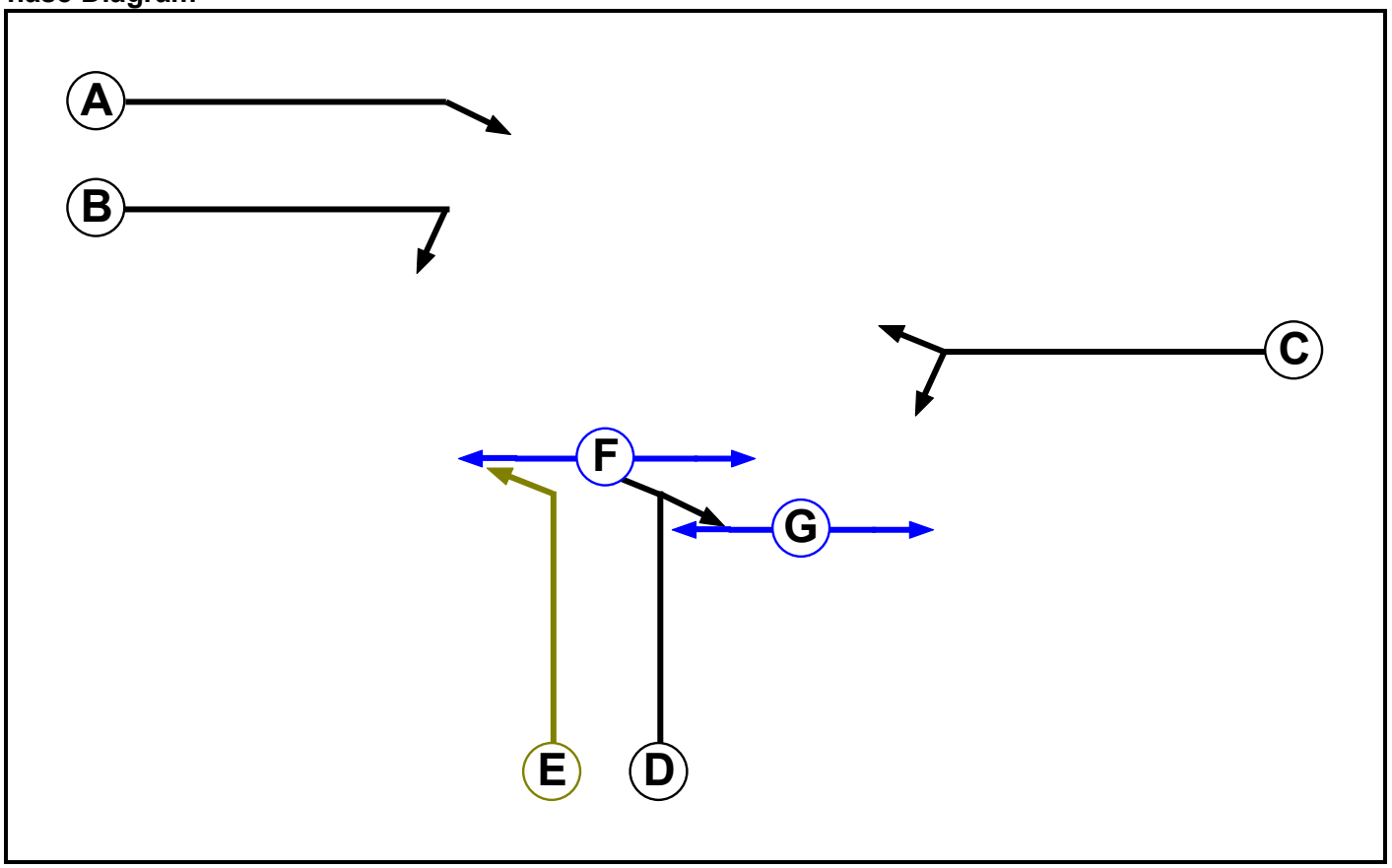
		To Stage	
		1	2
From Stage	1		5
	2	7	

Stage Stream: 3

		To Stage	
		1	2
From Stage	1		5
	2	5	

C5 - Albion Land east access

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Filter	D	4	0
F	Pedestrian		5	5
G	Pedestrian		5	5

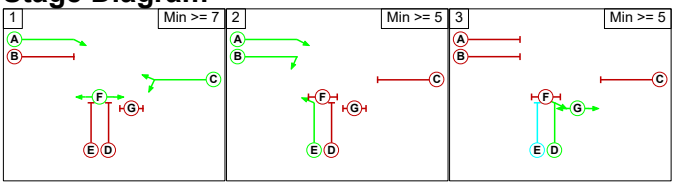
Phase Intergreens Matrix

		Starting Phase						
		A	B	C	D	E	F	G
Terminating Phase	A		-	-	5	-	-	-
	B	-		5	5	-	-	7
	C	-	5		5	-	-	6
	D	5	5	5		-	5	-
	E	-	-	-	-		5	-
	F	-	-	-	7	7		-
	G	-	5	5	-	-	-	

Phases in Stage

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

Stage Diagram



Phase Delays

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

Prohibited Stage Change

		To Stage		
		1	2	3
From Stage	1		7	7
	2	X		7
	3	5	5	

Give-Way Lane Input Data

Junction: J1: Baynards Green
There are no Opposed Lanes in this Junction

Junction: J2: Padbury Roundabout
There are no Opposed Lanes in this Junction

Junction: J3: Cherwell											
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)
J3:2/2 (A43)	J3:7/2 (Ahead)	1030	0	J3:9/1	0.48	All	-	-	-	-	-

Junction: J4: Unnamed Junction											
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)
J4:1/1	J4:10/1 (Ahead)	1057	0	J4:7/1	0.28	All	-	-	-	-	-
J4:1/2	J4:10/2 (Ahead)	1057	0	J4:7/1	0.28	All	-	-	-	-	-
				J4:7/2	0.28	All					
J4:2/1	J4:3/1 (U-Turn)	1205	0	J4:6/1	0.31	All	-	-	-	-	-
J4:2/2	J4:4/1 (Ahead)	1205	0	J4:6/1	0.31	All	-	-	-	-	-
J4:9/1	J4:5/1 (Ahead)	1215	0	J4:4/1	0.32	All	-	-	-	-	-
	J4:7/1 (Ahead)	1215	0	J4:4/1	0.32	All					
J4:9/2	J4:7/2 (Ahead)	1215	0	J4:4/1	0.32	All	-	-	-	-	-

Lane Input Data

Junction: J1: Baynards Green												
Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
J1:1/1 (A43 North)	U	B	2	3	20.0	Geom	-	3.65	0.00	Y	Arm J5:2 Left	70.00
J1:1/2 (A43 North)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm J1:2 Ahead	60.00
J1:1/3 (A43 North)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm J1:2 Ahead	60.00
J1:1/4 (A43 North)	U	B	2	3	21.0	Geom	-	3.65	0.00	Y	Arm J1:2 Ahead	60.00
J1:2/1	U	C	1	3	10.4	Geom	-	4.00	0.00	Y	Arm J5:3 Ahead	50.00
J1:2/2	U	C	2	3	10.4	Geom	-	4.00	0.00	N	Arm J5:3 Ahead	50.00
J1:2/3	U	C	1	3	10.4	Geom	-	4.00	0.00	N	Arm J5:3 Ahead	40.00
J1:2/4	U	C	2	3	2.6	Geom	-	4.00	0.00	Y	Arm J1:4 Right	30.00
J1:3/1 (B4100 East)	U	D	2	3	14.0	Geom	-	3.65	0.00	Y	Arm J5:3 Left	30.00
J1:3/2 (B4100 East)	U	D	2	3	34.8	Geom	-	3.65	0.00	Y	Arm J1:4 Ahead	70.00
J1:3/3 (B4100 East)	U	D	2	3	34.8	Geom	-	3.65	0.00	N	Arm J1:4 Ahead	70.00
J1:4/1	U	E	1	3	8.7	Geom	-	4.00	0.00	Y	Arm J1:6 Right	40.00
											Arm J5:1 Right	40.00
J1:4/2	U	E	1	3	8.7	Geom	-	4.00	0.00	N	Arm J1:6 Right	35.00
J1:5/1 (A43 South)	U	F	2	3	104.3	Geom	-	3.65	0.00	Y	Arm J1:6 Ahead	60.00
											Arm J5:1 Left	60.00
J1:5/2 (A43 South)	U	F	2	3	104.3	Geom	-	3.65	0.00	Y	Arm J1:6 Ahead	60.00
J1:5/3 (A43 South)	U	F	2	3	28.0	Geom	-	3.65	0.00	Y	Arm J1:6 Ahead	60.00
J1:6/1	U	G	1	3	8.7	Geom	-	4.00	0.00	Y	Arm J1:8 Ahead	35.00
J1:6/2	U	G	1	3	8.7	Geom	-	4.00	0.00	N	Arm J1:8 Ahead	35.00
J1:6/3	U	G	1	3	9.2	Geom	-	4.00	0.00	Y	Arm J1:9 Right	30.00
J1:7/1 (B4100	U	H	2	3	60.0	Geom	-	3.65	0.00	Y	Arm J1:8 Left	30.00

West)											Arm J1:9 Ahead	50.00
J1:7/2 (B4100 West)	U	H	2	3	10.5	Geom	-	3.65	0.00	Y	Arm J1:9 Ahead	50.00
J1:8/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:8/2	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:9/1	U	A	1	3	8.7	Geom	-	4.00	0.00	Y	Arm J5:2 Ahead	35.00
J1:9/2	U	A	1	3	8.7	Geom	-	4.00	0.00	N	Arm J1:2 Right	35.00
											Arm J5:2 Ahead	35.00
J1:10/1	U		2	3	48.7	Inf	-	-	-	-	-	-

Junction: J2: Padbury Roundabout

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
J2:1/1 (A43 north)	U	B	2	3	95.7	Geom	-	3.65	0.00	Y	Arm J2:2 Ahead	50.00
J2:1/2 (A43 north)	U	B	2	3	95.7	Geom	-	3.65	0.00	N	Arm J2:2 Ahead	50.00
J2:2/1	U		2	3	5.2	Inf	-	-	-	-	-	-
J2:2/2	U		2	3	5.2	Inf	-	-	-	-	-	-
J2:3/1 (A43 south)	U	C	2	3	52.2	Geom	-	3.65	0.00	Y	Arm J2:4 Ahead	30.00
J2:3/2 (A43 south)	U	C	2	3	52.2	Geom	-	3.65	0.00	N	Arm J2:4 Ahead	30.00
J2:4/1	U		2	3	13.0	Inf	-	-	-	-	-	-
J2:4/2	U		2	3	13.0	Inf	-	-	-	-	-	-
J2:5/1 (Junction 10 s'bound offslip)	U	D	2	3	10.8	Geom	-	3.65	0.00	Y	Arm J2:4 Left	40.00
J2:5/2 (Junction 10 s'bound offslip)	U	D	2	3	95.7	Geom	-	3.65	0.00	N	Arm J2:4 Left	50.00
											Arm J2:6 Ahead	50.00
J2:5/3 (Junction 10 s'bound offslip)	U	D	2	3	95.7	Geom	-	3.65	0.00	N	Arm J2:6 Ahead	50.00
J2:6/1	U	A	2	3	8.7	Geom	-	3.65	0.00	Y	Arm J2:2 Right	Inf
J2:6/2	U	A	2	3	8.7	Geom	-	3.65	0.00	N	Arm J2:2 Right	Inf

Junction: J3: Cherwell												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
J3:1/1 (A43)	U	A	2	3	52.2	Geom	-	3.65	0.00	Y	Arm J3:4 Left	Inf
											Arm J3:10 Ahead	Inf
J3:1/2 (A43)	U	A	2	3	52.2	Geom	-	3.65	0.00	Y	Arm J3:10 Ahead	Inf
J3:1/3 (A43)	U	A	2	3	12.2	Geom	-	3.65	0.00	Y	Arm J3:10 Ahead	Inf
J3:2/1 (A43)	U		2	3	41.7	Inf	-	-	-	-	-	-
J3:2/2 (A43)	O		2	3	41.7	Inf	-	-	-	-	-	-
J3:3/1	U		2	3	5.2	Inf	-	-	-	-	-	-
J3:3/2	U		2	3	5.2	Inf	-	-	-	-	-	-
J3:4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J3:5/1 (MSA)	U	C	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J3:11 Left	30.00
J3:5/2 (MSA)	U	C	2	3	60.0	Geom	-	3.50	0.00	N	Arm J3:6 Left	40.00
											Arm J3:9 Ahead	Inf
J3:6/1	U		2	3	5.2	Inf	-	-	-	-	-	-
J3:6/2	U		2	3	5.2	Inf	-	-	-	-	-	-
J3:7/1	U		2	3	7.0	Inf	-	-	-	-	-	-
J3:7/2	U		2	3	7.0	Inf	-	-	-	-	-	-
J3:8/1	U	B	2	3	5.2	User	1850	-	-	-	-	-
J3:9/1	U		2	3	7.8	Inf	-	-	-	-	-	-
J3:10/1	U	D	2	3	8.7	Geom	-	3.65	0.00	Y	Arm J3:11 Ahead	Inf
J3:10/2	U	D	2	3	8.7	Geom	-	3.65	0.00	N	Arm J3:11 Ahead	Inf
J3:10/3	U	D	2	3	8.7	Geom	-	3.65	0.00	N	Arm J3:6 Ahead	Inf
J3:11/1 (M40 SB onslip)	U		2	3	87.0	Inf	-	-	-	-	-	-
J3:11/2 (M40 SB onslip)	U		2	3	87.0	Inf	-	-	-	-	-	-
J3:12/1	U		2	3	173.9	Inf	-	-	-	-	-	-

Junction: J4: Unnamed Junction												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
J4:1/1	O		2	3	165.2	Inf	-	-	-	-	-	-
J4:1/2	O		2	3	8.7	Inf	-	-	-	-	-	-
J4:2/1	O		2	3	41.7	Inf	-	-	-	-	-	-
J4:2/2	O		2	3	41.7	Inf	-	-	-	-	-	-
J4:3/1	U		2	3	173.9	Inf	-	-	-	-	-	-
J4:4/1	U		2	3	9.6	Inf	-	-	-	-	-	-
J4:5/1	U		2	3	173.9	Inf	-	-	-	-	-	-
J4:6/1	U		2	3	5.2	Inf	-	-	-	-	-	-
J4:7/1	U		2	3	7.8	Inf	-	-	-	-	-	-
J4:7/2	U		2	3	7.8	Inf	-	-	-	-	-	-
J4:8/1	U		2	3	5.2	Inf	-	-	-	-	-	-
J4:8/2	U		2	3	5.2	Inf	-	-	-	-	-	-
J4:9/1	O		2	3	173.9	Inf	-	-	-	-	-	-
J4:9/2	O		2	3	173.9	Inf	-	-	-	-	-	-
J4:10/1	U		2	3	8.7	Inf	-	-	-	-	-	-
J4:10/2	U		2	3	8.7	Inf	-	-	-	-	-	-
J4:11/1	U		2	3	104.3	Inf	-	-	-	-	-	-
J4:12/1	U		2	3	8.7	Inf	-	-	-	-	-	-
J4:13/1	U		2	3	87.0	Inf	-	-	-	-	-	-
J4:14/1	U		2	3	87.0	Inf	-	-	-	-	-	-

Junction: J5: Unnamed Junction												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
J5:1/1	U	E	2	3	11.3	Geom	-	3.65	0.00	Y	Arm J1:10 Ahead	Inf
J5:2/1	U	A	2	3	10.4	Geom	-	3.65	0.00	Y	Arm J6:1 Ahead	Inf
J5:2/2	U	A	2	3	10.4	Geom	-	3.65	0.00	Y	Arm J6:1 Ahead	Inf
J5:3/1	U	C	2	3	7.0	Geom	-	3.65	0.00	Y	Arm J2:1 Ahead	Inf
J5:3/2	U	C	2	3	7.0	Geom	-	3.65	0.00	Y	Arm J2:1 Ahead	Inf
J5:3/3	U	C	2	3	7.0	Geom	-	3.65	0.00	Y	Arm J2:1 Ahead	Inf

Junction: J6: Albion Land east access												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
J6:1/1	U	A	2	3	34.8	Geom	-	3.65	0.00	Y	Arm J6:2 Ahead	Inf
J6:1/2	U	B	2	3	8.7	Geom	-	3.65	0.00	Y	Arm J6:3 Right	18.00
J6:2/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J6:3/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J6:4/1	U	C	2	3	60.0	Geom	-	3.65	0.00	Y	Arm J6:3 Left Arm J6:5 Ahead	12.00 Inf
J6:5/1	U		2	3	10.4	Inf	-	-	-	-	-	-
J6:6/1	U	D E	2	3	8.7	Geom	-	3.50	0.00	Y	Arm J6:5 Left	12.00
J6:6/2	U	D	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J6:2 Right	18.00

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2034 RC3A - AM'	08:00	09:00	01:00	
2: '2034 RC3A - PM'	17:00	18:00	01:00	

Scenario 1: '2034 RC3A - AM Peak' (FG1: '2034 RC3A - AM', Plan 1: 'Network Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination								
		A	B	C	D	E	F	G	H	Tot.
Origin	A	0	395	64	1487	517	0	119	42	2624
	B	241	0	0	1	9	195	276	31	753
	C	76	0	0	260	82	190	0	0	608
	D	1220	2	246	0	23	0	47	22	1560
	E	199	10	0	16	0	254	16	8	503
	F	0	259	241	0	214	0	29	14	757
	G	94	345	0	46	13	8	0	11	517
	H	18	16	0	17	6	5	3	0	65
	Tot.	1848	1027	551	1827	864	652	490	128	7387

Traffic Lane Flows

Lane	Scenario 1: 2034 RC3A - AM Peak
Junction: J1: Baynards Green	
J1:1/1 (short)	437
J1:1/2 (with short)	1139(In) 702(Out)
J1:1/3 (with short)	1485(In) 752(Out)
J1:1/4 (short)	733
J1:2/1	709
J1:2/2	778
J1:2/3 (with short)	767(In) 648(Out)
J1:2/4 (short)	119
J1:3/1 (short)	233
J1:3/2 (with short)	588(In) 355(Out)
J1:3/3	183
J1:4/1	474
J1:4/2	183
J1:5/1	712
J1:5/2 (with short)	1190(In) 875(Out)
J1:5/3 (short)	315
J1:6/1	696
J1:6/2	1058
J1:6/3	315
J1:7/1 (with short)	517(In) 258(Out)
J1:7/2 (short)	259
J1:8/1	790
J1:8/2	1058
J1:9/1	327
J1:9/2	411
J1:10/1	490
Junction: J2: Padbury Roundabout	
J2:1/1	1152
J2:1/2	1216
J2:2/1	1357
J2:2/2	1466
J2:3/1	759
J2:3/2	841
J2:4/1	966

J2:4/2	936
J2:5/1 (short)	207
J2:5/2 (with short)	507(In) 300(Out)
J2:5/3	250
J2:6/1	205
J2:6/2	250
Junction: J3: Cherwell	
J3:1/1	1117
J3:1/2 (with short)	1706(In) 739(Out)
J3:1/3 (short)	967
J3:2/1	1277
J3:2/2	509
J3:3/1	1277
J3:3/2	323
J3:4/1	551
J3:5/1	260
J3:5/2	348
J3:6/1	398
J3:6/2	841
J3:7/1	1277
J3:7/2	585
J3:8/1	262
J3:9/1	76
J3:10/1	812
J3:10/2	755
J3:10/3	967
J3:11/1	1072
J3:11/2	755
J3:12/1	1827
Junction: J4: Unnamed Junction	
J4:1/1 (with short)	503(In) 233(Out)
J4:1/2 (short)	270
J4:2/1	398
J4:2/2	841
J4:3/1	652
J4:4/1	841
J4:5/1	864
J4:6/1	254
J4:7/1	818
J4:7/2	719
J4:8/1	1051
J4:8/2	735

J4:9/1	841
J4:9/2	719
J4:10/1	1051
J4:10/2	989
J4:11/1	1560
J4:12/1	503
J4:13/1	503
J4:14/1	864
Junction: J5: Unnamed Junction	
J5:1/1	490
J5:2/1	764
J5:2/2	344
J5:3/1	942
J5:3/2	778
J5:3/3	648
Junction: J6: Albion Land east access	
J6:1/1 (with short)	1108(In) 1011(Out)
J6:1/2 (short)	97
J6:2/1	1027
J6:3/1	128
J6:4/1	753
J6:5/1	771
J6:6/1 (short)	49
J6:6/2 (with short)	65(In) 16(Out)

Lane Saturation Flows

Junction: J1: Baynards Green								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (A43 North)	3.65	0.00	Y	Arm J5:2 Left	70.00	100.0 %	1938	1938
J1:1/2 (A43 North)	3.65	0.00	Y	Arm J1:2 Ahead	60.00	100.0 %	1932	1932
J1:1/3 (A43 North)	3.65	0.00	N	Arm J1:2 Ahead	60.00	100.0 %	2068	2068
J1:1/4 (A43 North)	3.65	0.00	Y	Arm J1:2 Ahead	60.00	100.0 %	1932	1932
J1:2/1	4.00	0.00	Y	Arm J5:3 Ahead	50.00	100.0 %	1956	1956
J1:2/2	4.00	0.00	N	Arm J5:3 Ahead	50.00	100.0 %	2092	2092
J1:2/3	4.00	0.00	N	Arm J5:3 Ahead	40.00	100.0 %	2077	2077
J1:2/4	4.00	0.00	Y	Arm J1:4 Right	30.00	100.0 %	1919	1919
J1:3/1 (B4100 East)	3.65	0.00	Y	Arm J5:3 Left	30.00	100.0 %	1886	1886
J1:3/2 (B4100 East)	3.65	0.00	Y	Arm J1:4 Ahead	70.00	100.0 %	1938	1938
J1:3/3 (B4100 East)	3.65	0.00	N	Arm J1:4 Ahead	70.00	100.0 %	2076	2076
J1:4/1	4.00	0.00	Y	Arm J1:6 Right	40.00	16.0 %	1942	1942
				Arm J5:1 Right	40.00	84.0 %		
J1:4/2	4.00	0.00	N	Arm J1:6 Right	35.00	100.0 %	2066	2066
J1:5/1 (A43 South)	3.65	0.00	Y	Arm J1:6 Ahead	60.00	87.1 %	1932	1932
				Arm J5:1 Left	60.00	12.9 %		
J1:5/2 (A43 South)	3.65	0.00	Y	Arm J1:6 Ahead	60.00	100.0 %	1932	1932
J1:5/3 (A43 South)	3.65	0.00	Y	Arm J1:6 Ahead	60.00	100.0 %	1932	1932
J1:6/1	4.00	0.00	Y	Arm J1:8 Ahead	35.00	100.0 %	1932	1932
J1:6/2	4.00	0.00	N	Arm J1:8 Ahead	35.00	100.0 %	2066	2066
J1:6/3	4.00	0.00	Y	Arm J1:9 Right	30.00	100.0 %	1919	1919
J1:7/1 (B4100 West)	3.65	0.00	Y	Arm J1:8 Left	30.00	36.4 %	1909	1909
				Arm J1:9 Ahead	50.00	63.6 %		
J1:7/2 (B4100 West)	3.65	0.00	Y	Arm J1:9 Ahead	50.00	100.0 %	1922	1922
J1:8/1	Infinite Saturation Flow						Inf	Inf
J1:8/2	Infinite Saturation Flow						Inf	Inf
J1:9/1	4.00	0.00	Y	Arm J5:2 Ahead	35.00	100.0 %	1932	1932
J1:9/2	4.00	0.00	N	Arm J1:2 Right	35.00	16.3 %	2066	2066
				Arm J5:2 Ahead	35.00	83.7 %		
J1:10/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Padbury Roundabout								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (A43 north)	3.65	0.00	Y	Arm J2:2 Ahead	50.00	100.0 %	1922	1922
J2:1/2 (A43 north)	3.65	0.00	N	Arm J2:2 Ahead	50.00	100.0 %	2058	2058
J2:2/1	Infinite Saturation Flow						Inf	Inf
J2:2/2	Infinite Saturation Flow						Inf	Inf
J2:3/1 (A43 south)	3.65	0.00	Y	Arm J2:4 Ahead	30.00	100.0 %	1886	1886
J2:3/2 (A43 south)	3.65	0.00	N	Arm J2:4 Ahead	30.00	100.0 %	2019	2019
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:4/2	Infinite Saturation Flow						Inf	Inf
J2:5/1 (Junction 10 s'bound offslip)	3.65	0.00	Y	Arm J2:4 Left	40.00	100.0 %	1908	1908
J2:5/2 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm J2:4 Left	50.00	31.7 %	2058	2058
				Arm J2:6 Ahead	50.00	68.3 %		
J2:5/3 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm J2:6 Ahead	50.00	100.0 %	2058	2058
J2:6/1	3.65	0.00	Y	Arm J2:2 Right	Inf	100.0 %	1980	1980
J2:6/2	3.65	0.00	N	Arm J2:2 Right	Inf	100.0 %	2120	2120

Junction: J3: Cherwell								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J3:1/1 (A43)	3.65	0.00	Y	Arm J3:4 Left	Inf	27.3 %	1980	1980
				Arm J3:10 Ahead	Inf	72.7 %		
J3:1/2 (A43)	3.65	0.00	Y	Arm J3:10 Ahead	Inf	100.0 %	1980	1980
J3:1/3 (A43)	3.65	0.00	Y	Arm J3:10 Ahead	Inf	100.0 %	1980	1980
J3:2/1 (A43 Lane 1)	Infinite Saturation Flow						Inf	Inf
J3:2/2 (A43 Lane 2)	Infinite Saturation Flow						Inf	Inf
J3:3/1	Infinite Saturation Flow						Inf	Inf
J3:3/2	Infinite Saturation Flow						Inf	Inf
J3:4/1	Infinite Saturation Flow						Inf	Inf
J3:5/1 (MSA)	3.50	0.00	Y	Arm J3:11 Left	30.00	100.0 %	1871	1871
J3:5/2 (MSA)	3.50	0.00	N	Arm J3:6 Left	40.00	78.2 %	2045	2045
				Arm J3:9 Ahead	Inf	21.8 %		
J3:6/1	Infinite Saturation Flow						Inf	Inf
J3:6/2	Infinite Saturation Flow						Inf	Inf
J3:7/1	Infinite Saturation Flow						Inf	Inf
J3:7/2	Infinite Saturation Flow						Inf	Inf
J3:8/1	This lane uses a directly entered Saturation Flow						1850	1850
J3:9/1	Infinite Saturation Flow						Inf	Inf
J3:10/1	3.65	0.00	Y	Arm J3:11 Ahead	Inf	100.0 %	1980	1980
J3:10/2	3.65	0.00	N	Arm J3:11 Ahead	Inf	100.0 %	2120	2120
J3:10/3	3.65	0.00	N	Arm J3:6 Ahead	Inf	100.0 %	2120	2120
J3:11/1 (M40 SB onslip Lane 1)	Infinite Saturation Flow						Inf	Inf
J3:11/2 (M40 SB onslip Lane 2)	Infinite Saturation Flow						Inf	Inf
J3:12/1	Infinite Saturation Flow						Inf	Inf

Junction: J4: Unnamed Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J4:1/1	Infinite Saturation Flow						Inf	Inf
J4:1/2	Infinite Saturation Flow						Inf	Inf
J4:2/1	Infinite Saturation Flow						Inf	Inf
J4:2/2	Infinite Saturation Flow						Inf	Inf
J4:3/1	Infinite Saturation Flow						Inf	Inf
J4:4/1	Infinite Saturation Flow						Inf	Inf
J4:5/1	Infinite Saturation Flow						Inf	Inf
J4:6/1	Infinite Saturation Flow						Inf	Inf
J4:7/1	Infinite Saturation Flow						Inf	Inf
J4:7/2	Infinite Saturation Flow						Inf	Inf
J4:8/1	Infinite Saturation Flow						Inf	Inf
J4:8/2	Infinite Saturation Flow						Inf	Inf
J4:9/1	Infinite Saturation Flow						Inf	Inf
J4:9/2	Infinite Saturation Flow						Inf	Inf
J4:10/1	Infinite Saturation Flow						Inf	Inf
J4:10/2	Infinite Saturation Flow						Inf	Inf
J4:11/1	Infinite Saturation Flow						Inf	Inf
J4:12/1	Infinite Saturation Flow						Inf	Inf
J4:13/1	Infinite Saturation Flow						Inf	Inf
J4:14/1	Infinite Saturation Flow						Inf	Inf

Junction: J5: Unnamed Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J5:1/1	3.65	0.00	Y	Arm J1:10 Ahead	Inf	100.0 %	1980	1980
J5:2/1	3.65	0.00	Y	Arm J6:1 Ahead	Inf	100.0 %	1980	1980
J5:2/2	3.65	0.00	Y	Arm J6:1 Ahead	Inf	100.0 %	1980	1980
J5:3/1	3.65	0.00	Y	Arm J2:1 Ahead	Inf	100.0 %	1980	1980
J5:3/2	3.65	0.00	Y	Arm J2:1 Ahead	Inf	100.0 %	1980	1980
J5:3/3	3.65	0.00	Y	Arm J2:1 Ahead	Inf	100.0 %	1980	1980

Junction: J6: Albion Land east access								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J6:1/1	3.65	0.00	Y	Arm J6:2 Ahead	Inf	100.0 %	1980	1980
J6:1/2	3.65	0.00	Y	Arm J6:3 Right	18.00	100.0 %	1828	1828
J6:2/1	Infinite Saturation Flow						Inf	Inf
J6:3/1	Infinite Saturation Flow						Inf	Inf
J6:4/1	3.65	0.00	Y	Arm J6:3 Left	12.00	4.1 %	1970	1970
				Arm J6:5 Ahead	Inf	95.9 %		
J6:5/1	Infinite Saturation Flow						Inf	Inf
J6:6/1	3.50	0.00	Y	Arm J6:5 Left	12.00	100.0 %	1747	1747
J6:6/2	3.50	0.00	Y	Arm J6:2 Right	18.00	100.0 %	1814	1814

Scenario 2: '2034 RC3A - PM Peak' (FG2: '2034 RC3A - PM', Plan 1: 'Network Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination								
		A	B	C	D	E	F	G	H	Tot.
Origin	A	0	292	112	1288	216	0	78	20	2006
	B	374	0	0	3	7	248	250	12	894
	C	101	0	0	308	0	216	0	0	625
	D	1713	1	254	0	76	0	27	14	2085
	E	182	2	0	3	0	209	5	2	403
	F	0	292	243	0	142	0	16	5	698
	G	122	206	0	66	20	19	0	2	435
	H	39	36	0	18	11	11	14	0	129
	Tot.	2531	829	609	1686	472	703	390	55	7275

Traffic Lane Flows

Lane	Scenario 2: 2034 RC3A - PM Peak
Junction: J1: Baynards Green	
J1:1/1 (short)	312
J1:1/2 (with short)	845(In) 533(Out)
J1:1/3 (with short)	1161(In) 589(Out)
J1:1/4 (short)	572
J1:2/1	547
J1:2/2	627
J1:2/3 (with short)	625(In) 547(Out)
J1:2/4 (short)	78
J1:3/1 (short)	298
J1:3/2 (with short)	707(In) 409(Out)
J1:3/3	268
J1:4/1	487
J1:4/2	268
J1:5/1	999
J1:5/2 (with short)	1361(In) 1045(Out)
J1:5/3 (short)	316
J1:6/1	1096
J1:6/2	1313
J1:6/3	316
J1:7/1 (with short)	435(In) 217(Out)
J1:7/2 (short)	218
J1:8/1	1218
J1:8/2	1313
J1:9/1	252
J1:9/2	377
J1:10/1	390
Junction: J2: Padbury Roundabout	
J2:1/1	1039
J2:1/2	980
J2:2/1	1215
J2:2/2	1189
J2:3/1	977
J2:3/2	1070
J2:4/1	1183

J2:4/2	1177
J2:5/1 (short)	206
J2:5/2 (with short)	489(In) 283(Out)
J2:5/3	209
J2:6/1	176
J2:6/2	209
Junction: J3: Cherwell	
J3:1/1	900
J3:1/2 (with short)	1504(In) 830(Out)
J3:1/3 (short)	674
J3:2/1	1669
J3:2/2	534
J3:3/1	1669
J3:3/2	378
J3:4/1	609
J3:5/1	308
J3:5/2	317
J3:6/1	494
J3:6/2	396
J3:7/1	1669
J3:7/2	635
J3:8/1	257
J3:9/1	101
J3:10/1	545
J3:10/2	833
J3:10/3	674
J3:11/1	853
J3:11/2	833
J3:12/1	1686
Junction: J4: Unnamed Junction	
J4:1/1 (with short)	403(In) 191(Out)
J4:1/2 (short)	212
J4:2/1	494
J4:2/2	396
J4:3/1	703
J4:4/1	396
J4:5/1	472
J4:6/1	209
J4:7/1	979
J4:7/2	1030
J4:8/1	1170
J4:8/2	1033

J4:9/1	1055
J4:9/2	1030
J4:10/1	1170
J4:10/2	1242
J4:11/1	2085
J4:12/1	403
J4:13/1	403
J4:14/1	472
Junction: J5: Unnamed Junction	
J5:1/1	390
J5:2/1	564
J5:2/2	272
J5:3/1	845
J5:3/2	627
J5:3/3	547
Junction: J6: Albion Land east access	
J6:1/1 (with short)	836(In) 793(Out)
J6:1/2 (short)	43
J6:2/1	829
J6:3/1	55
J6:4/1	894
J6:5/1	975
J6:6/1 (short)	93
J6:6/2 (with short)	129(In) 36(Out)

Lane Saturation Flows

Junction: J1: Baynards Green								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (A43 North)	3.65	0.00	Y	Arm J5:2 Left	70.00	100.0 %	1938	1938
J1:1/2 (A43 North)	3.65	0.00	Y	Arm J1:2 Ahead	60.00	100.0 %	1932	1932
J1:1/3 (A43 North)	3.65	0.00	N	Arm J1:2 Ahead	60.00	100.0 %	2068	2068
J1:1/4 (A43 North)	3.65	0.00	Y	Arm J1:2 Ahead	60.00	100.0 %	1932	1932
J1:2/1	4.00	0.00	Y	Arm J5:3 Ahead	50.00	100.0 %	1956	1956
J1:2/2	4.00	0.00	N	Arm J5:3 Ahead	50.00	100.0 %	2092	2092
J1:2/3	4.00	0.00	N	Arm J5:3 Ahead	40.00	100.0 %	2077	2077
J1:2/4	4.00	0.00	Y	Arm J1:4 Right	30.00	100.0 %	1919	1919
J1:3/1 (B4100 East)	3.65	0.00	Y	Arm J5:3 Left	30.00	100.0 %	1886	1886
J1:3/2 (B4100 East)	3.65	0.00	Y	Arm J1:4 Ahead	70.00	100.0 %	1938	1938
J1:3/3 (B4100 East)	3.65	0.00	N	Arm J1:4 Ahead	70.00	100.0 %	2076	2076
J1:4/1	4.00	0.00	Y	Arm J1:6 Right	40.00	29.8 %	1942	1942
				Arm J5:1 Right	40.00	70.2 %		
J1:4/2	4.00	0.00	N	Arm J1:6 Right	35.00	100.0 %	2066	2066
J1:5/1 (A43 South)	3.65	0.00	Y	Arm J1:6 Ahead	60.00	95.2 %	1932	1932
				Arm J5:1 Left	60.00	4.8 %		
J1:5/2 (A43 South)	3.65	0.00	Y	Arm J1:6 Ahead	60.00	100.0 %	1932	1932
J1:5/3 (A43 South)	3.65	0.00	Y	Arm J1:6 Ahead	60.00	100.0 %	1932	1932
J1:6/1	4.00	0.00	Y	Arm J1:8 Ahead	35.00	100.0 %	1932	1932
J1:6/2	4.00	0.00	N	Arm J1:8 Ahead	35.00	100.0 %	2066	2066
J1:6/3	4.00	0.00	Y	Arm J1:9 Right	30.00	100.0 %	1919	1919
J1:7/1 (B4100 West)	3.65	0.00	Y	Arm J1:8 Left	30.00	56.2 %	1902	1902
				Arm J1:9 Ahead	50.00	43.8 %		
J1:7/2 (B4100 West)	3.65	0.00	Y	Arm J1:9 Ahead	50.00	100.0 %	1922	1922
J1:8/1	Infinite Saturation Flow						Inf	Inf
J1:8/2	Infinite Saturation Flow						Inf	Inf
J1:9/1	4.00	0.00	Y	Arm J5:2 Ahead	35.00	100.0 %	1932	1932
J1:9/2	4.00	0.00	N	Arm J1:2 Right	35.00	27.9 %	2066	2066
				Arm J5:2 Ahead	35.00	72.1 %		
J1:10/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Padbury Roundabout								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (A43 north)	3.65	0.00	Y	Arm J2:2 Ahead	50.00	100.0 %	1922	1922
J2:1/2 (A43 north)	3.65	0.00	N	Arm J2:2 Ahead	50.00	100.0 %	2058	2058
J2:2/1	Infinite Saturation Flow						Inf	Inf
J2:2/2	Infinite Saturation Flow						Inf	Inf
J2:3/1 (A43 south)	3.65	0.00	Y	Arm J2:4 Ahead	30.00	100.0 %	1886	1886
J2:3/2 (A43 south)	3.65	0.00	N	Arm J2:4 Ahead	30.00	100.0 %	2019	2019
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:4/2	Infinite Saturation Flow						Inf	Inf
J2:5/1 (Junction 10 s'bound offslip)	3.65	0.00	Y	Arm J2:4 Left	40.00	100.0 %	1908	1908
J2:5/2 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm J2:4 Left	50.00	37.8 %	2058	2058
				Arm J2:6 Ahead	50.00	62.2 %		
J2:5/3 (Junction 10 s'bound offslip)	3.65	0.00	N	Arm J2:6 Ahead	50.00	100.0 %	2058	2058
J2:6/1	3.65	0.00	Y	Arm J2:2 Right	Inf	100.0 %	1980	1980
J2:6/2	3.65	0.00	N	Arm J2:2 Right	Inf	100.0 %	2120	2120

Junction: J3: Cherwell								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J3:1/1 (A43)	3.65	0.00	Y	Arm J3:4 Left	Inf	39.4 %	1980	1980
				Arm J3:10 Ahead	Inf	60.6 %		
J3:1/2 (A43)	3.65	0.00	Y	Arm J3:10 Ahead	Inf	100.0 %	1980	1980
J3:1/3 (A43)	3.65	0.00	Y	Arm J3:10 Ahead	Inf	100.0 %	1980	1980
J3:2/1 (A43 Lane 1)	Infinite Saturation Flow						Inf	Inf
J3:2/2 (A43 Lane 2)	Infinite Saturation Flow						Inf	Inf
J3:3/1	Infinite Saturation Flow						Inf	Inf
J3:3/2	Infinite Saturation Flow						Inf	Inf
J3:4/1	Infinite Saturation Flow						Inf	Inf
J3:5/1 (MSA)	3.50	0.00	Y	Arm J3:11 Left	30.00	100.0 %	1871	1871
J3:5/2 (MSA)	3.50	0.00	N	Arm J3:6 Left	40.00	68.1 %	2053	2053
				Arm J3:9 Ahead	Inf	31.9 %		
J3:6/1	Infinite Saturation Flow						Inf	Inf
J3:6/2	Infinite Saturation Flow						Inf	Inf
J3:7/1	Infinite Saturation Flow						Inf	Inf
J3:7/2	Infinite Saturation Flow						Inf	Inf
J3:8/1	This lane uses a directly entered Saturation Flow						1850	1850
J3:9/1	Infinite Saturation Flow						Inf	Inf
J3:10/1	3.65	0.00	Y	Arm J3:11 Ahead	Inf	100.0 %	1980	1980
J3:10/2	3.65	0.00	N	Arm J3:11 Ahead	Inf	100.0 %	2120	2120
J3:10/3	3.65	0.00	N	Arm J3:6 Ahead	Inf	100.0 %	2120	2120
J3:11/1 (M40 SB onslip Lane 1)	Infinite Saturation Flow						Inf	Inf
J3:11/2 (M40 SB onslip Lane 2)	Infinite Saturation Flow						Inf	Inf
J3:12/1	Infinite Saturation Flow						Inf	Inf

Junction: J4: Unnamed Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J4:1/1	Infinite Saturation Flow						Inf	Inf
J4:1/2	Infinite Saturation Flow						Inf	Inf
J4:2/1	Infinite Saturation Flow						Inf	Inf
J4:2/2	Infinite Saturation Flow						Inf	Inf
J4:3/1	Infinite Saturation Flow						Inf	Inf
J4:4/1	Infinite Saturation Flow						Inf	Inf
J4:5/1	Infinite Saturation Flow						Inf	Inf
J4:6/1	Infinite Saturation Flow						Inf	Inf
J4:7/1	Infinite Saturation Flow						Inf	Inf
J4:7/2	Infinite Saturation Flow						Inf	Inf
J4:8/1	Infinite Saturation Flow						Inf	Inf
J4:8/2	Infinite Saturation Flow						Inf	Inf
J4:9/1	Infinite Saturation Flow						Inf	Inf
J4:9/2	Infinite Saturation Flow						Inf	Inf
J4:10/1	Infinite Saturation Flow						Inf	Inf
J4:10/2	Infinite Saturation Flow						Inf	Inf
J4:11/1	Infinite Saturation Flow						Inf	Inf
J4:12/1	Infinite Saturation Flow						Inf	Inf
J4:13/1	Infinite Saturation Flow						Inf	Inf
J4:14/1	Infinite Saturation Flow						Inf	Inf

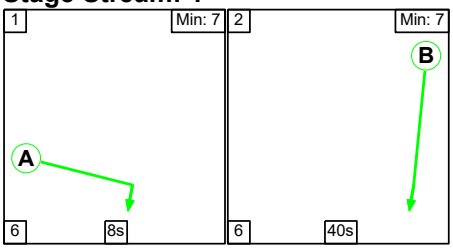
Junction: J5: Unnamed Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J5:1/1	3.65	0.00	Y	Arm J1:10 Ahead	Inf	100.0 %	1980	1980
J5:2/1	3.65	0.00	Y	Arm J6:1 Ahead	Inf	100.0 %	1980	1980
J5:2/2	3.65	0.00	Y	Arm J6:1 Ahead	Inf	100.0 %	1980	1980
J5:3/1	3.65	0.00	Y	Arm J2:1 Ahead	Inf	100.0 %	1980	1980
J5:3/2	3.65	0.00	Y	Arm J2:1 Ahead	Inf	100.0 %	1980	1980
J5:3/3	3.65	0.00	Y	Arm J2:1 Ahead	Inf	100.0 %	1980	1980

Junction: J6: Albion Land east access								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J6:1/1	3.65	0.00	Y	Arm J6:2 Ahead	Inf	100.0 %	1980	1980
J6:1/2	3.65	0.00	Y	Arm J6:3 Right	18.00	100.0 %	1828	1828
J6:2/1	Infinite Saturation Flow						Inf	Inf
J6:3/1	Infinite Saturation Flow						Inf	Inf
J6:4/1	3.65	0.00	Y	Arm J6:3 Left	12.00	1.3 %	1977	1977
				Arm J6:5 Ahead	Inf	98.7 %		
J6:5/1	Infinite Saturation Flow						Inf	Inf
J6:6/1	3.50	0.00	Y	Arm J6:5 Left	12.00	100.0 %	1747	1747
J6:6/2	3.50	0.00	Y	Arm J6:2 Right	18.00	100.0 %	1814	1814

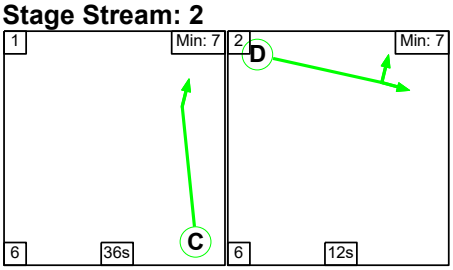
Scenario 1: '2034 RC3A - AM Peak' (FG1: '2034 RC3A - AM', Plan 1: 'Network Plan 1')
C1 - Padbury

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

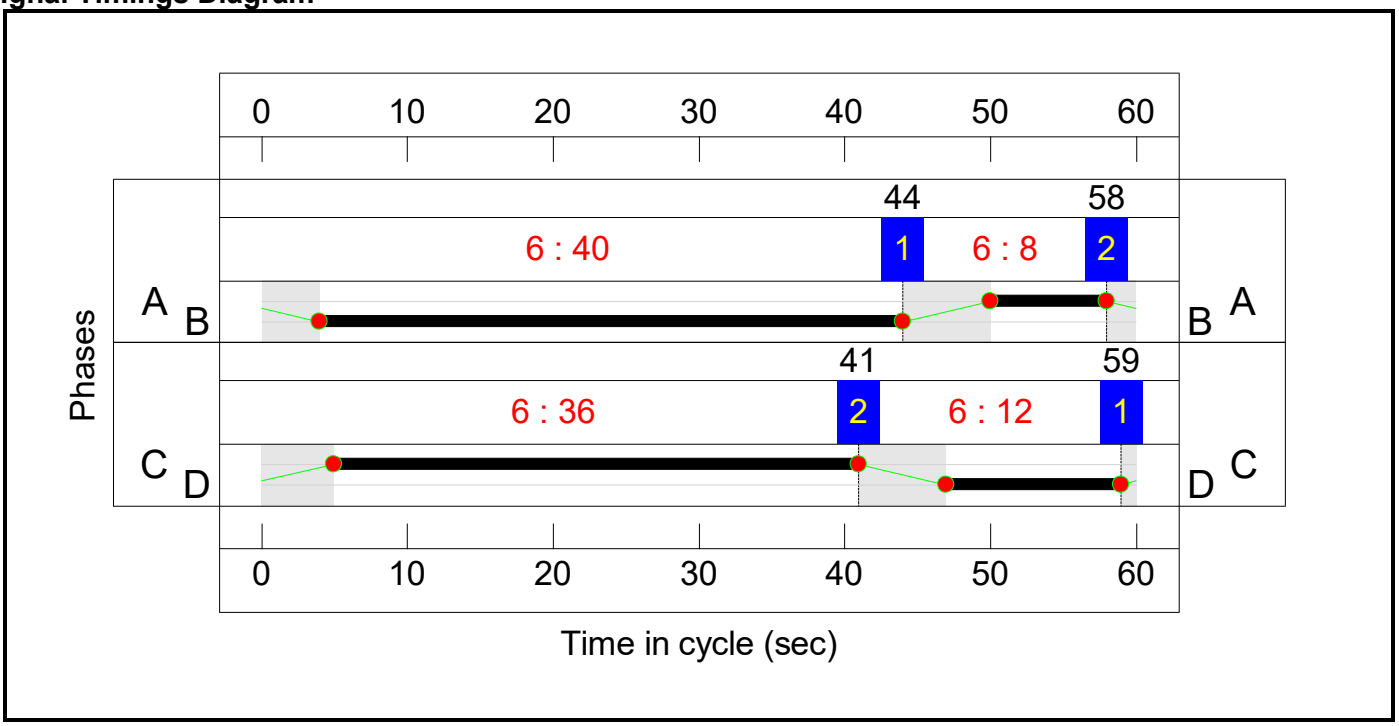
Stage Stream: 1

Stage	1	2
Duration	8	40
Change Point	44	58

Stage Stream: 2

Stage	1	2
Duration	36	12
Change Point	59	41

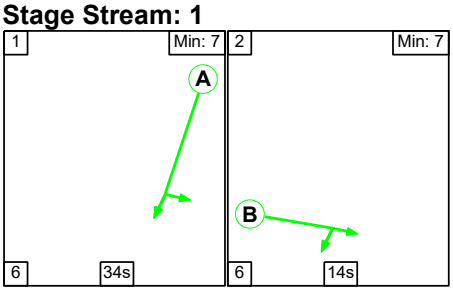
Signal Timings Diagram



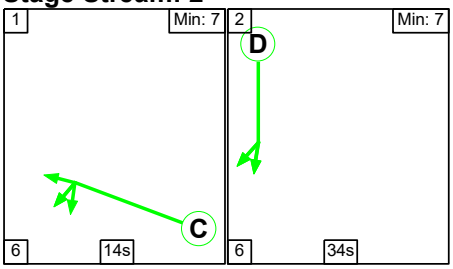
C2 - Cherwell

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

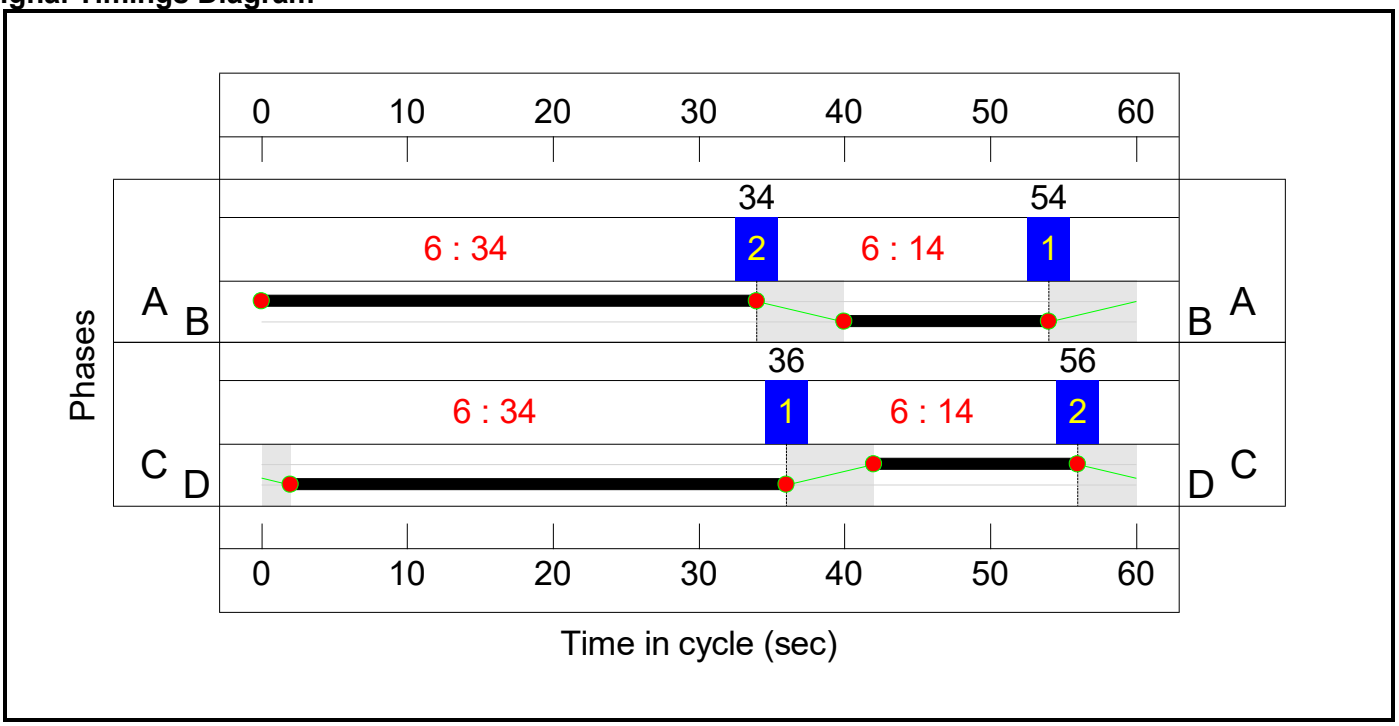
Stage Stream: 1

Stage	1	2
Duration	34	14
Change Point	54	34

Stage Stream: 2

Stage	1	2
Duration	14	34
Change Point	36	56

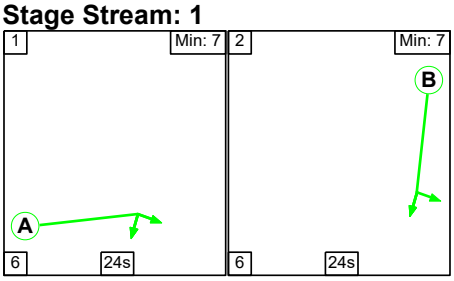
Signal Timings Diagram



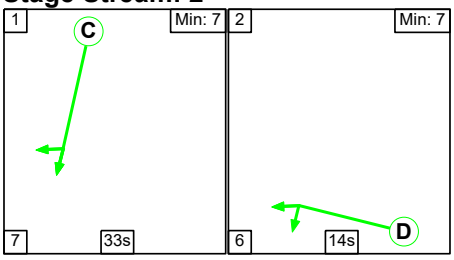
C3 - Baynards Green

Stage Sequence Diagram

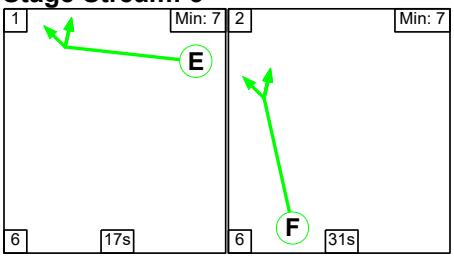
Stage Stream: 1



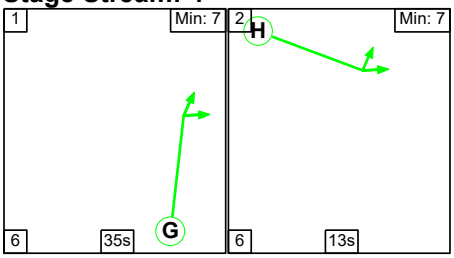
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	24	24
Change Point	0	30

Stage Stream: 2

Stage	1	2
Duration	33	14
Change Point	24	4

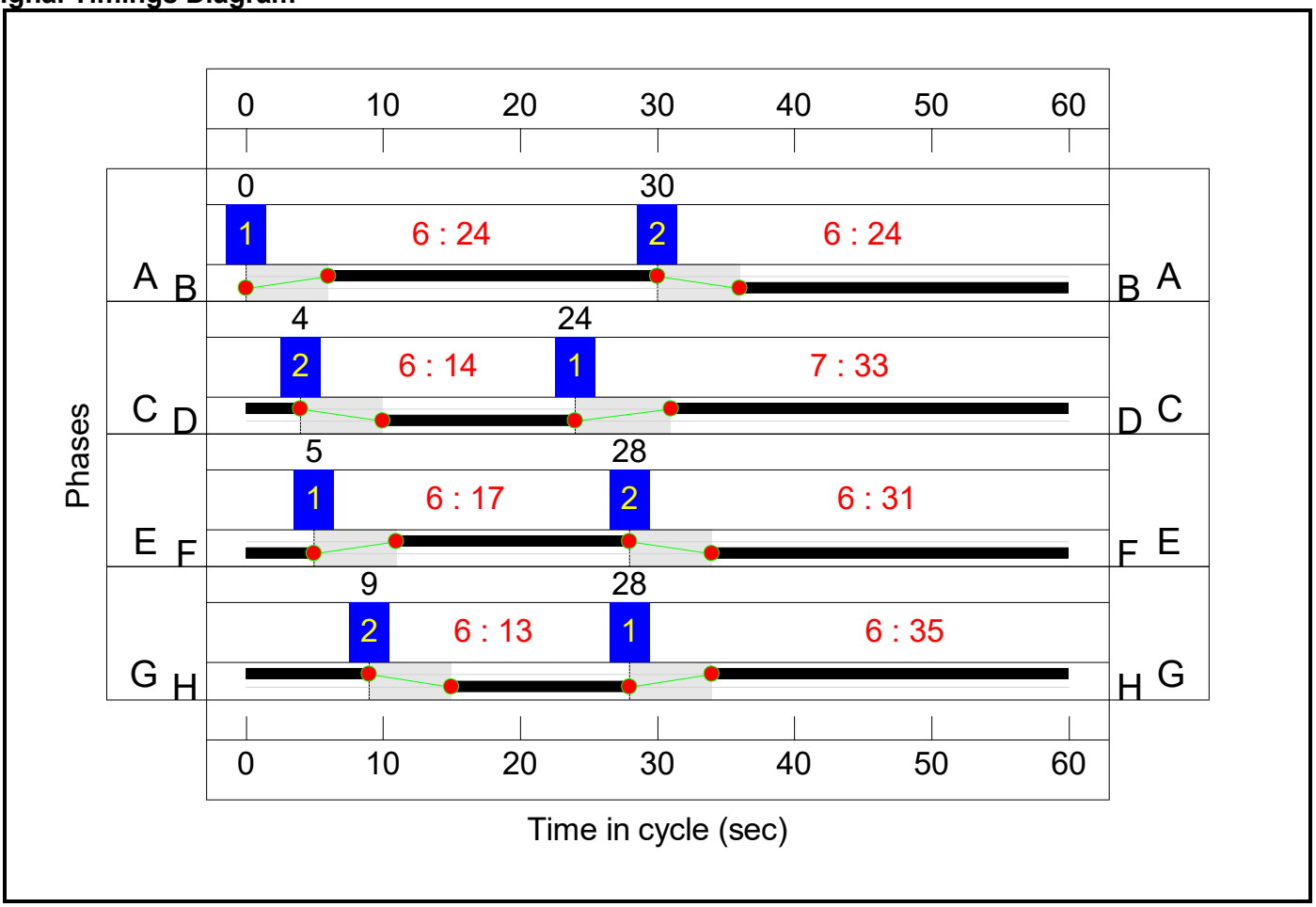
Stage Stream: 3

Stage	1	2
Duration	17	31
Change Point	5	28

Stage Stream: 4

Stage	1	2
Duration	35	13
Change Point	28	9

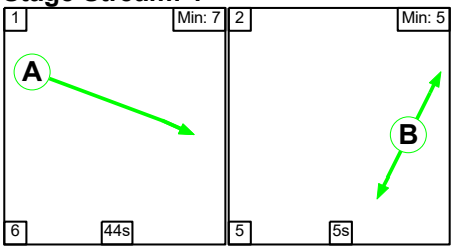
Signal Timings Diagram



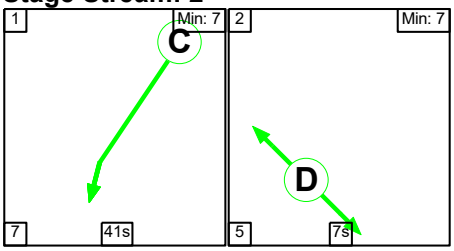
C4 - BG exit crossings

Stage Sequence Diagram

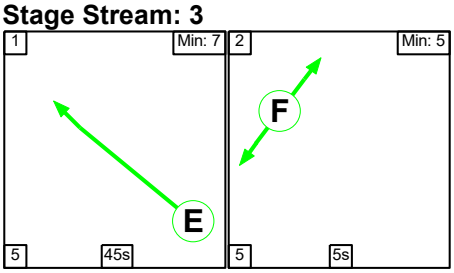
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	44	5
Change Point	0	50

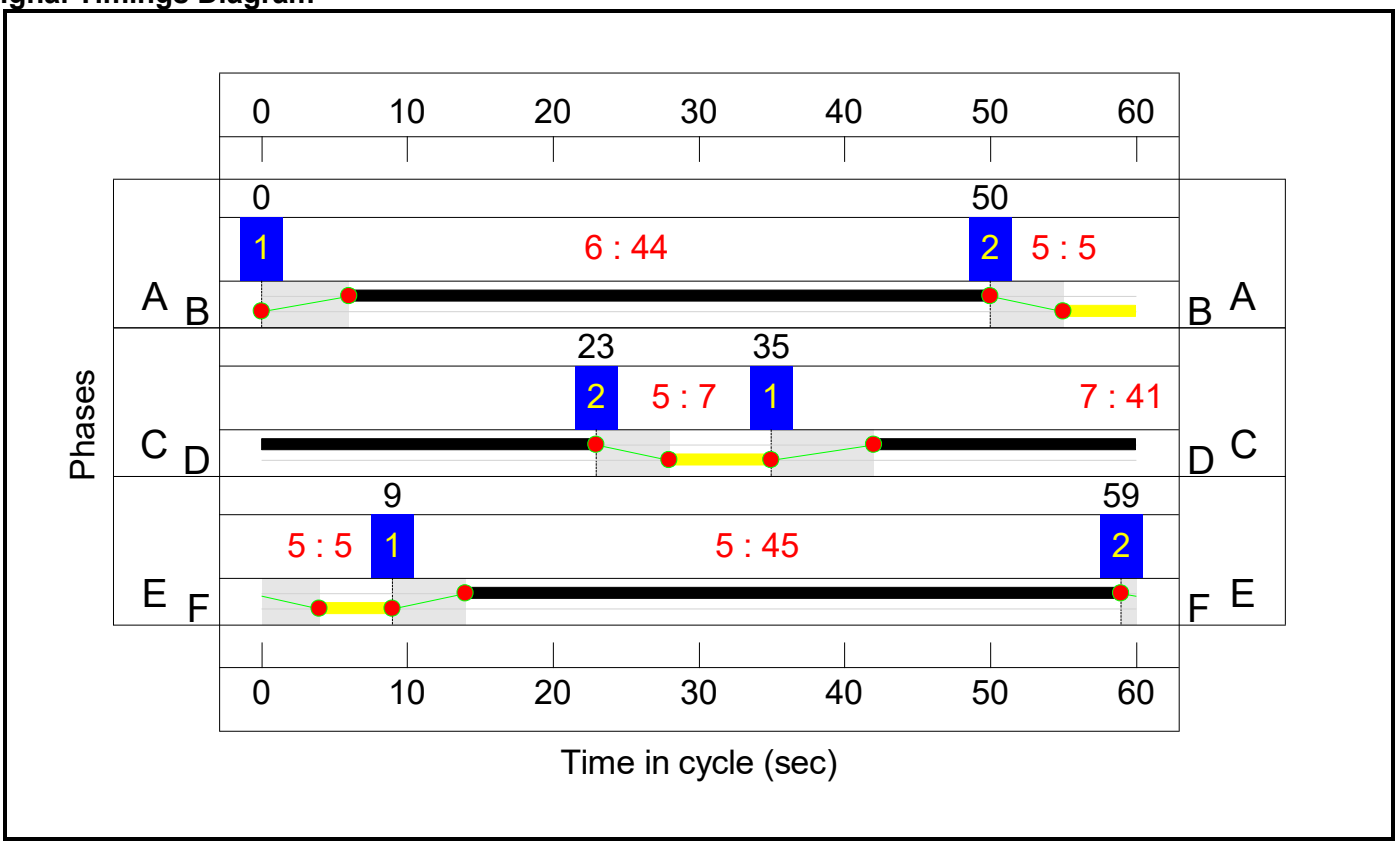
Stage Stream: 2

Stage	1	2
Duration	41	7
Change Point	35	23

Stage Stream: 3

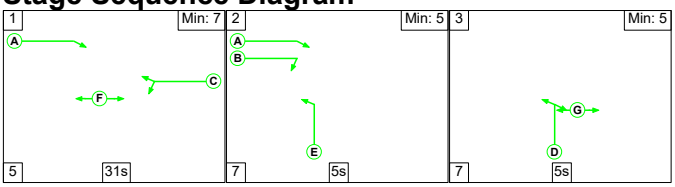
Stage	1	2
Duration	45	5
Change Point	9	59

Signal Timings Diagram



C5 - Albion Land east access

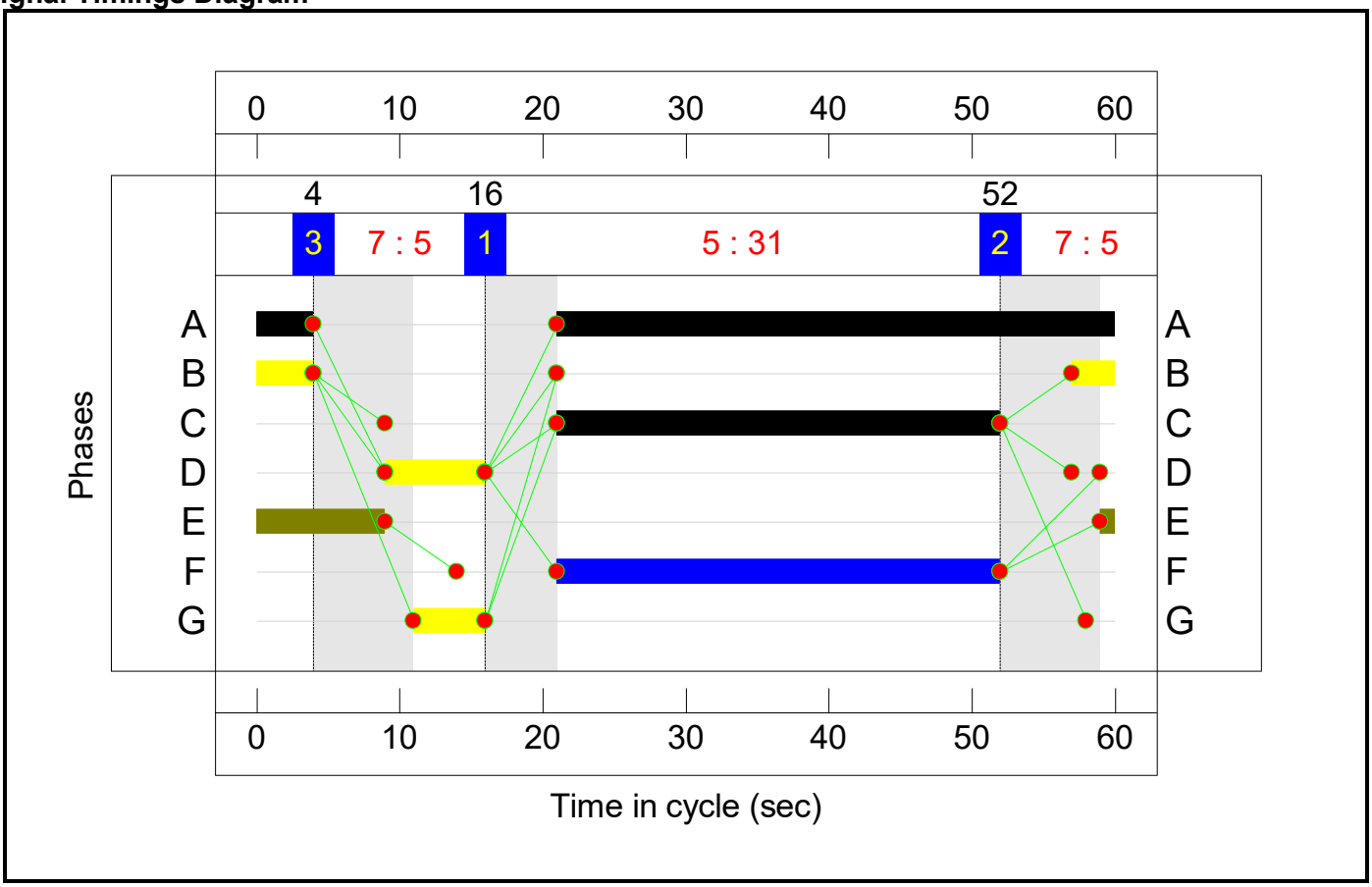
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	31	5	5
Change Point	16	52	4

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Reference Case Network Model	-	-	**N/A**	-	-		-	-	-	-	-	-	**99.4%**
J1: Baynards Green	-	-	**N/A**	-	-		-	-	-	-	-	-	**91.1%**
1/2+1/1	A43 North Ahead Left	U	3:1	N/A	C3:B		1	24	-	1139	1932:1938	805+501	87.2 : 87.2%
1/3+1/4	A43 North Ahead	U	3:1	N/A	C3:B		1	24	-	1485	2068:1932	862+805	87.3 : 91.1%
2/1	Ahead	U	3:2	N/A	C3:C		1	33	-	709	1956	1141	62.1%
2/2	Ahead	U	3:2	N/A	C3:C		1	33	-	778	2092	1185	65.6%
2/3+2/4	Right Ahead	U	3:2	N/A	C3:C		1	33	-	767	2077:1919	1064+195	60.9 : 60.9%
3/2+3/1	B4100 East Ahead Left	U	3:2	N/A	C3:D		1	14	-	588	1938:1886	484+410	73.3 : 56.8%
3/3	B4100 East Ahead	U	3:2	N/A	C3:D		1	14	-	183	2076	519	35.3%
4/1	Right Right2	U	3:3	N/A	C3:E		1	17	-	474	1942	615	77.1%
4/2	Right	U	3:3	N/A	C3:E		1	17	-	183	2066	654	28.0%
5/1	A43 South Ahead Left	U	3:3	N/A	C3:F		1	31	-	712	1932	1030	69.1%
5/2+5/3	A43 South Ahead	U	3:3	N/A	C3:F		1	31	-	1190	1932:1932	1030+430	84.9 : 73.2%
6/1	Ahead	U	3:4	N/A	C3:G		1	35	-	696	1932	1191	58.4%
6/2	Ahead	U	3:4	N/A	C3:G		1	35	-	1058	2066	1274	83.0%
6/3	Right	U	3:4	N/A	C3:G		1	35	-	315	1919	1183	26.6%
7/1+7/2	B4100 West Left Ahead	U	3:4	N/A	C3:H		1	13	-	517	1909:1922	445+448	57.9 : 57.8%
9/1	Ahead	U	3:1	N/A	C3:A		1	24	-	327	1932	837	39.1%
9/2	Right Ahead	U	3:1	N/A	C3:A		1	24	-	411	2066	895	45.9%
J2: Padbury Roundabout	-	-	**N/A**	-	-		-	-	-	-	-	-	**87.7%**
1/1	A43 north Ahead	U	1:1	N/A	C1:B		1	40	-	1152	1922	1313	87.7%
1/2	A43 north Ahead	U	1:1	N/A	C1:B		1	40	-	1216	2058	1406	86.5%

3/1	A43 south Ahead	U	1:2	N/A	C1:C		1	36	-	759	1886	1163	65.3%
3/2	A43 south Ahead	U	1:2	N/A	C1:C		1	36	-	841	2019	1245	67.5%
5/2+5/1	Junction 10 s'bound offslip Left Ahead	U	1:2	N/A	C1:D		1	12	-	507	2058:1908	446+308	67.3 : 67.3%
5/3	Junction 10 s'bound offslip Ahead	U	1:2	N/A	C1:D		1	12	-	250	2058	446	56.1%
6/1	Right	U	1:1	N/A	C1:A		1	8	-	205	1980	297	69.0%
6/2	Right	U	1:1	N/A	C1:A		1	8	-	250	2120	318	78.6%
J3: Cherwell	-	-	**N/A**	-	-		-	-	-	-	-	-	**99.4%**
1/1	A43 Left Ahead	U	2:1	N/A	C2:A		1	34	-	1117	1980	1155	96.7%
1/2+1/3	A43 Ahead	U	2:1	N/A	C2:A		1	34	-	1706	1980:1980	743+973	99.4 : 99.4%
2/2	A43 Ahead	O	N/A	N/A	-		-	-	-	509	Inf	993	51.2%
5/1	MSA Left	U	2:2	N/A	C2:C		1	14	-	260	1871	468	55.6%
5/2	MSA Left Ahead	U	2:2	N/A	C2:C		1	14	-	348	2045	511	68.1%
8/1	Ahead Right	U	2:1	N/A	C2:B		1	14	-	262	1850	462	56.6%
10/1	Ahead	U	2:2	N/A	C2:D		1	34	-	812	1980	1155	70.3%
10/2	Ahead	U	2:2	N/A	C2:D		1	34	-	755	2120	1237	59.7%
10/3	Ahead	U	2:2	N/A	C2:D		1	34	-	967	2120	1237	77.1%
J4: Unnamed Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**88.5%**
1/1+1/2	Ahead	O	N/A	N/A	-		-	-	-	503	Inf : Inf	541+627	43.1 : 43.1%
2/1	U-Turn	O	N/A	N/A	-		-	-	-	398	Inf	1126	35.3%
2/2	Ahead	O	N/A	N/A	-		-	-	-	841	Inf	1126	73.6%
9/1	Ahead Ahead2	O	N/A	N/A	-		-	-	-	841	Inf	950	88.5%
9/2	Ahead	O	N/A	N/A	-		-	-	-	719	Inf	950	75.7%
J5: Unnamed Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**68.0%**
1/1	Ahead	U	4:3	N/A	C4:E		1	45	-	490	1980	1518	32.3%
2/1	Ahead	U	4:1	N/A	C4:A		1	44	-	764	1980	1485	51.4%
2/2	Ahead	U	4:1	N/A	C4:A		1	44	-	344	1980	1485	23.2%
3/1	Ahead	U	4:2	N/A	C4:C		1	41	-	942	1980	1386	68.0%

3/2	Ahead	U	4:2	N/A	C4:C		1	41	-	778	1980	1386	56.1%
3/3	Ahead	U	4:2	N/A	C4:C		1	41	-	648	1980	1386	46.8%
J6: Albion Land east access	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**73.9%**
1/1+1/2	Ahead Right	U	N/A	N/A	C5:A C5:B		1	43:7	-	1108	1980:1828	1369+131	73.9 : 73.9%
4/1	Left Ahead	U	N/A	N/A	C5:C		1	31	-	753	1970	1051	71.7%
6/2+6/1	Right Left	U	N/A	N/A	C5:D	C5:E	1	7:17	10	65	1814:1747	171+524	9.3 : 9.3%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Reference Case Network Model	**-**	**-**	**4301**	**0**	**0**	**56.9**	**63.2**	**0.0**	**120.1**	**-**	**-**	**-**	**-**
J1: Baynards Green	**-**	**-**	**0**	**0**	**0**	**25.4**	**12.4**	**0.0**	**37.7**	**-**	**-**	**-**	**-**
1/2+1/1	1139	1139	-	-	-	4.7	3.3	-	8.0	25.3	10.5	3.3	13.8
1/3+1/4	1485	1485	-	-	-	6.7	3.9	-	10.6	25.7	11.5	3.9	15.4
2/1	709	709	-	-	-	0.1	0.0	-	0.1	0.4	0.3	0.0	0.3
2/2	778	778	-	-	-	0.1	0.0	-	0.1	0.6	0.6	0.0	0.6
2/3+2/4	767	767	-	-	-	0.1	0.0	-	0.1	0.6	0.7	0.0	0.7
3/2+3/1	588	588	-	-	-	3.1	1.0	-	4.1	24.8	5.8	1.0	6.7
3/3	183	183	-	-	-	0.8	0.3	-	1.1	22.0	2.9	0.3	3.2
4/1	474	474	-	-	-	0.6	0.0	-	0.6	4.3	2.0	0.0	2.0
4/2	183	183	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	712	712	-	-	-	1.1	1.1	-	2.2	11.1	4.9	1.1	6.1
5/2+5/3	1190	1190	-	-	-	2.1	2.2	-	4.3	13.0	29.1	2.2	31.3
6/1	696	696	-	-	-	0.2	0.0	-	0.2	1.1	1.3	0.0	1.3
6/2	1058	1058	-	-	-	0.8	0.0	-	0.8	2.6	3.1	0.0	3.1
6/3	315	315	-	-	-	0.0	0.0	-	0.0	0.0	4.3	0.0	4.3
7/1+7/2	517	517	-	-	-	2.9	0.7	-	3.6	25.2	3.8	0.7	4.5
9/1	327	327	-	-	-	1.0	0.0	-	1.0	10.8	2.8	0.0	2.8
9/2	411	411	-	-	-	1.0	0.0	-	1.0	8.5	2.7	0.0	2.7
J2: Padbury Roundabout	**-**	**-**	**0**	**0**	**0**	**9.9**	**10.1**	**0.0**	**20.0**	**-**	**-**	**-**	**-**
1/1	1152	1152	-	-	-	0.7	3.4	-	4.1	12.7	15.2	3.4	18.6
1/2	1216	1216	-	-	-	0.8	3.1	-	3.9	11.5	16.1	3.1	19.2
3/1	759	759	-	-	-	1.5	0.9	-	2.5	11.7	8.1	0.9	9.1
3/2	841	841	-	-	-	1.7	1.0	-	2.8	11.8	9.6	1.0	10.6
5/2+5/1	507	507	-	-	-	3.0	1.0	-	4.0	28.4	4.6	1.0	5.6
5/3	250	250	-	-	-	1.5	0.6	-	2.1	30.1	3.7	0.6	4.3

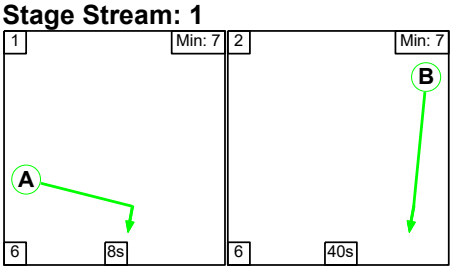
6/1	205	205	-	-	-	0.4	0.0	-	0.4	6.8	0.7	0.0	0.7
6/2	250	250	-	-	-	0.4	0.0	-	0.4	5.4	0.7	0.0	0.7
J3: Cherwell	**-**	**-**	**509**	**0**	**0**	**16.7**	**30.8**	**0.0**	**47.6**	**-**	**-**	**-**	**-**
1/1	1117	1117	-	-	-	4.1	9.7	-	13.8	44.6	16.0	9.7	25.7
1/2+1/3	1706	1676	-	-	-	7.4	18.2	-	25.6	54.0	28.2	18.2	46.4
2/2	509	509	509	0	0	0.0	0.5	-	0.5	3.7	0.0	0.5	0.5
5/1	260	260	-	-	-	1.4	0.6	-	2.0	28.2	3.8	0.6	4.4
5/2	348	348	-	-	-	2.0	1.1	-	3.0	31.2	5.2	1.1	6.3
8/1	262	262	-	-	-	1.4	0.6	-	2.1	28.6	3.8	0.6	4.4
10/1	812	812	-	-	-	0.2	0.0	-	0.2	0.8	0.4	0.0	0.4
10/2	739	739	-	-	-	0.2	0.0	-	0.2	0.9	0.6	0.0	0.6
10/3	954	954	-	-	-	0.1	0.0	-	0.1	0.4	0.2	0.0	0.2
J4: Unnamed Junction	**-**	**-**	**3792**	**0**	**0**	**0.6**	**7.2**	**0.0**	**7.8**	**-**	**-**	**-**	**-**
1/1+1/2	503	503	1006	0	0	0.0	0.4	-	0.4	2.7	0.0	0.4	0.4
2/1	398	398	398	0	0	0.0	0.3	-	0.3	2.5	0.0	0.3	0.3
2/2	828	828	828	0	0	0.6	1.4	-	1.9	8.5	11.4	1.4	12.8
9/1	841	841	841	0	0	0.0	3.6	-	3.6	15.5	0.0	3.6	3.6
9/2	719	719	719	0	0	0.0	1.5	-	1.5	7.7	0.0	1.5	1.5
J5: Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**0.7**	**0.0**	**0.0**	**0.7**	**-**	**-**	**-**	**-**
1/1	490	490	-	-	-	0.0	0.0	-	0.0	0.3	0.3	0.0	0.3
2/1	764	764	-	-	-	0.3	0.0	-	0.3	1.4	1.9	0.0	1.9
2/2	344	344	-	-	-	0.0	0.0	-	0.0	0.0	1.7	0.0	1.7
3/1	942	942	-	-	-	0.1	0.0	-	0.1	0.4	0.5	0.0	0.5
3/2	778	778	-	-	-	0.2	0.0	-	0.2	0.8	0.6	0.0	0.6
3/3	648	648	-	-	-	0.1	0.0	-	0.1	0.6	0.7	0.0	0.7
J6: Albion Land east access	**-**	**-**	**0**	**0**	**0**	**3.6**	**2.7**	**0.0**	**6.3**	**-**	**-**	**-**	**-**
1/1+1/2	1108	1108	-	-	-	1.0	1.4	-	2.4	8.0	12.3	1.4	13.7
4/1	753	753	-	-	-	2.2	1.3	-	3.5	16.6	9.4	1.3	10.7
6/2+6/1	65	65	-	-	-	0.3	0.1	-	0.4	19.9	0.6	0.1	0.6

C1 - Padbury	Stream: 1	PRC for Signalled Lanes (%):	2.6	Total Delay for Signalled Lanes (pcuHr):	8.71	Cycle Time (s):	60
C1 - Padbury	Stream: 2	PRC for Signalled Lanes (%):	33.2	Total Delay for Signalled Lanes (pcuHr):	11.31	Cycle Time (s):	60
C2 - Cherwell	Stream: 1	PRC for Signalled Lanes (%):	-10.4	Total Delay for Signalled Lanes (pcuHr):	41.51	Cycle Time (s):	60
C2 - Cherwell	Stream: 2	PRC for Signalled Lanes (%):	16.7	Total Delay for Signalled Lanes (pcuHr):	5.52	Cycle Time (s):	60
C3 - Baynards Green	Stream: 1	PRC for Signalled Lanes (%):	-1.2	Total Delay for Signalled Lanes (pcuHr):	20.58	Cycle Time (s):	60
C3 - Baynards Green	Stream: 2	PRC for Signalled Lanes (%):	22.8	Total Delay for Signalled Lanes (pcuHr):	5.51	Cycle Time (s):	60
C3 - Baynards Green	Stream: 3	PRC for Signalled Lanes (%):	6.0	Total Delay for Signalled Lanes (pcuHr):	7.06	Cycle Time (s):	60
C3 - Baynards Green	Stream: 4	PRC for Signalled Lanes (%):	8.4	Total Delay for Signalled Lanes (pcuHr):	4.59	Cycle Time (s):	60
C4 - BG exit crossings	Stream: 1	PRC for Signalled Lanes (%):	74.9	Total Delay for Signalled Lanes (pcuHr):	0.30	Cycle Time (s):	60
C4 - BG exit crossings	Stream: 2	PRC for Signalled Lanes (%):	32.4	Total Delay for Signalled Lanes (pcuHr):	0.39	Cycle Time (s):	60
C4 - BG exit crossings	Stream: 3	PRC for Signalled Lanes (%):	178.8	Total Delay for Signalled Lanes (pcuHr):	0.04	Cycle Time (s):	60
C5 - Albion Land east access		PRC for Signalled Lanes (%):	21.8	Total Delay for Signalled Lanes (pcuHr):	6.28	Cycle Time (s):	60
		PRC Over All Lanes (%):	-10.4	Total Delay Over All Lanes(pcuHr):	120.09		

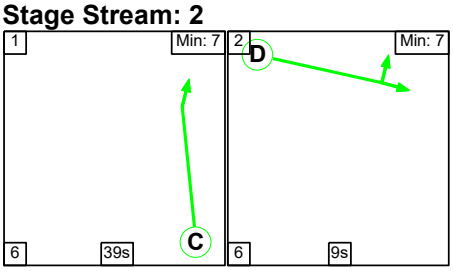
Scenario 2: '2034 RC3A - PM Peak' (FG2: '2034 RC3A - PM', Plan 1: 'Network Plan 1')
C1 - Padbury

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

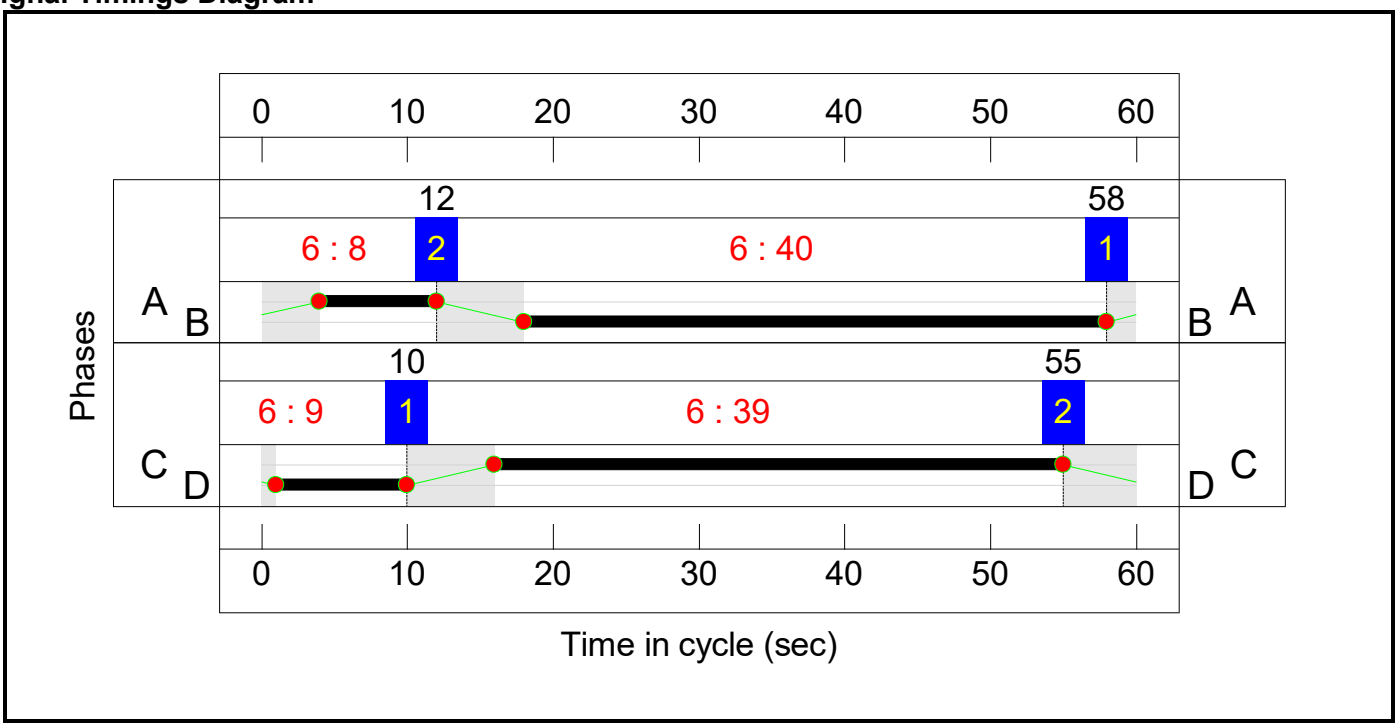
Stage Stream: 1

Stage	1	2
Duration	8	40
Change Point	58	12

Stage Stream: 2

Stage	1	2
Duration	39	9
Change Point	10	55

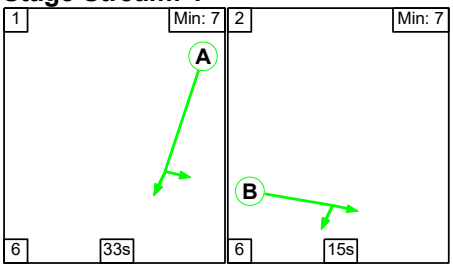
Signal Timings Diagram



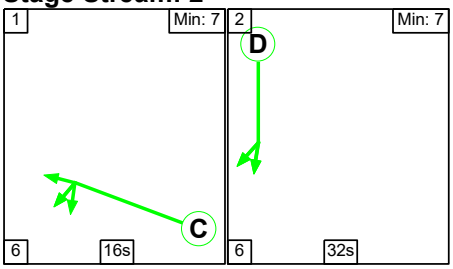
C2 - Cherwell

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

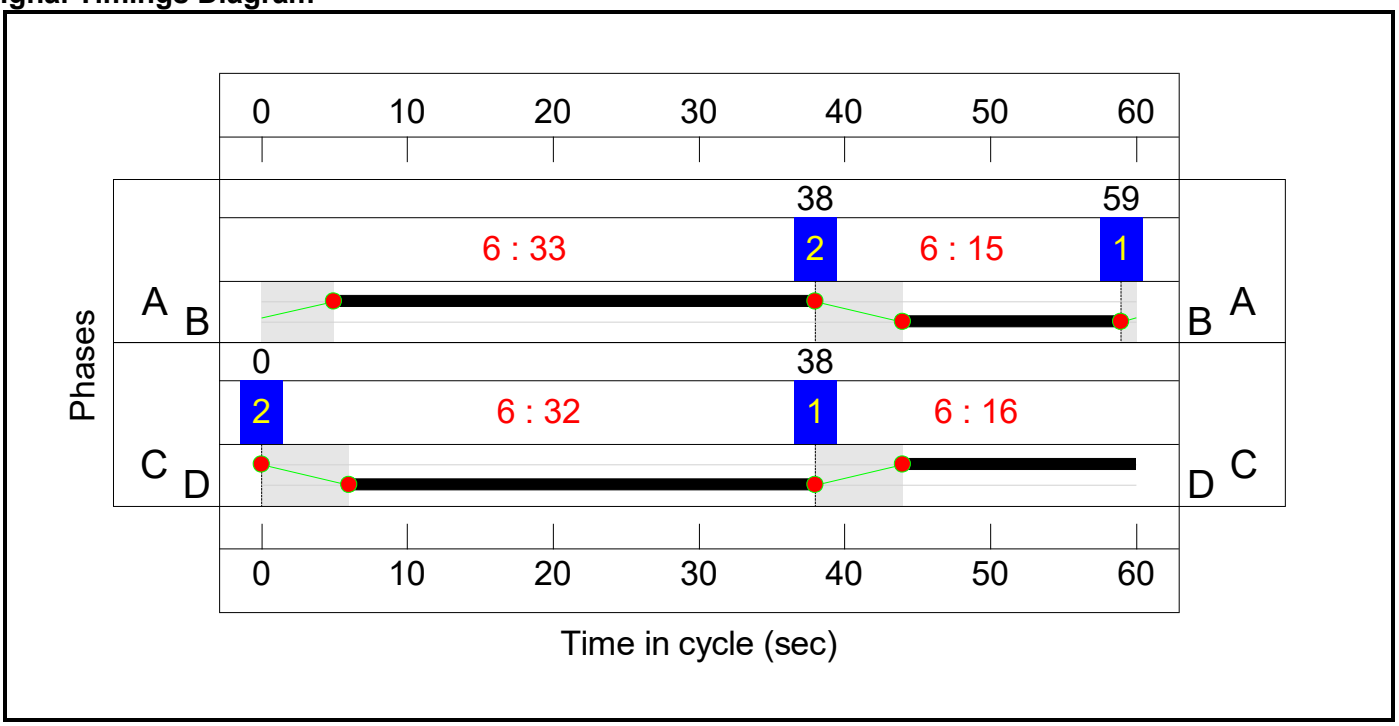
Stage Stream: 1

Stage	1	2
Duration	33	15
Change Point	59	38

Stage Stream: 2

Stage	1	2
Duration	16	32
Change Point	38	0

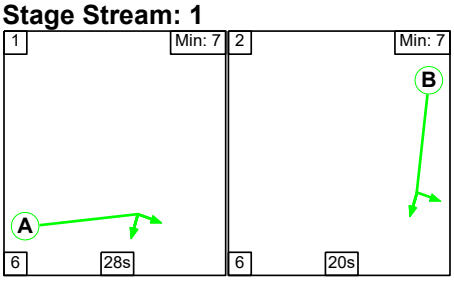
Signal Timings Diagram



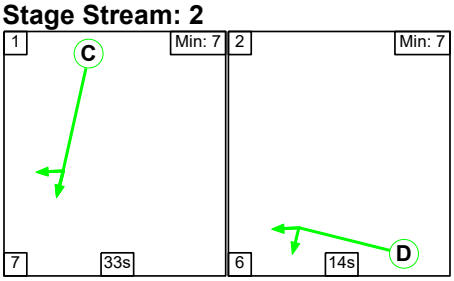
C3 - Baynards Green

Stage Sequence Diagram

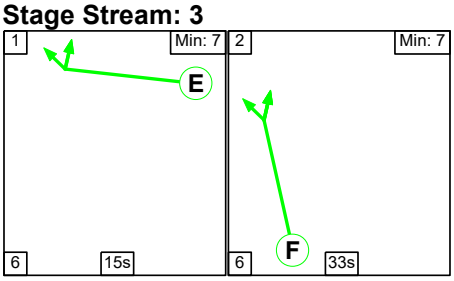
Stage Stream: 1



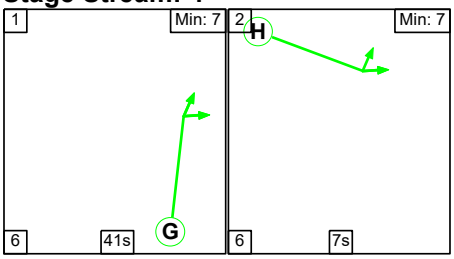
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	28	20
Change Point	0	34

Stage Stream: 2

Stage	1	2
Duration	33	14
Change Point	25	5

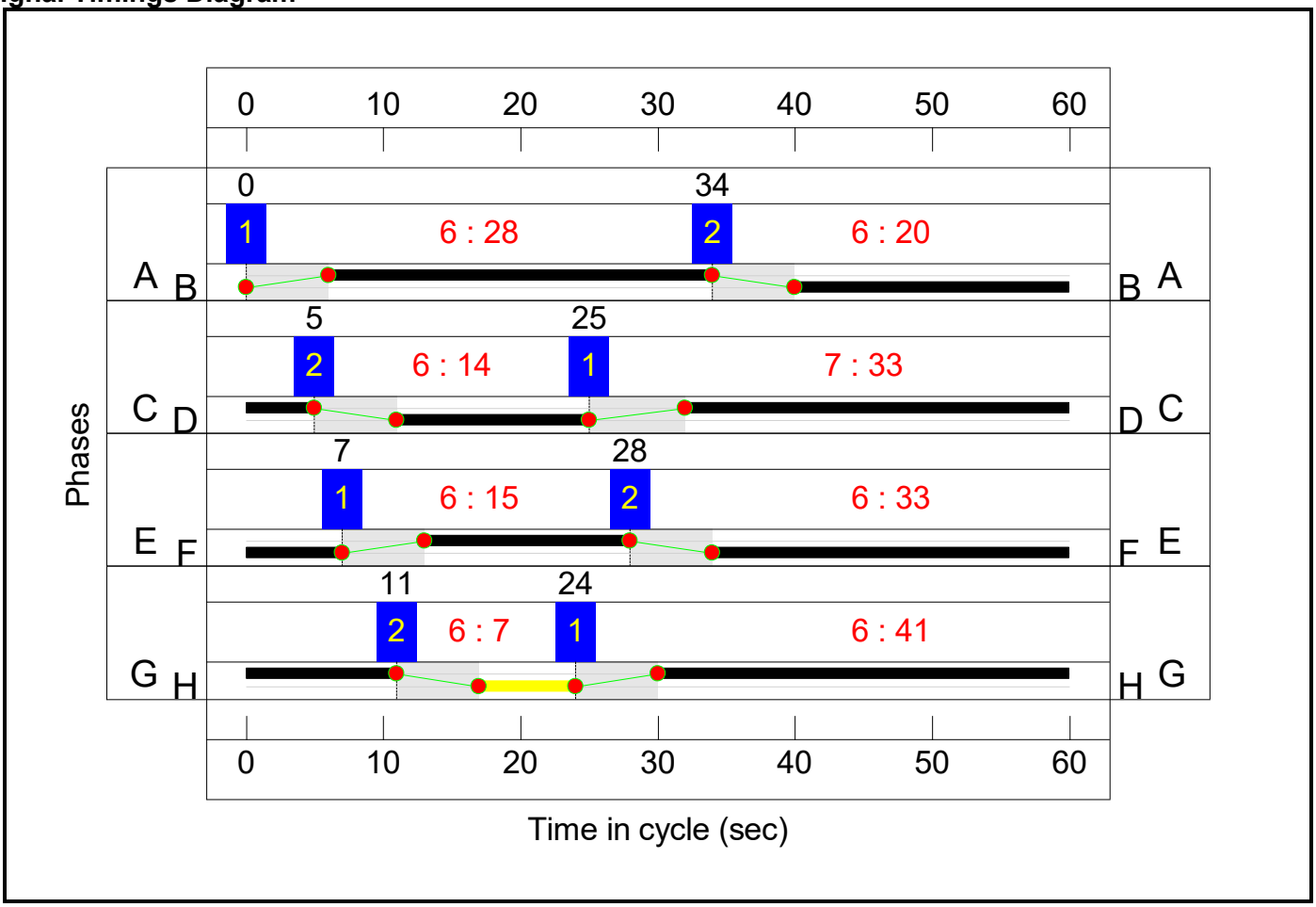
Stage Stream: 3

Stage	1	2
Duration	15	33
Change Point	7	28

Stage Stream: 4

Stage	1	2
Duration	41	7
Change Point	24	11

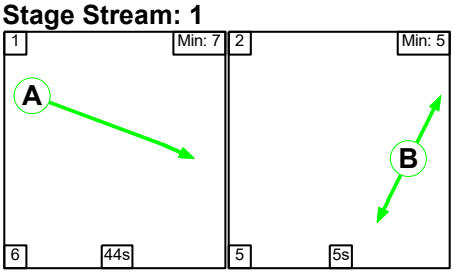
Signal Timings Diagram



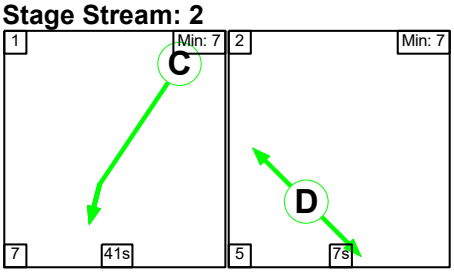
C4 - BG exit crossings

Stage Sequence Diagram

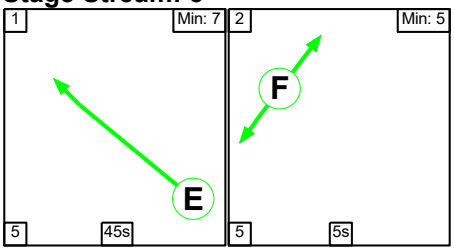
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	44	5
Change Point	1	51

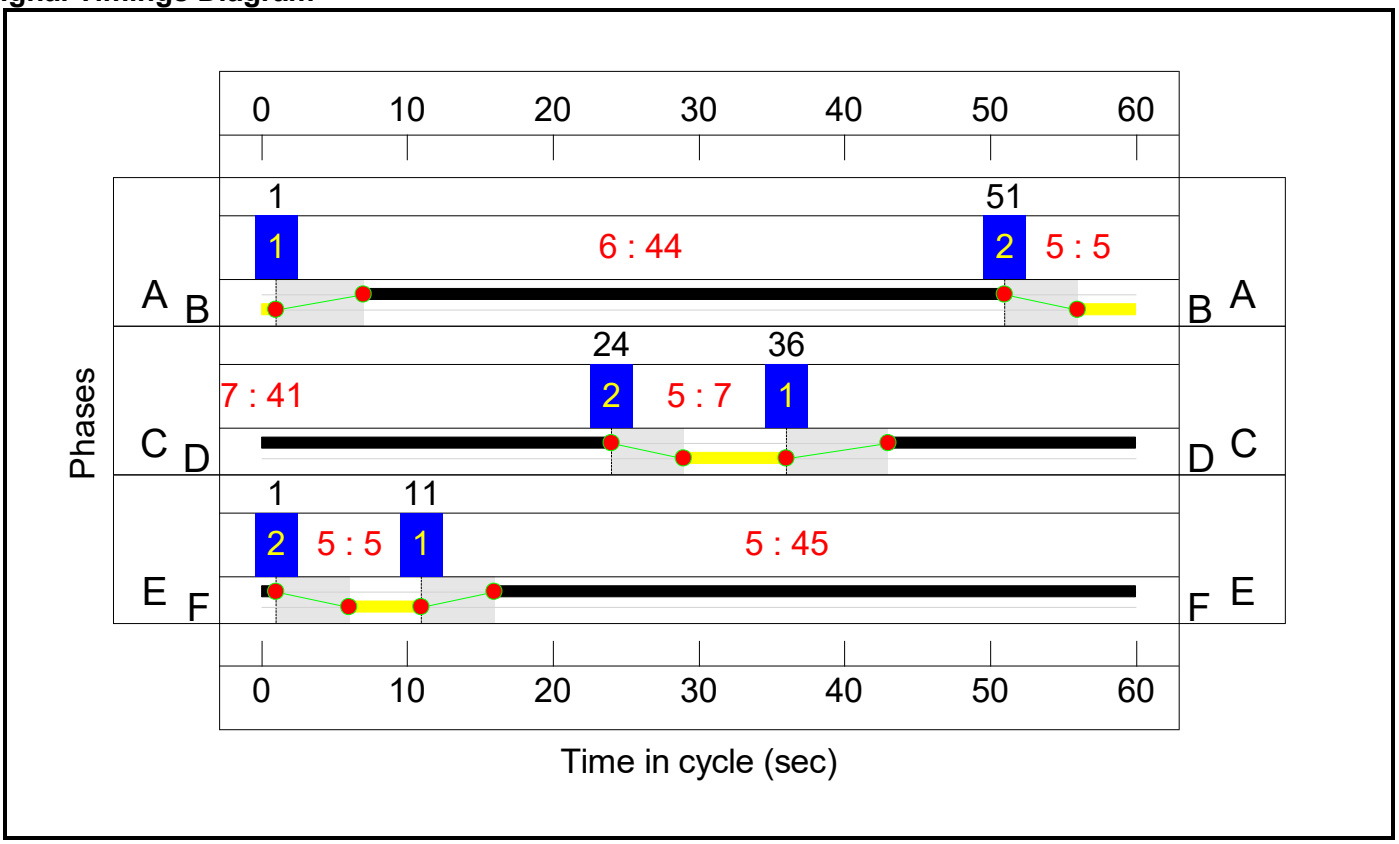
Stage Stream: 2

Stage	1	2
Duration	41	7
Change Point	36	24

Stage Stream: 3

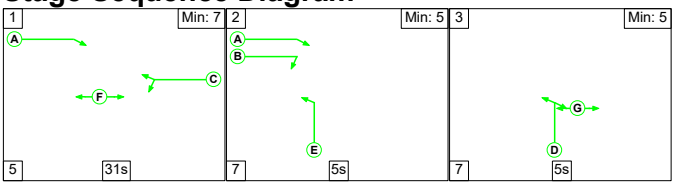
Stage	1	2
Duration	45	5
Change Point	11	1

Signal Timings Diagram



C5 - Albion Land east access

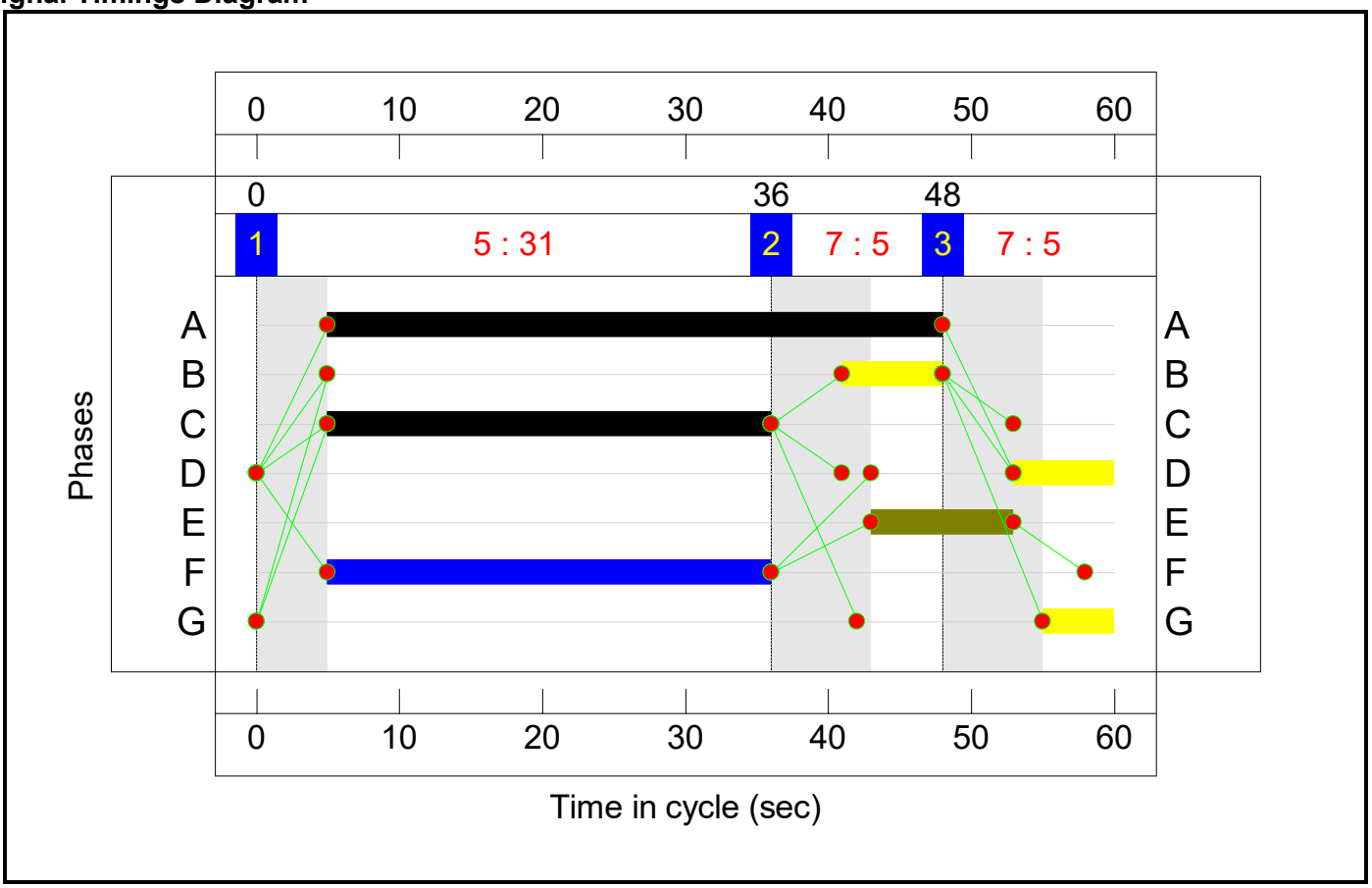
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	31	5	5
Change Point	0	36	48

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Reference Case Network Model	-	-	**N/A**	-	-		-	-	-	-	-	-	**96.9%**
J1: Baynards Green	-	-	**N/A**	-	-		-	-	-	-	-	-	**95.5%**
1/2+1/1	A43 North Ahead Left	U	3:1	N/A	C3:B		1	20	-	845	1932:1938	676+396	78.8 : 78.8%
1/3+1/4	A43 North Ahead	U	3:1	N/A	C3:B		1	20	-	1161	2068:1932	724+676	81.4 : 84.6%
2/1	Ahead	U	3:2	N/A	C3:C		1	33	-	547	1956	1141	47.9%
2/2	Ahead	U	3:2	N/A	C3:C		1	33	-	627	2092	1185	52.9%
2/3+2/4	Right Ahead	U	3:2	N/A	C3:C		1	33	-	625	2077:1919	1099+157	49.8 : 49.8%
3/2+3/1	B4100 East Ahead Left	U	3:2	N/A	C3:D		1	14	-	707	1938:1886	484+471	84.4 : 63.2%
3/3	B4100 East Ahead	U	3:2	N/A	C3:D		1	14	-	268	2076	519	51.6%
4/1	Right Right2	U	3:3	N/A	C3:E		1	15	-	487	1942	550	88.5%
4/2	Right	U	3:3	N/A	C3:E		1	15	-	268	2066	585	45.8%
5/1	A43 South Ahead Left	U	3:3	N/A	C3:F		1	33	-	999	1932	1095	91.2%
5/2+5/3	A43 South Ahead	U	3:3	N/A	C3:F		1	33	-	1361	1932:1932	1095+361	95.5 : 87.6%
6/1	Ahead	U	3:4	N/A	C3:G		1	41	-	1096	1932	1385	79.2%
6/2	Ahead	U	3:4	N/A	C3:G		1	41	-	1313	2066	1481	88.7%
6/3	Right	U	3:4	N/A	C3:G		1	41	-	316	1919	1375	23.0%
7/1+7/2	B4100 West Left Ahead	U	3:4	N/A	C3:H		1	7	-	435	1902:1922	254+256	85.6 : 85.1%
9/1	Ahead	U	3:1	N/A	C3:A		1	28	-	252	1932	966	26.1%
9/2	Right Ahead	U	3:1	N/A	C3:A		1	28	-	377	2066	1033	36.5%
J2: Padbury Roundabout	-	-	**N/A**	-	-		-	-	-	-	-	-	**82.5%**
1/1	A43 north Ahead	U	1:1	N/A	C1:B		1	40	-	1039	1922	1313	79.1%
1/2	A43 north Ahead	U	1:1	N/A	C1:B		1	40	-	980	2058	1406	69.7%

3/1	A43 south Ahead	U	1:2	N/A	C1:C		1	39	-	977	1886	1257	77.7%
3/2	A43 south Ahead	U	1:2	N/A	C1:C		1	39	-	1070	2019	1346	79.5%
5/2+5/1	Junction 10 s'bound offslip Left Ahead	U	1:2	N/A	C1:D		1	9	-	489	2058:1908	343+318	82.5 : 64.8%
5/3	Junction 10 s'bound offslip Ahead	U	1:2	N/A	C1:D		1	9	-	209	2058	343	60.9%
6/1	Right	U	1:1	N/A	C1:A		1	8	-	176	1980	297	59.3%
6/2	Right	U	1:1	N/A	C1:A		1	8	-	209	2120	318	65.7%
J3: Cherwell	-	-	**N/A**	-	-		-	-	-	-	-	-	**87.5%**
1/1	A43 Left Ahead	U	2:1	N/A	C2:A		1	33	-	900	1980	1122	80.2%
1/2+1/3	A43 Ahead	U	2:1	N/A	C2:A		1	33	-	1504	1980:1980	948+770	87.5 : 87.5%
2/2	A43 Ahead	O	N/A	N/A	-		-	-	-	534	Inf	981	54.4%
5/1	MSA Left	U	2:2	N/A	C2:C		1	16	-	308	1871	530	58.1%
5/2	MSA Left Ahead	U	2:2	N/A	C2:C		1	16	-	317	2053	582	54.5%
8/1	Ahead Right	U	2:1	N/A	C2:B		1	15	-	257	1850	493	52.1%
10/1	Ahead	U	2:2	N/A	C2:D		1	32	-	545	1980	1089	50.0%
10/2	Ahead	U	2:2	N/A	C2:D		1	32	-	833	2120	1166	71.4%
10/3	Ahead	U	2:2	N/A	C2:D		1	32	-	674	2120	1166	57.8%
J4: Unnamed Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**96.9%**
1/1+1/2	Ahead	O	N/A	N/A	-		-	-	-	403	Inf : Inf	445+494	42.9 : 42.9%
2/1	U-Turn	O	N/A	N/A	-		-	-	-	494	Inf	1140	43.3%
2/2	Ahead	O	N/A	N/A	-		-	-	-	396	Inf	1140	34.7%
9/1	Ahead Ahead2	O	N/A	N/A	-		-	-	-	1055	Inf	1088	96.9%
9/2	Ahead	O	N/A	N/A	-		-	-	-	1030	Inf	1088	94.6%
J5: Unnamed Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**61.0%**
1/1	Ahead	U	4:3	N/A	C4:E		1	45	-	390	1980	1518	25.7%
2/1	Ahead	U	4:1	N/A	C4:A		1	44	-	564	1980	1485	38.0%
2/2	Ahead	U	4:1	N/A	C4:A		1	44	-	272	1980	1485	18.3%
3/1	Ahead	U	4:2	N/A	C4:C		1	41	-	845	1980	1386	61.0%

3/2	Ahead	U	4:2	N/A	C4:C		1	41	-	627	1980	1386	45.2%
3/3	Ahead	U	4:2	N/A	C4:C		1	41	-	547	1980	1386	39.5%
J6: Albion Land east access	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**84.8%**
1/1+1/2	Ahead Right	U	N/A	N/A	C5:A C5:B		1	43:7	-	836	1980:1828	1404+76	56.5 : 56.5%
4/1	Left Ahead	U	N/A	N/A	C5:C		1	31	-	894	1977	1054	84.8%
6/2+6/1	Right Left	U	N/A	N/A	C5:D	C5:E	1	7:17	10	129	1814:1747	203+524	17.7 : 17.7%

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: Reference Case Network Model	**-**	**-**	**4315**	**0**	**0**	**66.0**	**58.1**	**0.0**	**124.1**	**-**	**-**	**-**	**-**
J1: Baynards Green	**-**	**-**	**0**	**0**	**0**	**30.8**	**20.0**	**0.0**	**50.8**	**-**	**-**	**-**	**-**
1/2+1/1	845	845	-	-	-	3.9	1.8	-	5.7	24.4	7.8	1.8	9.7
1/3+1/4	1161	1161	-	-	-	5.8	2.4	-	8.1	25.3	8.8	2.4	11.2
2/1	547	547	-	-	-	0.0	0.0	-	0.0	0.1	0.2	0.0	0.2
2/2	627	627	-	-	-	0.0	0.0	-	0.0	0.3	0.6	0.0	0.6
2/3+2/4	625	625	-	-	-	0.1	0.0	-	0.1	0.3	0.9	0.0	0.9
3/2+3/1	707	707	-	-	-	6.2	1.4	-	7.6	38.7	6.7	1.4	8.1
3/3	268	268	-	-	-	2.3	0.5	-	2.8	38.3	4.3	0.5	4.8
4/1	487	487	-	-	-	0.4	0.0	-	0.4	3.1	1.4	0.0	1.4
4/2	268	268	-	-	-	0.0	0.0	-	0.0	0.7	0.1	0.0	0.1
5/1	999	999	-	-	-	3.0	4.7	-	7.7	27.9	10.3	4.7	15.0
5/2+5/3	1361	1361	-	-	-	3.2	6.4	-	9.5	25.2	36.2	6.4	42.5
6/1	1096	1096	-	-	-	0.2	0.0	-	0.2	0.7	2.4	0.0	2.4
6/2	1313	1313	-	-	-	0.7	0.0	-	0.7	2.0	4.5	0.0	4.5
6/3	316	316	-	-	-	0.0	0.0	-	0.0	0.0	4.3	0.0	4.3
7/1+7/2	435	435	-	-	-	3.1	2.7	-	5.8	47.9	3.5	2.7	6.2
9/1	252	252	-	-	-	0.9	0.0	-	0.9	12.9	2.6	0.0	2.6
9/2	377	377	-	-	-	0.9	0.0	-	0.9	8.9	2.6	0.0	2.6
J2: Padbury Roundabout	**-**	**-**	**0**	**0**	**0**	**13.7**	**8.8**	**0.0**	**22.5**	**-**	**-**	**-**	**-**
1/1	1039	1039	-	-	-	1.8	1.9	-	3.7	12.7	15.7	1.9	17.5
1/2	980	980	-	-	-	2.6	1.1	-	3.8	13.9	16.0	1.1	17.2
3/1	977	977	-	-	-	2.1	1.7	-	3.8	13.9	11.6	1.7	13.3
3/2	1070	1070	-	-	-	2.2	1.9	-	4.2	14.0	12.5	1.9	14.4
5/2+5/1	489	489	-	-	-	3.2	1.4	-	4.6	34.1	4.5	1.4	5.9
5/3	209	209	-	-	-	1.3	0.8	-	2.1	36.5	3.2	0.8	4.0

6/1	176	176	-	-	-	0.2	0.0	-	0.2	4.5	0.3	0.0	0.3
6/2	209	209	-	-	-	0.1	0.0	-	0.1	2.5	0.2	0.0	0.2
J3: Cherwell	**-**	**-**	**534**	**0**	**0**	**16.1**	**7.8**	**0.0**	**23.9**	**-**	**-**	**-**	**-**
1/1	900	900	-	-	-	3.6	2.0	-	5.6	22.3	12.2	2.0	14.2
1/2+1/3	1504	1504	-	-	-	7.0	3.4	-	10.4	24.9	21.3	3.4	24.7
2/2	534	534	534	0	0	0.0	0.6	-	0.6	4.0	0.0	0.6	0.6
5/1	308	308	-	-	-	1.6	0.7	-	2.3	26.5	4.4	0.7	5.1
5/2	317	317	-	-	-	1.6	0.6	-	2.2	25.0	4.4	0.6	5.0
8/1	257	257	-	-	-	1.3	0.5	-	1.8	25.7	3.6	0.5	4.2
10/1	545	545	-	-	-	0.3	0.0	-	0.3	2.3	0.8	0.0	0.8
10/2	833	833	-	-	-	0.5	0.0	-	0.5	2.2	1.2	0.0	1.2
10/3	674	674	-	-	-	0.2	0.0	-	0.2	1.2	0.5	0.0	0.5
J4: Unnamed Junction	**-**	**-**	**3781**	**0**	**0**	**0.5**	**18.1**	**0.0**	**18.5**	**-**	**-**	**-**	**-**
1/1+1/2	403	403	806	0	0	0.0	0.4	-	0.4	3.3	0.0	0.4	0.4
2/1	494	494	494	0	0	0.0	0.4	-	0.4	2.8	1.7	0.4	2.0
2/2	396	396	396	0	0	0.0	0.3	-	0.3	2.4	0.7	0.3	0.9
9/1	1055	1055	1055	0	0	0.3	9.9	-	10.2	34.8	13.2	9.9	23.1
9/2	1030	1030	1030	0	0	0.2	7.1	-	7.3	25.4	11.2	7.1	18.3
J5: Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**0.6**	**0.0**	**0.0**	**0.6**	**-**	**-**	**-**	**-**
1/1	390	390	-	-	-	0.0	0.0	-	0.0	0.2	0.2	0.0	0.2
2/1	564	564	-	-	-	0.2	0.0	-	0.2	1.6	1.4	0.0	1.4
2/2	272	272	-	-	-	0.0	0.0	-	0.0	0.1	2.3	0.0	2.3
3/1	845	845	-	-	-	0.1	0.0	-	0.1	0.3	0.4	0.0	0.4
3/2	627	627	-	-	-	0.1	0.0	-	0.1	0.8	0.6	0.0	0.6
3/3	547	547	-	-	-	0.1	0.0	-	0.1	0.9	0.9	0.0	0.9
J6: Albion Land east access	**-**	**-**	**0**	**0**	**0**	**4.3**	**3.5**	**0.0**	**7.8**	**-**	**-**	**-**	**-**
1/1+1/2	836	836	-	-	-	0.7	0.6	-	1.4	5.9	13.7	0.6	14.4
4/1	894	894	-	-	-	3.0	2.7	-	5.7	22.8	12.7	2.7	15.4
6/2+6/1	129	129	-	-	-	0.6	0.1	-	0.7	20.6	1.1	0.1	1.2

C1 - Padbury	Stream: 1	PRC for Signalled Lanes (%):	13.8	Total Delay for Signalled Lanes (pcuHr):	7.81	Cycle Time (s):	60
C1 - Padbury	Stream: 2	PRC for Signalled Lanes (%):	9.1	Total Delay for Signalled Lanes (pcuHr):	14.69	Cycle Time (s):	60
C2 - Cherwell	Stream: 1	PRC for Signalled Lanes (%):	2.8	Total Delay for Signalled Lanes (pcuHr):	17.80	Cycle Time (s):	60
C2 - Cherwell	Stream: 2	PRC for Signalled Lanes (%):	26.0	Total Delay for Signalled Lanes (pcuHr):	5.55	Cycle Time (s):	60
C3 - Baynards Green	Stream: 1	PRC for Signalled Lanes (%):	6.4	Total Delay for Signalled Lanes (pcuHr):	15.71	Cycle Time (s):	60
C3 - Baynards Green	Stream: 2	PRC for Signalled Lanes (%):	6.6	Total Delay for Signalled Lanes (pcuHr):	10.56	Cycle Time (s):	60
C3 - Baynards Green	Stream: 3	PRC for Signalled Lanes (%):	-6.1	Total Delay for Signalled Lanes (pcuHr):	17.74	Cycle Time (s):	60
C3 - Baynards Green	Stream: 4	PRC for Signalled Lanes (%):	1.5	Total Delay for Signalled Lanes (pcuHr):	6.74	Cycle Time (s):	60
C4 - BG exit crossings	Stream: 1	PRC for Signalled Lanes (%):	137.0	Total Delay for Signalled Lanes (pcuHr):	0.25	Cycle Time (s):	60
C4 - BG exit crossings	Stream: 2	PRC for Signalled Lanes (%):	47.6	Total Delay for Signalled Lanes (pcuHr):	0.34	Cycle Time (s):	60
C4 - BG exit crossings	Stream: 3	PRC for Signalled Lanes (%):	250.3	Total Delay for Signalled Lanes (pcuHr):	0.03	Cycle Time (s):	60
C5 - Albion Land east access		PRC for Signalled Lanes (%):	6.1	Total Delay for Signalled Lanes (pcuHr):	7.77	Cycle Time (s):	60
		PRC Over All Lanes (%):	-7.7	Total Delay Over All Lanes(pcuHr):	124.09		

APPENDIX F

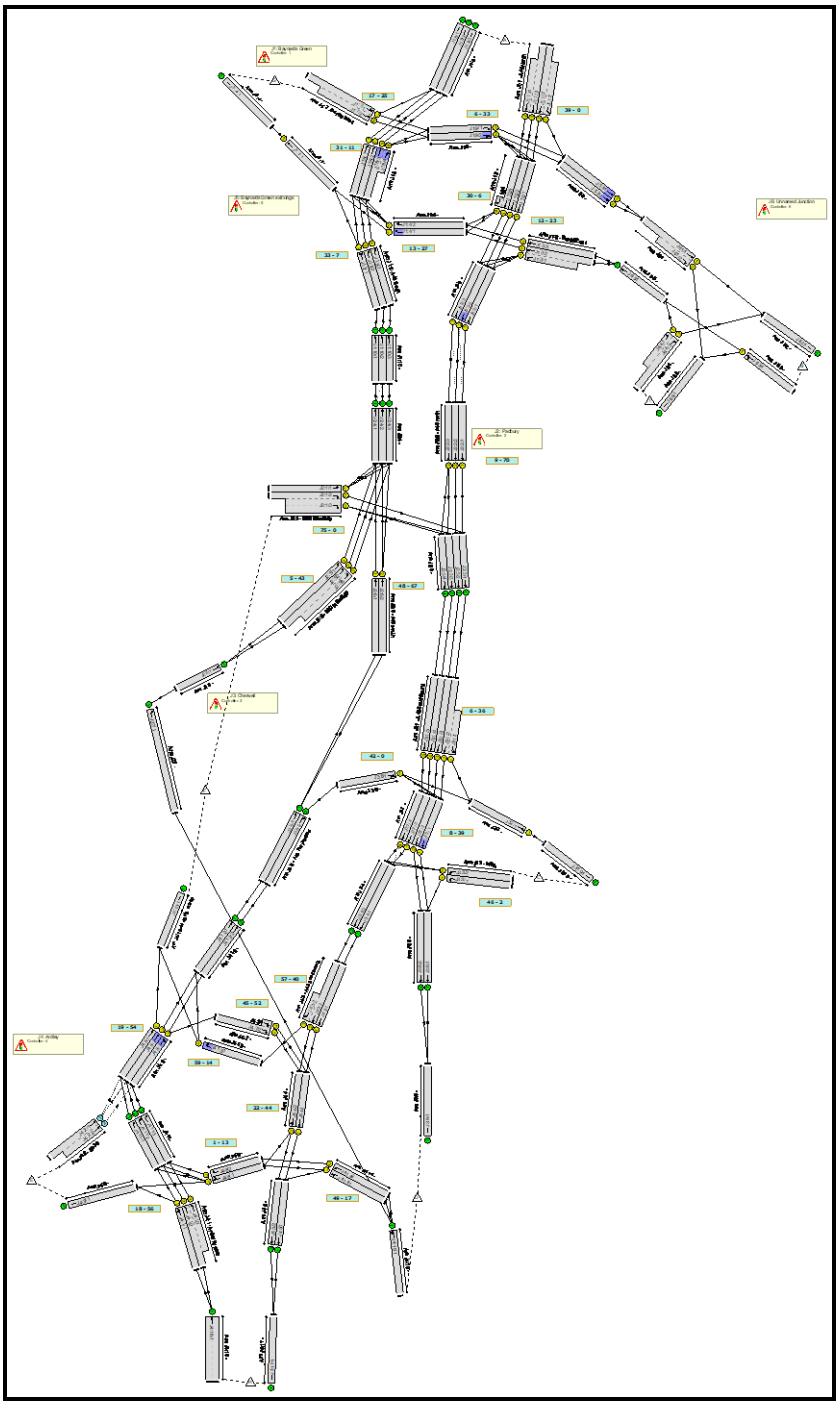
BAYNARD'S GREEN AND M40 JUNCTION 10 DS3A LINSIG REPORT

Full Input Data And Results

User and Project Details

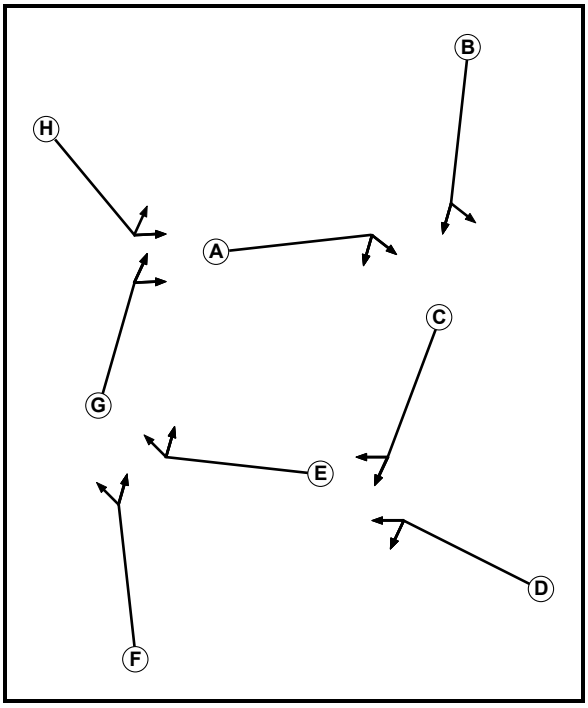
Project:	**Oxfordshire SRFI**
Title:	**EMBEDDED MITIGATION Network Model**
Location:	M40 Junction 10 and Batnards Green complex
Additional detail:	
File name:	250902 M40J10 Embedded mitigation model.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



C1 - Baynards Green

Phase Diagram



Phase Input Data

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

Phase Intergreens Matrix

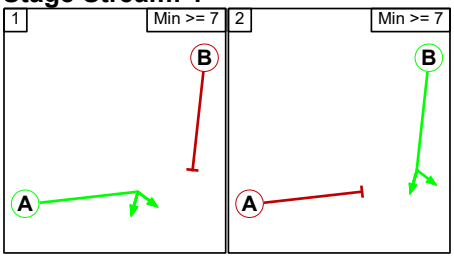
		Starting Phase							
		A	B	C	D	E	F	G	H
Terminating Phase	A		6	-	-	-	-	-	-
	B	6		-	-	-	-	-	-
	C	-	-		6	-	-	-	-
	D	-	-	7		-	-	-	-
	E	-	-	-	-		6	-	-
	F	-	-	-	-	6		-	-
	G	-	-	-	-	-	-		6
	H	-	-	-	-	-	-	6	

Phases in Stage

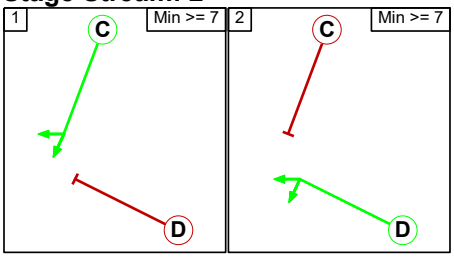
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D
3	1	E
3	2	F
4	1	G
4	2	H

Stage Diagram

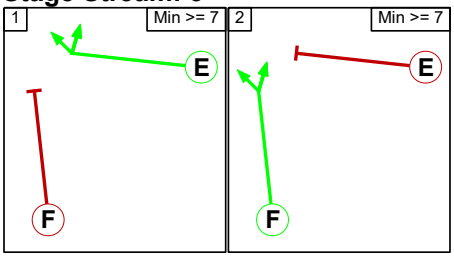
Stage Stream: 1



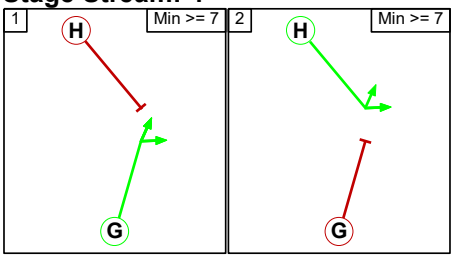
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		6
	2	7	

Stage Stream: 3

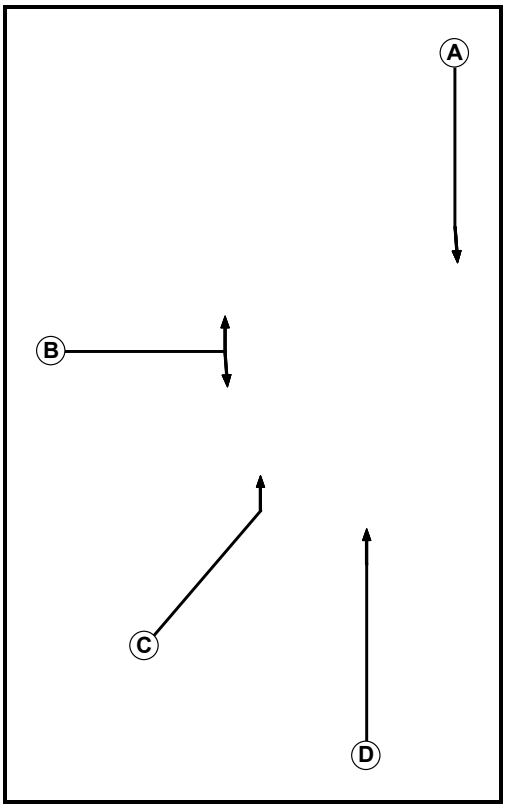
	To Stage		
From Stage		1	2
	1		6
	2	6	

Stage Stream: 4

	To Stage		
From Stage		1	2
	1		6
	2	6	

C2 - Padbury

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	6
B	Traffic	1		7	7
C	Traffic	1		7	7
D	Traffic	1		7	7

Phase Intergreens Matrix

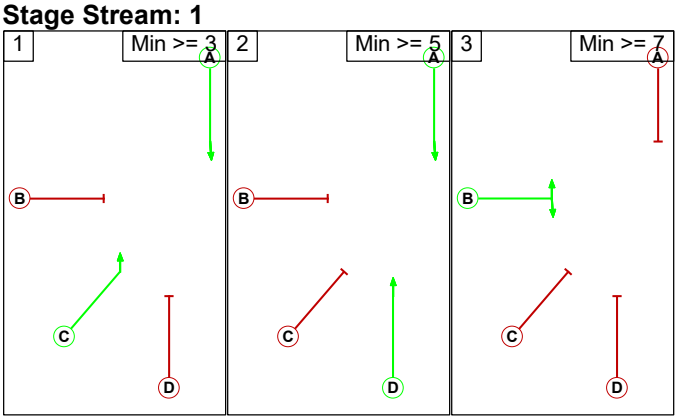
		Starting Phase			
		A	B	C	D
Terminating Phase	A		5	-	-
	B	9		5	7
	C	-	8		5
	D	-	8	5	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	3	A	Losing	1	1
2	3	A	Losing	3	3

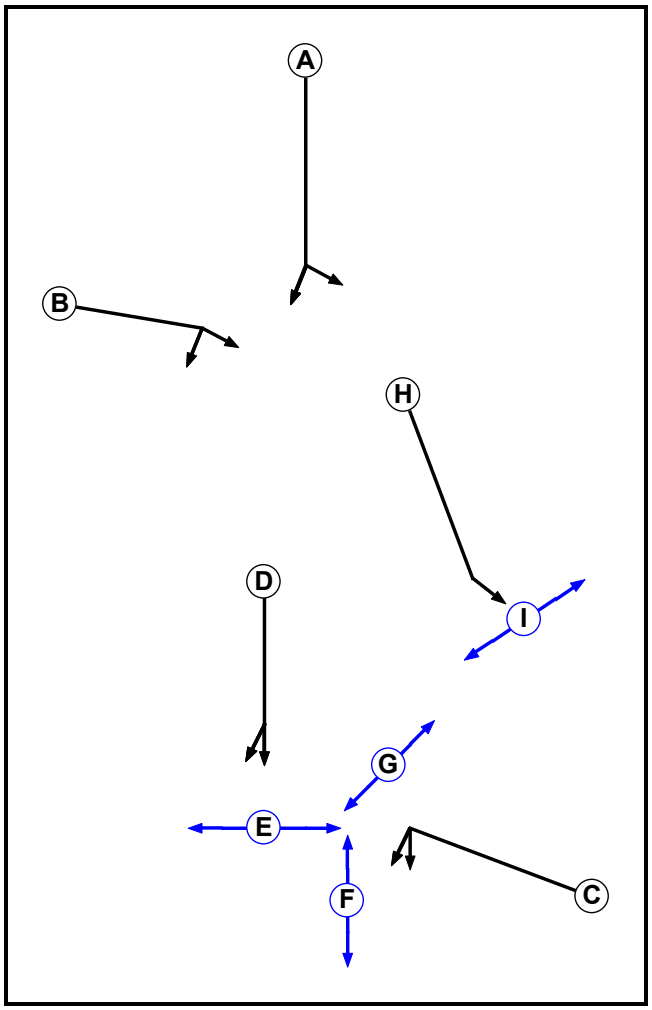
Prohibited Stage Change

Stage Stream: 1

		To Stage		
		1	2	3
From Stage	1		5	8
	2	5		8
	3	9	9	

C3 - Cherwell

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7
E	Pedestrian	2		5	5
F	Pedestrian	2		5	5
G	Pedestrian	2		5	5
H	Traffic	3		7	7
I	Pedestrian	3		5	5

Phase Intergreens Matrix

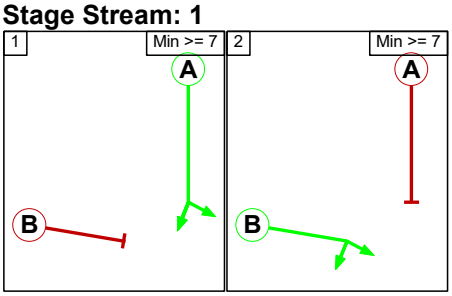
		Starting Phase								
		A	B	C	D	E	F	G	H	I
Terminating Phase	A		6	-	-	-	-	-	-	-
	B	6		-	-	-	-	-	-	-
	C	-	-		6	-	6	6	-	-
	D	-	-	7		7	-	-	-	-
	E	-	-	-	6		-	-	-	-
	F	-	-	6	-	-		-	-	-
	G	-	-	6	-	-	-		-	-
	H	-	-	-	-	-	-	-		6
	I	-	-	-	-	-	-	-	6	

Phases in Stage

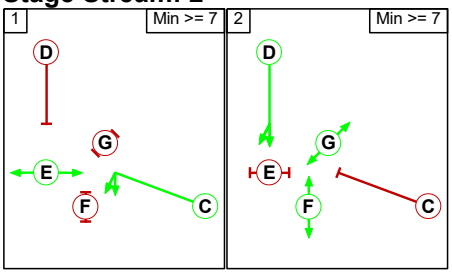
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C E
2	2	D F G
3	1	H
3	2	I

Stage Diagram

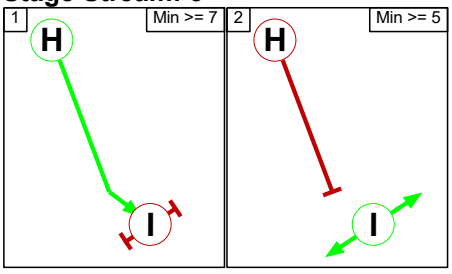
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Phase Delays

Stage Stream: 1

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

Stage Stream: 2

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

Stage Stream: 3

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

Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		6
	2	6	

Stage Stream: 2

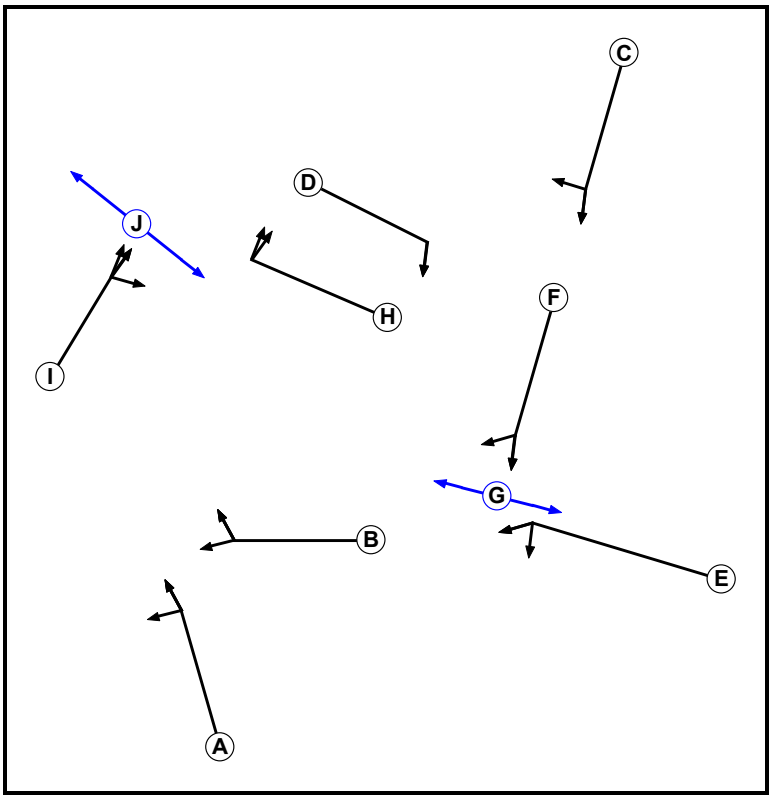
		To Stage	
		1	2
From Stage	1		6
	2	7	

Stage Stream: 3

		To Stage	
		1	2
From Stage	1		6
	2	6	

C4 - Ardley

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7
E	Traffic	3		7	4
F	Traffic	3		7	7
G	Pedestrian	3		7	7
H	Traffic	4		7	4
I	Traffic	4		7	6
J	Pedestrian	4		7	7

Phase Intergreens Matrix

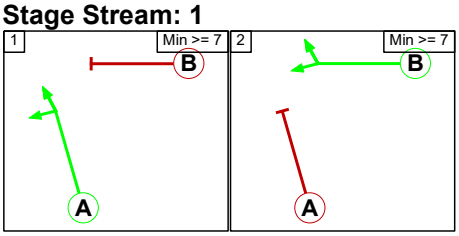
		Starting Phase									
		A	B	C	D	E	F	G	H	I	J
Terminating Phase	A		5	-	-	-	-	-	-	-	-
	B	5		-	-	-	-	-	-	-	-
	C	-	-		5	-	-	-	-	-	-
	D	-	-	5		-	-	-	-	-	-
	E	-	-	-	-		5	-	-	-	-
	F	-	-	-	-	5		5	-	-	-
	G	-	-	-	-	-	8		-	-	-
	H	-	-	-	-	-	-	-		5	-
	I	-	-	-	-	-	-	-	5		5
	J	-	-	-	-	-	-	-	-	8	

Phases in Stage

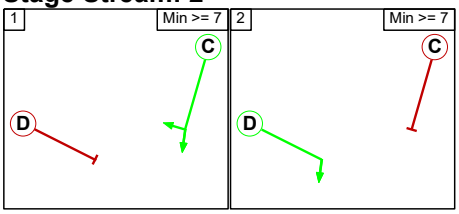
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D
3	1	E G
3	2	F
4	1	I
4	2	H J

Stage Diagram

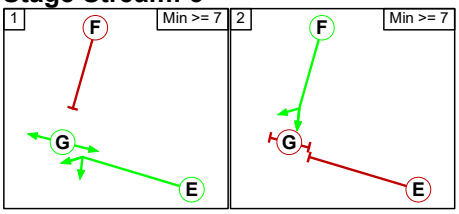
Stage Stream: 1



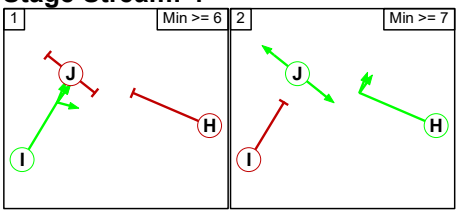
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Phase Delays

Stage Stream: 1

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

Stage Stream: 2

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

Stage Stream: 3

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	E	Losing	3	3

Stage Stream: 4

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	I	Losing	1	1
2	1	H	Losing	3	3

Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		5
	2	5	

Stage Stream: 2

		To Stage	
		1	2
From Stage	1		5
	2	5	

Stage Stream: 3

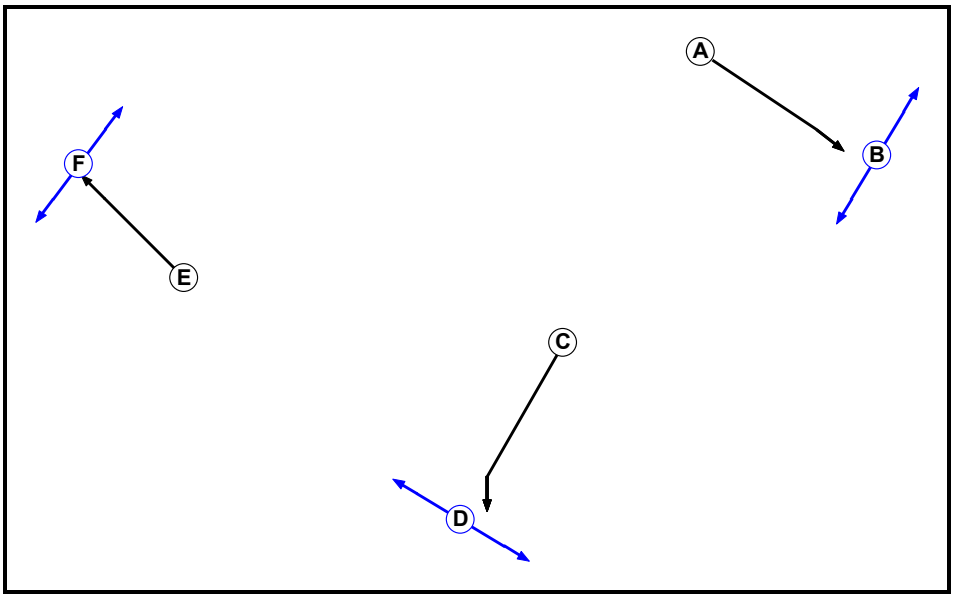
		To Stage	
		1	2
From Stage	1		8
	2	5	

Stage Stream: 4

		To Stage	
		1	2
From Stage	1		6
	2	8	

C5 - Baynards Green exit xings

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Pedestrian	1		5	5
C	Traffic	2		7	7
D	Pedestrian	2		7	7
E	Traffic	3		7	7
F	Pedestrian	3		5	5

Phase Intergreens Matrix

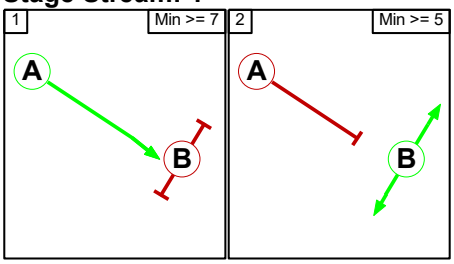
		Starting Phase					
		A	B	C	D	E	F
Terminating Phase	A		5	-	-	-	-
	B	6		-	-	-	-
	C	-	-		5	-	-
	D	-	-	7		-	-
	E	-	-	-	-		5
	F	-	-	-	-	5	

Phases in Stage

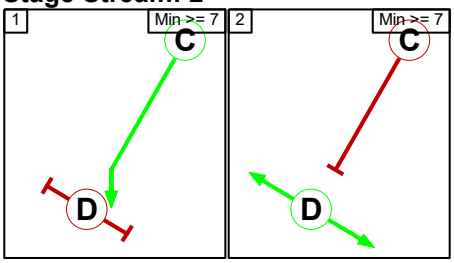
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D
3	1	E
3	2	F

Stage Diagram

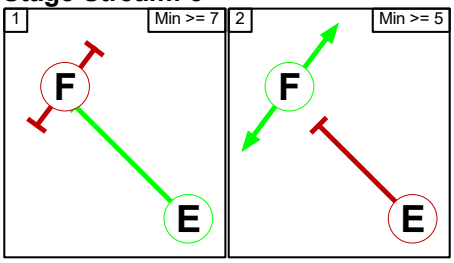
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Phase Delays

Stage Stream: 1

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

Stage Stream: 2

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

Stage Stream: 3

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

Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		5
	2	6	

Stage Stream: 2

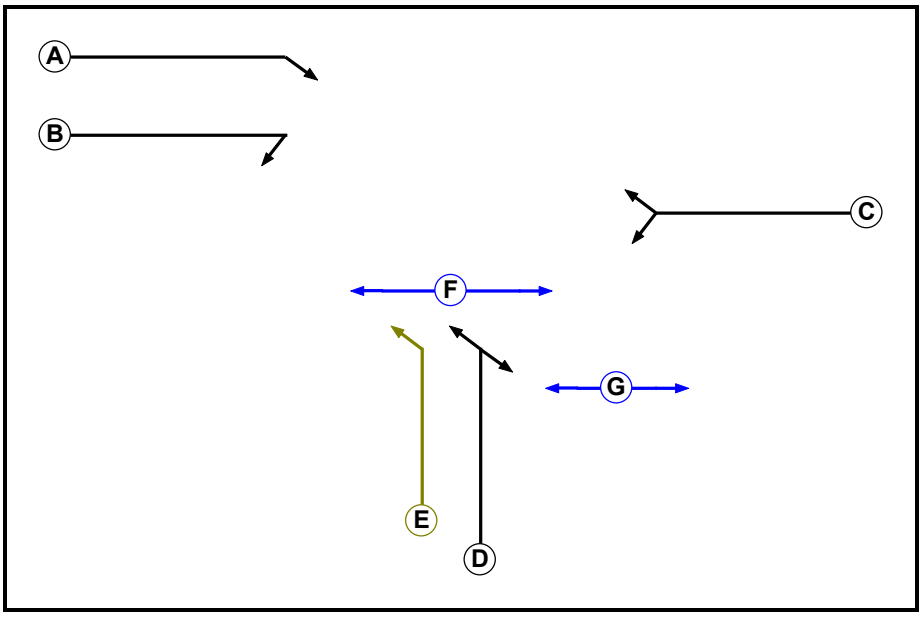
		To Stage	
		1	2
From Stage	1		5
	2	7	

Stage Stream: 3

		To Stage	
		1	2
From Stage	1		5
	2	5	

C6 - AL site access

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	1		7	7
D	Traffic	1		7	7
E	Filter	1	D	4	0
F	Pedestrian	1		5	5
G	Pedestrian	1		5	5

Phase Intergreens Matrix

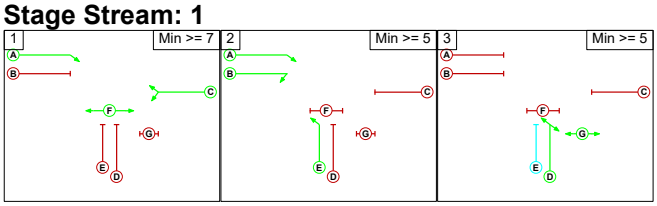
		Starting Phase						
		A	B	C	D	E	F	G
Terminating Phase	A		-	-	5	-	-	-
	B	-		5	5	-	-	7
	C	-	5		5	-	-	6
	D	5	5	5		-	5	-
	E	-	-	-	-		5	-
	F	-	-	-	7	7		-
	G	-	5	5	-	-	-	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



Prohibited Stage Change

Stage Stream: 1

		To Stage		
		1	2	3
From Stage	1		7	7
	2	X		7
	3	5	5	

Give-Way Lane Input Data

Junction: J1: Baynards Green
There are no Opposed Lanes in this Junction

Junction: J2: Padbury
There are no Opposed Lanes in this Junction

Junction: J3: Cherwell
There are no Opposed Lanes in this Junction

Junction: J4: Ardley											
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)**
J4:2/1 (B430)	J4:8/1 (Ahead)	1000	0	J4:11/1	0.33	All	-	-	-	-	-
				J4:11/2	0.33	All					
	J4:8/2 (Ahead)	1000	0	J4:11/1	0.33	All					
				J4:11/2	0.33	All					
J4:2/2 (B430)	J4:8/3 (Ahead)	1000	0	J4:11/1	0.33	All	-	-	-	-	-
				J4:11/2	0.33	All					
				J4:11/3	0.33	All					

Junction: J5: Baynards Green exit xings
There are no Opposed Lanes in this Junction

Junction: J6: Unnamed Junction
There are no Opposed Lanes in this Junction

Lane Input Data

Junction: J1: Baynards Green												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
J1:1/1 (A43 North)	U	B	2	3	20.0	Geom	-	3.65	0.00	Y	Arm J5:3 Left	70.00
J1:1/2 (A43 North)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm J1:2 Ahead	45.00
J1:1/3 (A43 North)	U	B	2	3	60.0	Geom	-	3.65	0.00	N	Arm J1:2 Ahead	45.00
J1:1/4 (A43 North)	U	B	2	3	26.1	Geom	-	3.65	0.00	N	Arm J1:2 Ahead	45.00
J1:2/1	U	C	1	3	10.4	Geom	-	4.00	0.00	Y	Arm J5:2 Ahead	50.00
J1:2/2	U	C	1	3	10.4	Geom	-	4.00	0.00	N	Arm J5:2 Ahead	50.00
J1:2/3	U	C	1	3	10.4	Geom	-	4.00	0.00	N	Arm J5:2 Ahead	50.00
J1:2/4	U	C	1	3	2.1	Geom	-	4.00	0.00	Y	Arm J1:4 Right	30.00
J1:3/1 (B4100 East)	U	D	2	3	13.9	Geom	-	3.65	0.00	Y	Arm J5:2 Left	30.00
J1:3/2 (B4100 East)	U	D	2	3	34.8	Geom	-	3.65	0.00	N	Arm J1:4 Ahead	50.00
J1:3/3 (B4100 East)	U	D	2	3	34.8	Geom	-	3.65	0.00	N	Arm J1:4 Ahead	50.00
J1:4/1	U	E	1	3	10.4	Geom	-	4.00	0.00	Y	Arm J5:1 Ahead	40.00
J1:4/2	U	E	1	3	10.4	Geom	-	4.00	0.00	N	Arm J1:6 Right	35.00
J1:5/1 (A43 South)	U	F	2	3	52.2	Geom	-	3.65	0.00	Y	Arm J1:6 Ahead	55.00
											Arm J5:1 Ahead	55.00
J1:5/2 (A43 South)	U	F	2	3	52.2	Geom	-	3.65	0.00	N	Arm J1:6 Ahead	50.00
J1:5/3 (A43 South)	U	F	2	3	52.2	Geom	-	3.65	0.00	N	Arm J1:6 Ahead	50.00
J1:6/1	U	G	1	3	10.4	Geom	-	4.00	0.00	Y	Arm J1:8 Ahead	35.00
J1:6/2	U	G	1	3	10.4	Geom	-	4.00	0.00	N	Arm J1:8 Ahead	35.00
J1:6/3	U	G	1	3	10.4	Geom	-	4.00	0.00	N	Arm J1:8 Ahead	35.00
J1:6/4	U	G	2	3	5.0	Geom	-	4.00	0.00	Y	Arm J1:9 Right	30.00
J1:7/1 (B4100	U	H	2	3	60.0	Geom	-	3.65	0.00	Y	Arm J1:8 Left	30.00

West)											Arm J1:9 Ahead	40.00
J1:7/2 (B4100 West)	U	H	2	3	15.7	Geom	-	3.65	0.00	N	Arm J1:9 Ahead	40.00
J1:8/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:8/2	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:8/3	U		2	3	60.0	User	2000	-	-	-	-	-
J1:9/1	U	A	1	3	10.4	Geom	-	4.00	0.00	Y	Arm J5:3 Ahead	35.00
J1:9/2	U	A	1	3	10.4	Geom	-	4.00	0.00	N	Arm J1:2 Right	30.00
											Arm J5:3 Ahead	35.00
J1:10/1	U		2	3	52.2	Inf	-	-	-	-	-	-
J1:10/2	U		2	3	52.2	Inf	-	-	-	-	-	-
J1:10/3	U		2	3	52.2	Inf	-	-	-	-	-	-

Junction: J2: Padbury												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
J2:1/1 (M40 SB offslip)	U	B	2	3	95.7	Geom	-	3.65	0.00	Y	Arm J2:4 Left	40.00
J2:1/2 (M40 SB offslip)	U	B	2	3	95.7	Geom	-	3.65	0.00	Y	Arm J2:3 Right	50.00
J2:1/3 (M40 SB offslip)	U	B	2	3	15.7	User	3400	-	-	-	-	-
J2:2/1 (A43 north)	U	A	2	3	109.6	Geom	-	3.65	0.00	Y	Arm J2:3 Ahead	Inf
J2:2/2 (A43 north)	U	A	2	3	109.6	Geom	-	3.65	0.00	N	Arm J2:3 Ahead	Inf
J2:2/3 (A43 north)	U	A	2	3	109.6	Geom	-	3.65	0.00	N	Arm J2:3 Ahead	Inf
J2:3/1	U		2	3	0.9	Inf	-	-	-	-	-	-
J2:3/2	U		2	3	0.9	Inf	-	-	-	-	-	-
J2:3/3	U		2	3	0.9	Inf	-	-	-	-	-	-
J2:3/4	U		2	3	0.9	Inf	-	-	-	-	-	-
J2:4/1	U		2	3	10.4	Inf	-	-	-	-	-	-
J2:4/2	U		2	3	10.4	Inf	-	-	-	-	-	-
J2:4/3	U		2	3	10.4	Inf	-	-	-	-	-	-
J2:5/1 (M40 NB offslip)	U	C	2	3	173.9	Geom	-	3.65	0.00	Y	Arm J2:4 Left	Inf
J2:5/2 (M40 NB offslip)	U	C	2	3	173.9	Geom	-	3.65	0.00	N	Arm J2:4 Left	Inf
J2:5/3 (M40 NB offslip)	U	C	2	3	17.4	Geom	-	3.65	0.00	N	Arm J2:4 Left	Inf
J2:6/1 (A43 south)	U	D	2	3	57.4	Geom	-	3.65	0.00	Y	Arm J2:4 Ahead	Inf
J2:6/2 (A43 south)	U	D	2	3	57.4	Geom	-	3.65	0.00	N	Arm J2:4 Ahead	Inf
J2:7/1	U		2	3	173.9	Inf	-	-	-	-	-	-
J2:8/1	U		2	3	52.2	Inf	-	-	-	-	-	-

Junction: J3: Cherwell												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
J3:1/1 (A43 Southbound)	U	A	2	3	9.6	Geom	-	3.63	0.00	Y	Arm J3:2 Left	Inf
J3:1/2 (A43 Southbound)	U	A	2	3	52.2	Geom	-	3.65	0.00	N	Arm J3:7 Ahead	Inf
J3:1/3 (A43 Southbound)	U	A	2	3	52.2	Geom	-	3.65	0.00	N	Arm J3:7 Ahead	Inf
J3:1/4 (A43 Southbound)	U	A	2	3	52.2	Geom	-	3.65	0.00	Y	Arm J3:7 Ahead	Inf
J3:1/5 (A43 Southbound)	U	A	2	3	52.2	Geom	-	3.65	0.00	N	Arm J3:7 Ahead	Inf
J3:2/1	U	H	2	3	10.4	Geom	-	4.00	0.00	Y	Arm J3:10 Ahead	Inf
J3:3/1 (MSA)	U	C	2	3	60.0	Geom	-	4.50	0.00	Y	Arm J3:8 Left	15.00
J3:3/2 (MSA)	U	C	2	3	60.0	Geom	-	4.00	0.00	N	Arm J3:4 Left	30.00
J3:4/1	U		2	3	5.2	Inf	-	-	-	-	-	-
J3:4/2	U		2	3	5.2	Inf	-	-	-	-	-	-
J3:5/1 (A43 Northbound)	U		2	3	36.5	Inf	-	-	-	-	-	-
J3:5/2 (A43 Northbound)	U		2	3	36.5	Inf	-	-	-	-	-	-
J3:6/1	U	B	2	3	10.4	Geom	-	4.50	0.00	Y	Arm J3:2 Ahead	40.00
											Arm J3:7 Right	30.00
J3:7/1	U	D	0	3	8.7	Geom	-	4.00	0.00	Y	Arm J3:8 Ahead	Inf
J3:7/2	U	D	0	3	8.7	Geom	-	4.00	0.00	N	Arm J3:8 Ahead	Inf
J3:7/3	U	D	0	3	8.7	Geom	-	4.00	0.00	Y	Arm J3:4 Ahead	Inf
J3:7/4	U	D	0	3	8.7	Geom	-	4.00	0.00	N	Arm J3:4 Ahead	Inf
J3:8/1	U		2	3	87.0	Inf	-	-	-	-	-	-
J3:8/2	U		2	3	87.0	Inf	-	-	-	-	-	-
J3:9/1	U		2	3	173.9	Inf	-	-	-	-	-	-
J3:10/1	U		2	3	48.7	Inf	-	-	-	-	-	-

Junction: J4: Ardley

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
J4:1/1 (Ardley bypass)	U	A	2	3	87.0	Geom	-	3.65	0.00	Y	Arm J4:9 Left	30.00
											Arm J4:11 Ahead	30.00
J4:1/2 (Ardley bypass)	U	A	2	3	87.0	Geom	-	3.65	0.00	N	Arm J4:11 Ahead	30.00
J4:1/3 (Ardley bypass)	U	A	2	3	12.2	Geom	-	3.65	0.00	N	Arm J4:11 Ahead	30.00
J4:2/1 (B430)	O		2	3	60.0	Geom	-	3.50	0.00	Y	Arm J4:8 Ahead	40.00
J4:2/2 (B430)	O		2	3	10.4	Geom	-	3.50	0.00	N	Arm J4:8 Ahead	Inf
J4:3/1 (A43 Southbound)	U	C	2	3	26.1	Geom	-	3.65	0.00	Y	Arm J4:4 Ahead	30.00
J4:3/2 (A43 Southbound)	U	C	2	3	26.1	Geom	-	3.65	0.00	N	Arm J4:4 Ahead	30.00
J4:3/3 (A43 Southbound)	U	C	2	3	6.3	Geom	-	3.65	0.00	N	Arm J4:13 Right	50.00
J4:4/1	U	F	1	3	10.4	Geom	-	4.00	0.00	Y	Arm J4:5 Ahead	30.00
J4:4/2	U	F	1	3	10.4	Geom	-	4.00	0.00	N	Arm J4:5 Ahead	30.00
											Arm J4:6 Right	30.00
J4:5/1	U		2	3	87.0	Inf	-	-	-	-	-	-
J4:5/2	U		2	3	87.0	Inf	-	-	-	-	-	-
J4:6/1	U	B	1	3	10.4	Geom	-	4.00	0.00	Y	Arm J4:9 Ahead	40.00
											Arm J4:11 Right	40.00
J4:6/2	U	B	1	3	10.4	Geom	-	4.00	0.00	N	Arm J4:11 Right	40.00
J4:7/1	U	D	2	3	2.1	Geom	-	4.00	0.00	Y	Arm J4:4 Right	40.00
J4:7/2	U	D	2	3	12.2	Geom	-	4.00	0.00	N	Arm J4:4 Right	40.00
J4:8/1	U	I	2	3	13.9	Geom	-	4.00	0.00	Y	Arm J4:10 Ahead	Inf
J4:8/2	U	I	2	3	13.9	Geom	-	4.00	0.00	Y	Arm J4:12 Ahead	Inf
J4:8/3	U	I	2	3	13.9	Geom	-	4.00	0.00	N	Arm J4:7 Right	Inf
											Arm J4:12 Ahead	Inf
J4:9/1	U		2	3	60.0	Inf	-	-	-	-	-	-

J4:10/1 (M40 NB onslip)	U		2	3	139.1	Inf	-	-	-	-	-	-
J4:11/1	U		2	3	13.9	Inf	-	-	-	-	-	-
J4:11/2	U		0	3	13.9	Inf	-	-	-	-	-	-
J4:11/3	U		0	3	13.9	Inf	-	-	-	-	-	-
J4:12/1	U		2	3	8.7	Inf	-	-	-	-	-	-
J4:12/2	U		2	3	8.7	Inf	-	-	-	-	-	-
J4:13/1	U	H	1	3	16.5	Geom	-	4.00	0.00	Y	Arm J4:10 Right	40.00
											Arm J4:12 Right	40.00
J4:14/1	U	E	2	3	173.9	Geom	-	3.65	0.00	Y	Arm J4:5 Left	30.00
											Arm J4:6 Ahead	Inf
J4:14/2	U	E	2	3	173.9	Geom	-	3.65	0.00	N	Arm J4:6 Ahead	30.00
J4:15/1	U		2	3	60.9	Inf	-	-	-	-	-	-
J4:16/1	U		2	3	173.9	Inf	-	-	-	-	-	-
J4:17/1	U		2	3	173.9	Inf	-	-	-	-	-	-

Junction: J5: Baynards Green exit xings

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)
J5:1/1	U	E	2	3	11.3	Geom	-	3.65	0.00	Y	Arm J5:4 Ahead	Inf
J5:2/1	U	C	2	3	8.7	Geom	-	3.65	0.00	Y	Arm J2:2 Ahead	Inf
J5:2/2	U	C	2	3	8.7	Geom	-	3.65	0.00	N	Arm J2:2 Ahead	Inf
J5:2/3	U	C	2	3	8.7	Geom	-	3.65	0.00	N	Arm J2:2 Ahead	Inf
J5:3/1	U	A	2	3	11.3	Geom	-	3.60	0.00	Y	Arm J6:1 Ahead	Inf
J5:3/2	U	A	2	3	11.3	Geom	-	3.60	0.00	N	Arm J6:1 Ahead	Inf
J5:4/1	U		2	3	48.7	Inf	-	-	-	-	-	-

Junction: J6: Unnamed Junction

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
J6:1/1	U	A	2	3	34.8	Geom	-	3.65	0.00	Y	Arm J6:2 Ahead	Inf
J6:1/2	U	B	2	3	8.7	Geom	-	3.65	0.00	Y	Arm J6:6 Right	18.00
J6:2/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J6:3/1	U	C	2	3	60.0	Geom	-	3.65	0.00	Y	Arm J6:5 Ahead	Inf
											Arm J6:6 Left	12.00
J6:4/1	U	D E	2	3	8.7	Geom	-	3.50	0.00	Y	Arm J6:5 Left	12.00
J6:4/2	U	D	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J6:2 Right	18.00
J6:5/1	U		2	3	10.4	Inf	-	-	-	-	-	-
J6:6/1	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2034 DS3A - AM'	08:00	09:00	01:00	
2: '2034 DS3A - PM'	17:00	18:00	01:00	

Scenario 1: '2034 DS3A - AM peak' (FG1: '2034 DS3A - AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination									
		A	B	C	D	E	F	G	H	I	Tot.
Origin	A	0	290	60	1820	5	0	104	517	39	2835
	B	238	0	0	4	0	42	296	64	32	676
	C	76	0	0	342	0	190	0	0	0	608
	D	1188	1	245	0	21	0	47	215	22	1739
	E	9	1	0	29	0	186	1	92	0	318
	F	60	245	241	0	35	0	26	589	14	1210
	G	106	346	0	152	0	8	0	97	12	721
	H	188	9	0	175	52	330	21	0	6	781
	I	18	15	0	18	0	5	3	7	0	66
	Tot.	1883	907	546	2540	113	761	498	1581	125	8954

Traffic Lane Flows

Lane	Scenario 1: 2034 DS3A - AM peak
Junction: J1: Baynards Green	
J1:1/1 (short)	329
J1:1/2 (with short)	1105(In) 776(Out)
J1:1/3 (with short)	1730(In) 809(Out)
J1:1/4 (short)	921
J1:2/1	813
J1:2/2	902
J1:2/3 (with short)	1048(In) 944(Out)
J1:2/4 (short)	104
J1:3/1 (short)	140
J1:3/2 (with short)	439(In) 299(Out)
J1:3/3	256
J1:4/1	403
J1:4/2	256
J1:5/1	587
J1:5/2	665
J1:5/3	662
J1:6/1	596
J1:6/2	777
J1:6/3 (with short)	702(In) 404(Out)
J1:6/4 (short)	298
J1:7/1 (with short)	721(In) 348(Out)
J1:7/2 (short)	373
J1:8/1	702
J1:8/2	777
J1:8/3	404
J1:9/1	388
J1:9/2	525
J1:10/1	587
J1:10/2	665
J1:10/3	662
Junction: J2: Padbury	
J2:1/1	345
J2:1/2 (with short)	865(In) 241(Out)
J2:1/3 (short)	624

J2:2/1	1003
J2:2/2	1051
J2:2/3	745
J2:3/1	1244
J2:3/2	1051
J2:3/3	642
J2:3/4	727
J2:4/1	700
J2:4/2	552
J2:4/3	662
J2:5/1	466
J2:5/2 (with short)	792(In) 459(Out)
J2:5/3 (short)	333
J2:6/1	153
J2:6/2	158
J2:7/1	1258
J2:8/1	1258
Junction: J3: Cherwell	
J3:1/1 (short)	301
J3:1/2 (with short)	1244(In) 943(Out)
J3:1/3	1051
J3:1/4	642
J3:1/5	727
J3:2/1	546
J3:3/1	342
J3:3/2	266
J3:4/1	674
J3:4/2	961
J3:5/1	311
J3:5/2	449
J3:6/1	449
J3:7/1	1042
J3:7/2	1156
J3:7/3	642
J3:7/4	727
J3:8/1	1384
J3:8/2	1156
J3:9/1	2540
J3:10/1	546
Junction: J4: Ardley	
J4:1/1	382
J4:1/2 (with short)	399(In) 224(Out)

J4:1/3 (short)	175
J4:2/1 (with short)	318(In) 197(Out)
J4:2/2 (short)	121
J4:3/1	674
J4:3/2 (with short)	961(In) 640(Out)
J4:3/3 (short)	321
J4:4/1	709
J4:4/2	697
J4:5/1	924
J4:5/2	657
J4:6/1	61
J4:6/2	245
J4:7/1 (short)	35
J4:7/2 (with short)	92(In) 57(Out)
J4:8/1	516
J4:8/2	235
J4:8/3	541
J4:9/1	113
J4:10/1	761
J4:11/1	330
J4:11/2	224
J4:11/3	420
J4:12/1	311
J4:12/2	449
J4:13/1	321
J4:14/1	236
J4:14/2	245
J4:15/1	1739
J4:16/1	781
J4:17/1	1581
Junction: J5: Baynards Green exit xings	
J5:1/1	498
J5:2/1	813
J5:2/2	924
J5:2/3	1062
J5:3/1	717
J5:3/2	268
J5:4/1	498
Junction: J6: Unnamed Junction	
J6:1/1 (with short)	985(In) 892(Out)
J6:1/2 (short)	93

J6:2/1	907
J6:3/1	676
J6:4/1 (short)	51
J6:4/2 (with short)	66(In) 15(Out)
J6:5/1	695
J6:6/1	125

Lane Saturation Flows

Junction: J1: Baynards Green								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (A43 North)	3.65	0.00	Y	Arm J5:3 Left	70.00	100.0 %	1938	1938
J1:1/2 (A43 North)	3.65	0.00	Y	Arm J1:2 Ahead	45.00	100.0 %	1916	1916
J1:1/3 (A43 North)	3.65	0.00	N	Arm J1:2 Ahead	45.00	100.0 %	2052	2052
J1:1/4 (A43 North)	3.65	0.00	N	Arm J1:2 Ahead	45.00	100.0 %	2052	2052
J1:2/1	4.00	0.00	Y	Arm J5:2 Ahead	50.00	100.0 %	1956	1956
J1:2/2	4.00	0.00	N	Arm J5:2 Ahead	50.00	100.0 %	2092	2092
J1:2/3	4.00	0.00	N	Arm J5:2 Ahead	50.00	100.0 %	2092	2092
J1:2/4	4.00	0.00	Y	Arm J1:4 Right	30.00	100.0 %	1919	1919
J1:3/1 (B4100 East)	3.65	0.00	Y	Arm J5:2 Left	30.00	100.0 %	1886	1886
J1:3/2 (B4100 East)	3.65	0.00	N	Arm J1:4 Ahead	50.00	100.0 %	2058	2058
J1:3/3 (B4100 East)	3.65	0.00	N	Arm J1:4 Ahead	50.00	100.0 %	2058	2058
J1:4/1	4.00	0.00	Y	Arm J5:1 Ahead	40.00	100.0 %	1942	1942
J1:4/2	4.00	0.00	N	Arm J1:6 Right	35.00	100.0 %	2066	2066
J1:5/1 (A43 South)	3.65	0.00	Y	Arm J1:6 Ahead	55.00	83.8 %	1927	1927
				Arm J5:1 Ahead	55.00	16.2 %		
J1:5/2 (A43 South)	3.65	0.00	N	Arm J1:6 Ahead	50.00	100.0 %	2058	2058
J1:5/3 (A43 South)	3.65	0.00	N	Arm J1:6 Ahead	50.00	100.0 %	2058	2058
J1:6/1	4.00	0.00	Y	Arm J1:8 Ahead	35.00	100.0 %	1932	1932
J1:6/2	4.00	0.00	N	Arm J1:8 Ahead	35.00	100.0 %	2066	2066
J1:6/3	4.00	0.00	N	Arm J1:8 Ahead	35.00	100.0 %	2066	2066
J1:6/4	4.00	0.00	Y	Arm J1:9 Right	30.00	100.0 %	1919	1919
J1:7/1 (B4100 West)	3.65	0.00	Y	Arm J1:8 Left	30.00	30.5 %	1901	1901
				Arm J1:9 Ahead	40.00	69.5 %		
J1:7/2 (B4100 West)	3.65	0.00	N	Arm J1:9 Ahead	40.00	100.0 %	2043	2043
J1:8/1	Infinite Saturation Flow						Inf	Inf
J1:8/2	Infinite Saturation Flow						Inf	Inf
J1:8/3	This lane uses a directly entered Saturation Flow						2000	2000
J1:9/1	4.00	0.00	Y	Arm J5:3 Ahead	35.00	100.0 %	1932	1932
J1:9/2	4.00	0.00	N	Arm J1:2 Right	30.00	49.0 %	2060	2060
				Arm J5:3 Ahead	35.00	51.0 %		
J1:10/1	Infinite Saturation Flow						Inf	Inf
J1:10/2	Infinite Saturation Flow						Inf	Inf
J1:10/3	Infinite Saturation Flow						Inf	Inf

Junction: J2: Padbury								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (M40 SB offslip)	3.65	0.00	Y	Arm J2:4 Left	40.00	100.0 %	1908	1908
J2:1/2 (M40 SB offslip)	3.65	0.00	Y	Arm J2:3 Right	50.00	100.0 %	1922	1922
J2:1/3 (M40 SB offslip Lane 3)	This lane uses a directly entered Saturation Flow						3400	3400
J2:2/1 (A43 north)	3.65	0.00	Y	Arm J2:3 Ahead	Inf	100.0 %	1980	1980
J2:2/2 (A43 north)	3.65	0.00	N	Arm J2:3 Ahead	Inf	100.0 %	2120	2120
J2:2/3 (A43 north)	3.65	0.00	N	Arm J2:3 Ahead	Inf	100.0 %	2120	2120
J2:3/1	Infinite Saturation Flow						Inf	Inf
J2:3/2	Infinite Saturation Flow						Inf	Inf
J2:3/3	Infinite Saturation Flow						Inf	Inf
J2:3/4	Infinite Saturation Flow						Inf	Inf
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:4/2	Infinite Saturation Flow						Inf	Inf
J2:4/3	Infinite Saturation Flow						Inf	Inf
J2:5/1 (M40 NB offslip)	3.65	0.00	Y	Arm J2:4 Left	Inf	100.0 %	1980	1980
J2:5/2 (M40 NB offslip)	3.65	0.00	N	Arm J2:4 Left	Inf	100.0 %	2120	2120
J2:5/3 (M40 NB offslip)	3.65	0.00	N	Arm J2:4 Left	Inf	100.0 %	2120	2120
J2:6/1 (A43 south)	3.65	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1980	1980
J2:6/2 (A43 south)	3.65	0.00	N	Arm J2:4 Ahead	Inf	100.0 %	2120	2120
J2:7/1	Infinite Saturation Flow						Inf	Inf
J2:8/1	Infinite Saturation Flow						Inf	Inf

Junction: J3: Cherwell								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J3:1/1 (A43 Southbound)	3.63	0.00	Y	Arm J3:2 Left	Inf	100.0 %	1978	1978
J3:1/2 (A43 Southbound)	3.65	0.00	N	Arm J3:7 Ahead	Inf	100.0 %	2120	2120
J3:1/3 (A43 Southbound)	3.65	0.00	N	Arm J3:7 Ahead	Inf	100.0 %	2120	2120
J3:1/4 (A43 Southbound)	3.65	0.00	Y	Arm J3:7 Ahead	Inf	100.0 %	1980	1980
J3:1/5 (A43 Southbound)	3.65	0.00	N	Arm J3:7 Ahead	Inf	100.0 %	2120	2120
J3:2/1	4.00	0.00	Y	Arm J3:10 Ahead	Inf	100.0 %	2015	2015
J3:3/1 (MSA)	4.50	0.00	Y	Arm J3:8 Left	15.00	100.0 %	1877	1877
J3:3/2 (MSA)	4.00	0.00	N	Arm J3:4 Left	30.00	100.0 %	2052	2052
J3:4/1	Infinite Saturation Flow						Inf	Inf
J3:4/2	Infinite Saturation Flow						Inf	Inf
J3:5/1 (A43 Northbound Lane 1)	Infinite Saturation Flow						Inf	Inf
J3:5/2 (A43 Northbound Lane 2)	Infinite Saturation Flow						Inf	Inf
J3:6/1	4.50	0.00	Y	Arm J3:2 Ahead	40.00	54.6 %	1980	1980
				Arm J3:7 Right	30.00	45.4 %		
J3:7/1	4.00	0.00	Y	Arm J3:8 Ahead	Inf	100.0 %	2015	2015
J3:7/2	4.00	0.00	N	Arm J3:8 Ahead	Inf	100.0 %	2155	2155
J3:7/3	4.00	0.00	Y	Arm J3:4 Ahead	Inf	100.0 %	2015	2015
J3:7/4	4.00	0.00	N	Arm J3:4 Ahead	Inf	100.0 %	2155	2155
J3:8/1	Infinite Saturation Flow						Inf	Inf
J3:8/2	Infinite Saturation Flow						Inf	Inf
J3:9/1	Infinite Saturation Flow						Inf	Inf
J3:10/1	Infinite Saturation Flow						Inf	Inf

Junction: J4: Ardley								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J4:1/1 (Ardley bypass)	3.65	0.00	Y	Arm J4:9 Left	30.00	13.6 %	1886	1886
				Arm J4:11 Ahead	30.00	86.4 %		
J4:1/2 (Ardley bypass)	3.65	0.00	N	Arm J4:11 Ahead	30.00	100.0 %	2019	2019
J4:1/3 (Ardley bypass)	3.65	0.00	N	Arm J4:11 Ahead	30.00	100.0 %	2019	2019
J4:2/1 (B430)	3.50	0.00	Y	Arm J4:8 Ahead	40.00	100.0 %	1894	1894
J4:2/2 (B430)	3.50	0.00	N	Arm J4:8 Ahead	Inf	100.0 %	2105	2105
J4:3/1 (A43 Southbound)	3.65	0.00	Y	Arm J4:4 Ahead	30.00	100.0 %	1886	1886
J4:3/2 (A43 Southbound)	3.65	0.00	N	Arm J4:4 Ahead	30.00	100.0 %	2019	2019
J4:3/3 (A43 Southbound)	3.65	0.00	N	Arm J4:13 Right	50.00	100.0 %	2058	2058
J4:4/1	4.00	0.00	Y	Arm J4:5 Ahead	30.00	100.0 %	1919	1919
J4:4/2	4.00	0.00	N	Arm J4:5 Ahead	30.00	94.3 %	2052	2052
				Arm J4:6 Right	30.00	5.7 %		
J4:5/1	Infinite Saturation Flow						Inf	Inf
J4:5/2	Infinite Saturation Flow						Inf	Inf
J4:6/1	4.00	0.00	Y	Arm J4:9 Ahead	40.00	100.0 %	1942	1942
				Arm J4:11 Right	40.00	0.0 %		
J4:6/2	4.00	0.00	N	Arm J4:11 Right	40.00	100.0 %	2077	2077
J4:7/1	4.00	0.00	Y	Arm J4:4 Right	40.00	100.0 %	1942	1942
J4:7/2	4.00	0.00	N	Arm J4:4 Right	40.00	100.0 %	2077	2077
J4:8/1	4.00	0.00	Y	Arm J4:10 Ahead	Inf	100.0 %	2015	2015
J4:8/2	4.00	0.00	Y	Arm J4:12 Ahead	Inf	100.0 %	2015	2015
J4:8/3	4.00	0.00	N	Arm J4:7 Right	Inf	17.0 %	2155	2155
				Arm J4:12 Ahead	Inf	83.0 %		
J4:9/1	Infinite Saturation Flow						Inf	Inf
J4:10/1 (M40 NB onslip Lane 1)	Infinite Saturation Flow						Inf	Inf
J4:11/1	Infinite Saturation Flow						Inf	Inf
J4:11/2	Infinite Saturation Flow						Inf	Inf
J4:11/3	Infinite Saturation Flow						Inf	Inf
J4:12/1	Infinite Saturation Flow						Inf	Inf
J4:12/2	Infinite Saturation Flow						Inf	Inf
J4:13/1	4.00	0.00	Y	Arm J4:10 Right	40.00	76.3 %	1942	1942
				Arm J4:12 Right	40.00	23.7 %		
J4:14/1	3.65	0.00	Y	Arm J4:5 Left	30.00	91.1 %	1894	1894
				Arm J4:6 Ahead	Inf	8.9 %		
J4:14/2	3.65	0.00	N	Arm J4:6 Ahead	30.00	100.0 %	2019	2019

J4:15/1	Infinite Saturation Flow	Inf	Inf
J4:16/1	Infinite Saturation Flow	Inf	Inf
J4:17/1	Infinite Saturation Flow	Inf	Inf

Junction: J5: Baynards Green exit xings

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J5:1/1	3.65	0.00	Y	Arm J5:4 Ahead	Inf	100.0 %	1980	1980
J5:2/1	3.65	0.00	Y	Arm J2:2 Ahead	Inf	100.0 %	1980	1980
J5:2/2	3.65	0.00	N	Arm J2:2 Ahead	Inf	100.0 %	2120	2120
J5:2/3	3.65	0.00	N	Arm J2:2 Ahead	Inf	100.0 %	2120	2120
J5:3/1	3.60	0.00	Y	Arm J6:1 Ahead	Inf	100.0 %	1975	1975
J5:3/2	3.60	0.00	N	Arm J6:1 Ahead	Inf	100.0 %	2115	2115
J5:4/1	Infinite Saturation Flow						Inf	Inf

Junction: J6: Unnamed Junction

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J6:1/1	3.65	0.00	Y	Arm J6:2 Ahead	Inf	100.0 %	1980	1980
J6:1/2	3.65	0.00	Y	Arm J6:6 Right	18.00	100.0 %	1828	1828
J6:2/1	Infinite Saturation Flow						Inf	Inf
J6:3/1	3.65	0.00	Y	Arm J6:5 Ahead	Inf	95.3 %	1968	1968
				Arm J6:6 Left	12.00	4.7 %		
J6:4/1	3.50	0.00	Y	Arm J6:5 Left	12.00	100.0 %	1747	1747
J6:4/2	3.50	0.00	Y	Arm J6:2 Right	18.00	100.0 %	1814	1814
J6:5/1	Infinite Saturation Flow						Inf	Inf
J6:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 2: '2034 DS3A - PM peak' (FG2: '2034 DS3A - PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination									
		A	B	C	D	E	F	G	H	I	Tot.
Origin	A	0	285	112	1378	10	0	81	283	20	2169
	B	308	0	0	7	4	46	293	28	12	698
	C	101	0	0	308	0	216	0	0	0	625
	D	1892	8	257	0	55	0	66	174	15	2467
	E	19	0	0	23	0	169	0	16	0	227
	F	0	256	243	0	32	0	8	299	5	843
	G	111	199	0	71	2	6	0	49	2	440
	H	578	31	0	188	231	646	10	0	2	1686
	I	39	33	0	20	1	10	15	11	0	129
	Tot.	3048	812	612	1995	335	1093	473	860	56	9284

Traffic Lane Flows

Lane	Scenario 2: 2034 DS3A - PM peak
Junction: J1: Baynards Green	
J1:1/1 (short)	305
J1:1/2 (with short)	871(In) 566(Out)
J1:1/3 (with short)	1298(In) 641(Out)
J1:1/4 (short)	657
J1:2/1	568
J1:2/2	681
J1:2/3 (with short)	743(In) 662(Out)
J1:2/4 (short)	81
J1:3/1 (short)	127
J1:3/2 (with short)	435(In) 308(Out)
J1:3/3	347
J1:4/1	389
J1:4/2	347
J1:5/1	907
J1:5/2	1045
J1:5/3	1039
J1:6/1	961
J1:6/2	1191
J1:6/3 (with short)	1102(In) 785(Out)
J1:6/4 (short)	317
J1:7/1 (with short)	440(In) 212(Out)
J1:7/2 (short)	228
J1:8/1	1072
J1:8/2	1191
J1:8/3	785
J1:9/1	256
J1:9/2	390
J1:10/1	907
J1:10/2	1045
J1:10/3	1039
Junction: J2: Padbury	
J2:1/1	269
J2:1/2 (with short)	574(In) 243(Out)
J2:1/3 (short)	331

J2:2/1	812
J2:2/2	776
J2:2/3	450
J2:3/1	1055
J2:3/2	776
J2:3/3	351
J2:3/4	430
J2:4/1	1051
J2:4/2	901
J2:4/3	1039
J2:5/1	679
J2:5/2 (with short)	1301(In) 672(Out)
J2:5/3 (short)	629
J2:6/1	364
J2:6/2	378
J2:7/1	1980
J2:8/1	1980
Junction: J3: Cherwell	
J3:1/1 (short)	355
J3:1/2 (with short)	1055(In) 700(Out)
J3:1/3	776
J3:1/4	351
J3:1/5	430
J3:2/1	612
J3:3/1	308
J3:3/2	317
J3:4/1	353
J3:4/2	745
J3:5/1	742
J3:5/2	468
J3:6/1	468
J3:7/1	804
J3:7/2	883
J3:7/3	351
J3:7/4	430
J3:8/1	1112
J3:8/2	883
J3:9/1	1995
J3:10/1	612
Junction: J4: Ardley	
J4:1/1	877
J4:1/2 (with short)	809(In) 621(Out)

J4:1/3 (short)	188
J4:2/1 (with short)	227(In) 188(Out)
J4:2/2 (short)	39
J4:3/1	353
J4:3/2 (with short)	745(In) 366(Out)
J4:3/3 (short)	379
J4:4/1	357
J4:4/2	378
J4:5/1	531
J4:5/2	329
J4:6/1	105
J4:6/2	257
J4:7/1 (short)	4
J4:7/2 (with short)	16(In) 12(Out)
J4:8/1	815
J4:8/2	641
J4:8/3	484
J4:9/1	335
J4:10/1	1093
J4:11/1	646
J4:11/2	622
J4:11/3	445
J4:12/1	742
J4:12/2	468
J4:13/1	379
J4:14/1	230
J4:14/2	257
J4:15/1	2467
J4:16/1	1686
J4:17/1	860
Junction: J5: Baynards Green exit xings	
J5:1/1	473
J5:2/1	568
J5:2/2	708
J5:2/3	762
J5:3/1	561
J5:3/2	262
J5:4/1	473
Junction: J6: Unnamed Junction	
J6:1/1 (with short)	823(In) 779(Out)
J6:1/2 (short)	44

J6:2/1	812
J6:3/1	698
J6:4/1 (short)	96
J6:4/2 (with short)	129(In) 33(Out)
J6:5/1	782
J6:6/1	56

Lane Saturation Flows

Junction: J1: Baynards Green								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (A43 North)	3.65	0.00	Y	Arm J5:3 Left	70.00	100.0 %	1938	1938
J1:1/2 (A43 North)	3.65	0.00	Y	Arm J1:2 Ahead	45.00	100.0 %	1916	1916
J1:1/3 (A43 North)	3.65	0.00	N	Arm J1:2 Ahead	45.00	100.0 %	2052	2052
J1:1/4 (A43 North)	3.65	0.00	N	Arm J1:2 Ahead	45.00	100.0 %	2052	2052
J1:2/1	4.00	0.00	Y	Arm J5:2 Ahead	50.00	100.0 %	1956	1956
J1:2/2	4.00	0.00	N	Arm J5:2 Ahead	50.00	100.0 %	2092	2092
J1:2/3	4.00	0.00	N	Arm J5:2 Ahead	50.00	100.0 %	2092	2092
J1:2/4	4.00	0.00	Y	Arm J1:4 Right	30.00	100.0 %	1919	1919
J1:3/1 (B4100 East)	3.65	0.00	Y	Arm J5:2 Left	30.00	100.0 %	1886	1886
J1:3/2 (B4100 East)	3.65	0.00	N	Arm J1:4 Ahead	50.00	100.0 %	2058	2058
J1:3/3 (B4100 East)	3.65	0.00	N	Arm J1:4 Ahead	50.00	100.0 %	2058	2058
J1:4/1	4.00	0.00	Y	Arm J5:1 Ahead	40.00	100.0 %	1942	1942
J1:4/2	4.00	0.00	N	Arm J1:6 Right	35.00	100.0 %	2066	2066
J1:5/1 (A43 South)	3.65	0.00	Y	Arm J1:6 Ahead	55.00	90.7 %	1927	1927
				Arm J5:1 Ahead	55.00	9.3 %		
J1:5/2 (A43 South)	3.65	0.00	N	Arm J1:6 Ahead	50.00	100.0 %	2058	2058
J1:5/3 (A43 South)	3.65	0.00	N	Arm J1:6 Ahead	50.00	100.0 %	2058	2058
J1:6/1	4.00	0.00	Y	Arm J1:8 Ahead	35.00	100.0 %	1932	1932
J1:6/2	4.00	0.00	N	Arm J1:8 Ahead	35.00	100.0 %	2066	2066
J1:6/3	4.00	0.00	N	Arm J1:8 Ahead	35.00	100.0 %	2066	2066
J1:6/4	4.00	0.00	Y	Arm J1:9 Right	30.00	100.0 %	1919	1919
J1:7/1 (B4100 West)	3.65	0.00	Y	Arm J1:8 Left	30.00	52.4 %	1896	1896
				Arm J1:9 Ahead	40.00	47.6 %		
J1:7/2 (B4100 West)	3.65	0.00	N	Arm J1:9 Ahead	40.00	100.0 %	2043	2043
J1:8/1	Infinite Saturation Flow						Inf	Inf
J1:8/2	Infinite Saturation Flow						Inf	Inf
J1:8/3	This lane uses a directly entered Saturation Flow						2000	2000
J1:9/1	4.00	0.00	Y	Arm J5:3 Ahead	35.00	100.0 %	1932	1932
J1:9/2	4.00	0.00	N	Arm J1:2 Right	30.00	32.8 %	2062	2062
				Arm J5:3 Ahead	35.00	67.2 %		
J1:10/1	Infinite Saturation Flow						Inf	Inf
J1:10/2	Infinite Saturation Flow						Inf	Inf
J1:10/3	Infinite Saturation Flow						Inf	Inf

Junction: J2: Padbury								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (M40 SB offslip)	3.65	0.00	Y	Arm J2:4 Left	40.00	100.0 %	1908	1908
J2:1/2 (M40 SB offslip)	3.65	0.00	Y	Arm J2:3 Right	50.00	100.0 %	1922	1922
J2:1/3 (M40 SB offslip Lane 3)	This lane uses a directly entered Saturation Flow						3400	3400
J2:2/1 (A43 north)	3.65	0.00	Y	Arm J2:3 Ahead	Inf	100.0 %	1980	1980
J2:2/2 (A43 north)	3.65	0.00	N	Arm J2:3 Ahead	Inf	100.0 %	2120	2120
J2:2/3 (A43 north)	3.65	0.00	N	Arm J2:3 Ahead	Inf	100.0 %	2120	2120
J2:3/1	Infinite Saturation Flow						Inf	Inf
J2:3/2	Infinite Saturation Flow						Inf	Inf
J2:3/3	Infinite Saturation Flow						Inf	Inf
J2:3/4	Infinite Saturation Flow						Inf	Inf
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:4/2	Infinite Saturation Flow						Inf	Inf
J2:4/3	Infinite Saturation Flow						Inf	Inf
J2:5/1 (M40 NB offslip)	3.65	0.00	Y	Arm J2:4 Left	Inf	100.0 %	1980	1980
J2:5/2 (M40 NB offslip)	3.65	0.00	N	Arm J2:4 Left	Inf	100.0 %	2120	2120
J2:5/3 (M40 NB offslip)	3.65	0.00	N	Arm J2:4 Left	Inf	100.0 %	2120	2120
J2:6/1 (A43 south)	3.65	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1980	1980
J2:6/2 (A43 south)	3.65	0.00	N	Arm J2:4 Ahead	Inf	100.0 %	2120	2120
J2:7/1	Infinite Saturation Flow						Inf	Inf
J2:8/1	Infinite Saturation Flow						Inf	Inf

Junction: J3: Cherwell								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J3:1/1 (A43 Southbound)	3.63	0.00	Y	Arm J3:2 Left	Inf	100.0 %	1978	1978
J3:1/2 (A43 Southbound)	3.65	0.00	N	Arm J3:7 Ahead	Inf	100.0 %	2120	2120
J3:1/3 (A43 Southbound)	3.65	0.00	N	Arm J3:7 Ahead	Inf	100.0 %	2120	2120
J3:1/4 (A43 Southbound)	3.65	0.00	Y	Arm J3:7 Ahead	Inf	100.0 %	1980	1980
J3:1/5 (A43 Southbound)	3.65	0.00	N	Arm J3:7 Ahead	Inf	100.0 %	2120	2120
J3:2/1	4.00	0.00	Y	Arm J3:10 Ahead	Inf	100.0 %	2015	2015
J3:3/1 (MSA)	4.50	0.00	Y	Arm J3:8 Left	15.00	100.0 %	1877	1877
J3:3/2 (MSA)	4.00	0.00	N	Arm J3:4 Left	30.00	100.0 %	2052	2052
J3:4/1	Infinite Saturation Flow						Inf	Inf
J3:4/2	Infinite Saturation Flow						Inf	Inf
J3:5/1 (A43 Northbound Lane 1)	Infinite Saturation Flow						Inf	Inf
J3:5/2 (A43 Northbound Lane 2)	Infinite Saturation Flow						Inf	Inf
J3:6/1	4.50	0.00	Y	Arm J3:2 Ahead	40.00	54.9 %	1980	1980
				Arm J3:7 Right	30.00	45.1 %		
J3:7/1	4.00	0.00	Y	Arm J3:8 Ahead	Inf	100.0 %	2015	2015
J3:7/2	4.00	0.00	N	Arm J3:8 Ahead	Inf	100.0 %	2155	2155
J3:7/3	4.00	0.00	Y	Arm J3:4 Ahead	Inf	100.0 %	2015	2015
J3:7/4	4.00	0.00	N	Arm J3:4 Ahead	Inf	100.0 %	2155	2155
J3:8/1	Infinite Saturation Flow						Inf	Inf
J3:8/2	Infinite Saturation Flow						Inf	Inf
J3:9/1	Infinite Saturation Flow						Inf	Inf
J3:10/1	Infinite Saturation Flow						Inf	Inf

Junction: J4: Ardley								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J4:1/1 (Ardley bypass)	3.65	0.00	Y	Arm J4:9 Left	30.00	26.3 %	1886	1886
				Arm J4:11 Ahead	30.00	73.7 %		
J4:1/2 (Ardley bypass)	3.65	0.00	N	Arm J4:11 Ahead	30.00	100.0 %	2019	2019
J4:1/3 (Ardley bypass)	3.65	0.00	N	Arm J4:11 Ahead	30.00	100.0 %	2019	2019
J4:2/1 (B430)	3.50	0.00	Y	Arm J4:8 Ahead	40.00	100.0 %	1894	1894
J4:2/2 (B430)	3.50	0.00	N	Arm J4:8 Ahead	Inf	100.0 %	2105	2105
J4:3/1 (A43 Southbound)	3.65	0.00	Y	Arm J4:4 Ahead	30.00	100.0 %	1886	1886
J4:3/2 (A43 Southbound)	3.65	0.00	N	Arm J4:4 Ahead	30.00	100.0 %	2019	2019
J4:3/3 (A43 Southbound)	3.65	0.00	N	Arm J4:13 Right	50.00	100.0 %	2058	2058
J4:4/1	4.00	0.00	Y	Arm J4:5 Ahead	30.00	100.0 %	1919	1919
J4:4/2	4.00	0.00	N	Arm J4:5 Ahead	30.00	87.0 %	2052	2052
				Arm J4:6 Right	30.00	13.0 %		
J4:5/1	Infinite Saturation Flow						Inf	Inf
J4:5/2	Infinite Saturation Flow						Inf	Inf
J4:6/1	4.00	0.00	Y	Arm J4:9 Ahead	40.00	99.0 %	1942	1942
				Arm J4:11 Right	40.00	1.0 %		
J4:6/2	4.00	0.00	N	Arm J4:11 Right	40.00	100.0 %	2077	2077
J4:7/1	4.00	0.00	Y	Arm J4:4 Right	40.00	100.0 %	1942	1942
J4:7/2	4.00	0.00	N	Arm J4:4 Right	40.00	100.0 %	2077	2077
J4:8/1	4.00	0.00	Y	Arm J4:10 Ahead	Inf	100.0 %	2015	2015
J4:8/2	4.00	0.00	Y	Arm J4:12 Ahead	Inf	100.0 %	2015	2015
J4:8/3	4.00	0.00	N	Arm J4:7 Right	Inf	3.3 %	2155	2155
				Arm J4:12 Ahead	Inf	96.7 %		
J4:9/1	Infinite Saturation Flow						Inf	Inf
J4:10/1 (M40 NB onslip Lane 1)	Infinite Saturation Flow						Inf	Inf
J4:11/1	Infinite Saturation Flow						Inf	Inf
J4:11/2	Infinite Saturation Flow						Inf	Inf
J4:11/3	Infinite Saturation Flow						Inf	Inf
J4:12/1	Infinite Saturation Flow						Inf	Inf
J4:12/2	Infinite Saturation Flow						Inf	Inf
J4:13/1	4.00	0.00	Y	Arm J4:10 Right	40.00	73.4 %	1942	1942
				Arm J4:12 Right	40.00	26.6 %		
J4:14/1	3.65	0.00	Y	Arm J4:5 Left	30.00	75.7 %	1908	1908
				Arm J4:6 Ahead	Inf	24.3 %		
J4:14/2	3.65	0.00	N	Arm J4:6 Ahead	30.00	100.0 %	2019	2019

J4:15/1	Infinite Saturation Flow	Inf	Inf
J4:16/1	Infinite Saturation Flow	Inf	Inf
J4:17/1	Infinite Saturation Flow	Inf	Inf

Junction: J5: Baynards Green exit xings

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J5:1/1	3.65	0.00	Y	Arm J5:4 Ahead	Inf	100.0 %	1980	1980
J5:2/1	3.65	0.00	Y	Arm J2:2 Ahead	Inf	100.0 %	1980	1980
J5:2/2	3.65	0.00	N	Arm J2:2 Ahead	Inf	100.0 %	2120	2120
J5:2/3	3.65	0.00	N	Arm J2:2 Ahead	Inf	100.0 %	2120	2120
J5:3/1	3.60	0.00	Y	Arm J6:1 Ahead	Inf	100.0 %	1975	1975
J5:3/2	3.60	0.00	N	Arm J6:1 Ahead	Inf	100.0 %	2115	2115
J5:4/1	Infinite Saturation Flow						Inf	Inf

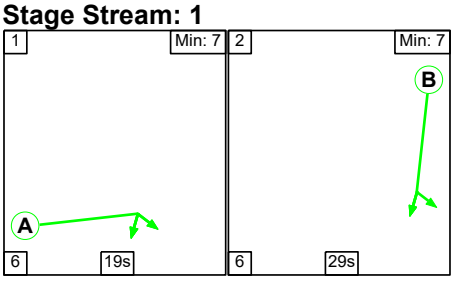
Junction: J6: Unnamed Junction

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J6:1/1	3.65	0.00	Y	Arm J6:2 Ahead	Inf	100.0 %	1980	1980
J6:1/2	3.65	0.00	Y	Arm J6:6 Right	18.00	100.0 %	1828	1828
J6:2/1	Infinite Saturation Flow						Inf	Inf
J6:3/1	3.65	0.00	Y	Arm J6:5 Ahead	Inf	98.3 %	1976	1976
				Arm J6:6 Left	12.00	1.7 %		
J6:4/1	3.50	0.00	Y	Arm J6:5 Left	12.00	100.0 %	1747	1747
J6:4/2	3.50	0.00	Y	Arm J6:2 Right	18.00	100.0 %	1814	1814
J6:5/1	Infinite Saturation Flow						Inf	Inf
J6:6/1	Infinite Saturation Flow						Inf	Inf

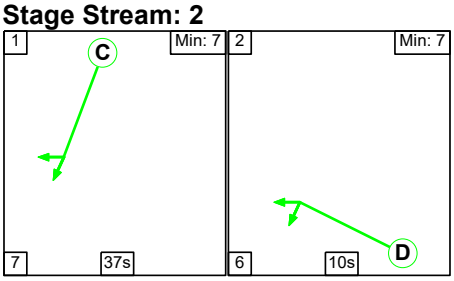
Scenario 1: '2034 DS3A - AM peak' (FG1: '2034 DS3A - AM', Plan 1: 'Network Control Plan 1')
C1 - Baynards Green

Stage Sequence Diagram

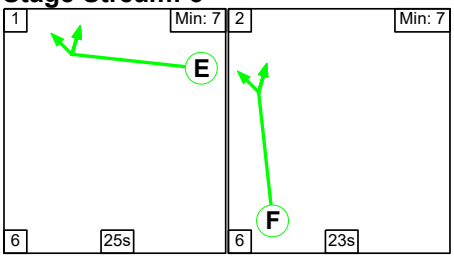
Stage Stream: 1



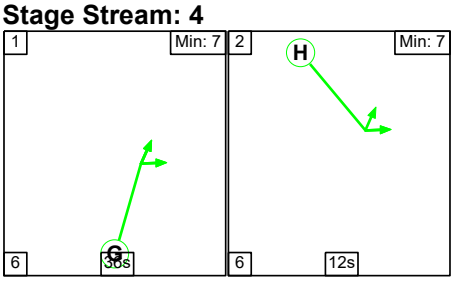
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	19	29
Change Point	58	23

Stage Stream: 2

Stage	1	2
Duration	37	10
Change Point	18	2

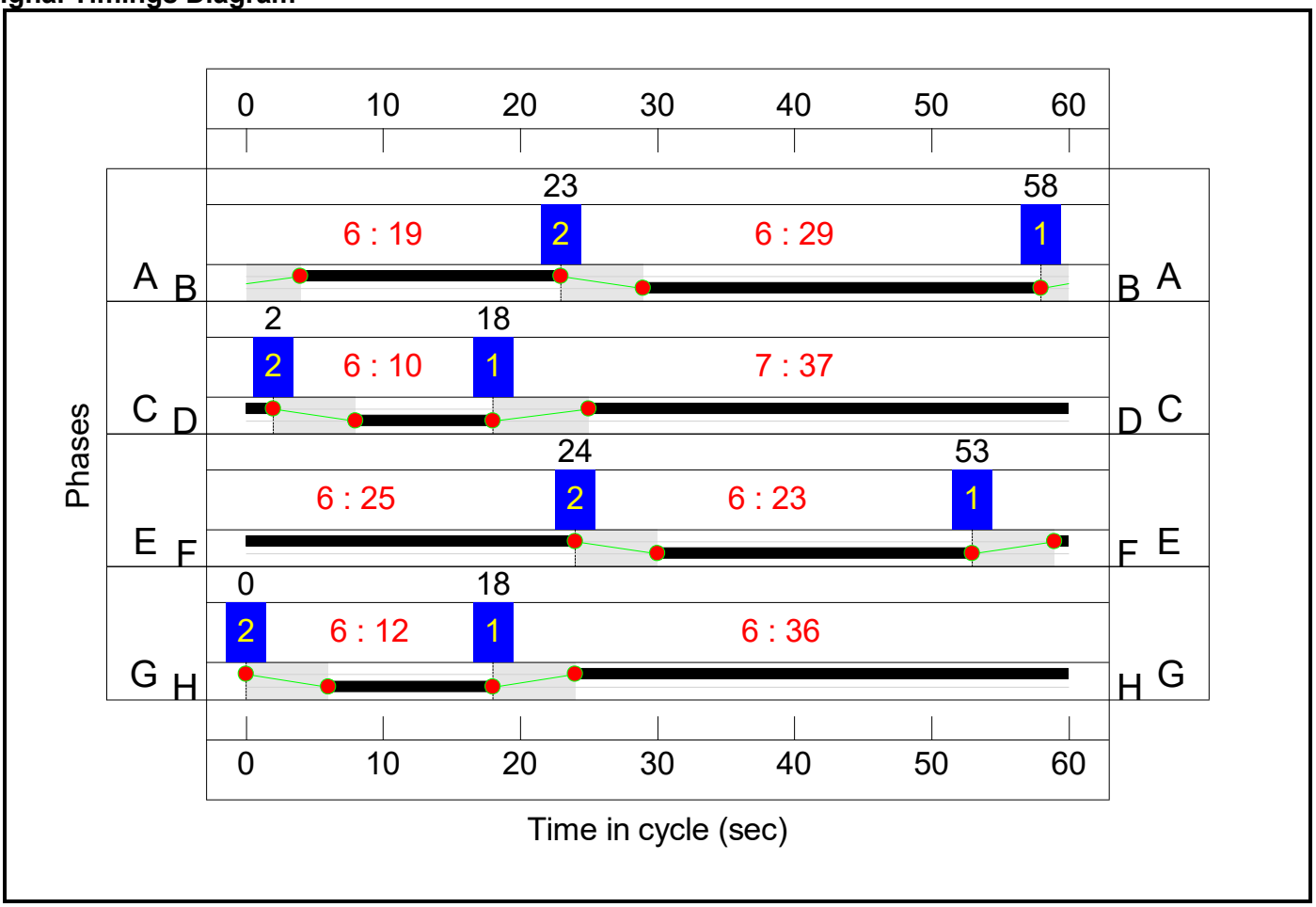
Stage Stream: 3

Stage	1	2
Duration	25	23
Change Point	53	24

Stage Stream: 4

Stage	1	2
Duration	36	12
Change Point	18	0

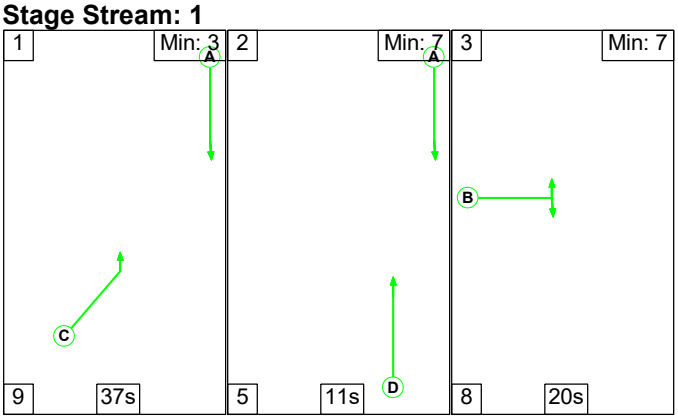
Signal Timings Diagram



C2 - Padbury

Stage Sequence Diagram

Stage Stream: 1

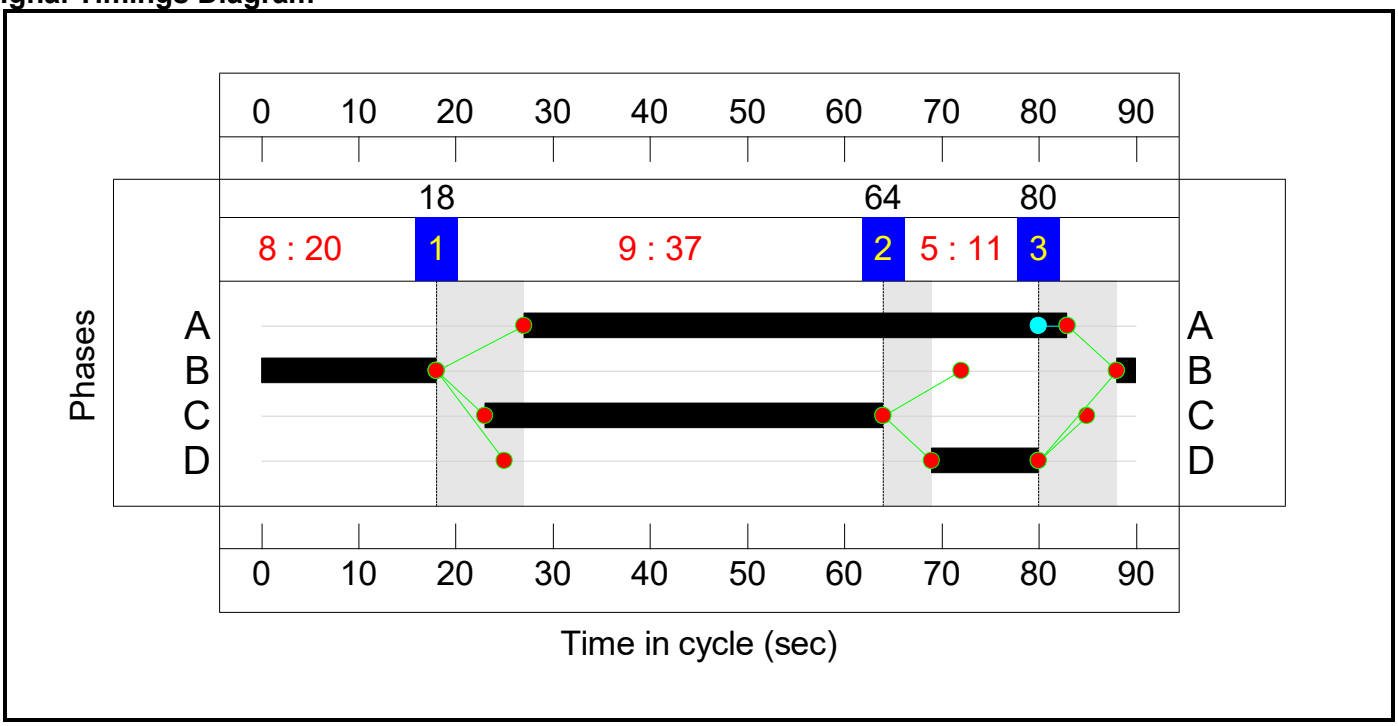


Stage Timings

Stage Stream: 1

Stage	1	2	3
Duration	37	11	20
Change Point	18	64	80

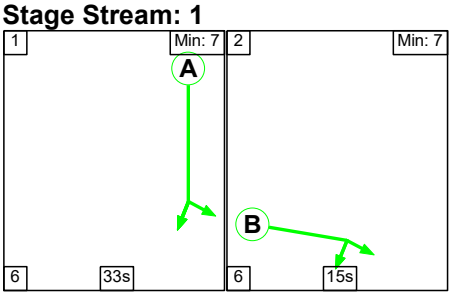
Signal Timings Diagram



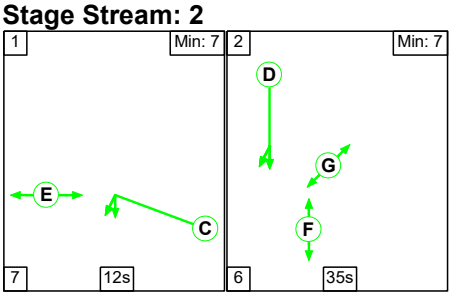
C3 - Cherwell

Stage Sequence Diagram

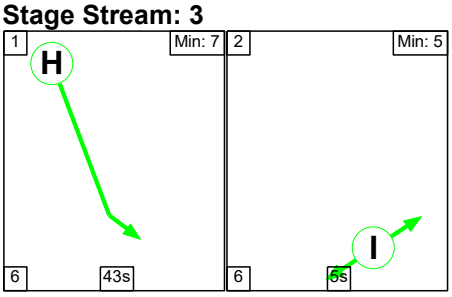
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	33	15
Change Point	51	30

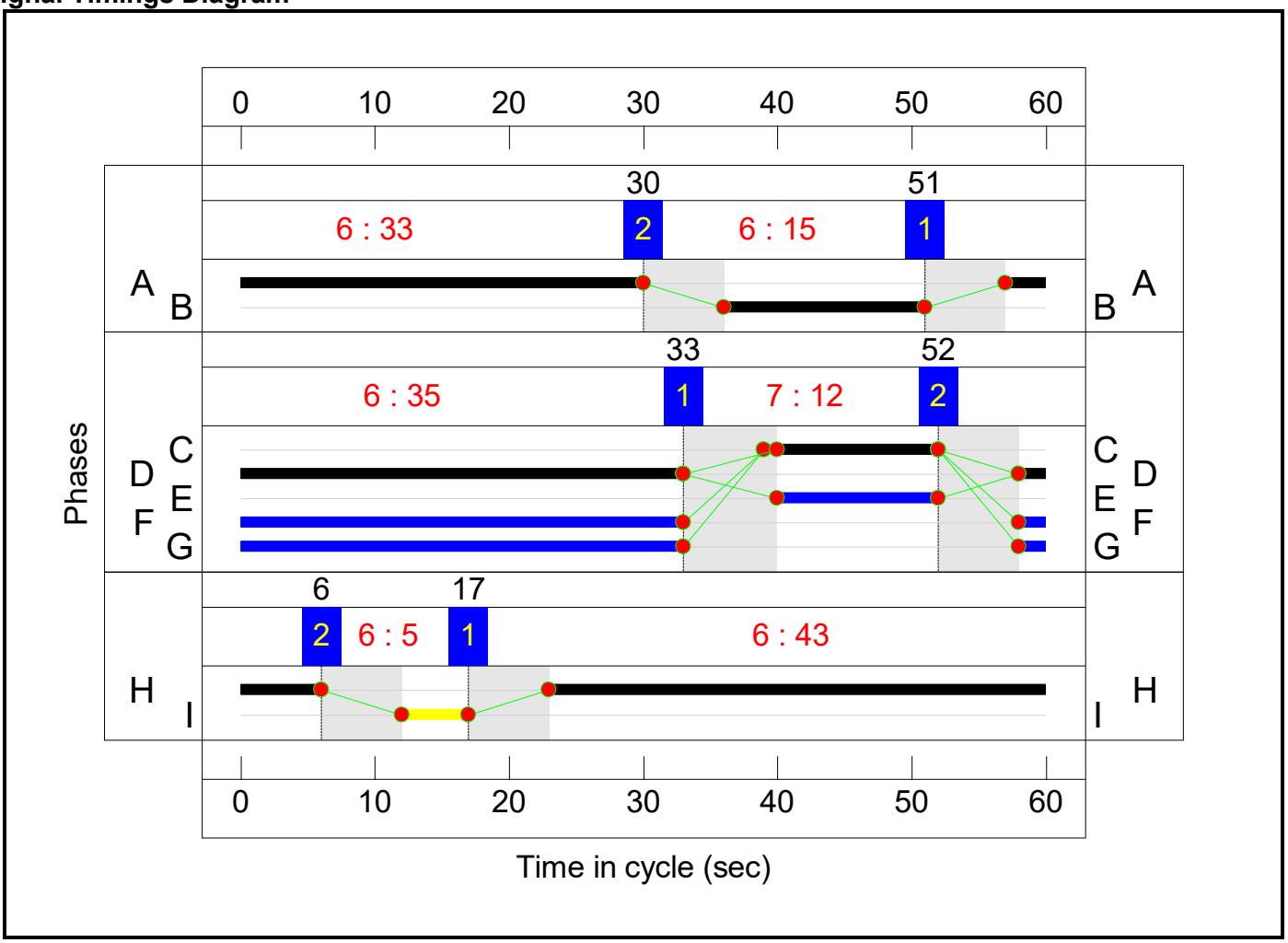
Stage Stream: 2

Stage	1	2
Duration	12	35
Change Point	33	52

Stage Stream: 3

Stage	1	2
Duration	43	5
Change Point	17	6

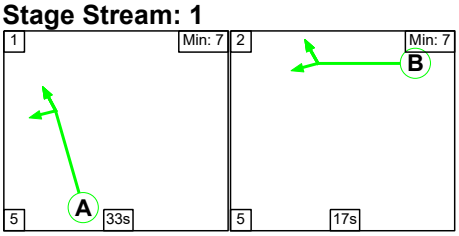
Signal Timings Diagram



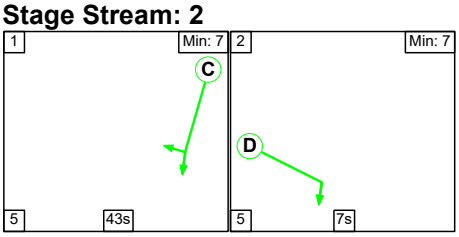
C4 - Ardley

Stage Sequence Diagram

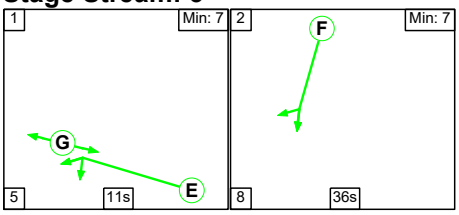
Stage Stream: 1



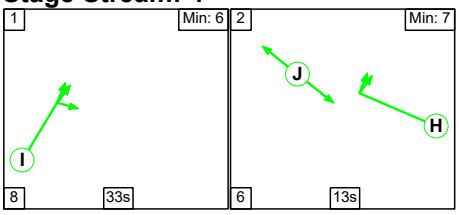
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	33	17
Change Point	24	2

Stage Stream: 2

Stage	1	2
Duration	43	7
Change Point	6	54

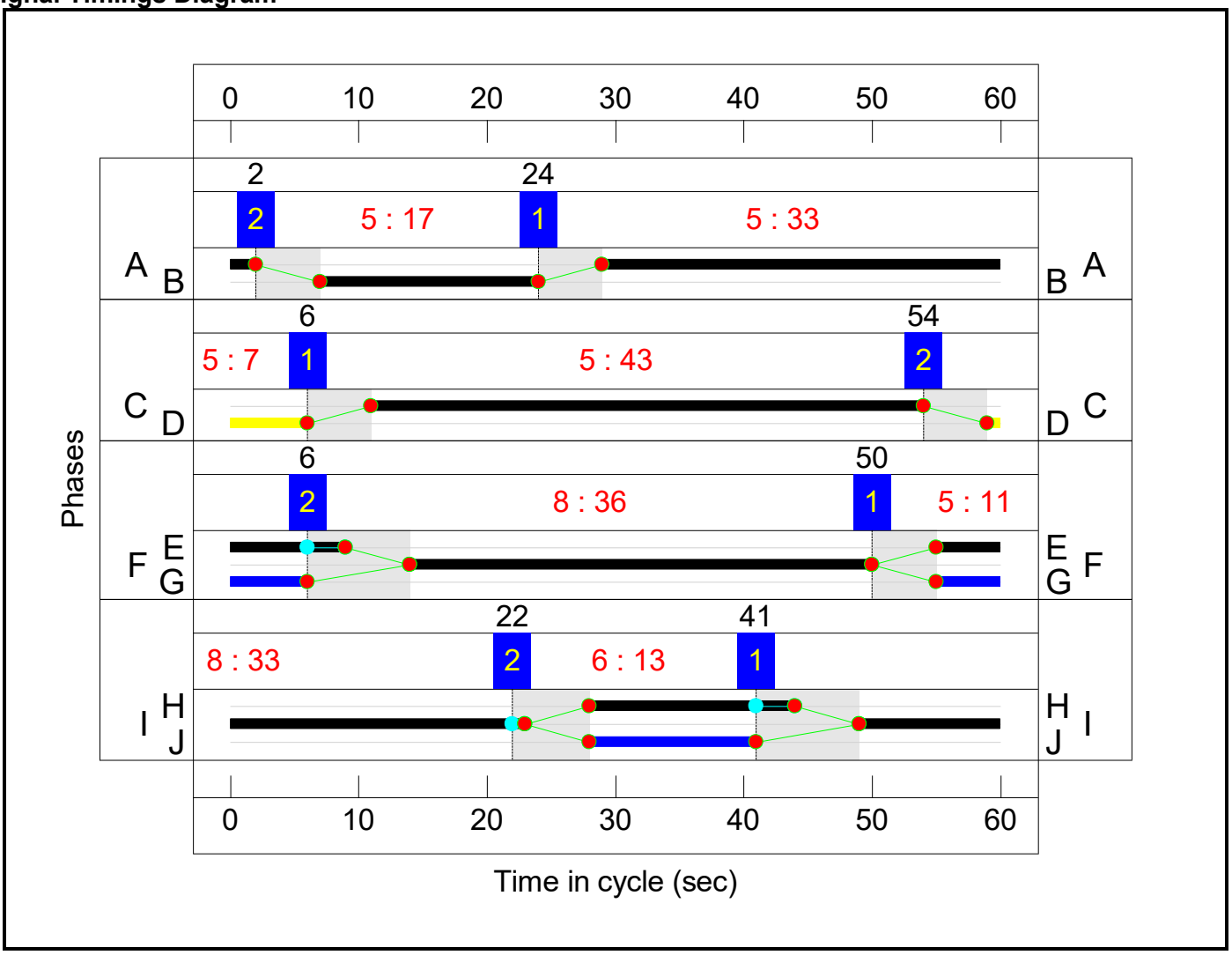
Stage Stream: 3

Stage	1	2
Duration	11	36
Change Point	50	6

Stage Stream: 4

Stage	1	2
Duration	33	13
Change Point	41	22

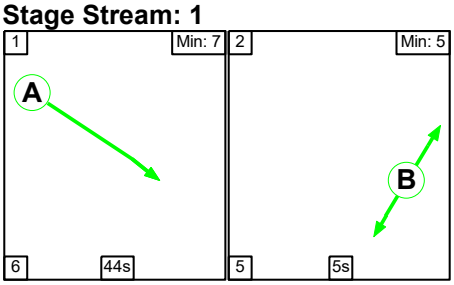
Signal Timings Diagram



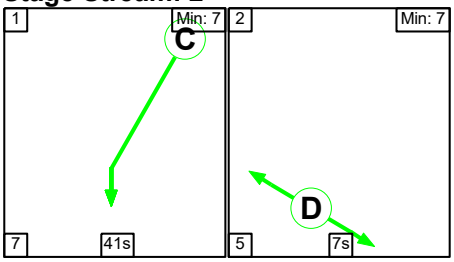
C5 - Baynards Green exit xings

Stage Sequence Diagram

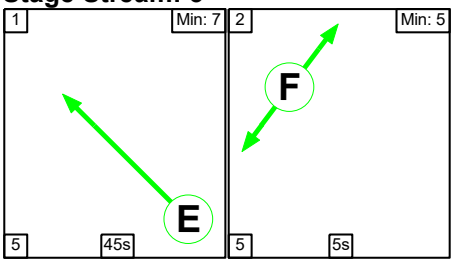
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	44	5
Change Point	0	50

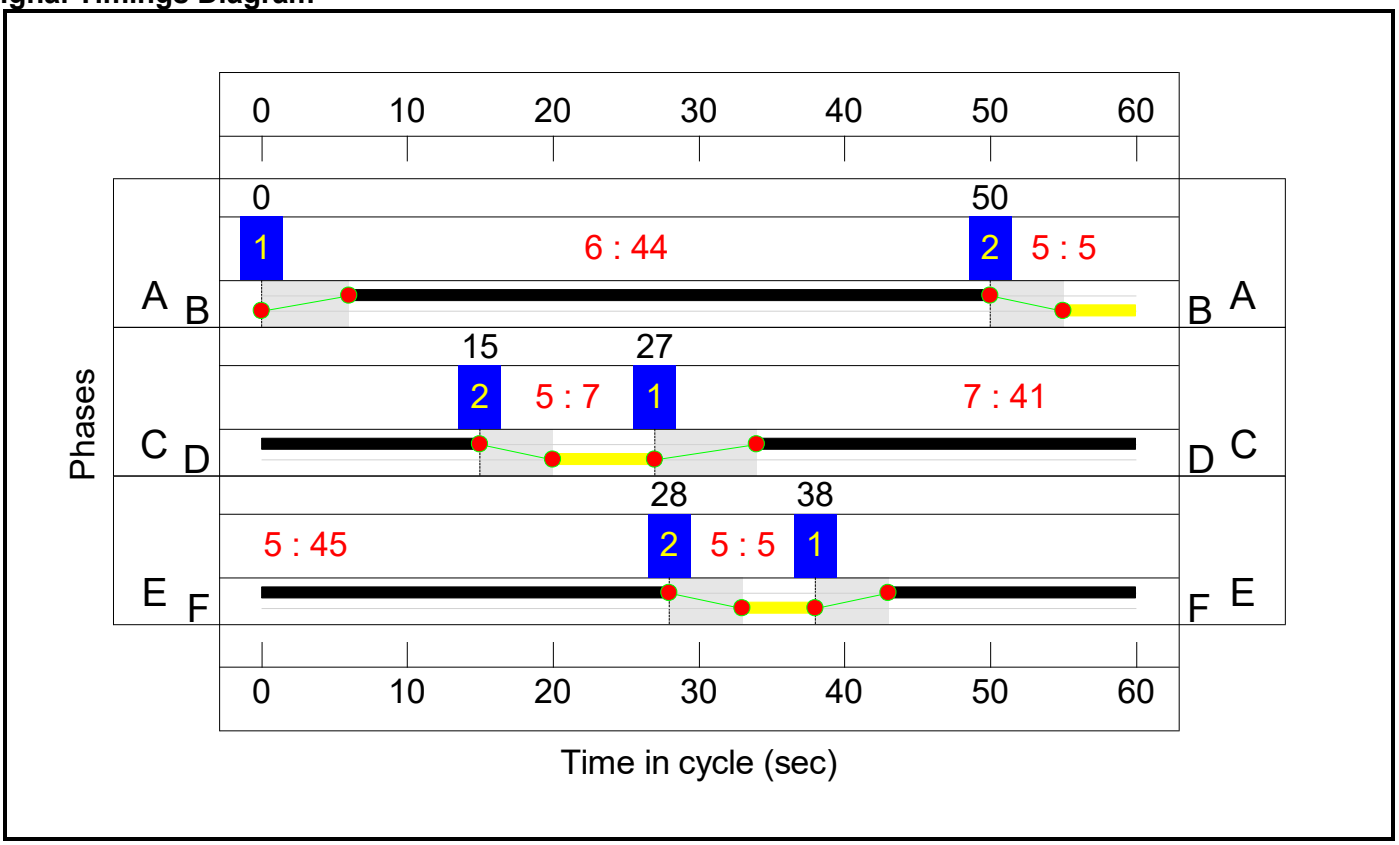
Stage Stream: 2

Stage	1	2
Duration	41	7
Change Point	27	15

Stage Stream: 3

Stage	1	2
Duration	45	5
Change Point	38	28

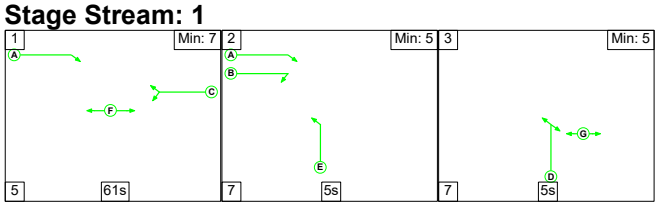
Signal Timings Diagram



C6 - AL site access

Stage Sequence Diagram

Stage Stream: 1

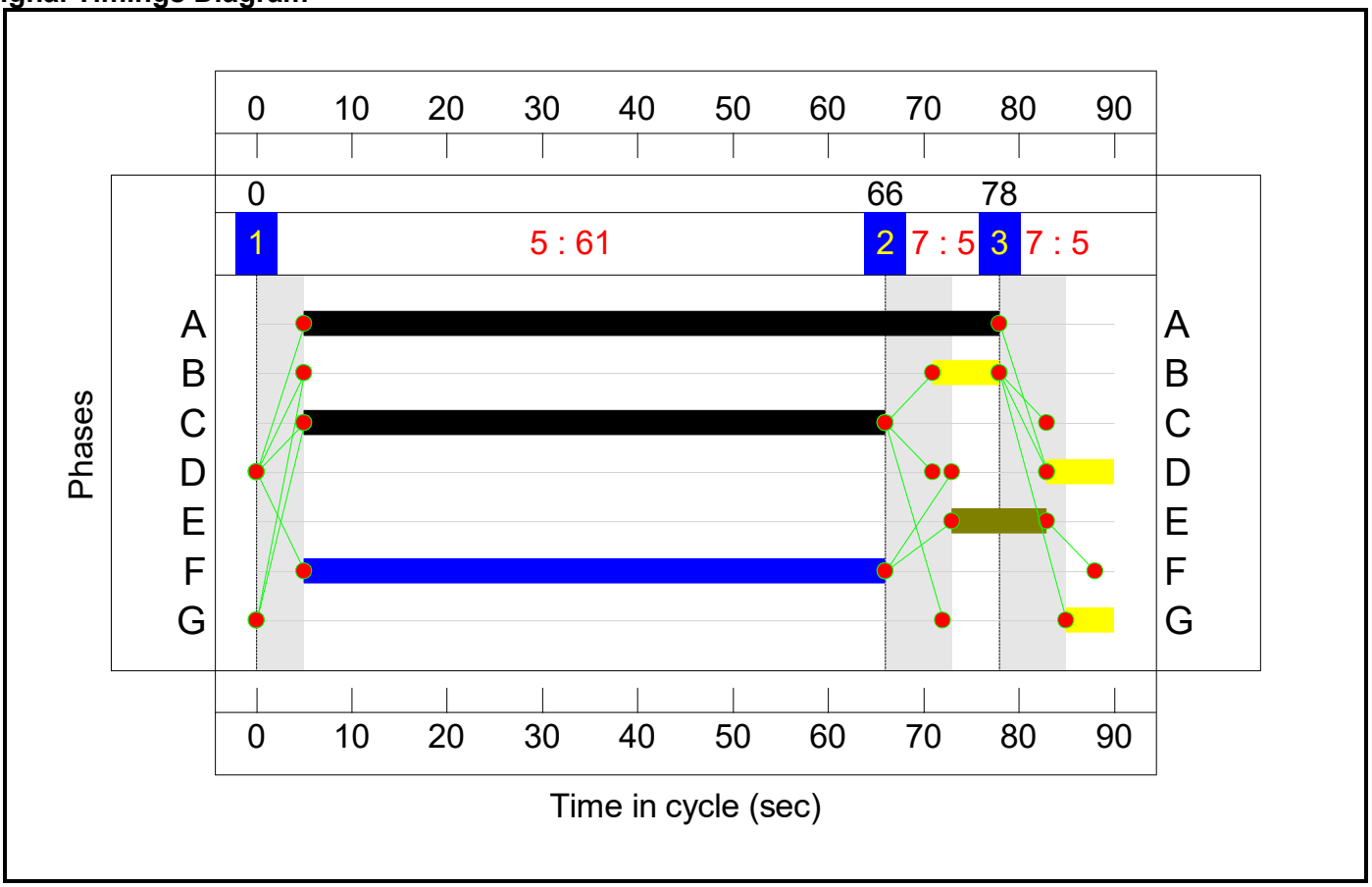


Stage Timings

Stage Stream: 1

Stage	1	2	3
Duration	61	5	5
Change Point	0	66	78

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Option 28 Network Model	-	-	**N/A**	-	-		-	-	-	-	-	-	**89.8%**
J1: Baynards Green	-	-	**N/A**	-	-		-	-	-	-	-	-	**89.8%**
1/2+1/1	A43 North Ahead Left	U	1:1	N/A	C1:B		1	29	-	1105	1916:1938	958+406	81.0 : 81.0%
1/3+1/4	A43 North Ahead	U	1:1	N/A	C1:B		1	29	-	1730	2052:2052	960+1026	84.3 : 89.8%
2/1	Ahead	U	1:2	N/A	C1:C		1	37	-	813	1956	1271	63.9%
2/2	Ahead	U	1:2	N/A	C1:C		1	37	-	902	2092	1360	66.3%
2/3+2/4	Right Ahead	U	1:2	N/A	C1:C		1	37	-	1048	2092:1919	1244+137	75.9 : 75.9%
3/2+3/1	B4100 East Ahead Left	U	1:2	N/A	C1:D		1	10	-	439	2058:1886	377+243	79.2 : 57.7%
3/3	B4100 East Ahead	U	1:2	N/A	C1:D		1	10	-	256	2058	377	67.9%
4/1	Ahead	U	1:3	N/A	C1:E		1	25	-	403	1942	874	46.1%
4/2	Right	U	1:3	N/A	C1:E		1	25	-	256	2066	930	27.5%
5/1	A43 South Ahead Ahead2	U	1:3	N/A	C1:F		1	23	-	587	1927	771	76.2%
5/2	A43 South Ahead	U	1:3	N/A	C1:F		1	23	-	665	2058	823	80.8%
5/3	A43 South Ahead	U	1:3	N/A	C1:F		1	23	-	662	2058	823	80.4%
6/1	Ahead	U	1:4	N/A	C1:G		1	36	-	596	1932	1224	48.7%
6/2	Ahead	U	1:4	N/A	C1:G		1	36	-	777	2066	1308	59.4%
6/3+6/4	Ahead Right	U	1:4	N/A	C1:G		1	36	-	702	2066:1919	857+632	47.2 : 47.2%
7/1+7/2	B4100 West Left Ahead	U	1:4	N/A	C1:H		1	12	-	721	1901:2043	412+443	84.5 : 84.3%
8/3		U	N/A	N/A	-		-	-	-	404	2000	2000	20.2%
9/1	Ahead	U	1:1	N/A	C1:A		1	19	-	388	1932	676	57.4%
9/2	Right Ahead	U	1:1	N/A	C1:A		1	19	-	525	2060	721	72.8%
J2: Padbury	-	-	**N/A**	-	-		-	-	-	-	-	-	**80.0%**

1/1	M40 SB offslip Left	U	2:1	N/A	C2:B		1	20	-	345	1908	445	77.5%
1/2+1/3	M40 SB offslip Right	U	2:1	N/A	C2:B		1	20	-	865	1922:3400	321+793	75.0 : 78.7%
2/1	A43 north Ahead	U	2:1	N/A	C2:A		1	56	-	1003	1980	1254	80.0%
2/2	A43 north Ahead	U	2:1	N/A	C2:A		1	56	-	1051	2120	1343	78.3%
2/3	A43 north Ahead	U	2:1	N/A	C2:A		1	56	-	745	2120	1343	55.5%
5/1	M40 NB offslip Left	U	2:1	N/A	C2:C		1	41	-	466	1980	924	50.4%
5/2+5/3	M40 NB offslip Left	U	2:1	N/A	C2:C		1	41	-	792	2120:2120	870+631	52.8 : 52.8%
6/1	A43 south Ahead	U	2:1	N/A	C2:D		1	11	-	153	1980	264	58.0%
6/2	A43 south Ahead	U	2:1	N/A	C2:D		1	11	-	158	2120	283	55.9%
J3: Cherwell	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**88.8%**
1/2+1/1	A43 Southbound Left Ahead	U	3:1	N/A	C3:A		1	33	-	1244	2120:1978	1062+339	88.8 : 88.8%
1/3	A43 Southbound Ahead	U	3:1	N/A	C3:A		1	33	-	1051	2120	1201	87.5%
1/4	A43 Southbound Ahead	U	3:1	N/A	C3:A		1	33	-	642	1980	1122	57.2%
1/5	A43 Southbound Ahead	U	3:1	N/A	C3:A		1	33	-	727	2120	1201	60.5%
2/1	Ahead	U	3:3	N/A	C3:H		1	43	-	546	2015	1478	37.0%
3/1	MSA Left	U	3:2	N/A	C3:C		1	12	-	342	1877	407	84.1%
3/2	MSA Left	U	3:2	N/A	C3:C		1	12	-	266	2052	445	59.8%
6/1	Ahead Right	U	3:1	N/A	C3:B		1	15	-	449	1980	528	85.0%
7/1	Ahead	U	3:2	N/A	C3:D		1	35	-	1042	2015	1276	81.7%
7/2	Ahead	U	3:2	N/A	C3:D		1	35	-	1156	2155	1365	84.7%
7/3	Ahead	U	3:2	N/A	C3:D		1	35	-	642	2015	1276	50.3%
7/4	Ahead	U	3:2	N/A	C3:D		1	35	-	727	2155	1365	53.3%

J4: Ardley	-	-	**N/A**	-	-		-	-	-	-	-	-	**58.3%**
1/1	Ardley bypass Left Ahead	U	4:1	N/A	C4:A		1	33	-	382	1886	1069	35.7%
1/2+1/3	Ardley bypass Ahead	U	4:1	N/A	C4:A		1	33	-	399	2019:2019	975+762	23.0 : 23.0%
2/1+2/2	B430 Ahead	O	N/A	N/A	-		-	-	-	318	1894:2105	827+508	23.8 : 23.8%
3/1	A43 Southbound Ahead	U	4:2	N/A	C4:C		1	43	-	674	1886	1383	48.7%
3/2+3/3	A43 Southbound Ahead Right	U	4:2	N/A	C4:C		1	43	-	961	2019:2058	1117+560	57.3 : 57.3%
4/1	Ahead	U	4:3	N/A	C4:F		1	36	-	709	1919	1215	58.3%
4/2	Ahead Right	U	4:3	N/A	C4:F		1	36	-	697	2052	1300	53.6%
6/1	Ahead Right	U	4:1	N/A	C4:B		1	17	-	61	1942	615	9.9%
6/2	Right	U	4:1	N/A	C4:B		1	17	-	245	2077	658	37.3%
7/2+7/1	Right	U	4:2	N/A	C4:D		1	7	-	92	2077:1942	229+141	24.9 : 24.9%
8/1	Ahead	U	4:4	N/A	C4:I		1	34	-	516	2015	1175	43.9%
8/2	Ahead	U	4:4	N/A	C4:I		1	34	-	235	2015	1175	20.0%
8/3	Right Ahead	U	4:4	N/A	C4:I		1	34	-	541	2155	1257	43.0%
13/1	Right Right2	U	4:4	N/A	C4:H		1	16	-	321	1942	583	55.1%
14/1	Left Ahead	U	4:3	N/A	C4:E		1	14	-	236	1894	474	49.8%
14/2	Ahead	U	4:3	N/A	C4:E		1	14	-	245	2019	505	48.5%
J5: Baynards Green exit xings	-	-	**N/A**	-	-		-	-	-	-	-	-	**71.6%**
1/1	Ahead	U	5:3	N/A	C5:E		1	45	-	498	1980	1518	32.8%
2/1	Ahead	U	5:2	N/A	C5:C		1	41	-	813	1980	1386	58.7%
2/2	Ahead	U	5:2	N/A	C5:C		1	41	-	924	2120	1484	62.3%
2/3	Ahead	U	5:2	N/A	C5:C		1	41	-	1062	2120	1484	71.6%
3/1	Ahead	U	5:1	N/A	C5:A		1	44	-	717	1975	1481	48.4%
3/2	Ahead	U	5:1	N/A	C5:A		1	44	-	268	2115	1586	16.9%
J6: Unnamed Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**59.4%**

1/1+1/2	Ahead Right	U	6:1	N/A	C6:A C6:B		1	73:7	-	985	1980:1828	1501+156	59.4 : 59.4%
3/1	Ahead Left	U	6:1	N/A	C6:C		1	61	-	676	1968	1356	49.9%
4/2+4/1	Right Left	U	6:1	N/A	C6:D	C6:E	1	7:17	10	66	1814:1747	103+349	14.6 : 14.6%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Option 28 Network Model	**-**	**-**	**636**	**0**	**0**	**87.8**	**42.9**	**0.0**	**130.7**	**-**	**-**	**-**	**-**
J1: Baynards Green	**-**	**-**	**0**	**0**	**0**	**29.4**	**16.0**	**0.0**	**45.4**	**-**	**-**	**-**	**-**
1/2+1/1	1105	1105	-	-	-	3.5	2.1	-	5.6	18.4	10.8	2.1	12.9
1/3+1/4	1730	1730	-	-	-	6.3	3.3	-	9.6	19.9	13.8	3.3	17.1
2/1	813	813	-	-	-	0.0	0.0	-	0.0	0.2	0.6	0.0	0.6
2/2	902	902	-	-	-	0.1	0.0	-	0.1	0.5	1.5	0.0	1.5
2/3+2/4	1048	1048	-	-	-	0.2	0.0	-	0.2	0.6	2.1	0.0	2.1
3/2+3/1	439	439	-	-	-	2.8	1.2	-	4.0	32.7	4.7	1.2	5.9
3/3	256	256	-	-	-	1.6	1.0	-	2.7	37.4	3.9	1.0	4.9
4/1	403	403	-	-	-	0.3	0.0	-	0.3	2.4	1.4	0.0	1.4
4/2	256	256	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	587	587	-	-	-	2.5	1.6	-	4.1	25.2	8.3	1.6	9.9
5/2	665	665	-	-	-	2.9	2.0	-	5.0	27.0	9.8	2.0	11.8
5/3	662	662	-	-	-	2.9	2.0	-	4.9	26.8	9.7	2.0	11.7
6/1	596	596	-	-	-	0.1	0.0	-	0.1	0.5	1.6	0.0	1.6
6/2	777	777	-	-	-	0.1	0.0	-	0.1	0.6	1.8	0.0	1.8
6/3+6/4	702	702	-	-	-	0.1	0.0	-	0.1	0.4	5.3	0.0	5.3
7/1+7/2	721	721	-	-	-	4.5	2.6	-	7.1	35.5	5.9	2.6	8.5
8/3	404	404	-	-	-	0.0	0.1	-	0.1	1.1	0.6	0.1	0.7
9/1	388	388	-	-	-	0.7	0.0	-	0.7	6.1	2.4	0.0	2.4
9/2	525	525	-	-	-	0.7	0.0	-	0.7	4.7	2.5	0.0	2.5
J2: Padbury	**-**	**-**	**0**	**0**	**0**	**28.4**	**10.1**	**0.0**	**38.5**	**-**	**-**	**-**	**-**
1/1	345	345	-	-	-	3.1	1.7	-	4.8	49.7	8.0	1.7	9.7
1/2+1/3	865	865	-	-	-	7.6	1.7	-	9.4	38.9	7.3	1.7	9.0
2/1	1003	1003	-	-	-	3.4	2.0	-	5.4	19.3	18.4	2.0	20.4
2/2	1051	1051	-	-	-	3.5	1.8	-	5.3	18.1	19.0	1.8	20.8
2/3	745	745	-	-	-	1.9	0.6	-	2.6	12.3	10.3	0.6	11.0

5/1	466	466	-	-	-	2.2	0.5	-	2.7	20.7	8.0	0.5	8.5
5/2+5/3	792	792	-	-	-	3.5	0.6	-	4.0	18.4	7.8	0.6	8.3
6/1	153	153	-	-	-	1.6	0.7	-	2.2	52.7	3.6	0.7	4.3
6/2	158	158	-	-	-	1.6	0.6	-	2.2	50.8	3.7	0.6	4.3
J3: Cherwell	**-**	**-**	**0**	**0**	**0**	**16.2**	**11.7**	**0.0**	**27.9**	**-**	**-**	**-**	**-**
1/2+1/1	1244	1244	-	-	-	3.3	3.8	-	7.0	20.4	13.7	3.8	17.5
1/3	1051	1051	-	-	-	3.3	3.3	-	6.6	22.6	14.9	3.3	18.2
1/4	642	642	-	-	-	1.5	0.7	-	2.2	12.1	6.8	0.7	7.4
1/5	727	727	-	-	-	1.7	0.8	-	2.5	12.4	7.9	0.8	8.6
2/1	546	546	-	-	-	0.2	0.0	-	0.2	1.1	1.5	0.0	1.5
3/1	342	342	-	-	-	2.1	2.5	-	4.6	48.4	5.4	2.5	7.9
3/2	266	266	-	-	-	1.6	0.7	-	2.3	31.1	4.0	0.7	4.7
6/1	449	449	-	-	-	1.7	0.0	-	1.7	13.5	7.3	0.0	7.3
7/1	1042	1042	-	-	-	0.5	0.0	-	0.5	1.7	2.0	0.0	2.0
7/2	1156	1156	-	-	-	0.4	0.0	-	0.4	1.2	1.8	0.0	1.8
7/3	642	642	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/4	727	727	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J4: Ardley	**-**	**-**	**636**	**0**	**0**	**9.6**	**3.8**	**0.0**	**13.3**	**-**	**-**	**-**	**-**
1/1	382	382	-	-	-	0.8	0.3	-	1.0	9.7	3.4	0.3	3.7
1/2+1/3	399	399	-	-	-	0.7	0.1	-	0.8	7.6	1.8	0.1	2.0
2/1+2/2	318	318	636	0	0	0.0	0.2	-	0.2	1.9	0.3	0.2	0.5
3/1	674	674	-	-	-	0.0	0.5	-	0.5	2.6	3.7	0.5	4.1
3/2+3/3	961	961	-	-	-	0.8	0.7	-	1.4	5.3	7.4	0.7	8.1
4/1	709	709	-	-	-	0.2	0.0	-	0.2	0.8	0.8	0.0	0.8
4/2	697	697	-	-	-	0.2	0.0	-	0.2	0.9	1.0	0.0	1.0
6/1	61	61	-	-	-	0.3	0.0	-	0.3	16.9	0.8	0.0	0.8
6/2	245	245	-	-	-	0.4	0.0	-	0.4	5.4	3.9	0.0	3.9
7/2+7/1	92	92	-	-	-	0.4	0.2	-	0.6	23.4	0.8	0.2	1.0
8/1	516	516	-	-	-	1.0	0.4	-	1.4	9.9	6.2	0.4	6.6
8/2	235	235	-	-	-	0.4	0.1	-	0.5	7.8	2.6	0.1	2.7
8/3	541	541	-	-	-	0.6	0.4	-	1.0	6.3	3.1	0.4	3.5

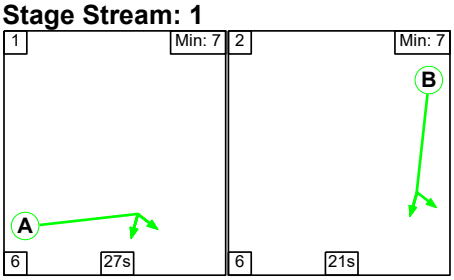
13/1	321	321	-	-	-	1.4	0.0	-	1.4	15.5	5.2	0.0	5.2
14/1	236	236	-	-	-	1.3	0.5	-	1.8	26.8	3.3	0.5	3.8
14/2	245	245	-	-	-	1.3	0.5	-	1.8	26.1	3.5	0.5	3.9
J5: Baynards Green exit xings	**-**	**-**	**0**	**0**	**0**	**0.8**	**0.0**	**0.0**	**0.8**	**-**	**-**	**-**	**-**
1/1	498	498	-	-	-	0.1	0.0	-	0.1	0.4	0.8	0.0	0.8
2/1	813	813	-	-	-	0.1	0.0	-	0.1	0.3	0.6	0.0	0.6
2/2	924	924	-	-	-	0.2	0.0	-	0.2	0.6	1.6	0.0	1.6
2/3	1062	1062	-	-	-	0.3	0.0	-	0.3	1.0	5.4	0.0	5.4
3/1	717	717	-	-	-	0.2	0.0	-	0.2	0.9	1.1	0.0	1.1
3/2	268	268	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J6: Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**3.5**	**1.3**	**0.0**	**4.8**	**-**	**-**	**-**	**-**
1/1+1/2	985	985	-	-	-	1.7	0.7	-	2.4	8.7	7.2	0.7	7.9
3/1	676	676	-	-	-	1.2	0.5	-	1.7	9.3	7.9	0.5	8.4
4/2+4/1	66	66	-	-	-	0.6	0.1	-	0.7	36.2	1.0	0.1	1.1

C1 - Baynards Green	Stream: 1	PRC for Signalled Lanes (%):	0.3	Total Delay for Signalled Lanes (pcuHr):	16.54	Cycle Time (s): 60
C1 - Baynards Green	Stream: 2	PRC for Signalled Lanes (%):	13.6	Total Delay for Signalled Lanes (pcuHr):	7.00	Cycle Time (s): 60
C1 - Baynards Green	Stream: 3	PRC for Signalled Lanes (%):	11.4	Total Delay for Signalled Lanes (pcuHr):	14.29	Cycle Time (s): 60
C1 - Baynards Green	Stream: 4	PRC for Signalled Lanes (%):	6.5	Total Delay for Signalled Lanes (pcuHr):	7.39	Cycle Time (s): 60
C2 - Padbury	Stream: 1	PRC for Signalled Lanes (%):	12.5	Total Delay for Signalled Lanes (pcuHr):	38.52	Cycle Time (s): 90
C3 - Cherwell	Stream: 1	PRC for Signalled Lanes (%):	1.4	Total Delay for Signalled Lanes (pcuHr):	19.98	Cycle Time (s): 60
C3 - Cherwell	Stream: 2	PRC for Signalled Lanes (%):	6.3	Total Delay for Signalled Lanes (pcuHr):	7.78	Cycle Time (s): 60
C3 - Cherwell	Stream: 3	PRC for Signalled Lanes (%):	143.6	Total Delay for Signalled Lanes (pcuHr):	0.17	Cycle Time (s): 60
C4 - Ardley	Stream: 1	PRC for Signalled Lanes (%):	141.6	Total Delay for Signalled Lanes (pcuHr):	2.53	Cycle Time (s): 60
C4 - Ardley	Stream: 2	PRC for Signalled Lanes (%):	57.1	Total Delay for Signalled Lanes (pcuHr):	2.51	Cycle Time (s): 60
C4 - Ardley	Stream: 3	PRC for Signalled Lanes (%):	54.3	Total Delay for Signalled Lanes (pcuHr):	3.85	Cycle Time (s): 60
C4 - Ardley	Stream: 4	PRC for Signalled Lanes (%):	63.3	Total Delay for Signalled Lanes (pcuHr):	4.26	Cycle Time (s): 60
C5 - Baynards Green exit xings	Stream: 1	PRC for Signalled Lanes (%):	85.9	Total Delay for Signalled Lanes (pcuHr):	0.18	Cycle Time (s): 60
C5 - Baynards Green exit xings	Stream: 2	PRC for Signalled Lanes (%):	25.8	Total Delay for Signalled Lanes (pcuHr):	0.53	Cycle Time (s): 60
C5 - Baynards Green exit xings	Stream: 3	PRC for Signalled Lanes (%):	174.3	Total Delay for Signalled Lanes (pcuHr):	0.06	Cycle Time (s): 60
C6 - AL site access	Stream: 1	PRC for Signalled Lanes (%):	51.4	Total Delay for Signalled Lanes (pcuHr):	4.80	Cycle Time (s): 90
		PRC Over All Lanes (%):	0.3	Total Delay Over All Lanes(pcuHr):	130.69	

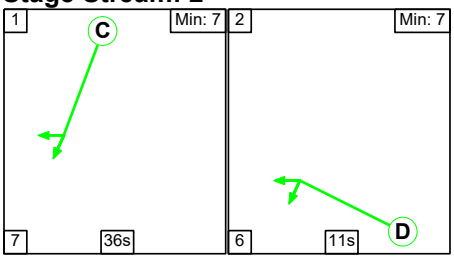
Scenario 2: '2034 DS3A - PM peak' (FG2: '2034 DS3A - PM', Plan 1: 'Network Control Plan 1')
C1 - Baynards Green

Stage Sequence Diagram

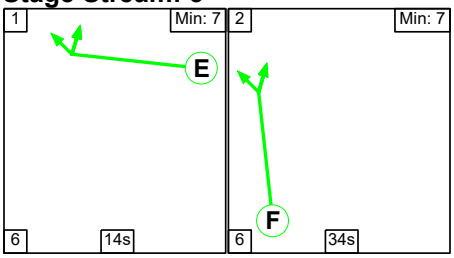
Stage Stream: 1



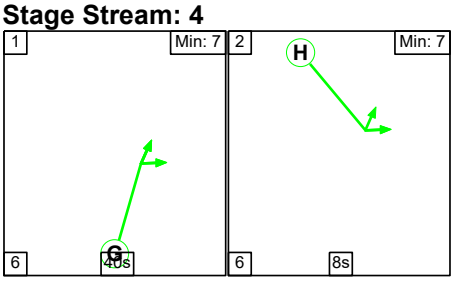
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	27	21
Change Point	0	33

Stage Stream: 2

Stage	1	2
Duration	36	11
Change Point	23	6

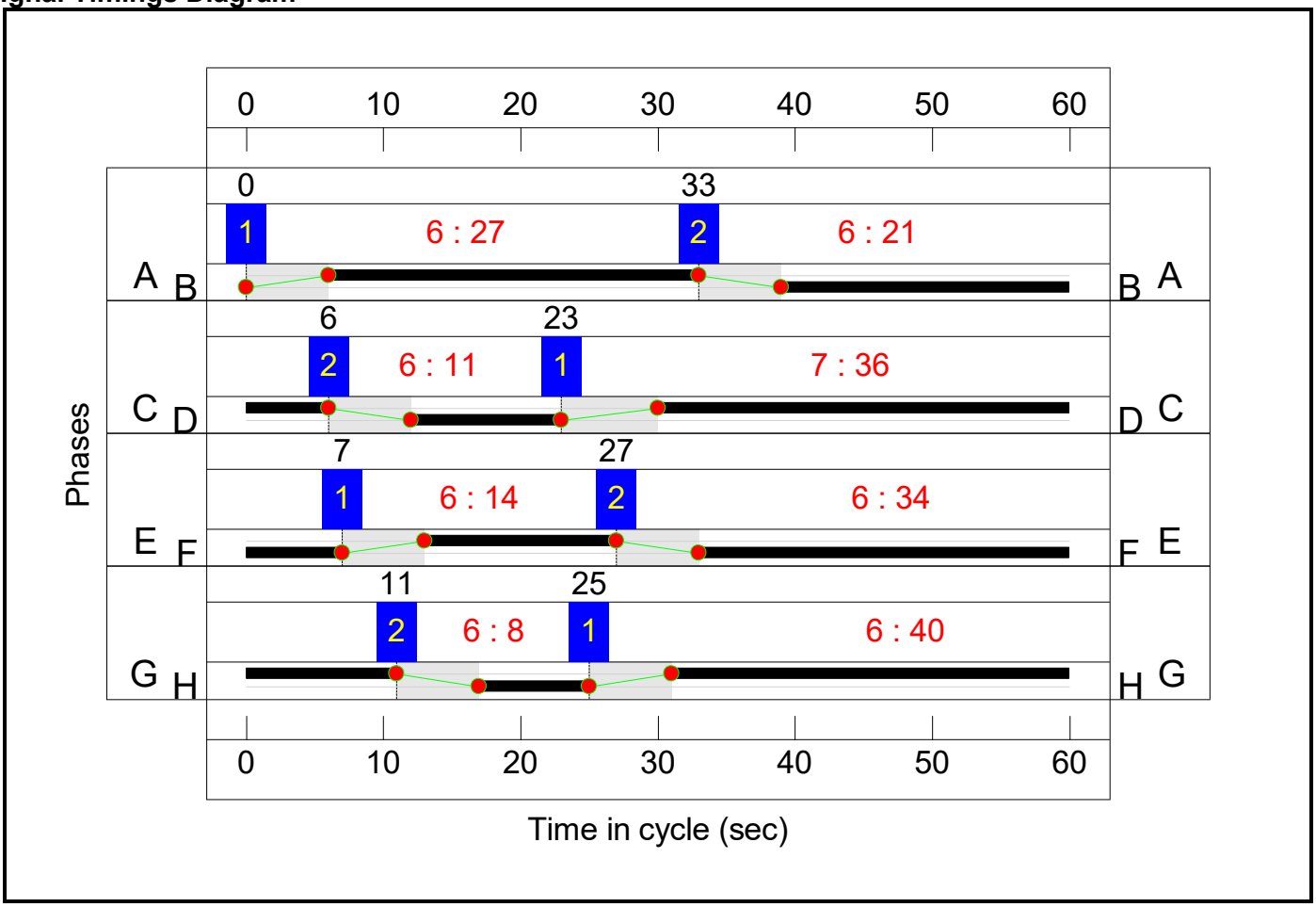
Stage Stream: 3

Stage	1	2
Duration	14	34
Change Point	7	27

Stage Stream: 4

Stage	1	2
Duration	40	8
Change Point	25	11

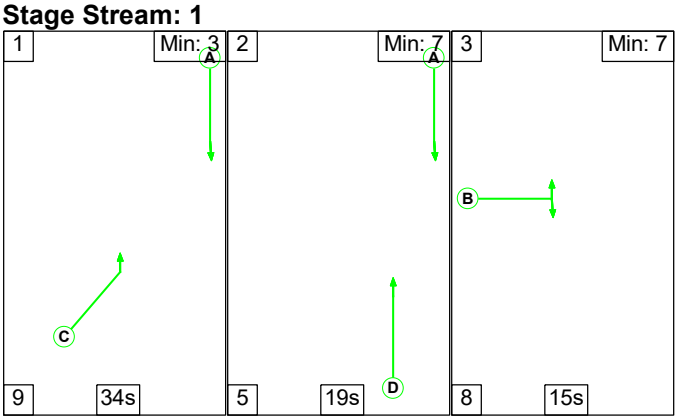
Signal Timings Diagram



C2 - Padbury

Stage Sequence Diagram

Stage Stream: 1

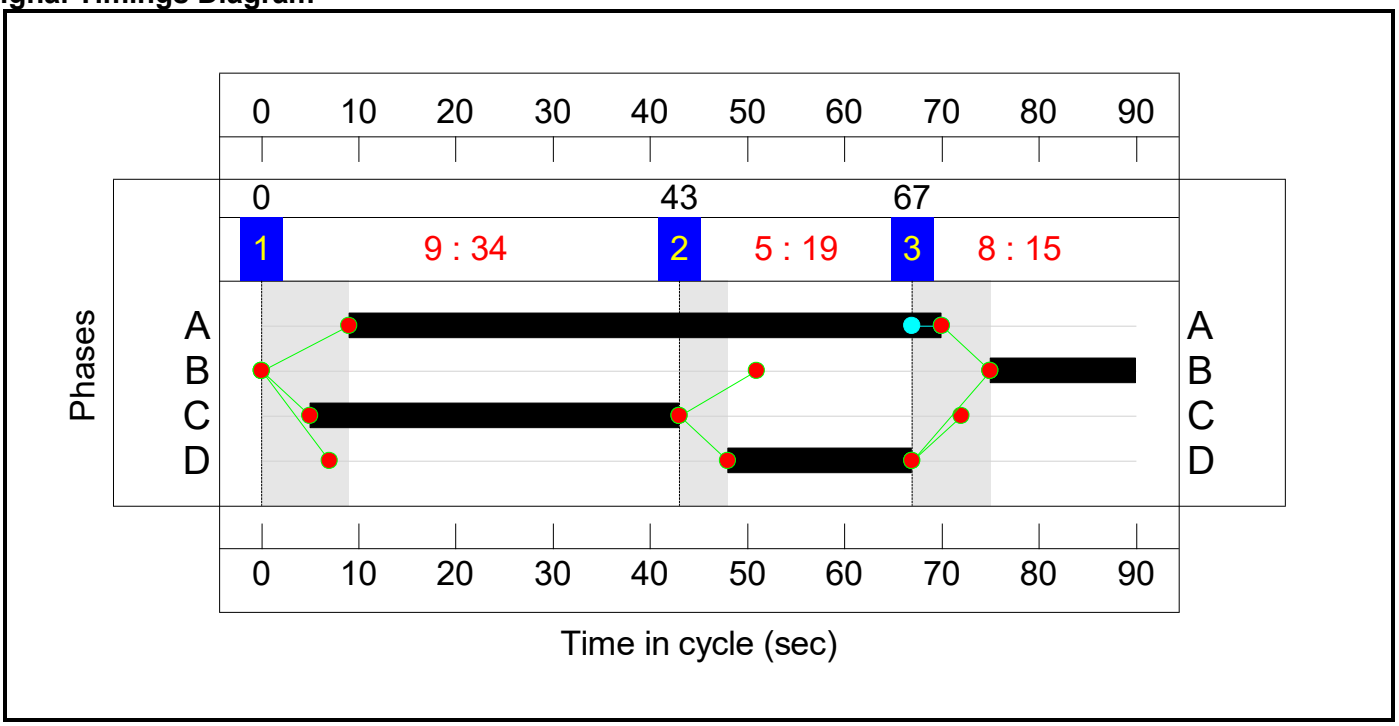


Stage Timings

Stage Stream: 1

Stage	1	2	3
Duration	34	19	15
Change Point	0	43	67

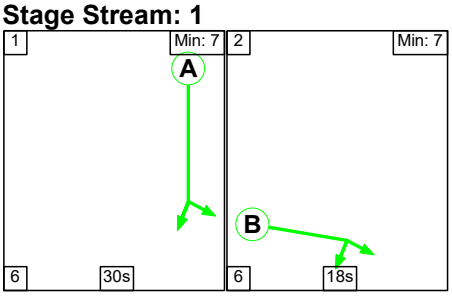
Signal Timings Diagram



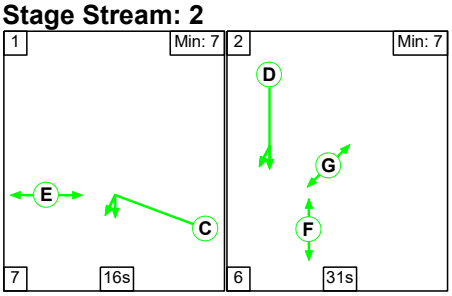
C3 - Cherwell

Stage Sequence Diagram

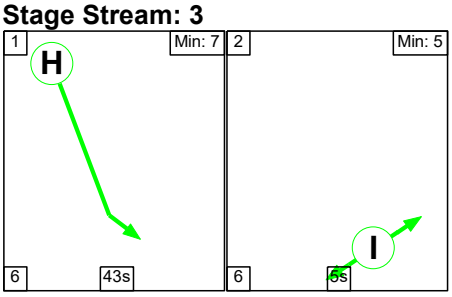
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	30	18
Change Point	0	36

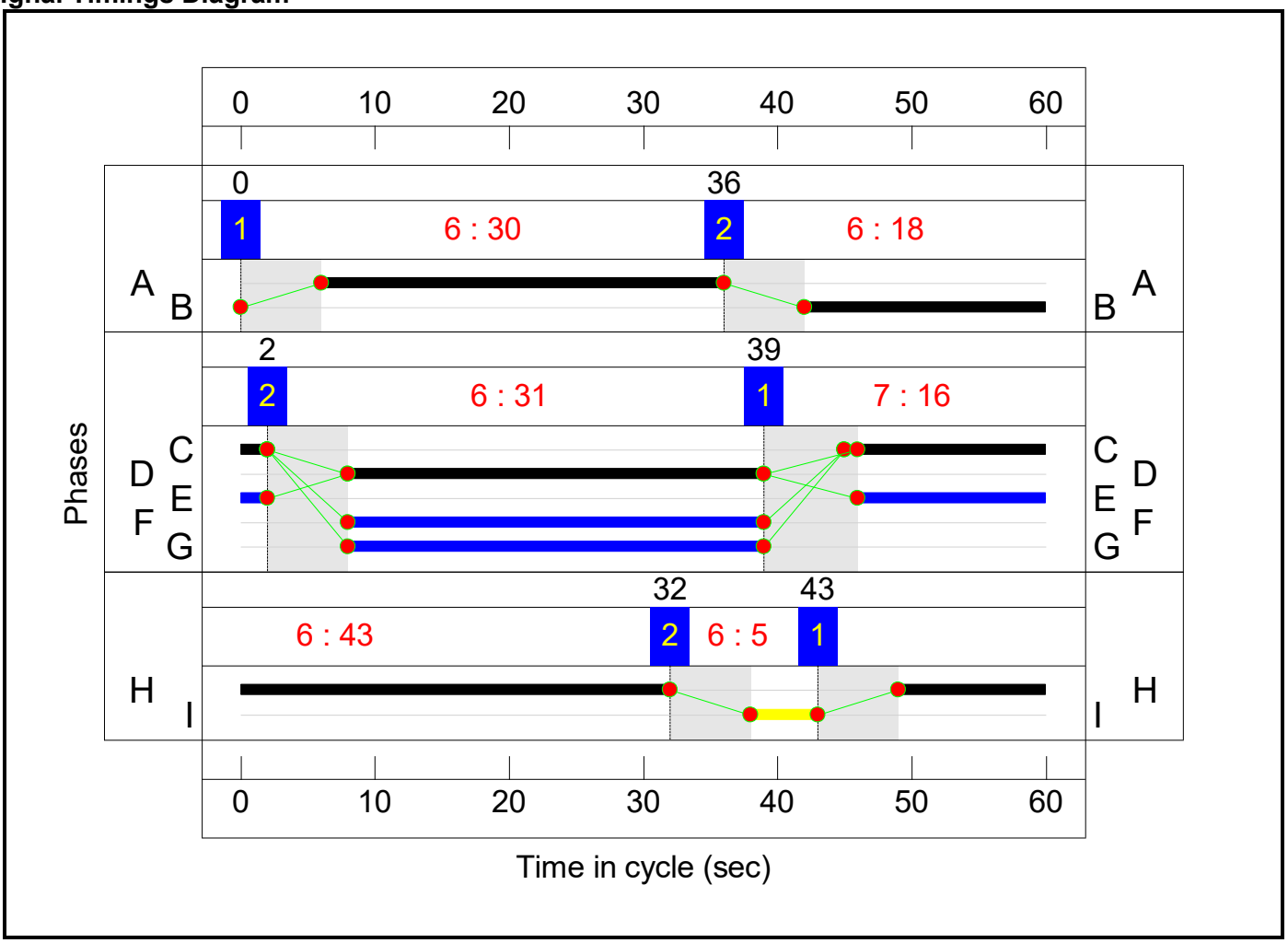
Stage Stream: 2

Stage	1	2
Duration	16	31
Change Point	39	2

Stage Stream: 3

Stage	1	2
Duration	43	5
Change Point	43	32

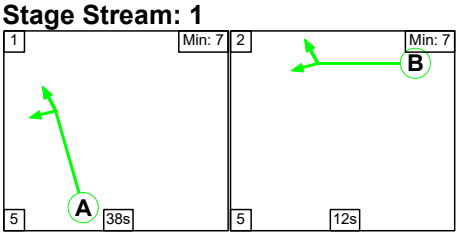
Signal Timings Diagram



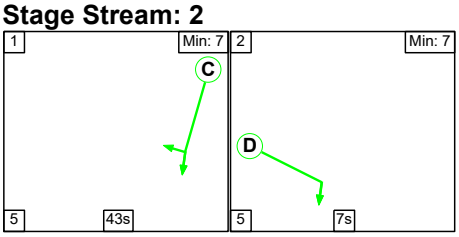
C4 - Ardley

Stage Sequence Diagram

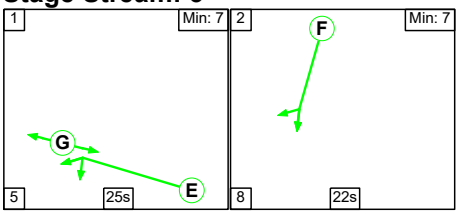
Stage Stream: 1



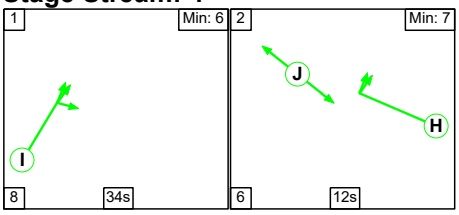
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	38	12
Change Point	13	56

Stage Stream: 2

Stage	1	2
Duration	43	7
Change Point	52	40

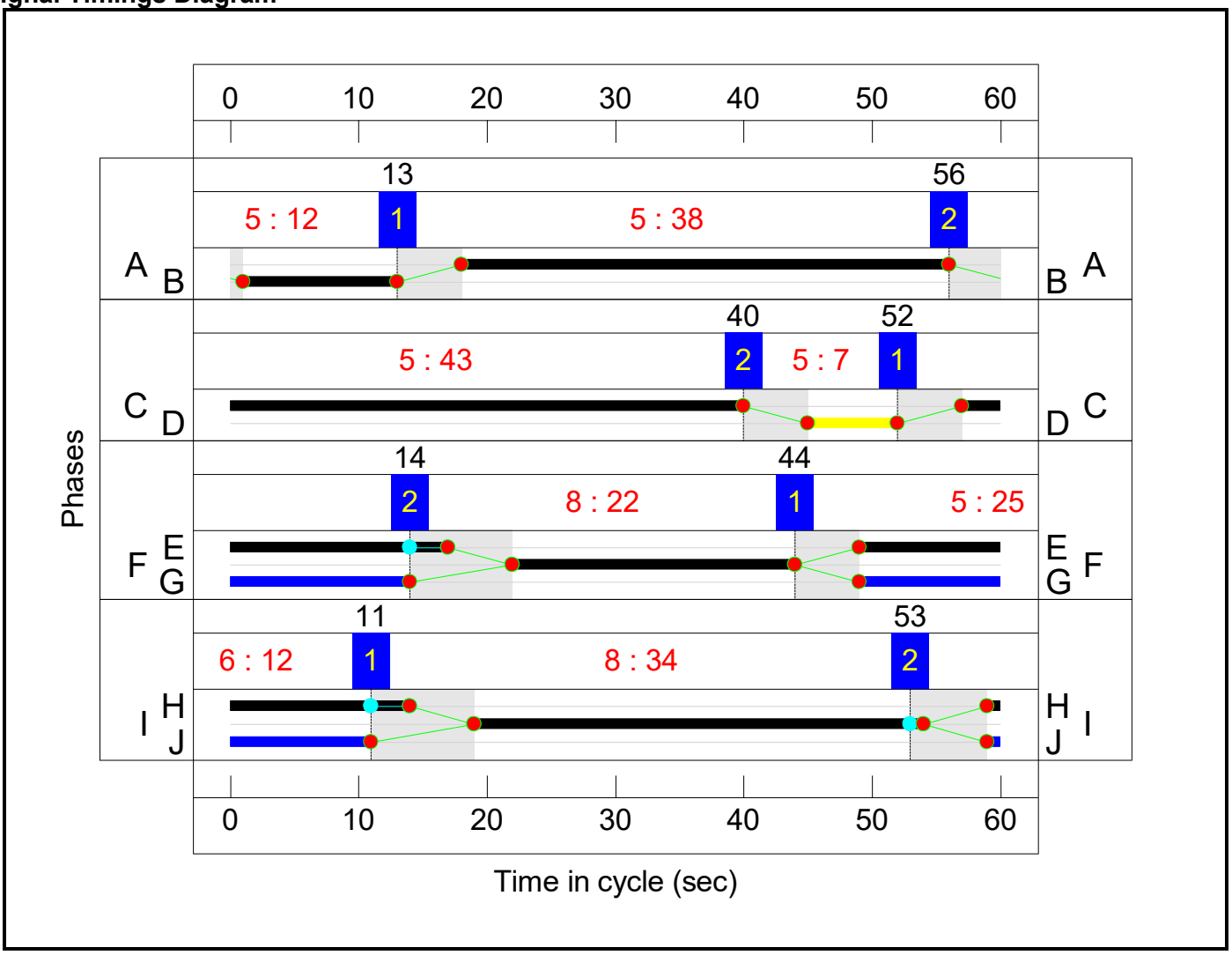
Stage Stream: 3

Stage	1	2
Duration	25	22
Change Point	44	14

Stage Stream: 4

Stage	1	2
Duration	34	12
Change Point	11	53

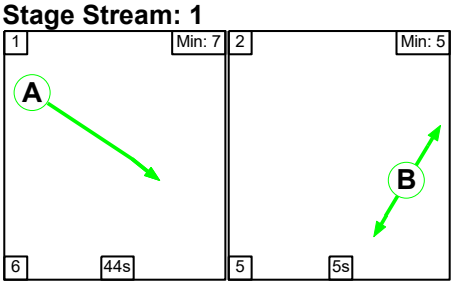
Signal Timings Diagram



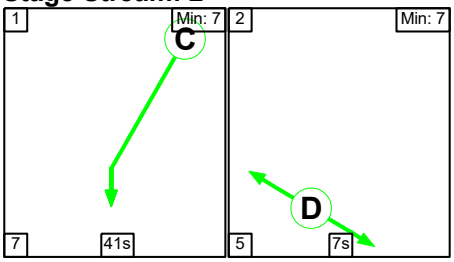
C5 - Baynards Green exit xings

Stage Sequence Diagram

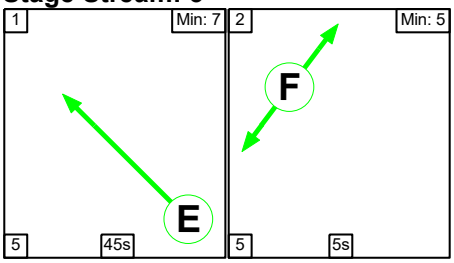
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	44	5
Change Point	0	50

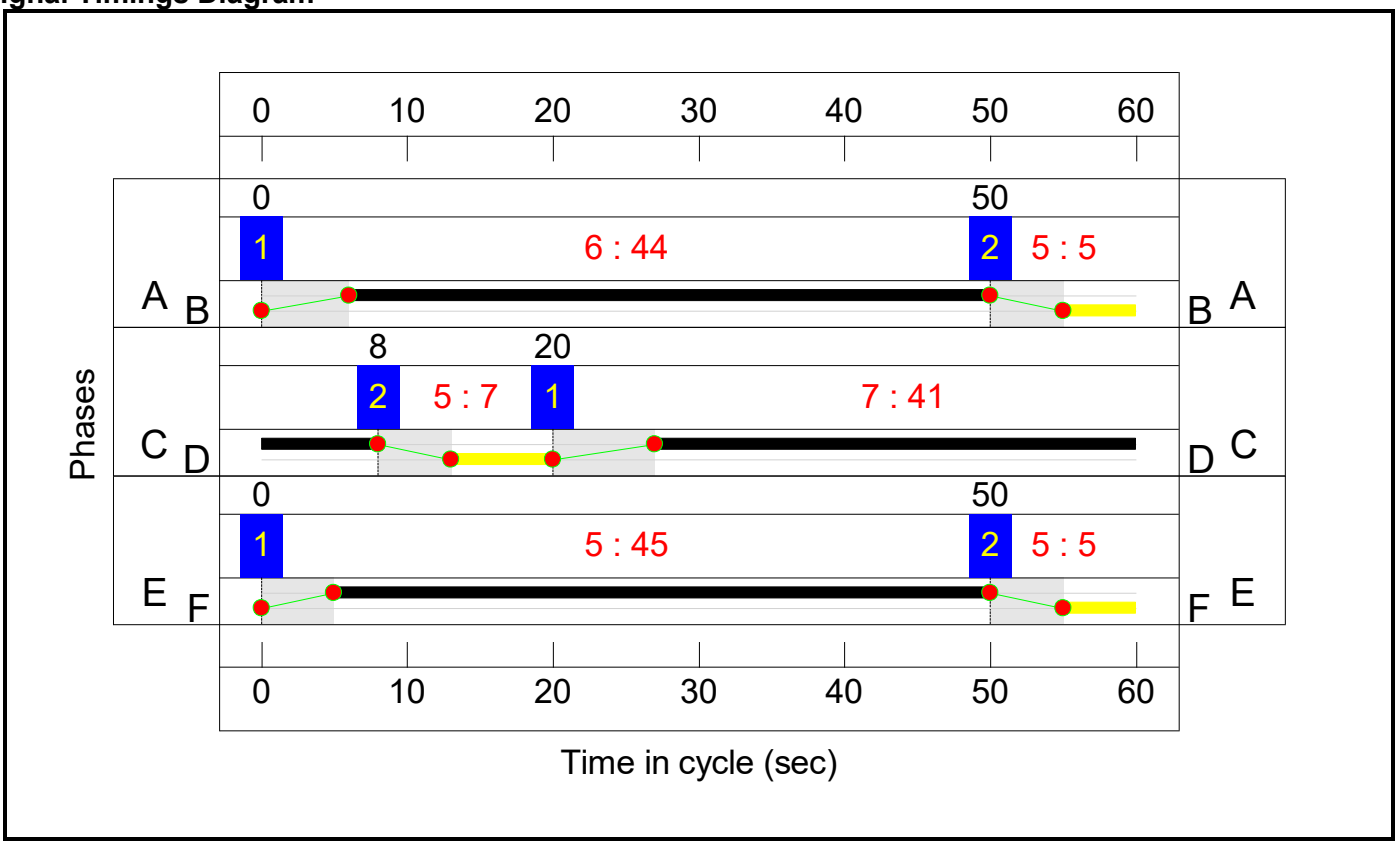
Stage Stream: 2

Stage	1	2
Duration	41	7
Change Point	20	8

Stage Stream: 3

Stage	1	2
Duration	45	5
Change Point	0	50

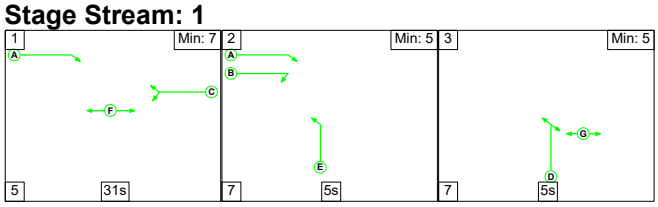
Signal Timings Diagram



C6 - AL site access

Stage Sequence Diagram

Stage Stream: 1

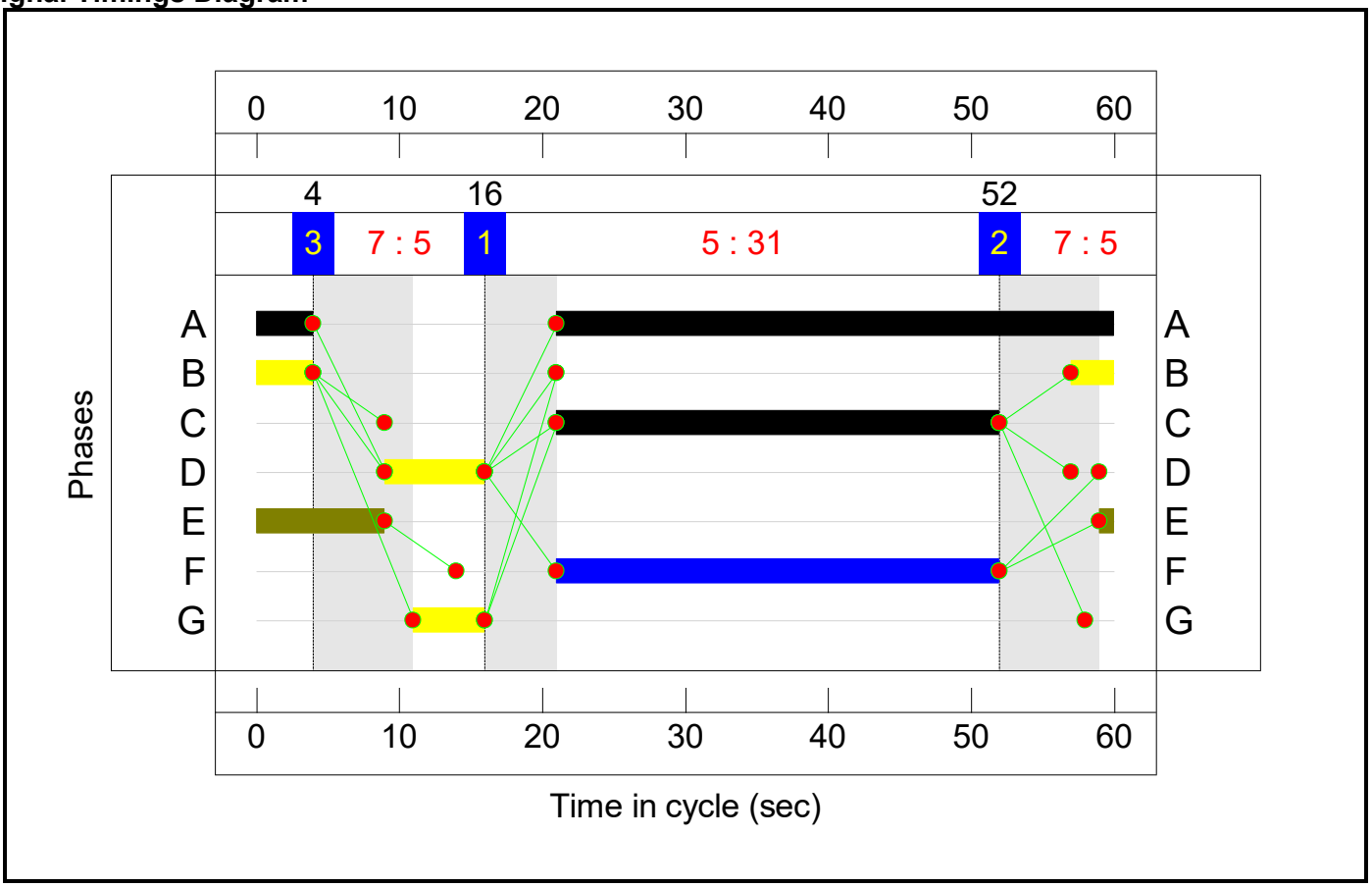


Stage Timings

Stage Stream: 1

Stage	1	2	3
Duration	31	5	5
Change Point	16	52	4

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Option 28 Network Model	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.3%**
J1: Baynards Green	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.3%**
1/2+1/1	A43 North Ahead Left	U	1:1	N/A	C1:B		1	21	-	871	1916:1938	703+379	80.6 : 80.6%
1/3+1/4	A43 North Ahead	U	1:1	N/A	C1:B		1	21	-	1298	2052:2052	752+752	85.2 : 87.3%
2/1	Ahead	U	1:2	N/A	C1:C		1	36	-	568	1956	1239	45.9%
2/2	Ahead	U	1:2	N/A	C1:C		1	36	-	681	2092	1325	51.4%
2/3+2/4	Right Ahead	U	1:2	N/A	C1:C		1	36	-	743	2092:1919	1200+147	55.2 : 55.2%
3/2+3/1	B4100 East Ahead Left	U	1:2	N/A	C1:D		1	11	-	435	2058:1886	412+170	74.8 : 74.8%
3/3	B4100 East Ahead	U	1:2	N/A	C1:D		1	11	-	347	2058	412	84.3%
4/1	Ahead	U	1:3	N/A	C1:E		1	14	-	389	1942	518	75.1%
4/2	Right	U	1:3	N/A	C1:E		1	14	-	347	2066	551	63.0%
5/1	A43 South Ahead Ahead2	U	1:3	N/A	C1:F		1	34	-	907	1927	1124	80.7%
5/2	A43 South Ahead	U	1:3	N/A	C1:F		1	34	-	1045	2058	1200	87.0%
5/3	A43 South Ahead	U	1:3	N/A	C1:F		1	34	-	1039	2058	1200	86.5%
6/1	Ahead	U	1:4	N/A	C1:G		1	40	-	961	1932	1352	71.1%
6/2	Ahead	U	1:4	N/A	C1:G		1	40	-	1191	2066	1446	82.4%
6/3+6/4	Ahead Right	U	1:4	N/A	C1:G		1	40	-	1102	2066:1919	1092+441	71.9 : 71.9%
7/1+7/2	B4100 West Left Ahead	U	1:4	N/A	C1:H		1	8	-	440	1896:2043	284+306	74.5 : 74.4%
8/3		U	N/A	N/A	-		-	-	-	785	2000	2000	39.3%
9/1	Ahead	U	1:1	N/A	C1:A		1	27	-	256	1932	934	27.4%
9/2	Right Ahead	U	1:1	N/A	C1:A		1	27	-	390	2062	997	39.1%
J2: Padbury	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.7%**

1/1	M40 SB offslip Left	U	2:1	N/A	C2:B		1	15	-	269	1908	339	79.3%
1/2+1/3	M40 SB offslip Right	U	2:1	N/A	C2:B		1	15	-	574	1922:3400	342+604	71.1 : 54.8%
2/1	A43 north Ahead	U	2:1	N/A	C2:A		1	61	-	812	1980	1364	59.5%
2/2	A43 north Ahead	U	2:1	N/A	C2:A		1	61	-	776	2120	1460	53.1%
2/3	A43 north Ahead	U	2:1	N/A	C2:A		1	61	-	450	2120	1460	30.8%
5/1	M40 NB offslip Left	U	2:1	N/A	C2:C		1	38	-	679	1980	858	79.1%
5/2+5/3	M40 NB offslip Left	U	2:1	N/A	C2:C		1	38	-	1301	2120:2120	815+762	82.5 : 82.5%
6/1	A43 south Ahead	U	2:1	N/A	C2:D		1	19	-	364	1980	440	82.7%
6/2	A43 south Ahead	U	2:1	N/A	C2:D		1	19	-	378	2120	471	80.2%
J3: Cherwell	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**75.2%**
1/2+1/1	A43 Southbound Left Ahead	U	3:1	N/A	C3:A		1	30	-	1055	2120:1978	931+472	75.2 : 75.2%
1/3	A43 Southbound Ahead	U	3:1	N/A	C3:A		1	30	-	776	2120	1095	70.8%
1/4	A43 Southbound Ahead	U	3:1	N/A	C3:A		1	30	-	351	1980	1023	34.3%
1/5	A43 Southbound Ahead	U	3:1	N/A	C3:A		1	30	-	430	2120	1095	39.3%
2/1	Ahead	U	3:3	N/A	C3:H		1	43	-	612	2015	1478	41.4%
3/1	MSA Left	U	3:2	N/A	C3:C		1	16	-	308	1877	532	57.9%
3/2	MSA Left	U	3:2	N/A	C3:C		1	16	-	317	2052	581	54.5%
6/1	Ahead Right	U	3:1	N/A	C3:B		1	18	-	468	1980	627	74.6%
7/1	Ahead	U	3:2	N/A	C3:D		1	31	-	804	2015	1142	70.4%
7/2	Ahead	U	3:2	N/A	C3:D		1	31	-	883	2155	1221	72.3%
7/3	Ahead	U	3:2	N/A	C3:D		1	31	-	351	2015	1142	30.7%
7/4	Ahead	U	3:2	N/A	C3:D		1	31	-	430	2155	1221	35.2%

J4: Ardley	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**71.5%**
1/1	Ardley bypass Left Ahead	U	4:1	N/A	C4:A		1	38	-	877	1886	1226	71.5%
1/2+1/3	Ardley bypass Ahead	U	4:1	N/A	C4:A		1	38	-	809	2019:2019	1193+361	52.1 : 52.1%
2/1+2/2	B430 Ahead	O	N/A	N/A	-		-	-	-	227	1894:2105	600+124	31.3 : 31.3%
3/1	A43 Southbound Ahead	U	4:2	N/A	C4:C		1	43	-	353	1886	1383	25.5%
3/2+3/3	A43 Southbound Ahead Right	U	4:2	N/A	C4:C		1	43	-	745	2019:2058	925+958	39.6 : 39.6%
4/1	Ahead	U	4:3	N/A	C4:F		1	22	-	357	1919	768	46.5%
4/2	Ahead Right	U	4:3	N/A	C4:F		1	22	-	378	2052	821	46.1%
6/1	Ahead Right	U	4:1	N/A	C4:B		1	12	-	105	1942	453	23.2%
6/2	Right	U	4:1	N/A	C4:B		1	12	-	257	2077	485	53.0%
7/2+7/1	Right	U	4:2	N/A	C4:D		1	7	-	16	2077:1942	252+84	4.8 : 4.8%
8/1	Ahead	U	4:4	N/A	C4:I		1	35	-	815	2015	1209	67.4%
8/2	Ahead	U	4:4	N/A	C4:I		1	35	-	641	2015	1209	53.0%
8/3	Right Ahead	U	4:4	N/A	C4:I		1	35	-	484	2155	1293	37.4%
13/1	Right Right2	U	4:4	N/A	C4:H		1	15	-	379	1942	550	68.9%
14/1	Left Ahead	U	4:3	N/A	C4:E		1	28	-	230	1908	922	24.9%
14/2	Ahead	U	4:3	N/A	C4:E		1	28	-	257	2019	976	26.3%
J5: Baynards Green exit xings	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**51.3%**
1/1	Ahead	U	5:3	N/A	C5:E		1	45	-	473	1980	1518	31.2%
2/1	Ahead	U	5:2	N/A	C5:C		1	41	-	568	1980	1386	41.0%
2/2	Ahead	U	5:2	N/A	C5:C		1	41	-	708	2120	1484	47.7%
2/3	Ahead	U	5:2	N/A	C5:C		1	41	-	762	2120	1484	51.3%
3/1	Ahead	U	5:1	N/A	C5:A		1	44	-	561	1975	1481	37.9%
3/2	Ahead	U	5:1	N/A	C5:A		1	44	-	262	2115	1586	16.5%
J6: Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**66.2%**

1/1+1/2	Ahead Right	U	6:1	N/A	C6:A C6:B		1	43:7	-	823	1980:1828	1402+79	55.5 : 55.5%
3/1	Ahead Left	U	6:1	N/A	C6:C		1	31	-	698	1976	1054	66.2%
4/2+4/1	Right Left	U	6:1	N/A	C6:D	C6:E	1	7:17	10	129	1814:1747	180+524	18.3 : 18.3%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Option 28 Network Model	**-**	**-**	**454**	**0**	**0**	**85.5**	**42.7**	**0.0**	**128.2**	**-**	**-**	**-**	**-**
J1: Baynards Green	**-**	**-**	**0**	**0**	**0**	**28.2**	**19.2**	**0.0**	**47.4**	**-**	**-**	**-**	**-**
1/2+1/1	871	871	-	-	-	3.9	2.0	-	5.9	24.5	8.3	2.0	10.4
1/3+1/4	1298	1298	-	-	-	6.3	3.0	-	9.4	26.1	10.0	3.0	13.1
2/1	568	568	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	681	681	-	-	-	0.0	0.0	-	0.0	0.1	0.3	0.0	0.3
2/3+2/4	743	743	-	-	-	0.0	0.0	-	0.0	0.1	0.9	0.0	0.9
3/2+3/1	435	435	-	-	-	2.4	1.5	-	3.9	32.2	5.0	1.5	6.5
3/3	347	347	-	-	-	2.1	2.5	-	4.5	47.2	5.6	2.5	8.1
4/1	389	389	-	-	-	0.4	0.0	-	0.4	3.5	1.4	0.0	1.4
4/2	347	347	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	907	907	-	-	-	2.5	2.1	-	4.5	18.0	11.8	2.1	13.9
5/2	1045	1045	-	-	-	3.1	3.2	-	6.3	21.7	14.5	3.2	17.7
5/3	1039	1039	-	-	-	3.0	3.1	-	6.1	21.3	14.4	3.1	17.5
6/1	961	961	-	-	-	0.2	0.0	-	0.2	0.7	2.3	0.0	2.3
6/2	1191	1191	-	-	-	0.2	0.0	-	0.2	0.7	2.4	0.0	2.4
6/3+6/4	1102	1102	-	-	-	0.1	0.0	-	0.1	0.5	5.3	0.0	5.3
7/1+7/2	440	440	-	-	-	3.0	1.4	-	4.4	36.1	3.6	1.4	5.0
8/3	785	785	-	-	-	0.0	0.3	-	0.3	1.5	0.6	0.3	0.9
9/1	256	256	-	-	-	0.4	0.0	-	0.4	6.1	2.2	0.0	2.2
9/2	390	390	-	-	-	0.5	0.0	-	0.5	4.2	2.3	0.0	2.3
J2: Padbury	**-**	**-**	**0**	**0**	**0**	**30.5**	**12.5**	**0.0**	**43.0**	**-**	**-**	**-**	**-**
1/1	269	269	-	-	-	2.6	1.8	-	4.5	59.8	6.4	1.8	8.2
1/2+1/3	574	574	-	-	-	5.5	0.8	-	6.2	39.0	5.7	0.8	6.4
2/1	812	812	-	-	-	1.7	0.7	-	2.4	10.6	10.6	0.7	11.3
2/2	776	776	-	-	-	1.5	0.6	-	2.0	9.5	9.5	0.6	10.1
2/3	450	450	-	-	-	0.7	0.2	-	0.9	7.3	4.4	0.2	4.6

5/1	679	679	-	-	-	4.1	1.9	-	6.0	31.8	14.5	1.9	16.4
5/2+5/3	1301	1301	-	-	-	7.5	2.3	-	9.9	27.3	13.8	2.3	16.1
6/1	364	364	-	-	-	3.4	2.3	-	5.6	55.7	8.6	2.3	10.9
6/2	378	378	-	-	-	3.5	1.9	-	5.4	51.7	8.9	1.9	10.9
J3: Cherwell	**-**	**-**	**0**	**0**	**0**	**12.4**	**4.6**	**0.0**	**17.0**	**-**	**-**	**-**	**-**
1/2+1/1	1055	1055	-	-	-	2.9	1.5	-	4.4	14.9	8.4	1.5	9.9
1/3	776	776	-	-	-	2.4	1.2	-	3.6	16.7	9.7	1.2	10.9
1/4	351	351	-	-	-	0.8	0.3	-	1.1	11.2	3.4	0.3	3.7
1/5	430	430	-	-	-	1.1	0.3	-	1.4	11.5	4.3	0.3	4.6
2/1	612	612	-	-	-	0.2	0.0	-	0.2	1.3	4.0	0.0	4.0
3/1	308	308	-	-	-	1.6	0.7	-	2.3	26.4	4.4	0.7	5.0
3/2	317	317	-	-	-	1.6	0.6	-	2.2	25.0	4.4	0.6	5.0
6/1	468	468	-	-	-	1.0	0.0	-	1.0	7.5	7.2	0.0	7.2
7/1	804	804	-	-	-	0.5	0.0	-	0.5	2.1	2.3	0.0	2.3
7/2	883	883	-	-	-	0.4	0.0	-	0.4	1.7	1.8	0.0	1.8
7/3	351	351	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/4	430	430	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J4: Ardley	**-**	**-**	**454**	**0**	**0**	**10.6**	**4.8**	**0.0**	**15.4**	**-**	**-**	**-**	**-**
1/1	877	877	-	-	-	1.7	1.2	-	2.9	12.0	9.5	1.2	10.7
1/2+1/3	809	809	-	-	-	1.1	0.5	-	1.7	7.4	5.2	0.5	5.7
2/1+2/2	227	227	454	0	0	0.1	0.2	-	0.3	5.1	1.0	0.2	1.2
3/1	353	353	-	-	-	0.2	0.2	-	0.4	3.9	1.1	0.2	1.3
3/2+3/3	745	745	-	-	-	0.3	0.3	-	0.6	2.8	6.9	0.3	7.2
4/1	357	357	-	-	-	0.4	0.0	-	0.4	4.3	1.2	0.0	1.2
4/2	378	378	-	-	-	0.5	0.0	-	0.5	4.7	1.4	0.0	1.4
6/1	105	105	-	-	-	0.5	0.0	-	0.5	18.1	1.6	0.0	1.6
6/2	257	257	-	-	-	0.8	0.0	-	0.8	10.9	3.7	0.0	3.7
7/2+7/1	16	16	-	-	-	0.1	0.0	-	0.1	21.7	0.1	0.0	0.2
8/1	815	815	-	-	-	1.0	1.0	-	2.1	9.2	3.6	1.0	4.6
8/2	641	641	-	-	-	0.7	0.6	-	1.3	7.2	2.2	0.6	2.8
8/3	484	484	-	-	-	0.9	0.3	-	1.2	8.9	5.3	0.3	5.6

13/1	379	379	-	-	-	1.1	0.0	-	1.1	10.2	1.9	0.0	1.9
14/1	230	230	-	-	-	0.6	0.2	-	0.7	11.7	2.2	0.2	2.4
14/2	257	257	-	-	-	0.7	0.2	-	0.8	11.7	2.5	0.2	2.7
J5: Baynards Green exit xings	**-**	**-**	**0**	**0**	**0**	**0.6**	**0.0**	**0.0**	**0.6**	**-**	**-**	**-**	**-**
1/1	473	473	-	-	-	0.1	0.0	-	0.1	0.6	0.6	0.0	0.6
2/1	568	568	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	708	708	-	-	-	0.1	0.0	-	0.1	0.3	0.5	0.0	0.5
2/3	762	762	-	-	-	0.3	0.0	-	0.3	1.3	1.7	0.0	1.7
3/1	561	561	-	-	-	0.2	0.0	-	0.2	1.2	1.2	0.0	1.2
3/2	262	262	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J6: Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**3.1**	**1.7**	**0.0**	**4.8**	**-**	**-**	**-**	**-**
1/1+1/2	823	823	-	-	-	0.5	0.6	-	1.2	5.1	11.2	0.6	11.8
3/1	698	698	-	-	-	2.0	1.0	-	2.9	15.1	8.3	1.0	9.3
4/2+4/1	129	129	-	-	-	0.6	0.1	-	0.7	20.6	1.2	0.1	1.3

C1 - Baynards Green	Stream: 1 PRC for Signalled Lanes (%):	3.1	Total Delay for Signalled Lanes (pcuHr):	16.22	Cycle Time (s): 60
C1 - Baynards Green	Stream: 2 PRC for Signalled Lanes (%):	6.8	Total Delay for Signalled Lanes (pcuHr):	8.47	Cycle Time (s): 60
C1 - Baynards Green	Stream: 3 PRC for Signalled Lanes (%):	3.4	Total Delay for Signalled Lanes (pcuHr):	17.34	Cycle Time (s): 60
C1 - Baynards Green	Stream: 4 PRC for Signalled Lanes (%):	9.3	Total Delay for Signalled Lanes (pcuHr):	5.00	Cycle Time (s): 60
C2 - Padbury	Stream: 1 PRC for Signalled Lanes (%):	8.8	Total Delay for Signalled Lanes (pcuHr):	42.97	Cycle Time (s): 90
C3 - Cherwell	Stream: 1 PRC for Signalled Lanes (%):	19.7	Total Delay for Signalled Lanes (pcuHr):	11.41	Cycle Time (s): 60
C3 - Cherwell	Stream: 2 PRC for Signalled Lanes (%):	24.5	Total Delay for Signalled Lanes (pcuHr):	5.37	Cycle Time (s): 60
C3 - Cherwell	Stream: 3 PRC for Signalled Lanes (%):	117.3	Total Delay for Signalled Lanes (pcuHr):	0.22	Cycle Time (s): 60
C4 - Ardley	Stream: 1 PRC for Signalled Lanes (%):	25.8	Total Delay for Signalled Lanes (pcuHr):	5.90	Cycle Time (s): 60
C4 - Ardley	Stream: 2 PRC for Signalled Lanes (%):	127.5	Total Delay for Signalled Lanes (pcuHr):	1.06	Cycle Time (s): 60
C4 - Ardley	Stream: 3 PRC for Signalled Lanes (%):	93.5	Total Delay for Signalled Lanes (pcuHr):	2.50	Cycle Time (s): 60
C4 - Ardley	Stream: 4 PRC for Signalled Lanes (%):	30.7	Total Delay for Signalled Lanes (pcuHr):	5.63	Cycle Time (s): 60
C5 - Baynards Green exit xings	Stream: 1 PRC for Signalled Lanes (%):	137.6	Total Delay for Signalled Lanes (pcuHr):	0.18	Cycle Time (s): 60
C5 - Baynards Green exit xings	Stream: 2 PRC for Signalled Lanes (%):	75.3	Total Delay for Signalled Lanes (pcuHr):	0.33	Cycle Time (s): 60
C5 - Baynards Green exit xings	Stream: 3 PRC for Signalled Lanes (%):	188.8	Total Delay for Signalled Lanes (pcuHr):	0.08	Cycle Time (s): 60
C6 - AL site access	Stream: 1 PRC for Signalled Lanes (%):	35.9	Total Delay for Signalled Lanes (pcuHr):	4.84	Cycle Time (s): 60
	PRC Over All Lanes (%):	3.1	Total Delay Over All Lanes(pcuHr):	128.17	

APPENDIX G

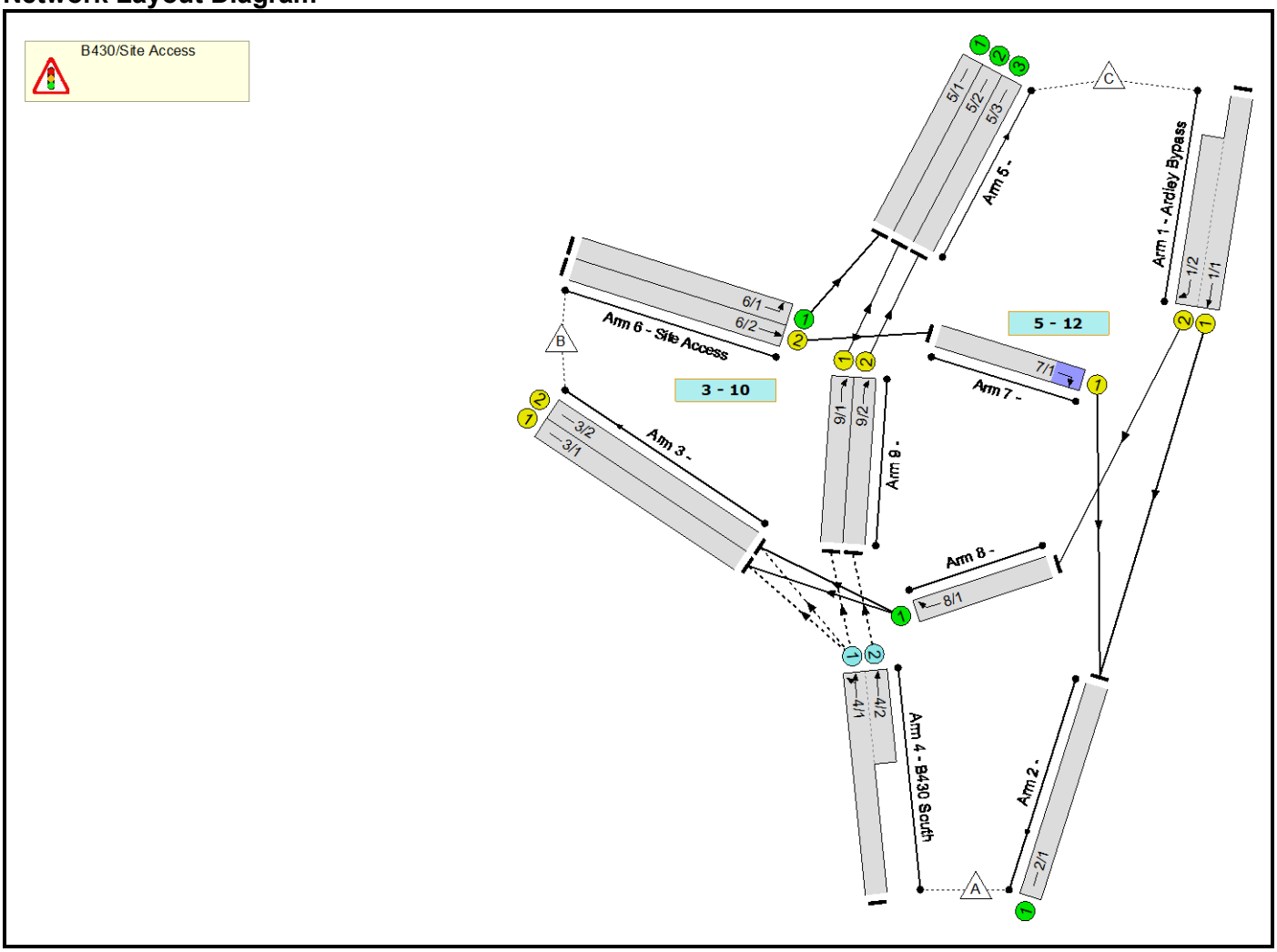
PRINCIPAL SITE ACCESS LINSIG REPORT

Full Input Data And Results

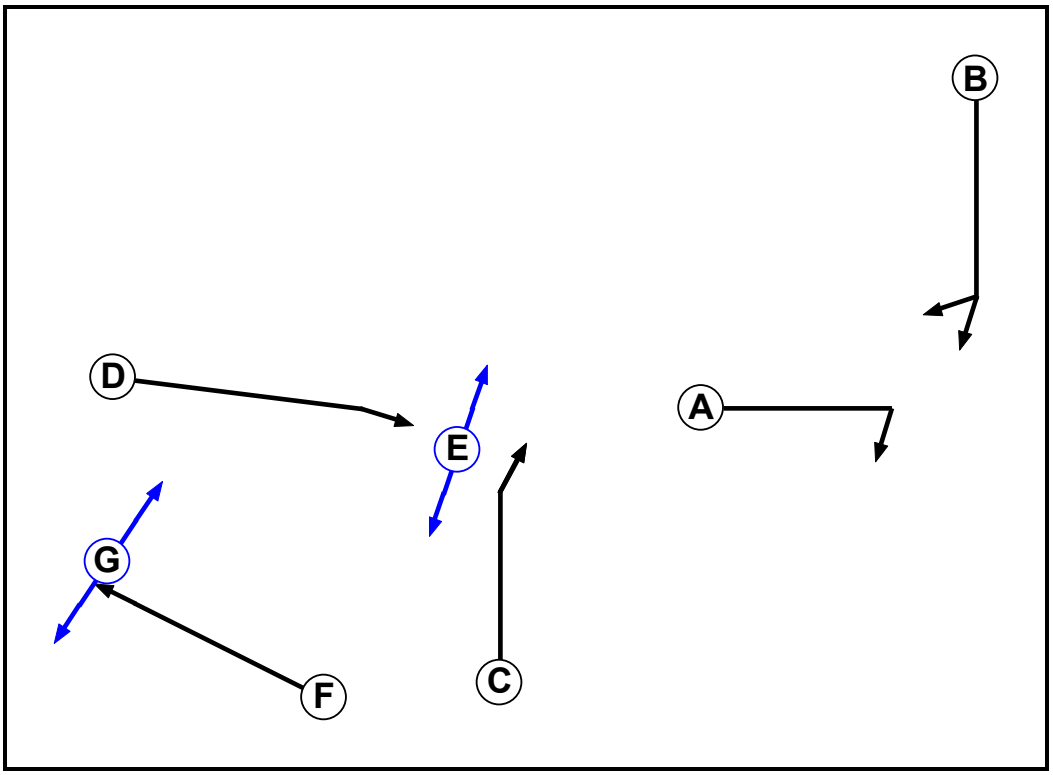
User and Project Details

Project:	**OxSRFI**
Title:	**Proposed site access gyratory**
Location:	
Additional detail:	
File name:	250902 Site Access gyratory (actual flows).lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7
E	Pedestrian	2		6	6
F	Traffic	3		7	7
G	Pedestrian	3		5	5

Phase Intergreens Matrix

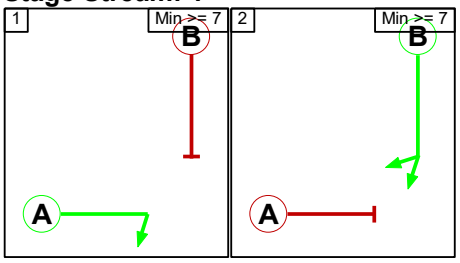
		Starting Phase						
		A	B	C	D	E	F	G
Terminating Phase	A		5	-	-	-	-	-
	B	5		-	-	-	-	-
	C	-	-		5	-	-	-
	D	-	-	5		5	-	-
	E	-	-	-	5		-	-
	F	-	-	-	-	-		5
	G	-	-	-	-	-	6	

Phases in Stage

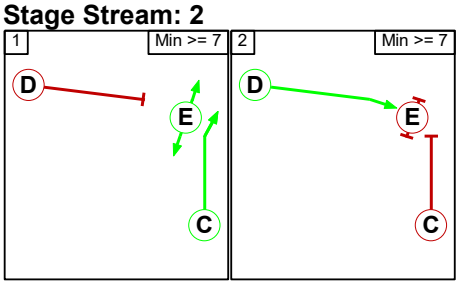
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C E
2	2	D
3	1	F
3	2	G

Stage Diagram

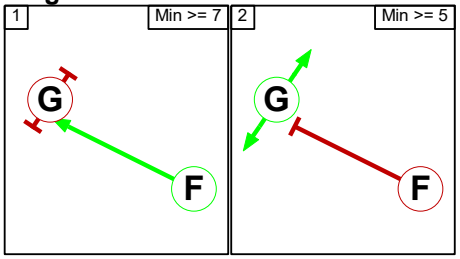
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Phase Delays

Stage Stream: 1

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

Stage Stream: 2

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

Stage Stream: 3

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

Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		5
	2	5	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		5
	2	5	

Stage Stream: 3

	To Stage		
From Stage		1	2
	1		5
	2	6	

Give-Way Lane Input Data

Junction: B430/Site Access											
Lane	**Movement**	**Max Flow when Giving Way (PCU/Hr)**	**Min Flow when Giving Way (PCU/Hr)**	**Opposing Lane**	**Opp. Lane Coeff.**	**Opp. Mvmnts.**	**Right Turn Storage (PCU)**	**Non-Blocking Storage (PCU)**	**RTF**	**Right Turn Move up (s)**	**Max Turns in Intergreen (PCU)**
4/1 (B430 South)	3/1 (Left)	1177	0	8/1	0.34	All	-	-	-	-	-
	3/2 (Left)	1177	0	8/1	0.34	All					
	9/1 (Ahead)	1177	0	8/1	0.34	All					
4/2 (B430 South)	9/2 (Ahead)	1174	0	8/1	0.34	All	-	-	-	-	-

Lane Input Data

Junction: B430/Site Access												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (Ardley Bypass)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 2 Ahead	Inf
1/2 (Ardley Bypass)	U	B	2	3	15.1	Geom	-	3.65	0.00	N	Arm 8 Right	50.00
2/1	U		2	3	60.0	Inf	-	-	-	-	-	-
3/1	U	F	2	3	10.4	Geom	-	3.50	0.00	Y		
3/2	U	F	2	3	10.4	Geom	-	3.55	0.00	Y		
4/1 (B430 South)	O		2	3	60.0	Geom	-	3.50	0.00	Y	Arm 3 Left	30.00
											Arm 9 Ahead	Inf
4/2 (B430 South)	O		2	3	6.3	Inf	-	-	-	-	-	-
5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
5/2	U		2	3	60.0	Inf	-	-	-	-	-	-
5/3	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Site Access)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/2 (Site Access)	U	D	2	3	60.0	Geom	-	3.50	0.00	N	Arm 7 Ahead	Inf
7/1	U	A	2	3	7.8	Geom	-	3.50	0.00	Y	Arm 2 Right	Inf
8/1	U		2	3	13.0	Inf	-	-	-	-	-	-
9/1	U	C	2	3	9.6	Geom	-	3.50	0.00	Y	Arm 5 Ahead	Inf
9/2	U	C	2	3	9.6	Geom	-	3.50	0.00	Y	Arm 5 Ahead	Inf

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2034 DS3A - AM'	08:00	09:00	01:00	
2: '2034 DS3A - PM'	17:00	18:00	01:00	

Scenario 1: '2034 DS3A - Morning Peak' (FG1: '2034 DS3A - AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	365	424	789
	B	57	0	356	413
	C	737	845	0	1582
	Tot.	794	1210	780	2784

Traffic Lane Flows

Lane	Scenario 1: 2034 DS3A - Morning Peak
Junction: B430/Site Access	
1/1 (with short)	1582(In) 737(Out)
1/2 (short)	845
2/1	794
3/1	599
3/2	611
4/1 (with short)	789(In) 547(Out)
4/2 (short)	242
5/1	356
5/2	182
5/3	242
6/1	356
6/2	57
7/1	57
8/1	845
9/1	182
9/2	242

Lane Saturation Flows

Junction: B430/Site Access

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Ardley Bypass)	3.65	0.00	Y	Arm 2 Ahead	Inf	100.0 %	1980	1980
1/2 (Ardley Bypass)	3.65	0.00	N	Arm 8 Right	50.00	100.0 %	2058	2058
2/1	Infinite Saturation Flow						Inf	Inf
3/1	3.50	0.00	Y				1965	1965
3/2	3.55	0.00	Y				1970	1970
4/1 (B430 South)	3.50	0.00	Y	Arm 3 Left	30.00	66.7 %	1902	1902
				Arm 9 Ahead	Inf	33.3 %		
4/2 (B430 South Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
5/3	Infinite Saturation Flow						Inf	Inf
6/1 (Site Access Lane 1)	Infinite Saturation Flow						Inf	Inf
6/2 (Site Access)	3.50	0.00	N	Arm 7 Ahead	Inf	100.0 %	2105	2105
7/1	3.50	0.00	Y	Arm 2 Right	Inf	100.0 %	1965	1965
8/1	Infinite Saturation Flow						Inf	Inf
9/1	3.50	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1965	1965
9/2	3.50	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1965	1965

Scenario 2: '2034 DS3A - Evening Peak' (FG2: '2034 DS3A - PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	150	753	903
	B	388	0	934	1322
	C	402	456	0	858
	Tot.	790	606	1687	3083

Traffic Lane Flows

Lane	Scenario 2: 2034 DS3A - Evening Peak
Junction: B430/Site Access	
1/1 (with short)	858(In) 402(Out)
1/2 (short)	456
2/1	790
3/1	302
3/2	304
4/1 (with short)	903(In) 526(Out)
4/2 (short)	377
5/1	934
5/2	376
5/3	377
6/1	934
6/2	388
7/1	388
8/1	456
9/1	376
9/2	377

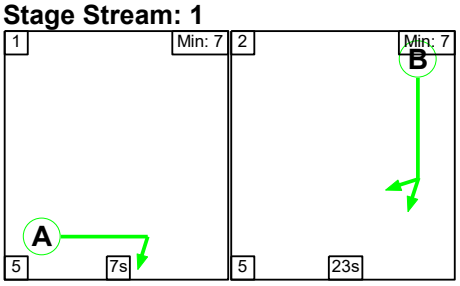
Lane Saturation Flows

Junction: B430/Site Access								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Ardley Bypass)	3.65	0.00	Y	Arm 2 Ahead	Inf	100.0 %	1980	1980
1/2 (Ardley Bypass)	3.65	0.00	N	Arm 8 Right	50.00	100.0 %	2058	2058
2/1	Infinite Saturation Flow						Inf	Inf
3/1	3.50	0.00	Y				1965	1965
3/2	3.55	0.00	Y				1970	1970
4/1 (B430 South)	3.50	0.00	Y	Arm 3 Left	30.00	28.5 %	1937	1937
				Arm 9 Ahead	Inf	71.5 %		
4/2 (B430 South Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
5/2	Infinite Saturation Flow						Inf	Inf
5/3	Infinite Saturation Flow						Inf	Inf
6/1 (Site Access Lane 1)	Infinite Saturation Flow						Inf	Inf
6/2 (Site Access)	3.50	0.00	N	Arm 7 Ahead	Inf	100.0 %	2105	2105
7/1	3.50	0.00	Y	Arm 2 Right	Inf	100.0 %	1965	1965
8/1	Infinite Saturation Flow						Inf	Inf
9/1	3.50	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1965	1965
9/2	3.50	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1965	1965

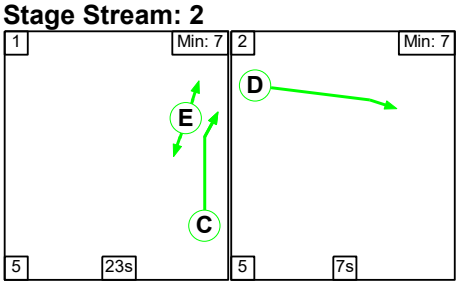
Scenario 1: '2034 DS3A - Morning Peak' (FG1: '2034 DS3A - AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

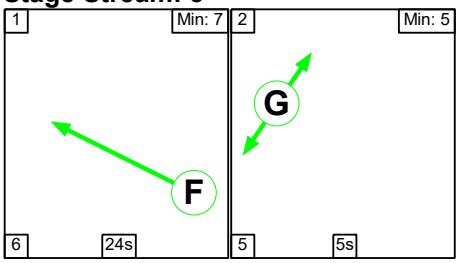
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	7	23
Change Point	0	12

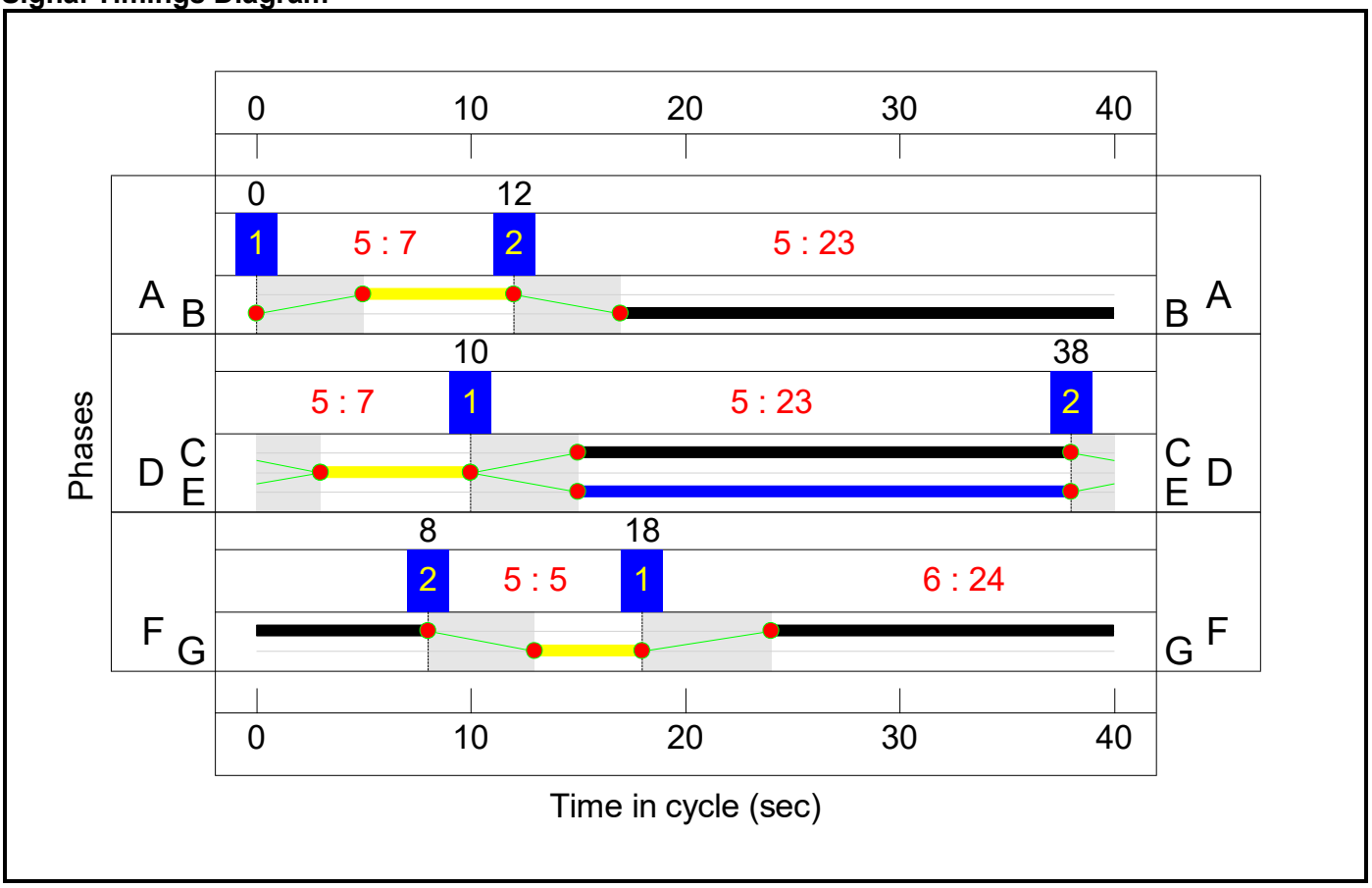
Stage Stream: 2

Stage	1	2
Duration	23	7
Change Point	10	38

Stage Stream: 3

Stage	1	2
Duration	24	5
Change Point	18	8

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Proposed site access gyratory	-	-	**N/A**	-	-		-	-	-	-	-	-	**78.3%**
B430/Site Access	-	-	**N/A**	-	-		-	-	-	-	-	-	**78.3%**
1/1+1/2	Ardley Bypass Ahead Right	U	1	N/A	B		1	23	-	1582	1980:2058	941+1079	78.3 : 78.3%
2/1		U	N/A	N/A	-		-	-	-	794	Inf	Inf	0.0%
3/1		U	3	N/A	F		1	24	-	599	1965	1228	48.8%
3/2		U	3	N/A	F		1	24	-	611	1970	1231	49.6%
4/1+4/2	B430 South Left Ahead	O	N/A	N/A	-		-	-	-	789	1902: Inf	890+394	61.5 : 61.5%
5/1		U	N/A	N/A	-		-	-	-	356	Inf	Inf	0.0%
5/2		U	N/A	N/A	-		-	-	-	182	Inf	Inf	0.0%
5/3		U	N/A	N/A	-		-	-	-	242	Inf	Inf	0.0%
6/1	Site Access Left	U	N/A	N/A	-		-	-	-	356	Inf	Inf	0.0%
6/2	Site Access Ahead	U	2	N/A	D		1	7	-	57	2105	421	13.5%
7/1	Right	U	1	N/A	A		1	7	-	57	1965	393	14.5%
8/1	Right	U	N/A	N/A	-		-	-	-	845	Inf	Inf	0.0%
9/1	Ahead	U	2	N/A	C		1	23	-	182	1965	1179	15.4%
9/2	Ahead	U	2	N/A	C		1	23	-	242	1965	1179	20.5%

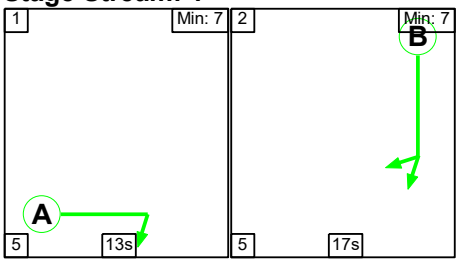
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Proposed site access gyratory	**-**	**-**	**1578**	**0**	**0**	**3.4**	**3.8**	**0.0**	**7.3**	**-**	**-**	**-**	**-**
B430/Site Access	**-**	**-**	**1578**	**0**	**0**	**3.4**	**3.8**	**0.0**	**7.3**	**-**	**-**	**-**	**-**
1/1+1/2	1582	1582	-	-	-	2.3	1.8	-	4.1	9.3	6.3	1.8	8.1
2/1	794	794	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	599	599	-	-	-	0.2	0.5	-	0.7	4.3	1.3	0.5	1.8
3/2	611	611	-	-	-	0.2	0.5	-	0.7	4.2	1.2	0.5	1.7
4/1+4/2	789	789	1578	0	0	0.0	0.8	-	0.8	3.7	1.4	0.8	2.2
5/1	356	356	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	182	182	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/3	242	242	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	356	356	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	57	57	-	-	-	0.2	0.1	-	0.3	18.1	0.5	0.1	0.6
7/1	57	57	-	-	-	0.0	0.0	-	0.0	0.6	0.0	0.0	0.0
8/1	845	845	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	182	182	-	-	-	0.2	0.1	-	0.3	5.5	0.9	0.1	1.0
9/2	242	242	-	-	-	0.2	0.1	-	0.4	5.6	1.2	0.1	1.3

C1	Stream: 1 PRC for Signalled Lanes (%):	15.0	Total Delay for Signalled Lanes (pcuHr):	4.12	Cycle Time (s): 40
C1	Stream: 2 PRC for Signalled Lanes (%):	338.5	Total Delay for Signalled Lanes (pcuHr):	0.94	Cycle Time (s): 40
C1	Stream: 3 PRC for Signalled Lanes (%):	81.4	Total Delay for Signalled Lanes (pcuHr):	1.43	Cycle Time (s): 40
	PRC Over All Lanes (%):	15.0	Total Delay Over All Lanes(pcuHr):	7.30	

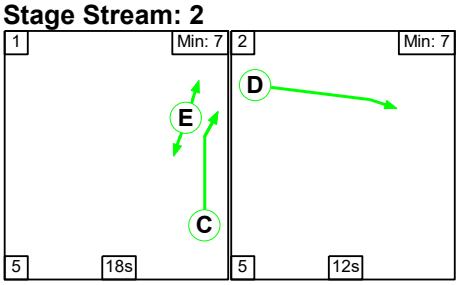
Scenario 2: '2034 DS3A - Evening Peak' (FG2: '2034 DS3A - PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

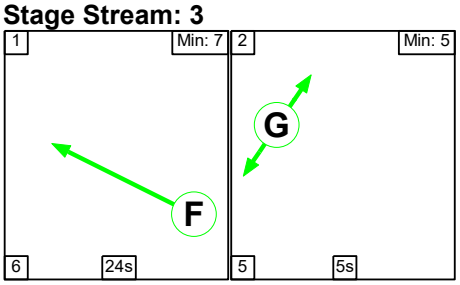
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	13	17
Change Point	0	18

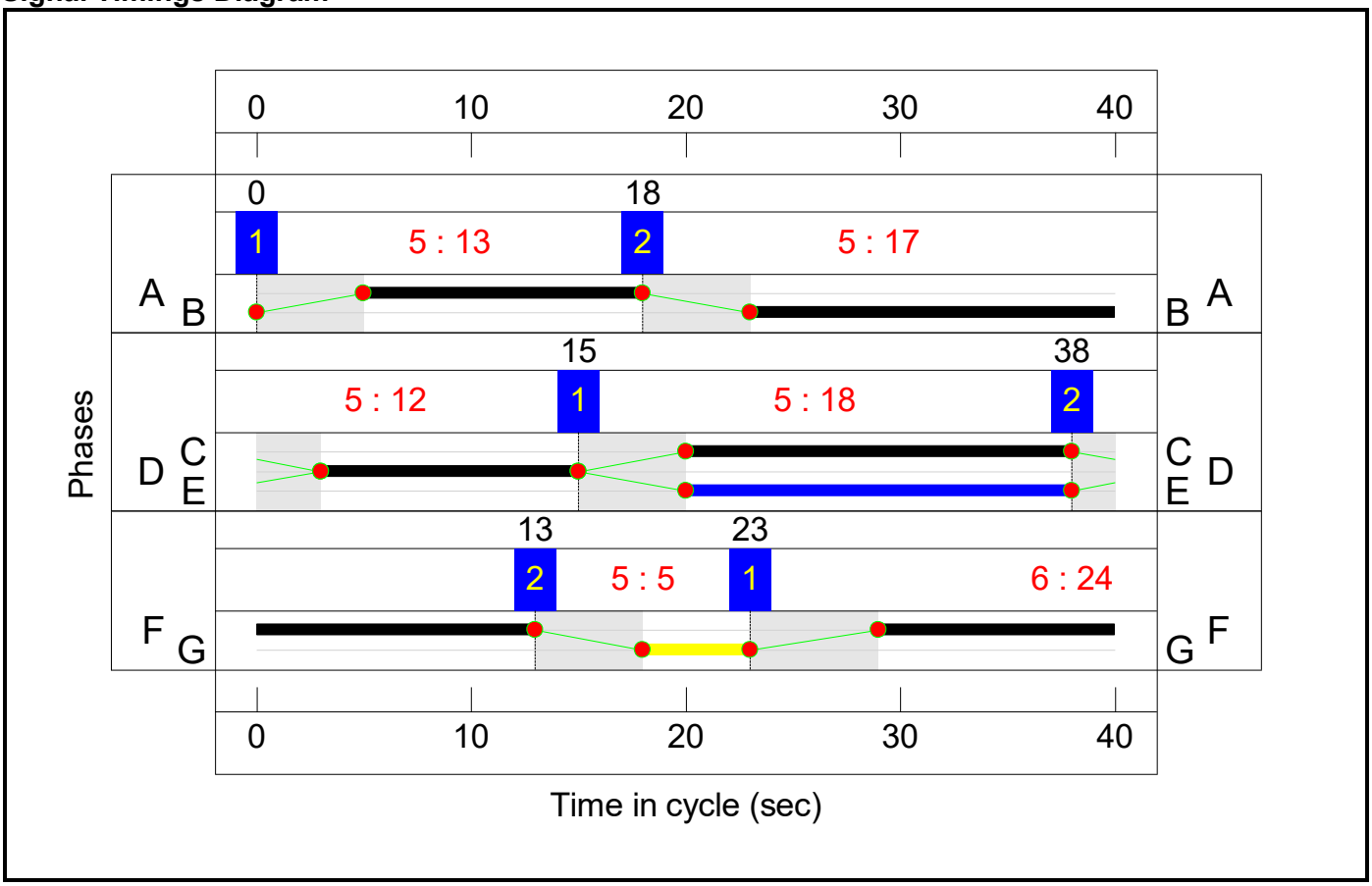
Stage Stream: 2

Stage	1	2
Duration	18	12
Change Point	15	38

Stage Stream: 3

Stage	1	2
Duration	24	5
Change Point	23	13

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Proposed site access gyratory	-	-	**N/A**	-	-		-	-	-	-	-	-	**56.7%**
B430/Site Access	-	-	**N/A**	-	-		-	-	-	-	-	-	**56.7%**
1/1+1/2	Ardley Bypass Ahead Right	U	1	N/A	B		1	17	-	858	1980:2058	891+926	45.1 : 49.2%
2/1		U	N/A	N/A	-		-	-	-	790	Inf	Inf	0.0%
3/1		U	3	N/A	F		1	24	-	302	1965	1228	24.6%
3/2		U	3	N/A	F		1	24	-	304	1970	1231	24.7%
4/1+4/2	B430 South Left Ahead	O	N/A	N/A	-		-	-	-	903	1937: Inf	1022+732	51.5 : 51.5%
5/1		U	N/A	N/A	-		-	-	-	934	Inf	Inf	0.0%
5/2		U	N/A	N/A	-		-	-	-	376	Inf	Inf	0.0%
5/3		U	N/A	N/A	-		-	-	-	377	Inf	Inf	0.0%
6/1	Site Access Left	U	N/A	N/A	-		-	-	-	934	Inf	Inf	0.0%
6/2	Site Access Ahead	U	2	N/A	D		1	12	-	388	2105	684	56.7%
7/1	Right	U	1	N/A	A		1	13	-	388	1965	688	56.4%
8/1	Right	U	N/A	N/A	-		-	-	-	456	Inf	Inf	0.0%
9/1	Ahead	U	2	N/A	C		1	18	-	376	1965	933	40.3%
9/2	Ahead	U	2	N/A	C		1	18	-	377	1965	933	40.4%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Proposed site access gyratory	**-**	**-**	**1806**	**0**	**0**	**4.6**	**2.6**	**0.0**	**7.3**	**-**	**-**	**-**	**-**
B430/Site Access	**-**	**-**	**1806**	**0**	**0**	**4.6**	**2.6**	**0.0**	**7.3**	**-**	**-**	**-**	**-**
1/1+1/2	858	858	-	-	-	1.8	0.4	-	2.3	9.6	3.5	0.4	4.0
2/1	790	790	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	302	302	-	-	-	0.1	0.2	-	0.3	3.2	0.6	0.2	0.7
3/2	304	304	-	-	-	0.0	0.2	-	0.2	2.3	0.1	0.2	0.3
4/1+4/2	903	903	1806	0	0	0.0	0.5	-	0.5	2.1	0.3	0.5	0.8
5/1	934	934	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	376	376	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/3	377	377	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	934	934	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	388	388	-	-	-	1.2	0.7	-	1.9	17.2	3.6	0.7	4.2
7/1	388	388	-	-	-	0.0	0.0	-	0.0	0.2	0.1	0.0	0.1
8/1	456	456	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	376	376	-	-	-	0.7	0.3	-	1.0	10.1	2.6	0.3	2.9
9/2	377	377	-	-	-	0.7	0.3	-	1.1	10.1	2.6	0.3	3.0

C1	Stream: 1 PRC for Signalled Lanes (%):	59.5	Total Delay for Signalled Lanes (pcuHr):	2.31	Cycle Time (s): 40
C1	Stream: 2 PRC for Signalled Lanes (%):	58.7	Total Delay for Signalled Lanes (pcuHr):	3.96	Cycle Time (s): 40
C1	Stream: 3 PRC for Signalled Lanes (%):	264.5	Total Delay for Signalled Lanes (pcuHr):	0.46	Cycle Time (s): 40
	PRC Over All Lanes (%):	58.7	Total Delay Over All Lanes(pcuHr):	7.25	

APPENDIX H

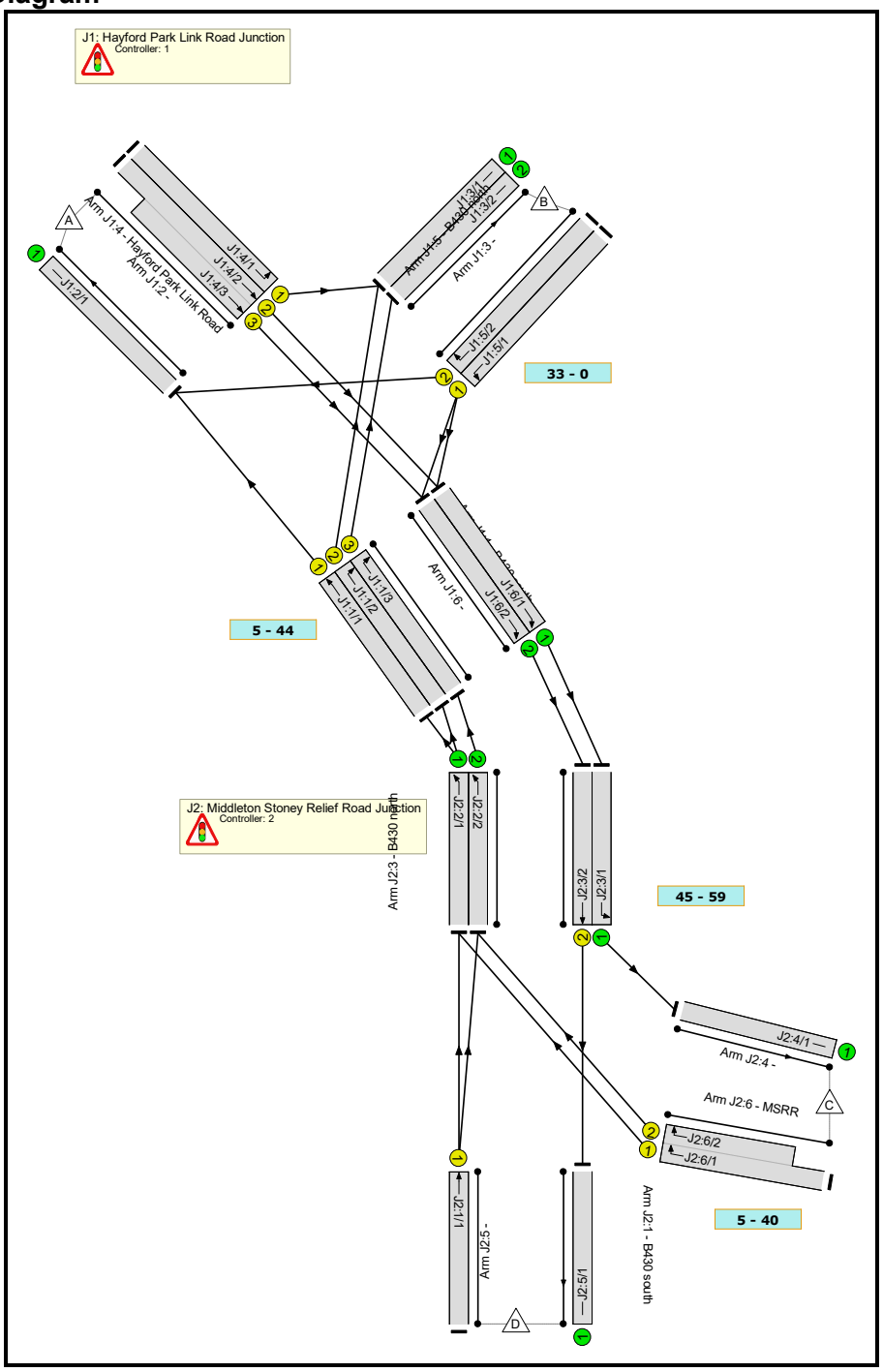
B430/MSRR AND B430/HPLR NETWORK LINGSIG REPORT

Full Input Data And Results

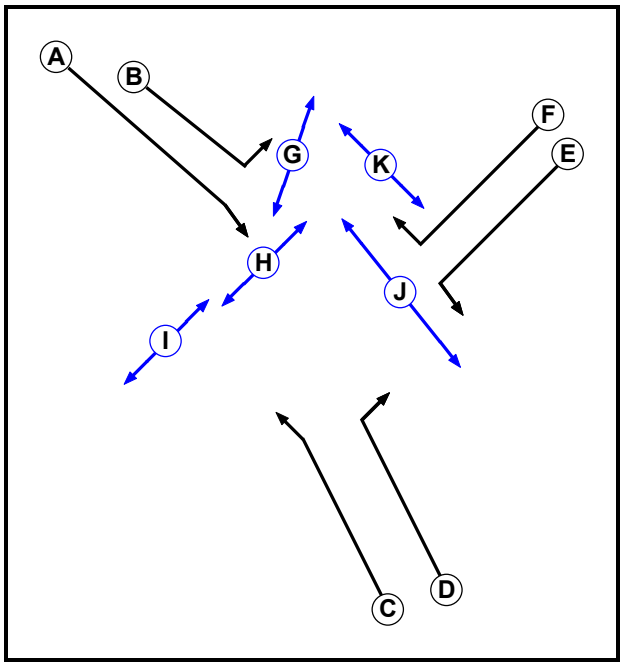
User and Project Details

Project:	**OxSRFI**
Title:	**Propesed Hayford Park Link Road to Middleton Stoney Releif Road**
Location:	
Additional detail:	Network Model
File name:	250902 B430_HPLR_MSRR network model.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



C1
Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		7	7
F	Traffic		7	7
G	Pedestrian		5	5
H	Pedestrian		6	6
I	Pedestrian		5	5
J	Pedestrian		7	7
K	Pedestrian		7	7

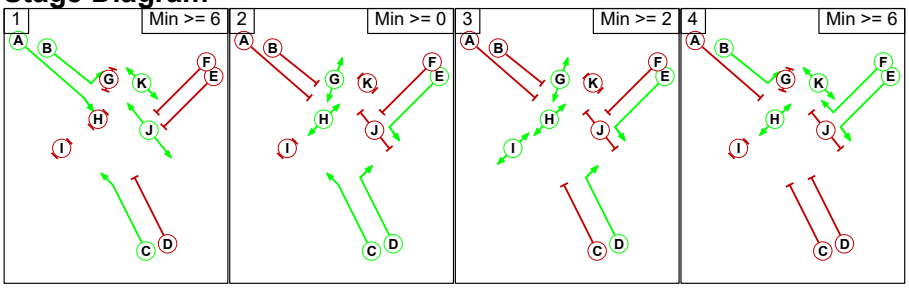
Phase Intergreens Matrix

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

Phases in Stage

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

Stage Diagram



Phase Delays

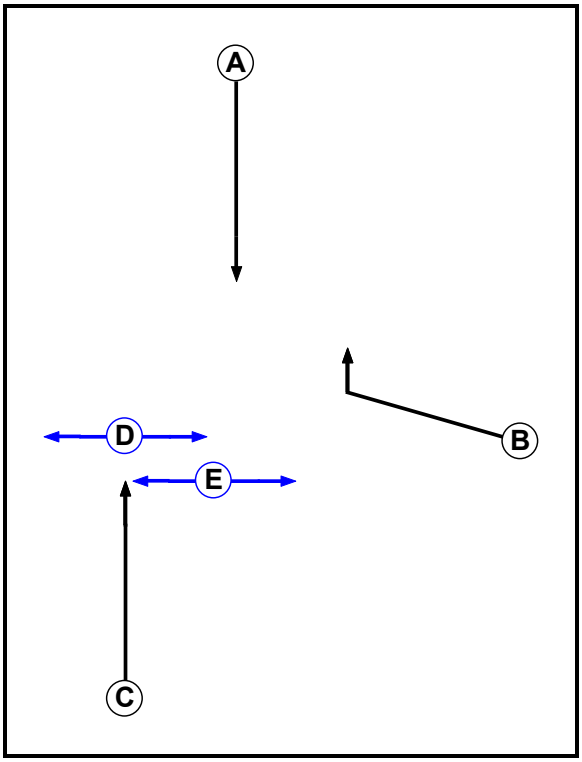
Term. Stage	Start Stage	Phase	Type	Value	Cont value
2	4	C	Losing	1	1

Prohibited Stage Change

		To Stage			
		1	2	3	4
From Stage	1		8	8	8
	2	7		5	7
	3	7	5		7
	4	6	6	6	

C2

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	6
D	Pedestrian		5	5
E	Pedestrian		5	5

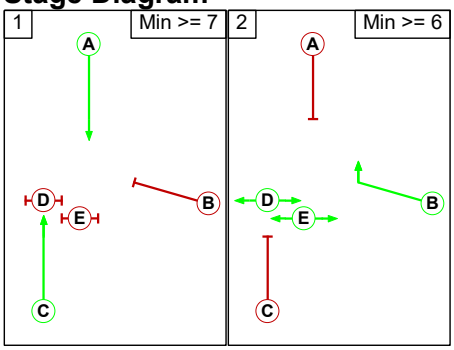
Phase Intergreens Matrix

		Starting Phase				
		A	B	C	D	E
Terminating Phase	A		6	-	-	7
	B	5		5	-	-
	C	-	5		5	-
	D	-	-	5		-
	E	5	-	-	-	

Phases in Stage

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

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	C	Losing	1	1

Prohibited Stage Change

	To Stage		
		1	2
From Stage	1		7
	2	5	

Lane Input Data

Junction: J1: Hayford Park Link Road Junction												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
J1:1/1 (B430 south)	U	C	2	3	31.3	Geom	-	3.50	0.00	Y	Arm J1:2 Ahead	Inf
J1:1/2 (B430 south)	U	D	2	3	31.3	Geom	-	3.50	0.00	Y	Arm J1:3 Right	40.00
J1:1/3 (B430 south)	U	D	2	3	31.3	Geom	-	3.50	0.00	Y	Arm J1:3 Right	40.00
J1:2/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:3/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:3/2	U		2	3	60.0	User	1900	-	-	-	-	-
J1:4/1 (Hayford Park Link Road)	U	B	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:3 Left	15.00
J1:4/2 (Hayford Park Link Road)	U	A	2	3	60.0	Geom	-	3.65	0.00	Y	Arm J1:6 Ahead	Inf
J1:4/3 (Hayford Park Link Road)	U	A	2	3	87.5	Geom	-	3.65	0.00	Y	Arm J1:6 Ahead	Inf
J1:5/1 (B430 north)	U	E	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:6 Left	30.00
J1:5/2 (B430 north)	U	F	2	3	60.0	Geom	-	3.65	0.00	Y	Arm J1:2 Right	25.00
J1:6/1	U		2	3	3.5	Inf	-	-	-	-	-	-
J1:6/2	U		2	3	3.5	Inf	-	-	-	-	-	-

Junction: J2: Middleton Stoney Relief Road Junction												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
J2:1/1 (B430 south)	U	C	2	3	60.0	Geom	-	4.00	0.00	Y	Arm J2:2 Ahead	Inf
J2:2/1	U		2	3	3.5	Inf	-	-	-	-	-	-
J2:2/2	U		2	3	3.5	Inf	-	-	-	-	-	-
J2:3/1 (B430 north)	U		2	3	31.3	Inf	-	-	-	-	-	-
J2:3/2 (B430 north)	U	A	2	3	31.3	Geom	-	3.50	0.00	Y	Arm J2:5 Ahead	Inf
J2:4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:6/1 (MSRR)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm J2:2 Right	30.00
J2:6/2 (MSRR)	U	B	2	3	17.4	Geom	-	3.65	0.00	Y	Arm J2:2 Right	30.00

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2034 DS3A - AM'	08:00	09:00	01:00	
2: '2034 DS3A - PM'	17:00	18:00	01:00	

Scenario 1: '2034 DS3A - AM peak hour' (FG1: '2034 DS3A - AM', Plan 1: 'DS3 AM')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	204	487	97	788
	B	254	0	445	85	784
	C	442	495	0	0	937
	D	76	90	0	0	166
	Tot.	772	789	932	182	2675

Traffic Lane Flows

Lane	Scenario 1: 2034 DS3A - AM peak hour
Junction: J1: Hayford Park Link Road Junction	
J1:1/1	518
J1:1/2	296
J1:1/3	289
J1:2/1	772
J1:3/1	500
J1:3/2	289
J1:4/1	204
J1:4/2 (with short)	584(In) 487(Out)
J1:4/3 (short)	97
J1:5/1	530
J1:5/2	254
J1:6/1	932
J1:6/2	182
Junction: J2: Middleton Stoney Relief Road Junction	
J2:1/1	166
J2:2/1	814
J2:2/2	289
J2:3/1	932
J2:3/2	182
J2:4/1	932
J2:5/1	182
J2:6/1 (with short)	937(In) 686(Out)
J2:6/2 (short)	251

Lane Saturation Flows

Junction: J1: Hayford Park Link Road Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (B430 south)	3.50	0.00	Y	Arm J1:2 Ahead	Inf	100.0 %	1965	1965
J1:1/2 (B430 south)	3.50	0.00	Y	Arm J1:3 Right	40.00	100.0 %	1894	1894
J1:1/3 (B430 south)	3.50	0.00	Y	Arm J1:3 Right	40.00	100.0 %	1894	1894
J1:2/1	Infinite Saturation Flow						Inf	Inf
J1:3/1	Infinite Saturation Flow						Inf	Inf
J1:3/2	This lane uses a directly entered Saturation Flow						1900	1900
J1:4/1 (Hayford Park Link Road)	3.50	0.00	Y	Arm J1:3 Left	15.00	100.0 %	1786	1786
J1:4/2 (Hayford Park Link Road)	3.65	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1980	1980
J1:4/3 (Hayford Park Link Road)	3.65	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1980	1980
J1:5/1 (B430 north)	3.50	0.00	Y	Arm J1:6 Left	30.00	100.0 %	1871	1871
J1:5/2 (B430 north)	3.65	0.00	Y	Arm J1:2 Right	25.00	100.0 %	1868	1868
J1:6/1	Infinite Saturation Flow						Inf	Inf
J1:6/2	Infinite Saturation Flow						Inf	Inf

Junction: J2: Middleton Stoney Relief Road Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (B430 south)	4.00	0.00	Y	Arm J2:2 Ahead	Inf	100.0 %	2015	2015
J2:2/1	Infinite Saturation Flow						Inf	Inf
J2:2/2	Infinite Saturation Flow						Inf	Inf
J2:3/1 (B430 north Lane 1)	Infinite Saturation Flow						Inf	Inf
J2:3/2 (B430 north)	3.50	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1965	1965
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1 (MSRR)	3.65	0.00	Y	Arm J2:2 Right	30.00	100.0 %	1886	1886
J2:6/2 (MSRR)	3.65	0.00	Y	Arm J2:2 Right	30.00	100.0 %	1886	1886

Scenario 2: '2034 DS3A - PM peak hour' (FG2: '2034 DS3A - PM', Plan 1: 'DS3 AM')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	218	361	75	654
	B	453	0	512	121	1086
	C	164	556	0	0	720
	D	23	128	0	0	151
	Tot.	640	902	873	196	2611

Traffic Lane Flows

Lane	Scenario 2: 2034 DS3A - PM peak hour
Junction: J1: Hayford Park Link Road Junction	
J1:1/1	187
J1:1/2	343
J1:1/3	341
J1:2/1	640
J1:3/1	561
J1:3/2	341
J1:4/1	218
J1:4/2 (with short)	436(In) 361(Out)
J1:4/3 (short)	75
J1:5/1	633
J1:5/2	453
J1:6/1	873
J1:6/2	196
Junction: J2: Middleton Stoney Relief Road Junction	
J2:1/1	151
J2:2/1	530
J2:2/2	341
J2:3/1	873
J2:3/2	196
J2:4/1	873
J2:5/1	196
J2:6/1 (with short)	720(In) 444(Out)
J2:6/2 (short)	276

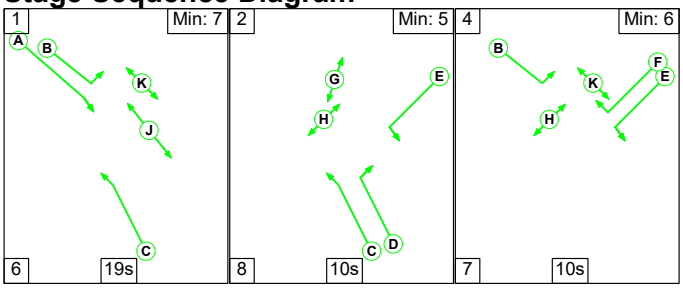
Lane Saturation Flows

Junction: J1: Hayford Park Link Road Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (B430 south)	3.50	0.00	Y	Arm J1:2 Ahead	Inf	100.0 %	1965	1965
J1:1/2 (B430 south)	3.50	0.00	Y	Arm J1:3 Right	40.00	100.0 %	1894	1894
J1:1/3 (B430 south)	3.50	0.00	Y	Arm J1:3 Right	40.00	100.0 %	1894	1894
J1:2/1	Infinite Saturation Flow						Inf	Inf
J1:3/1	Infinite Saturation Flow						Inf	Inf
J1:3/2	This lane uses a directly entered Saturation Flow						1900	1900
J1:4/1 (Hayford Park Link Road)	3.50	0.00	Y	Arm J1:3 Left	15.00	100.0 %	1786	1786
J1:4/2 (Hayford Park Link Road)	3.65	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1980	1980
J1:4/3 (Hayford Park Link Road)	3.65	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1980	1980
J1:5/1 (B430 north)	3.50	0.00	Y	Arm J1:6 Left	30.00	100.0 %	1871	1871
J1:5/2 (B430 north)	3.65	0.00	Y	Arm J1:2 Right	25.00	100.0 %	1868	1868
J1:6/1	Infinite Saturation Flow						Inf	Inf
J1:6/2	Infinite Saturation Flow						Inf	Inf

Junction: J2: Middleton Stoney Relief Road Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (B430 south)	4.00	0.00	Y	Arm J2:2 Ahead	Inf	100.0 %	2015	2015
J2:2/1	Infinite Saturation Flow						Inf	Inf
J2:2/2	Infinite Saturation Flow						Inf	Inf
J2:3/1 (B430 north Lane 1)	Infinite Saturation Flow						Inf	Inf
J2:3/2 (B430 north)	3.50	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1965	1965
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1 (MSRR)	3.65	0.00	Y	Arm J2:2 Right	30.00	100.0 %	1886	1886
J2:6/2 (MSRR)	3.65	0.00	Y	Arm J2:2 Right	30.00	100.0 %	1886	1886

Scenario 1: '2034 DS3A - AM peak hour' (FG1: '2034 DS3A - AM', Plan 1: 'DS3 AM')
C1

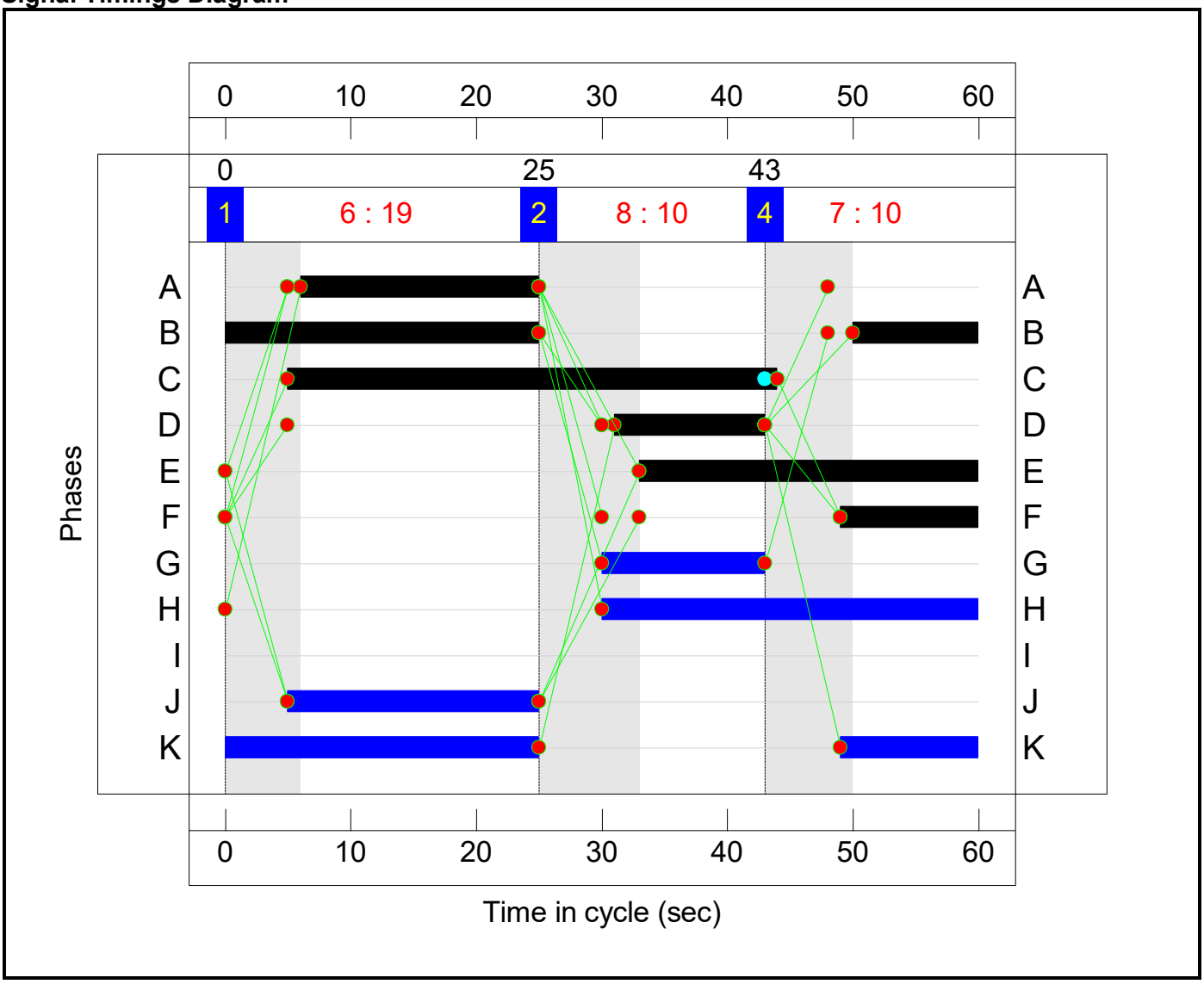
Stage Sequence Diagram



Stage Timings

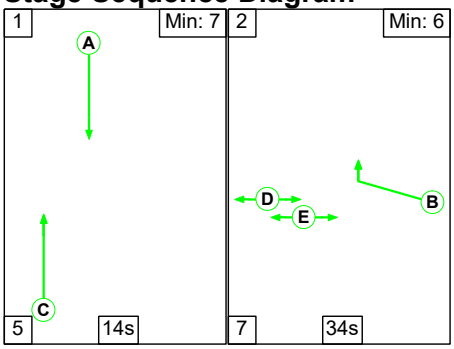
Stage	1	2	4
Duration	19	10	10
Change Point	0	25	43

Signal Timings Diagram



C2

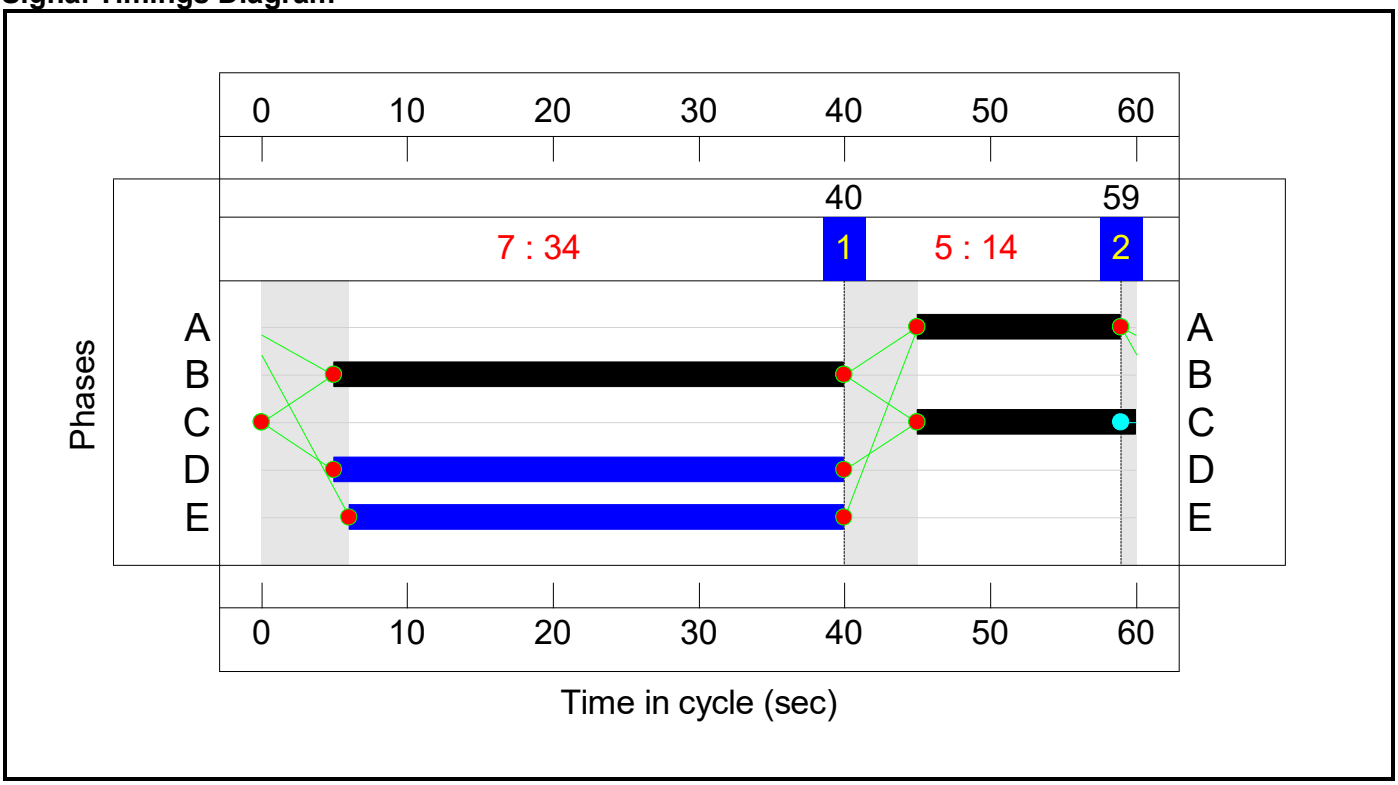
Stage Sequence Diagram



Stage Timings

Stage	1	2
Duration	14	34
Change Point	40	59

Signal Timings Diagram



Network Results

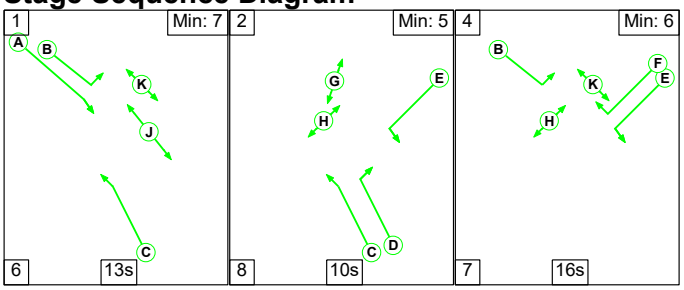
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Propesed Hayford Park Link Road to Middleton Stoney Releif Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**73.8%**
J1: Hayford Park Link Road Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**73.8%**
1/1	B430 south Ahead	U	N/A	N/A	C1:C		1	39	-	518	1965	1310	39.5%
1/2	B430 south Right	U	N/A	N/A	C1:D		1	12	-	296	1894	410	72.1%
1/3	B430 south Right	U	N/A	N/A	C1:D		1	12	-	289	1894	410	70.4%
3/2		U	N/A	N/A	-		-	-	-	289	1900	1900	15.2%
4/1	Hayford Park Link Road Left	U	N/A	N/A	C1:B		1	35	-	204	1786	1072	19.0%
4/2+4/3	Hayford Park Link Road Ahead	U	N/A	N/A	C1:A		1	19	-	584	1980:1980	660+329	73.8 : 29.5%
5/1	B430 north Left	U	N/A	N/A	C1:E		1	27	-	530	1871	873	60.7%
5/2	B430 north Right	U	N/A	N/A	C1:F		1	11	-	254	1868	374	68.0%
J2: Middleton Stoney Relief Road Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**60.8%**
1/1	B430 south Ahead	U	N/A	N/A	C2:C		1	15	-	166	2015	537	30.9%
3/2	B430 north Ahead	U	N/A	N/A	C2:A		1	14	-	182	1965	491	37.0%
6/1+6/2	MSRR Right	U	N/A	N/A	C2:B		1	35	-	937	1886:1886	1129+413	60.8 : 60.8%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Propesed Hayford Park Link Road to Middleton Stoney Releif Road	**-**	**-**	**0**	**0**	**0**	**13.3**	**6.8**	**0.0**	**20.1**	**-**	**-**	**-**	**-**
J1: Hayford Park Link Road Junction	**-**	**-**	**0**	**0**	**0**	**9.8**	**5.5**	**0.0**	**15.3**	**-**	**-**	**-**	**-**
1/1	518	518	-	-	-	0.5	0.3	-	0.8	5.5	2.4	0.3	2.7
1/2	296	296	-	-	-	1.4	1.3	-	2.7	33.0	4.6	1.3	5.8
1/3	289	289	-	-	-	1.5	1.2	-	2.6	32.9	4.5	1.2	5.6
3/2	289	289	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1
4/1	204	204	-	-	-	0.3	0.1	-	0.4	7.5	1.5	0.1	1.6
4/2+4/3	584	584	-	-	-	2.8	0.7	-	3.5	21.5	7.2	0.7	7.9
5/1	530	530	-	-	-	1.8	0.8	-	2.5	17.1	6.5	0.8	7.2
5/2	254	254	-	-	-	1.6	1.0	-	2.6	37.0	3.9	1.0	4.9
J2: Middleton Stoney Relief Road Junction	**-**	**-**	**0**	**0**	**0**	**3.5**	**1.3**	**0.0**	**4.8**	**-**	**-**	**-**	**-**
1/1	166	166	-	-	-	0.8	0.2	-	1.0	22.4	2.2	0.2	2.4
3/2	182	182	-	-	-	0.9	0.3	-	1.2	23.8	2.3	0.3	2.6
6/1+6/2	937	937	-	-	-	1.8	0.8	-	2.6	10.0	7.1	0.8	7.8

C1	PRC for Signalled Lanes (%):	22.0	Total Delay for Signalled Lanes (pcuHr):	15.19	Cycle Time (s): 60
C2	PRC for Signalled Lanes (%):	48.1	Total Delay for Signalled Lanes (pcuHr):	4.83	Cycle Time (s): 60
	PRC Over All Lanes (%):	22.0	Total Delay Over All Lanes(pcuHr):	20.11	

Scenario 2: '2034 DS3A - PM peak hour' (FG2: '2034 DS3A - PM', Plan 1: 'DS3 AM')
C1

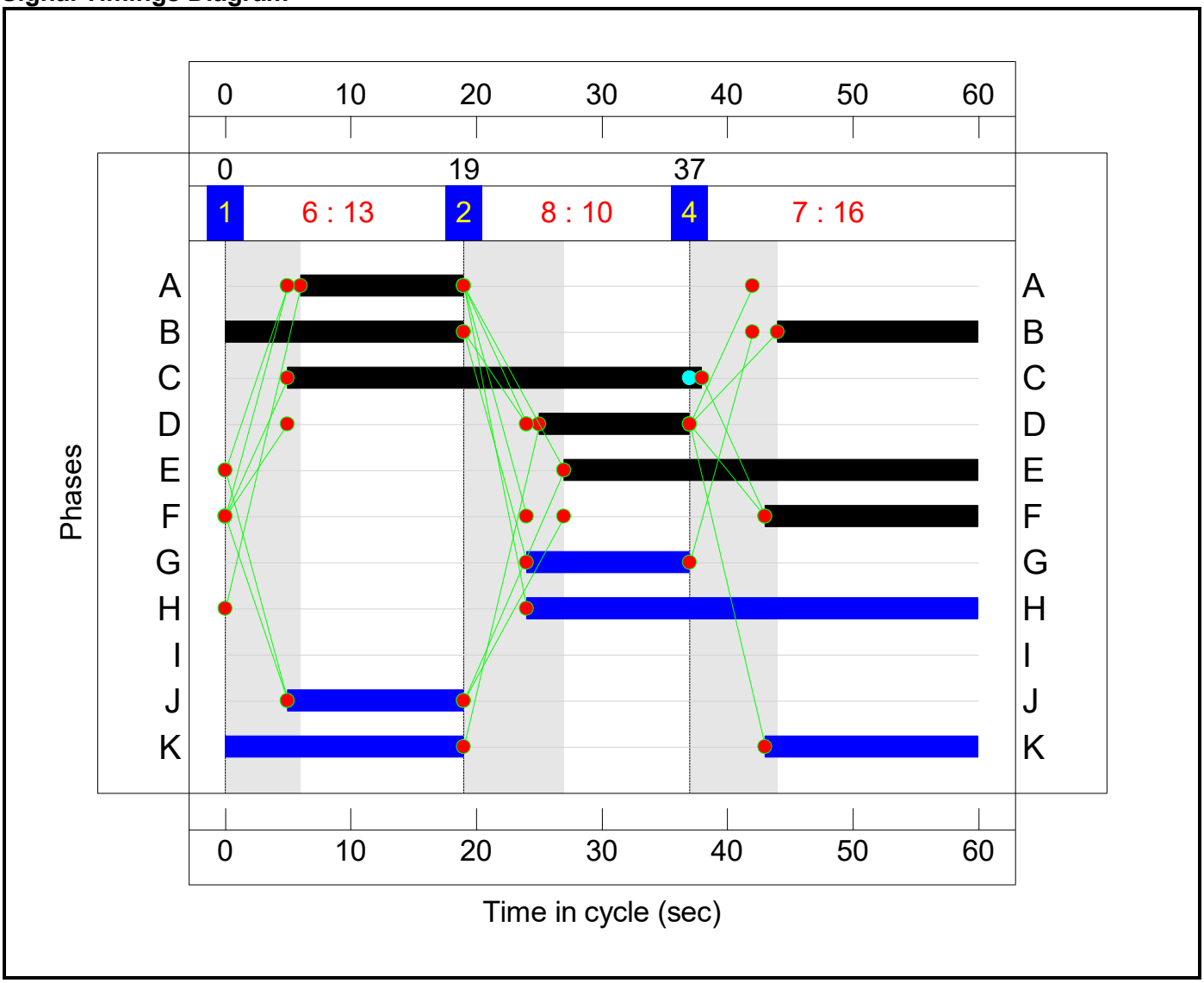
Stage Sequence Diagram



Stage Timings

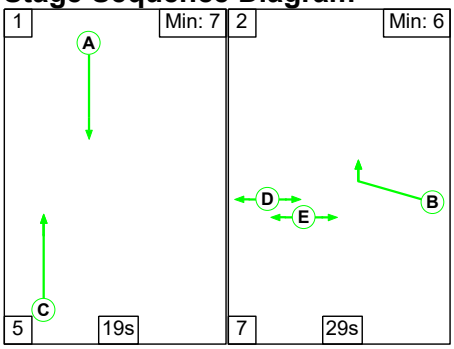
Stage	1	2	4
Duration	13	10	16
Change Point	0	19	37

Signal Timings Diagram



C2

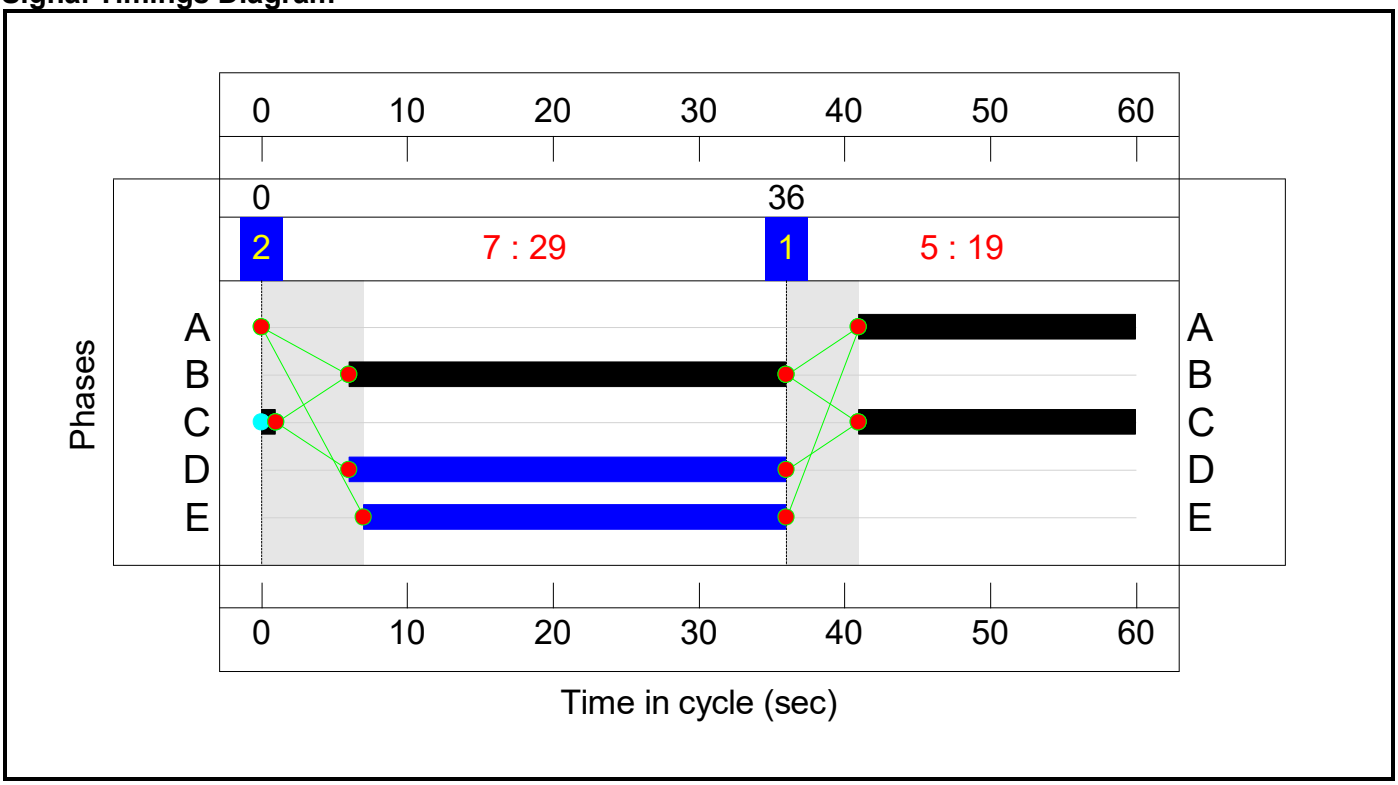
Stage Sequence Diagram



Stage Timings

Stage	1	2
Duration	19	29
Change Point	36	0

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Propesed Hayford Park Link Road to Middleton Stoney Releif Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**83.6%**
J1: Hayford Park Link Road Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**83.6%**
1/1	B430 south Ahead	U	N/A	N/A	C1:C		1	33	-	187	1965	1113	16.8%
1/2	B430 south Right	U	N/A	N/A	C1:D		1	12	-	343	1894	410	83.6%
1/3	B430 south Right	U	N/A	N/A	C1:D		1	12	-	341	1894	410	83.1%
3/2		U	N/A	N/A	-		-	-	-	341	1900	1900	17.9%
4/1	Hayford Park Link Road Left	U	N/A	N/A	C1:B		1	35	-	218	1786	1072	20.3%
4/2+4/3	Hayford Park Link Road Ahead	U	N/A	N/A	C1:A		1	13	-	436	1980:1980	462+341	78.1 : 22.0%
5/1	B430 north Left	U	N/A	N/A	C1:E		1	33	-	633	1871	1060	59.7%
5/2	B430 north Right	U	N/A	N/A	C1:F		1	17	-	453	1868	560	80.8%
J2: Middleton Stoney Relief Road Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**45.6%**
1/1	B430 south Ahead	U	N/A	N/A	C2:C		1	20	-	151	2015	705	21.4%
3/2	B430 north Ahead	U	N/A	N/A	C2:A		1	19	-	196	1965	655	29.9%
6/1+6/2	MSRR Right	U	N/A	N/A	C2:B		1	30	-	720	1886:1886	974+606	45.6 : 45.6%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Propesed Hayford Park Link Road to Middleton Stoney Releif Road	**-**	**-**	**0**	**0**	**0**	**13.4**	**9.2**	**0.0**	**22.5**	**-**	**-**	**-**	**-**
J1: Hayford Park Link Road Junction	**-**	**-**	**0**	**0**	**0**	**10.3**	**8.4**	**0.0**	**18.7**	**-**	**-**	**-**	**-**
1/1	187	187	-	-	-	0.2	0.1	-	0.3	6.6	0.9	0.1	1.0
1/2	343	343	-	-	-	1.6	2.4	-	4.0	41.8	5.4	2.4	7.8
1/3	341	341	-	-	-	1.7	2.3	-	4.0	41.8	5.4	2.3	7.7
3/2	341	341	-	-	-	0.0	0.1	-	0.1	1.2	0.0	0.1	0.1
4/1	218	218	-	-	-	0.3	0.1	-	0.5	7.6	1.6	0.1	1.8
4/2+4/3	436	436	-	-	-	2.5	0.6	-	3.1	25.9	5.6	0.6	6.2
5/1	633	633	-	-	-	1.5	0.7	-	2.2	12.7	6.9	0.7	7.6
5/2	453	453	-	-	-	2.4	2.0	-	4.5	35.6	6.9	2.0	9.0
J2: Middleton Stoney Relief Road Junction	**-**	**-**	**0**	**0**	**0**	**3.0**	**0.8**	**0.0**	**3.8**	**-**	**-**	**-**	**-**
1/1	151	151	-	-	-	0.6	0.1	-	0.7	17.0	1.8	0.1	1.9
3/2	196	196	-	-	-	0.7	0.2	-	0.9	17.0	2.1	0.2	2.3
6/1+6/2	720	720	-	-	-	1.8	0.4	-	2.2	10.9	4.6	0.4	5.0

C1 PRC for Signalled Lanes (%): 7.7 Total Delay for Signalled Lanes (pcuHr): 18.59 Cycle Time (s): 60

C2 PRC for Signalled Lanes (%): 97.5 Total Delay for Signalled Lanes (pcuHr): 3.82 Cycle Time (s): 60

PRC Over All Lanes (%): 7.7 Total Delay Over All Lanes(pcuHr): 22.51

APPENDIX I

B430/MSRR JUNCTION 9 ARCADY REPORT

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: 250704 MSRR_B4030 roundabout.j9
Path: C:\Users\ADC\OneDrive - ADC Infrastructure Limited\ADC Projects\ADC1794 OxSRFI\Calculations\Junction Models\4. MSRR_B4030 roundabout
Report generation date: 04/09/2025 10:39:46

»proposed roundabout layout - DS3A, AM
»proposed roundabout layout - DS3A, PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	proposed roundabout layout - DS3A							
1 - B4030 (W)	0.4	4.60	0.29	A	0.3	3.79	0.20	A
2 - MSRR	1.4	5.06	0.58	A	1.1	4.47	0.53	A
3 - Middleton Road	0.2	4.65	0.16	A	0.1	4.08	0.09	A
4 - B4030 (E)	3.0	9.85	0.75	A	4.9	14.50	0.84	B

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	OxSRFI
Location	B4030/MSRR roundabout
Site number	
Date	03/09/2025
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	ADC1794
Enumerator	ADC
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	DS3A	AM	ONE HOUR	07:45	09:15	15
D2	DS3A	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	proposed roundabout layout	100.000

proposed roundabout layout - DS3A, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	B4030/MSRR	Standard Roundabout		1, 2, 3, 4	7.07	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	B4030 (W)	
2	MSRR	
3	Middleton Road	
4	B4030 (E)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - B4030 (W)	3.65	6.40	23.0	20.0	60.0	39.0	
2 - MSRR	3.65	7.70	29.5	20.0	60.0	28.0	
3 - Middleton Road	3.80	6.50	11.0	20.0	60.0	37.0	
4 - B4030 (E)	3.65	7.20	20.0	12.0	60.0	47.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - B4030 (W)	0.541	1655
2 - MSRR	0.606	1972
3 - Middleton Road	0.528	1571
4 - B4030 (E)	0.521	1628

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	DS3A	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - B4030 (W)		✓	290	100.000
2 - MSRR		✓	887	100.000
3 - Middleton Road		✓	137	100.000
4 - B4030 (E)		✓	1002	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - B4030 (W)	2 - MSRR	3 - Middleton Road	4 - B4030 (E)
From	1 - B4030 (W)	0	33	34	223
	2 - MSRR	3	0	60	824
	3 - Middleton Road	92	40	0	5
	4 - B4030 (E)	175	824	3	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - B4030 (W)	2 - MSRR	3 - Middleton Road	4 - B4030 (E)
From	1 - B4030 (W)	0	0	0	1
	2 - MSRR	0	0	0	7
	3 - Middleton Road	0	0	0	0
	4 - B4030 (E)	4	6	0	0

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (Veh/hr)	Demand in PCU (PCU/hr)
07:45-08:00	1 - B4030 (W)	218	220
	2 - MSRR	668	711
	3 - Middleton Road	103	103
	4 - B4030 (E)	754	797
08:00-08:15	1 - B4030 (W)	261	263
	2 - MSRR	797	849
	3 - Middleton Road	123	123
	4 - B4030 (E)	901	952
08:15-08:30	1 - B4030 (W)	319	322
	2 - MSRR	977	1040
	3 - Middleton Road	151	151
	4 - B4030 (E)	1103	1165
08:30-08:45	1 - B4030 (W)	319	322
	2 - MSRR	977	1040
	3 - Middleton Road	151	151
	4 - B4030 (E)	1103	1165
08:45-09:00	1 - B4030 (W)	261	263
	2 - MSRR	797	849
	3 - Middleton Road	123	123
	4 - B4030 (E)	901	952
09:00-09:15	1 - B4030 (W)	218	220
	2 - MSRR	668	711
	3 - Middleton Road	103	103
	4 - B4030 (E)	754	797

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1 - B4030 (W)	0.29	4.60	0.4	A
2 - MSRR	0.58	5.06	1.4	A
3 - Middleton Road	0.16	4.65	0.2	A
4 - B4030 (E)	0.75	9.85	3.0	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	218	649	1274	0.171	218	0.2	3.407	A
2 - MSRR	668	195	1740	0.384	665	0.6	3.344	A
3 - Middleton Road	103	788	1131	0.091	103	0.1	3.502	A
4 - B4030 (E)	754	101	1491	0.506	750	1.0	4.834	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	261	778	1201	0.217	260	0.3	3.826	A
2 - MSRR	797	233	1718	0.464	796	0.9	3.903	A
3 - Middleton Road	123	943	1044	0.118	123	0.1	3.908	A
4 - B4030 (E)	901	121	1481	0.608	899	1.5	6.157	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	319	950	1103	0.289	319	0.4	4.585	A
2 - MSRR	977	286	1688	0.579	975	1.4	5.034	A
3 - Middleton Road	151	1154	926	0.163	151	0.2	4.640	A
4 - B4030 (E)	1103	148	1468	0.752	1098	2.9	9.582	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	319	954	1101	0.290	319	0.4	4.605	A
2 - MSRR	977	286	1687	0.579	977	1.4	5.064	A
3 - Middleton Road	151	1156	925	0.163	151	0.2	4.649	A
4 - B4030 (E)	1103	149	1468	0.752	1103	3.0	9.851	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	261	784	1198	0.218	261	0.3	3.846	A
2 - MSRR	797	234	1717	0.464	799	0.9	3.929	A
3 - Middleton Road	123	946	1042	0.118	123	0.1	3.920	A
4 - B4030 (E)	901	122	1481	0.608	906	1.6	6.323	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	218	655	1271	0.172	219	0.2	3.423	A
2 - MSRR	668	196	1739	0.384	669	0.6	3.365	A
3 - Middleton Road	103	792	1128	0.091	103	0.1	3.513	A
4 - B4030 (E)	754	102	1491	0.506	757	1.0	4.918	A

proposed roundabout layout - DS3A, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	B4030/MSRR	Standard Roundabout		1, 2, 3, 4	9.39	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	DS3A	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - B4030 (W)		✓	219	100.000
2 - MSRR		✓	839	100.000
3 - Middleton Road		✓	84	100.000
4 - B4030 (E)		✓	1141	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - B4030 (W)	2 - MSRR	3 - Middleton Road	4 - B4030 (E)
From	1 - B4030 (W)	0	2	45	172
	2 - MSRR	56	0	36	747
	3 - Middleton Road	58	13	0	13
	4 - B4030 (E)	461	675	5	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - B4030 (W)	2 - MSRR	3 - Middleton Road	4 - B4030 (E)
From	1 - B4030 (W)	0	0	0	3
	2 - MSRR	0	0	0	6
	3 - Middleton Road	0	0	0	0
	4 - B4030 (E)	0	6	0	0

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (Veh/hr)	Demand in PCU (PCU/hr)
16:45-17:00	1 - B4030 (W)	165	169
	2 - MSRR	632	665
	3 - Middleton Road	63	63
	4 - B4030 (E)	859	889
17:00-17:15	1 - B4030 (W)	197	202
	2 - MSRR	754	795
	3 - Middleton Road	76	76
	4 - B4030 (E)	1026	1062
17:15-17:30	1 - B4030 (W)	241	247
	2 - MSRR	924	973
	3 - Middleton Road	92	92
	4 - B4030 (E)	1256	1301
17:30-17:45	1 - B4030 (W)	241	247
	2 - MSRR	924	973
	3 - Middleton Road	92	92
	4 - B4030 (E)	1256	1301
17:45-18:00	1 - B4030 (W)	197	202
	2 - MSRR	754	795
	3 - Middleton Road	76	76
	4 - B4030 (E)	1026	1062
18:00-18:15	1 - B4030 (W)	165	169
	2 - MSRR	632	665
	3 - Middleton Road	63	63
	4 - B4030 (E)	859	889

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1 - B4030 (W)	0.20	3.79	0.3	A
2 - MSRR	0.53	4.47	1.1	A
3 - Middleton Road	0.09	4.08	0.1	A
4 - B4030 (E)	0.84	14.50	4.9	B

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	165	519	1327	0.124	164	0.1	3.094	A
2 - MSRR	632	167	1774	0.356	629	0.5	3.140	A
3 - Middleton Road	63	731	1164	0.054	63	0.1	3.268	A
4 - B4030 (E)	859	95	1524	0.564	854	1.3	5.331	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	197	621	1270	0.155	197	0.2	3.355	A
2 - MSRR	754	199	1755	0.430	753	0.7	3.591	A
3 - Middleton Road	76	876	1084	0.070	75	0.1	3.567	A
4 - B4030 (E)	1026	114	1515	0.677	1023	2.0	7.269	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	241	757	1194	0.202	241	0.3	3.778	A
2 - MSRR	924	244	1728	0.534	922	1.1	4.457	A
3 - Middleton Road	92	1072	975	0.095	92	0.1	4.077	A
4 - B4030 (E)	1256	140	1502	0.836	1246	4.7	13.518	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	241	763	1190	0.203	241	0.3	3.791	A
2 - MSRR	924	244	1728	0.535	924	1.1	4.474	A
3 - Middleton Road	92	1073	974	0.095	92	0.1	4.081	A
4 - B4030 (E)	1256	140	1502	0.837	1255	4.9	14.498	B

17:45 - 18:00

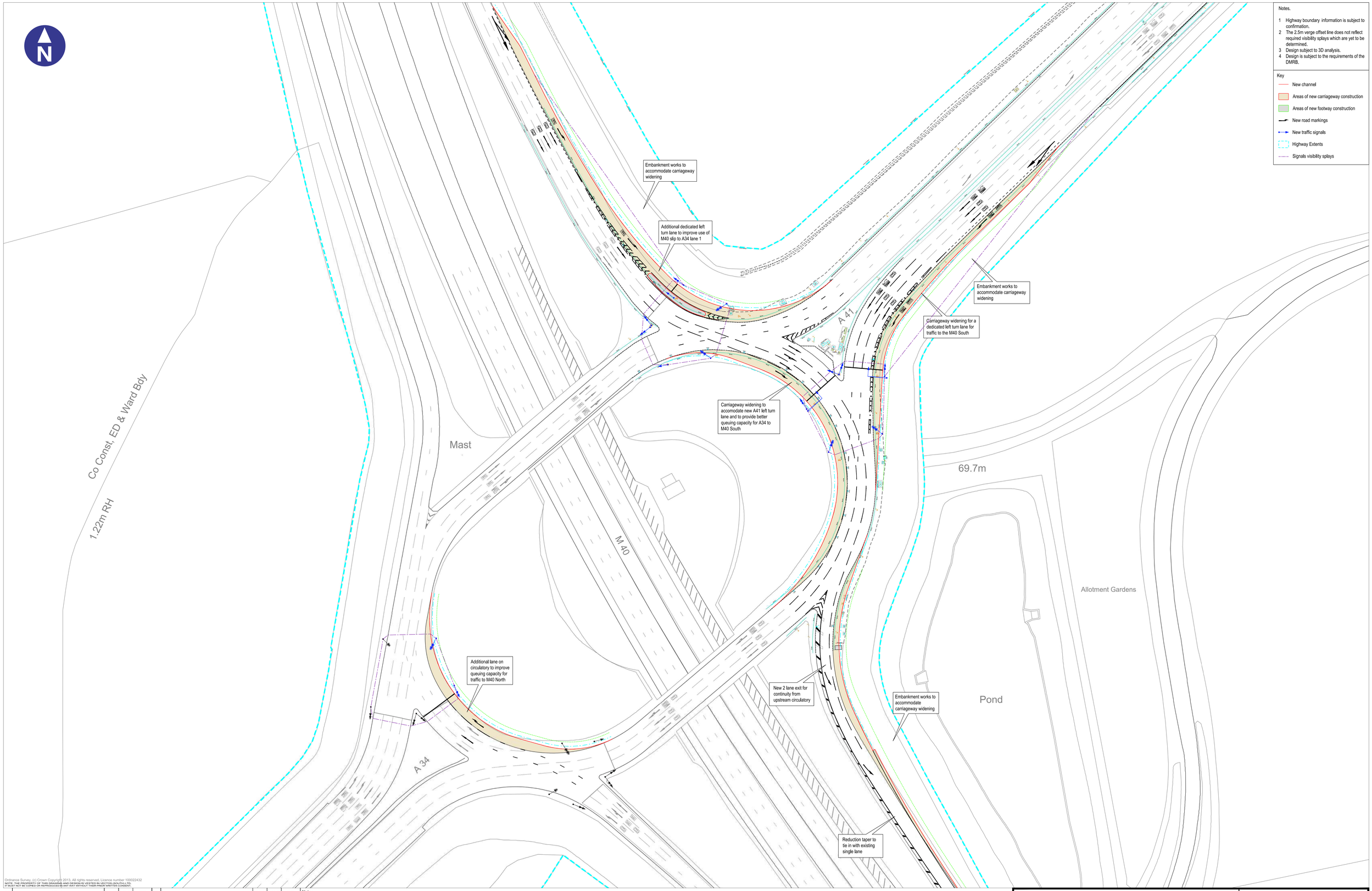
Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	197	630	1265	0.156	197	0.2	3.371	A
2 - MSRR	754	200	1754	0.430	756	0.8	3.612	A
3 - Middleton Road	76	878	1083	0.070	76	0.1	3.573	A
4 - B4030 (E)	1026	114	1515	0.677	1037	2.2	7.699	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - B4030 (W)	165	524	1324	0.125	165	0.1	3.105	A
2 - MSRR	632	167	1774	0.356	632	0.6	3.156	A
3 - Middleton Road	63	735	1162	0.054	63	0.1	3.274	A
4 - B4030 (E)	859	96	1524	0.564	862	1.3	5.470	A

APPENDIX J

M40 JUNCTION 9 IMPROVEMENT SCHEME



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REV.	DETAILS	DRAWN	CHECKED	DATE	REV.	DETAILS	DRAWN	CHECKED	DATE
-	-	-	-	-	-	-	-	-	-

Notes:
1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

PROJECT: Symmetry Park

CLIENT: Tritax

DRAWING TITLE:
M40 Junction 9 - A34 / A41 Bicester
Junction Improvement Scheme
General Arrangement

vectos. | PART OF SLR
The Cursitor, 38 Chancery Lane, London, WC2A 1EN
020 7580 7373
vectos@vectos.co.uk

DRAWN:	CHECKED:	DATE:	SCALES:	DRAWING NUMBER:	REVISION:
RB	JB	24.02.23	1:500 at A0	205223/PD/19	-

APPENDIX K

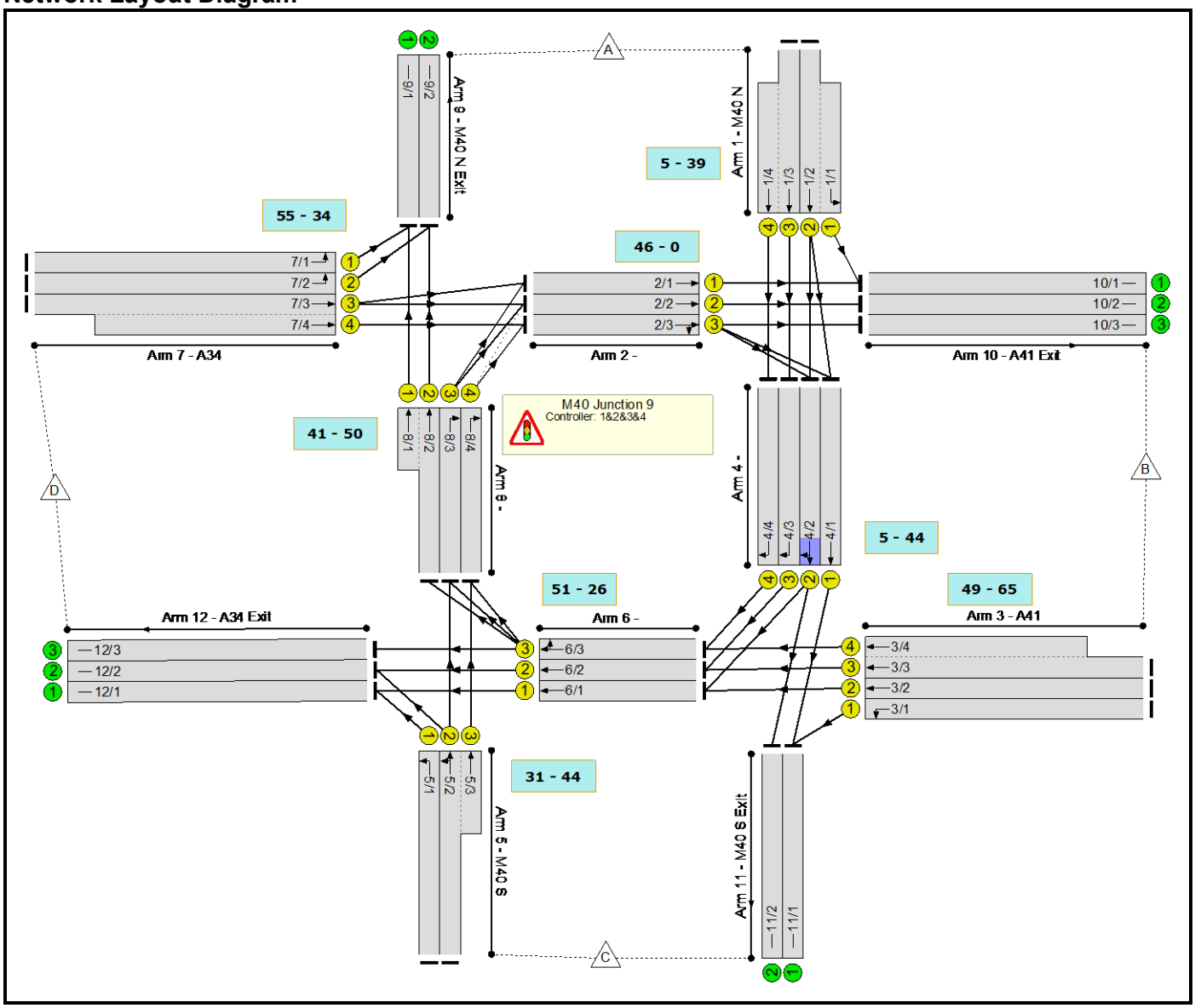
M40 JUNCTION 9 RC3A LINSIG REPORT

Full Input Data And Results

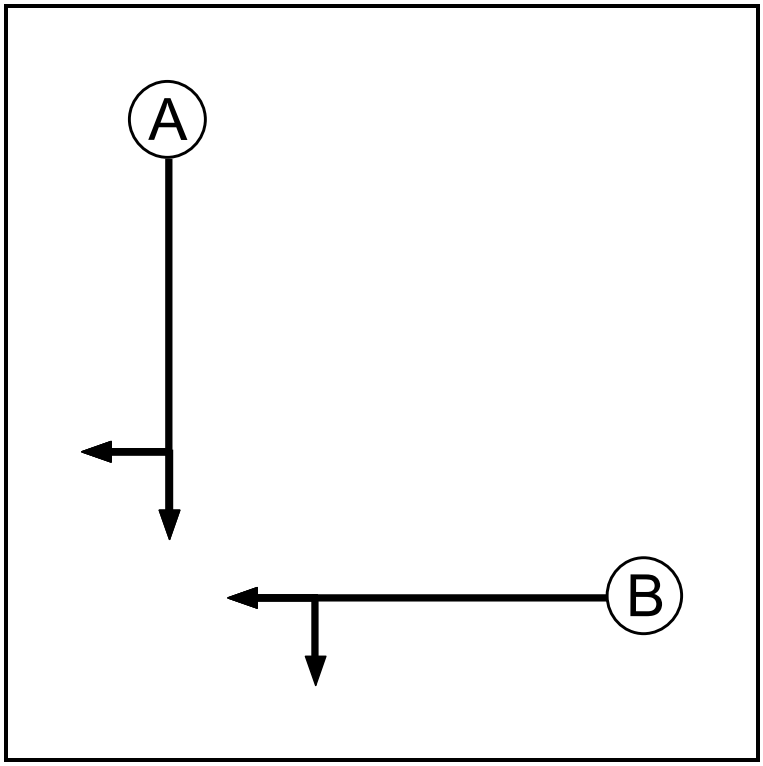
User and Project Details

Project:	**OxSRFI**
Title:	**M40 Junction 9**
Location:	M40 Junction 9, Wendlebury
Additional detail:	Base model with Tritax improvements
File name:	250903 M40 Junction 9 - RC3A.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



C1
Phase Diagram



Phase Input Data

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

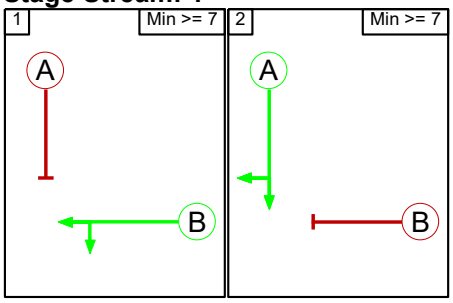
Phase Intergreens Matrix

	Starting Phase		
Terminating Phase		A	B
	A		5
	B	7	

Phases in Stage

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

Stage Diagram
Stage Stream: 1



Phase Delays

Stage Stream: 1

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

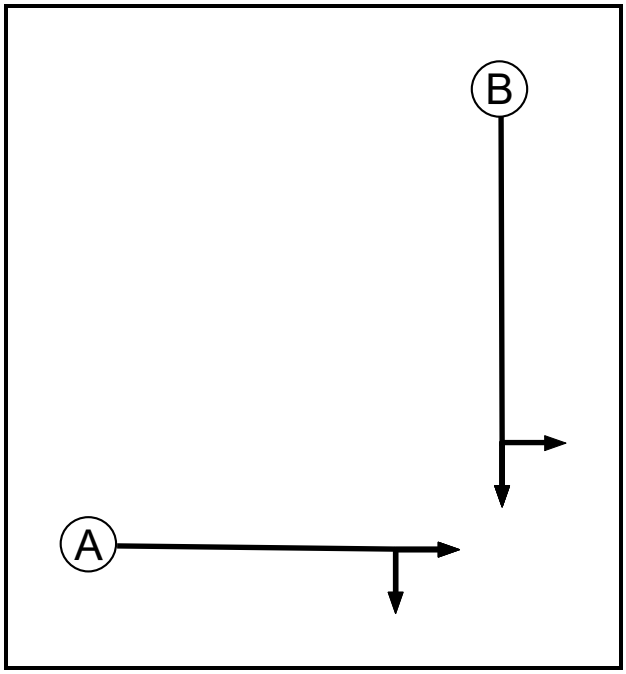
Prohibited Stage Change

Stage Stream: 1

	To Stage		
		1	2
From Stage	1		7
	2	5	

C2

Phase Diagram



Phase Input Data

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

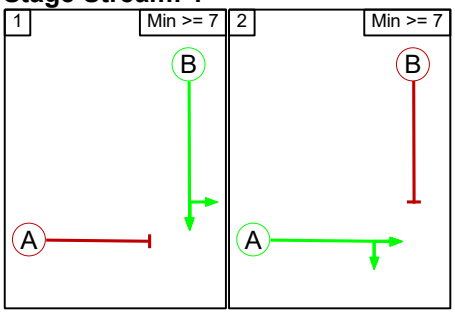
Phase Intergreens Matrix

	Starting Phase		
		A	B
Terminating Phase	A		5
	B	7	

Phases in Stage

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

Stage Diagram
Stage Stream: 1



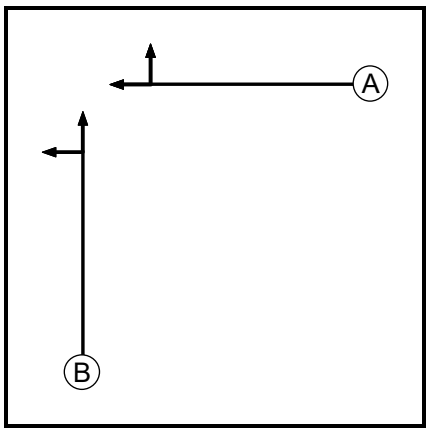
Phase Delays
Stage Stream: 1

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

Prohibited Stage Change
Stage Stream: 1

	To Stage		
		1	2
From Stage	1		7
	2	5	

C3
Phase Diagram



Phase Input Data

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

Phase Intergreens Matrix

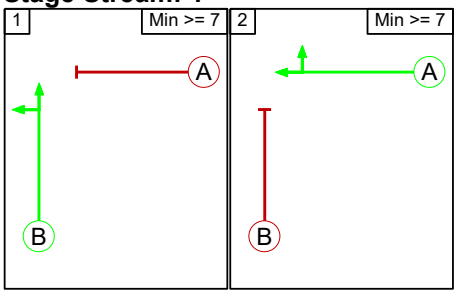
	Starting Phase		
Terminating Phase		A	B
	A		5
	B	7	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



Phase Delays

Stage Stream: 1

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

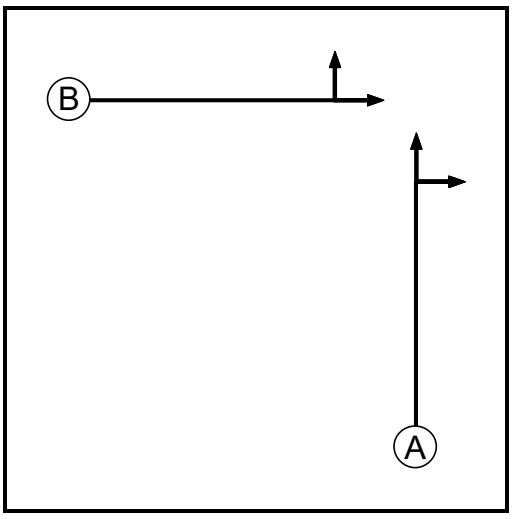
Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		7
	2	5	

C4

Phase Diagram



Phase Input Data

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

Phase Intergreens Matrix

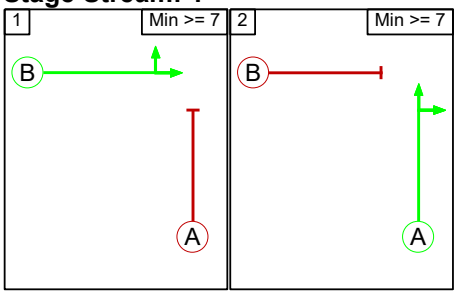
		Starting Phase	
		A	B
Terminating Phase	A		5
	B	7	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



Phase Delays

Stage Stream: 1

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

Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		7
	2	5	

Lane Input Data

Junction: M40 Junction 9												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (M40 N)	U	B	2	3	26.0	Geom	-	3.65	0.00	Y	Arm 10 Left	40.00
1/2 (M40 N)	U	B	2	3	60.0	User	1906	-	-	-	-	-
1/3 (M40 N)	U	B	2	3	60.0	User	1825	-	-	-	-	-
1/4 (M40 N)	U	B	2	3	28.0	User	1845	-	-	-	-	-
2/1	U	A	2	3	20.0	User	1945	-	-	-	-	-
2/2	U	A	2	3	26.0	User	1977	-	-	-	-	-
2/3	U	A	2	3	26.0	User	1869	-	-	-	-	-
3/1 (A41)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 11 Left	45.00
3/2 (A41)	U	B	2	3	33.9	User	1905	-	-	-	-	-
3/3 (A41)	U	B	2	3	33.9	User	1965	-	-	-	-	-
3/4 (A41)	U	B	2	3	33.9	User	1960	-	-	-	-	-
4/1	U	A	2	3	5.0	User	1906	-	-	-	-	-
4/2	U	A	2	3	5.0	User	1906	-	-	-	-	-
4/3	U	A	2	3	5.0	User	1825	-	-	-	-	-
4/4	U	A	2	3	6.0	User	1845	-	-	-	-	-
5/1 (M40 S)	U	B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 12 Left	60.00
5/2 (M40 S)	U	B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 8 Ahead	80.00
											Arm 12 Left	60.00
5/3 (M40 S)	U	B	2	3	6.0	Geom	-	3.25	0.00	N	Arm 8 Ahead	80.00
6/1	U	A	2	3	20.0	User	1906	-	-	-	-	-
6/2	U	A	2	3	31.0	User	1981	-	-	-	-	-
6/3	U	A	2	3	31.0	User	1960	-	-	-	-	-
7/1 (A34)	U	B	2	3	60.0	User	1851	-	-	-	-	-
7/2 (A34)	U	B	2	3	60.0	User	2025	-	-	-	-	-
7/3 (A34)	U	B	2	3	60.0	User	1973	-	-	-	-	-
7/4 (A34)	U	B	2	3	28.0	User	1869	-	-	-	-	-
8/1	U	A	2	3	4.5	Geom	-	3.80	0.00	Y	Arm 9 Ahead	55.00

8/2	U	A	2	3	6.0	Geom	-	3.80	0.00	Y	Arm 9 Ahead	55.00
8/3	U	A	2	3	6.0	Geom	-	3.80	0.00	Y	Arm 2 Right	55.00
8/4	U	A	2	3	6.0	Geom	-	3.80	0.00	N	Arm 2 Right	55.00
9/1 (M40 N Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
9/2 (M40 N Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
10/1 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
10/2 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
10/3 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
11/1 (M40 S Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
11/2 (M40 S Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
12/1 (A34 Exit)	U		2	3	8.7	User	2100	-	-	-	-	-
12/2 (A34 Exit)	U		2	3	8.7	User	2100	-	-	-	-	-
12/3 (A34 Exit)	U		2	3	8.7	User	2100	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2034 RC3A - AM'	08:00	09:00	01:00	
2: '2034 RC3A - PM'	17:00	18:00	01:00	

Scenario 1: '2034 RC3A - AM' (FG1: '2034 RC3A - AM', Plan 1: 'Staging Plan No. 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	422	0	2143	2565
	B	139	0	305	1232	1676
	C	0	373	0	299	672
	D	2343	1275	703	0	4321
	Tot.	2482	2070	1008	3674	9234

Traffic Lane Flows

Lane	Scenario 1: 2034 RC3A - AM
Junction: M40 Junction 9	
1/1 (short)	422
1/2 (with short)	1187(In) 765(Out)
1/3 (with short)	1378(In) 677(Out)
1/4 (short)	701
2/1	731
2/2	747
2/3	873
3/1	305
3/2	432
3/3 (with short)	939(In) 470(Out)
3/4 (short)	469
4/1	362
4/2	1106
4/3	677
4/4	701
5/1	227
5/2 (with short)	445(In) 265(Out)
5/3 (short)	180
6/1	1197
6/2	1147
6/3	1170
7/1	1116
7/2	1227
7/3 (with short)	1978(In) 1105(Out)
7/4 (short)	873
8/1 (short)	69
8/2 (with short)	139(In) 70(Out)
8/3	193
8/4	180
9/1	1185
9/2	1297
10/1	1153
10/2	747
10/3	170

11/1	667
11/2	341
12/1	1424
12/2	1219
12/3	1031

Lane Saturation Flows

Junction: M40 Junction 9

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (M40 N)	3.65	0.00	Y	Arm 10 Left	40.00	100.0 %	1908	1908
1/2 (M40 N Lane 2)	This lane uses a directly entered Saturation Flow						1906	1906
1/3 (M40 N Lane 3)	This lane uses a directly entered Saturation Flow						1825	1825
1/4 (M40 N Lane 4)	This lane uses a directly entered Saturation Flow						1845	1845
2/1	This lane uses a directly entered Saturation Flow						1945	1945
2/2	This lane uses a directly entered Saturation Flow						1977	1977
2/3	This lane uses a directly entered Saturation Flow						1869	1869
3/1 (A41)	3.65	0.00	Y	Arm 11 Left	45.00	100.0 %	1916	1916
3/2 (A41 Lane 2)	This lane uses a directly entered Saturation Flow						1905	1905
3/3 (A41 Lane 3)	This lane uses a directly entered Saturation Flow						1965	1965
3/4 (A41 Lane 4)	This lane uses a directly entered Saturation Flow						1960	1960
4/1	This lane uses a directly entered Saturation Flow						1906	1906
4/2	This lane uses a directly entered Saturation Flow						1906	1906
4/3	This lane uses a directly entered Saturation Flow						1825	1825
4/4	This lane uses a directly entered Saturation Flow						1845	1845
5/1 (M40 S)	3.25	0.00	Y	Arm 12 Left	60.00	100.0 %	1893	1893
5/2 (M40 S)	3.25	0.00	Y	Arm 8 Ahead Arm 12 Left	80.00 60.00	72.8 % 27.2 %	1901	1901
5/3 (M40 S)	3.25	0.00	N	Arm 8 Ahead	80.00	100.0 %	2042	2042
6/1	This lane uses a directly entered Saturation Flow						1906	1906
6/2	This lane uses a directly entered Saturation Flow						1981	1981
6/3	This lane uses a directly entered Saturation Flow						1960	1960
7/1 (A34 Lane 1)	This lane uses a directly entered Saturation Flow						1851	1851
7/2 (A34 Lane 2)	This lane uses a directly entered Saturation Flow						2025	2025
7/3 (A34 Lane 3)	This lane uses a directly entered Saturation Flow						1973	1973
7/4 (A34 Lane 4)	This lane uses a directly entered Saturation Flow						1869	1869
8/1	3.80	0.00	Y	Arm 9 Ahead	55.00	100.0 %	1942	1942
8/2	3.80	0.00	Y	Arm 9 Ahead	55.00	100.0 %	1942	1942
8/3	3.80	0.00	Y	Arm 2 Right	55.00	100.0 %	1942	1942
8/4	3.80	0.00	N	Arm 2 Right	55.00	100.0 %	2078	2078

9/1 (M40 N Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
9/2 (M40 N Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
10/1 (A41 Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
10/2 (A41 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
10/3 (A41 Exit Lane 3)	Infinite Saturation Flow	Inf	Inf
11/1 (M40 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
11/2 (M40 S Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
12/1 (A34 Exit Lane 1)	This lane uses a directly entered Saturation Flow	2100	2100
12/2 (A34 Exit Lane 2)	This lane uses a directly entered Saturation Flow	2100	2100
12/3 (A34 Exit Lane 3)	This lane uses a directly entered Saturation Flow	2100	2100

Scenario 2: '2034 RC3A - PM' (FG2: '2034 RC3A - PM', Plan 1: 'Staging Plan No. 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	145	0	2563	2708
	B	311	0	436	635	1382
	C	0	338	0	715	1053
	D	2717	1162	162	0	4041
	Tot.	3028	1645	598	3913	9184

Traffic Lane Flows

Lane	Scenario 2: 2034 RC3A - PM
Junction: M40 Junction 9	
1/1 (short)	145
1/2 (with short)	1022(In) 877(Out)
1/3 (with short)	1686(In) 814(Out)
1/4 (short)	872
2/1	526
2/2	601
2/3	535
3/1	436
3/2	207
3/3 (with short)	739(In) 367(Out)
3/4 (short)	372
4/1	108
4/2	931
4/3	814
4/4	872
5/1	410
5/2 (with short)	643(In) 395(Out)
5/3 (short)	248
6/1	1084
6/2	1181
6/3	1244
7/1	1296
7/2	1421
7/3 (with short)	1324(In) 892(Out)
7/4 (short)	432
8/1 (short)	155
8/2 (with short)	311(In) 156(Out)
8/3	90
8/4	248
9/1	1451
9/2	1577
10/1	671
10/2	601
10/3	373

11/1	544
11/2	54
12/1	1494
12/2	1486
12/3	933

Lane Saturation Flows

Junction: M40 Junction 9

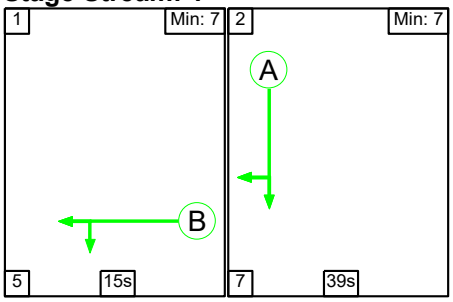
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (M40 N)	3.65	0.00	Y	Arm 10 Left	40.00	100.0 %	1908	1908
1/2 (M40 N Lane 2)	This lane uses a directly entered Saturation Flow						1906	1906
1/3 (M40 N Lane 3)	This lane uses a directly entered Saturation Flow						1825	1825
1/4 (M40 N Lane 4)	This lane uses a directly entered Saturation Flow						1845	1845
2/1	This lane uses a directly entered Saturation Flow						1945	1945
2/2	This lane uses a directly entered Saturation Flow						1977	1977
2/3	This lane uses a directly entered Saturation Flow						1869	1869
3/1 (A41)	3.65	0.00	Y	Arm 11 Left	45.00	100.0 %	1916	1916
3/2 (A41 Lane 2)	This lane uses a directly entered Saturation Flow						1905	1905
3/3 (A41 Lane 3)	This lane uses a directly entered Saturation Flow						1965	1965
3/4 (A41 Lane 4)	This lane uses a directly entered Saturation Flow						1960	1960
4/1	This lane uses a directly entered Saturation Flow						1906	1906
4/2	This lane uses a directly entered Saturation Flow						1906	1906
4/3	This lane uses a directly entered Saturation Flow						1825	1825
4/4	This lane uses a directly entered Saturation Flow						1845	1845
5/1 (M40 S)	3.25	0.00	Y	Arm 12 Left	60.00	100.0 %	1893	1893
5/2 (M40 S)	3.25	0.00	Y	Arm 8 Ahead Arm 12 Left	80.00 60.00	22.8 % 77.2 %	1895	1895
5/3 (M40 S)	3.25	0.00	N	Arm 8 Ahead	80.00	100.0 %	2042	2042
6/1	This lane uses a directly entered Saturation Flow						1906	1906
6/2	This lane uses a directly entered Saturation Flow						1981	1981
6/3	This lane uses a directly entered Saturation Flow						1960	1960
7/1 (A34 Lane 1)	This lane uses a directly entered Saturation Flow						1851	1851
7/2 (A34 Lane 2)	This lane uses a directly entered Saturation Flow						2025	2025
7/3 (A34 Lane 3)	This lane uses a directly entered Saturation Flow						1973	1973
7/4 (A34 Lane 4)	This lane uses a directly entered Saturation Flow						1869	1869
8/1	3.80	0.00	Y	Arm 9 Ahead	55.00	100.0 %	1942	1942
8/2	3.80	0.00	Y	Arm 9 Ahead	55.00	100.0 %	1942	1942
8/3	3.80	0.00	Y	Arm 2 Right	55.00	100.0 %	1942	1942
8/4	3.80	0.00	N	Arm 2 Right	55.00	100.0 %	2078	2078

9/1 (M40 N Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
9/2 (M40 N Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
10/1 (A41 Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
10/2 (A41 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
10/3 (A41 Exit Lane 3)	Infinite Saturation Flow	Inf	Inf
11/1 (M40 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
11/2 (M40 S Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
12/1 (A34 Exit Lane 1)	This lane uses a directly entered Saturation Flow	2100	2100
12/2 (A34 Exit Lane 2)	This lane uses a directly entered Saturation Flow	2100	2100
12/3 (A34 Exit Lane 3)	This lane uses a directly entered Saturation Flow	2100	2100

Scenario 1: '2034 RC3A - AM' (FG1: '2034 RC3A - AM', Plan 1: 'Staging Plan No. 1')
C1

Stage Sequence Diagram

Stage Stream: 1

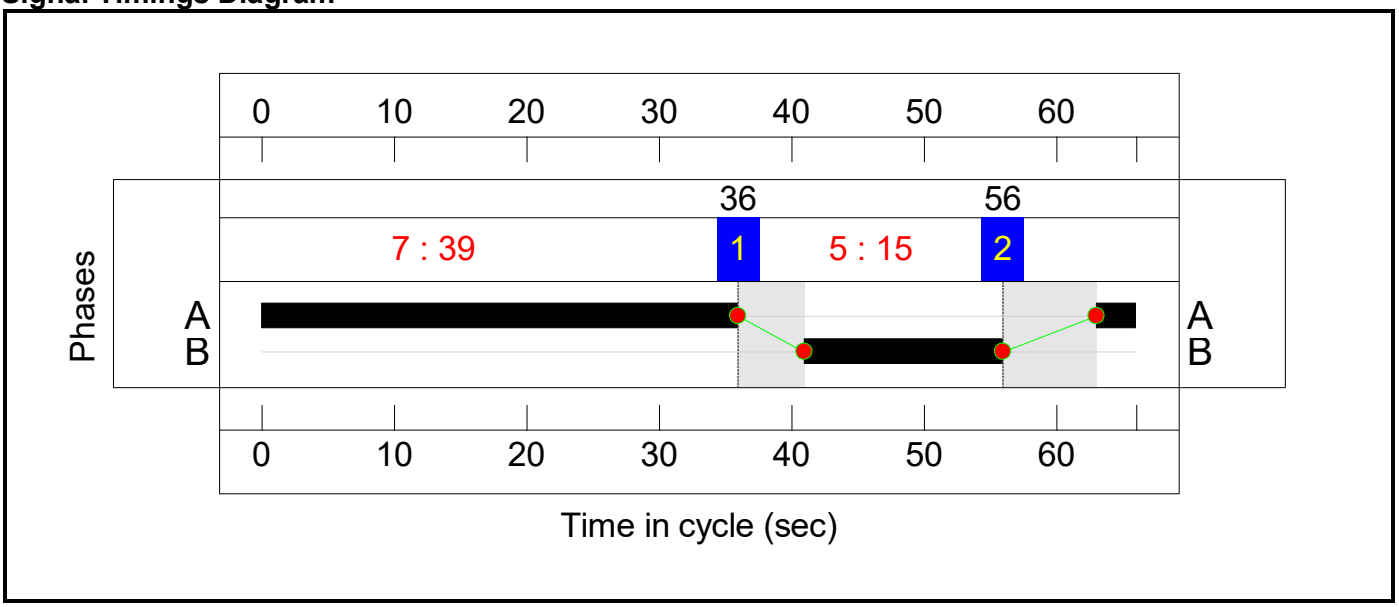


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	15	39
Change Point	36	56

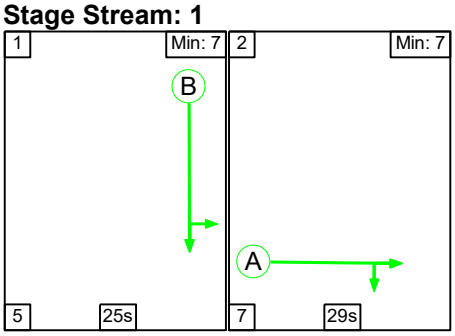
Signal Timings Diagram



C2

Stage Sequence Diagram

Stage Stream: 1

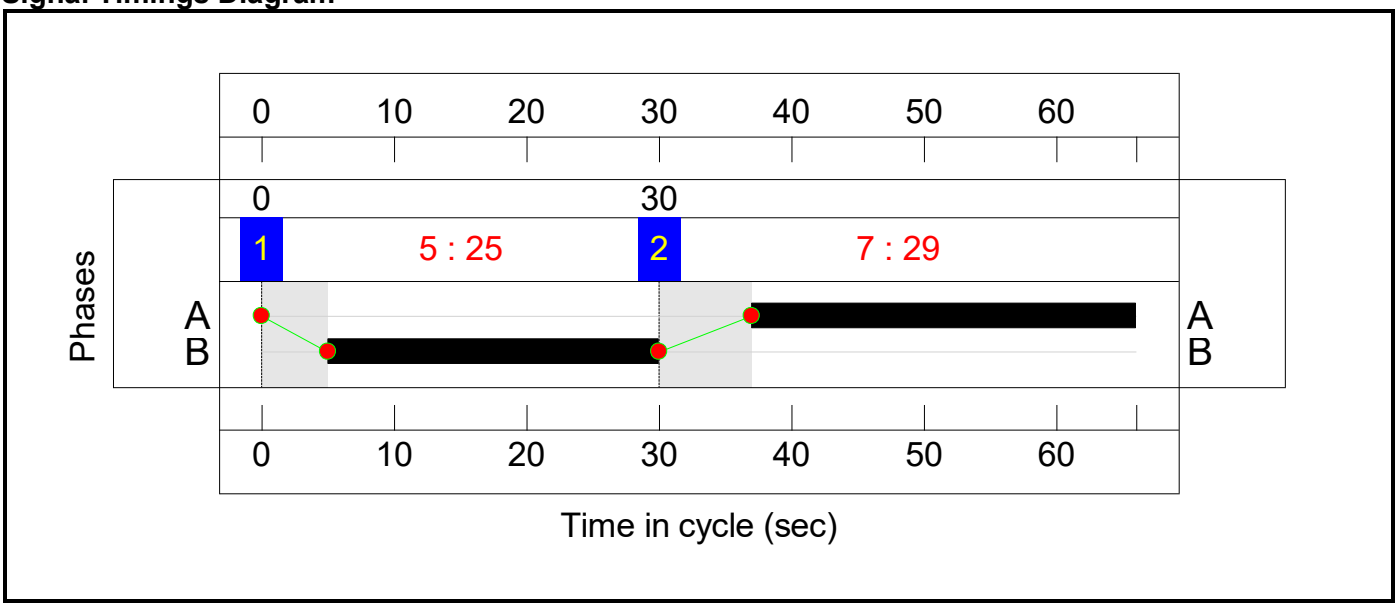


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	25	29
Change Point	0	30

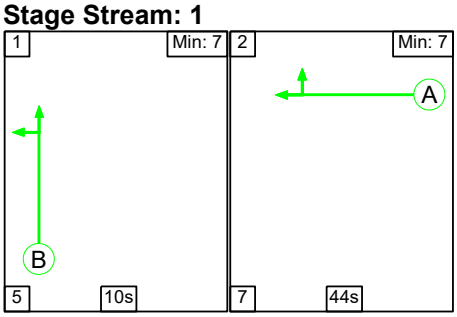
Signal Timings Diagram



C3

Stage Sequence Diagram

Stage Stream: 1

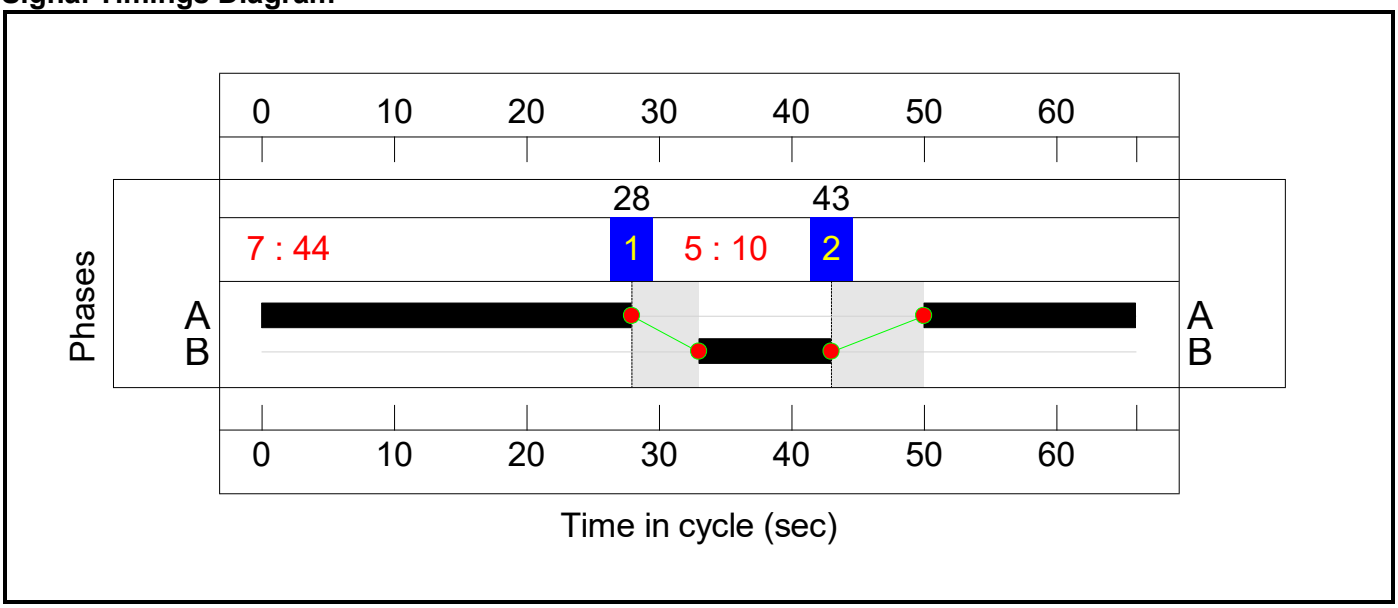


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	10	44
Change Point	28	43

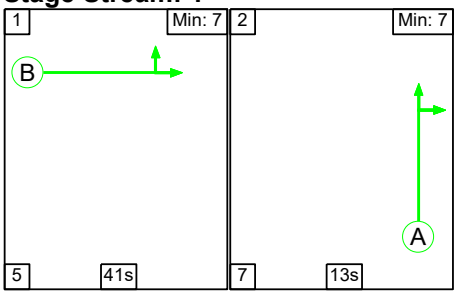
Signal Timings Diagram



C4

Stage Sequence Diagram

Stage Stream: 1

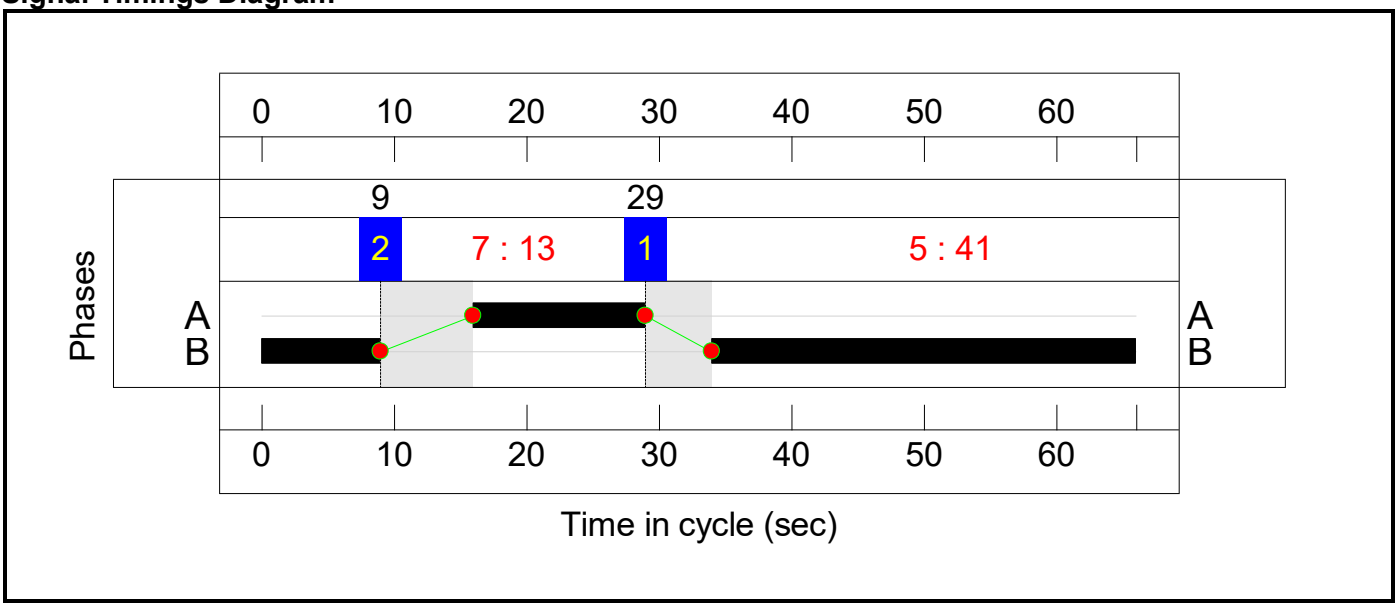


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	41	13
Change Point	29	9

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: M40 Junction 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**102.7%**
M40 Junction 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**102.7%**
1/2+1/1	M40 N Ahead Left	U	2:1	N/A	C2:B		1	25	-	1187	1906:1908	751+519	101.9 : 81.4%
1/3+1/4	M40 N Ahead	U	2:1	N/A	C2:B		1	25	-	1378	1825:1845	719+727	94.2 : 96.4%
2/1	Ahead	U	2:1	N/A	C2:A		1	29	-	731	1945	884	81.0%
2/2	Ahead	U	2:1	N/A	C2:A		1	29	-	747	1977	899	81.5%
2/3	Right Ahead	U	2:1	N/A	C2:A		1	29	-	873	1869	850	100.0%
3/1	A41 Left	U	1:1	N/A	C1:B		1	15	-	305	1916	464	65.7%
3/2	A41 Ahead	U	1:1	N/A	C1:B		1	15	-	432	1905	462	93.5%
3/3+3/4	A41 Ahead	U	1:1	N/A	C1:B		1	15	-	939	1965:1960	476+475	98.7 : 98.7%
4/1	Ahead	U	1:1	N/A	C1:A		1	39	-	362	1906	1155	30.5%
4/2	Right Ahead	U	1:1	N/A	C1:A		1	39	-	1106	1906	1155	93.7%
4/3	Right	U	1:1	N/A	C1:A		1	39	-	677	1825	1106	61.2%
4/4	Right	U	1:1	N/A	C1:A		1	39	-	701	1845	1118	62.7%
5/1	M40 S Left	U	3:1	N/A	C3:B		1	10	-	227	1893	316	71.9%
5/2+5/3	M40 S Ahead Left	U	3:1	N/A	C3:B		1	10	-	445	1901:2042	317+215	83.6 : 83.6%
6/1	Ahead	U	3:1	N/A	C3:A		1	44	-	1197	1906	1300	91.0%
6/2	Ahead	U	3:1	N/A	C3:A		1	44	-	1147	1981	1351	84.9%
6/3	Right Ahead	U	3:1	N/A	C3:A		1	44	-	1170	1960	1336	87.6%
7/1	A34 Left	U	4:1	N/A	C4:B		1	41	-	1116	1851	1178	94.7%
7/2	A34 Left	U	4:1	N/A	C4:B		1	41	-	1227	2025	1289	95.2%
7/3+7/4	A34 Ahead	U	4:1	N/A	C4:B		1	41	-	1978	1973:1869	1076+850	102.7 : 102.7%
8/2+8/1	Ahead	U	4:1	N/A	C4:A		1	13	-	139	1942:1942	343+338	20.4 : 20.4%

8/3	Right	U	4:1	N/A	C4:A		1	13	-	193	1942	412	46.9%
8/4	Right	U	4:1	N/A	C4:A		1	13	-	180	2078	441	40.8%
12/1	A34 Exit	U	N/A	N/A	-		-	-	-	1424	2100	2100	67.1%
12/2	A34 Exit	U	N/A	N/A	-		-	-	-	1219	2100	2100	58.0%
12/3	A34 Exit	U	N/A	N/A	-		-	-	-	1031	2100	2100	49.1%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: M40 Junction 9	**-**	**-**	**0**	**0**	**0**	**75.6**	**100.7**	**0.0**	**176.3**	**-**	**-**	**-**	**-**
M40 Junction 9	**-**	**-**	**0**	**0**	**0**	**75.6**	**100.7**	**0.0**	**176.3**	**-**	**-**	**-**	**-**
1/2+1/1	1187	1173	-	-	-	6.5	13.3	-	19.8 (15.8+4.0)	60.2 (74.3:34.5)	14.3	13.3	27.6
1/3+1/4	1378	1378	-	-	-	7.4	8.2	-	15.6 (7.6+8.0)	40.8 (40.7:40.9)	12.5	8.2	20.7
2/1	716	716	-	-	-	3.5	0.0	-	3.5	17.6	10.5	0.0	10.5
2/2	732	732	-	-	-	3.6	0.0	-	3.6	17.6	11.0	0.0	11.0
2/3	850	850	-	-	-	4.6	0.2	-	4.8	20.4	15.6	0.2	15.8
3/1	305	305	-	-	-	1.9	0.9	-	2.9	33.7	5.0	0.9	5.9
3/2	432	432	-	-	-	2.9	5.3	-	8.3	69.0	7.7	5.3	13.0
3/3+3/4	939	939	-	-	-	6.5	12.5	-	19.0 (9.5+9.5)	72.9 (72.9:72.9)	8.5	12.5	21.0
4/1	352	352	-	-	-	1.4	0.2	-	1.6	16.6	6.5	0.2	6.7
4/2	1083	1083	-	-	-	1.5	0.0	-	1.5	4.9	7.3	0.0	7.3
4/3	677	677	-	-	-	0.2	0.0	-	0.2	1.3	0.7	0.0	0.7
4/4	701	701	-	-	-	0.3	0.0	-	0.3	1.5	0.8	0.0	0.8
5/1	227	227	-	-	-	1.6	1.2	-	2.9	45.8	3.9	1.2	5.2
5/2+5/3	445	445	-	-	-	3.2	2.4	-	5.6 (3.4+2.2)	45.6 (46.2:44.7)	4.6	2.4	7.1
6/1	1183	1183	-	-	-	4.9	0.0	-	4.9	14.9	21.0	0.0	21.0
6/2	1147	1147	-	-	-	3.5	0.0	-	3.5	10.9	20.6	0.0	20.6
6/3	1170	1170	-	-	-	3.7	0.0	-	3.7	11.5	21.0	0.0	21.0
7/1	1116	1116	-	-	-	3.4	7.3	-	10.7	34.5	18.6	7.3	25.9
7/2	1227	1227	-	-	-	3.8	7.9	-	11.7	34.3	20.4	7.9	28.4
7/3+7/4	1978	1926	-	-	-	6.8	38.9	-	45.7 (25.7+19.9)	83.1 (83.9:82.2)	52.6	38.9	91.4
8/2+8/1	139	139	-	-	-	0.1	0.0	-	0.1 (0.1+0.1)	2.7 (2.7:2.7)	0.7	0.0	0.7

8/3	193	193	-	-	-	2.1	0.0	-	2.1	39.6	3.5	0.0	3.5
8/4	180	180	-	-	-	2.0	0.0	-	2.0	40.6	3.3	0.0	3.3
12/1	1410	1410	-	-	-	0.0	1.0	-	1.0	2.6	0.0	1.0	1.0
12/2	1219	1219	-	-	-	0.0	0.7	-	0.7	2.0	0.0	0.7	0.7
12/3	1031	1031	-	-	-	0.0	0.5	-	0.5	1.7	0.0	0.5	0.5

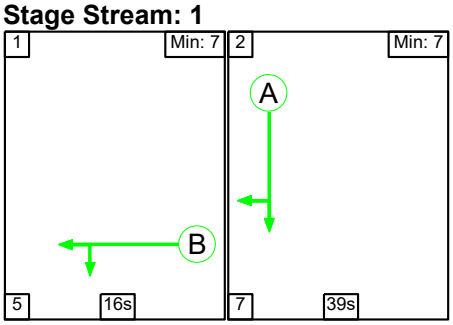
C1	Stream: 1 PRC for Signalled Lanes (%):	-9.7	Total Delay for Signalled Lanes (pcuHr):	33.77	Cycle Time (s):	66
C2	Stream: 1 PRC for Signalled Lanes (%):	-13.2	Total Delay for Signalled Lanes (pcuHr):	47.36	Cycle Time (s):	66
C3	Stream: 1 PRC for Signalled Lanes (%):	-1.1	Total Delay for Signalled Lanes (pcuHr):	20.64	Cycle Time (s):	66
C4	Stream: 1 PRC for Signalled Lanes (%):	-14.1	Total Delay for Signalled Lanes (pcuHr):	72.33	Cycle Time (s):	66
	PRC Over All Lanes (%):	-14.1	Total Delay Over All Lanes(pcuHr):	176.29		

Scenario 2: '2034 RC3A - PM' (FG2: '2034 RC3A - PM', Plan 1: 'Staging Plan No. 1')

C1

Stage Sequence Diagram

Stage Stream: 1

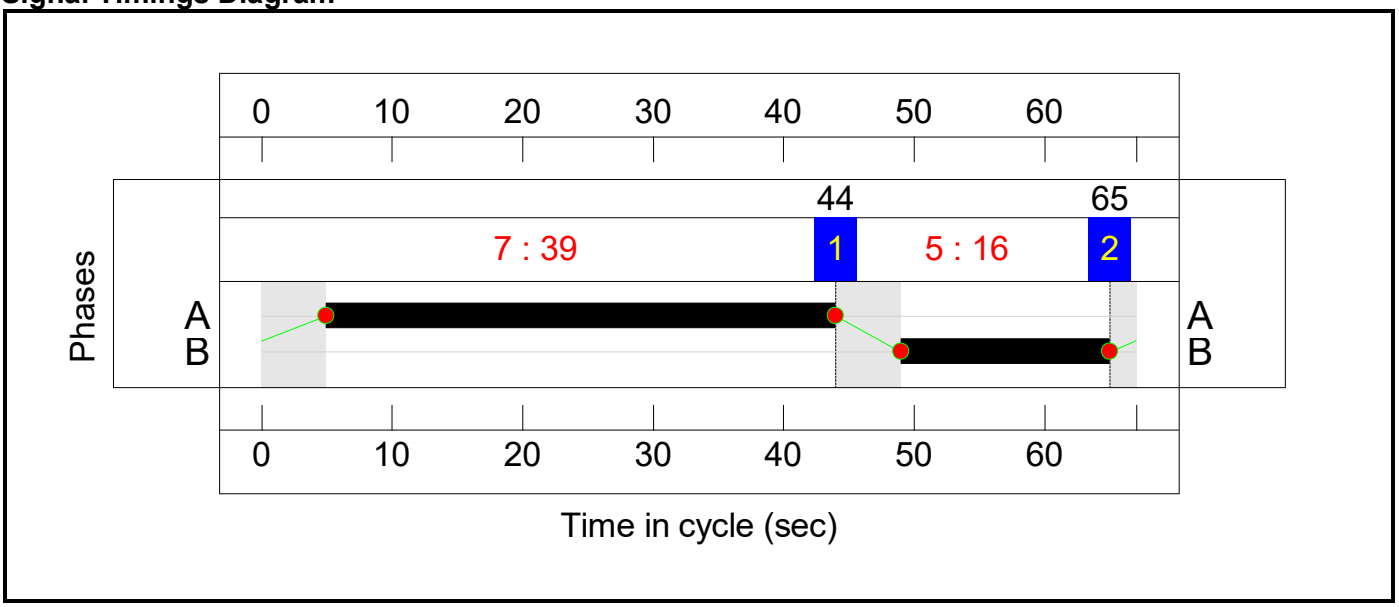


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	16	39
Change Point	44	65

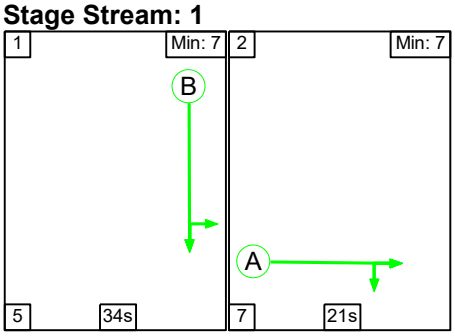
Signal Timings Diagram



C2

Stage Sequence Diagram

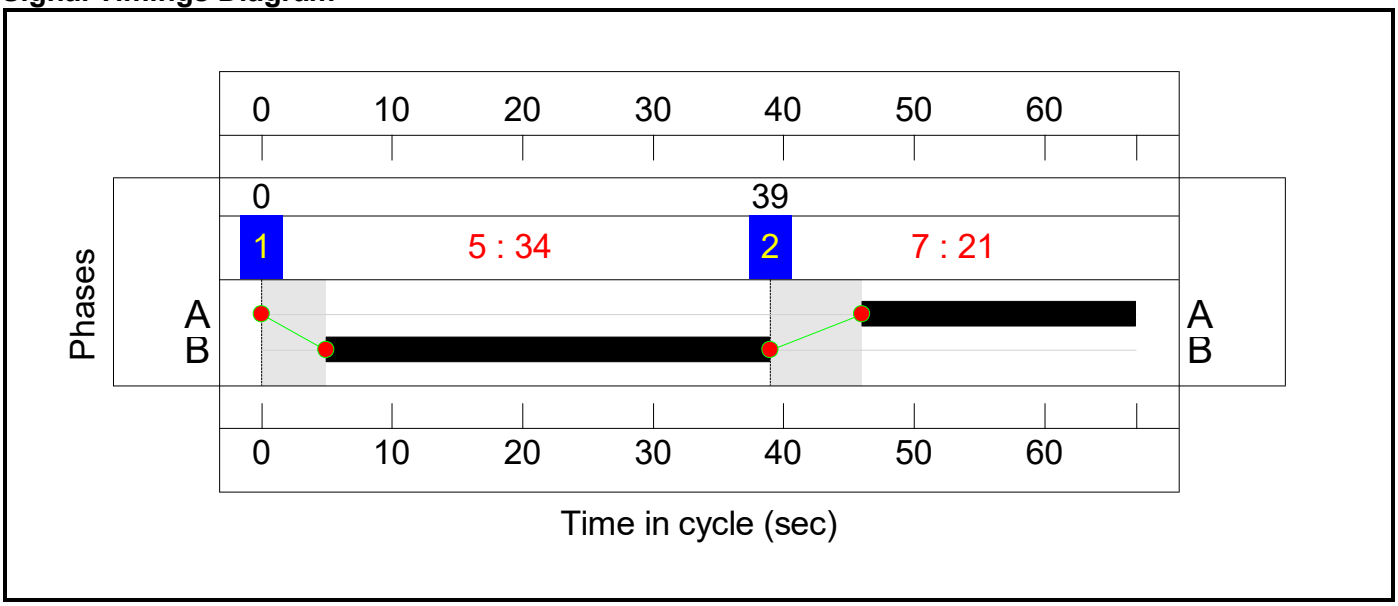
Stage Stream: 1



Stage Timings
Stage Stream: 1

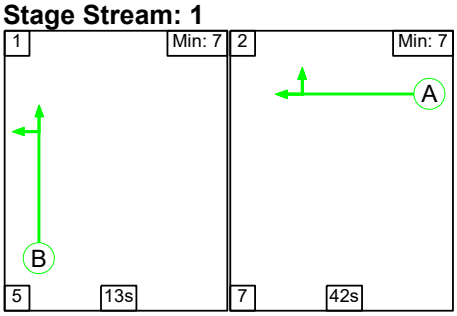
Stage	1	2
Duration	34	21
Change Point	0	39

Signal Timings Diagram



C3

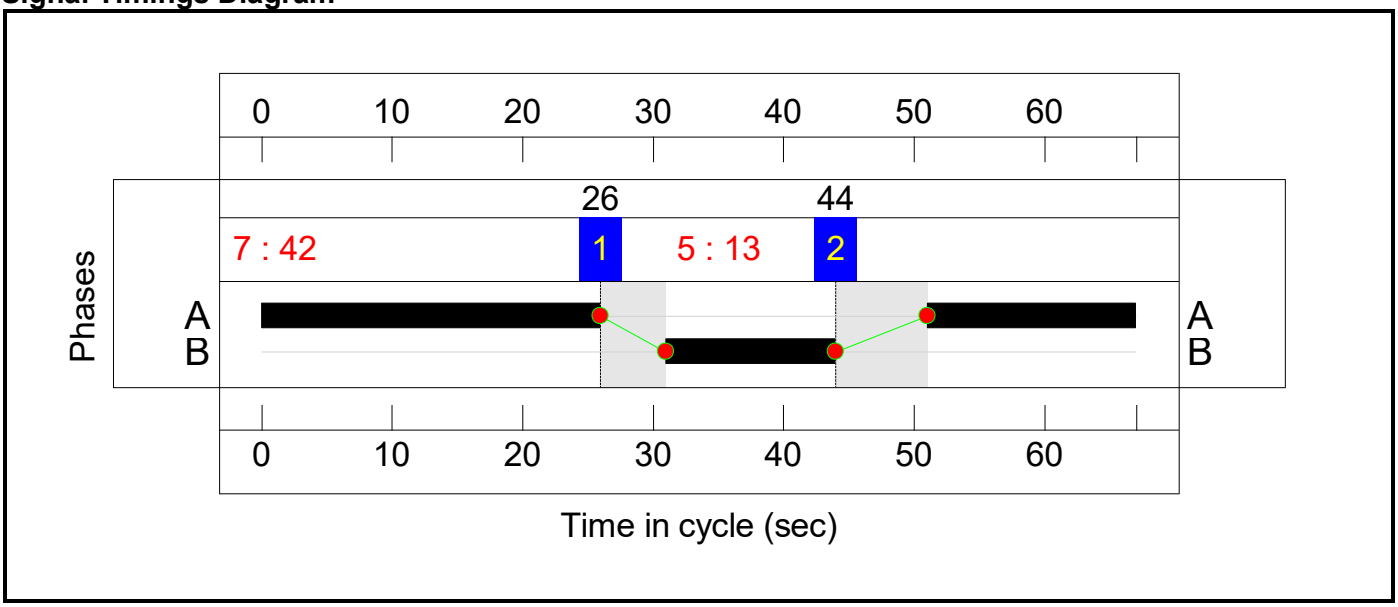
Stage Sequence Diagram
Stage Stream: 1



Stage Timings
Stage Stream: 1

Stage	1	2
Duration	13	42
Change Point	26	44

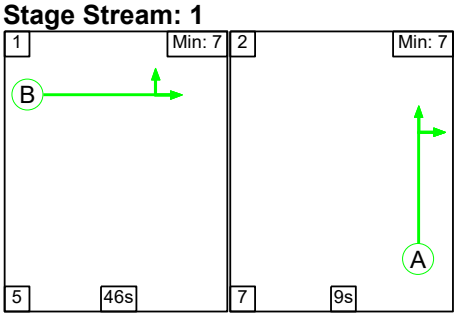
Signal Timings Diagram



C4

Stage Sequence Diagram

Stage Stream: 1

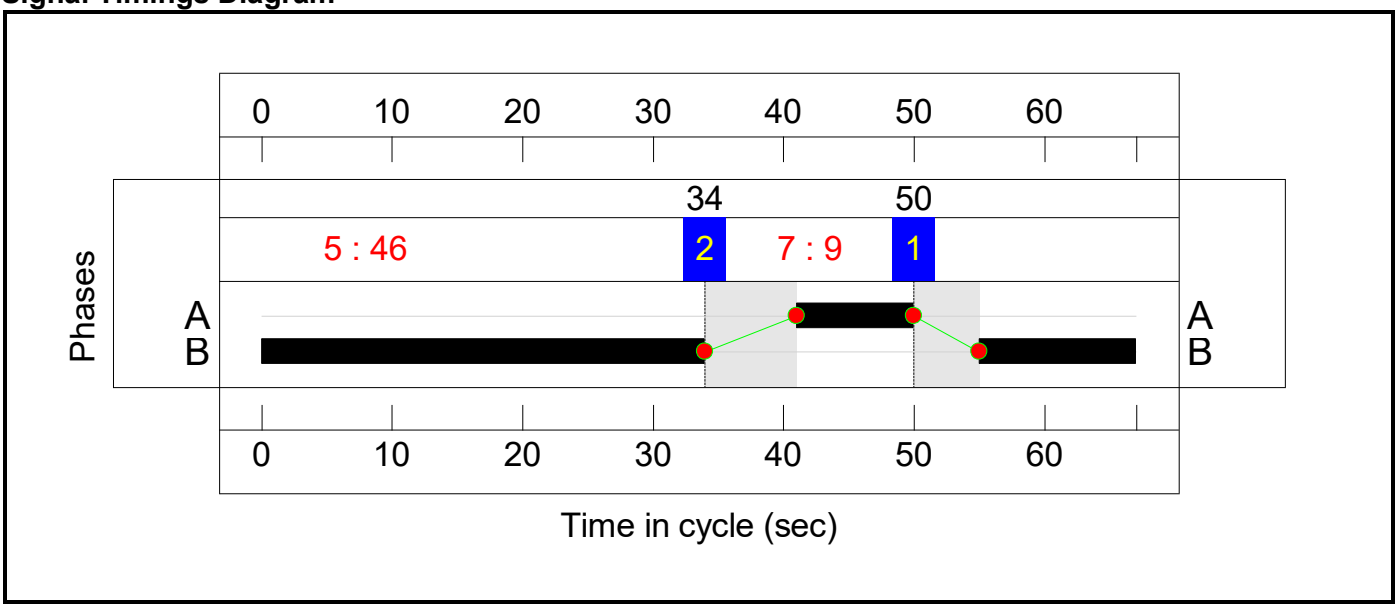


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	46	9
Change Point	50	34

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: M40 Junction 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**105.1%**
M40 Junction 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**105.1%**
1/2+1/1	M40 N Ahead Left	U	2:1	N/A	C2:B		1	34	-	1022	1906:1908	996+165	88.1 : 88.1%
1/3+1/4	M40 N Ahead	U	2:1	N/A	C2:B		1	34	-	1686	1825:1845	886+949	91.9 : 91.9%
2/1	Ahead	U	2:1	N/A	C2:A		1	21	-	526	1945	639	81.9%
2/2	Ahead	U	2:1	N/A	C2:A		1	21	-	601	1977	649	91.3%
2/3	Right Ahead	U	2:1	N/A	C2:A		1	21	-	535	1869	614	86.4%
3/1	A41 Left	U	1:1	N/A	C1:B		1	16	-	436	1916	486	89.7%
3/2	A41 Ahead	U	1:1	N/A	C1:B		1	16	-	207	1905	483	42.8%
3/3+3/4	A41 Ahead	U	1:1	N/A	C1:B		1	16	-	739	1965:1960	499+497	73.6 : 74.8%
4/1	Ahead	U	1:1	N/A	C1:A		1	39	-	108	1906	1138	9.5%
4/2	Right Ahead	U	1:1	N/A	C1:A		1	39	-	931	1906	1138	81.8%
4/3	Right	U	1:1	N/A	C1:A		1	39	-	814	1825	1090	74.7%
4/4	Right	U	1:1	N/A	C1:A		1	39	-	872	1845	1101	79.2%
5/1	M40 S Left	U	3:1	N/A	C3:B		1	13	-	410	1893	396	103.7%
5/2+5/3	M40 S Ahead Left	U	3:1	N/A	C3:B		1	13	-	643	1895:2042	376+236	105.1 : 105.1%
6/1	Ahead	U	3:1	N/A	C3:A		1	42	-	1084	1906	1223	88.6%
6/2	Ahead	U	3:1	N/A	C3:A		1	42	-	1181	1981	1271	92.9%
6/3	Right Ahead	U	3:1	N/A	C3:A		1	42	-	1244	1960	1258	98.9%
7/1	A34 Left	U	4:1	N/A	C4:B		1	46	-	1296	1851	1298	99.8%
7/2	A34 Left	U	4:1	N/A	C4:B		1	46	-	1421	2025	1421	100.0%
7/3+7/4	A34 Ahead	U	4:1	N/A	C4:B		1	46	-	1324	1973:1869	1306+632	68.3 : 68.3%
8/2+8/1	Ahead	U	4:1	N/A	C4:A		1	9	-	311	1942:1942	279+277	56.0 : 56.0%

8/3	Right	U	4:1	N/A	C4:A		1	9	-	90	1942	290	29.6%
8/4	Right	U	4:1	N/A	C4:A		1	9	-	248	2078	310	76.1%
12/1	A34 Exit	U	N/A	N/A	-		-	-	-	1494	2100	2100	70.5%
12/2	A34 Exit	U	N/A	N/A	-		-	-	-	1486	2100	2100	70.1%
12/3	A34 Exit	U	N/A	N/A	-		-	-	-	933	2100	2100	44.4%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: M40 Junction 9	**-**	**-**	**0**	**0**	**0**	**66.2**	**91.6**	**0.0**	**157.7**	**-**	**-**	**-**	**-**
M40 Junction 9	**-**	**-**	**0**	**0**	**0**	**66.2**	**91.6**	**0.0**	**157.7**	**-**	**-**	**-**	**-**
1/2+1/1	1022	1022	-	-	-	3.8	3.5	-	7.3 (6.5+0.8)	25.7 (26.5:20.7)	14.4	3.5	17.9
1/3+1/4	1686	1686	-	-	-	6.6	5.3	-	11.9 (5.7+6.2)	25.4 (25.1:25.8)	14.5	5.3	19.8
2/1	523	523	-	-	-	3.6	0.0	-	3.6	24.8	9.4	0.0	9.4
2/2	592	592	-	-	-	3.6	0.0	-	3.6	22.1	10.5	0.0	10.5
2/3	530	530	-	-	-	3.7	0.0	-	3.7	24.9	9.4	0.0	9.4
3/1	436	436	-	-	-	2.9	3.8	-	6.7	55.4	7.8	3.8	11.5
3/2	207	207	-	-	-	1.2	0.4	-	1.6	27.4	3.2	0.4	3.6
3/3+3/4	739	739	-	-	-	4.7	1.4	-	6.1 (3.0+3.1)	29.9 (29.9:30.0)	6.3	1.4	7.7
4/1	108	108	-	-	-	0.5	0.1	-	0.6	18.4	2.0	0.1	2.1
4/2	931	931	-	-	-	0.2	0.0	-	0.2	0.9	1.0	0.0	1.0
4/3	814	814	-	-	-	0.3	0.0	-	0.3	1.2	0.7	0.0	0.7
4/4	872	872	-	-	-	0.3	0.0	-	0.3	1.3	0.8	0.0	0.8
5/1	410	396	-	-	-	3.4	14.4	-	17.8	155.9	7.9	14.4	22.3
5/2+5/3	643	612	-	-	-	5.4	22.6	-	27.9 (17.2+10.7)	156.4 (157.2:155.2)	9.3	22.6	31.9
6/1	1084	1084	-	-	-	5.3	0.0	-	5.3	17.5	19.7	0.0	19.7
6/2	1181	1181	-	-	-	4.1	0.0	-	4.1	12.4	21.3	0.0	21.3
6/3	1244	1244	-	-	-	4.6	0.0	-	4.6	13.4	23.0	0.0	23.0
7/1	1296	1296	-	-	-	3.6	17.4	-	21.0	58.3	23.8	17.4	41.2
7/2	1421	1421	-	-	-	4.0	19.0	-	22.9	58.1	26.5	19.0	45.4
7/3+7/4	1324	1324	-	-	-	1.8	1.1	-	2.9 (2.1+0.8)	7.9 (8.4:6.8)	8.9	1.1	10.0
8/2+8/1	311	311	-	-	-	2.0	0.0	-	2.0 (1.0+1.0)	22.9 (22.9:22.9)	2.9	0.0	2.9
8/3	86	86	-	-	-	0.2	0.0	-	0.2	7.4	0.6	0.0	0.6
8/4	236	236	-	-	-	0.4	0.0	-	0.4	6.8	3.8	0.0	3.8

12/1	1480	1480	-	-	-	0.0	1.2	-	1.2	2.9	0.0	1.2	1.2
12/2	1471	1471	-	-	-	0.0	1.2	-	1.2	2.9	0.0	1.2	1.2
12/3	933	933	-	-	-	0.0	0.4	-	0.4	1.5	0.0	0.4	0.4

C1	Stream: 1 PRC for Signalled Lanes (%):	0.4	Total Delay for Signalled Lanes (pcuHr):	15.80	Cycle Time (s): 67
C2	Stream: 1 PRC for Signalled Lanes (%):	-2.1	Total Delay for Signalled Lanes (pcuHr):	30.10	Cycle Time (s): 67
C3	Stream: 1 PRC for Signalled Lanes (%):	-16.7	Total Delay for Signalled Lanes (pcuHr):	59.66	Cycle Time (s): 67
C4	Stream: 1 PRC for Signalled Lanes (%):	-11.1	Total Delay for Signalled Lanes (pcuHr):	49.40	Cycle Time (s): 67
	PRC Over All Lanes (%):	-16.7	Total Delay Over All Lanes(pcuHr):	157.72	

APPENDIX L

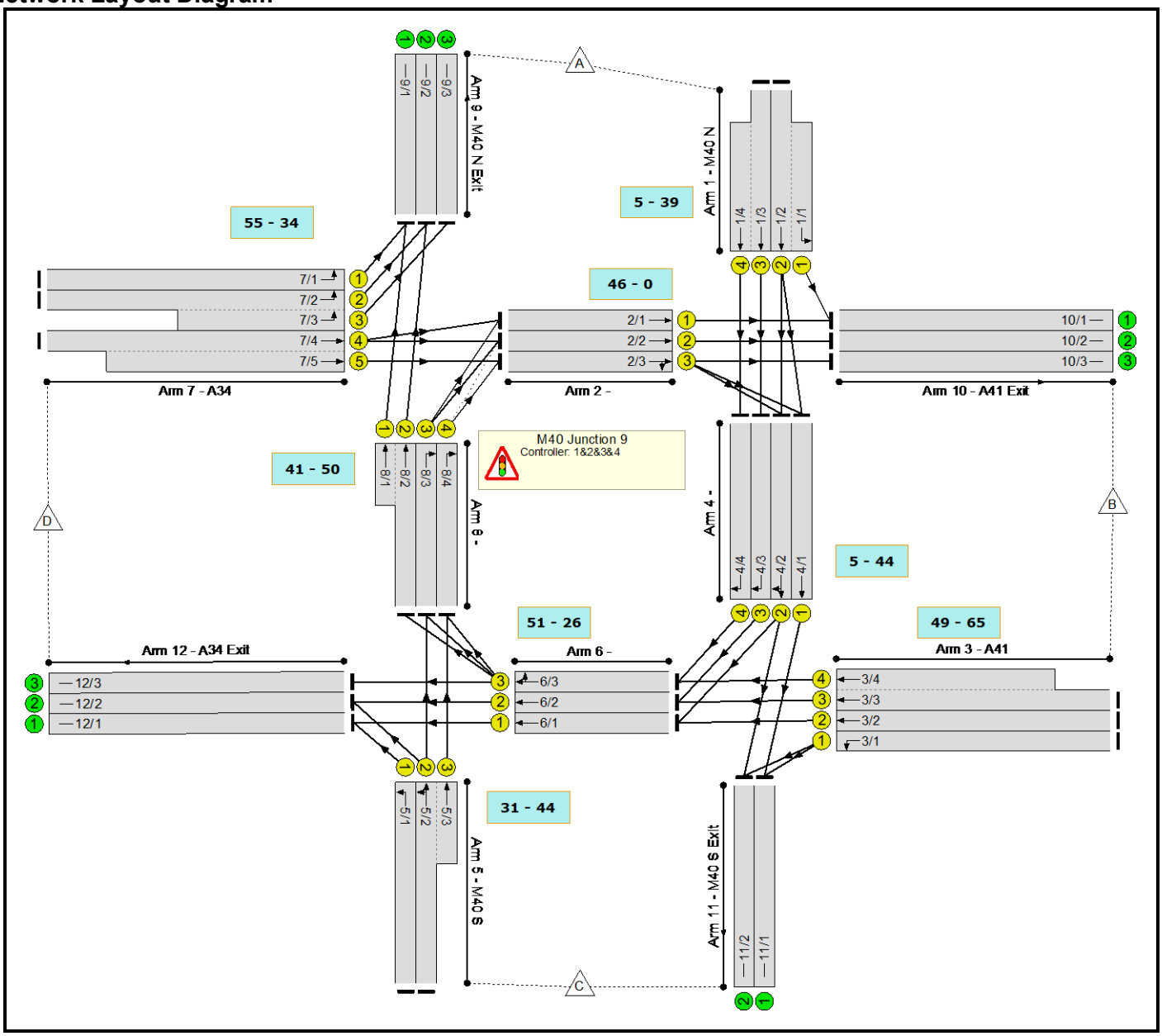
M40 JUNCTION 9 DS3A LINSIG REPORT

Full Input Data And Results

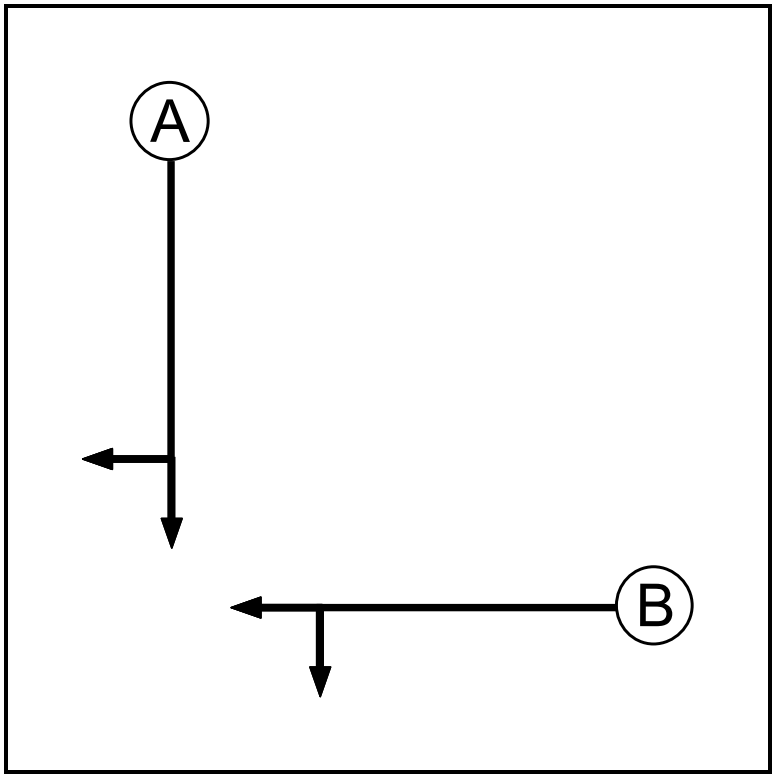
User and Project Details

Project:	**OxSRFI**
Title:	**M40 Junction 9 - with mitigtion**
Location:	M40 Junction 9, Wendlebury
Additional detail:	
File name:	250903 M40 Junction 9 - DS3A.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



C1
Phase Diagram



Phase Input Data

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

Phase Intergreens Matrix

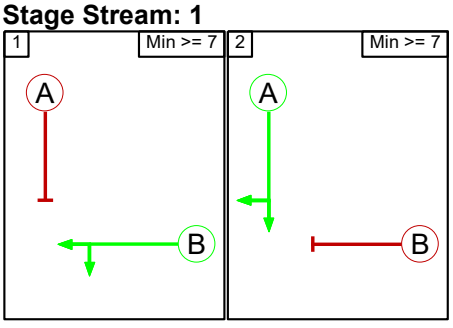
	Starting Phase		
Terminating Phase		A	B
	A		5
	B	7	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



Phase Delays

Stage Stream: 1

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

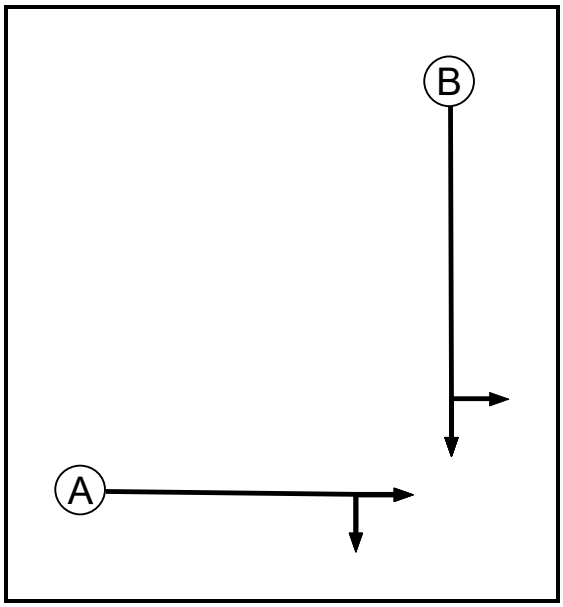
Prohibited Stage Change

Stage Stream: 1

From Stage \ To Stage	1	2
1		7
2	5	

C2

Phase Diagram



Phase Input Data

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

Phase Intergreens Matrix

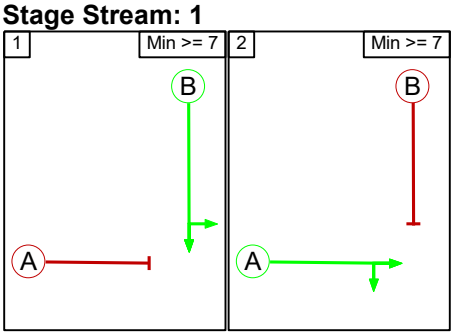
Terminating Phase \ Starting Phase	A	B
A		5
B	7	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



Phase Delays

Stage Stream: 1

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

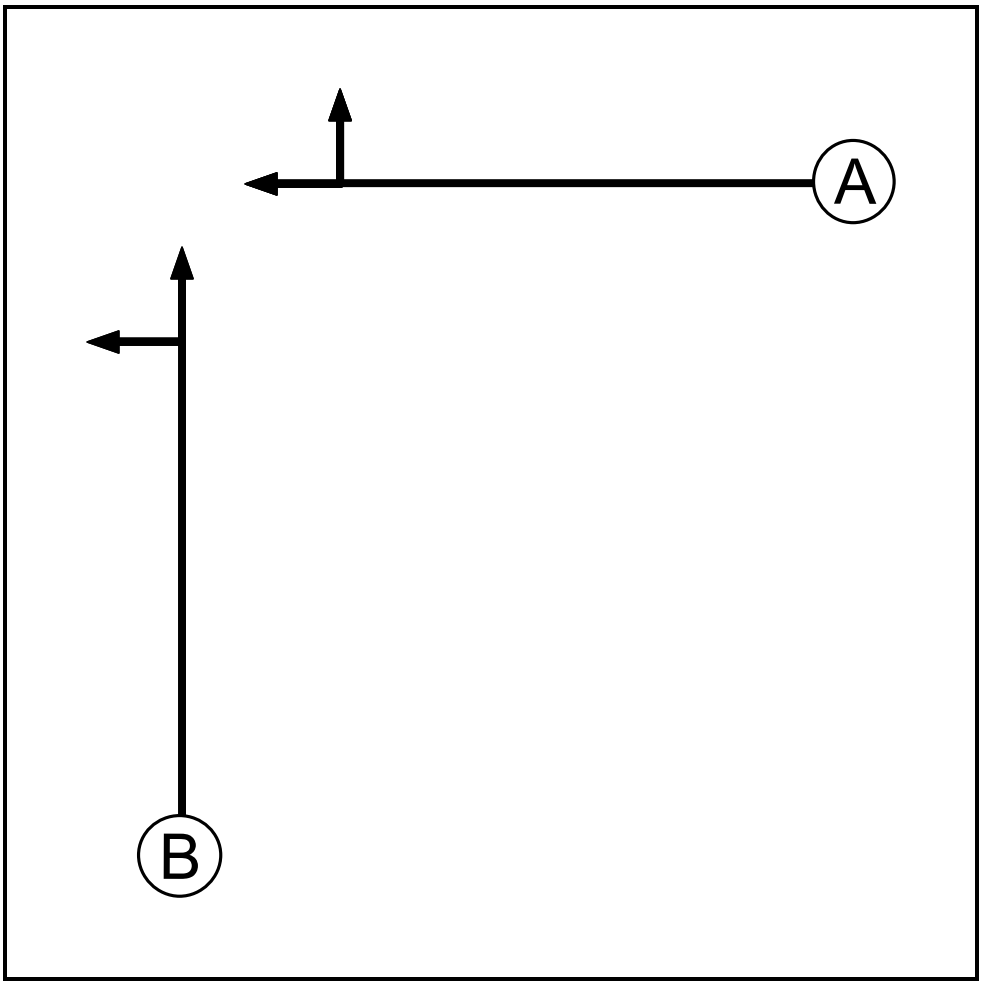
Prohibited Stage Change

Stage Stream: 1

From Stage \ To Stage	1	2
1		7
2	5	

C3

Phase Diagram



Phase Input Data

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

Phase Intergreens Matrix

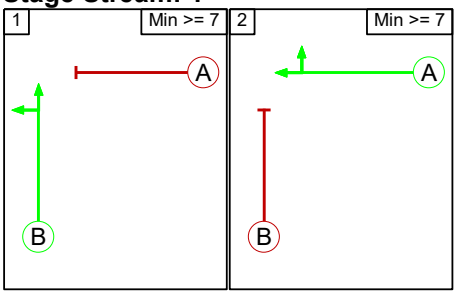
		Starting Phase	
		A	B
Terminating Phase	A		5
	B	7	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



Phase Delays

Stage Stream: 1

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

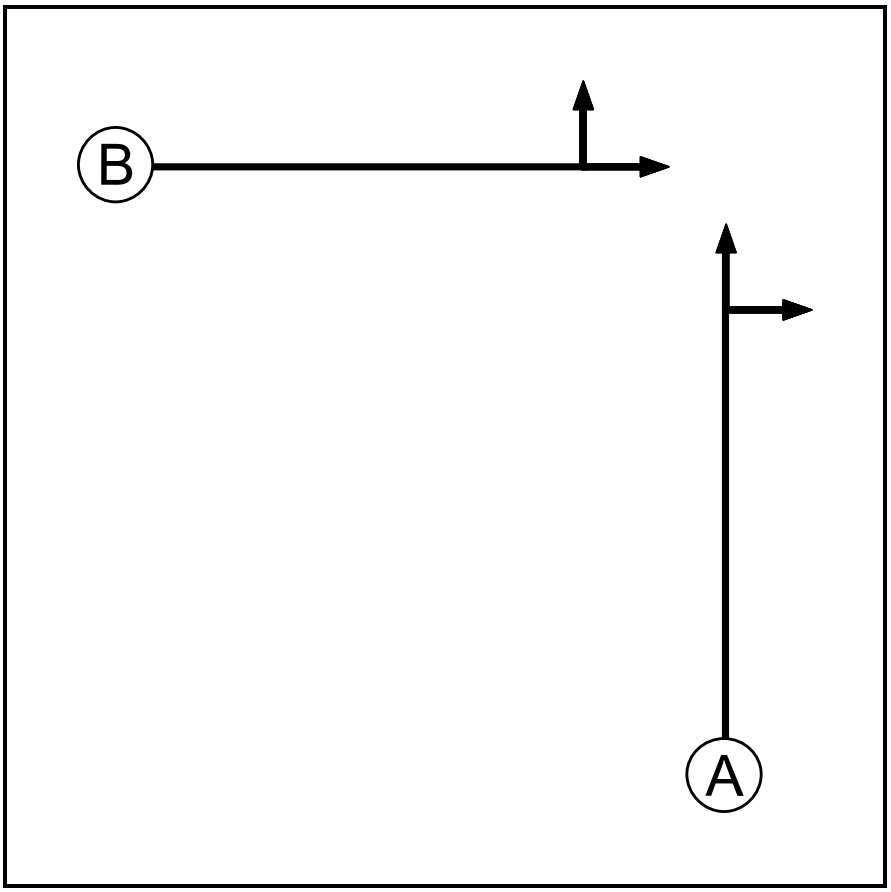
Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		7
	2	5	

C4

Phase Diagram



Phase Input Data

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

Phase Intergreens Matrix

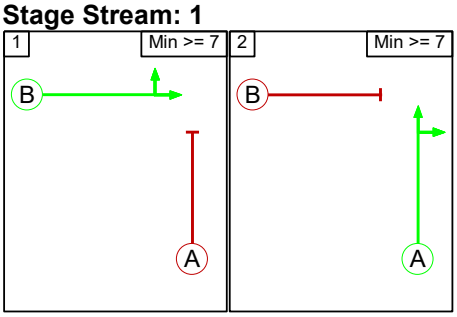
	Starting Phase		
		A	B
Terminating Phase	A		5
	B	7	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



Phase Delays

Stage Stream: 1

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

Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		7
	2	5	

Lane Input Data

Junction: M40 Junction 9

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (M40 N)	U	B	2	3	17.4	Geom	-	3.65	0.00	Y	Arm 10 Left	40.00
1/2 (M40 N)	U	B	2	3	60.0	User	1906	-	-	-	-	-
1/3 (M40 N)	U	B	2	3	60.0	User	1825	-	-	-	-	-
1/4 (M40 N)	U	B	2	3	29.6	User	1845	-	-	-	-	-
2/1	U	A	2	3	20.0	User	1945	-	-	-	-	-
2/2	U	A	2	3	26.0	User	1977	-	-	-	-	-
2/3	U	A	2	3	26.0	User	1869	-	-	-	-	-
3/1 (A41)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 11 Left	45.00
3/2 (A41)	U	B	2	3	60.0	User	1905	-	-	-	-	-
3/3 (A41)	U	B	2	3	60.0	User	1965	-	-	-	-	-
3/4 (A41)	U	B	2	3	33.9	User	1960	-	-	-	-	-
4/1	U	A	2	3	5.0	User	1906	-	-	-	-	-
4/2	U	A	2	3	5.0	User	1906	-	-	-	-	-
4/3	U	A	2	3	5.0	User	1825	-	-	-	-	-
4/4	U	A	2	3	6.0	User	1845	-	-	-	-	-
5/1 (M40 S)	U	B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 12 Left	60.00
5/2 (M40 S)	U	B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 8 Ahead	80.00
											Arm 12 Left	60.00
5/3 (M40 S)	U	B	2	3	6.0	Geom	-	3.25	0.00	N	Arm 8 Ahead	80.00
6/1	U	A	2	3	20.0	User	1906	-	-	-	-	-
6/2	U	A	2	3	31.0	User	1981	-	-	-	-	-
6/3	U	A	2	3	31.0	User	1960	-	-	-	-	-
7/1 (A34)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 9 Left	60.00
7/2 (A34)	U	B	2	3	60.0	Geom	-	3.80	0.00	N	Arm 9 Left	60.00
7/3 (A34)	U	B	2	3	12.2	Geom	-	3.80	0.00	N	Arm 9 Left	60.00
7/4 (A34)	U	B	2	3	60.0	User	1973	-	-	-	-	-
7/5 (A34)	U	B	2	3	28.0	User	1869	-	-	-	-	-
8/1	U	A	2	3	4.5	Geom	-	3.80	0.00	Y	Arm 9 Ahead	55.00

8/2	U	A	2	3	6.0	Geom	-	3.80	0.00	Y	Arm 9 Ahead	55.00
8/3	U	A	2	3	6.0	Geom	-	3.80	0.00	Y	Arm 2 Right	55.00
8/4	U	A	2	3	6.0	Geom	-	3.80	0.00	N	Arm 2 Right	55.00
9/1 (M40 N Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
9/2 (M40 N Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
9/3 (M40 N Exit)	U		2	3	8.7	User	1800	-	-	-	-	-
10/1 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
10/2 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
10/3 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
11/1 (M40 S Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
11/2 (M40 S Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
12/1 (A34 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
12/2 (A34 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
12/3 (A34 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2034 DS3A - AM'	08:00	09:00	01:00	
2: '2034 DS3A - PM'	17:00	18:00	01:00	

Scenario 1: '2034 DS3A - AM' (FG1: '2034 DS3A - AM', Plan 1: 'Staging Plan No. 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	422	0	2525	2947
	B	71	0	296	990	1357
	C	0	299	0	341	640
	D	2385	1229	657	0	4271
	Tot.	2456	1950	953	3856	9215

Traffic Lane Flows

Lane	Scenario 1: 2034 DS3A - AM
Junction: M40 Junction 9	
1/1 (short)	422
1/2 (with short)	1270(In) 848(Out)
1/3 (with short)	1677(In) 818(Out)
1/4 (short)	859
2/1	693
2/2	753
2/3	739
3/1	296
3/2	327
3/3 (with short)	734(In) 380(Out)
3/4 (short)	354
4/1	404
4/2	1101
4/3	818
4/4	859
5/1	214
5/2 (with short)	426(In) 246(Out)
5/3 (short)	180
6/1	1175
6/2	1198
6/3	1213
7/1	913
7/2 (with short)	1472(In) 893(Out)
7/3 (short)	579
7/4 (with short)	1886(In) 1147(Out)
7/5 (short)	739
8/1 (short)	36
8/2 (with short)	71(In) 35(Out)
8/3	119
8/4	180
9/1	949
9/2	928
9/3	579

10/1	1115
10/2	753
10/3	82
11/1	552
11/2	401
12/1	1389
12/2	1325
12/3	1142

Lane Saturation Flows

Junction: M40 Junction 9								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (M40 N)	3.65	0.00	Y	Arm 10 Left	40.00	100.0 %	1908	1908
1/2 (M40 N Lane 2)	This lane uses a directly entered Saturation Flow						1906	1906
1/3 (M40 N Lane 3)	This lane uses a directly entered Saturation Flow						1825	1825
1/4 (M40 N Lane 4)	This lane uses a directly entered Saturation Flow						1845	1845
2/1	This lane uses a directly entered Saturation Flow						1945	1945
2/2	This lane uses a directly entered Saturation Flow						1977	1977
2/3	This lane uses a directly entered Saturation Flow						1869	1869
3/1 (A41)	3.65	0.00	Y	Arm 11 Left	45.00	100.0 %	1916	1916
3/2 (A41 Lane 2)	This lane uses a directly entered Saturation Flow						1905	1905
3/3 (A41 Lane 3)	This lane uses a directly entered Saturation Flow						1965	1965
3/4 (A41 Lane 4)	This lane uses a directly entered Saturation Flow						1960	1960
4/1	This lane uses a directly entered Saturation Flow						1906	1906
4/2	This lane uses a directly entered Saturation Flow						1906	1906
4/3	This lane uses a directly entered Saturation Flow						1825	1825
4/4	This lane uses a directly entered Saturation Flow						1845	1845
5/1 (M40 S)	3.25	0.00	Y	Arm 12 Left	60.00	100.0 %	1893	1893
5/2 (M40 S)	3.25	0.00	Y	Arm 8 Ahead	80.00	48.4 %	1898	1898
				Arm 12 Left	60.00	51.6 %		
5/3 (M40 S)	3.25	0.00	N	Arm 8 Ahead	80.00	100.0 %	2042	2042
6/1	This lane uses a directly entered Saturation Flow						1906	1906
6/2	This lane uses a directly entered Saturation Flow						1981	1981
6/3	This lane uses a directly entered Saturation Flow						1960	1960
7/1 (A34)	3.65	0.00	Y	Arm 9 Left	60.00	100.0 %	1932	1932
7/2 (A34)	3.80	0.00	N	Arm 9 Left	60.00	100.0 %	2083	2083
7/3 (A34)	3.80	0.00	N	Arm 9 Left	60.00	100.0 %	2083	2083
7/4 (A34 Lane 4)	This lane uses a directly entered Saturation Flow						1973	1973
7/5 (A34 Lane 5)	This lane uses a directly entered Saturation Flow						1869	1869
8/1	3.80	0.00	Y	Arm 9 Ahead	55.00	100.0 %	1942	1942
8/2	3.80	0.00	Y	Arm 9 Ahead	55.00	100.0 %	1942	1942
8/3	3.80	0.00	Y	Arm 2 Right	55.00	100.0 %	1942	1942

8/4	3.80	0.00	N	Arm 2 Right	55.00	100.0 %	2078	2078
9/1 (M40 N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (M40 N Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
9/3 (M40 N Exit Lane 3)	This lane uses a directly entered Saturation Flow						1800	1800
10/1 (A41 Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
10/2 (A41 Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/3 (A41 Exit Lane 3)	Infinite Saturation Flow						Inf	Inf
11/1 (M40 S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
11/2 (M40 S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
12/1 (A34 Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
12/2 (A34 Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
12/3 (A34 Exit Lane 3)	Infinite Saturation Flow						Inf	Inf

Scenario 2: '2034 DS3A - PM' (FG2: '2034 DS3A - PM', Plan 1: 'Staging Plan No. 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	176	0	2662	2838
	B	162	0	442	637	1241
	C	0	330	0	721	1051
	D	2953	926	156	0	4035
	Tot.	3115	1432	598	4020	9165

Traffic Lane Flows

Lane	Scenario 2: 2034 DS3A - PM
Junction: M40 Junction 9	
1/1 (short)	176
1/2 (with short)	1089(In) 913(Out)
1/3 (with short)	1749(In) 876(Out)
1/4 (short)	873
2/1	411
2/2	561
2/3	440
3/1	442
3/2	162
3/3 (with short)	637(In) 324(Out)
3/4 (short)	313
4/1	132
4/2	937
4/3	876
4/4	873
5/1	382
5/2 (with short)	669(In) 383(Out)
5/3 (short)	286
6/1	1075
6/2	1200
6/3	1186
7/1	1167
7/2 (with short)	1786(In) 1041(Out)
7/3 (short)	745
7/4 (with short)	1082(In) 729(Out)
7/5 (short)	353
8/1 (short)	81
8/2 (with short)	162(In) 81(Out)
8/3	44
8/4	286
9/1	1248
9/2	1122
9/3	745

10/1	587
10/2	561
10/3	284
11/1	353
11/2	245
12/1	1457
12/2	1539
12/3	1024

Lane Saturation Flows

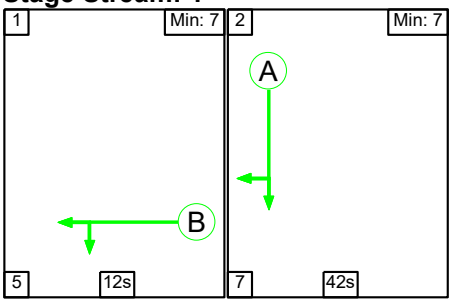
Junction: M40 Junction 9								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (M40 N)	3.65	0.00	Y	Arm 10 Left	40.00	100.0 %	1908	1908
1/2 (M40 N Lane 2)	This lane uses a directly entered Saturation Flow						1906	1906
1/3 (M40 N Lane 3)	This lane uses a directly entered Saturation Flow						1825	1825
1/4 (M40 N Lane 4)	This lane uses a directly entered Saturation Flow						1845	1845
2/1	This lane uses a directly entered Saturation Flow						1945	1945
2/2	This lane uses a directly entered Saturation Flow						1977	1977
2/3	This lane uses a directly entered Saturation Flow						1869	1869
3/1 (A41)	3.65	0.00	Y	Arm 11 Left	45.00	100.0 %	1916	1916
3/2 (A41 Lane 2)	This lane uses a directly entered Saturation Flow						1905	1905
3/3 (A41 Lane 3)	This lane uses a directly entered Saturation Flow						1965	1965
3/4 (A41 Lane 4)	This lane uses a directly entered Saturation Flow						1960	1960
4/1	This lane uses a directly entered Saturation Flow						1906	1906
4/2	This lane uses a directly entered Saturation Flow						1906	1906
4/3	This lane uses a directly entered Saturation Flow						1825	1825
4/4	This lane uses a directly entered Saturation Flow						1845	1845
5/1 (M40 S)	3.25	0.00	Y	Arm 12 Left	60.00	100.0 %	1893	1893
5/2 (M40 S)	3.25	0.00	Y	Arm 8 Ahead	80.00	11.5 %	1894	1894
				Arm 12 Left	60.00	88.5 %		
5/3 (M40 S)	3.25	0.00	N	Arm 8 Ahead	80.00	100.0 %	2042	2042
6/1	This lane uses a directly entered Saturation Flow						1906	1906
6/2	This lane uses a directly entered Saturation Flow						1981	1981
6/3	This lane uses a directly entered Saturation Flow						1960	1960
7/1 (A34)	3.65	0.00	Y	Arm 9 Left	60.00	100.0 %	1932	1932
7/2 (A34)	3.80	0.00	N	Arm 9 Left	60.00	100.0 %	2083	2083
7/3 (A34)	3.80	0.00	N	Arm 9 Left	60.00	100.0 %	2083	2083
7/4 (A34 Lane 4)	This lane uses a directly entered Saturation Flow						1973	1973
7/5 (A34 Lane 5)	This lane uses a directly entered Saturation Flow						1869	1869
8/1	3.80	0.00	Y	Arm 9 Ahead	55.00	100.0 %	1942	1942
8/2	3.80	0.00	Y	Arm 9 Ahead	55.00	100.0 %	1942	1942
8/3	3.80	0.00	Y	Arm 2 Right	55.00	100.0 %	1942	1942

8/4	3.80	0.00	N	Arm 2 Right	55.00	100.0 %	2078	2078
9/1 (M40 N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (M40 N Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
9/3 (M40 N Exit Lane 3)	This lane uses a directly entered Saturation Flow						1800	1800
10/1 (A41 Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
10/2 (A41 Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/3 (A41 Exit Lane 3)	Infinite Saturation Flow						Inf	Inf
11/1 (M40 S Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
11/2 (M40 S Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
12/1 (A34 Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
12/2 (A34 Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
12/3 (A34 Exit Lane 3)	Infinite Saturation Flow						Inf	Inf

Scenario 1: '2034 DS3A - AM' (FG1: '2034 DS3A - AM', Plan 1: 'Staging Plan No. 1')
C1

Stage Sequence Diagram

Stage Stream: 1

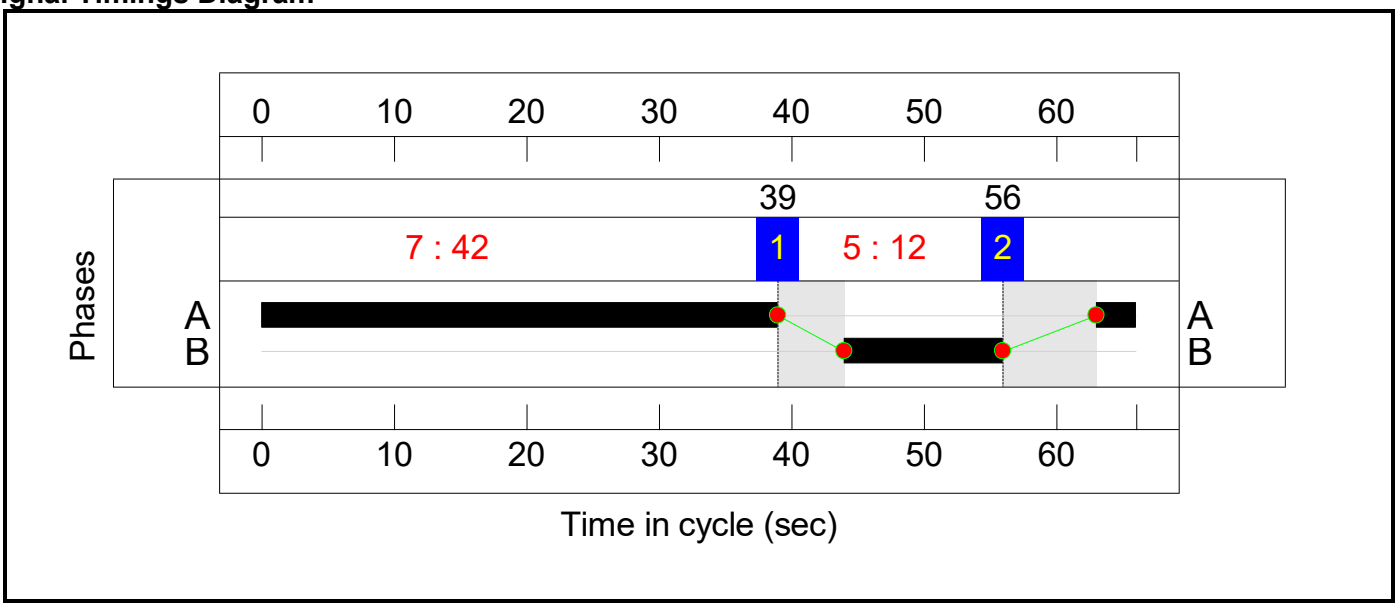


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	12	42
Change Point	39	56

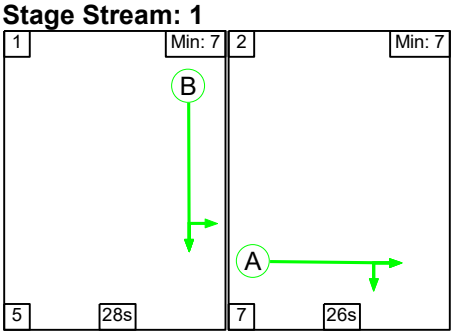
Signal Timings Diagram



C2

Stage Sequence Diagram

Stage Stream: 1

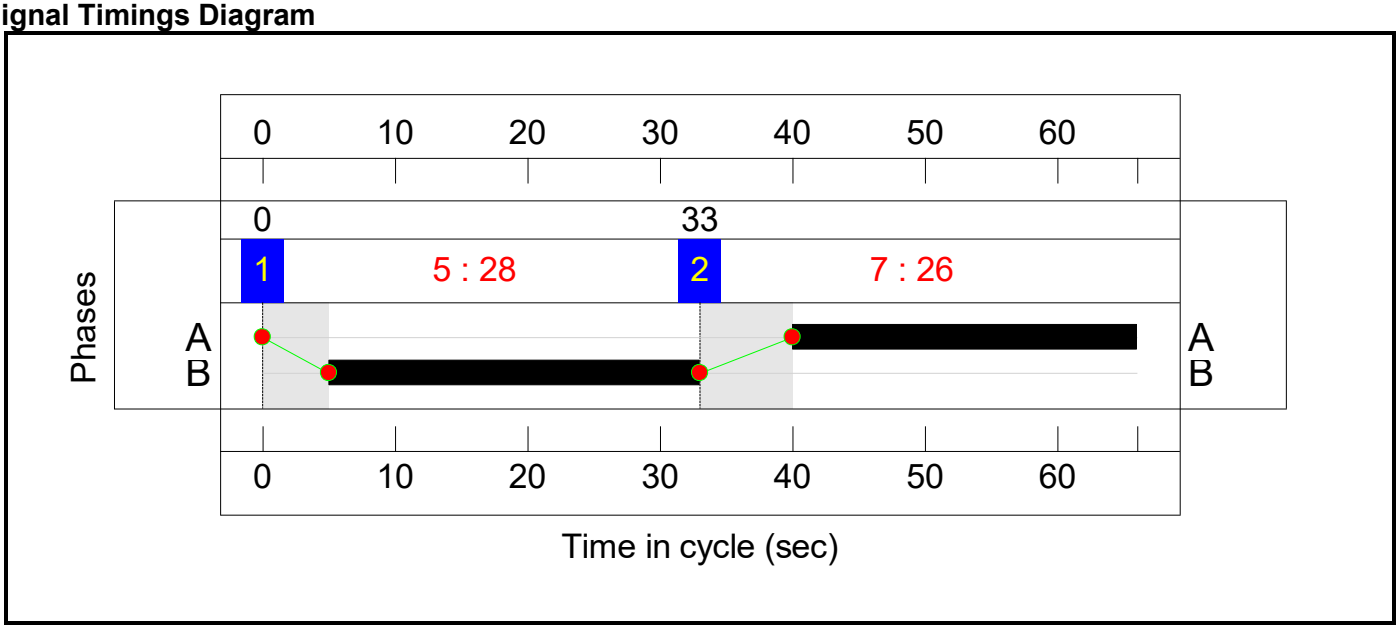


Stage Timings

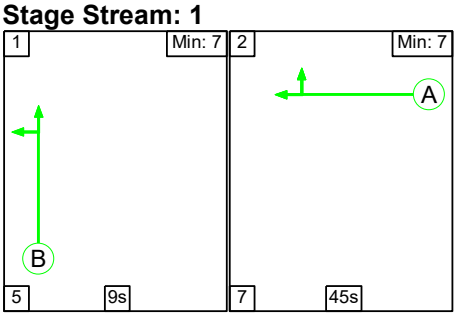
Stage Stream: 1

Stage	1	2
Duration	28	26
Change Point	0	33

Signal Timings Diagram



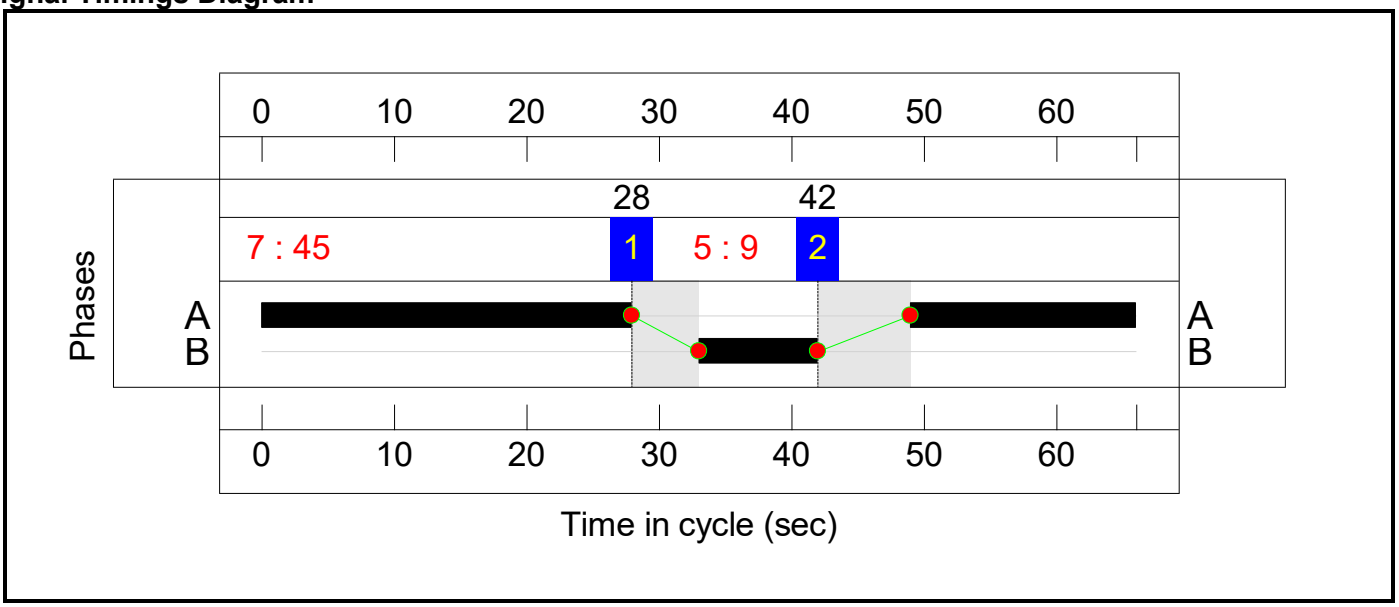
C3
Stage Sequence Diagram
Stage Stream: 1



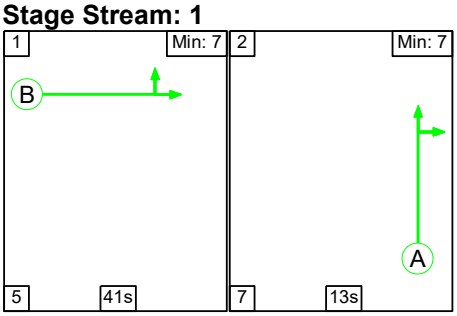
Stage Timings
Stage Stream: 1

Stage	1	2
Duration	9	45
Change Point	28	42

Signal Timings Diagram



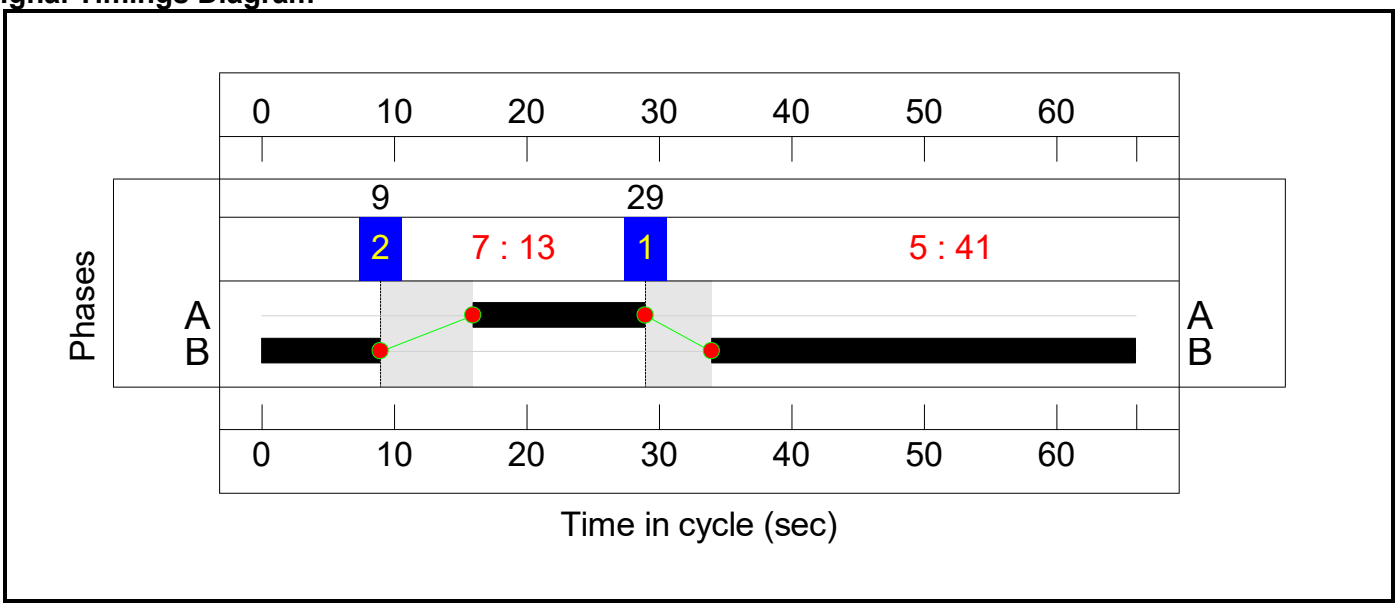
C4
Stage Sequence Diagram
Stage Stream: 1



Stage Timings
Stage Stream: 1

Stage	1	2
Duration	41	13
Change Point	29	9

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: M40 Junction 9 - with mitigtion	-	-	**N/A**	-	-		-	-	-	-	-	-	**106.0%**
M40 Junction 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**106.0%**
1/2+1/1	M40 N Ahead Left	U	2:1	N/A	C2:B		1	28	-	1270	1906:1908	837+417	101.3 : 101.3%
1/3+1/4	M40 N Ahead	U	2:1	N/A	C2:B		1	28	-	1677	1825:1845	802+811	102.0 : 106.0%
2/1	Ahead	U	2:1	N/A	C2:A		1	26	-	693	1945	796	87.1%
2/2	Ahead	U	2:1	N/A	C2:A		1	26	-	753	1977	809	93.1%
2/3	Right Ahead	U	2:1	N/A	C2:A		1	26	-	739	1869	765	96.7%
3/1	A41 Left	U	1:1	N/A	C1:B		1	12	-	296	1916	377	78.4%
3/2	A41 Ahead	U	1:1	N/A	C1:B		1	12	-	327	1905	375	87.1%
3/3+3/4	A41 Ahead	U	1:1	N/A	C1:B		1	12	-	734	1965:1960	387+386	98.2 : 91.7%
4/1	Ahead	U	1:1	N/A	C1:A		1	42	-	404	1906	1242	32.5%
4/2	Right Ahead	U	1:1	N/A	C1:A		1	42	-	1101	1906	1242	87.8%
4/3	Right	U	1:1	N/A	C1:A		1	42	-	818	1825	1189	67.4%
4/4	Right	U	1:1	N/A	C1:A		1	42	-	859	1845	1202	67.4%
5/1	M40 S Left	U	3:1	N/A	C3:B		1	9	-	214	1893	287	74.6%
5/2+5/3	M40 S Ahead Left	U	3:1	N/A	C3:B		1	9	-	426	1898:2042	288+210	85.5 : 85.5%
6/1	Ahead	U	3:1	N/A	C3:A		1	45	-	1175	1906	1328	87.7%
6/2	Ahead	U	3:1	N/A	C3:A		1	45	-	1198	1981	1381	85.6%
6/3	Right Ahead	U	3:1	N/A	C3:A		1	45	-	1213	1960	1366	85.3%
7/1	A34 Left	U	4:1	N/A	C4:B		1	41	-	913	1932	1229	74.3%
7/2+7/3	A34 Left	U	4:1	N/A	C4:B		1	41	-	1472	2083:2083	1065+691	83.8 : 83.8%
7/4+7/5	A34 Ahead	U	4:1	N/A	C4:B		1	41	-	1886	1973:1869	1174+757	97.7 : 97.7%
8/2+8/1	Ahead	U	4:1	N/A	C4:A		1	13	-	71	1942:1942	335+344	10.5 : 10.5%

8/3	Right	U	4:1	N/A	C4:A		1	13	-	119	1942	412	28.9%
8/4	Right	U	4:1	N/A	C4:A		1	13	-	180	2078	441	40.8%
9/3	M40 N Exit	U	N/A	N/A	-		-	-	-	579	1800	1800	32.2%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: M40 Junction 9 - with mitigtion	**-**	**-**	**0**	**0**	**0**	**70.1**	**98.2**	**0.0**	**168.3**	**-**	**-**	**-**	**-**
M40 Junction 9	**-**	**-**	**0**	**0**	**0**	**70.1**	**98.2**	**0.0**	**168.3**	**-**	**-**	**-**	**-**
1/2+1/1	1270	1259	-	-	-	6.2	22.2	-	28.4 (19.5+8.9)	80.6 (82.8:76.2)	15.7	22.2	37.9
1/3+1/4	1677	1613	-	-	-	10.6	42.2	-	52.8 (17.6+35.2)	113.3 (77.5:147.3)	16.6	42.2	58.8
2/1	693	693	-	-	-	4.2	0.0	-	4.2	21.6	10.9	0.0	10.9
2/2	753	753	-	-	-	4.3	0.0	-	4.3	20.8	12.8	0.0	12.8
2/3	739	739	-	-	-	3.7	0.0	-	3.7	18.0	10.0	0.0	10.0
3/1	296	296	-	-	-	2.1	1.7	-	3.8	46.4	5.1	1.7	6.8
3/2	327	327	-	-	-	2.3	3.0	-	5.3	58.9	5.7	3.0	8.7
3/3+3/4	734	734	-	-	-	5.3	6.9	-	12.3 (6.4+5.9)	60.2 (60.4:60.0)	6.9	6.9	13.8
4/1	404	404	-	-	-	1.0	0.2	-	1.2	10.9	7.2	0.2	7.5
4/2	1090	1090	-	-	-	0.9	0.0	-	0.9	3.1	5.4	0.0	5.4
4/3	802	802	-	-	-	0.3	0.0	-	0.3	1.6	1.1	0.0	1.1
4/4	811	811	-	-	-	0.4	0.0	-	0.4	1.6	1.1	0.0	1.1
5/1	214	214	-	-	-	1.6	1.4	-	3.0	50.6	3.7	1.4	5.2
5/2+5/3	426	426	-	-	-	3.2	2.7	-	5.9 (3.5+2.5)	50.0 (50.5:49.3)	4.4	2.7	7.1
6/1	1164	1164	-	-	-	3.8	0.0	-	3.8	11.9	20.9	0.0	20.9
6/2	1182	1182	-	-	-	3.4	0.0	-	3.4	10.4	21.1	0.0	21.1
6/3	1165	1165	-	-	-	3.5	0.0	-	3.5	10.8	20.8	0.0	20.8
7/1	913	913	-	-	-	2.1	1.4	-	3.5	13.9	11.4	1.4	12.8
7/2+7/3	1472	1472	-	-	-	2.9	2.5	-	5.4 (3.4+2.0)	13.2 (13.9:12.3)	10.4	2.5	13.0
7/4+7/5	1886	1886	-	-	-	4.8	13.2	-	18.0 (11.4+6.7)	34.4 (35.7:32.5)	18.2	13.2	31.4
8/2+8/1	71	71	-	-	-	0.1	0.0	-	0.1 (0.0+0.0)	3.1 (3.1:3.1)	0.1	0.0	0.1
8/3	119	119	-	-	-	1.3	0.0	-	1.3	38.6	2.2	0.0	2.2

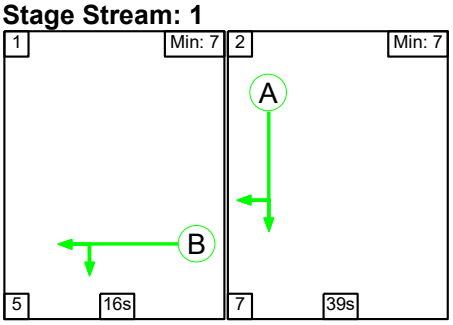
8/4	180	180	-	-	-	2.0	0.3	-	2.4	47.6	3.3	0.3	3.6
9/3	579	579	-	-	-	0.0	0.2	-	0.3	1.6	4.1	0.2	4.3

C1	Stream: 1 PRC for Signalled Lanes (%):	-9.1	Total Delay for Signalled Lanes (pcuHr):	24.30	Cycle Time (s): 66
C2	Stream: 1 PRC for Signalled Lanes (%):	-17.7	Total Delay for Signalled Lanes (pcuHr):	93.39	Cycle Time (s): 66
C3	Stream: 1 PRC for Signalled Lanes (%):	2.7	Total Delay for Signalled Lanes (pcuHr):	19.70	Cycle Time (s): 66
C4	Stream: 1 PRC for Signalled Lanes (%):	-8.5	Total Delay for Signalled Lanes (pcuHr):	30.68	Cycle Time (s): 66
	PRC Over All Lanes (%):	-17.7	Total Delay Over All Lanes(pcuHr):	168.34	

Scenario 2: '2034 DS3A - PM' (FG2: '2034 DS3A - PM', Plan 1: 'Staging Plan No. 1')
C1

Stage Sequence Diagram

Stage Stream: 1

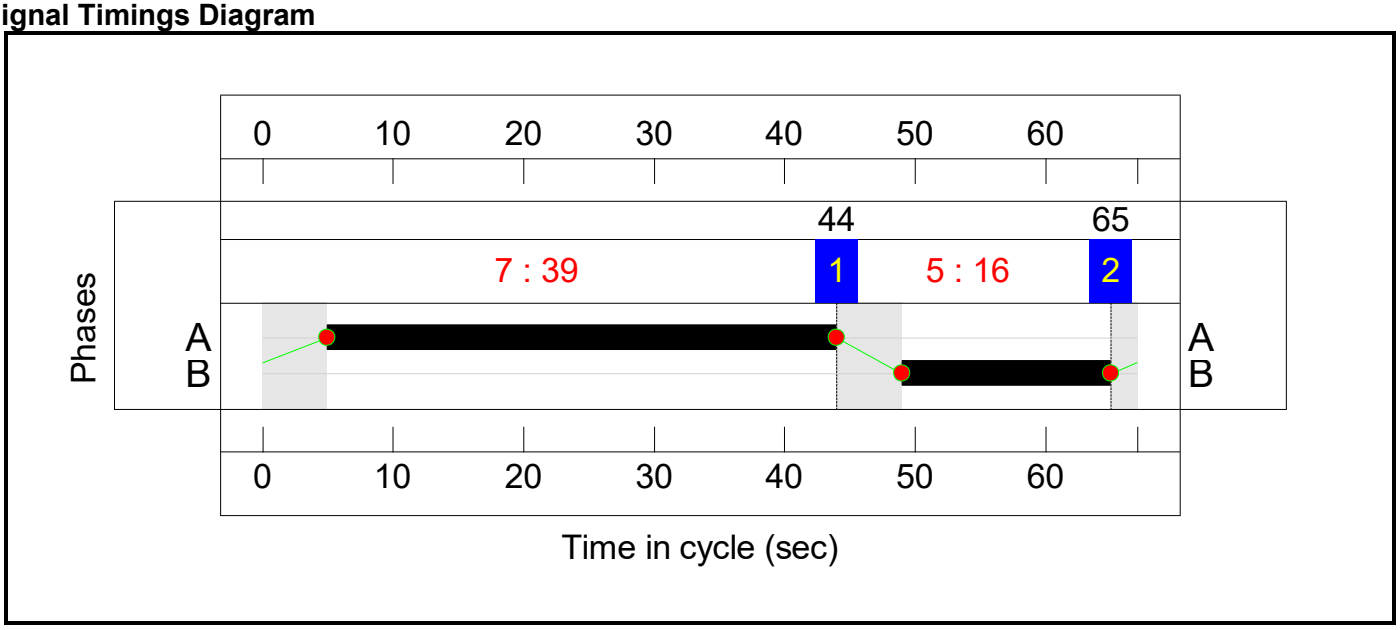


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	16	39
Change Point	44	65

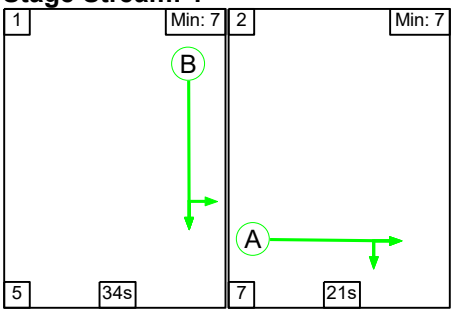
Signal Timings Diagram



C2

Stage Sequence Diagram

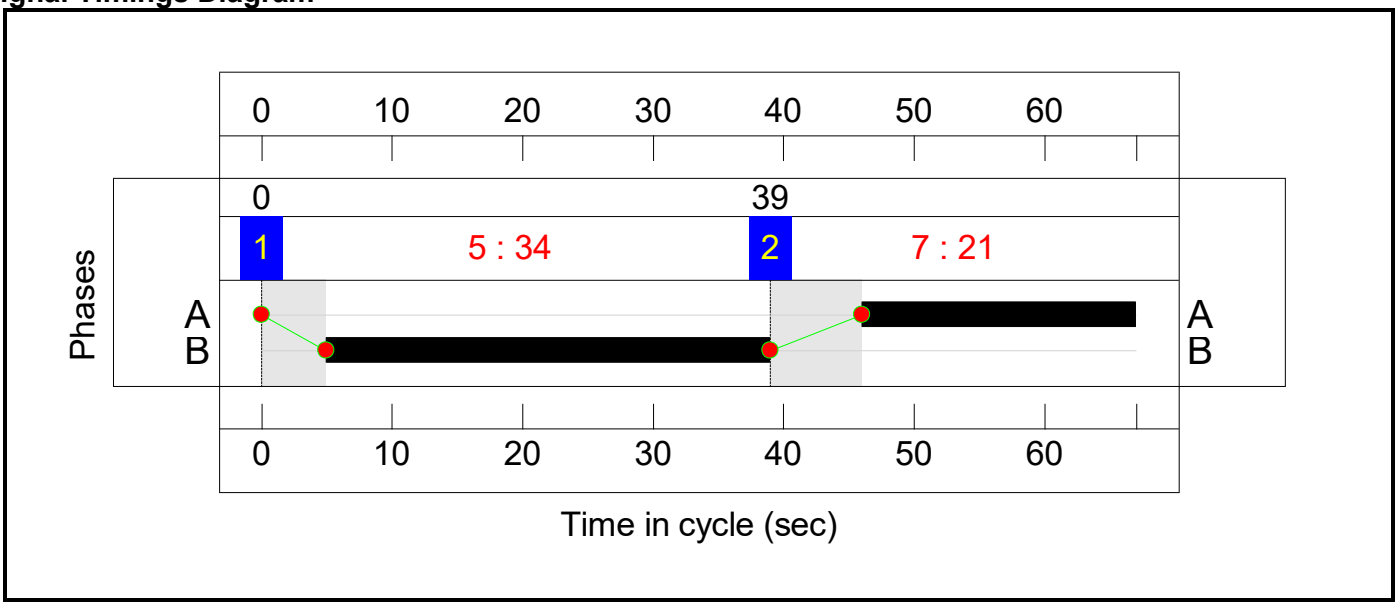
Stage Stream: 1



Stage Timings
Stage Stream: 1

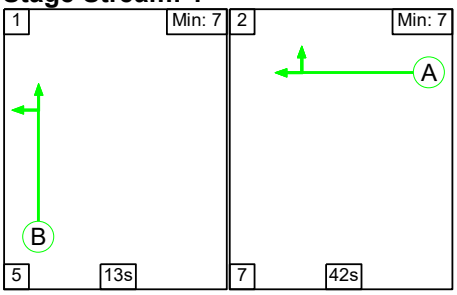
Stage	1	2
Duration	34	21
Change Point	0	39

Signal Timings Diagram



C3

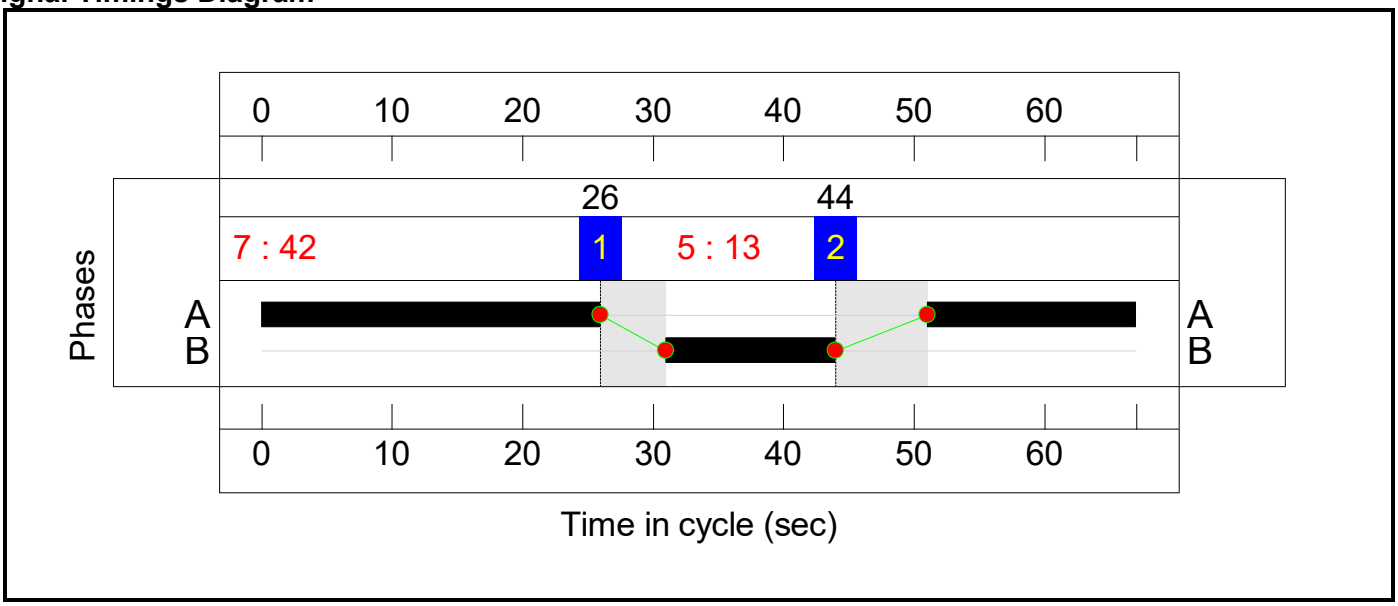
Stage Sequence Diagram
Stage Stream: 1



Stage Timings
Stage Stream: 1

Stage	1	2
Duration	13	42
Change Point	26	44

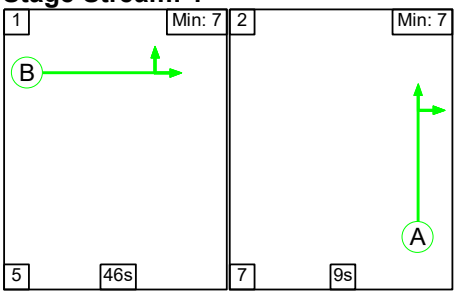
Signal Timings Diagram



C4

Stage Sequence Diagram

Stage Stream: 1

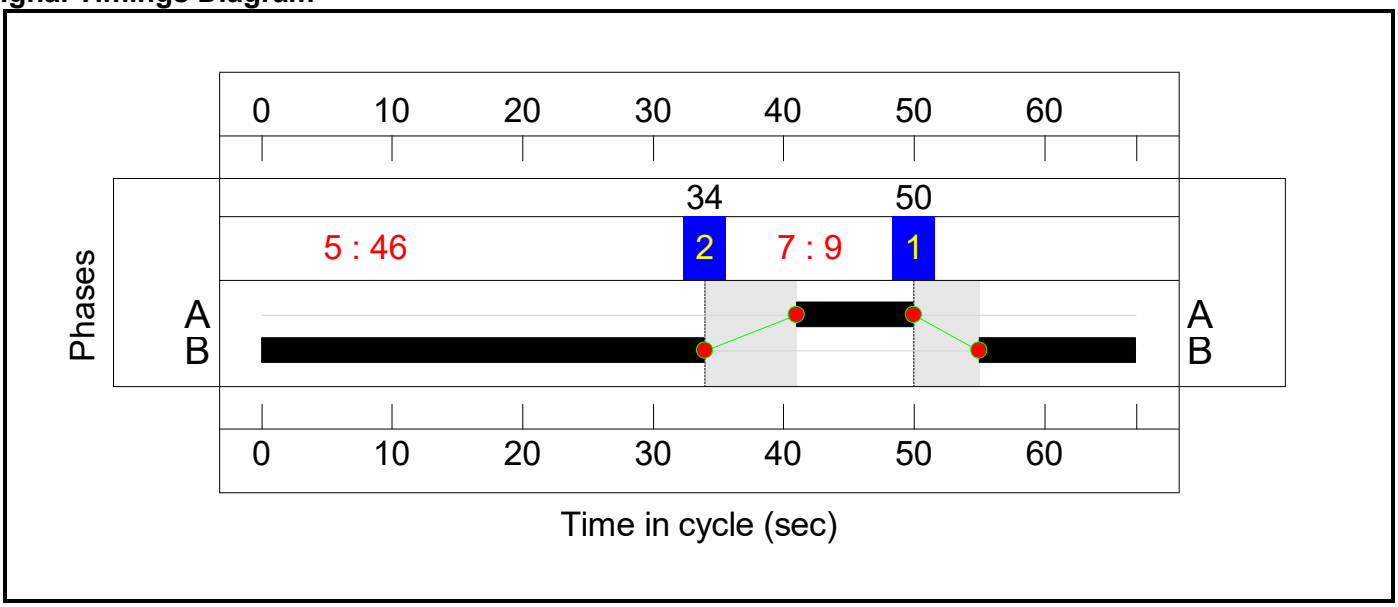


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	46	9
Change Point	50	34

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: M40 Junction 9 - with mitigtion	-	-	**N/A**	-	-		-	-	-	-	-	-	**102.8%**
M40 Junction 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**102.8%**
1/2+1/1	M40 N Ahead Left	U	2:1	N/A	C2:B		1	34	-	1089	1906:1908	996+192	91.7 : 91.7%
1/3+1/4	M40 N Ahead	U	2:1	N/A	C2:B		1	34	-	1749	1825:1845	919+916	95.3 : 95.3%
2/1	Ahead	U	2:1	N/A	C2:A		1	21	-	411	1945	639	64.2%
2/2	Ahead	U	2:1	N/A	C2:A		1	21	-	561	1977	649	85.5%
2/3	Right Ahead	U	2:1	N/A	C2:A		1	21	-	440	1869	614	71.3%
3/1	A41 Left	U	1:1	N/A	C1:B		1	16	-	442	1916	486	90.9%
3/2	A41 Ahead	U	1:1	N/A	C1:B		1	16	-	162	1905	483	33.5%
3/3+3/4	A41 Ahead	U	1:1	N/A	C1:B		1	16	-	637	1965:1960	499+497	65.0 : 62.9%
4/1	Ahead	U	1:1	N/A	C1:A		1	39	-	132	1906	1138	11.6%
4/2	Right Ahead	U	1:1	N/A	C1:A		1	39	-	937	1906	1138	82.3%
4/3	Right	U	1:1	N/A	C1:A		1	39	-	876	1825	1090	80.4%
4/4	Right	U	1:1	N/A	C1:A		1	39	-	873	1845	1101	79.3%
5/1	M40 S Left	U	3:1	N/A	C3:B		1	13	-	382	1893	396	96.6%
5/2+5/3	M40 S Ahead Left	U	3:1	N/A	C3:B		1	13	-	669	1894:2042	372+278	102.8 : 102.8%
6/1	Ahead	U	3:1	N/A	C3:A		1	42	-	1075	1906	1223	87.9%
6/2	Ahead	U	3:1	N/A	C3:A		1	42	-	1200	1981	1271	94.4%
6/3	Right Ahead	U	3:1	N/A	C3:A		1	42	-	1186	1960	1258	94.3%
7/1	A34 Left	U	4:1	N/A	C4:B		1	46	-	1167	1932	1355	86.1%
7/2+7/3	A34 Left	U	4:1	N/A	C4:B		1	46	-	1786	2083:2083	1124+805	92.6 : 92.6%
7/4+7/5	A34 Ahead	U	4:1	N/A	C4:B		1	46	-	1082	1973:1869	1306+632	55.8 : 55.8%
8/2+8/1	Ahead	U	4:1	N/A	C4:A		1	9	-	162	1942:1942	278+278	29.1 : 29.1%

8/3	Right	U	4:1	N/A	C4:A		1	9	-	44	1942	290	14.8%
8/4	Right	U	4:1	N/A	C4:A		1	9	-	286	2078	310	89.7%
9/3	M40 N Exit	U	N/A	N/A	-		-	-	-	745	1800	1800	41.4%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: M40 Junction 9 - with mitigtion	**-**	**-**	**0**	**0**	**0**	**58.6**	**57.5**	**0.0**	**116.1**	**-**	**-**	**-**	**-**
M40 Junction 9	**-**	**-**	**0**	**0**	**0**	**58.6**	**57.5**	**0.0**	**116.1**	**-**	**-**	**-**	**-**
1/2+1/1	1089	1089	-	-	-	4.1	5.0	-	9.1 (7.9+1.2)	30.2 (31.2:25.0)	15.5	5.0	20.5
1/3+1/4	1749	1749	-	-	-	7.1	8.5	-	15.6 (7.8+7.8)	32.1 (32.2:32.0)	14.8	8.5	23.3
2/1	410	410	-	-	-	2.8	0.0	-	2.8	24.3	7.2	0.0	7.2
2/2	555	555	-	-	-	3.2	0.0	-	3.2	20.8	8.3	0.0	8.3
2/3	438	438	-	-	-	2.9	0.0	-	2.9	23.8	7.0	0.0	7.0
3/1	442	442	-	-	-	3.0	4.2	-	7.2	58.5	7.9	4.2	12.1
3/2	162	162	-	-	-	0.9	0.3	-	1.2	26.0	2.4	0.3	2.7
3/3+3/4	637	637	-	-	-	3.9	0.9	-	4.8 (2.5+2.4)	27.3 (27.3:27.2)	5.3	0.9	6.2
4/1	132	132	-	-	-	0.5	0.1	-	0.5	14.9	2.4	0.1	2.5
4/2	937	937	-	-	-	0.4	0.0	-	0.4	1.6	1.3	0.0	1.3
4/3	876	876	-	-	-	0.3	0.0	-	0.3	1.3	0.9	0.0	0.9
4/4	873	873	-	-	-	0.3	0.0	-	0.3	1.3	0.8	0.0	0.8
5/1	382	382	-	-	-	2.8	7.0	-	9.7	91.8	7.0	7.0	14.0
5/2+5/3	669	651	-	-	-	5.2	18.3	-	23.5 (13.5+10.0)	126.6 (127.3:125.8)	8.5	18.3	26.8
6/1	1075	1075	-	-	-	4.4	0.0	-	4.4	14.9	19.4	0.0	19.4
6/2	1200	1200	-	-	-	4.4	0.0	-	4.4	13.2	21.8	0.0	21.8
6/3	1186	1186	-	-	-	4.4	0.0	-	4.4	13.4	21.5	0.0	21.5
7/1	1167	1167	-	-	-	2.4	3.0	-	5.4	16.8	16.2	3.0	19.2
7/2+7/3	1786	1786	-	-	-	2.7	5.8	-	8.5 (5.1+3.4)	17.1 (17.6:16.3)	11.3	5.8	17.1
7/4+7/5	1082	1082	-	-	-	1.3	0.6	-	2.0 (1.4+0.6)	6.5 (6.8:5.8)	6.3	0.6	6.9
8/2+8/1	162	162	-	-	-	0.8	0.0	-	0.8 (0.4+0.4)	17.1 (17.1:17.1)	1.5	0.0	1.5
8/3	43	43	-	-	-	0.1	0.0	-	0.1	7.2	0.2	0.0	0.2
8/4	278	278	-	-	-	0.5	3.6	-	4.1	53.1	4.8	3.6	8.3
9/3	745	745	-	-	-	0.0	0.4	-	0.4	1.9	5.5	0.4	5.9

C1	Stream: 1	PRC for Signalled Lanes (%):	-1.0	Total Delay for Signalled Lanes (pcuHr):	14.78	Cycle Time (s):	67
C2	Stream: 1	PRC for Signalled Lanes (%):	-5.9	Total Delay for Signalled Lanes (pcuHr):	33.60	Cycle Time (s):	67
C3	Stream: 1	PRC for Signalled Lanes (%):	-14.2	Total Delay for Signalled Lanes (pcuHr):	46.53	Cycle Time (s):	67
C4	Stream: 1	PRC for Signalled Lanes (%):	-2.9	Total Delay for Signalled Lanes (pcuHr):	20.82	Cycle Time (s):	67
		PRC Over All Lanes (%):	-14.2	Total Delay Over All Lanes(pcuHr):	116.12		

APPENDIX M

B4030 MIDDLETON STONEY ROAD/EMPIRE ROAD JUNCTION 9 PICADY REPORT

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896
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Filename: 250904 MSR_Empire Road T-junction.j9
Path: C:\Users\ADC\OneDrive - ADC Infrastructure Limited\ADC Projects\ADC1794 OxSRFI\Calculations\Junction Models\17. MSR_Employ access T-junction
Report generation date: 04/09/2025 10:59:24

«2034 DS3A, PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	2034 RC3A							
Stream B-C	0.2	8.23	0.17	A	0.6	10.14	0.38	B
Stream B-A	0.1	17.38	0.07	C	0.3	21.83	0.25	C
Stream C-AB	0.5	10.41	0.35	B	0.2	7.14	0.18	A
	2034 DS3A							
Stream B-C	22.0	1601.86	2.09	F	24.1	381.46	1.28	F
Stream B-A	5.1	2035.01	1.96	F	9.3	452.22	1.23	F
Stream C-AB	0.7	14.98	0.43	B	0.3	9.36	0.22	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	OxSRFI
Location	Middleton Stoney Road/Empire Road
Site number	
Date	12/08/2025
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	ADC1794
Enumerator	ADC-AAD-PC1\ADC
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2034 DS3A	PM	ONE HOUR	16:45	18:15	15

2034 DS3A, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		39.66	E

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	B4030 Middleton Stoney road west		Major
B	Empire Road		Minor
C	B4030 Middleton Stoney road east		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00		✓	3.50	250.0	✓	8.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	6.00	4.50	3.65	3.65	✓	1.00	160	150

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	582	0.101	0.256	0.161	0.366
1	B-C	809	0.119	0.300	-	-
1	C-B	820	0.304	0.304	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	932	100.000
B		✓	243	100.000
C		✓	1199	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	29	903
	B	63	0	180
	C	1103	96	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	6
	B	0	0	0
	C	4	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-C	1.28	381.46	24.1	F
B-A	1.23	452.22	9.3	F
C-AB	0.22	9.36	0.3	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	136	554	0.245	134	0.3	8.556	A
B-A	47	226	0.210	46	0.3	19.926	C
C-AB	72	595	0.122	72	0.1	6.876	A
C-A	830			830			
A-B	22			22			
A-C	680			680			

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	162	474	0.342	161	0.5	11.484	B
B-A	57	154	0.367	55	0.5	36.012	E
C-AB	86	551	0.157	86	0.2	7.742	A
C-A	992			992			
A-B	26			26			
A-C	812			812			

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	198	158	1.251	148	13.0	199.715	F
B-A	69	57	1.226	49	5.6	296.045	F
C-AB	106	490	0.216	105	0.3	9.343	A
C-A	1214			1214			
A-B	32			32			
A-C	994			994			

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	198	155	1.277	154	24.1	381.464	F
B-A	69	57	1.219	55	9.3	452.221	F
C-AB	106	490	0.216	106	0.3	9.359	A
C-A	1214			1214			
A-B	32			32			
A-C	994			994			

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	162	366	0.442	255	0.8	64.101	F
B-A	57	130	0.437	90	0.9	128.477	F
C-AB	86	551	0.157	87	0.2	7.760	A
C-A	992			992			
A-B	26			26			
A-C	812			812			

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	136	549	0.247	138	0.3	8.797	A
B-A	47	226	0.210	50	0.3	20.687	C
C-AB	72	595	0.122	72	0.1	6.895	A
C-A	830			830			
A-B	22			22			
A-C	680			680			

APPENDIX N

B4030 MIDDLETON STONEY ROAD/HOWES LANE JUNCTION 9 ARCADY REPORT

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: 250827 B4030 MSR_Vendee Dr roundabout.j9
Path: C:\Users\ADC\OneDrive - ADC Infrastructure Limited\ADC Projects\ADC1794 OxSRFI\Calculations\Junction Models\16. B4030 MSR_Vendee Dr roundabout
Report generation date: 04/09/2025 11:17:01

»2034 RC3A, AM
»2034 RC3A, PM
»2034 DS3A, AM
»2034 DS3A, PM

Summary of junction performance

	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
	2034 RC3A					
Arm 1	7.5	30.78	0.90	19.8	87.79	1.00
Arm 2	3.9	23.25	0.81	1.4	10.90	0.59
Arm 3	1.6	9.72	0.62	1.9	10.13	0.66
Arm 4	0.8	5.09	0.45	132.4	365.93	1.21
	2034 DS3A					
Arm 1	121.4	388.88	1.21	170.2	652.44	1.28
Arm 2	5.7	33.40	0.87	1.2	10.07	0.54
Arm 3	65.9	213.71	1.13	4.4	18.84	0.82
Arm 4	2.6	13.65	0.73	226.3	709.01	1.38

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	OxSRFI
Location	B4030 Middleton Stoney Road/Howes Lane
Site number	
Date	03/09/2025
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	ADC1794
Enumerator	ADC-AUTOCAD\ADC
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2034 RC3A	AM	ONE HOUR	07:45	09:15	15
D2	2034 RC3A	PM	ONE HOUR	16:45	18:15	15
D3	2034 DS3A	AM	ONE HOUR	07:45	09:15	15
D4	2034 DS3A	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2034 RC3A, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	19.18	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	B4030 Middleton Stoney Road	
2	Howes Lane	
3	Middleton Stoney Road	
4	Vendee Drive	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.60	7.40	4.4	21.0	54.0	44.0	
2	3.10	6.10	10.6	23.5	54.0	37.0	
3	3.65	6.75	6.0	22.0	54.0	40.0	
4	3.60	6.80	10.3	24.0	54.0	42.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.509	1332
2	0.528	1392
3	0.529	1416
4	0.548	1524

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2034 RC3A	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	853	100.000
2		✓	581	100.000
3		✓	545	100.000
4		✓	516	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	67	601	185
	2	61	0	43	477
	3	286	9	0	250
	4	84	248	184	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	26	1	1
	2	2	0	0	5
	3	2	0	0	0
	4	0	5	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.90	30.78	7.5	D
2	0.81	23.25	3.9	C
3	0.62	9.72	1.6	A
4	0.45	5.09	0.8	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	642	331	1126	0.570	637	1.3	7.290	A
2	437	725	965	0.454	434	0.8	6.746	A
3	410	540	1108	0.370	408	0.6	5.128	A
4	388	266	1343	0.289	387	0.4	3.758	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	767	396	1092	0.702	763	2.3	10.798	B
2	522	868	891	0.586	520	1.4	9.637	A
3	490	647	1050	0.467	489	0.9	6.404	A
4	464	319	1314	0.353	463	0.5	4.227	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	939	485	1047	0.897	921	6.8	25.472	D
2	640	1051	798	0.802	631	3.6	20.496	C
3	600	784	975	0.615	597	1.6	9.450	A
4	568	390	1276	0.445	567	0.8	5.071	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	939	486	1047	0.897	936	7.5	30.781	D
2	640	1065	791	0.809	638	3.9	23.249	C
3	600	794	970	0.619	600	1.6	9.724	A
4	568	392	1275	0.446	568	0.8	5.094	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	767	397	1092	0.702	787	2.5	12.543	B
2	522	891	880	0.594	532	1.5	10.632	B
3	490	663	1041	0.471	493	0.9	6.601	A
4	464	323	1312	0.353	465	0.6	4.252	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	642	332	1125	0.571	647	1.4	7.598	A
2	437	735	960	0.456	440	0.8	6.962	A
3	410	548	1104	0.372	412	0.6	5.209	A
4	388	269	1342	0.290	389	0.4	3.780	A

2034 RC3A, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	175.32	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2034 RC3A	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	750	100.000
2		✓	426	100.000
3		✓	629	100.000
4		✓	1275	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	111	428	211
	2	108	0	22	296
	3	445	20	0	164
	4	303	585	387	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	16	3	2
	2	7	0	0	4
	3	0	0	0	0
	4	1	2	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	1.00	87.79	19.8	F
2	0.59	10.90	1.4	B
3	0.66	10.13	1.9	B
4	1.21	365.93	132.4	F

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	565	738	910	0.621	558	1.6	10.069	B
2	321	763	939	0.341	319	0.5	5.782	A
3	474	459	1164	0.407	471	0.7	5.178	A
4	960	429	1271	0.755	948	2.9	10.778	B

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	674	871	844	0.799	666	3.6	19.409	C
2	383	907	865	0.443	382	0.8	7.429	A
3	565	550	1114	0.508	564	1.0	6.532	A
4	1146	514	1225	0.936	1119	9.6	28.731	D

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	826	904	828	0.997	784	14.1	54.537	F
2	469	1019	808	0.581	467	1.3	10.481	B
3	693	663	1051	0.659	689	1.9	9.842	A
4	1404	628	1162	1.208	1156	71.5	136.690	F

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	826	906	827	0.999	803	19.8	87.789	F
2	469	1036	799	0.587	469	1.4	10.901	B
3	693	671	1047	0.661	692	1.9	10.128	B
4	1404	631	1161	1.210	1160	132.4	319.338	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	674	943	809	0.834	730	6.0	54.625	F
2	383	990	823	0.465	385	0.9	8.258	A
3	565	570	1103	0.513	569	1.1	6.785	A
4	1146	518	1222	0.938	1213	115.7	365.925	F

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	565	974	793	0.712	578	2.6	17.685	C
2	321	875	883	0.363	322	0.6	6.433	A
3	474	468	1159	0.409	475	0.7	5.278	A
4	960	433	1269	0.756	1258	41.0	226.826	F

2034 DS3A, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	203.05	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2034 DS3A	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	1147	100.000
2		✓	593	100.000
3		✓	922	100.000
4		✓	641	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	87	776	284
	2	162	0	43	388
	3	690	25	0	207
	4	259	260	122	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	21	1	12
	2	4	0	0	6
	3	4	0	0	0
	4	10	5	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	1.21	388.88	121.4	F
2	0.87	33.40	5.7	D
3	1.13	213.71	65.9	F
4	0.73	13.65	2.6	B

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	864	304	1114	0.775	851	3.2	13.102	B
2	446	877	869	0.514	442	1.0	8.365	A
3	694	621	1031	0.673	686	2.0	10.208	B
4	483	653	1087	0.444	479	0.8	5.899	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1031	364	1084	0.951	1001	10.7	34.943	D
2	533	1035	787	0.678	529	2.0	13.770	B
3	829	739	966	0.858	816	5.1	22.303	C
4	576	778	1020	0.565	574	1.3	8.048	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1263	442	1045	1.208	1040	66.4	144.692	F
2	653	1094	756	0.864	640	5.2	28.408	D
3	1015	851	905	1.122	891	36.3	97.647	F
4	706	866	972	0.726	701	2.5	13.015	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1263	445	1044	1.210	1043	121.4	328.839	F
2	653	1098	754	0.866	651	5.7	33.398	D
3	1015	862	899	1.129	897	65.9	213.712	F
4	706	873	968	0.729	705	2.6	13.650	B

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1031	371	1080	0.954	1072	111.2	388.878	F
2	533	1101	752	0.709	546	2.6	18.345	C
3	829	771	948	0.874	934	39.6	204.949	F
4	576	873	968	0.595	581	1.5	9.388	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	864	312	1110	0.778	1100	52.1	269.449	F
2	446	1109	747	0.597	451	1.5	12.291	B
3	694	690	992	0.700	842	2.5	47.084	E
4	483	776	1020	0.473	485	0.9	6.753	A

2034 DS3A, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	464.18	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2034 DS3A	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	1082	100.000
2		✓	380	100.000
3		✓	792	100.000
4		✓	1278	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	145	656	281
	2	103	0	42	235
	3	626	39	0	127
	4	469	476	333	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	12	1	10
	2	7	0	0	4
	3	1	0	0	0
	4	6	2	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	1.28	652.44	170.2	F
2	0.54	10.07	1.2	B
3	0.82	18.84	4.4	C
4	1.38	709.01	226.3	F

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	815	628	963	0.846	796	4.8	19.744	C
2	286	935	848	0.338	284	0.5	6.365	A
3	596	459	1146	0.520	592	1.1	6.447	A
4	962	574	1170	0.823	945	4.2	15.081	C

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	973	714	920	1.057	895	24.3	72.483	F
2	342	1054	786	0.435	341	0.8	8.071	A
3	712	535	1104	0.645	709	1.8	9.058	A
4	1149	688	1108	1.037	1073	23.1	58.794	F

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1191	692	931	1.279	930	89.7	230.915	F
2	418	1072	776	0.539	417	1.1	9.979	A
3	872	612	1061	0.822	862	4.2	17.322	C
4	1407	837	1027	1.370	1026	118.4	257.464	F

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1191	690	932	1.278	932	154.6	482.969	F
2	418	1073	775	0.540	418	1.2	10.074	B
3	872	614	1060	0.823	871	4.4	18.836	C
4	1407	845	1023	1.376	1023	214.5	575.150	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	973	733	911	1.068	911	170.2	652.439	F
2	342	1075	775	0.441	343	0.8	8.367	A
3	712	542	1100	0.647	722	1.9	9.758	A
4	1149	699	1102	1.043	1101	226.3	709.010	F

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	815	764	895	0.910	890	151.3	650.367	F
2	286	1073	776	0.369	287	0.6	7.374	A
3	596	486	1131	0.527	599	1.1	6.811	A
4	962	581	1166	0.825	1161	176.7	625.519	F

APPENDIX 29

M40 JUNCTION 9 TECHNICAL NOTE

M40 JUNCTION 9

OXFORDSHIRE SRFI

ADC Infrastructure Limited, City Buildings, 34-36 Carrington Street, Nottingham, NG1 7FG
tel. 0115 941 4817, www.ADCinfrastructure.com

DOCUMENT CONTROL

project number: ADC1794			report reference: ADC1794-RP-AT	
version	date	author	reviewer	comments
1		M. Higgins	S Dunhill	internal draft
2	19/12/2025	M. Higgins	S Dunhill	first issue

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1.0 INTRODUCTION

1.1 ADC Infrastructure Limited are commissioned by Oxfordshire Railfreight Limited to assess the transport and infrastructure requirements of a proposed Strategic Rail Freight Interchange (SRFI) in Oxfordshire; the subject of a Development Consent Order (DCO) application for a Nationally Significant Infrastructure Project (NSIP), to be known as OxSRFI.

1.2 The proposals include a package of embedded highway works, including alterations to Junction 10 of the M40 motorway and to the A43, both of which meet thresholds for nationally significant highway works and the application will therefore also include two highway NSIPs as part of the DCO. The embedded highway works also include an improvement to the A34 approach to M40 Junction 9.

Transport Working Group and transport modelling strategy

1.3 A Transport Working Group (TWG) was established in November 2020 comprising National Highways (who have responsibility for the Strategic Road Network (SRN)), Aecom (National Highways' term consultant), Oxfordshire County Council (OCC) (who have responsibility for the local highway network), and Cherwell District Council (CDC), the local planning authority.

1.4 The transport modelling methodology was discussed and agreed with the TWG. To ensure that the potential transport impacts of the Proposed Development are fully considered, and to confirm that the proposed embedded highway works are appropriate in scale and function, a three-stage transport modelling approach is being followed:

- Stage 1 comprised the options assessment and preliminary design of the embedded Highway Works. The Stage 1 modelling and design work has been completed, and the embedded highway mitigation proposals are agreed in principle with the TWG.
- Stage 2 comprises strategic transport modelling using the Bicester Transport Model (BTM).
- Stage 3 comprises detailed assessment of the study area using industry standard software.

Stage 2 transport modelling summary

1.5 The stage 2 BTM work is ongoing, though the following scenarios have been completed:

- 2031 (DfT Circular 01/2022 compliant scenario) Reference Case (RC1) and Do-Something case (DS1) scenarios.
- 2031 (DfT Circular 01/2022 compliant scenario) Reference Case with Albion Land (RC1A) and Do-Something case with Albion Land (DS1A) scenarios.
- 2034 (Completion Year) Reference Case with Albion Land (RC3A), Do-Something case with Albion Land (DS3A) and Do-Something case with Albion Land and the Framework Travel Plan (DS3AwTP) scenarios.

1.6 Technical Note AN (ref. ADC1794-RP-AN) presented the analysis of the Stage 2 Transport Modelling for the RC3A and DS3A scenarios, establishing the impacts of the Proposed Development in the 2034 Completion Year without the effects of the Framework Travel Plan. That work formed part of the transport information submitted for the statutory consultation. The Stage 2 Transport Modelling analysis concluded by establishing the study area to be taken forward into the Stage 3 Transport Modelling.

1.7 The study area was agreed with National Highways and OCC following the statutory consultation and includes M40 Junction 9 (study area junction 7).

Stage 3 transport modelling summary and update

1.8 The Stage 3 Transport Modelling involves detailed junction modelling of the study area junctions using industry standard software. The detailed junction modelling uses the peak hour traffic flows output from the Stage 2 Transport Modelling (the BTM strategic modelling).

1.9 The Stage 3 Transport Modelling work is ongoing. An Interim Report (ref: ADC1794-RP-AO-v3) was prepared for the statutory consultation and presents the outcomes of the detailed assessment of the study area junctions that had been completed prior to the consultation, using industry standard assessment tools in the 2034 Completion Year (RC3A and DS3A scenarios). This was primarily focused on the assessment of the embedded highway works, including M40 Junction 9. That work demonstrated that the embedded highway works would satisfactorily accommodate the Proposed Development in the 2034 Completion Year.

National Highways statutory consultation response

1.10 The DCO statutory (Stage 2) consultation ran from 23 September 2025 to 4 November 2025. National Highways provided their response to the statutory consultation in a letter dated 4 November 2025. The letter is provided at **Appendix 1** and the relevant sections regarding M40 Junction 9 are provided below for convenience:

1. (Paragraph 3.5) *With regards to Junction 9, a common factor recorded within the Technical Note was for collisions occurring on the A34 approach to the junction, consisting of rear end shunt type collisions that are likely to be associated with congestion on the approach. It is stated that there is an opportunity as part of the embedded highway works for OxSRFI to provide additional speed control and safety improvements in this location. The Applicant will need to demonstrate the need for interventions in this location and for the suitability of proposed solutions.*
2. (Paragraph 6.2) *The development proposes to widen the A34 carriageway to assist with increasing capacity. The proposal would also include an additional flared entry lane between the A34 and the M40 Northbound approximately 60metres long with a lane merge on the exit. The scheme would also include a provision of a splitter island on the entry to the gyratory.*
3. (Paragraph 6.3) *A similar scheme was previously introduced by National Highways providing a non-segregated free flow lane from the A34 to the M40. This is understood to have been removed following a series of collisions associated with this layout*.
4. (Paragraph 6.4) *It is noted that the Interim Road Safety Audit has identified a risk of collisions resulting from lane changes and hesitation due to the complexity of the junction. No solutions have been provided to reduce this risk; therefore, this design is yet to be agreed. It is acknowledged that the principle of mitigation at this junction has been established through the TWG, particularly pre-pause of the project. However, National Highways is not yet in a position to agree this form of mitigation is the appropriate measure to be provided.*
5. (Paragraph 6.5) *The Applicant needs to demonstrate the impact of the Development on the junction, that the proposed mitigation is appropriate to the need and that evidence from appropriate modelling and an RSA1 demonstrates that the solution is appropriate and safe. In addition, several new developments close to the junction, with SRN mitigation needs, have been brought forward since the intervention was initially developed. It is important that any mitigation is compatible with other proposals for the junction.*

1.11 The Applicant meet with National Highways on 18 November 2025 to discuss their response to the statutory consultation, including the above comments. It was agreed to report this report to respond to the points raised by National Highways on the proposed mitigation scheme at M40 Junction 9.

2.0 M40 JUNCTION 9 – BACKGROUND AND CONTEXT TO THE PROPOSED MITIGATION

Pre project pause assessment work

2.1 The initial 'Do-Something' runs of the BTM undertaken before the project was publicly paused by the Applicant identified that a capacity constraint at the A34 approach to M40 Junction 9 in the evening peak hour had the potential to cause undesirable reassignment of traffic from the SRN to the B430 northbound towards M40 Junction 10. The effects of the Proposed Development and the proposed embedded highway works (M40 Junction 10, the Ardley Bypass, the HPLR and the MSRR) on the highway network in the vicinity of M40 Junction 9 was examined in detail in Technical Note 12 (ref. ADC1794-RP-AG-V2), which was submitted to the TWG. A copy of the technical note is provided Appendix 3.25 of the PEIR report submitted for the statutory consultation.

2.2 Technical Note 12 concluded that in the evening peak hour, congestion on the A34 eastbound approach to M40 Junction 9 could prevent traffic from reaching the M40 northbound. Consequently, some background traffic on the A34 wishing to travel north was shown to reassign away from the SRN and use the B430, through Weston-on-the-Green and Middleton Stoney towards M40 Junction 10. Whilst residual impacts due to this reassignment would not negate the positive effects of the Middleton Stoney Relief Road (MSRR) and Heyford Park Link Road (HPLR) in reducing overall traffic volumes in Middleton Stoney, it was considered appropriate to keep this longer distance through-traffic on the SRN.

2.3 As discussed in Technical Note 12, the preferred scheme would provide a third left-turn lane between the A34 and the M40 northbound at the existing signal controlled approach to J9, with associated widening of the M40 northbound merge. The results of BTM modelling presented in Technical Note 12 showed that the proposed improvement would remove the delay on the A34 approach to M40 Junction 9 in the evening peak hour and therefore, the reassignment of traffic from the A34 to the B430 northbound would not occur.

2.4 The improvement scheme at M40 Junction 9 is shown at the Highway Plans General Arrangement Document 2.7D which is provided at **Appendix 2**. An extract is shown on **Figure 1**.

2.5 Therefore, Technical Note 12 concluded that the proposed highway mitigation at M40 Junction 9 would help facilitate the positive effects of the works at M40 Junction 10, the Ardley Bypass, the HPLR and the MSRR. The outcomes of Technical Note 12 and the proposed mitigation scheme were discussed and agreed with the TWG, and the proposed improvement scheme has since been included in the package of embedded highway works.

2.6 Following the public restart of the project in late 2024, the work to justify the requirement of the improvement at M40 Junction 9 was not revisited as the elements of the proposals at M40 Junction 10 that had changed would not impact the operation of A34 at M40 Junction 9 (i.e. the embedded highway works would still include the same upgrade to the Ardley roundabout, the northbound M40 to A43 connection and the improvements to the A43 Baynards Green roundabout). Further, the detailed assessment of M40 Junction 9 in the 2034 Completion Year scenario presented in the Stage 3 Transport Modelling Interim Report (submitted for statutory consultation) demonstrated that the proposed improvements would significantly reduce congestion on the A34 approach to M40 Junction 9, as intended.

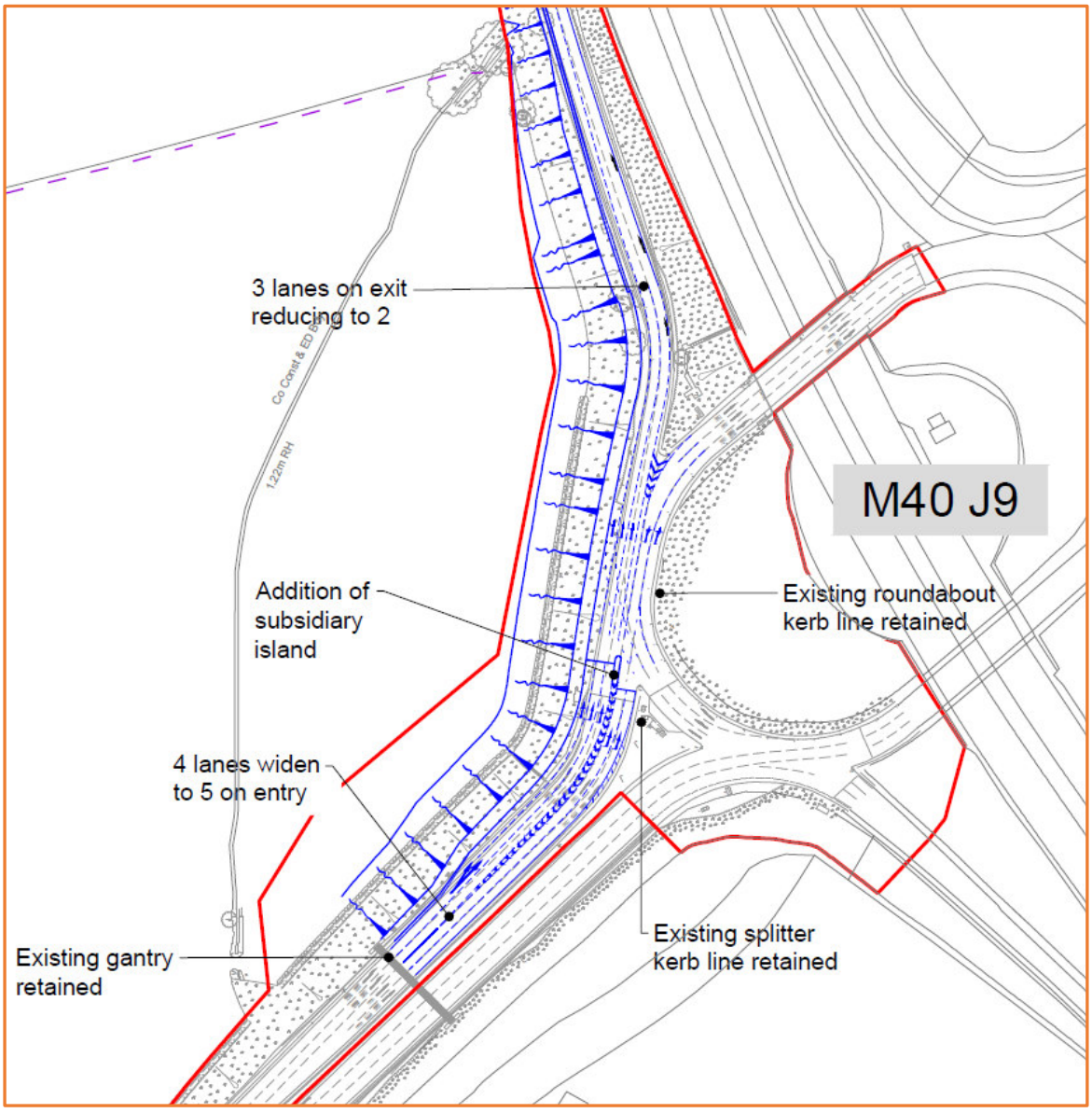


Figure 1: proposed M40 Junction 9 improvement scheme

M40 Junction 9 third-party proposed improvement scheme

2.7 Planning application (ref. 25/00284/F) is for the erection of 9 additional employment units located to the north, east and west of the consented Siemens Healthineers development, north of the A41, east of M40 Junction 9. This site forms part of the employment allocation in the draft Cherwell Local Plan 2042.

2.8 Included with the planning application for that scheme is a proposed improvement scheme at M40 Junction 9. That scheme includes additional left-turn lanes at the M40 Junction 9 SB and A41 approaches, as shown on the drawing provided at Appendix J of the Stage 3 Transport Modelling Interim Report. The mitigation scheme (developed by SLR) has been developed with input from National Highways and is agreed in principle, subject to review of the detailed modelling presented in the Transport Assessment and RSA for that application.

2.9 The draft Cherwell Local Plan 2042 also sets out a requirement as part of the draft allocation for a mitigation scheme at M40 Junction 9. Therefore, given the in-principle support for the scheme from National Highways, it was agreed with the TWG that there is sufficient certainty of the improvement scheme at M40 Junction 9 becoming committed that it should be included within

the 2034 RC3A model runs, and therefore it is also included in the DS3A scenario. However, the scheme was not included in the RC1A and DS1A scenarios as there is reduced certainty that it would be fully constructed and operational by 2031.

2.10 As part of the Transport Assessment work undertaken to support the planning application, SLR prepared a LinSig model of the existing layout of M40 Junction 9. As reported in that work, the LinSig model was calibrated and validated using survey data and on-site measurements of saturation flows, green-times. The LinSig model was recreated and adapted to represent the embedded highway works mitigation scheme shown at **Figure 1**, as detailed in the Stage 3 Transport Modelling Interim Report.

2.11 The LinSig modelling presented in the Stage 3 Transport Modelling Interim Report demonstrated that the proposed OxSRFI improvement works would complement the improvement works proposed as part of the employment allocation.

3.0 RESPONSE TO NATIONAL HIGHWAYS – COMMENT 1

National Highways comment

3.1 At paragraph 3.5 of their response, National Highways state a" *common factor recorded within the Technical Note was for collisions occurring on the A34 approach to the junction, consisting of rear end shunt type collisions that are likely to be associated with congestion on the approach. It is stated that there is an opportunity as part of the embedded highway works for OxSRFI to provide additional speed control and safety improvements in this location. The Applicant will need to demonstrate the need for interventions in this location and for the suitability of proposed solutions*".

ADC Infrastructure response

3.2 In response to the above, a letter dated 17 December 2025 was sent to National Highways and OCC. The letter is provided at **Appendix 3**.

4.0 RESPONSE TO NATIONAL HIGHWAYS – COMMENTS 2 AND 3

Notional Highways comment

4.1 At paragraphs 6.2 and 6.3 of their response, National Highways state that "*the proposal would also include an additional flared entry lane between the A34 and the M40 Northbound approximately 60 metres long with a lane merge on the exit. The scheme would also include a provision of a splitter island on the entry to the gyratory.*

A similar scheme was previously introduced by National Highways providing a non-segregated free flow lane from the A34 to the M40. This is understood to have been removed following a series of collisions associated with this layout".

ADC Infrastructure response

4.2 As discussed in Section 2, the requirement for a mitigation scheme on the A34 approach to M40 Junction 9 is detailed in Technical Note 12.

4.3 To reduce congestion on the A34 approach to M40 Junction 9, a range of options were considered, including the potential to provide a segregated left-turn lane from the A34 to the M40 northbound. Paragraph 6.1.7 of CD 116 of the Design Manual for Roads and Bridges[1] states that "*Where flows taking the first exit are greater than 1,500 vehicles per hour, alternative junction forms or methods of junction control should be used*".

4.4 Technical Note 12 demonstrated that in the evening peak hour for the 2031 'do something' scenario, the left-turn movement from the A34 to the M40 northbound was forecast to be 2,655 pcus, which would be materially above the stipulated threshold for a segregated left-turn lane and hence the segregated left-turn lane option was discounted.

4.5 **Figure 2** shows that the Stage 2 Transport Modelling for the 2031 DS1A scenario forecasts that traffic flow from the A34 to the M40 northbound would be 2,304 pcus in the morning peak hour and 2,860 pcus in the evening peak hour. Hence, the Stage 2 Transport Modelling supports the conclusion reached in Technical Note 12.

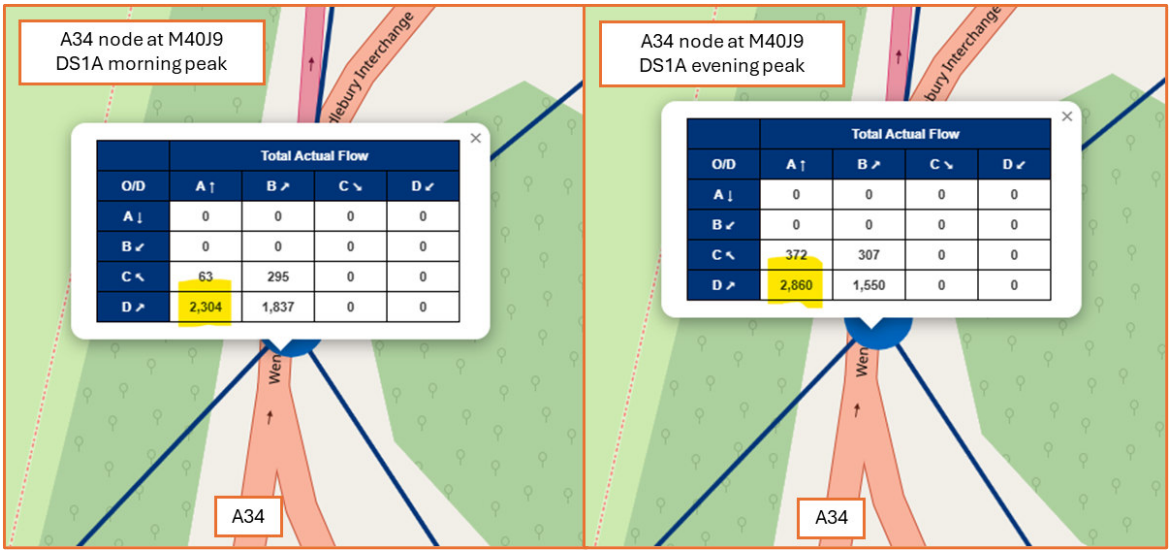


Figure 2: traffic flows at the A34 approach node at M40 Junction 9 in the 2031 DS1A scenario

[1]DMRB, CD 116 – Geometric Design of Roundabouts.

4.6 Therefore, as detailed in Technical Note 12, the proposed mitigation scheme is for the A34 approach to be widened to provide a third left-turn lane from the A34 to the M40 northbound. This would be an additional flared entry lane circa. 60m long with an additional merge lane on the M40 northbound exit. The proposals include for the provision of a splitter island on the entry to the gyratory to help drivers differentiate between the left-turn and ahead movements, fostering good lane discipline, and safely housing traffic signal poles and heads. The improvement scheme at M40 Junction 9 is shown at **Appendix 2** and an extract is shown on **Figure 1** in Section 3.

4.7 A non-segregated left-turn arrangement is not proposed. All five A34 approach lanes would operate under traffic signal control, as demonstrated in the LinSig modelling presented in the Stage 3 Transport Modelling Interim Report and also Section 6 of this report. For clarity, the A34 approach to M40 Junction 9 did previously operate with a non-segregated left-turn arrangement, but this was removed some time ago and replaced by the current traffic signal controlled operation. The proposed scheme would retain traffic signal control operation.

4.8 The proposed improvement scheme was discussed with the TWG and agreed in principle. Hence, it forms part of the embedded Highway Works and therefore has been included in all 'Do Something' BTM model scenarios.

5.0 RESPONSE TO NATIONAL HIGHWAYS – COMMENT 4

National Highways comment

5.1 At paragraph 6.4 of their response, National Highways state "*the Interim Road Safety Audit has identified a risk of collisions resulting from lane changes and hesitation due to the complexity of the junction. No solutions have been provided to reduce this risk; therefore, this design is yet to be agreed. It is acknowledged that the principle of mitigation at this junction has been established through the TWG, particularly pre-pause of the project. However, National Highways is not yet in a position to agree this form of mitigation is the appropriate measure to be provided*".

ADC Infrastructure response

5.2 The recommendation in the Interim Stage 1 RSA was for sufficient advance lane destination signing, supplemented by clear lane destination markings alongside the arrows.

5.3 The Applicant team agree with the recommendation in the Interim Stage 1 RSA. The signage strategy will be updated in the coming weeks to incorporate the recommendation, and this will be further developed at the detailed design stage.

5.4 Further, the existing junction arrangement has four approach lanes, with two lanes allocated for traffic to the M40 northbound and two lanes allocated for traffic to the circulating carriageway. There is no splitter island. The mitigation proposals include for provision of a splitter island on the entry to the gyratory to help drivers differentiate between the left-turn and ahead movements, to foster good lane discipline, and safely house traffic signal poles and heads.

6.0 RESPONSE TO NATIONAL HIGHWAYS – COMMENT 5

National Highways comment

6.1 At paragraph 6.5 of their response, National Highways state "*The Applicant needs to demonstrate the impact of the Development on the junction, that the proposed mitigation is appropriate to the need and that evidence from appropriate modelling and an RSA1 demonstrates that the solution is appropriate and safe. In addition, several new developments close to the junction, with SRN mitigation needs, have been brought forward since the intervention was initially developed. It is important that any mitigation is compatible with other proposals for the junction*".

ADC Infrastructure response

6.2 As discussed in Section 2, the analysis supporting the requirement for a mitigation scheme on the A34 approach to M40 Junction 9 is set out in Technical 12. The analysis presented in Technical Note 12 was discussed with the TWG and the proposed improvement scheme (**Figure 1**) was agreed in principle. Hence, it forms part of the embedded highway works and is therefore included in all 'Do Something' BTM model scenarios.

6.3 The detailed assessment of M40 Junction 9 in the 2034 Completion Year scenario presented in the Stage 3 Transport Modelling Interim Report demonstrated that the proposed improvements would significantly reduce congestion on the A34 approach to M40 Junction 9 as intended. The 2034 DS3A scenario includes the proposed third-party improvement scheme discussed in section 2, and the modelling demonstrates that the two schemes would be complimentary.

6.4 The Personal Injury Accident Technical Note (ref: ADC1794-RP-G-v2) showed that over the study period there have been 83 recorded accidents on the A34 approach to M40 Junction 9, of which 76 were slight and seven were serious. More than 96% of the PIAs on the A34 approach to Junction 9 were rear-end shunt type accidents which occur in stationary or slow-moving queues caused by congestion.

6.5 The analysis presented in the Stage 3 Transport Modelling Interim Report shows that the queues on the A34 approach would be materially reduced with the embedded highway works in place and therefore, it is probable that the frequency of rear-end-shunts on the A34 would also reduce.

6.6 The assessment presented in the Stage 2 and Stage 3 Transport Modelling Reports considered the operation of M40 Junction 9 in the 2034 Completion Year. Following the completion of the statutory consultation, the BTM modelling of the 2031 (DfT Circular 01/2022 compliant scenario) Reference Case with Albion Land (RC1A) and Do-Something case with Albion Land (DS1A) scenarios has been completed. Hence, the following analysis demonstrates the positive effect of the proposed M40 Junction 9 improvement scheme in the 2031 DS1A scenario.

Delay analysis – RC1A and DS1A scenarios

6.7 To understand the likely effects due to the Proposed Development and the embedded highway works at M40 Junction 9, graphical Saturn plots showing the delay (in seconds) at the junction have been considered for the RC1A and DS1A scenarios. The plots showing the delay for each scenario are provided at **Appendix 4** for the morning and evening peak hours respectively, with extracts of the delay plots provided at **Figure 3** below.

6.8 At M40 Junction 9, **Figure 3** shows that there is no material delay on the M40 northbound diverge, A41 or A34 approaches in the 2031 RC1A morning peak hour scenario, with no material increases

in delay on these approaches in the 2031 DS1A scenario. However, **Figure 3** shows that there would be delay on the M40 southbound diverge at M40 Junction 9 in the RC1A morning peak hour scenario (91 seconds), which becomes more pronounced in the DS1A scenario (178 seconds). As discussed in detail in the Stage 2 Transport Modelling Report, this increase in delay is largely due to the proposed embedded highway works resolving the existing congestion at M40 Junction 10 and therefore allowing increased volumes of background traffic southbound towards Junction 9.

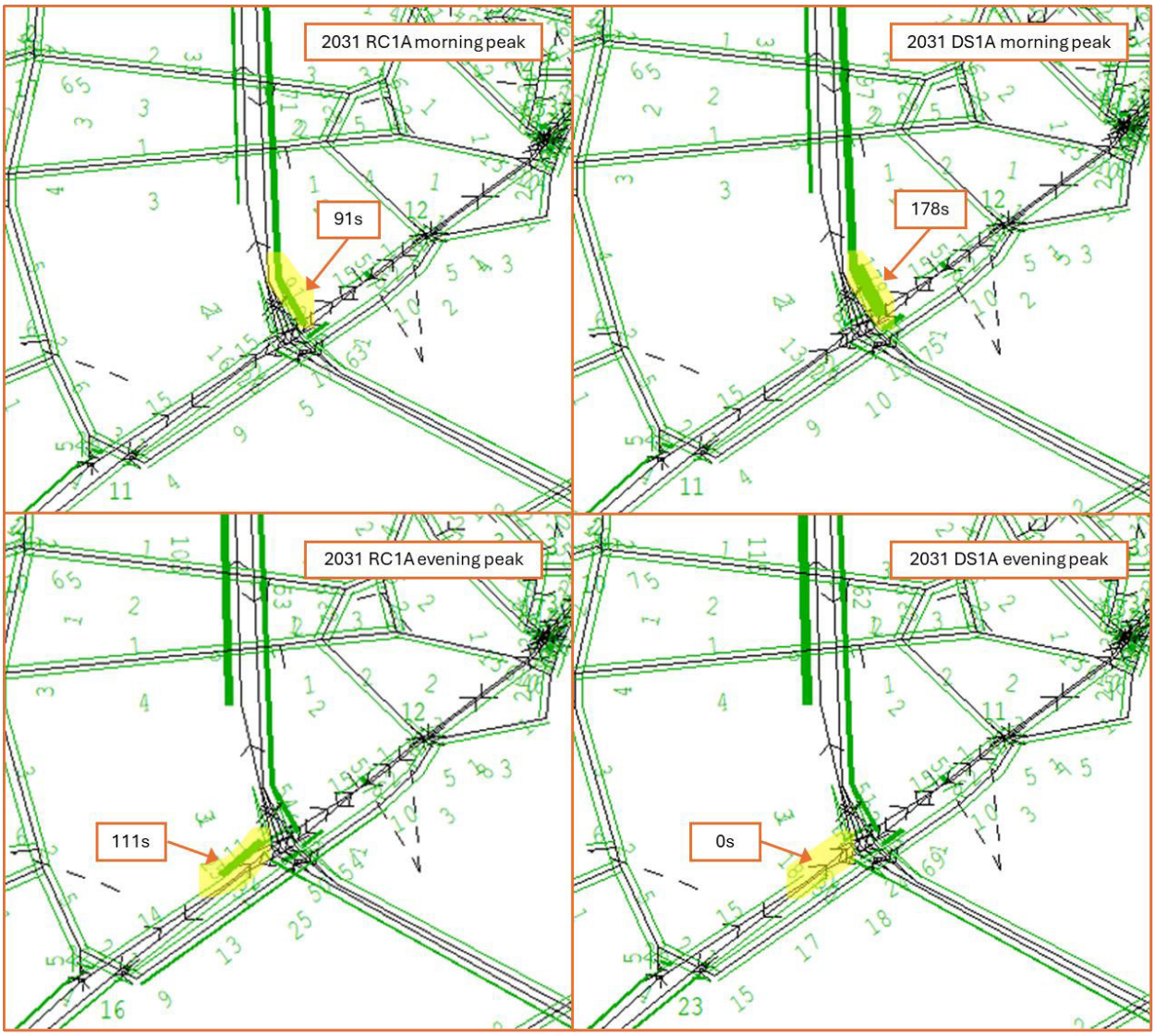


Figure 3: extracts of delay plots from the RC1A scenario on the left and the DS1A scenario on the right (yellow highlight added)

6.9 In the 2034 Completion Year scenario, the third-party mitigation scheme at M40 Junction 9 would be in place, providing improvements to the M40 southbound diverge and the A41 approach. Delay plots for the 2034 DS3A scenario (**Appendix 4**, extracts shown at **Figure 4**) show that in the 2034 DS3A morning and evening peak hour scenarios, the third-party improvements would reduce delay on the M40 southbound diverge (88 seconds and 24 seconds, respectively) when compared to the delay shown in the 2031 RC1A and DS1A scenarios. This further demonstrates that the two improvement schemes would be complementary.

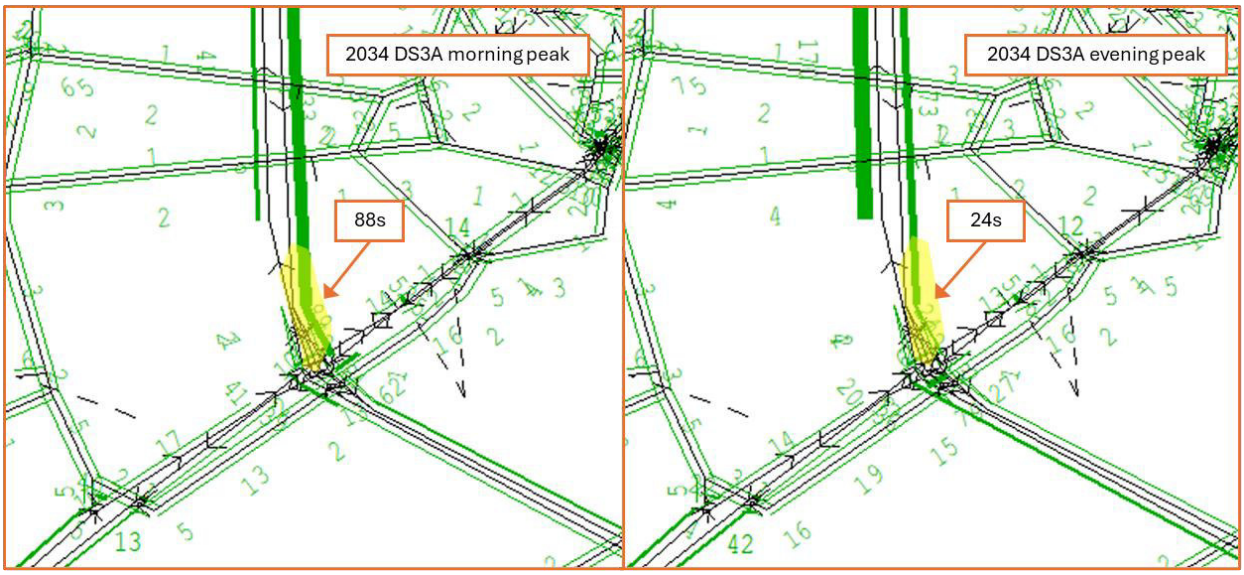


Figure 4: extracts of delay plots from the DS3A morning peak hour scenario on the left and the DS3A evening peak hour scenario on the right (yellow highlight added)

6.10 In the 2031 evening peak hour, **Figure 3** shows that in the RC1A scenario there would be no material changes in the levels of delay on the M40 northbound, M40 southbound, or A41 approaches when comparing the DS1A scenario. However, **Figure 3** shows that in the RC1A evening peak hour there would be delay of 111 seconds on the A34 approach. In the DS1A scenario with the proposed improvement in place there would be no material delay on the A34, demonstrating that the proposed improvement scheme would provide significant benefit.

PASSQ analysis– RC1A and DS1A scenarios

6.11 The positive effect of the proposed highway works on the A34 approach to M40 Junction 9 is demonstrated further when analysing the PASSQ plots for the respective 2031 RC1A and DS1A scenarios.

6.12 Generally, Saturn traffic assignments (such as in the BTM) are based on the representation of a single modelled hour. However, where significant volumes of traffic travel in the pre-peak, this can underestimate the conditions in the network during the peak hour as queues could already be present in the peak hour network. To allow sufficient traffic to be present, the 'PASSQ' function has been used in the BTM to provide a 'warm up' period to the peak. This ensures that traffic conditions on the modelled network at the start of the peak hour are realistic. If there is congestion in the period preceding the peak hour, it is dealt with in the BTM by passing residual queues on to the peak hour as additional demand. This effect is known as 'PASSQ'. The BTM models the PASSQ as fixed link and turning flows in the peak hour period.

6.13 The 2031 RC1A and DS1A PASSQ plots for the evening peak hour are provided at **Appendix 5**, and extracts are provided at **Figure 5** below.

6.14 On the left hand-side, **Figure 5** shows that in the 2031 RC1A evening peak hour scenario, there is a significant PASSQ effect on the M40 northbound (349 pcus) due to congestion on the A34 eastbound approach to M40 Junction 9 preventing traffic from reaching this route in the preceding period.

6.15 On the right hand-side, **Figure 5** shows that with the development and embedded highway works in place, the PASSQ on the M40 is almost entirely eliminated due to the improved performance

of the A34 approach to M40 Junction 9, demonstrating that all traffic is able to complete this part of its journey.



Figure 5: extracts of PASSQ plots from the 2031 RC1A scenario on the left and DS1A scenarios on the right (yellow highlight added)

A34 turning flows analysis – RC1A and DS1A scenarios

6.16 The effect of the proposed highway works on the A34 approach to M40 Junction 9 can be further understood when analysing the turning movement plots for the respective 2031 RC1A and DS1A scenarios in the evening peak hour. The 2031 RC1A and DS1A turning movements plots are provided at **Appendix 6**, and extracts are provided at **Figure 6** below.



Figure 6: extract of turning flow plots from the 2031 RC1A (left) and DS1A (right) evening peak hour (yellow highlight added)

6.17 In the 2031 RC1A evening peak hour, **Figure 6** shows that of the 2,665 pcus travelling from the A34 to the M40 northbound, 171 pcus choose to 'slingshot' around the circulating carriageway. This effect is caused by the above highlighted congestion on the A34 approach in the evening peak hour. On the right-hand side of **Figure 6**, with the proposed improvements in place in the DS1A scenario there are no pcus undertaking the 'slingshot' manoeuvre, despite the A34 to M40

northbound flow increasing by 183 pcus as more vehicles route via the SRN instead of lower category routes, due to the benefits delivered by embedded highway works, including the M40 Junction 9 improvements. This is a positive effect.

Detailed junction modelling - RC1A and DS1A scenarios

6.18 Section 3 of the Stage 3 Transport Modelling Interim Report details the development of M40 the M40 Junction 9 LinSig models for the 2034 RC3A and DS3A scenarios, which have been adapted from the validated SLR LinSig base model. Since the stage 2 statutory consultation, the BTM transport modelling for the 2031 (DfT Circular 01/2022 compliant scenario) Reference Case with Albion Land (RC1A) and Do-Something case with Albion Land (DS1A) scenarios has been completed. Therefore, it is appropriate for the detailed junction modelling to be updated for these scenarios.

6.19 As discussed above and in Section 2, the third-party mitigation scheme at M40 Junction 9 was not included in the RC1A and DS1A scenarios as there is reduced certainty that it would be fully constructed and operational by 2031.

6.20 The SLR LinSig model of the future baseline junction arrangement at M40 Junction 9 has been recreated and run with traffic flows extracted from the BTM for the 2031 RC1A scenario. The cycle times from the 2034 RC3A model have been retained and only minor changes to the green times have been made to account for variance in the traffic data. The RC1A traffic flows are provided in **Appendix 6** and the LinSig model results for the future baseline junction are summarised in the table below, with the full LinSig report provided at **Appendix 7**.

6.21 Further, the RC1A LinSig model for M40 Junction 9 has been modified to represent the proposed OxSRFI embedded Highway Works at M40 Junction 9 and modelled with the DS1A traffic flows (**Appendix 6**). The LinSig model results for the proposed improvement scheme are provided in **Appendix 8** and also summarised in the table below.

Metric	2031 RC1A		2031 DS1A	
	AM Peak	PM Peak	AM Peak	PM Peak
PRC	-21.6%	-13.9%	-22.1%	-8.8%
Total delay (pcuHr)	204.76	157.05	198.41	102.92
A34 Degree of Saturation	96.6%	102.5%	95.1%	91.5%
A34 to M40 NB MMQ (pcu)	24.8	55.6	12.2	18.6
A34 to circ. MMQ (pcu)	26.0	11.1	26.5	7.9
M40 SB MMQ (pcu)	40.7	22.9	55.3	30.2
A41 MMQ (pcu)	60.3	14.2	30.8	7.6
M40 NB MMQ (pcu)	5.9	16.2	5.6	15.8

* MMQ – mean maximum queue
* DoS – degree of saturation

6.22 Comparing the 2031 RC1A and DS1A scenarios shows that the practical reserve capacity (PRC) deteriorates by 0.5% in the DS1A morning peak hour, which is not material, though the total delay at the junction reduces slightly. The results show that the performance of the A34 approach to the junction improves in the DS1A morning peak hour, with a large reduction in A34 to M40 northbound queue length. The queue length also reduces significantly on the A41 approach, as background traffic reassigns away from the A41 in the DS1A scenario as a result of the positive effects of the embedded highway works (detailed in the Stage 2 Transport Modelling Report).

6.23 In the evening peak hour, the overall performance of the junction is improved by 5.1% in the DS1A scenario when compared to the RC1A scenario in terms of PRC, with the total delay at the section significantly reducing. Importantly, there are material improvements to the degree of saturation (improved by 11%) and MMQ (reduced by 37 pcus, or c.220m) for the A34 to M40 northbound movement.

Summary

6.24 Overall, there is no material change in the performance of M40 Junction 9 in the DS1A scenario in the morning peak hour, though the mitigation proposals on the A34 reduce congestion and queuing. Whilst the BTM and detailed modelling shows that delay would increase on the M40 southbound diverge in the DS1A morning peak hour scenario due to the embedded highway works releasing the existing bottleneck at M40 Junction 10, the third-party mitigation scheme detailed in Section 2 would reduce these effects in the DC3A scenario. Hence, the compatibility of the two schemes is demonstrated.

6.25 In the evening peak hour, the overall performance of M40 Junction 9 improves in the DS1A scenario, with materially reduced congestion and queue lengths on the A34 approach. The BTM modelling shows that delay and PASSQ effects are largely eliminated. Hence, the proposed embedded highway works would mitigate the impact of the Proposed Development at the junction, helping to return traffic to the SRN route between the A34 and the M40 and A43 northbound, as detailed in the Stage 2 Transport Modelling Report.

6.26 Further, the reduced congestion on the A34 approach to M40 Junction 9 would assist in reducing the frequency of rear-end shunt type accidents occurring on this part of the network. The recommendation of the Interim Stage 1 RSA are accepted and will be incorporated into the forthcoming signage strategy updates and also during detailed design.

APPENDIX 1

NATIONAL HIGHWAYS STATUTORY CONSULTATION RESPONSE

Alice Lawman
Spatial Planning
National Highways
Woodlands
Manton Lane
Bedford
MK41 7LW
4 November 2025

Dear Sir/Madam

Oxfordshire Strategic Rail Freight Interchange – Section 42 Consultation Submission

1. Introduction

1.1. National Highways welcomes the opportunity to respond to the consultation for the Oxfordshire Strategic Rail Freight Interchange Nationally Significant Infrastructure Project (NSIP). The proposal consists of the following elements:

- A new rail freight interchange, connected to the Chiltern Main Line;
- Approximately 603,870sqm of rail served warehousing, plus up to 201,283sqm of additional floorspace in the form of mezzanines;
- New landscaping and green infrastructure including sustainable drainage systems;
- Significant highways improvements including improvements to the Strategic Road Network including Junction 10 and Junction 9 of the M40, the A43 and Local Road Network including a bypass east of Ardley and vehicular access, Heyford Park Link Road, Middleton Stoney Relief Road.

1.2. The proposed development is being promoted by Oxfordshire Railfreight Limited (the 'Applicant') and will be delivered by Mountpark, if consented.

1.3. On behalf of the Secretary of State for Transport, National Highways is responsible for managing and operating a safe and efficient Strategic Road Network (SRN) under the provisions of the Infrastructure Act 2015 and is the highway authority for the SRN. The Department for Transport (DfT) Circular 01/2022 (Strategic road

network and the delivery of sustainable development) sets out how National Highways will work with developers to ensure that specific tests are met when promoting a scheme. This includes ensuring the transport impact is understood, any mitigation (or other infrastructure) is designed in accordance with the relevant standards and that environmental impacts are appraised and mitigated accordingly. In addition, National Highways is responsible for ensuring the SRN serves its purpose as a part of a national system for through traffic in accordance with Section 10 of the Highways Act 1980, and to satisfy the reasonable requirements of road safety.

1.4. In respect of this development, the SRN in the vicinity of the proposed development consists of the M40, A43 and A34.

1.5. National Highways is mindful that the project could have significant implications on the SRN at various locations, both during construction and operation, due to both the scale and nature of the development. Consequently, substantial mitigation works on the SRN are proposed.

1.6. National Highways is supportive of the proposed development in principle, which seeks mode shift of freight from road to rail, and acknowledges that mitigation on the M40 and the A43 will be required. However, it is not possible at this time to express support for the specific mitigation proposals contained within the consultation documentation as the modelling evidence is yet to be completed to enable the safe and effective operation of the SRN to be demonstrated, nor is it yet possible to be certain that mitigation at other SRN locations will not be required. It is noted specifically that there is an absence of complete data to support the Traffic and Transport Chapter of the Draft Environmental Statement, as well as other chapters reliant on traffic data, such as Air Quality and Noise. National Highways hopes to be in a position to agree the modelling outputs and proposed mitigation in advance of submission of the DCO application.

1.7. We acknowledge the collaborative manner in which Mountpark and their consultants have engaged with National Highways during the development of the project and mitigation proposals so far and look forward to continuing working with you as you develop your proposals.

1.8. Please see specific comments with regards to the SRN on specific sections and documents of the consultation below:

2. Preliminary Environmental Impact Report (PEIR)

2.1. The PEIR provides an initial understanding of the potential likely significant effects of the scheme, both positive and negative, and a final assessment will be set out within the submission version of the Environmental Statement. National Highways

has reviewed the Traffic and Transport chapter which covers the effects of the scheme during construction and operation of the proposed development.

2.2. The approach and assumptions described are generally acceptable to National Highways. Further assessment will be undertaken and the results presented within the Environmental Statement, which will be reviewed by National Highways at the appropriate stage.

3. Traffic and Transport

3.1. Chapter 3 of the PEIR provides an overview of the Traffic and Transport impacts of the proposed scheme.

3.2. Figure 3.1 sets out the initial study area for the Traffic and Transport assessment, which has been defined based on the area where there are likely to be transport effects resulting from the project. The study area scope covers several SRN junctions including, the M40 Junction 10 complex, M40 Junction 9 and four roundabouts on the A43, between the Barley Mow Roundabout and A43/Buckingham Road east of Brackley. This approach is considered appropriate by National Highways. However, based on the outputs from the modelling exercise, the study area may be required to be extended to ensure the impact of the development on the SRN is fully considered. National Highways requires junction impact assessments to be undertaken on junctions experiencing an increase of 30 additional trips during the peak periods.

3.3. Appendix 3.09 sets out the proposed Transport Modelling Scenarios. The assessment years and assessment scenarios are considered acceptable to provide an overview of the impact of the development. The assessment scenarios are consistent with previous discussions between National Highways and the applicant. Both strategic and microsimulation modelling is not yet complete, and National Highways will need to be satisfied with the detailed methodology and assumptions to conclude its review to determine whether the impacts of the development are fully demonstrated and suitably mitigated.

3.4. Appendix 3.10 Personal Injury Accident (PIA) Assessment Technical Note sets out collision data obtained for the five-year period between 1 January 2015 and 30 November 2020. This is not the most recently available five-year period of collision data and National Highways requires that the most recent available data for a five-year period is obtained from the local highway authority, with an exclusion for the period of Covid19 restrictions. The study area and review carried out for PIA is considered to be extensive, and National Highways is content that that study area sufficiently accounts for Junctions 9 and 10 of the M40, and the carriageway in between and the A43. The PIA should be updated to encompass the most recent time period to ensure that there is a full and more contemporary

understanding of the network in terms of safety and ensure the proposed development will not exacerbate existing collision clusters.

3.5. With regards to Junction 9, a common factor recorded within the Technical Note was for collisions occurring on the A34 approach to the junction, consisting of rear end shunt type collisions that are likely to be associated with congestion on the approach. It is stated that there is an opportunity as part of the embedded highway works for OxSRFI to provide additional speed control and safety improvements in this location. The Applicant will need to demonstrate the need for interventions in this location and for the suitability of proposed solutions.

3.6. Appendix 3.30 Trip Generation Technical Note describes the methodology previously agreed with National Highways during Transport Working Group (TWG) meetings. It is noted that the trip rates have been generated from similar developments, such as Northampton Gateway and East Midlands Gateway SRFIs. Notwithstanding that the assessment approach was previously agreed, the time elapsed since then is such that we would encourage a validation exercise in order to demonstrate the rates stated in the Trip Generation Technical Note remain the most appropriate ones to use. Aside from this request, the trip rates have been reviewed by National Highways' transport consultants, and we are satisfied that the trip generation has been correctly calculated.

4. Construction Impacts of the Proposed Development

4.1. Appendix 3.29 Construction Traffic states that the construction of the proposed development is expected to take up to 7 years. The proposed year of commencement is 2028 with on-site works, completing in 2034.

4.2. The document sets out a timeline of construction works required, with the focus of the M40 Junction 10 and the A43 works taking place between 2029 and 2032. This is understood to include both phases of the works. The works to the M40 Junction 9 start in 2031 and anticipated to be completed in 2032. For all works to the SRN, a Roadspace booking will be required via the National Highways Roadspace team. Please allow sufficient time for this within your programme.

4.3. It is noted that the document does not identify a need for Abnormal Indivisible Loads (AIL) would be required during the construction of proposed development. Notwithstanding this, please note that National Highways follows a government Water Preferred Policy, which means we would expect the loads to arrive via the nearest suitable port of entry. National Highways would need to agree any AILs that are intended to use the Strategic Road Network. Further guidance can be found at https://nationalhighways.co.uk/road-safety/abnormal-loads-and-the-esdal-system/. National Highways recommends discussing this matter before a decision is made on the proposed route.

5. Proposed SRN Mitigation Works - M40 Junction 10 and A43

5.1. The proposed development includes embedded mitigation measures at the M40 Junction 10, consisting of the following phases of works:

- Phase 1 would deliver improvements to Ardley, Cherwell, and Baynard's Green roundabouts prior to first occupation on site.
- Phase 2 would deliver the full M40 junction 10 improvements, including the two new free flow-links between the M40 and the A43, to be delivered prior to the occupation of more than 2 million sqft (approximately 185,806sqm) of the development.

5.2. Several iterations of the proposed works to Junction 10 and the A43 have been considered as part of the TWG. The proposed scheme, Option 25a, was developed from amendments to the layout informed by feedback from National Highways. Option 25a has been reviewed previously by National Highways and was considered suitable in principle to mitigate the impact of the development on Junction 10 and the A43. However, National Highways will need to see evidence from the VISSIM modelling and a Road Safety Audit (RSA) 1 that the proposed scheme can safely accommodate the increase in traffic arising from the proposed development.

5.3. Minor alterations may also be required part of the Detailed Design check, which will take place prior to construction of the works. All works are required to be compliant with the standards set out within the Design Manual for Roads and Bridges (DMRB). Where the standards cannot be complied with, a departure from standard will be required. It is recommended that departures from standards are submitted for consideration prior to submission of the DCO to ensure they can be accepted and do not require further design changes which could affect the red line boundary. Works to the SRN are required to comply with the standards at the time of construction, not consent, to ensure that they comply with the latest safety critical standard.

5.4. It has been noted that due to the complexity of the proposed layout, there is a potential t for some road users to be confused and potentially to increase the risk for "wrong way driving" incidents. To minimise this risk, the signing strategy will be particularly important and I also recommend that the designer reviews the recently published Wrong Way Driving: Assessment and Mitigation Toolkit, which can be found on the Road Design Guidance page.

5.5. Any road markings that are proposed should be appropriate and logical to road users, and any signs that are proposed should be consistent with the road markings. Figures D.1 and D.2 of CD 116 give some guidance on the installation of road markings and signs at roundabouts, and Section 6 of the Traffic Signals Manual (TSM) Chapter 5 should also be reviewed by the designer.

5.6. The layout of the M40 northbound on-slip with a long, straight section and a tight bend before the merge, in effect creating what would feel like a link road, could potentially result in “loss of control type” collisions due to high speeds. It is noted that a speed limit of 40mph is proposed, but we are concerned that drivers will not adhere to the speed limit. We are keen to understand the consideration given to how compliance with the speed limit can be ensured on this link.

5.7. The roundabouts and junctions between Ardley and Padbury should help reduce vehicle speeds when it is heavily trafficked, but lower speeds would maximise a road user’s time to understand and react to the complex layout, particularly when the traffic volumes are low. Given the complexity of the arrangement from Ardley to Padbury, we would be keen to discuss whether it would be appropriate to reduce the proposed 50mph limit.

6. Proposed SRN Mitigation Works - M40 Junction 9

6.1. The proposed development seeks to provide embedded mitigation measures at M40 Junction 9. Modelling outputs suggest that in the 2031 PM Peak hour, there is forecast baseline congestion on the A34 eastbound approach to the junction. The congestion results in traffic not reaching the M40 northbound and rerouting on to the local road network to rejoin the M40 at junction 10.

6.2. The development proposes to widen the A34 carriageway to assist with increasing capacity. The proposal would also include an additional flared entry lane between the A34 and the M40 Northbound approximately 60metres long with a lane merge on the exit. The scheme would also include a provision of a splitter island on the entry to the gyratory.

6.3. A similar scheme was previously introduced by National Highways providing a non-segregated free flow lane from the A34 to the M40. This is understood to have been removed following a series of collisions associated with this layout.

6.4. It is noted that the Interim Road Safety Audit has identified a risk of collisions resulting from lane changes and hesitation due to the complexity of the junction. No solutions have been provided to reduce this risk; therefore, this design is yet to be agreed. It is acknowledged that the principle of mitigation at this junction has been established through the TWG, particularly pre-pause of the project. However, National Highways is not yet in a position to agree this form of mitigation is the appropriate measure to be provided.

6.5. The Applicant needs to demonstrate the impact of the Development on the junction, that the proposed mitigation is appropriate to the need and that evidence from appropriate modelling and an RSA1 demonstrates that the solution is appropriate and safe. In addition, several new developments close to the junction, with SRN mitigation needs, have been brought forward since the intervention was

intially developed. It is important that any mitigation is compatible with other proposals for the junction.

7. Ecology and Biodiversity

7.1. Chapter 9 sets out the preliminary findings of the Ecology and Biodiversity assessment. It is understood that the proposed development will deliver at least 10% net gain.

7.2. National Highways has undertaken a review of the assessment regarding the aspects of the proposed development that could potentially interact with the SRN and National Highways operational land.

7.3. Vegetation clearance and subsequent re-planting appear to be proposed, with some new woodland and scrub planting located within the SRN boundary. Any planting specifications must comply with the requirements in DMRB Standards, namely LD 117 and LC 120.

7.4. The key consideration for National Highways is how these habitats will be implemented, managed, and maintained within the highway estate – particularly during the establishment phase when the contractor undertaking planting would typically be responsible for aftercare. Arrangements for aftercare should be aligned to an extended defect correction period of 5 years during which the contractor is responsible for delivery of routine and cyclical activities required to support establishment and any remedial planting works. The arrangements for aftercare, long-term management and any subsequent handover back to National Highways will need to be addressed in National Highways' Protective Provisions.

7.5. Any new planting which is located within land under National Highways ownership must be feasible to maintain in accordance with the standards for long term inspection and management, GS 801 and GM 701.

7.6. Design coordination should ensure planting near the SRN, in particular the A34 / M40 junction, does not impact visibility, drainage, or maintenance access.

7.7. National Highways' position on third party NSIPs is for like replacement and 10% Biodiversity Net Gain **within its own land ownership.** This is due to National Highways' obligations and KPIs for the SRN, on which it is measured. We would be happy to discuss these matters further in advance of the scheme being finalised.

8. Air Quality

8.1. National Highways has undertaken a review of chapter 4, Air Quality, regarding the potential for the proposed SRN mitigation works to impact adversely on air quality.

8.2. National Highways is required to work with local authorities to achieve air quality standards on its network and is measured on its performance in this regard by the Office for Road and Rail. With this in mind, any works to the SRN must meet National Highways' obligations on air quality and not give rise to exceedances. Where the physical interventions to the SRN worsen air quality, measures will be required to provide amelioration. It is understood that detailed assessments of the likely effects on air quality will be carried out once the transport modelling has been completed. National Highways will complete a review of the Air Quality impacts of the scheme when these become available and will be happy to discuss any impacts and appropriate mitigations at the appropriate time.

9. Noise

9.1. National Highways has undertaken a review of chapter 5, Noise and Vibration, regarding he potential for the proposed SRN mitigation works to impact adversely on noise receptors.

9.2. The primary construction activities of relevance to National Highways, from a noise and vibration perspective, are the works related to the SRN.

9.3. With respect to the works at Junction 10 and the A43, daytime noise levels have been predicted based on indicative activities and initial indications are that there will not be any exceedances of the SOAEL. Sufficient detail is not yet available to allow for the reliable prediction of noise from night-time works, but it is considered that these would also be unlikely to exceed the SOAEL. Paragraph 5.5.12 states that noise from night-time works would be 'appropriately managed' but no further detail is given. It would be helpful to understand if the Applicant intends to apply for Section 61 consent for such works and if the noise arising from them will be monitored.

9.4. As there are no sensitive receptors within 100m of the Junction 10 and the A43 works, and 100m is the recommended study area in DMRB LA111 Noise and Vibration for construction vibration, vibration effects are considered negligible.

9.5. An assessment of construction noise and vibration with respect to the works at Junction 9 has not been completed at this stage but it is understood that this will be included within the final ES. National Highways will review this assessment when it is available.

9.6. The primary operational activities of relevance to National Highways, from a noise and vibration perspective, concern road traffic on the SRN. In particular, this will

derive from additional road traffic accessing the SRFI from the redesigned M40 Junction 10 and A43 and changes in traffic patterns on the SRN as a result of the Proposed Development.

9.7. The LOAEL and SOAEL values for operational road traffic noise are given in Table 5.13 and are consistent with those presented in LA111. Impact classifications for changes in road traffic noise are provided in Table 5.14, for the daytime, and Table 5.15, for the night-time. It is unclear why the long-term change classifications, provided in Table 3.54b of LA111, have been used for the short-term changes in daytime noise when levels are below the SOAEL. This should be given further justification as it is a dilution of the impact classifications, which from LA111, are independent of the absolute level. Furthermore, significant effects are only classified for receptors with operational road traffic noise above the SOAEL. This is in direct contrast to LA111 where any receptor subject to more than a negligible change in road traffic noise may be significantly affected depending on the context.

9.8. As explained in paragraph 5.5.30, the operational road traffic noise from the Proposed Development has not yet been fully assessed.

9.9. National Highways has a Key Performance Indicator to mitigate households affected by noise located in Noise Important Areas and is more broadly committed to reducing excessive noise across the network where practically possible. Receptor R9, adjacent to the A43 north of Junction 10, sits within a Noise Important Area and opportunities should be sought to improve noise for affected residents, such as utilising sympathetic design measures, and implementing mitigation measures where appropriate. We are happy to discuss this, and any other matters related to noise and vibration, at the appropriate time.

9.10. Detailed construction and operational noise predictions for works that interact with the SRN are not presented at this stage. These should be completed prior to submission, with consideration given to the criteria for significant effects, as outlined above.

10. Drainage

10.1. National Highways recommend that the DCO red line boundary allows sufficient space for all drainage assets that are required such as ditches, culverts, and ponds as well as the access tracks to maintain and inspect them. The buffer zone between the drainage assets and the highway boundary will also need to be maintained**.**

11. Technology Strategy

11.1. National Highways is currently reviewing the DCO boundary in relation to technology assets within the area, including assets within the verges and the carriageway.

11.2. Please note that Loop sites within the carriageway could be susceptible to damage from the construction process. Any assets that are damaged will require replacement as part of the scheme works.

11.3. Further information will be provided as it becomes available. All works involving National Highways technology assets are required to comply with DMRB standards.

12. Signage Strategy

12.1. National Highways has provided verbal feedback regarding the Signage Strategy in the recent TWG. To this end, the following points were raised:

- Middleton Stoney does not need to be signed as this is a minor destination past Ardley. This should only be signed on the local Highway Authrority network not on the SRN.
- Brackley is not a Primary destination and should not be signed.
- RS15 - We would prefer this to be one sign not two on a backing board
- RS14 - due to the close proximity of the junctions, the option with both junctions is preferred.

12.2. All amendments to existing signs or any additional signs are required to meet DMRB standards and comply with the Traffic Signs Manual.

13. Cumulative Effects

13.1. Chapter 16 Cumulative Effects Assessment of the PEIR presents t the potential significant cumulative effects that may arise from the Project in combination with other developments in the area.

13.2. National Highways broadly welcomes the approach taken to assess the cumulative impact of developments in the area. National Highways however is concerned that two significant developments within the area which are currently being reviewed and assessed by the Local Planning Authority have been discounted from the assessment, namely Puy du Fou and Heyford Park. As a result, the cumulative impact on the SRN cannot be fully understood. National Highways is of the view that any developments that are reasonably likely to be determined before this project proceeds to examination should be included within the assessment.

14. Construction Environmental Management Plan

14.1. Environmental Statement Appendix 2.3 sets out the Construction Environmental Management Plan (CEMP) for the project, setting out the

overarching systems and controls to be adopted during the construction of the project to minimise any adverse environmental impacts. The CEMP seeks to provide the framework for all phases, and construction component-specific P-CEMP's will be produced for individual elements. It is anticipated that the SRN mitigation works will be informed by a P-CEMP. However, this is not currently confirmed.

14.2. The CEMP summarises the proposed mitigation works to the SRN, and it is stated that the works to the M40 will take place at an early stage given its role in providing a strategic access to the development. Key transport aspects of the CEMP are set out as follows:

- All construction works affecting the Strategic Road Network will be expected to follow traffic management arrangements agreed with National Highways. Proposed measures include controls on construction routes, maintaining emergency access and implementing signage.
- The plans must ensure safe and efficient access for construction vehicles, while minimising disruption to existing traffic flows.
- Temporary speed limits and other control measures (e.g., lane closures, diversions) may be implemented as part of these arrangements, subject to DCO provisions.
- Coordination with National Highways is essential to maintain emergency access and ensure compliance with national standards.

15. Construction Traffic Management Plan (CTMP)

15.1. It is acknowledged that a CTMP has not been provided at this time. However, the Applicant will be including a draft outline version within the DCO submission.

15.2. It is anticipated that most of the construction traffic will be routed via the SRN and then via the Local Road Network before reaching the site. This approach is considered acceptable in principle. However, further investigations of impacts on each junction will be required before agreement can be provided, for example a phased model identifying the impact at each junction combining the construction traffic to the site and to the construction site for the mitigation works.

15.3. In a forthcoming CTMP, additional details are required on matters, such as delivery of materials outside of the SRN peak hours and, monitoring, and enforcement of the proposed HGV routes. Furthermore, any proposals for monitoring equipment/measures that need to be implemented along the SRN will need to be agreed with National Highways. National Highways will need to be satisfied that there are sufficient processes in place to ensure enforcement of any suggested measures and the action that will be taken if these prove to be unsuccessful in ensuring forecast traffic numbers are not exceeded.

15.4. It should be noted that the signage strategy for the Construction Route is yet to be agreed. National Highways will need to agree any proposed signage to be located on the Strategic Road Network.

16. Land Acquisition

16.1. National Highways would object to the compulsory acquisition of any of its land or rights to safeguard its interests and the safety and integrity of the SRN. Further discussion regarding land requirements is recommended in advance of the DCO application submission.

17. Draft Development Consent Order and Protective Provisions

17.1. National Highways thanks the Applicant for sharing the draft Development Consent Order ("dDCO") as part of the statutory consultation documents. We note that Protective Provisions for the protection of National Highways are not included as part of the dDCO at this stage. It is National Highways' position that Protective Provisions that safeguard the Strategic Road Network are secured on the face of the order, and we shall seek to negotiate these with the Applicant.

18. Concluding Remarks

18.1. Whilst National Highways remains supportive of the principle of the development, National Highways will object to this scheme if the issues raised in this letter are not resolved satisfactorily. National Highways reserves the right to expand, amend or clarify any of the issues in this Section 42 Consultation Response, and to produce additional grounds of objection to an Examining Authority during the Relevant Representations submission.

18.2. National Highways trusts its response provides clarification of its concerns and identifies the matters which National Highways considers need to be addressed. However, if you have any questions or comments regarding the contents of the letter then please do not hesitate to contact me on the details provided. National Highways looks forward to continuing positive engagement with Mountpark and its consultant team as the project progresses.

Yours Sincerely

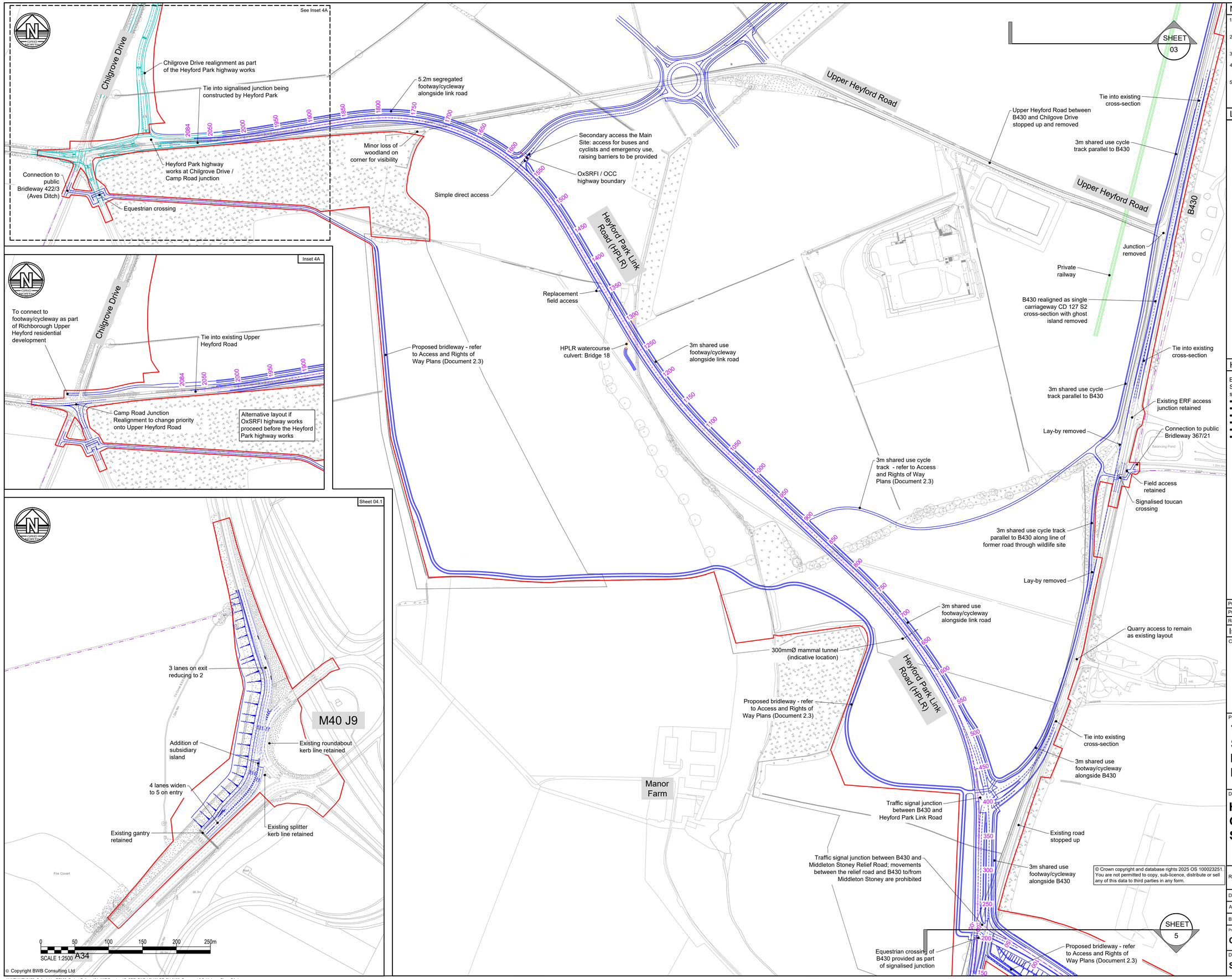
Alice lawman

Alice Lawman – Spatial Planner

National Highways Spatial Planning (East)

APPENDIX 2

M40 JUNCTION 9 IMPROVEMENT SCHEME



Notes

1. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
2. The height of proposed bridges, embankments and depths of cuttings are indicative subject to the limits of deviation referred to in the order.
3. All structure positions and sizes shown are indicative only.
4. The proposed works including their specific alignment will be subject to detailed design within the limits of deviation identified on the works plans.
5. Horizontal and vertical deviation of the highway alignments are permitted in accordance with Article 4 of the Development Consent Order.

Legend

- Draft Order Limits
- Highway Works
- Cross-section locations
- 250 Chainage
- New, amended or removed structures (various types as annotated) - refer to Bridge Plans (Document 2.12)
- Existing public right of way retained (shown for reference only)
- 3rd party scheme as annotated (indicative and shown for reference only)
- Private railway (shown for reference only, refer to Rail Plans, Document 2.11)
- Highway boundary/interface as described

The legend is identical on all sheets of the highway plans and therefore not all items detailed in the legend are represented on each sheet

Highway Works

By reference to the Works Plans (Document 2.2) and Schedule 1 of the Development Consent Order this plan shows the following highway works:

- Work No. 12 (part)
- Work No. 13A
- Work No. 13B
- Work No. 22
- Work No. 23 (part)
- Work No. 25 (part)

Rev	Date	Details of issue / revision	Drw	Ch'd	Apv
P02	15.09.25	Issued for consultation	SRH	SRH	SRH
P01	01.09.25	Preliminary Issue	SB	SRH	SRH

Issues & Revisions

Client

OxSRFI OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Project Title

THE OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE AND HIGHWAYS ORDER 202X

Drawing Title

HIGHWAY PLANS GENERAL ARRANGEMENT SHEET 04

Regulation:	6(2)	Document:	2.7D
Drawn:	S.Birchall	Checked:	S.Hilditch
Approved:	S.Hilditch	Date:	20.06.25
BWB Ref:	NTH2479	Scale@A1:	1:2500

Project - Originator - Functional Breakdown - Spatial Breakdown - Form - Discipline - Number

OxSRFI-BWB-LSI-04-DR-CH-0104

Drawing Status	Rev
S3 - FOR COMMENT	P02

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APPENDIX 3

LETTER REGARDING J9 17.12.25

National Highways
Three Snowhill
Snow Hill Queensway
Birmingham
B4 6GA

BY POST AND EMAIL:

National Highways:

Jeremy Bloom <consulting@jeremybloom.co.uk> Alice Lawman <alice.lawman@nationalhighways.co.uk> Sarah Marshall sarah.marshall@nationalhighways.co.uk Vicky Fowler <vicky.fowler@gowlingwlg.com>

Oxfordshire County Council:

Joy White joy.White@Oxfordshire.gov.uk George Gurney, <george.gurney@oxfordshire.gov.uk>

17 December 2025

Dear Sir or Madam

Proposals for a strategic rail freight interchange and warehousing on land south of the Chiltern Railway line, west of the B430, east of Upper Heyford Former Airfield together with M40 J10 and A43 Highway Improvements, the provision of a bypass to Ardley and a relief road for Middleton Stoney and a new Heyford Park Link Road in Oxfordshire

We write regarding the proposed application for the Oxfordshire Strategic Rail Freight Interchange ("the Project"), to be submitted on behalf of Oxfordshire Railfreight Limited ("the Applicant").

The Project recently concluded its statutory consultation. National Highways submitted a response to that consultation in which it queried the risk of collision at Junction 9 of the M40. After reviewing these comments, the Applicant now proposes to amend the Order Limits accordingly (as defined in the draft Development Consent Order and being the limits in which the authorised development may be carried out). The background and rationale for this is explained below.

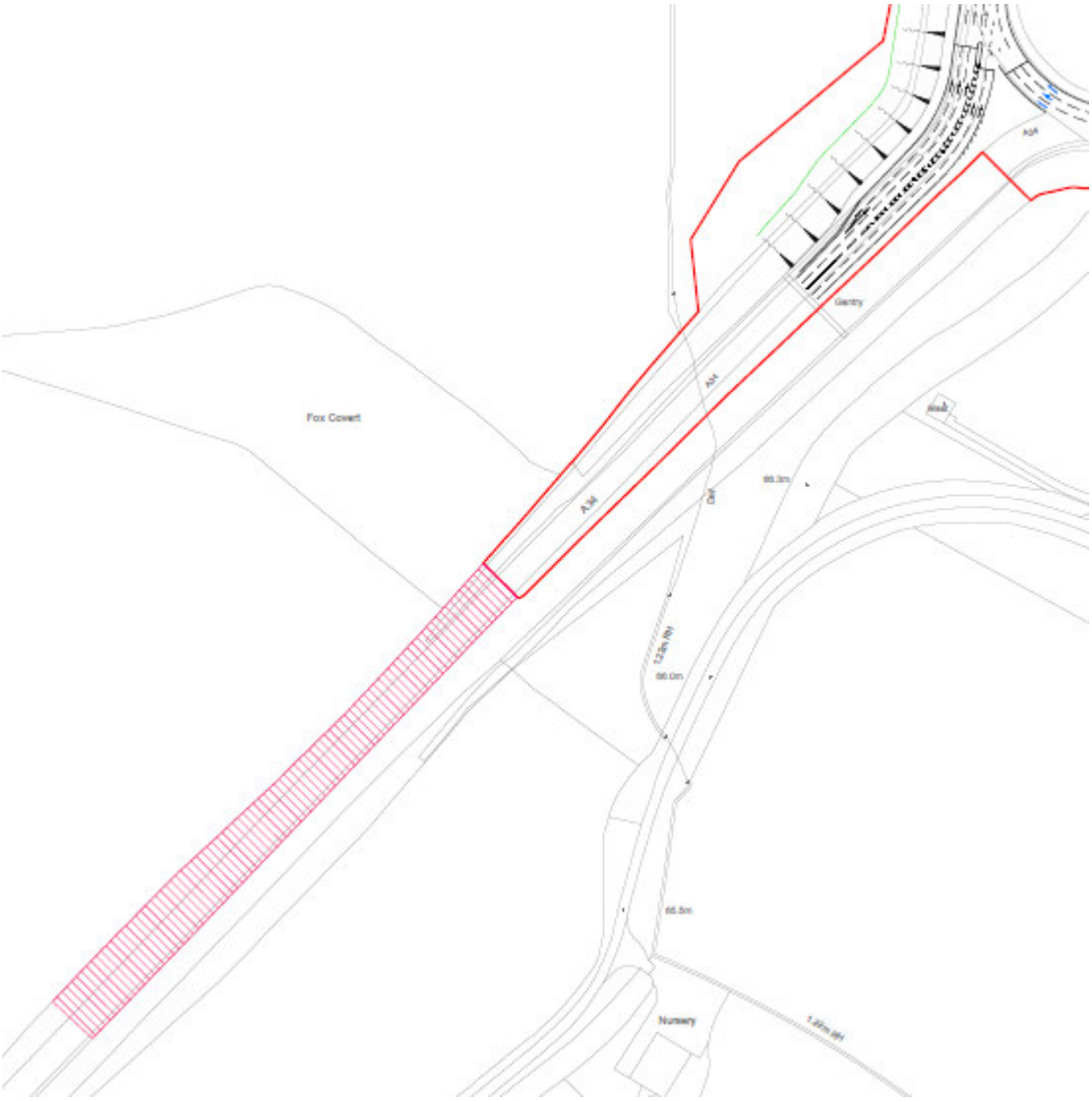
As part of the consultation, the Project included a scheme at Junction 9 of the M40 to increase capacity for users approaching from the A34. This consists of an additional left turn lane from the A34 to M40 which will be signalised alongside the two existing lanes.

In recent years there has been a large number of personal injury collisions ("PICs") on the A34 northbound approach. Between January 2015 to December 2020, which is the study period included in the statutory consultation, 83 PICs have occurred. A review of more recent PIC data, for the period between January 2021 and December 2023, shows that a further 11 PICs have occurred on this approach. These PICs are notable, in that they are overwhelmingly the same type of PIC (rear shunt), occurring in the same location (on the A34 approach to J9), with a likely contributory factor being queuing on the approach to the junction.

National Highways, in your response to the statutory consultation, queried how the proposals at J9 will address these collisions and sought assurance that "*the proposed development will not exacerbate existing collision clusters.*". Furthermore, the NN NPS (para 4.61) requires that "*all reasonable steps have been taken and will be taken to minimise the risk of road casualties arising from the scheme and contribute to improvements in the safety of the strategic road network*."

With the introduction of the additional left turn lane the predicted mean maximum queue length on the A34 is forecast to reduce from approximately 541m (91 pcus) to 185m (31 pcus) (when comparing the future year of 2034 with and without the Project). Whilst queue lengths are forecast to be significantly shorter with the Project than without it, in accordance with the NN NPS, the Applicant has considered whether there are any reasonable steps which can be taken to minimise the risk of road casualties.

The Applicant is therefore proposing to implement a 50mph speed limit on the A34 northbound approach to J9 to reduce vehicle speeds on the approach to the junction, for a distance of 500m and this will be included for in the draft Development Consent Order. The 500m distance exceeds the forecast predicted maximum queue length. To enable the Project to provide the signage for the 50mph limit the Applicant is proposing to extend the Order Limits (The extension will take the limits farther south on the A34 as shown on the drawing below. All of the land included in the extended Order Limits is within the publicly adopted highway (being the A34 trunk road) with the subsoils being owned by National Highways and Oxfordshire County Council. For completeness, we enclose the title information detailing the subsoil ownership.



Plan showing proposed extension to Order Limits (hatched area)

The proposed change to reduce the speed limit on the A34 approach to M40 J9, alongside the reduction in queuing that is associated with the proposed highway improvement, are considered by the Applicant to be reasonable steps to minimise the risk of road casualties at this location and contribute to improvements in the safety of the strategic road network. We would be grateful if you could confirm this addresses National Highways consultation comments on this matter. We would also welcome any other comments on the proposals.

We ask that these are provided within the next 35 days and no later than **22 January 2026** in order that we have sufficient time to consider them before the application is finalised.

For your information, a copy of this correspondence has also been sent to Oxfordshire County Council and Cherwell District Council.

Yours faithfully

Oxfordshire Railfreight Limited

Oxfordshire Railfreight Limited

Enc: Register of title and plan for ON284418

Cc:

National Highways

Alice Lawman
Spatial Planner
Operations (East)
National Highways
Woodlands
Manton Lane
Bedford
MK41 7LW

National Highways
Bridge House
1 Walnut Tree Close
Guildford
Surrey
GU14LZ

Oxfordshire County Council

Joy White
Team Leader, Transport Development Management (North)
Planning Regulation and Enforcement
Economy and Place Directorate
Oxfordshire County Council
County Hall
New Road
Oxford
OX1 1ND

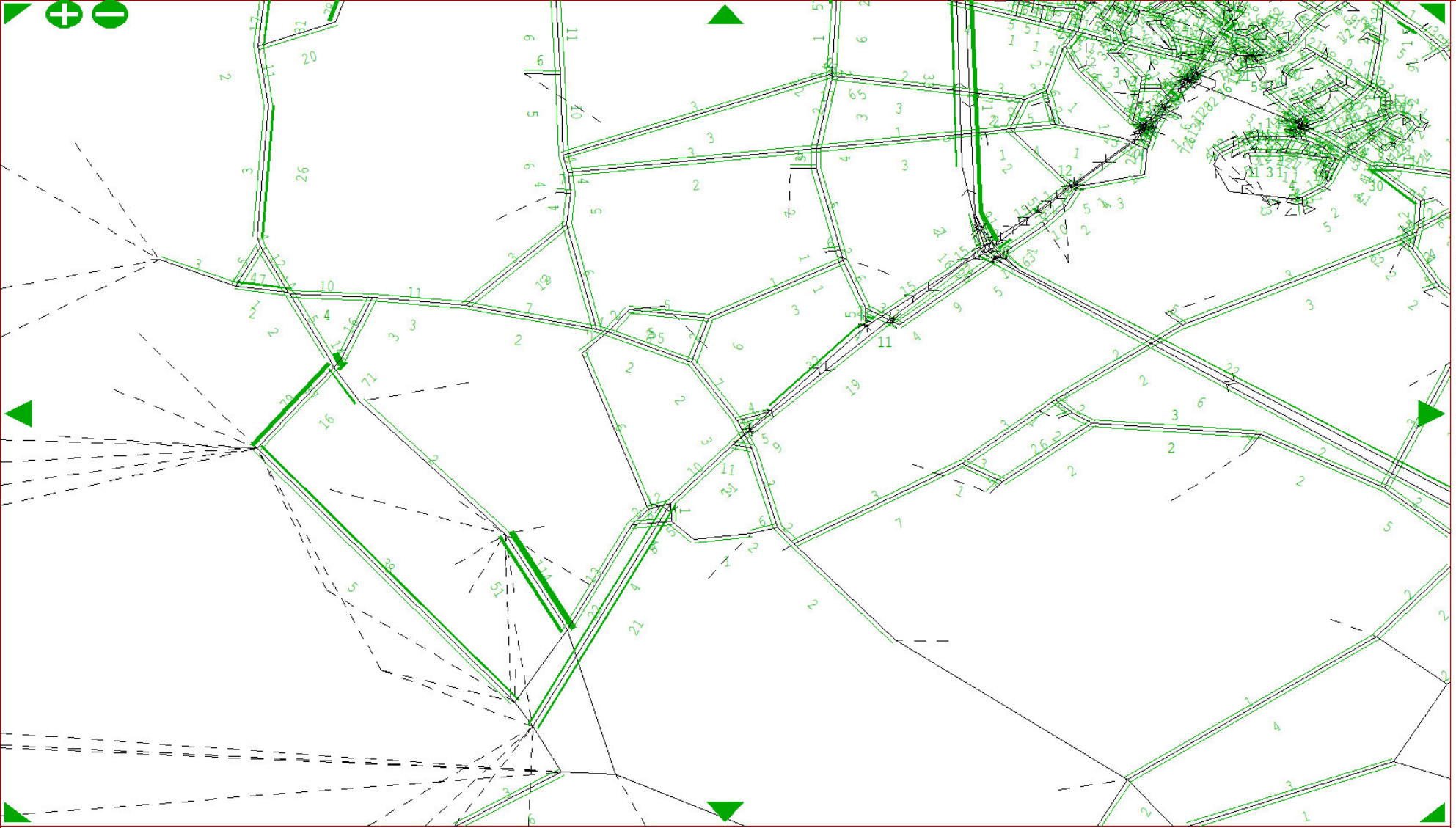
Cc George Gurney

Cherwell District Council

BY EMAIL ONLY: Andy Bateson and Nick Wyke

APPENDIX 4

BTM DELAY PLOTS



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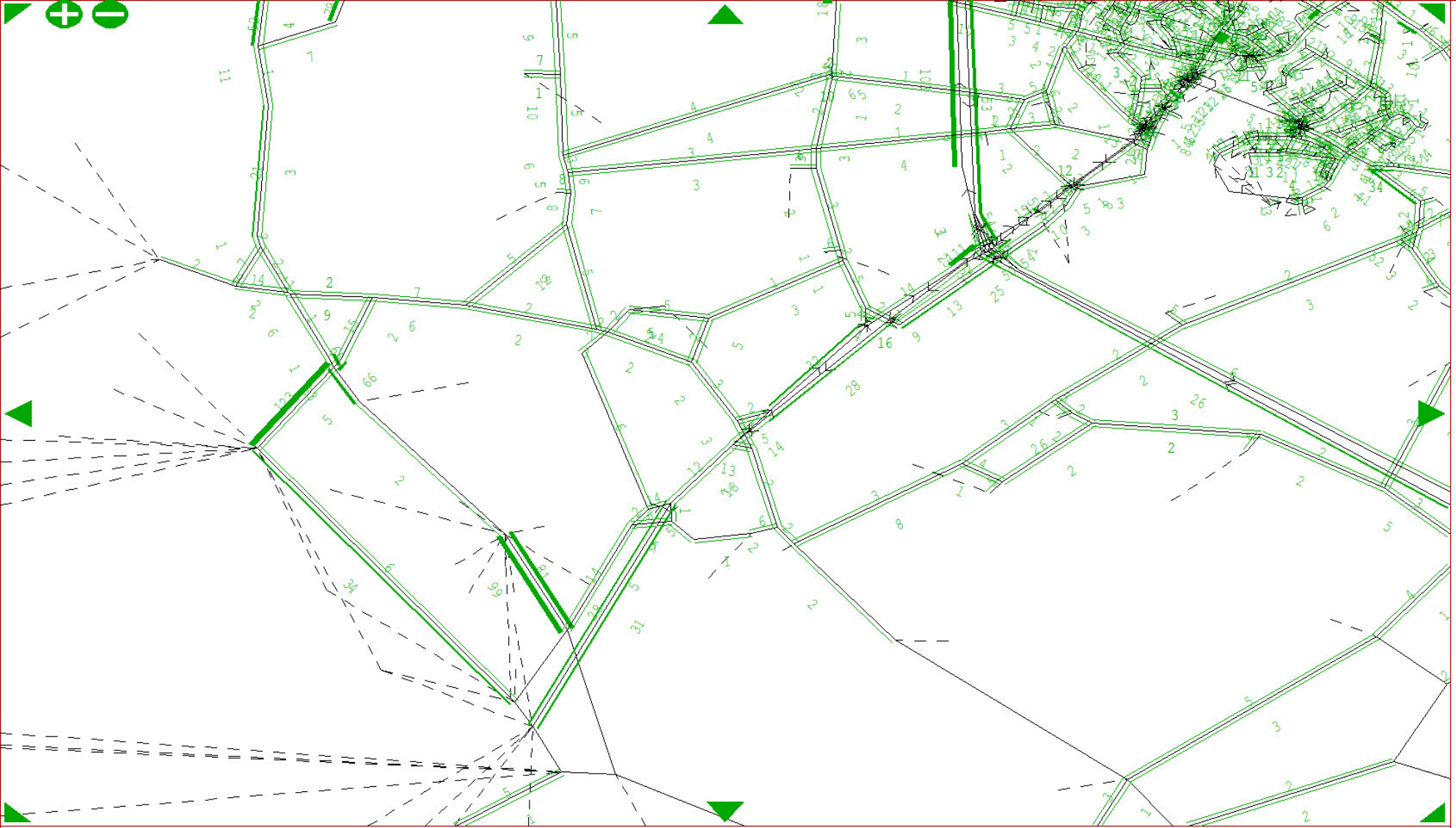
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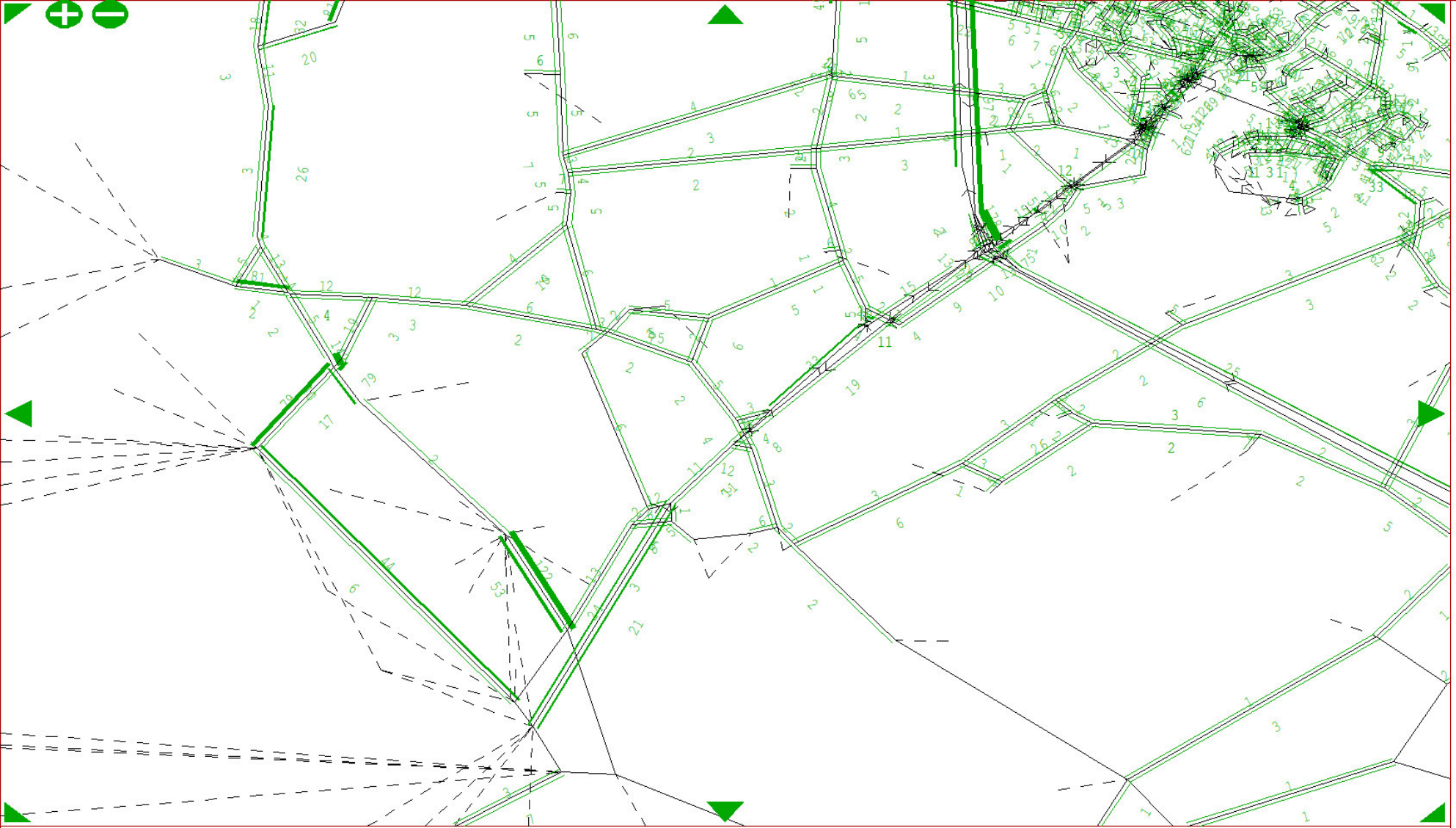
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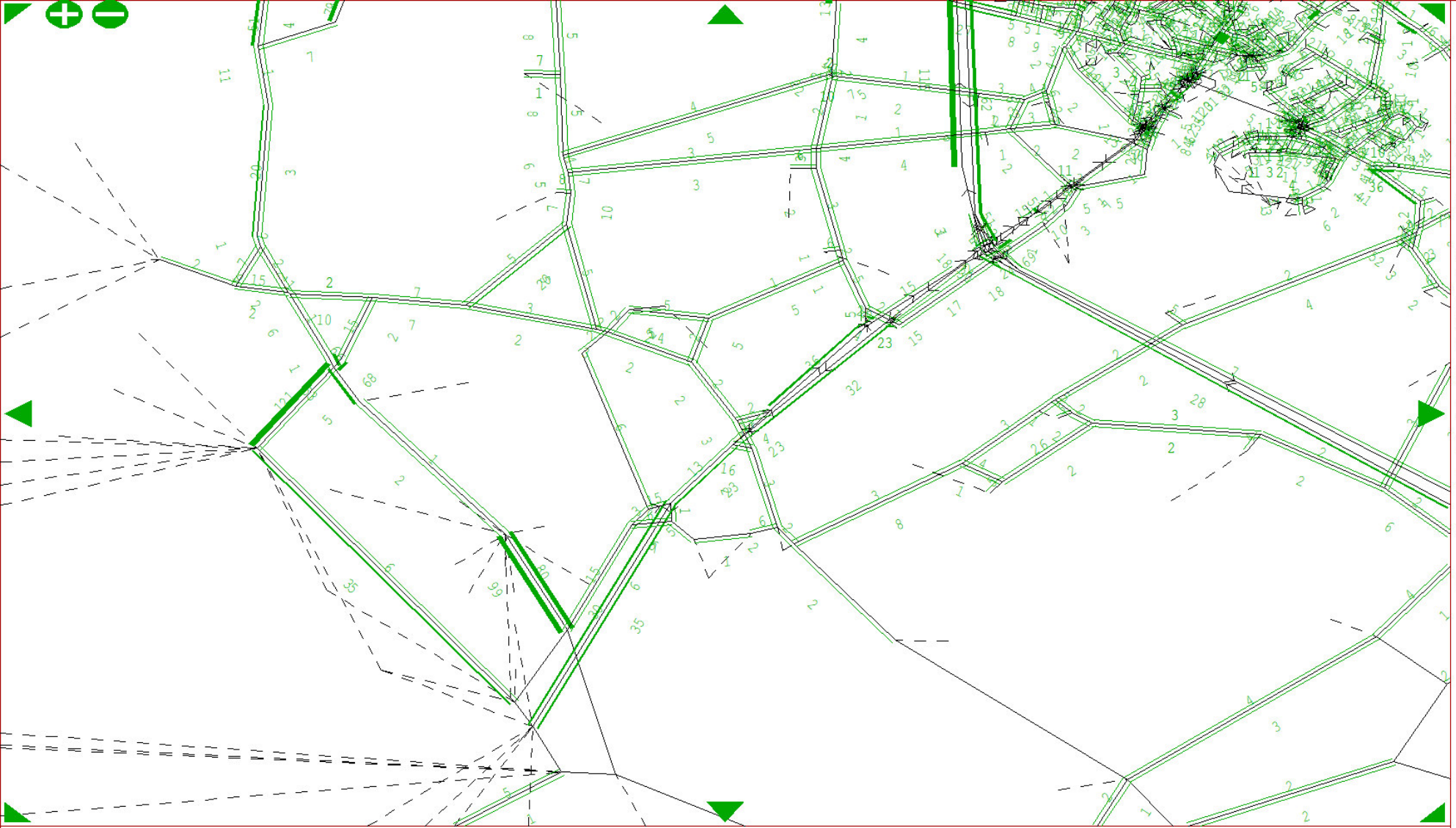
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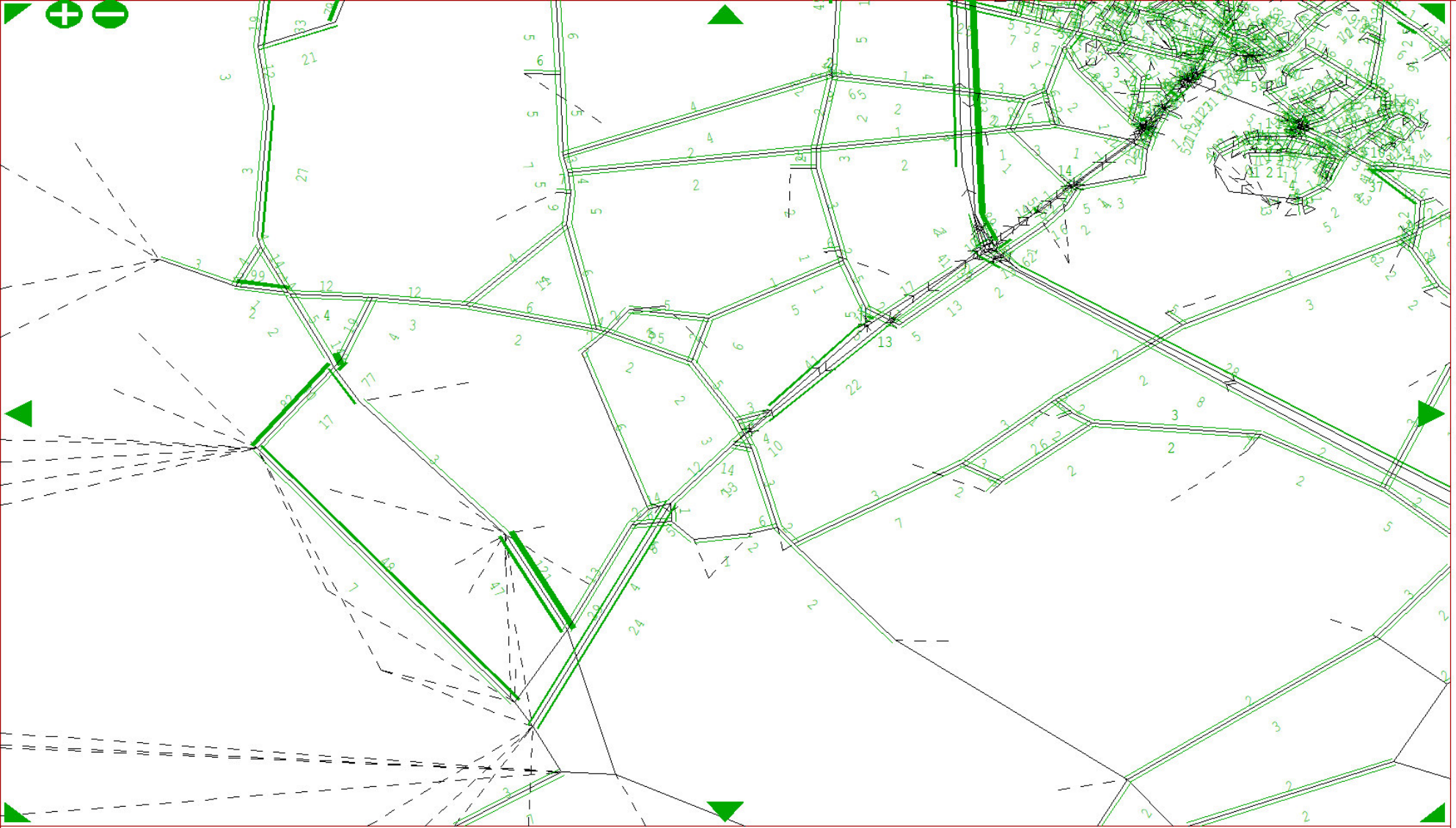
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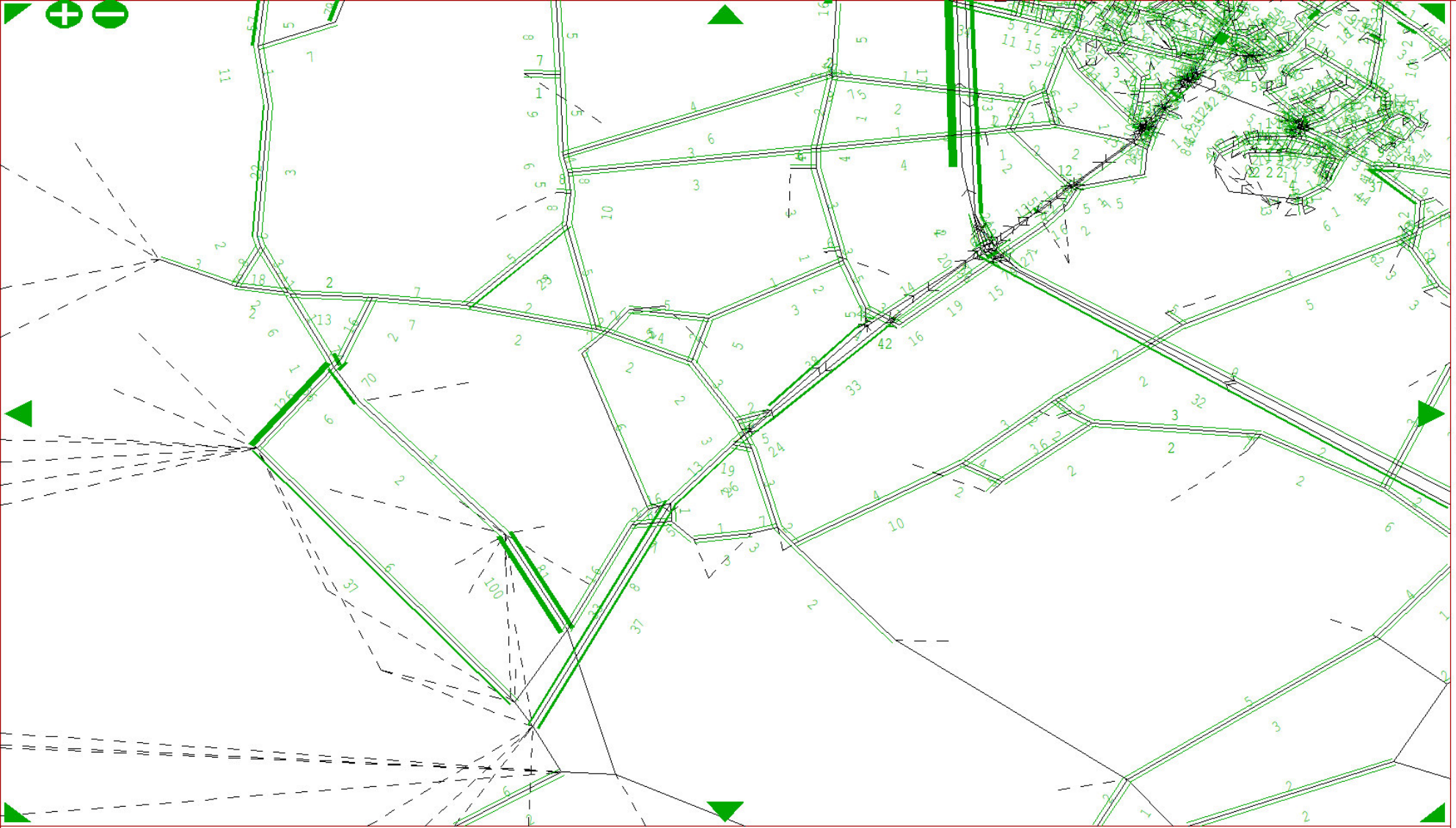
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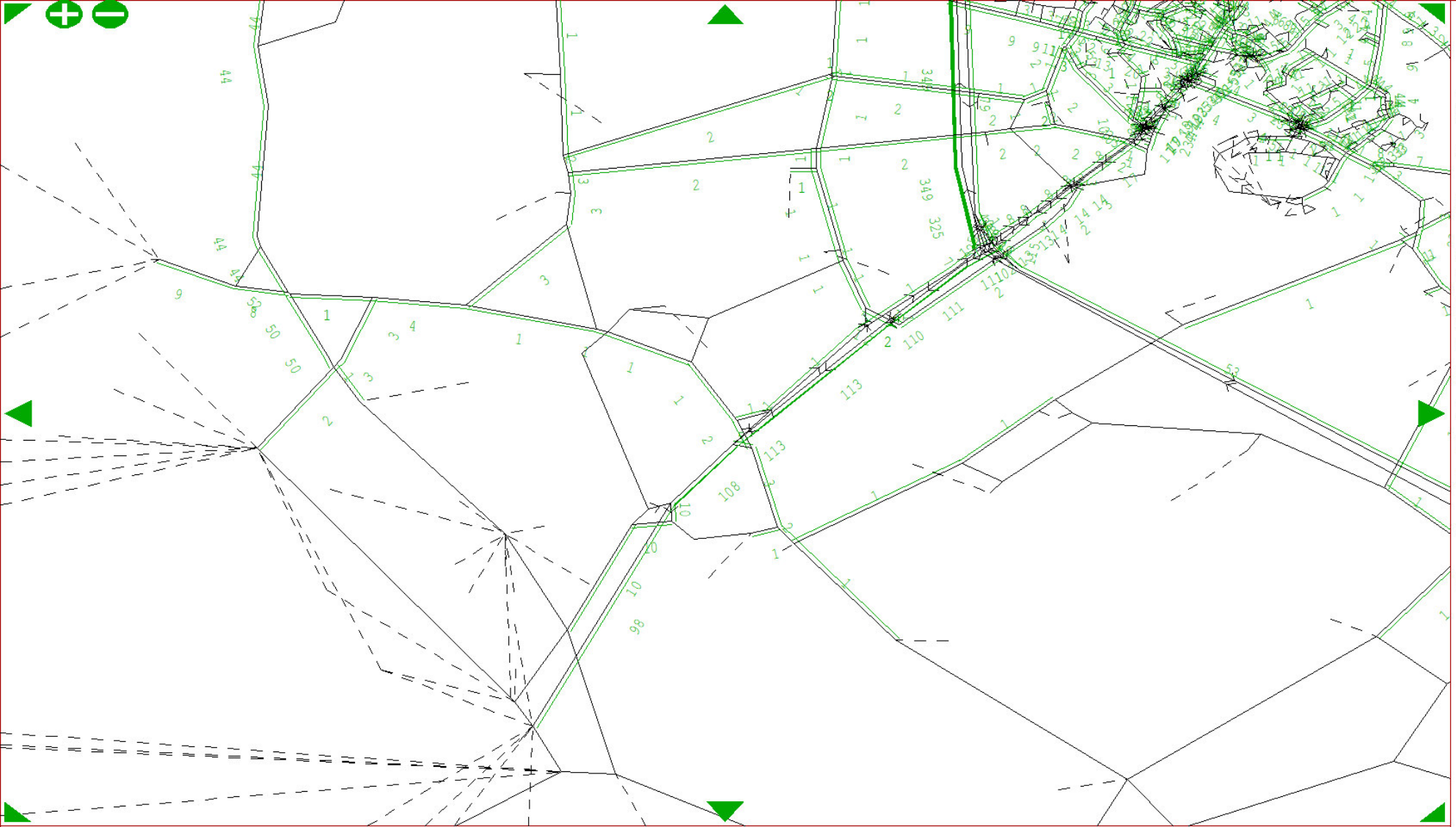
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APPENDIX 5

BTM PASSQ PLOTS



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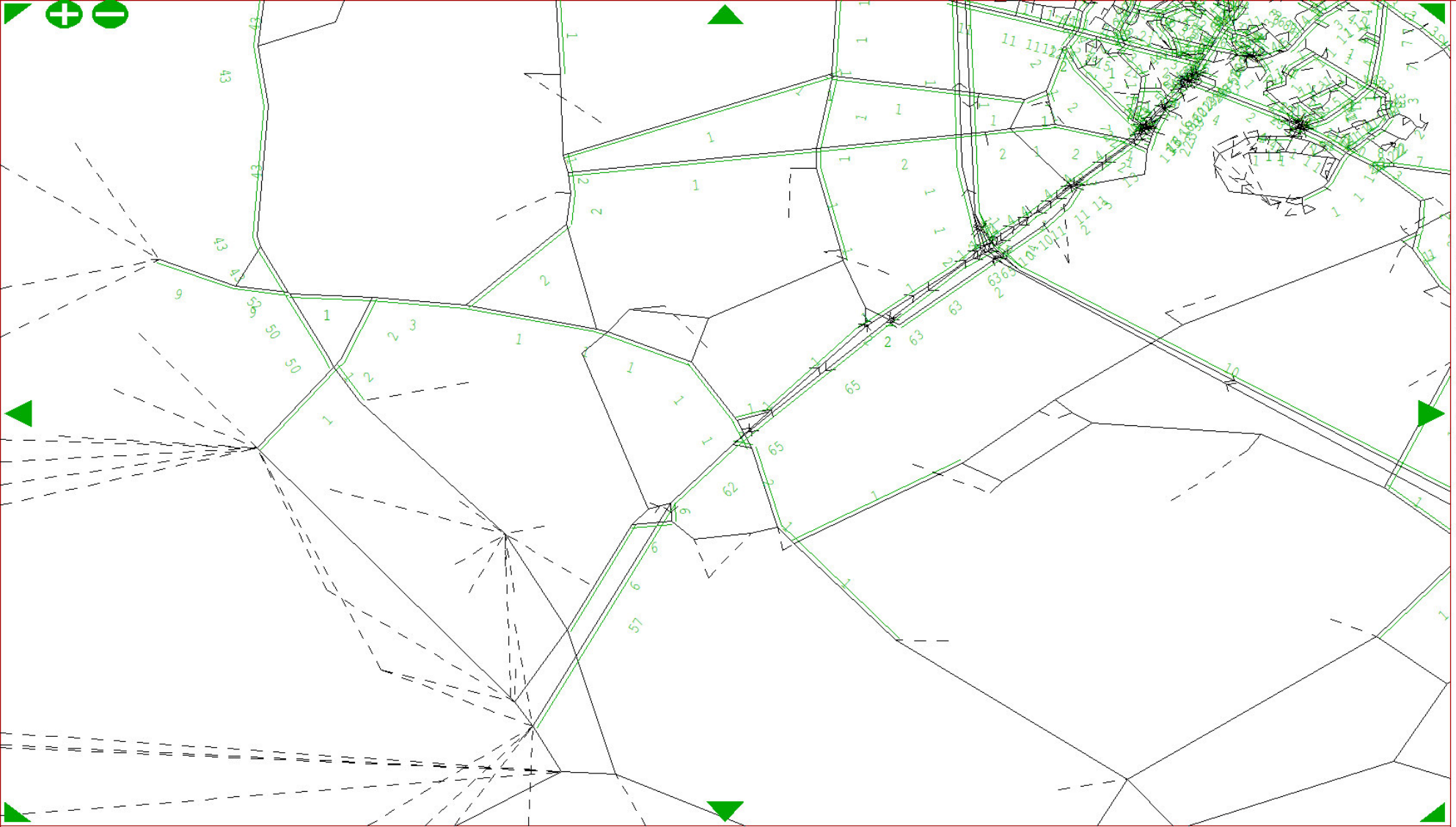
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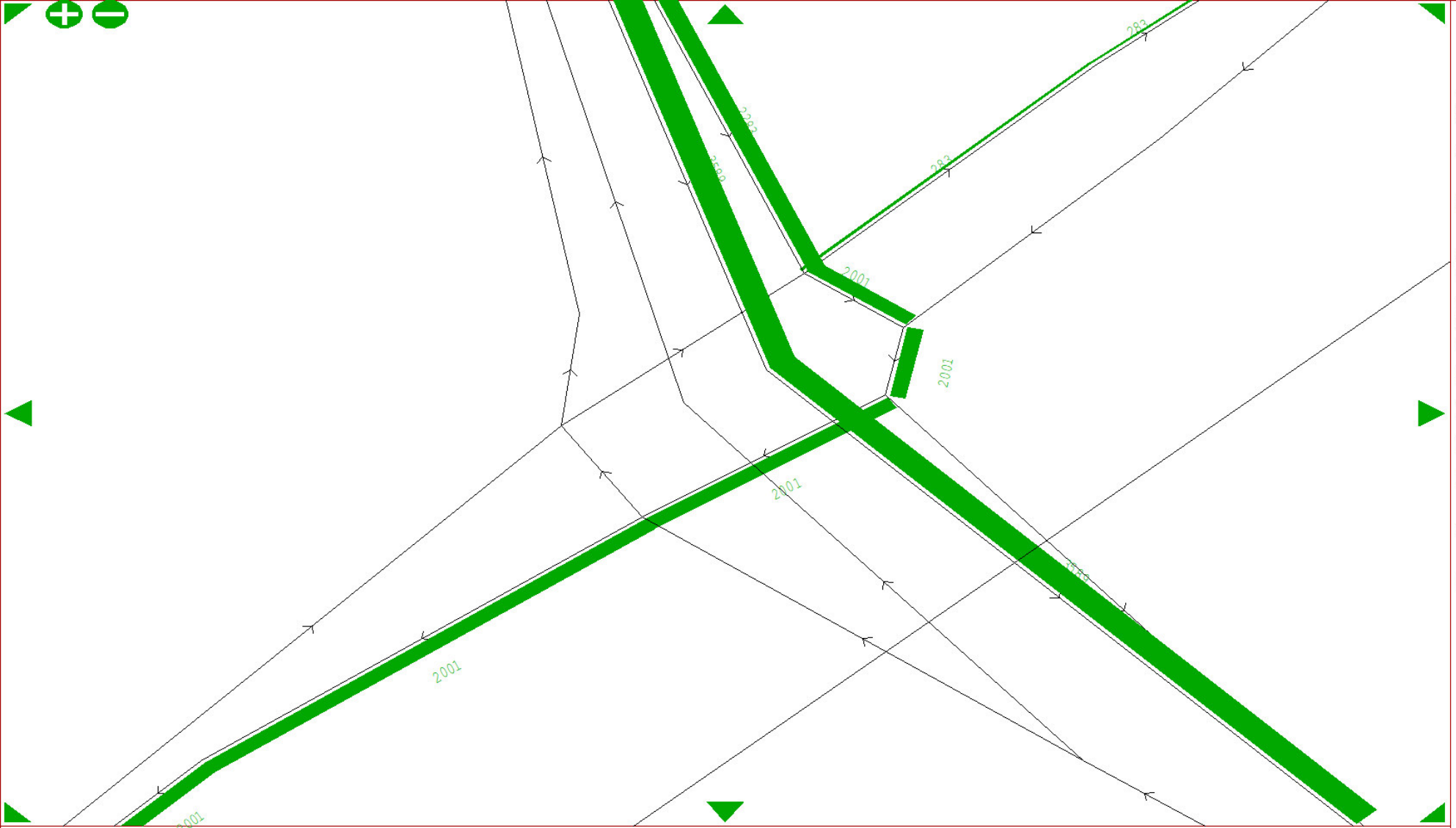
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APPENDIX 6

M40 JUNCTION 9 TURNING FLOWS



Link
Annotation
Display
Options:

Display Mode >
Bandwidths
...with...
Units = ?
600.00 /mm

Toggle numer
/ geometric

Annotate as
space permit

Numerical se >
lection/trun
cation menu

2-way link s
annotation:
Directional

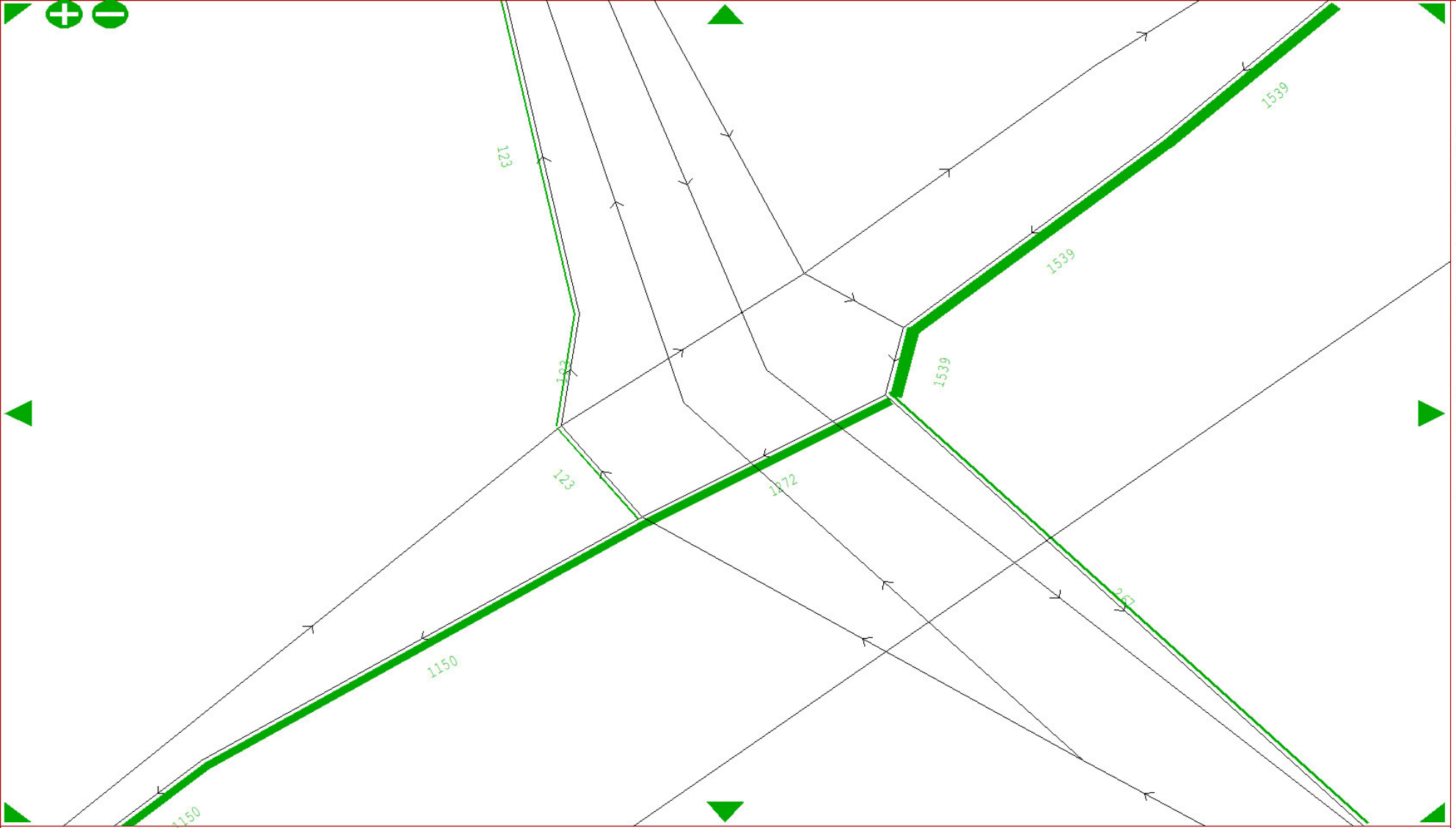
Bandwdth par >

Pen and/or >
range defs

offset Gap = ?
1.0 mm

Q - Return

+ Menu bar!



Selected Link Assignment
Thru links:
10191 10190

Total Demand Flow = 1539

Network fixd Flow = 38

All User Cls

saVe in D.B. x

Full stats x

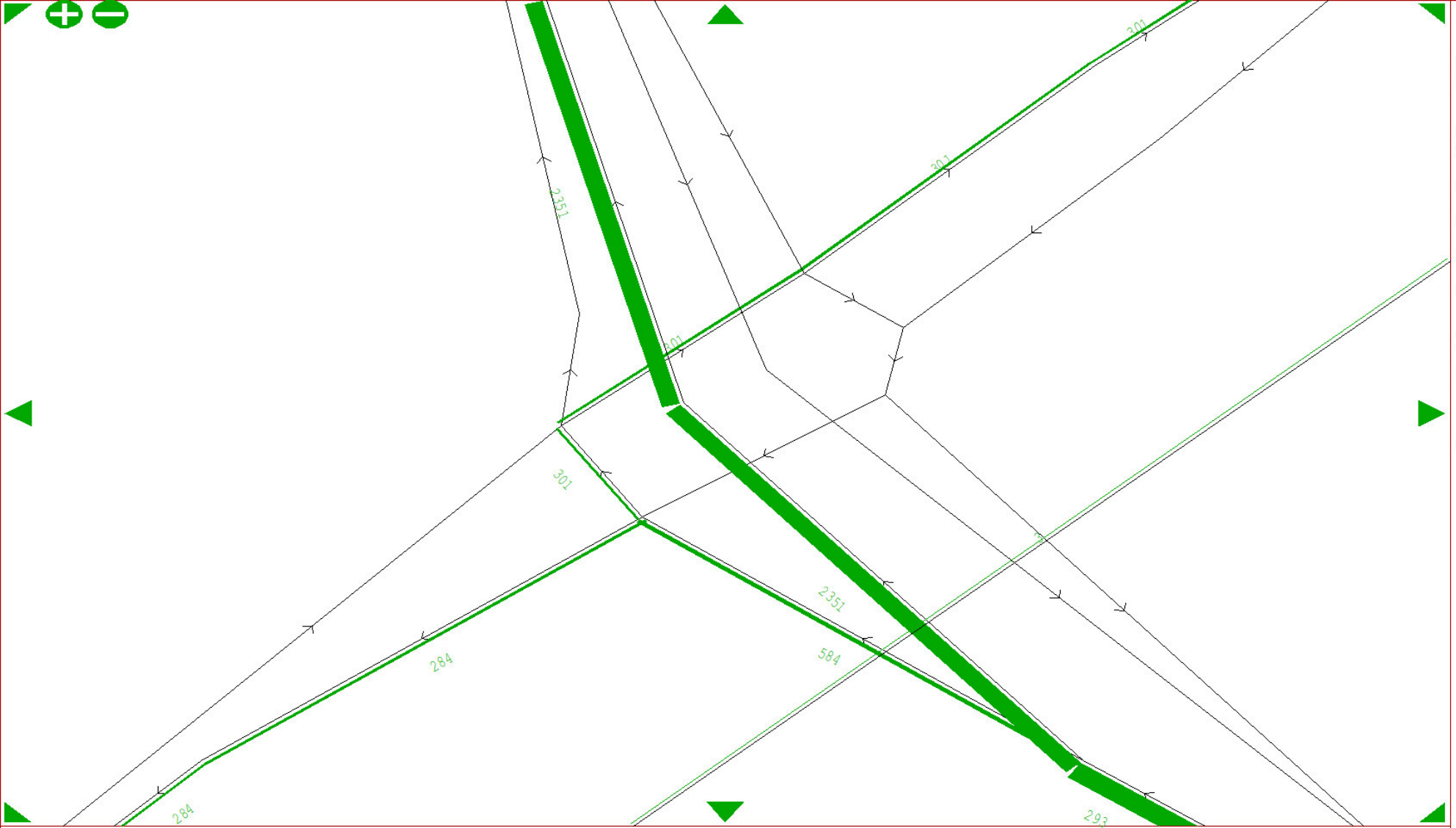
Information x

diSplay of link annotat >

Q - Return

+ Menu bar!

See 11.8.1



Selected Link Assignment
Thru links:
91320 10035

Total Demand Flow = 2935

All User Cls

saVe in D.B. x

Full stats x

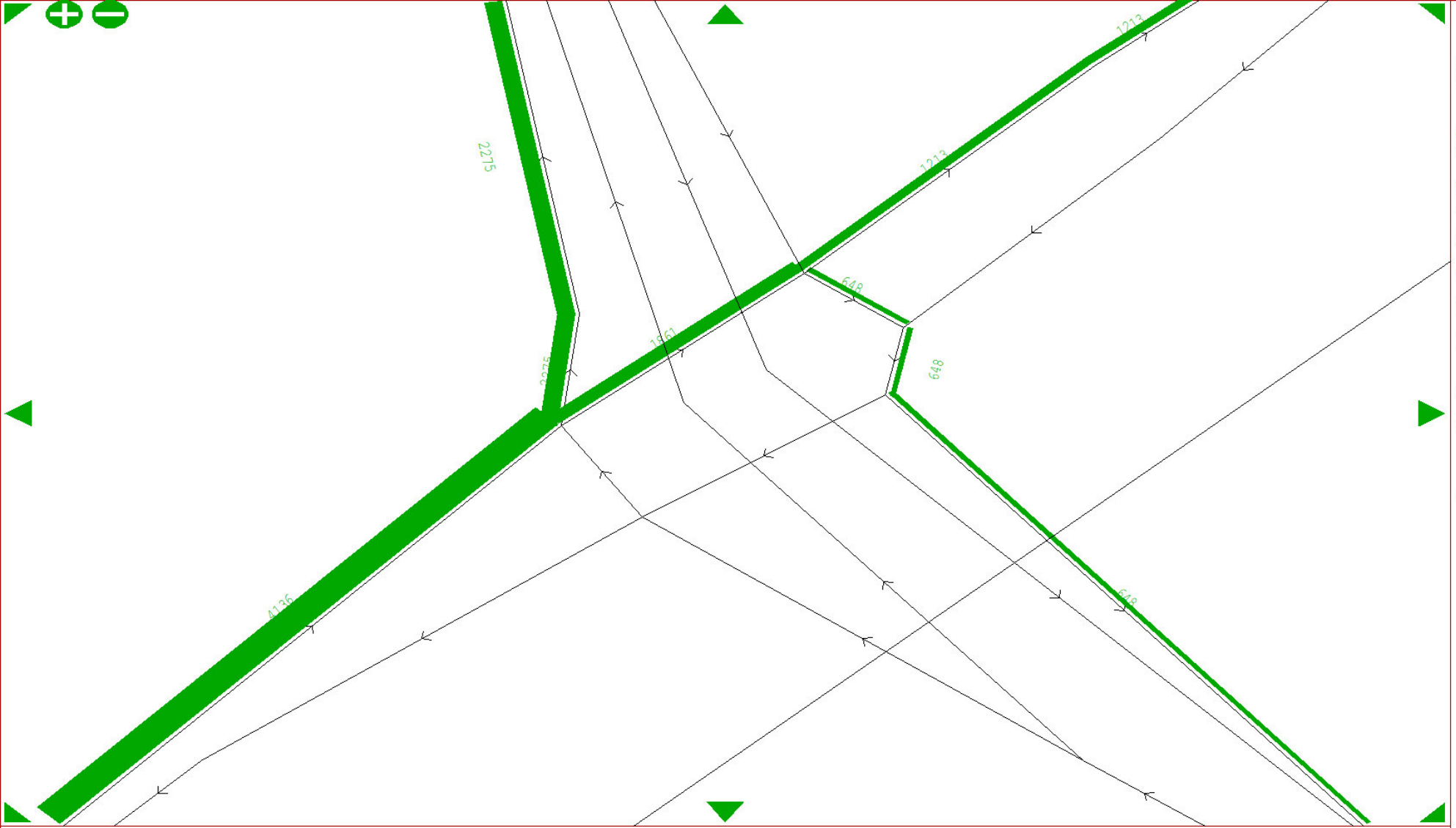
Information x

diSplay of link annotat >

Q - Return

+ Menu bar!

See 11.8.1



Selected Link Assignment
Thru links:
10006 10005

Total Demand Flow = 4136

Network fixd Flow = 27

All User Cls

saVe in D.B. x

Full stats x

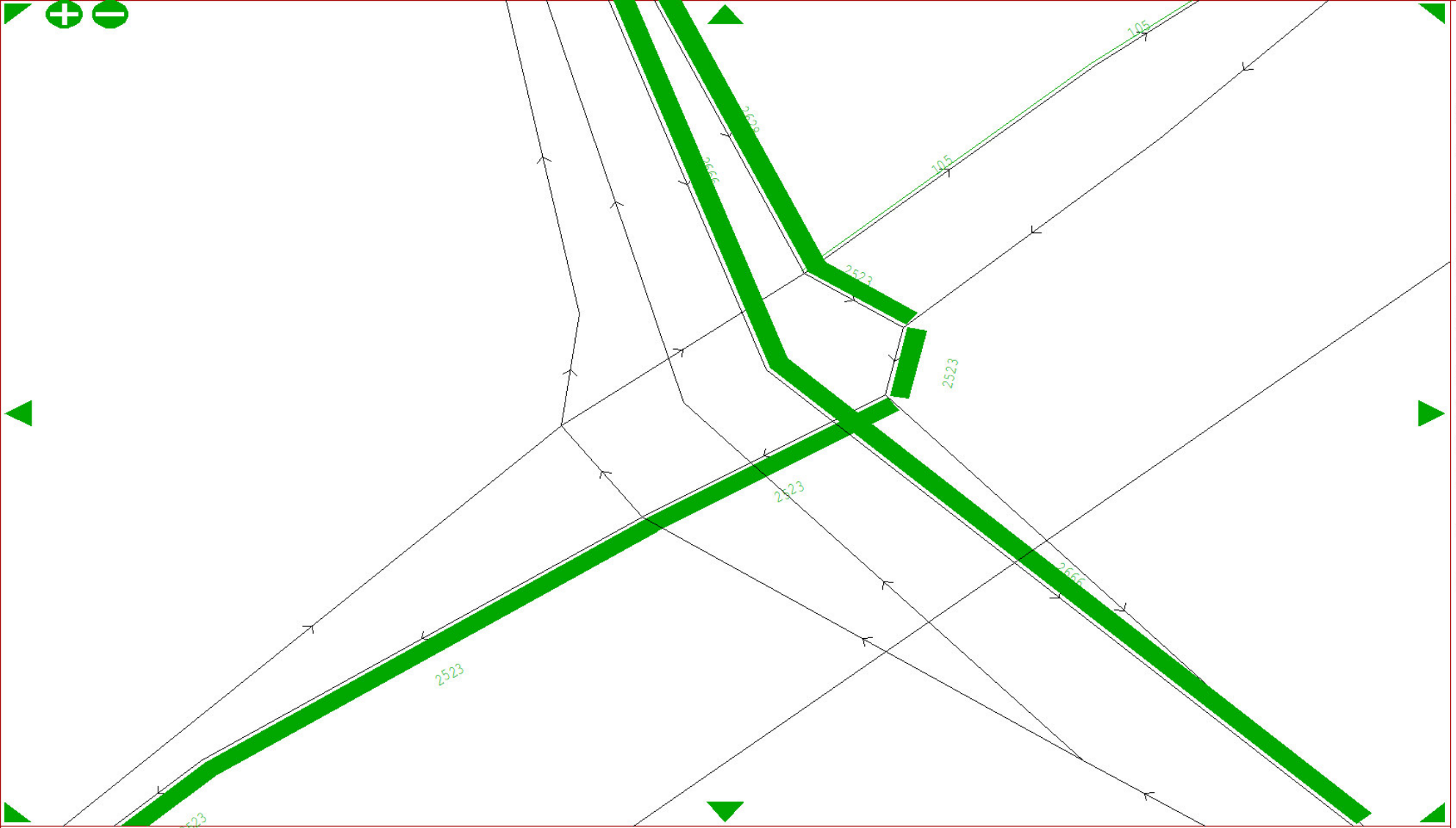
Information x

diSplay of link annotat >

Q - Return

+ Menu bar!

See 11.8.1



Link
Annotation
Display
Options:

Display Mode >
Bandwidths
...with...
Units = ?
600.00 /mm

Toggle numer
/ geometric

Annotate as
space permit

Numerical se >
lection/trun
cation menu

2-way link s
annotation:
Directional

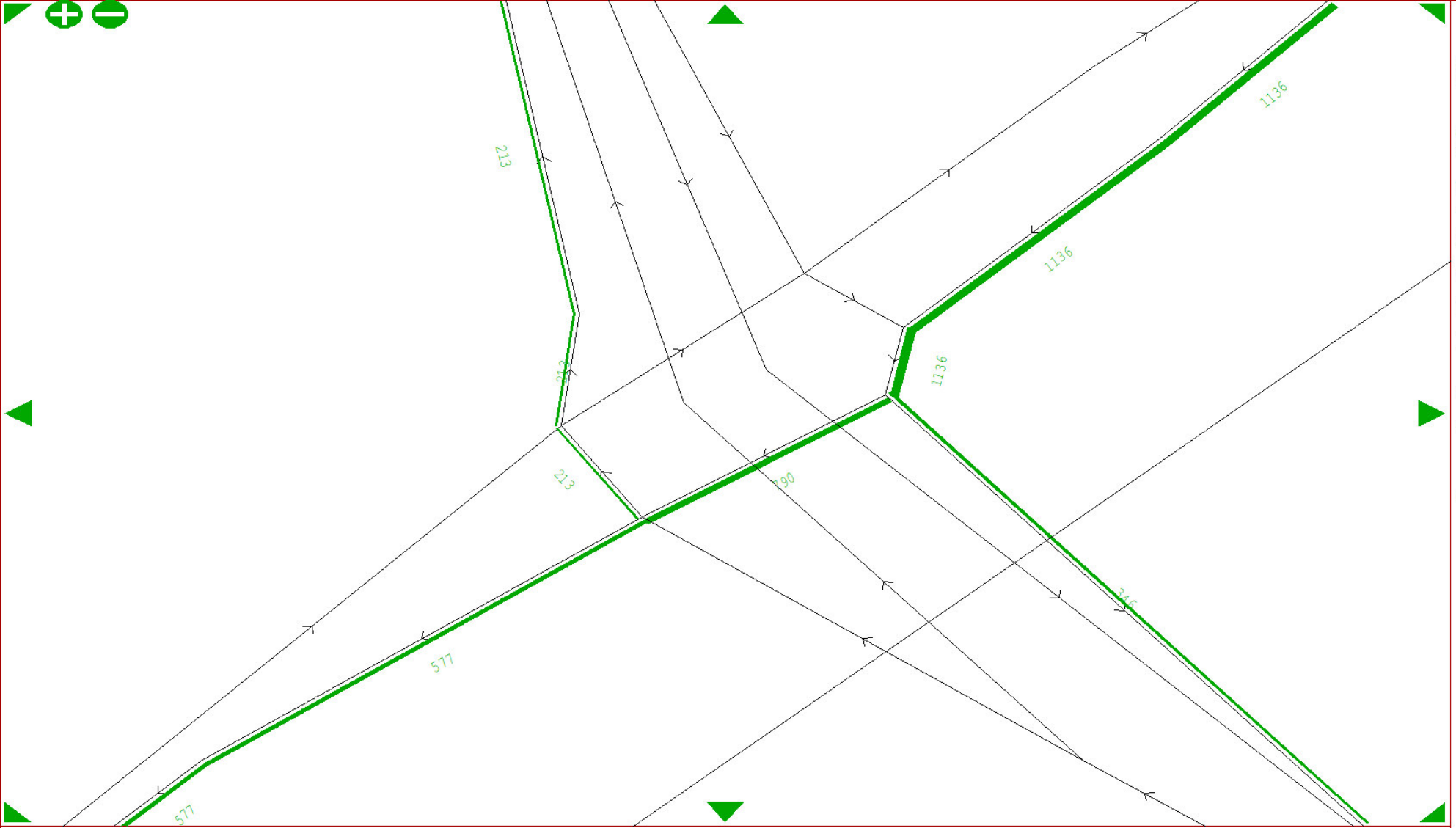
Bandwdth par >

Pen and/or >
range defs

offset Gap = ?
1.0 mm

Q - Return

+ Menu bar!



Selected Link Assignment
Thru links:
10191 10190

Total Demand Flow = 1136

Network fixd Flow = 37

All User Cls

saVe in D.B. x

Full stats x

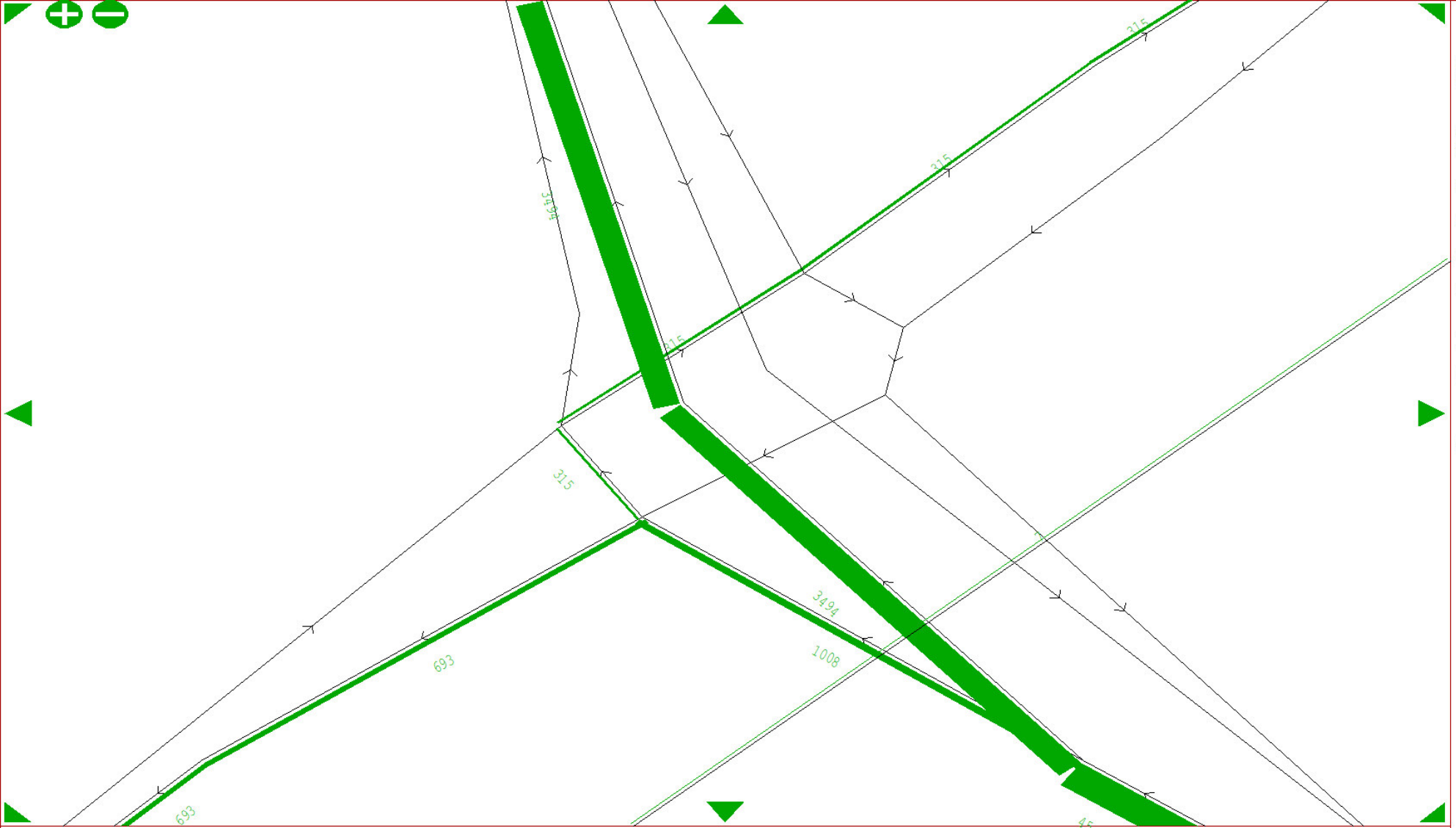
Information x

diSplay of link annotat >

Q - Return

+ Menu bar!

See 11.8.1



Selected Link Assignment
Thru links:
91320 10035

Total Demand Flow = 4502

All User Cls

saVe in D.B. x

Full stats x

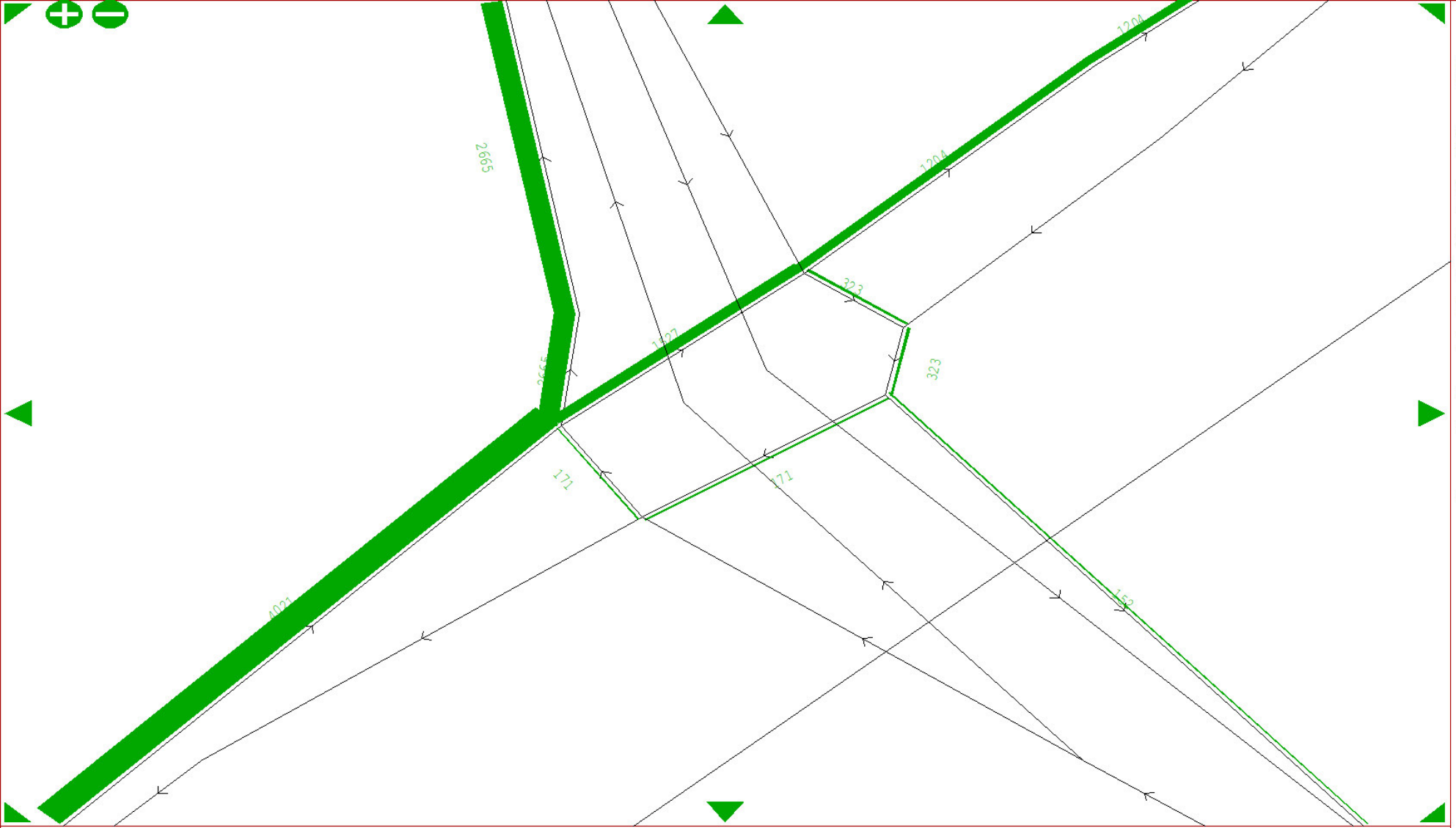
Information x

diSplay of link annotat >

Q - Return

+ Menu bar!

See 11.8.1



Selected Link Assignment
Thru links:
10006 10005

Total Demand Flow = 4021

Network fixd Flow = 25

All User Cls

saVe in D.B. x

Full stats x

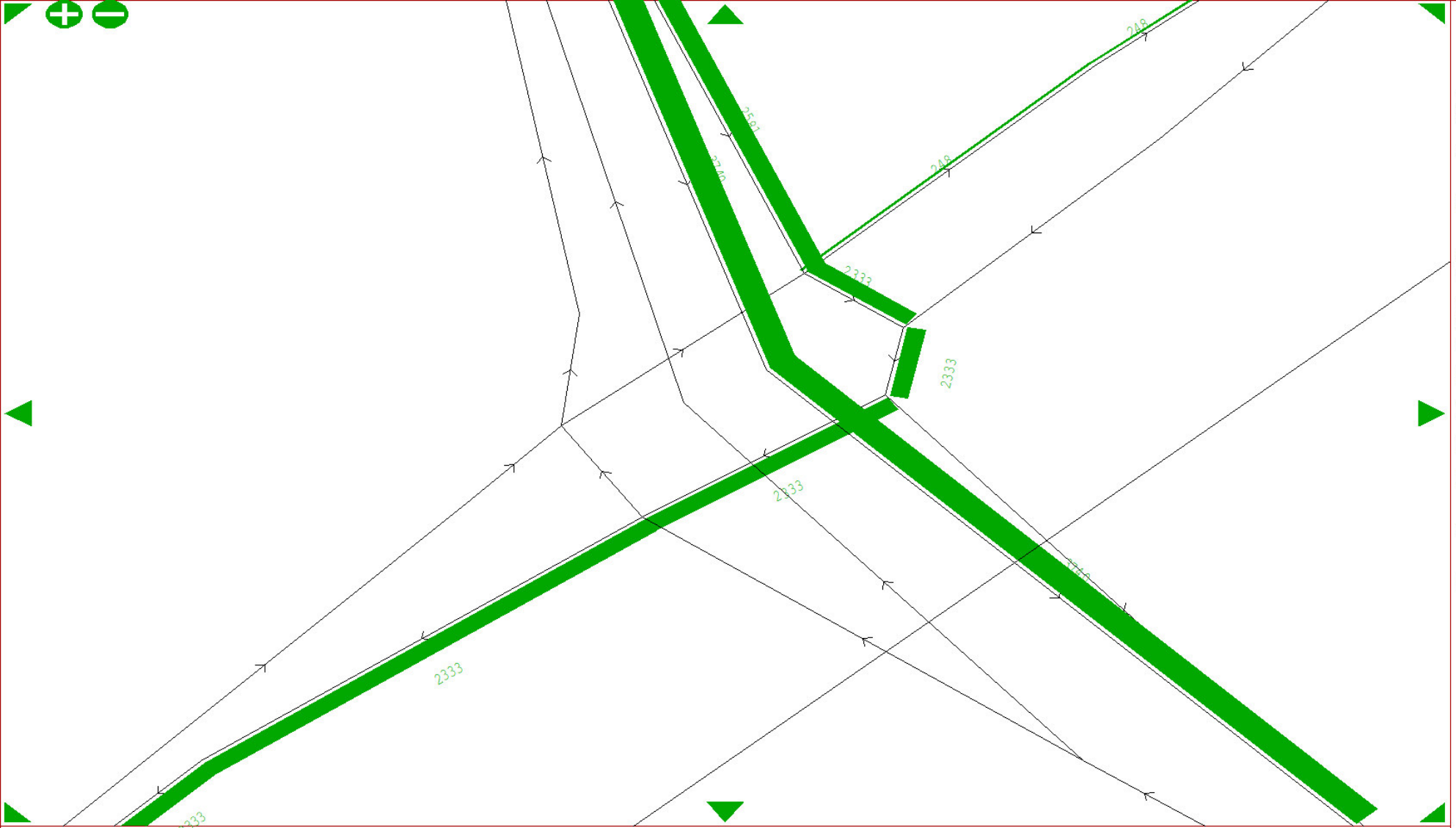
Information x

diSplay of link annotat >

Q - Return

+ Menu bar!

See 11.8.1



Link Annotation Display Options:

Display Mode >
Bandwidths ...with...
Units = ?
600.00 /mm

Toggle numer / geometric

Annotate as space permit

Numerical selection/truncation menu >

2-way link annotation: Directional s

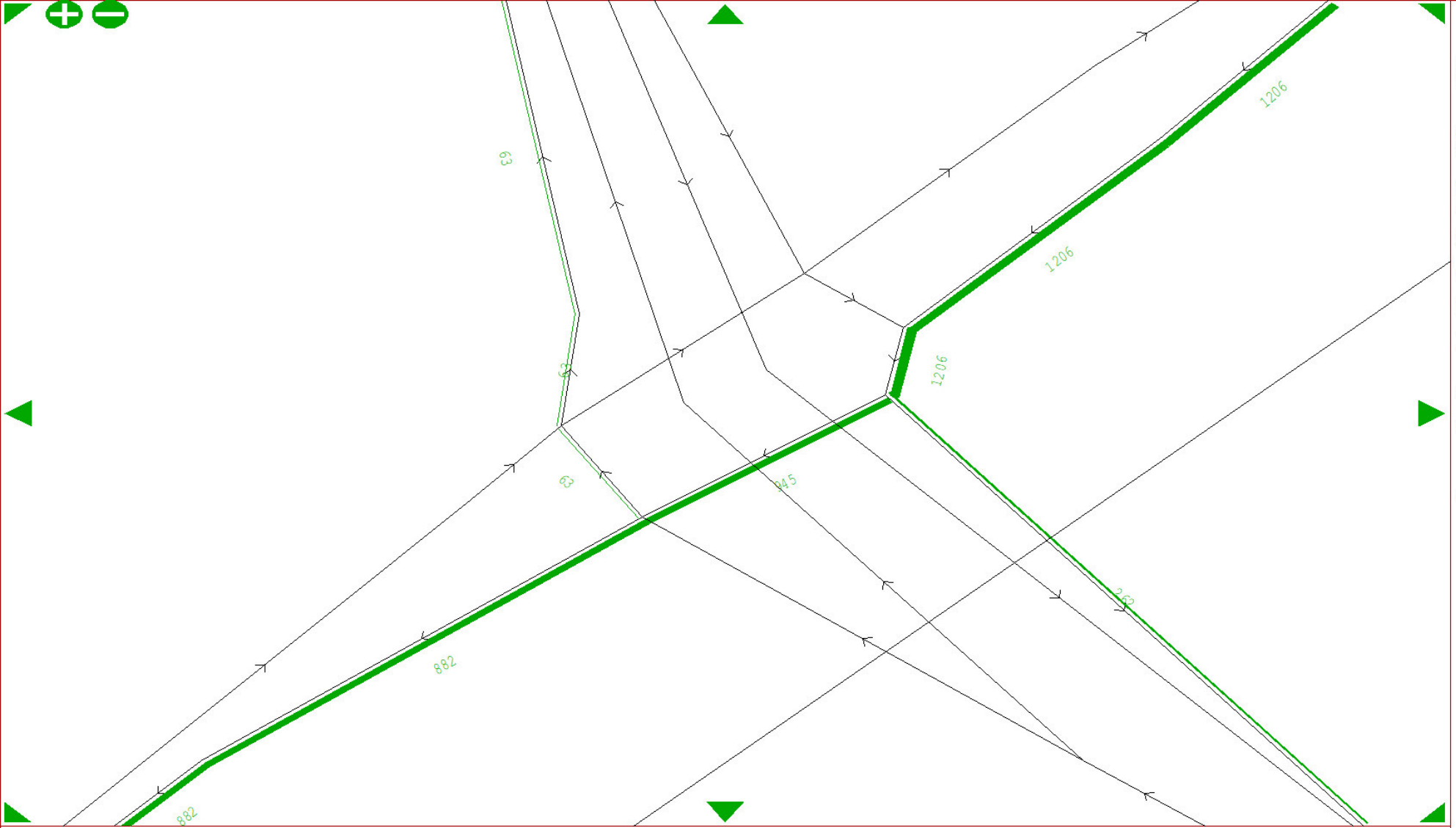
Bandwdth par >

Pen and/or range defs >

offset Gap = ?
1.0 mm

Q - Return

+ Menu bar!



Selected Link Assignment
Thru links:
10191 10190

Total Demand Flow = 1206

Network fixd Flow = 29

All User Cls

saVe in D.B. x

Full stats x

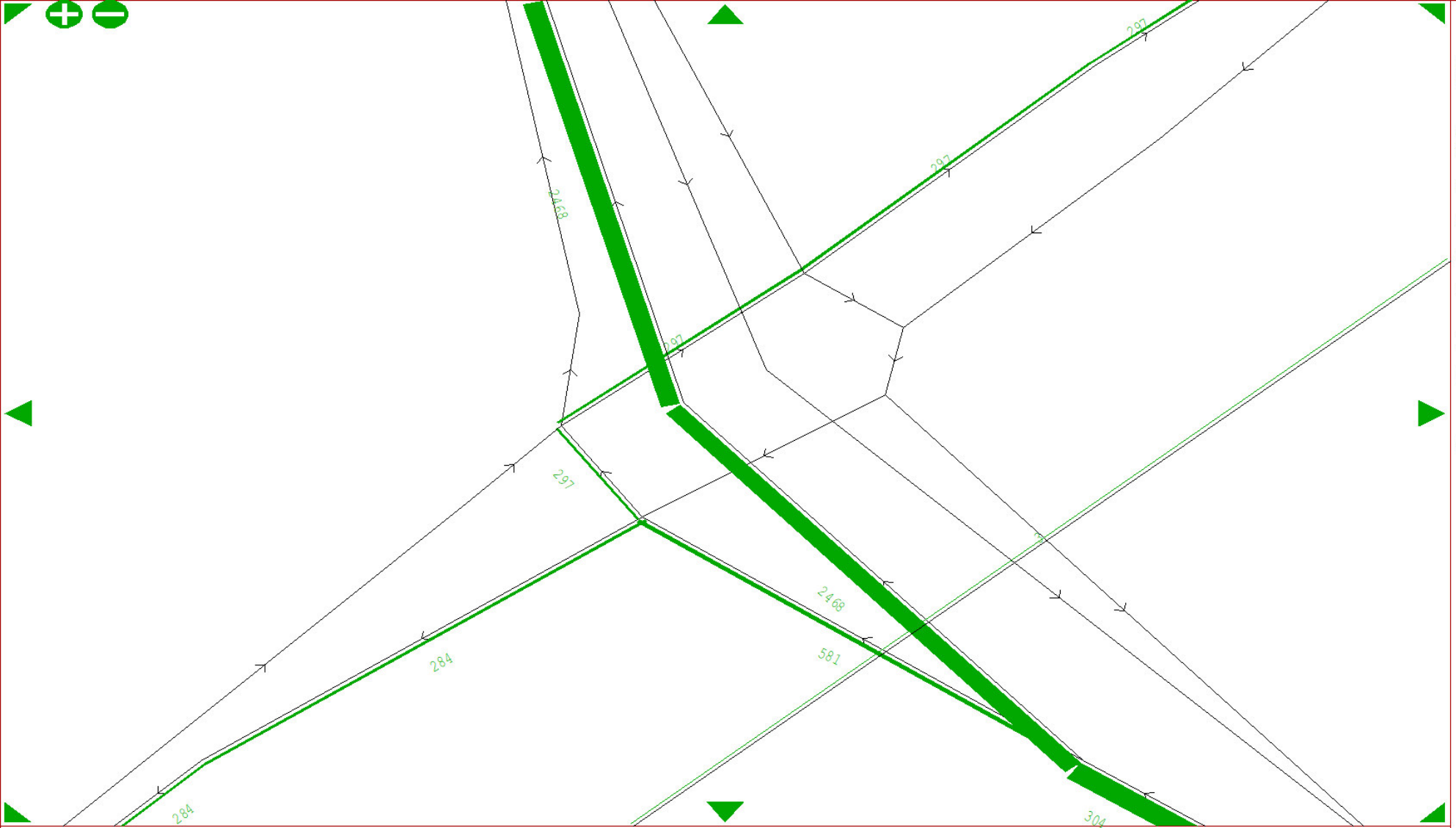
Information x

diSplay of link annotat >

Q - Return

+ Menu bar!

See 11.8.1



Selected
Link
Assignment
Thru links:
91320 10035

Total Demand
Flow = 3049

All User Cls

saVe in D.B. x

Full stats x

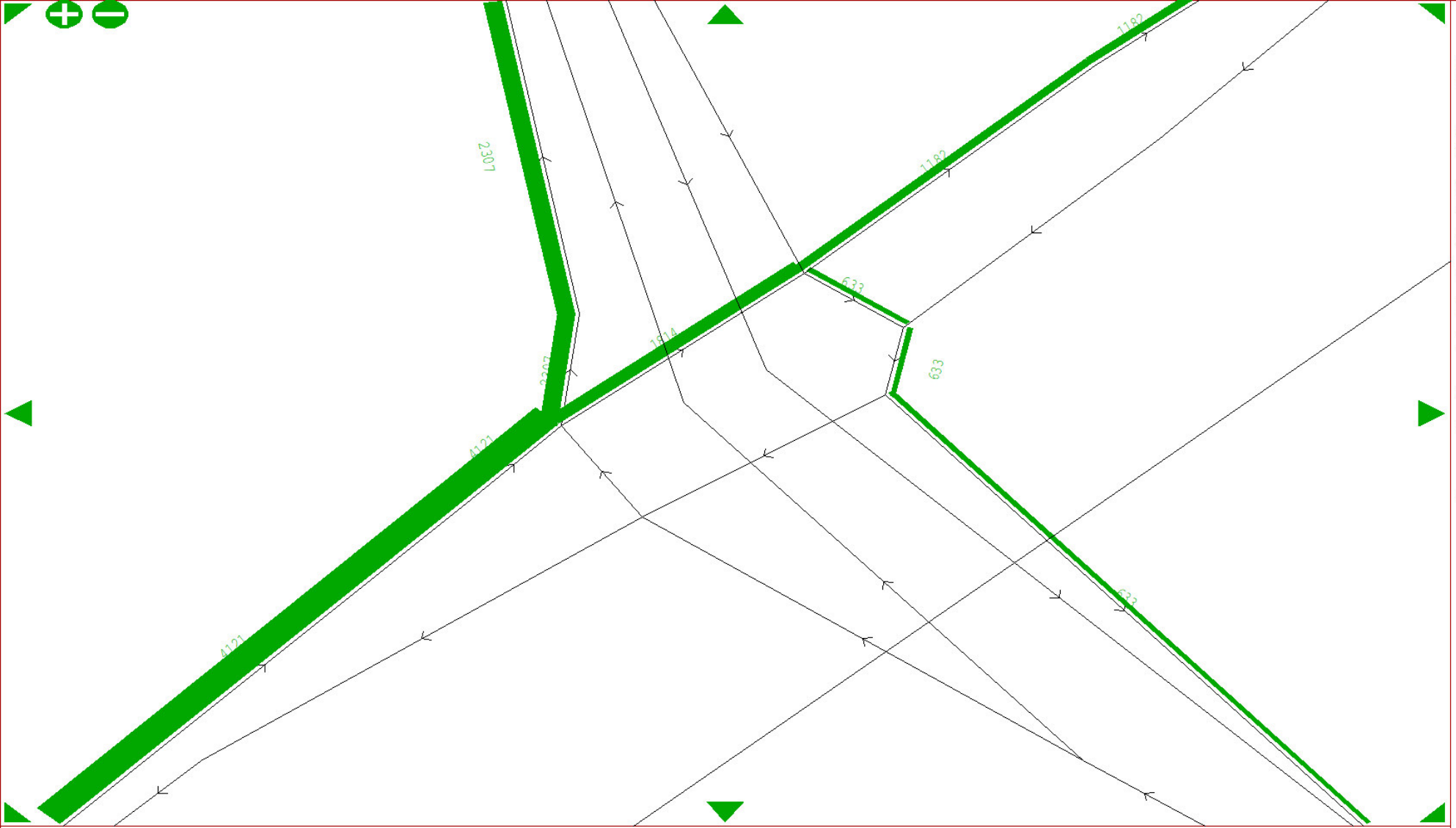
Information x

diSplay of
link annotat >

Q - Return

+ Menu bar!

See 11.8.1



Selected Link Assignment
Thru links:
10006 97502

Total Demand Flow = 4121

Network fixd Flow = 26

All User Cls

saVe in D.B. x

Full stats x

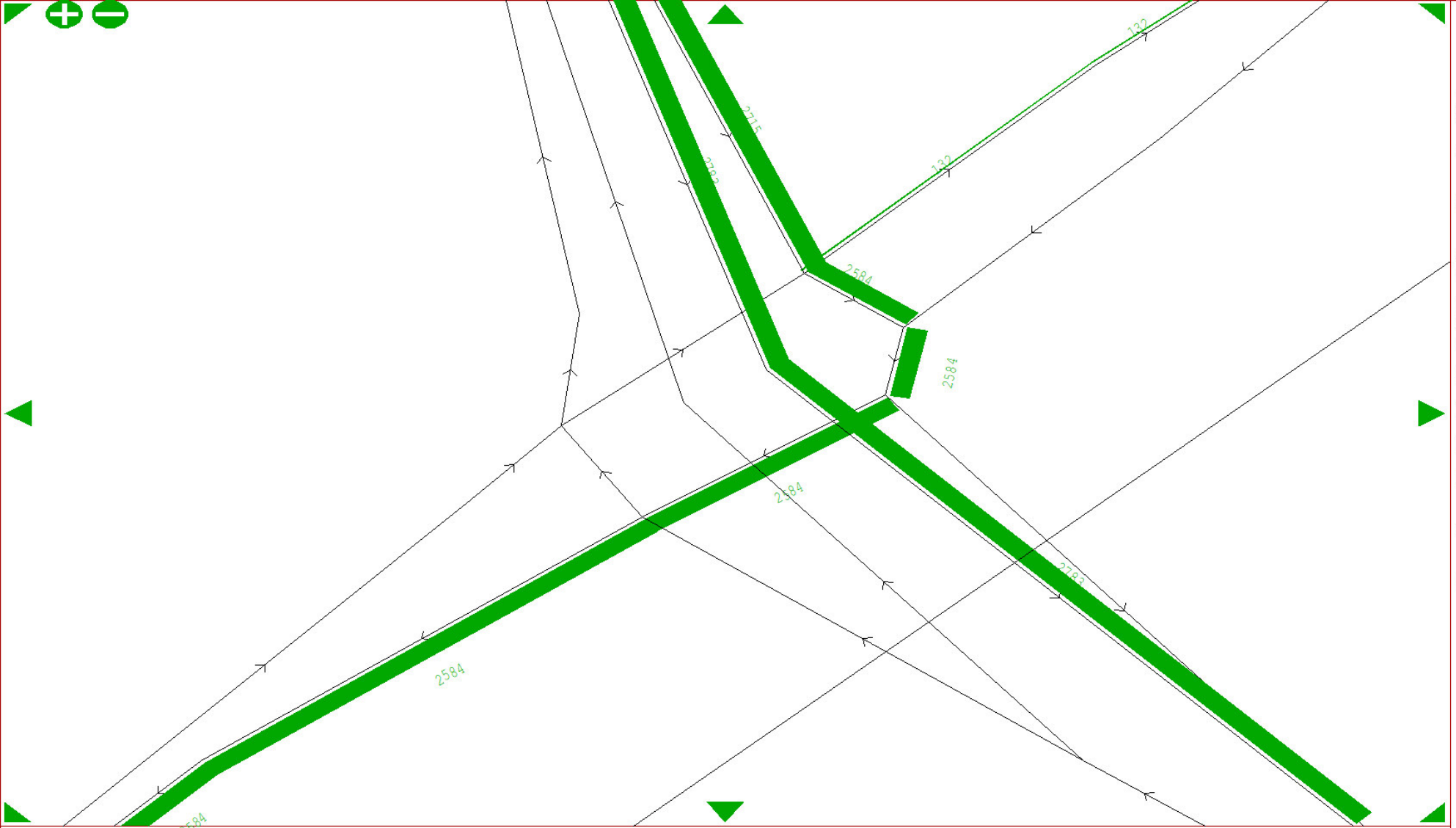
Information x

diSplay of link annotat >

Q - Return

+ Menu bar!

See 11.8.1



Link Annotation Display Options:

Display Mode >
Bandwidths
...with...
Units = ?
600.00 /mm

Toggle numer / geometric

Annotate as space permit

Numerical se lection/trun cation menu >

2-way link annotation: Directional s

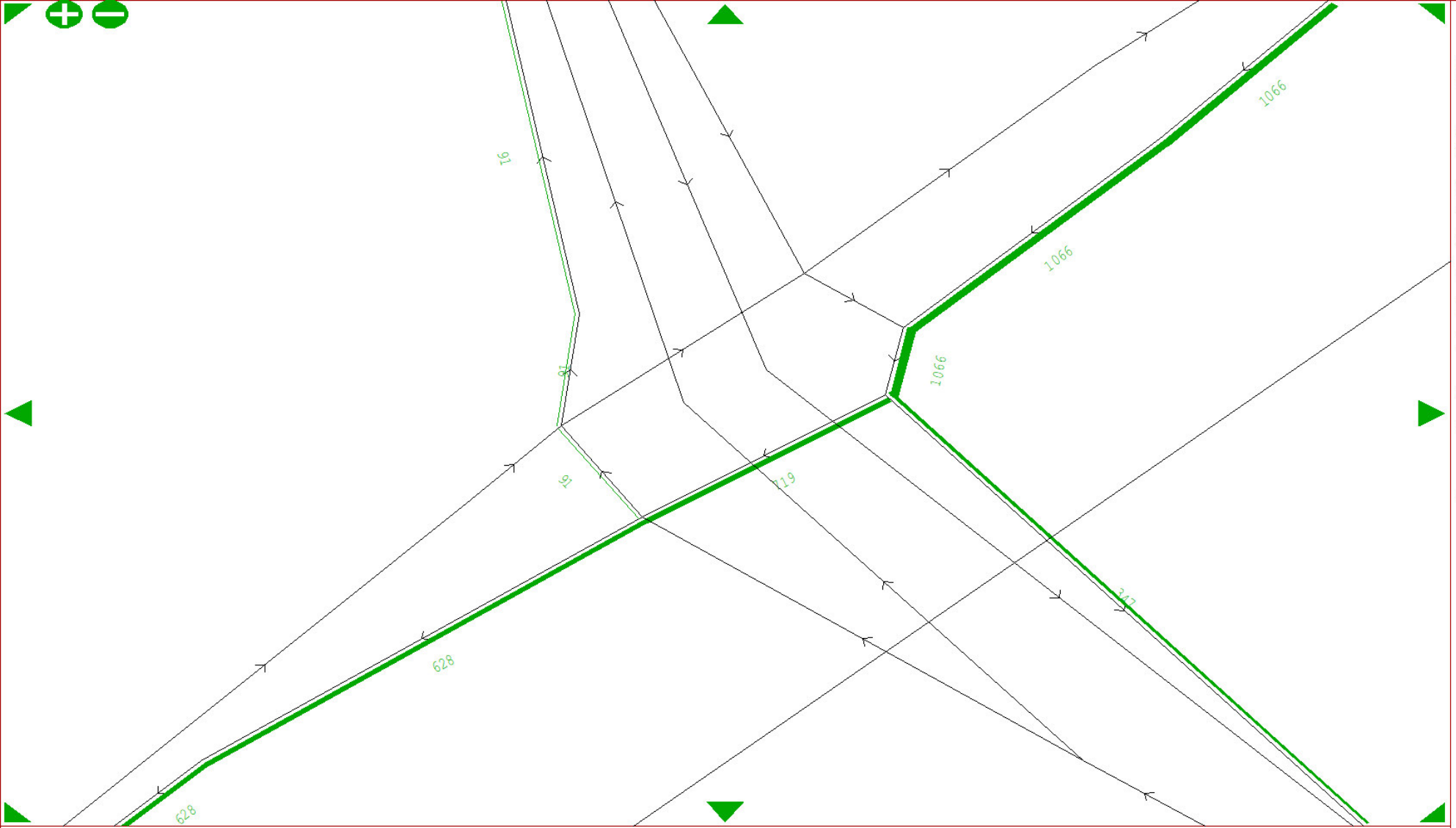
Bandwdth par >

Pen and/or range defs >

offset Gap = ?
1.0 mm

Q - Return

+ Menu bar!



Selected Link Assignment
Thru links:
10191 10190

Total Demand Flow = 1066

Network fixd Flow = 34

All User Cls

saVe in D.B. x

Full stats x

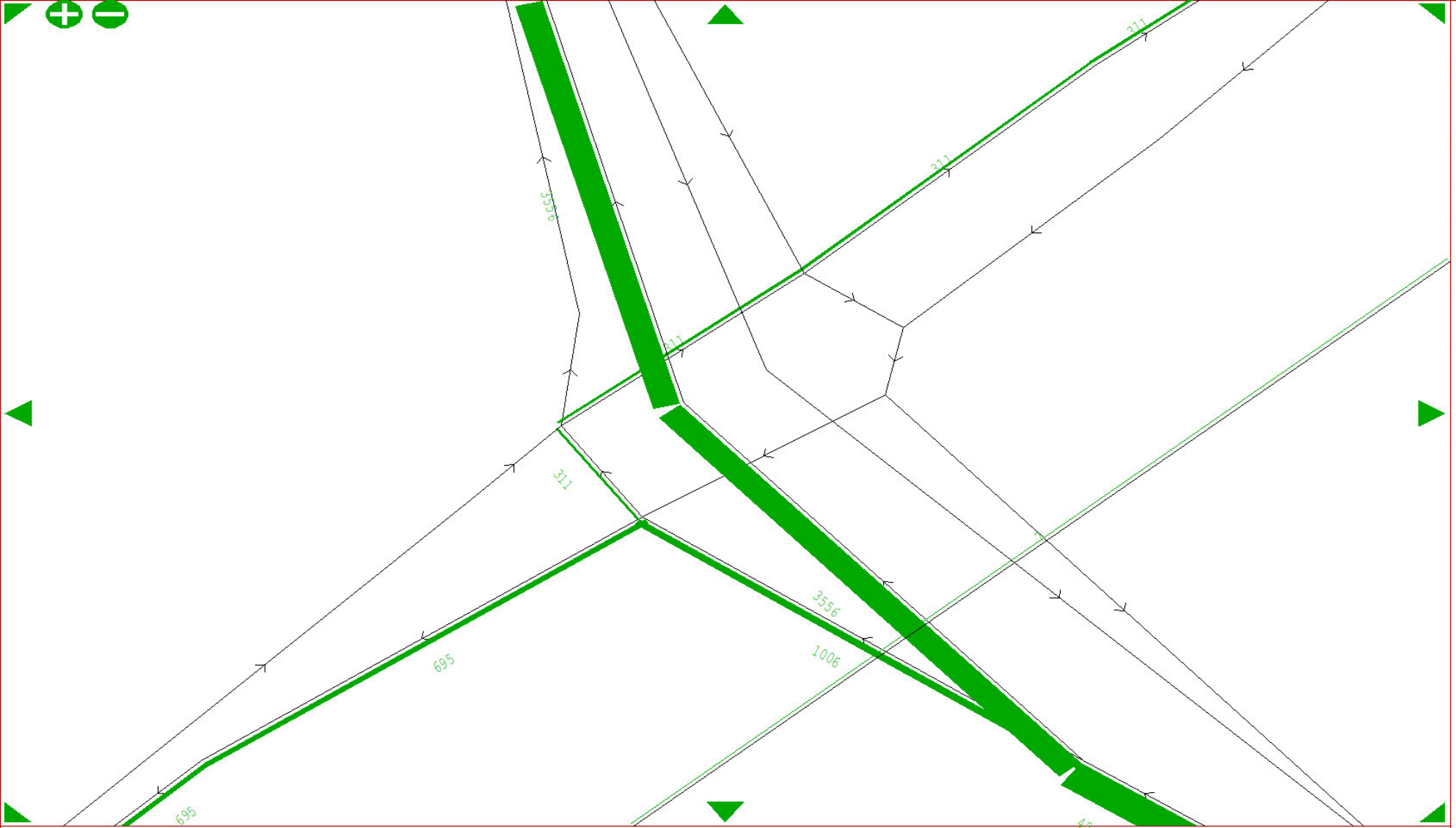
Information x

diSplay of link annotat >

Q - Return

+ Menu bar!

See 11.8.1



Selected Link Assignment
Thru links:
91320 10035

Total Demand Flow = 4562

All User Cls

saVe in D.B. x

Full stats x

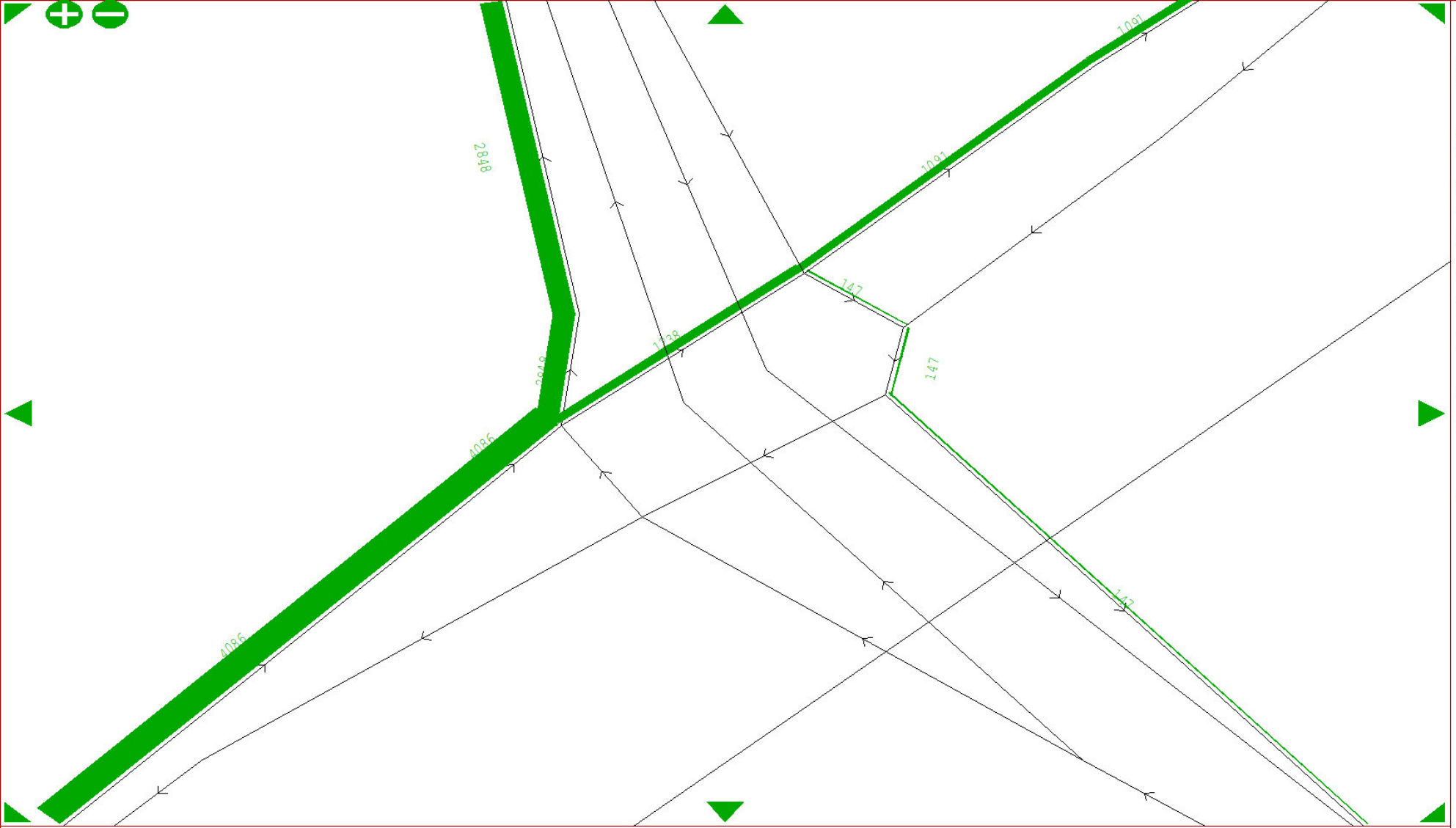
Information x

diSplay of link annotat >

Q - Return

+ Menu bar!

See 11.8.1



Selected Link Assignment
Thru links:
10006 97502

Total Demand Flow = 4086

Network fixd Flow = 25

All User Cls

saVe in D.B. x

Full stats x

Information x

diSplay of link annotat >

Q - Return

+ Menu bar!

See 11.8.1

APPENDIX 7

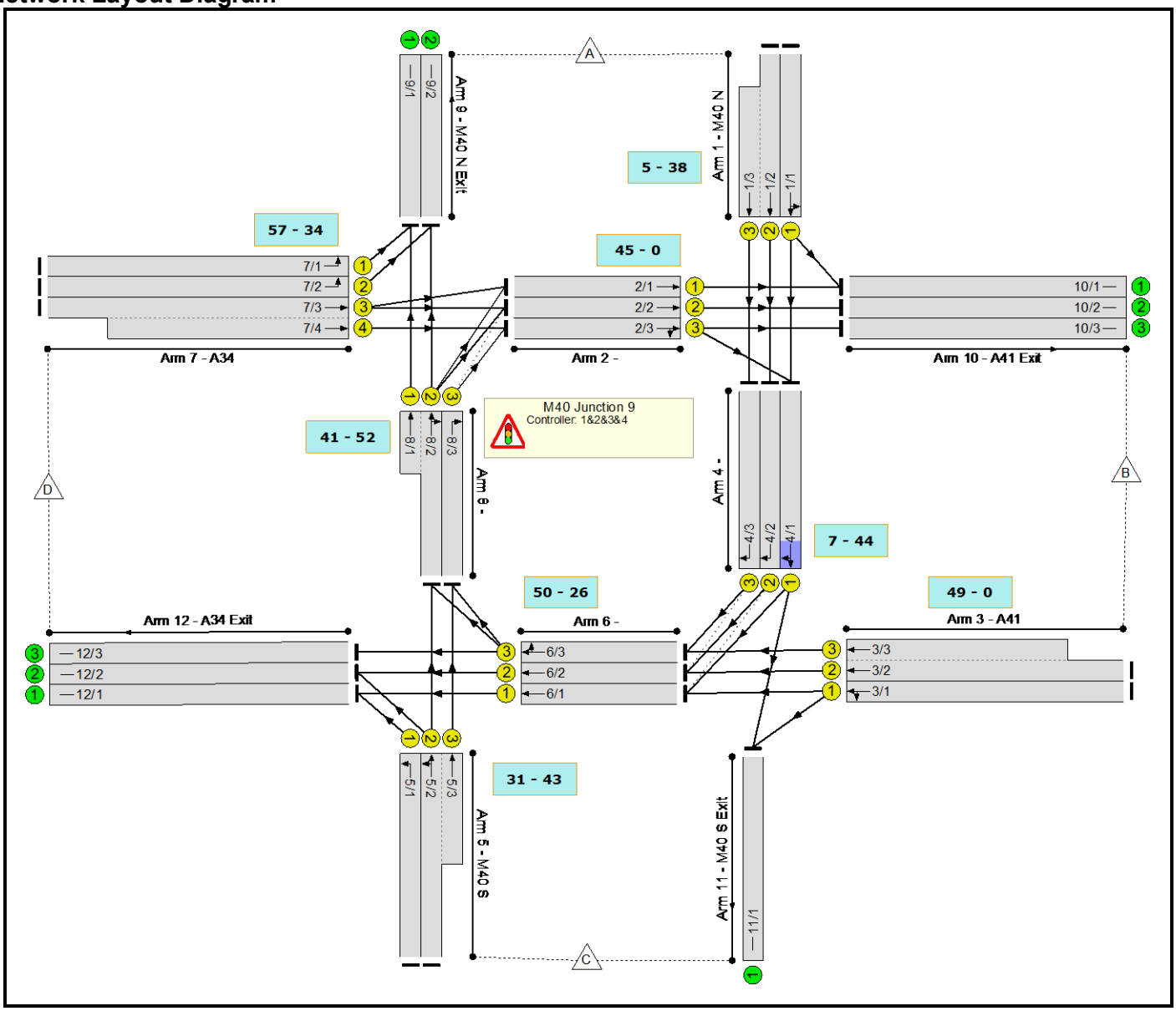
M40 JUNCTION 9 RC1A LINSIG REPORT

Full Input Data And Results

User and Project Details

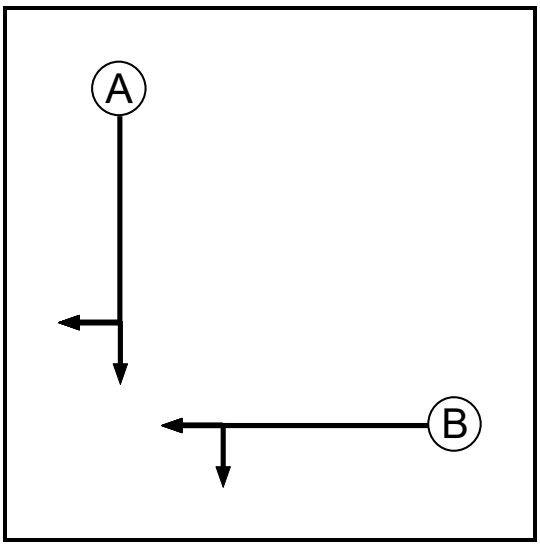
Project:	**OxSRFI**
Title:	**M40 Junction 9**
Location:	M40 Junction 9, Wendlebury
Additional detail:	2031 RC1A - existing layout
File name:	251217 M40 Junction 9 - RC1A.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



Controller :C1

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min (s)	Cont Min (s)
A	Traffic	1		7	7
B	Traffic	1		7	7

Phase Intergreens Matrix

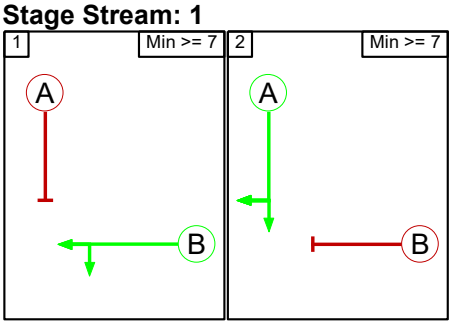
	Starting Phase		
Terminating Phase		A	B
	A		5
	B	7	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



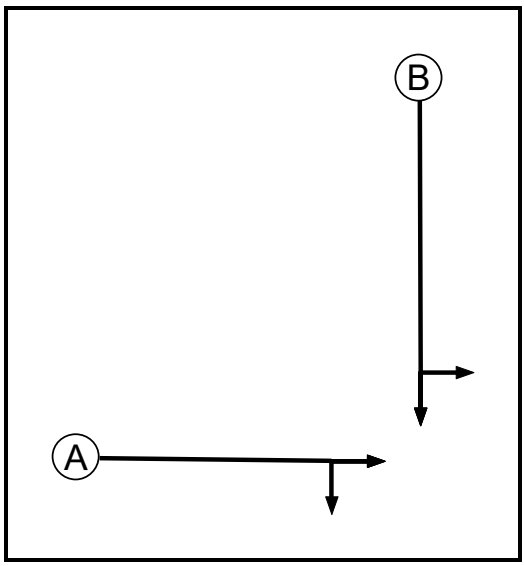
Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		7
	2	5	

Controller :C2

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min (s)	Cont Min (s)
A	Traffic	1		7	7
B	Traffic	1		7	7

Phase Intergreens Matrix

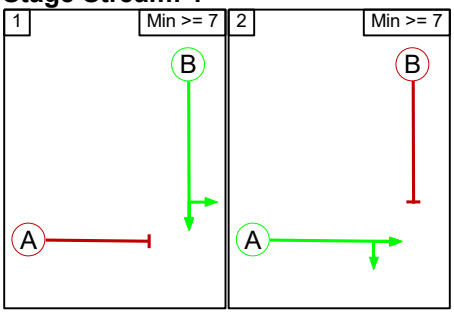
Terminating Phase \ Starting Phase		A	B
		A	B
A			5
B	7		

Phases in Stage

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

Stage Diagram

Stage Stream: 1



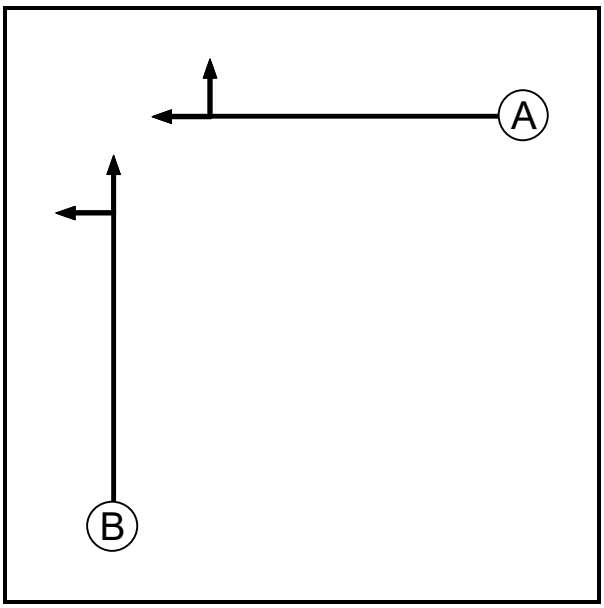
Prohibited Stage Change

Stage Stream: 1

From Stage \ To Stage		1	2
	1		7
	2	5	

Controller :C3

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min (s)	Cont Min (s)
A	Traffic	1		7	7
B	Traffic	1		7	7

Phase Intergreens Matrix

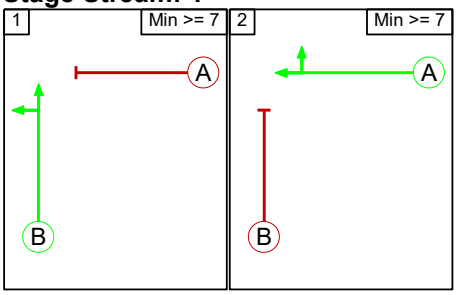
		Starting Phase	
		A	B
Terminating Phase	A		5
	B	7	

Phases in Stage

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

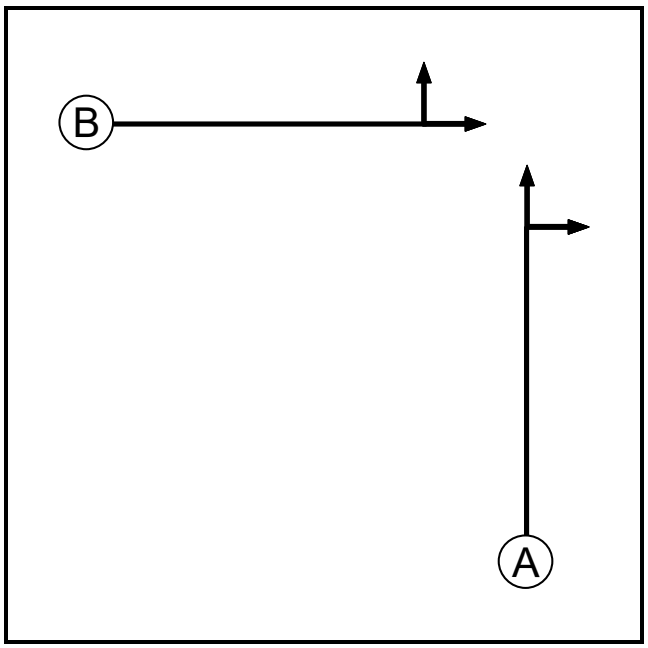
Stage Diagram

Stage Stream: 1



Controller :C4

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min (s)	Cont Min (s)
A	Traffic	1		7	7
B	Traffic	1		7	7

Phase Intergreens Matrix

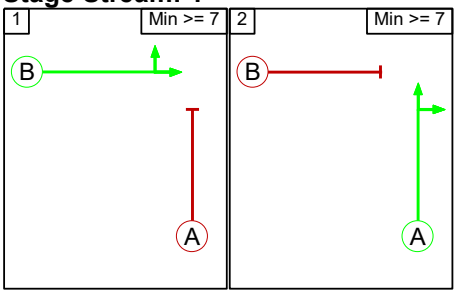
Terminating Phase	Starting Phase		
		A	B
A			5
B	7		

Phases in Stage

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

Stage Diagram

Stage Stream: 1



Lane Input Data

Junction: M40 Junction 9

Lane	Lane Type	Phases	Start Disp. (s)	End Disp. (s)	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient (%)	Nearside Lane	Turns	Turning Radius (m)
1/1 (M40 N)	U	B	2	3	60.0	User	1906	-	-	-	-	-
1/2 (M40 N)	U	B	2	3	60.0	User	1825	-	-	-	-	-
1/3 (M40 N)	U	B	2	3	28.0	User	1845	-	-	-	-	-
2/1	U	A	2	3	20.0	User	1945	-	-	-	-	-
2/2	U	A	2	3	26.0	User	1977	-	-	-	-	-
2/3	U	A	2	3	26.0	User	1869	-	-	-	-	-
3/1 (A41)	U	B	2	3	60.0	User	1905	-	-	-	-	-
3/2 (A41)	U	B	2	3	60.0	User	1965	-	-	-	-	-
3/3 (A41)	U	B	2	3	34.8	User	1960	-	-	-	-	-
4/1	U	A	2	3	5.0	User	1906	-	-	-	-	-
4/2	U	A	2	3	5.0	User	1825	-	-	-	-	-
4/3	U	A	2	3	6.0	User	1845	-	-	-	-	-
5/1 (M40 S)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 12 Left	60.00
5/2 (M40 S)	U	B	2	3	60.0	Geom	-	3.20	0.00	Y	Arm 8 Ahead	60.00
											Arm 12 Left	60.00
5/3 (M40 S)	U	B	2	3	8.0	Geom	-	3.20	0.00	Y	Arm 8 Ahead	60.00
6/1	U	A	2	3	20.0	User	1906	-	-	-	-	-
6/2	U	A	2	3	31.0	User	1825	-	-	-	-	-
6/3	U	A	2	3	31.0	User	1845	-	-	-	-	-
7/1 (A34)	U	B	2	3	60.0	User	1851	-	-	-	-	-
7/2 (A34)	U	B	2	3	60.0	User	2025	-	-	-	-	-
7/3 (A34)	U	B	2	3	60.0	User	1973	-	-	-	-	-
7/4 (A34)	U	B	2	3	28.0	User	1869	-	-	-	-	-
8/1	U	A	2	3	4.5	Geom	-	3.80	0.00	Y	Arm 9 Ahead	55.00
8/2	U	A	2	3	6.0	Geom	-	3.80	0.00	Y	Arm 2 Right	55.00
											Arm 9 Ahead	55.00
8/3	U	A	2	3	6.0	Geom	-	3.80	0.00	N	Arm 2 Right	55.00
9/1 (M40 N Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-

9/2 (M40 N Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
10/1 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
10/2 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
10/3 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
11/1 (M40 S Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
12/1 (A34 Exit)	U		2	3	8.7	User	2100	-	-	-	-	-
12/2 (A34 Exit)	U		2	3	8.7	User	2100	-	-	-	-	-
12/3 (A34 Exit)	U		2	3	8.7	User	2100	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2031 RC1A - AM'	08:00	09:00	01:00	
2: '2031 RC1A - PM'	17:00	18:00	01:00	

Scenario 1: '2031 RC1A - AM' (FG1: '2031 RC1A - AM', Plan 1: 'Staging Plan No. 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	283	0	2001	2284
	B	123	0	267	1150	1540
	C	0	301	0	284	585
	D	2275	1213	648	0	4136
	Tot.	2398	1797	915	3435	8545

Traffic Lane Flows

Lane	Scenario 1: 2031 RC1A - AM
Junction: M40 Junction 9	
1/1	759
1/2 (with short)	1525(In) 756(Out)
1/3 (short)	769
2/1	686
2/2	682
2/3	794
3/1	499
3/2 (with short)	1041(In) 521(Out)
3/3 (short)	520
4/1	1124
4/2	756
4/3	769
5/1	212
5/2 (with short)	373(In) 243(Out)
5/3 (short)	130
6/1	1001
6/2	1128
6/3	1145
7/1	1082
7/2	1193
7/3 (with short)	1861(In) 1067(Out)
7/4 (short)	794
8/1 (short)	105
8/2 (with short)	294(In) 189(Out)
8/3	130
9/1	1187
9/2	1211
10/1	969
10/2	682
10/3	146
11/1	915
12/1	1213
12/2	1200
12/3	1022

Lane Saturation Flows

Junction: M40 Junction 9								
Lane	**Lane Width (m)**	**Gradient (%)**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (M40 N Lane 1)	This lane uses a directly entered Saturation Flow						1906	1906
1/2 (M40 N Lane 2)	This lane uses a directly entered Saturation Flow						1825	1825
1/3 (M40 N Lane 3)	This lane uses a directly entered Saturation Flow						1845	1845
2/1	This lane uses a directly entered Saturation Flow						1945	1945
2/2	This lane uses a directly entered Saturation Flow						1977	1977
2/3	This lane uses a directly entered Saturation Flow						1869	1869
3/1 (A41 Lane 1)	This lane uses a directly entered Saturation Flow						1905	1905
3/2 (A41 Lane 2)	This lane uses a directly entered Saturation Flow						1965	1965
3/3 (A41 Lane 3)	This lane uses a directly entered Saturation Flow						1960	1960
4/1	This lane uses a directly entered Saturation Flow						1906	1906
4/2	This lane uses a directly entered Saturation Flow						1825	1825
4/3	This lane uses a directly entered Saturation Flow						1845	1845
5/1 (M40 S)	3.65	0.00	Y	Arm 12 Left	60.00	100.0 %	1932	1932
5/2 (M40 S)	3.20	0.00	Y	Arm 8 Ahead	60.00	70.4 %	1888	1888
				Arm 12 Left	60.00	29.6 %		
5/3 (M40 S)	3.20	0.00	Y	Arm 8 Ahead	60.00	100.0 %	1888	1888
6/1	This lane uses a directly entered Saturation Flow						1906	1906
6/2	This lane uses a directly entered Saturation Flow						1825	1825
6/3	This lane uses a directly entered Saturation Flow						1845	1845
7/1 (A34 Lane 1)	This lane uses a directly entered Saturation Flow						1851	1851
7/2 (A34 Lane 2)	This lane uses a directly entered Saturation Flow						2025	2025
7/3 (A34 Lane 3)	This lane uses a directly entered Saturation Flow						1973	1973
7/4 (A34 Lane 4)	This lane uses a directly entered Saturation Flow						1869	1869
8/1	3.80	0.00	Y	Arm 9 Ahead	55.00	100.0 %	1942	1942
8/2	3.80	0.00	Y	Arm 2 Right	55.00	90.5 %	1942	1942
				Arm 9 Ahead	55.00	9.5 %		
8/3	3.80	0.00	N	Arm 2 Right	55.00	100.0 %	2078	2078
9/1 (M40 N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (M40 N Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/1 (A41 Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

10/2 (A41 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
10/3 (A41 Exit Lane 3)	Infinite Saturation Flow	Inf	Inf
11/1 (M40 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
12/1 (A34 Exit Lane 1)	This lane uses a directly entered Saturation Flow	2100	2100
12/2 (A34 Exit Lane 2)	This lane uses a directly entered Saturation Flow	2100	2100
12/3 (A34 Exit Lane 3)	This lane uses a directly entered Saturation Flow	2100	2100

Scenario 2: '2031 RC1A - PM' (FG2: '2031 RC1A - PM', Plan 1: 'Staging Plan No. 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	105	0	2523	2628
	B	375	0	346	577	1298
	C	0	315	0	693	1008
	D	2665	1204	152	0	4021
	Tot.	3040	1624	498	3793	8955

Traffic Lane Flows

Lane	Scenario 2: 2031 RC1A - PM
Junction: M40 Junction 9	
1/1	894
1/2 (with short)	1734(In) 851(Out)
1/3 (short)	883
2/1	519
2/2	627
2/3	525
3/1	438
3/2 (with short)	860(In) 300(Out)
3/3 (short)	560
4/1	941
4/2	851
4/3	883
5/1	335
5/2 (with short)	673(In) 358(Out)
5/3 (short)	315
6/1	1108
6/2	1158
6/3	1209
7/1	1271
7/2	1394
7/3 (with short)	1356(In) 895(Out)
7/4 (short)	461
8/1 (short)	188
8/2 (with short)	375(In) 187(Out)
8/3	315
9/1	1459
9/2	1581
10/1	624
10/2	627
10/3	373
11/1	498
12/1	1443
12/2	1516
12/3	834

Lane Saturation Flows

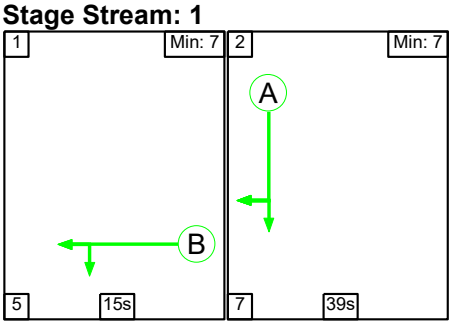
Junction: M40 Junction 9								
Lane	**Lane Width (m)**	**Gradient (%)**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (M40 N Lane 1)	This lane uses a directly entered Saturation Flow						1906	1906
1/2 (M40 N Lane 2)	This lane uses a directly entered Saturation Flow						1825	1825
1/3 (M40 N Lane 3)	This lane uses a directly entered Saturation Flow						1845	1845
2/1	This lane uses a directly entered Saturation Flow						1945	1945
2/2	This lane uses a directly entered Saturation Flow						1977	1977
2/3	This lane uses a directly entered Saturation Flow						1869	1869
3/1 (A41 Lane 1)	This lane uses a directly entered Saturation Flow						1905	1905
3/2 (A41 Lane 2)	This lane uses a directly entered Saturation Flow						1965	1965
3/3 (A41 Lane 3)	This lane uses a directly entered Saturation Flow						1960	1960
4/1	This lane uses a directly entered Saturation Flow						1906	1906
4/2	This lane uses a directly entered Saturation Flow						1825	1825
4/3	This lane uses a directly entered Saturation Flow						1845	1845
5/1 (M40 S)	3.65	0.00	Y	Arm 12 Left	60.00	100.0 %	1932	1932
5/2 (M40 S)	3.20	0.00	Y	Arm 8 Ahead	60.00	0.0 %	1888	1888
				Arm 12 Left	60.00	100.0 %		
5/3 (M40 S)	3.20	0.00	Y	Arm 8 Ahead	60.00	100.0 %	1888	1888
6/1	This lane uses a directly entered Saturation Flow						1906	1906
6/2	This lane uses a directly entered Saturation Flow						1825	1825
6/3	This lane uses a directly entered Saturation Flow						1845	1845
7/1 (A34 Lane 1)	This lane uses a directly entered Saturation Flow						1851	1851
7/2 (A34 Lane 2)	This lane uses a directly entered Saturation Flow						2025	2025
7/3 (A34 Lane 3)	This lane uses a directly entered Saturation Flow						1973	1973
7/4 (A34 Lane 4)	This lane uses a directly entered Saturation Flow						1869	1869
8/1	3.80	0.00	Y	Arm 9 Ahead	55.00	100.0 %	1942	1942
8/2	3.80	0.00	Y	Arm 2 Right	55.00	0.0 %	1942	1942
				Arm 9 Ahead	55.00	100.0 %		
8/3	3.80	0.00	N	Arm 2 Right	55.00	100.0 %	2078	2078
9/1 (M40 N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (M40 N Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
10/1 (A41 Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

10/2 (A41 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
10/3 (A41 Exit Lane 3)	Infinite Saturation Flow	Inf	Inf
11/1 (M40 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
12/1 (A34 Exit Lane 1)	This lane uses a directly entered Saturation Flow	2100	2100
12/2 (A34 Exit Lane 2)	This lane uses a directly entered Saturation Flow	2100	2100
12/3 (A34 Exit Lane 3)	This lane uses a directly entered Saturation Flow	2100	2100

Scenario 1: '2031 RC1A - AM' (FG1: '2031 RC1A - AM', Plan 1: 'Staging Plan No. 1')
Controller :C1

Stage Sequence Diagram

Stage Stream: 1

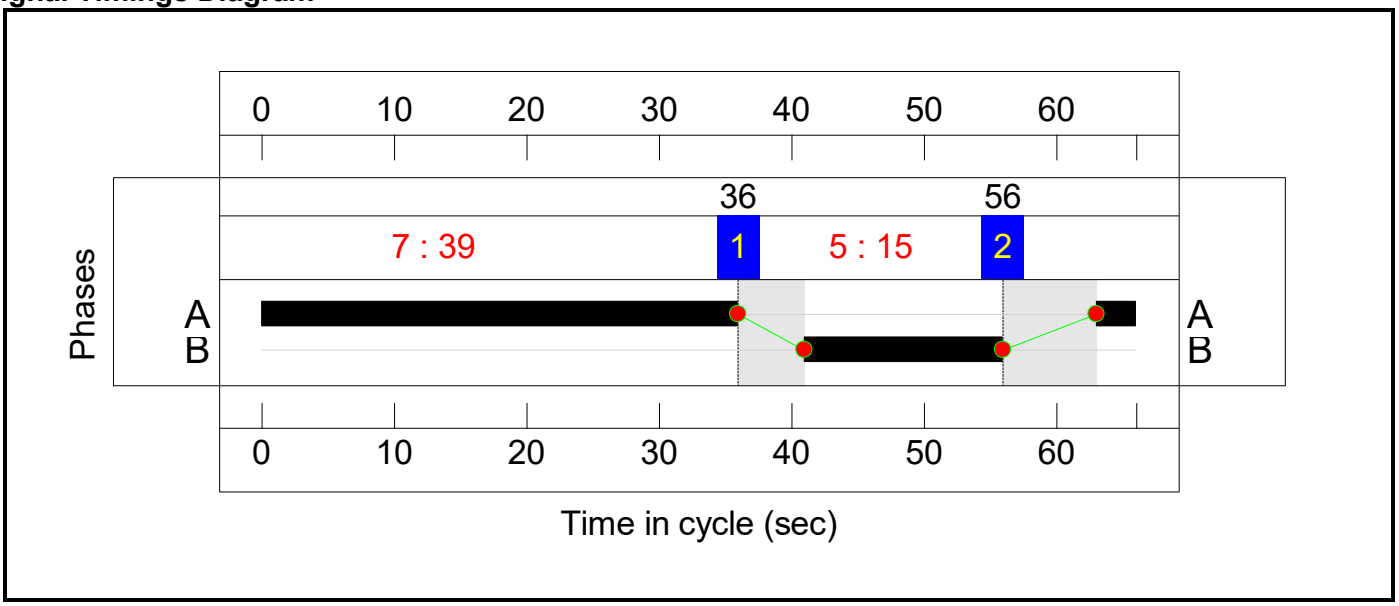


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	15	39
Change Point	36	56

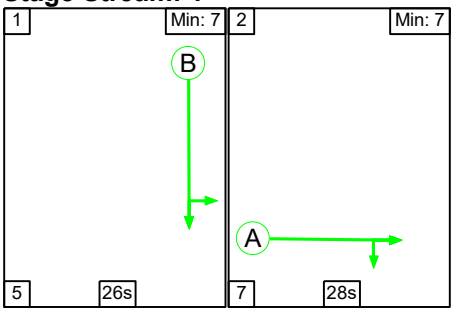
Signal Timings Diagram



Controller :C2

Stage Sequence Diagram

Stage Stream: 1

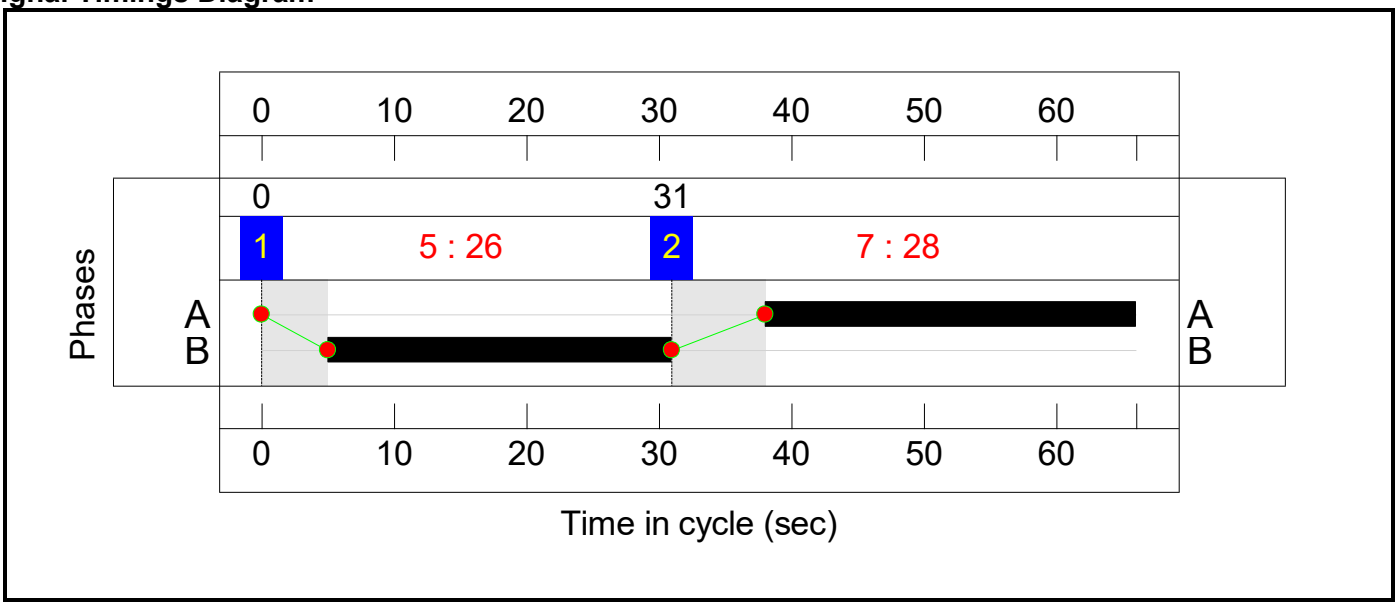


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	26	28
Change Point	0	31

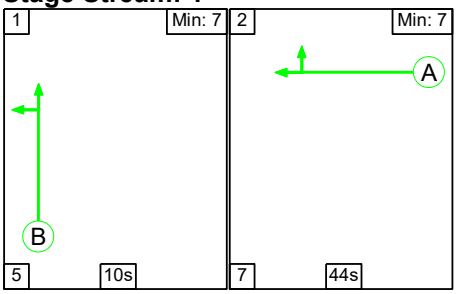
Signal Timings Diagram



Controller :C3

Stage Sequence Diagram

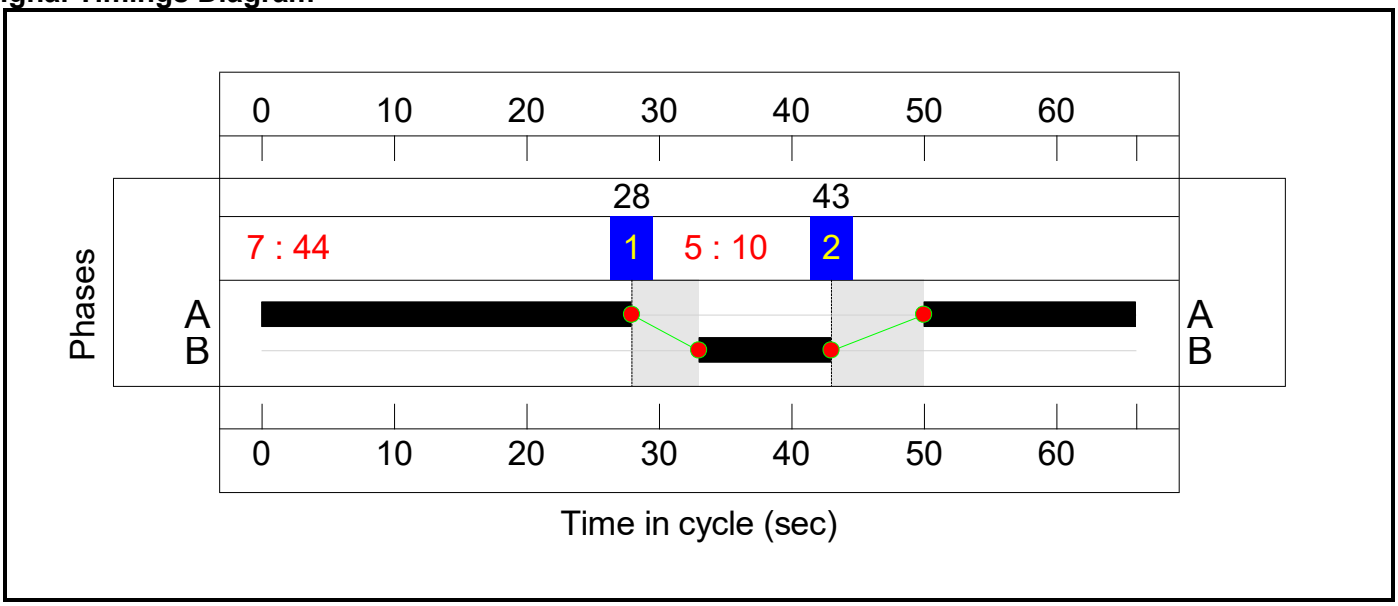
Stage Stream: 1



Stage Timings
Stage Stream: 1

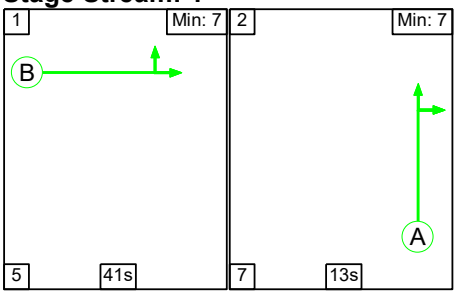
Stage	1	2
Duration	10	44
Change Point	28	43

Signal Timings Diagram



Controller :C4

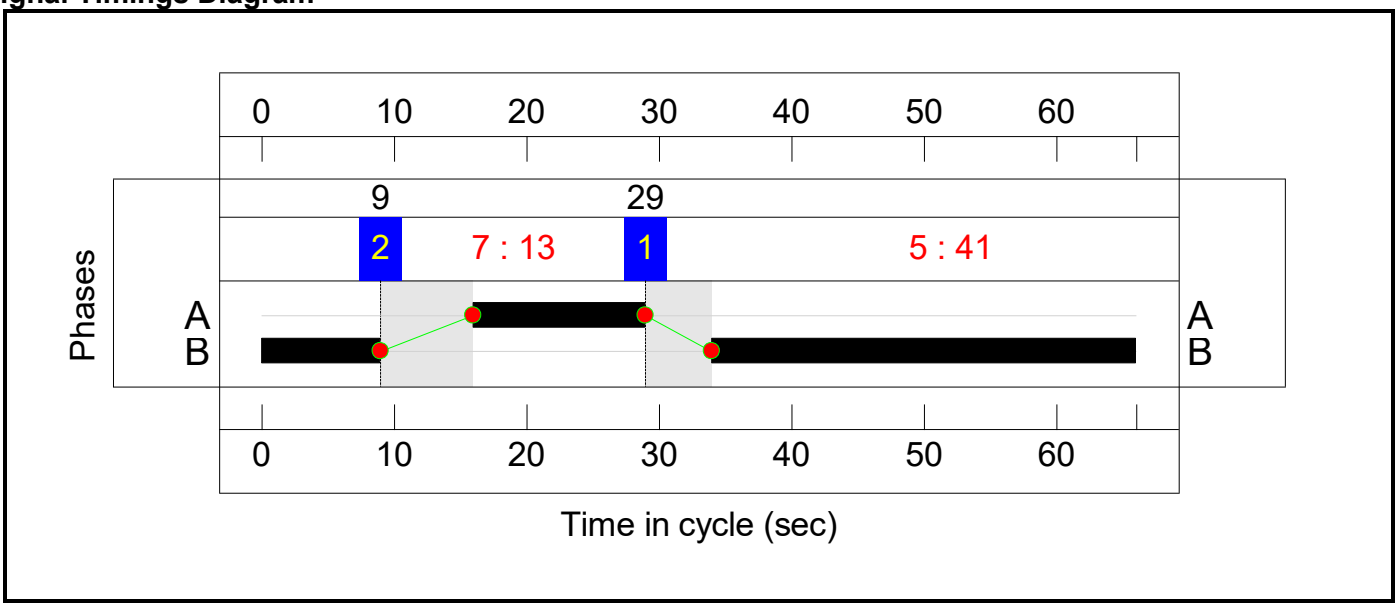
Stage Sequence Diagram
Stage Stream: 1



Stage Timings
Stage Stream: 1

Stage	1	2
Duration	41	13
Change Point	29	9

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: M40 Junction 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**109.4%**
M40 Junction 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**109.4%**
1/1	M40 N Ahead Left	U	2:1	N/A	C2:B		1	26	-	759	1906	780	97.3%
1/2+1/3	M40 N Ahead	U	2:1	N/A	C2:B		1	26	-	1525	1825:1845	747+755	101.3 : 101.9%
2/1	Ahead	U	2:1	N/A	C2:A		1	28	-	686	1945	855	80.3%
2/2	Ahead	U	2:1	N/A	C2:A		1	28	-	682	1977	869	78.5%
2/3	Right Ahead	U	2:1	N/A	C2:A		1	28	-	794	1869	821	96.7%
3/1	A41 Ahead Left	U	1:1	N/A	C1:B		1	15	-	499	1905	462	108.1%
3/2+3/3	A41 Ahead	U	1:1	N/A	C1:B		1	15	-	1041	1965:1960	476+475	109.4 : 109.4%
4/1	Right Ahead	U	1:1	N/A	C1:A		1	39	-	1124	1906	1155	97.3%
4/2	Right	U	1:1	N/A	C1:A		1	39	-	756	1825	1106	67.5%
4/3	Right	U	1:1	N/A	C1:A		1	39	-	769	1845	1118	67.5%
5/1	M40 S Left	U	3:1	N/A	C3:B		1	10	-	212	1932	322	65.8%
5/2+5/3	M40 S Ahead Left	U	3:1	N/A	C3:B		1	10	-	373	1888:1888	315+168	77.2 : 77.2%
6/1	Ahead	U	3:1	N/A	C3:A		1	44	-	1001	1906	1300	75.4%
6/2	Ahead	U	3:1	N/A	C3:A		1	44	-	1128	1825	1244	86.4%
6/3	Right Ahead	U	3:1	N/A	C3:A		1	44	-	1145	1845	1258	86.5%
7/1	A34 Left	U	4:1	N/A	C4:B		1	41	-	1082	1851	1178	91.9%
7/2	A34 Left	U	4:1	N/A	C4:B		1	41	-	1193	2025	1289	92.6%
7/3+7/4	A34 Ahead	U	4:1	N/A	C4:B		1	41	-	1861	1973:1869	1105+822	96.6 : 96.6%
8/2+8/1	Right Ahead	U	4:1	N/A	C4:A		1	13	-	294	1942:1942	370+206	50.6 : 46.6%
8/3	Right	U	4:1	N/A	C4:A		1	13	-	130	2078	441	29.5%
12/1	A34 Exit	U	N/A	N/A	-		-	-	-	1213	2100	2100	56.8%
12/2	A34 Exit	U	N/A	N/A	-		-	-	-	1200	2100	2100	54.6%
12/3	A34 Exit	U	N/A	N/A	-		-	-	-	1022	2100	2100	46.5%

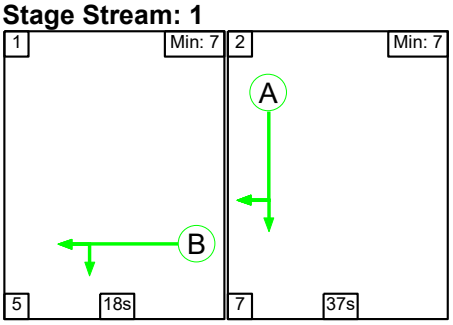
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: M40 Junction 9	**-**	**-**	**0**	**0**	**0**	**69.5**	**135.2**	**0.0**	**204.8**	**-**	**-**	**-**	**-**
1/1	759	759	-	-	-	4.0	9.5	-	13.6	64.4	13.5	9.5	23.0
1/2+1/3	1525	1501	-	-	-	9.0	26.3	-	35.3	83.3 (77.5:89.1)	14.4	26.3	40.7
2/1	686	686	-	-	-	3.5	0.0	-	3.5	18.3	10.0	0.0	10.0
2/2	682	682	-	-	-	3.5	0.0	-	3.5	18.6	9.7	0.0	9.7
2/3	794	794	-	-	-	4.0	0.0	-	4.0	18.3	10.5	0.0	10.5
3/1	499	462	-	-	-	4.3	23.8	-	28.1	203.0	9.8	23.8	33.7
3/2+3/3	1041	952	-	-	-	9.3	50.0	-	59.2	204.8	10.4	50.0	60.3
4/1	1124	1124	-	-	-	3.5	0.0	-	3.5	11.2	18.6	0.0	18.6
4/2	747	747	-	-	-	0.6	0.0	-	0.6	2.9	1.6	0.0	1.6
4/3	755	755	-	-	-	0.6	0.0	-	0.6	2.9	1.6	0.0	1.6
5/1	212	212	-	-	-	1.5	0.9	-	2.5	41.8	3.6	0.9	4.5
5/2+5/3	373	373	-	-	-	2.7	1.6	-	4.3 (2.8+1.5)	41.6 (42.2:40.5)	4.3	1.6	5.9
6/1	980	980	-	-	-	2.8	0.0	-	2.8	10.2	16.2	0.0	16.2
6/2	1075	1075	-	-	-	2.8	0.0	-	2.8	9.3	19.0	0.0	19.0
6/3	1089	1089	-	-	-	2.8	0.0	-	2.8	9.4	19.3	0.0	19.3
7/1	1082	1082	-	-	-	3.2	5.1	-	8.3	27.5	17.1	5.1	22.2
7/2	1193	1193	-	-	-	3.5	5.6	-	9.1	27.5	19.2	5.6	24.8
7/3+7/4	1861	1861	-	-	-	4.5	10.6	-	15.1	29.3 (30.1:28.2)	15.4	10.6	26.0
8/2+8/1	283	283	-	-	-	2.0	0.0	-	2.0 (1.9+0.1)	25.3 (36.3:3.6)	3.3	0.0	3.3
8/3	130	130	-	-	-	1.5	0.0	-	1.5	40.4	2.4	0.0	2.4
12/1	1192	1192	-	-	-	0.0	0.7	-	0.7	2.0	0.0	0.7	0.7
12/2	1147	1147	-	-	-	0.0	0.6	-	0.6	1.9	0.0	0.6	0.6
12/3	976	976	-	-	-	0.0	0.4	-	0.4	1.6	0.0	0.4	0.4

C1	Stream: 1 PRC for Signalled Lanes (%):	-21.6	Total Delay for Signalled Lanes (pcuHr):	92.05	Cycle Time (s): 66
C2	Stream: 1 PRC for Signalled Lanes (%):	-13.2	Total Delay for Signalled Lanes (pcuHr):	59.92	Cycle Time (s): 66
C3	Stream: 1 PRC for Signalled Lanes (%):	4.0	Total Delay for Signalled Lanes (pcuHr):	15.17	Cycle Time (s): 66
C4	Stream: 1 PRC for Signalled Lanes (%):	-7.3	Total Delay for Signalled Lanes (pcuHr):	35.93	Cycle Time (s): 66
	PRC Over All Lanes (%):	-21.6	Total Delay Over All Lanes(pcuHr):	204.76	

Scenario 2: '2031 RC1A - PM' (FG2: '2031 RC1A - PM', Plan 1: 'Staging Plan No. 1')
Controller :C1

Stage Sequence Diagram

Stage Stream: 1

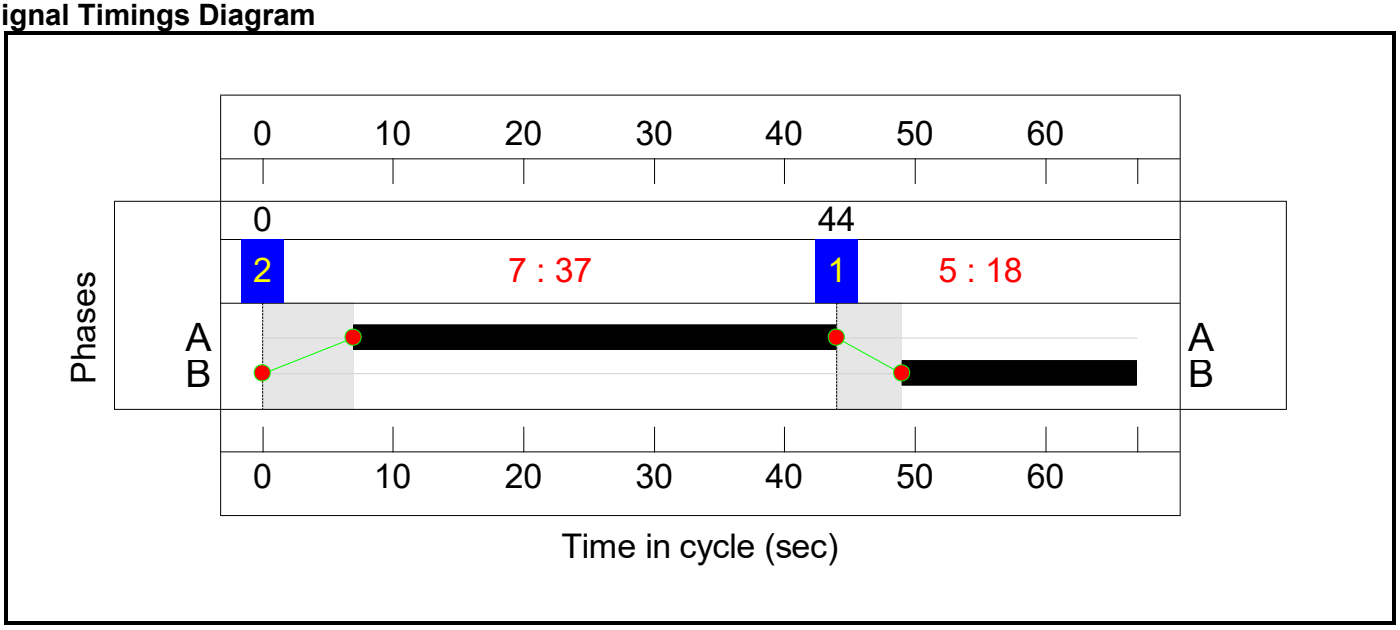


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	18	37
Change Point	44	0

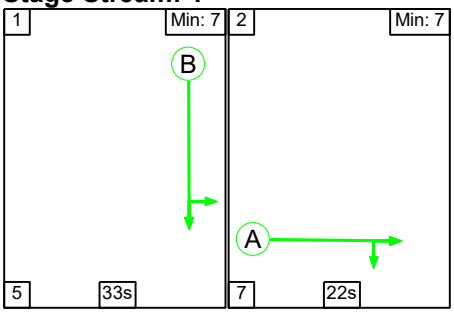
Signal Timings Diagram



Controller :C2

Stage Sequence Diagram

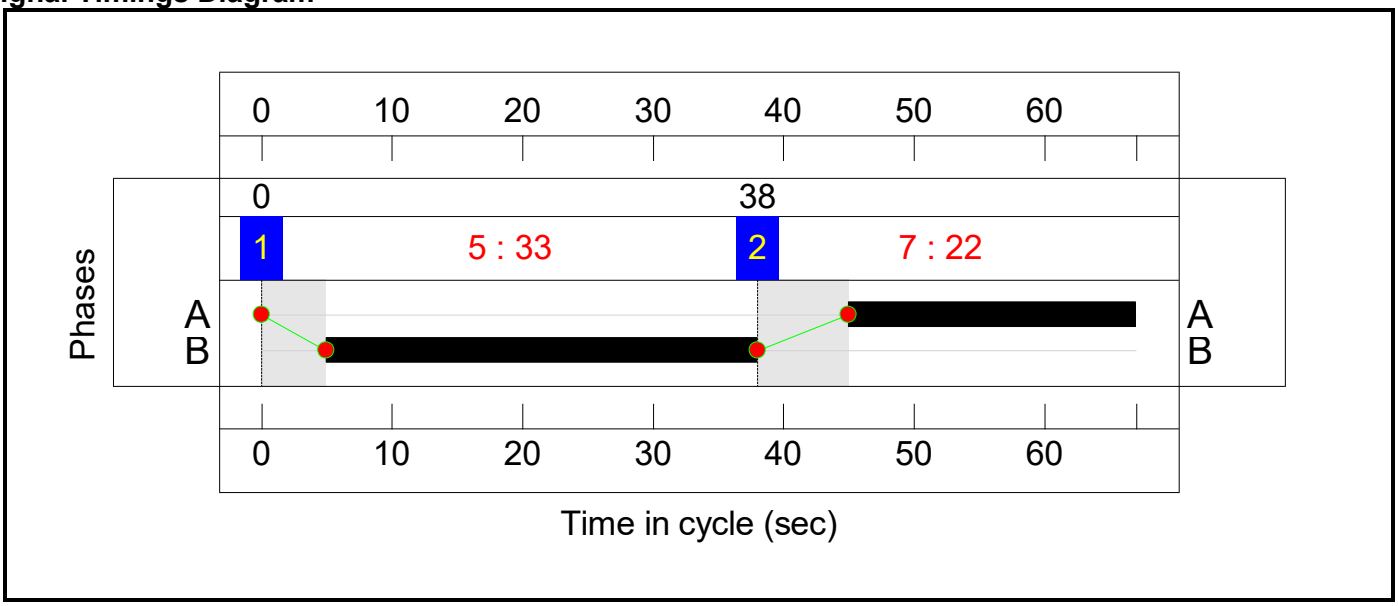
Stage Stream: 1



Stage Timings
Stage Stream: 1

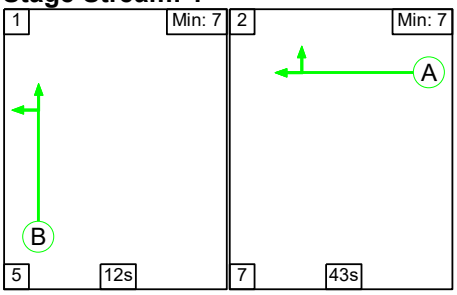
Stage	1	2
Duration	33	22
Change Point	0	38

Signal Timings Diagram



Controller :C3

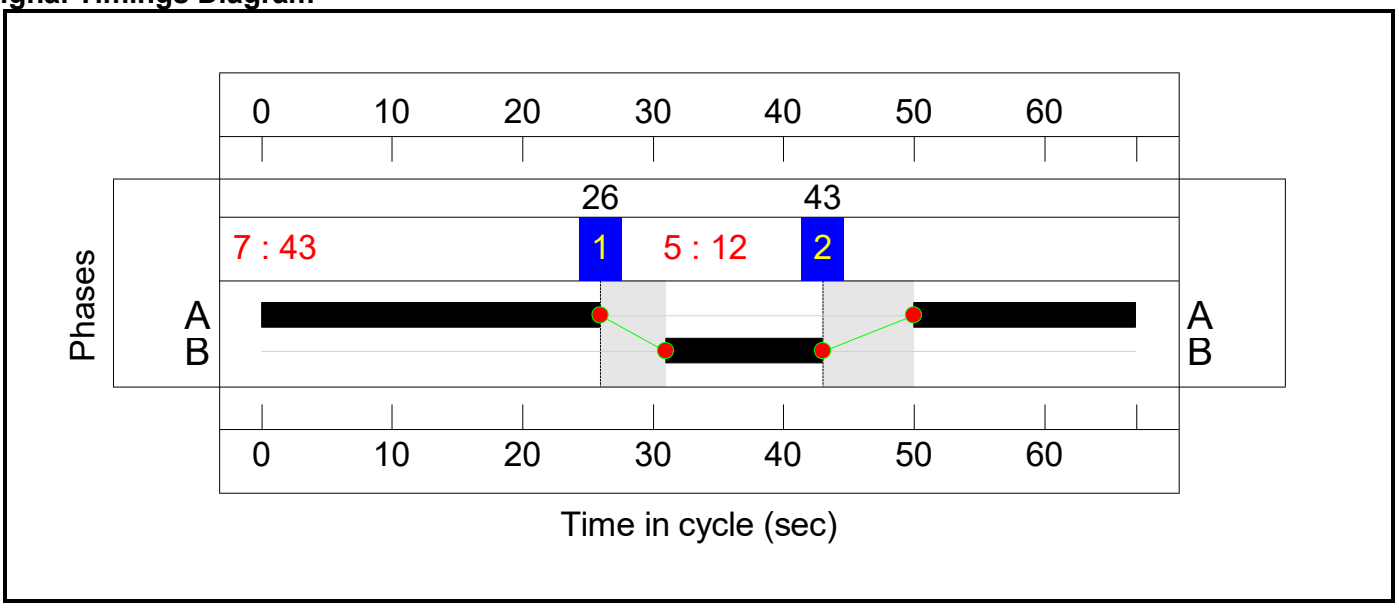
Stage Sequence Diagram
Stage Stream: 1



Stage Timings
Stage Stream: 1

Stage	1	2
Duration	12	43
Change Point	26	43

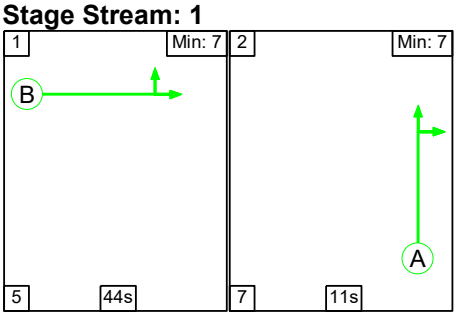
Signal Timings Diagram



Controller :C4

Stage Sequence Diagram

Stage Stream: 1

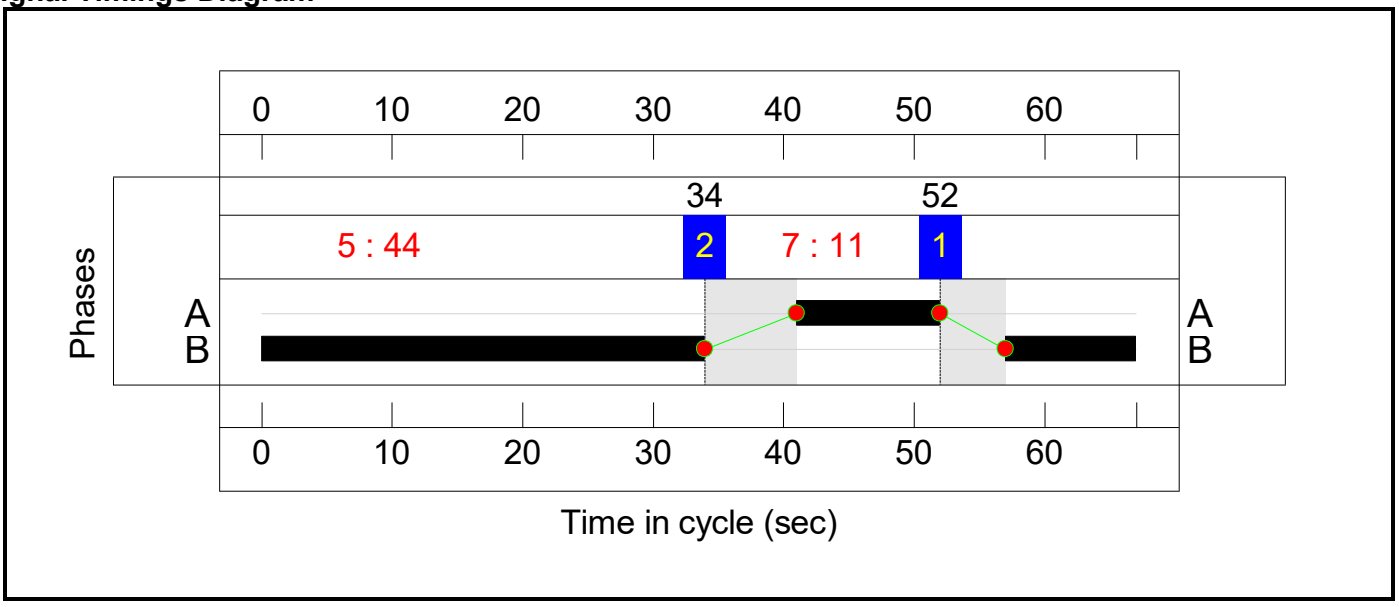


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	44	11
Change Point	52	34

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: M40 Junction 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**102.5%**
1/1	M40 N Ahead Left	U	2:1	N/A	C2:B		1	33	-	894	1906	967	92.4%
1/2+1/3	M40 N Ahead	U	2:1	N/A	C2:B		1	33	-	1734	1825:1845	901+934	94.5 : 94.5%
2/1	Ahead	U	2:1	N/A	C2:A		1	22	-	519	1945	668	77.7%
2/2	Ahead	U	2:1	N/A	C2:A		1	22	-	627	1977	679	92.4%
2/3	Right Ahead	U	2:1	N/A	C2:A		1	22	-	525	1869	642	81.8%
3/1	A41 Ahead Left	U	1:1	N/A	C1:B		1	18	-	438	1905	540	81.1%
3/2+3/3	A41 Ahead	U	1:1	N/A	C1:B		1	18	-	860	1965:1960	557+556	53.8 : 100.8%
4/1	Right Ahead	U	1:1	N/A	C1:A		1	37	-	941	1906	1081	87.0%
4/2	Right	U	1:1	N/A	C1:A		1	37	-	851	1825	1035	82.2%
4/3	Right	U	1:1	N/A	C1:A		1	37	-	883	1845	1046	84.4%
5/1	M40 S Left	U	3:1	N/A	C3:B		1	12	-	335	1932	375	89.4%
5/2+5/3	M40 S Ahead Left	U	3:1	N/A	C3:B		1	12	-	673	1888:1888	366+322	97.7 : 97.7%
6/1	Ahead	U	3:1	N/A	C3:A		1	43	-	1108	1906	1252	88.5%
6/2	Ahead	U	3:1	N/A	C3:A		1	43	-	1158	1825	1199	96.6%
6/3	Right Ahead	U	3:1	N/A	C3:A		1	43	-	1209	1845	1212	99.4%
7/1	A34 Left	U	4:1	N/A	C4:B		1	44	-	1271	1851	1243	102.2%
7/2	A34 Left	U	4:1	N/A	C4:B		1	44	-	1394	2025	1360	102.5%
7/3+7/4	A34 Ahead	U	4:1	N/A	C4:B		1	44	-	1356	1973:1869	1278+658	70.0 : 70.0%
8/2+8/1	Right Ahead	U	4:1	N/A	C4:A		1	11	-	375	1942:1942	306+308	60.7 : 60.7%
8/3	Right	U	4:1	N/A	C4:A		1	11	-	315	2078	372	84.6%
12/1	A34 Exit	U	N/A	N/A	-		-	-	-	1443	2100	2100	68.7%
12/2	A34 Exit	U	N/A	N/A	-		-	-	-	1516	2100	2100	72.2%
12/3	A34 Exit	U	N/A	N/A	-		-	-	-	834	2100	2100	39.6%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: M40 Junction 9	**-**	**-**	**0**	**0**	**0**	**66.3**	**90.8**	**0.0**	**157.1**	**-**	**-**	**-**	**-**
1/1	894	894	-	-	-	3.8	5.3	-	9.1	36.8	15.4	5.3	20.7
1/2+1/3	1734	1734	-	-	-	7.4	7.5	-	14.9 (7.3+7.6)	30.9 (30.7:31.1)	15.5	7.5	22.9
2/1	519	519	-	-	-	3.5	0.0	-	3.5	24.6	9.6	0.0	9.6
2/2	627	627	-	-	-	3.5	0.0	-	3.5	20.0	9.9	0.0	9.9
2/3	525	525	-	-	-	3.6	0.0	-	3.6	24.8	9.2	0.0	9.2
3/1	438	438	-	-	-	2.7	2.1	-	4.8	39.3	7.5	2.1	9.6
3/2+3/3	860	856	-	-	-	5.5	3.8	-	9.3 (2.3+7.0)	38.8 (27.3:45.0)	10.4	3.8	14.2
4/1	941	941	-	-	-	0.9	0.0	-	0.9	3.4	3.8	0.0	3.8
4/2	851	851	-	-	-	0.2	0.0	-	0.2	1.0	0.6	0.0	0.6
4/3	883	883	-	-	-	0.3	0.0	-	0.3	1.1	0.6	0.0	0.6
5/1	335	335	-	-	-	2.5	3.6	-	6.0	64.6	6.0	3.6	9.6
5/2+5/3	673	673	-	-	-	5.0	9.6	-	14.6 (7.8+6.8)	78.1 (78.4:77.7)	6.6	9.6	16.2
6/1	1108	1108	-	-	-	5.0	0.0	-	5.0	16.2	20.2	0.0	20.2
6/2	1158	1158	-	-	-	4.5	0.0	-	4.5	13.9	21.3	0.0	21.3
6/3	1205	1205	-	-	-	3.0	0.0	-	3.0	8.9	22.2	0.0	22.2
7/1	1271	1243	-	-	-	4.8	26.1	-	30.9	87.5	24.2	26.1	50.3
7/2	1394	1360	-	-	-	5.4	29.0	-	34.4	88.8	26.6	29.0	55.6
7/3+7/4	1356	1356	-	-	-	2.3	1.2	-	3.4 (2.4+1.0)	9.1 (9.7:7.9)	9.9	1.2	11.1
8/2+8/1	372	372	-	-	-	2.2	0.0	-	2.2 (1.1+1.1)	21.4 (21.4:21.4)	3.5	0.0	3.5
8/3	315	315	-	-	-	0.3	0.0	-	0.3	3.4	5.5	0.0	5.5
12/1	1443	1443	-	-	-	0.0	1.1	-	1.1	2.7	0.0	1.1	1.1
12/2	1516	1516	-	-	-	0.0	1.3	-	1.3	3.1	0.0	1.3	1.3
12/3	833	833	-	-	-	0.0	0.3	-	0.3	1.4	0.0	0.3	0.3

C1	Stream: 1 PRC for Signalled Lanes (%):	-11.9	Total Delay for Signalled Lanes (pcuHr):	15.44	Cycle Time (s): 67
C2	Stream: 1 PRC for Signalled Lanes (%):	-5.0	Total Delay for Signalled Lanes (pcuHr):	34.68	Cycle Time (s): 67
C3	Stream: 1 PRC for Signalled Lanes (%):	-10.5	Total Delay for Signalled Lanes (pcuHr):	33.02	Cycle Time (s): 67
C4	Stream: 1 PRC for Signalled Lanes (%):	-13.9	Total Delay for Signalled Lanes (pcuHr):	71.20	Cycle Time (s): 67
	PRC Over All Lanes (%):	-13.9	Total Delay Over All Lanes(pcuHr):	157.05	

APPENDIX 8

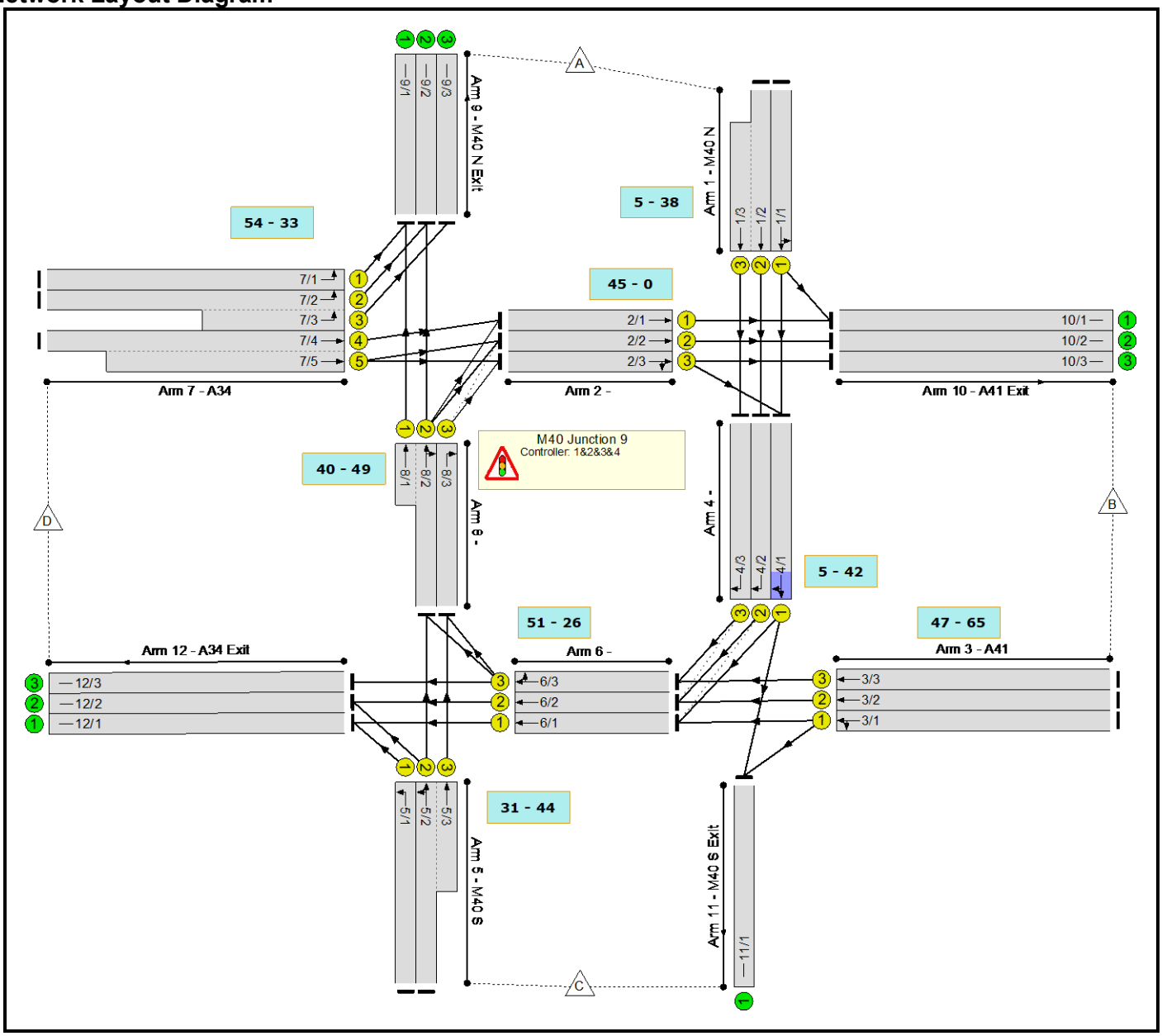
M40 JUNCTION 9 DS1A LINSIG REPORT

Full Input Data And Results

User and Project Details

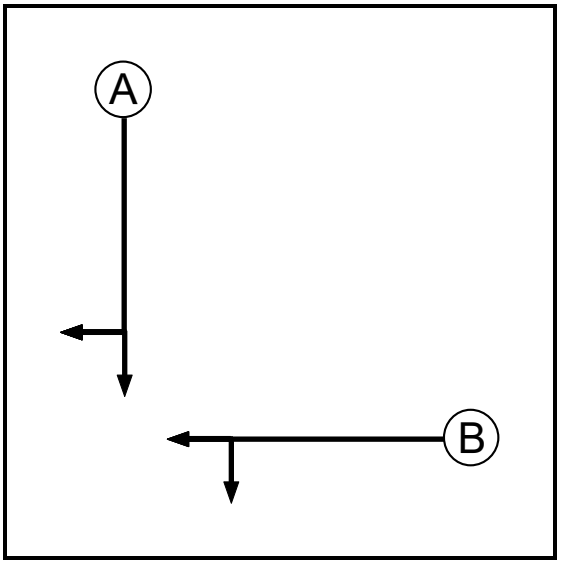
Project:	**OxSRFI**
Title:	**M40 Junction 9 - with mitigtion**
Location:	M40 Junction 9, Wendlebury
Additional detail:	2031 DS1A
File name:	251217 M40 Junction 9 - DS1A.lsg3x
Author:	Mark Higgins
Company:	ADC Infrastructure
Address:	Nottingham

Network Layout Diagram



Controller :C1

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min (s)	Cont Min (s)
A	Traffic	1		7	7
B	Traffic	1		7	7

Phase Intergreens Matrix

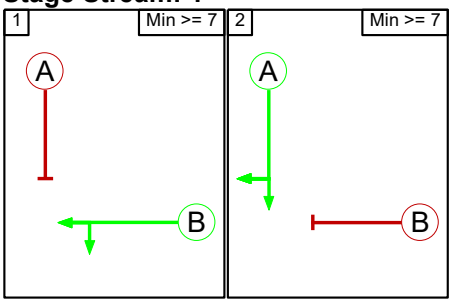
	Starting Phase		
Terminating Phase		A	B
	A		5
	B	7	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



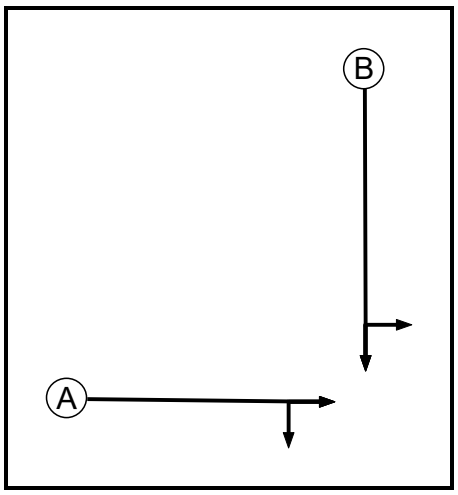
Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		7
	2	5	

Controller :C2

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min (s)	Cont Min (s)
A	Traffic	1		7	7
B	Traffic	1		7	7

Phase Intergreens Matrix

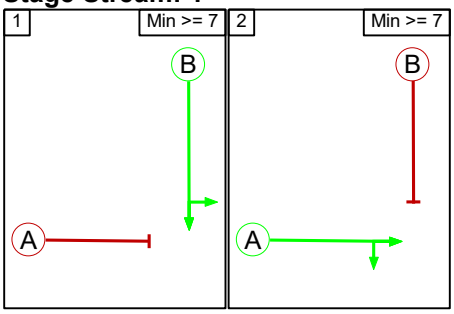
		Starting Phase	
		A	B
Terminating Phase	A		5
	B	7	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



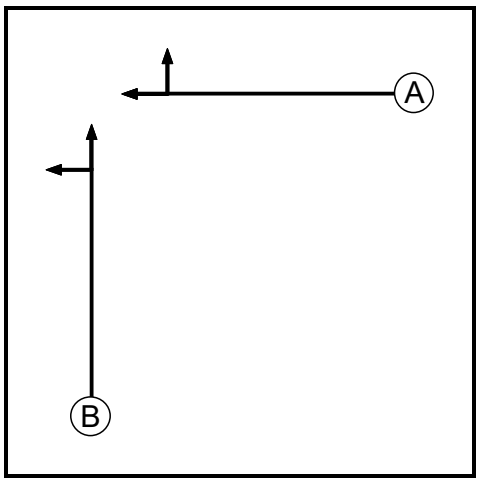
Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		7
	2	5	

Controller :C3

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min (s)	Cont Min (s)
A	Traffic	1		7	7
B	Traffic	1		7	7

Phase Intergreens Matrix

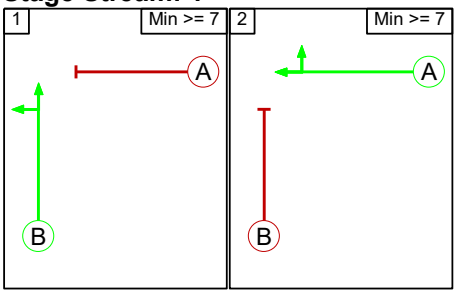
		Starting Phase	
		A	B
Terminating Phase	A		5
	B	7	

Phases in Stage

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

Stage Diagram

Stage Stream: 1



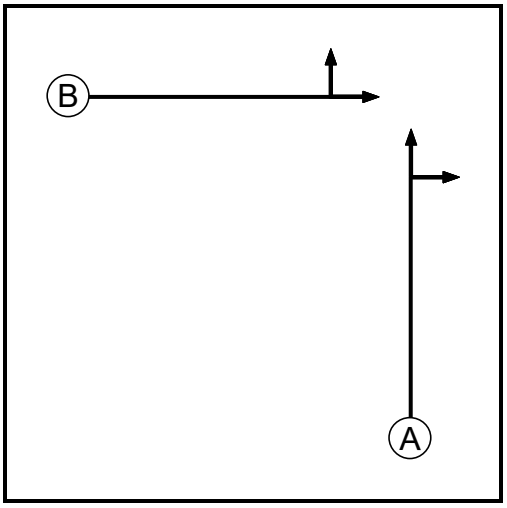
Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		7
	2	5	

Controller :C4

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min (s)	Cont Min (s)
A	Traffic	1		7	7
B	Traffic	1		7	7

Phase Intergreens Matrix

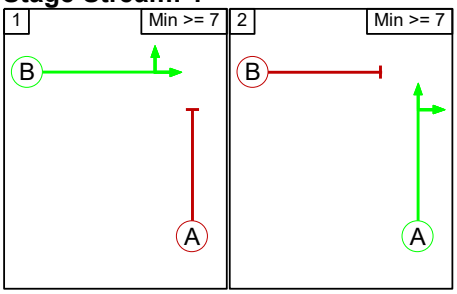
Terminating Phase	Starting Phase		
		A	B
A			5
B	7		

Phases in Stage

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

Stage Diagram

Stage Stream: 1



Prohibited Stage Change

Stage Stream: 1

From Stage	To Stage		
		1	2
1			7
2	5		

Lane Input Data

Junction: M40 Junction 9												
Lane	Lane Type	Phases	Start Disp. (s)	End Disp. (s)	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient (%)	Nearside Lane	Turns	Turning Radius (m)
1/1 (M40 N)	U	B	2	3	60.0	User	1828	-	-	-	-	-
1/2 (M40 N)	U	B	2	3	60.0	User	1868	-	-	-	-	-
1/3 (M40 N)	U	B	2	3	29.6	User	1908	-	-	-	-	-
2/1	U	A	2	3	26.0	User	1945	-	-	-	-	-
2/2	U	A	2	3	26.0	User	1977	-	-	-	-	-
2/3	U	A	2	3	26.0	User	1869	-	-	-	-	-
3/1 (A41)	U	B	2	3	60.0	User	1824	-	-	-	-	-
3/2 (A41)	U	B	2	3	60.0	User	1876	-	-	-	-	-
3/3 (A41)	U	B	2	3	60.0	User	1887	-	-	-	-	-
4/1	U	A	2	3	4.0	User	1869	-	-	-	-	-
4/2	U	A	2	3	5.0	User	1868	-	-	-	-	-
4/3	U	A	2	3	6.0	User	1951	-	-	-	-	-
5/1 (M40 S)	U	B	2	3	60.0	User	1932	-	-	-	-	-
5/2 (M40 S)	U	B	2	3	60.0	User	1888	-	-	-	-	-
5/3 (M40 S)	U	B	2	3	8.0	User	1888	-	-	-	-	-
6/1	U	A	2	3	20.0	User	1866	-	-	-	-	-
6/2	U	A	2	3	31.0	User	1904	-	-	-	-	-
6/3	U	A	2	3	31.0	User	1887	-	-	-	-	-
7/1 (A34)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 9 Left	60.00
7/2 (A34)	U	B	2	3	60.0	Geom	-	3.80	0.00	N	Arm 9 Left	60.00
7/3 (A34)	U	B	2	3	10.4	Geom	-	3.80	0.00	N	Arm 9 Left	60.00
7/4 (A34)	U	B	2	3	60.0	User	1973	-	-	-	-	-
7/5 (A34)	U	B	2	3	30.0	User	1869	-	-	-	-	-
8/1	U	A	2	3	4.5	User	1942	-	-	-	-	-
8/2	U	A	2	3	4.0	User	1942	-	-	-	-	-
8/3	U	A	2	3	4.0	User	2078	-	-	-	-	-
9/1 (M40 N Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
9/2 (M40 N Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
9/3 (M40 N Exit)	U		2	3	8.7	User	1800	-	-	-	-	-

10/1 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
10/2 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
10/3 (A41 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
11/1 (M40 S Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
12/1 (A34 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
12/2 (A34 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
12/3 (A34 Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2031 DS1A - AM'	08:00	09:00	01:00	
2: '2031 DS1A - PM'	17:00	18:00	01:00	

Scenario 1: '2031 DS1A - AM' (FG1: '2031 DS1A - AM', Plan 1: 'Staging Plan No. 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	248	0	2333	2581
	B	63	0	262	882	1207
	C	0	297	0	284	581
	D	2307	1182	633	0	4122
	Tot.	2370	1727	895	3499	8491

Traffic Lane Flows

Lane	Scenario 1: 2031 DS1A - AM
Junction: M40 Junction 9	
1/1	811
1/2 (with short)	1770(In) 874(Out)
1/3 (short)	896
2/1	743
2/2	721
2/3	648
3/1	393
3/2	406
3/3	408
4/1	1196
4/2	874
4/3	896
5/1	204
5/2 (with short)	377(In) 238(Out)
5/3 (short)	139
6/1	1039
6/2	1125
6/3	1114
7/1	895
7/2 (with short)	1412(In) 864(Out)
7/3 (short)	548
7/4 (with short)	1815(In) 704(Out)
7/5 (short)	1111
8/1 (short)	63
8/2 (with short)	221(In) 158(Out)
8/3	139
9/1	958
9/2	864
9/3	548
10/1	991
10/2	721
10/3	15
11/1	895
12/1	1243
12/2	1205
12/3	1051

Lane Saturation Flows

Junction: M40 Junction 9								
Lane	**Lane Width (m)**	**Gradient (%)**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (M40 N Lane 1)	This lane uses a directly entered Saturation Flow						1828	1828
1/2 (M40 N Lane 2)	This lane uses a directly entered Saturation Flow						1868	1868
1/3 (M40 N Lane 3)	This lane uses a directly entered Saturation Flow						1908	1908
2/1	This lane uses a directly entered Saturation Flow						1945	1945
2/2	This lane uses a directly entered Saturation Flow						1977	1977
2/3	This lane uses a directly entered Saturation Flow						1869	1869
3/1 (A41 Lane 1)	This lane uses a directly entered Saturation Flow						1824	1824
3/2 (A41 Lane 2)	This lane uses a directly entered Saturation Flow						1876	1876
3/3 (A41 Lane 3)	This lane uses a directly entered Saturation Flow						1887	1887
4/1	This lane uses a directly entered Saturation Flow						1869	1869
4/2	This lane uses a directly entered Saturation Flow						1868	1868
4/3	This lane uses a directly entered Saturation Flow						1951	1951
5/1 (M40 S Lane 1)	This lane uses a directly entered Saturation Flow						1932	1932
5/2 (M40 S Lane 2)	This lane uses a directly entered Saturation Flow						1888	1888
5/3 (M40 S Lane 3)	This lane uses a directly entered Saturation Flow						1888	1888
6/1	This lane uses a directly entered Saturation Flow						1866	1866
6/2	This lane uses a directly entered Saturation Flow						1904	1904
6/3	This lane uses a directly entered Saturation Flow						1887	1887
7/1 (A34)	3.65	0.00	Y	Arm 9 Left	60.00	100.0 %	1932	1932
7/2 (A34)	3.80	0.00	N	Arm 9 Left	60.00	100.0 %	2083	2083
7/3 (A34)	3.80	0.00	N	Arm 9 Left	60.00	100.0 %	2083	2083
7/4 (A34 Lane 4)	This lane uses a directly entered Saturation Flow						1973	1973
7/5 (A34 Lane 5)	This lane uses a directly entered Saturation Flow						1869	1869
8/1	This lane uses a directly entered Saturation Flow						1942	1942
8/2	This lane uses a directly entered Saturation Flow						1942	1942
8/3	This lane uses a directly entered Saturation Flow						2078	2078
9/1 (M40 N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (M40 N Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
9/3 (M40 N Exit Lane 3)	This lane uses a directly entered Saturation Flow						1800	1800

10/1 (A41 Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
10/2 (A41 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
10/3 (A41 Exit Lane 3)	Infinite Saturation Flow	Inf	Inf
11/1 (M40 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
12/1 (A34 Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
12/2 (A34 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
12/3 (A34 Exit Lane 3)	Infinite Saturation Flow	Inf	Inf

Scenario 2: '2031 DS1A - PM' (FG2: '2031 DS1A - PM', Plan 1: 'Staging Plan No. 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	132	0	2584	2716
	B	91	0	342	628	1061
	C	0	311	0	695	1006
	D	2848	1091	147	0	4086
	Tot.	2939	1534	489	3907	8869

Traffic Lane Flows

Lane	Scenario 2: 2031 DS1A - PM
Junction: M40 Junction 9	
1/1	877
1/2 (with short)	1839(In) 891(Out)
1/3 (short)	948
2/1	526
2/2	545
2/3	478
3/1	360
3/2	320
3/3	381
4/1	892
4/2	891
4/3	948
5/1	362
5/2 (with short)	644(In) 383(Out)
5/3 (short)	261
6/1	972
6/2	1149
6/3	1182
7/1	1158
7/2 (with short)	1690(In) 1023(Out)
7/3 (short)	667
7/4 (with short)	1238(In) 476(Out)
7/5 (short)	762
8/1 (short)	47
8/2 (with short)	141(In) 94(Out)
8/3	261
9/1	1205
9/2	1067
9/3	667
10/1	658
10/2	545
10/3	331
11/1	489
12/1	1334
12/2	1482
12/3	1091

Lane Saturation Flows

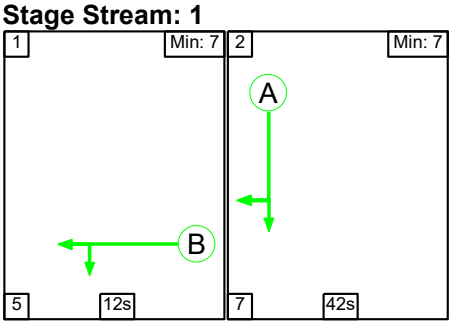
Junction: M40 Junction 9								
Lane	**Lane Width (m)**	**Gradient (%)**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (M40 N Lane 1)	This lane uses a directly entered Saturation Flow						1828	1828
1/2 (M40 N Lane 2)	This lane uses a directly entered Saturation Flow						1868	1868
1/3 (M40 N Lane 3)	This lane uses a directly entered Saturation Flow						1908	1908
2/1	This lane uses a directly entered Saturation Flow						1945	1945
2/2	This lane uses a directly entered Saturation Flow						1977	1977
2/3	This lane uses a directly entered Saturation Flow						1869	1869
3/1 (A41 Lane 1)	This lane uses a directly entered Saturation Flow						1824	1824
3/2 (A41 Lane 2)	This lane uses a directly entered Saturation Flow						1876	1876
3/3 (A41 Lane 3)	This lane uses a directly entered Saturation Flow						1887	1887
4/1	This lane uses a directly entered Saturation Flow						1869	1869
4/2	This lane uses a directly entered Saturation Flow						1868	1868
4/3	This lane uses a directly entered Saturation Flow						1951	1951
5/1 (M40 S Lane 1)	This lane uses a directly entered Saturation Flow						1932	1932
5/2 (M40 S Lane 2)	This lane uses a directly entered Saturation Flow						1888	1888
5/3 (M40 S Lane 3)	This lane uses a directly entered Saturation Flow						1888	1888
6/1	This lane uses a directly entered Saturation Flow						1866	1866
6/2	This lane uses a directly entered Saturation Flow						1904	1904
6/3	This lane uses a directly entered Saturation Flow						1887	1887
7/1 (A34)	3.65	0.00	Y	Arm 9 Left	60.00	100.0 %	1932	1932
7/2 (A34)	3.80	0.00	N	Arm 9 Left	60.00	100.0 %	2083	2083
7/3 (A34)	3.80	0.00	N	Arm 9 Left	60.00	100.0 %	2083	2083
7/4 (A34 Lane 4)	This lane uses a directly entered Saturation Flow						1973	1973
7/5 (A34 Lane 5)	This lane uses a directly entered Saturation Flow						1869	1869
8/1	This lane uses a directly entered Saturation Flow						1942	1942
8/2	This lane uses a directly entered Saturation Flow						1942	1942
8/3	This lane uses a directly entered Saturation Flow						2078	2078
9/1 (M40 N Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/2 (M40 N Exit Lane 2)	Infinite Saturation Flow						Inf	Inf
9/3 (M40 N Exit Lane 3)	This lane uses a directly entered Saturation Flow						1800	1800

10/1 (A41 Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
10/2 (A41 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
10/3 (A41 Exit Lane 3)	Infinite Saturation Flow	Inf	Inf
11/1 (M40 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
12/1 (A34 Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
12/2 (A34 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
12/3 (A34 Exit Lane 3)	Infinite Saturation Flow	Inf	Inf

Scenario 1: '2031 DS1A - AM' (FG1: '2031 DS1A - AM', Plan 1: 'Staging Plan No. 1')
Controller :C1

Stage Sequence Diagram

Stage Stream: 1

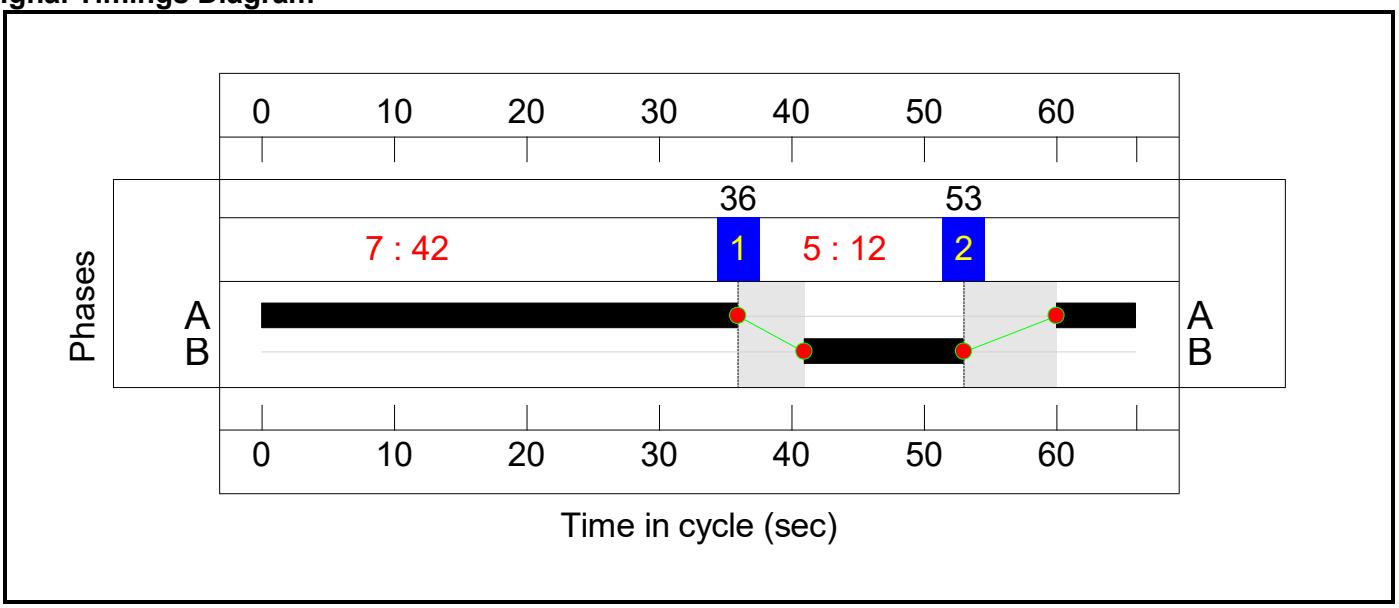


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	12	42
Change Point	36	53

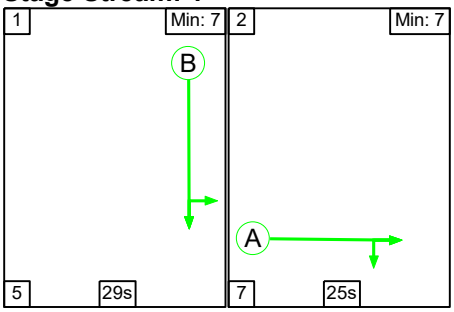
Signal Timings Diagram



Controller :C2

Stage Sequence Diagram

Stage Stream: 1

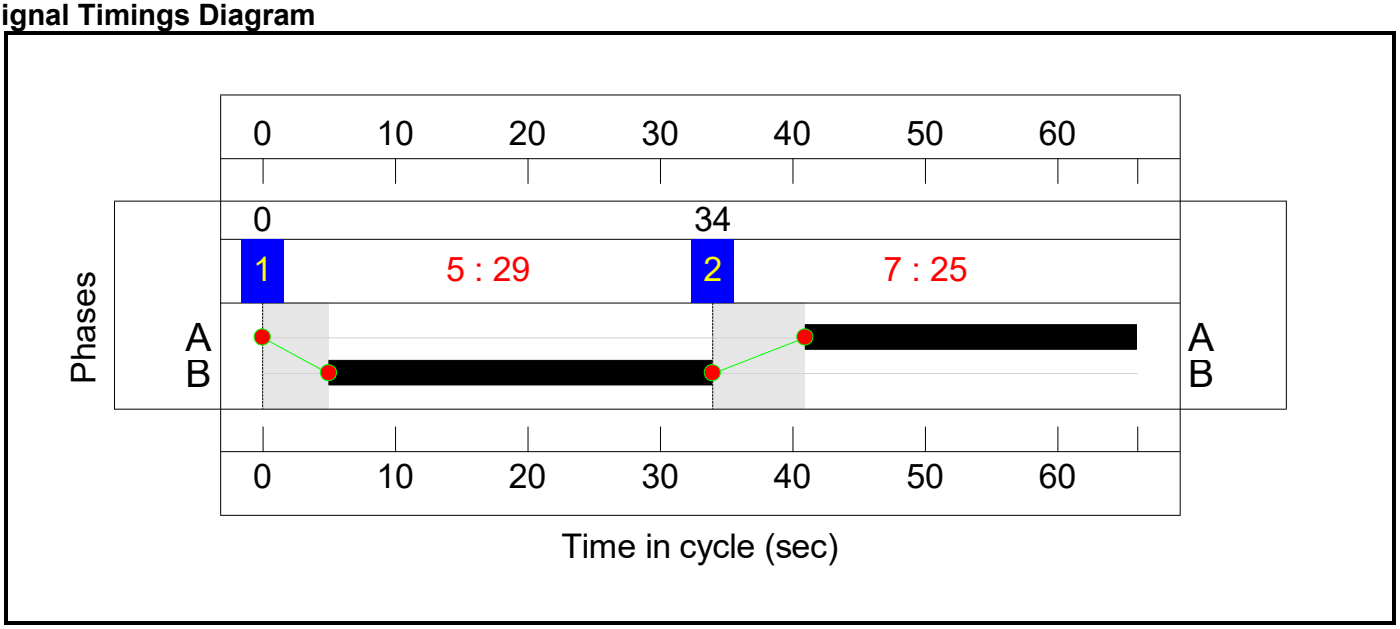


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	29	25
Change Point	0	34

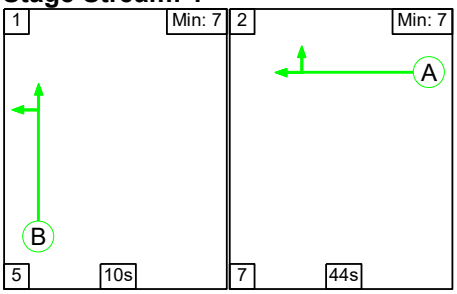
Signal Timings Diagram



Controller :C3

Stage Sequence Diagram

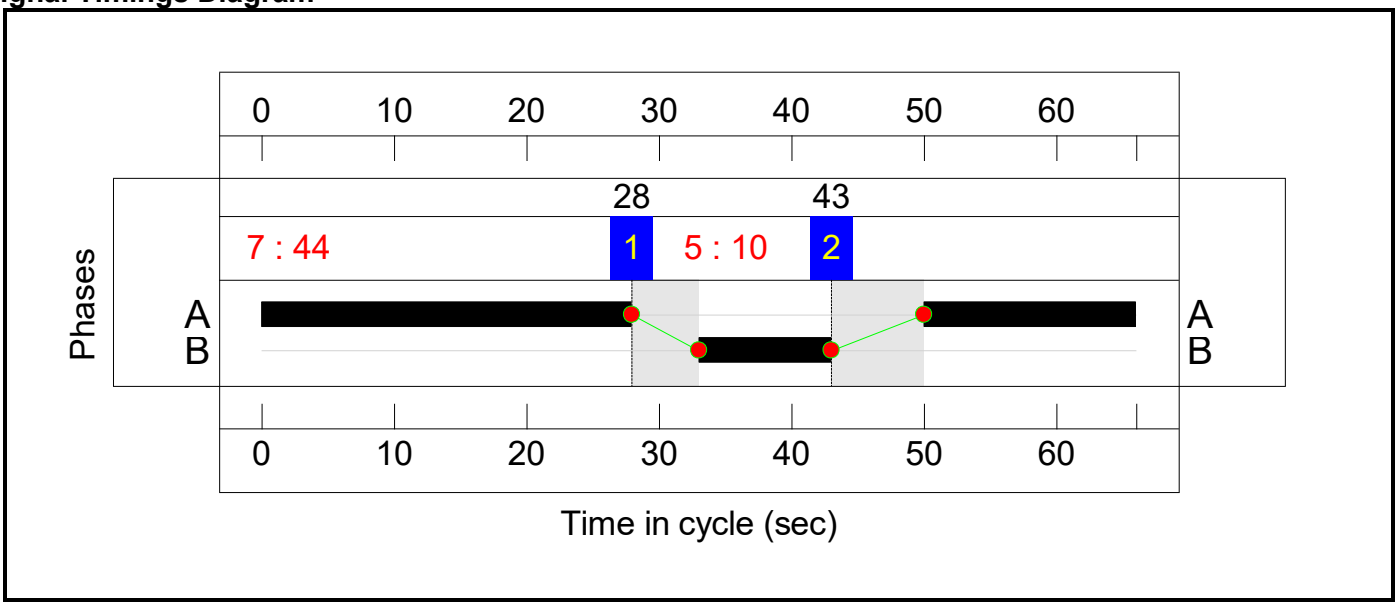
Stage Stream: 1



Stage Timings
Stage Stream: 1

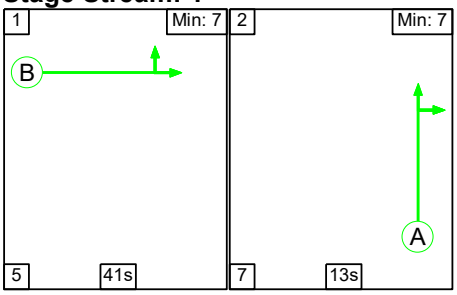
Stage	1	2
Duration	10	44
Change Point	28	43

Signal Timings Diagram



Controller :C4

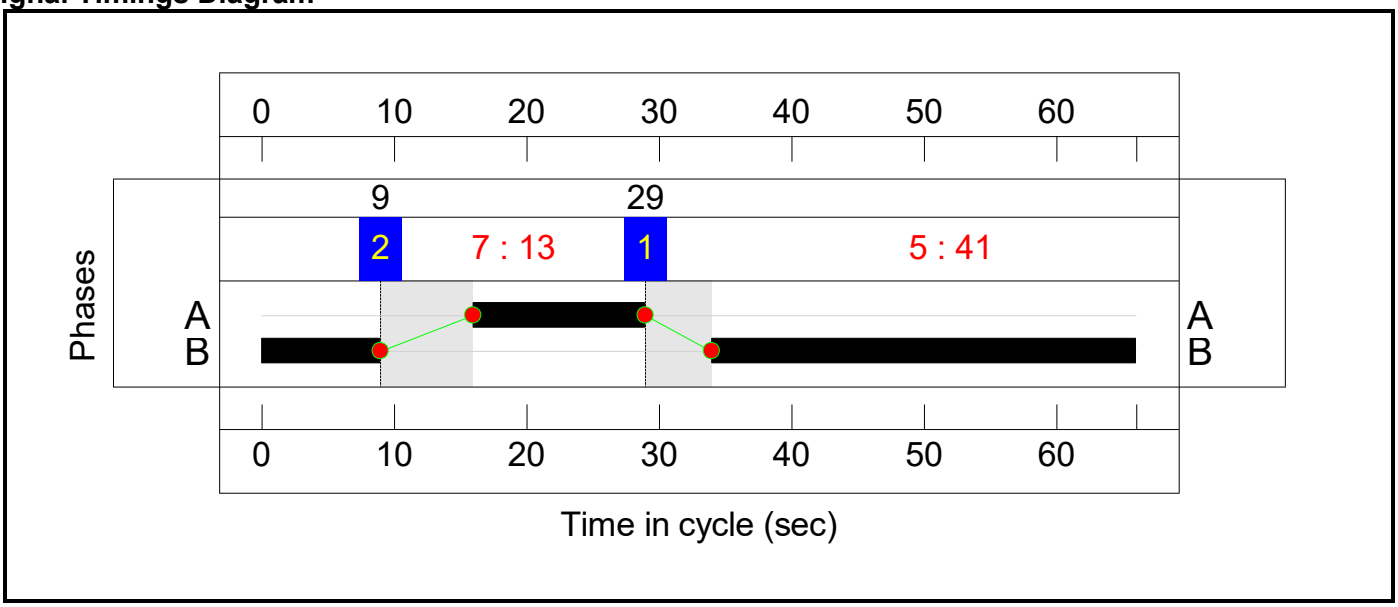
Stage Sequence Diagram
Stage Stream: 1



Stage Timings
Stage Stream: 1

Stage	1	2
Duration	41	13
Change Point	29	9

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
M40 Junction 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**109.9%**
1/1	M40 N Ahead Left	U	2:1	N/A	C2:B		1	29	-	811	1828	831	97.6%
1/2+1/3	M40 N Ahead	U	2:1	N/A	C2:B		1	29	-	1770	1868:1908	849+867	102.9 : 103.3%
2/1	Ahead	U	2:1	N/A	C2:A		1	25	-	743	1945	766	97.0%
2/2	Ahead	U	2:1	N/A	C2:A		1	25	-	721	1977	779	92.6%
2/3	Right Ahead	U	2:1	N/A	C2:A		1	25	-	648	1869	736	88.0%
3/1	A41 Ahead Left	U	1:1	N/A	C1:B		1	12	-	393	1824	359	109.4%
3/2	A41 Ahead	U	1:1	N/A	C1:B		1	12	-	406	1876	370	109.9%
3/3	A41 Ahead	U	1:1	N/A	C1:B		1	12	-	408	1887	372	109.8%
4/1	Right Ahead	U	1:1	N/A	C1:A		1	42	-	1196	1869	1218	98.2%
4/2	Right	U	1:1	N/A	C1:A		1	42	-	874	1868	1217	69.8%
4/3	Right	U	1:1	N/A	C1:A		1	42	-	896	1951	1271	68.2%
5/1	M40 S Left	U	3:1	N/A	C3:B		1	10	-	204	1932	322	63.4%
5/2+5/3	M40 S Ahead Left	U	3:1	N/A	C3:B		1	10	-	377	1888:1888	315+184	75.6 : 75.6%
6/1	Ahead	U	3:1	N/A	C3:A		1	44	-	1039	1866	1272	80.0%
6/2	Ahead	U	3:1	N/A	C3:A		1	44	-	1125	1904	1298	82.2%
6/3	Right Ahead	U	3:1	N/A	C3:A		1	44	-	1114	1887	1287	82.0%
7/1	A34 Left	U	4:1	N/A	C4:B		1	41	-	895	1932	1229	72.8%
7/2+7/3	A34 Left	U	4:1	N/A	C4:B		1	41	-	1412	2083:2083	1044+662	82.7 : 82.7%
7/4+7/5	A34 Ahead	U	4:1	N/A	C4:B		1	41	-	1815	1973:1869	740+1168	95.1 : 95.1%
8/2+8/1	Right Ahead	U	4:1	N/A	C4:A		1	13	-	221	1942:1942	384+153	41.2 : 37.5%
8/3	Right	U	4:1	N/A	C4:A		1	13	-	139	2078	441	31.5%
9/3	M40 N Exit	U	N/A	N/A	-		-	-	-	548	1800	1800	30.4%

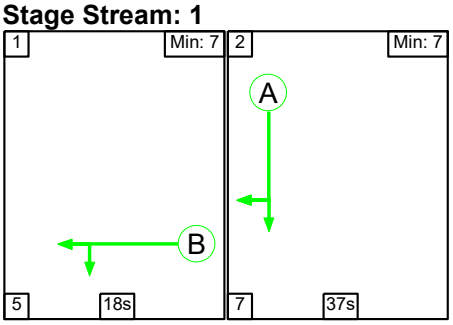
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
M40 Junction 9	**-**	**-**	**0**	**0**	**0**	**68.6**	**129.8**	**0.0**	**198.4**	**-**	**-**	**-**	**-**
1/1	811	811	-	-	-	4.0	10.1	-	14.1	62.5	14.4	10.1	24.5
1/2+1/3	1770	1716	-	-	-	10.5	38.4	-	48.9	99.4 (95.9:102.7)	17.0	38.4	55.3
2/1	743	743	-	-	-	3.6	0.0	-	3.6	17.3	12.5	0.0	12.5
2/2	721	721	-	-	-	4.1	0.0	-	4.1	20.7	12.4	0.0	12.4
2/3	648	648	-	-	-	4.2	0.0	-	4.2	23.5	10.0	0.0	10.0
3/1	393	359	-	-	-	3.7	21.4	-	25.1	230.1	7.8	21.4	29.3
3/2	406	370	-	-	-	3.8	22.7	-	26.5	235.3	8.1	22.7	30.8
3/3	408	372	-	-	-	3.8	22.7	-	26.5	233.8	8.1	22.7	30.8
4/1	1196	1196	-	-	-	3.5	0.0	-	3.5	10.6	19.5	0.0	19.5
4/2	849	849	-	-	-	1.1	0.0	-	1.1	4.6	3.2	0.0	3.2
4/3	867	867	-	-	-	1.1	0.0	-	1.1	4.6	3.2	0.0	3.2
5/1	204	204	-	-	-	1.5	0.9	-	2.3	40.7	3.5	0.9	4.3
5/2+5/3	377	377	-	-	-	2.7	1.5	-	4.2	40.1 (40.7:39.2)	4.1	1.5	5.6
6/1	1018	1018	-	-	-	3.1	0.0	-	3.1	11.0	16.8	0.0	16.8
6/2	1067	1067	-	-	-	2.6	0.0	-	2.6	8.9	18.1	0.0	18.1
6/3	1055	1055	-	-	-	2.6	0.0	-	2.6	8.8	17.9	0.0	17.9
7/1	895	895	-	-	-	2.0	1.3	-	3.3	13.5	10.9	1.3	12.3
7/2+7/3	1412	1412	-	-	-	2.7	2.4	-	5.0	12.9 (13.5:11.9)	9.8	2.4	12.2
7/4+7/5	1815	1815	-	-	-	4.6	8.3	-	12.9	25.6 (23.2:27.2)	18.2	8.3	26.5
8/2+8/1	215	215	-	-	-	1.8	0.0	-	1.8	29.4 (39.1:2.7)	2.9	0.0	2.9
8/3	139	139	-	-	-	1.6	0.0	-	1.6	40.4	2.5	0.0	2.5
9/3	548	548	-	-	-	0.0	0.2	-	0.2	1.5	3.6	0.2	3.8

C1	Stream: 1 PRC for Signalled Lanes (%):	-22.1	Total Delay for Signalled Lanes (pcuHr):	83.84	Cycle Time (s): 66
C2	Stream: 1 PRC for Signalled Lanes (%):	-14.8	Total Delay for Signalled Lanes (pcuHr):	74.87	Cycle Time (s): 66
C3	Stream: 1 PRC for Signalled Lanes (%):	9.5	Total Delay for Signalled Lanes (pcuHr):	14.82	Cycle Time (s): 66
C4	Stream: 1 PRC for Signalled Lanes (%):	-5.7	Total Delay for Signalled Lanes (pcuHr):	24.64	Cycle Time (s): 66
	PRC Over All Lanes (%):	-22.1	Total Delay Over All Lanes(pcuHr):	198.41	

Scenario 2: '2031 DS1A - PM' (FG2: '2031 DS1A - PM', Plan 1: 'Staging Plan No. 1')
Controller :C1

Stage Sequence Diagram

Stage Stream: 1

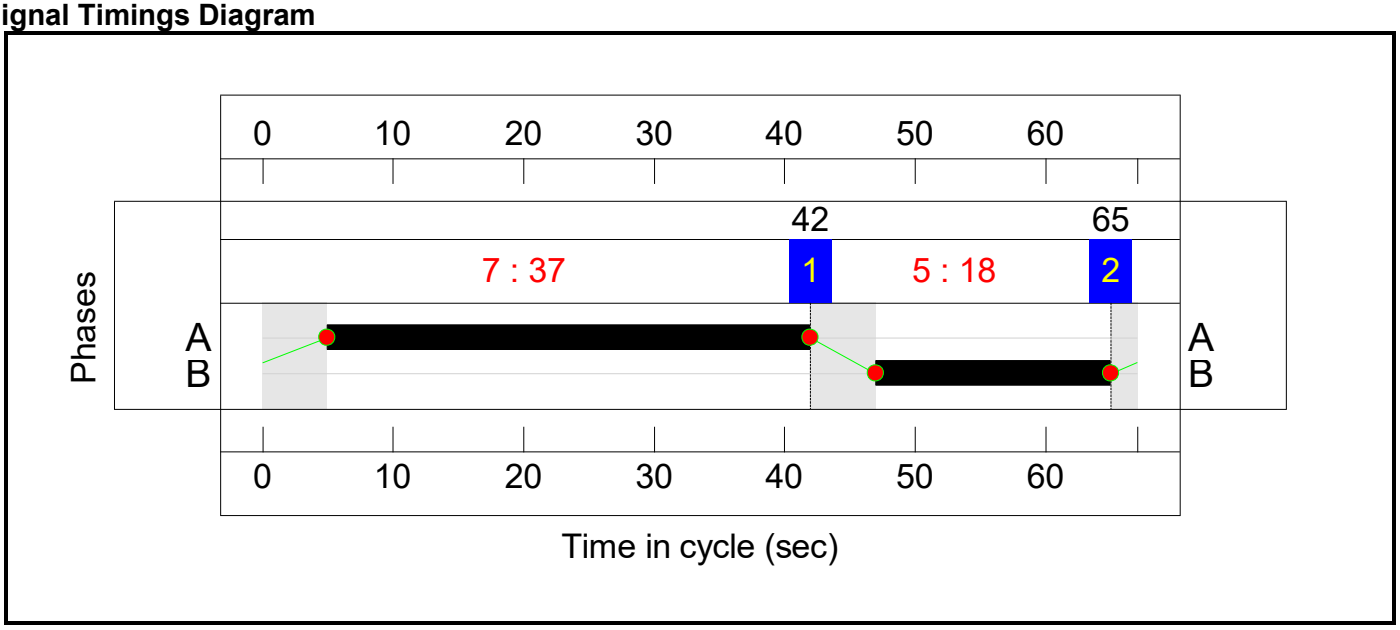


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	18	37
Change Point	42	65

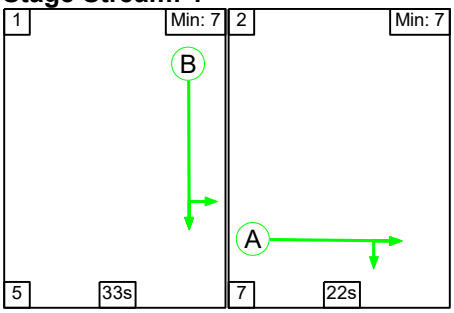
Signal Timings Diagram



Controller :C2

Stage Sequence Diagram

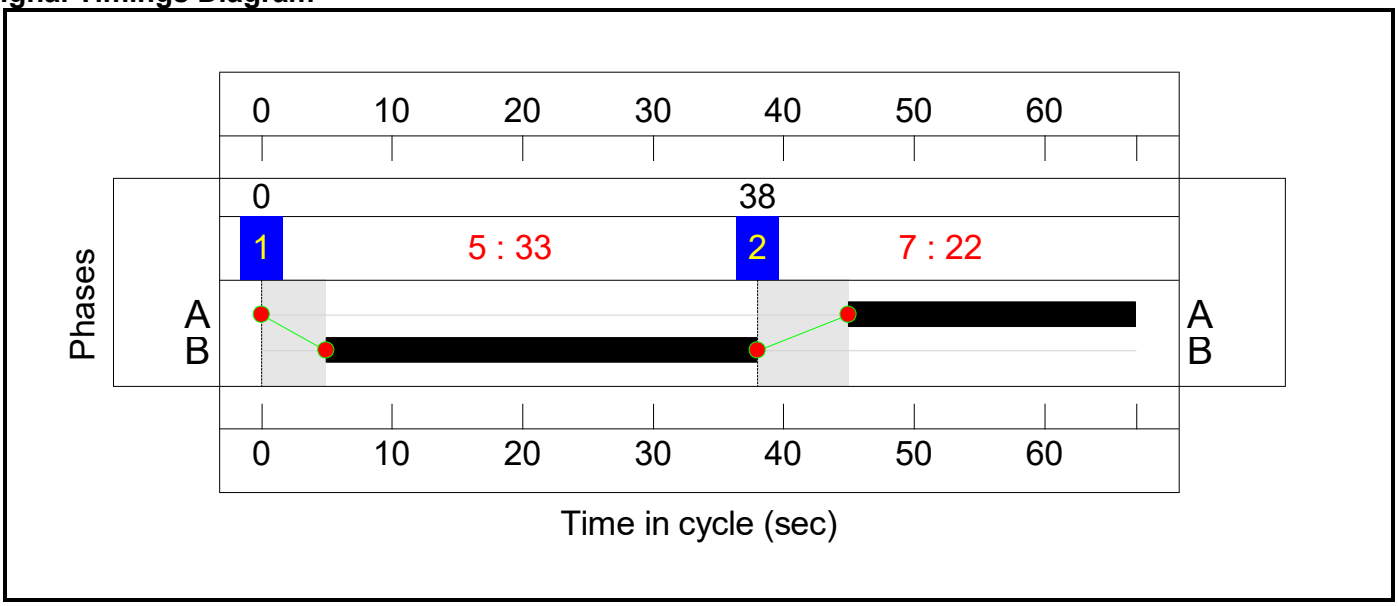
Stage Stream: 1



Stage Timings
Stage Stream: 1

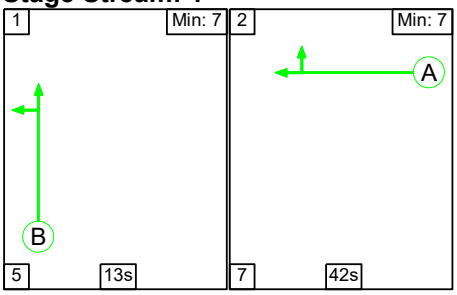
Stage	1	2
Duration	33	22
Change Point	0	38

Signal Timings Diagram



Controller :C3

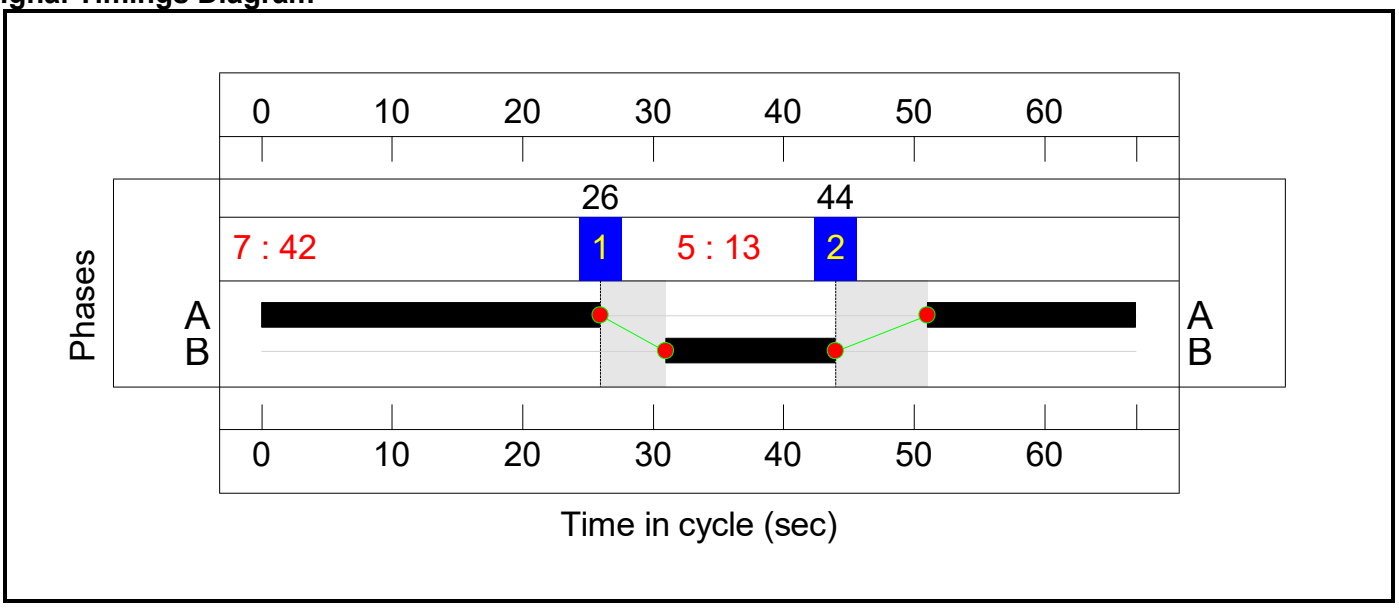
Stage Sequence Diagram
Stage Stream: 1



Stage Timings
Stage Stream: 1

Stage	1	2
Duration	13	42
Change Point	26	44

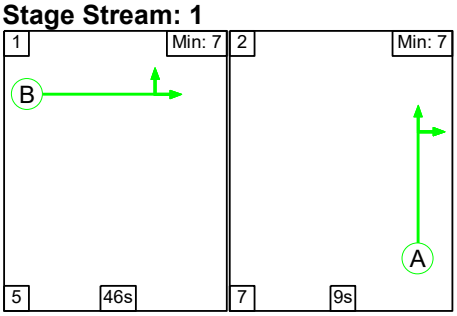
Signal Timings Diagram



Controller :C4

Stage Sequence Diagram

Stage Stream: 1

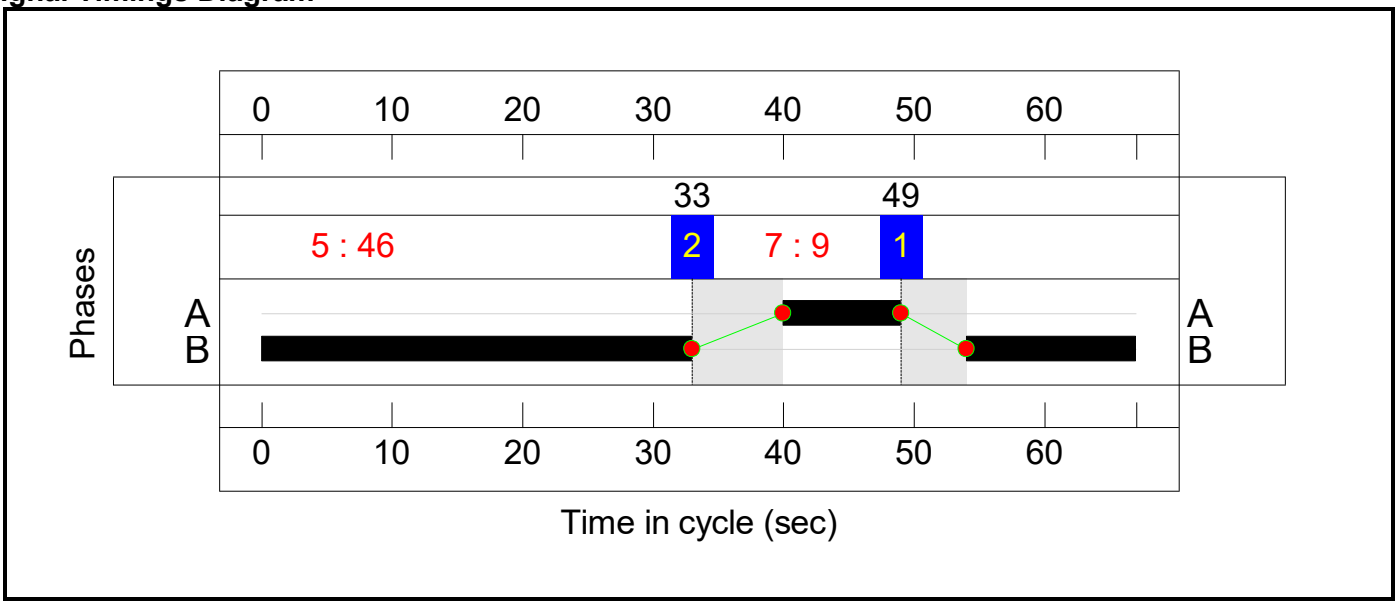


Stage Timings

Stage Stream: 1

Stage	1	2
Duration	46	9
Change Point	49	33

Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
M40 Junction 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**97.9%**
1/1	M40 N Ahead Left	U	2:1	N/A	C2:B		1	33	-	877	1828	928	94.5%
1/2+1/3	M40 N Ahead	U	2:1	N/A	C2:B		1	33	-	1839	1868:1908	915+968	97.4 : 97.9%
2/1	Ahead	U	2:1	N/A	C2:A		1	22	-	526	1945	668	78.8%
2/2	Ahead	U	2:1	N/A	C2:A		1	22	-	545	1977	679	80.3%
2/3	Right Ahead	U	2:1	N/A	C2:A		1	22	-	478	1869	642	74.5%
3/1	A41 Ahead Left	U	1:1	N/A	C1:B		1	18	-	360	1824	517	69.6%
3/2	A41 Ahead	U	1:1	N/A	C1:B		1	18	-	320	1876	532	60.2%
3/3	A41 Ahead	U	1:1	N/A	C1:B		1	18	-	381	1887	535	71.2%
4/1	Right Ahead	U	1:1	N/A	C1:A		1	37	-	892	1869	1060	84.1%
4/2	Right	U	1:1	N/A	C1:A		1	37	-	891	1868	1059	84.1%
4/3	Right	U	1:1	N/A	C1:A		1	37	-	948	1951	1107	85.7%
5/1	M40 S Left	U	3:1	N/A	C3:B		1	13	-	362	1932	404	89.7%
5/2+5/3	M40 S Ahead Left	U	3:1	N/A	C3:B		1	13	-	644	1888:1888	395+269	97.1 : 97.1%
6/1	Ahead	U	3:1	N/A	C3:A		1	42	-	972	1866	1198	81.2%
6/2	Ahead	U	3:1	N/A	C3:A		1	42	-	1149	1904	1222	94.0%
6/3	Right Ahead	U	3:1	N/A	C3:A		1	42	-	1182	1887	1211	97.6%
7/1	A34 Left	U	4:1	N/A	C4:B		1	46	-	1158	1932	1355	85.4%
7/2+7/3	A34 Left	U	4:1	N/A	C4:B		1	46	-	1690	2083:2083	1118+729	91.5 : 91.5%
7/4+7/5	A34 Ahead	U	4:1	N/A	C4:B		1	46	-	1238	1973:1869	733+1174	64.9 : 64.9%
8/2+8/1	Right Ahead	U	4:1	N/A	C4:A		1	9	-	141	1942:1942	290+145	32.4 : 32.4%
8/3	Right	U	4:1	N/A	C4:A		1	9	-	261	2078	310	84.2%
9/3	M40 N Exit	U	N/A	N/A	-		-	-	-	667	1800	1800	37.1%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
M40 Junction 9	**-**	**-**	**0**	**0**	**0**	**58.4**	**44.5**	**0.0**	**102.9**	**-**	**-**	**-**	**-**
1/1	877	877	-	-	-	3.8	6.8	-	10.6	43.6	15.3	6.8	22.2
1/2+1/3	1839	1839	-	-	-	8.1	13.1	-	21.2 (10.2+11.0)	41.5 (41.1:41.7)	17.1	13.1	30.2
2/1	526	526	-	-	-	3.8	0.0	-	3.8	26.1	9.4	0.0	9.4
2/2	545	545	-	-	-	4.1	0.0	-	4.1	27.4	10.1	0.0	10.1
2/3	478	478	-	-	-	2.1	0.0	-	2.1	15.8	5.0	0.0	5.0
3/1	360	360	-	-	-	2.1	1.1	-	3.3	32.7	5.9	1.1	7.0
3/2	320	320	-	-	-	1.8	0.7	-	2.6	29.2	5.1	0.7	5.8
3/3	381	381	-	-	-	2.3	1.2	-	3.5	33.0	6.3	1.2	7.6
4/1	892	892	-	-	-	1.2	0.0	-	1.2	4.8	4.0	0.0	4.0
4/2	891	891	-	-	-	0.5	0.0	-	0.5	2.1	1.3	0.0	1.3
4/3	948	948	-	-	-	0.7	0.0	-	0.7	2.8	1.8	0.0	1.8
5/1	362	362	-	-	-	2.6	3.7	-	6.3	62.5	6.5	3.7	10.2
5/2+5/3	644	644	-	-	-	4.6	8.7	-	13.3 (8.0+5.3)	74.4 (75.2:73.2)	7.0	8.7	15.8
6/1	972	972	-	-	-	4.5	0.0	-	4.5	16.7	17.3	0.0	17.3
6/2	1149	1149	-	-	-	4.3	0.0	-	4.3	13.5	20.7	0.0	20.7
6/3	1182	1182	-	-	-	4.2	0.0	-	4.2	12.9	21.6	0.0	21.6
7/1	1158	1158	-	-	-	2.4	2.9	-	5.2	16.3	15.8	2.9	18.6
7/2+7/3	1690	1690	-	-	-	2.5	5.1	-	7.5 (4.7+2.8)	16.1 (16.6:15.2)	12.3	5.1	17.3
7/4+7/5	1238	1238	-	-	-	1.6	0.9	-	2.5 (0.9+1.6)	7.3 (6.6:7.7)	7.0	0.9	7.9
8/2+8/1	141	141	-	-	-	0.6	0.0	-	0.6 (0.4+0.2)	14.8 (14.2:15.9)	1.2	0.0	1.2
8/3	261	261	-	-	-	0.4	0.0	-	0.4	5.7	4.3	0.0	4.3
9/3	667	667	-	-	-	0.0	0.3	-	0.3	1.7	4.2	0.3	4.5

C1	Stream: 1 PRC for Signalled Lanes (%):	5.1	Total Delay for Signalled Lanes (pcuHr):	11.82	Cycle Time (s): 67
C2	Stream: 1 PRC for Signalled Lanes (%):	-8.8	Total Delay for Signalled Lanes (pcuHr):	41.86	Cycle Time (s): 67
C3	Stream: 1 PRC for Signalled Lanes (%):	-8.4	Total Delay for Signalled Lanes (pcuHr):	32.63	Cycle Time (s): 67
C4	Stream: 1 PRC for Signalled Lanes (%):	-1.7	Total Delay for Signalled Lanes (pcuHr):	16.29	Cycle Time (s): 67
	PRC Over All Lanes (%):	-8.8	Total Delay Over All Lanes(pcuHr):	102.92	

APPENDIX 30

A43 CORRIDOR TECHNICAL NOTE

A43 CORRIDOR

OXFORDSHIRE SRFI

ADC Infrastructure Limited, City Buildings, 34-36 Carrington Street, Nottingham, NG1 7FG
tel. 0115 941 4817, www.ADCinfrastructure.com

DOCUMENT CONTROL

project number: ADC1794			report reference: ADC1794-RP-AP	
version	date	author	reviewer	comments
1		M. Higgins	S Dunhill	internal draft
2	08/12/2025	M. Higgins	S Dunhill	first issue
3	26/03/2026	M. Higgins	S Dunhill	minor corrections to the DS1 scenario

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1.0 INTRODUCTION

1.1 ADC Infrastructure Limited are commissioned by Oxfordshire Railfreight Limited to assess the transport and infrastructure requirements of a proposed Strategic Rail Freight Interchange (SRFI) in Oxfordshire; the subject of a Development Consent Order (DCO) application for a Nationally Significant Infrastructure Project (NSIP), to be known as OxSRFI.

1.2 The proposals include various highway improvements, including alterations to Junction 10 of the M40 motorway and to the A43, both of which meet thresholds for nationally significant highway works and the application will therefore also include two highway NSIPs as part of the DCO.

1.3 This report considers the traffic impacts of the proposed OxSRFI development on the A43 corridor between the A43/A422 Brackley Bypass gyratory and the A43 north of the Baynards Green Roundabout.

Report structure

1.4 The report is structured as follows:

- Section 2 presents a summary and update of the Stage 2 and Stage 3 Transport Modelling.
- Section 3 presents the analysis of the traffic impacts on the A43 corridor for the cumulative scenario without Albion Land.
- Section 4 presents the analysis of the traffic impacts on the A43 corridor for the cumulative scenario with Albion Land.
- Section 5 presents the summary and conclusions.

2.0 SUMMARY OF THE TRANSPORT MODELLING

Transport Working Group and transport modelling strategy

2.1 A Transport Working Group (TWG) was established in November 2020 comprising National Highways (who have responsibility for the Strategic Road Network (SRN)), Aecom (National Highways' term consultant), Oxfordshire County Council (OCC) (who have responsibility for the local highway network), and Cherwell District Council (CDC), the local planning authority.

2.2 To ensure that the potential transport impacts of the Proposed Development are fully considered, and to confirm that the proposed embedded highway mitigation works are appropriate in scale and function, a three-stage transport modelling approach is being followed:

- Stage 1 comprised the options assessment and preliminary design of the embedded Highway Works. The Stage 1 modelling and design work has been completed, and the embedded highway mitigation proposals are agreed in principle with the TWG. The embedded Highway Works are detailed in Technical Note AN (ref. ADC1794-RP-AN).
- Stage 2 comprises strategic transport modelling using the Bicester Transport Model (BTM).
- Stage 3 comprises detailed assessment of the study area using industry standard software, including micro-simulation (VISSIM) modelling of the M40 Junction 10 complex.

2.3 It was established and agreed with the TWG that the BTM is the appropriate strategic transport model to use to assess the traffic impacts of the Proposed Development in Stage 2. The agreed assessment years and scenarios to be tested in the BTM are as follows:

1. **DfT Circular 01/2022 Compliant Scenario**: assessment of the impact on the SRN (year of opening with 100% of the Proposed Development and all embedded Highway Works).
2. **2031 Opening Year**: the opening year assessment, with the first phase of the Proposed Development and the first phase of the embedded Highway Works, used to demonstrate the suitability of proposed first phase of development on both SRN and local road network.
3. **2034 Completion Year**: the completion year assessment, with all of the Proposed Development and all of the embedded Highway Works.
4. **2042 Future Year (Sensitivity Test)**: end of Local Plan period, for information only.

2.4 It is agreed with the TWG that Scenarios 2, 3 and 4 will be assessed with and without the Framework Travel Plan. For each scenario there is Reference Case (without OxSRFI) and Do-Something Case (with OxSRFI) as summarised in the table below.

Scenario name	Year	Scenario ID			
		Baseline	Reference Case	Do Something	Do-Something with Travel Plan
Baseline	2023	B2023	-	-	-
Baseline	2024	B2024	-	-	-
1: DfT Circular 01/2022	2031	-	RC1 SRN	DS1 SRN	-
2: Opening Year	2031	-	RC2	DS2	DS2wTP
3: Completion Year	2034	-	RC3	DS3	DS3wTP
4: Local Plan (Sensitivity)	2042	-	RC4	DS4	DS4wTP

2.5 The Albion Land scheme[1] received a resolution to grant planning permission at the 3 July 2025 CDC planning committee meeting. Up to that point the Stage 2 transport modelling was proceeding without the inclusion of this scheme as it was a speculative planning application with

[1] Albion Land scheme (planning applications references 21/03268/OUT, 21/03267/OUT, and 21/03266/F)

no planning status and did not form part of the agreed Uncertainty Log for the modelling scenarios. However, following the resolution to grant planning permission for the Albion Land development, the TWG requested that the Albion Land scheme be included in the Reference Case Stage 2 transport modelling scenarios, because the scheme includes a requirement to upgrade the A43 Baynard's Green to a signal controlled roundabout. Accordingly, the Stage 2 transport modelling has been updated to include the Albion Land scheme and the associated highway improvement at Baynard's Green in the Reference Case.

2.6 The updated assessment scenarios use the same naming convention as given in the above table, but with a 'A' suffix, to denote that they include the Albion land scheme and that scheme's highway works, as set out in the table below.

Scenario name	Year	Scenario ID (with Albion Land scheme)			
		Baseline	Reference Case	Do Something	Do-Something with Travel Plan
Baseline	2023	B2023	-	-	-
Baseline	2024	B2024	-	-	-
1: DfT Circular 01/2022	2031	-	RC1A SRN	DS1A SRN	-
2: Opening Year	2031	-	RC2A	DS2A	DS2AwTP
3: Completion Year	2034	-	RC3A	DS3A	DS3AwTP
4: Local Plan (Sensitivity)	2042	-	RC4A	DS4A	DS4AwTP

2.7 It was agreed with the TWG that these assessment scenarios are those on which the assessment of the transport effects of the Proposed Development be examined. However, the Albion Land scheme does not yet have a decision notice and CDC have advised that the scheme is to be taken back before planning committee and CDC have indicated that this is likely to be sometime in early 2026.

2.8 Therefore, until and unless planning permission pursuant to that scheme is obtained, it is also appropriate with regards to the layout and operation of the A43 Baynard's Green junction to continue to consider the relevant scenarios from the table at paragraph 2.4. That being the RC1 SRN and DS1 SRN scenarios. In this way, the DCO will include for a range of options at the A43 Baynard's Green to allow for the following situations:

- The Albion Land scheme does not receive planning permission.
- The Albion Land scheme does receive planning permission(s) but has not yet commenced construction of the works at the A43 Baynard's Green Roundabout in accordance with the planning permission(s) for that scheme.
- The works at the A43 Baynard's Green Roundabout in accordance with the planning permission(s) for the Albion Land scheme have been completed or have commenced construction.

Stage 2 transport modelling summary and update

2.9 The stage 2 BTM modelling work is ongoing, though the following scenarios have been completed:

- 2031 (DfT Circular 01/2022 compliant scenario) Reference Case (RC1) and Do-Something case (DS1) scenarios.
- 2031 (DfT Circular 01/2022 compliant scenario) Reference Case with Albion Land (RC1A) and Do-Something case with Albion Land (DS1A) scenarios.
- 2034 (Completion Year) Reference Case with Albion Land (RC3A) and Do-Something case with Albion Land (DS3A) scenarios.

2.10 Technical Note AN (ref. ADC1794-RP-AN) presents the analysis of the Stage 2 Transport Modelling for the RC3A and DS3A scenarios, establishing the impacts of the Proposed Development in the 2034 Completion Year without the effects of the STS and Framework Travel Plan. The Stage 2 Transport Modelling analysis concludes by establishing the study area to be taken forward into the Stage 3 Transport Modelling.

2.11 Included in the study area are the A43 Barley Mow Roundabout, the A43 Groves Roundabout and the A43/A422 Brackley Bypass gyratory.

Stage 3 transport modelling summary and update

2.12 The Stage 3 Transport Modelling will involve detailed junction modelling of the study area junctions using industry standard software. The detailed junction modelling will use the peak hour traffic flows output from the Stage 2 Transport Modelling (the BTM strategic modelling).

2.13 The Stage 3 Transport Modelling work is ongoing. An Interim Report (ref: ADC1794-RP-AO-v3) was prepared for the Stage 2 Statutory Consultation and presents the outcomes of the detailed assessment of the study area junctions completed to date, using industry standard assessment tools in the 2034 Completion Year (DS3A scenario).

2.14 The remaining Stage 3 Transport Modelling work is ongoing and will be reported in the final Transport Assessment.

2.15 However, as part of this ongoing Stage 3 modelling work, capacity issues have been noted at the A43 Barley Mow Roundabout and hence this report uses outputs from the BTM to consider in detail the likely impacts on the A43 corridor between the A43/422 Brackley Bypass gyratory and the A43 north of the Baynards Green Roundabout. This report also presents the results of detailed junction assessments of the A43 Barley Mow Roundabout for the 2031 RC1, RC1A, DS1 and DS1A scenarios.

3.0 A43 CORRIDOR – CUMULATIVE SCENARIO WITHOUT ALBION LAND

3.1 To understand the effect of the Proposed Development and the embedded Highway Works on the A43 corridor in the cumulative scenario without the Albion Land development, this section of this report details the changes in traffic flow and network performance between the A43/A422 Brackley Bypass and the A43 Baynards Green Roundabout in the 2031 DS1 scenario, when compared to the 2031 RC1 scenario. This is achieved through analysis of the following:

- development traffic assignment
- total flow difference due to the Proposed Development and the embedded Highway Works
- changes to the volume to capacity (V/C) ratios at links and nodes
- detailed junction assessment at the Barley Mow Roundabout
- journey time and delay.

Development traffic assignment

3.2 The table below quantifies the total number of development trips assigned to the A43 corridor in the 2031 DS1 scenario for the morning and evening peak hours. The '% of total' is the percentage of the total OxSRFI development traffic on a link (based on the two-way flow).

OxSRFI development traffic assignment - A43 corridor				
Link	AM peak hour		PM peak hour	
	Total (pcu)	% of total	Total (pcu)	% of total
A422 Brackley Bypass WB	0	0%	0	0%
A422 Brackley Bypass EB	2		4	
Oxford Road NB	5	3%	55	4%
Oxford Road SB	47		16	
A43 Brackley Bypass EB	23	10%	152	10%
A43 Brackley Bypass WB	134		43	
A43 SB between Brackley and Groves Roundabout	183	13%	64	14%
A43 NB between Groves Roundabout and Brackley	28		207	
A43 SB between Groves Roundabout and Barley Mow	183	13%	64	14%
A43 NB between Barley Mow and Groves Roundabout	28		207	
A421 EB	15	5%	71	5%
A421 WB	61		29	
B4031 EB	34	2%	11	3%
B4031 WB	2		39	
A43 SB between Barley Mow and Baynards Green	278	20%	104	22%
A43 NB between Baynards Green and Barley Mow	44		318	

3.3 The table details the OxSRFI traffic routing for the 2031 DS1 scenario as follows:

- 20% of the two-way development traffic is on the A43 between the Baynard's Green and Barley Mow Roundabouts in the morning peak hour, increasing to 22% in the evening peak hour.
- At the Barley Mow Roundabout, development traffic splits with 13% remaining on the A43 in the morning peak (14% in the evening peak), and 5% routing on the A421 to/from Buckingham and the east in both peak hours.
- Just 2% of the development traffic flow is on the B4031 in the morning peak hour, 3% in the evening peak hour.
- 10% of the development traffic routes to/from the A43 Brackley Bypass.
- 3% of the development traffic flow routes to/from Brackley via Oxford Road in the morning peak hour, 4% in the evening peak.
- There are very few development trips on the A422 Brackley bypass in either the morning or evening peak hours.

Traffic flow change – morning peak hour

3.4 The development traffic routing on the A43 corridor is detailed above. However, the future year traffic volumes on the highway network are comprised of two elements. Firstly, the development traffic, but also background traffic that may reassign because a) the changes to infrastructure and highway conditions mean that alternative routes become quicker and/or more attractive, or b) existing trips on the network reassign due to changes in the demand model i.e. employment trips to/from OxSRFI replacing trips to/from other employment zones in the model.

3.5 Technical Note AN (the Stage 2 Transport Modelling Report) concluded that for the M40 and A43 corridors in the 2034 completion year, there is a significant amount of background traffic reassignment due to the embedded Highway Works helping to return background traffic to the higher category roads and away from the local road network, which is a positive effect.

3.6 This section of the report considers the traffic flow changes on the A43 corridor in greater detail for the 2031 DfT 01/2022 Circular compliant scenario. The table below summarises the total change in traffic flow, the volume of development vehicle trips and the change in background traffic flows in the morning peak hour for the 2031 DS1 scenario as compared to the RC1 scenario. The traffic flows are given in pcus.

2031 DS1 vs RC1 flow analysis - morning peak hour					
Link	RC1	DS1	Flow difference	OxSRFI	Background traffic change
A422 Brackley Bypass WB	372	368	-4	0	-4
A422 Brackley Bypass EB	267	307	40	2	38
Oxford Road NB	167	151	-16	5	-21
Oxford Road SB	251	431	180	47	133
A43 Brackley Bypass EB	1,274	1,273	-1	23	-24
A43 Brackley Bypass WB	1,874	2,032	158	134	24
A43 SB between Brackley and Groves Roundabout	1,913	2,152	239	183	56
A43 NB between Groves Roundabout and Brackley	1,334	1,298	-36	28	-64
A43 SB between Groves Roundabout and Barley Mow	1,918	2,154	236	183	53
A43 NB between Barley Mow and Groves Roundabout	1,339	1,294	-45	28	-73
A421 EB	836	614	-222	15	-237
A421 WB	624	878	254	61	193
B4031 EB	228	314	86	34	52
B4031 WB	203	136	-67	2	-69
A43 SB between Barley Mow and Baynards Green	2,185	2,785	600	278	322
A43 NB between Baynards Green and Barley Mow	1,793	1,716	-77	44	-121

3.7 The changes to the traffic flows on the A43 corridor are summarised below:

- There are no material traffic flow changes in the morning peak hour on the A422 Brackley Bypass due to the proposed development.
- There is a modest traffic increase southbound on Oxford Road due to development traffic.
- Traffic flows increase on the A43 Brackley Bypass approach to the A43/A422 Brackley Bypass gyratory by 158 pcus and this increase is largely due to development trips, with a small amount of additional traffic due to background reassignment.
- Northbound on the A43 from Baynards Green to south of the A43/A422 Brackley Bypass gyratory, traffic flows decrease slightly with the OxSRFI development in place. Hence, northbound from Baynard's Green a relatively small volume of background traffic is being displaced by development traffic. This is not a material effect and is likely to be due to changes to the demand model.
- Southbound on the A43 from south of the A43/A422 Brackley Bypass gyratory to the Barley Mow Roundabout, traffic flows increase by slightly more that the OxSRFI development traffic on this route, indicating that there is some background traffic reassigning to this

route. This is mostly due to the embedded Highway Works, especially the upgrades to the Baynard's Green Roundabout and M40 Junction 10.

- There would be a significant increase of 254 pcus on the A421 westbound towards the A43 southbound. The OxSRFI development traffic flow on this route is 61 pcus, meaning that there is a background traffic reassignment of 193 pcus on this route. This is traffic routing towards Bicester, Oxford and the M40 southbound from Buckingham and Milton Keynes switching to the A421/A43/M40 from minor routes through and around Bicester towards the A41 and M40 Junction 9. This reassignment occurs due to the embedded Highway Works improving journey times to the M40 southbound via M40 Junction 10. **Figure 1** below shows the traffic flow differences around the Barley Mow Roundabout (green indicates a traffic increase and blue indicates a decrease).
- The B4031 eastbound approach to the Barley Mow Roundabout has a modest traffic increase made up of both development traffic and reassigning background traffic towards the A43 south. There is a corresponding reduction in westbound traffic on the B4031 which is almost exclusively due to background traffic reassignment.
- On the A43 southbound between the Barley Mow Roundabout and Baynard's Green the traffic flow increases by 600 pcus, with 54% of this traffic increase caused by background traffic reassigning to the A43 due to improved journey times and reduced delay delivered by the embedded Highway Works at Baynard's Green and M40 Junction 10.
- Traffic travelling eastbound from the Barley Mow Roundabout on the A421 reduces significantly due to background traffic reassignment. In the 2031 RC1 morning peak hour scenario, traffic travelling towards Bicester from the A43 southbound is turning left off the A43 at the Barley Mow Roundabout to route south via the A421 eastbound and Hethe Road. In the DS1 scenario, the positive impact of the MSRR, Ardley Bypass, Baynard's Green and M40 Junction 10 upgrades mean that this traffic remains on the A43. This effect can be seen by the blue line (traffic flow decrease) in the flow difference plot in **Figure 1** below.

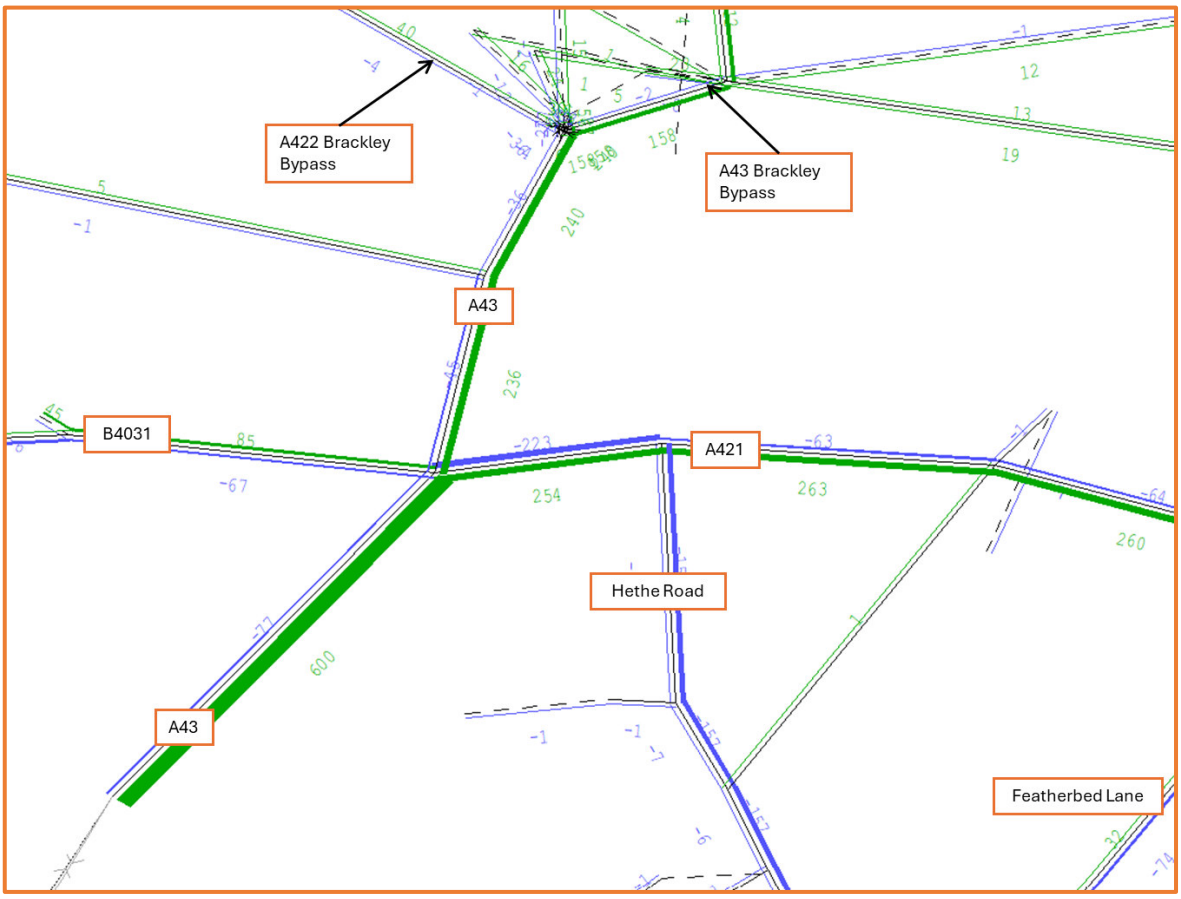


Figure 1: extract of the morning peak hour flow difference plot (DS1-RC1) for A43, A421 and Barley Mow

Traffic flow change – evening peak hour

3.8 The table below summarises the total change in traffic flow, the volume of development vehicle trips and the change in background traffic flows in the evening peak hour for the 2031 DS1 scenario as compared to the RC1 scenario. The traffic flows are given in pcus.

2031 DS1 vs RC1 flow analysis - evening peak hour					
Link	RC1	DS1	Flow difference	OxSRFI	Background traffic change
A422 Brackley Bypass WB	221	212	-9	0	-9
A422 Brackley Bypass EB	380	429	49	4	45
Oxford Road NB	255	339	84	55	29
Oxford Road SB	183	178	-5	16	-21
A43 Brackley Bypass EB	1,735	2,013	278	152	126
A43 Brackley Bypass WB	1,357	1,391	34	43	-9
A43 SB between Brackley and Groves Roundabout	1,448	1,528	80	64	16
A43 NB between Groves Roundabout and Brackley	1,738	2,094	356	207	149
A43 SB between Groves Roundabout and Barley Mow	1,457	1,532	75	64	11
A43 NB between Barley Mow and Groves Roundabout	1,748	2,101	353	207	146
A421 EB	572	791	219	71	148
A421 WB	664	652	-12	29	-41
B4031 EB	186	195	9	11	-2
B4031 WB	210	312	102	39	63
A43 SB between Barley Mow and Baynards Green	1,924	1,987	63	104	-41
A43 NB between Baynards Green and Barley Mow	2,147	2,812	665	318	347

3.9 There is a strong tidal traffic flow effect on the A43 between Brackley and M40 Junction 10 and hence many of the effects described above for the morning peak hour are reversed for the evening peak, as summarised below:

- There is a modest increase in traffic flow on the eastbound approach to the A43/A422 Brackley Bypass, mostly due to background traffic reassignment.
- There is also a modest increase in traffic northbound on Oxford Road due to development traffic and background traffic reassignment.
- The traffic flow on the A43 Brackley Bypass eastbound exit from the A43/A422 Brackley Bypass gyratory increases by 278 pcus. This increase is due to both development traffic (55%) and background traffic reassignment (45%).
- Southbound on the A43 from south of the A43/A422 Brackley Bypass gyratory to the Barley Mow Roundabout, traffic flows increase by slightly more that the OxSRFI development traffic on this route, with a relatively small amount of background traffic reassignment. South of the Barley Mow Roundabout, the southbound traffic flow increases by slightly less than the OxSRFI development traffic flow.
- On the A43 northbound between Baynard's Green and the Barley Mow Roundabout, the traffic flow increases by 665 pcus, with 52% of this traffic increase caused by background traffic reassigning to the A43 due to improved journey times and reduced delay delivered by the embedded Highway Works at Baynard's Green and M40 Junction 10.
- Northbound on the A43 from the Barley Mow Roundabout to south of the A43/A422 Brackley Bypass gyratory, traffic flows increase by c.350 pcus with the OxSRFI development in place, with 42% of this increase due to background traffic reassignment.
- There would be no material traffic increase on the A421 westbound in the evening peak.
- Traffic travelling east from the Barley Mow Roundabout on the A421 increases by 219 pcus, with 68% of this increase due to background traffic reassignment. This is the reverse effect described for the morning peak hour, with traffic routing towards Buckingham and Milton Keynes from Bicester, Oxford and the M40 switching to the M40/A43/A421 route from minor routes through and around Bicester. This reassignment occurs due to the improvements

delivered by the embedded Highway Works at Baynard's Green and M40 Junction 10. **Figure 2** below shows the traffic flow differences around the Barley Mow Roundabout.

- There is no material change in traffic flows on the B4031 eastbound approach to the Barley Mow Roundabout in the evening peak hour. The B4031 westbound flow increases by 102 pcus, with 60% of this increase due to background traffic reassignment.

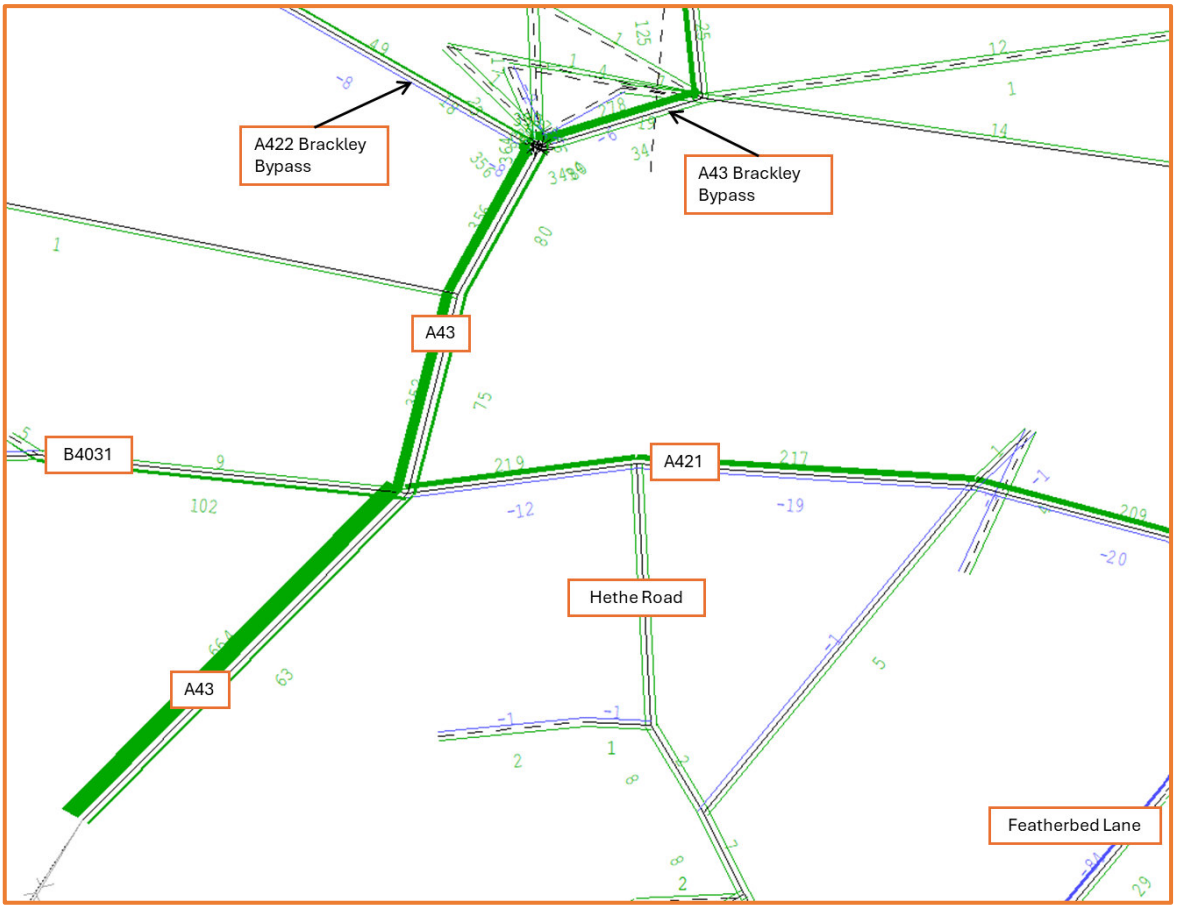


Figure 2: extract of the evening peak hour flow difference plot (DS1-RC1) for A43, A421 and Barley Mow

Volume over capacity ratio

3.10 To further understand the likely impact of these traffic flow changes, it is necessary to consider the levels of congestion on the A43 corridor in the RC1 scenario and understand how congestion levels change with the Proposed Development in place. This can be achieved by calculating the ratio of traffic volumes against the theoretical capacity on links and nodes throughout the network. Link/node volume to capacity (V/C) ratios exceeding 85% indicate that the link/node is under stress which may result in increases in delay and, therefore, journey time.

3.11 The table below summarises the link/node V/C ratios for the 2031 RC1 and DS1 scenarios in the respective morning and evening peak hours. The table also shows the difference between the two scenarios.

2031 DS1 vs RC1 V/C analysis						
Link	morning peak			evening peak		
	RC1	DS1	DS1 - RC1	RC1	DS1	DS1 - RC1
A422 Brackley Bypass EB	13%	15%	2%	19%	22%	3%
Oxford Road SB	20%	25%	5%	15%	15%	0%
A43 Brackley Bypass WB	57%	63%	6%	41%	42%	1%
A43 SB between Brackley and Groves Roundabout	87%	100%	13%	66%	70%	4%
A43 NB between Groves Roundabout and Brackley	33%	33%	0%	43%	52%	9%
A43 SB between Groves Roundabout and Barley Mow	94%	111%	17%	69%	79%	10%
A43 NB between Barley Mow and Groves Roundabout	61%	59%	-2%	79%	95%	16%
A421 WB	69%	118%	49%	65%	66%	1%
B4031 EB	25%	35%	10%	24%	34%	10%
A43 SB between Barley Mow and Baynards Green	127%	77%	-50%	87%	60%	-27%
A43 NB between Baynards Green and Barley Mow	58%	54%	-4%	69%	91%	22%

3.12 For the morning peak hour, the table shows that the majority of links/nodes on the A43 corridor would have V/C ratios below 85%. However, the table shows that there are three links/nodes with a V/C above 85% in the RC1 scenario and three links/nodes with a V/C above 85% in the DS1 scenario:

- The A43 southbound approach to the Groves Roundabout would have a V/C of 87% in the RC1 scenario, increasing to 100% in the DS1 scenario. The traffic flows on the two minor road approaches to the Groves Roundabout are very low and hence the operation of the Groves Roundabout is not considered a major factor in the operation of the A43 corridor. Therefore, whilst this roundabout is identified as a study area junction and will be assessed in detail as part of the Transport Assessment, it is not considered in detail in this paper.
- The A43 southbound approach to the Barley Mow Roundabout would have a V/C of 94% in the RC1 scenario, increasing to 111% in the DS1 scenario.
- The A421 westbound approach to the Barley Mow Roundabout would have a V/C of 69% in the RC1 scenario, increasing to 118% in the DS1 scenario.
- The A43 southbound approach to the Baynard's Green Roundabout would have a V/C of 127% in the RC1 scenario. The proposed improvements to the roundabout that form part of the embedded Highway Works agreed in principle with the TWG would remove this congestion, with the V/C dropping to 77% in the DS1 scenario.

3.13 In the evening peak hour, the table shows that there is one link/node with a V/C above 85% in the RC1 scenario and only two links/nodes with a V/C above 85% in the DS1 scenario:

- The V/C on the A43 northbound approach to the Groves Roundabout would have a V/C of 79% in the RC1 scenario, increasing to 95% in the DS1 scenario.
- The V/C on the A43 northbound approach to the Barley Mow Roundabout would have a V/C of 69% in the RC1 scenario, increasing to 91% in the DS1 scenario.
- The A43 southbound approach to the Baynard's Green Roundabout would have a V/C of 87% in the RC1 scenario dropping to 60% in the DS1 scenario with the embedded Highway Works in place.

Barley Mow Roundabout

3.14 The analysis above shows that there are large traffic increases on the A43 and A421 approaches to the Barley Mow Roundabout in the 2031 DS1 scenario for both the morning and evening peak hours. A significant proportion of the traffic flow increase is due to background traffic reassignment that is likely induced by the improvements afforded at the Baynard's Green Roundabout and M40 Junction 10. Background traffic is returned to the higher category roads and away from the local road network, which is a positive effect.

3.15 However, the V/C analysis suggests that when the capacity constraints on the SRN at Baynard's Green and M40 Junction 10 is removed, the background traffic reassignment is causing some of the approaches to the Barley Mow Roundabout to become congested. Therefore, the performance of the Barley Mow Roundabout has been considered in detail.

3.16 The A43 Barley Mow Roundabout is a four-arm priority controlled roundabout, located c.5km north of the Baynard's Green Roundabout. The A43 north and south arms each has a two-lane approach, with the A421 and B4031 approaches both having single lanes, flaring to two lanes at the entry. The existing roundabout is shown at **Figure 3** below.

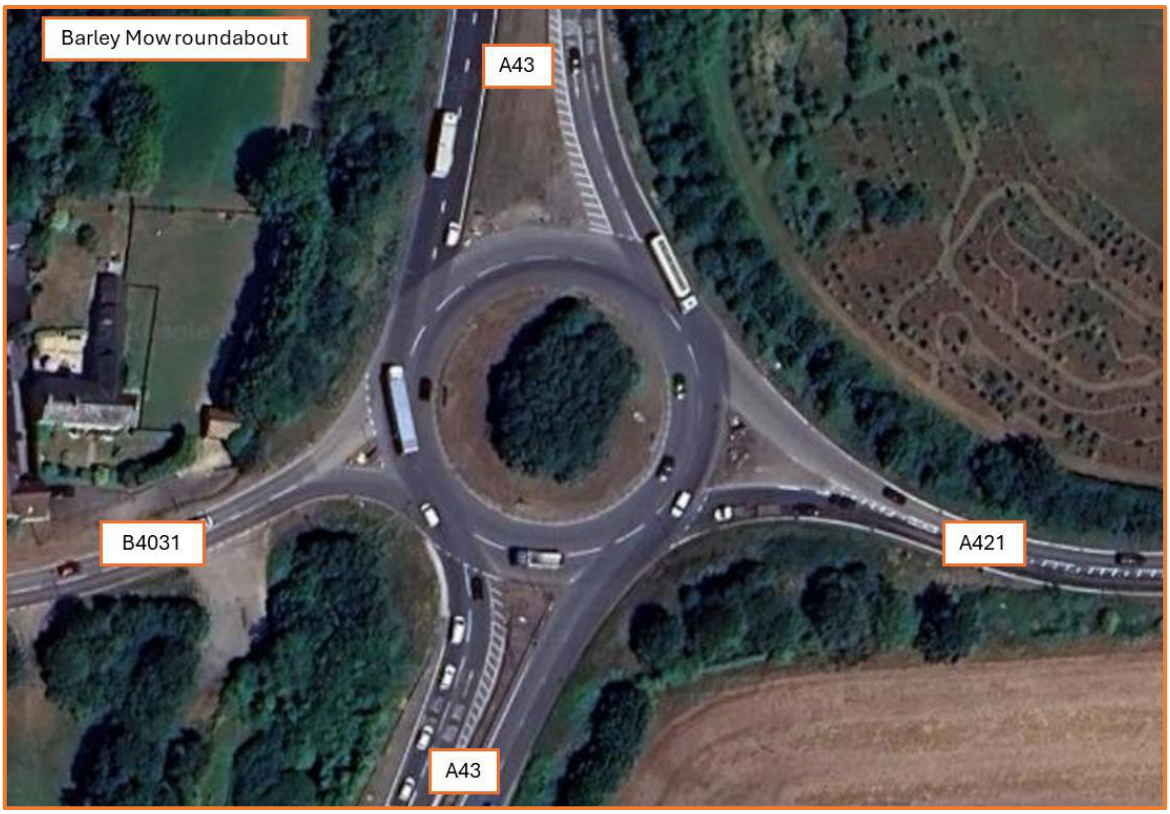


Figure 3: A43 Barley Mow Roundabout

3.17 A model of the junction was created using Junctions 11 ARCADY software with geometries measured from OS mapping. The model was tested with the 2031 RC1 and DS1 traffic forecasts from the BTM, provided at **Appendix A**. The ARCADY geometries and model results are provided at **Appendix B** and summarised below.

	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2031 - RC1						
A43 North	74.0	119.8	107%	3.3	8.1	77%
A421	2.9	19.5	75%	2.1	11.0	68%
A43 South	3.8	7.6	80%	14.3	24.3	95%
B4031	0.9	13.9	48%	1.4	26.1	60%
2031 - DS1						
A43 North	197.2	338.4	120%	5.3	12.3	85%
A421	97.9	540.3	124%	2.3	12.6	70%
A43 South	2.7	5.8	73%	312.7	466.8	124%
B4031	1.4	15.2	59%	2.3	41.7	72%

3.18 The results show that in the RC1 morning peak hour the A421, A43 south and B4031 approaches to the roundabout would operate with a ratio of flow to capacity (RFC) comfortably below 85%,

indicating that there are no capacity issues on these arms. However, the A43 north arm would have a RFC of 107%, and is subject to queuing and delay. In the evening peak hour, the results show that the A421, A43 north and B4031 approaches to the roundabout would operate with a ratio of flow to capacity (RFC) comfortably below 85%, but the A43 south approach would have a RFC of 95% with some queuing and delay.

3.19 Hence, without the OxSRFI development and no mitigation works at Baynard's Green or M40 Junction 10, there would be a capacity issue on the A43 southbound approach to the Barley Mow Roundabout in the 2031 morning peak hour, with the A43 northbound approach operating close to capacity in the 2031 evening peak hour.

3.20 With OxSRFI and the associated embedded Highway Works (including Baynard's Green and M40 Junction 10) in place, the ARCADY results show that in the 2031 DS1 morning peak hour, the performance of the roundabout would deteriorate when compared to the RC1 scenario. In the DS1 morning peak hour, the RFC on the A43 southbound approach would increase from 107% to 120%, and the A421 approach would have a RFC of 124%, increasing from 75%. In the DS1 evening peak hour, the RFC on the A43 northbound approach would increase from 95% to 124%, though the RFC on the other three approaches does not increase above 85%.

3.21 The ARCADY results above and the V/C analysis presented earlier in this section both demonstrate that in the morning peak hour there would be increased congestion on the A43 southbound and A421 approaches to the Barley Mow Roundabout, with increased congestion on the A43 northbound approach in the evening peak hour. These increases in congestion are due to both development traffic flows and a large volume of reassigning background traffic. The high volumes of reassigning traffic to the A43 and A421 indicate that the wider network improvements delivered by the OxSRFI embedded Highway Works outweigh the increased congestion at the Barley Mow Roundabout such that these routes are still favourable.

Journey time and delay analysis

3.22 To understand the effects of the embedded highway mitigation strategy on the wider network, and in particular to understand how the performance of the Barley Mow Roundabout could affect the popularity of the A43 and A421 corridors, journey times and delays in the RC1 and DS1 scenarios have been extracted from the BTM for the following routes:

- from the A43 (just south of Brackley) to the M40 beyond the end of M40 SB slip road
- from the M40 NB (existing) diverging slip to the A43 (just South of Brackley)
- from the A421 (Barton Hartshorn junction) to end of M40 SB slip road
- from the M40 NB (existing) diverging slip to A421 (Barton Hartshorn junction).

3.23 The average journey times and delay on the above routes in the RC1 and DS1 morning peak hour scenarios are summarised in tables below, and the Saturn plots containing the journey time and delay data are provided at **Appendix C**.

2031 journey time analysis - morning peak hour (time in seconds)			
Link	RC1	DS1	DS1-RC1
A43 (south of Brackley) to end of M40 SB slip road	817	501	-316
M40 NB diverging slip to A43 (south of Brackley)	386	444	58
A421 (Barton Hartshorn jct) to end of M40 SB slip road	1,033	804	-229
M40 NB diverging slip to A421 (Barton Hartshorn jct)	621	667	46

2031 average delay - morning peak hour (time in seconds)			
Link	RC1	DS1	DS1-RC1
A43 (south of Brackley) to end of M40 SB slip road	442	116	-326
M40 NB diverging slip to A43 (south of Brackley)	31	17	-14
A421 (Barton Hartshorn jct) to end of M40 SB slip road	453	214	-239
M40 NB diverging slip to A421 (Barton Hartshorn jct)	60	37	-23

3.24 The table shows that in the morning peak hour there would be significant reductions in journey time and delay on the route between the A43 south of Brackley to the M40 south of Junction 10 (journey time reduces by more than 5 minutes), and on the route between the A421 at the Barton Hartshorn junction and the M40 south of Junction 10 (journey time reduces by c.4 minutes). There are relatively modest increases in journey time on the opposing routes north, largely due to the increased journey distance due to the new M40 to A43 slip road (c.750m) and the increased presence of traffic signals. However, as shown, delay on these routes still reduces as traffic flow is better controlled and junction capacities have increased.

3.25 In the evening peak hour, the tables below shows that there would be journey time and delay reductions on all four routes, with the journey times on the two northbound routes to the A43 south of Brackley and the A421 reducing by more than 1 minute 30 seconds and 1 minute 20 seconds, respectively. There would also be significant delay reductions on these routes.

2031 journey time analysis - evening peak hour (time in seconds)			
Link	RC1	DS1	DS1-RC1
A43 (south of Brackley) to end of M40 SB slip road	463	420	-43
M40 NB diverging slip to A43 (south of Brackley)	577	485	-92
A421 (Barton Hartshorn jct) to end of M40 SB slip road	687	641	-46
M40 NB diverging slip to A421 (Barton Hartshorn jct)	797	715	-82

2031 average delay - evening peak hour (time in seconds)			
Link	RC1	DS1	DS1-RC1
A43 (south of Brackley) to end of M40 SB slip road	96	34	-62
M40 NB diverging slip to A43 (south of Brackley)	220	67	-153
A421 (Barton Hartshorn jct) to end of M40 SB slip road	116	51	-65
M40 NB diverging slip to A421 (Barton Hartshorn jct)	235	93	-142

3.26 Therefore, the analysis of journey times between the A43 south of Brackley and the M40 south of Junction 10, and also between the A421 at the Barton Hartshorn junction and the M40 south of Junction 10, show that there would be significant improvements despite the induced congestion issues at the Barley Mow Roundabout. Hence, the improvements to journey time and delay delivered by the embedded Highway Works at Baynard's Green and M40 Junction 10 outweigh the increased congestion at the Barley Mow Roundabout such that these routes are still likely to attract high volumes of reassigning traffic to the A43 and A421, which is a positive effect.

4.0 A43 CORRIDOR – CUMULATIVE SCENARIO WITH ALBION LAND

4.1 As discussed in Section 2, the Albion Land scheme to the east and west of Baynards Green on the B4100 received a resolution to grant planning permission at the 3 July 2025 CDC planning committee meeting. Following the resolution to grant planning permission, the TWG requested that the Albion Land scheme be included in the Reference Case Stage 2 transport modelling scenarios, because the scheme includes a requirement to upgrade the A43 Baynard's Green to a signal controlled roundabout.

4.2 However, the Albion Land scheme does not yet have a decision notice, and CDC have advised that the scheme is to be taken back before planning committee. Therefore, until and unless planning permission pursuant to that scheme is obtained, it is appropriate to consider the impact of the Proposed Development on the A43 corridor in the 'without Albion Land' cumulative RC1 and DS1 scenarios, as set out in detail in Section 3.

4.3 Nonetheless, the 2031 01/2022 DfT Circular compliant 'with Albion Land' scenarios have also been modelled in the BTM to give the cumulative scenario with Albion Land. Hence, this section of this report considers the effect of the Proposed Development and the embedded Highway Works on the A43 corridor between the A43/A422 Brackley Bypass and the A43 Baynard's Green Roundabout in the 2031 DS1A scenario, when compared to the 2031 RC1A scenario.

Development traffic assignment

4.4 The table below quantifies the total number of development vehicle trips assigned to the A43 corridor in the 2031 DS1A scenario for the morning and evening peak hours. The table also provides a comparison to the DS1 scenario so that the effect of the Albion Land scheme on the OxSRFI development traffic assignment can be understood. The traffic flows are given in pcus.

OxSRFI development traffic assignment - A43 corridor (shown in pcus)						
Link	AM peak hour			PM peak hour		
	DS1	DS1A	Difference	DS1	DS1A	Difference
A422 Brackley Bypass WB	0	0	0	0	0	0
A422 Brackley Bypass EB	0	0	0	5	4	-1
Oxford Road NB	6	5	-1	55	55	0
Oxford Road SB	61	47	-14	19	18	-1
A43 Brackley Bypass EB	28	23	-5	151	152	1
A43 Brackley Bypass WB	170	134	-36	46	42	-4
A43 SB between Brackley and Groves Roundabout	231	181	-50	70	64	-6
A43 NB between Groves Roundabout and Brackley	34	28	-6	206	207	1
A43 SB between Groves Roundabout and Barley Mow	231	180	-51	70	64	-6
A43 NB between Barley Mow and Groves Roundabout	34	28	-6	206	207	1
A421 EB	17	15	-2	71	71	0
A421 WB	76	62	-14	32	30	-2
B4031 EB	45	34	-11	13	11	-2
B4031 WB	3	2	-1	39	39	0
A43 SB between Barley Mow and Baynards Green	319	251	-68	114	105	-9
A43 NB between Baynards Green and Barley Mow	54	44	-10	316	317	1

4.5 The table shows that in both the morning and evening peak hours there is no material difference in the assignment pattern between the DS1 and DS1A scenarios. However, the table does show that in the morning peak hour there would be less OxSRFI development traffic routing southbound on the A43 in the DS1A scenario. This is likely to be due to changes in the BTM demand model with the Albion Land development in place (i.e. the additional jobs created at the Albion Land site alter the OxSRFI employee distribution).

Traffic flow change – morning peak hour

4.6 To consider the traffic flow changes due to the Albion Land development and their associated improvement to the Baynard's Green Roundabout, the table below summarises the total change in traffic flow in the morning peak hour for the 2031 RC1A scenario as compared to the RC1 scenario. The traffic flows are given in pcus.

2031 RC1A vs RC1 flow analysis - morning peak hour (shown in pcus)			
Link	RC1	RC1A	Flow difference
A422 Brackley Bypass WB	372	373	1
A422 Brackley Bypass EB	267	301	34
Oxford Road NB	167	159	-8
Oxford Road SB	251	272	21
A43 Brackley Bypass EB	1,274	1,309	35
A43 Brackley Bypass WB	1,874	1,946	72
A43 SB between Brackley and Groves Roundabout	1,913	2,039	126
A43 NB between Groves Roundabout and Brackley	1,334	1,360	26
A43 SB between Groves Roundabout and Barley Mow	1,918	2,050	132
A43 NB between Barley Mow and Groves Roundabout	1,339	1,336	-3
A421 EB	836	672	-164
A421 WB	624	685	61
B4031 EB	228	284	56
B4031 WB	203	173	-30
A43 SB between Barley Mow and Baynards Green	2,185	2,552	367
A43 NB between Baynards Green and Barley Mow	1,793	1,763	-30

4.7 The changes to the traffic flows between the RC1A and RC1 scenarios in the morning peak hour on the A43 corridor are summarised below:

- There are no material traffic flow changes in the morning peak hour on the A422 Brackley Bypass or Oxford Road due to the Albion Land development.
- Traffic flows increase on the A43 Brackley Bypass approach to the A43/A422 Brackley Bypass gyratory by 72 pcus.
- Northbound on the A43 from Baynard's Green to south of the A43/A422 Brackley Bypass gyratory, there are no material changes in traffic flow with the Albion Land development in place.
- Southbound on the A43 from south of the A43/A422 Brackley Bypass gyratory to the Barley Mow Roundabout, traffic flows increase by c.130 pcus on this route.
- There would be an increase of 61 pcus on the A421 westbound towards the A43 southbound. This is a relatively modest change and does not suggest that there is a material reassignment effect on the A421 westbound due to the Albion Land scheme at Baynard's Green.
- The B4031 eastbound approach to the Barley Mow Roundabout has a modest traffic increase, with a corresponding reduction in westbound traffic.
- On the A43 southbound between the Barley Mow Roundabout and Baynard's Green the traffic flow increases by 367 pcus.
- As discussed in Section 3, traffic travelling eastbound from the Barley Mow Roundabout on the A421 reduces due to background traffic reassignment from the route south via the A421 eastbound and Hethe Road, with this traffic instead staying on A43.

4.8 To consider the effects of the 2031 cumulative scenario with Albion Land, the table below summarises the total change in traffic flow, the volume of OxSRFI development vehicle trips and the change in background traffic flows in the morning peak hour for the 2031 DS1A scenario as compared to the RC1 scenario.

2031 DS1A vs RC1 flow analysis - morning peak hour (shown in pcus)					
Link	RC1	DS1A	Flow difference	OxSRFI	Background traffic change
A422 Brackley Bypass WB	372	369	-3	0	-3
A422 Brackley Bypass EB	267	290	23	0	23
Oxford Road NB	167	149	-18	5	-23
Oxford Road SB	251	313	62	47	15
A43 Brackley Bypass EB	1,274	1,312	38	23	15
A43 Brackley Bypass WB	1,874	2,105	231	134	97
A43 SB between Brackley and Groves Roundabout	1,913	2,214	301	181	120
A43 NB between Groves Roundabout and Brackley	1,334	1,335	1	28	-27
A43 SB between Groves Roundabout and Barley Mow	1,918	2,197	279	180	99
A43 NB between Barley Mow and Groves Roundabout	1,339	1,332	-7	28	-35
A421 EB	836	620	-216	15	-231
A421 WB	624	880	256	62	194
B4031 EB	228	321	93	34	59
B4031 WB	203	134	-69	2	-71
A43 SB between Barley Mow and Baynards Green	2,185	2,783	598	251	347
A43 NB between Baynards Green and Barley Mow	1,793	1,753	-40	44	-84

4.9 When compared to the table at paragraph 3.6, it is evident that the magnitude of the likely traffic changes between the DS1 vs RC1 and the DS1A vs RC1 scenarios is very similar, with the key differences being a reduction in OxSRFI development traffic routing southbound along the A43 due to changes in the demand model, as discussed above, and an increase in the amount of background traffic reassignment on the A43 southbound and the A421 westbound.

Traffic flow change – evening peak hour

4.10 The table below summarises the total change in traffic flow in the evening peak hour for the 2031 RC1A scenario as compared to the RC1 scenario. The traffic flows are in pcus.

2031 RC1A vs RC1 flow analysis - evening peak hour			
Link	RC1	RC1A	Flow difference
A422 Brackley Bypass WB	221	228	7
A422 Brackley Bypass EB	380	410	30
Oxford Road NB	255	286	31
Oxford Road SB	183	180	-3
A43 Brackley Bypass EB	1,735	1,883	148
A43 Brackley Bypass WB	1,357	1,392	35
A43 SB between Brackley and Groves Roundabout	1,448	1,512	64
A43 NB between Groves Roundabout and Brackley	1,738	1,925	187
A43 SB between Groves Roundabout and Barley Mow	1,457	1,521	64
A43 NB between Barley Mow and Groves Roundabout	1,748	1,936	188
A421 EB	572	659	87
A421 WB	664	621	-43
B4031 EB	186	192	6
B4031 WB	210	242	32
A43 SB between Barley Mow and Baynards Green	1,924	1,909	-15
A43 NB between Baynards Green and Barley Mow	2,147	2,413	266

4.11 The changes to the traffic flows between the RC1A and RC1 scenarios in the evening peak hour on the A43 corridor are summarised below:

- There are no material traffic flow changes in the evening peak hour on the A422 Brackley Bypass or Oxford Road due to the Albion Land development.
- Traffic flows increase on the A43 Brackley Bypass eastbound exit from the A43/A422 Brackley Bypass gyratory by 148 pcus.

- Southbound on the A43 from south of the A43/A422 Brackley Bypass gyratory to the Barley Mow Roundabout, traffic flows increase by 64 pcus. South of the Barley Mow Roundabout, the southbound traffic flow reduces slightly with the Albion Land development in place.
- On the A43 northbound between Baynard's Green and the Barley Mow Roundabout, the traffic flow increases by 266 pcus. Northbound on the A43 from the Barley Mow Roundabout to south of the A43/A422 Brackley Bypass gyratory, traffic flows increase by c.180 pcus.
- There would be traffic decrease of 43 pcus on the A421 westbound in the evening peak.
- Traffic travelling east from the Barley Mow Roundabout on the A421 increases by 87 pcus. This is a relatively modest change and does not suggest that there is a material reassignment effect on the A421 westbound due to the Albion Land scheme at Baynard's Green.
- There is no material change in traffic flows on the B4031 in the evening peak hour.

4.12 To consider the effects of the 2031 cumulative scenario with Albion Land, the table below summarises the total change in traffic flow, the volume of OxSRFI development vehicle trips and the change in background traffic flows in the evening peak hour for the 2031 DS1A scenario as compared to the RC1 scenario. The traffic flows are in pcus.

2031 DS1A vs RC1 flow analysis - evening peak hour (shown n pcus)					
Link	RC1	DS1A	Flow difference	OxSRFI	Background traffic change
A422 Brackley Bypass WB	221	217	-4	0	-4
A422 Brackley Bypass EB	380	428	48	4	44
Oxford Road NB	255	347	92	55	37
Oxford Road SB	183	185	2	18	-16
A43 Brackley Bypass EB	1,735	2,078	343	152	191
A43 Brackley Bypass WB	1,357	1,420	63	42	21
A43 SB between Brackley and Groves Roundabout	1,448	1,563	115	64	51
A43 NB between Groves Roundabout and Brackley	1,738	2,172	434	207	227
A43 SB between Groves Roundabout and Barley Mow	1,457	1,563	106	64	42
A43 NB between Barley Mow and Groves Roundabout	1,748	2,178	430	207	223
A421 EB	572	813	241	71	170
A421 WB	664	650	-14	30	-44
B4031 EB	186	198	12	11	1
B4031 WB	210	312	102	39	63
A43 SB between Barley Mow and Baynards Green	1,924	2,009	85	105	-20
A43 NB between Baynards Green and Barley Mow	2,147	2,902	755	317	438

4.13 When compared to the table at paragraph 3.8, it is evident that the pattern and magnitude of the likely traffic changes between the DS1 vs RC1 and the DS1A vs RC1 scenarios are very similar, with the key difference being an increase in the amount of background traffic reassignment on the A43 northbound and the A421 eastbound.

Volume over capacity ratio

4.14 The table below summarises the link/node V/C ratios for the 2031 RC1A and DS1A scenarios in the respective morning and evening peak hours. The table also shows the difference between the two scenarios.

2031 DS1A vs RC1A V/C analysis						
Link	morning peak			evening peak		
	RC1A	DS1A	DS1A - RC1A	RC1A	DS1A	DS1A - RC1A
A422 Brackley Bypass EB	15%	15%	0%	21%	21%	0%
Oxford Road SB	22%	25%	3%	14%	15%	1%
A43 Brackley Bypass WB	59%	64%	5%	42%	43%	1%
A43 SB between Brackley and Groves Roundabout	93%	101%	8%	69%	71%	2%
A43 NB between Groves Roundabout and Brackley	34%	33%	-1%	48%	54%	6%
A43 SB between Groves Roundabout and Barley Mow	101%	109%	8%	74%	81%	7%
A43 NB between Barley Mow and Groves Roundabout	59%	61%	2%	88%	99%	11%
A421 WB	85%	117%	32%	62%	66%	4%
B4031 EB	31%	35%	4%	28%	36%	8%
A43 SB between Barley Mow and Baynards Green	81%	72%	-9%	73%	66%	-7%
A43 NB between Baynards Green and Barley Mow	56%	55%	-1%	78%	94%	16%

4.15 For the morning peak hour, the table shows that the majority of links/nodes on the A43 corridor would have V/C ratios below 85%. However, the table shows that there are three links/nodes with a V/C above 85% in the RC1A and DS1A scenarios:

- The A43 southbound approach to the Groves Roundabout would have a V/C of 93% in the RC1A scenario, increasing to 101% in the DS1A scenario. This roundabout is identified as a study area junction and will be assessed in detail as part of the Transport Assessment.
- The A43 southbound approach to the Barley Mow Roundabout would have a V/C of 101% in the RC1A scenario, increasing to 109% in the DS1A scenario.
- The A421 westbound approach to the Barley Mow Roundabout would have a V/C of 85% in the RC1A scenario, increasing to 117% in the DS1A scenario, largely due to background traffic reassignment in the RS1A scenario.

4.16 When compared to the V/C results for the RC1 and DS1 scenarios, it is evident that in the morning peak hour the V/C ratios have increased on the critical links/nodes in the RC1A scenario compared to RC1 due to the impact of Albion Land, whilst there is no material change in the V/C ratios in the DS1A scenario compared to the DS1 scenario.

4.17 In the evening peak hour, the table shows that there is one link/node with a V/C above 85% in the RC1A scenario and two links/nodes with a V/C above 85% in the DS1A scenario:

- The V/C on the A43 northbound approach to the Groves Roundabout would have a V/C of 88% in the RC1A scenario, increasing to 99% in the DS1A scenario.
- The V/C on the A43 northbound approach to the Barley Mow Roundabout would have a V/C of 78% in the RC1A scenario, increasing to 94% in the DS1A scenario.

4.18 When compared to the V/C results for the RC1 and DS1 scenarios for the evening peak hour, the V/C ratios have increased on the critical links/nodes in the RC1A scenario compared to RC1 due to the impact of Albion Land. There is a modest increase in the V/C ratio on the A43 northbound approach to the Groves Roundabout in the DS1A scenario compared to DS1, whish there is a reduction in the V/C ratio on the A43 northbound approach to the Barley Mow Roundabout in the DS1A scenario compared to the DS1 scenario.

Barley Mow Roundabout

4.19 The Junctions 11 ARCADY model of the Barley Mow Roundabout was tested with the 2031 RC1A traffic forecasts from the BTM, provided at **Appendix A**. The model results are provided at **Appendix B** and summarised below. For ease of comparison, the results of the RC1 scenario are repeated in the table.

	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
RC1						
A43 North	74.0	119.8	107%	3.3	8.1	77%
A421	2.9	19.5	75%	2.1	11.0	68%
A43 South	3.8	7.6	80%	14.3	24.3	95%
B4031	0.9	13.9	48%	1.4	26.1	60%
RC1A						
A43 North	145.7	231.6	115%	4.5	10.5	82%
A421	9.9	61.2	94%	1.9	10.9	66%
A43 South	3.4	7.1	78%	102.4	127.9	108%
B4031	1.4	16.9	59%	2.8	51.0	76%
RC1A - RC1 (change due to Albion Land)						
A43 North	71.7	111.8	8%	1.2	2.5	5%
A421	7.0	41.7	19%	-0.2	-0.1	-2%
A43 South	-0.4	-0.5	-2%	88.1	103.7	13%
B4031	0.5	3.0	11%	1.4	24.9	16%

4.20 The results show that in the RC1A morning peak hour the A43 south and B4031 approaches to the roundabout would operate with a ratio of flow to capacity (RFC) comfortably below 85%, indicating that there are no capacity issues on these arms. However, the A43 north arm would have an RFC of 115%, with queuing and delay. The A421 arm would have an RFC of 94%.

4.21 In the RC1A evening peak hour, the results show that the A421, A43 north and B4031 approaches to the roundabout would operate with a ratio of flow to capacity (RFC) comfortably below 85%, but the A43 south approach would have an RFC of 108% with queuing and delay.

4.22 When compared to the results for the RC1 scenario, it is evident that in the RC1A scenario (with the Albion Land development and the associated improvement at the Baynard's Green Roundabout in place), the performance of the Barley Mow Roundabout would deteriorate due to traffic from the Albion Land development and background traffic reassignment due to the Baynard's Green improvements.

4.23 The Junctions 11 ARCADY model of the Barley Mow roundabout was also tested with the 2031 DS1A traffic forecasts from the BTM, provided at **Appendix A**. The model results are provided at **Appendix B** and summarised below. For ease of comparison, the results of the RC1, RC1A and DS1 scenarios are repeated in the table.

	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
RC1						
A43 North	74.0	119.8	107%	3.3	8.1	77%
A421	2.9	19.5	75%	2.1	11.0	68%
A43 South	3.8	7.6	80%	14.3	24.3	95%
B4031	0.9	13.9	48%	1.4	26.1	60%
RC1A						
A43 North	145.7	231.6	115%	4.5	10.5	82%
A421	9.9	61.2	94%	1.9	10.9	66%
A43 South	3.4	7.1	78%	102.4	127.9	108%
B4031	1.4	16.9	59%	2.8	51.0	76%
DS1						
A43 North	197.2	338.4	120%	5.3	12.3	85%
A421	97.9	540.3	124%	2.3	12.6	70%
A43 South	2.7	5.8	73%	312.7	466.8	124%
B4031	1.4	15.2	59%	2.3	41.7	72%
DS1A						
A43 North	223.6	400.4	123%	5.9	13.6	86%
A421	99.9	550.2	124%	2.4	13.1	71%
A43 South	3.0	6.3	75%	393.7	575.9	128%
B4031	1.6	17.5	63%	2.6	45.7	74%

4.24 With OxSRFI and the associated embedded Highway Works in place, the ARCADY results show that in the 2031 DS1A morning peak hour, the performance of the roundabout would deteriorate when compared to the RC1A scenario. In the DS1A morning peak hour, the RFC on the A43 southbound approach would increase from 115% to 123%, and the A421 approach would have a RFC of 124%, increasing from 94%. In the DS1A evening peak hour, the RFC on the A43 northbound approach would increase from 108% to 128%.

4.25 As discussed in Section 3, the ARCADY results above and the V/C analysis presented earlier in this Section both demonstrate that in the morning peak hour there would be increased congestion on the A43 southbound and A421 approaches to the Barley Mow Roundabout, with increased congestion on the A43 northbound approach in the evening peak hour. These increases in congestion are due to both development traffic flows and a significant volume of reassigning background traffic, especially on the A421 approach in the morning peak hour and the A43 northbound approach in the evening peak hour. The high volumes of reassigning traffic to the A43 and A421 indicate that the wider network improvements delivered by the embedded Highway Works outweigh the increased congestion at the Barley Mow Roundabout such that these routes are still favourable.

4.26 The analysis of the traffic flow changes on the A43 corridor in Section 3 and earlier in this section of this report, identified that due to the proposed OxSRFI development and the embedded Highway Works, there would be a material background traffic reassignment on the route between the A421 and the M40 south of Junction 10. However, the ARCADY assessments indicate that in the DS1 and DS1A scenarios there would be significant congestion on the A421 approach to the Barley Mow roundabout in the morning peak hour and on the A43 northbound approach to the roundabout in the evening peak hour. Hence, if the modelled levels of congestion materialised on street, the reassignment effects might not occur. This is considered at **Appendix D** of this report.

Journey time and delay analysis

4.27 To understand the effects of the cumulative scenario with Albion Land on the wider network, and in particular to understand how the performance of the Barley Mow Roundabout could affect the popularity of the A43 and A421 corridors, journey times and delays in the RC1A and DS1A scenarios have been considered routes set out in Section 3 of this report.

4.28 The average journey times and delay on the above routes in the RC1A and DS1A morning peak hour scenarios are summarised in tables below, and the Saturn plots containing the journey time and delay data are provided at **Appendix C**. Further, comparisons between the RC1, RC1A and DS1A scenarios are also presented.

2031 journey time analysis - morning peak hour (time in seconds)					
Link	RC1	RC1A	DS1A	DS1A - RC1	DS1A - RC1A
A43 (south of Brackley) to end of M40 SB slip road	817	750	527	-290	-223
M40 NB diverging slip to A43 (south of Brackley)	386	417	449	63	32
A421 (Barton Hartshorn jct) to end of M40 SB slip road	1,033	962	810	-223	-152
M40 NB diverging slip to A421 (Barton Hartshorn jct)	621	642	672	51	30

2031 average delay - morning peak hour (time in seconds)					
Link	RC1	RC1A	DS1A	DS1A - RC1	DS1A - RC1A
A43 (south of Brackley) to end of M40 SB slip road	442	344	141	-301	-203
M40 NB diverging slip to A43 (south of Brackley)	31	40	20	-11	-20
A421 (Barton Hartshorn jct) to end of M40 SB slip road	453	351	219	-234	-132
M40 NB diverging slip to A421 (Barton Hartshorn jct)	60	62	39	-21	-23

4.29 The tables above show that in the 2031 DS1A morning peak hour there would be significant reductions in journey time and delay on the route between the A43 south of Brackley to the M40 south of Junction 10, and on the route between the A421 at the Barton Hartshorn junction and the M40 south of Junction 10. There are relatively modest increases in journey time on the opposing routes north, largely due to the increased journey distance due to the new M40 to A43 slip road (c.750m) and the presence of traffic signals. However, delay would reduce on these routes as the traffic would be better managed by the new junction arrangements.

4.30 In the evening peak hour, the table shows that would be journey time reductions between the DS1A and RC1A scenarios on the two northbound routes to the A43 south of Brackley and the A421, with reductions in delay on all four routes.

2031 journey time analysis - evening peak hour (time in seconds)					
Link	RC1	RC1A	DS1A	DS1A - RC1	DS1A - RC1A
A43 (south of Brackley) to end of M40 SB slip road	463	514	425	-38	-89
M40 NB diverging slip to A43 (south of Brackley)	577	479	482	-95	3
A421 (Barton Hartshorn jct) to end of M40 SB slip road	687	733	646	-41	-87
M40 NB diverging slip to A421 (Barton Hartshorn jct)	797	703	709	-88	6

2031 average delay - evening peak hour (time in seconds)					
Link	RC1	RC1A	DS1A	DS1A - RC1	DS1A - RC1A
A43 (south of Brackley) to end of M40 SB slip road	96	117	36	-60	-81
M40 NB diverging slip to A43 (south of Brackley)	220	104	66	-154	-38
A421 (Barton Hartshorn jct) to end of M40 SB slip road	116	132	52	-64	-80
M40 NB diverging slip to A421 (Barton Hartshorn jct)	235	122	88	-147	-34

4.31 Hence, in the cumulative scenario with Albion Land, the improvements to journey time and delay delivered by the embedded Highway Works at Baynard's Green and M40 Junction 10 outweigh the increased congestion at the Barley Mow Roundabout such that these routes are still likely to attract high volumes of reassigning traffic to the A43 and A421, which is a positive effect.

5.0 SUMMARY AND CONCLUSION

5.1 The analysis of the A43 corridor between the A43/A422 Brackley Bypass and Baynard's Green for the 2031 RC1, DS1, RC1A and DS1A scenarios shows that there would be large traffic increases southbound on the A43 and westbound on the A421 in the 2031 DS1 and DS1A scenarios in the morning peak hour. There would be large traffic increases northbound on the A43 and eastbound on the A421 in the 2031 DS1 and DS1A scenarios in the evening peak hour.

5.2 The magnitude of the likely traffic changes between the DS1 vs RC1 and the DS1A vs RC1 scenarios is very similar, with the key differences being a reduction in OxSRFI development traffic routing southbound along the A43 due to changes in the BTM demand model (due the extra jobs associated with Albion Land), and an increase in the amount of background traffic reassignment on the A43 southbound and the A421 westbound.

5.3 As identified in Section 3, a significant proportion of the traffic flow increases is due to background traffic reassignment that is likely induced by the significant improvements delivered by the embedded Highway Works associated with the proposed development, particularly at the Baynard's Green Roundabout and M40 Junction 10. Background traffic is returned to the higher category roads and away from the local road network, which is a positive effect.

5.4 The V/C analysis and detailed junction modelling of the Barley Mow Roundabout suggests that due to traffic increases caused by development traffic flows and background traffic reassignment induced by the removal of the capacity constraints on the SRN at Baynard's Green and M40 Junction 10, there would be increased congestion at the Barley Mow Roundabout in the RC1A (should Albion Land deliver the Baynard's Green improvements), DS1 and DS1A scenarios, as compared to the RC1 scenario. In the morning peak hour congestion would significantly increase on the A43 southbound and A421 approaches. In the evening peak hour, congestion would increase on the A43 northbound approach.

5.5 However, analysis of journey times between the A43 south of Brackley and the M40 south of Junction 10, and also between the A421 at the Barton Hartshorn junction and the M40 south of Junction 10, show that there would be significant improvements (reductions in journey time) despite the congestion issues at the Barley Mow Roundabout. Hence, the improvements to journey time and delay delivered by the embedded Highway Works at Baynard's Green and M40 Junction 10 outweigh the increased congestion at the Barley Mow Roundabout such that these routes are still likely to attract high volumes of reassigning traffic to the A43 and A421, which is a positive effect.

5.6 Therefore, whilst there would be additional congestion at the Barley Mow Roundabout in the cumulative assessment scenarios, it would be unreasonable to require the OxSRFI scheme to provide capacity mitigation works at the roundabout, given that the increased congestion arises due to suppressed demand on the A43 corridor that is released due to the improvements that will be delivered at Baynard's Green and M40 Junction 10.

APPENDIX A

A43 BARLEY MOW TRAFFIC FLOWS

2031 RC1 - AM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	207	1,564	24	1,795
B ←	88	0	330	83	502
C ↗	1,135	431	0	96	1,662
D →	24	103	93	0	220
Total	1,247	741	1,988	203	4,178

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	39	115	0	154
B ←	21	0	133	0	154
C ↗	84	81	0	0	164
D →	10	0	0	0	10
Total	115	120	247	0	482

% HGV				
O/D	A ↑	B →	C ↙	D ←
A ↓	0%	19%	7%	0%
B ←	24%	0%	40%	0%
C ↗	7%	19%	0%	0%
D →	43%	0%	0%	0%

2031 RC1A- AM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	121	1,783	3	1,907
B ←	92	0	391	81	563
C ↗	1,136	386	0	90	1,612
D →	26	70	180	0	276
Total	1,254	578	2,354	173	4,358

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	39	139	0	178
B ←	21	0	133	0	154
C ↗	108	81	0	0	188
D →	10	0	0	0	10
Total	139	120	271	0	530

% HGV				
O/D	A ↑	B →	C ↙	D ←
A ↓	0%	33%	8%	0%
B ←	23%	0%	34%	0%
C ↗	9%	21%	0%	0%
D →	39%	0%	0%	0%

2031DS1 - AM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	87	1,930	3	2,020
B ←	64	0	637	48	749
C ↗	1,111	367	0	89	1,567
D →	26	65	215	0	306
Total	1,201	519	2,782	140	4,642

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	39	114	0	153
B ←	21	0	133	0	154
C ↗	84	81	0	0	165
D →	10	0	0	0	10
Total	115	120	247	0	483

% HGV				
O/D	A ↑	B →	C ↙	D ←
A ↓	0%	45%	6%	0%
B ←	33%	0%	21%	0%
C ↗	8%	22%	0%	0%
D →	38%	0%	0%	0%

2031DS1A - AM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	93	1,949	3	2,046
B ←	64	0	639	48	752
C ↗	1,129	368	0	88	1,586
D →	26	67	220	0	312
Total	1,219	529	2,808	140	4,696

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	39	138	0	177
B ←	21	0	133	0	154
C ↗	108	81	0	0	189
D →	10	0	0	0	10
Total	139	120	270	0	529

% HGV				
O/D	A ↑	B →	C ↙	D ←
A ↓	0%	42%	7%	0%
B ←	33%	0%	21%	0%
C ↗	10%	22%	0%	0%
D →	40%	0%	0%	0%

2031 RC1 - PM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	110	1,264	9	1,383
B ←	111	0	449	66	627
C ↗	1,574	354	0	131	2,059
D →	5	56	125	0	186
Total	1,690	521	1,838	206	4,255

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	12	76	6	93
B ←	15	0	33	0	48
C ↗	58	55	0	0	113
D →	0	0	0	0	0
Total	73	66	109	6	255

% HGV				
O/D	A ↑	B →	C ↙	D ←
A ↓	0%	11%	6%	64%
B ←	14%	0%	7%	0%
C ↗	4%	15%	0%	0%
D →	0%	0%	0%	0%

2031 RC1A - PM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	109	1,306	16	1,431
B ←	120	0	381	81	583
C ↗	1,732	426	0	140	2,298
D →	6	66	120	0	192
Total	1,858	602	1,807	238	4,504

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	12	97	6	114
B ←	15	0	33	0	48
C ↗	84	62	0	0	146
D →	0	0	0	0	0
Total	99	74	130	6	309

% HGV				
O/D	A ↑	B →	C ↙	D ←
A ↓	0%	11%	7%	36%
B ←	13%	0%	9%	0%
C ↗	5%	15%	0%	0%
D →	0%	0%	0%	0%

2031 DS1 - PM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	90	1,343	15	1,448
B ←	116	0	413	79	608
C ↗	1,901	572	0	212	2,685
D →	5	61	128	0	194
Total	2,022	723	1,884	306	4,935

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	12	77	6	95
B ←	15	0	33	0	48
C ↗	72	67	0	0	139
D →	0	0	0	0	0
Total	87	79	110	6	283

% HGV				
O/D	A ↑	B →	C ↙	D ←
A ↓	0%	13%	6%	40%
B ←	13%	0%	8%	0%
C ↗	4%	12%	0%	0%
D →	0%	0%	0%	0%

2031 DS1A - PM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	89	1,359	15	1,463
B ←	119	0	407	79	606
C ↗	1,959	589	0	213	2,761
D →	6	68	124	0	198
Total	2,084	746	1,891	307	5,027

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	12	97	6	115
B ←	15	0	33	0	49
C ↗	91	67	0	0	158
D →	0	0	0	0	0
Total	106	79	131	6	322

% HGV				
O/D	A ↑	B →	C ↙	D ←
A ↓	0%	13%	7%	37%
B ←	13%	0%	8%	0%
C ↗	5%	11%	0%	0%
D →	0%	0%	0%	0%

APPENDIX B

A43 BARLEY MOW JUNCTIONS 11 ARCADY REPORT

Junctions 11

ARCADY 11 - Roundabout Module

Version: 11.1.0.2307
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Filename: 251124 A43_A421 Barleymow roundabout.j11
Path: C:\Users\ADC\OneDrive - ADC Infrastructure Limited\ADC Projects\ADC1794 OxSRFI\Calculations\Junction Models\21. A43 Barley Mow roundabout
Report generation date: 08/12/2025 14:29:45

»D1 - 2031 | RC1 | AM
»D2 - 2031 | RC1 | PM
»D3 - 2031 | RC1A | AM
»D4 - 2031 | RC1A | PM
»D5 - 2031 | DS1 | AM
»D6 - 2031 | DS1 | PM
»D7 - 2031 | DS1A | PM
»D8 - 2031 | DS1A | AM

Summary of junction performance

	AM				PM			
	Set ID	Queue (Veh)	Delay (s)	RFC	Set ID	Queue (Veh)	Delay (s)	RFC
	2031 - RC1							
Arm 1	D1	74.0	119.82	1.07	D2	3.3	8.07	0.77
Arm 2		2.9	19.49	0.75		2.1	11.02	0.68
Arm 3		3.8	7.62	0.80		14.3	24.25	0.95
Arm 4		0.9	13.87	0.48		1.4	26.10	0.60
	2031 - RC1A							
Arm 1	D3	145.7	231.60	1.15	D4	4.5	10.53	0.82
Arm 2		9.9	61.19	0.94		1.9	10.92	0.66
Arm 3		3.4	7.11	0.78		102.4	127.91	1.08
Arm 4		1.4	16.86	0.59		2.8	51.00	0.76
	2031 - DS1							
Arm 1	D5	197.2	338.36	1.20	D6	5.3	12.30	0.85
Arm 2		97.9	540.26	1.24		2.3	12.56	0.70
Arm 3		2.7	5.77	0.73		312.7	466.84	1.24
Arm 4		1.4	15.17	0.59		2.3	41.71	0.72
	2031 - DS1A							
Arm 1	D8	223.6	400.42	1.23	D7	5.9	13.63	0.86
Arm 2		99.9	550.16	1.24		2.4	13.13	0.71
Arm 3		3.0	6.26	0.75		393.7	575.87	1.28
Arm 4		1.6	17.48	0.63		2.6	45.73	0.74

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	OxSRFI
Location	A43/A421 Barley Mow roundabout
Site number	
Date	08/12/2025
Version	v 1
Status	preliminary
Identifier	
Client	
Jobnumber	ADC1794
Enumerator	ADC
Description	2031 SRN scenario

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use simulation for HCM roundabouts	Use iterations for HCM roundabouts
5.75						0.85	36.00	20.00		

Demand Set Summary

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2031	RC1	AM	ONE HOUR	07:45	09:15	15	✓
D2	2031	RC1	PM	ONE HOUR	16:45	18:15	15	✓
D3	2031	RC1A	AM	ONE HOUR	07:45	09:15	15	✓
D4	2031	RC1A	PM	ONE HOUR	16:45	18:15	15	✓
D5	2031	DS1	AM	ONE HOUR	07:45	09:15	15	✓
D6	2031	DS1	PM	ONE HOUR	16:45	18:15	15	✓
D7	2031	DS1A	PM	ONE HOUR	16:45	18:15	15	✓
D8	2031	DS1A	AM	ONE HOUR	07:45	09:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

D1 - 2031 | RC1 | AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	56.48	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	56.48	F

Arms

Arms

Arm	Name	Description	No give-way line
1	A43 North		
2	A421		
3	A43 South		
4	B4031		

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Entry only	Exit only
1	7.50	7.70	0.2	70.5	67.0	8.0		
2	3.80	7.90	20.6	40.2	67.0	13.5		
3	7.30	8.90	44.5	28.5	67.0	30.0		
4	3.30	7.20	8.4	18.5	67.0	13.5		

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.683	2542
2	0.599	2067
3	0.682	2685
4	0.509	1554

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2031	RC1	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1795	100.000
2		ONE HOUR	✓	501	100.000
3		ONE HOUR	✓	1662	100.000
4		ONE HOUR	✓	220	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	207	1564	24
	2	88	0	330	83
	3	1135	431	0	96
	4	24	103	93	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	19	7	0
	2	24	0	40	0
	3	7	19	0	0
	4	43	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	1.07	119.82	74.0	F	1647	2471
2	0.75	19.49	2.9	C	460	690
3	0.80	7.62	3.8	A	1525	2288
4	0.48	13.87	0.9	B	202	303

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1351	338	470	2012	0.672	1343	935	0.0	2.0	5.323	A
2	377	94	1258	968	0.390	375	555	0.0	0.6	6.039	A
3	1251	313	146	2347	0.533	1247	1487	0.0	1.1	3.258	A
4	166	41	1241	815	0.203	165	152	0.0	0.3	5.531	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1614	403	562	1946	0.829	1603	1119	2.0	4.6	10.215	B
2	450	113	1502	849	0.530	448	664	0.6	1.1	8.943	A
3	1494	374	175	2327	0.642	1492	1776	1.1	1.8	4.294	A
4	198	49	1484	683	0.290	197	182	0.3	0.4	7.399	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1976	494	687	1858	1.064	1826	1366	4.6	42.1	55.329	F
2	552	138	1717	744	0.741	545	796	1.1	2.7	17.579	C
3	1830	457	211	2302	0.795	1822	2052	1.8	3.7	7.376	A
4	242	61	1813	506	0.479	240	220	0.4	0.9	13.460	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1976	494	690	1855	1.065	1849	1373	42.1	74.0	119.818	F
2	552	138	1738	734	0.752	551	801	2.7	2.9	19.486	C
3	1830	457	213	2301	0.795	1830	2076	3.7	3.8	7.624	A
4	242	61	1821	501	0.483	242	222	0.9	0.9	13.871	B

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1614	403	567	1943	0.831	1885	1127	74.0	6.2	73.993	F
2	450	113	1752	727	0.620	455	700	2.9	1.7	13.478	B
3	1494	374	181	2323	0.643	1502	2026	3.8	1.8	4.423	A
4	198	49	1495	677	0.292	200	187	0.9	0.4	7.572	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1351	338	473	2010	0.672	1368	941	6.2	2.1	5.748	A
2	377	94	1280	957	0.394	381	561	1.7	0.7	6.292	A
3	1251	313	148	2345	0.534	1254	1513	1.8	1.2	3.305	A
4	166	41	1248	810	0.204	166	154	0.4	0.3	5.594	A

D2 - 2031 | RC1 | PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	17.05	C

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	17.05	C

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2031	RC1	PM	ONE HOUR	16:45	18:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1383	100.000
2		ONE HOUR	✓	626	100.000
3		ONE HOUR	✓	2059	100.000
4		ONE HOUR	✓	186	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	110	1264	9
	2	111	0	449	66
	3	1574	354	0	131
	4	5	56	125	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	11	6	64
	2	14	0	7	0
	3	4	15	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.77	8.07	3.3	A	1269	1904
2	0.68	11.02	2.1	B	574	862
3	0.95	24.25	14.3	C	1889	2834
4	0.60	26.10	1.4	D	171	256

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1041	260	401	2099	0.496	1037	1267	0.0	1.0	3.379	A
2	471	118	1048	1304	0.361	469	390	0.0	0.6	4.299	A
3	1550	388	139	2442	0.635	1543	1378	0.0	1.7	3.977	A
4	140	35	1528	726	0.193	139	154	0.0	0.2	6.125	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1243	311	479	2043	0.608	1241	1515	1.0	1.5	4.474	A
2	563	141	1254	1183	0.476	561	466	0.6	0.9	5.779	A
3	1851	463	167	2422	0.764	1845	1649	1.7	3.2	6.182	A
4	167	42	1827	564	0.297	166	185	0.2	0.4	9.047	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1523	381	579	1973	0.772	1516	1831	1.5	3.3	7.756	A
2	689	172	1531	1020	0.676	685	565	0.9	2.0	10.602	B
3	2267	567	203	2395	0.946	2230	2012	3.2	12.5	18.553	C
4	205	51	2209	357	0.574	201	224	0.4	1.3	22.687	C

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1523	381	587	1968	0.774	1522	1855	3.3	3.3	8.071	A
2	689	172	1538	1015	0.679	689	571	2.0	2.1	11.015	B
3	2267	567	205	2395	0.947	2260	2023	12.5	14.3	24.247	C
4	205	51	2238	341	0.600	204	226	1.3	1.4	26.098	D

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1243	311	492	2034	0.611	1250	1554	3.3	1.6	4.633	A
2	563	141	1266	1176	0.478	567	477	2.1	0.9	5.957	A
3	1851	463	169	2421	0.765	1895	1665	14.3	3.3	7.398	A
4	167	42	1875	538	0.311	171	189	1.4	0.5	9.913	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1041	260	405	2096	0.497	1044	1277	1.6	1.0	3.428	A
2	471	118	1055	1300	0.362	473	393	0.9	0.6	4.357	A
3	1550	388	140	2441	0.635	1556	1388	3.3	1.8	4.100	A
4	140	35	1541	719	0.195	141	156	0.5	0.2	6.240	A

D3 - 2031 | RC1A | AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	111.57	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	111.57	F

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2031	RC1A	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1907	100.000
2		ONE HOUR	✓	564	100.000
3		ONE HOUR	✓	1612	100.000
4		ONE HOUR	✓	276	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	121	1783	3
	2	92	0	391	81
	3	1136	386	0	90
	4	26	70	180	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	33	8	0
	2	23	0	34	0
	3	9	21	0	0
	4	39	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	1.15	231.60	145.7	F	1750	2625
2	0.94	61.19	9.9	F	518	776
3	0.78	7.11	3.4	A	1479	2219
4	0.59	16.86	1.4	C	253	380

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1436	359	477	1985	0.723	1425	940	0.0	2.5	6.328	A
2	425	106	1470	882	0.482	421	432	0.0	0.9	7.753	A
3	1214	303	131	2321	0.523	1209	1759	0.0	1.1	3.227	A
4	208	52	1210	829	0.251	206	130	0.0	0.3	5.769	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1714	429	570	1919	0.893	1696	1125	2.5	7.3	15.002	C
2	507	127	1749	741	0.684	502	517	0.9	2.1	14.826	B
3	1449	362	157	2303	0.629	1447	2095	1.1	1.7	4.190	A
4	248	62	1448	698	0.356	247	156	0.3	0.5	7.974	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	2100	525	696	1831	1.147	1819	1372	7.3	77.4	92.014	F
2	621	155	1900	666	0.933	598	615	2.1	7.9	42.982	E
3	1775	444	186	2283	0.777	1768	2311	1.7	3.4	6.896	A
4	304	76	1767	522	0.583	301	187	0.5	1.3	16.068	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	2100	525	700	1828	1.149	1827	1379	77.4	145.7	223.478	F
2	621	155	1909	661	0.939	613	618	7.9	9.9	61.185	F
3	1775	444	191	2280	0.778	1775	2331	3.4	3.4	7.110	A
4	304	76	1775	517	0.588	304	190	1.3	1.4	16.859	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1714	429	576	1915	0.895	1902	1136	145.7	98.9	231.600	F
2	507	127	1945	641	0.790	530	533	9.9	4.3	36.342	E
3	1449	362	165	2298	0.631	1456	2309	3.4	1.7	4.311	A
4	248	62	1461	690	0.359	251	160	1.4	0.6	8.260	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1436	359	480	1982	0.724	1820	948	98.9	2.8	69.113	F
2	425	106	1840	693	0.612	435	460	4.3	1.6	14.451	B
3	1214	303	136	2318	0.524	1216	2139	1.7	1.1	3.274	A
4	208	52	1219	824	0.252	209	133	0.6	0.3	5.855	A

D4 - 2031 | RC1A | PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	71.91	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	71.91	F

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2031	RC1A	PM	ONE HOUR	16:45	18:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1431	100.000
2		ONE HOUR	✓	582	100.000
3		ONE HOUR	✓	2298	100.000
4		ONE HOUR	✓	192	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	109	1306	16
	2	120	0	381	81
	3	1732	426	0	140
	4	6	66	120	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	11	7	36
	2	13	0	9	0
	3	5	15	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.82	10.53	4.5	B	1313	1970
2	0.66	10.92	1.9	B	534	801
3	1.08	127.91	102.4	F	2109	3163
4	0.76	51.00	2.8	F	176	264

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1077	269	458	2041	0.528	1073	1391	0.0	1.1	3.703	A
2	438	110	1081	1267	0.346	436	450	0.0	0.5	4.321	A
3	1730	433	163	2406	0.719	1720	1354	0.0	2.5	5.176	A
4	145	36	1705	623	0.232	143	177	0.0	0.3	7.493	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1286	322	546	1979	0.650	1284	1659	1.1	1.8	5.157	A
2	523	131	1293	1142	0.458	522	537	0.5	0.8	5.791	A
3	2066	516	195	2383	0.867	2052	1620	2.5	6.0	10.444	B
4	173	43	2035	443	0.390	171	212	0.3	0.6	13.199	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1576	394	629	1921	0.820	1566	1891	1.8	4.3	9.862	A
2	641	160	1574	977	0.656	637	621	0.8	1.8	10.473	B
3	2530	633	237	2353	1.075	2326	1974	6.0	56.9	56.682	F
4	211	53	2316	289	0.732	205	248	0.6	2.3	39.970	E

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1576	394	638	1915	0.823	1575	1908	4.3	4.5	10.530	B
2	641	160	1586	970	0.661	641	627	1.8	1.9	10.919	B
3	2530	633	239	2352	1.076	2348	1988	56.9	102.4	127.907	F
4	211	53	2337	277	0.762	210	250	2.3	2.8	50.997	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1286	322	609	1934	0.665	1296	1892	4.5	2.0	5.735	A
2	523	131	1308	1133	0.462	527	597	1.9	0.9	5.980	A
3	2066	516	197	2382	0.867	2359	1639	102.4	29.2	103.210	F
4	173	43	2324	285	0.605	177	232	2.8	1.7	34.570	D

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1077	269	485	2021	0.533	1081	1479	2.0	1.2	3.842	A
2	438	110	1092	1261	0.348	439	474	0.9	0.5	4.392	A
3	1730	433	164	2405	0.719	1836	1368	29.2	2.6	7.594	A
4	145	36	1815	563	0.257	150	185	1.7	0.4	8.823	A

D5 - 2031 | DS1 | AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	241.47	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	241.47	F

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2031	DS1	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	2020	100.000
2		ONE HOUR	✓	749	100.000
3		ONE HOUR	✓	1567	100.000
4		ONE HOUR	✓	306	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	87	1930	3
	2	64	0	637	48
	3	1111	367	0	89
	4	26	65	215	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	45	6	0
	2	33	0	21	0
	3	8	22	0	0
	4	38	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	1.20	338.36	197.2	F	1854	2780
2	1.24	540.26	97.9	F	687	1031
3	0.73	5.77	2.7	A	1438	2157
4	0.59	15.17	1.4	C	281	421

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1521	380	485	2015	0.755	1509	901	0.0	3.0	6.963	A
2	564	141	1605	873	0.646	557	389	0.0	1.8	11.136	B
3	1180	295	86	2361	0.500	1176	2076	0.0	1.0	3.028	A
4	230	58	1157	865	0.266	229	105	0.0	0.4	5.651	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1816	454	580	1947	0.933	1786	1076	3.0	10.4	19.614	C
2	673	168	1902	718	0.938	647	465	1.8	8.3	40.996	E
3	1409	352	99	2351	0.599	1407	2450	1.0	1.5	3.806	A
4	275	69	1382	740	0.372	274	124	0.4	0.6	7.719	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	2224	556	708	1855	1.199	1849	1305	10.4	104.2	118.997	F
2	825	206	2004	666	1.239	661	553	8.3	49.3	172.367	F
3	1725	431	102	2349	0.734	1720	2563	1.5	2.7	5.683	A
4	337	84	1679	576	0.585	334	143	0.6	1.4	14.663	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	2224	556	712	1852	1.201	1852	1308	104.2	197.2	294.432	F
2	825	206	2009	663	1.244	662	555	49.3	89.9	392.832	F
3	1725	431	102	2349	0.735	1725	2569	2.7	2.7	5.771	A
4	337	84	1684	574	0.587	337	143	1.4	1.4	15.169	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1816	454	586	1943	0.935	1933	1081	197.2	167.9	338.363	F
2	673	168	2045	643	1.048	641	473	89.9	97.9	540.258	F
3	1409	352	99	2351	0.599	1414	2588	2.7	1.5	3.859	A
4	275	69	1388	736	0.374	278	124	1.4	0.6	7.910	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1521	380	488	2012	0.756	2000	910	167.9	48.1	196.454	F
2	564	141	2077	625	0.902	619	412	97.9	84.2	530.354	F
3	1180	295	95	2353	0.501	1182	2600	1.5	1.0	3.079	A
4	230	58	1167	858	0.269	231	110	0.6	0.4	5.752	A

D6 - 2031 | DS1 | PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	259.54	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	259.54	F

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2031	DS1	PM	ONE HOUR	16:45	18:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1448	100.000
2		ONE HOUR	✓	608	100.000
3		ONE HOUR	✓	2685	100.000
4		ONE HOUR	✓	194	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	90	1343	15
	2	116	0	413	79
	3	1901	572	0	212
	4	5	61	128	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	13	6	40
	2	13	0	8	0
	3	4	12	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.85	12.30	5.3	B	1329	1993
2	0.70	12.56	2.3	B	558	837
3	1.24	466.84	312.7	F	2464	3696
4	0.72	41.71	2.3	E	178	267

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1090	273	567	1984	0.549	1085	1509	0.0	1.2	3.982	A
2	458	114	1113	1261	0.363	455	540	0.0	0.6	4.455	A
3	2021	505	157	2436	0.830	2003	1411	0.0	4.6	8.003	A
4	146	37	1932	510	0.286	144	229	0.0	0.4	9.808	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1302	325	665	1917	0.679	1298	1761	1.2	2.1	5.787	A
2	547	137	1331	1133	0.482	545	632	0.6	0.9	6.105	A
3	2414	603	188	2414	1.000	2334	1688	4.6	24.6	30.442	D
4	174	44	2254	336	0.519	172	269	0.4	1.0	21.629	C

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1594	399	711	1886	0.845	1582	1819	2.1	5.0	11.412	B
2	669	167	1622	963	0.695	664	672	0.9	2.2	11.876	B
3	2956	739	229	2385	1.240	2382	2057	24.6	168.1	151.041	F
4	214	53	2321	299	0.715	209	291	1.0	2.2	38.143	E

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1594	399	715	1884	0.846	1593	1820	5.0	5.3	12.303	B
2	669	167	1635	955	0.701	669	674	2.2	2.3	12.558	B
3	2956	739	231	2383	1.240	2383	2073	168.1	311.4	364.290	F
4	214	53	2323	298	0.717	213	292	2.2	2.3	41.714	E

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1302	325	686	1902	0.684	1314	1815	5.3	2.2	6.247	A
2	547	137	1350	1123	0.487	552	651	2.3	1.0	6.366	A
3	2414	603	191	2412	1.001	2409	1711	311.4	312.7	466.837	F
4	174	44	2324	298	0.585	178	275	2.3	1.5	30.719	D

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1090	273	661	1917	0.569	1094	1810	2.2	1.3	4.389	A
2	458	114	1123	1255	0.365	459	632	1.0	0.6	4.532	A
3	2021	505	159	2435	0.830	2427	1424	312.7	211.2	389.045	F
4	146	37	2323	299	0.488	148	263	1.5	1.0	24.170	C

D7 - 2031 | DS1A | PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	322.01	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	322.01	F

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2031	DS1A	PM	ONE HOUR	16:45	18:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1463	100.000
2		ONE HOUR	✓	605	100.000
3		ONE HOUR	✓	2761	100.000
4		ONE HOUR	✓	198	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	89	1359	15
	2	119	0	407	79
	3	1959	589	0	213
	4	6	68	124	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	13	7	37
	2	13	0	8	0
	3	5	11	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.86	13.63	5.9	B	1342	2014
2	0.71	13.13	2.4	B	555	833
3	1.28	575.87	393.7	F	2534	3800
4	0.74	45.73	2.6	E	182	273

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1101	275	581	1961	0.562	1096	1553	0.0	1.3	4.139	A
2	455	114	1122	1250	0.364	453	556	0.0	0.6	4.503	A
3	2079	520	160	2423	0.858	2056	1416	0.0	5.6	9.318	A
4	149	37	1987	475	0.314	147	229	0.0	0.4	10.926	B

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1315	329	672	1899	0.692	1311	1782	1.3	2.2	6.084	A
2	544	136	1341	1120	0.485	542	642	0.6	0.9	6.214	A
3	2482	621	191	2401	1.034	2354	1693	5.6	37.7	41.485	E
4	178	44	2279	316	0.563	175	266	0.4	1.2	24.965	C

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1611	403	712	1874	0.860	1597	1818	2.2	5.6	12.458	B
2	666	167	1634	947	0.703	661	676	0.9	2.3	12.340	B
3	3040	760	233	2371	1.282	2370	2062	37.7	205.2	189.304	F
4	218	55	2317	295	0.740	213	285	1.2	2.4	41.669	E

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1611	403	716	1871	0.861	1610	1819	5.6	5.9	13.626	B
2	666	167	1648	939	0.709	666	678	2.3	2.4	13.134	B
3	3040	760	234	2370	1.283	2370	2079	205.2	372.7	440.310	F
4	218	55	2318	294	0.741	217	286	2.4	2.6	45.731	E

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1315	329	688	1889	0.696	1329	1815	5.9	2.3	6.594	A
2	544	136	1362	1108	0.491	549	655	2.4	1.0	6.508	A
3	2482	621	193	2399	1.035	2398	1718	372.7	393.7	575.867	F
4	178	44	2321	293	0.607	182	270	2.6	1.7	33.353	D

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1101	275	662	1905	0.578	1105	1809	2.3	1.4	4.526	A
2	455	114	1133	1244	0.366	457	635	1.0	0.6	4.585	A
3	2079	520	161	2422	0.858	2416	1429	393.7	309.4	524.131	F
4	149	37	2319	295	0.505	151	257	1.7	1.1	25.487	D

D8 - 2031 | DS1A | AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	268.60	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	268.60	F

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2031	DS1A	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	2045	100.000
2		ONE HOUR	✓	751	100.000
3		ONE HOUR	✓	1585	100.000
4		ONE HOUR	✓	313	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	93	1949	3
	2	64	0	639	48
	3	1129	368	0	88
	4	26	67	220	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	42	7	0
	2	33	0	21	0
	3	10	22	0	0
	4	40	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	1.23	400.42	223.6	F	1877	2815
2	1.24	550.16	99.9	F	689	1034
3	0.75	6.26	3.0	A	1454	2182
4	0.63	17.48	1.6	C	287	431

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1540	385	491	1994	0.772	1527	914	0.0	3.3	7.507	A
2	565	141	1622	857	0.660	558	396	0.0	1.9	11.756	B
3	1193	298	85	2331	0.512	1189	2094	0.0	1.0	3.140	A
4	236	59	1171	848	0.278	234	104	0.0	0.4	5.852	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1838	460	587	1926	0.955	1799	1092	3.3	13.0	23.459	C
2	675	169	1915	703	0.961	644	472	1.9	9.8	46.520	E
3	1425	356	99	2322	0.614	1423	2460	1.0	1.6	3.995	A
4	281	70	1399	720	0.391	280	123	0.4	0.6	8.165	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	2252	563	716	1834	1.227	1830	1324	13.0	118.4	136.379	F
2	827	207	1986	666	1.241	662	560	9.8	51.0	180.190	F
3	1745	436	101	2320	0.752	1740	2547	1.6	3.0	6.147	A
4	345	86	1699	553	0.623	341	142	0.6	1.6	16.699	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	2252	563	721	1831	1.230	1831	1328	118.4	223.6	336.460	F
2	827	207	1990	664	1.244	664	562	51.0	91.7	401.348	F
3	1745	436	102	2319	0.752	1745	2552	3.0	3.0	6.262	A
4	345	86	1705	550	0.627	344	142	1.6	1.6	17.483	C

08:45 - 09:00

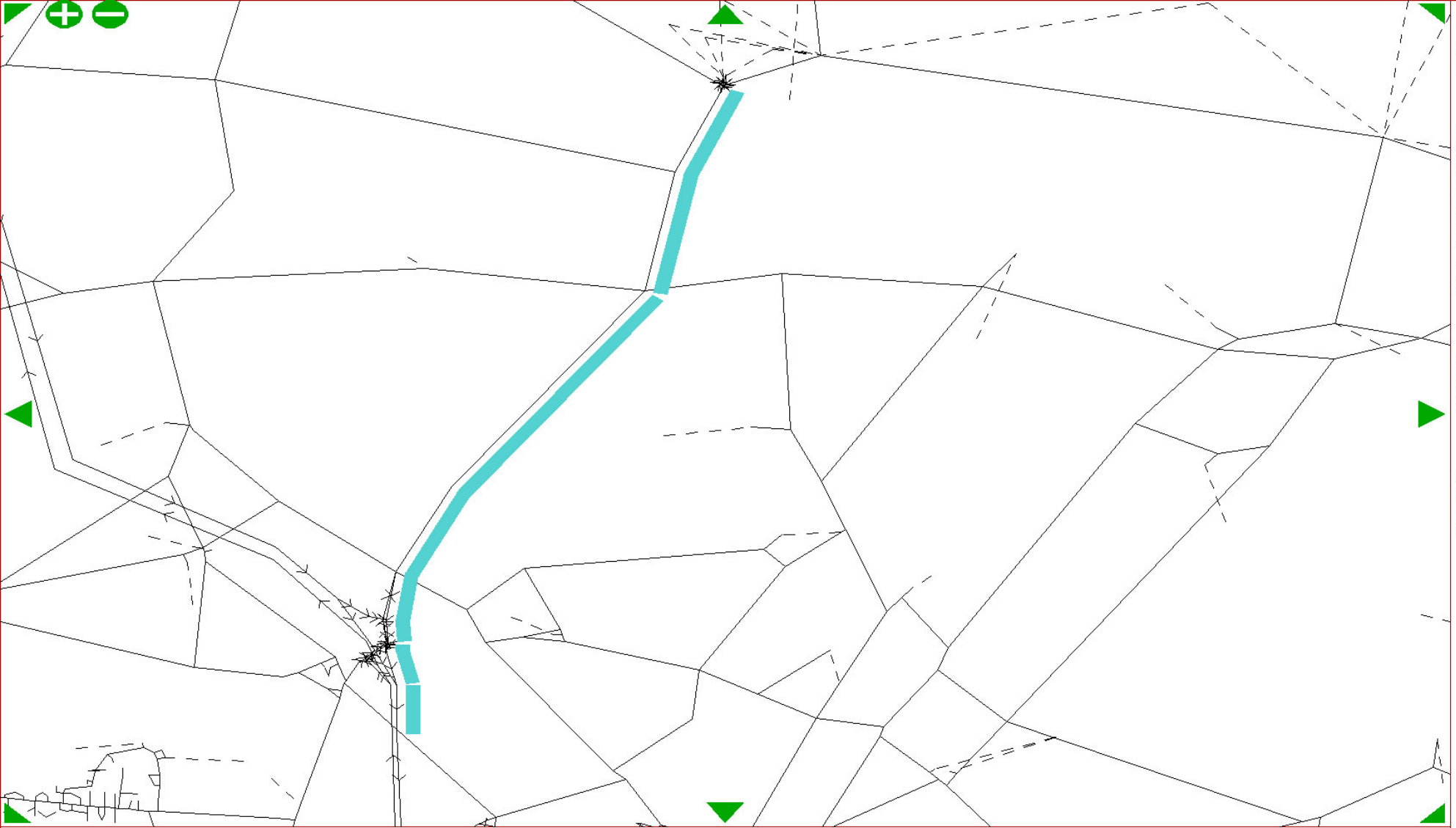
Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1838	460	594	1921	0.957	1913	1097	223.6	205.0	400.417	F
2	675	169	2026	644	1.049	643	480	91.7	99.9	550.163	F
3	1425	356	99	2322	0.614	1430	2570	3.0	1.6	4.063	A
4	281	70	1406	716	0.393	285	123	1.6	0.7	8.425	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1540	385	495	1991	0.773	1982	924	205.0	94.5	273.254	F
2	565	141	2058	626	0.904	619	418	99.9	86.3	541.750	F
3	1193	298	95	2324	0.513	1195	2582	1.6	1.1	3.197	A
4	236	59	1182	841	0.280	237	109	0.7	0.4	5.968	A

APPENDIX C

BTM JOURNEY TIME DATA



JOY RIDE:
FROM 97602
TO 10071

Cumulative:

NODE = 10071
Priority
Time = 817
Delay= 442
Dist = 9929
Speed= 43.78
FCost= 1061

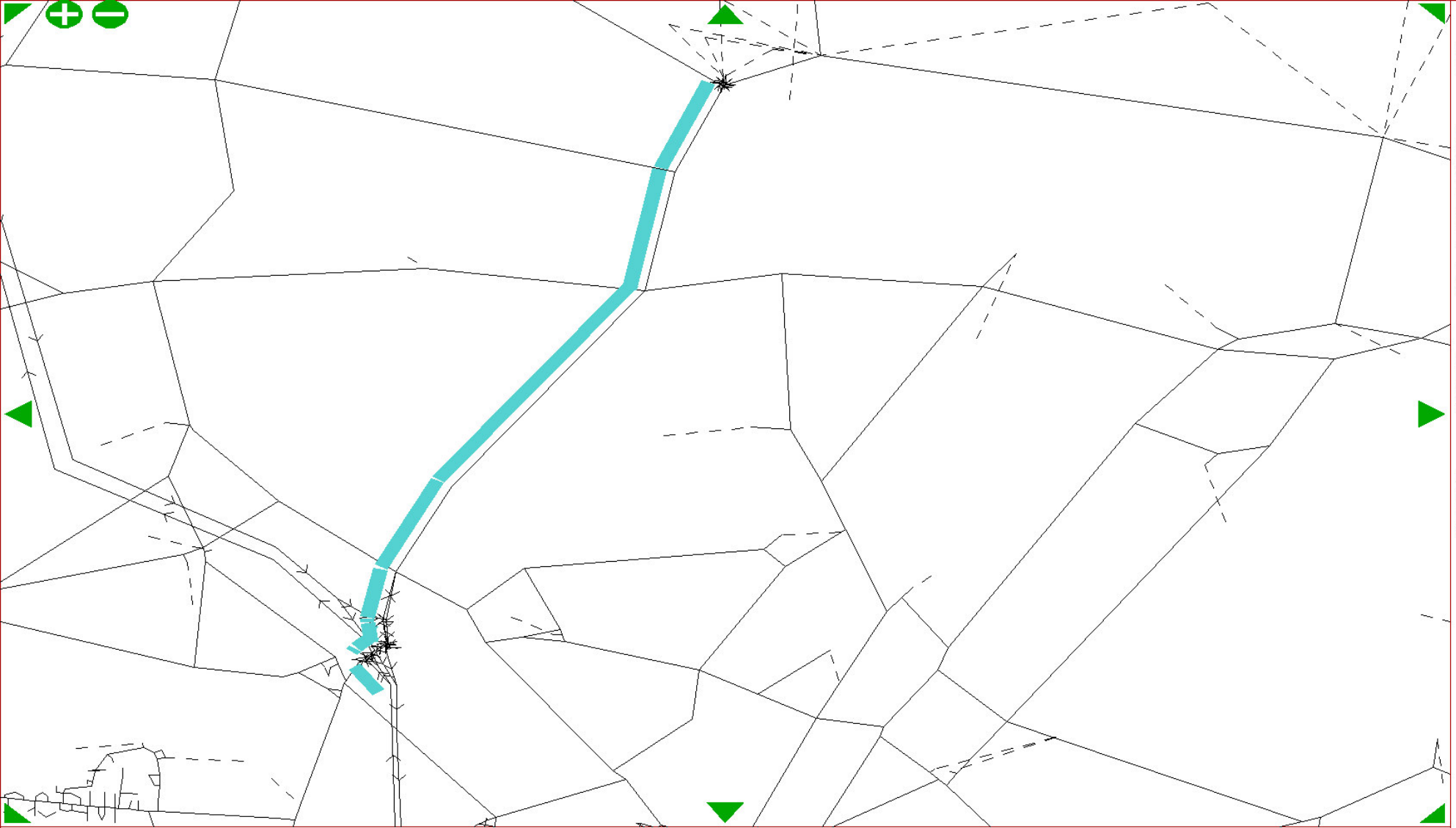
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5655
V/C% = 86

Last turn:

Time = 193
Speed= 8.26
Select the
next node



JOY RIDE:
FROM 10065
TO 97602

Cumulative:

NODE = 97602
Priority
Time = 386
Delay= 31
Dist = 9765
Speed= 91.03
FCost= 626

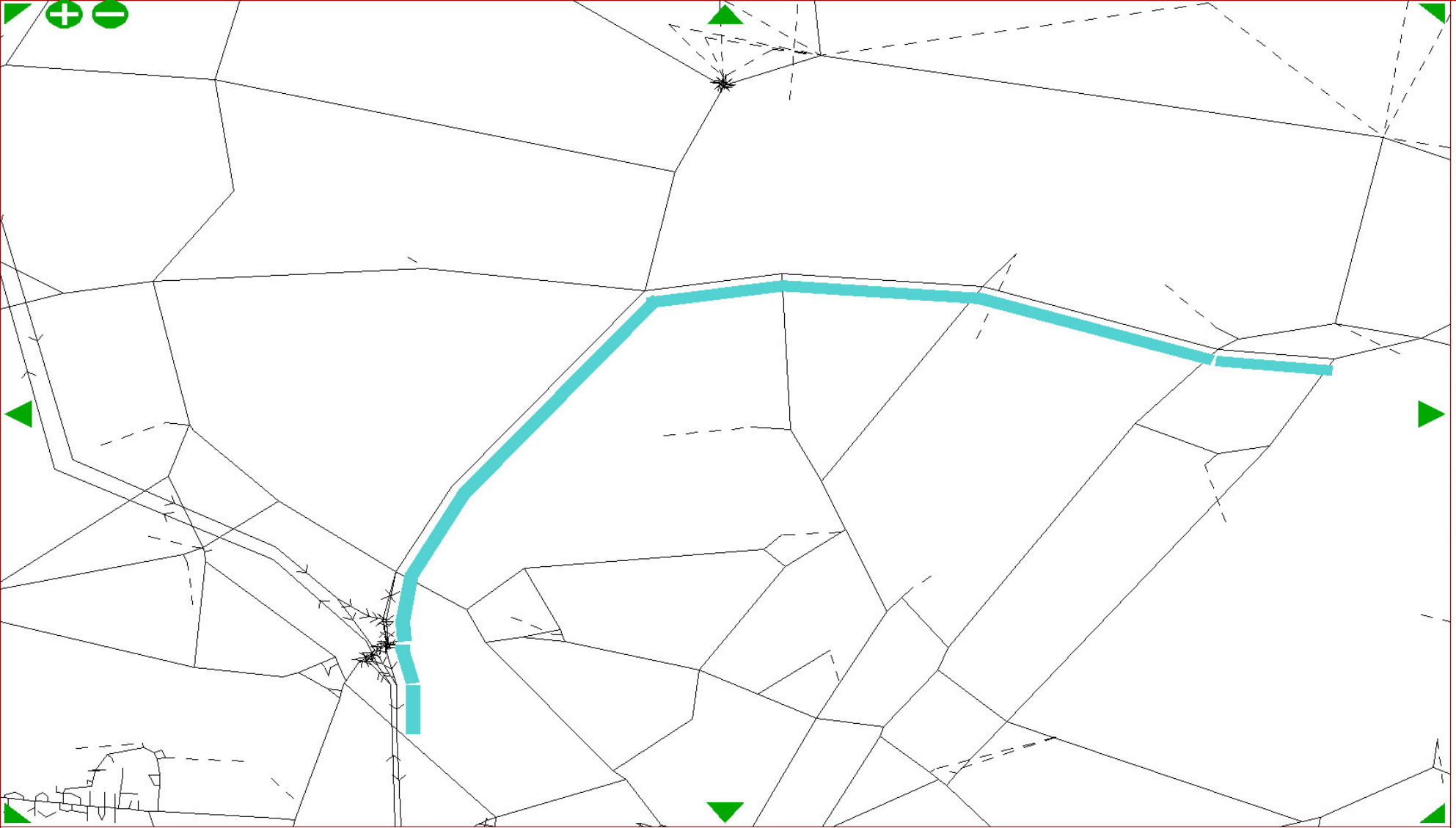
Definitions:
See 11.8.2.1

This link:

Time = 34
Dist = 1008
Flow = 1334
V/C% = 33

Last turn:

Time = 5
Speed= 98.10
Select the
next node



JOY RIDE:
FROM 42012
TO 10071

Cumulative:

NODE = 10071
Prioritv
Time = 1033
Delav= 453
Dist = 14981
Speed= 52.22
FCost= 1401

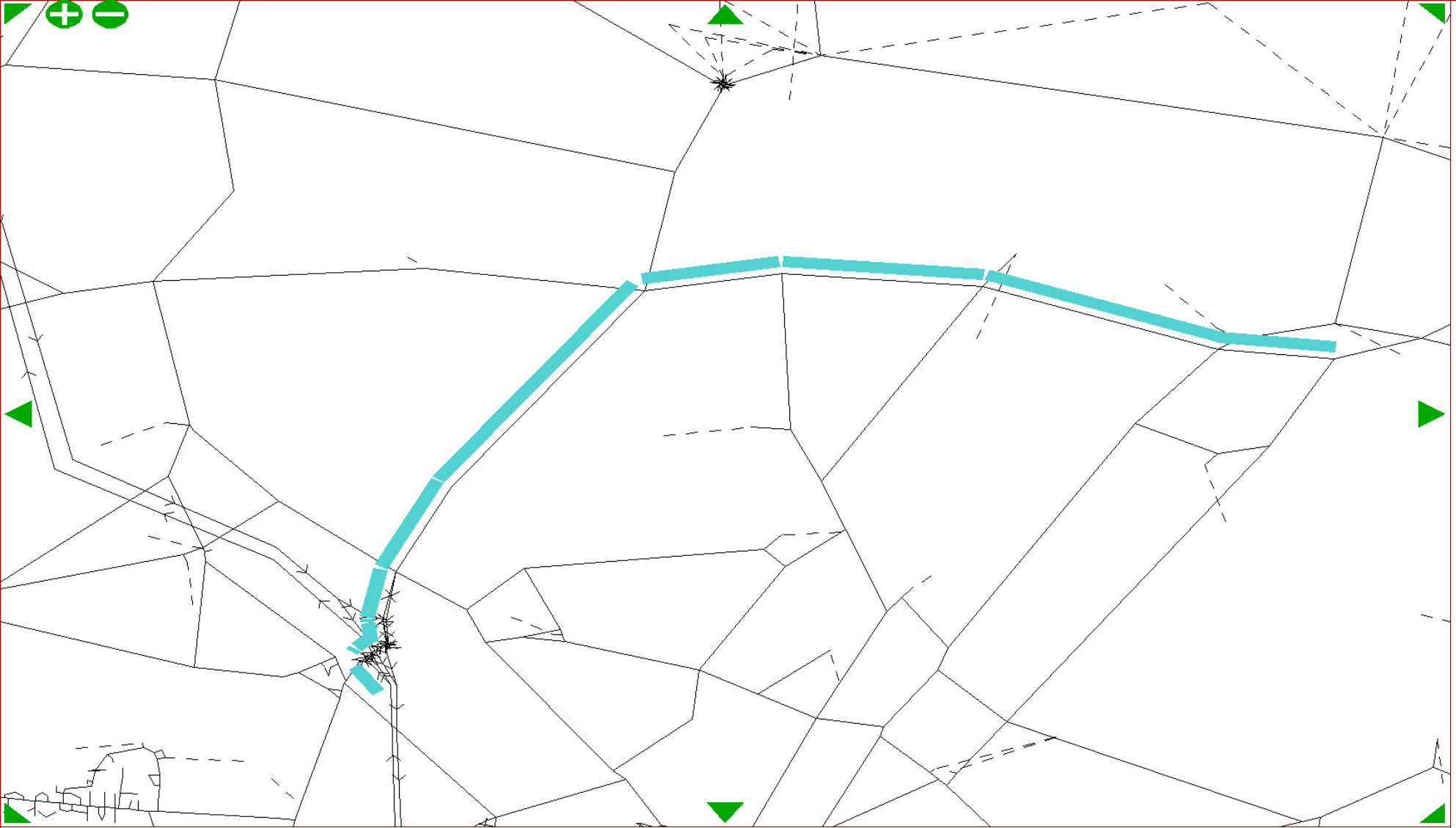
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5655
V/C% = 86

Last turn:

Time = 193
Speed= 8.26
Select the
next node



JOY RIDE:
FROM 10065
TO 42012

Cumulative:

NODE = 42012
Priority
Time = 621
Delay= 60
Dist = 14817
Speed= 85.95
FCost= 985

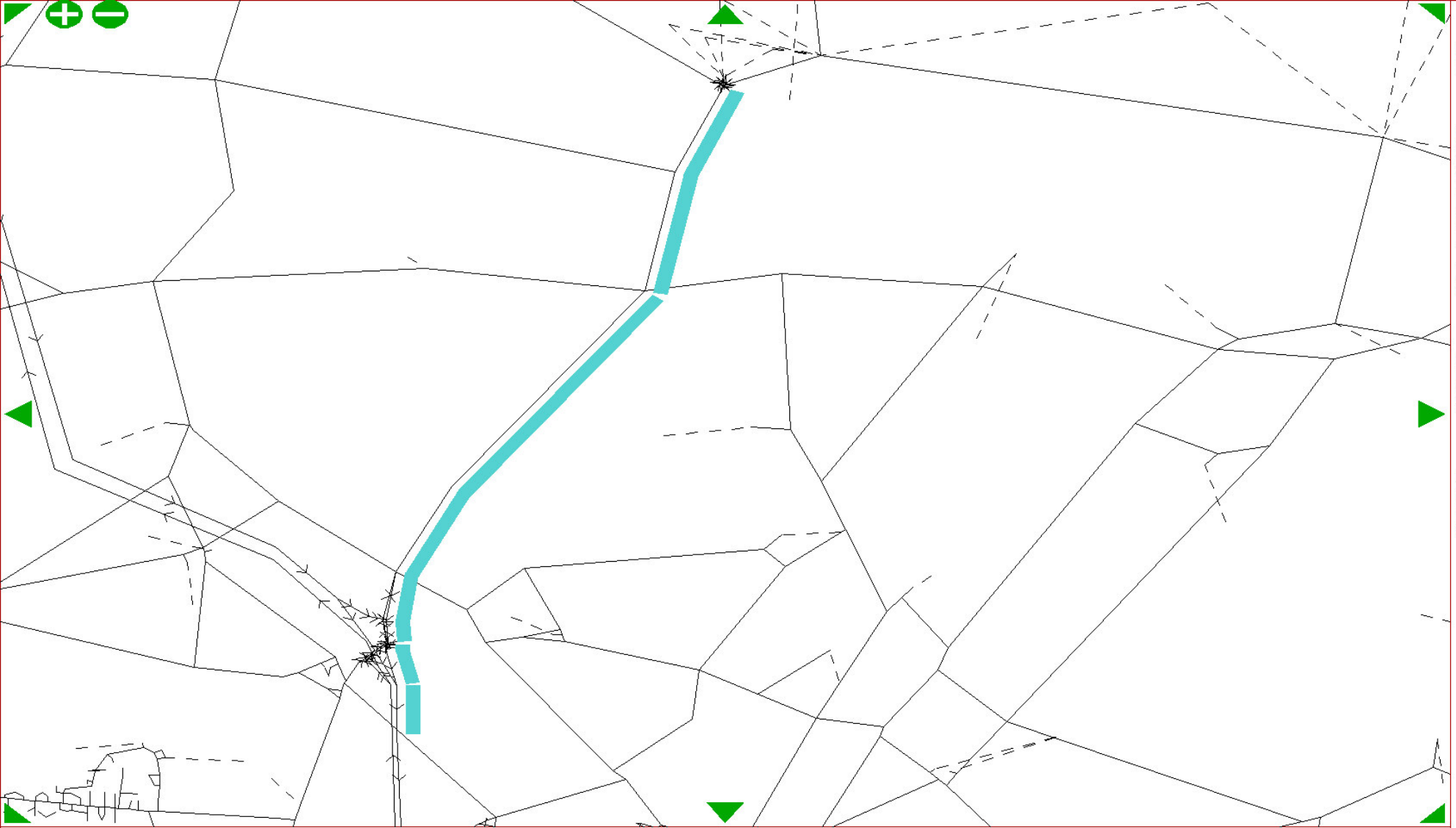
Definitions:
See 11.8.2.1

This link:

Time = 47
Dist = 1398
Flow = 821
V/C% = 23

Last turn:

Time = 6
Speed= 81.58
Select the
next node



JOY RIDE:
FROM 97602
TO 10071

Cumulative:

NODE = 10071
Priority
Time = 463
Delay= 96
Dist = 9929
Speed= 77.14
FCost= 708

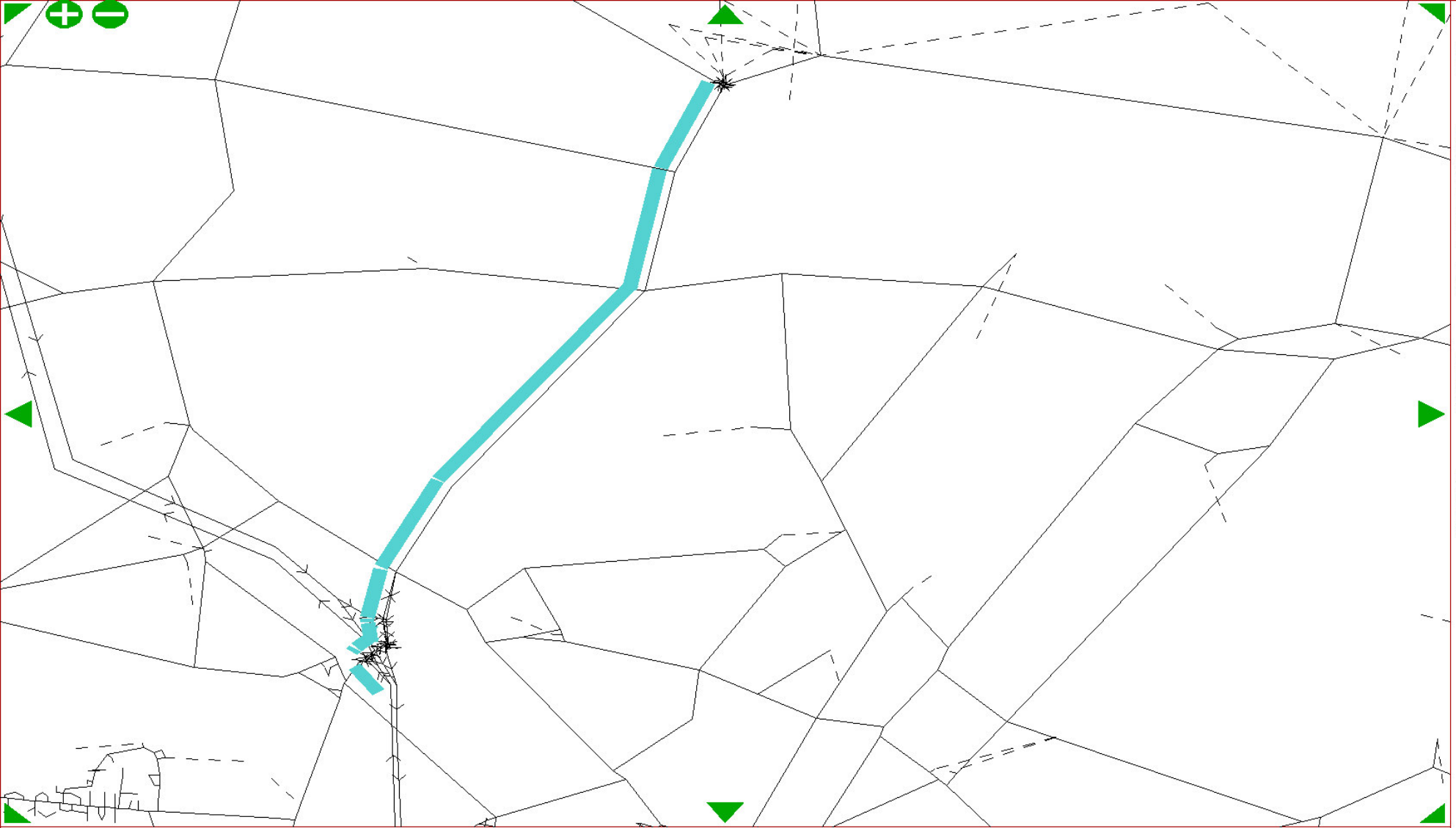
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5295
V/C% = 80

Last turn:

Time = 49
Speed= 23.46
Select the
next node



JOY RIDE:
FROM 10065
TO 97602

Cumulative:

NODE = 97602
Prioritv
Time = 577
Delav= 220
Dist = 9765
Speed= 60.95
FCost= 817

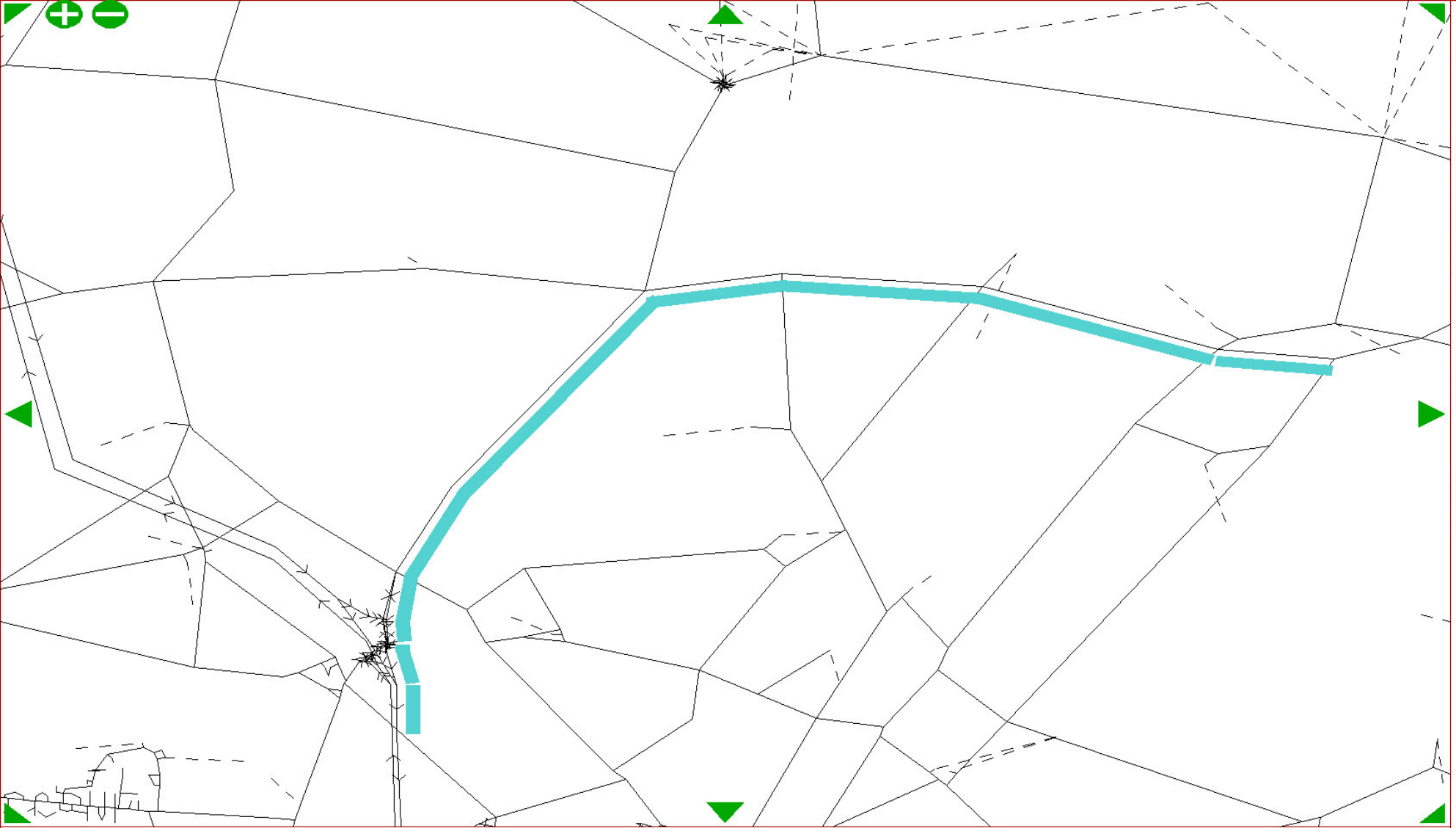
Definitions:
See 11.8.2.1

This link:

Time = 34
Dist = 1008
Flow = 1738
V/C% = 43

Last turn:

Time = 7
Speed= 94.73
Select the
next node



JOY RIDE:
FROM 42012
TO 10071

Cumulative:

NODE = 10071
Prioritv
Time = 687
Delav= 116
Dist = 14981
Speed= 78.46
FCost= 1056

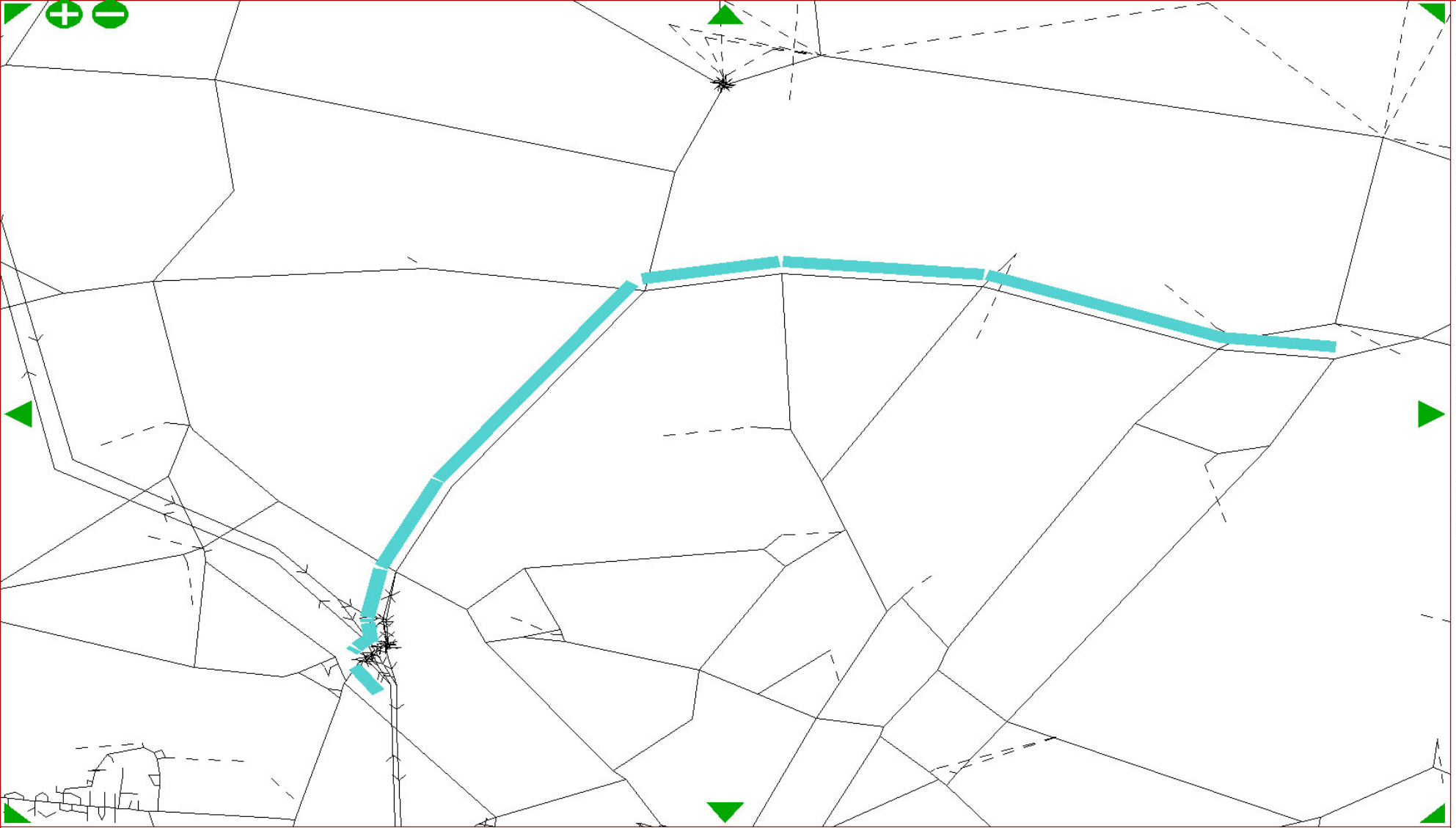
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5295
V/C% = 80

Last turn:

Time = 49
Speed= 23.46
Select the
next node



JOY RIDE:
FROM 10065
TO 42012

Cumulative:

NODE = 42012
Priority
Time = 797
Delay= 235
Dist = 14817
Speed= 66.94
FCost= 1161

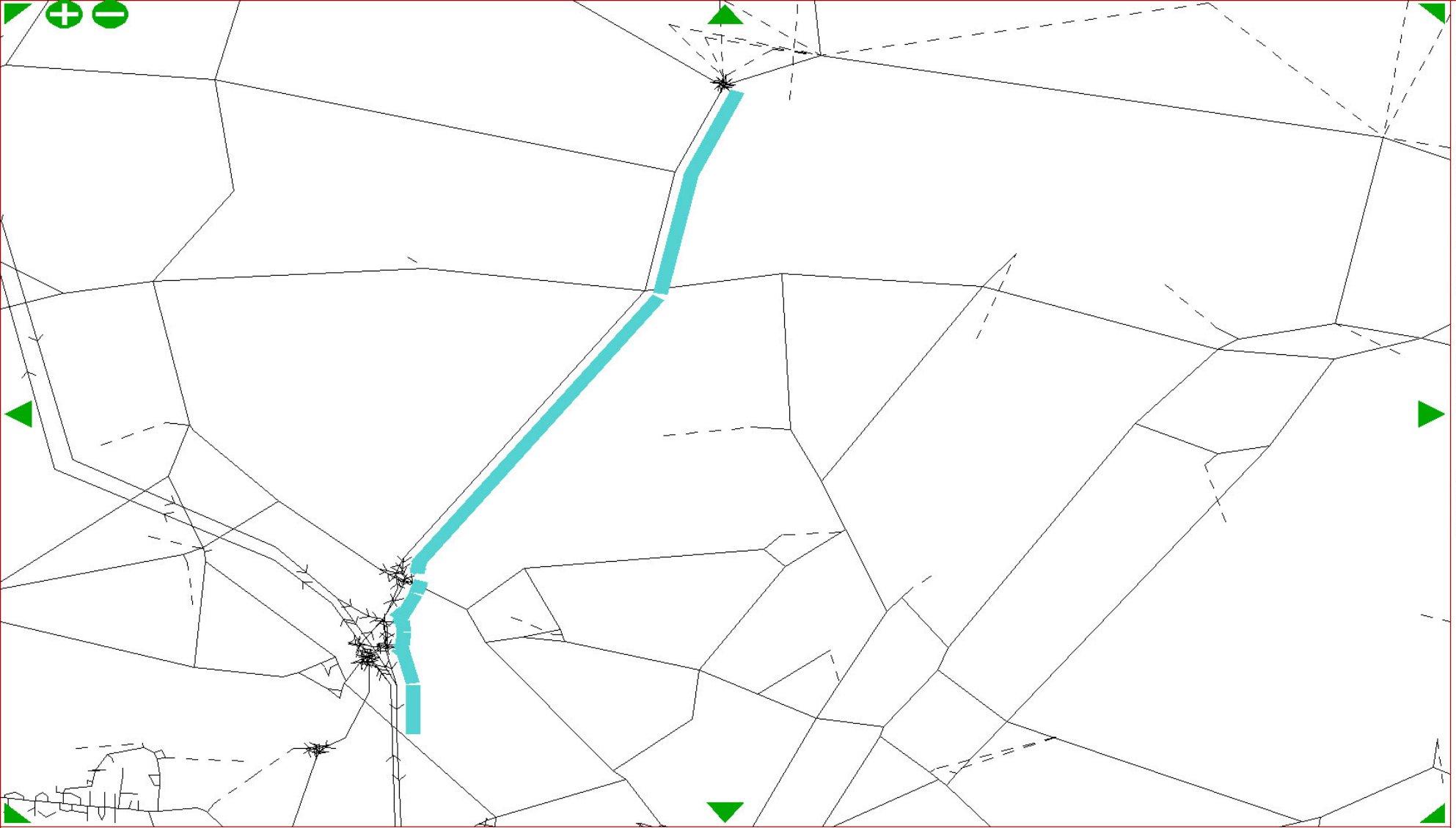
Definitions:
See 11.8.2.1

This link:

Time = 47
Dist = 1398
Flow = 1067
V/C% = 30

Last turn:

Time = 9
Speed= 81.58
Select the
next node



JOY RIDE:
FROM 97602
TO 10071

Cumulative:

NODE = 10071
Priority
Time = 501
Delay= 116
Dist = 9969
Speed= 71.66
FCost= 746

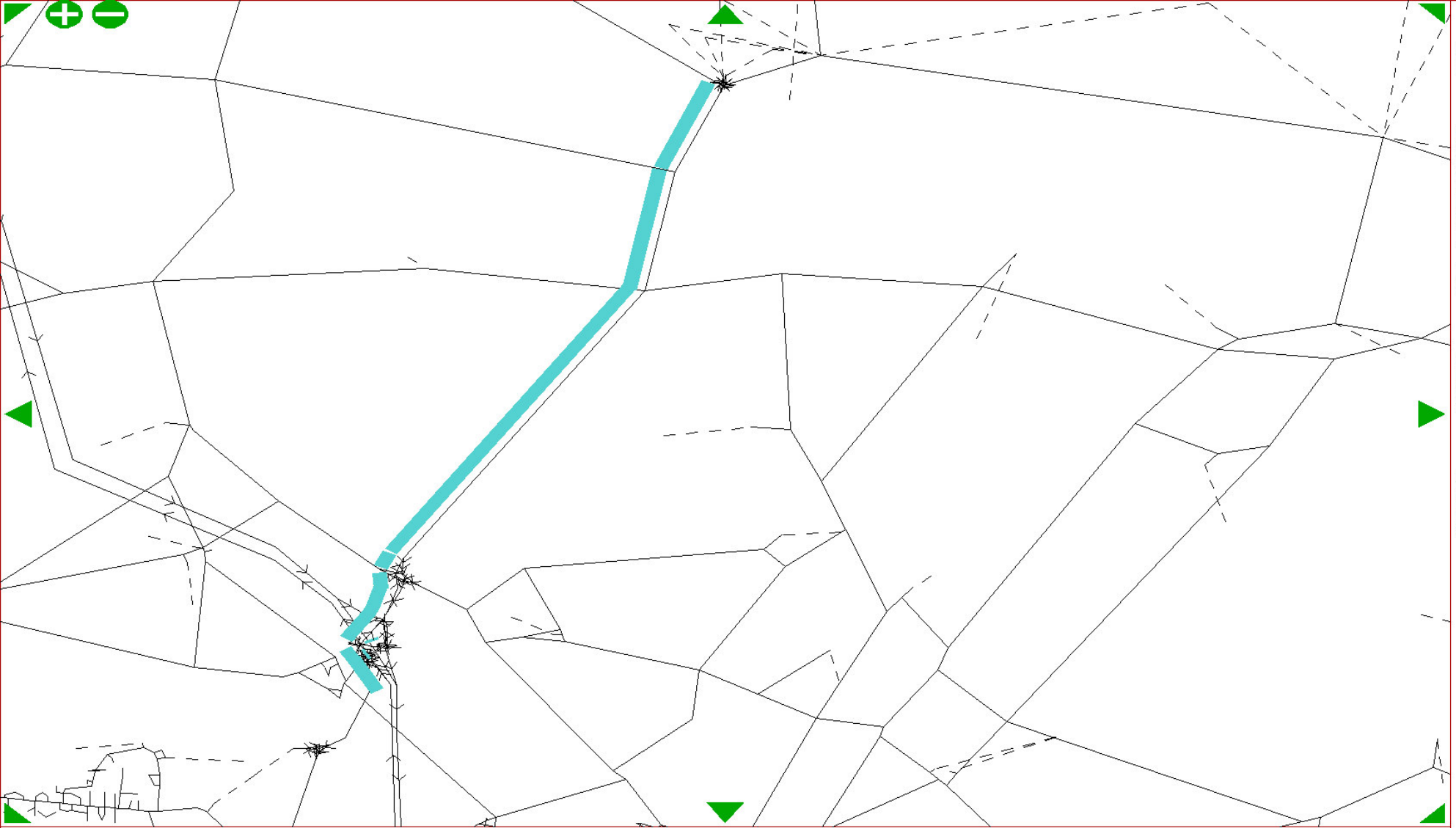
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 6174
V/C% = 94

Last turn:

Time = 3
Speed= 94.08
Select the
next node



JOY RIDE:
FROM 10065
TO 97602

Cumulative:

NODE = 97602
Priority
Time = 444
Delay= 17
Dist = 10477
Speed= 84.92
FCost= 702

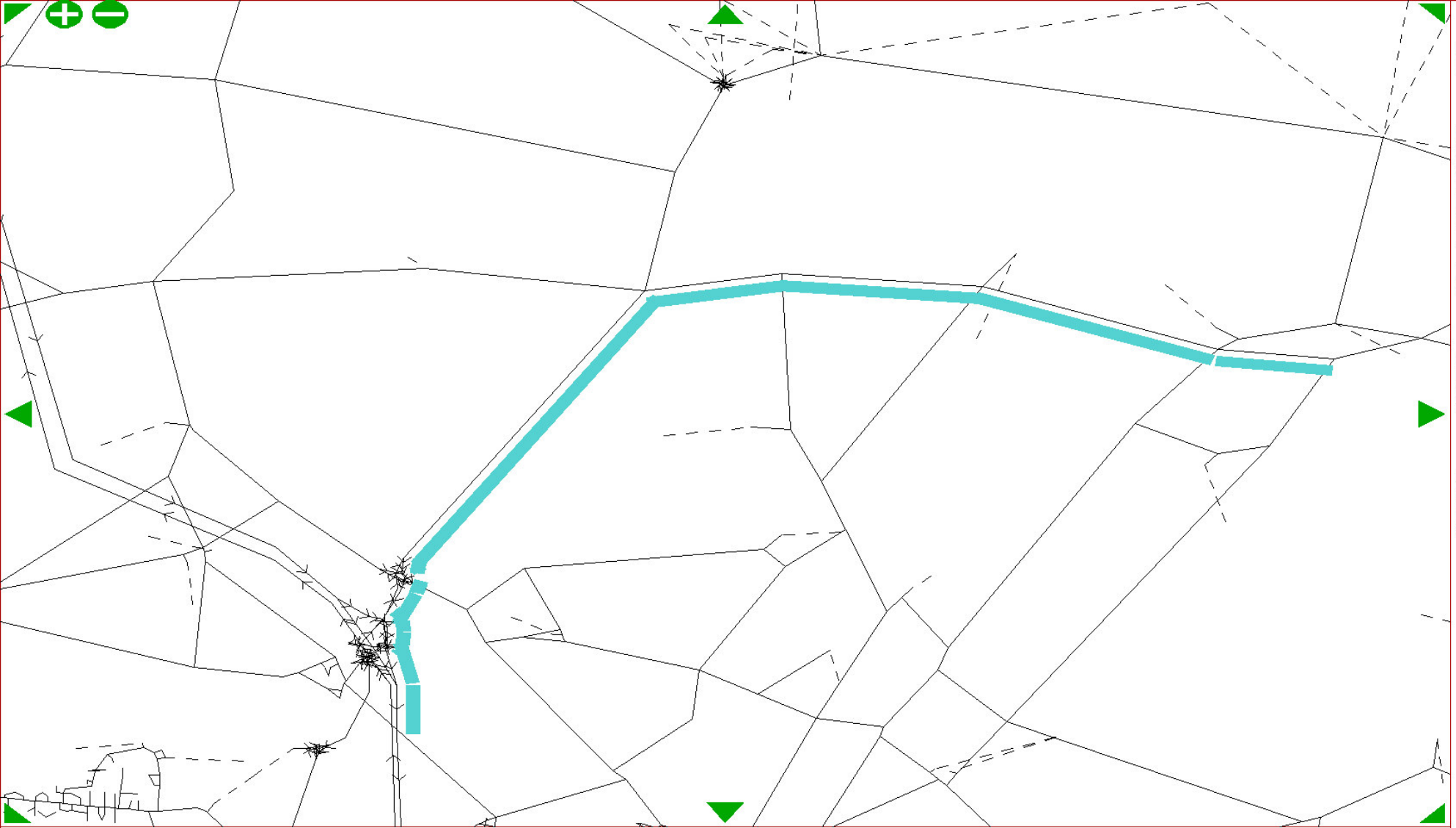
Definitions:
See 11.8.2.1

This link:

Time = 34
Dist = 1008
Flow = 1298
V/C% = 32

Last turn:

Time = 5
Speed= 98.30
Select the
next node



JOY RIDE:
FROM 42012
TO 10071

Cumulative:

NODE = 10071
Prioritv
Time = 804
Delay= 214
Dist = 15021
Speed= 67.29
FCost= 1173

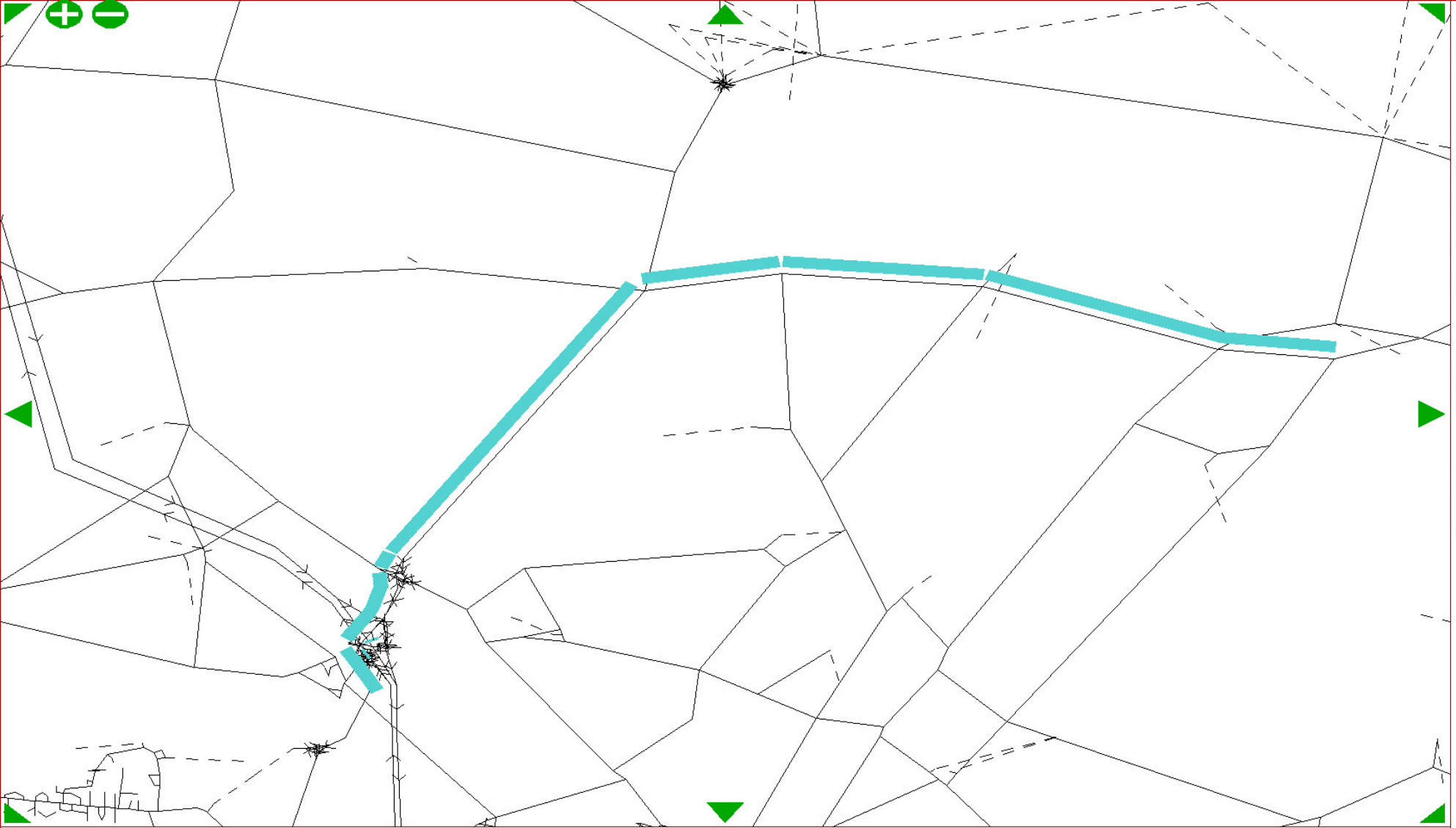
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 6174
V/C% = 94

Last turn:

Time = 3
Speed= 94.08
Select the
next node



JOY RIDE:
FROM 10065
TO 42012

Cumulative:

NODE = 42012
Priority
Time = 667
Delay= 37
Dist = 15529
Speed= 83.79
FCost= 1049

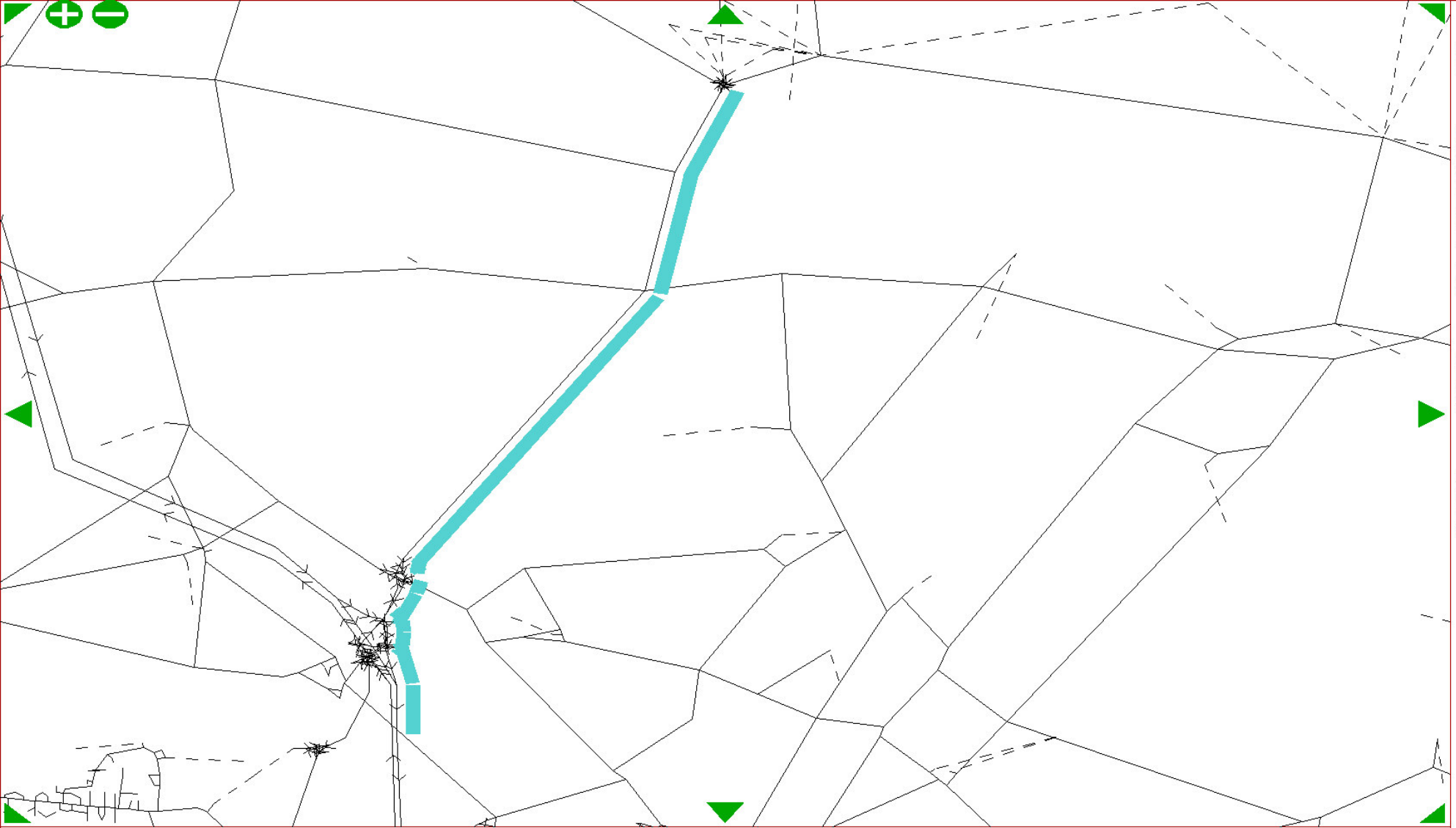
Definitions:
See 11.8.2.1

This link:

Time = 47
Dist = 1398
Flow = 800
V/C% = 22

Last turn:

Time = 6
Speed= 83.02
Select the
next node



JOY RIDE:
FROM 97602
TO 10071

Cumulative:

NODE = 10071
Prioritv
Time = 420
Delay= 34
Dist = 9969
Speed= 85.50
FCost= 665

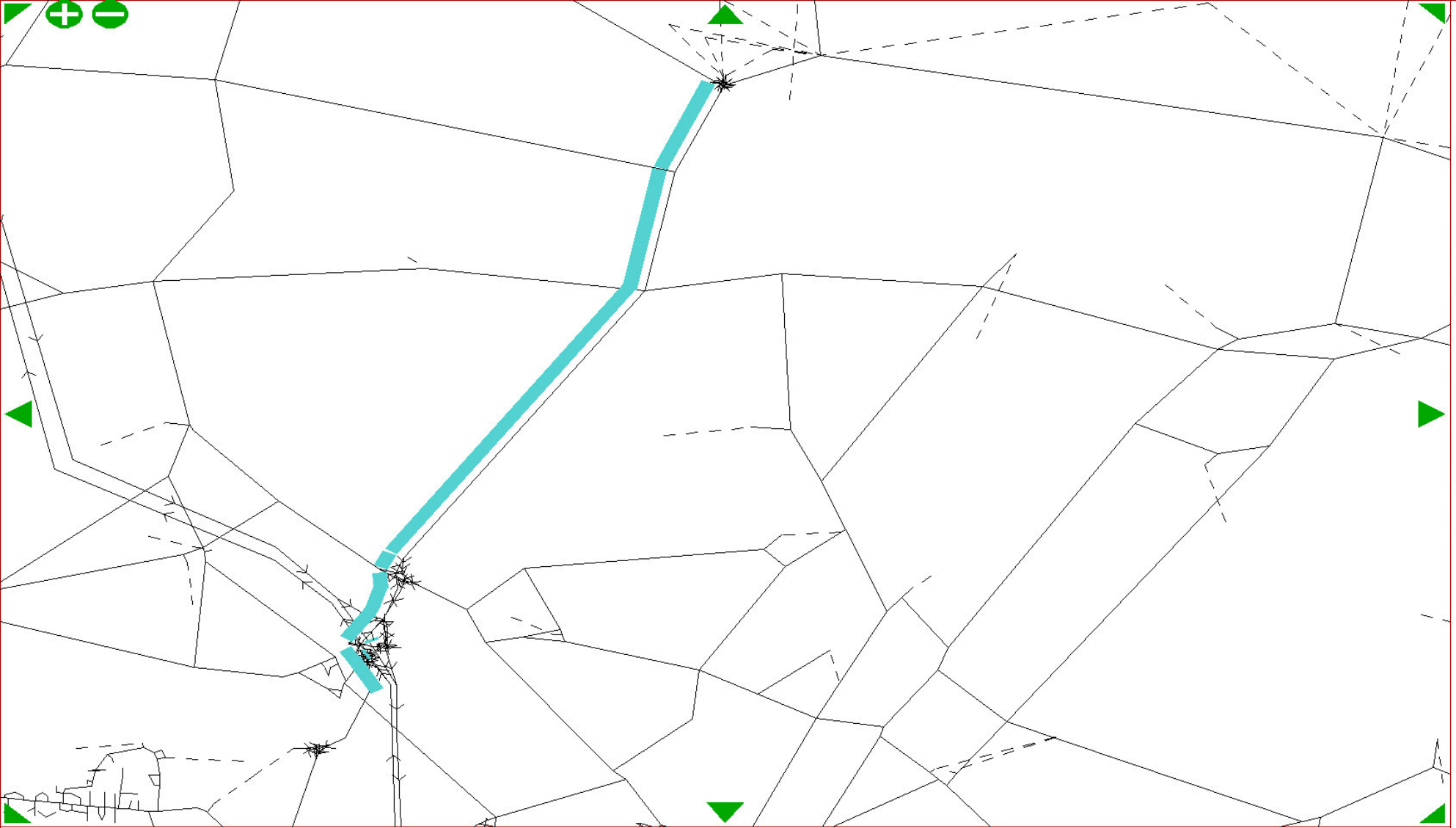
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5457
V/C% = 83

Last turn:

Time = 2
Speed=101.49
Select the
next node



JOY RIDE:
FROM 10065
TO 97602

Cumulative:

NODE = 97602
Priority
Time = 485
Delay= 67
Dist = 10477
Speed= 77.82
FCost= 742

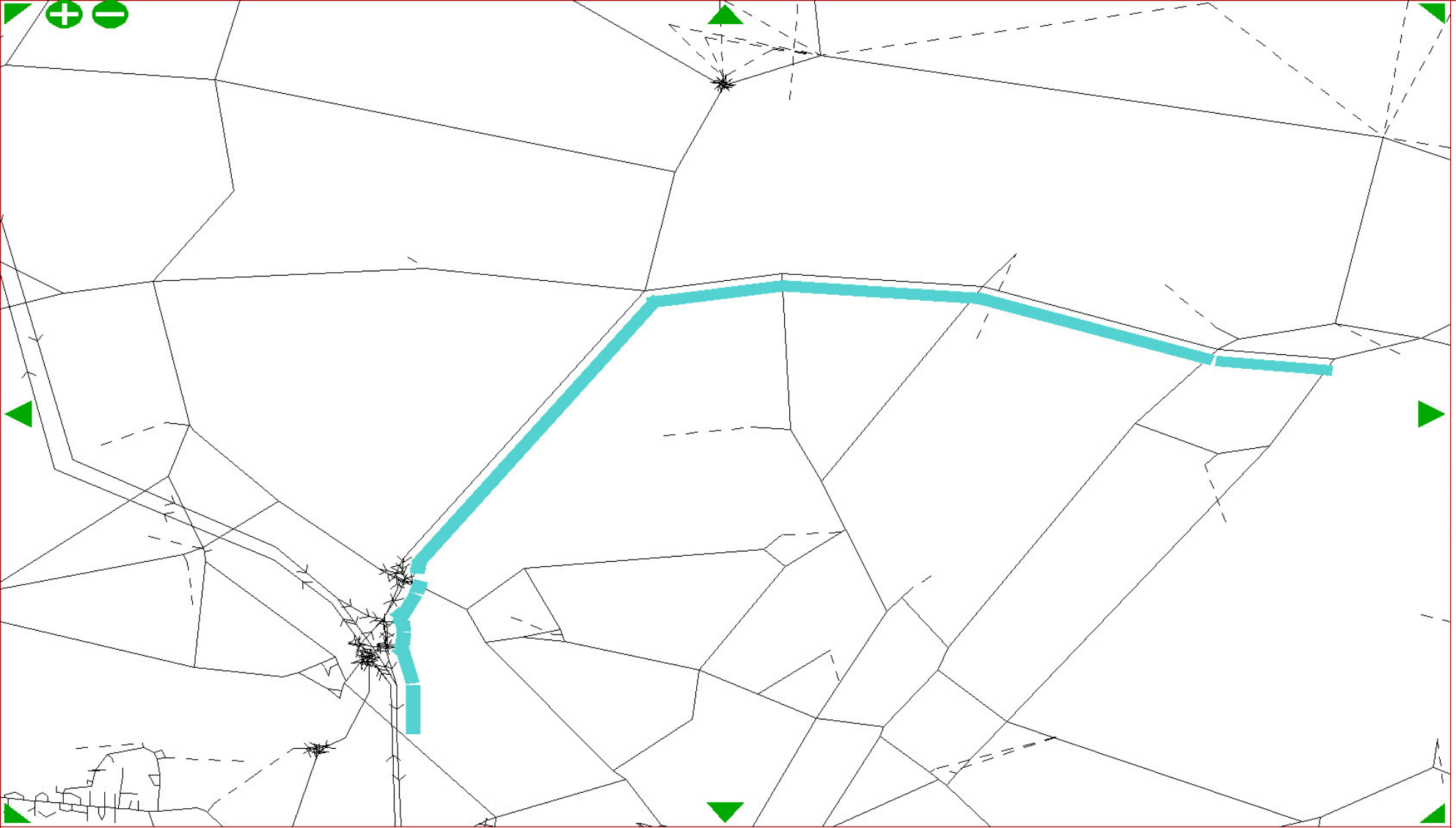
Definitions:
See 11.8.2.1

This link:

Time = 35
Dist = 1008
Flow = 2094
V/C% = 52

Last turn:

Time = 15
Speed= 83.84
Select the
next node



JOY RIDE:
FROM 42012
TO 10071

Cumulative:

NODE = 10071
Prioritv
Time = 641
Delav= 51
Dist = 15021
Speed= 84.34
FCost= 1011

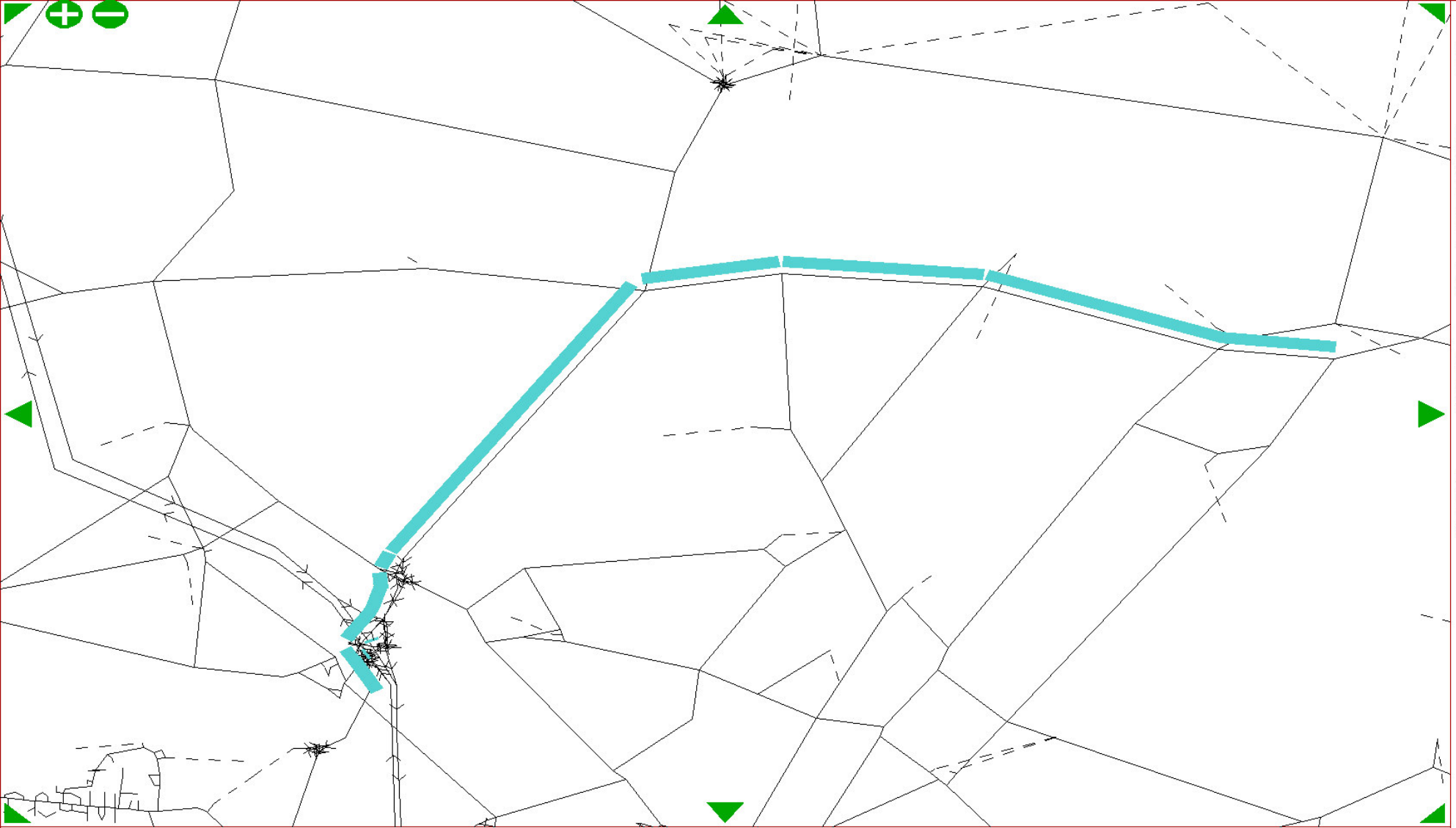
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5457
V/C% = 83

Last turn:

Time = 2
Speed=101.49
Select the
next node



JOY RIDE:
FROM 10065
TO 42012

Cumulative:

NODE = 42012
Priority
Time = 715
Delay= 93
Dist = 15529
Speed= 78.15
FCost= 1097

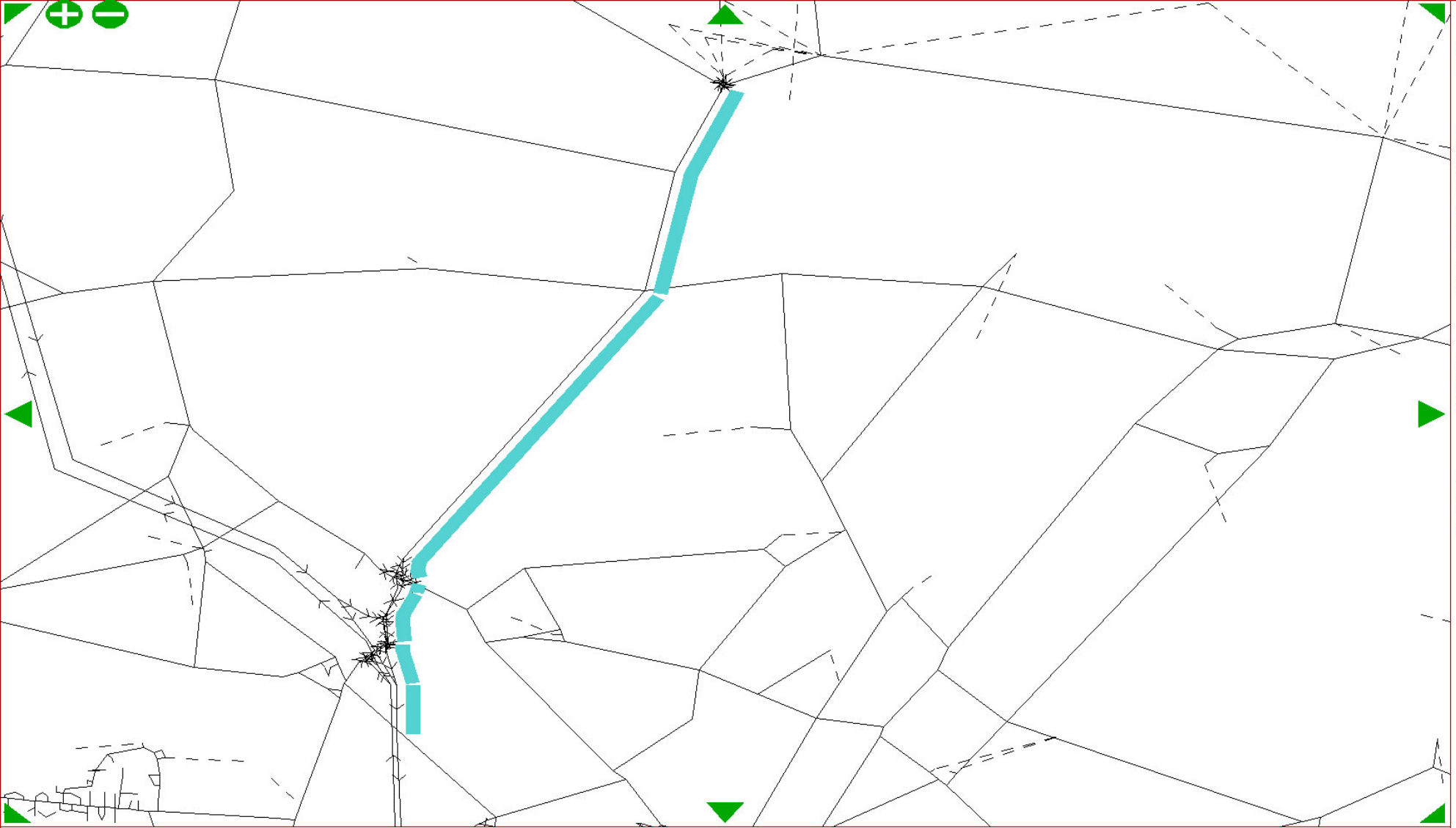
Definitions:
See 11.8.2.1

This link:

Time = 47
Dist = 1398
Flow = 1186
V/C% = 33

Last turn:

Time = 11
Speed= 75.88
Select the
next node



JOY RIDE:
FROM 97602
TO 10071

Cumulative:

NODE = 10071
Priority
Time = 750
Delay= 344
Dist = 10141
Speed= 48.65
FCost= 1000

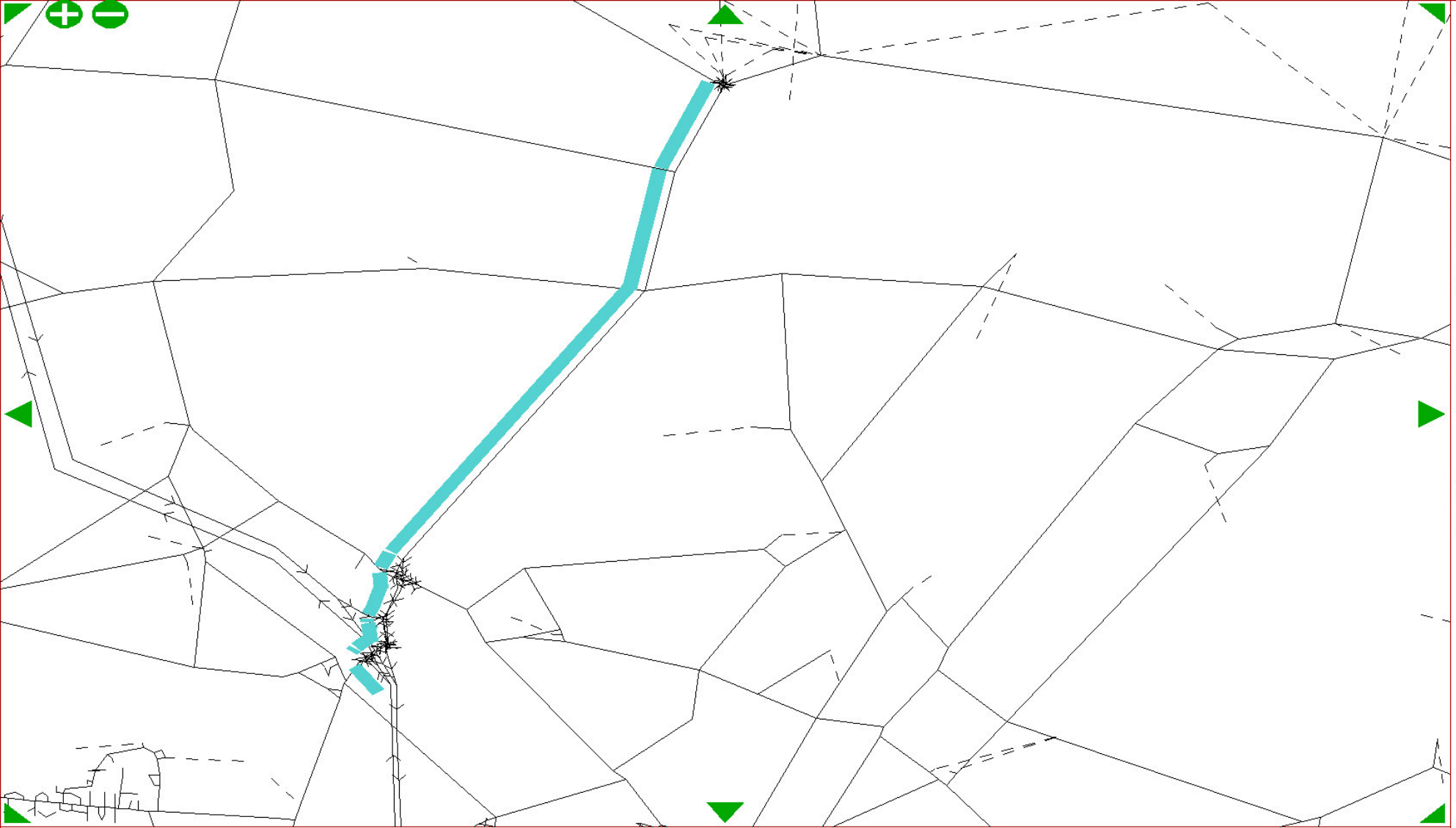
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5741
V/C% = 87

Last turn:

Time = 263
Speed= 6.27
Select the
next node



JOY RIDE:
FROM 10065
TO 97602

Cumulative:

NODE = 97602
Priority
Time = 417
Delay= 40
Dist = 9827
Speed= 84.83
FCost= 659

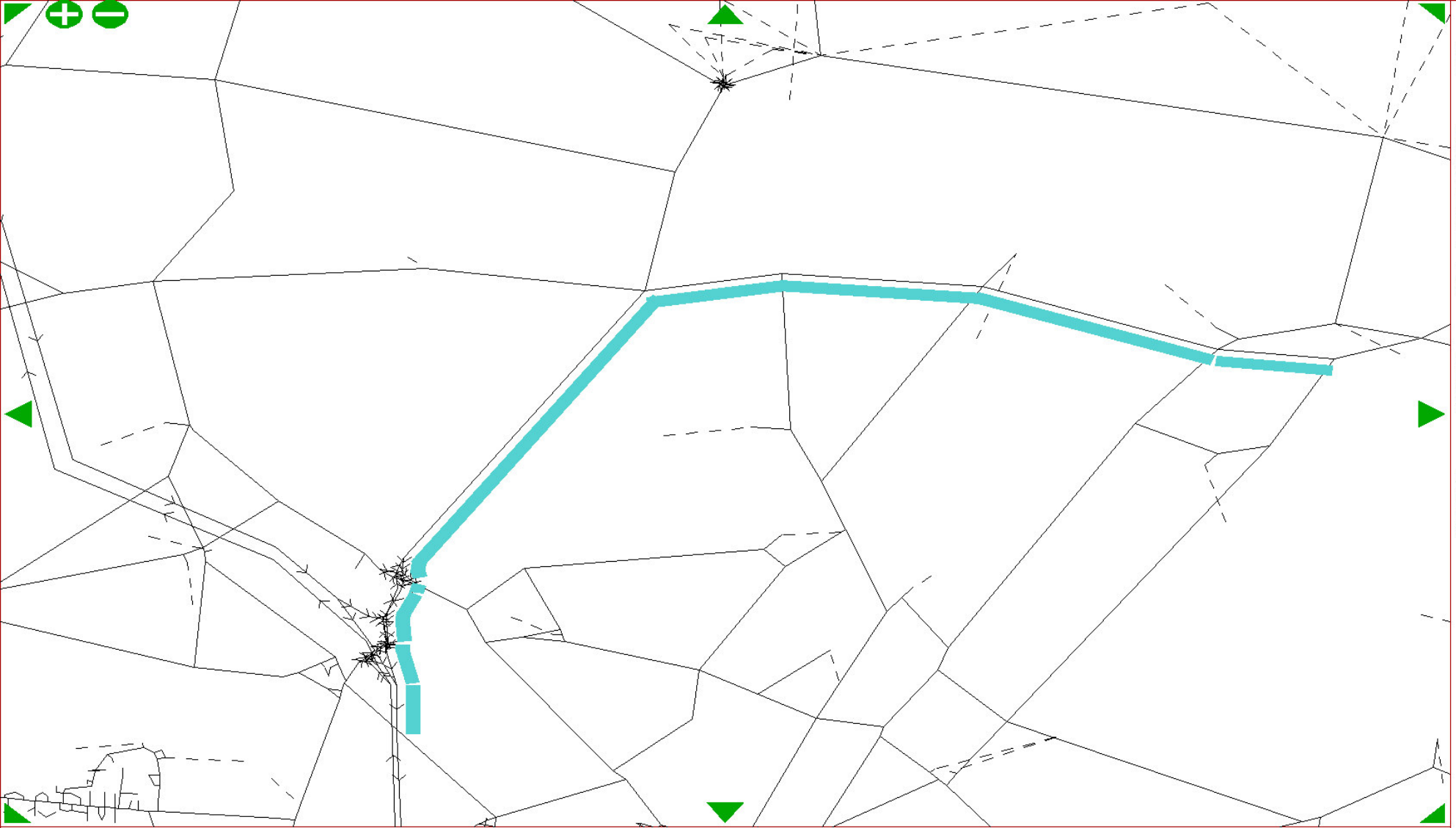
Definitions:
See 11.8.2.1

This link:

Time = 34
Dist = 1008
Flow = 1360
V/C% = 34

Last turn:

Time = 5
Speed= 97.97
Select the
next node



JOY RIDE:
FROM 42012
TO 10071

Cumulative:

NODE = 10071
Prioritv
Time = 962
Delav= 351
Dist = 15193
Speed= 56.88
FCost= 1335

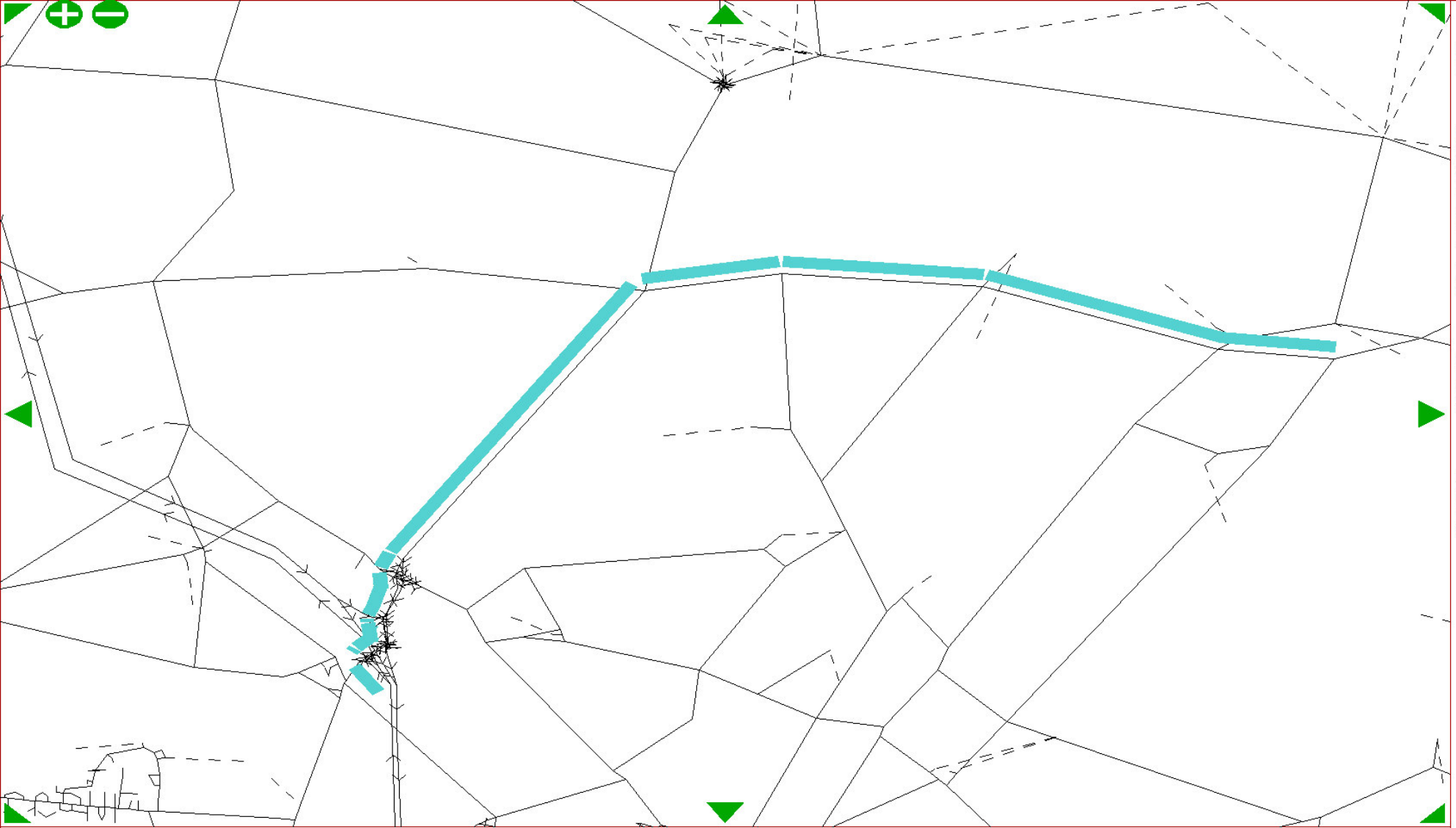
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5741
V/C% = 87

Last turn:

Time = 263
Speed= 6.27
Select the
next node



JOY RIDE:
FROM 10065
TO 42012

Cumulative:

NODE = 42012
Priority
Time = 642
Delay= 62
Dist = 14879
Speed= 83.38
FCost= 1008

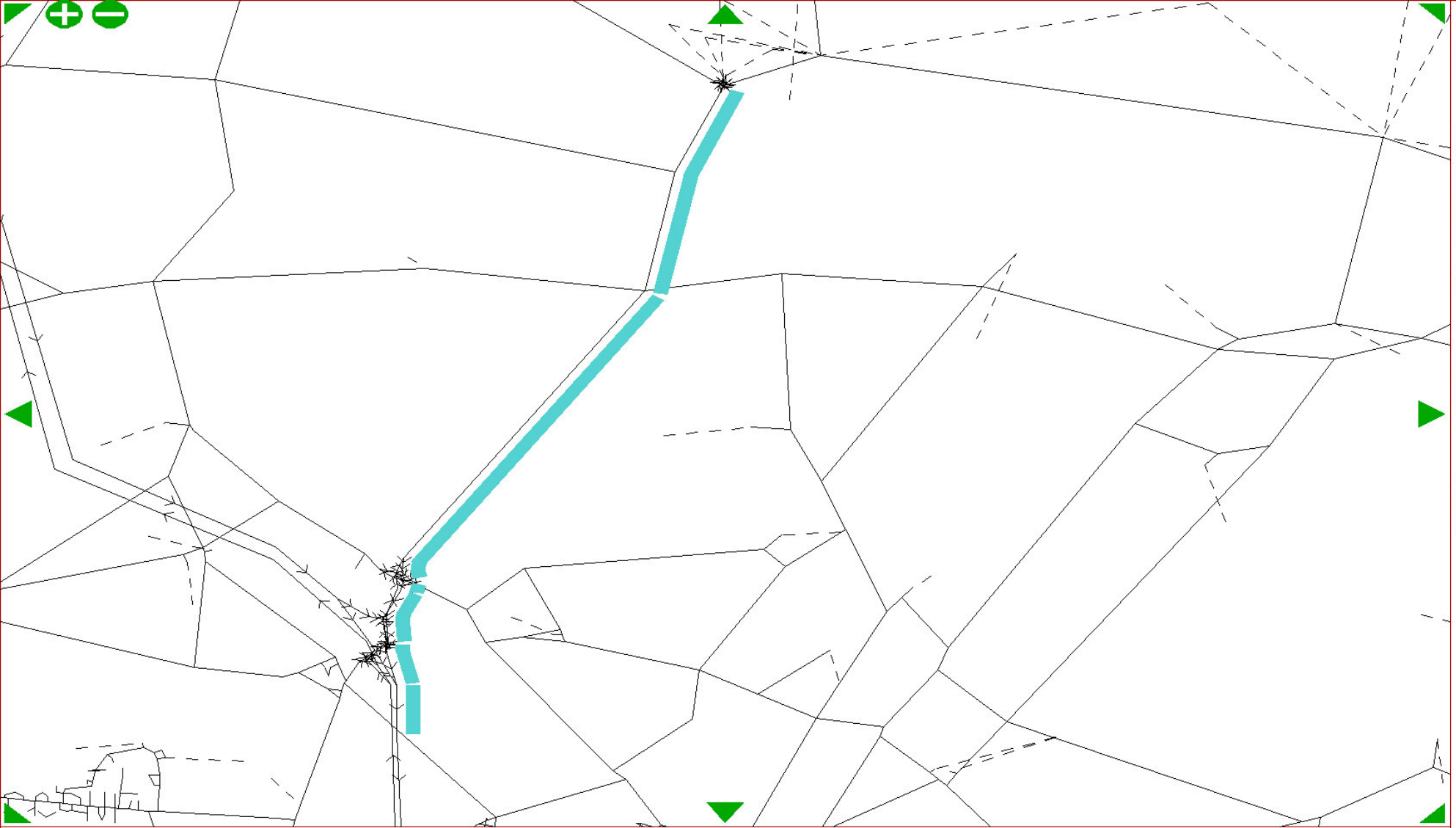
Definitions:
See 11.8.2.1

This link:

Time = 47
Dist = 1398
Flow = 815
V/C% = 23

Last turn:

Time = 6
Speed= 82.32
Select the
next node



JOY RIDE:
FROM 97602
TO 10071

Cumulative:

NODE = 10071
Priority
Time = 514
Delay= 117
Dist = 10141
Speed= 71.03
FCost= 763

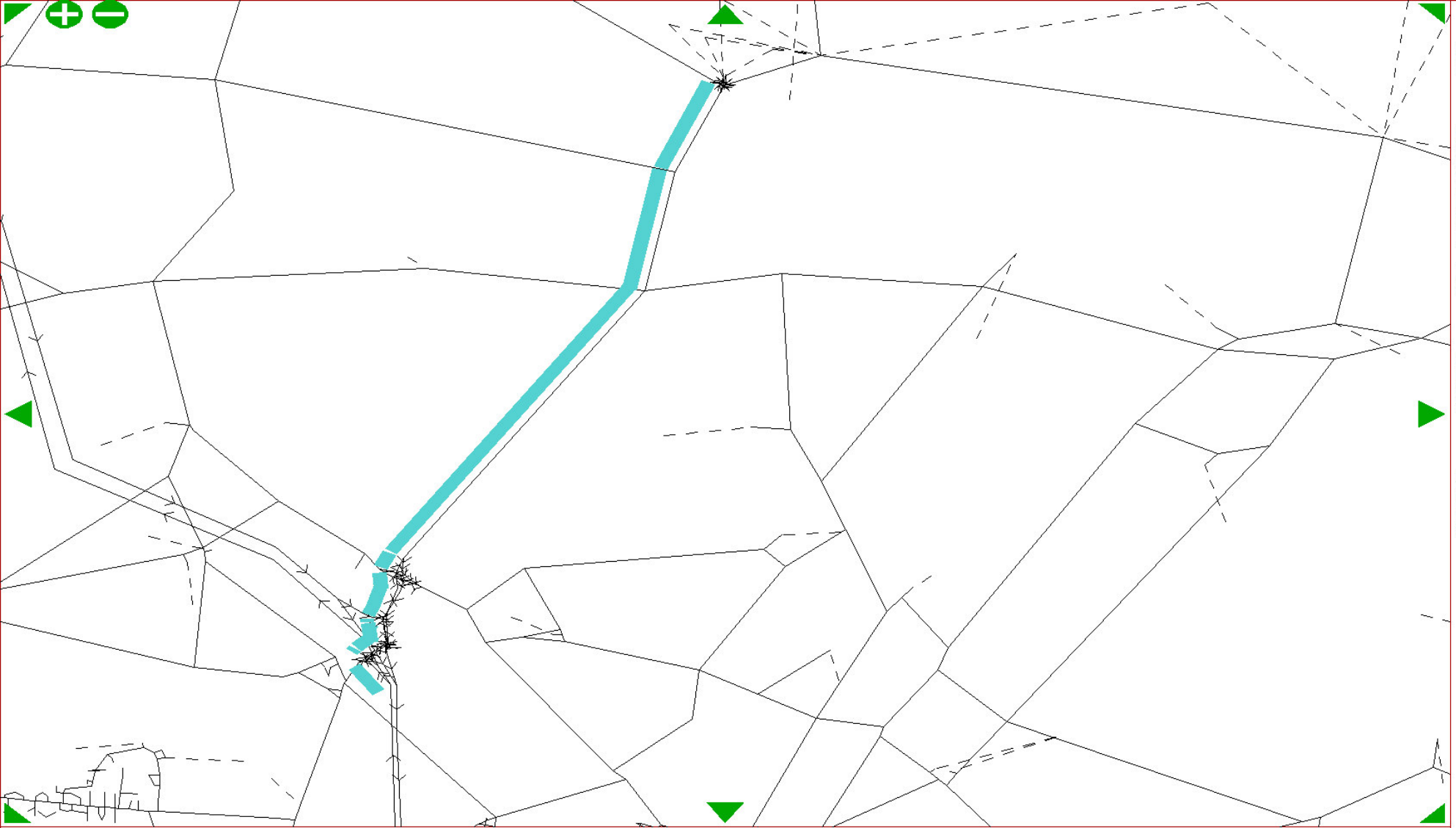
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5285
V/C% = 80

Last turn:

Time = 66
Speed= 19.18
Select the
next node



JOY RIDE:
FROM 10065
TO 97602

Cumulative:

NODE = 97602
Priority
Time = 479
Delay= 104
Dist = 9827
Speed= 73.81
FCost= 721

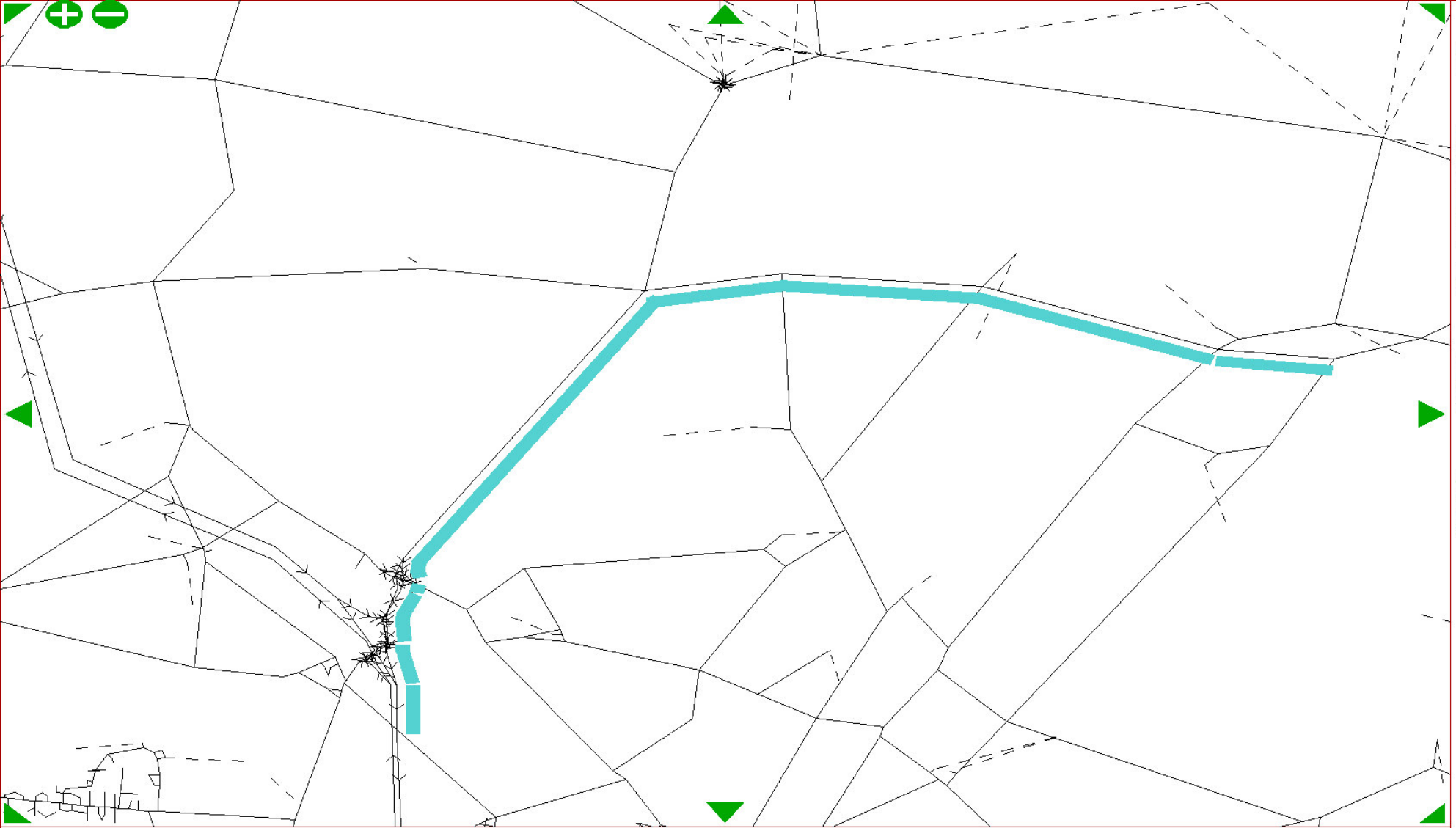
Definitions:
See 11.8.2.1

This link:

Time = 35
Dist = 1008
Flow = 1925
V/C% = 48

Last turn:

Time = 9
Speed= 91.02
Select the
next node



JOY RIDE:
FROM 42012
TO 10071

Cumulative:

NODE = 10071
Prioritv
Time = 733
Delav= 132
Dist = 15193
Speed= 74.62
FCost= 1107

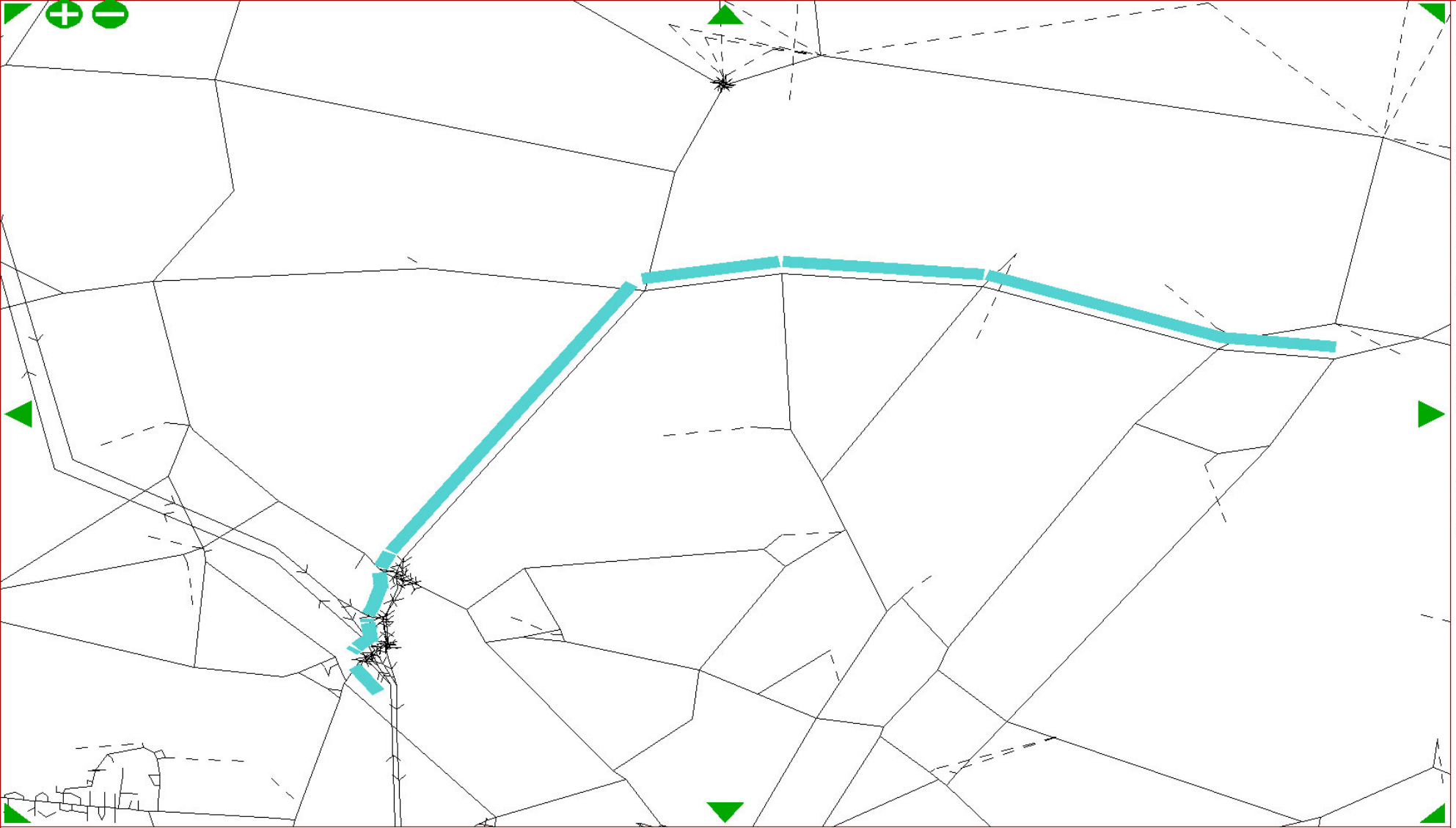
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5285
V/C% = 80

Last turn:

Time = 66
Speed= 19.18
Select the
next node



JOY RIDE:
FROM 10065
TO 42012

Cumulative:

NODE = 42012
Priority
Time = 703
Delay= 122
Dist = 14879
Speed= 76.20
FCost= 1069

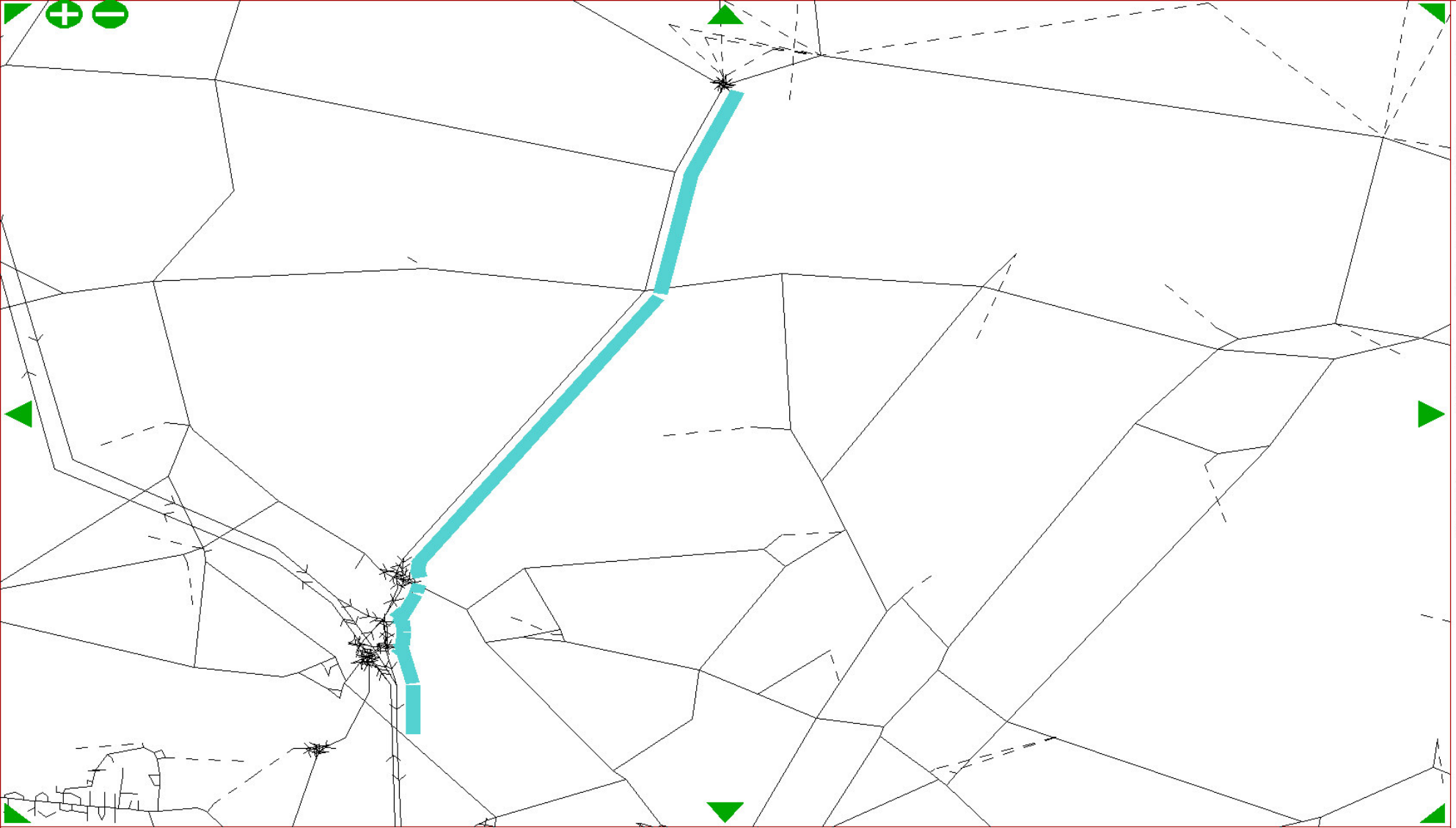
Definitions:
See 11.8.2.1

This link:

Time = 47
Dist = 1398
Flow = 1113
V/C% = 31

Last turn:

Time = 10
Speed= 79.60
Select the
next node



JOY RIDE:
FROM 97602
TO 10071

Cumulative:

NODE = 10071
Priority
Time = 527
Delay= 141
Dist = 9991
Speed= 68.28
FCost= 773

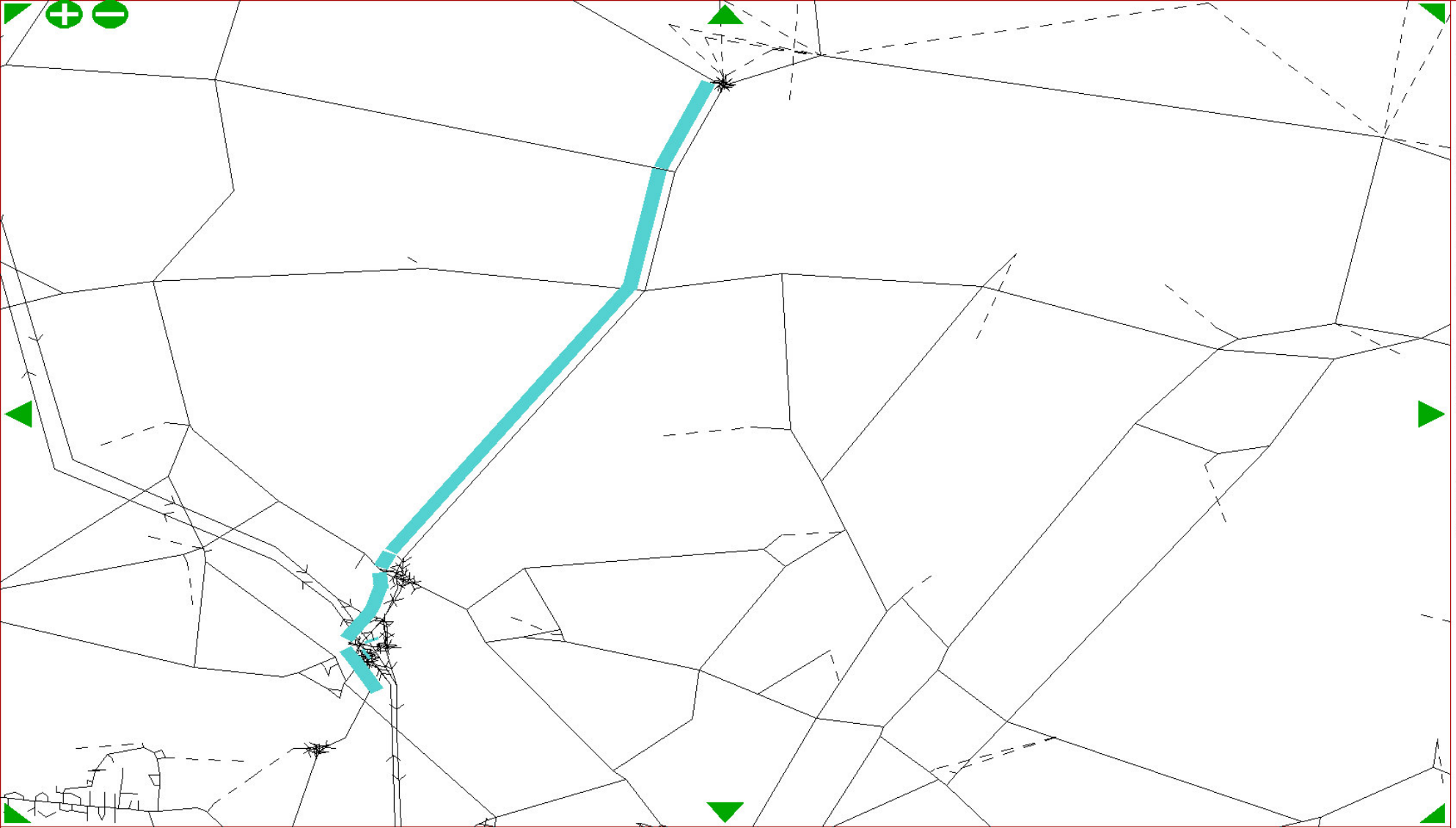
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 6203
V/C% = 94

Last turn:

Time = 3
Speed= 93.47
Select the
next node



JOY RIDE:
FROM 10065
TO 97602

Cumulative:

NODE = 97602
Priority
Time = 449
Delay= 20
Dist = 10495
Speed= 84.20
FCost= 707

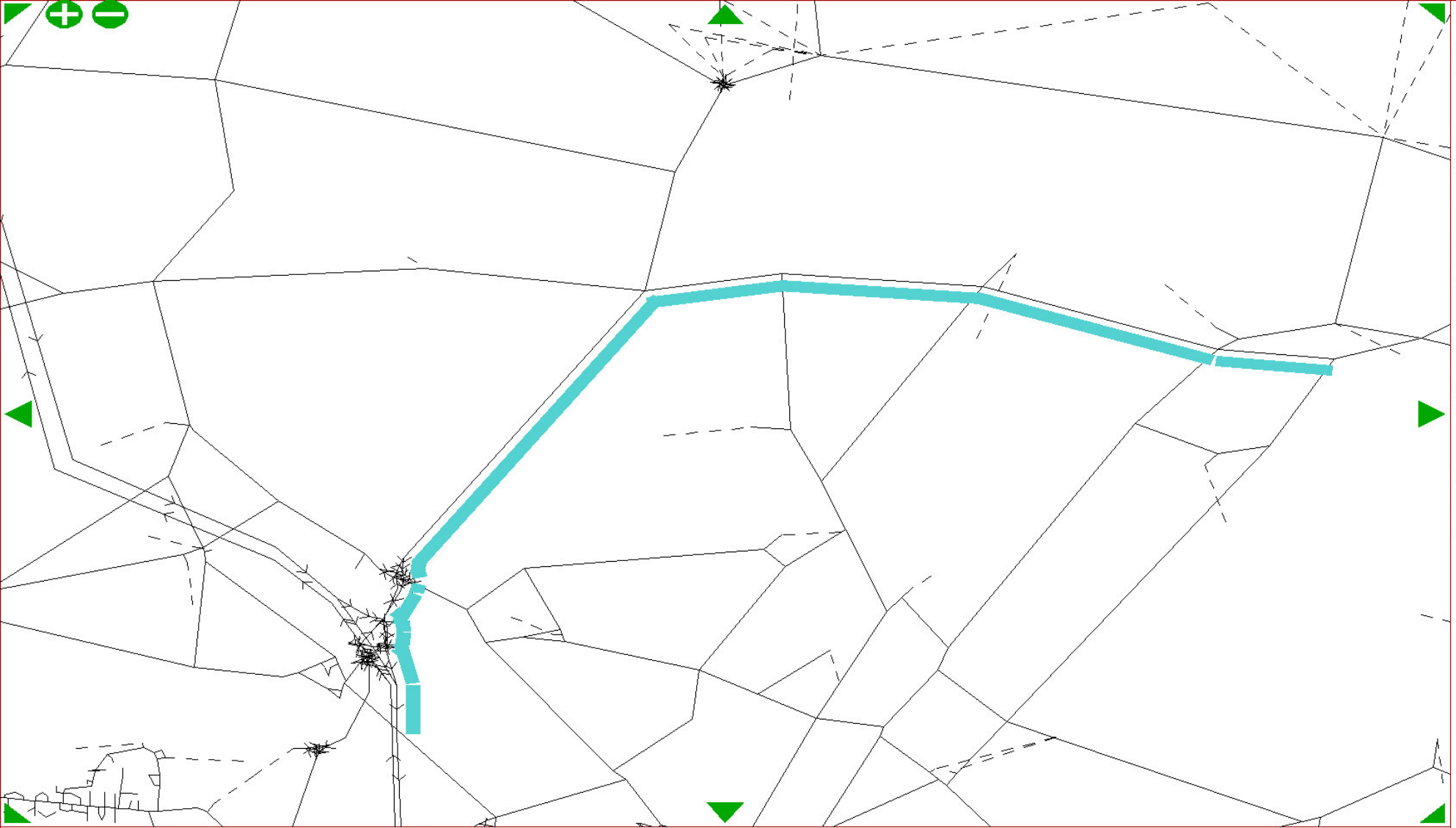
Definitions:
See 11.8.2.1

This link:

Time = 34
Dist = 1008
Flow = 1335
V/C% = 33

Last turn:

Time = 5
Speed= 98.13
Select the
next node



JOY RIDE:
FROM 42012
TO 10071

Cumulative:

NODE = 10071
Priority
Time = 810
Delay= 219
Dist = 15043
Speed= 66.89
FCost= 1180

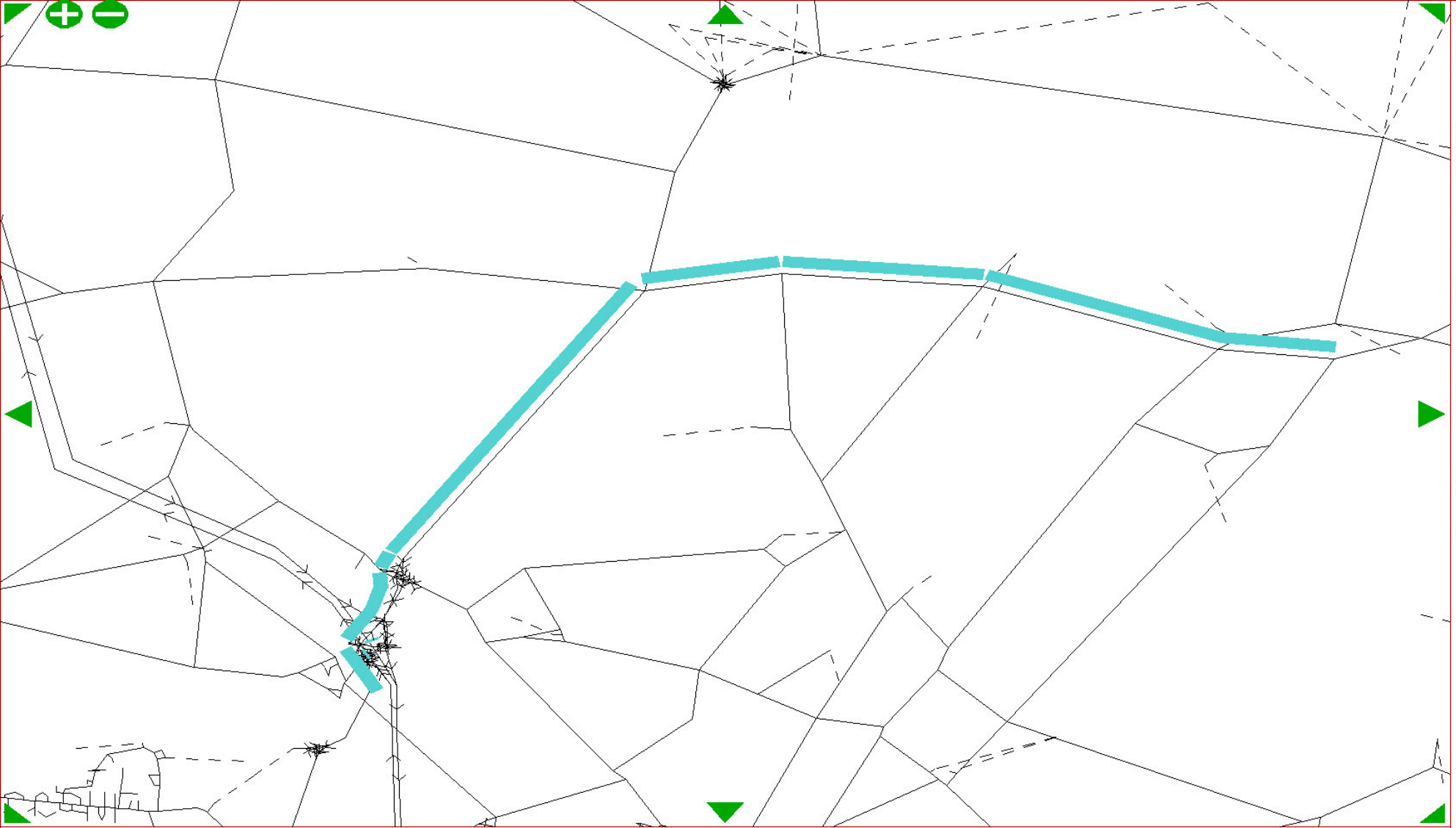
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 6203
V/C% = 94

Last turn:

Time = 3
Speed= 93.47
Select the
next node



JOY RIDE:
FROM 10065
TO 42012

Cumulative:

NODE = 42012
Priority
Time = 672
Delay= 39
Dist = 15547
Speed= 83.30
FCost= 1054

Definitions:
See 11.8.2.1

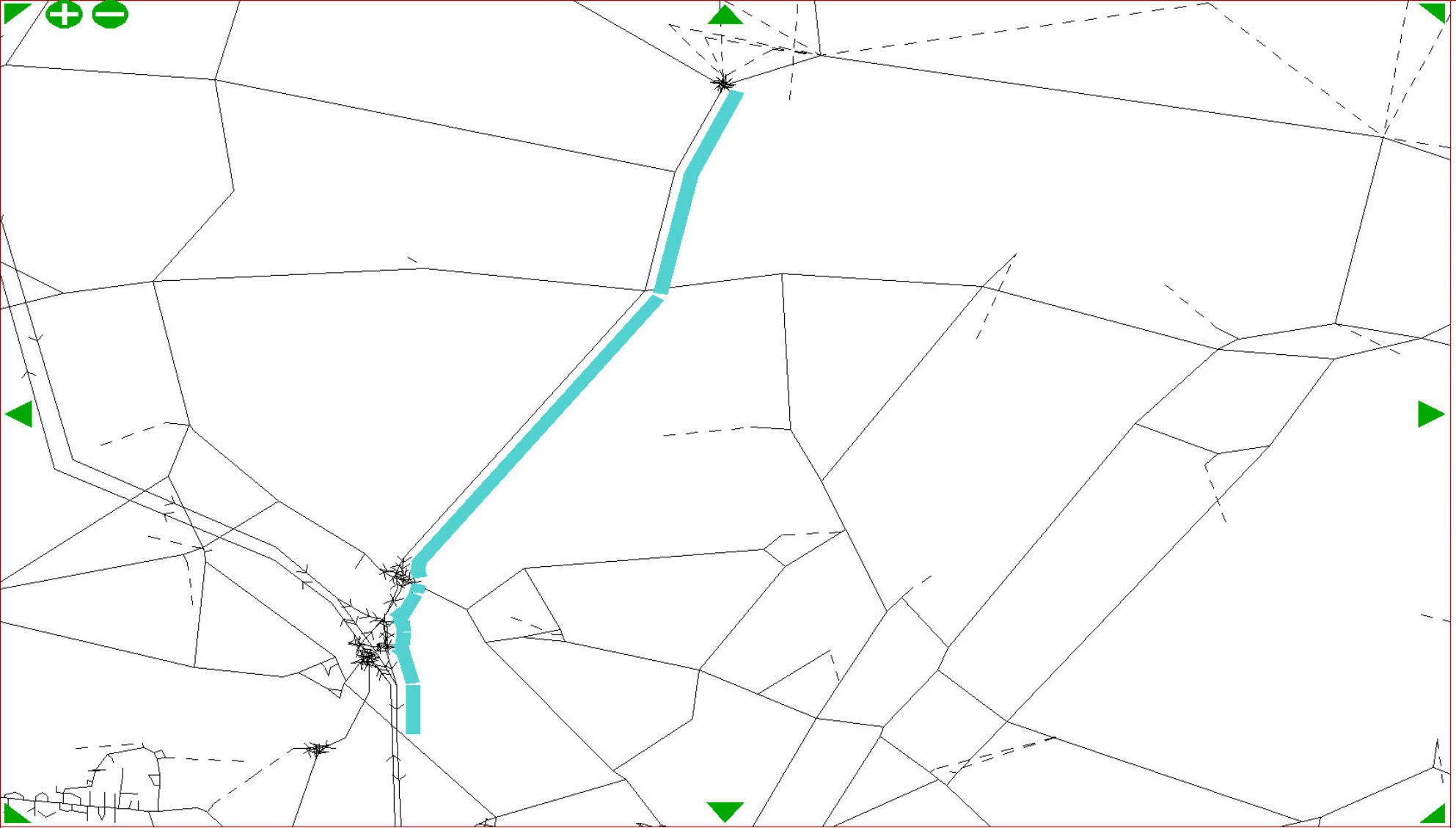
This link:

Time = 47
Dist = 1398
Flow = 797
V/C% = 22

Last turn:

Time = 6
Speed= 83.09

Select the next node



JOY RIDE:
FROM 97602
TO 10071

Cumulative:

NODE = 10071
Prioritv
Time = 425
Delav= 36
Dist = 9991
Speed= 84.63
FCost= 671

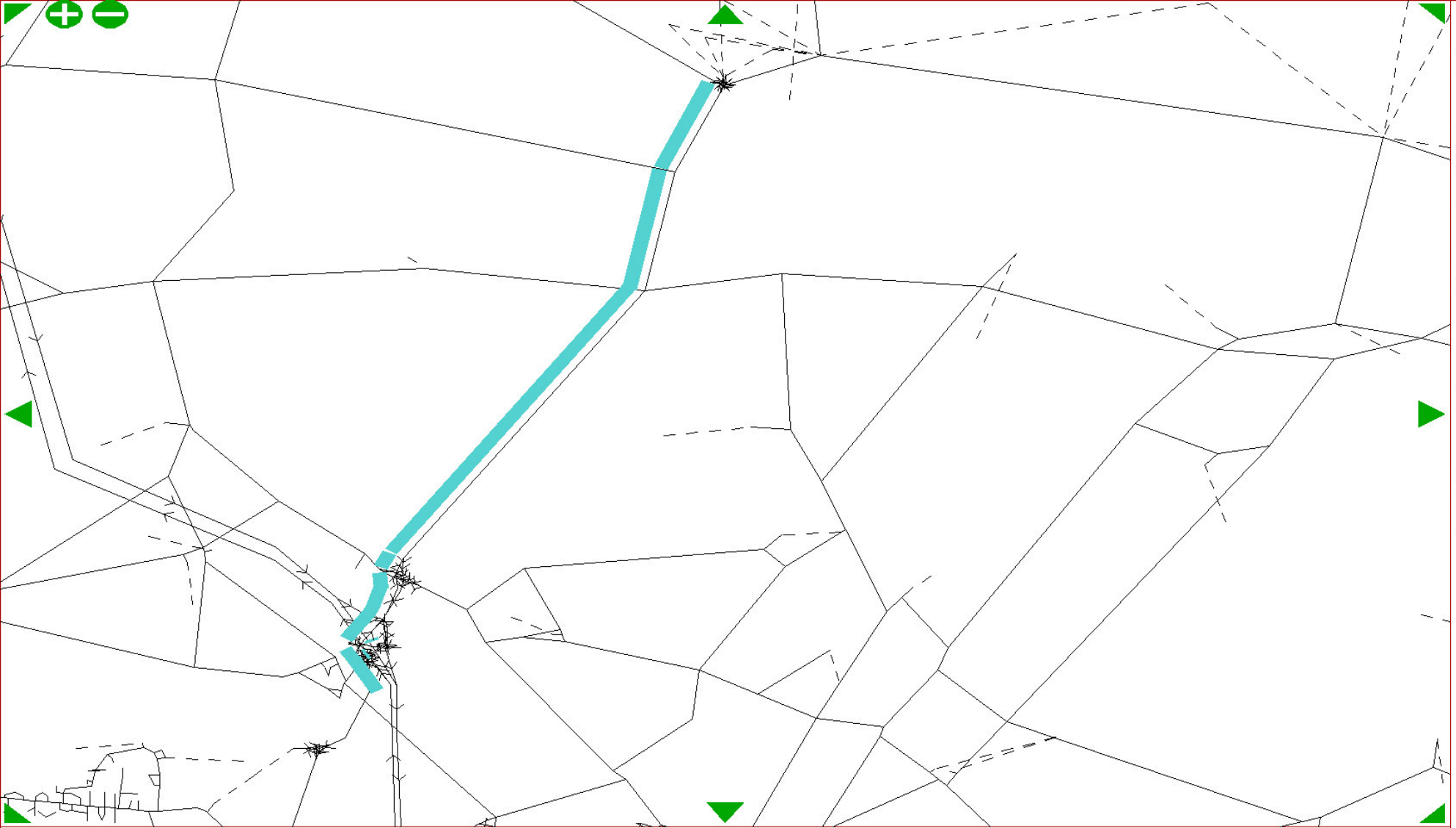
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5497
V/C% = 83

Last turn:

Time = 2
Speed=100.89
Select the
next node



JOY RIDE:
FROM 10065
TO 97602

Cumulative:

NODE = 97602
Priority
Time = 482
Delay= 66
Dist = 10495
Speed= 78.32
FCost= 741

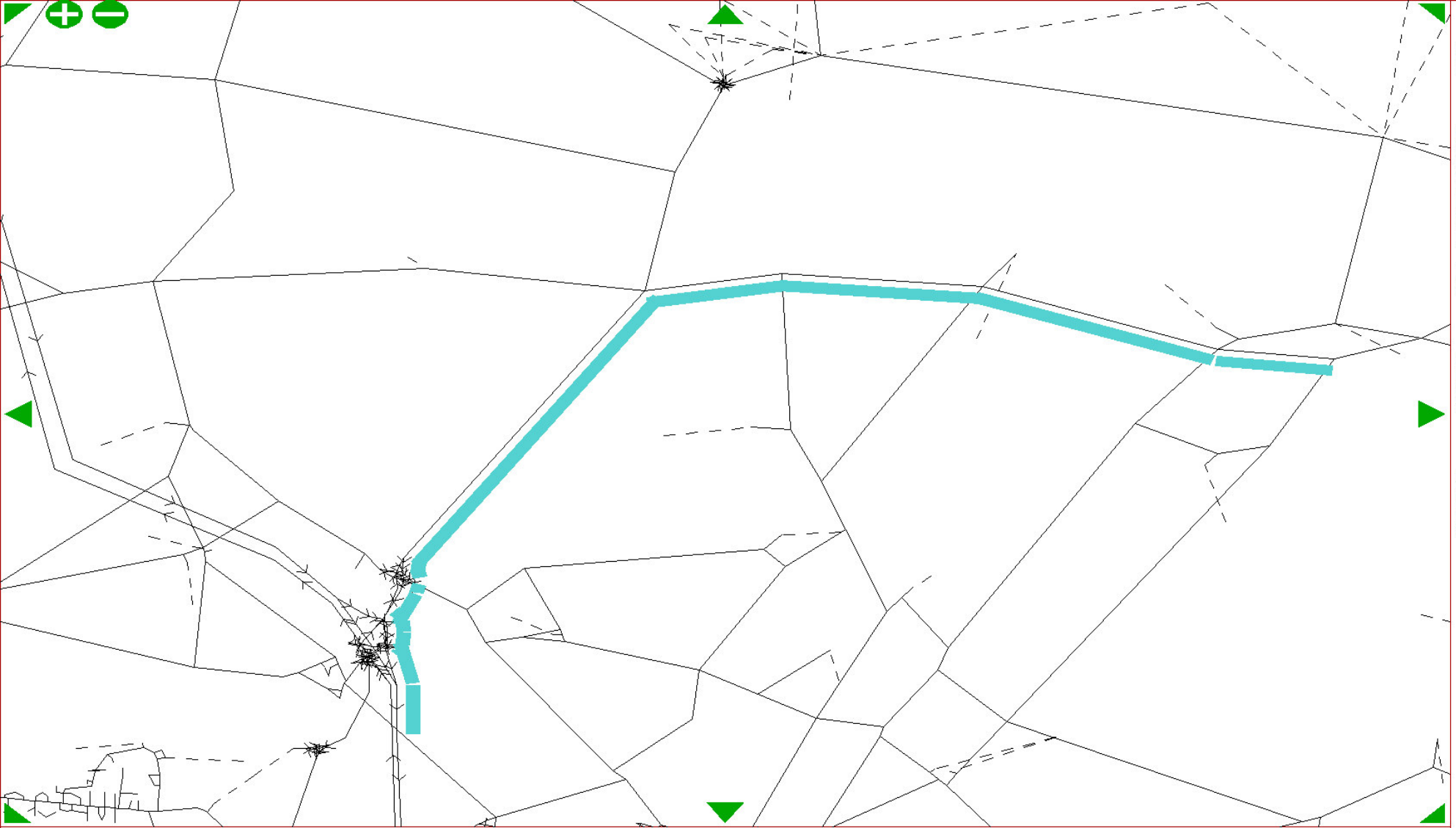
Definitions:
See 11.8.2.1

This link:

Time = 35
Dist = 1008
Flow = 2172
V/C% = 54

Last turn:

Time = 21
Speed= 77.43
Select the
next node



JOY RIDE:
FROM 42012
TO 10071

Cumulative:

NODE = 10071
Prioritv
Time = 646
Delav= 52
Dist = 15043
Speed= 83.89
FCost= 1016

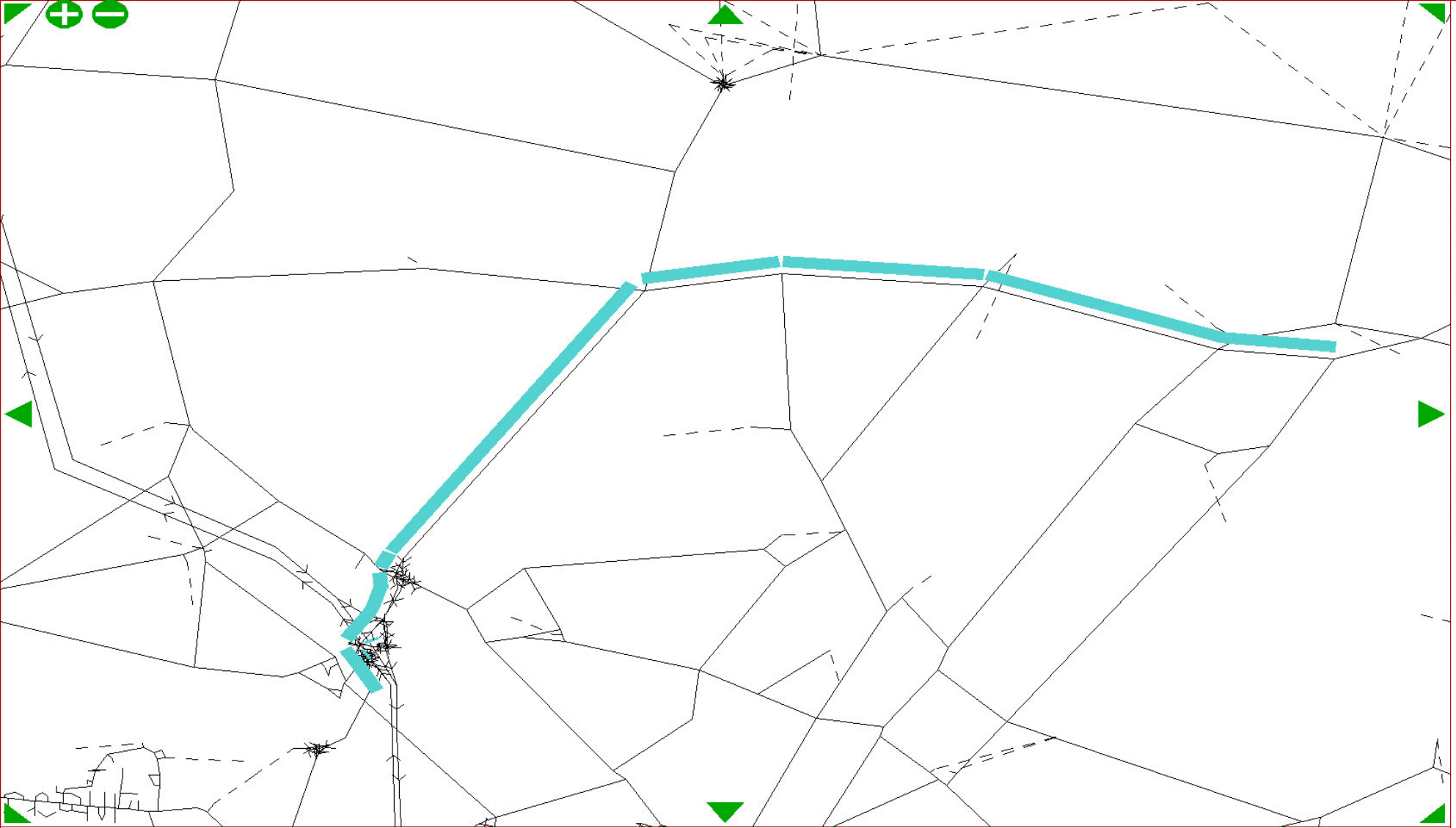
Definitions:
See 11.8.2.1

This link:

Time = 6
Dist = 200
Flow = 5497
V/C% = 83

Last turn:

Time = 2
Speed=100.89
Select the
next node



JOY RIDE:
FROM 10065
TO 42012

Cumulative:

NODE = 42012
Priority
Time = 709
Delay= 88
Dist = 15547
Speed= 78.96
FCost= 1091

Definitions:
See 11.8.2.1

This link:

Time = 47
Dist = 1398
Flow = 1200
V/C% = 33

Last turn:

Time = 12
Speed= 75.29
Select the
next node

APPENDIX D

ANNEX: A43 BARLEY MOW JUNCTION WITH NO A421 BACKGROUND TRAFFIC REASSIGNMENT

OXFORDSHIRE SRFI
A43 CORRIDOR: ANNEX

Introduction

1. ADC Infrastructure Limited are commissioned by Oxfordshire Railfreight Limited to assess the transport and infrastructure requirements of a proposed Strategic Rail Freight Interchange (SRFI) in Oxfordshire; the subject of a Development Consent Order (DCO) application for a Nationally Significant Infrastructure Project (NSIP), to be known as OxSRFI.

2. Technical Note AQ (ref. ADC1794-RP-AQ-v2) considers the impacts of the OxSRFI development traffic, and also background traffic that may reassign, on the A43 corridor between the A43/A422 Brackley Bypass gyratory and the A43 north of the Baynard's Green Roundabout. In conjunction with Technical Note AQ, this Annex report considers the traffic impacts of the proposed OxSRFI development at the Barley Mow Roundabout should the background traffic reassignment not occur as forecast.

3. Hence, this Annex report should be read in conjunction with Technical Note AQ.

A43 Barley Mow with no A421 reassignment

4. The analysis of the A43 corridor between the A43/A422 Brackley Bypass and Baynard's Green for the 2031 RC1, DS1, RC1A and DS1A scenarios shows that there would be large traffic increases southbound on the A43 and westbound on the A421 in the 2031 DS1 and DS1A scenarios in the morning peak hour. There would be large traffic increases northbound on the A43 and eastbound on the A421 in the 2031 DS1 and DS1A scenarios in the evening peak hour.

5. Considering the effect of the Albion Land development, the magnitude of the likely traffic changes between the DS1 vs RC1 and the DS1A vs RC1 scenarios is very similar, with the key differences being a reduction in OxSRFI development traffic routing southbound along the A43 due to changes in the BTM demand model (due the extra jobs associated with Albion Land), and an increase in the amount of background traffic reassignment on the A43 southbound and the A421 westbound.

6. A significant proportion of these traffic flow increases is due to background traffic reassignment that is likely induced by the significant improvements delivered by the embedded Highway Works associated with the proposed development, particularly at the Baynard's Green Roundabout and M40 Junction 10.

7. However, the ARCADY assessments presented in Technical Note AQ indicate that in the DS1 and DS1A scenarios there would be congestion on the A421 approach to the Barley Mow roundabout in the morning peak hour and on the A43 northbound approach to the roundabout in the evening peak hour. Hence, if the modelled levels of congestion materialised on street, it is possible that the forecast background traffic reassignment effects might not occur.

8. To consider this scenario, the A421 to/from A43 south background traffic reassignment flows have been isolated and removed from the DS1 scenario. The resulting 'DS1 Alt' traffic flows at the Barley Mow roundabout (**Appendix 1**) have been modelled in ARCADY and the results are summarised below and presented in **Appendix 2**.

	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
RC1A						
A43 North	145.7	231.6	115%	4.5	10.5	82%
A421	9.9	61.2	94%	1.9	10.9	66%
A43 South	3.4	7.1	78%	102.4	127.9	108%
B4031	1.4	16.9	59%	2.8	51.0	76%
DS1 Alt						
A43 North	191.0	334.2	120%	4.6	10.7	83%
A421	5.0	30.7	85%	3.0	15.5	76%
A43 South	4.5	9.0	82%	118.5	143.5	109%
B4031	1.4	18.9	60%	2.8	50.0	76%
nd no reassignment to the NH accepted position)						
A43 North	45.3	102.6	5%	0.1	0.2	1%
A421	-4.9	-30.5	-9%	1.1	4.6	10%
A43 South	1.1	1.9	4%	16.1	15.6	1%
B4031	0.0	2.0	1%	0.0	-1.0	0%

9. The table above shows that if the A421 to/from A43 south background traffic reassignment did not occur, there would be no capacity issue on the A421 approach to the roundabout. Further, when compared to the results of the RC1A scenario (which is the level of operation at the Barley Mow Roundabout accepted by National Highways for the Albion Land development), in the 'DS1 alt' morning peak hour the RFC on the A43 southbound approach would increase by 5%, which is not a severe impact, especially when considering the scale of the improvements provided by the embedded Highway Works across the wider network. In the 'DS1 alt' evening peak hour the RFC on the A43 northbound approach would not materially change.

10. Therefore, the key difference between the accepted position at the Barley Mow Roundabout for the Albion Land development and the performance of the junction with the OxSRFI development in place, without Albion Land, is the level of background traffic reassignment that could occur between the A421 and the A43 south. In terms of the performance of the wider highway network, this reassignment effect is regarded as positive.

Summary and conclusion

11. Due to the forecast congestion on the A421 approach to the Barley Mow Roundabout in the morning peak hour and on the A43 northbound approach in the evening peak hour, if the A421 to/from A43 south background traffic reassignment did not occur, modelling shows that there would be no capacity issue on the A421 approach to the roundabout. Further, when compared to the results of the RC1A scenario (which is the level of operation accepted by NH for the Albion Land development), the impacts on the A43 southbound and northbound approaches that would arise in the DS1 scenario (cumulative OxSRFI scenario without Albion Land) would not be severe.

12. Therefore, the key difference between the accepted position at the Barley Mow roundabout for the Albion Land development and the performance of the junction with the OxSRFI development in place is the level of background traffic reassignment that could occur between the A421 and the A43 south. In terms of the performance of the wider highway network, this reassignment effect is regarded as positive.

13. In practise, the amount background traffic reassignment on the A421 and A43 would reach an equilibrium, with increased congestion at the Barley Mow Roundabout offset by the improvements to journey time and delay at Baynard's Green and M40 Junction 10 as a result of the extensive OxSRFI embedded Highway Works. Therefore, there should be no requirement for the OxSRFI scheme to provide mitigation works at the Barley Mow Roundabout.

APPENDIX 1

A43 BARLEY MOW TRAFFIC FLOWS – NO A421 REASSIGNMENT

2031 OxSRFI - AM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓			171		171
B ←			57		57
C ↗	20	10		2	32
D →			34		34
Total	20	10	262	2	294

Total HGV Flow (PCU)					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓			20		20
B ←			12		12
C ↗	19	11			30
D →					0
Total	19	11	32	0	62

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓			11		11
B ←			7		7
C ↗	11	6			17
D →					0
Total	11	6	18	0	35

2031DS1 Alt - AM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	207	1,735	24	1,966
B ←	88	0	387	83	559
C ↗	1,155	441	0	98	1,694
D →	24	103	127	0	254
Total	1,267	751	2,250	205	4,472

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	39	135	0	174
B ←	21	0	145	0	166
C ↗	103	92	0	0	194
D →	10	0	0	0	10
Total	134	131	279	0	544

% HGV				
O/D	A ↑	B →	C ↙	D ←
A ↓	0%	19%	8%	0%
B ←	24%	0%	37%	0%
C ↗	9%	21%	0%	0%
D →	43%	0%	0%	0%

2031 OxSRFI - PM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓			53		53
B ←			25		25
C ↗	199	66		39	304
D →			11		11
Total	199	66	89	39	393

Total HGV Flow (PCU)					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓			20		20
B ←			12		12
C ↗	19	11			30
D →					0
Total	19	11	32	0	62

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓			11		11
B ←			7		7
C ↗	11	6			17
D →					0
Total	11	6	18	0	35

2031 DS1 Alt - PM

Total Actual Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	110	1,317	9	1,436
B ←	111	0	474	66	652
C ↗	1,773	420	0	170	2,363
D →	5	56	136	0	197
Total	1,889	587	1,927	245	4,648

Total HGV Flow					
O/D	A ↑	B →	C ↙	D ←	Total
A ↓	0	12	96	6	113
B ←	15	0	45	0	60
C ↗	77	66	0	0	143
D →	0	0	0	0	0
Total	92	77	141	6	317

% HGV				
O/D	A ↑	B →	C ↙	D ←
A ↓	0%	11%	7%	64%
B ←	14%	0%	10%	0%
C ↗	4%	16%	0%	0%
D →	0%	0%	0%	0%

APPENDIX 2

A43 BARLEY MOW JUNCTIONS 11 ARCADY REPORT – NO REASSIGNMENT

Junctions 11

ARCADY 11 - Roundabout Module

Version: 11.1.0.2307
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+44 (0)1344 379777 software@trl.co.uk trlsoftware.com

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Filename: 251125 A43_A421 Barleymow roundabout - No AL.j11
Path: C:\Users\ADC\OneDrive - ADC Infrastructure Limited\ADC Projects\ADC1794 OxSRFI\Calculations\Junction Models\21. A43 Barley Mow roundabout
Report generation date: 08/12/2025 14:39:47

»D1 - 2031 | RC1A | AM
»D2 - 2031 | RC1A | PM
»D7 - 2031 | DS1 Alt | AM
»D8 - 2031 | DS1 Alt | PM

Summary of junction performance

	AM				PM			
	Set ID	Queue (Veh)	Delay (s)	RFC	Set ID	Queue (Veh)	Delay (s)	RFC
	2031 - RC1A							
Arm 1	D1	145.7	231.60	1.15	D2	4.5	10.53	0.82
Arm 2		9.9	61.19	0.94		1.9	10.92	0.66
Arm 3		3.4	7.11	0.78		102.4	127.91	1.08
Arm 4		1.4	16.86	0.59		2.8	51.00	0.76
	2031 - DS1 Alt							
Arm 1	D7	191.0	334.24	1.20	D8	4.6	10.69	0.83
Arm 2		5.0	30.73	0.85		3.0	15.47	0.76
Arm 3		4.5	8.99	0.82		118.5	143.51	1.09
Arm 4		1.4	18.88	0.60		2.8	50.03	0.76

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	OxSRFI
Location	A43/A421 Barley Mow roundabout
Site number	
Date	08/12/2025
Version	v1
Status	preliminary
Identifier	
Client	
Jobnumber	ADC1794
Enumerator	ADC
Description	DS1 no reassignment

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use simulation for HCM roundabouts	Use iterations for HCM roundabouts
5.75						0.85	36.00	20.00		

Demand Set Summary

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2031	RC1A	AM	ONE HOUR	07:45	09:15	15	✓
D2	2031	RC1A	PM	ONE HOUR	16:45	18:15	15	✓
D7	2031	DS1 Alt	AM	ONE HOUR	07:45	09:15	15	✓
D8	2031	DS1 Alt	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

D1 - 2031 | RC1A | AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	111.57	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	111.57	F

Arms

Arms

Arm	Name	Description	No give-way line
1	A43 North		
2	A421		
3	A43 South		
4	B4031		

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Entry only	Exit only
1	7.50	7.70	0.2	70.5	67.0	8.0		
2	3.80	7.90	20.6	40.2	67.0	13.5		
3	7.30	8.90	44.5	28.5	67.0	30.0		
4	3.30	7.20	8.4	18.5	67.0	13.5		

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.683	2542
2	0.599	2067
3	0.682	2685
4	0.509	1554

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2031	RC1A	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1907	100.000
2		ONE HOUR	✓	564	100.000
3		ONE HOUR	✓	1612	100.000
4		ONE HOUR	✓	276	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	121	1783	3
	2	92	0	391	81
	3	1136	386	0	90
	4	26	70	180	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	33	8	0
	2	23	0	34	0
	3	9	21	0	0
	4	39	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	1.15	231.60	145.7	F	1750	2625
2	0.94	61.19	9.9	F	518	776
3	0.78	7.11	3.4	A	1479	2219
4	0.59	16.86	1.4	C	253	380

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1436	359	477	1985	0.723	1425	940	0.0	2.5	6.328	A
2	425	106	1470	882	0.482	421	432	0.0	0.9	7.753	A
3	1214	303	131	2321	0.523	1209	1759	0.0	1.1	3.227	A
4	208	52	1210	829	0.251	206	130	0.0	0.3	5.769	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1714	429	570	1919	0.893	1696	1125	2.5	7.3	15.002	C
2	507	127	1749	741	0.684	502	517	0.9	2.1	14.826	B
3	1449	362	157	2303	0.629	1447	2095	1.1	1.7	4.190	A
4	248	62	1448	698	0.356	247	156	0.3	0.5	7.974	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	2100	525	696	1831	1.147	1819	1372	7.3	77.4	92.014	F
2	621	155	1900	666	0.933	598	615	2.1	7.9	42.982	E
3	1775	444	186	2283	0.777	1768	2311	1.7	3.4	6.896	A
4	304	76	1767	522	0.583	301	187	0.5	1.3	16.068	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	2100	525	700	1828	1.149	1827	1379	77.4	145.7	223.478	F
2	621	155	1909	661	0.939	613	618	7.9	9.9	61.185	F
3	1775	444	191	2280	0.778	1775	2331	3.4	3.4	7.110	A
4	304	76	1775	517	0.588	304	190	1.3	1.4	16.859	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1714	429	576	1915	0.895	1902	1136	145.7	98.9	231.600	F
2	507	127	1945	641	0.790	530	533	9.9	4.3	36.342	E
3	1449	362	165	2298	0.631	1456	2309	3.4	1.7	4.311	A
4	248	62	1461	690	0.359	251	160	1.4	0.6	8.260	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1436	359	480	1982	0.724	1820	948	98.9	2.8	69.113	F
2	425	106	1840	693	0.612	435	460	4.3	1.6	14.451	B
3	1214	303	136	2318	0.524	1216	2139	1.7	1.1	3.274	A
4	208	52	1219	824	0.252	209	133	0.6	0.3	5.855	A

D2 - 2031 | RC1A | PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	71.91	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	71.91	F

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2031	RC1A	PM	ONE HOUR	16:45	18:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1431	100.000
2		ONE HOUR	✓	582	100.000
3		ONE HOUR	✓	2298	100.000
4		ONE HOUR	✓	192	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	109	1306	16
	2	120	0	381	81
	3	1732	426	0	140
	4	6	66	120	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	11	7	36
	2	13	0	9	0
	3	5	15	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.82	10.53	4.5	B	1313	1970
2	0.66	10.92	1.9	B	534	801
3	1.08	127.91	102.4	F	2109	3163
4	0.76	51.00	2.8	F	176	264

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1077	269	458	2041	0.528	1073	1391	0.0	1.1	3.703	A
2	438	110	1081	1267	0.346	436	450	0.0	0.5	4.321	A
3	1730	433	163	2406	0.719	1720	1354	0.0	2.5	5.176	A
4	145	36	1705	623	0.232	143	177	0.0	0.3	7.493	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1286	322	546	1979	0.650	1284	1659	1.1	1.8	5.157	A
2	523	131	1293	1142	0.458	522	537	0.5	0.8	5.791	A
3	2066	516	195	2383	0.867	2052	1620	2.5	6.0	10.444	B
4	173	43	2035	443	0.390	171	212	0.3	0.6	13.199	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1576	394	629	1921	0.820	1566	1891	1.8	4.3	9.862	A
2	641	160	1574	977	0.656	637	621	0.8	1.8	10.473	B
3	2530	633	237	2353	1.075	2326	1974	6.0	56.9	56.682	F
4	211	53	2316	289	0.732	205	248	0.6	2.3	39.970	E

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1576	394	638	1915	0.823	1575	1908	4.3	4.5	10.530	B
2	641	160	1586	970	0.661	641	627	1.8	1.9	10.919	B
3	2530	633	239	2352	1.076	2348	1988	56.9	102.4	127.907	F
4	211	53	2337	277	0.762	210	250	2.3	2.8	50.997	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1286	322	609	1934	0.665	1296	1892	4.5	2.0	5.735	A
2	523	131	1308	1133	0.462	527	597	1.9	0.9	5.980	A
3	2066	516	197	2382	0.867	2359	1639	102.4	29.2	103.210	F
4	173	43	2324	285	0.605	177	232	2.8	1.7	34.570	D

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1077	269	485	2021	0.533	1081	1479	2.0	1.2	3.842	A
2	438	110	1092	1261	0.348	439	474	0.9	0.5	4.392	A
3	1730	433	164	2405	0.719	1836	1368	29.2	2.6	7.594	A
4	145	36	1815	563	0.257	150	185	1.7	0.4	8.823	A

D7 - 2031 | DS1 Alt | AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	151.52	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	151.52	F

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2031	DS1 Alt	AM	ONE HOUR	07:45	09:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1966	100.000
2		ONE HOUR	✓	558	100.000
3		ONE HOUR	✓	1694	100.000
4		ONE HOUR	✓	254	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	207	1735	24
	2	88	0	387	83
	3	1155	441	0	98
	4	24	103	127	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	19	8	0
	2	24	0	37	0
	3	9	21	0	0
	4	43	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	1.20	334.24	191.0	F	1804	2706
2	0.85	30.73	5.0	D	512	768
3	0.82	8.99	4.5	A	1554	2332
4	0.60	18.88	1.4	C	233	350

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1480	370	503	1972	0.750	1468	950	0.0	2.9	6.994	A
2	420	105	1409	897	0.468	417	562	0.0	0.9	7.444	A
3	1275	319	146	2307	0.553	1270	1680	0.0	1.2	3.457	A
4	191	48	1263	796	0.240	190	153	0.0	0.3	5.930	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1767	442	602	1902	0.929	1739	1136	2.9	10.0	19.442	C
2	502	125	1670	767	0.654	498	671	0.9	1.8	13.179	B
3	1523	381	174	2288	0.666	1520	1994	1.2	2.0	4.667	A
4	228	57	1511	659	0.347	228	183	0.3	0.5	8.332	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	2165	541	733	1808	1.197	1801	1386	10.0	100.8	118.293	F
2	614	154	1750	728	0.844	603	785	1.8	4.6	26.755	D
3	1865	466	207	2266	0.823	1855	2146	2.0	4.4	8.572	A
4	280	70	1843	475	0.588	276	219	0.5	1.4	17.805	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	2165	541	738	1804	1.200	1804	1394	100.8	191.0	292.649	F
2	614	154	1754	726	0.846	613	789	4.6	5.0	30.728	D
3	1865	466	210	2264	0.824	1865	2157	4.4	4.5	8.992	A
4	280	70	1853	469	0.596	279	221	1.4	1.4	18.885	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1767	442	609	1897	0.932	1887	1148	191.0	161.2	334.244	F
2	502	125	1804	700	0.716	511	692	5.0	2.7	19.796	C
3	1523	381	180	2285	0.667	1533	2135	4.5	2.0	4.852	A
4	228	57	1525	651	0.351	232	188	1.4	0.5	8.659	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1480	370	507	1969	0.752	1957	957	161.2	41.9	188.973	F
2	420	105	1847	678	0.620	424	617	2.7	1.7	14.395	B
3	1275	319	154	2302	0.554	1278	2117	2.0	1.3	3.528	A
4	191	48	1271	791	0.242	192	161	0.5	0.3	6.020	A

D8 - 2031 | DS1 Alt | PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 3 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A43/A421 Barleymow Roundabout	Standard Roundabout		1, 2, 3, 4	79.94	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	79.94	F

Traffic Demand

Demand Set Details

ID	Year	Scenario	Time period	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2031	DS1 Alt	PM	ONE HOUR	16:45	18:15	15	✓

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1436	100.000
2		ONE HOUR	✓	651	100.000
3		ONE HOUR	✓	2363	100.000
4		ONE HOUR	✓	197	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	110	1317	9
	2	111	0	474	66
	3	1773	420	0	170
	4	5	56	136	0

Vehicle Mix

HV data entry mode	PCU Factor for a HV (PCU)
HV Percentages	2.00

Heavy Vehicle %

		To			
		1	2	3	4
From	1	0	11	7	64
	2	14	0	10	0
	3	4	16	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.83	10.69	4.6	B	1318	1977
2	0.76	15.47	3.0	C	597	896
3	1.09	143.51	118.5	F	2168	3252
4	0.76	50.03	2.8	F	181	271

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1081	270	458	2039	0.530	1077	1414	0.0	1.1	3.726	A
2	490	123	1096	1246	0.393	488	439	0.0	0.6	4.730	A
3	1779	445	139	2437	0.730	1768	1444	0.0	2.6	5.304	A
4	148	37	1724	618	0.240	147	183	0.0	0.3	7.630	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1291	323	546	1976	0.653	1288	1686	1.1	1.9	5.208	A
2	585	146	1311	1121	0.522	584	523	0.6	1.1	6.679	A
3	2124	531	167	2417	0.879	2109	1727	2.6	6.6	11.128	B
4	177	44	2056	437	0.405	176	219	0.3	0.7	13.684	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1581	395	626	1921	0.823	1571	1904	1.9	4.4	10.002	B
2	717	179	1596	955	0.751	710	601	1.1	2.8	14.308	B
3	2602	650	203	2391	1.088	2369	2102	6.6	64.8	61.967	F
4	217	54	2319	294	0.737	210	252	0.7	2.4	39.970	E

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1581	395	634	1915	0.825	1580	1919	4.4	4.6	10.685	B
2	717	179	1608	948	0.756	716	607	2.8	3.0	15.470	C
3	2602	650	205	2390	1.089	2387	2119	64.8	118.5	143.513	F
4	217	54	2337	284	0.763	215	254	2.4	2.8	50.030	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1291	323	603	1935	0.667	1301	1903	4.6	2.0	5.763	A
2	585	146	1327	1111	0.527	593	577	3.0	1.1	7.036	A
3	2124	531	169	2415	0.879	2395	1750	118.5	50.8	129.005	F
4	177	44	2324	293	0.605	182	241	2.8	1.7	33.692	D

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1081	270	500	2008	0.538	1085	1567	2.0	1.2	3.911	A
2	490	123	1107	1239	0.395	492	477	1.1	0.7	4.828	A
3	1779	445	141	2436	0.730	1971	1459	50.8	2.8	11.746	B
4	148	37	1913	516	0.288	153	198	1.7	0.4	10.067	B

APPENDIX 31

M40 JUNCTION 10 DESIGN STRATEGY RECORD

BWB
A CAF GROUP COMPANY

TRANSPORT AND INFRASTRUCTURE

Oxfordshire Strategic Railfreight Interchange (OxSRFI) M40 J10 Improvements Design Strategy Record

DOCUMENT ISSUE RECORD

Document Number:	OxSRFI-BWB-GEN-XX-RP-CH-0007
BWB Reference:	NTH2479

Revision	Date of Issue	Status	Author:	Checked:	Approved:
P01	31.07.2025	S3	Stephen Birchall BSc (Hons)	Simon Hilditch MEng (Hons) CEng MICE MCIHT	Simon Hilditch MEng (Hons) CEng MICE MCIHT
P02	26.03.2026	S3	Ryan Picknell MEng (Hons)	Simon Hilditch MEng (Hons) CEng MICE MCIHT	Simon Hilditch MEng (Hons) CEng MFICE MCIHT

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1. INTRODUCTION

Instruction

1.1 The Oxfordshire Strategic Rail Freight Interchange (OxSRFI) requires substantial improvements to the strategic road network (SRN) and local road network (LRN), adding new links as well as upgrading existing infrastructure.

1.2 BWB Consulting (BWB) has been instructed by Oxfordshire Railfreight Ltd (the Client) to develop the highway design for the works on the SRN and LRN, which includes the preparation of this Design Strategy Record (DSR). This report is for the works at M40 J10 including the A43 corridor north of J10.

Purpose and scope of this report

1.3 The objective of this DSR report, is to record the key decisions made during design.

1.4 The report will record the relaxations and departures from standards contained within the highway design. A detailed narrative for the justification, including a safety risk assessment, is to be submitted separately for approval for each departure.

1.5 The following reports and documents are to be provided separately to this DSR at the appropriate stage of design:

- Transport assessment and modelling;
- Geotechnical reporting to CD 622;
- Structures AIPs (where required) to CG 300;
- Maintenance and repair statement to GD 304;
- WCHAR assessment and review to GG 142; and
- Stage 1 road safety audit to GG 119.

1.6 The record of how the scheme complies with the principles of good road design, as described in GG 103[1], is found at the Highways Design Approach Document, **DCO Document 5.8C**.

1.7 The location of the Scheme is shown on **Figure 1.1** below.

[1] DMRB GG 103 Introduction and general requirements for sustainable development and design, revision 0

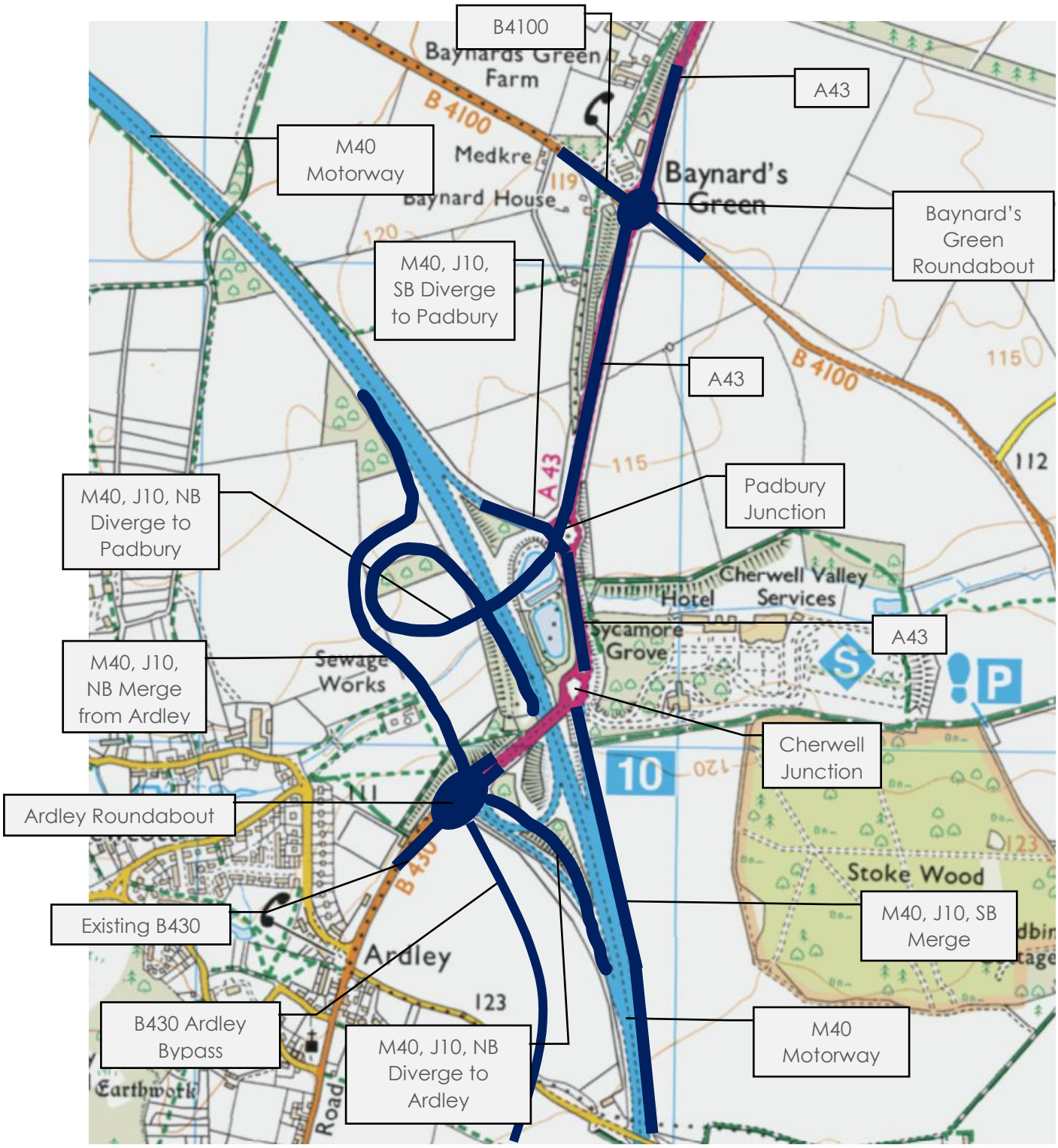


Figure 1.1: Scheme location and overview

Acronyms and Abbreviations

ADS	Advanced direction sign
DMRB	Design Manual for Roads and Bridges
DSR	Design Strategy Record
ERT	Emergency roadside telephone
HPLR	Heyford Park Link Road
MSRR	Middleton Stoney Relief Road
LRN	Local Road Network
OxSRFI	Oxfordshire Strategic Rail Freight Interchange
OCC	Oxfordshire County Council
NH	National Highways
SRN	Strategic Road Network
VMS	Variable Message Sign

List of drawings

1.8 The tables below set out the scheme design drawings that are to be read in conjunction with this report. They are provided separately and are not appended to this report.

1.9 The detailed general arrangement and geometric layout design, found in **Appendix A**, are depicted on the following design drawings:

Geometric layout sheet	Section of scheme	General arrangement and geometry layout drawing
01	A43 North of Baynard's Green	OxSRFI-BWB-HGN-01-DR-CH-0105
02	B4100 West	OxSRFI-BWB-HGN-02-DR-CH-0105
03	B4100 East	OxSRFI-BWB-HGN-03-DR-CH-0105
04	A43 Baynard's Green to Padbury	OxSRFI-BWB-HGN-04-DR-CH-0105
05	A43 Baynard's Green to Padbury M40, J10, SB Diverge to Padbury	OxSRFI-BWB-HGN-05-DR-CH-0105
06	A43 Padbury to Cherwell	OxSRFI-BWB-HGN-06-DR-CH-0105
07	M40, J10, SB Merge from Cherwell M40, J10, NB Diverge to Ardley	OxSRFI-BWB-HGN-07-DR-CH-0105
08	M40, J10, SB Merge from Cherwell M40, J10, NB Diverge to Ardley	OxSRFI-BWB-HGN-08-DR-CH-0105
12	Ardley Roundabout	OxSRFI-BWB-HGN-12-DR-CH-0105
13	M40, J10, NB Merge from Ardley M40, J10A, NB Diverge to Padbury	OxSRFI-BWB-HGN-13-DR-CH-0105
14	M40, J10, NB Merge from Ardley M40, J10,A NB Diverge to Padbury	OxSRFI-BWB-HGN-14-DR-CH-0105
15	M40, J10, NB Merge from Ardley	OxSRFI-BWB-HGN-15-DR-CH-0105

1.10 The long sections and cross-sections, provided separately and not appended to this report, are depicted on the following drawings:

Section of scheme	Longsection drawings	Cross-section drawings
A43 North of Baynard's Green	DCO Document 2.7N	DCO Document 2.7F
B4100 West of Baynard's Green	DCO Document 2.7N	n/a
B4100 East of Baynard's Green	DCO Document 2.7N	n/a
A43 Baynard's Green to Padbury	DCO Document 2.7O	DCO Document 2.7F
M40, J10, SB Diverge to Padbury	DCO Document 2.7O	DCO Document 2.7F
A43 Padbury to Cherwell	DCO Document 2.7O	DCO Document 2.7G
M40, J10, SB Merge from Cherwell	DCO Document 2.7R	DCO Document 2.7H
M40, J10, NB Diverge to Ardley	DCO Document 2.7Q	DCO Document 2.7H
M40, J10, NB Merge from Ardley	DCO Document 2.7P	DCO Document 2.7G
M40, J10A, NB Diverge to Padbury	DCO Document 2.7P	DCO Document 2.7G

1.11 The following drawings have been prepared to demonstrate vehicle tracking, found in **Appendix B**:

Section of scheme	Vehicle tracking
Baynard's Green	OxSRFI-BWB-GEN-XX-DR-CH-0008
Padbury	OxSRFI-BWB-GEN-XX-DR-CH-0006
Cherwell	OxSRFI-BWB-GEN-XX-DR-CH-0007
Ardley Roundabout	OxSRFI-BWB-GEN-XX-DR-CH-0007

Traffic data

1.12 The traffic data used in this report is preliminary and subject to agreement of the outputs from the Bicester Transport Model. The data used is the Circular 01/2022 compliant scenario for the design year of 2031.

Collision history

1.13 This is found at **Transport Assessment Appendix 2**

2. SCHEME OVERVIEW AND DESIGN STANDARDS

Overview of Standards

2.1 The M40 J10 Improvements scheme will be designed in accordance with the Design Manual for Roads and Bridges (DMRB) standards, based on the versions of the standards that are in place at the time of the Development Consent Order (DCO) submission.

Use of enhanced all-purpose dual carriageway and Smart Motorway standards

2.2 The A43 is not an enhanced all-purpose dual carriageway and therefore GD 300[2] does not apply to this scheme.

2.3 GD 301[3] defines a Smart Motorway as "*Motorways that use variable mandatory speed limits to increase capacity and smooth the flow of traffic*." The M40 at J9 and J10 does not have and is not proposed to have variable mandatory speed limits. By definition, within GD 301, the M40 J9 and J10 schemes are not a Smart Motorway and does not interface with a Smart Motorway.

2.4 In relation to the works on the M40 the scheme design standards for the scheme are, therefore, those for a conventional urban motorway and GD 301, and the Smart Motorway standards found in the England National Application Annexes to the main DMRB standards, do not apply to this scheme.

Safety risk assessment

2.5 Safety risk assessments are to be undertaken for departures from standard.

Highway authority, road class, design speed and speed limit

2.6 The road classes and design speeds for each section of the scheme are listed below, these have been determined in accordance with CD 109[4] table 2.5 and CD 122[5] table 5.4.

Section of scheme	Highway Authority	Road Class	Design Speed (kph)	Existing signed Speed limit (mph)	Proposed speed limit (mph) where different
M40 Mainline	NH	Rural motorway	120B*	National speed limit	As existing
M40 J10 northbound diverge slip road	NH	Rural motorway connector road: slip road	70B*	National speed limit	As existing
M40 J10 northbound merge slip road	NH	Rural motorway connector road: slip road designed as interchange link as >750m	85A	National speed limit	40 due to proposed loop, then national speed limit onto M40

[2] DMRB GD 300 Enhanced all-purpose dual carriageways, Revision 2.1.0
[3] DMRB GD 301 Smart motorways, Revision 1.0.0
[4] DMRB CD 109 Highway link design, Revision 1
[5] DMRB CD 122 Geometric design of grade separated junctions, Revision 1.1.1

Section of scheme	Highway Authority	Road Class	Design Speed (kph)	Existing signed Speed limit (mph)	Proposed speed limit (mph) where different
M40 J10A northbound to A43 northbound slip road	NH	Rural motorway connector road: slip road designed as interchange link as >750m	85A	n/a	40 due to proposed loop, then 50 at Padbury junction
M40 J10 southbound diverge slip road	NH	Rural motorway connector road: slip road	70B*	National speed limit	As existing
M40 J10 southbound merge slip road	NH	Rural motorway connector road: slip road	70B*	National speed limit	As existing
A43 between Ardley and Cherwell junctions	NH	Dumb-bell connector	70	50	As existing
A43 between Cherwell and Padbury junctions	NH	Rural all-purpose	120	50	As existing
A43 between Padbury and Baynard's Green junctions	NH	Rural all-purpose	120	50	As existing
A43 north of Baynard's Green	NH	Rural all-purpose	120	National speed limit	50 at immediate area of junction, then national speed limit

* On existing motorways and in accordance with CD 109 para E/1.3, for existing features that are to be retained, design speeds can be classified as band B.

Summary of departures from standard

2.7 The departures from standard listed below are a summary of those described in detail in this report.

Location	Type	Reason	Prepared for departure(s)	Highway Authority
M40 Mainline	Cross-section	Hard shoulder not provided under bridge at NB diverge	G1	NH
M40 Mainline	Cross-section	Hard shoulder not provided under bridge at SB merge	G2	NH
M40 J10 NB Diverge to Ardley	Cross-section	Required lane width to standard not provided at tie-in to existing	G3	NH
M40 J10A NB Diverge to Padbury	Diverge layout	Lane-drop and ghost-island layout not provided	G4	NH
M40 J10A NB Diverge to Padbury	Link geometry	Use of relaxations given in CD 109 on a connector road	G5	NH

Location	Type	Reason	Prepared for departure(s)	Highway Authority
M40 J10A NB Diverge to Padbury	Visibility / SSD	Visibility of full loop not achieved	G6	NH
M40 J10 NB Merge from Ardley	Link geometry	Use of relaxations given in CD 109 on a connector road	G7	NH
M40 J10 SB Diverge to Padbury	Cross-section	Use of single lane cross-section and connecting to narrow hard shoulder	G8	NH
Baynard's Green B4100 east	Link geometry	1 step below desirable minimum crest K on immediate approach to the junction	G9	OCC
Baynard's Green B4100 west	Cross-section	Lack of hard-strips	G10	OCC
Baynard's Green B4100 east	Cross-section	Lack of hard-strips	G11	OCC
Baynard's Green B4100 east	Roundabout geometry	Entry path radius >100m	G12	NH
Baynard's Green – A43 south	Roundabout geometry	Entry path radius >100m	G13	NH
Padbury – A43	Link geometry	Two step below sag K value within immediate approach to junction	G14	NH
Padbury – A43	Link geometry	Two step below crest K value within immediate approach to junction	G15	NH
Cherwell – A43	Link geometry	Three step below crest K value within immediate approach to junction	G16	NH
Cherwell – A43	Link geometry	SSD below desirable minimum within immediate approach to junction	G17	NH
Baynard's Green – A43 North	Roundabout geometry	Entry path radius >100m	G18	NH
M40 J10 NB Diverge to Ardley	Cross-section	Entry lane widths >4.5m	G19	NH
M40 J10 NB merge first VMS	VMS location	VMS at a distance of 115m beyond the J10 northbound merge entry datum point	S1	NH
M40 NB through J10	VMS visibility	Visibility J10 final VMS to J10A final VMS not achieved for ⅔ of distance	S2	NH
M40 NB through J10	VMS visibility	Visibility J10A final VMS to J10 first VMS not achieved for ⅔ of distance	S3	NH
M40 NB through J10	VMS visibility	Visibility J10 first VMS to J10-11 intermediate VMS not achieved for ⅔ of distance	S4	NH
M40 J10 SB merge first VMS	VMS location	VMS at a distance of 151m beyond the J10 southbound merge entry datum point	S5	NH
M40 J10A NB diverge	ERT location	ERT is not located between 400m and 300m upstream of exit datum point	T1	NH

Location	Type	Reason	Prepared for departure(s)	Highway Authority
M40 J10 SB merge	ERT location	ERT located before 300m upstream of hard shoulder discontinuity	T2	NH
M40 J10 SB merge	ERT location	ERT located beyond 300m downstream of hard shoulder discontinuity	T3	NH

3. M40 MAINLINE (JUNCTION 10)

3.1 The M40 mainline through Junction 10 is on a gentle radius of approximately 3000m radius and there are no significant vertical alignment features. Therefore, the desirable minimum SSD of 295m is achieved in both directions through the junction. The radius does, however, affect the sighting of successive VMS.

3.2 Except at the merges and diverges no changes to the existing cross-section are proposed, the existing cross-section generally complies with CD 127 standard section D3M.

3.3 At the existing J10 overbridges there is an existing hard-shoulder discontinuity in the northbound direction. This dates from the early 2000s when the northbound merge was realigned into a loop – prior to this the merge was located north of the junction. The auxiliary lane merge provided at the end of the loop was installed in place of the hard shoulder under the two bridges within J10.

3.4 In the proposed scheme layout the northbound merge is moved farther north, to make space for the J10A diverge and loop. The start of the J10A diverge taper is to the south of the overbridges which means that a hard shoulder cannot be provided under the bridges without reconstruction of the bridges being undertaken. This would be significantly disruptive, and it is therefore proposed to retain the hard shoulder discontinuity. The hard shoulder discontinuity is therefore a **departure from standard** reference **G1**.

3.5 On the M40 southbound the proposed extended auxiliary lane merge will result in a hard shoulder discontinuity at the Ardley Road bridge. Further details of the merge are provided at section 8 below. This discontinuity is **departure from standard** reference **G2.**

Weaving

3.6 There are no weaving sections within the proposals for J10 improvements.

3.7 The distance between the amended J10 and both existing junctions J9 and J11 exceeds 3km and hence no further assessment of weaving is required under CD 122.

Decision / Outcome 3-1: A weaving assessment is not required for the scheme.

Spacing of successive merges and diverges

3.8 Based on the merge and diverge layout types set out above an assessment has been made of the spacing of the successive merges and diverges on the M40 though J10 and J10A northbound.

3.9 As set out in CD 122 para 3.36 the minimum spacing between successive merges and diverges, measured between the tips of the diverge and merge noses, is in metres, 3.75 times the design speed. The M40 design speed is 120kph and hence the minimum spacing is 3.75 x 120 = 450m.

3.10 The following table provides an assessment of the merge and diverge spacing against this minimum distance.

Upstream diverge/merge	Downstream diverge / merge	Weaving section?	Distance between tip of noses (m)	Exceeds minimum 450m distance?
M40 J10 northbound diverge	M40 J10A northbound diverge	No	705	Yes
M40 J10A northbound diverge	M40 J10 northbound merge	No	625	Yes

Decision / Outcome 3-2: The minimum spacing requirements for successive merges and diverges are met and there are no weaving sections within J10.

4. M40 J10 NORTHBOUND DIVERGE TO ARDLEY JUNCTION

Layout

4.1 The J10 northbound diverge is an existing Layout A option 1 diverge (2-lane taper diverge), the scheme does not propose to amend the diverge layout.

4.2 The design year traffic data for the diverge is as follows:

Location	AM Peak		PM Peak	
	Total Vehicles	%HGV	Total Vehicles	%HGV
M40 downstream of J10 NB diverge	3948	11.4	5516	9.2
J10 NB Diverge	354	n/a	338	n/a

4.3 The mainline gradient is <2% and based on the above no adjustments to the flows are required in accordance with CD 122 paragraph 3.9.

4.4 The traffic data has been inserted into CD 122 Figure 3.26b, motorway diverging diagram, and this confirms that a Layout A diverge is required. This is shown on **Figure 4.1** below.

4.5 The criteria for providing a layout A option 2 (auxiliary lane) diverge, as set out at CD 122 paragraph 3.28, are not met.

4.6 This assessment has confirmed that the existing layout A option 1 diverge layout is appropriate for the scheme and hence it is not proposed to undertake any works to the diverge. This means that the exit datum point for the diverge will remain as the existing location.

4.7 As the scheme does not amend the diverge layout a detailed assessment of the diverge parameters has not been undertaken.

Decision / Outcome 4-1: The existing Layout A option 1, 2-lane taper, J10 northbound diverge layout is to be retained.

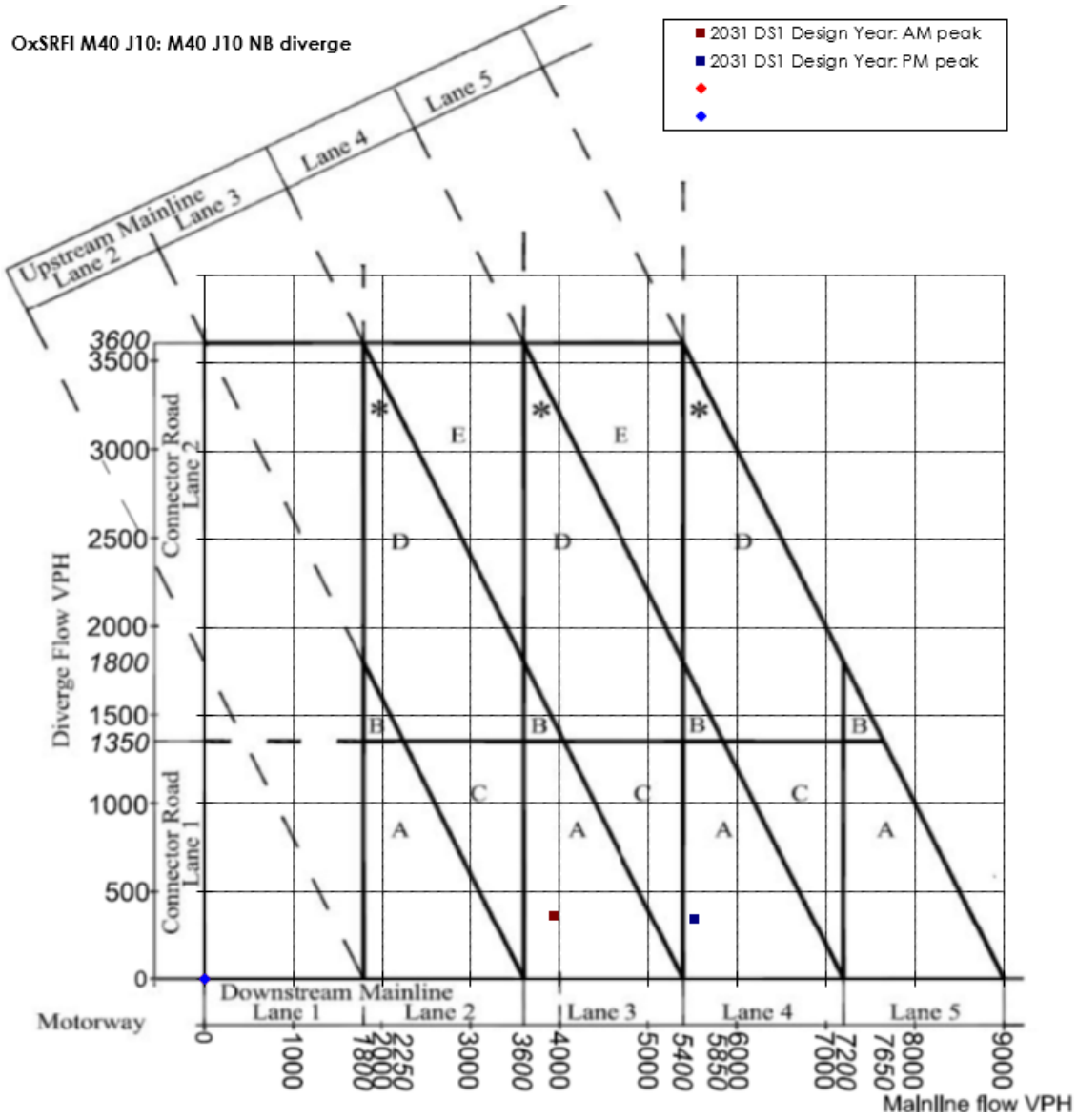


Figure 4.1 M40 J10 northbound diverge layout to Ardley requirement using traffic data

Design Speed and Geometry

4.8 In accordance with CD 122, para 5.4 and Table 5.4, the minimum design speed for a slip road connector shall be 70kph where the mainline design speed is 120kph.

4.9 The geometry of the J10 northbound diverge slip road is shown on **drawings OxSRFI-BWB-HGN-07-DR-CH-0105 & OxSRFI-BWB-HGN-08-DR-CH-0105**.

Horizontal alignment

4.10 The horizontal alignment is summarised as follows:

J10 NB diverge to Ardley	Horizontal Design Parameters
Description	• Straight as design transitions from link design to CD 109, into grade separated junction design to CD 122 • Left hand radius 2080m • Straight • Right hand radius 510m (minimum R with 3.5% superelevation) • Straight • Left hand radius 866m (minimum R with 2.5% superelevation) • Left hand radius 2880 • Left hand radius 854m (minimum R with 2.5% superelevation) • Right hand radius 1020m • Left hand radius 2036m • Left hand radius 360mm (minimum R with 5.0% superelevation) • Left hand radius 120m as design transitions from CD 122 grade separated junction design, into roundabout design to CD 116
Compliance with DMRB	**Compliant**

Vertical alignment

4.11 The vertical alignment is summarised as follows:

J10 NB diverge to Ardley	Vertical Design Parameters
Description	• Existing geometry retained until connector road realignment begins • Grade 0.9% uphill • Sag K 20 • Grade 2.4% uphill • Crest K 30 • Grade 0.5% downhill • Sag K 20 • 1.3% uphill as design transitions from CD122 grade separated junction design, into roundabout design to CD 116
Compliance with DMRB	**Compliant**

Stopping Sight Distance / Visibility

4.12 As stated within CD 122, para 3.34 mainline SSD shall be provided along the diverge and into the connector road up to the back of the nose. CD 109, Table 2.10, states that the desirable SSD for a 120kph design speed is 295m.

4.13 From the back of the nose the SSD reduces to the slip road design SSD of 120m.

4.14 The SSD has been assessed as follows:

J10 NB diverge to Ardley	Visibility Parameters
Description	• Minimum SSD of 295m achieved to back of nose • Minimum SSD of 120m achieved to junction
Compliance with DMRB	**Compliant**

Cross-section (Connector Road – Slip Road)

4.15 The traffic data above has been inserted into CD 122 table 5.17b and this confirms that the minimum slip road cross-section is DG1A (single lane diverge slip road with hard shoulder). However, based on the upstream diverge layout and the downstream junction layout a two lane diverge slip road to cross-section DG2A is proposed.

4.16 In accordance with CD 127, para 2.1, Figure 2.1.1N1b provides the required cross-sectional dimensions for a rural motorway connector road.

Lane Widths

4.17 The cross-section of the length of revised slip road is two no. 3.65m wide traffic lanes. However, at the tie-in to the existing slip road which is beyond the back of the diverge nose, the existing lane widths are 3.0m. As the scheme connects into this non-standard cross-section this is a **departure from standard** reference **G3.**

4.18 The cross-section of the length of revised slip road is two no. 3.65m wide traffic lanes. However, at the tie-in to the Ardley Roundabout the lane widths are 4.94m to accommodate heavy duty vehicle swept paths. As the lane widths exceed the maximum of 4.5m as set out in CD116 para 3.14 this is a **departure from standard** reference **G19.**

Hard Shoulders / Hard Strips / Verges

4.19 Connector road type DG2A states that a 1.0m hard strip and 2.5m verge shall be provided on the nearside, and a 1.0m hard strip and 2.0m verge on the offside. These widths are provided along the length of the realigned slip road.

4.20 The minimum verge width will be widened as necessary to accommodate relevant assets e.g. motorway communications ducting, lighting, signage, VRS and the like.

5. M40 J10A NORTHBOUND DIVERGE TO PADBURY JUNCTION

Layout

5.1 The J10A northbound diverge is the proposed diverge to provide the M40 northbound to A43 northbound link, connecting to the Padbury junction.

5.2 The design year traffic data for the diverge is as follows:

Location	AM Peak		PM Peak	
	Total Vehicles	%HGV	Total Vehicles	%HGV
M40 downstream of J10A NB diverge	2891	11.5	3787	10.1
J10A NB Diverge	1058	n/a	1729	n/a

5.3 The mainline gradient is <2% and based on the above no adjustments to the flows are required in accordance with CD 122 paragraph 3.9.

5.4 The traffic data has been inserted into CD 122 Figure 3.26b, motorway diverging diagram. This shows that a Layout D diverge (two lane diverge with lane drop) is required. This is shown on **Figure 5.1** below.

5.5 The M40 currently has three lanes in each direction between J9 and J10 and this scheme does not include for providing additional capacity on this overall link. Therefore, a lane drop (from four lanes to three lanes) cannot be provided. Ideally a Layout B diverge would be provided (and the figure does show that it is close to the boundary). However, the presence of the existing bridges which take the A43 over the M40 within J10 constrain the cross-section to around a 15m paved width which can only accommodate 4 lanes in total.

5.6 To provide a Layout B option 1 diverge without replacing the bridges would move the nose around 290m downstream, and this would be around 150m for a Layout B option 2 diverge. Both of these layouts would mean the overall junction solution could not be provided, or a departure for reduced SSD into the diverge loop would be needed.

5.7 Therefore, a Layout A option 1 diverge is proposed but this requires a **departure from standard** reference **G4**. VISSIM modelling will be undertaken to assess the operation of this proposal

Decision / Outcome 5-1: A Layout A option 1, 2-lane taper, J10A northbound diverge layout is to be provided. This could be adapted into a Layout C in future should a fourth lane be added to the M40.

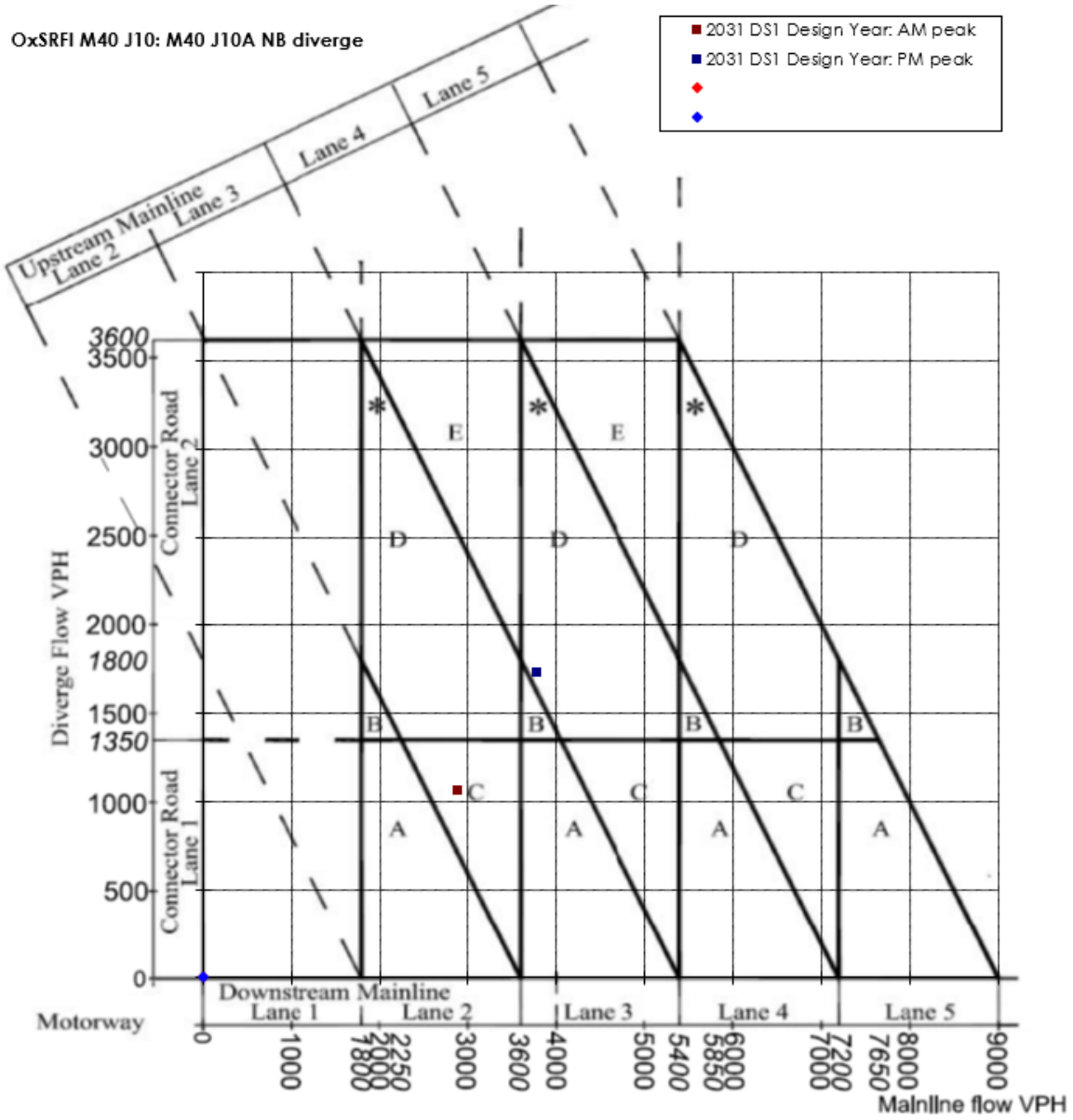


Figure 5.1 M40 J10A northbound diverge layout to Padbury requirement using traffic data

5.8 The following table summarises the geometric parameters for the Layout A option 1 diverge:

Element	Standard (CD 122) dimensions	Proposed Design	
		Details	Comments including Relaxations / Departures
Exit datum point	At start of taper	At start of taper	None
Taper	185m	185m	Taper for 2-lane slip road is provided
Nose length	80m	80m	None
Nose ratio	1:15	1:15	Compliant as nose ratio is minimum value
Near straight	510m min radius for 80m	Straight for for > 80m	None

Design Speed and Geometry

5.9 In accordance with CD 122, para 5.4 and Table 5.4, the minimum design speed for a slip road connector shall be 70kph where the mainline design speed is 120kph. However, the J10A slip road is over 0.75km long (it is 0.9km long) and is therefore to be designed as an interchange link and will therefore have a design speed of 85kph.

5.10 The geometry of the J10 northbound diverge slip road is shown on **drawings OxSRFI-BWB-HGN-05-DR-CH-0105, OxSRFI-BWB-HGN-06-DR-CH-0105, OxSRFI-BWB-HGN-07-DR-CH-0105, OxSRFI-BWB-HGN-13-DR-CH-0105 & OxSRFI-BWB-HGN-14-DR-CH-0105**.

Horizontal alignment

5.11 The horizontal alignment is summarised as follows:

J10 NB diverge to Padbury	Horizontal Design Parameters
Description	• Straight connecting to back of diverge nose (CD 122 compliant near straight) • Left hand radius 2080m • Left hand radius 75m (loop) • Left hand radius 510m (minimum R with 5.0% superelevation) • Straight • Left hand radius 87m as design transitions from CD 122 grade separated junction design, into at-grade priority and signal-controlled junction design to CD 123
Compliance with DMRB	**Compliant**

Vertical alignment

5.12 The vertical alignment is summarised as follows:

J10 NB diverge to Padbury	Vertical Design Parameters
Description	• Grade 1.1% downhill as design transitions from link design to CD 109, into grade separated junction design to CD 122 • Sag K 276 • Grade 0.6% downhill • Sag K 100 • Grade 0.5% downhill • Sag K 180 • Grade 0.6% uphill • Crest k 55 • Grade 0.5% downhill • Sag K 13 (two steps below desirable minimum) – **departure** • Grade 7.0% uphill • Crest K 17 (two steps below desirable minimum) – **departure**

J10 NB diverge to Padbury	Vertical Design Parameters
	• Grade 7.0% downhill as design transitions from CD 122 grade separated junction design, into at-grade priority and signal-controlled junction design to CD 123
Compliance with DMRB	CD 122 para 1.3 does not permit the use of relaxations given in CD 109. The Crest and Sag curves highlighted above are two steps below desirable minimum, for a design speed of 85kph. A **departure** is required, reference **G5.** Due to the loop element speeds will be reduced and a 40mph speed limit will be in place. As the link connects from a motorway (and not to a motorway), CD 122 para 5.7, then an increased gradient of 7% is permitted.

Stopping Sight Distance / Visibility

5.13 As stated within CD 122, para 3.34 mainline SSD shall be provided along the diverge and into the connector road up to the back of the nose. CD 109, Table 2.10, states that the desirable SSD for a 120kph design speed is 295m.

5.14 From the back of the nose the SSD reduces to the slip road design SSD of 160m.

5.15 The SSD has been assessed as follows:

J10 NB diverge to Padbury	Visibility Parameters
Description	• Minimum SSD of 295m achieved to back of nose • One step below desirable minimum SSD of 120m achieved on the loop - **Departure** • Two steps below desirable minimum SSD of 90m achieved over the M40 overbridge - **Departure**
Compliance with DMRB	CD 122 does not permit obscured visibility across the loop. Due to the retention of the woodland a minimum SSD of 120m is proposed. On this basis a **departure** is required, reference **G6.** The reduction in SSD over the bridge is dealt with as part of departure **G5.**

Loop visibility

5.16 The M40NB to A43 interchange link at J10A will include a loop element designed to CD 122 para 5.10. The loop will take the interchange link through a total angle of 270 degrees and it has a radius of 75m.

5.17 Transition curves into and out of the loop are not proposed as per CD 122 para 5.9. This is because on the entry to a loop a transition curve can present to the driver a false sense of the tightness of the geometry leading to high entry speeds. As there is 295m visibility provided from the diverge to the start of the loop the start of the loop will be clearly visible to drivers and it is in fact this criteria that has been used to determine the location of the loop.

5.18 CD 122 para 5.14 requires that within a loop, full visibility of the entire loop is required. However, within the location of the loop there is a block of established woodland. It is clearly not possible for a driver to be able to see the entire loop when on any part of it (i.e. a driver cannot see behind them to a different part of the loop) and we therefore propose to retain an element of this woodland, which will have clear environmental benefits.

5.19 Due to the radius of the loop a speed limit of 40mph is proposed and is to be incorporated into the speed limit provisions of the Development Consent Order (DCO) for the scheme. Use of a 40mph speed limit is in keeping with similar radius loops on other parts of the motorway network (for example on the M1 J24A southbound link to the A50 eastbound). Based on providing a 40mph speed limit we therefore propose to provide a stopping sight distance of 120m around the inside of the loop, 120m being determined from CD 109 table 2.10 for a 70kph design speed (which is appropriate for a 40mph road). This is however a departure from standard and is **departure from standard** reference **G6**.

Cross-section (Connector Road – Interchange Link)

5.20 The traffic data above has been inserted into CD 122 table 5.17b and this confirms that the minimum slip road cross-section is DG2A (two lane diverge slip road with hard strip).

5.21 However, the J10A slip road is over 0.75km long (it is 0.9km long) and is therefore to be designed as an interchange link. As it is longer than 1km the required cross-section is IL2A (2-lane interchange link with hard shoulder).

5.22 In accordance with CD 127, para 2.1, Figure 2.1.1N1b provides the required cross-sectional dimensions for a rural motorway connector road.

Lane Widths

5.23 The cross-section of the length of the merge slip road is two no. 3.65m wide traffic lanes. This widens to two no. 4m wide traffic lanes to accommodate the loop, due to the geometry consisting of a minimum radius of 75m, in accordance with CD 123.

Hard Shoulders / Hard Strips / Verges

5.24 Connector road type IL2A states that a 3.3m hard shoulder and 1.5m verge shall be provided on the nearside, and a 0.7m hard strip and 2.3m verge on the offside.

5.25 The minimum verge width will be widened as necessary to accommodate relevant assets e.g. motorway communications ducting, lighting, signage, VRS and the like.

6. M40 J10 NORTHBOUND MERGE FROM ARDLEY JUNCTION

Layout

6.1 The existing J10 northbound merge is a Layout B auxiliary lane merge. Due to the construction of the J10A northbound diverge, the existing merge has to be relocated.

6.2 The design year traffic data for the merge is as follows:

Location	AM Peak		PM Peak	
	Total Vehicles	%HGV	Total Vehicles	%HGV
M40 upstream of J10 NB merge	2891	11.4	3787	10.1
J10 NB Merge	575	20.6	860	13.5

6.3 The mainline gradient is <2% and based on the above no adjustments to the mainline flows are required in accordance with CD 122 para 3.9.

6.4 The merge gradient for the full length of the slip road and nose is <2% but the merge flows have been increased using factors derived from CD 122 para 3.9 due to the %HGV.

6.5 The traffic data has been inserted into CD 122 Figure 3.12b, motorway merging diagram, and this confirms that a Layout B merge is required. This is shown on **Figure 6.1** below.

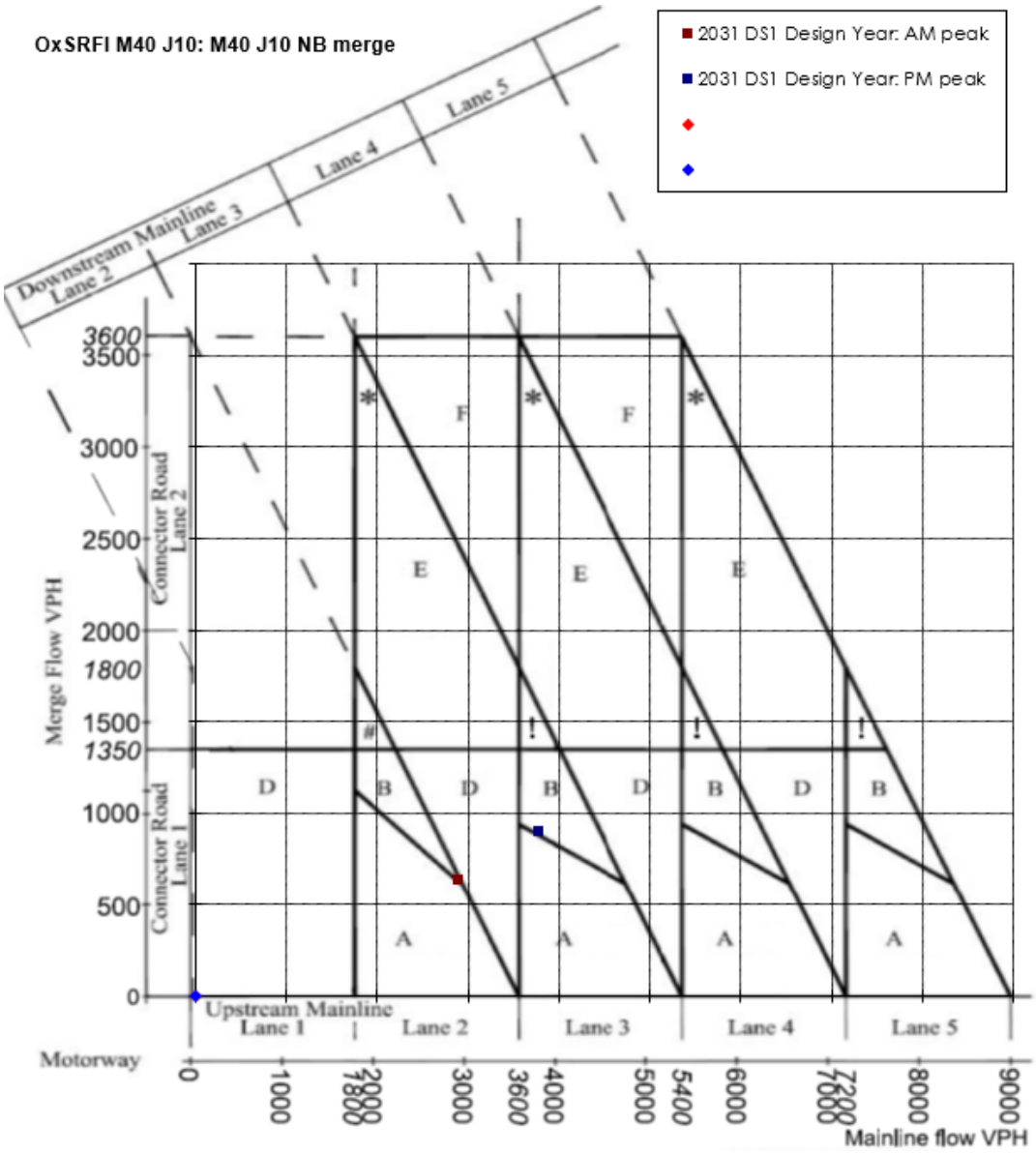


Figure 6.1 M40 J10 northbound merge layout from Ardley requirement using traffic data

6.6 The following table summarises the geometric parameters for the proposed Layout B merge:

Element	Standard (CD 122) dimensions	Proposed Design	
		Details	Comments including Relaxations / Departures
Nose length	115m	115m	None
Nose ratio	1:40	1:23	Compliant as nose ratio is minimum value
Auxiliary lane length	230m	230m	None
End Taper length	75m	75m	None
Entry datum point	At end of taper	At end of taper	None

Decision / Outcome 6-1: The J10 northbound merge is to be relocated and a Layout B auxiliary lane merge provided.

Loop

6.7 The relocated J10 northbound merge slip road is to be provided in the form of a low-radius loop as it will closely follow the geometric alignment of the M40NB to A43NB interchange link. A loop is defined by CD 122 as having an angle of around 180 degrees or more. The proposed loop element will turn through two radii of 90 degrees and will resemble that shown on CD 122 Figure 5.10.

Design Speed and Geometry

6.8 In accordance with CD 122, para 5.4 and Table 5.4, the minimum design speed for an interchange link connector shall be 85kph where the mainline design speed is 120kph.

6.9 The geometry of the J10 northbound merge slip road is shown on **drawings OxSRFI-BWB-HGN-13-DR-CH-0105, OxSRFI-BWB-HGN-14-DR-CH-0105 & OxSRFI-BWB-HGN-15-DR-CH-0105**.

Horizontal alignment

6.10 The horizontal alignment is summarised as follows:

J10 NB Merge from Ardley	Horizontal Design Parameters
Description	• Left hand radius 60m as design transitions from roundabout design to CD 116, into grade separated junction design to CD 122 • Left hand radius 360m (one step below desirable minimum) – **departure** • Left hand radius 510m (minimum R with 5.0% superelevation) • Left hand radius 92m (loop) • Straight • Left hand radius 75m (loop) • Left hand radius 1020m (minimum R with 2.5% superelevation) – CD 122 near straight connecting into back of nose
Compliance with DMRB	As the connector roads begins when leaving Ardley the 360m radius is one step below desirable minimum allowed for a design speed of 85kph. As the loop ends and transitions into the slip providing entry on to the mainline the radii is also 360m. CD 122 does not permit the use of relaxations given in CD 109. On this basis a **departure** is required, reference **G7.**

Vertical alignment

6.11 The vertical alignment is summarised as follows:

J10 NB Merge from Ardley	Vertical Design Parameters
Description	• Grade 0.8% downhill and crest K10 as design transitions from roundabout design to CD 116, into grade separation junction design to CD 122 • Grade 4.5% downhill

J10 NB Merge from Ardley	Vertical Design Parameters
	• Sag K 20 • Grade 1.7% uphill • Crest K 30 (one step below desirable minimum) – **departure** • Grade 2.7% downhill • Sag k 20 • Grade 0.7% downhill • Sag K 20 • Grade 2.4% uphill • Crest K 20 (two steps below desirable minimum) – **departure** • Grade 0.7% uphill • Sag K 20 • Grade 1.1% uphill • Grade 1.0% uphill as design transitions from CD 122 grade separated junction design, into link design to CD 109
Compliance with DMRB	As there are two loops running adjacent, similar geometry (30 K) is used to ensure similar levels are maintained to aid in achieving stopping site distance and avoid uneven earthworks. As the loop transitions from design levels to existing to match the mainline a crest of 20 K is utilised. CD 122 does not permit the use of relaxations given in CD 109. This is dealt with under departure **G7.**

Stopping Sight Distance / Visibility

6.12 As stated within CD 122, para 3.23 & 3.24, SSD shall be provided along the connector road and up to the back of the nose. Mainline SSD shall be provided from the back of the nose. CD 109, Table 2.10, states that the desirable SSD for a 85kph design speed is 160m.

6.13 From the back of the nose the SSD increases to mainline design speed SSD of 295m.

6.14 The SSD has been assessed as follows:

J10 NB Merge from Ardley	Visibility Parameters
Description	• Minimum SSD of 160m achieved on Ardley roundabout exit • Two steps below desirable minimum SSD of 90m before the start of the northbound loops – **departure** • Minimum SSD of 160m achieved across the loops (1.05 to 1.05) • Minimum SSD of 160m achieved from loop to back of nose • Mainline SSD of 295m achieve from back of nose
Compliance with DMRB	Due to providing similar vertical geometry for the northbound and southbound loops as well as tieing back into existing mainline for the northbound merge, this has influenced the SSD. At two steps below desirable minimum and that CD 122 does not permit the use of relaxations given in CD 109. This is dealt with under departure **G7.**

Cross-section (Connector Road – Interchange Link)

6.15 The traffic data above has been inserted into CD 122 table 5.17b and this confirms that the minimum slip road cross-section is MG1A (single lane merge slip road with hard shoulder). The J10 northbound merge slip road 815m long which means, being longer that 750m, it is to be designed as an interchange link as required by CD 122 para 5.5. However, as it is shorter than 1km and is not on an average uphill gradient of more than 3% it can be a single lane (CD 122 para 5.3). The required cross-section is therefore IL1A (single lane interchange link with hard shoulder).

6.16 In accordance with CD 127, para 2.1, Figure 2.1.1N1b provides the required cross-sectional dimensions for a rural motorway connector road.

Lane Widths

6.17 The cross-section of the length of the merge slip road (interchange link IL1A) is one no. 3.7m wide traffic lane. This widens to one 4m wide traffic lane to accommodate the loops due to the geometry consisting of a minimum radius of 75m, in accordance with CD 123 Table 5.10 (which is referenced from CD 122 para 5.18 Note 2).

Hard Shoulders / Hard Strips / Verges

6.18 Connector road type IL1A states that a 3.3m hard shoulder and 1.5m verge shall be provided on the nearside, and a 0.7m hard strip and 2.3m verge on the offside along the length of the realigned slip road.

6.19 The minimum verge width will be widened as necessary to accommodate relevant assets e.g. motorway communications ducting, lighting, signage, VRS and the like.

7. M40 J10 SOUTHBOUND DIVERGE TO PADBURY JUNCTION

Layout

7.1 The J10 southbound diverge is an existing Layout A option 1 diverge (1-lane taper diverge), the scheme does not propose to amend the diverge layout.

7.2 The design year traffic data for the diverge is as follows:

Location	AM Peak		PM Peak	
	Total Vehicles	%HGV	Total Vehicles	%HGV
M40 downstream of J10 SB diverge	3420	16.0	3348	9.8
J10 SB Diverge	918	n/a	650	n/a

7.3 The mainline gradient is <2% and based on the above no adjustments to the flows are required in accordance with CD 122 paragraph 3.9.

7.4 The traffic data has been inserted into CD 122 Figure 3.26b, motorway diverging diagram, and this confirms that a Layout A diverge is required. This is shown on **Figure 7.1** below.

7.5 This assessment has confirmed that the existing diverge layout is appropriate for the scheme and hence it is not proposed to undertake any works to the diverge. This means that the exit datum point for the diverge will remain as the existing location.

7.6 As the scheme does not amend the diverge layout a detailed assessment of the diverge parameters has not been undertaken.

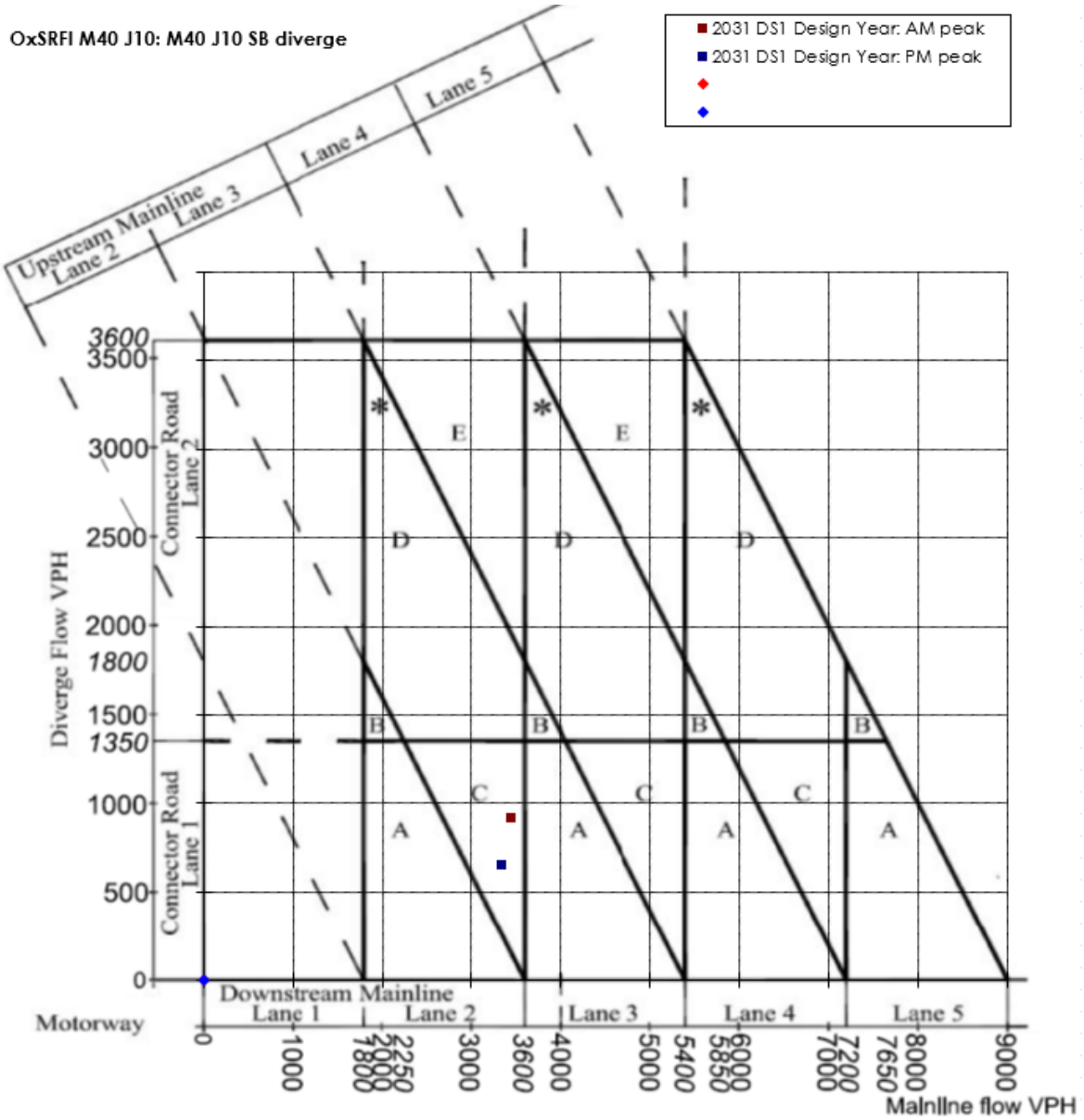


Figure 7.1 M40 J10 southbound diverge layout to Padbury requirement using traffic data

Decision / Outcome 7-1: The existing Layout A option 1, J10 southbound diverge layout is to be retained.

Design Speed and Geometry

7.7 In accordance with CD 122, para 5.4 and Table 5.4, the minimum design speed for a slip road connector shall be 70kph where the mainline design speed is 120kph.

7.8 The geometry of the J10 southbound diverge slip road is shown on **drawing OxSRFI-BWB-HGN-05-DR-CH-0105.**

Horizontal alignment

7.9 The horizontal alignment is summarised as follows:

J10 SB Diverge to Padbury	Horizontal Design Parameters
Description	• Left hand radius 345m (one step below desirable minimum) as design transitions from CD 122 grade separated junction design, into link design to CD 109 – **existing departure** • Left hand radius 300m as design transitions from CD 122 grade separated junction design, into at-grade priority and signal-controlled junction design to CD 123
Compliance with DMRB	**One existing departure**

Vertical alignment

7.10 The vertical alignment is summarised as follows:

J10 SB Diverge to Padbury	Vertical Design Parameters
Description	• Existing geometry retained until connector road realignment begins • Grade 1.6% downhill • Crest K 272 • Grade 1.8% downhill • Sag K 20 • Grade 3.3% uphill • Crest K 30 • Grade 1.8% uphill as design transitions from CD122 grade separated junction design, into at-grade priority and signal-controlled junction design to CD 123
Compliance with DMRB	**Compliant**

Stopping Sight Distance / Visibility

7.11 As stated within CD 122, para 3.34 mainline SSD shall be provided along the diverge and into the connector road up to the back of the nose. CD 109, Table 2.10, states that the desirable SSD for a 120kph design speed is 295m. The works covered in this section however do no conflict with mainline SSD as widening begins over 160m from the back of the nose.

7.12 From the back of the nose the SSD reduces to the slip road design SSD of 120m.

7.13 The SSD has been assessed as follows:

J10 SB Diverge to Padbury	Visibility Parameters
Description	• Minimum SSD of 120m achieved
Compliance with DMRB	**Compliant**

Cross-section (Connector Road – Slip Road)

7.14 The traffic data above has been inserted into CD 122 table 5.17b and this confirms that the minimum slip road cross-section is DG2A (two lane slip diverge road with hard strip). The existing slip road is to cross-section DG1A (single lane diverge slip road with hard shoulder). The threshold for the change is 900vph but this is not related to the link capacity which is taken to be 1350vph. As the downstream end of the slip road the number of lanes increases based on the capacity of Padbury junction. However, the retention of the existing slip road cross-section, which has a non-standard hard shoulder width, is **departure from standard** reference **G8.**

7.15 In accordance with CD 127, para 2.1, Figure 2.1.1N1b provides the required cross-sectional dimensions for a rural motorway connector road.

Lane Widths

7.16 The cross-section of the length of revised slip road is three no. 4m wide traffic lanes and one 4.5m lane. The 4.5m left-turn only lane has been retained, albeit realigned as part of the works. On approach to the signal-controlled junction the carriageway widens to accommodate three 4m right-turn only lanes.

Hard Shoulders / Hard Strips / Verges

7.17 Connector road type DG2A states that a 1.0m hard strip and 2.5m verge shall be provided on the nearside, and a 1.0m hard strip and 2.0m verge on the offside. These widths are provided along the length of the realigned slip road with hard-strips tapering out as the junction develops.

7.18 The minimum verge width will be widened as necessary to accommodate relevant assets e.g. motorway communications ducting, lighting, signage, VRS and the like.

8. M40 J10 SOUTHBOUND MERGE FROM CHERWELL JUNCTION

Layout

8.1 The existing J10 northbound merge is a Layout A taper lane merge. The existing merge has an excessively long nose of around 450m which is a legacy from previous layouts for this junction.

8.2 The design year traffic data for the merge is as follows:

Location	AM Peak		PM Peak	
	Total Vehicles	%HGV	Total Vehicles	%HGV
M40 upstream of J10 SB diverge	3420	16.0	3348	9.8
J10 SB Merge	1960	18.7	1658	13.5

8.3 The mainline gradient is <2% and based on the above a minor adjustment to the mainline flows is required in the AM peak hour in accordance with CD 122 para 3.9.

8.4 The merge gradient for the full length of the slip road is <2% but the merge flows have been increased using factors derived from CD 122 para 3.9 due to the %HGV.

8.5 The adjusted traffic data has been inserted into CD 122 Figure 3.12b, motorway merging diagram. This is shown on **Figure 8.1** below.

8.6 The required merge type would require a lane gain to be provided on the M40 northbound. However, it is not within the scope of the scheme to provide a fourth lane on the M40. As this is an existing slip road and not a new element, the relaxations under CD 122 section E/1 apply. Therefore, as per para E/1.3.3b, a "*Layout C or Layout E3 (see Figure E/1.3) can be used instead of Layout E1 and E2*."

8.7 Layout E option 3 provides an auxiliary lane for the second merge instead of a taper. There is no guidance in this section as to when a layout E option 3 should be used instead of Layout C. To determine this an assessment has been made using the likely amount of traffic using lane 1 on the slip road, which feeds into the second merge point.

8.8 As a reasonable worst-case approach for assessment 100% of the HGV traffic and 50% of other vehicles is assigned to lane 1 (for the second merge point) and the remaining traffic is assigned to lane 2 (for the first merge point). A further version of the motorway merging diagram has then been developed to review the second merge point in isolation. This is shown on **Figure 8.2** below. This assessment shows that a layout B merge would be appropriate which has an auxiliary lane.

8.9 On this basis it is therefore appropriate to use the layout E option 3 merge.

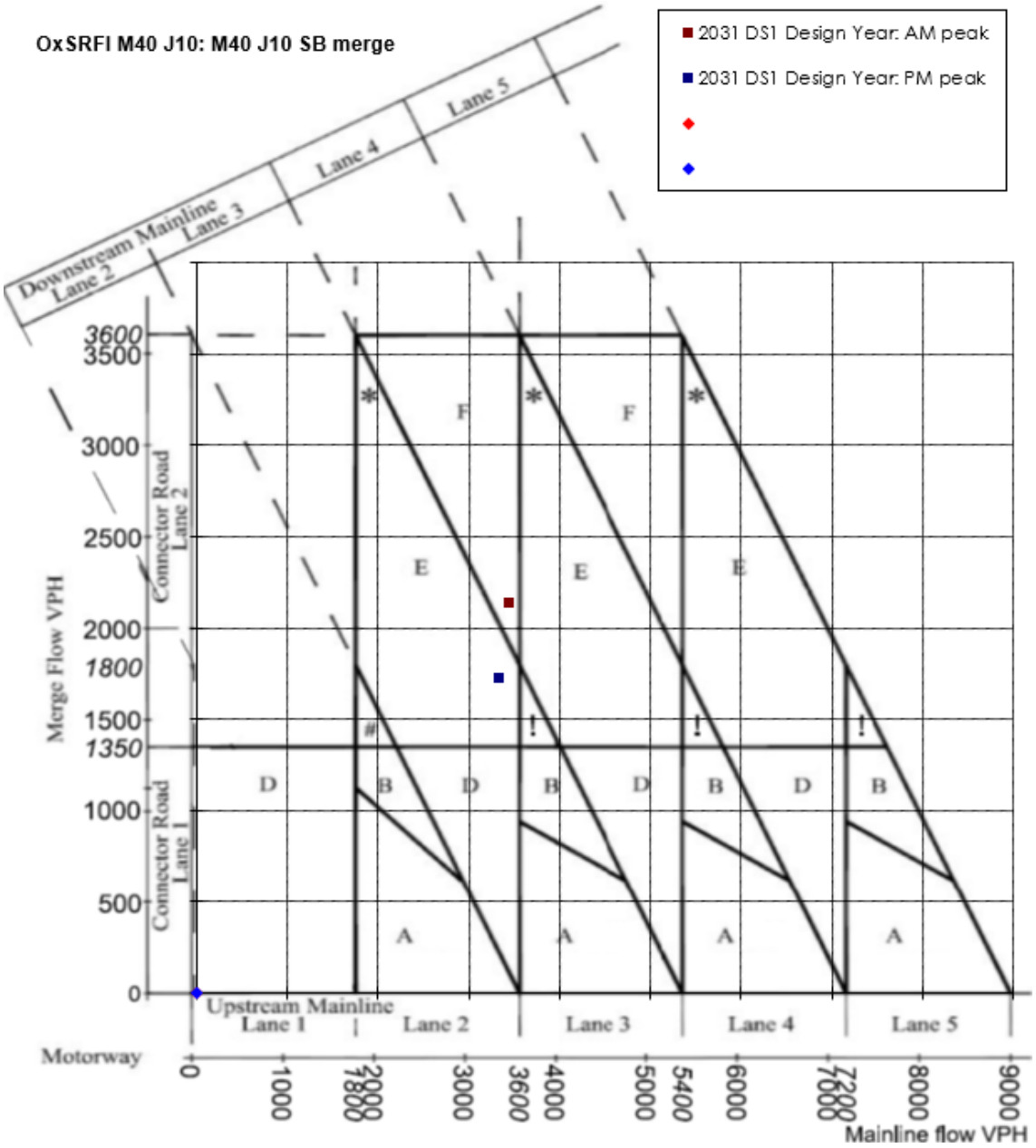


Figure 8.1 M40 J10 southbound merge layout from Cherwell requirement using traffic data

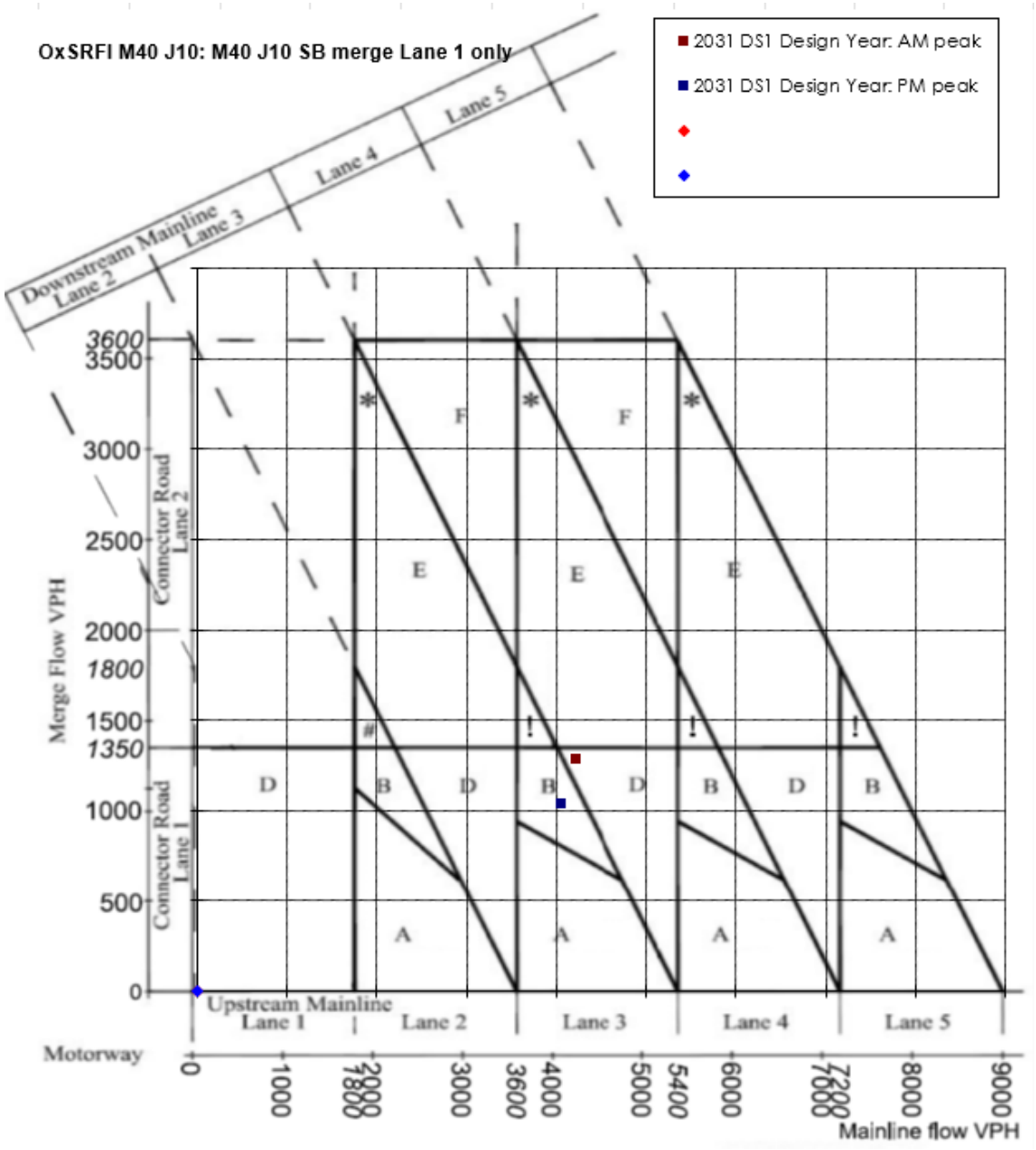


Figure 8.2 M40 J10 southbound merge layout – 2nd merge in isolation

8.10 The following table summarises the geometric parameters for the proposed Layout E3 merge:

Element	Standard (CD 122) dimensions	Proposed Design	
		Details	Comments including Relaxations / Departures
Nose length	115m	115m	None
Nose ratio	1:40	1:23	Compliant as nose ratio is minimum value
Taper (merge lane 2)	205m	180m	None
Ghost Island Tail	180m	180m	None
Auxiliary lane length	230m	230m	None
End Taper length	75m	75m	None
Entry datum point	At end of taper	At end of taper	None

Decision / Outcome 8-1: The J10 southbound merge is to be upgraded to a layout E option 3 merge.

Design Speed and Geometry

8.11 In accordance with CD 122, para 5.4 and Table 5.4, the minimum design speed for a slip road connector shall be 70kph where the mainline design speed is 120kph.

8.12 The geometry of the J10 southbound merge slip road is shown on **drawings OxSRFI-BWB-HGN-06-DR-CH-0105, OxSRFI-BWB-HGN-07-DR-CH-0105 & OxSRFI-BWB-HGN-08-DR-CH-0105**.

Horizontal alignment

8.13 The horizontal alignment is summarised as follows:

J10 SB Merge from Cherwell	Horizontal Design Parameters
Description	• Straight as design transitions from signal-controlled junction design to CD 123, into grade separated junction design to CD 122 • Transition • Left hand radius 720m (minimum R with 2.5% superelevation) • Left hand radius 1020m (CD 122 near straight) into back of nose
Compliance with DMRB	**Compliant**

Vertical alignment

8.14 The vertical alignment is summarised as follows:

J10 SB Merge from Cherwell	Vertical Design Parameters
Description	• Crest k 30 • Grade 3.1% downhill • Sag K 20 • Grade 0.7% uphill • Crest K 298 • Grade 1.4% downhill
Compliance with DMRB	**Compliant**

Stopping Sight Distance / Visibility

8.15 As stated, CD 122, para 3.23 & 3.24, SSD shall be provided along the connector road and up to the back of the nose. Mainline SSD shall be provided from the back of the nose. CD 109, Table 2.10, states that the desirable SSD for a 70kph design speed is 120m.

8.16 From the back of the nose the SSD increases to mainline design speed SSD of 295m.

8.17 The SSD has been assessed as follows:

J10 SB Merge from Cherwell	Visibility Parameters
Description	• Minimum SSD of 120m achieved to back of nose • Minimum mainline SSD of 295m achieved Southbound to mainline from back of nose
Compliance with DMRB	**Compliant**

Cross-section (Connector Road – Interchange Link)

8.18 The traffic data above has been inserted into CD 122 table 5.17b and this confirms that the minimum Slip road cross-section is MG2C (two lane merge slip road without hard shoulder).

8.19 The existing slip road is a single lane with a hard shoulder and this will be widened to cross-section MG2C as part of this scheme.

8.20 In accordance with CD 127, para 2.1, Figure 2.1.1N1b provides the required cross-sectional dimensions for a rural motorway connector road.

Lane Widths

8.21 The cross-section of the length of the merge slip road is two no. 3.65m wide traffic lane.

Hard Shoulders / Hard Strips / Verges

8.22 Connector road type MG2C states that a 3.3m hard shoulder and 1.5m verge shall be provided on the nearside, and a 0.7m hard strip and 2.3m verge on the offside. These widths are provided along the length of the slip road.

8.23 The minimum verge width will be widened as necessary to accommodate relevant assets e.g. motorway communications ducting, lighting, signage, VRS and the like.

9. BAYNARD'S GREEN ROUNDABOUT (A43 NORTH & B4100)

Layout

9.1 The works at Baynard's Green looks to upgrade the existing roundabout to accommodate the improvements works for the A43 and B4100.

9.2 A43 north of Baynard's Green retains the dual cross-section which gradually widens to three lanes, providing an additional 160m capacity, southbound, on the approach to the roundabout. The northbound roundabout exit features an extra lane also, that gradually tapers to two lanes in-keeping with the existing cross-section.

9.3 The A43 mainline, south of Baynard's Green is discussed in section 10.

9.4 B4100 east increases to two lanes on the exit of the roundabout which gradually transitions back to one, in-keeping with the existing cross-section. The approach to the roundabout increases from two lanes on entry only, at the flare, to two lanes with the addition of a left turn only lane, increasing capacity up to 120m further.

9.5 B4100 west retains single lane dualling, providing a right turn lane into Ambury Road and preventing a right turn on to the B4100. This has however been realigned slightly to the south.

Design Speed and Geometry

9.6 A43 north is a D2AP, dual carriageway, all-purpose, rural route, with a design speed of 120kph and the national speed limit applies.

9.7 B4100 east is an S2, single carriageway, all-purpose, rural route, with a design speed of 100kph and the national speed limit applies.

9.8 B4100 west is an S2, single carriageway, all-purpose, rural route, with a design speed of 100kph and the national speed limit applies.

Horizontal alignment

9.9 The horizontal alignment is summarised as follows:

Horizontal Design Parameters	A43 North	B4100 East	B4100 West
Description	• Left hand radius 2880m as design transitions from CD 116 roundabout design into link design to CD 109 • Right hand radius 1086m as design ties into existing - (minimum R with 5.0% superelevation)	• Straight as design transitions from CD 116 roundabout design into link design to CD 109 • Right hand radius 2040m • Straight as design ties into existing	• Left hand radius 929m as design transitions from CD 116 roundabout design into link design to CD 109 - (minimum R with 5.0% superelevation) • Straight • Left hand radius 665m - (one step below desirable minimum) – **relaxation** • Straight as design ties into existing
Compliance with DMRB	**Compliant**	**Compliant**	One **relaxation**

Vertical alignment

9.10 The vertical alignment is summarised as follows:

Vertical Design Parameters	A43 North	B4100 East	B4100 West
Description	• Crest K 30 as design transitions from CD 116 roundabout design into link design to CD 109 • Grade 0.6% uphill • Crest K 182 • Grade 0.3% uphill as design ties into existing	• Grade 2.0% downhill as design transitions from CD 116 roundabout design into link design to CD 109 • Sag K 26 • Grade 0.5% downhill • Crest K 55 - (one step below desirable minimum) – **departure** • Grade 1.6% downhill • Sag K 42 • Grade 0.3% downhill as design ties into existing	• Grade 1.3% uphill as design transitions from CD 116 roundabout design into link design to CD 109 • Sag K 26 • Grade 1.8% uphill • Crest K 100 • Grade 1.6% uphill as design ties into existing
Compliance with DMRB	**Compliant**	CD 109 does not allow relaxations on the immediate approach to a junction. On this basis a	**Compliant**

Vertical Design Parameters	A43 North	B4100 East	B4100 West
		departure is required, reference **G9**.	

Stopping Sight Distance / Visibility

9.11 Stopping Site Distance has been assessed, in accordance with CD 109, Table 2.10 and paragraph 3.

9.12 The SSD has been assessed as follows:

Visibility Parameters	A43 North	B4100 East	B4100 West
Description	• Minimum SSD northbound of 295m achieved • Minimum SSD southbound of 295m achieved	• Minimum SSD northbound of 215m achieved Minimum SSD southbound of 215m achieved	• Minimum SSD northbound of 215m achieved • Minimum SSD southbound of 215m achieved
Compliance with DMRB	**Compliant**	**Compliant**	**Compliant**

Cross-section

9.13 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a dual two lane carriageway, all-purpose, rural road for the A43 north.

9.14 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road for the B4100 east.

9.15 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road for the B4100 west.

Lane Widths

9.16 Lane width of 3.65m as required by CD 127.

Hard Shoulders / Hard Strips / Verges

9.17 Hard strips have been provided for the A43 north, compliant with CD 127. Hard strips have not been included for B4100 west due to the short lengths of new carriageway and as the existing cross-section does not feature hard strips, this is in-keeping with the existing route, but this is a **departure**, reference **G10**. The B4100 east design does feature hard strips that are in-keeping with the existing cross-section, these have been provided at a width of 300mm, however this does deviate from standard, therefore a **departure** is required, reference **G11**.

9.18 The following are provided in accordance with CD 127:

- 2.5m minimum verge

Swept Paths & Entry Path Radius (Deflection)

9.19 All directions of travel have been assessed using the maximum legal European, 16.5m long, articulated heavy goods vehicle, in accordance with CD 116.

9.20 B4100 east, westbound direction of travel achieves and entry path radius of 150m which is requires a **departure** from standard, reference **G12.**

9.21 B4100 West, eastbound direction of travel achieves and entry path radius of 99m which is complaint under CD 116.

9.22 A43 mainline, northbound direction of travel achieves and entry path radius of 259m which is requires a **departure** from standard, reference **G13.**

9.23 A43 north, southbound direction of travel achieves and entry path radius of 359m which is requires a **departure** from standard, reference **G18.**

10. PADBURY JUNCTION (A43 MAINLINE)

Layout

10.1 The works at Padbury replace the existing roundabout with a signalised junction to accommodate the improvements works for M40, J10, NB Diverge; M40, J10, EB Diverge, as well as the upgrades to the A43.

10.2 A43 mainline between Baynard's Green and Padbury (as highlighted in section 9) increases from two lanes to three lanes northbound and southbound directions of travel.

10.3 A43 mainline between Padbury and Cherwell also increases from two lanes to four, southbound, as well as introducing a dedicated left turn lane on the approach to Cherwell signalised junction. The northbound link between Padbury and Cherwell has been discussed in section 11.

10.4 M40 Northbound and Southbound Diverges that lead to Padbury have been discussed in sections 5 and 7.

Design Speed and Geometry

10.5 A43 north of Padbury is a D2AP, dual carriageway, all-purpose, rural route, with a design speed of 120kph and a speed limit of 50mph.

10.6 A43 south of Padbury to Cherwell is an all-purpose dual carriageway, rural route, with a design speed of 120kph and a speed limit of 50mph. Four lanes are proposed southbound with the existing two retained northbound.

Horizontal alignment

10.7 The horizontal alignment is summarised as follows:

Horizontal Design Parameters	A43 Mainline (north of Padbury)	A43 Mainline (south of Padbury)
Description	• Left hand radius 2040m as design transitions from CD 116 roundabout design into link design to CD 109 - (minimum R with 2.5% superelevation) • Transition • Straight • Transition • Left hand radius 720m as design transitions from CD 109 link design to CD 123 at-grade priority and signal-controlled junction design - (minimum R with 5.0% superelevation)	• Left hand radius 720m as design transitions from CD 123 at-grade priority and signal-controlled junction design to CD 109 link design - (minimum R with 5.0% superelevation) • Transition • Straight • Transition • Right hand radius 90m as design transitions from CD 116 roundabout design into link design to CD 109
Compliance with DMRB	**Compliant**	**Compliant**

Vertical alignment

10.8 The vertical alignment is summarised as follows:

Vertical Design Parameters	A43 Mainline (north of and within Padbury)	A43 Mainline (south of Padbury)
Description	• Grade 1.8% downhill as design transitions from CD 116 roundabout design into link design to CD 109 • Sag K 37 • Grade 0.1% uphill • Crest K 182 • Grade 0.6% downhill • Grade 0.5% downhill • Sag K 20 - (two step below desirable minimum) – **departure** • Grade 2.0% uphill • Crest K 55 as design transitions from CD 109 link design to CD 123 at-grade priority and signal-controlled junction design – **departure**	• Crest K 55 - as design transitions from CD 123 at-grade priority and signal-controlled junction design to CD 109 link design (one step below desirable minimum) – **departure** • Grade 1.1% downhill • Sag K 20 • Grade 4.7% downhill as design transitions from CD 109 link design to CD 116 roundabout design
Compliance with DMRB	CD 109 does not allow relaxations on the immediate approach to a junction. On this basis a **departure** is required, references **G14** and **G15**.	CD 109 does not allow relaxations on the immediate approach to a junction. On this basis a **departure** is required, reference **G15** (as it is the same crest).

Stopping Sight Distance / Visibility

10.9 Stopping Site Distance has been assessed, in accordance with CD 109, Table 2.10 and paragraph 3.

10.10 The SSD has been assessed as follows:

Visibility Parameters	A43 Mainline (north of Padbury)	A43 Mainline (south of Padbury)
Description	• Minimum SSD of 295m achieved northbound to Baynards Green • Minimum SSD of 295m achieved southbound to Padbury	• Minimum SSD of 295m achieved southbound to Cherwell
Compliance with DMRB	**Compliant**	**Compliant**

Cross-section

10.11 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a dual three lane carriageway, all-purpose, rural road for the A43 mainline northbound and southbound between Baynard's Green and Padbury.

10.12 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a dual three lane carriageway, all-purpose, rural road for the A43 mainline southbound from Padbury to Cherwell. Although this link is four lanes the same principles have been applied with wider middle lanes to accommodate road markings without a reduction in active lane width.

Lane Widths

10.13 Lane width of 3.65m except for cross-sections of three lanes and wider which provide middle lane widths of 3.7m as required by CD 127.

Hard Shoulders / Hard Strips / Verges

10.14 Hard strips and verge widths have been provided compliant with CD127.

Swept Paths

10.15 All directions of travel have been assessed using the maximum legal, European, 16.5m long, articulated heavy goods vehicle, in accordance with CD 123.

11. CHERWELL JUNCTION (A43 MAINLINE)

Layout

11.1 The works at Cherwell looks to replace the existing signalised roundabout with a signalised junction to accommodate the improvement works for M40, J10, SB Merge; as well as the upgrades to the A43.

11.2 A43 mainline, northbound between Cherwell and Padbury remains as two lanes, however it has been realigned slightly to accommodate the changes at Padbury.

Design Speed and Geometry

11.3 A43 northbound from Cherwell to Padbury is a D2AP, dual carriageway, all-purpose, rural route, with a design speed of 120kph and a speed limit of 50mph.

Horizontal alignment

11.4 The horizontal alignment is summarised as follows:

Horizontal Design Parameters	A43 Northbound (Cherwell to Padbury)
Description	• Straight as design transitions from CD 116 roundabout design into link design to CD 109 • Left hand radius 1449m (minimum R with 3.5% superelevation) • Straight • Right hand radius of 184m as design transitions from CD 109 link design to CD 123 at-grade priority and signal-controlled junction design
Compliance with DMRB	**Compliant**

Vertical alignment

11.5 The vertical alignment is summarised as follows:

Vertical Design Parameters	A43 Mainline (Cherwell to Padbury)
Description	• Grade 5.9% downhill and Sag K13 as design transitions from CD 116 roundabout design into link design to CD 109 • Grade 1.2% uphill • Crest K 30 as design transitions from CD 109 link design to CD 123 grade separated junction design (3 steps below desirable minimum SSD) - **departure**
Compliance with DMRB	CD 109 does not allow relaxations on the immediate approach to a junction. On this basis a **departure** is required, reference **G16**.

Stopping Sight Distance / Visibility

11.6 Stopping Site Distance has been assessed, in accordance with CD 109, Table 2.10 and paragraph 3.

11.7 The SSD has been assessed as follows:

Visibility Parameters	A43 Mainline (Cherwell to Padbury)
Description	• Three steps below desirable minimum SSD where it fails to achieve 295m northbound to Padbury
Compliance with DMRB	CD 109 does not permit relaxations on the approach to a junction. Visibility ranges between 127m to 273m over 120m (12 intervals). Visibility of 127m gradually increases until it reaches full SSD of 295m. This does however classify as four steps below desirable minimum stopping site distance. On this basis a **departure** is required, reference **G17.**

Cross-section

11.8 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a dual, two lane carriageway, all-purpose, rural road for the A43 north to Padbury.

Lane Widths

11.9 Lane width of 3.65m as required by CD 127.

Hard Shoulders / Hard Strips / Verges

11.10 Hard strips and verge widths have been provided, compliant with CD127.

Swept Paths

11.11 All directions of travel have been assessed using the maximum legal European, 16.5m long, articulated heavy goods vehicle, in accordance with CD 123.

12. ARDLEY ROUNDABOUT (B430 & A43 EAST OF M40)

Layout

12.1 The works north of Ardley looks to upgrade the existing roundabout to accommodate the improvements works for J10, M40, NB diverge / Merge, existing B430, A43 and B430 Ardley Bypass.

12.2 A43 east of Ardley roundabout retains the dual cross-section, however the entry and exit has been re-designed to align with the elongated circulatory.

12.3 B430 provides two lanes northbound in-keeping with the existing cross-section, however the revised design extends this for a further 50m, as well as adding an additional left turn lane for the M40, J10, northbound merge.

12.4 Ardley Bypass has been discussed in **report OxSFRI-BWB-GEN-XX-RP-CH-0011.**

12.5 M40, J10, Northbound Diverge to Ardley has been discussed in section 4.

12.6 M40, J10, Northbound Merge from Ardley has been discussed in section 6.

Design Speed and Geometry

12.7 A43 east is a D2AP, dual carriageway, all-purpose, rural route, with a design speed of 70kph to Cherwell junction as it is a dumb-bell link road, it has a speed limit of 50mph.

12.8 The existing B430 west is an S2, single carriageway, all-purpose, rural route, and following the construction of the B430 Ardley Bypass it will have a design speed of 70kph and a speed limit of 40mph

Horizontal alignment

12.9 The horizontal alignment is summarised as follows:

Horizontal Design Parameters	A43 East	B430 West
Description	• Mainline horizontal geometry unchanged	• Straight as design ties into existing • Right hand radius 360m - (minimum R with 5.0% superelevation) as design transitions from link design to CD 109 to CD 116 roundabout design
Compliance with DMRB	N/A	**Compliant**

Vertical alignment

12.10 The vertical alignment is summarised as follows:

Vertical Design Parameters	A43 East	B430 West
Description	• Mainline vertical geometry unchanged	• Grade 0.3% downhill as design ties in with existing • Crest K 103 • Grade 1.0% downhill • Sag K 20 • Grade 1.0% uphill as design transitions from link design to CD 109 to CD 116 roundabout design
Compliance with DMRB	N/A	**Compliant**

Stopping Sight Distance / Visibility

12.11 Stopping Site Distance has been assessed, in accordance with CD 109, Table 2.10 and paragraph 3.

12.12 The SSD has been assessed as follows:

Visibility Parameters	A43 East	B430 West
Description	• Minimum SSD northbound of 120m achieved • Minimum SSD southbound of 120m achieved to central signal	• Minimum SSD northbound of 120m achieved • Minimum SSD southbound of 120m achieved
Compliance with DMRB	**Compliant**	**Compliant**

Cross-section

12.13 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a dual, two lane carriageway, all-purpose, rural road for the A43 east.

12.14 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road for B430 West.

Lane Widths

12.15 Lane widths of 3.65m in accordance with by CD 127.

Hard Shoulders / Hard Strips / Verges

12.16 Hard strips have not been included in the design for A43 east as the existing cross-section does not feature hard strips, this is in-keeping with the existing route. CD 122 does not give a cross-sectional requirement for a dumb-bell link road. B430 northbound existing cross-section does feature reduced width (non-compliant) hard strips, however the revised design does not include hard strips as this is in-keeping with CD 116 to terminate hard strips as widening begins.

12.17 The following are provided in accordance with CD 127:

- 2.5m nearside verge
- 2.5m offside verge

Swept Paths & Entry Path Radius (Deflection)

12.18 Articulated combination heavy good vehicle with a single rear axle has been used on all single lanes constrained by kerbs. All other directions of travel have been assessed using the maximum legal European, 16.5m long, articulated heavy goods vehicle, in accordance with CD 116.

12.19 A43 east, southbound direction of travel achieves an entry path radius of 97m which is complaint under CD 116.

12.20 M40, J10, Northbound Diverge to Ardley, achieves an entry path radius of 59m which is complaint under CD 116.

12.21 Ardley Bypass, northbound direction of travel achieves an entry path radius of 88m which is complaint under CD 116.

12.22 Existing B430, northbound direction of travel, achieves an entry path radius of 99m which is compliant under CD 116.

13. M40 MAINLINE SIGNAGE PROVISION

13.1 This section of the report should be read in conjunction with the following Signing Strategy drawings found at **Transport Assessment Appendix 40**:

- OxSRFI-BWB-GEN-XX-SK-CH-SK058_Directional Signing Strategy Sheet 1 of 2
- OxSRFI-BWB-GEN-XX-SK-CH-SK059_Directional Signing Strategy Sheet 2 of 2

13.2 The locations for the directional signage for the M40 for Junctions 10 and 10A, have been reviewed against the requirements of CD 146[6].

Use of gantry signs

13.3 CD 146 para 3.9 sets out a clear list of criteria, one of which is to be met, before gantry signs can be considered. The following table provides an assessment of the M40 in each direction on the approach to J10/10A.

Criteria	Met?
the carriageway has or will have 4 or more running lanes;	No
the carriageway has 3 running lanes and carries (or will carry within 15 years of opening) 33,000 vehicles per day (1-way) (high growth estimate) and the proportion of HGVs is greater than 20%;	No Whilst the 1-way AADT is over 58,000 vehicles, the proportion of HGVs is 18%
the number of lanes available to a driver going ahead reduces after the junction;	No
a series of junctions are (an average of) less than 3km apart measured between centres of junctions;	No The junction spacing point from mid link J8-9 to mid link J10-11 is 27.5km and there are currently 2 junctions in this gap (9 and 10) giving a spacing of 9km (27.5/(2+1)); with the new J10A this reduces to 6.9km, still well above the 3km threshold.
the road is on a structure but does not have a hard shoulder;	No
the road is on a steep embankment or in a deep cutting;	No
an assessment of the cost has confirmed that it is cheaper to provide gantry mounted signs rather than mounting direction signs on the left-hand side of the road	No (a detailed assessment has not been undertaken but it stands to reason that verge signs are cheaper as there is sufficient space in the verge to provide them)

13.4 As can be seen none of the criteria are met and hence gantry signing is not to be considered.

[6] CD 146 Positioning of signalling and advance direction signs, version 2.0.0

Decision 13-1: Verge mounted direction signs are to be provided at all exits for J10 & 10A.

M40 northbound

13.5 Due to the provision of the new junction 10A there would be two closely-spaced exits. The following table assesses whether or not the signs on the approach to both exits can be spaced in accordance with CD 146 table 3.3.2.

Northbound	Final DS	Secondary ADS	Primary ADS
J10 exit sequence	27m before exit datum (within permitted 50m tolerance)	**½-mile** 863m before exit datum (which is within ½ mile +10%) New verge-mounted sign to replace existing but in a compliant location as existing does not comply as it is 907m before exit datum (>+10%)	**1-mile** 1596m before exit datum (which is within 1 mile -20m)
J10A exit sequence	At exit datum	**½-mile** 785m before exit datum (which is ½ mile -20m) This should be co-located with the J10 final DS. However, see discussion below.	**1-mile** 1620m before exit datum (which is within 1 mile +10%), co-located with J10 secondary ADS **Additional 1⅓-mile** 2353m before exit datum (which is within 1⅓-mile +10%), co-located with J10 primary ADS

13.6 As noted above there is a contradiction between the requirements of CD 146 table 3.3.2 which require a secondary ADS to be located at either ½ or ⅓ mile, and the advise of TSM Ch 7 para 10.3.5 which states "*The final advance direction sign at the first junction should be to the standard design with the second exit destinations being included with the forward destinations. The junction number for the first exit only should appear on this sign and should be placed in the bottom left hand corner.*"

13.7 Liaison with NH is required to agree the most suitable signage layout for the two diverges.

Decision / Outcome 13-2: The J10 and J10A northbound exit signage should be co-located at the distances set out above but further liaison is needed on the J10A ½ mile secondary ADS.

M40 southbound

13.8 The existing diverge for J10 is to be retained and there is only one exit for southbound traffic. The following table assesses whether or not the signs on the approach to the exit can be spaced in accordance with CD 146 table 3.3.2.

Northbound	Final DS	Secondary ADS	Primary ADS
J10 exit sequence	22m before exit datum	**½-mile** 845m before exit datum (which is within ½ mile +10%)	**1-mile** 1601m before exit datum (which is within 1 mile -20m)

Northbound	Final DS	Secondary ADS	Primary ADS
	(within permitted 50m tolerance)		

Decision / Outcome 13-3: The signage for the J10 southbound diverge is compliant to CD 146.

14. M40 SLIP ROADS AND A43 SIGNAGE PROVISION

14.1 As stated in CD 146 para 5.12 the need for ADS on the approach to at-grade junctions shall be determined on a case by case basis.

14.2 The proposed ADS are shown on following Signing Strategy drawings found at **Transport Assessment Appendix 40**:

- OxSRFI-BWB-GEN-XX-SK-CH-SK058_Directional Signing Strategy Sheet 1 of 2
- OxSRFI-BWB-GEN-XX-SK-CH-SK059_Directional Signing Strategy Sheet 2 of 2

14.3 The proposed layout would provide four lanes on the A43 southbound between the Padbury and Cherwell junctions. Whilst this is not a motorway, a review of the need for a gantry sign on this section has been undertaken using the criteria found at CD 146 para 3.9:

Criteria	Met?
the carriageway has or will have 4 or more running lanes;	**Yes**
the carriageway has 3 running lanes and carries (or will carry within 15 years of opening) 33,000 vehicles per day (1-way) (high growth estimate) and the proportion of HGVs is greater than 20%;	No
the number of lanes available to a driver going ahead reduces after the junction;	**Yes**
a series of junctions are (an average of) less than 3km apart measured between centres of junctions;	**Yes**
the road is on a structure but does not have a hard shoulder;	No
the road is on a steep embankment or in a deep cutting;	No
an assessment of the cost has confirmed that it is cheaper to provide gantry mounted signs rather than mounting direction signs on the left-hand side of the road	No (a detailed assessment has not been undertaken but it stands to reason that verge signs are cheaper as there is sufficient space in the verge to provide them)

14.4 Based on the above it is appropriate to consider providing a gantry ADS on this section of the A43. Given that there are multiple destinations to take through the Cherwell junction, including access to the Cherwell Valley services, it is considered that a gantry ADS should be provided.

Decision / Outcome 14-1: A gantry mounted ADS should be provided on the A43 southbound approach to the Cherwell junction

14.5 The ADS gantry is structure reference I as shown on the Bridge Overview Plan, **DCO Document 2.12**.

15. MOTORWAY COMMUNICATIONS

15.1 This section of the report should be read in conjunction with the following Technology Strategy drawings found at **Transport Assessment Appendix 41**:

- OxSRFI-BWB-GEN-XX-SK-CH-SK065_M40 J10 Technology Strategy (North)
- OxSRFI-BWB-GEN-XX-SK-CH-SK066_M40 J10 Technology Strategy (South)

Overview

15.2 The existing motorway communications technology on the M40 and A43 at and around J10 comprises the following:

- Strategic VMS (3-line MS3) signals on the mainline approaches to J10 both northbound and southbound;
- Strategic VMS (3-line MS3) signals on the A43 southbound approach to the Baynard's Green junction;
- VMS (MS4) signals on the mainline between both J9 & J10 and J10 & J11;
- CCTV cameras;
- Emergency Roadside Telephones (ERTs);
- Entry Slip Signals (ESS);
- Motorway Incident Detection and Automatic Signalling (MIDAS); and
- Associated infrastructure such as cabinets.

15.3 The following elements of the scheme affect the existing communications technology and/or require additional technology installations:

- The provision of the M40 northbound diverge at J10A;
- The alteration of the M40 southbound merge at J10;
- The relocation of the M40 northbound merge;
- Alterations to the layout of the Cherwell junction where existing ESS are located; and
- Alterations to the M40 J9 roundabout which affect existing ESS.

15.4 The impact of the above works on each aspect of the communications technology is reviewed below.

15.5 Motorway technology is referenced to the carriageway letter and marker post (MP) kilometrage location along the mainline motorway, and the following table sets out how the relevant coding is used at J10:

Carriageway Code	Carriageway
A	M40 mainline northbound
B	M40 mainline southbound
J	M40 northbound diverge
K	M40 northbound merge
L	M40 southbound diverge
M	M40 southbound merge

Strategic MS3 signals

15.6 As noted above these are provided on both northbound M40 approaches to J10 as well as the A43 southbound approach to Baynard's Green.

15.7 None of the strategic MS3 signals on the A43 are directly impacted by the physical works. This means that no further assessment of the A43 signals has been undertaken as they will be retained.

15.8 For the M40 the physical works does not impact on the location of the strategic MS3 signals but the directional signs are to be amended hence an assessment has been undertaken of their location in relation to the signing.

15.9 CD 146 para 4.12 states that the strategic MS3 signal is to be located between 200m and 400m upstream of both the primary and secondary ADS. CD 146 does not mandate that strategic MS3 signals are required, but they can be retained. The scheme proposes to retain the signals in their current locations and the following tables assess whether or not the locations are compliant with CD 146 in relation to the J10 diverges. Note that this assessment is made based on any adjustments to the ADS locations as set out in Section 13.

M40 Direction	Primary MS3 distance from ADS (m)	Secondary MS3 distance from ADS (m)	Comments
Northbound	212	356	Compliant to CD 146
Southbound	202	200	Compliant to CD 146

15.10 As strategic MS3 signals are not mandatory we do not propose that they are specifically provided for the proposed J10A diverge. However, as the signals are provided for the upstream J10 diverge then they can also be used to display messages related to the J10A diverge and the A43. In addition the final VMS is retained after the J10 diverge and this is located 318m upstream of the J10A exit datum point.

Decision / Outcome 15-1: The existing Strategic MS3 signals are to be retained in their current locations.

VMS (MS4) signals

M40 northbound VMS locations

15.11 At present VMS (MS4) signals are provided at the following locations on the M40 northbound at or near J10:

- An intermediate inter-junction VMS is located 1230m prior to the Primary Strategic MS3 VMS;
- A final VMS is located immediately after the J10 northbound diverge;
- A first VMS is located 408m downstream of the J10 northbound merge which does not comply with the maximum 400m distance in CD 146; and
- An intermediate VMS is located 1,490m downstream of the first VMS.

15.12 Except for the first VMS, the above are in CD 146 compliant locations. The distance between the final VMS and first VMS is 1,185m which means that an intra-junction VMS is not required as it is less than 1,500m.

15.13 There are no primary and secondary VMS currently provided between the strategic MS3 signal and the ADS. This does not comply with CD 146 paras 4.5 and 4.6. However, as the scheme does not amend the J10 northbound diverge and its exit datum point will remain in the same location, this is an **existing departure** which is unaffected by the scheme and hence it is not for this scheme to provide these VMS.

15.14 The provision of the additional diverge at J10A northbound would require a final VMS to be provided. This is a new VMS and it has been located as close as practicable to the back of the diverge nose as required by CD 146 paras 4.8 and 4.8.1. This is structure reference C as shown on the Bridge Overview Plan, **DCO Document 2.12**.

15.15 The relocation of the J10 northbound merge means that the existing first VMS located downstream of the entry datum point would not be in the correct location for the new merge layout.

15.16 There is a distance of 1,125m between the relocated J10 northbound merge entry datum point and the intermediate VMS downstream of the existing first VMS. CD 146 requires intermediate VMS to be spaced at intervals between 600 and 1,500m, and the first VMS is to be located between 200m and 400m downstream of the entry datum point. Hence a new first VMS is required.

15.17 There is an existing farm accommodation bridge 150m downstream of the relocated J10 northbound merge entry datum point which would restrict visibility to a first VMS if it were placed downstream of the bridge, within the standard 200m to 400m tolerance as set out in CD 146 para 4.4. We therefore propose to provide the first VMS at a distance of 115m beyond the J10 northbound merge entry datum point which is a departure from standard, reference **Departure S1**. This is structure reference B as shown on the Bridge Overview Plan, **DCO Document 2.12**.

15.18 Placing the first VMS in this location will mean it is approximately equidistant between the preceding VMS (i.e. the J10A final VMS) and the downstream VMS (i.e. the first J10-J11 intermediate VMS). Furthermore, the J10 northbound merge is an auxiliary lane merge and if the first VMS were measured the exit datum point for a CD 122 Layout A taper merge then it would be at 215m i.e. within the 200m to 400m range.

M40 northbound VMS visibility assessment

15.19 A visibility assessment has been made between the successive VMS. This assessment has been undertaken between the VMS that are to be retained south and north of the junction, namely the existing J10 final VMS and the intermediate VMS downstream of the first VMS. CD 146 para 4.10 requires that each VMS is visible for a distance of ⅔ that of the actual distance between the two successive VMS. The assessment is set out below.

Upstream VMS	Downstream VMS	Actual distance between VMS (m)	⅔ of actual distance (m)	Visibility to downstream VMS (m)	Comments
J10 final VMS	J10A final VMS	759	505	466	This is an improvement on existing layout (downstream J10 first VMS can be seen for 460m but should be seen for 790m, but this is still a departure from standard, reference **Departure S2**.
J10A final VMS	J10 first VMS	907	604	437	This is an improvement on existing layout (downstream J10 first VMS can be seen for 460m but should be seen for 790m, but this is still a departure from standard, reference **Departure S3**.
J10 first VMS	J10-11 first intermediate VMS	1008	672	395	This is an improvement on existing layout (downstream J10 first intermediate VMS can be seen for 395m but should be seen for 790m, but this is still a departure from standard, reference **Departure S4**.

15.20 The principal reason for the lack of visibility to the downstream VMS in each case is due to the existing motorway being on a left-hand bend of approximately 3km radius, with woodland alongside the motorway and several overbridges. Whilst the revised VMS proposals would not be compliant to CD 146, they do provide an improvement over the existing situation.

Decision / Outcome 15-2: A new J10A final VMS should be provide and the J10 first VMS should be relocated, with departures from standard sought as necessary.

M40 southbound VMS locations

15.21 At present VMS (MS4) signals are provided at the following locations on the M40 southbound at J10:

- An intermediate inter-junction VMS is located 1,420m prior to the Primary Strategic MS3 VMS;
- A final VMS is located immediately after the J10 southbound diverge;
- A first VMS is located 295m downstream of the J10 southbound merge; and
- An intermediate VMS is located 1,215m downstream of the first VMS.

15.22 All of the above are in CD 146 compliant locations. However, the distance between the final VMS and first VMS is 1,735m which means that an intra-junction VMS should be provided as required by CD 146 para 4.9 as it is more than 1,500m. This is an **existing departure** from standard.

15.23 There are no primary and secondary VMS currently provided between the strategic MS3 signal and the ADS. This does not comply with CD 146. However, as the scheme does not amend the southbound diverge exit datum point this is an **existing departure** which is unaffected by the scheme and hence it is not for this scheme to provide these VMS.

15.24 The J10 southbound merge is to be amended so that a two-lane merge is provided with an auxiliary lane on the nearside. The existing first VMS would be located 151m beyond the

entry datum point and we do not propose to relocate the VMS. This is a departure from standard, reference **Departure S5.**

M40 southbound VMS visibility assessment

15.25 A visibility assessment has been made between the successive VMS. This assessment has been undertaken between the VMS that are to be retained north and south of the junction, namely the existing J10 southbound final VMS and the J10 southbound first VMS. CD 146 para 4.10 requires that each VMS is visible for a distance of ⅔ that of the actual distance between the two successive VMS. The assessment is set out below.

Upstream VMS	Downstream VMS	Actual distance between VMS (m)	⅔ of actual distance (m)	Visibility to downstream VMS (m)	Comments
J10 final VMS	J10A first VMS	1,010	673	870	This is an improvement on existing layout (existing downstream J10 first VMS can be seen for 980m but should be seen for 1,156m and the existing departure from standard would no longer be applicable.
J10A first VMS	J10 first VMS	725	483	>725	This is an improvement on existing layout (existing downstream J10 first VMS can be seen for 980m but should be seen for 1,156m and the existing departure from standard would no longer be applicable.

15.26 As can be seen compliant visibility is achieved between successive VMS on the M40 southbound through J10.

Decision / Outcome 15-3: The southbound VMS should be retained and a departure from standard sought for the first VMS location with respect to the J10 southbound entry datum.

CCTV

15.27 The following existing CCTV cameras are located within the extent of this scheme:

- MP 105/2B-4, south of the J10 southbound merge in the southbound verge;
- MP 106/2B+36, within junction 10, south of the J10 bridge on the southbound verge;
- MP 106/3A+69, within junction 10, north of the J10 bridge on the northbound verge; and
- MP 107/2B+58, north of the J10 southbound diverge on the southbound verge.

15.28 The existing CCTV camera at MP 106/3A+69 may be physically affected by the construction of the new J10A northbound diverge, if so it can be repositioned nearby and that can be determined at detailed design stage.

15.29 The proposed scheme will provide a new northbound diverge slip road at J10A, and importantly for CCTV coverage, a new bridge spanning the M40 for the northbound diverge slip road to Padbury junction. The scheme will realign the J10 northbound diverge and merge slip roads.

15.30 TD 136[7] table 3.1.1 (with para 3.1.1) lists where CCTV coverage is required. For motorways with more than 10,000 vehicles per lane per day (which is the case for the M40), of the various scenarios listed, coverage is required for "*Motorway/motorway interchanges or motorway/major all-purpose road interchanges where there is a traffic diversion strategy or where speed or lane width restrictions are needed because of construction features such as sub-standard radius bends*."

15.31 We therefore take the view that CCTV coverage of the realigned and new slip roads is required.

15.32 An assessment has been made of the proposed layout versus existing CCTV locations to determine the likely extent of CCTV coverage of the new road layout if no changes were made to the CCTV locations and this is presented below.

New or realigned slip road or link	CCTV coverage	Additional CCTV needed?	Further commentary
J10 NB diverge	CCTV at 106/2B+36 will cover all of this slip road	No	Detailed landscaping design will need to avoid obscuring the slip road from the CCTV
J10A NB diverge slip road	CCTV at 106/3A+69 will cover the start of the slip road, most of the loop and the interchange link towards Padbury CCTV at 107/2B+58 will cover the section of the loop that may be obscured from 106/3A+69 due to the bridge	No	Detailed landscaping design will need to avoid obscuring the slip road from the CCTV
J10 NB merge	CCTV at 106/3A+69 will cover the start of the slip road including the loop CCTV at 107/2B+58 will cover the end of the slip road	No	
J10 SB diverge	CCTV at 107/2B+58 will cover the start of the slip road, end of the slip road and Padbury roundabout may be obscured due to new bridges	Potentially	Potentially at Padbury, see further assessment below
J10 SB merge	CCTV at 106/2B+36 will cover all of this slip road	No	
Cherwell and Ardley roundabouts	CCTV at 106/2B+36 covers these junctions	No	
Padbury junction	CCTV at 106/2B+36 partially covers this junction	Potentially	See further assessment below
Baynard's Green roundabout	None existing	Yes	See further assessment below

15.33 With the provision of the new J10A northbound slip road and associated bridge there is a potential need for additional CCTV to cover this new section of road. A new CCTV camera

[7] TD 136 Design of permanent traffic cameras, version 1.0.0

located at the Padbury junction would provide coverage along the new slip road, Padbury junction and along the A43 to Baynard's Green roundabout.

15.34 This additional CCTV would enable compliance with TD 136 table 3.1.1 for the revised junction arrangement and would offer additional benefits in covering the A43 Baynard's Green junction which currently does not have coverage.

Decision / Outcome 15-4: Existing CCTV is to be retained and a new CCTV provided at the Padbury junction which would also cover the A43 to the Baynard's Green roundabout.

Emergency Roadside Telephones (ERTs)

15.35 Several existing ERTs are located within the extent of this scheme. The following table lists the existing ERTs and how they are affected by the scheme.

ERT MP location	Carriageway	Existing purpose	Is ERT directly affected by the scheme
104/8A+69	M40 northbound	Near junction	Unaffected
104/8B+69	M40 southbound	Near junction	Unaffected
106/1A-3	M40 northbound	Intra-junction	Unaffected
106/1B-3	M40 southbound	Intra-junction	Unaffected
102/6K-62	M40 northbound merge	Slip road, and south of mainline hardshoulder discontinuity	Slip road removed, ERT can be removed
106/3B+49	M40 southbound	Intra-junction, does not serve any current purpose following removal of previous M40 SB merge slip given nearby ERT at 106/6B-20	No, but ERT could be removed.
106/6A-20	M40 northbound	Intra-junction, north of mainline hardshoulder discontinuity	Will become intra-junction ERT between J10A NB diverge and J10 NB merge, ERT retained
106/6B-20	M40 southbound	Intra-junction, north of mainline hardshoulder discontinuity	Unaffected
107/7A+40	M40 northbound	Near junction	Unaffected
107/7A-40	M40 southbound	Near junction	Unaffected

15.36 With the changes to the existing ERT locations as described above, the construction of the new and relocated slip roads will mean additional ERTs are required. The hard shoulder discontinuity at the existing J10 overbridge on the M40 northbound and Ardley Road overbridge on the M40 southbound will also affect ERT locations. TD 137 paras 5.1 to 5.15 set out the siting and spacing requirements and each carriageway is assessed in detail below.

15.37 The following table sets out proposed the sequence of ERTs on the M40 mainline and assesses them against TD 137[8].

[8] TD 137 Design of emergency roadside telephones, version 1.0.0

ERT MP location	Purpose	Existing or new ERT	Assessment to TD 137	Commentary
Northbound				
104/8A+69	Near junction	Existing retained	508m upstream of exit datum point, does not comply with TD 137 para 5.3	This is an **existing departure** unaffected by the scheme
-	Near junction for new J10A diverge	-	An ERT is required by TD 137 para 5.3 between 400m and 300m upstream of an exit datum point	It is not possible to provide a single ERT both at the required distance before the exit datum point and before the hard shoulder discontinuity. We do not consider that providing two ERTs within a short distance is appropriate and hence an ERT for the J10A exit has been omitted. This is a departure from standard, reference **departure T1**.
106/1A-3	Hard shoulder discontinuity Intra-junction (between J10 and J10A diverges)	Existing retained	382m downstream of back of diverge nose with 50m hard shoulder either side, **compliant** to TD 137 para 5.7 130m upstream of hard shoulder discontinuity, **compliant** to TD 137 para 5.4	This ERT is not located between 400m and 300m upstream of the J10A exit datum point, which is covered by **departure T1** discussed above.
106/6A-20	Intra-junction (between J10A diverge and J10 merge)	Existing retained	177m downstream of back of diverge nose with 50m hard shoulder either side, **compliant** to TD 137 para 5.4	
106/6J-20	Hard shoulder discontinuity	New	286m downstream of hard shoulder discontinuity, **compliant** to TD 137 para 5.4	Additional ERT needed downstream of discontinuity, on slip road but aligned with mainline ERT
107/7A+40	Near junction	Existing retained	369m downstream of entry datum point, **compliant** to TD 137 para 5.3	ERT is 1,100m downstream of existing entry datum point which does not comply with TD 137 para 5.3 but this is resolved by the proposed scheme
Southbound				
107/7B+40	Near junction	Existing retained	498m upstream of exit datum point, does not comply with TD 137 para 5.3	This is an **existing departure** unaffected by the scheme
106/6B-20	Intra-junction (between J10 diverge and J10A merge)	Existing retained	419m downstream of back of diverge nose with 50m hard shoulder either side, **compliant** to TD 137 para 5.7	
106/1B-3	Intra-junction (between J10A merge and J10 merge)	Existing retained	50m hard shoulder either side, **compliant** to TD 137 para 5.7	

ERT MP location	Purpose	Existing or new ERT	Assessment to TD 137	Commentary
106/1M-3	Hard shoulder discontinuity at Ardley Road bridge	New	An ERT is required between 100m and 300m upstream of the end of the hard shoulder discontinuity, the proposed ERT is 585m upstream	The hard shoulder discontinuity is within the merge and an ERT within the merge area is not permitted. Alignment of the new ERT on the connector road with that on the mainline would provide consistency in alignment of ERTs. However, this is a departure from standard, reference **departure T2**.
-	Hard shoulder discontinuity at Ardley Road bridge	-	An ERT is required between 100m and 300m downstream of the end of the hard shoulder discontinuity, the ERT at 104/8B+69 is 354m downstream	We do not consider that providing two ERTs within a short distance is appropriate and hence an ERT for the hard shoulder discontinuity has been omitted. This is a departure from standard, reference **departure T3**.
104/8B+69	Near junction	Existing retained	354m downstream of entry datum point, **compliant** to TD 137 para 5.3	ERT is 493m downstream of existing entry datum point which does not comply with TD 137 para 5.3 but this is resolved by the proposed scheme

15.38 There are no existing ERT present on the J10 slip roads. The need for ERTs on the revised slip roads are assessed in the table below.

Slip Road	Nearest ERT to start/end of slip road	Distance from ERT to start/end of slip road	Commentary
J10 NB diverge	104/8A+69	<1,500m	ERT not required on slip road
J10A NB diverge	106/6J-20	<1,500m	New ERT near start of slip road due to mainline hard shoulder discontinuity as discussed above No further ERT required on slip road Mainline ERT at 106/6A-20 will need screening from slip road
J10 NB merge	107/7A+40	1,600m	New ERT to be provided on slip road, before the M40-A43NB carriageway is alongside, at MP 106/1K+28 which is approx. 1,500m before the ERT at 107/7A+40
J10 SB diverge	107/7B+40	<1,500m	ERT not required on slip road
J10 SB merge	104/8B+69	<1,500m	ERT not required on slip road Mainline ERT at 106/1B-3 will need screening from slip road

Decision / Outcome 15-5: Two existing ERTs are to be removed as part of the works as they are not required. Two new ERTs are to be provided north of the hard shoulder

discontinuity on the slip roads, in line with the ERTs on the mainline. Existing ERTs that are in non-compliant locations and unaffected by the scheme are retained. Departures from standard are to be sought for specific aspects of ERT provision.

Motorway Incident Detection and Automatic Signalling (MIDAS)

15.39 Existing MIDAS detection locations will be affected by the works and new MIDAS detection will be required based on the revised scheme layout. This will be assessed during the detailed design stage.

Entry Slip Signals (ESS)

15.40 Based on the existing motorway signalling all ESS would be MS1 signals.

M40 Junction 9

15.41 The enlargement of the northwest side of the roundabout, and in particular the widening of the M40 NB entry slip road to three lanes, will affect the existing ESS and they will be relocated or replaced as necessary.

M40 Junction 10

15.42 ESS are present at the start of the existing J10 NB and SB merge slip roads.

15.43 For the J10 NB merge slip road the existing ESS will be removed and new ESS provided at the start of the relocated J10 NB merge.

15.44 For the J10 SB merge slip road the existing ESS can be retained but they may need to be slightly relocated to accommodate the proposed crossings to connect the new footway/cycleway through J10 to the existing bridleway south of the motorway service area.

16. GANTRY DESIGN: ACCESS AND SIGNAL POSITION

16.1 The assessment in Sections 13, 14 (signage) and 15 (signalling) above sets the need or otherwise for gantries. The assessment concluded that one signage gantry is required and that two new MS4 VMS gantries are required and one existing MS4 VMS gantry removed. The new gantries are to be provided as follows:

Gantry for	Location	Structure reference on the Bridge Overview Plan, DCO Document 2.12
VMS	M40 J10A NB final VMS	C
VMS	M40 J10 NB first VMS	B
ADS	A43 southbound approach to Cherwell junction	I

16.2 This section assesses the access to each gantry and the signal position on the gantry, this in turn dictates the type of gantry required.

Access and non-access gantries

16.3 A detailed risk assessment, which uses a similar methodology to that used for Smart Motorway schemes, has been undertaken to determine if access gantries are required. The risk-based approach is in line with MPI 39[9] and the risk scoring has been reviewed based on the scheme proposals. The output of this updated risk assessment (document OxSRFI-BWB-GHS-XX-SH-CS-0001) is found at **Appendix C**.

16.4 The assessment covers only routine activities that would require access at height that are of a short duration. Ground level activities (e.g. maintenance at a cabinet) are not included within the assessment as it would be unaffected by the structural form.

16.5 It can be seen from this assessment that:

- Gantries with technology assets such as signalling should be accessible;
- ADS only gantries do not need to be accessible but an ONA or MHS should be provided; and
- Where existing gantries are not accessible there is no merit in providing an ONA or MHS.

Decision / Outcome 16-1: Accessible gantries should be provided for the new MS4 VMS gantries.

Access to the gantries

16.6 This section provides details of how each gantry can be accessed and it is for the maintainer to determine which method of access will be most suitable for the task in hand. For example, they may consider, subject to detailed risk assessment, that the hard shoulder can be used for short duration minor maintenance tasks.

[9] MPI 39 "Gantry Access – Assessment of Risk for the Provision of Fixed Access", March 2015

16.7 It can be seen from the risk assessment that the priority order to apply for provision of access to an accessible gantry is:

- Off-network access (ONA) (safest option);
- Maintenance hard standing (MHS);
- Hard-shoulder parking; and
- Requirement to use lane closures and traffic management (least safe option).

16.8 A detailed review of access to each gantry site has been undertaken and where practicable an off-network access (ONA) or a maintenance hardstanding (MHS) area is provided. These are likely to be of most benefit for minor short-duration maintenance work.

16.9 Based on the proposed gantry locations we have reviewed the provision of ONA or MHS as follows:

- Structure C is located between the northbound mainline and the M40-A43 NB interchange link. An ONA route from J10 is not possible due to the road layout and therefore an MHS is proposed downstream of the proposed bridge, with a walking route back along the verge to the gantry.
- Structure B is located on the northbound mainline downstream of the J10 entry datum point just before the accommodation overbridge. The bridge carries a private farm track and hence an ONA from the bridge is not possible. It is also not possible to provide an MHS at this location due to the available verge width and hence access from the hard shoulder is the proposed solution.
- Structure I is located on the A43 adjacent to a shared use footway/cycleway which will provide access.

VMS signal position

16.10 CD 146 does not stipulate the location of a VMS in terms of its location above the carriageway in the cross section, i.e. the lateral position. This is an important consideration as it determines the design of the gantry structures.

16.11 The M40 north and south of J10 is or three-lane rural motorway with a standard hard shoulder (except for a discontinuity at the existing J10 bridges).

16.12 The principal risk with the lateral position of the VMS is the risk of obscuration by high sided vehicles. As the number of lanes reduces, the likelihood of obscuration is reduced (i.e. on a single lane there is no obscuration; for four lanes there is a much greater likelihood).

16.13 The other consideration is visibility. As noted in Section 15, departures are needed due to restricted visibility for certain VMS. The lateral position of the VMS will influence the visibility. This is particularly relevant to MS4 signs on left-hand bends as the Enhanced Matrix Indicator (EMI) element is left of where it would be for an MS3 (as discussed in the former standard, IAN 109/08[10], at para 2.6).

16.14 The gantries that will support VMS signs, and the ideal placing of the VMS for maximum visibility, are as follows:

[10] IAN 109/08 Advice Regarding the Motorway Signal Mark 4 (MS4)

Gantry Ref	VMS purpose	Location	No. lanes	Hard shoulder	Alignment / visibility restrictions	Ideal placing of VMS for maximum visibility
Structure C	J10A NB final VMS	As close as practicable downstream of back of J10A diverge nose Nearside verge, between mainline and slip road	3	Yes	Visibility restriction due to left hand bend and established vegetation (departure **S2**)	Projected out across hard shoulder into lane 1
Structure B	J10 NB first VMS	115m downstream of J10 entry datum point (departure **S1**)	3	Yes	Visibility restriction due to left hand bend and established vegetation (departure **S3**)	Projected out across hard shoulder into lane 1

16.15 As can be seen above the VMS for gantry structures B and C should be projected out as far as reasonably practicable.

16.16 The most appropriate solution for these gantries is to project the VMS using the standard VMS gantry designs for 4-lane smart motorways. These have the edge of the VMS at around 3m from the centre of the gantry support. A typical detail for these gantries is shown in

16.17 **Figure 16-1** below.

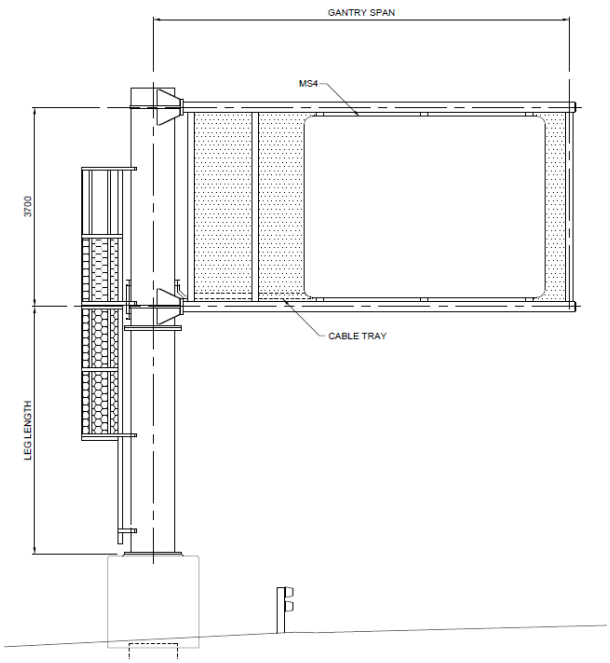


Figure 16-1: MS4 accessible cantilever gantry

Decision / Outcome 16-2: The lateral position of the VMS should be projected out at a distance of around 3m from the gantry support.

Structure general arrangement drawings

16.18 The bridge plans showing the gantry elevations are depicted on the following design drawings:

Structure Ref	Section of scheme	Bridge Plan drawing
B	M40 Northbound (north of J10)	DCO Document 2.12I
C	M40 Northbound (at J10)	DCO Document 2.12I
I	A43 Southbound (between Padbury and Cherwell)	DCO Document 2.12I

17. ROAD LIGHTING

17.1 This section should be read in conjunction with the road lighting strategy found at Figure 8.1 of the Environmental Statement, **DCO Document 6.8G**.

Existing lighting provision and impact of scheme on lighting

17.2 The existing M40 mainline is unlit at junctions 9 and 10, and between them.

M40 Junction 9

17.3 The M40 Junction 9 roundabout, the A34 to the south and exit onto the M40 northbound sip road are lit.

17.4 The scheme will provide additional capacity from the A34 northbound to M40 northbound and this will affect the existing lighting of this part of the roundabout so replacement lighting will be required.

17.5 The extent of lighting on the M40 northbound entry slip road at J9 will need to be reviewed due to the provision of a lane drop on the slip road at the roundabout exit.

M40 Junction 10

17.6 At M40 J10 the existing Ardley, Cherwell and Padbury roundabouts are lit, along with the A43 linking between each roundabout and the immediate approaches and exits to these roundabouts from and to the M40 slip roads.

17.7 The following elements of the scheme affect the existing lighting and/or require consideration of additional lighting:

- The provision of the M40 J10A northbound diverge and slip road which will include a low-radius loop and a bridge structure over the M40;
- The relocation of the M40 J10 northbound merge and slip road which will include a low-radius loop;
- The alteration of the M40 J10 southbound merge slip road; and
- Upgrades to the Ardley, Cherwell, Padbury and Baynard's Green junction.

A43/B4100 Baynard's Green

17.8 The A43 / B4100 Baynard's Green roundabout is lit, along with the A43 between it and the Padbury roundabout. The A43 north of the roundabout, and B4100 either side of the roundabout, are lit for a short distance on the immediate approach and exit to and from the roundabout.

17.9 The changes to the roundabout will affect the existing lighting and the extent of lighting on the approaches and exits needs to be assessed.

M40 mainline and slip roads at Junction 10

17.10 As noted above the M40 mainline and majority of the lengths of slip roads at J10 are unlit. A review of personal injury collisions (PICs) has been undertaken to review if there are any issues of note that could require provision of lighting on the mainline through the junction.

17.11 16 PICs are recorded as occurring on the M40 mainline or slip-roads in the vicinity of Junction 10 in the five year study period between 01/01/2015 and 30/11/2020. 12 PICs occurred on the M40 mainline and four occurred on the slip-roads.

17.12 Of the slip-road PICs, all four occurred in daylight. Of the mainline PICs, 10 occurred in daylight and two occurred in night-time unlit conditions. Both PICs that occurred in darkness were judged to be 'Failure to Look Properly' as the main contributing factor and neither mention lighting as an additional contributing factor. One PIC occurred on the northbound carriageway and one on the southbound, so there is no locational trend.

17.13 In summary of the PICs that occurred on the M40 in the vicinity of J10 only 12.5% occurred in darkness, and lighting was not mentioned as a factor in any of the night-time PICs. Therefore we can say with reasonable confidence that there is no identifiable issue with night-time collisions on the M40 mainline at J10, and there is no evidence identifying lighting as a particular issue.

17.14 Whilst the provision of an additional northbound diverge and southbound merge will add additional features onto the M40 mainline that will make the visual task more difficult, there are no weaving sections being provided and given that there are no existing issues identified with lack of lighting on the mainline we do not consider that lighting of the M40 mainline through the junction is required.

M40 J10 and J10A slip roads

17.15 As the M40 mainline is not proposed to be lit, in general the only lighting proposed for the slip roads will be at the immediate approach to or exit from a junction. These are as follows:

- M40 J10 northbound exit slip road: Approach to Ardley roundabout;
- M40 J10A northbound exit slip road: Approach to Padbury junction;
- M40 J10 northbound entry slip road: Exit from Ardley roundabout; and
- M40 J10 southbound entry slip road: Exit from Cherwell roundabout.

17.16 Note that the M40 J10 southbound exit slip road approach to Padbury roundabout is unaffected by the scheme. Lighting on this slip road will be assessed to determine the impact of the bridges and additional / replacement lighting provided as necessary.

Low-radius loops

17.17 The J10A northbound exit slip road will include a low-radius loop of radius 75m. Due to the tightness of the loop geometry which would occur downstream of the motorway diverge drivers may not assimilate the road layout which could lead to loss of control accidents. That being said, there are examples of low-radius loops on the motorway network that are not lit, such as M6 J34 southbound and M180 J3 westbound.

17.18 At the detailed design stage we would recommend that a detailed study into the provision of lighting on low-radius loops is undertaken using PIC data from real-world examples for different flow conditions. For the purposes of environmental assessment, we recommend that at this stage of the design it is assumed that the low-radius loop should be lit through the hours of darkness.

17.19 We also recommend that a length of the slip road equating to 5 seconds of drive time at 70mph on the approach to the loop is also lit, to give drivers visual guidance of the loop. The lighting would then run to the Padbury junction.

17.20 The J10 northbound entry slip road also incorporates a low-radius loop and we recommend that at this stage of the design this is illuminated for the same reasons as for the J10A northbound exit slip road. As the length of the slip road between the loop and the upstream Ardley roundabout lighting is less than 160m, the slip road between the Ardley roundabout and the loop would be lit. The lighting would be terminated at the end of the loop.

Lighting design class

17.21 A risk assessment has been produced in accordance with BS 5489-1:2020[11] for each section of road within the scheme. This includes for all roads that connect to each junction, even if the road will be unlit except at the junction. This risk assessment is based upon the traffic data modelling produced for the OxSRFI scheme and assumes an Environmental Class of E2 (Rural).

17.22 The risk assessments have determined the required design and conflict classes and these are set out in the table below for each section of road within the scheme.

Section of scheme	Link road Class	Notes
M40 J10 northbound exit slip road	M3	
Ardley Bypass	M3	
Former B430 to/from Ardley	M4	
M40 J10 northbound entry slip road	M4	
A43 link road between Ardley and Cherwell	n/a	Within conflict area
M40 J10 southbound entry slip road	n/a	Road unlit beyond the conflict area
A43 link road between Cherwell and Padbury	M2 SB M3 NB	
M40 J10 southbound exit slip road	M3	
A43 link road between Padbury and Baynard's Green	M2	
M40 J10A northbound exit slip road (link to Padbury)	M4	
B4100 north of Baynard's Green	M3	
A43 north of Baynard's Green	M2	
B4100 south of Baynard's Green	M3	

[11] Design of road lighting Part 1: Lighting of roads and public amenity areas — Code of practice

17.23 For the conflict areas at junctions, the highest link road class at a junction is then used to determine the conflict class for the junction in accordance with BS 5489-1:2020 para A3.2 and table A.4. This means that the conflict classes for each junction are as set out in the table below.

Junction	Road with highest link road class connecting to junction	Link road Class for this Road	Conflict Area Class for junction
Ardley	Ardley Bypass M40 J10 northbound exit slip road	M3	C2
Cherwell	A43 link road between Padbury and Baynard's Green	M2	C1
Padbury	A43	M2	C1
Baynard's Green	A43	M2	C1

APPENDIX A

Geometrical Layout Sheets

GRID NORTH

Track

Prospect House

A43

339

A43

CD109 Table 2.10
Existing centreline - Des min radius with 5% s/e and transitions for 120kph design speed = 1020m

CD127 Figure 2.1.1N1e
Dual carriageway rural all-purpose carriageway with 2no 3.65m wide lanes

CD109 Table 2.10
295m SSD visibility provided for 1.5xSSD in advance of roundabout

CD127 Figure 2.1.1N1e
Dual carriageway rural all-purpose carriageway with 2no 3.65m wide lanes

CD127 Table 2.28
Minimum transition taper for 120kph design speed = 1:55

3.65m
3.65m
1.00m
1.00m
300
R=1085.615m
2.50m
250
R=900m
1.00m
1.00m
200
3.65m
3.65m
3.00m
3.00m
3.65m
3.65m
300
300
R=900m
R=1085.615m

120.3m

DMRB CD 109
A43 Rural all-purpose dual carriageway
Link Design - 120kph Design Speed

Baynards Green Farm

El Sub Sta

See Sheet 2

unication)

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Legend

- Order Limits
- OCC / OxSRFI boundary
- CDxxx — Adheres to standard
- CDxxx — Relaxation or acceptable deviation from standard
- **CDxxx** — Deviation that requires a departure from standard
- Junction visibility
- Forward visibility
- Visibility Splay with Relaxation
- Visibility Splay with Departure
- STr — Alignment - Straight
- R=xxxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

Rev	Date	Details of issue / revision	Drw	Rev
P02	16.03.26	Issued following updates	RP	SRH
P01	31.07.25	Preliminary issue	RP	SRH

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Project Title
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OXFORDSHIRE
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Drawing Title
GEOMETRICAL LAYOUT SHEET 01

Drawn:	R.Picknell		Reviewed:	S.Hilditch	
BWB Ref:	NTH2479	Date:	31.07.25	Scale@A1:	1:500

Drawing Status
PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSRFI-BWB-HGN-01-DR-CH-0105	**S2**	**P02**

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DMRB CD 109
Link Design - 100kph
Design Speed

DMRB CD 116
Roundabout
Design

DMRB CD 116
Roundabout
Design

Departure Ref: G10
CD127 Figure 2.1.1N1b
Tie-in with existing B4100 West has no hard strips provided due to short lengths of new carriageway and as existing cross section does not feature hard strips

CD109 Table 2.10
Des min radius with adverse camber and without transitions for 100kph design speed = 2040m
Achieved radius 665.294m

CD109 Table 2.10
Existing centreline - Des min radius with adverse camber and without transitions for 120kph design speed = 1020m

CD123 Para 7.2
295m SSD visibility to nearside signal head

CD116 Para 3.26
Entry path radius 73m

CD116 Para 3.18.2
Projected kerb tangential to central island

CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD123 Table 5.22
70kph Design Speed
10m Turning Length
40m Deceleration Lane
15m Direct Taper

CD116 Para 3.28.3
Taper = 1:9.1
Exit lane widths should taper from between 7.5m and 7.0m to 6.0m at between 1:15 and 1:20
(Due to right turn into local services)

CD116 Para 3.18.2
Projected kerb tangential to central island

CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

Departure Ref: G13
CD116 Para 3.26
Entry path radius 308m

CD109 Table 2.10
Des min radius with 2.5% s/e for 120kph design speed = 2040m

CD127 Figure 2.1.1N1e
Dual carriageway rural all-purpose carriageway D3AP

Departure Ref: G18
CD116 Para 3.26
Entry path radius 359m

CD116 Para 3.18.2
Projected kerb tangential to central island

CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD116 Para 3.18.2
Projected kerb tangential to central island

Departure Ref: G12
CD116 Para 3.26
Entry path radius 167m

CD116 Para 3.28.2
Taper = 1:38
Exit lane widths at start and end of island

Baynard's Green
Baynard's Barn
Baynard House
Baynard's Green Roundabout
Filling Station
Medkre
Pond
El Sub Sta
Mast (Telecommunication)
B4100
A43

See Sheet 1
See Sheet 4
See Sheet 3

Rev	Date	Details of issue / revision	Drw	Rev
P02	16.03.26	Issued following updates	RP	SRH
P01	31.07.25	Preliminary issue	RP	SRH

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Drawing Title
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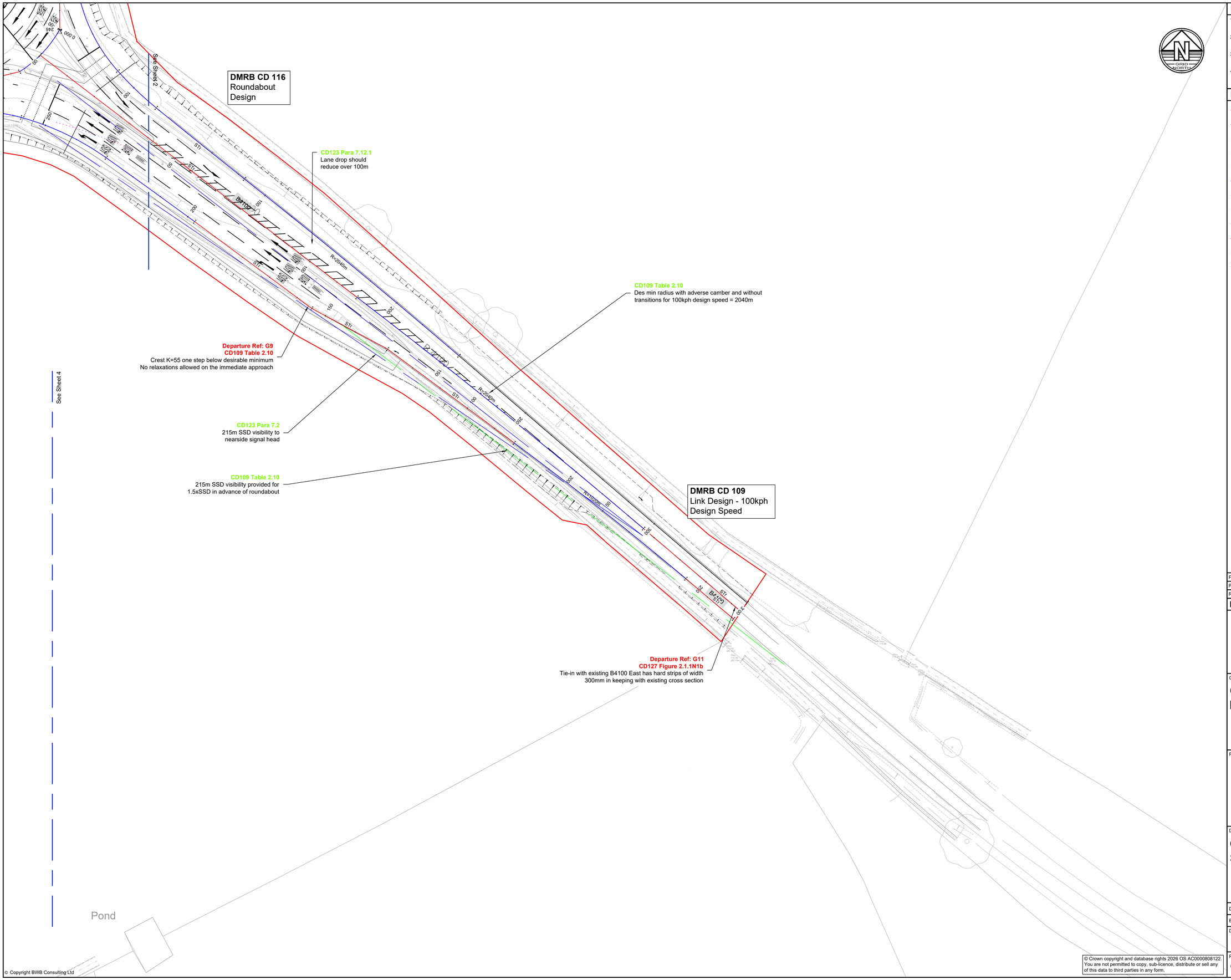
Drawn:	R.Picknell		Reviewed:	S.Hildtich	
BWB Ref:	NTH2479	Date:	31.07.25	Scale@A1:	1:500

Drawing Status
PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSRFI-BWB-HGN-02-DR-CH-0105	S2	P02

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Drawing Title

GEOMETRICAL LAYOUT SHEET 03

Drawn:	R.Picknell	Reviewed:	S.Hilditch
BWB Ref:	NTH2479	Date: 31.07.25	Scale@A1: 1:500

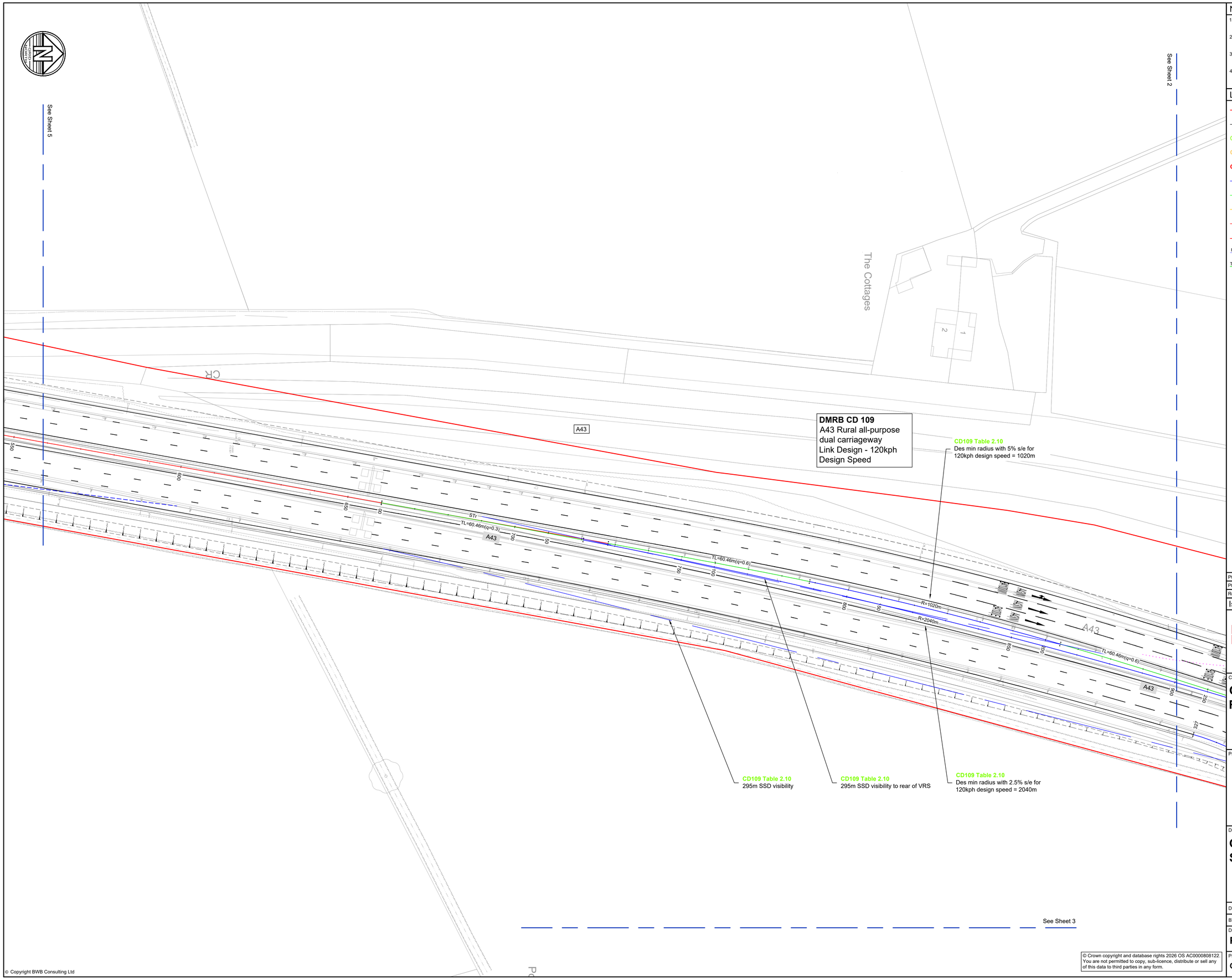
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Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSRFI-BWB-HGN-03-DR-CH-0105	S2	P02

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- Forward visibility
- Visibility Splay with Relaxation
- Visibility Splay with Departure
- STr — Alignment - Straight
- R=xxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

Rev	Date	Details of issue / revision	Drw	Rev
P02	16.03.26	Issued following updates	RP	SRH
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DMRB CD 122
Gade Separated Junction Design - 70kph Design Speed

DMRB CD 123
Priority/Signalised Junction Design

DMRB CD 109
A43 Rural all-purpose dual carriageway Link Design - 120kph Design Speed

DMRB CD 122
Diverge slip road - 70kph Design Speed

DMRB CD 123
Priority/Signalised Junction Design

See Sheet 6

See Sheet 14

See Inset 5.1

See Sheet 5

See Sheet 4

CD123 Table 5.22
Direct taper length = 15m for 85kph design speed

CD123 Para 7.2
160m SSD visibility to nearside signal head

CD123 Para 7.2
120m SSD visibility to nearside signal heads

CD109 Table 2.10
120m SSD visibility provided for 1.5xSSD in advance of junction

Retaining wall feature

Departure Ref: G8
CD 122 Table 5.17b
Slip road cross-section DG2A required
CD127 Figure 2.1.N1b
Slip road cross-section DG1A not achieved due to existing hard shoulder width

Existing Departure
CD109 Table 2.10
Existing hard shoulder - Des min radius with 5% s/e and transitions for 120kph design speed = 360m
Achieved radius = 344.584m

Departure Ref: G16
CD109 Table 2.10
Crest K=30 three step below desirable minimum
No relaxations allowed on the immediate approach

Departure Ref: G15
CD109 Table 2.10
Crest K=55 two step below desirable minimum
No relaxations allowed on the immediate approach

CD109 Table 2.10
Des min radius with 3.5% s/e for 85kph design speed = 720m

CD109 Table 2.10
Des min radius with 3.5% s/e for 85kph design speed = 720m

CD123 Para 7.2
295m SSD visibility to nearside signal head

Departure Ref: G14
CD109 Table 2.10
Crest K=20 two step below desirable minimum
No relaxations allowed on the immediate approach

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- Traffic signal equipment

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DMRB CD 122
Diverge slip road (interchange link) - 85kph Design Speed

Departure Ref: G4
CD122
Layout A Option 1 - Lane drop and ghost island not provided

CD122 Para 5.8
Near straight length at least equal to length of nose
Near Straight Length = 80m

CD122 Table 3.32
Nose Length = 80m
(Ch185m to Ch265m)

Departure Ref: G5
CD109 Table 2.10
Des Min SSD below 295m for 120kph design speed rural motorway

DMRB CD 123
Priority/Signalised Junction Design

Departure Ref: G1
CD127 Figure 2.1.1N1b
Hard shoulder reduced below 3.3m in front of bridge abutment

Departure Ref: G17
CD109 Table 2.10
Full SSD @ 295m
Ranges from 127m to 273m over 120m (12 intervals)
Immediate approach to junction

DMRB CD 109
A43 Rural all-purpose dual carriageway Link Design - 120kph Design Speed

See Sheet 13
See Sheet 7
See Sheet 15
M 40
A43
Def
Water
Tank
Water

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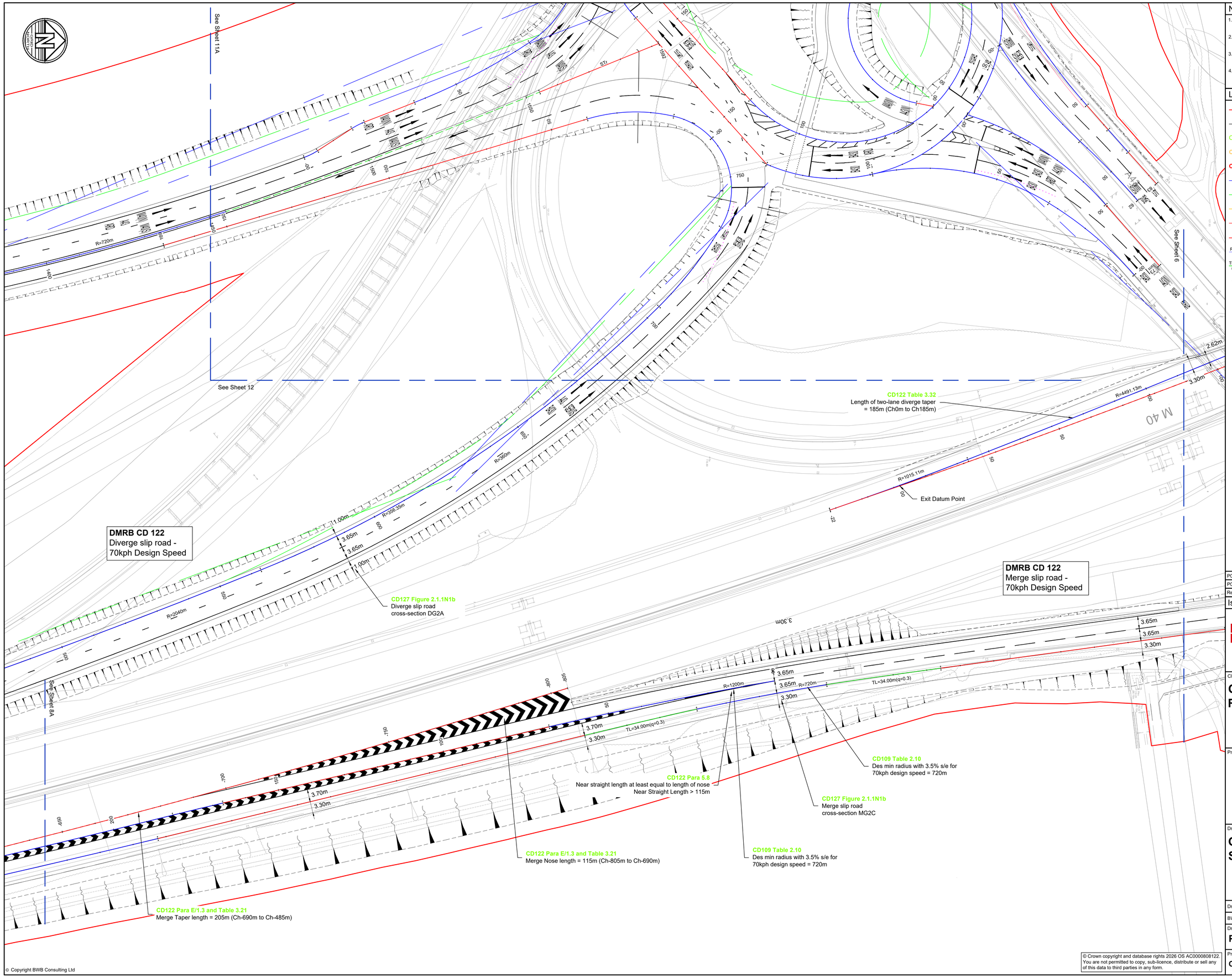
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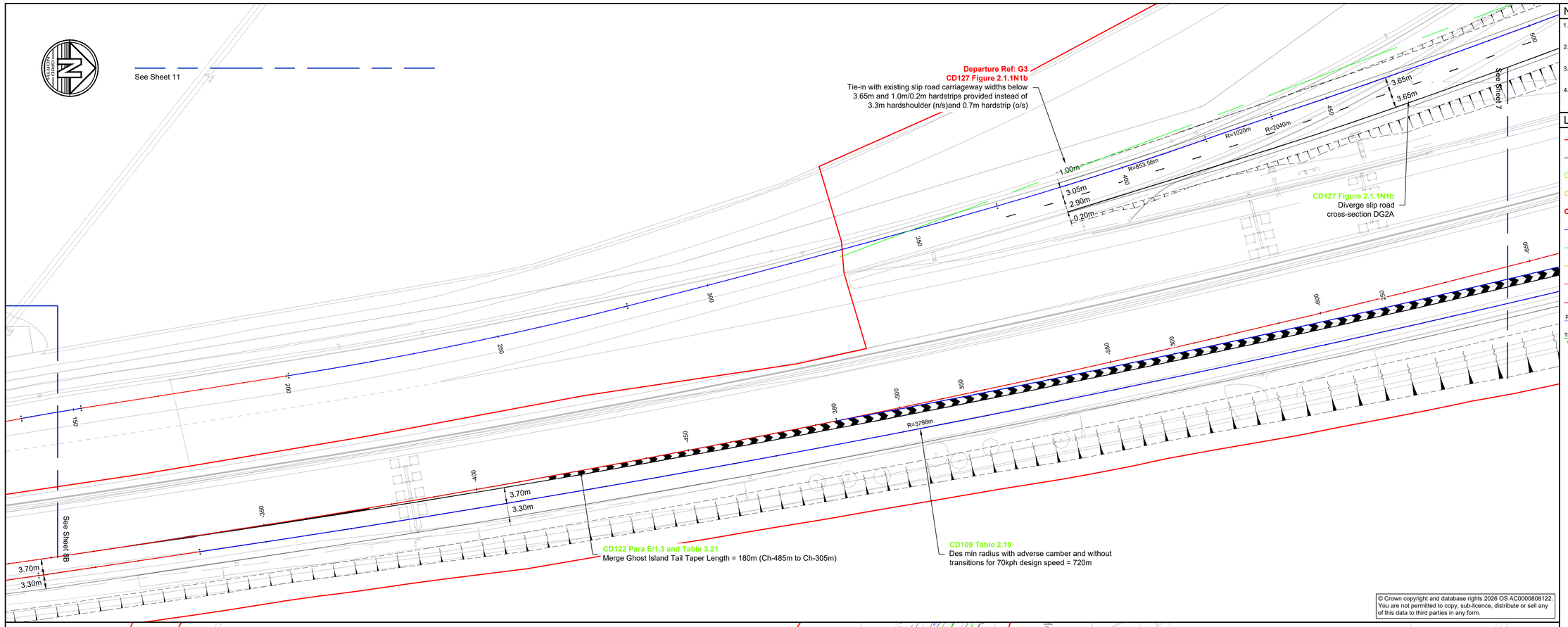
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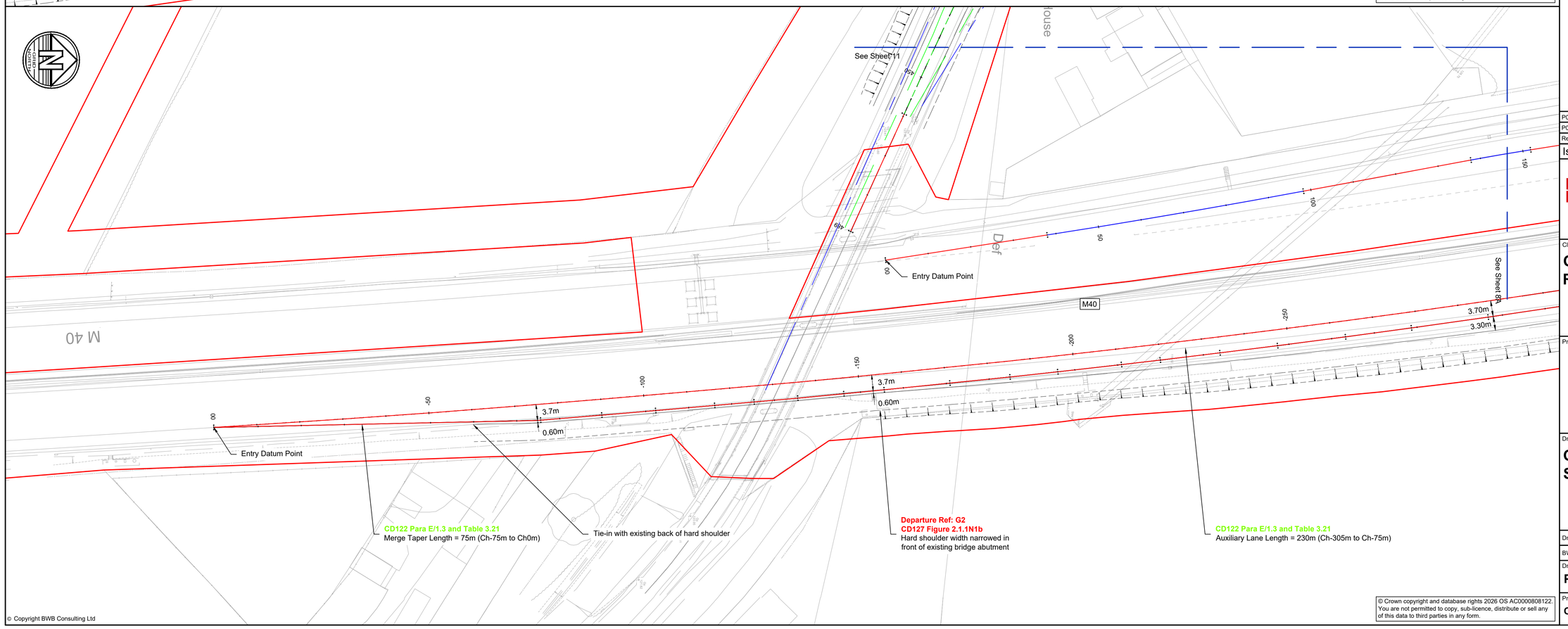
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GEOMETRICAL LAYOUT SHEET 08

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GRID NORTH

See Sheet 13

DMRB CD 116
Roundabout
Design

CD116 Para 3.28.4
Taper = 1:38
Exit lane widths

CD116 Para 3.26
Entry path radius
98m

CD109 Table 2.10
120m SSD visibility to central signal (nearside signal to 0.26m object height obscured by bridge parapet)

CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD116 Para 3.18.2
Projected kerb tangential to central island

CD116 Para 3.26
Entry path radius 99m

CD116 Para 3.18.2
Projected kerb tangential to central island

CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD116 Para 3.45
215m SSD visibility to roundabout give-way line

Ardley roundabout

CD116 Para 3.18.2
Projected kerb tangential to central island

Departure Ref: G19
CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD116 Para 3.26
Entry path radius 37m

CD116 Para 3.26
Entry path radius 61m

CD116 Para 3.28.4
Taper = 1:27
Exit lane widths at start and end of island

CD123 Para 7.2
215m SSD visibility to nearside signal head

CD109 Table 2.10
215m SSD visibility provided for 1.5xSSD in advance of roundabout

CD123 Figure 3.4
Direct access approach visibility at 4.5m offset from major road

CD109 Table 2.10
215m SSD southbound visibility

CD116 Para 3.28.2
Taper = 1:25
Exit lane widths at start and end of island

CD116 Para 3.18.2
Projected kerb tangential to central island

CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD123 Para 7.2
215m SSD visibility to nearside signal head

CD109 Table 2.10
215m SSD visibility provided for 1.5xSSD in advance of roundabout

Def

Path

Club House

B430

J10

See Sheet 11A

See Sheet 7

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P03	16.03.26	Issued following updates	RP	SRH
P02	03.10.25	Cutline updated	SB	SRH
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GEOMETRICAL LAYOUT SHEET 12

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OxSRFI-BWB-HGN-12-DR-CH-0105	**S2**	**P03**

See Sheet 14

Departure Ref: G7
CD109 Table 2.10
Reduced SSD visibility splay for merge slip road with k=30 (1.05m to 0.26m)

DMRB CD 122
Merge slip road (interchange link) - 85kph Design Speed

CD127 Figure 2.1.1N1b
Interchange Link cross-section IL1A

CD109 Table 2.10
160m SSD visibility splay for merge slip road (1.05m to 0.26m)

Departure Ref: G7
CD122 Para 1.3
1-step below desirable minimum radius on interchange link

R=519.171m
3.70m
3.30m
R=360m
Pond
FB
Sewage Works
Tank
See Sheet 6
See Sheet 12

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See Sheet 15

CD122 Para 5.14
120m SSD visibility splay for diverge slip road (1.05m to 1.05m)

CD122 Para 5.10
Min 75m radius for loop

CD127 Figure 2.1.1N1b
Interchange Link cross-section IL1A
CD122 Para 5.18
lane widening to CD123

DMRB CD 122
Merge slip road (interchange link) - 85kph Design Speed

DMRB CD 122
Diverge slip road (interchange link) - 85kph Design Speed

CD122 Para 5.10
Min 75m radius for loop

CD127 Figure 2.1.1N1b
Interchange Link cross-section IL2A
CD122 Para 5.18
lane widening to CD123

Departure Ref: G6
CD122 Para 5.14
120m SSD visibility splay for diverge slip road loop (1.05m to 1.05m) (i.e. not 'whole loop' due to woodland)

CD122 Para 5.14
160m SSD visibility splay for merge slip road loop (1.05m to 1.05m)

Departure Ref: G5
CD109 Table 2.10
Sag K=13 two step below desirable minimum
Crest K=17 two step below desirable minimum
CD 122 para 1.3 does not permit the use of relaxations given in CD 109

CD122 Para 3.34
295m SSD visibility splay from end of diverge slip road taper (1.05m to 0.26m)

CD127 Figure 2.1.1N1b
Interchange Link cross-section IL2A
CD122 Para 5.18
lane widening to CD123

CD127 Figure 2.1.1N1b
Interchange Link cross-section IL1A
CD122 Para 5.18
lane widening to CD123

See Sheet 13

See Sheet 5

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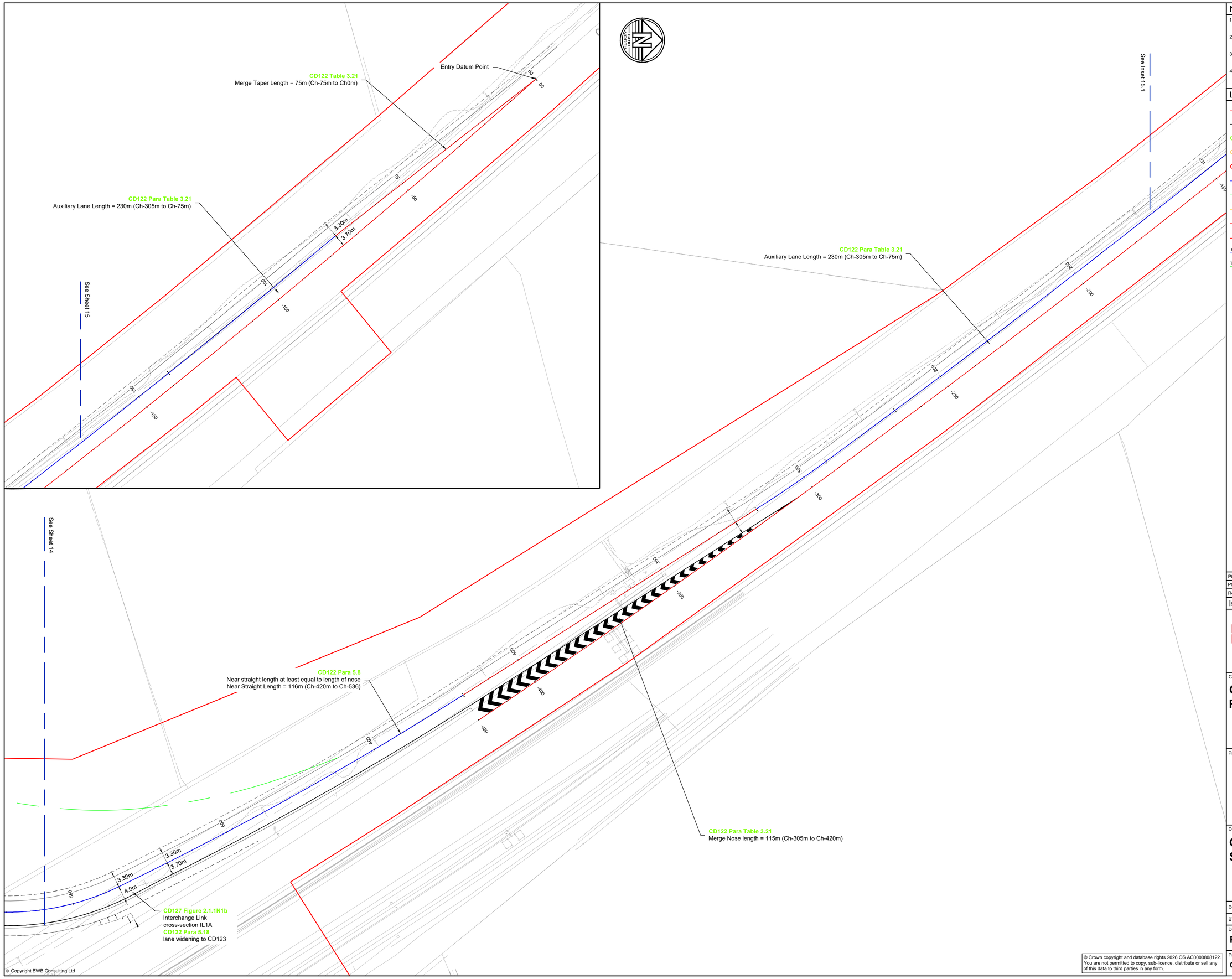
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OXFORDSHIRE RAILFREIGHT LTD.

Project Title

OxSRFI OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title

GEOMETRICAL LAYOUT SHEET 15

Drawn:	R.Picknell		Reviewed:	S.Hilditch	
BWB Ref:	NTH2479	Date:	31.07.25	Scale@A1:	1:500

Drawing Status

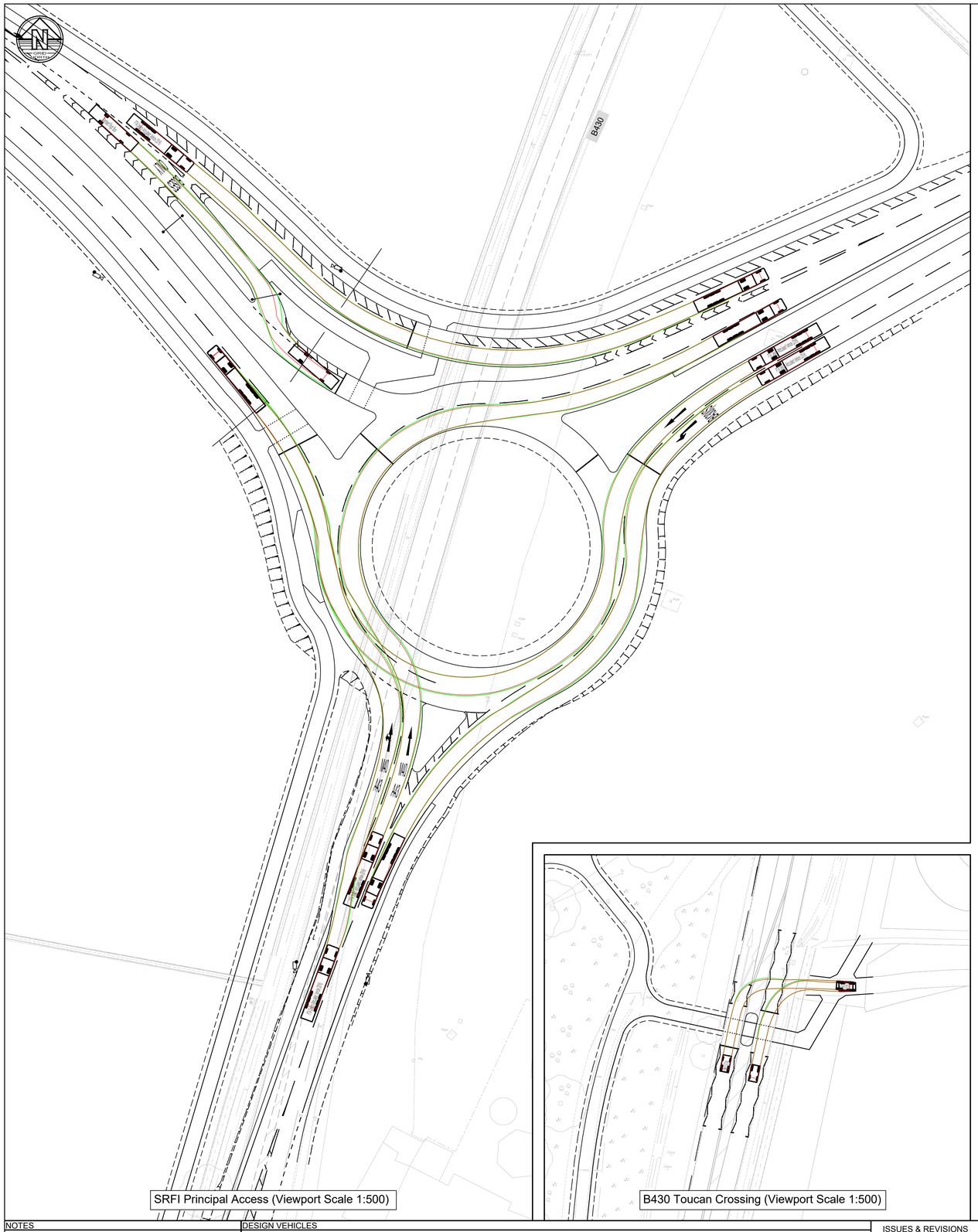
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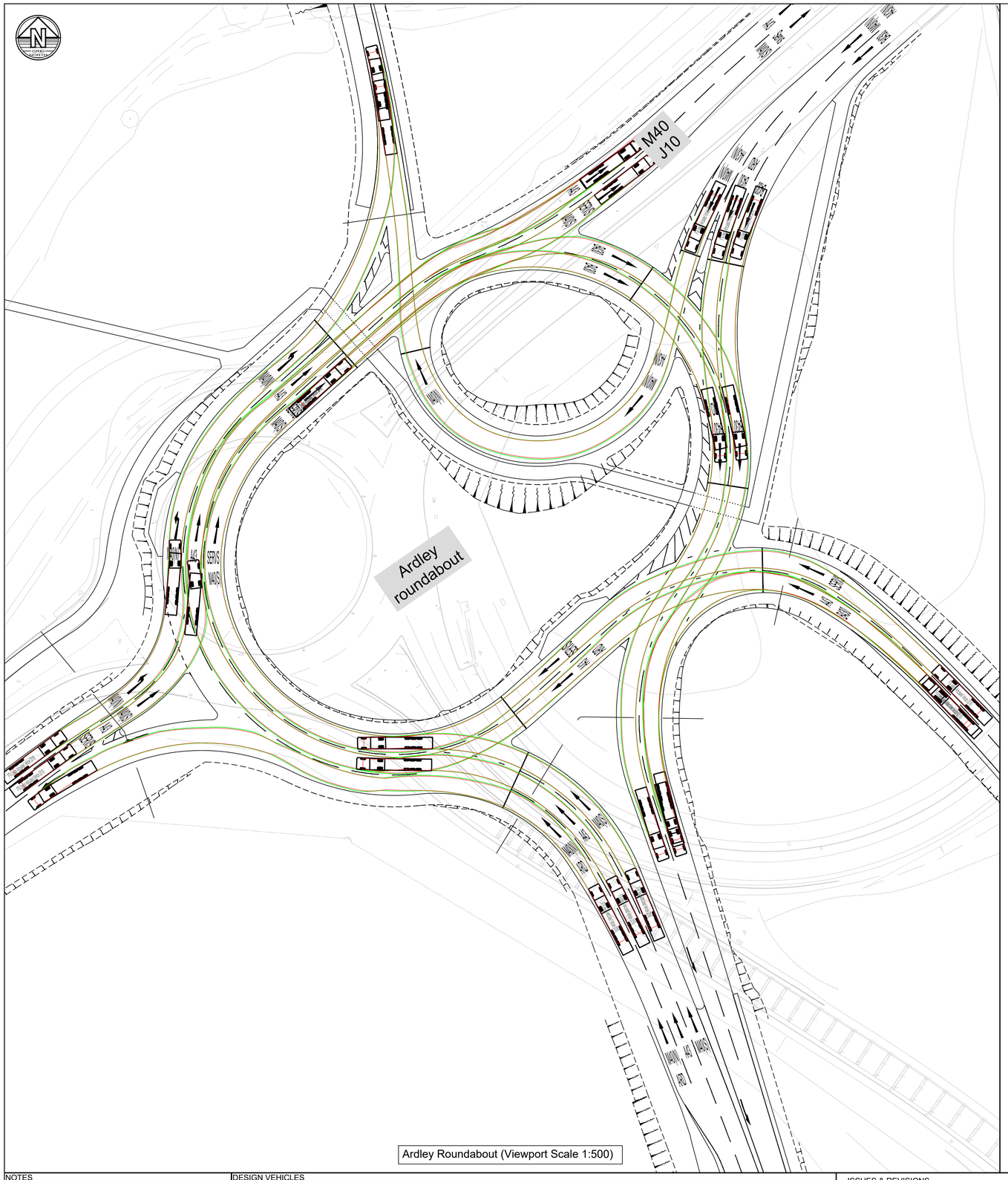
Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSRFI-BWB-HGN-15-DR-CH-0105	**S2**	**P02**

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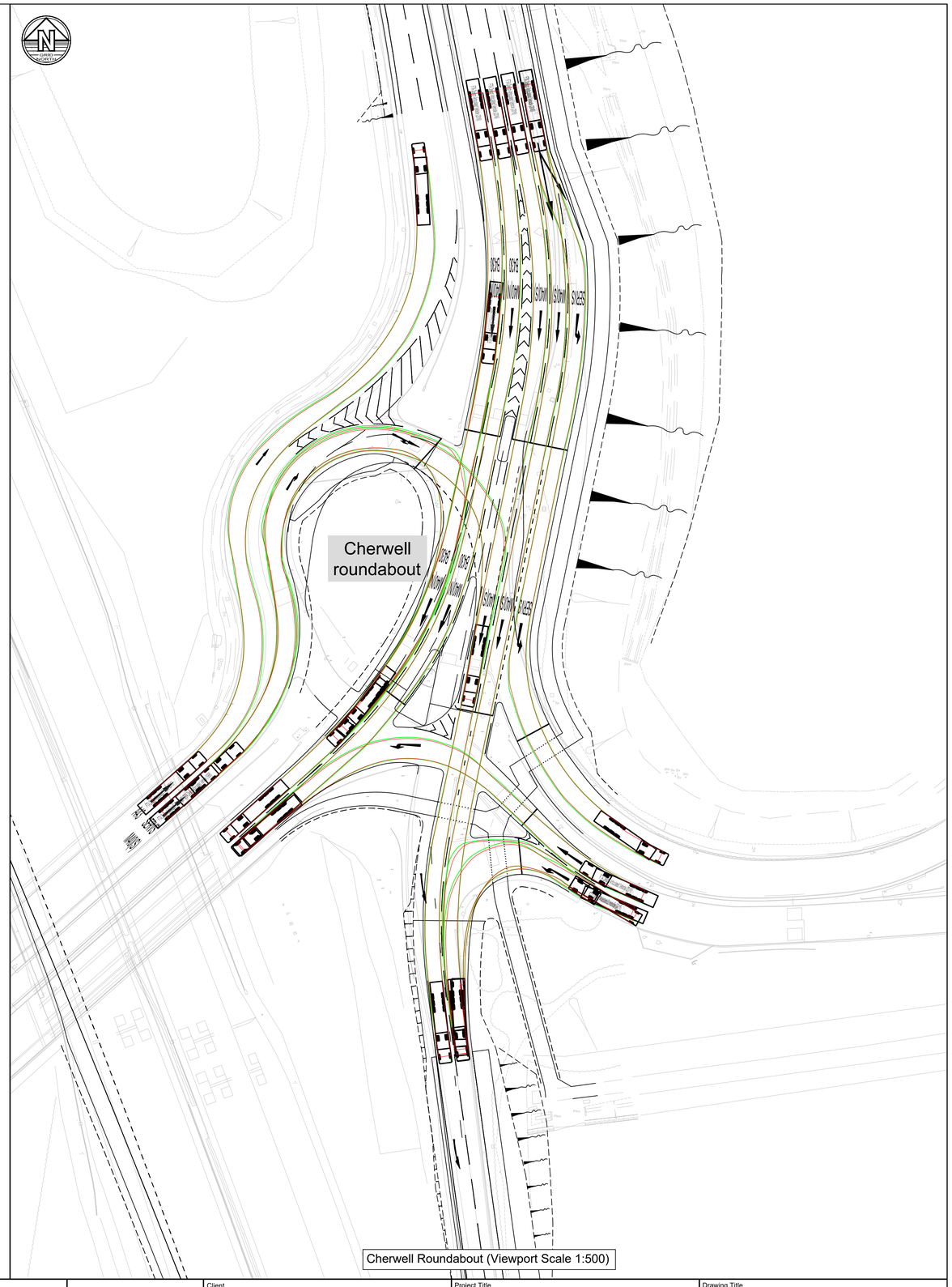
APPENDIX B

Highway Plans Swept Paths


B430
Bus Only
Bus Only
Bus Only



Ardley Roundabout (Viewport Scale 1:500)



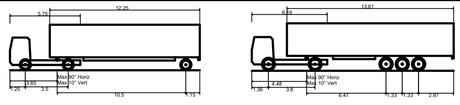
Cherwell Roundabout (Viewport Scale 1:500)

NOTES

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2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

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DESIGN VEHICLES



Articulated Combination

Overall Length	15.500m
Overall Width	2.550m
Overall Body Height	3.713m
Min Body Ground Clearance	0.436m
Track Width	2.550m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.500m

FTA Design Articulated Vehicle (2016)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Max Track Width	2.470m
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	6.600m

ISSUES & REVISIONS

Rev	Date	Details of issue / revision	Drw	Rev
P01	19.06.25	Issued for information	RP	SRH
P02	06.03.26	Issued following updates	RP	SRH

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Client
OXFORDSHIRE RAILFREIGHT LTD.

Project Title
OxSRFI
OXFORDSHIRE
STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title
HIGHWAY PLANS SWEPT PATHS

Drawn:	R.Picknell		Reviewed:	S. Hilditch			
BWB Ref:	NTH2479	Date:	19.06.25	Scale@A1:	1:500		

Drawing Status
FOR INFORMATION

Project - Originator - Zone - Level - Type - Role - Number
OxSRFI-BWB-GEN-XX-DR-CH-0007

Status: **S2** Rev: **P02**

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Baynard's Green

Baynard's Barn

Baynard House

Baynard's Green

Baynard's Green Roundabout

A43

B4100

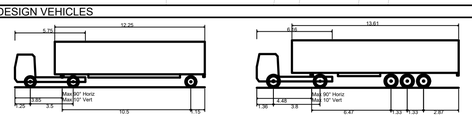
Baynard's Green Roundabout (Viewport Scale 1:500)

NOTES

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DESIGN VEHICLES



Articulated Combination	
Overall Length	15.500m
Overall Width	2.550m
Overall Body Height	3.713m
Min Body Ground Clearance	0.438m
Track Width	2.550m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.500m

FTA Design Articulated Vehicle (2016)	
Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Max Track Width	2.470m
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	6.600m

ISSUES & REVISIONS

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Client
OXFORDSHIRE RAILFREIGHT LTD.

Project Title
OxSRFI
OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title
HIGHWAY PLANS SWEPT PATHS

Drawn:	R.Picknell	Reviewed:	S. Hilditch		
BWB Ref:	NTH2479	Date:	19.06.25	Scale@A1:	1:500

Drawing Status
FOR INFORMATION

Project - Originator - Zone - Level - Type - Role - Number
OxSRFI-BWB-GEN-XX-DR-CH-0008

Status: **S2** Rev: **P02**

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APPENDIX C

Gantry access risk assessment

Access to Gantries Risk Assessment - Summary Sheet | **Document** | **OxSRFI-BWB-GHS-XX-SH-CS-0001**

1. INTRODUCTION | **Scheme** | **M40 Junction 10**

This assessment provides a comparative risk review between gantries provided with fix permanent access for maintenance and those where maintenance access would be achieved using mobile elevated work platforms (MEWP).

2. GANTRY TYPES

The project contains a mixture of cantilever and portal gantries supporting a variety of signalling equipment and associated cabling and ancillary items, as listed below.

Existing MS3	6
New Cantilever MS3	0
Existing Cantilever MS4	5
New Cantilever MS4	2
Existing Superspan Gantries	0
Proposed Superspan Signal Gantries	0
Proposed Superspan ADS only Gantries	0
Existing large cantilever	0
Proposed Large Cantilever	0
ADS only	1

3. ASSESSMENT ASSUMPTIONS

The assessment covers **only routine activities that would require access at height**. Ground level activities (e.g. maintenance at a cabinet) is not included within the assessment as it would be unaffected by the structural form.

Generc **risks of accessing the site** are shown below, derived using a simple probability / severity matrix. These scores are common to Smart Motorway assessments. However, as access to site is at least as risky as activities on site, the access to site scores are then weighted by a factor of 10 to be similar order of magnitude to the accessible / non-accessible scores developed in the specific risk assessments.

The Non-accessible scoring assumes that irrrespective of the general access type, a lane closure / TTM will be required for access in any event

This assessment will consider only the **new** MS4 cantilever and superspan gantries to help determine the safety risk decision of accessible cf. non-accessible structures. The other types will not be considered, as noted below:

MS3 Cantilevers : The configuration of the MS3 signal is such that they have permanent fixed access provision based on previous standards. For this scheme 6no existing MS3s will be retained (with existing access provisions maintained).

4. SUMMARY OF RESULTS

General Scores

General Gantry Type	Access	Structure risk score - accessible	Structure risk score - non-accessible	Access to site risk score	Total Score (Accessible)	Total Score (Non - accessible)
Cantilever MS4	Off network access	302	420	60	362	1020
	Maintenance hard standing via ERA			240	542	1020
	Hard shoulder			320	622	1020
	Lane closure TTM			600	902	1020

Access to Site Scores

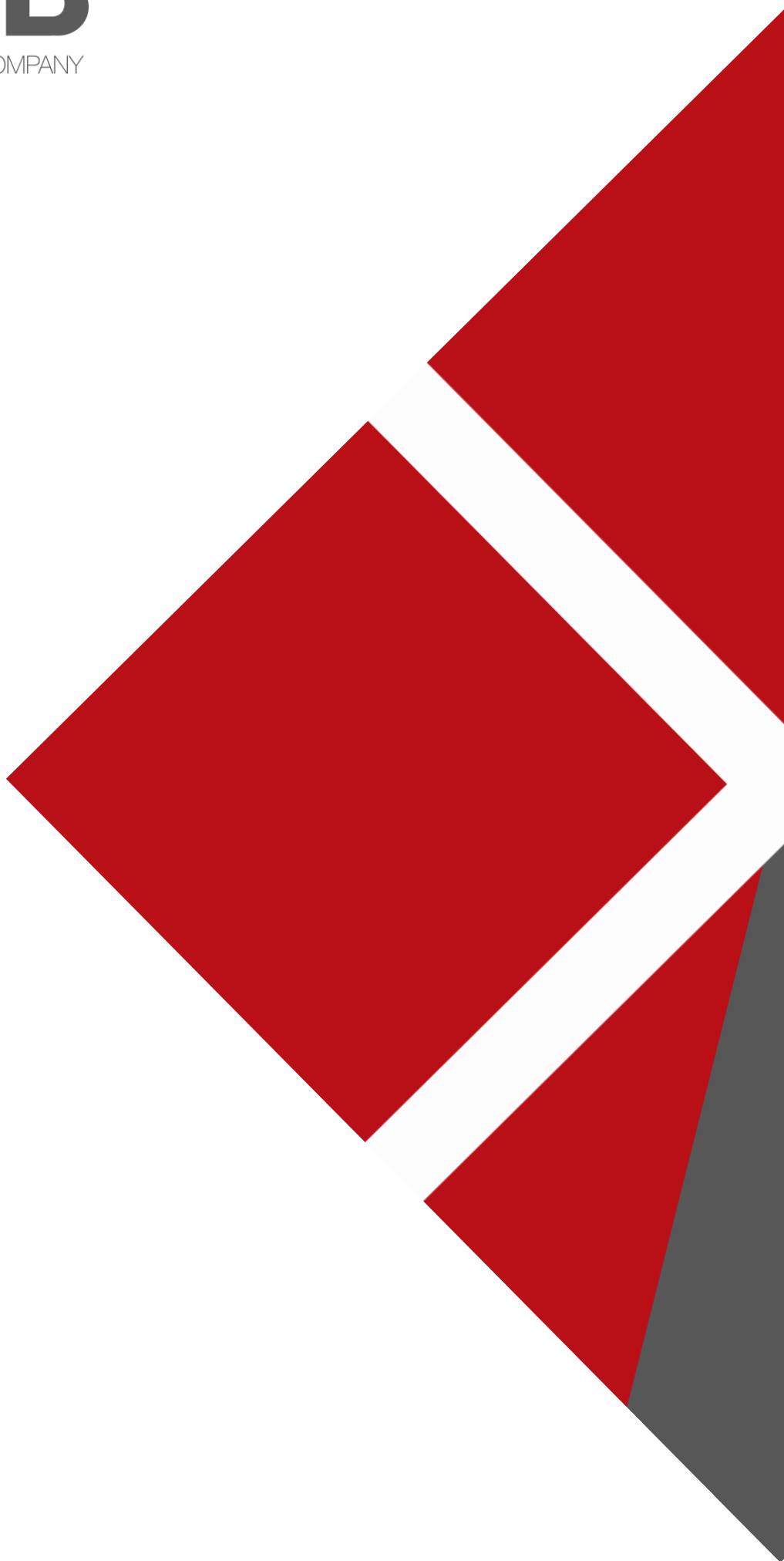
	Probability of Injury (to workers/road users)	Severity	Risk Rating	Weighted access to site risk weighting
ONA	2	3	6	60
Maintenance hard standing via ERA	4	6	24	240
Hard shoulder	4	8	32	320
TTM	6	10	60	600

Gantry Specific Scores

Gantry purpose	Type	Chainage	Access to site	Total Score (Access)	Total Score (Non-Access)	Score increase to non-access	% increase to non-access
J10 NB final VMS	Existing MS4 Cantilever		Hard shoulder	622	1020	398	164%
J10A NB final VMS	New MS4 Cantilever		Maintenance hard standing	542	1020	478	188%
J10 NB first VMS	New MS4 Cantilever		Hard shoulder	622	1020	398	164%
J10-11 NB first intermediate VMS	Existing MS4 Cantilever		Hard shoulder	622	1020	398	164%
J10 SB final VMS	Existing MS4 Cantilever		Hard shoulder	622	1020	398	164%
J10 SB first VMS	Existing MS4 Cantilever		Hard shoulder	622	1020	398	164%
J10-9 SB first intermediate VMS	Existing MS4 Cantilever		Hard shoulder	622	1020	398	164%
A43 SB to Cherwell	ADS only		Off network access	276	254	-22	92%

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APPENDIX 32

ARDLEY BYPASS DESIGN STRATEGY RECORD

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INFRASTRUCTURE

Mountpark
Oxfordshire Strategic Rail Freight Interchange (OxSRFI)
B430 Ardley Bypass, Ardley Road, B430 / OxSRFI Principal Access Roundabout
Geometric Design Strategy Record

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INFRASTRUCTURE

Mountpark

Oxfordshire Strategic Rail Freight Interchange (OxSRFI)

B430 Ardley Bypass,

Ardley Road,

B430 / OxSRFI Principal Access Roundabout

Geometric Design Strategy Record

Nottingham
5th Floor, Waterfront House, Station Street
Nottingham, NG2 3DQ
T: 0115 924 1100

March 2026

DOCUMENT ISSUE RECORD

Document Number:	OxSRFI-BWB-GEN-XX-RP-CH-0011
BWB Reference:	NTH2479

Revision	Date of Issue	Status	Author:	Checked:	Approved:
P01	07.10.2025	For comment	Stephen Birchall BSc (Hons)	Simon Hilditch MEng (Hons) CEng MICE MCIHT	Simon Hilditch MEng (Hons) CEng MICE MCIHT
P02	25.03.2026	For comment	Ryan Picknell MEng (Hons)	Simon Hilditch MEng (Hons) CEng MICE MCIHT	Simon Hilditch MEng (Hons) CEng MFICE MCIHT

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FIGURES

Figure 1.1 Location Plan

1. INTRODUCTION

Instruction

1.1 The Oxfordshire Strategic Rail Freight Interchange (OxSRFI) requires substantial improvements to the strategic road network (SRN) and local road network (LRN), adding new links as well as upgrading existing infrastructure.

1.2 BWB Consulting (BWB) has been instructed by Mountpark (the Client) to develop the highway design for the works on the SRN and LRN, which includes the preparation of this Design Strategy Record (DSR).

1.3 **Figure 1.1** below shows the overall location of the works of OxSFRI and the road network, in relation to the aspects covered in this report.

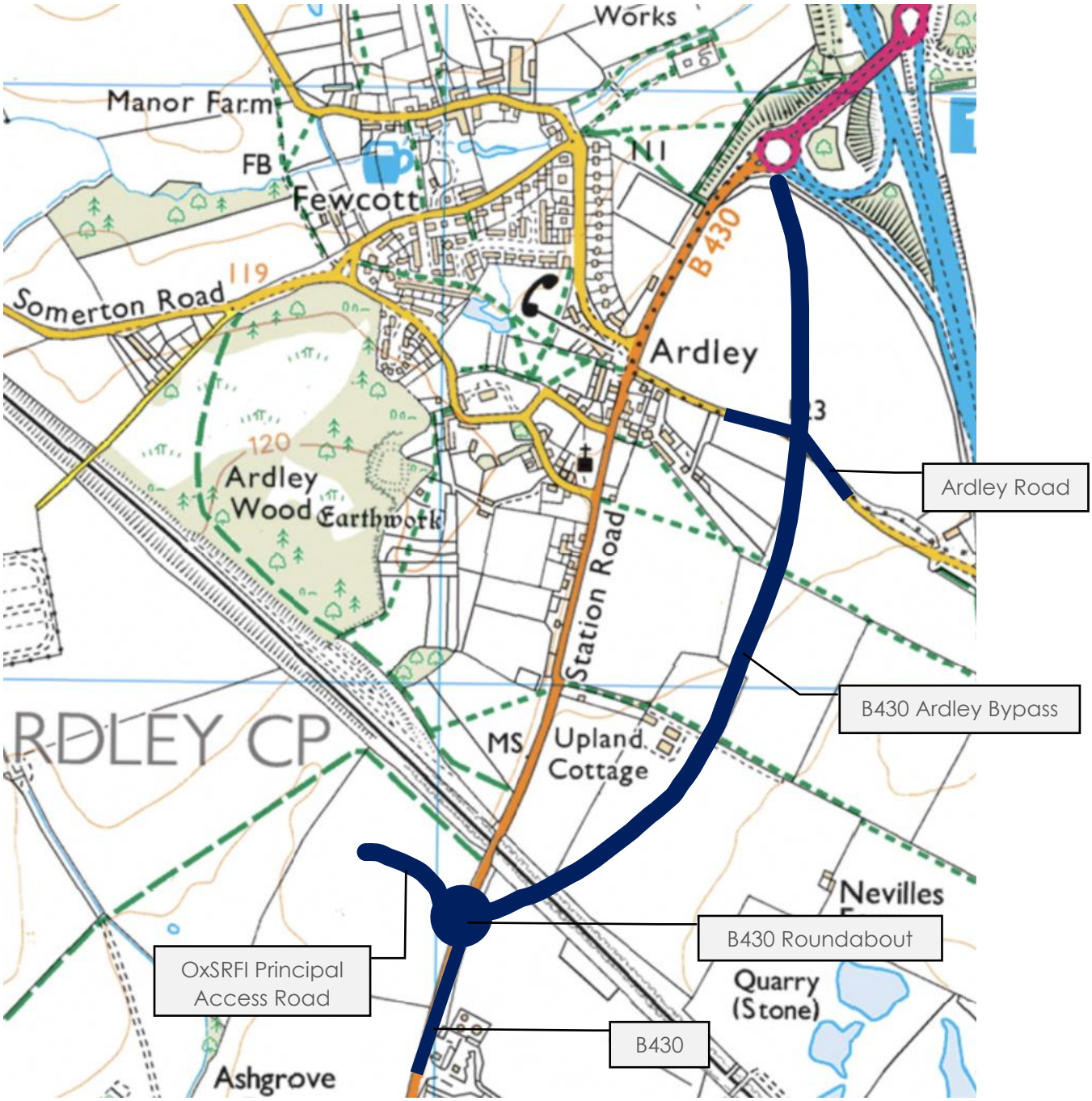


Figure 1.1 Location plan

Acronyms and Abbreviations

DMRB	Design Manual for Roads and Bridges
DSR	Design Strategy Record
LRN	Local Road Network
OxSRFI	Oxfordshire Strategic Rail Freight Interchange
OCC	Oxfordshire County Council
NH	National Highways

SRN	Strategic Road Network

Objectives

1.4 The objective of this DSR report, is to record the key decisions made during design.

1.5 The report will record the relaxations and departures from standards contained within the highway design. A detailed narrative for the justification, including a safety risk assessment, is to be submitted separately for approval for each departure.

1.6 The DSR is also used to record how the scheme complies with the principles of good road design set out in GG 103.

1.7 The following reports and documents are to be provided separately to this DSR:

- Transport assessment and modelling;
- Geotechnical reporting to CD 622;
- Directional signage strategy;
- Lighting strategy;
- Structures options reports and AIPs (where required) to CG 300;
- Maintenance and repair statement to GD 304;
- WCHAR assessment and review to GG 142; and
- Stage 1 road safety audit to GG 119.

List of Drawings

1.8 The table below sets out the scheme design and option drawings that are to be read in conjunction with this report. The Geometrical Layouts are provided in **Appendix B** and the Highway Plans Swept Paths are provided in **Appendix C**. The Highway Plans GA, Longsections and Cross Sections are provided separately and are not appended to this report.

Drawing no.	Title	Report section
OxSRFI-BWB-HGN-09-DR-CH-0105	Geometrical Layout	5
OxSRFI-BWB-HGN-10-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-11-DR-CH-0105	Geometrical Layout	3/4
OxSRFI-BWB-HGN-11A-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-12-DR-CH-0105	Geometrical Layout	3
DCO Document 2.7B	Highway Plans General Arrangement	3/4
DCO Document 2.7C	Highway Plans General Arrangement	3/5
DCO Document 2.7R	Highway Plans Longsections	4
DCO Document 2.7S	Highway Plans Longsections	3/5
DCO Document 2.7H	Highway Plans Cross Sections	3/4
DCO Document 2.7I	Highway Plans Cross Sections	5

Drawing no.	Title	Report section
OxSRFI-BWB-GEN-XX-DR-CH-0006	Highway Plans Swept Paths	5

2. SCHEME OVERVIEW AND DESIGN STANDARDS

Scheme overview

2.1 The proposed works on the LRN covered by this report are listed below, collectively referred to within this report as the LRN works.

Section of scheme	Description	DCO Work No.
B430 including OxSRFI Principal Access Junction	New junction to provide main site access, with existing B430 realigned to the south	11
Ardley Road	Route upgrade to realign and provide a bridge over Ardley Bypass	19
B430 Adley Bypass	A new link between B430 and Ardley Roundabout	20

2.2 **Drawing OxSRFI-BWB-GEN-ZZ-SK-CH-SK041** shows the overall scheme context of OxSRFI and the existing road network and **Figure 1.1** shows the locations of the above works.

Overview of Standards

2.3 The scheme spans across two highway authority boundaries, NH and OCC. This report provides design commentary on the OCC areas of responsibility only i.e. the LRN works. The SRN design commentary is covered by a separate report.

2.4 The LRN works will be designed in accordance with the following standards:

Doc. Ref.	Document Title	Version / Revision
DMRB CD 109	Highway link design	Revision 1
DMRB CD 116	Geometric design of roundabouts	Version 2.1.0
DMRB CD 123	Geometric design of at-grade priority and signal-controlled junctions	Version 2.1.0
DMRB CD 127	Cross-sections and headrooms	Version 1.0.1
LTN 1/20	Cycle infrastructure design	July 2020

Highway Authority, Road Class, Design Speed and Speed Limit

2.5 The road classes and design speeds for each section of the scheme are listed below. Design speeds have been determined in accordance with CD 109, Section 2.

Section of scheme	Road class	Cross-section	Design speed (kph)	Existing or proposed signed speed limit (mph)
B430 Ardley Bypass	All-purpose, rural	WS2+1	100	National speed limit
Ardley Road	All-purpose, rural	S2	100	Existing retained (National speed limit)
B430	All-purpose, rural	S2	100	Existing retained (National speed limit)
OxSRFI Principal Access Road	All-purpose, urban	D2UAP	60	30mph

2.6 Ardley Road is an S2, all-purpose, rural, single carriageway with a current speed limit of 60mph (100kph). This link however has sub-standard geometry in accordance with CD 109 and does not adhere to the cross section in-line with CD 127. Therefore, due to its nature, it has been designed to 70kph (40mph). It is not considered appropriate to design rural lanes in full accordance with the DMRB, which is purposely written for trunk roads, although in many cases it is also used for local major roads, hence why it is appropriate for the B430 Ardley Bypass.

3. ARDLEY BYPASS

Layout

3.1 The scheme proposes a link between the B430 and Ardley roundabout. The B430 currently connects to Ardley roundabout, however the bypass will filter traffic away from Ardley village.

3.2 Ardley Bypass provides greater capacity as well as easing congestion in Ardley by providing two lanes northbound which widens to three on the approach to Ardley roundabout. The southbound direction of travel provides one lane which widens to two on the approach to B430 roundabout.

3.3 The primary reason for the provision of two lanes northbound is to allow the free-flow segregated left turn lane out of the OxSRFI site without having to provide a lane drop at the merge point.

Design Speed and Geometry

3.4 Ardley Bypass is a wide single 2+1, single carriageway, all-purpose, rural route, with a design speed of 100kph and a speed limit of 60mph.

Horizontal alignment

3.5 The horizontal alignment is summarised as follows:

Ardley Bypass	Horizontal Design Parameters
Description	• Right hand radius 2040m as design transitions from CD 116 roundabout design into link design to CD 109 • Straight • Transition • Left hand radius 760m - (minimum R with 5.0% superelevation) • Transition • Straight • Transition • Left hand radius 720m- (minimum R with 5.0% superelevation) • Transition • Straight as design transitions from link design to CD 109 to CD 116 roundabout design
Compliance with DMRB	**Compliant**

Vertical alignment

3.6 The vertical alignment for each option is summarised as follows:

Ardley Bypass	Vertical Design Parameters

Description	• Grade 0.5% uphill as design transitions from CD 116 roundabout design into link design to CD 109 • Crest K 100 • Grade 1.0% downhill • Sag K 26 • Grade 0.6% uphill • Crest K 100 • Grade 0.6% downhill • Sag K 26 • Grade 2.5% uphill • Crest K 100 • Grade 0.9% downhill as design transitions from link design to CD 109 to CD 116 roundabout design
Compliance with DMRB	**Compliant**

Stopping Sight Distance / Visibility

3.7 Stopping Site Distance has been assessed in accordance with CD 109, Table 2.10 and paragraph 3.

3.8 The minimum SSD has been assessed as follows:

Ardley Bypass	Visibility Parameters
Description	• Minimum SSD northbound of 215m achieved • Minimum SSD southbound of 215m achieved
Compliance with DMRB	**Compliant**

Cross-section

3.9 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a wide single 2+1 (WS2+1) carriageway, all-purpose, rural road for Ardley Bypass.

Lane width

3.10 The lane widths are 3.5m as required by CD 127.

Hard shoulder, hard strip and verge

3.11 The following are provided in accordance with CD 127:

- 5.0m verge (extra 2.5m provided northbound for visibility)
- 1.0m hard strip
- 1.0m lane separation
- 1.0m hard strip

- 2.5m verge southbound

Swept Paths

3.12 All directions of travel have been assessed using the maximum legal, European, 16.5m long, articulated heavy goods vehicle, in accordance with CD 116.

Departures From Standard

3.13 **Appendix A** provides a summary of the road layout departures from standard within this section.

4. ARDLEY ROAD

Layout

4.1 The scheme proposes to continue to provide a link between the Ardley and Bucknell via Ardley Road, however due to Ardley bypass it will be maintained via a bridge.

Design Speed and Geometry

4.2 Ardley Road is a single carriageway all-purpose rural lane, with a design speed of 70kph and a speed limit of 40mph.

Horizontal alignment

4.3 The horizontal alignment is summarised as follows:

Ardley Road	Horizontal Design Parameters
Description	• Straight as design ties into existing • Transition • Right hand radius 360m - (minimum R with 5.0% superelevation) • Transition • Straight • Transition • Left hand radius 280m - (one step below desirable minimum) – **Relaxation but results in SSD departure – see below** • Transition • Straight as design ties into existing
Compliance with DMRB	**Compliant**

Vertical alignment

4.4 The vertical alignment for each option is summarised as follows:

Ardley Road	Vertical Design Parameters
Description	• Grade 0.5% downhill as design ties into existing • Sag K 13 - (one step below desirable minimum) – **Relaxation** • Grade 1.4% uphill • Crest K 17 - (one step below desirable minimum) – **Relaxation but results in SSD departure – see below** • Grade 5.0% downhill • Sag K 13 - (one step below desirable minimum) – **Relaxation but results in SSD departure – see below** • Grade 4.3% uphill as design ties into existing
Compliance with DMRB	The K 13 sag curve is coincident with the 280m radius which is not a permitted combination of relaxations and a **departure** is required, reference **ARD/1.**

Stopping Sight Distance / Visibility

4.5 Stopping Site Distance has been assessed in accordance with CD 109, Table 2.10 and paragraph 3.

4.6 The minimum SSD has been assessed as follows:

Ardley Road	Visibility Parameters
Description	• Two steps below desirable minimum SSD where it fails to achieve 120m eastbound • Two steps below desirable minimum SSD where it fails to achieve 120m westbound
Compliance with DMRB	Eastbound visibility achieves full SSD on approach to and the passing of the bridge, however full SSD cannot be achieved over the bridge and SSD ranges between 88m to 112m, over 90m (9 intervals). Visibility of 88m gradually increases until it reaches full SSD. The westbound achieves full SSD on approach and passing of the bridge however visibility is reduced over the bridge with SSD ranging between 85m to 118m over 90m (9 intervals). This does however classify as two steps below desirable minimum stopping site distance in both directions and when combined with vertical relaxation a **departure** is required, reference **ARD/2.**

Cross-section

4.7 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for an S2, single carriageway, all-purpose, rural road. However, as this is a rural lane use of CD 127 is not considered to be mandatory.

Lane width

4.8 The lane width is 3.0m which is a deviation from CD 127 (3.65m). The existing cross section varies with an approximate lane width being around 2.25m. An increased lane width, has been proposed for the realigned section of road, but full compliance with CD 127 is not proposed as it is likely to create excessive speed. As this is a rural lane the use of 3.0m lane widths is considered acceptable.

Hard shoulder, hard strip and verge

4.9 Hard strips have not been included due to the short lengths of new carriageway and as the existing cross-section does not feature hard strips, this is in-keeping with the existing rural lane.

4.10 The following are provided for the realigned section of road:

- 5.5m verge (1.5m verge, 2.5 shared use footway / cycleway, 1.0m verge westbound)

  2.5m verge eastbound

Swept Paths

4.11 Assessment undertaken using a 7.5 tonne rigid design vehicle as this is the maximum legal vehicle weight allowed for Ardley Road.

Departures From Standard

4.12 **Appendix A** provides a summary of the road layout departures from standard within this section.

5. B430 OXSRFI PRINCIPAL ACCESS ROUNDABOUT

Layout

5.1 The works south of Ardley looks to upgrade the B430 and incorporate a roundabout to accommodate the OxSRFI and divert traffic from driving through Ardley village via the Ardley Bypass.

5.2 The OxSRFI principal access road provides two lanes eastbound and westbound, however the eastbound dual splits, providing one lane approaching the roundabout and a segregated left turn lane on to the B430 Ardley Bypass. The left turn land also provides an addition short length of carriageway for buses only.

5.3 The B430 south of the OxSRFI principal access keeps the same cross-section including retention of the ghost island into the waste recycling centre, however it has been re-aligned to link into the new roundabout with the addition of an extra lane on approach and the junction with the recycling centre amended to remove the northernmost right-turn exit lane which is not compliant with CD 123.

Design Speed and Geometry

5.4 B430 is an S2, single carriageway, all-purpose, rural route, with a design speed of 100kph with the national speed limit in place.

5.5 The OxSRFI Principal Access Road is a D2UAP, dual carriageway, all-purpose, urban route, with a design speed of 60kph and a speed limit of 30mph.

Horizontal alignment

5.6 The horizontal alignment is summarised as follows:

Horizontal Design Parameters	B430	OxSRFI Access Road
Description	• Straight as design ties into existing to CD 109 Link Design • Right hand radius 1020m - (minimum R with 3.5% superelevation) • Right hand radius 720m - (minimum R with 5.0% superelevation) as design transitions from link design to CD 109 to CD 116 roundabout design	• Right hand radius 255m - (minimum R with 5.0% superelevation) as design transitions from link design to CD 109 to CD 116 roundabout design • Straight • Left hand radius 85m as design transitions from link design to CD 109 to CD 116 roundabout design
Compliance with DMRB	**Compliant**	**Compliant**

Vertical alignment

5.7 The vertical alignment is summarised as follows:

Vertical Design Parameters	B430	SRFI Access Road
Description	• Grade 0.6% uphill as design ties in with existing • Crest K 100 • Grade 0.5% downhill • Sag K 26 • Grade 0.5% uphill as design transitions from link design to CD 109 to CD 116 roundabout design	• Grade 0.5% uphill • Crest K 17 • Grade 1.0% downhill • Sag K 13 • Grade 5.0% uphill • Crest K 17 • Grade 2.0% uphill as design transitions from link design to CD 109 to CD 116 roundabout design
Compliance with DMRB	**Compliant**	**Compliant**

Stopping Sight Distance / Visibility

5.8 Stopping Site Distance has been assessed, in accordance with CD 109, Table 2.10 and paragraph 3.

5.9 The SSD has been assessed as follows:

Visibility Parameters	B430	SRFI Access Road
Description	• Minimum SSD northbound of 215m achieved • Six steps below desirable minimum SSD where it fails to achieve 215m	• Minimum SSD westbound of 90m achieved • Minimum SSD eastbound of 90m achieved
Compliance with DMRB	The SSD at the exit (at the ICD) is 120m which is below the required 215m. The reduced visibility is due to the dense vegetation that screens the water treatment plant and properties. Full SSD of 215m is achieved where the design approximately transitions from CD 116 roundabout design, into CD 109 Link design towards the end of the exit radius. A **departure** is required, reference **ARD/3.**	**Compliant**

Cross Section

5.10 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road for B430.

5.11 In accordance with CD 127, para 2.1, Figure 2.1.1N1g, provides the required cross-sectional dimensions for a dual, two lane carriageway, all-purpose, urban road for the SRFI Access Road.

Lane Widths

5.12 Lane widths of 3.65m in accordance with by CD 127.

Hard Shoulders / Hard Strips / Verges

5.13 The following are provided for the B430 and OxSRFI Access Road in accordance with CD 127:

Element	B430	OxSRFI Access Road
Verge	2.5m verges	6.0m verges (2m verge, 3m shared footway / cycleway, 1m verge)
Hard strips	Hard strips have been included for the B430 in accordance with CD 127 however the existing tie-in is sub-standard as it does not feature hardstrips and on this basis a **Departure** is required, reference **ARD/4**.	The OxSRFI Access Road does not include hard strips which is in accordance with urban roads standards to CD 127

Swept Paths & Entry Path Radius (Deflection)

5.14 All directions of travel have been assessed using the maximum legal, European, 16.5m long, articulated heavy goods vehicle, in accordance with CD 116.

5.15 B430, northbound direction of travel achieves and entry path radius of 66m which is complaint under CD 116.

5.16 SRFI, eastbound direction of travel achieves and entry path radius of 95m which is complaint under CD 116.

5.17 Ardley Bypass, southbound direction of travel achieves and entry path radius of 92m which is complaint under CD 116.

Departures From Standard

5.18 **Appendix A** provides a summary of the road layout departures from standard within this section.

APPENDIX A

List of Road Layout departures from standard

OCC Reference	Designers Departure Reference	Likely Departure Safety Risk Category	Design Standard	Departure Location	Departure Summary
TBC	ARD/1	A	CD 109	Ardley Road	Vertical and horizontal geometry – relaxations in combination
TBC	ARD/2	A	CD 109	Ardley Road	Vertical Geometry and reduced SSD – relaxations in combination
TBC	ARD/3	A	CD 109	B430	Visibility – full Stopping Site Distance not achieved at roundabout exit
TBC	ARD/4	A	CD 127	B430	Cross Section - Tie in to existing, no hard strips

APPENDIX B

Geometrical Layouts

DMRB CD 109
B430
S2 carriageway
100kph Design Speed

DMRB CD 109
SRFI Principal Access
D2UAP carriageway
60kph Design Speed

DMRB CD 109
Ardley Bypass
Wide Single 2+1 carriageway
100kph Design Speed

CD116 Figure 3.45
Full SSD at 3.65m from island

CD109 Table 2.10
Full SSD 215m

CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD116 Para 3.26
Entry path radius 66m

CD116 Para 3.18.2
Projected kerb tangential to central island

CD116 Para 3.29.1
Entry kerb radius 20m

CD116 Para 3.28.4
Taper = 1:27
Exit lane widths at start and end of island

CD109 Table 2.10
90m SSD visibility from roundabout exit

CD109 Table 2.10
90m SSD

CD116 Table 6.33
Entry taper 1:30

CD109 Table 2.10
90m SSD visibility on junction approach

CD123 Para 7.2
90m SSD visibility to nearside signal head

CD116 Para 3.26
Entry path radius 95m

OCC / OxSRFI boundary

CD116 Para 3.26
Entry path radius 92m

CD116 Para 3.29.1
Entry kerb radius 15m

CD116 Para 3.29.1
Entry kerb radius 60m

CD116 Para 3.18.1
Entry angle 27.4°

CD116 Para 3.18.1
Entry angle 36°

CD116 Para 3.18.1
Entry angle 35.2°

CD116 Table 6.33
Exit taper 1:30

CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD116 Para 3.29.1
Entry kerb radius 20m

CD116 Para 3.26
Entry path radius 92m

CD116 Para 3.18.2
Projected kerb tangential to central island

CD123 Para 7.2
215m SSD visibility to nearside signal head

CD109 Table 2.10
215m SSD

CD116 Para 3.28.2
Taper = 1:19
Exit lane widths at start and end of island

CD109 Table 2.10
215m SSD southbound achieved

120m visibility possible on roundabout exit with some extra clearance

Departure Ref: ARD/4
CD127 Fig 2.1.1N1e
S2 cross section at tie in - failed as no existing hard strips

Departure Ref: ARD/3
CD109 Table 2.10
215m SSD southbound visibility from roundabout exit

Ardley Fields Farm Cottages

Weighbridge

Public Recycling Facility

Tanks

Notes

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4. Any discrepancies noted on site are to be reported to the engineer immediately.

Legend

- Order Limits
- OCC / OxSRFI boundary
- CDxxx — Adheres to standard
- CDxxx — Relaxation or acceptable deviation from standard
- **CDxxx** — Deviation that requires a departure from standard
- Junction visibility
- Forward visibility
- Visibility Splay with Relaxation
- Visibility Splay with Departure
- STr — Alignment - Straight
- R=xxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

Rev	Date	Details of issue / revision	Drw	Rev
P02	16.03.26	Issued following updates	RP	SRH
P01	03.10.25	Preliminary issue	SB	SRH

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Client
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Project Title
OxSRFI OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title
GEOMETRICAL LAYOUT SHEET 09

Drawn:	S.Birchall		Reviewed:	S.Hilditch
BWB Ref:	NTH2479	Date:	03.10.25	Scale@A1: 1:500

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Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSRFI-BWB-HGN-09-DR-CH-0105	S2	P02

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- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

See Sheet 10A

See Sheet 10B

CD109 Table 2.10
215m SSD

CD123 Para 7.2
215m SSD visibility to nearside signal head

CD109 Table 2.10
215m SSD visibility provided for 1.5xSSD in advance of roundabout

CD123 Figure 3.4
Full SSD at 9m offset from major road

CD109 Table 2.10
Full SSD 215m

CD123 para 5.6.2
15m radii with 1:10 taper over 25m

CD123 para 5.6.1
15m radii

CD123 Figure 3.2a / 3.2b
Junction approach visibility at 15m offset from major road

TL=93.918m(q=0.3)

R=720m

1.00m
3.50m
3.50m
1.00m
3.50m
1.00m

R15

R15

200
250
300
350
400
450

DMRB CD 109
Ardley Bypass
Wide Single 2+1 carriageway
100kph Design Speed

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See Sheet 10A

See Sheet 11

CD109 Table 2.10
215m SSD visibility provided for 1.5xSSD in advance of roundabout

Track

R=720m

1.00m
3.50m
3.50m
1.00m
3.50m
1.00m

500
550
600
650
700
750
800
850

CD123 Figure 3.4
Full SSD at 9m offset from major road

CD109 Table 2.10
Full SSD 215m

DMRB CD 109
Ardley Bypass
Wide Single 2+1 carriageway
100kph Design Speed

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P02	16.03.26	Issued following updates	RP	SRH
P01	03.10.25	Preliminary issue	SB	SRH

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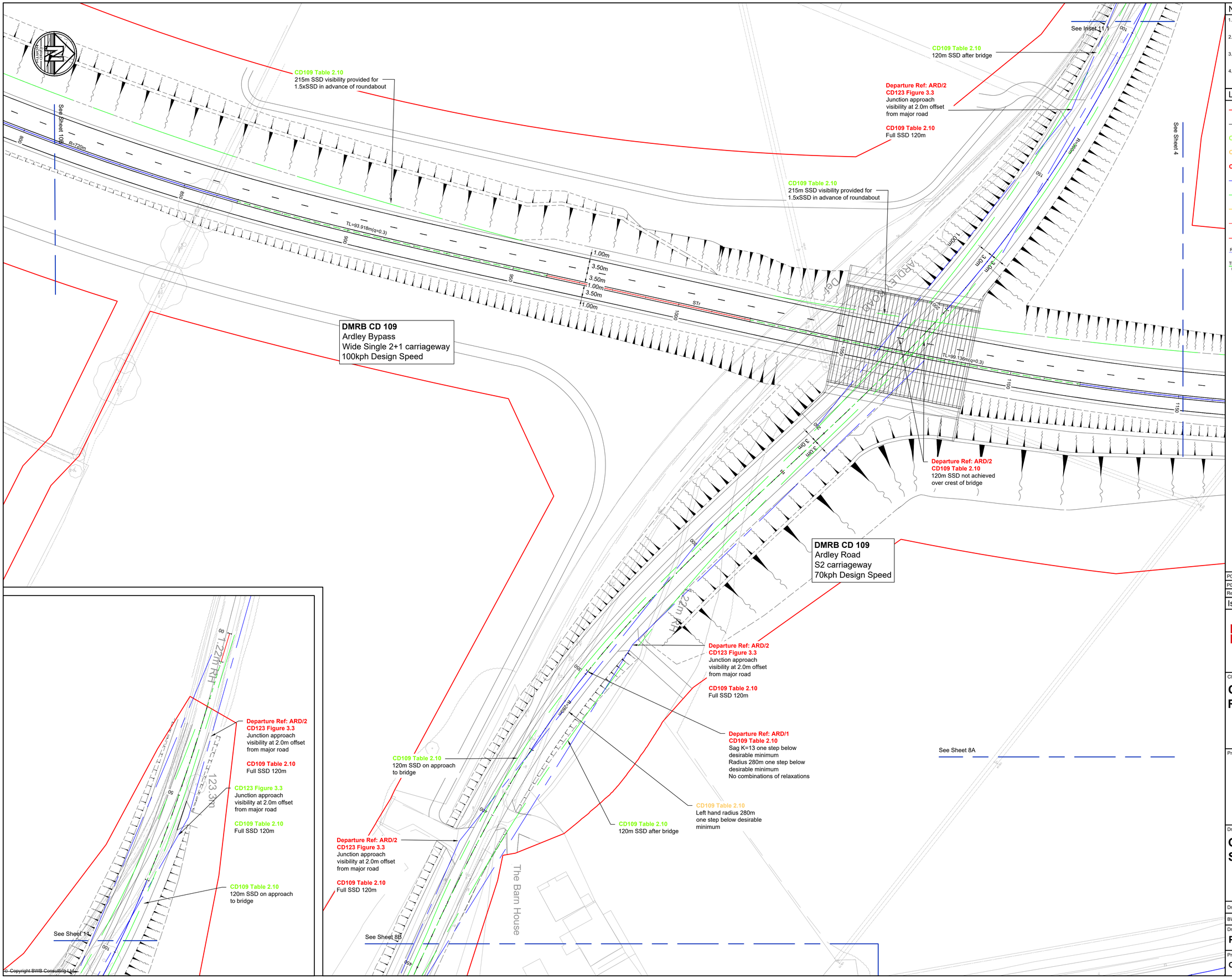
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Drawing Title
GEOMETRICAL LAYOUT SHEET 10

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Legend

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- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

Rev	Date	Details of issue / revision	Drw	Rev
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P01	03.10.25	Preliminary issue	SB	SRH

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Drawing Title

GEOMETRICAL LAYOUT SHEET 11

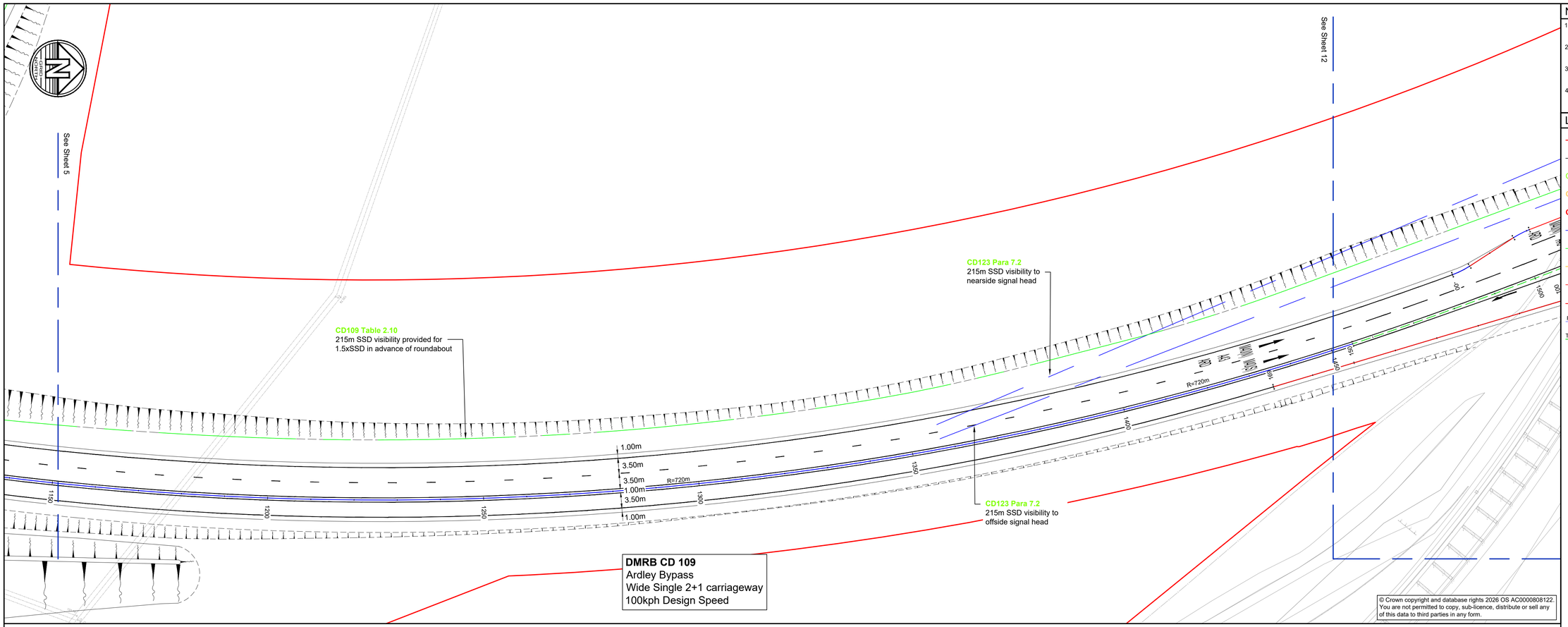
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Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSRFI-BWB-HGN-11-DR-CH-0105	S2	P02

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See Sheet 5
See Sheet 12
CD109 Table 2.10
215m SSD visibility provided for
1.5xSSD in advance of roundabout
CD123 Para 7.2
215m SSD visibility to
nearside signal head
CD123 Para 7.2
215m SSD visibility to
offside signal head
1.00m
3.50m
3.50m
1.00m
3.50m
1.00m
R=720m
R=720m
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
1650
1700
1750
1800
1850
1900
1950
2000
2050
2100
2150
2200
2250
2300
2350
2400
2450
2500
2550
2600
2650
2700
2750
2800
2850
2900
2950
3000
3050
3100

GRID NORTH

See Sheet 13

DMRB CD 116
Roundabout
Design

CD116 Para 3.28.4
Taper = 1:38
Exit lane widths

CD116 Para 3.26
Entry path radius
98m

CD109 Table 2.10
120m SSD visibility to central signal (nearside signal to 0.26m object height obscured by bridge parapet)

CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD116 Para 3.18.2
Projected kerb tangential to central island

CD116 Para 3.26
Entry path radius 99m

CD116 Para 3.18.2
Projected kerb tangential to central island

CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD116 Para 3.45
215m SSD visibility to roundabout give-way line

Ardley roundabout

CD116 Para 3.18.2
Projected kerb tangential to central island

Departure Ref: G19
CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD116 Para 3.26
Entry path radius 37m

CD116 Para 3.26
Entry path radius 61m

CD116 Para 3.28.4
Taper = 1:27
Exit lane widths at start and end of island

CD123 Para 7.2
215m SSD visibility to nearside signal head

CD109 Table 2.10
215m SSD visibility provided for 1.5xSSD in advance of roundabout

CD123 Figure 3.4
Direct access approach visibility at 4.5m offset from major road

CD109 Table 2.10
215m SSD southbound visibility

CD116 Para 3.28.2
Taper = 1:25
Exit lane widths at start and end of island

CD116 Para 3.18.2
Projected kerb tangential to central island

CD116 Para 3.14
Entry lane widths shall not be <3m or >4.5m

CD123 Para 7.2
215m SSD visibility to nearside signal head

CD109 Table 2.10
215m SSD visibility provided for 1.5xSSD in advance of roundabout

Def

Path

Club House

B430

J10

See Sheet 11A

See Sheet 7

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Legend

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- Traffic signal equipment

P03	16.03.26	Issued following updates	RP	SRH
P02	03.10.25	Cutline updated	SB	SRH
P01	31.07.25	Preliminary issue	RP	SRH
Rev	Date	Details of issue / revision	Drw	Rev

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Drawing Title
GEOMETRICAL LAYOUT SHEET 12

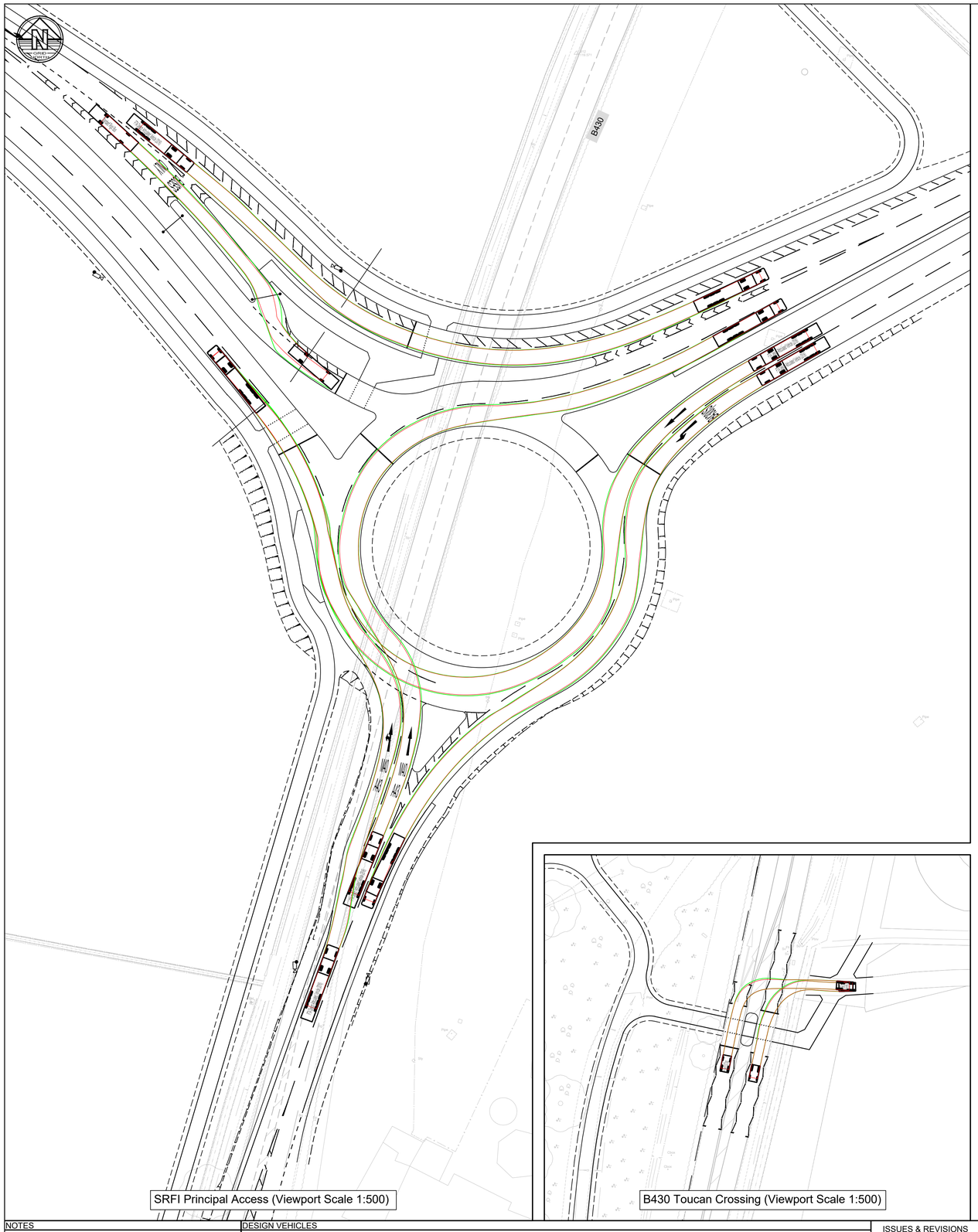
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BWB Ref:	NTH2479	Date:	31.07.25	Scale@A1:	1:500

Drawing Status
PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSRFI-BWB-HGN-12-DR-CH-0105	**S2**	**P03**

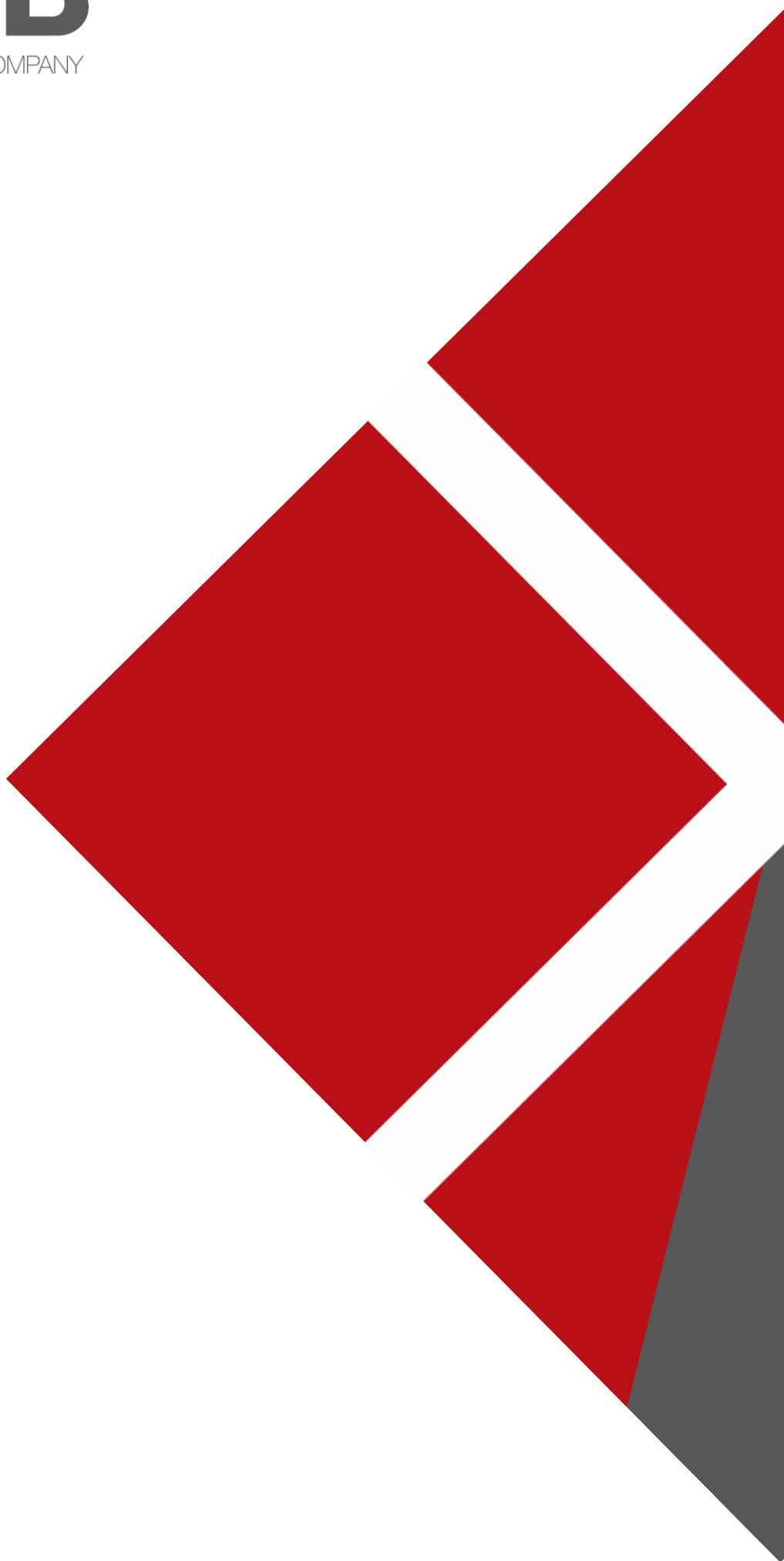
APPENDIX C

Highway Plans Swept Paths


B430
Bus Only
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APPENDIX 33

HEYFORD PARK LINK ROAD DESIGN STRATEGY RECORD

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INFRASTRUCTURE

Mountpark Oxfordshire Strategic Rail Freight Interchange (OxSRFI) Heyford Park Link Road, Geometric Design Strategy Record

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Nottingham
5th Floor, Waterfront House, Station Street
Nottingham, NG2 3DQ
T: 0115 924 1100

March 2026

DOCUMENT ISSUE RECORD

Document Number:	OxSRFI-BWB-GEN-XX-RP-CH-0012
BWB Reference:	NTH2479

Revision	Date of Issue	Status	Author:	Checked:	Approved:
P01	11.11.2025	For comment	Ryan Picknell MEng (Hons) GMICE	Simon Hilditch MEng (Hons) CEng MICE MCIHT	Simon Hilditch MEng (Hons) CEng MICE MCIHT
P02	24.03.2026	For comment	Ryan Picknell MEng (Hons)	Simon Hilditch MEng (Hons) CEng MICE MCIHT	Simon Hilditch MEng (Hons) CEng MFICE MCIHT

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FIGURES

Figure 1.1 Location Plan

1. INTRODUCTION

Instruction

1.1 The Oxfordshire Strategic Rail Freight Interchange (OxSRFI) requires substantial improvements to the strategic road network (SRN) and local road network (LRN), adding new links as well as upgrading existing infrastructure.

1.2 BWB Consulting (BWB) has been instructed by Mountpark (the Client) to develop the highway design for the works on the SRN and LRN, which includes the preparation of this Design Strategy Record (DSR). This report is for the Heyford Park Link Road (HPLR).

1.3 **Figure 1.1** below shows the overall location of the works of OxSFRI and the road network, in relation to the aspects covered in this report.

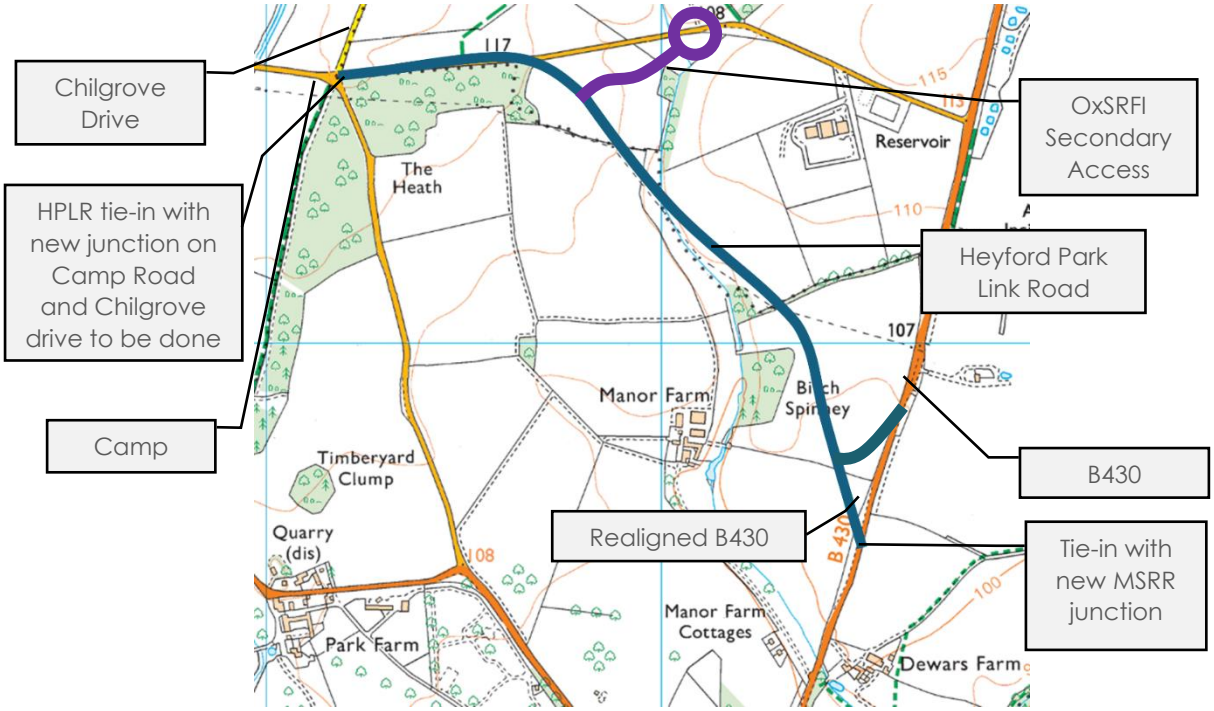


Figure 1.1 Location plan

Acronyms and Abbreviations

DMRB	Design Manual for Roads and Bridges
DSR	Design Strategy Record
HPLR	Heyford Park Link Road
MSRR	Middleton Stoney Relief Road
LRN	Local Road Network
OxSRFI	Oxfordshire Strategic Rail Freight Interchange
OCC	Oxfordshire County Council
NH	National Highways
SRN	Strategic Road Network

Objectives

1.4 The objective of this DSR report, is to record the key decisions made during design.

1.5 The report will record the relaxations and departures from standards contained within the highway design. A detailed narrative for the justification, including a safety risk assessment, is to be submitted separately for approval for each departure.

1.6 The DSR is also used to record how the scheme complies with the principles of good road design set out in GG 103.

1.7 The following reports and documents are to be provided separately to this DSR:

- Transport assessment and modelling;
- Geotechnical reporting to CD 622;
- Directional signage strategy;
- Lighting strategy;
- Structures options reports and AIPs (where required) to CG 300;
- Maintenance and repair statement to GD 304;
- WCHAR assessment and review to GG 142; and
- Stage 1 road safety audit to GG 119.

List of Drawings

1.8 The table below sets out the scheme design and option drawings that are to be read in conjunction with this report. The Geometrical Layouts are provided in **Appendix B** and the Highway Plans Swept Paths are provided in **Appendix C**. The Highway Plans GA, Longsections and Cross Sections are provided separately and are not appended to this report.

Drawing no.	Title	Report section
OxSRFI-BWB-HGN-17-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-18-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-19-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-20-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-21-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-22-DR-CH-0105	Geometrical Layout	3
DCO Document 2.7D	Highway Plans General Arrangement	3/4
DCO Document 2.7T	Highway Plans Longsections	3/4
DCO Document 2.7I	Highway Plans Cross Sections	3
DCO Document 2.7J	Highway Plans Cross Sections	4
OxSRFI-BWB-GEN-XX-DR-CH-0010	Highway Plans Swept Paths	4

2. SCHEME OVERVIEW AND DESIGN STANDARDS

Scheme overview

2.1 The proposed works on the LRN covered by this report are listed below, collectively referred to within this report as the LRN works.

Section of scheme	Description	DCO Work No.
Heyford Park Link Road (HPLR)	Construction of a relief road with active travel facilities around the southeastern side of Heyford Park, including two signalised junctions with the B430 and Camp Road and a secondary SRFI access for buses, pedestrians, cyclists and emergency access.	12
B430 Junction	Realignment of the road with traffic signalised junction between B430 and HPLR with active travel facilities.	12

2.2 **Drawing OxSRFI-BWB-GEN-ZZ-SK-CH-SK041** shows the overall scheme context of OxSRFI and the existing road network and **Figure 1.1** shows the locations of the above works.

Overview of Standards

2.3 The OxSRFI scheme spans across two highway authority boundaries, NH and OCC. This report provides design commentary for the HPLR which is within the OCC area of responsibility only i.e. the LRN works. The SRN design commentary is covered by a separate report.

2.4 The LRN works will be designed in accordance with the following standards:

Doc. Ref.	Document Title	Version / Revision
DMRB CD 109	Highway link design	Revision 1
DMRB CD 123	Geometric design of at-grade priority and signal-controlled junctions	Version 2.1.0
DMRB CD 127	Cross-sections and headrooms	Version 1.0.1
LTN 1/20	Cycle infrastructure design	July 2020

Highway Authority, Road Class, Design Speed and Speed Limit

2.5 The road classes and design speeds for each section of the scheme are listed below. Design speeds have been determined in accordance with CD 109, Section 2.

Section of scheme	Road class	Cross-section	Design speed (kph)	Existing or proposed signed speed limit (mph)
Heyford Park Link Road	All-purpose, rural	S2	100	National speed limit (proposed)
B430	All-purpose, rural	S2	100	Existing retained (National speed limit)

3. HEYFORD PARK LINK ROAD

Layout

3.1 The scheme proposes to provide a link between the B430 and Camp Road. The HPLR will provide a route to direct traffic flows from the MSRR east of Middleton Stoney Village to Heyford Park, helping relieve congestion in the villages.

3.2 The new link is termed Heyford Park Link Road and its classification is an S2, single carriageway, all-purpose, rural, link road, under CD 127.

Design Speed and Geometry

3.3 As noted above this is an S2, single carriageway, all-purpose, rural, link road with a design speed of 100kph (60mph). Therefore, the proposal has been designed in accordance with CD 109, Table 2.10.

Horizontal alignment

3.4 The horizontal alignment is summarised as follows:

HPLR	Horizontal Design Parameters
Description	• Right hand radius 850m (existing centreline) • Straight (existing straight) • Transition (q=0.6) • Left hand radius 510m (one step below minimum R with 7.0% superelevation) – **Relaxation** • Transition (q=0.6) • Straight • Transition (q=0.6) • Left hand radius 360m (two steps below minimum R with 7.0% superelevation) – **Relaxation** • Transition (q=0.6) • Left hand radius 720m (minimum R with 5.0% superelevation) • Transition (q=0.6) • Straight • Transition (q=0.3) • Right hand radius 720m (minimum R with 5.0% superelevation) • Transition (q=0.3) • Straight • Transition (sqrt(24R)) • Left hand radius 300m (between 2 and 3 steps below minimum R with 7.0% superelevation) – **Relaxation** • Transition (sqrt(24R)) • Straight • Right hand radius 724m (minimum R with 5.0% superelevation)
Compliance with DMRB	**Compliant**

Vertical alignment

3.5 The vertical alignment is summarised as follows:

HPLR	Vertical Design Parameters
Description	• Grade 0.51% uphill (tie-in to existing B430 levels) • Crest K 100 • Grade 1.05 downhill • Sag K 35 • Grade 2.0% uphill • Crest K 108 • Grade 1.0% downhill • Sag K 55 • Grade 1.25% uphill • Sag K 85 • Crest K 108 • Sag K 80 • Crest K 110 (tie-in to Heyford Park Junction works)
Compliance with DMRB	**Compliant**

3.6 Due to the tie-ins with the B430 and Camp Road, as well as land constraints involving the nearby woodland, there is not sufficient space to increase the horizontal radii to remove transitions or to reduce the superelevation due to the short nature of the link road, and as mentioned, to ensure the link ties in nicely with the adjoining roads. All horizontal geometry is compliant for the design speed.

3.7 Longer transitions have been applied where there is reasonable justification to increase the transition length over a change in cross section superelevation.

Stopping Sight Distance / Visibility

3.8 Stopping Site Distance has been assessed at 100kph in accordance with CD 109, Table 2.10 and paragraph 3.

3.9 The minimum SSD has been assessed as follows:

HPLR	Visibility Parameters
Description	Minimum SSD of 215m achieved Northbound, with the exception of • The visibility beyond the existing route is dependent on the Heyford Park Works third party scheme although full SSD is expected to be achieved • Four 10m intervals located on the exit of the B430 junction. Over the 40m, SSD of >209m achieved – **Relaxation** • Nine 10m intervals located beyond the existing route failed full SSD within immediate approach to MSRR junction. Over the 90m, SSD of >88m achieved – **Departure required** One step below desirable minimum SSD of 160m achieved Northbound where it fails to achieve 215m on the proposed route

HPLR	Visibility Parameters
	Minimum SSD southbound of 215m achieved, with the exception of • Three 10m intervals located beyond the Chilgrove Drive junction. Over the 30m, SSD of >142m is achieved – **Relaxation** • Nine 10m intervals located beyond the MSRR junction. Over the 90m, SSD 131m achieved - **Relaxation** • Nine 10m intervals located passed the design extents on the existing route. Over the 90m, SSD of >90m achieved – **Existing departure** One step below desirable minimum SSD of 160m achieved Northbound where it fails to achieve 215m on the proposed route
Compliance with DMRB	CD 109 does not permit the use of relaxations, or a combination of relaxations on the immediate approach to a junction nor SSD below two steps below desirable minimum. Existing vertical crest on the B430 of 28K is impeding vertical SSD both northbound and southbound. On this basis a **departure** is required, reference **HPLR/1.**

Cross-section

3.10 In accordance with CD 127, para 2.1, Figure 2.1.1N1e provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road.

Lane width

3.11 The lane width is 3.65m as required by CD 127. Although the horizontal alignment of the link does have a radius of less than 400m, the lane widths are already at maximum width and hence no lane widening is required.

Hard shoulder, hard strip and verge

3.12 The following are provided in accordance with CD 127 for cross-section Single (S2) and recommendations from LTN 1/20 regarding cycle width provisions:

Item	Provision (m) between Chilgrove Drive junction and Secondary Access	Provision (m) between Secondary Access and B430
Verge (southwest side)	2.5	2.5
Hard strip (southwest side)	1.0	1.0
Hard strip (northeast side	1.0	1.0
Separation margin (northeast side) excl hard strip)	2.0	2.0
Footway/cycleway (northeast side)	3.0 cycle track (2-way) 0.2 separation 2.0 footway	3.0 shared use

3.13 The enhanced provision between the Chilgrove Drive junction and the secondary access is due to the likelihood of pedestrian use between Heyford Park and the OxSRFI site. Elsewhere the likelihood of pedestrian use is predicted to be very low especially as leisure routes for pedestrians are provided elsewhere through the landscaping areas.

3.14 Verge widths, where applicable, have been increased over the minimum value to accommodate the requisite stopping sight distance in accordance with CD 109 and CD127 para 2.13.1 (1).

Swept Paths

3.15 Directions of travel with connection to the B430 and MSRR have been assessed using an articulated vehicle, 16.5m long, articulated heavy goods vehicle, in accordance with CD 123.

3.16 Directions of travel with connection to the SRFI Secondary Access have been assessed using a Standard Rigid Bus, 12.0m long, as the access is only to be used by buses and emergency vehicles.

Summary

3.17 The HPLR is a fully compliant geometric design to CD 109 and CD 127.

3.18 In terms of specific intervals on the northbound and southbound directions of travel SSD failing to achieve 215m, the design still achieved SSD to 160m which is one step below desirable minimum. As there are no horizontal geometry relaxations and it is not on the approach to a junction, then this is an acceptable relaxation and still compliant.

3.19 The existing vertical crest on the B430 of 28K is impeding vertical visibility for both northbound and southbound directions. As this is within the immediate approach to the MSRR junction northbound and not achieving the maximum two steps below desirable minimum SSD on southbound, a departure from standard is required.

Departures From Standard

3.20 **Appendix A** provides a summary of the road layout departures from standard within this section.

4. HPLR & B430 JUNCTION

Layout

4.1 The B430 improvement proposes to realign the route to incorporate a signalised junction and provide active travel facilities. The realignment is to accommodate the signalised junction with the Heyford Park Link Road with the idea of the active travel facilities linking the public rights of way between Heyford Park and Middleton Stoney. At present the B430 is a rural, all-purpose, S2 single carriageway.

Design Speed and Geometry

4.2 B430 is an S2, single carriageway, all-purpose, rural route, with a design speed of 100kph with the national speed limit in place.

Horizontal alignment

4.3 The horizontal alignment is summarised as follows:

B4030	Horizontal Design Parameters
Description	• Straight (existing straight) • Right hand radius 1100m (existing centreline) • Transition (sqrt(24R)) • Right hand radius 180m (4 steps below minimum R with 7.0% superelevation) – **Relaxation**
Compliance with DMRB	**Compliant**

Vertical alignment

4.4 The vertical alignment is summarised as follows:

B4030	Vertical Design Parameters
Description	• Grade 0.42% downhill (tie-in to existing B430 levels) • Crest K 100 • Grade 4.01% downhill (tie-in to HPLR)
Compliance with DMRB	**Compliant**

Stopping Sight Distance / Visibility

4.5 Stopping Site Distance has been assessed at 100kph, in accordance with CD 109, Table 2.10 and paragraph 3.

4.6 The minimum SSD has been assessed as follows:

B4030	Visibility Parameters
Description	Minimum SSD of 215m achieved Northbound Minimum SSD of 215m achieved Southbound
Compliance with DMRB	**Compliant**

Cross-section

4.7 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road for B430.

Lane width

4.8 The lane width is 3.65m as required by CD 127. Although the horizontal alignment of the link does have a radius of less than 400m, the lane widths are already at maximum width and hence no lane widening is required.

Hard shoulder, hard strip and verge

4.9 The following is provided for the B430 in accordance with CD 127 and recommendations from LTN 1/20 regarding cycle width provisions:

Element	B430
Shared use footway / cycleway	3.0m with 1.0m verge beyond
Separation margin (northeast side) excl hard strip)	2.0m
Hard strips	Hard strips have been included for the B430 in accordance with CD 127 however the existing tie-in is sub-standard as it does not feature hardstrips and on this basis a **Departure** is required, reference **HPLR/2**.

Swept Paths

4.10 Directions of travel with connection to the HPLR and B430 have been assessed using an articulated vehicle, 16.5m long, articulated heavy goods vehicle, in accordance with CD 123.

Summary

4.11 B430 has a fully compliant geometric design to CD 109 and complies with CD 127 except for the hard strips.

Departures From Standard

4.12 **Appendix A** provides a summary of the road layout departures from standard within this section.

5. B430 & MSRR JUNCTION

Layout

5.1 A new junction is to be provided between the Middleton Stoney Relief Road (MSRR) and the realigned B430. This will incorporate a signalised junction and provide active travel facilities. The realignment is to accommodate the signalised junction with the Heyford Park Link Road with the idea of the active travel facilities linking the public rights of way between Heyford Park and Middleton Stoney.

5.2 The Geometric Design Strategy Record for the MSRR has been covered in a separate report, refer to OxSRFI-BWB-GEN-XX-RP-CH-0010 for details.

Design Speed and Geometry

5.3 The MSRR is an S2, single carriageway, all-purpose, rural, link road with a design speed of 100kph (60mph). Therefore, the proposal has been designed in accordance with CD 109, Table 2.10.

Horizontal alignment

5.4 For details regarding horizontal alignment refer to the Geometric Design Strategy Record for the MSRR, namely OxSRFI-BWB-GEN-XX-RP-CH-0010.

Vertical alignment

5.5 For details regarding vertical alignment refer to the Geometric Design Strategy Record for the MSRR, namely OxSRFI-BWB-GEN-XX-RP-CH-0010.

Stopping Sight Distance / Visibility

5.6 For details regarding stopping sight distance and visibility refer to the Geometric Design Strategy Record for the MSRR, namely OxSRFI-BWB-GEN-XX-RP-CH-0010.

Cross-section

5.7 In accordance with CD 127, para 2.1, Figure 2.1.1N1e provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road.

Lane width

5.8 The lane width is 3.65m as required by CD 127. The horizontal alignment of the link does not have a radius of less than 400m and hence no lane widening is required.

Hard shoulder, hard strip and verge

5.9 The following are provided in accordance with CD 127 for cross-section Single (S2):

- 2.5m verge
- 1.0m nearside hard strip
- 1.0m offside hard strip
- 6.0m verge (2.0m verge, 3.0m shared use footway / cycleway & 1.0m verge)

5.10 Hard strips have been included for the B430 in accordance with CD 127 however the existing tie-in on the B430 to the south is sub-standard as it does not feature hardstrips and on this basis a **Departure** is required. This is included within reference **HPLR/2.**

Swept Paths

5.11 Directions of travel with connection to the B430 and MSRR have been assessed using an articulated vehicle, 16.5m long, articulated heavy goods vehicle, in accordance with CD 123.

Summary

5.12 MSRR has a fully compliant geometric design to CD 109 and complies with CD 127.

Departures From Standard

5.13 **Appendix A** provides a summary of the road layout departures from standard within this section.

APPENDIX A

List of Road Layout departures from standard

OCC Reference	Designers Departure Reference	Likely Departure Safety Risk Category	Design Standard	Departure Location	Departure Summary
TBC	HPLR/1	A	CD 109	Northbound immediate approach to MSRR junction and Southbound exit from MSRR junction	Vertical Visibility – Northbound visibility not achieving SSD of 215m due to existing vertical crest curve of 28K Vertical Visibility – Southbound visibility not achieving required two steps below desirable minimum of 120m due to existing vertical crest curve of 28K
TBC	HPLR/2	A	CD 127	B430	Cross Section - No hard strips added to existing B430 north and south of B430/HPLR/MSRR junction

APPENDIX B

Geometrical Layouts

GRID NORTH

See Sheet 16

See Sheet 18

CD109 Table 2.10
Norhtbound visibility assessment dependent on the Heyford Park third party scheme but full SSD expected to be achieved

CD109 Para 2.13
Southbound Immediate approach to SRFI Secondary Access junction at 1.5 times the desirable minimum stopping distance (215 x 1.5=322.5m)

CD109 Figure 3.1
Achieve Southbound SSD from drivers eye height (1.05m) to object height (0.26m)

CD109 Table 2.10
Full SSD @ 215m - Failed
3 x10m intervals achieved >142m)

CD127 Fig 2.1.1N1e
S2 cross section

CD109 para 4.13
Transition 84.85m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 300 L=237.9m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 300 L=119.0m

transition check CD109 para 4.15.1
SQroute(24 x 300) L=84.85m

Tie in to signalised junction being constructed by the Heyford Park third party scheme (alternative layout provided on OxSRFI-BWB-LSI-04-DR-CH-0104)

CD143 Para E/3.5
Unsegregated footway / cycleway 3.0m minimum

119.0m

2050

2000

1950

1900

1850

1800

1750

TL=84.85m ((Sqrt(24R)))

3.65m

3.65m

STr

R=724m

114.7m

1.22m RH

CD123 Para 7.2
215m SSD visibility to signal head

DMRB CD 109
Heyford Park Link Road (HPLR)
Design Speed: 100kph

CD109 Para 2.13
Northbound Immediate approach to Chilgrove Drive junction at 1.5 times the desirable minimum stopping distance (215 x 1.5=322.5m)

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

ETL

Camp Rd

Chilgrove Drive

Alchester Valley Area

Notes

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Legend

- Order Limits
- OCC / OxSRFI boundary
- CDxxx — Adheres to standard
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- **CDxxx** — Deviation that requires a departure from standard
- Junction visibility
- Forward visibility
- Visibility Splay with Relaxation
- Visibility Splay with Departure
- STr — Alignment - Straight
- R=xxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment
- 3rd party scheme as annotated (indicative and shown for reference only)

Rev	Date	Details of issue / revision	Drw	Rev
P02	16.03.26	Issued following updates	RP	SRH
P01	11.11.25	Preliminary issue	RP	SRH

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Project Title
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Drawing Title
GEOMETRICAL LAYOUT SHEET 17

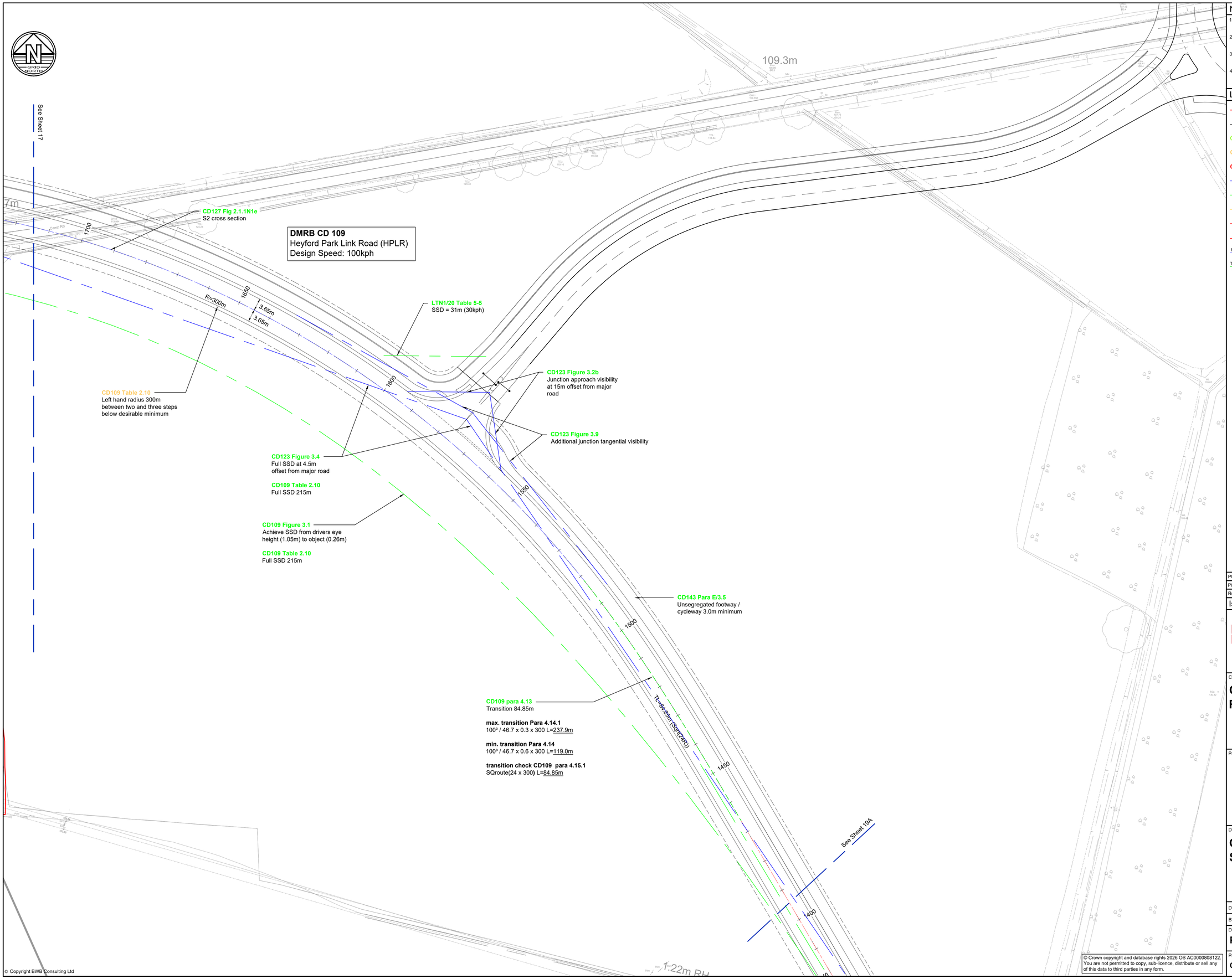
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- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

Rev	Date	Details of issue / revision	Drw	Rev
P02	16.03.26	Issued following updates	RP	SRH
P01	11.11.25	Preliminary issue	RP	SRH

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GEOMETRICAL LAYOUT SHEET 18

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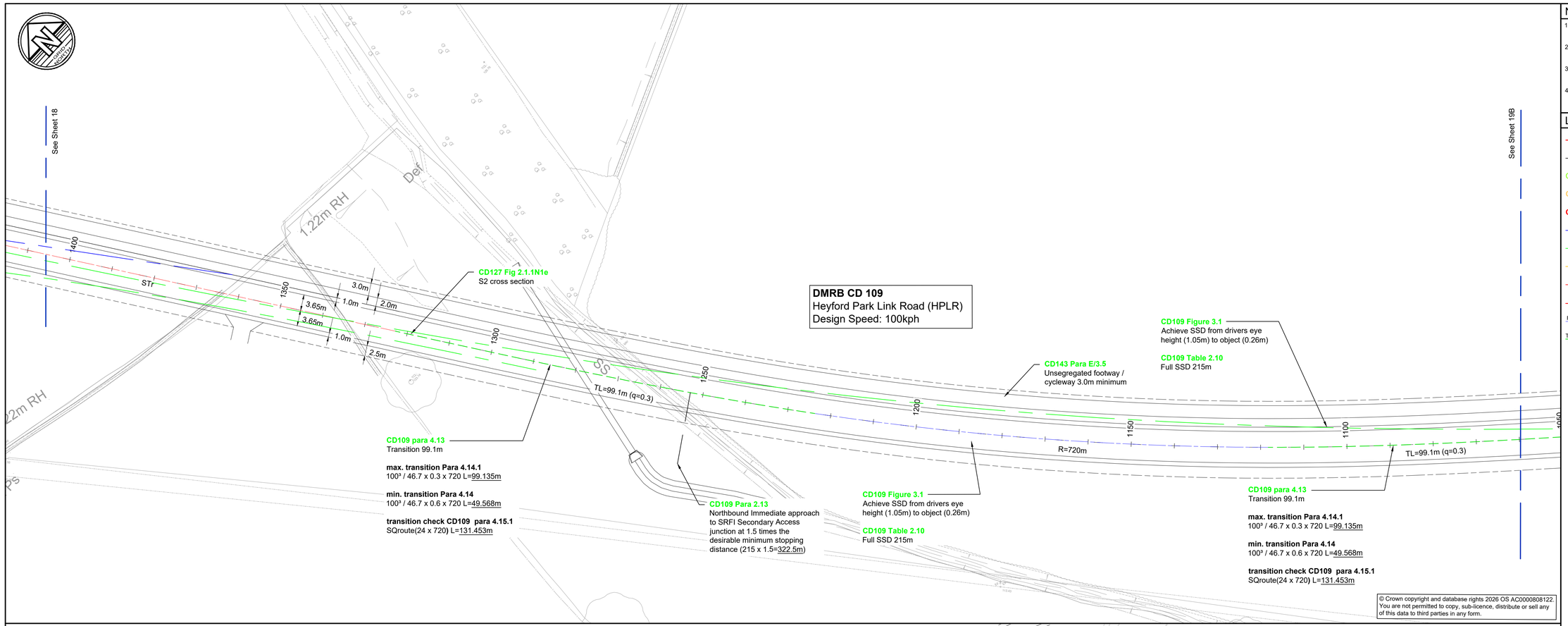
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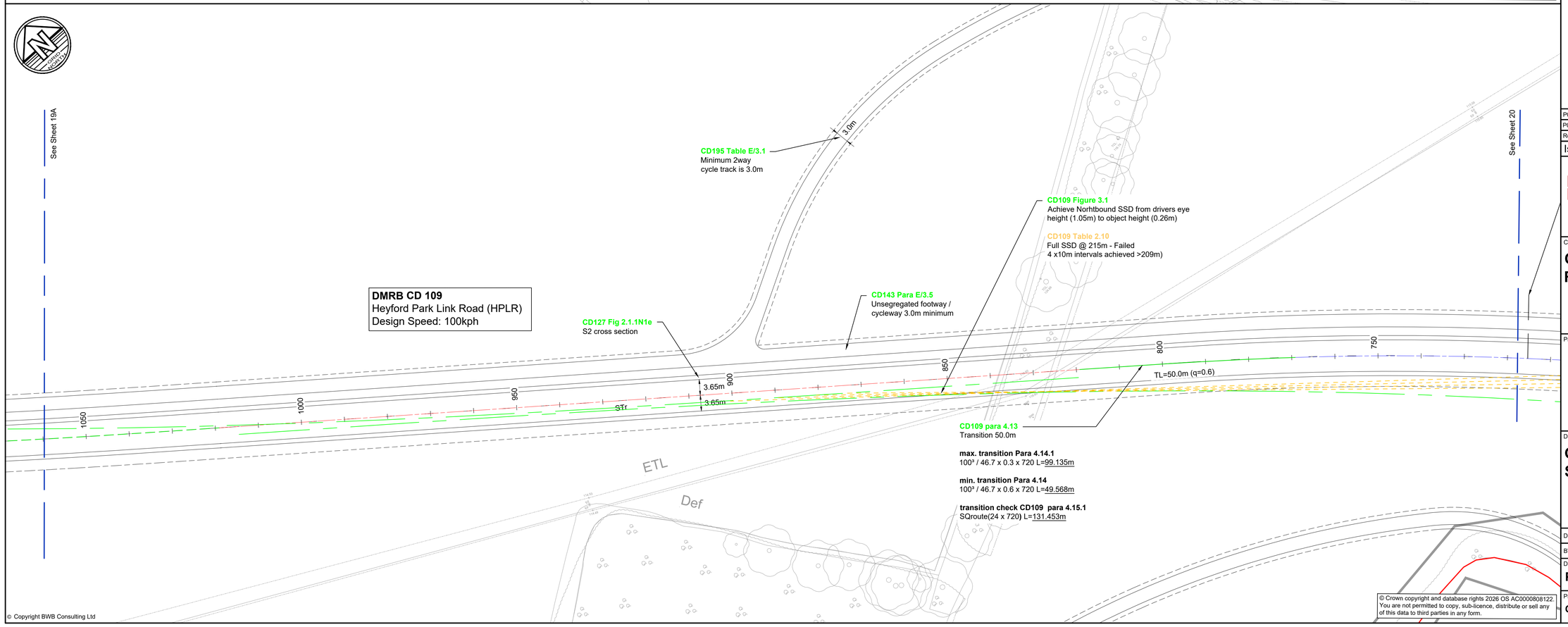
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- Forward visibility
- Visibility Splay with Relaxation
- Visibility Splay with Departure
- STr — Alignment - Straight
- R=xxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

P02	16.03.26	Issued following updates	RP	SRH
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GEOMETRICAL LAYOUT SHEET 19

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Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSFI-BWB-HGN-19-DR-CH-0105	S2	P02

GRID NORTH

See Sheet 19B

750

CD109 Para 2.13
Southbound Immediate approach to B430 junction at 1.5 times the desirable minimum stopping distance (215 x 1.5=322.5m)

CD109 Figure 3.1
Achieve Northtbound SSD from drivers eye height (1.05m) to object height (0.26m)

CD109 Table 2.10
Full SSD @ 215m - Failed
4 x10m intervals achieved >209m)

700

CD127 Fig 2.1.1N1e
S2 cross section

R=720m

1.0m
3.65m
3.65m
1.0m
3.0m
2.5m

650

CD143 Para E/3.5
Unsegregated footway / cycleway 3.0m minimum

CD127 table 2.28
Rate of change 1:50

600

Revision 3 Priority Area

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

CD123 Para 7.2
215m SSD visibility to signal head

CD123 Figure 3.4
Full SSD at 9m offset from major road

CD109 Table 2.10
Full SSD 215m

TL=50.0m (q=0.6)

CD109 para 4.13
Transition 50.0m

max. transition Para 4.14.1
100^3 / 46.7 x 0.3 x 720 L=99.135m

min. transition Para 4.14
100^3 / 46.7 x 0.6 x 720 L=49.568m

transition check CD109 para 4.15.1
SQroute(24 x 720) L=131.453m

550

CD109 Para 2.13
Southbound Immediate approach to MSRR junction at 1.5 times the desirable minimum stopping distance (215 x 1.5=322.5m)

See Sheet 21

CD143 Para E/3.5
Unsegregated footway / cycleway 3.0m minimum

B430

-158
-150
EXSTr
-100
-50
EXR=1100m

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

106.0m

CD123 Figure 3.1
Junction approach SSD visibility

CD109 Table 2.10
Full SSD 215m

00

Departure Ref: HPLR/2
CD127 Fig 2.1.1N1e
S2 cross section at tie in - failed as no existing hard strips

50

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- Traffic signal equipment

Rev	Date	Details of issue / revision	Drw	Rev
P02	16.03.26	Issued following updates	RP	SRH
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GEOMETRICAL LAYOUT SHEET 20

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Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSFI-BWB-HGN-20-DR-CH-0105	S2	P02

GRID NORTH

See Sheet 20

CD143 Para E/3.5
Unsegregated footway / cycleway 3.0m minimum

CD123 Figure 5.21b
Major / minor priority junction with nearside diverge with nearside auxiliary lane

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

CD127 table 2.28
Rate of change 1:50

CD109 Table 2.10
Left hand radius 360m two steps below desirable minimum

CD123 Table 5.22
Direct taper 25m
Deceleration length 80m

CD123 Para 7.9
Dedicated left turn lane width

CD123 para 5.6.2
15m radii with 1:10 taper over 25m

CD123 para 7.14
Signalised junction geomtery shall be same as section 5

CD123 table 6.1.1
Island taper 1:35

CD123 table 6.1.1
Island taper 1:30

CD123 Para 5.13
Island 141m²

LTN1/20 Table 5-5
SSD = 31m (30kph)

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

CD143 table E/4.7
Island depth 3.6m

CD123 para 7.1
Intersection angle 71°

CD143 table E/4.7
Island depth 3.6m

CD123 table 6.1.1
Island taper 1:54

CD123 Para 5.13
Island 224m²

CD123 Para 7.9
Dedicated left turn lane width

CD123 para 7.13
Design shall incorporate turning radii for worst case swept path on signalised junction

CD123 table 6.1.1
Island taper 1:30

CD123 Figure 3.2b
Junction approach visibility at 15m offset from major road

CD123 Para 7.9
Dedicated left turn lane width

CD109 para 4.13
Transition 100.0m chosen to accommodate superelevation turnover

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 360 L=198.271m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 360 L=99.135m

transition check CD109 para 4.15.1
SQroute(24 x 360) L=92.951m

CD123 Para 5.13
Island 45m²

CD143 table E/4.7
Island depth 3.6m

CD123 Para 7.15
Island set-back 2.5m

CD123 table 6.1.1
Island taper 1:50

CD123 Para 7.2
215m SSD visibility to signal head

CD123 Para 7.15
Island set-back 1.5m

CD123 para 5.6.2
15m radii with 1:10 taper over 25m

CD123 para 7.14
Signalised junction geomtery shall be same as section 5

CD123 Figure 6.3e
Dual carriageway major / minor priority junction

CD123 Table 5.22

CD123 Figure 3.4
Full SSD at 9m offset from major road

CD109 Table 2.10
Full SSD 215m

CD123 Para 6.15
Dual carriageway lane width to match approach lane width either side of junction

CD123 Para 7.8.3
Lane width 3.65m

CD123 Fig 2.10
Dual carriageway with central reserve for priority junction
CD123 Fig 2.10

CD127 Fig 2.1.1N1e
D2AP cross section

CD143 Table 5.16
Minimum 2way bridleway is 3.0m

CD143 Para E/3.5
Unsegregated footway / cycleway 3.0m minimum

CD123 table 6.1.1
Island taper 1:50

CD123 Para 7.9
Dedicated left turn lane width

CD109 para 4.13
Transition 66.0m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 180 L=396.5m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 180 L=198.3m

transition check CD109 para 4.15.1
SQroute(24 x 180) L=65.73m

See Sheet 22

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Notes

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4. Any discrepancies noted on site are to be reported to the engineer immediately.

Legend

- Order Limits
- OCC / OxSRFI boundary
- CDxxx — Adheres to standard
- CDxxx — Relaxation or acceptable deviation from standard
- CDxxx — Deviation that requires a departure from standard
- Junction visibility
- Forward visibility
- Visibility Splay with Relaxation
- Visibility Splay with Departure
- STr — Alignment - Straight
- R=xxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

P02	16.03.26	Issued following updates	RP	SRH
P01	11.11.25	Preliminary issue	RP	SRH
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

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Client
OXFORDSHIRE RAILFREIGHT LTD.

Project Title
OxSRFI
OXFORDSHIRE
STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title
GEOMETRICAL LAYOUT SHEET 21

Drawn:	R.Picknell		Reviewed:	SRH	
BWB Ref:	NTH2479	Date:	11.11.25	Scale@A1:	1:500

Drawing Status
PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSFI-BWB-HGN-21-DR-CH-0105	S2	P02

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See Sheet 21

See Sheet 23

CD109 para 4.13
Transition 70.0m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 510 L=139.956m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 510 L=69.978m

transition check CD109 para 4.15.1
SQroute(24 x 510) L=110.634m

CD123 para 7.1
Intersection angle 110°

CD123 para 7.1.2
If not feasible it should be as close to 90° as practicable but no less than 70°

CD123 para 7.13

Design shall incorporate turning radii for worst case swept path on signalised junction

CD123 Para 7.8.3

Straight ahead lane widths minimum of 3.65m
CD123 Para 7.8.3

CD123 Para 7.2
215m SSD visibility to signal head

CD123 table 6.1.1

Island taper 1:30

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

CD109 Table 2.10
Left hand radius 510m one step below desirable minimum

CD109 Para 2.13
Northbound Immediate approach to B430 junction at 1.5 times the desirable minimum stopping distance (215 x 1.5=322.5m)

CD109 para 4.13
Transition 70.0m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 510 L=139.956m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 510 L=69.978m

transition check CD109 para 4.15.1
SQroute(24 x 510) L=110.634m

CD127 Table 2.28

Rate of change 1:100

CD109 Figure 3.1
Achieve Norhtbound SSD from drivers eye height (1.05m) to object height (0.26m)

Departure Ref: HPLR/1
CD109 Table 2.10
Full SSD @ 215m - Failed 50m after design ends - existing issue
(9 x10m intervals achieved >88m)
Immediate Approach to MSRR Junction
Existing vertical crest curve of 28K responsible

CD123 table 6.1.1

Island taper 1:50

CD123 Para 7.9

Dedicated left turn lane width

CD123 Figure 3.2a
Junction approach visibility at 15m offset from major road

CD123 Para 5.13
Island 175m²

CD123 table 6.1.1

Island taper 1:30

CD123 Figure 3.1
Junction approach SSD visibility

CD109 Table 2.10
Full SSD 215m

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

CD109 para 4.13
Transition 99.1m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 720 L=99.135m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 720 L=49.568m

transition check CD109 para 4.15.1
SQroute(24 x 720) L=131.453m

CD109 Figure 3.1
Achieve Southbound SSD from drivers eye height (1.05m) to object height (0.26m)

CD109 Table 2.10
Full SSD @ 215m - Failed
9 x10m intervals achieved >131m

CD123 Figure 3.4
Full SSD at 9m offset from major road

CD109 Table 2.10
Full SSD 215m

CD127 Fig 2.1.1N1e
S2 cross section

CD109 Figure 3.1
Achieve Southbound SSD from drivers eye height (1.05m) to object height (0.26m)

Existing Departure
CD109 Table 2.10
Full SSD @ 215m - Failed 50m after design ends - existing issue
(9 x10m intervals achieved >90m)
Existing departure unaffected by scheme proposals

CD143 Para E/3.5
Unsegregated footway / cycleway 3.0m minimum

CD143 Table 5.16
Minimum 2way bridleway is 3.0m

2.8m

TL=70.0m (q=0.6)

TL=99.1m (q=0.3)

R=200m

R=510m

STr

250 150 100 50 200

3.65 3.65 3.65 3.65 3.65 3.65

Revision 3 Priority Area

DMRB CD 109
Middleton Stoney Relief Road (MSRR)
Design Speed: 100kph

Notes

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Legend

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- CDxxx — Relaxation or acceptable deviation from standard
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- Junction visibility
- Forward visibility
- Visibility Splay with Relaxation
- Visibility Splay with Departure
- STr — Alignment - Straight
- R=xxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

P03	16.03.26	Issued following updates	RP	SRH
P02	11.11.25	HPLR geometry updated	RP	SRH
P01	03.06.25	Preliminary	SB	SRH
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

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Client
OXFORDSHIRE RAILFREIGHT LTD.

Project Title
OxSRFI OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title
GEOMETRICAL LAYOUT SHEET 22

Drawn:	S. Birchall		Reviewed:	S. Hilditch	
BWB Ref:	NTH2479	Date:	03.06.25	Scale@A1:	1:500

Drawing Status
PRELIMINARY

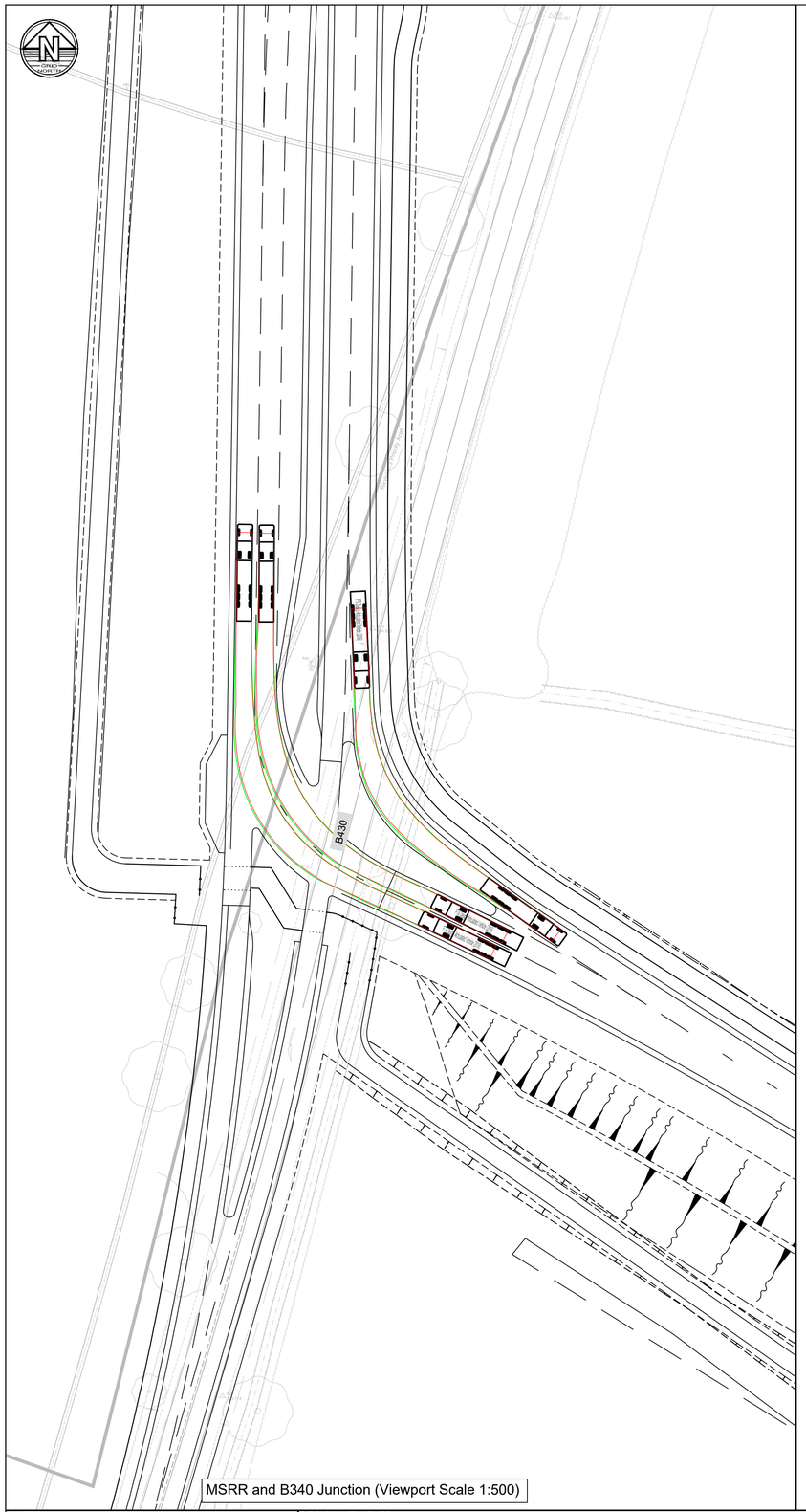
Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSFI-BWB-HGN-22-DR-CH-0105	S2	P03

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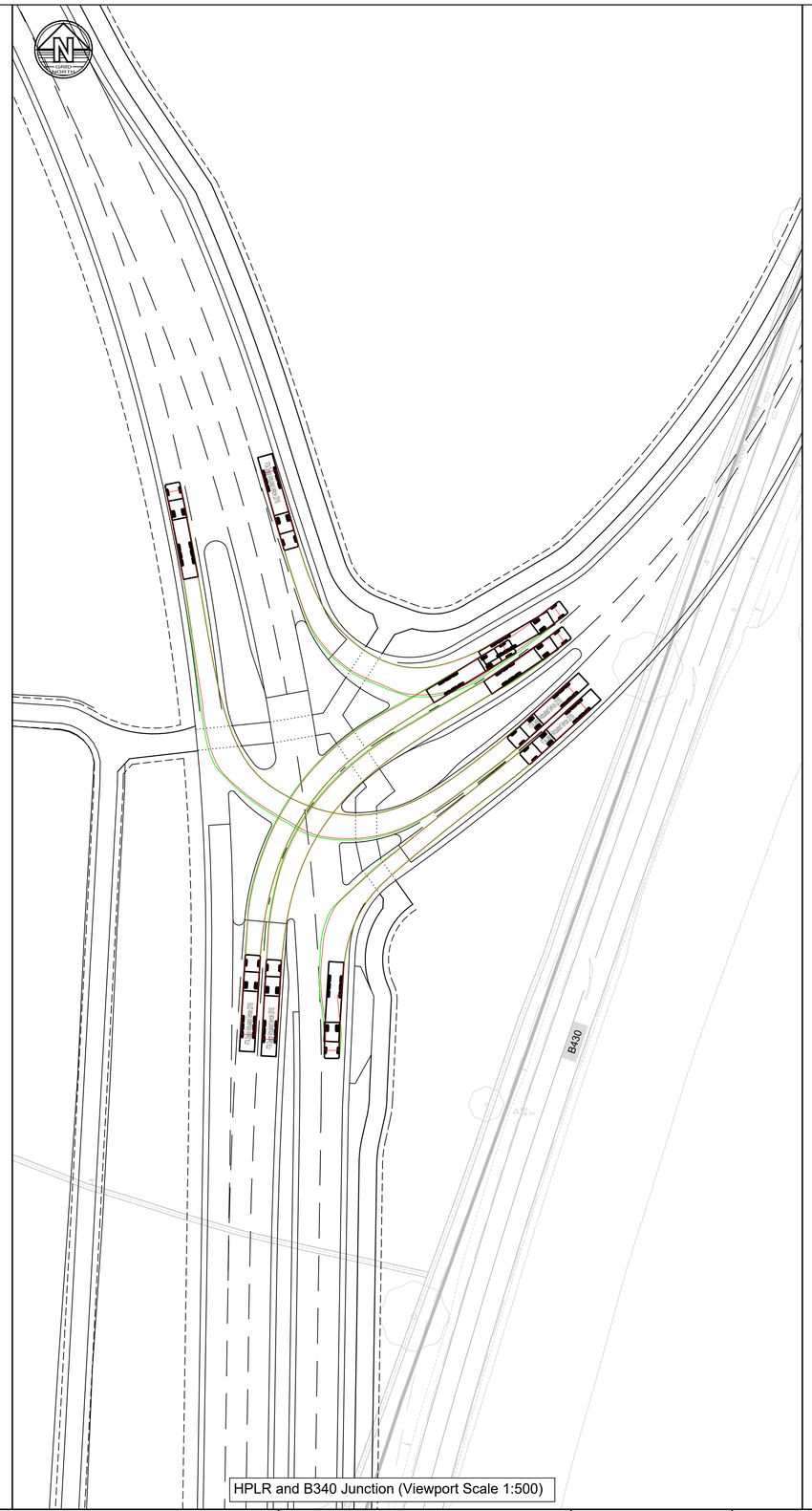
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APPENDIX C

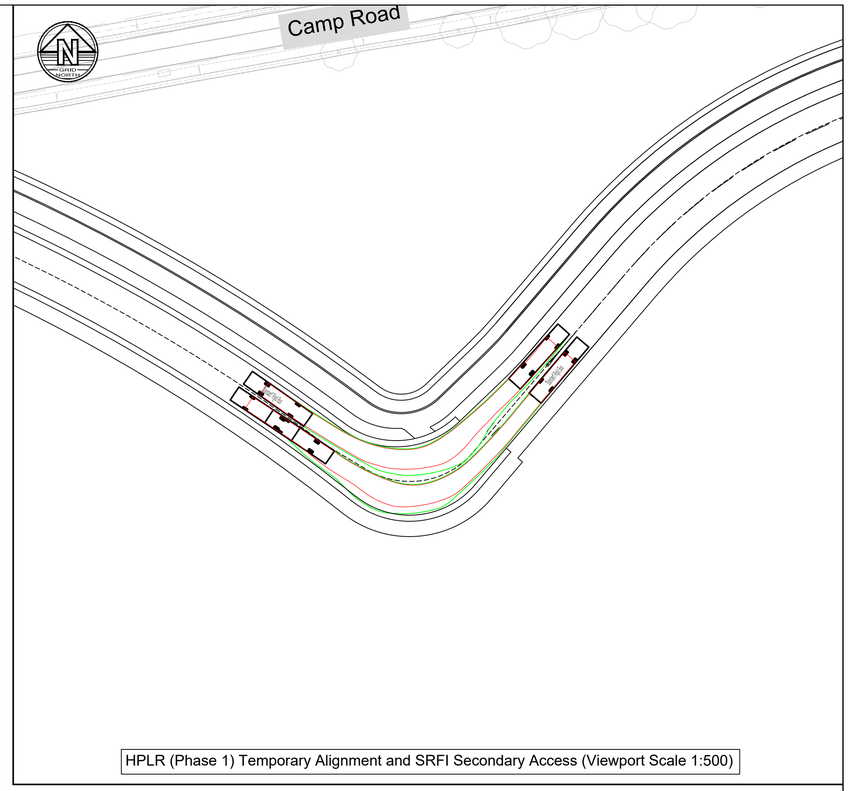
Highway Plans Swept Paths



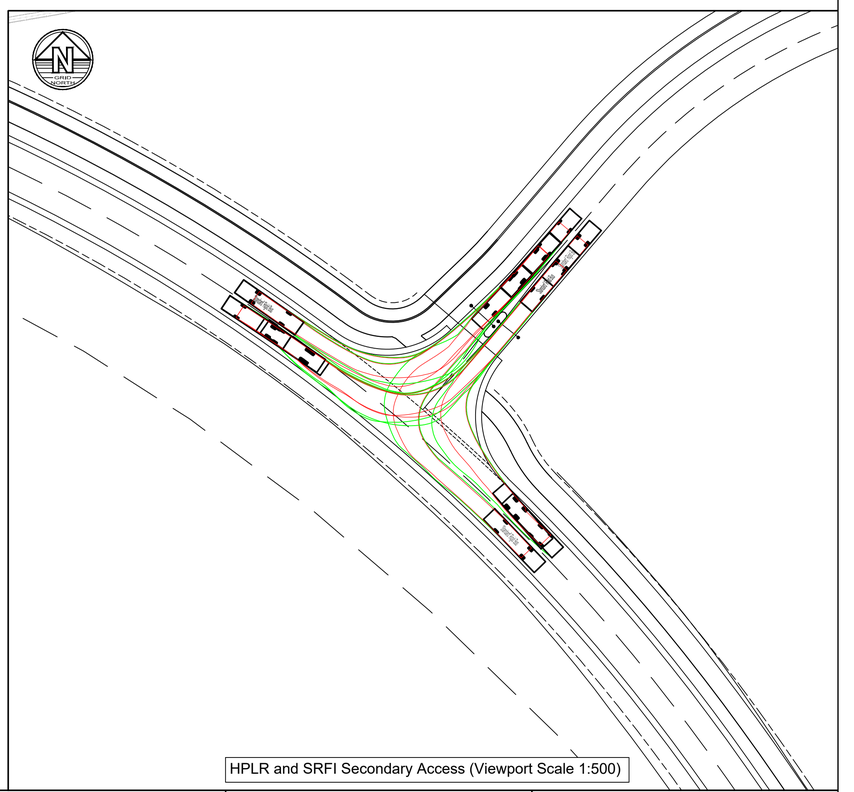
MSRR and B340 Junction (Viewport Scale 1:500)



HPLR and B340 Junction (Viewport Scale 1:500)



HPLR (Phase 1) Temporary Alignment and SRFI Secondary Access (Viewport Scale 1:500)



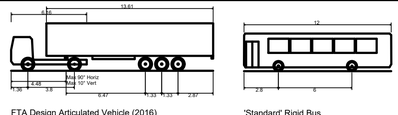
HPLR and SRFI Secondary Access (Viewport Scale 1:500)

NOTES

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2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.
5. All swept paths modelled with a forward speed of 15kph (approx 10mph).

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DESIGN VEHICLES



FTA Design Articulated Vehicle (2016)		'Standard' Rigid Bus	
Overall Length	16.480m	Overall Length	12.000m
Overall Width	2.550m	Overall Width	2.550m
Overall Body Height	3.870m	Overall Body Height	3.069m
Min Body Ground Clearance	0.515m	Min Body Ground Clearance	0.309m
Max Track Width	2.470m	Track Width	2.350m
Lock to lock time	3.00s	Lock to lock time	4.00s
Kerb to Kerb Turning Radius	6.600m	Wall to Wall Turning Radius	10.771m

ISSUES & REVISIONS

Rev	Date	Details of issue / revision	Drw	Rev
P01	11.11.25	Issued for information	RP	SRH
P02	06.03.26	Issued following updates	RP	SRH

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Client
OXFORDSHIRE RAILFREIGHT LTD.

Project Title
OxSRFI
OXFORDSHIRE
STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title
HIGHWAY PLANS SWEPT PATHS

Drawn:	R.Picknell		Reviewed:	S.Hilditch		
BWB Ref:	NTH2479	Date:	11.11.25	Scale@A1:	1:500	

Drawing Status
FOR INFORMATION

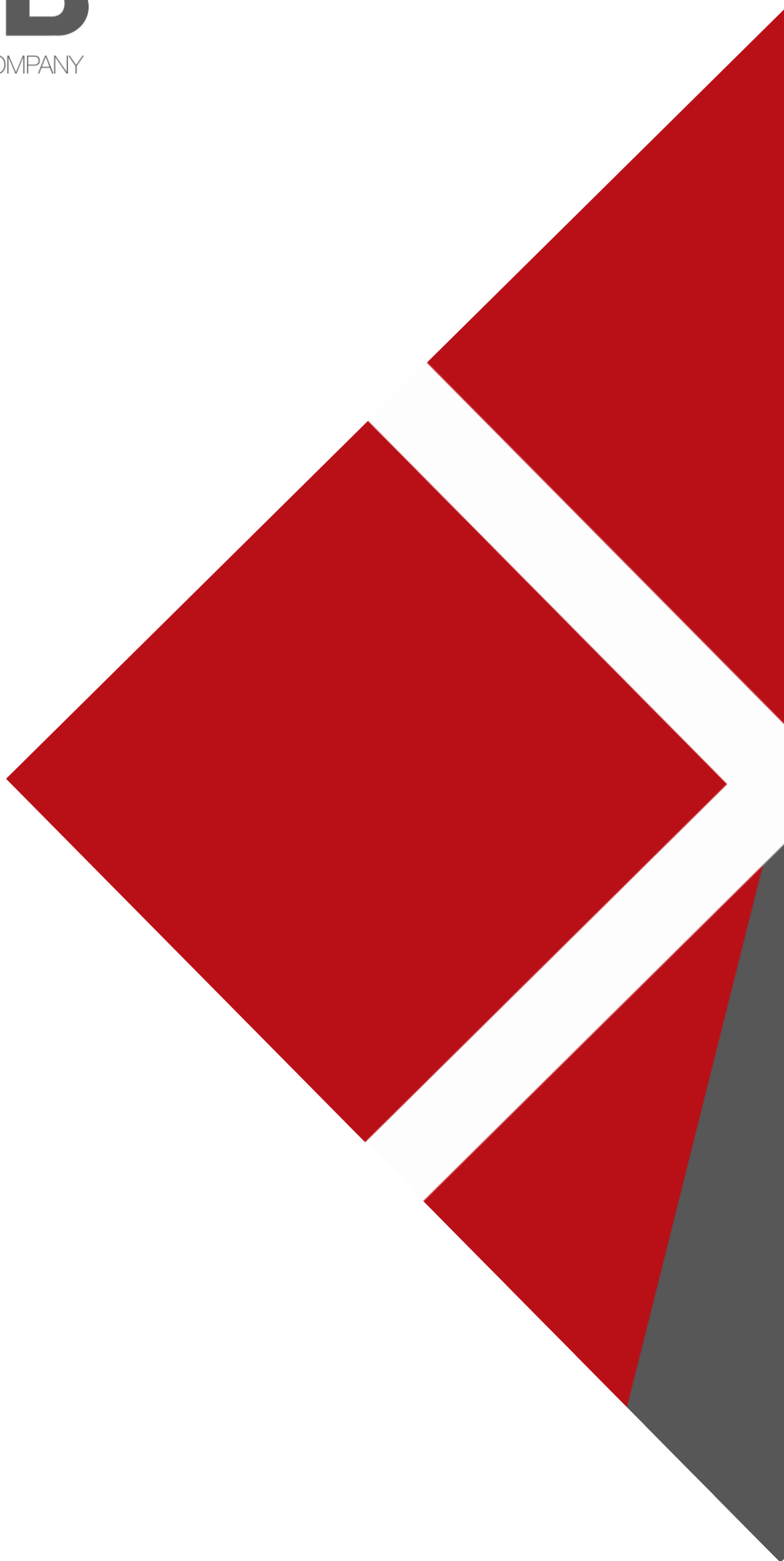
Project - Originator - Zone - Level - Type - Role - Number
OxSRFI-BWB-GEN-XX-DR-CH-0010

Status: **S2**

Rev: **P02**

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APPENDIX 34

MIDDLETON STONEY RELIEF ROAD DESIGN STRATEGY RECORD

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INFRASTRUCTURE

Mountpark Oxfordshire Strategic Rail Freight Interchange (OxSRFI) Middleton Stoney Relief Road, Geometric Design Strategy Record

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INFRASTRUCTURE

Mountpark Oxfordshire Strategic Rail Freight Interchange (OxSRFI) Middleton Stoney Relief Road Geometric Design Strategy Record

Nottingham
5th Floor, Waterfront House, Station Street
Nottingham, NG2 3DQ
T: 0115 924 1100

March 2026

DOCUMENT ISSUE RECORD

Document Number:	OxSRFI-BWB-GEN-XX-RP-CH-0010
BWB Reference:	NTH2479

Revision	Date of Issue	Status	Author:	Checked:	Approved:
P01	06.06.2025	For comment	Stephen Birchall BSc (Hons)	Simon Hilditch MEng (Hons) CEng MICE MCIHT	Simon Hilditch MEng (Hons) CEng MICE MCIHT
P02	25.03.2026	For comment	Ryan Picknell MEng (Hons)	Simon Hilditch MEng (Hons) CEng MICE MCIHT	Simon Hilditch MEng (Hons) CEng MFICE MCIHT

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FIGURES

Figure 1.1 Location Plan

1. INTRODUCTION

Instruction

1.1 The Oxfordshire Strategic Rail Freight Interchange (OxSRFI) requires substantial improvements to the strategic road network (SRN) and local road network (LRN), adding new links as well as upgrading existing infrastructure.

1.2 BWB Consulting (BWB) has been instructed by Mountpark (the Client) to develop the highway design for the works on the SRN and LRN, which includes the preparation of this Design Strategy Record (DSR). This report is for the Middleton Stoney Relief Road (MSRR).

1.3 **Figure 1.1** below shows the overall location of the works of OxSFRI and the road network, in relation to the aspects covered in this report.

1.4



Figure 1.1 Location plan

Acronyms and Abbreviations

DMRB	Design Manual for Roads and Bridges
DSR	Design Strategy Record
HPLR	Heyford Park Link Road
MSRR	Middleton Stoney Relief Road
LRN	Local Road Network

OxSRFI	Oxfordshire Strategic Rail Freight Interchange
OCC	Oxfordshire County Council
NH	National Highways
SRN	Strategic Road Network

Objectives

1.5 The objective of this DSR report, is to record the key decisions made during design.

1.6 The report will record the relaxations and departures from standards contained within the highway design. A detailed narrative for the justification, including a safety risk assessment, is to be submitted separately for approval for each departure.

1.7 The DSR is also used to record how the scheme complies with the principles of good road design set out in GG 103.

1.8 The following reports and documents are to be provided separately to this DSR:

- Transport assessment and modelling;
- Geotechnical reporting to CD 622;
- Directional signage strategy;
- Lighting strategy;
- Structures options reports and AIPs (where required) to CG 300;
- Maintenance and repair statement to GD 304;
- WCHAR assessment and review to GG 142; and
- Stage 1 road safety audit to GG 119.

List of Drawings

1.9 The table below sets out the scheme design and option drawings that are to be read in conjunction with this report. The Geometrical Layouts are provided in **Appendix B** and the Highway Plans Swept Paths are provided in **Appendix C**. The Highway Plans GA, Longsections and Cross Sections are provided separately and are not appended to this report.

Drawing no.	Title	Report section
OxSRFI-BWB-HGN-21-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-22-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-23-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-23-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-24-DR-CH-0105	Geometrical Layout	3
OxSRFI-BWB-HGN-25-DR-CH-0105	Geometrical Layout	3 / 4
OxSRFI-BWB-HGN-26-DR-CH-0105	Geometrical Layout	4
DCO Document 2.7E	Highway Plans General Arrangement	3/4
DCO Document 2.7U	Highway Plans Longsections	3/4

Drawing no.	Title	Report section
DCO Document 2.7K	Highway Plans Cross Sections	3
DCO Document 2.7L	Highway Plans Cross Sections	4
OxSRFI-BWB-GEN-XX-DR-CH-0005	Highway Plans Swept Paths	4

2. SCHEME OVERVIEW AND DESIGN STANDARDS

Scheme overview

2.1 The proposed works on the LRN covered by this report are listed below, collectively referred to within this report as the LRN works.

Section of scheme	Description	DCO Work No.
B4030	Route upgrade to tie-in with roundabout, linking MSRR and Middleton Road	TBC
Middleton Road	Route upgrade to tie-in with roundabout, linking MSRR and B4030	TBC
Middleton Stoney Relief Road (MSRR)	Construction of a relief road with active travel facilities around the northeastern side of Middleton Stoney, including a signalised junction with the B430, roundabout with the B4030, bridleway underpass and crossing of the Gagle Brook	TBC

2.2 Work numbering for the DCO is being established and will be added at a later date

2.3 **Drawing OxSRFI-BWB-GEN-ZZ-SK-CH-SK041** shows the overall scheme context of OxSRFI and the existing road network and **Figure 1.1** shows the locations of the above works.

Overview of Standards

2.4 The scheme spans across two highway authority boundaries, NH and OCC. This report provides design commentary on the OCC areas of responsibility only i.e. the LRN works. The SRN design commentary is covered by a separate report.

2.5 The LRN works will be designed in accordance with the following standards:

Doc. Ref.	Document Title	Version / Revision
DMRB CD 109	Highway link design	Revision 1
DMRB CD 116	Geometric design of roundabouts	Version 2.1.0
DMRB CD 123	Geometric design of at-grade priority and signal-controlled junctions	Version 2.1.0
DMRB CD 127	Cross-sections and headrooms	Version 1.0.1
LTN 1/20	Cycle infrastructure design	July 2020

Highway Authority, Road Class, Design Speed and Speed Limit

2.6 The road classes and design speeds for each section of the scheme are listed below. Design speeds have been determined in accordance with CD 109, Section 2.

Section of scheme	Road class	Cross-section	Design speed (kph)	Existing or proposed signed speed limit (mph)
Middleton Stoney Relief Road	All-purpose, rural	S2	100	National speed limit (proposed)
Middleton Road	All-purpose, rural	S1 with passing places	70 (see below)	National speed limit (existing retained)
B4030 (West of roundabout)	All-purpose, urban	SU2	60	30mph (existing retained - leaving village) National speed limit (existing) Extend 30mph speed limit and urban section to roundabout
B4030 (East of roundabout)	All-purpose, rural	S2	100	National speed limit (existing) - 50mph proposed

2.7 Middleton Road is an S1, all-purpose, rural, single track road with passing places that has a current a current speed limit of 60mph (100kph). However, due to its nature, it has been designed to 70kph (40mph). It is not considered appropriate to design rural lanes in full accordance with the DMRB, which is purposely written for trunk roads, although in many cases it is also used for local major roads, hence why it is appropriate for the B4030.

2.8 As the B4030 leaves Middleton Stoney the design speed is 60kph (30mph). This design speed is current until it passes Gagle Brook, which then transitions into 100kph (60mph) design speed, once it is sufficiently clear of the village. The start of the re-design does encroach between both design speeds; however, the design adheres to the upper parameters of 100kph. It is proposed that the 30mph speed limit is extended to the roundabout which is approximately 100m from the current speed limit change location.

3. MIDDLETON STONEY RELIEF ROAD

Layout

3.1 The scheme proposes to provide a link between the B430 and the B4030. At present the B430 Southbound and B4030 Westbound meet in Middleton Stoney Village. The MSRR will provide a link east of Middleton Stoney Village to relieve congestion.

3.2 The new link is termed Middleton Stoney relief Road and its classification is an S2, single carriageway, all-purpose, rural, link road, under CD 127.

Traffic flows

3.3 Traffic flow data will be added at a later date (see above explanation)

3.4 The following table sets out the design year traffic data for the link road.

Location	AM Peak		PM Peak		AADT	
	Vehicles	HGVs	Vehicles	HGVs	Vehicles	%HGV
MSRR						

Design Speed and Geometry

3.5 As noted above this is an S2, single carriageway, all-purpose, rural, link road with a design speed of 100kph (60mph). Therefore, the proposal has been designed in accordance with CD 109, Table 2.10.

Horizontal alignment

3.6 The horizontal alignment is summarised as follows:

MSRR	Horizontal Design Parameters
Description	• Right hand radius 200m as design transitions from junction design to CD 123, into link design to CD 109. • Straight • Transition • Right hand radius 720m (minimum R with 5.0% superelevation) • Transition • Straight • Transition • Left hand radius 720m (minimum R with 5.0% superelevation) • Left hand radius 40m as design transitions from link design to CD 109, into roundabout design to CD 116. • Straight • Left hand radius 165m • Straight

MSRR	Horizontal Design Parameters
Compliance with DMRB	**Compliant**

Vertical alignment

3.7 The vertical alignment for each option is summarised as follows:

MSRR	Vertical Design Parameters
Description	• Grade 1.0% uphill • Design transitions from junction design to CD 123 to link design to CD 109 • Crest K 106.5 • Grade 3.8% downhill • Sag K 26 • Grade 0.7% uphill • Crest K 100 • Grade 2.0% downhill • Sag K 26 • Grade 1.0% downhill
Compliance with DMRB	**Compliant**

3.8 Due to the tie-ins with the B430 and B4030, as well as land constraints and the location of Gagle Brook, there is not sufficient space to increase the horizontal radii to remove transitions or to reduce the superelevation due to the short nature of the relief road, and as mentioned, to ensure the link ties in nicely with the adjoining roads. All horizontal geometry is compliant for the design speed.

3.9 The design could be further simplified and elements removed from vertical geometry as well as gradients slackened, however it was important to reduce the height of the design to decrease the amount of dense vegetation removal around Gagle Brook, as well as ensuring geometry and stopping site distances adhered to standard. All vertical geometry is compliant for the design speed.

Stopping Sight Distance / Visibility

3.10 Stopping Site Distance has been assessed at 100kph in accordance with CD find109, Table 2.10 and paragraph 3.

3.11 The minimum SSD has been assessed as follows:

MSRR	Visibility Parameters
Description	• Minimum SSD of 215m achieved Southbound • Minimum SSD of 215m achieved Southbound, with the exception of three 10m intervals located south of Gaggle brook. Over the 30m, SSD of >206m achieved (permitted **relaxation**) • One step below desirable minimum SSD of 160m achieved northbound where it fails to achieve 215m (permitted **relaxation**)

Compliance with DMRB	**Compliant**

3.12 It can be seen from the above that northbound direction of travel fails to achieve full stopping sight distance of 215m at 3 intervals, with the affected corresponding mainline chainages being 910m, 920m and 930m. Distances of 213m, 206m and 214m can be achieved, which does fall slightly under the minimum required.

3.13 CD 109 does not permit relaxations on the immediate approaches to junctions and as a combination when a horizontal geometry relaxation is also required. In this case as the reduced SSD is mid link and there isn't a horizontal design relaxation, it does not fall into either category, so is classed as a permitted relaxation. Over this length the vertical alignment is a 100 K crest which is the desirable minimum for a design speed of 100kph. The horizontal alignment is made up of a 720m radius into a transition, which links to a straight element and into another transition. All geometry is fully compliant with CD 109.

Cross-section

3.14 In accordance with CD 127, para 2.1, Figure 2.1.1N1e provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road.

Lane width

3.15 The lane width is 3.65m as required by CD 127. The horizontal alignment of the link does not have a radius of less than 400m and hence no lane widening is required.

Hard shoulder, hard strip and verge

3.16 The following are provided in accordance with CD 127 for cross-section Single (S2):

- 2.5m verge
- 1.0m nearside hard strip
- 1.0m offside hard strip
- 6.0m verge (2.0m verge, 3.0m shared use footway / cycleway & 1.0m verge)

Summary

3.17 The MSRR is a fully compliant geometric design to CD 109 and CD 127.

3.18 In terms of the Northbound direction of travel SSD failing to achieve 215m for three intervals, the design still achieved SSD to 160m which is one step below desirable minimum. As there are no horizontal geometry relaxations and it is not on the approach to a junction, then this is an acceptable relaxation and still compliant.

Departures From Standard

3.19 No departures required

4. B4030 ROUNDABOUT (B4030 & MIDDLETON ROAD)

Layout

4.1 The B4030 improvement proposes to upgrade the route to incorporate a Roundabout. This upgrade is to accommodate the Middleton Stoney Relief Road, as well as all existing routes, including an existing field access to the south of the B4030. At present the B4030 is a rural, all-purpose, S2, single carriageway and Middleton Road is a rural, all-purpose, S1, with passing places. The existing field access to the south of the B4030 will also connect to the roundabout.

Traffic Flows

4.2 Traffic flow data will be added at a later date (see above explanation)

4.3 The following table sets out the design year traffic data for the link road.

Location	AM Peak		PM Peak		AADT	
	Vehicles	HGVs	Vehicles	HGVs	Vehicles	%HGV
B4030 West						
B4030 East						
Middleton Road						
MSRR	See Section 3					

Design Speed and Geometry

4.4 The B4030 splits between an S2, single carriageway, all-purpose, urban and rural route, with design speeds of 60kph and 100kph. The B4030 east has been designed in accordance with an S2, single carriageway, all-purpose, rural, link road, with a design speed of 100kph (60mph). The B4030 west design speed of 60kph (30mph) is proposed to be extended 100m to the roundabout to avoid a change in speed over a short length on the approach to the roundabout, however it has been designed to 100kph design speed in accordance with an SU2, single carriageway, all-purpose, urban, link road.

4.5 Middleton Road is an S1, all-purpose, rural, link road with passing places. The cross section does not adhere to any standard as it is a country lane. The route currently has a speed limit of 60mph (100kph); however, it has been designed to 70kph (40mph).

Horizontal alignment

4.6 The horizontal alignment is summarised as follows:

B4030 West	Horizontal Design Parameters
Description	• Straight • Transition • Left hand radius 2040m (minimum R)

	• Design transitions from link design to CD 109, into roundabout design to CD 116 • Left hand radius 90m • Straight
Compliance with DMRB	**Compliant**

B4030 East	Horizontal Design Parameters
Description	• Straight • Transition • Right hand radius 720m (minimum R with 5.0% superelevation) • Transition • Design transitions from link design to CD 109, into roundabout design to CD 116 • Straight
Compliance with DMRB	**Compliant**

Middleton Road	Horizontal Design Parameters
Description	• Left hand radius 1440m • Transition • Design transitions from link design to CD 109, into roundabout design to CD 116 • Straight
Compliance with DMRB	**Compliant**

Vertical alignment

4.7 The vertical alignment is summarised as follows:

B4030 West	Vertical Design Parameters
Description	• Grade 0.4% downhill (tie-in to existing) • Sag K 37 • Design transitions from link design to CD 109, into roundabout design to CD 116 • Straight 2.0% uphill
Compliance with DMRB	**Compliant**

B4030 East	Vertical Design Parameters
Description	• Grade 0.6% uphill (tie-in to existing)

	• Crest K 100 • Straight 0.5% downhill • Design transitions from link design to CD 109, into roundabout design to CD 116 • Sag K 10 • Straight 2.0% uphill
Compliance with DMRB	**Compliant**

Middleton Road	Vertical Design Parameters
Description	• Grade 4.5% downhill (tie-in to existing) • Crest K 17 (one step below desirable minimum - permitted **relaxation**) • Grade 7.5% downhill (permitted **relaxation**) • Design transitions from link design to CD 109, into roundabout design to CD 116 • Sag k 2 • Grade 2.0% uphill
Compliance with DMRB	CD 109 does not permit the use of relaxations, or a combination of relaxations on the immediate approach to a junction. Vertical crest of 17K (1 steps below desirable minimum) as well as 7.5% vertical gradient (6% desirable maximum, 8% permitted maximum). On this basis a **departure** is required reference **MSRR/1**

4.8 To provide adequate deflection and maximise buildability, the roundabout is situated north of the B4030, as opposed to centrally. Middleton Road currently has a gradient of over 4.5%. With the roundabout pushing the tie in point over 40m north, as well as boundary constraints to the east. To ensure the works keep within these extents, desirable minimums to CD 109 cannot be achieved. As rural routes consist of legacy geometry, it is a common occurrence that modern standards devised for the use to design trunk roads, cannot always be met.

Stopping Sight Distance / Visibility

4.9 Stopping Site Distance for the B4030 has been assessed at 100kph and Middleton Road has been assessed at 70kph, in accordance with CD 109, Table 2.10 and paragraph 3.

4.10 The minimum SSD has been assessed as follows:

B4030 West	Visibility Parameters
Description	Minimum SSD of 215m achieved Eastbound Minimum SSD of 215m achieved Westbound, with the exception of three 10m intervals located 60m passed the design extents on the existing route. Over the 30m, SSD of >185m achieved One step below desirable minimum SSD of 160m achieved Westbound where it fails to achieve 215m
Compliance with DMRB	**Compliant**

B4030 East	Visibility Parameters
Description	Minimum SSD of 215m achieved Northbound Minimum SSD of 215m achieved Southbound
Compliance with DMRB	**Compliant**

Middleton Road	Visibility Parameters
Description	Minimum SSD of 120m achieved Northbound Minimum SSD of 120m achieved Southbound
Compliance with DMRB	**Compliant**

4.11 It can be seen from the above that B4030 west, westbound direction of travel fails to achieve full stopping sight distance of 215m at 3 intervals, with the affected chainages being 60m passed the tie-in point, which is approximately 190m from the roundabout exit. Distances of 212m, 197m and 185m can be achieved, which does fall slightly under the minimum required. As this is the case for the current situation and the design does not worsen this, it can be deemed as an existing issue. As mentioned, the B4030 west has been designed to a 100kph design speed which requires a stopping site distance (SSD) of 215m. However, with the 30mph (60kph) speed limit being extended, the SSD requirement for this design speed is 90m, which the design has demonstrated it easily achieves.

4.12 Middleton Road is a national speed limit road, however due to it being a legacy rural route and that HGVs (>7.5 tonne) are not permitted, it is unrealistic for a road of this nature to be able to adhere to modern standards. As mentioned, Middleton Road has been assessed to 70kph design speed as opposed to 100kph. The nature of the existing route does not adhere to current standards, such as the cross section of the carriageway only achieves 4.5m or less, as oppose to 7.3m. Verge widths are also severely reduced in some areas by over 1.5m. Due to these factors, achieving 215m stopping site distances north and south is unachievable without re-designing the majority of Middleton Road, as well as affecting the existing landscape.

Cross-section

4.13 In accordance with CD 127, para 2.1, Figure 2.1.1N1e, provides the required cross-sectional dimensions for a single carriageway, all-purpose, rural road for the B4030 east and Middleton Road.

4.14 In accordance with CD 127, para 2.1, Figure 2.1.1N1g, provides the required cross-sectional dimensions for a single carriageway, all-purpose, urban road for the B4030 west.

Lane width

4.15 Lane width of 3.65m as required by CD 127. The horizontal alignment for B4030 east and west, as well as Middleton Road do not have a radius of less than 400m and hence no lane widening is required.

Hard shoulder, hard strip and verge

4.16 Hard strips have not been included in the design for B4030. Due to the short lengths of new carriageway and as the existing cross-section does not feature hard strips, this is in-keeping with the existing route, but this is a **departure** for the B4030 east, reference **MSRR/2**. The urban cross section (SU2) for the B4030 west does not require the use of hard strips.

4.17 The following are provided in accordance with CD 127 for cross-section Single (S2). Cross section :

- 2.5m nearside verge
- 2.5m offside verge

Summary

4.18 B4030, east and west of the roundabout are fully compliant geometric designs to CD 109 and comply with CD 127 except for the hard strips.

4.19 Middleton Road has been assessed to a lower design speed at 70kph as opposed to 100kph, based on the current geometry and usage, as well as it being an existing sub-standard route. Due to existing geometry and tying in with the roundabout proposed gradient of 7.5% exceeds the desirable minimum or 6%, as well as minimum desirable crest curve of 17k being one step below desirable minimum. As these relaxations are on the approach to the junction, a departure from standard is required.

Departures From Standard

4.20 **Appendix A** provides a summary of the road layout departures from standard within this section.

APPENDIX A

List of Road Layout departures from standard

OCC Reference	Designers Departure Reference	Likely Departure Safety Risk Category	Design Standard	Departure Location	Departure Summary
TBC	MSRR/1	A	CD 109	Middleton Road	Vertical Geometry - crest and gradient exceeds desirable minimums and are on approach to junction
TBC	MSRR/2	A	CD 127	B4030	Cross Section - No hard strips added to design

APPENDIX B

Geometrical Layouts

GRID NORTH

See Sheet 20

CD143 Para E/3.5
Unsegregated footway / cycleway 3.0m minimum

CD123 Figure 5.21b
Major / minor priority junction with nearside diverge with nearside auxiliary lane

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

CD127 table 2.28
Rate of change 1:50

CD109 Table 2.10
Left hand radius 360m two steps below desirable minimum

CD123 Table 5.22
Direct taper 25m
Deceleration length 80m

CD123 Para 7.9
Dedicated left turn lane width

CD123 para 5.6.2
15m radii with 1:10 taper over 25m

CD123 para 7.14
Signalised junction geomtery shall be same as section 5

CD123 table 6.1.1
Island taper 1:35

CD123 table 6.1.1
Island taper 1:30

CD123 Para 5.13
Island 141m²

LTN1/20 Table 5-5
SSD = 31m (30kph)

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

CD143 table E/4.7
Island depth 3.6m

CD123 para 7.1
Intersection angle 71°

CD143 table E/4.7
Island depth 3.6m

CD123 table 6.1.1
Island taper 1:54

CD123 Para 5.13
Island 224m²

CD123 Para 7.9
Dedicated left turn lane width

CD123 para 7.13
Design shall incorporate turning radii for worst case swept path on signalised junction

CD123 table 6.1.1
Island taper 1:30

CD123 Figure 3.2b
Junction approach visibility at 15m offset from major road

CD123 Para 7.9
Dedicated left turn lane width

CD109 para 4.13
Transition 100.0m chosen to accommodate superelevation turnover

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 360 L=198.271m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 360 L=99.135m

transition check CD109 para 4.15.1
SQroute(24 x 360) L=92.951m

CD123 Para 5.13
Island 45m²

CD143 table E/4.7
Island depth 3.6m

CD123 Para 7.15
Island set-back 2.5m

CD123 table 6.1.1
Island taper 1:50

CD123 Para 7.2
215m SSD visibility to signal head

CD123 Para 7.15
Island set-back 1.5m

CD123 para 5.6.2
15m radii with 1:10 taper over 25m

CD123 para 7.14
Signalised junction geomtery shall be same as section 5

CD123 Figure 6.3e
Dual carriageway major / minor priority junction

CD123 Table 5.22

CD123 Figure 3.4
Full SSD at 9m offset from major road

CD109 Table 2.10
Full SSD 215m

CD123 Para 6.15
Dual carriageway lane width to match approach lane width either side of junction

CD123 Para 7.8.3
Lane width 3.65m

CD123 Fig 2.10
Dual carriageway with central reserve for priority junction
CD123 Fig 2.10

CD127 Fig 2.1.1N1e
D2AP cross section

CD143 Table 5.16
Minimum 2way bridleway is 3.0m

CD143 Para E/3.5
Unsegregated footway / cycleway 3.0m minimum

CD123 table 6.1.1
Island taper 1:50

CD123 Para 7.9
Dedicated left turn lane width

CD109 para 4.13
Transition 66.0m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 180 L=396.5m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 180 L=198.3m

transition check CD109 para 4.15.1
SQroute(24 x 180) L=65.73m

See Sheet 22

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Legend

- Order Limits
- OCC / OxSRFI boundary
- CDxxx — Adheres to standard
- CDxxx — Relaxation or acceptable deviation from standard
- CDxxx — Deviation that requires a departure from standard
- Junction visibility
- Forward visibility
- Visibility Splay with Relaxation
- Visibility Splay with Departure
- STr — Alignment - Straight
- R=xxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

P02	16.03.26	Issued following updates	RP	SRH
P01	11.11.25	Preliminary issue	RP	SRH
Rev	Date	Details of issue / revision	Drw	Rev

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See Sheet 21

See Sheet 23

CD109 para 4.13
Transition 70.0m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 510 L=139.956m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 510 L=69.978m

transition check CD109 para 4.15.1
SQroute(24 x 510) L=110.634m

CD123 para 7.1
Intersection angle 110°

CD123 para 7.1.2
If not feasible it should be as close to 90° as practicable but no less than 70°

CD123 para 7.13

Design shall incorporate turning radii for worst case swept path on signalised junction

CD123 Para 7.8.3

Straight ahead lane widths minimum of 3.65m
CD123 Para 7.8.3

CD123 Para 7.2
215m SSD visibility to signal head

CD123 table 6.1.1

Island taper 1:30

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

CD109 Table 2.10
Left hand radius 510m one step below desirable minimum

CD109 Para 2.13
Northbound Immediate approach to B430 junction at 1.5 times the desirable minimum stopping distance (215 x 1.5=322.5m)

CD109 para 4.13
Transition 70.0m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 510 L=139.956m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 510 L=69.978m

transition check CD109 para 4.15.1
SQroute(24 x 510) L=110.634m

CD127 Table 2.28

Rate of change 1:100

CD109 Figure 3.1
Achieve Norhtbound SSD from drivers eye height (1.05m) to object height (0.26m)

Departure Ref: HPLR/1
CD109 Table 2.10
Full SSD @ 215m - Failed 50m after design ends - existing issue
(9 x10m intervals achieved >88m)
Immediate Approach to MSRR Junction
Existing vertical crest curve of 28K responsible

CD123 table 6.1.1

Island taper 1:50

CD123 Para 7.9

Dedicated left turn lane width

CD123 Figure 3.2a
Junction approach visibility at 15m offset from major road

CD123 Para 5.13
Island 175m²

CD123 table 6.1.1

Island taper 1:30

CD123 Figure 3.1
Junction approach SSD visibility

CD109 Table 2.10
Full SSD 215m

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

CD109 para 4.13
Transition 99.1m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 720 L=99.135m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 720 L=49.568m

transition check CD109 para 4.15.1
SQroute(24 x 720) L=131.453m

CD109 Figure 3.1
Achieve Southbound SSD from drivers eye height (1.05m) to object height (0.26m)

CD109 Table 2.10
Full SSD @ 215m - Failed
9 x10m intervals achieved >131m

CD123 Figure 3.4
Full SSD at 9m offset from major road

CD109 Table 2.10
Full SSD 215m

CD127 Fig 2.1.1N1e
S2 cross section

CD109 Figure 3.1
Achieve Southbound SSD from drivers eye height (1.05m) to object height (0.26m)

Existing Departure
CD109 Table 2.10
Full SSD @ 215m - Failed 50m after design ends - existing issue
(9 x10m intervals achieved >90m)
Existing departure unaffected by scheme proposals

CD143 Para E/3.5
Unsegregated footway / cycleway 3.0m minimum

CD143 Table 5.16
Minimum 2way bridleway is 3.0m

2.8m

TL=70.0m (q=0.6)

TL=99.1m (q=0.3)

R=200m

R=510m

STr

250 150 100 50 200

3.65 3.65 3.65 3.65 3.65 3.65

Revision 3 Priority Area

DMRB CD 109
Middleton Stoney Relief Road (MSRR)
Design Speed: 100kph

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- Visibility Splay with Departure
- STr — Alignment - Straight
- R=xxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

P03	16.03.26	Issued following updates	RP	SRH
P02	11.11.25	HPLR geometry updated	RP	SRH
P01	03.06.25	Preliminary	SB	SRH
Rev	Date	Details of issue / revision	Drw	Rev

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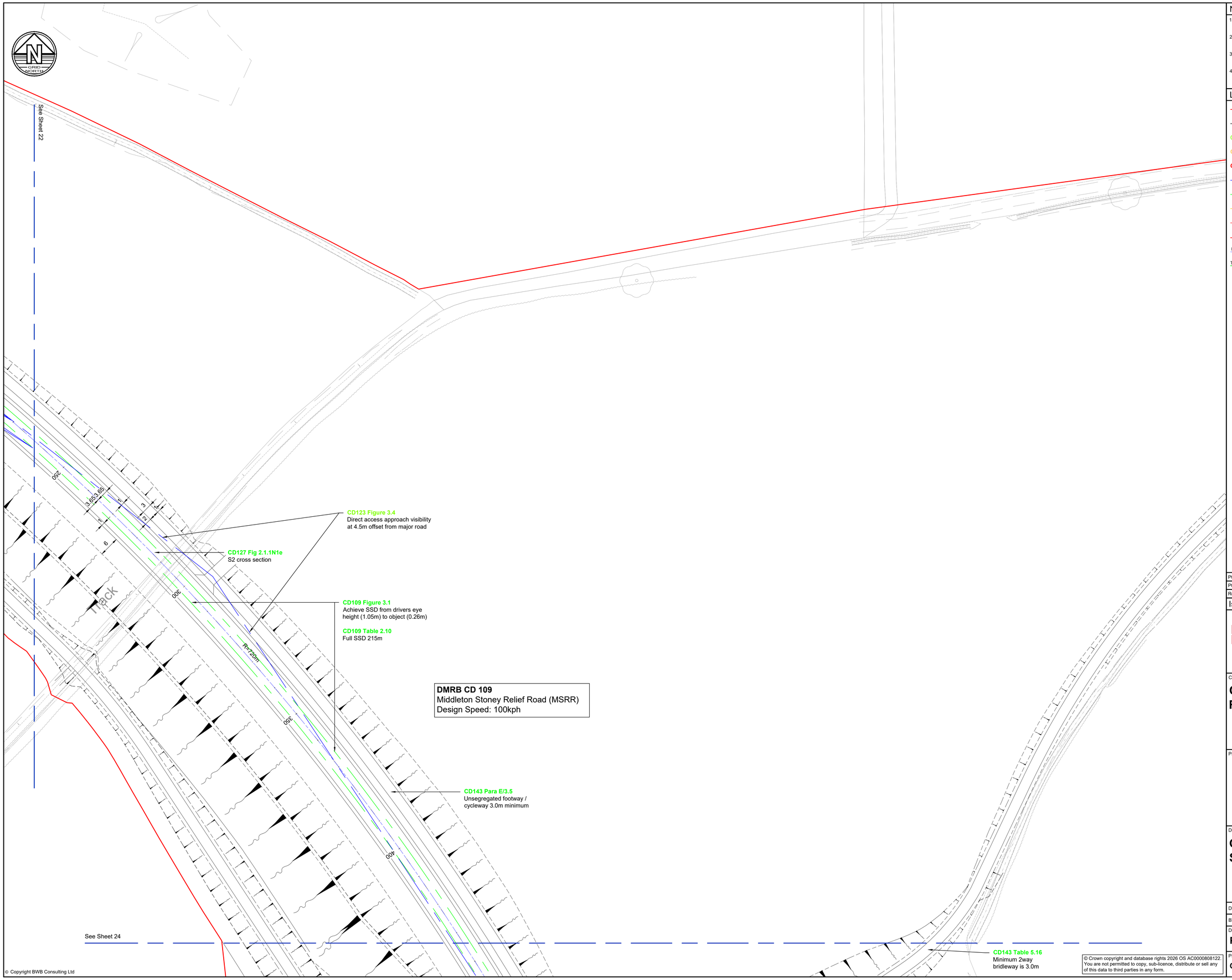
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- **CDxxx** — Deviation that requires a departure from standard
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- STr — Alignment - Straight
- R=xxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

Rev	Date	Details of issue / revision	Drw	Rev
P02	16.03.26	Issued following updates	RP	SRH
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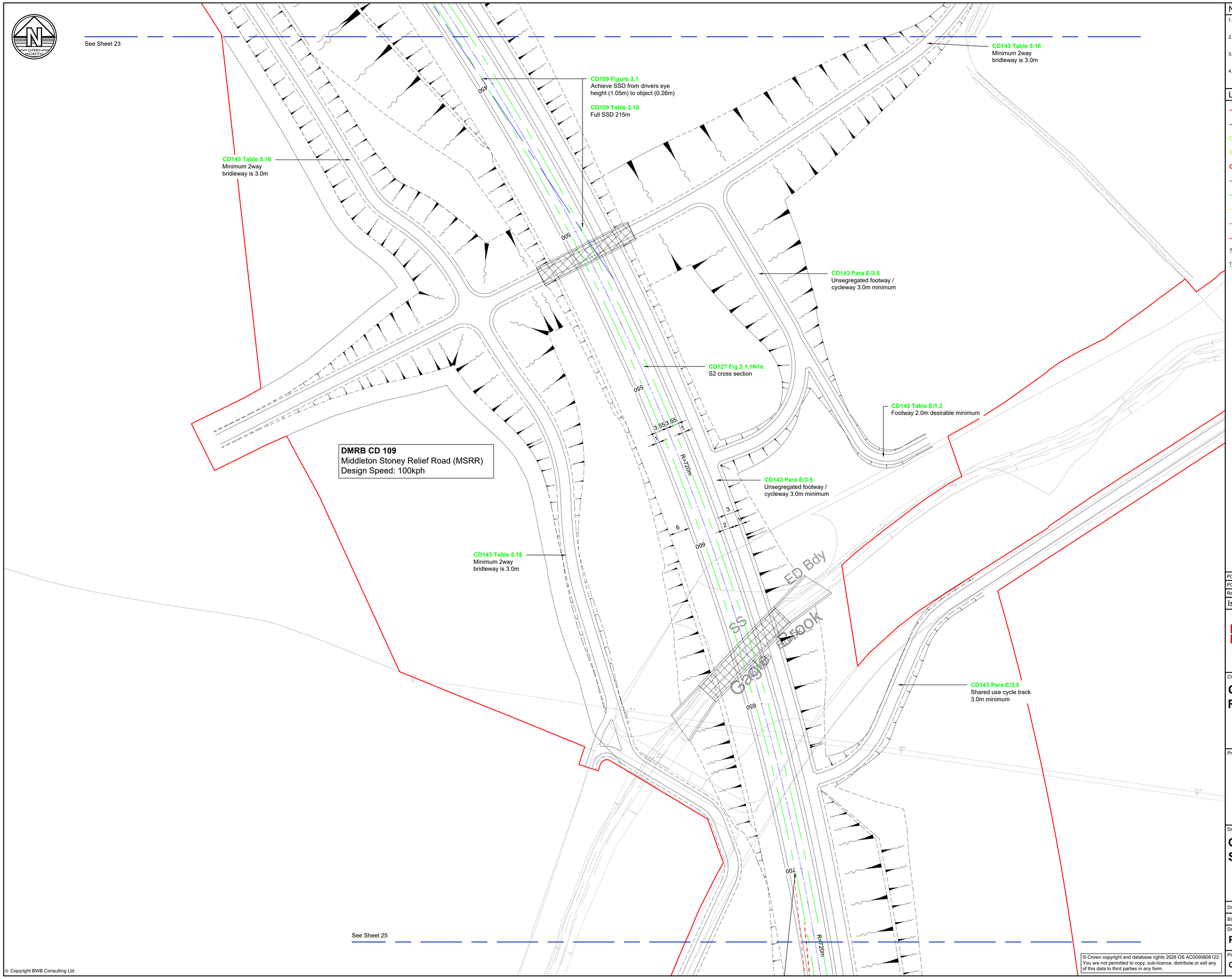
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- CDxxx — Deviation that requires a departure from standard
- Junction visibility
- Forward visibility
- Visibility Splay with Relaxation
- Visibility Splay with Departure
- STr — Alignment - Straight
- R=xxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

Rev	Date	Details of issue / revision	Drw	Rev
P02	16.03.26	Issued following updates	RP	SRH
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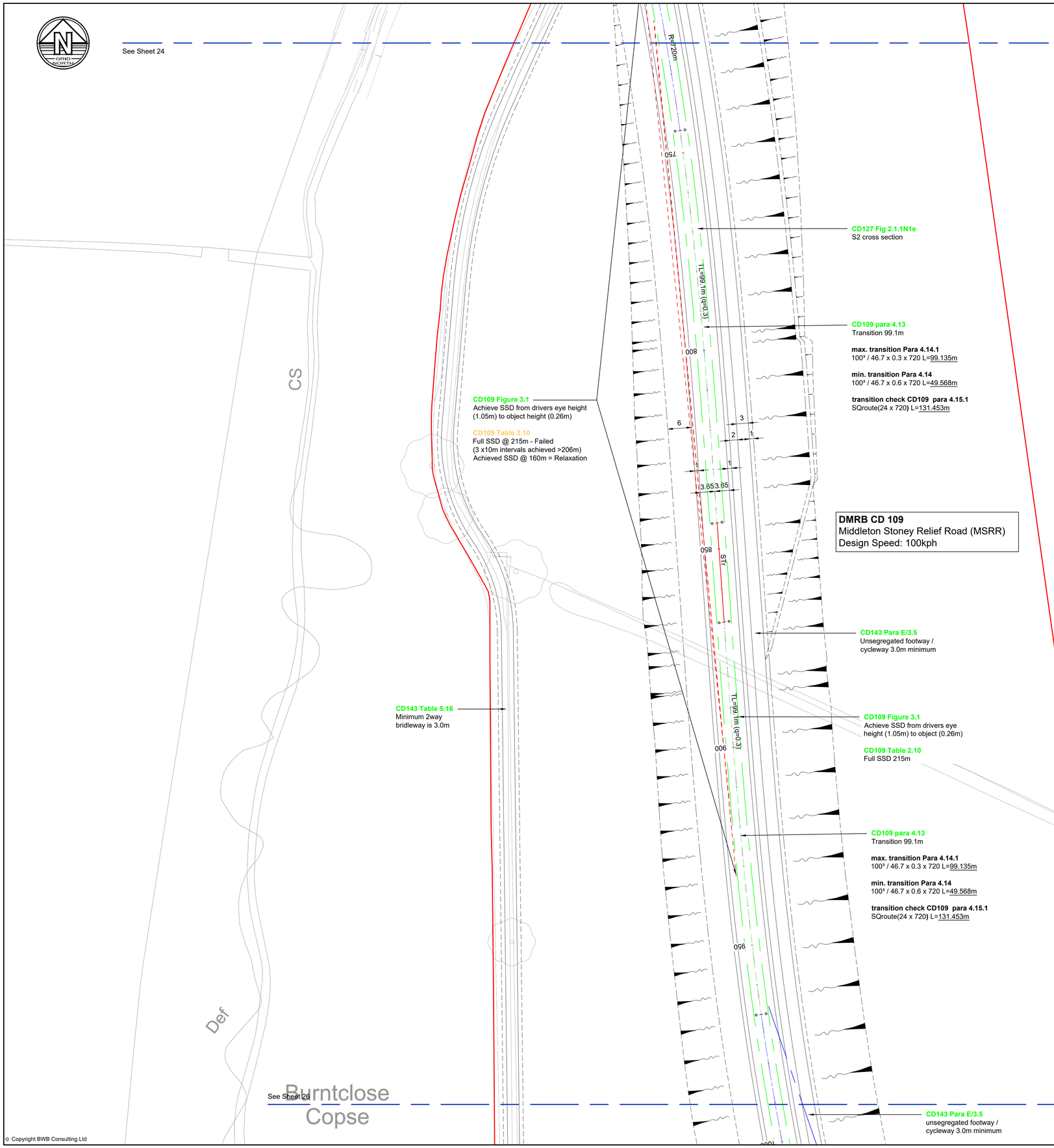
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OxSFI-BWB-HGN-24-DR-CH-0105	S2	P02

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Notes

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3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

Legend

- Order Limits
- OCC / OxSRFI boundary
- CDxxx — Adheres to standard
- CDxxx — Relaxation or acceptable deviation from standard
- **CDxxx** — Deviation that requires a departure from standard
- Junction visibility
- Forward visibility
- Visibility Splay with Relaxation
- Visibility Splay with Departure
- STr — Alignment - Straight
- R=xxxm — Alignment - Radius
- TL=xx.xm (q=0.x) — Alignment - Transition
- Traffic signal equipment

Rev	Date	Details of issue / revision	Drw	Rev
P02	16.03.26	Issued following updates	RP	SRH
P01	03.06.25	Preliminary	SB	SRH

Issues & Revisions

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Leeds | 0113 233 8000
London | 020 7407 3879
Manchester | 0161 233 4260
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Client

OXFORDSHIRE RAILFREIGHT LTD.

Project Title

OxSRFI OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title

GEOMETRICAL LAYOUT SHEET 25

Drawn:	S. Birchall		Reviewed:	S. Hilditch
BWB Ref:	NTH2479	Date:	03.06.25	Scale@A1: 1:500

Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSFI-BWB-HGN-25-DR-CH-0105	S2	P02

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GRID NORTH

Burntclose Copse

See Sheet 25

Spring Pond

ED Bdy

Gagle Brook

CS

Def Issues

CS

CR

ED Bdy

ED Bdy

B 4030

CH

FB

Brook Cottage

87.0m

87.0m

36.4m

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CD143 Table 5.16
Minimum 2way bridleway is 3.0m

CD143 Para E/3.5
unsegregated footway / cycleway 3.0m minimum

CD116 Figure 3.45
Full SSD at 3.65m from island

CD109 Table 2.10
Full SSD 215m

CD127 Fig 2.1.1N1e
S2 cross section

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

CD123 Para 7.12.1
Lane drop should reduce over 100m

CD116 Para 3.28.2
Exit width 7m

CD116 Para 3.28.2
Exit width - island 5.4m

CD116 Para 3.28.3
Taper 1:9

CD116 Para 3.29.1
Exit kerb radius 40m

CD116 Para 3.29.3
Exit kerb should be 40m or >20 <100m

CD109 para 4.13
Transition 50m
(Not required as min R without transitions achieved, however improves geometry)

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 2040 L=34.989m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 2040 L=17.495m

transition check CD109 para 4.15.1
SQroute(24 x 2040) L=221.269m

CD116 Para 3.29.1
Entry kerb radius 20m

CD116 Para 3.12
Entry width 6m

CD116 Para 3.14
Widths 3m

CD116 Para 3.14.2
Lane widths should be >3 <3.5m

Assessed to current design speed of 100kph (60mph), however will become an urban 60kph road, with the 30mph speed limit extended from the village to the roundabout

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object height (0.26m)

CD109 Table 2.10
Full SSD @ 215m - Failed 60m after design ends - existing issue
(3 x10m intervals achieved >185m)
Achieved SSD @ 160m

CD116 Figure 3.45
Full SSD at 3.65m from island

CD109 Table 2.10
Full SSD 215m

CD116 Para 3.26
Entry path radius 60m

CD127 Fig 2.1.1N1g
SU2 cross section

DMRB CD 109
B4030
Design Speed: 100kph

CD116 Para 3.26
Entry path radius 66m

CD116 Para 3.29.1
Exit kerb radius 20m

CD116 Para 3.29.3
Exit kerb should be 40m or >20 <100m

CD116 Para 3.18.1
Entry angle 29.1°

CD116 Para 3.18.1
Entry angle 36°

CD116 Para 3.18.1
Entry angle 25.2°

CD116 Para 3.18.1
Entry angle 30.5°

DMRB CD 116
Roundabout Design

CD116 Para 3.28.2
Exit width 7m

CD116 Para 3.28.2
Exit width - island 6.3m

CD116 Para 3.28.3
Taper 1:11

CD116 Para 3.29.1
Exit kerb radius 40m

CD116 Para 3.29.3
Exit kerb should be 40m or >20 <100m

CD116 Para 3.29.1
Entry kerb radius 20m

CD116 Para 3.26
Entry path radius 49m

CD116 Para 3.12
Entry width 7m

CD116 Para 3.14
Widths 3.5m

CD116 Para 3.14.2
Lane widths should be >3 <3.5m

DMRB CD 109
B4030
Design Speed: 100kph

CD109 para 4.13
Transition 50m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 720 L=99.135m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 720 L=49.568m

transition check CD109 para 4.15.1
SQroute(24 x 720) L=131.453m

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 215m

Assessed to current design speed of 100kph (60mph), however proposal to become 80kph with 50mph speed limit leaving the roundabout towards Bicester

Departure Ref: MSRR/2
CD127 Fig 2.1.1N1e
S2 cross section - failed as no hard strips

CD109 para 4.13
Transition 50m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 1440 L=49.568

min. transition Para 4.14
100³ / 46.7 x 0.6 x 1440 L=24.784m

transition check CD109 para 4.15.1
SQroute(24 x 1440) L=185.903m

CD116 Para 3.28.2
Exit width 7m

CD116 Para 3.28.2
Exit width - island 4.8m

CD116 Para 3.28.3
Taper 1:8

CD116 Para 3.12
Entry width 6m

CD116 Para 3.14
Widths 3.5m

CD116 Para 3.14.2
Lane widths should be >3 <3.5m

CD116 Para 3.29.1
Entry kerb radius 20m

CD143 Para E/3.5
Unsegregated footway / cycleway 3.0m minimum

CD116 Para 3.29.1
Exit kerb radius 40m

CD116 Para 3.29.3
Exit kerb should be 40m or >20 <100m

CD116 Para 3.28.2
Exit width 7m

CD116 Para 3.28.2
Exit width - island 6.3m

CD116 Para 3.28.3
Taper 1:10

CD109 para 4.13
Transition 50m

max. transition Para 4.14.1
100³ / 46.7 x 0.3 x 720 L=99.135m

min. transition Para 4.14
100³ / 46.7 x 0.6 x 720 L=49.568m

transition check CD109 para 4.15.1
SQroute(24 x 720) L=131.453m

CD116 Figure 3.45
Full SSD at 3.65m from island

CD109 Table 2.10
Full SSD 215m

CD109 Figure 3.1
Achieve SSD from drivers eye height (1.05m) to object (0.26m)

CD109 Table 2.10
Full SSD 120m for 70kph

CD116 Figure 3.45
Full SSD at 3.65m from island

CD109 Table 2.10
Full SSD 120m for 70kph

CD127 table 2.28
Rate of change 1:35

Departure Ref: MSRR/1
CD109 Table 2.10
Crest K=17 one step below desirable minimum
Grade 7.5% downhill permitted relaxation
No combinations of relaxations allowed on the immediate approach

See Sheet 25

See Sheet 27

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Rev	Date	Details of issue / revision	Drw	Rev
P02	16.03.26	Issued following updates	RP	SRH
P01	03.06.25	Preliminary	SB	SRH

Issues & Revisions

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Client
OXFORDSHIRE RAILFREIGHT LTD.

Project Title
OxSRFI OXFORDSHIRE STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title
GEOMETRICAL LAYOUT SHEET 26

Drawn:	S. Birchall		Reviewed:	S. Hilditch
BWB Ref:	NTH2479	Date:	03.06.25	Scale@A1: 1:500

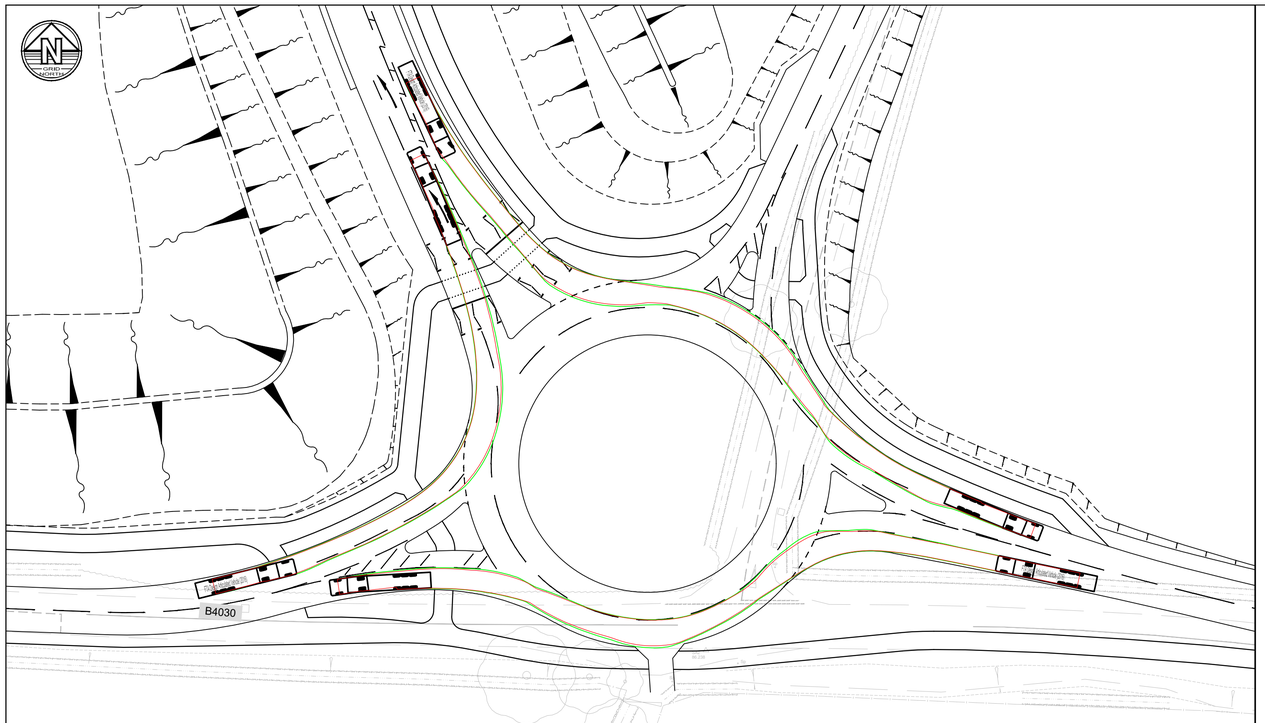
Drawing Status
PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
OxSFI-BWB-HGN-26-DR-CH-0105	S2	P02

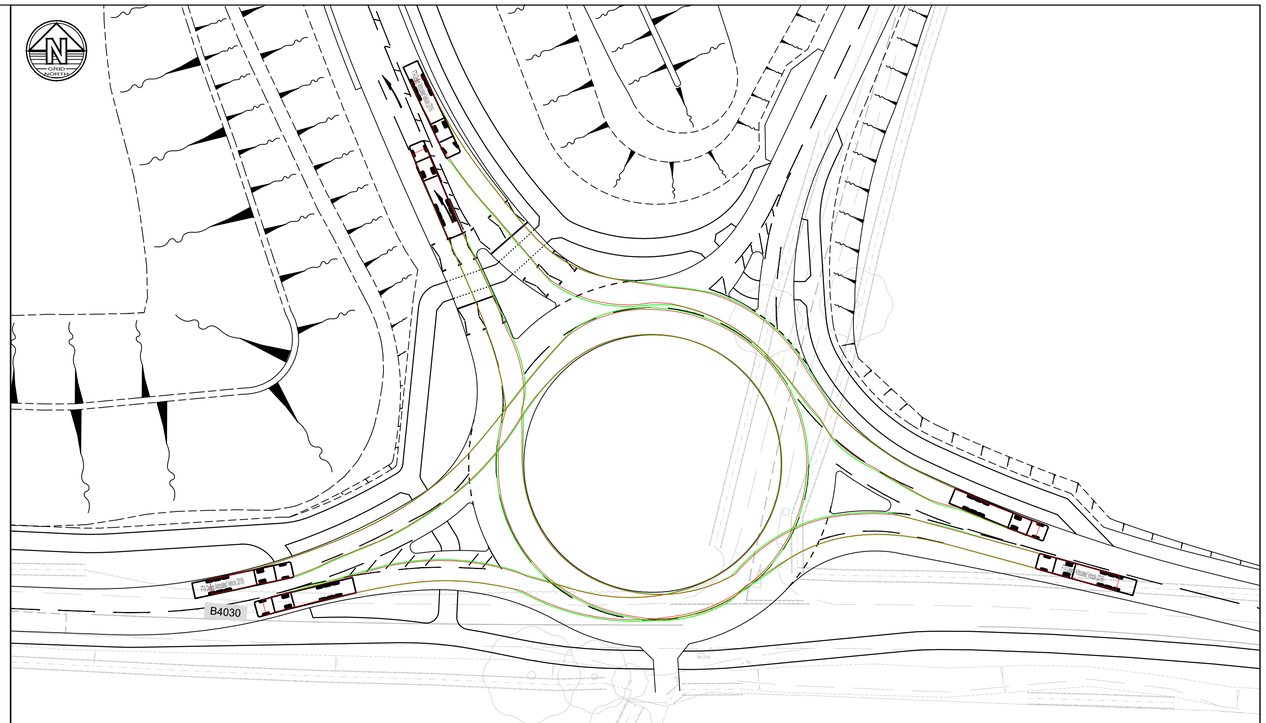
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APPENDIX C

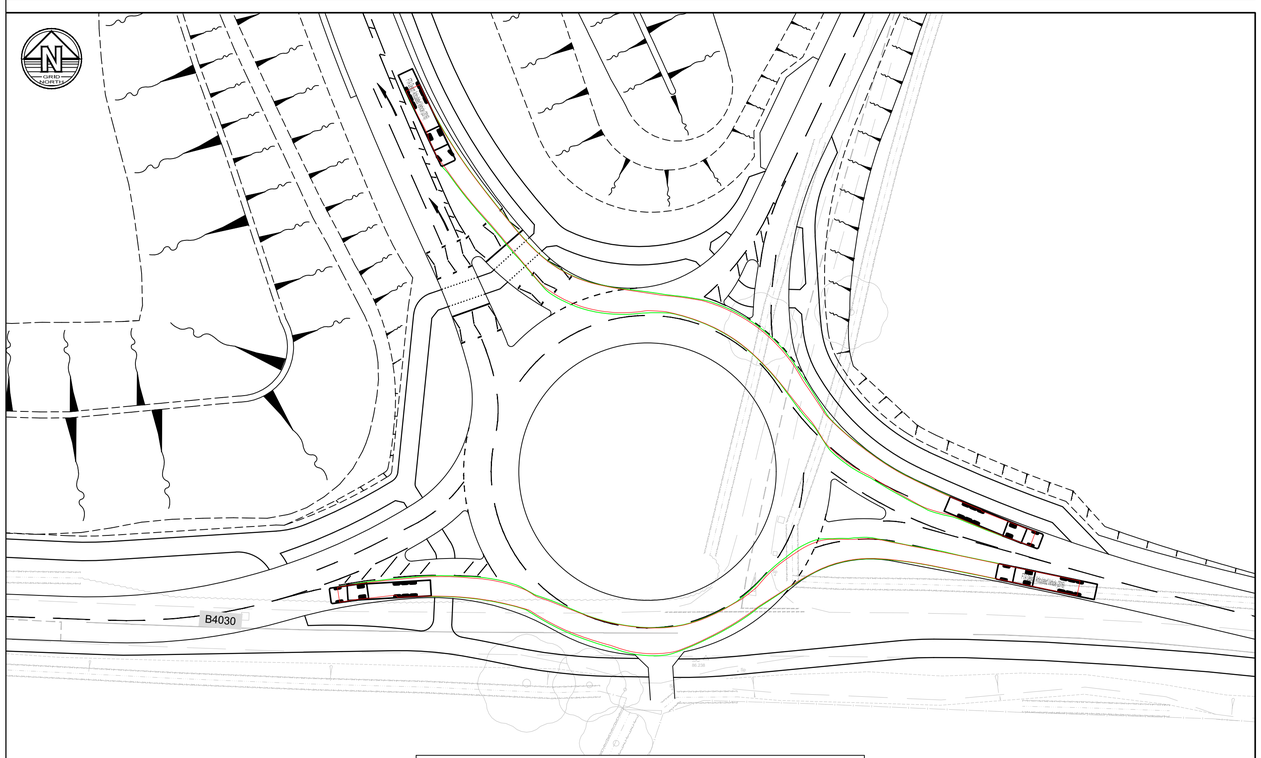
Highway Plans Swept Paths



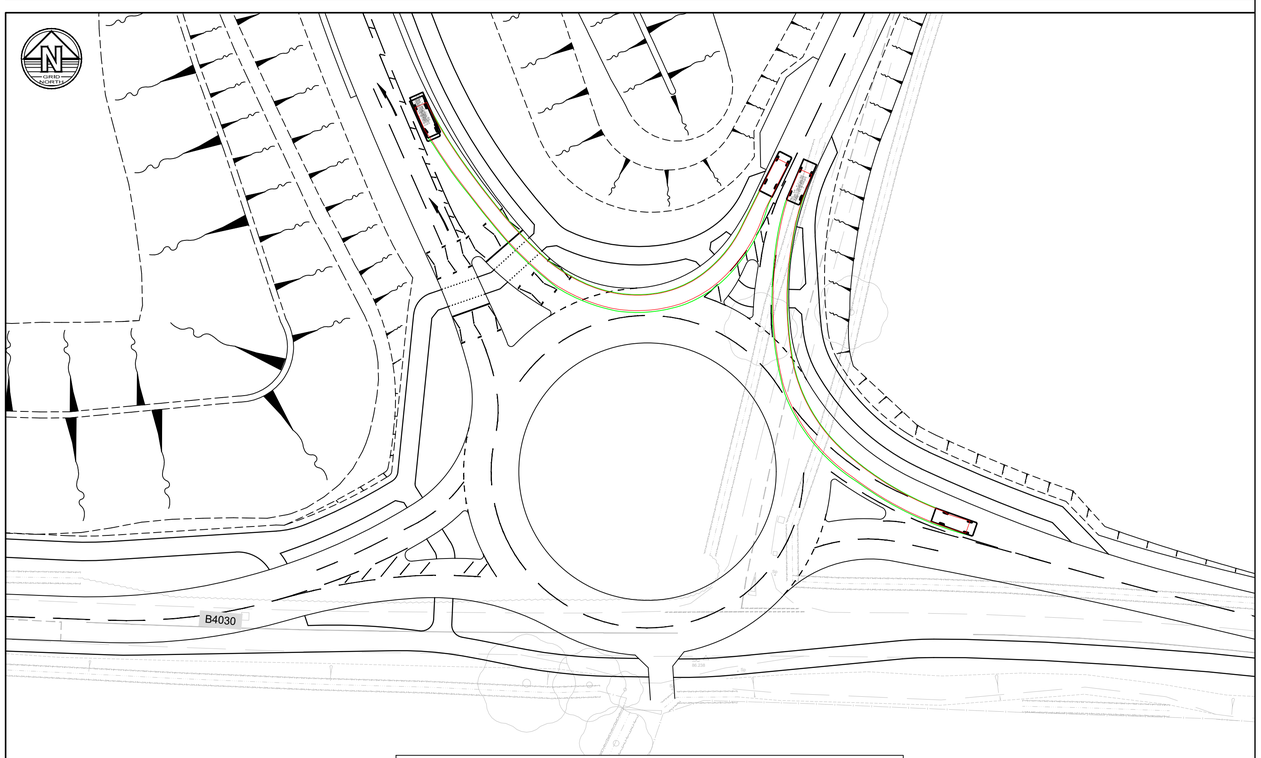
Middleton Stoney Roundabout and B4030 (Viewport Scale 1:500)



Middleton Stoney Roundabout and B4030 (Viewport Scale 1:500)



Middleton Stoney Roundabout and B4030 (Viewport Scale 1:500)



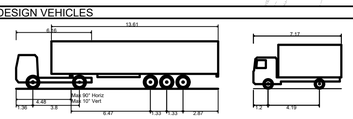
Middleton Stoney Roundabout and Middleton Road (Viewport Scale 1:500)

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DESIGN VEHICLES



FTA Design Articulated Vehicle (2016)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Max Track Width	2.470m
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	6.600m

FTA Design 7.5 Tonne Rigid Vehicle (2016)

Overall Length	7.170m
Overall Width	2.300m
Overall Body Height	3.580m
Min Body Ground Clearance	0.375m
Track Width	2.120m
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	7.000m

7.5 tonne rigid vehicle has been used on Middleton Road as there is a proposed 7.5 tonne weight limit. All other movements have been tracked with 16.5m articulated heavy goods vehicle in accordance with CD116 Terms and Definitions, Design Vehicle.

ISSUES & REVISIONS

Rev	Date	Details of issue / revision	Drw	Rev
P01	27.05.25	Issued for information	JP	SRH
P02	06.03.26	Issued following updates	RP	SRH

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Client
OXFORDSHIRE RAILFREIGHT LTD.

Project Title
OxSRFI
OXFORDSHIRE
STRATEGIC RAIL FREIGHT INTERCHANGE

Drawing Title
HIGHWAY PLANS SWEPT PATHS

Drawn:	J. Priestley		Reviewed:	S. Hilditch			
BWB Ref:	NTH2479	Date:	27.05.25	Scale@A1:	1:500		

Drawing Status: **FOR INFORMATION**

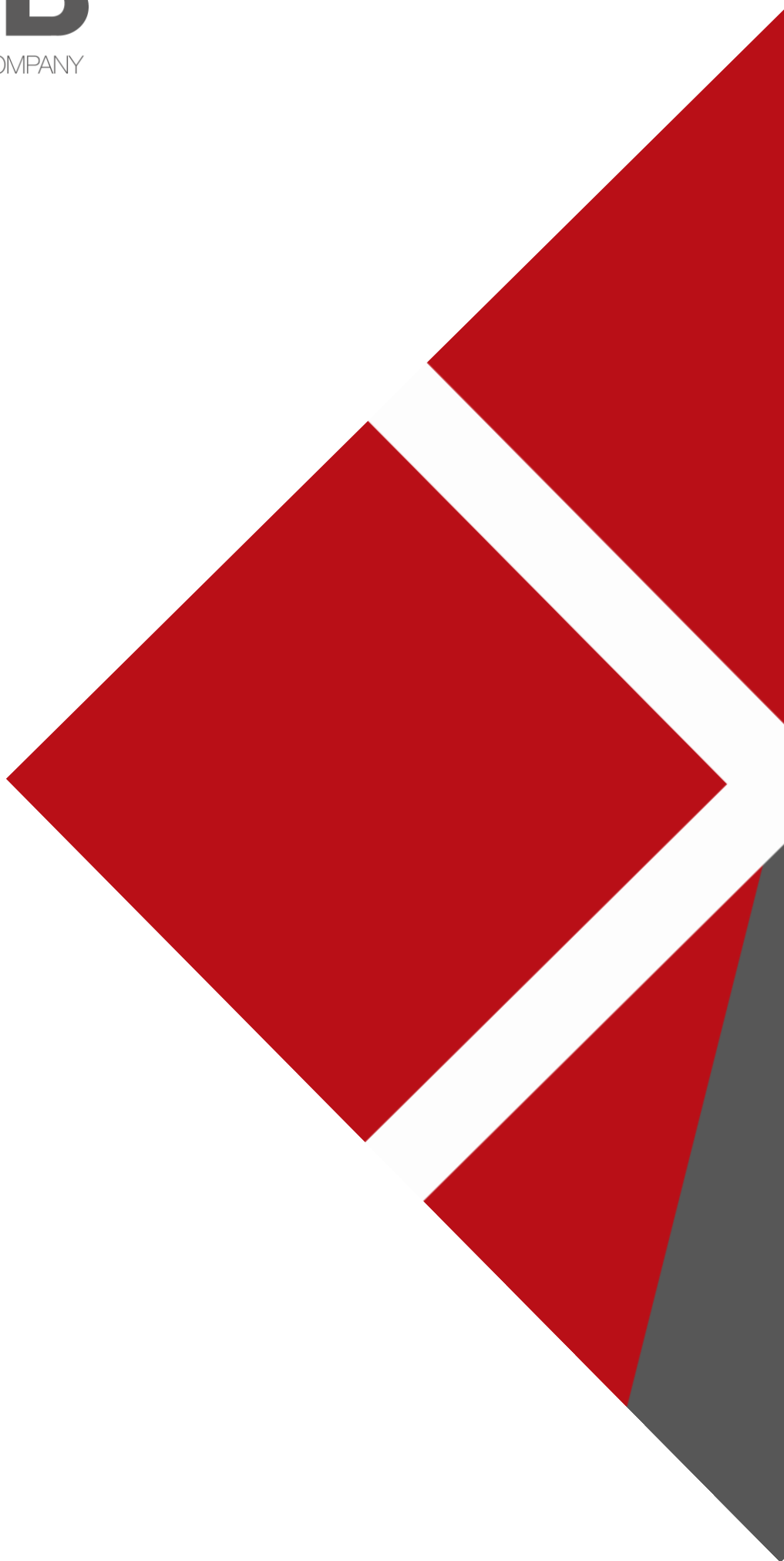
Project - Originator - Zone - Level - Type - Role - Number: **OxSRFI-BWB-GEN-XX-DR-CH-0005**

Status: **S2** Rev: **P02**

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