Southampton to London Pipeline Project

Volume 7

Transport Assessment

Application Document: 7.4

Planning Inspectorate Reference Number: EN070005
APFP Regulation No. 5(2)(q)
Revision No. 1.0
May 2019

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Southampton to London Pipeline Project

Esso Petroleum Company, Limited

Transport Assessment

May 2019

Project No:	B2325300
Document Title:	Transport Assessment
Document No:	
Revision:	R1.0
Date:	May 2019
Suitability Code	

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1 Introduction

1.1 Project Overview

1.1.1 Esso Petroleum Company, Limited (Esso) is making an application for development consent to replace 90km (56 miles) of its existing 105km (65 miles) aviation fuel pipeline that runs from the Fawley Refinery near Southampton, to the Esso West London Terminal storage facility in Hounslow. The replacement is 97km long and referred to as 'the project' within this report.

1.1.2 Esso has already replaced 10km of pipeline between Hamble and Boorley Green in Hampshire and now wants to replace the 90km (56 miles) of pipeline between Boorley Green and the Esso West London Terminal storage facility in Hounslow. The areas of land to be permanently or temporarily used for the project are known as the Order Limits.

1.1.3 The route and Order Limits are broken down into eight separate sections:

- Section A – Boorley Green to Bramdean;
- Section B – Bramdean to South of Alton;
- Section C – South of Alton to Crondall (via Alton pumping station);
- Section D – Crondall to Farnborough (A327 crossing);
- Section E – Farnborough (A327 crossing) to Bisley and Pirbright Ranges;
- Section F – Bisley and Pirbright Ranges to M25;
- Section G – M25 to M3; and
- Section H – M3 to the West London Terminal storage facility.

1.1.4 The replacement pipeline would be buried underground for its entire length. The minimum depth from the top of the pipe to the ground surface would be 1.2m in open cut sections, and deeper for trenchless crossings. A slightly shallower depth may conceivably be necessary in exceptional circumstances, but all indications are that this would not be required. The pipeline would also be buried deeper, typically 1.5m from top of pipe to ground surface, in roads and streets to account for other existing infrastructure such as utility pipes, cables and sewers.

1.1.5 Six logistics hubs would be established in locations close to the strategic road network. The logistics hubs would serve as points for accepting deliveries and storage of materials. Each of the hubs would include a pipe laydown area, secure plant storage area, bunded fuel storage, single-storey offices, staff welfare facilities and a vehicle parking area.

1.1.6 When the operator of the replacement pipeline determines that it would permanently cease pipeline operations, it would consider and implement an appropriate decommissioning strategy taking account of good industry practice, its obligations to landowners under the relevant pipeline deeds and all relevant statutory

requirements. Decommissioning of the existing pipeline does not form part of this project.

1.2 Broad Scope of the Assessment

1.2.1 The Transport Assessment has been produced to support the application for development consent under the Planning Act 2008. It assesses the impacts of the project on the transport network during construction. The primary transport-related impacts of the project relate to the construction vehicle trips on the highway network generated during installation of the pipeline. These effects could impact on private vehicles and public transport (buses), particularly in urban areas.

1.2.2 All designated Public Rights of Way (PRoW) would be identified and any potential temporary closures applied for/detailed in the draft Development Consent Order (DCO). All designated PRoW crossing the working area would be managed, including National Trails, with access only closed for short periods while construction activities occur.

1.2.3 Once the pipeline is operational, Esso would carry out a programme of inspection and maintenance in accordance with good practice and regulatory requirements. This would typically include:

- Inspections of valves, typically on a monthly basis.
- Pipeline route walkover inspections typically completed in the winter months every two years.
- Pipeline route helicopter inspections, typically every other week.
- Pipeline route patrols by vehicle/on foot in discrete areas, typically on a weekly basis.
- Cathodic Protection (CP) transformer rectifier cabinet inspections, typically on a monthly basis.
- Testing of CP system (measurement of current at CP test points), typically on a biannual basis.

1.2.4 Based on the information above, the transport effects associated with operation are expected to be very low and are therefore not included within the scope of this Transport Assessment.

1.2.5 In summary, the scope of this Transport Assessment comprises assessment of:

- the additional traffic that would be generated by the project during construction; and
- impacts on traffic, journey times and collisions resulting from project-related road closures and diversions.

1.3 Report Structure

1.3.1 The Transport Assessment is structured as follows:

- Section 1 provides an introduction;

- Section 2 reviews the relevant policy, legislation and guidance specific to the project and an overview of relevant stakeholder engagement;
- Section 3 outlines the design basis, proposed locations of logistics hubs and construction compounds, and the proposed traffic generated by the project;
- Section 4 outlines the method of assessment used within this Transport Assessment;
- Section 5 reviews the existing baseline comprising the local highway network, and summarises the existing traffic levels, public transport services and accessibility and a review of collision data on the highway network;
- Section 6 provides the scope of the assessment;
- Section 7 summarises the future baseline traffic flows, journey times and collisions;
- Section 8 summarises the impact of the project compared with the future baseline scenario;
- Section 9 provides an overview of the cumulative impacts of the project and agreed committed developments; and
- Section 10 summarises the above and draws out key conclusions.

2 Regulatory Context and Consultation

2.1 National Planning and Energy Policy

2.1.1 Due to the length of the replacement pipeline, the project is classified as a Nationally Significant Infrastructure Project (NSIP), as defined by Section 21 of The Planning Act (2008), and as such will require a Development Consent Order (DCO) to give consent to install the pipeline. Section 104 of Planning Act 2008 outlines the importance of National Policy Statements (NPSs) to the decision-making process when applications for development consent are under consideration. In this case there are two relevant NPSs. These are:

- The Overarching NPS for Energy (EN-1); and,
- NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4).

Overarching National Policy Statement for Energy (EN-1)

2.1.2 NPS EN-1 sets out the Government's overarching policy with regard to the development of NSIPs in the Energy sector. It outlines the high-level objectives, policy and regulatory framework. EN-1 emphasises the need for new energy projects to contribute to a secure, diverse and affordable energy supply. This is to support the Government's policies on sustainable development, in particular by mitigating and adapting to climate change.

2.1.3 EN-1 sets out detailed policies in respect of matters including traffic and transport. These policies have been taken into account in the preparation of the Transport Assessment:

- Paragraph 5.13.2 states that '*The consideration and mitigation of transport impacts is an essential part of Government's wider policy objectives for sustainable development as set out in Section 2.2 of this NPS*.'
- Paragraph 5.13.3 states that '*If a project is likely to have significant transport implications, the applicant's ES should include a transport assessment, using the NATA/WebTAG methodology stipulated in Department for Transport (DfT) guidance or any successor to such methodology. Applicants should consult the Highways Agency and Highways Authorities as appropriate on the assessment and mitigation*.'

2.1.4 This Transport Assessment (**application document 7.4**) fulfils the requirements for an assessment of transport impacts required by this policy.

2.1.5 WebTAG guidance is not appropriate for pipeline projects. However, highway authorities were consulted on the scope of the Transport Assessment

Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)

2.1.6 NPS EN-4, paragraph 2.19.8 states that '*When designing the route of new pipelines applicants should research relevant constraints including… railway crossings, major road crossings... These can be undertaken by means of desk top studies in the first*

instance, followed up by consulting the appropriate authority, operator, or conservation body if necessary.'

National Planning Policy Framework

2.1.7 The Revised National Planning Policy Framework (NPPF) was published in February 2019. This identifies in paragraph 5 that it *'does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision-making framework in the Planning Act 2008 (as amended) and relevant national policy statements for major infrastructure as well as any other matters that are relevant (which may include the National Planning Policy Framework).'* While NPS EN-1 and EN-4 remain the prime decision-making documents, where they do not provide guidance, each topic chapter has considered whether there is important and relevant guidance in the NPPF or Local Plans that may require consideration by the decision-making authority. At this stage it is not possible to confirm if such secondary guidance will be considered important or relevant by the Secretary of State and it is included for completeness to allow the Secretary of State to make such a determination.

2.1.8 Paragraph 109 of the NPPF states that '*development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe'*. This Transport Assessment provides an assessment to determine whether there would be severe impacts.

2.2 Consultation

2.2.1 Table 2.1 sets out the consultation and engagement that has been undertaken when developing this Transport Assessment.

Table 2.1: Register of Consultation and Engagement for this Transport Assessment

Date	Item	Topics Covered	Outcome
21 June 2018	Meeting with Surrey County Council Highways Team	Traffic Management and outline Transport Assessment Scoping	Criteria for Traffic Management agreed, Transport Assessment Scoping Report to be completed and issued
17 August 2018	Meeting with Hampshire County Council Highways Team	Traffic Management and outline Transport Assessment Scoping	Criteria for Traffic Management agreed, Transport Assessment Scoping Report to be completed and issued
2 January 2019	Transport Assessment Scoping Report issued to Hampshire County Council and Surrey County Council	See Transport Assessment Scoping Report	Surrey County Council to provide additional list of roads to be included in the Transport Assessment
9 January 2019	Meeting with Surrey County Council Highways Team	Review of Traffic Management drawings, layout of Temporary Traffic Signals and	Email received from Surrey County Council 15 January 2019 listing roads to be included for assessment: • Ashford Road;

Date	Item	Topics Covered	Outcome
		Transport Assessment Scoping Report	• A311 Blackwater Valley Road; • Chertsey Road; and • Windlesham Road.

3 Design Basis and Activities

3.1 Design Evolution

3.1.1 The project design is the result of a process of iterative design development that was introduced at project inception. Throughout the iterative design development process, the proposed pipeline route and above ground permanent and temporary infrastructure were systematically reviewed. This was achieved through feedback from the multi-disciplinary project team being recorded and incorporated as appropriate in the next stage of the proposed design.

3.1.2 The options appraisal and pipeline routing used criteria which were aimed at avoiding a wide variety of potential constraints, where practicable. These constraints included major urban areas, major infrastructure (such as motorways, roads and railways), proximity of populated areas (including residential properties, schools, hospitals, cemeteries) and potential for disruption to communities.

3.1.3 The route and Order Limits are broken down into eight separate sections, A to H as detailed in Section 1. Further details can be found in Chapter 3 Project Description of the Environmental Statement (ES) (**application document 6.2**).

3.1.4 Chapter 4 Design Evolution of the ES describes how the design has evolved to, amongst other things, take into account major roads and railways. Trenchless techniques are to be used for all crossings of trunk roads, motorways and railways. Where installation would take place within roads, street works are assumed to be under temporary traffic management in the majority of cases, and most would last less than four weeks. There are currently six locations where the installation works within the road are expected to exceed four weeks (Table 3.1).

Table 3.1: Diversions and Road Closures Exceeding Four Weeks

Location	Work Section	Traffic Control	Total Length of Road Affected (metres)	Estimated Duration of Works (weeks)
Naishes Lane	E	Traffic Management	656	7
Balmoral Drive	E	Diversion	375	5
St. Catherine's Road[1]	E	Diversion	110	5
B311 Red Road	F	Traffic Management	570	7
B377 Ashford Road	H	Traffic Management	1,310	15
Woodthorpe Road	H	Traffic Management	1,300	9

[1]St. Catherine's Road is expected to be constructed more slowly than other locations, i.e. less than 90m per week

Traffic Management and Diversions

3.1.5 Recommendations for temporary traffic signals would be in accordance with Chapter 8 of the Traffic Signs Manual (DfT, 2016), with the design and specification of signs complying with the Specification for Highway Works and Safety at Street Works and Road Works (DfT, 2013).

3.1.6 It is assumed that where applicable, temporary bus stops would be in operation during times of temporary traffic management where agreed with relevant bus companies.

3.1.7 For the purposes of undertaking a conservative assessment, road closures are assumed to be required for Balmoral Drive, between Frimley Green Road to Sandringham Way, and St Catherine's Road, between Rhododendron Road to Lake Road. At Balmoral Drive this is at the request of Surrey County Council Highways Department, while along St Catherine's Road it is because the highway is too narrow for works in the verge. Indicative diversion routes have been discussed with the highways departments at Hampshire and Surrey County Councils.

3.1.8 The Balmoral Drive diversion would follow the B3411 Frimley Green Road, Frimley Grove Gardens, Grove Cross Road and Buckingham Way. The Balmoral Drive diversion route within this assessment consists of the B3411 Frimley Green Road and Buckingham Way, however for the purposes of collisions and journey times the full length of the route was used, and a weighted average of traffic flows was used for changes in traffic flows and collisions.

3.1.9 The St. Catherine's Road diversion would follow Lake Road, B3015 Deepcut Bridge Road, Old Bisley Road, Alphington Avenue and Regent Way.

3.1.10 St. Catherine's Road is a minor residential road with a single-track section. A DfT study (2004) suggests that this type of road is not suited to large traffic flows, with a two-way capacity of 300 vehicles per hour. Therefore, the volume of traffic using St Catherine's Road would be expected to be low.

3.1.11 The temporary road closure and diversion powers are set out in the DCO. Details of diversions and closures will be consulted upon with relevant highway authorities.

3.2 Logistics Hubs and Construction Compounds

3.2.1 Temporary logistics hubs and construction compounds are required across the course of the project during construction. Six logistics hubs would be established in locations close to the strategic road network. The logistics hubs would serve as points for accepting deliveries and storage of materials. Each of the hubs would include a pipe laydown area, secure plant storage area, bunded fuel storage, single-storey offices, staff welfare facilities and a vehicle parking area.

3.2.2 Construction compounds are small satellite areas close to the route that are used for storing equipment, hosting staff facilities, and laying down pieces of the pipeline.

3.2.3 All logistics hubs and a sample of the construction compounds were selected for the Transport Assessment. Construction compounds from Section A and Section H were chosen as these provide a realistic worst case representation of predominately rural and urban sections respectively.

3.2.4 The locations and details of the logistics hubs and construction compounds that were assessed are presented in Table 3.2 and are illustrated in Figure 1 in Appendix 1.

Table 3.2: Locations of Logistics Hubs and Construction Compounds (A and H)

Location	Assumed Section Served
Logistics Hubs	
A31, Ropley Dean	A and B
A31/A32 Junction Northfield Lane, Alton	A, B and C
Hartland Park Village, Farnborough	C, D and E
Ministry of Defence (MoD) land: Deepcut Bridge Road, Frimley Green	D
M3 Junction 3: New Road, Windlesham	F and G
Brett Aggregates, Littleton Lane, Shepperton	H
Construction Compounds (A and H)	
Maddoxford Lane	A
Gregory Lane	A
Wintershill	A
B2177 Winchester Road	A
Stakes Lane	A
Wheely Down Road	A
Riversdown Road	A
A272	A
B376 Shepperton Road, M3 to B379	H
B376 Shepperton Road, B379 Brett Aggregates	H
Ashford Station to Ashford Community Centre, Woodthorpe Road	H
A30, West London Terminal, Short Lane	H
A30 to Ashford Sports Ground, Staines Road	H
A30, Orchard Way	H

3.3 Design and Good Practice Measures

3.3.1 Good practice measures are set out in the Register of Environmental Actions and Commitments (REAC) in ES Chapter 16 Environmental Management and Mitigation, and secured through DCO requirements such as the Code of Construction Practice. The Transport Assessment contains a number of project commitments to reduce impacts on the environment. These are indicated by a reference number like this (G20). The good practice measures that are most relevant to the Transport Assessment are listed in Table 3.3. These commitments inform the traffic management and diversion assumptions incorporated in this assessment.

Table 3.3: Good Practice Measures

Ref	Commitment	Benefit to:
G5	The contractor(s) would take place during normal working hours of 07:00 to 19:00 Monday to Saturday. Sunday or Bank Holiday working is not anticipated as being typical. Exceptions may be required for Bank Holiday and Sunday working (restricted to 08.00 to 18.00) or night-time working for activities such as: the continuous pulling phase for a major crossing using horizontal directional drilling; where daytime working would be excessively disruptive to normal traffic operation; cleaning/testing of the pipeline; or overnight traffic management measures.	Traffic flows

Ref	Commitment	Benefit to:
G15	Wheel washing would be provided at all logistics hubs and large compound access points on to the highway. An adequate supply of water would be made available at these locations at all times.	Collisions and safety
G20	Water assisted road cleaners would be deployed on public roads where necessary to prevent excessive dust or mud deposits.	Collisions and safety
G26	Construction traffic movements would be kept to the minimum reasonable for the effective and safe construction of the project.	Traffic flows and collisions and safety
G79	Pedestrian access to and from residential, commercial, community and agricultural land uses would be maintained throughout the construction period. Vehicle access would be maintained where practicable. This may require signed diversions. The means of access would be communicated to affected parties at least two weeks in advance.	Traffic flows, and walking, cycling and equestrians
G110	A Construction Traffic Management Plan (CTMP) would be produced. The contractor(s) would then implement measures within the CTMP.	Traffic flows, journey times and collisions and safety
G111	The CTMP would consider the traffic generated by construction vehicles and how the contractor(s) would manage the diversions and closures within the highway network (provided for under the development consent). The CTMP could also include, but would not be limited to, the following: • show the location of construction compound(s), access routes, site boundaries, entry/exit points; • develop measures to promote safe access to and from site; • detail each road crossing including the technique for installing the pipeline, access points and traffic management requirements; • define routes that would be taken by Heavy Goods Vehicles (HGVs), light vehicles (including Light Goods Vehicles with a gross weight less than 3.5 tonnes) and other site traffic; • make drivers aware of designated access routes; • provide appropriate temporary signage directing HGV drivers to relevant construction compounds; • show the location of temporary road closures including temporary diversion routes agreed with the relevant highway authority; • manage Abnormal Indivisible Loads: • provide proof of concept for the proposed measures, for example large vehicle swept path analysis at pinch points on the public highway; • provide a Travel Plan for transport of the construction workforce; and • provide measures for the monitoring of the CTMP and details of appropriate actions in the event of a non-compliance.	Traffic flows, journey times and collisions and safety
G114	All designated PRoW would be identified and any potential temporary closures applied for/detailed in the DCO. All designated PRoW crossing the working area would be managed, including National Trails, with access only closed for short periods while construction activities occur.	Walking, cycling and equestrians

3.4 Project Traffic Generation

3.4.1 A contractor has not yet been appointed and therefore the exact details for construction traffic and routes are not available. For the purposes of this report, a number of project assumptions were made so that the assessment could be

completed. These assumptions are set out in Appendix 2. A summary is provided in this section.

3.4.2 The project description provided within this Transport Assessment is the final form of the project in the application for development consent, and therefore it is possible that the appointed contractor(s) may diverge from the design and installation/construction methods described, within the limitations of the consenting process. However, in the event that such divergence occurs, it is anticipated that adherence to the terms of the consent would avoid the transport-related impacts being any worse than those associated with the final form of the project in the application for development consent.

Programme Assumptions

3.4.3 Installation of the pipeline is anticipated to run from January 2021 until January 2023 with mobilisation commencing after development consent is granted. Operation would commence from early 2023.

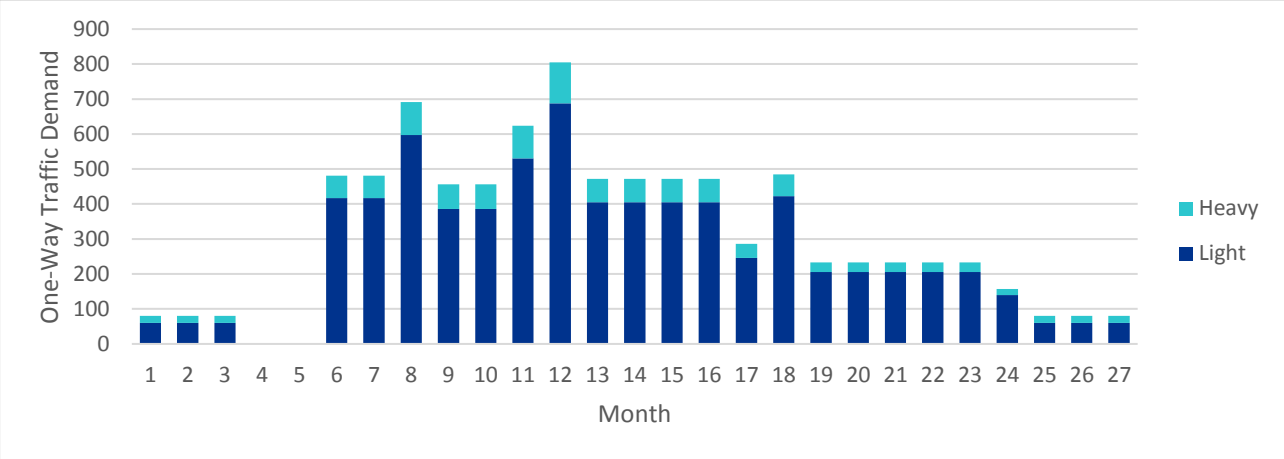
3.4.4 The Transport Assessment requires more detailed assumptions to allow forecasts to traffic flows. Therefore, an indicative programme, based on typical durations, has been assumed for the Transport Assessment and is set out in Table 3.4. This assumes that the logistics hubs would be set up during the three-month mobilisation phase and then the pipeline installation and reinstatement would take place over the following 24 months, with a total 27-month indicative work schedule. It is assumed that activity at some of these locations would be concurrent.

Table 3.4: An Indicative Work Schedule Assumed for the Purposes of the Traffic Generation

Activity	Start Month	End Month	Duration (Months)
Logistics Hub setup	1	3	3
Logistics Hub operation	4	24	21
Section A	6	8	3
Section B	8	11	4
Section C	8	12	5
Section D	6	12	7
Section E	11	16	6
Section F	12	18	7
Section G	18	23	6
Section H	18	24	7
Logistics Hub reinstatement	25	27	3

3.4.5 Based on detailed assumptions set out in Appendix 2, the one-way project traffic trip generation is illustrated in Illustration 3.1. This is total project traffic and not what would occur at a single location. Similar information for logistics hubs is also presented in Appendix 2.

Illustration 3.1 Total Project One-Way Traffic by Month and Class



3.4.6 Peak project traffic demand is expected to occur at the entrance and exit to logistics hubs. This is because construction staff would arrive at the logistics hubs for onward travel to their working destination and construction materials would be delivered to logistics hubs for onward delivery to subsequent locations comprising construction compounds and, in some cases, work fronts.

3.4.7 An average daily traffic demand for a construction compound was calculated based on the specific demand provided in the assumptions for a selection of 14 construction compounds. This is provided in Table 3.5.

Table 3.5: Daily One-Way Traffic Demand for an Average Construction Compound

Vehicle Class	One-way Demand
Car	0
Minibus	2
LGV	1
Other Goods Vehicle OGV1	1
Other Goods Vehicle OGV2	2
Total	**6**

4 Method of Assessment

4.1 Main Basis of Assessment

4.1.1 This section describes the Transport Assessment methodology. The methodology was set out within the Transport Assessment Scoping Report (see Appendix 3), which was issued to Hampshire and Surrey County Councils in January 2019. The methodology was informed by the following guidance:

- Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Management and Assessment – IEMA, 1993); and
- Guidance on Transport Assessment (Department for Transport, March 2007).

4.1.2 WebTAG guidance is not appropriate for pipeline projects. However, highway authorities were consulted on the scope of the Transport Assessment.

4.1.3 To determine if there would be severe impacts generated by project traffic, a sifting exercise was used based on the two-way logistics hub traffic demand and the 'Future Baseline' traffic flow. Following the sifting exercise, it was found that the traffic generated during construction is always greater than that produced during setup and reinstatement of logistics hubs. Based on this, only traffic flows from peak construction periods have been considered in this report. This exercise, showing the change in Annual Average Daily Traffic (AADT), is presented in Appendix 2. AADT is defined as the average over a full year of the number of vehicles passing a point in the road network each day.

4.1.4 A Baseline year of 2018 was used, with the assessment of impacts based on two scenarios:

- Future Baseline – which forecasts trip demand on the transport network including committed development but with no project traffic; and
- 'With Project' – which incorporates the Future Baseline adjusted for temporary diversions/traffic management associated with the project.

4.1.5 A Future Baseline year of 2022 was adopted for the assessment of the potential project traffic impacts because, based on the assumed programme, the assessed traffic management and diversions would occur later in the construction programme. Consequently, 2022 is the most appropriate year to use based on the construction programme.

4.1.6 For the Baseline, 2022 Future Baseline and 2022 With Project scenarios, there was an assessment of:

- traffic flows;
- journey times; and
- collisions.

4.1.7 Impacts on public transport were considered qualitatively.

4.1.8 Road closures would be required for parts of Balmoral Drive and St Catherine's Road. The closure at Balmoral Drive was requested by Surrey County Council highways department. For the purposes of assessment, the closure is assumed to extend from Frimley Green Road to Sandringham Way. The closure at St Catherine's Road is assumed because the highway is too narrow for works in the verge. For the purposes of assessment, it was assumed to be closed from Rhododendron Road to Lake Road. Indicative diversion routes have been discussed with the Highways Departments at Hampshire and Surrey County Councils.

Traffic Flows

4.1.9 Baseline traffic flows were collated from a variety of sources including publicly available information from the Department for Transport and traffic flows already available from local highway authorities. In addition, new traffic data was collected for some routes within the study area. This was commissioned by the project but undertaken by the local highway authorities. This ensured that there was sufficient traffic data to enable the assessment of the project. The type and sources of these data are presented in Appendix 4.

4.1.10 The different data sources required factoring to make them consistent for the assessment. This is a standard step in making data appropriate for use within a Transport Assessment, and consisted of the following:

- Generating 24-hour flows: because some of the existing information only provided 12-hour data. Flows from alternative count points were used to derive a traffic profile, to factor the 12-hour data to 24-hours. Existing traffic count locations were selected based on their proximity and suitability in terms of traffic profile, road type and their bi-directional flows.
- Weekend factors: weekend data were not available for all traffic count locations. A weekend factor was generated using those count points for which weekend data were available, to derive a global 'weekend day' factor for the project. This factor was then applied to the raw weekday traffic data to provide a 24-hour weekend day for every count location.
- The raw traffic data required factoring to achieve a consistent 2018 Baseline. This was achieved through a combination of National Trip End Model (NTEM) adjusted Trip End Modelling Programme (TEMPro) factors and the Road Traffic Forecast (RTF) 2018.

4.1.11 Committed development was assumed to be incorporated into the traffic growth factors. To generate traffic growth factors, TEMPro and NTEM were used for light vehicles and Road Traffic Forecasts (RTF) for heavy vehicles (see Table 4.2 for vehicle definitions). These were used to establish a common existing baseline of 2018 and to generate the 2022 Future Baseline. These factors were derived firstly by county and then by rural or urban area for weekday time periods and a weekend day:

- Weekday Off-Peak (00:00 – 07:00 and 19:00 – 00:00);
- Weekday AM Peak (07:00 – 10:00);
- Weekday Inter-Peak (10:00 – 16:00);

- Weekday PM Peak (16:00 – 19:00); and
- Weekend Day (average of Saturday (all day) and Sunday (all day)).

4.1.12 Adjusted TEMPro and RTF Growth factors are presented in Table 4.1.

Table 4.1: 2018 to 2022 TEMPro and RTF Factors

County	Period	Factor	
		Adjusted TEMPro	RTF
Surrey rural	Off-peak	1.0603	1.0230
	AM Peak	1.0677	1.0230
	Inter-peak	1.0710	1.0230
	PM Peak	1.0651	1.0230
Surrey urban	Off-peak	1.0404	1.0230
	AM Peak	1.0454	1.0230
	Inter-peak	1.0556	1.0230
	PM Peak	1.0449	1.0230
Hampshire rural	Off-peak	1.0603	1.0230
	AM Peak	1.0677	1.0230
	Inter-peak	1.0710	1.0230
	PM Peak	1.0651	1.0230
Hampshire urban	Off-peak	1.0502	1.0230
	AM Peak	1.0576	1.0230
	Inter-peak	1.0607	1.0230
	PM Peak	1.0549	1.0230

4.1.13 Where temporary diversions are proposed, the traffic on the road to be closed was isolated by hour of day and transferred to the proposed temporary diversion route. This allowed for the calculation of average weekday and average weekend days to reflect the weeks that temporary diversions would be in place.

4.1.14 24-hour AADT were calculated using a weighted average of the 24-hour weekday value and the 24-hour weekend day value for the Baseline and 2022 Future Baseline.

$$\frac{[(Average\ weekday\ \times 5) + (Average\ Weekend\ Day\ \times 2)]}{7} = Baseline\ AADT$$

4.1.15 To calculate the AADT for the 2022 With Project scenario, for example if the temporary diversion is in place for five weeks, a weighted average of five average weeks would be combined with 47 Future Baseline (2022) weeks.

$$\frac{[(With\ Project\ average\ day \times 5) + (Future\ Baseline\ average\ day \times 47)]}{52} = With\ Project\ AADT$$

4.1.16 18-hour Annual Average Weekday Traffic (AAWT) were calculated in a similar way to the AADT but for weekdays only (AAWT is defined as the average over a full year of the number of vehicles passing a point in the road network excluding weekends).

4.1.17 Weighted averages were calculated for the Balmoral Drive temporary diversion route based on the link lengths of the proposed diversion route. These were used for the assessment of traffic flows and collisions but not for journey times, which used the traffic flow on the separate parts of the temporary diversion route to calculate the total journey time.

Journey Times

4.1.18 Journey times for temporary diversions and traffic management were calculated using SATURN speed flow curve equations for bi-directional peak hours calculated for an average weekday. To represent a consistent worst case, 08:00-09:00 and 17:00-18:00 were selected as the AM and PM peak hours. The percentage of heavy-duty vehicles (HDVs) used in these calculations is based on the 18-hour weekday average.

4.1.19 The calculation of journey times using speed flow curves requires the conversion of traffic flows to Passenger Car Units (PCUs). The conversion factors for these are provided in Table 4.2.

Table 4.2: Conversion Factors for Passenger Car Units

Vehicle Class	Vehicle Type	Conversion Factors
Car	Light	1
Minibus	Light	1
Light goods vehicle (up to 3.5 tonnes)	Light	1
Heavy goods vehicle (exceeding 3.5 tonnes)	Heavy	2
Bus	Heavy	2

4.1.20 To supplement the journey times calculated using SATURN equations, traffic models of the temporary traffic management locations were completed using the software program LinSig V3,2,40,0. LinSig models traffic signals and their effect on traffic capacity and queuing. Delays associated with traffic management were assessed using 2022 Future Baseline traffic flows. All roads requiring traffic management were assumed to have temporary traffic signals at one location at any one time, with the traffic signal heads placed approximately 120 metres apart from each other.

Collisions

4.1.21 The latest five years of publicly available STATS19 collision data, between 1 January 2013 and 31 December 2017 inclusive, were obtained for the following:

- collisions;
- casualties; and
- vehicles.

4.1.22 Collisions were identified along the assessed routes within a 25m radius, based on previous experience to capture collisions at junctions and to allow for inaccuracy in recording of collision coordinates. Collision clusters were defined as a concentration of four or more collisions within 50m over a period of five years.

4.1.23 AADT and route length in kilometres were used in the assessment of collisions and safety, consistent with standard industry practice for assessing changes in collisions. This included calculating collisions per year and per 100 million vehicle kilometres (MVKs), for:

- Baseline;
- 2022 Future Baseline; and
- 2022 With Project.

4.1.24 The formula for calculating collisions per 100MVKs is:

$$\frac{Collisions\ x\ 100{,}000{,}000}{AADT\ x\ days\ x\ years\ x\ distance} = Collisions\ per\ 100MVK$$

4.1.25 The change in AADT between the 2022 Future Baseline and 2022 With Project was used to consider any change in collisions and clusters.

4.2 Assessment Criteria

4.2.1 Criteria used to establish the magnitude of impacts for traffic flows, journey times and collisions are set out below. They were used to inform the assessment as to whether there would be severe impacts as set out in NPPF.

4.2.2 Other considerations used to determine whether impacts would be severe were:

- duration of the impact;
- sensitivity of the route assessed qualitatively based on professional judgement incorporating:
  - ability of road users to accommodate change; and
  - importance of each location to transport network, for example ‘A’, ‘B’ or unclassified road type.

4.2.3 The duration of impacts on the transport network must be considered in context to normal conditions. For instance, a diversion is not the norm for road users but if it were in place for two years, for example, it would become the new norm. This could not be considered short term because new travel patterns and habits may be formed permanently. Taking this into consideration, the definitions adopted for impact duration were:

- short term: less than six months;
- medium term: six months to two years; and
- long term: more than two years.

4.2.4 Impacts on public transport (excepting journey times) were assessed qualitatively. The assessment criteria for traffic flows, journey times and collisions and safety were:

Changes to Traffic Flows

4.2.5 Changes in traffic flows were assessed based on thresholds of 30%, 60% and 90% for a period of more than four weeks in any 12-month period (IEMA, 1993). The traffic flows for the periods over which traffic flows would change were calculated for total traffic and change in Heavy Duty Vehicles (derived by combining HGVs and buses). Table 4.3 details the criteria for magnitude of assessment for change in traffic flows.

Table 4.3: Criteria for Magnitude of Assessment for Change in Traffic Flows (based on IEMA, 1993)

Change in Traffic Flows	Magnitude
A change in average daily traffic in excess of 90% for a period exceeding four weeks in any 12-month period	Large
A change in average daily traffic of between 60% and 90% for a period exceeding four weeks in any 12-month period	Medium
A change in average daily traffic of between 30% and 60% for a period exceeding four weeks in any 12-month period	Small
A change in average daily traffic of up to 30% for a period exceeding four weeks in any 12-month period	Negligible

Changes to Journey Times

4.2.6 Changes to journey times are most likely to result from temporary traffic diversions and traffic management required for the project. The assessment of journey times therefore focused on this matter. Analysis of temporary diversion routes using speed flow curves was undertaken based on 2022 Future Baseline and 2022 With Project traffic forecasts with temporary diversion routes in place.

4.2.7 Both AM and PM weekday (Monday to Friday) peak hours were assessed for each temporary diversion. Both directions were assessed where the diversion is bi-directional. Peak hours were determined based on available traffic data. Table 4.4 sets out the criteria for assessing the magnitude of change in journey times.

Table 4.4: Criteria for Assessing the Magnitude of Change in Journey Times (based on IEMA, 1993)

Change in Journey Times	Magnitude
A change in peak hour journey times in excess of 90% for a period exceeding four weeks in any 12-month period	Large
A change in peak hour journey times of between 60% and 90% for a period exceeding four weeks in any 12-month period	Medium
A change in peak hour journey times of between 30% and 60% for a period exceeding four weeks in any 12-month period	Small
A change in peak hour journey times of up to 30% for a period exceeding four weeks in any 12-month period	Negligible

4.2.8 The method for public transport (buses) replicated the method used for the assessment of journey times for general traffic, but with the value/sensitivity

assumed to be high. This is on the basis that passengers on buses are very sensitive to change, and that bus routes have little capacity to accommodate a change while maintaining a consistent level of service.

4.2.9 For the bus routes that would be affected, the following criterion have been used:

- Temporary changes in journey distances by bus for more than four weeks in any 12-month period, of more than 400m. The criterion is based on professional judgement and good practice used on similar projects.

Collisions and Safety

4.2.10 For the assessment of collisions and safety, the approach was a combination of quantitative and qualitative assessment. It considered likely changes in traffic speeds and driver behaviours that may result from changes in the operation of the traffic network (for example increased congestion); impacts at collision clusters were considered. The change in total collisions based on the collisions per 100 MVK was also used to inform the assessment. The criteria for assessing magnitude are set out in Table 4.5. The change to traffic volume and composition was considered to determine the potential for severe impacts relating to the number and severity of collisions.

Table 4.5: Criteria for Assessing the Magnitude of Change in Collisions (based on IEMA, 1993)

Change in collisions	Magnitude
A change in collision numbers likely to be more than 90% or severity of existing collisions likely to change by more than 90%.	Large
A change in collision numbers of between 60% and 90% or severity of existing collisions likely to change by between 60% and 90%.	Medium
A change in collision numbers of between 30% and 60% or severity of existing collisions likely to change by between 30% and 60%.	Small
A change in collision numbers not likely to be more than 30% or severity of existing collisions not likely to change by more than 30%.	Negligible

Basis of Assessment

4.2.11 Table 4.6 presents the different types of traffic flows used to compare the 2022 Future Baseline and 2022 With Project. AAWT and AADT were the basis of the 2022 Future Baseline assessment. Annualised averages were not used for the 2022 With Project traffic flows and journey time assessments as the annualisation of the traffic flows would not accurately reflect the likely impact during the temporary diversions and traffic management.

Table 4.6: Basis of Comparison

Assessment Type	2022 Future Baseline	2022 With Project
Traffic flows	AADT	With Diversion Average Day
Journey times	AAWT (peak hours)	With Diversion Average Weekday
Collisions	AADT	With Diversion AADT

5 2018 Existing Baseline Conditions

5.1.1 Table 5.1 presents details of each location assessed where logistics hubs, construction compounds, temporary traffic management or a diversion route is proposed.

Table 5.1 Traffic Management, Diversion, Logistics Hub and Construction Compound Locations

Location	Speed Limit (mph)	Width of Carriageway (metres)	Street-lit	Footway	Other
Traffic Management					
Naishes Lane, Fleet	30	6.0	Yes	Yes	Give way build-outs
B311 Red Road, Camberley	50	8.0	No	Yes	N/A
B377 Ashford Road, Staines	40	6.5	Yes	Yes	N/A
Woodthorpe Road, Ashford	30	9.5	Yes	Yes	N/A
Diversions					
Balmoral Drive, Frimley	30	7.0	Yes	Yes	N/A
St. Catherine's Road, Frimley	20	6.5	No	Yes	N/A
Logistics Hubs					
A31 Ropley Dean	60	7.0	No	No	N/A
A31/A32 Junction Northfield Lane, Alton	70	5.0	No	No	N/A
Hartland Park Village, Farnborough	60	8.0	Yes	Yes	N/A
Ministry of Defence (MoD) land: Deepcut Bridge Road, Frimley Green	50	6.5	Yes	Yes	Speed cushions
M3 Junction 3: New Road, Windlesham	50	6.0	No	Yes	N/A
Brett Aggregates, Littleton Lane, Shepperton	40	7.0	No	Yes	N/A
Construction Compounds					
Maddoxford Lane	30	4.5	No	Yes	N/A
Gregory Lane	30	4.0	No	No	N/A
Wintershill	40	5.5	No	No	N/A
B2177 Winchester Road	40/60	7.0	No	Yes	N/A
Stakes Lane	60	3.0	No	No	N/A
Wheely Down Road	60	4.0	No	No	N/A
Riversdown Road	60	3.0	No	No	N/A
A272	60	6.5	No	No	N/A
B376 Shepperton Road, M3 to B379	40	6.0	Yes	Yes	N/A
B379 Brett Aggregates	40	6.0	Yes	Yes	N/A
Ashford Station to Ashford Community Centre, Woodthorpe Road	30	9.5	Yes	Yes	N/A
A30, West London Terminal, Short Lane	30/40	7.0	Yes	Yes	N/A
A30 to Ashford Sports Ground, Staines Road	40	7.0	Yes	Yes	N/A
A30, Orchard Way	30/40	6.0	Yes	Yes	N/A

5.2 Traffic Flows

5.2.1 Based on the method in Section 4, 24-hour AADT and 18-hour AAWT were calculated for the locations shown in Table 5.2.

Table 5.2: Baseline AADT and AAWT

Route	AADT	AADT HDV	AAWT	AAWT HDV
Traffic Management				
Naishes Lane	1,600	64	1,707	74
B311 Red Road	4,585	56	4,997	61
B377 Ashford Road	6,451	244	6,939	265
Woodthorpe Road	7,302	106	7,850	111
Diversions				
Balmoral Drive	5,186	125	5,453	133
B3411 Frimley Green Road	13,245	200	14,221	225
Buckingham Way	2,448	217	2,711	249
Balmoral Drive diversion	6,556	210	7,091	240

5.2.2 Table 5.3 presents the AM and PM peak hour traffic flows for the Existing Baseline, which were used to calculate the journey times in Section 5.3.

Table 5.3: Baseline Peak Hour Traffic Flows (AAWT)

Route	Direction 1	Direction 2	Length (Metres)	AM Peak		PM Peak		HDV %
				Dir 1	Dir 2	Dir 1	Dir 2	
Traffic Management								
Naishes Lane	Northbound	Southbound	445	128	128	52	52	4%
B311 Red Road	Eastbound	Westbound	2,400	164	705	217	896	1%
B377 Ashford Road	Northbound	Southbound	1,500	491	499	244	253	4%
Woodthorpe Road	Eastbound	Westbound	1,400	363	437	395	435	1%
Diversions								
Balmoral Drive	Eastbound	Westbound	860	181	181	282	282	2%
B3411 Frimley Green Road	Northbound	Southbound	780	526	577	639	622	2%
Buckingham Way	Northbound	Southbound	1,270	120	235	149	114	9%
Balmoral Drive diversion	Northbound	Southbound	2,050	274	365	335	308	6%

5.3 Journey Times

5.3.1 Table 5.4 presents the journey times for each route (in seconds) based on the AM and PM peak hour traffic flows in Table 5.3.

Table 5.4: 2018 Baseline Journey Times

Route	Direction 1	Direction 2	AM Peak Direction 1 (Seconds)	AM Peak Direction 2 (Seconds)	PM Peak Direction 1 (Seconds)	PM Peak Direction 2 (Seconds)
Traffic Management						
Naishes Lane	Northbound	Southbound	35	35	34	34
B311 Red Road	Eastbound	Westbound	186	209	187	228
B377 Ashford Road	Northbound	Southbound	123	123	117	117
Woodthorpe Road	Eastbound	Westbound	111	113	112	113
Diversions						
Balmoral Drive	Northbound	Southbound	67	67	67	67
Balmoral Drive diversion route	Northbound	Southbound	163	164	165	165

5.3.2 Further information about the journey time routes is provided in Appendix 5, figures for traffic management and diversion routes are provided in Appendix 1.

5.4 Collisions and Safety

5.4.1 The change to traffic volume and composition was considered to determine the potential for severe impacts relating to the number and severity of collisions. AADT were used in the assessment of collisions and safety, consistent with standard industry practice for assessing changes in collisions.

5.4.2 Table 5.5 summarises the collisions recorded per MVKs for each of the assessed routes based on the Existing Baseline AADT.

Table 5.5: Existing Baseline Collisions

Route	Route Length (km)	AADT	Collisions/ 100 MVK	Average Yearly Collisions	Severity % (Slight/ Serious/ Fatal)
Traffic Management					
Naishes Lane	0.74	1,600	92.6	0.4	100/ 0/ 0
B311 Red Road	3.65	4,585	167.0	10.2	71/ 27/ 2
B377 Ashford Road	2.15	6,451	83.2	4.2	76/ 24/ 0
Woodthorpe Road	1.62	7,302	79.0	3.4	94/ 6/ 0
Diversions					
Balmoral Drive	0.84	5,186	38.0	0.6	67/ 33/ 0
Balmoral Drive diversion	2.05	6,556	40.8	2.0	70/ 30/ 0

Traffic Management and Diversions

5.4.3 This section presents the common causation factor of the collision clusters. Further details relating to the number and severity of collisions are provided in Appendix 6. Locations of collision clusters and severity are set out in Figure 2 in Appendix 1.

Naishes Lane

5.4.4 There were two recorded collisions over five years along Naishes Lane. Analysis of the data shows that the collisions were not clustered.

B311 Red Road

5.4.5 There were 51 recorded collisions over five years along B311 Red Road. Analysis of the data shows that there were four collision clusters:

- Cluster one, consisting of four collisions, located at the roundabout at the eastern end of B311 Red Road. The main causation factor for collisions at this location was driver error and there is no clear indication that the collisions have a common cause.
- Cluster two, consisting of seven collisions, located at the roundabout at the western end of B311 Red Road. The main causation factor for collisions at this location was driver error of vehicles already on, and joining the roundabout colliding with each other.
- Cluster three, consisting of eleven collisions, located at the T junction with MacDonald Road. The main causation factor for collisions at this location was vehicles joining the B311 Red Road and colliding with traffic already on the B311.
- Cluster four, consisting of nine collisions, located at the T junction with Lightwater Road. The main causation factor for collisions at this location was vehicles joining the B311 Red Road colliding with traffic already on the B311.

B377 Ashford Road

5.4.6 There were 21 recorded collisions over five years along the B377 Ashford Road. Analysis of the data shows that there were two main collision clusters:

- Cluster one, consisting of four collisions, located at the T junction with Gloucester Crescent. The main causation factor for collisions at this location was driver error and there is no clear indication that the collisions have a common cause.
- Cluster two, consisting of five collisions, located at the T junction with Charles Road. The main causation factor for collisions at this location was driver error and there was no clear indication that the collisions have a common cause.

Woodthorpe Road

5.4.7 There were 17 recorded collisions over five years along Woodthorpe Road. Analysis of the data shows that there was one cluster, consisting of eight collisions, located at the junction of Kingston Road and Woodthorpe Road. The main causation factor for collisions at this location was driver error and there is no clear indication that the collisions have a common cause.

Balmoral Drive

5.4.8 There were three recorded collisions over five years along Balmoral Drive. Analysis of the data shows that the collisions were not clustered.

Balmoral Drive Diversion

5.4.9 There were ten recorded collisions over five years along Frimley Green Road and Buckingham Way. Analysis of the data shows that the collisions were not clustered.

5.5 Public Transport Services

Existing Bus Facilities and Services

5.5.1 Table 5.6 and 5.7 outline the access to public transport facilities located at temporary traffic management, diversion and logistics hub sites. Further details of the bus services listed in Table 5.6 and 5.7 are detailed in Appendix 7. Bus service details were taken from Traveline South East (Traveline South East & Anglia, 2019) and Surrey County Council (Surrey County Council, 2019) websites. Logistics hubs are included because of the potential for sustainable travel by project construction workers.

Table 5.6: Public Transport Access at Traffic Management and Diversion Locations

Public Transport Access at Traffic Management and Diversions
Naishes Lane
Naishes Lane has adequate footway provision along its full extent which provides access to bus stops. There is one bus stop in each direction along the section of Naishes Lane that would be affected by the installation of the pipeline. Bus Routes: 10, 610
B311 Red Road
B311 Red Road has adequate footway provision along one side of the carriageway only. There is one bus stop in each direction along the section of B311 Red Road that would be affected by the installation of the pipeline. Bus Routes: 84, 500
B377 Ashford Road
B377 Ashford Road has adequate footway provision along one side of the carriageway only. There is one bus stop in each direction along the section of B377 Ashford Road that would be affected by the installation of the pipeline. Bus Routes: 574
Woodthorpe Road
Woodthorpe Road provides one of the main access routes to Ashford Railway Station, which is located at the eastern end of the road. Woodthorpe Road has footway provision on both sides of the carriageway along its full extent. There are bus stops at regular intervals along Woodthorpe Road. Bus Routes: 117, 667
St. Catherine's Road
St. Catherine's Road has a narrow footway along the section between Balmoral Drive and Rhododendron Road that would be affected by the pipeline installation.

Public Transport Access at Traffic Management and Diversions
There are no bus stops along St. Catherine's Road. Bus Routes: Not applicable
Balmoral Drive
Although there is a footway along the full length of Balmoral Drive there are no bus stops along the road. Bus Routes: Not applicable
Balmoral Drive diversion
Frimley Green Road has adequate footway provision on both sides of the carriageway along its full extent. There are two bus stops in each direction along Frimley Green Road. There are no bus stops along the remainder of the diversion. Bus Routes: 3 (all), 11 and 85 (part, southbound only)

Table 5.7: Public Transport Access at Logistics Hubs

Public Transport Access at Logistics Hubs
A31 Ropley Dean
A31 Ropley Dean has footway provision along one side of the carriageway that provides access along the A31 and into Ropley Dean. There are bus stops in both directions. Bus Routes: 64, 64X (eastbound only), 240 (part, between A31/Bishops Sutton Road junction and A31/ Petersfield Road junction.
A31/A32 Northfield Lane
There are bus stops in both directions on Northfield Lane and on Chawton Park Road in nearby Alton. Although the bus stops on Northfield Lane are immediately outside this proposed logistics hub there is no footway access to them. Bus Routes: 38
Hartland Park
There are no bus stops in the immediate vicinity of this logistics hub. Bus Routes: Not applicable
MoD Deepcut
The B3015 has adequate footway provisions on both sides of the carriageway. There are bus stops on the B3015 immediately adjacent to this logistics hub. Bus Routes: 11, 48, 85
New Road Windlesham
There are no bus stops in the immediate vicinity of this logistics hub. Bus Routes: Not applicable
Brett Aggregates
There are bus stops on B376 Shepperton Road immediately west of this logistics hub. There are also bus stops a little further to the south on Chertsey Road and Chertsey Bridge Road. Bus Routes: 458, 574, 656, 695, 813

5.5.2 Bus services in the surrounding area of each of the locations where logistics hubs, construction compounds, temporary traffic management or diversions are proposed, which may potentially experience impacts, are included in Appendix 7.

6 Scope of the Assessment

6.1 Assessed Locations

6.1.1 The scope of the assessment, as set out in the Transport Assessment Scoping Report (see Appendix 3), is based on a duration threshold exceeding four weeks before impacts may be recognised as severe. Therefore, impacts with a shorter duration were scoped out of the assessment.

6.1.2 There are currently six locations where the installation works within the road are expected to exceed four weeks and therefore these are scoped into the assessment. These locations are listed in Table 6.1. Locations which did not meet these criteria were assumed to have negligible impact on the road network and are listed in Appendix 8.

Table 6.1: Assessed Locations with the Potential for Severe Effects

Location	Work Section	Traffic Control	Total Length of Road Affected (Metres)	Duration of Works (Weeks)
Naishes Lane, Fleet	E	Traffic Management	656	7
Balmoral Drive, Frimley	E	Diversion	375	5
St. Catherine's Road[1], Frimley	E	Diversion	110	5
B311 Red Road, Camberley	F	Traffic Management	570	7
B377 Ashford Road, Staines	H	Traffic Management	1,310	15
Woodthorpe Road, Staines	H	Traffic Management	1,300	9
[1] *St. Catherine's Road is expected to be constructed more slowly than other locations*				

6.1.3 The assessment assumes that traffic management would be in place for four of the routes. This would comprise single lane working for the installation and traffic signals to provide one-way flows in the other carriageway.

6.2 Assessment of Project Traffic Demand

6.2.1 The change in AADT associated with the project traffic demand is not more than 3% as shown in Table 6.2. On this basis there would not be significant changes in existing traffic flows because a change of 30% or greater is required. Additionally, the strategic road network is designed to take large numbers of vehicles and therefore has ample capacity to accommodate the small changes in traffic flows generated by the project.

6.2.2 The project traffic demand is sufficiently low that it is unlikely to result in severe impacts, based on the assessment criteria for this project, and it therefore does not require further assessment.

Table 6.2: Change in AADT at Logistics Hubs

Logistics Hub	Approximate Count Point Location	2022 AADT	Peak Year Project Only AADT	AADT 2022 With Project	Change
A31 Ropley Dean	A31 Alresford Bypass	12,849	93	12,942	1%
A31/A32 Northfield Lane	A31 Alton Bypass	26,810	156	26,966	1%
Hartland Park	Ively Road	10,971	302	11,273	3%
MoD Deepcut	Deepcut Bridge Road	8,322	60	8,382	1%
New Road Windlesham	New Road Windlesham	5,944	191	6,135	3%
Brett Aggregates	B376 Shepperton Road	15,048	160	15,208	1%

6.2.3 Table 6.3 shows the AAWT for logistics hubs and the change compared with the 2022 Future Baseline. As with the AADT, the greatest change associated with the project logistics hubs is not more than 3%.

Table 6.3: Change in AAWT at Logistics Hubs

Logistics Hub	Approximate Count Point Location	2022 AAWT	Peak Year Project Only AAWT	AAWT 2022 With Project	Change
A31 Ropley Dean	A31 Alresford Bypass	13,850	108	13,958	1%
A31/A32 Northfield Lane	A31 Alton Bypass	28,682	182	28,864	1%
Hartland Park	Ively Road	11,648	352	12,000	3%
MoD Deepcut	Deepcut Bridge Road	9,156	71	9,227	1%
New Road Windlesham	New Road Windlesham	6,799	223	7,022	3%
Brett Aggregates	B376 Shepperton Road	16,238	186	16,424	1%

6.2.4 The availability of peak capacity is further demonstrated in Table 6.4, based on the principles of TA46/96 (Highways Agency, 1997) and TA79/99 (Highways Agency, 1999) and assuming project traffic is spread evenly over 12 hours. It shows that the peak traffic demand at logistics hubs, including with the project traffic demand, is significantly below capacity.

Table 6.4: Peak Capacity Assessment incorporating Logistics Hub Traffic

Logistics Hub	Approximate Count Point Location	Road Type	Total Traffic Demand	Road Capacity
Rural roads based on TA46/97 two-way peak day capacity				
A31 Ropley Dean	A31 Alresford Bypass	S2	12,942	25,377
A31/A32 Northfield Lane	A31 Alton Bypass	D2AP	26,966	63,264
Hartland Park	Ively Road	S2	11,273	25,981
New Road Windlesham	New Road Windlesham	S2	6,135	26,477
Urban roads based on TA79/99 one-way peak hour capacity				
MoD Deepcut	Deepcut Bridge Road	6.75m UAP3	457	1,110
Brett Aggregates	B376 Shepperton Road	6.75m UAP3	732	1,110

6.3 Items Scoped out of Further Assessment

6.3.1 There would be no impacts on travel by surface and underground rail or by air, therefore these were scoped out of the assessment.

6.3.2 Public Transport services (buses) were scoped out except for journey times because there would be negligible impact on bus routes. There are small changes in traffic flows associated with project traffic (see Tables 6.2 and 6.3) at logistics hubs and construction compounds and the road network has sufficient spare capacity (see Table 6.4).

6.3.3 There are unlikely to be severe impacts on walkers, cyclists and equestrians using these routes because all designated PRoW crossing the working area would be managed, including National Trails, with access only closed for short periods while construction activities occur. This would be managed through a CTMP. Therefore, these groups were scoped out of the assessment.

6.3.4 St. Catherine's Road is a minor residential road with a single-track section. A DfT study (2004) suggests that this type of road is not suited to large traffic flows, with a two-way capacity of 300 vehicles per hour. Therefore, the volume of traffic using St Catherine's Road would be expected to be low. Based on road characteristics and expected traffic flows, the likely severe impacts associated with diverting traffic away from St Catherine's Road would not be greater than those associated with the diversion that would be in place for Balmoral Drive.

6.4 Summary of Scope and Assessment Approach

6.4.1 Based on the method set out in Section 4, the Baseline set out in Section 5 and the scoping assessment included in Section 6.2, a summary of the scope of this assessment is provided as Table 6.5.

Table 6.5: Summary of Assessment Scope and Approach

Assessment	Diversions and Traffic Management	Logistics Hubs	Construction Compounds
Traffic flows	Quantitative	Excluded	Excluded
Public Transport	Excluded		
Journey Times (private)	Quantitative	Excluded	Excluded
Journey Times (bus)	Quantitative	Excluded	Excluded
Collisions and Safety	Quantitative	Excluded	Excluded
Pedestrians, cyclists and equestrians	Excluded		

7 2022 Future Baseline

7.1 Traffic Flows

7.1.1 The method outlined in Section 4 was used to derive a 2022 Future Baseline scenario.

7.1.2 Table 7.1 presents the 24-hour AADT and 18-hour AAWT for 2022 Future Baseline.

Table 7.1: 2022 Future Baseline AADT and AAWT Traffic Flows

Route	AADT	AADT HDV	AAWT	AADT HDV
Traffic Management				
Naishes Lane	1,688	65	1,801	76
B311 Red Road	4,779	58	5,234	63
B377	6,717	250	7,261	271
Woodthorpe Road	7,344	106	7,859	111
Diversions				
Balmoral Drive	5,401	128	5,712	136
B3411 Frimley Green Road	13,990	204	15,024	230
Buckingham Way	2,549	222	2,835	255
Balmoral Drive diversion	6,902	215	7,473	245

7.1.3 Table 7.2 presents the AM and PM peak hour traffic flows for the 2022 Future Baseline, which were used to calculate the journey times in Section 7.2.

Table 7.2: 2022 Future Baseline Peak Hour Traffic Flows (Average Weekday)

Route	Direction 1	Direction 2	AM Peak		PM Peak		HDV%
			Dir 1	Dir 2	Dir 1	Dir 2	
Traffic Management							
Naishes Lane	Northbound	Southbound	135	135	55	55	4%
B311 Red Road	Eastbound	Westbound	171	736	227	936	1%
B377 Ashford Road	Northbound	Southbound	513	521	255	264	4%
Woodthorpe Road	Eastbound	Westbound	364	437	396	435	1%
Diversions							
Balmoral Drive	Eastbound	Westbound	189	189	294	294	2%
B3411 Frimley Green Road	Northbound	Southbound	556	610	674	656	2%
Buckingham Way	Northbound	Southbound	125	245	156	119	9%
Balmoral Drive diversion	Northbound	Southbound	289	384	353	323	6%

7.2 Journey Times

7.2.1 Table 7.3 shows the 2022 Future Baseline journey times by direction and peak hour.

Table 7.3: 2022 Future Baseline Journey Times

Route	Direction 1	Direction 2	AM Peak Direction 1 (Seconds)	AM Peak Direction 2 (Seconds)	PM Peak Direction 1 (Seconds)	PM Peak Direction 2 (Seconds)
Traffic Management						
Naishes Lane	Northbound	Southbound	35	35	34	34
B311 Red Road	Eastbound	Westbound	187	212	187	233
B377 Ashford Road	Northbound	Southbound	123	124	117	118
Woodthorpe Road	Eastbound	Westbound	111	113	112	113
Diversions						
Balmoral Drive	Northbound	Southbound	67	67	68	68
Balmoral Drive diversion route	Northbound	Southbound	163	165	166	165

7.2.2 Further information regarding journey time routes is provided in Appendix 5.

7.3 Collisions and Safety

7.3.1 Table 7.4 shows the average number of collisions per year based on the AADT of the existing and 2022 Future Baseline. For all routes assessed, the increase in collisions is not significant, and therefore the change to collision clusters and severity of collisions is expected to be negligible.

Table 7.4: Existing and 2022 Future Baseline Collisions

Route	Route Length (km)	2022 Future Baseline		
		AADT	Collisions/100 MVK	Average Yearly Collisions
Traffic Management				
Naishes Lane	0.74	1,688	92.6	0.4
B311 Red Road	3.65	4,779	167.0	10.6
B377	2.15	6,717	83.2	4.4
Woodthorpe Road	1.62	7,344	79.0	3.4
Diversions				
Balmoral Drive	0.84	5,401	38.0	0.6
Balmoral Drive diversion	2.05	6,902	40.8	2.1

8 2022 Project Assessment

8.1 Traffic Flows

8.1.1 Impacts relating to project traffic generated by the logistics hubs and construction compounds were scoped out in Section 5. Therefore, the assessment in this section only relates to traffic generated by either temporary traffic management or temporary traffic diversions for the routes detailed in Table 8.1.

8.1.2 Table 8.1 shows the AADT, AAWT and Average Day traffic flows for 2022 With Project traffic flows. (Average Day as defined in Section 4.1.13).

Table 8.1: 2022 With Project AADT, AAWT and Average Day

Route	AADT	AADT HDV	AAWT	AAWT HDV	Average Day	Average Day HDV
Traffic Management						
Naishes Lane	1,688	65	1,801	76	1,688	65
B311 Red Road	4,779	58	5,234	63	4,779	58
B377 Ashford Road	6,717	250	7,261	271	6,717	250
Woodthorpe Road	7,344	106	7,859	111	7,344	106
Diversions						
Balmoral Drive	4,882	116	5,163	123	0	0
B3411 Frimley Green Road	14,510	217	15,573	243	19,392	333
Buckingham Way	3,068	234	3,384	268	7,950	350
Balmoral Drive diversion	7,421	228	8,022	259	12,303	343

8.1.3 Table 8.2 shows the changes between 2022 Future Baseline and 2022 With Project average daily traffic flows.

Table 8.2: 2022 Future Baseline AADT compared with 2022 With Project Average Day

Route	2022 Future Baseline AADT	2022 Future Baseline AADT HDV	2022 With Project Average Day	2022 With Project Average Day HDV	Difference (HDV)	% Change (HDV)
Traffic Management						
Naishes Lane	1,688	65	1,688	65	0 (0)	0% (0%)
B311 Red Road	4,779	58	4,779	58	0 (0)	0% (0%)
B377 Ashford Road	6,717	250	6,717	250	0 (0)	0% (0%)
Woodthorpe Road	7,344	106	7,344	106	0 (0)	0% (0%)
Diversions						
Balmoral Drive	5,401	128	0	0	-5,401 (-116)	-100% (-100%)
Balmoral Drive diversion	6,902	215	12,303	343	5,401 (128)	78% (60%)

8.1.4 Additional traffic is not expected to be produced by temporary traffic management routes. Changes are only expected along Balmoral Drive and the proposed Balmoral Drive diversion route, due to the proposed temporary diversion rerouting traffic and therefore changing the volume of traffic on those routes. The change in traffic on these routes would be short term and so would not cause a severe impact.

8.1.5 Table 8.3 presents the AM and PM peak hour traffic flows for 2022 With Project, which were used to calculate the journey times in Section 8.2.

Table 8.3: 2022 With Project Peak Hour Traffic Flows (Average Weekday)

Route	Direction 1	Direction 2	AM Peak		PM Peak		HDV%
			Dir 1	Dir 2	Dir 1	Dir 2	
Traffic Management							
Naishes Lane	Northbound	Southbound	135	135	55	55	4%
B311 Red Road	Eastbound	Westbound	171	736	227	936	1%
B377 Ashford Road	Northbound	Southbound	513	521	255	264	4%
Woodthorpe Road	Eastbound	Westbound	364	437	396	435	1%
Diversions							
Balmoral Drive	Eastbound	Westbound	0	0	0	0	0%
B3411 Frimley Green Road	Northbound	Southbound	745	799	968	950	2%
Buckingham Way	Northbound	Southbound	415	434	350	413	4%

8.1.6 The change in peak hour traffic flows from 2022 Future Baseline to 2022 With Project are negligible along temporary traffic management routes. The impact from the change in traffic flows along the Balmoral Drive diversion routes would only be short term due to the length of the works occurring there.

8.1.7 Table 8.4 presents the maximum change in peak hour traffic flows between 2022 Future Baseline and 2022 With Project scenarios. There are no changes along temporary traffic management routes due to traffic generated from the project, and all traffic along Balmoral Drive in the 2022 Future Baseline is expected to route along the proposed diversion. This would be subject to changes in traffic flows along the temporary diversion route but only for approximately five weeks. Based on the information presented in Table 8.4, changes in peak hour traffic flows would not cause severe impacts.

Table 8.4: Comparison of 2022 Future Baseline and 2022 With Project Average Weekday Peak Hour Traffic Flows

Location	2022 Future Baseline	Average Weekday	Difference	% Change
Traffic Management				
Naishes Lane	135	135	0	0%
B311 Red Road	171	171	0	0%
B377 Ashford Road	513	513	0	0%
Woodthorpe Road	364	364	0	0%

Location	2022 Future Baseline	Average Weekday	Difference	% Change
Diversions				
Balmoral Drive	294	0	-294	-100%
Balmoral Drive diversion	323	618	294	91%

8.2 Journey Times

8.2.1 Changes to journey times are most likely to result from temporary traffic diversions and temporary traffic management required for the project. These were based on 2022 Future Baseline and 2022 With Project traffic forecasts with diversion routes in place.

8.2.2 Table 8.5 presents the results from the LinSig modelling, which show the delay expected along the routes where temporary traffic management is proposed during AM and PM peak hours. The largest delay to journey times along temporary traffic management routes occurs on Red Road which would experience a predicted delay of 77 seconds.

Table 8.5: LinSig Delays

Route	Direction 1	Direction 2	AM Delay Direction 1 (Seconds)	AM Delay Direction 2 (Seconds)	PM Delay Direction 1 (Seconds)	PM Delay Direction 2 (Seconds)
Naishes Lane	Northbound	Southbound	31	31	30	30
B311 Red Road	Eastbound	Westbound	33	58	42	77
B377 Ashford Road	Northbound	Southbound	50	49	38	37
Woodthorpe Road	Eastbound	Westbound	44	41	44	42

8.2.3 Appendix 9 provides the outputs of the LinSig model.

8.2.4 Table 8.6 shows the 2022 With Project journey times predicted for temporary diversion routes, and traffic management with the LinSig delays incorporated. Detailed calculation of journey time information is provided in Appendix 5.

Table 8.6: 2022 With Project Journey Times

Route	Direction 1	Direction 2	AM Peak Direction 1 (Seconds)	AM Peak Direction 2 (Seconds)	PM Peak Direction 1 (Seconds)	PM Peak Direction 2 (Seconds)
Traffic Management						
Naishes Lane	Northbound	Southbound	66	66	64	64
B311 Red Road	Eastbound	Westbound	220	270	229	310
B377 Ashford Road	Northbound	Southbound	173	173	155	155
Woodthorpe Road	Eastbound	Westbound	155	154	156	155

Route	Direction 1	Direction 2	AM Peak Direction 1 (Seconds)	AM Peak Direction 2 (Seconds)	PM Peak Direction 1 (Seconds)	PM Peak Direction 2 (Seconds)
Diversions						
Balmoral Drive	Eastbound	Westbound	-	-	-	-
Balmoral Drive diversion route	Northbound	Southbound	171	173	173	178

8.2.5 Table 8.7 and Table 8.8 show the difference between the 2022 Future Baseline and the 2022 With Project scenarios. The maximum increase in journey time is identified along Balmoral Drive diversion in the PM Peak, with a predicted increase of 111 seconds (159%); although the percentage increase is high, the actual additional journey time is only two minutes.

Table 8.7: AM Peak Journey Times

Route	Direction 1	Direction 2	2022 Future Baseline (Seconds)		2022 With Project (Seconds)		Difference (Seconds)		% Difference (Seconds)	
			Dir 1	Dir 2	Dir 1	Dir 2	Dir 1	Dir 2	Dir 1	Dir 2
Traffic Management										
Naishes Lane	Northbound	Southbound	35	35	66	66	31	31	90%	90%
B311 Red Road	Eastbound	Westbound	187	212	220	270	33	58	18%	27%
B377 Ashford Road	Northbound	Southbound	123	124	173	173	50	49	41%	40%
Woodthorpe Road	Eastbound	Westbound	111	113	155	154	44	41	40%	36%
Diversions										
Balmoral Drive (compared with Balmoral Drive diversion)	Northbound	Southbound	67	67	171	173	104	106	156%	159%

Table 8.8: PM Peak Journey Times

Route	Direction 1	Direction 2	2022 Future Baseline (Seconds)		2022 With Project (Seconds)		Difference (Seconds)		% Difference (Seconds)	
			Dir 1	Dir 2	Dir 1	Dir 2	Dir 1	Dir 2	Dir 1	Dir 2
Traffic Management										
Naishes Lane	Northbound	Southbound	34	34	64	64	30	30	87%	87%
B311 Red Road	Eastbound	Westbound	187	233	229	310	42	77	22%	33%
B377 Ashford Road	Northbound	Southbound	117	118	155	155	38	37	32%	31%

Route	Direction 1	Direction 2	2022 Future Baseline (Seconds)		2022 With Project (Seconds)		Difference (Seconds)		% Difference (Seconds)	
			Dir 1	Dir 2	Dir 1	Dir 2	Dir 1	Dir 2	Dir 1	Dir 2
Woodthorpe Road	Eastbound	Westbound	112	113	156	155	44	42	39%	37%
Diversions										
Balmoral Drive (compared with Balmoral Drive diversion)	Northbound	Southbound	68	68	173	178	106	111	156%	164%

8.2.6 Based on the magnitude of change set out in Table 8.7 and Table 8.8, likely journey time impacts for private vehicles and buses are set out in Table 8.9. As the magnitude of change is the same in each direction, each route has been assessed for the AM and PM peaks only, not for each direction. As the criteria for assessment set out in Section 4.2 are not met for the traffic management, assessment of these was not included.

Table 8.9: Initial Journey Time Impact Summary

Route	Private Vehicles		Bus Users	
	AM Peak	PM Peak	AM Peak	PM Peak
Traffic Management				
Naishes Lane	Large	Medium	No change in bus route length	
B311 Red Road	Negligible	Small	No change in bus route length	
B377 Ashford Road	Small	Small	No change in bus route length	
Woodthorpe Road	Small	Small	No change in bus route length	
Diversions				
Balmoral Drive (compared with Balmoral Drive diversion)	Large	Large	There are no bus services on Balmoral Drive	

8.2.7 As the proposed temporary traffic management and diversions are over a period of no longer than 15 weeks (see Table 3.1), the anticipated impact on journey times is not considered large. The short term duration and low sensitivity to short changes in route for private vehicles mean it is reasonable to consider that the impact experienced by road users would not be severe.

8.3 Collisions and Safety

8.3.1 Table 8.10 provides an overview of the predicted collisions per 100 MVK and the average yearly collisions along each temporary traffic management and diversion route.

Table 8.10: 2022 Future Baselines and 2022 With Project Collision Comparison

Route	Route Length (km)	Collisions /100 MVK	2022 Future Baseline		2022 Future With Project		% Difference
			AADT	Average Yearly Collisions	AADT	Average Yearly Collisions	Average Yearly Collisions
Traffic Management							
Naishes Lane	0.74	92.6	1,688	0.4	1,688	0.4	0%
B311 Red Road	3.65	167.0	4,779	10.6	4,779	10.6	0%
B377 Ashford Road	2.15	83.2	6,717	4.4	6,717	4.4	0%
Woodthorpe Road	1.62	79.0	7,344	3.4	7,344	3.4	0%
Diversions							
Balmoral Drive	0.84	38.0	5,401	0.6	4,882	0.6	-10%
Balmoral Drive diversion	2.05	29.9	6,902	2.1	7,421	2.3	7%

8.3.2 The change in AADT values and vehicle composition along temporary traffic management routes, when comparing the 2022 Future Baseline and 2022 With Project scenarios are negligible (see Table 8.3). Because of this an effect on collision rates is not expected.

8.3.3 Balmoral Drive and Balmoral Drive diversion route were the only routes where a change in annual collisions is predicted due to the proposed temporary diversion.

8.3.4 As Balmoral Drive would be closed for approximately five weeks, the AADT would decrease between the 2022 Future Baseline and 2022 With Project scenarios, and therefore the number of predicted annual collisions along this route would reduce.

8.3.5 Due to the small increase in AADT along the Balmoral Drive diversion route, and because the change in traffic composition is negligible (see Table 8.1 and Table 8.2) there would not be a severe impact in terms of predicted collisions. It is also likely that the increase on Balmoral Drive diversion route would be largely offset by the reduction along Balmoral Drive.

9 Potential Severe Cumulative Impacts

9.1 Overview of Cumulative Assessment

9.1.1 Heathrow Airport Expansion was specifically requested for consideration within the Transport Assessment by the Planning Inspectorate and is considered in Section 9.2. A full assessment of committed developments listed alongside the project is included in Chapter 15 Cumulative Effects of the ES (**application document 6.2**), with a summary provided in Section 9.3.

9.2 Heathrow Airport Expansion

9.2.1 Growth associated with the operation of committed developments is incorporated into the traffic and transport assessment through the application of TEMPro and RTF. The exception to this is the Heathrow Airport Expansion.

9.2.2 Enabling works for the expansion project are currently anticipated to be undertaken between 2021 and 2024, with main construction activities between 2023 and 2035. Therefore, operation of the airport expansion would not occur alongside the construction of the Southampton to London Pipeline project.

9.2.3 The Heathrow Airport Expansion EIA Scoping Report Volume 1 Main Report (Heathrow Airport Limited, 2018) contains limited information as to the likely significant effects and the quantitative changes likely to arise from the project. Based on the construction programme of both projects, only the construction impacts listed in Table 9.1 are relevant.

9.2.4 It is likely that only the enabling works would be concurrent with construction of the project, during which time, effects from Heathrow Airport Expansion may be less significant compared with its main construction works. A comparison of likely significant impacts is provided in Table 9.1.

Table 9.1: Likely Cumulative Significant Impacts

Effect from Heathrow Airport Expansion	Receptor	Likely Severe Cumulative Impact	Reasoning based on Southampton to London Pipeline Project
Increase in HGV movements to and from the airport which could affect journey times, highway capacity and lead to severance or impact road safety.	Highway users (all modes)	No	HGVs associated with the Heathrow expansion project are not likely to travel on those roads where journey time delays would be generated by the project because these are not on main routes to and from Heathrow Airport.
Increased patronage of public transport services affecting capacity and crowding. Movements on the highway network causing journey delay, congestion and severance.	Highway users (all modes) Public transport users	No	It is not currently assumed that construction workers associated with the SLP project would use public transport. Traffic demand associated with the project has been demonstrated to not be significant.

Effect from Heathrow Airport Expansion	Receptor	Likely Severe Cumulative Impact	Reasoning based on Southampton to London Pipeline Project
Changes to road layout or functionality leading to journey delay, congestion and severance or impact road safety.	Highway users (all modes) Public transport users (not including rail)	No	Changes to the Southern Perimeter Road may increase traffic flows on the A30 Staines Road, which crosses the route the pipeline and its associated works. However, based on the timescales of the Heathrow Airport Expansion project it is not anticipated that these works would align temporally.

9.3 Summary of Cumulative Impacts

9.3.1 A full list of likely severe cumulative impacts is included in Table 9.2. Details of this assessment are included in the draft DCO (**application document 3.1**).

Table 9.2: Summary of Likely Cumulative Impacts

Development Title	Description	Likely Severe Cumulative Impact
Development Consent Order (DCO) / Significant Developments		
Heathrow Expansion	Adding a northwest runway at Heathrow to increase air-traffic movement, in addition to supporting airfield, terminal and transport infrastructure, works to the M25, local roads and rivers.	No
Southern Rail Link to Heathrow	Southern rail connection between Chertsey, Virginia Water and Staines with Heathrow Terminal 5.	No
River Thames Scheme	Flood relief channel from Datchet to Teddington Lock	No
Eastleigh Borough Council		
Eastleigh Borough Council F/15/76235	Construction of a 5km trunk sewer and associated works including new pumping station and pipe bridge.	No
Eastleigh Borough Council O/12/71514	Outline application with all matters reserved (except for access) for the demolition of golf driving range shelter and groundsman's equipment store and the development of 1,400 homes with access from Winchester Road and Maddoxford Lane.	No
Eastleigh Borough Council O/15/75953	Outline application for up to 680 residential units, mixed use comprising of retail and/or community/healthcare use, land for two-form entry primary school, formal and informal open space and sports pitches.	No
Eastleigh Borough Council O/16/79600	Outline Application for demolition of existing residential dwelling and associated farm buildings, development of up to 50 dwellings with access from Maddoxford Lane, site infrastructure, open space and associated landscaping.	No

Development Title	Description	Likely Severe Cumulative Impact
Eastleigh Borough Council O/18/83634	Hybrid planning application for the proposed development of a residential and education-led site with access off Woodhouse Lane.	No
Eastleigh Borough Council O/18/83698	Erection of up to 375 dwellings, public open space, allotments, drainage, landscaping, other supporting infrastructure and mitigation measures associated with the development.	No
Hampshire County Council		
Hampshire County Council CS/17/81226	Construction of a bypass for Botley, providing a connection from Station Hill (A334/A3051 junction) to Woodhouse Lane together with associated improvements/enabling works to Woodhouse Lane.	No
Hampshire County Council CS/18/82664	Development of the site for a new two-form entry primary school.	No
Hart District Council		
Hart District Council 16/00564/OUT	Outline application for commercial B1, B2, B8 development comprising 10 industrial units.	No
Hart District Council 17/00471/OUT	Development of 1,500 dwellings alongside commercial and community space, and a primary school.	No
Hart District Council 18/00694/OUT	Outline application for redevelopment of the site to provide a mixed-use retail and industrial park.	No
Runnymede Borough Council		
Runnymede Borough Council RU.13/0857	Hybrid planning application for the change of use from agriculture to publicly accessible open space.	No
Runnymede Borough Council RU.15/0855	Outline application for the erection of up to 130 residential dwellings.	No
Runnymede Borough Council RU.16/1053	Redevelopment of land to rear of existing office buildings to provide 174 residential units.	No
Runnymede Borough Council RU.16/1748	Proposed works comprising the following: 1) Multi-faith prayer room with offices; 2) Offices and ancillary accommodation; 3) Enclosure of a courtyard.	No
Runnymede Borough Council RU.17/1136	Proposed demolition of existing Runnymede Centre (former The Meads School); construction of new secondary school and sports hall.	No
Runnymede Borough Council RU.18/1280	Construction of 158 residential dwellings	No
Runnymede Borough Council RU.17/1815	Hybrid application comprising 212 houses and 116 apartments, an acute care wing, 72 key-worker dwellings, staff restaurant, six-deck car park and workshop.	No
Runnymede Borough Council RU.17/0793	Development for up to 1,400 dwellings, a primary school, 3,210m^2 of commercial space	No
Runnymede Borough Council RU.17/1749	Erection of up to 200 residential dwellings (class C3)	No

Development Title	Description	Likely Severe Cumulative Impact
Rushmoor Borough Council		
Rushmoor Borough Council 13/00187/OUT	Hybrid planning application comprising: 1) Application for full planning permission for the development of two data centres; 2) Application for full planning permission to make minor external alterations to Building A50; 3) Application for outline planning for business, industrial, storage and distribution and data centre use.	No
Rushmoor Borough Council 14/00572/FUL	Redevelopment of site to provide four buildings comprising seven units for B1(c), B2 and B8 uses.	No
Rushmoor Borough Council 16/00837/FULPP	Comprehensive redevelopment of the site comprising demolition of existing buildings and site clearance and erection of 159 residential units.	No
Rushmoor Borough Council 17/00515/FULPP	Change of use of land to provide a Suitable Alternative Natural Greenspace.	No
Rushmoor Borough Council 17/00866/FULPP	Erection of a retail unit (Class A1) for sale of bulky goods	No
Rushmoor Borough Council 18/00025/FULPP	Partial demolition of Kingsmead Shopping Centre (existing Debenhams store), erection of an extension	No
Rushmoor Borough Council 18/00140/FULPP	Demolition of existing structures and erection of 205 dwellings	No
Rushmoor Borough Council 18/00367/OUTPP	Outline application for the erection of up to 174 units across eight storeys	No
Rushmoor Borough Council 18/00657/FULPP	Construction of a new hangar	No
Surrey County Council		
Surrey County Council 12/01132/SCC	Extraction of sand and gravel and restoration to landscaped lakes for nature conservation after use	No
Spelthorne Borough Council		
Spelthorne Borough Council 15/00140/FUL	Provision of educational facilities for Brooklands College and joint-use sports facilities for Brooklands College and Thomas Knyvett College	No
Surrey Heath Borough Council		
Surrey Heath Borough Council 12/0546	Hybrid planning application for major residential-led development totalling 1,200 new dwellings	No
Surrey Heath Borough Council 16/0836	Demolition of the Quartermaster's block and adjacent outbuildings. Conversion of part of the Admin block to re-house the Quartermaster department. New build block to provide kitchen/dining hall, multifunctional space and six bedrooms. Remedial work to the external facade of the Grade II listed mansion and conversion of redundant kitchen area to other uses.	No

10 Conclusion

10.1.1 All logistics hubs and a sample of the construction compounds representative of a realistic worst case for both rural (Section A) and urban (Section H) locations were used for this assessment. Traffic count data were collected for the logistics hubs and representative worst case construction compounds as well as locations where traffic management and diversions that trigger the assessment criteria. These sites were used to provide a high level assessment of the impact the project would have on the transport network.

10.1.2 A criterion of construction works causing disruption to the surrounding road network for longer than four weeks, was used to identify locations to be assessed in more detail. Criteria for traffic flows, journey times and collisions and safety were used. Thresholds of 30%, 60% and 90% were adopted to reflect small, medium and large changes respectively. Bus services for which there would be changes in route of less than 400m are scoped out of journey time assessments. Pedestrians, cyclists and equestrians were also considered qualitatively.

10.1.3 This Transport Assessment considered potential severe impacts on the transport network and the assessment has concluded that:

- Effects associated with construction traffic: Assessment of project traffic demand for both logistics hubs and construction compounds, found that the traffic flows generated by them were sufficiently low (not more than 3%) meaning that impacts would not be severe and do not need to be assessed in detail.
- Effects associated with road closures and diversions: There are six locations where traffic management or closures would be in place for greater than four weeks. Additional traffic is not expected to be produced along the four temporary traffic management routes assessed. On this basis the impact is negligible. The proposed Balmoral Drive diversion route would experience an increase in traffic flows, of approximately 300 vehicles in an average weekday peak hour, but in the short term only; the impact would therefore be negligible. The impacts associated with diverting traffic away from St Catherine's Road would not be greater than those associated with the diversion that would be in place for Balmoral Drive and would therefore also be negligible.
- Effects to bus services along the temporary traffic management routes: These may witness extended journey times of up to two minutes, due to temporary traffic signals along some roads. It is also expected that there would be a negligible impact on bus routes where logistics hubs and construction compounds are located due to the small changes in traffic flows associated with project traffic and because the road network has sufficient spare capacity.

10.1.4 It is expected that impacts on journey times would be negligible because of their short term nature. There are no bus services that would experience a change in route greater than 400m, resulting in no severe impacts for bus users.

10.1.5 As additional traffic is not expected to be produced along the four temporary traffic management routes, it is assumed that the number of collisions and collision clusters would remain unchanged from the predicted 2022 Future Baseline.

10.1.6 Changes in AADT along Balmoral Drive and the Balmoral Drive diversion and the change in vehicle composition are negligible. On this basis there is not expected to be a change in collisions and impacts at cluster locations.

10.1.7 Based on the analysis provided in this Transport Assessment there are no severe impacts, and no severe cumulative impacts as detailed in Table 9.2, arising from the construction and operation of the project.

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Appendix 1 Figures

N

ESSO WEST LONDON STORAGE FACILITY

ALTON PUMPING STATION

BOORLEY GREEN

Section A

Section B

Section C

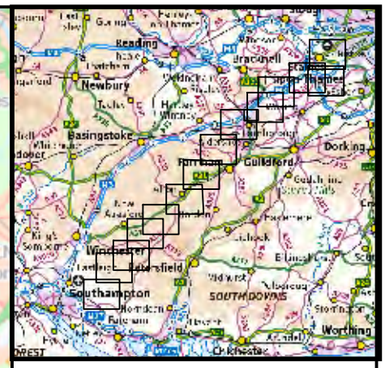
Section D

Section E

Section F

Section G

Section H



Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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Project

Southampton to London Pipeline Project

Drawing title

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KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:250,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003	
Drawing number	Figure A1 Key Plan	Rev 0

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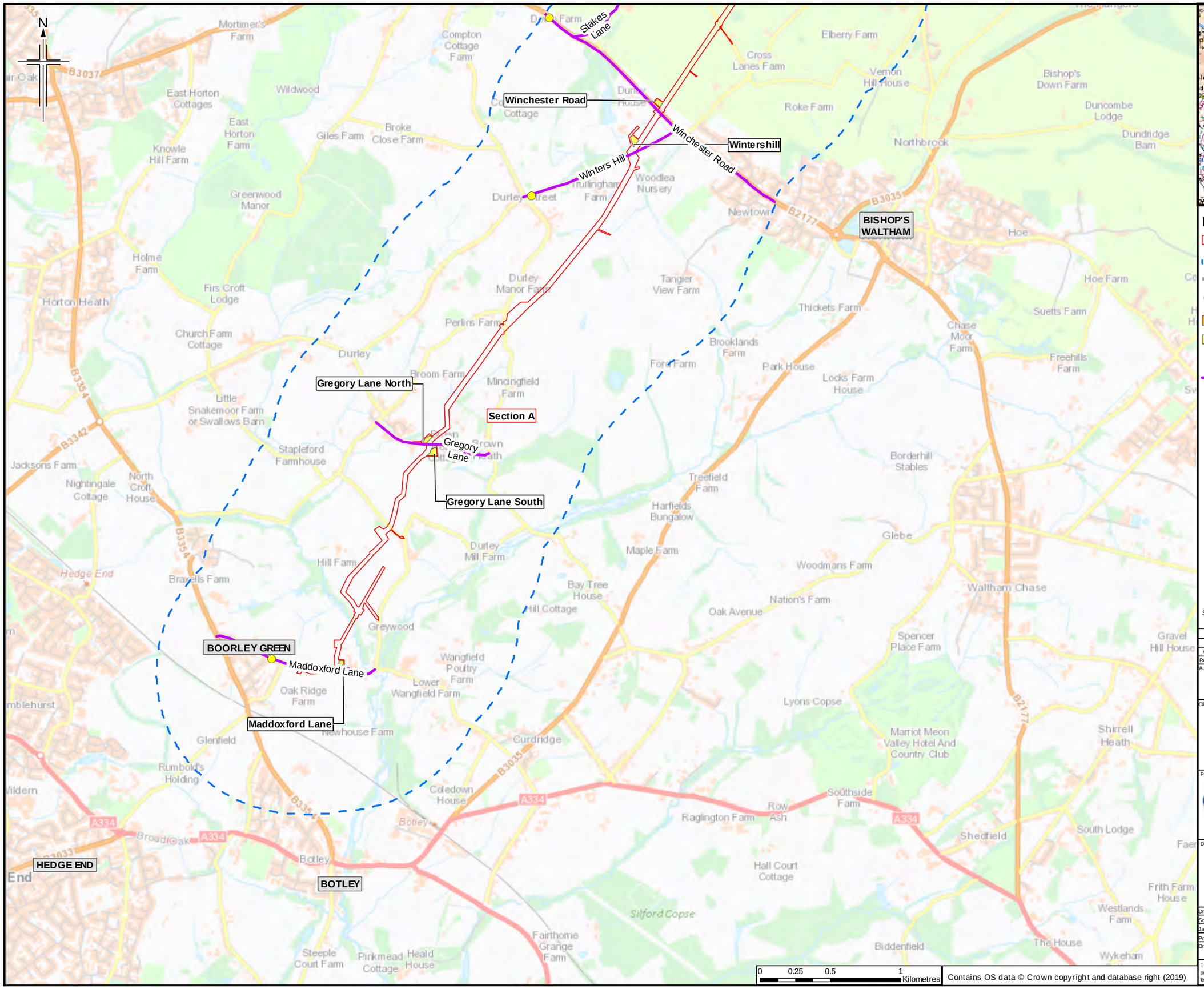

Sheet displays part of Section A

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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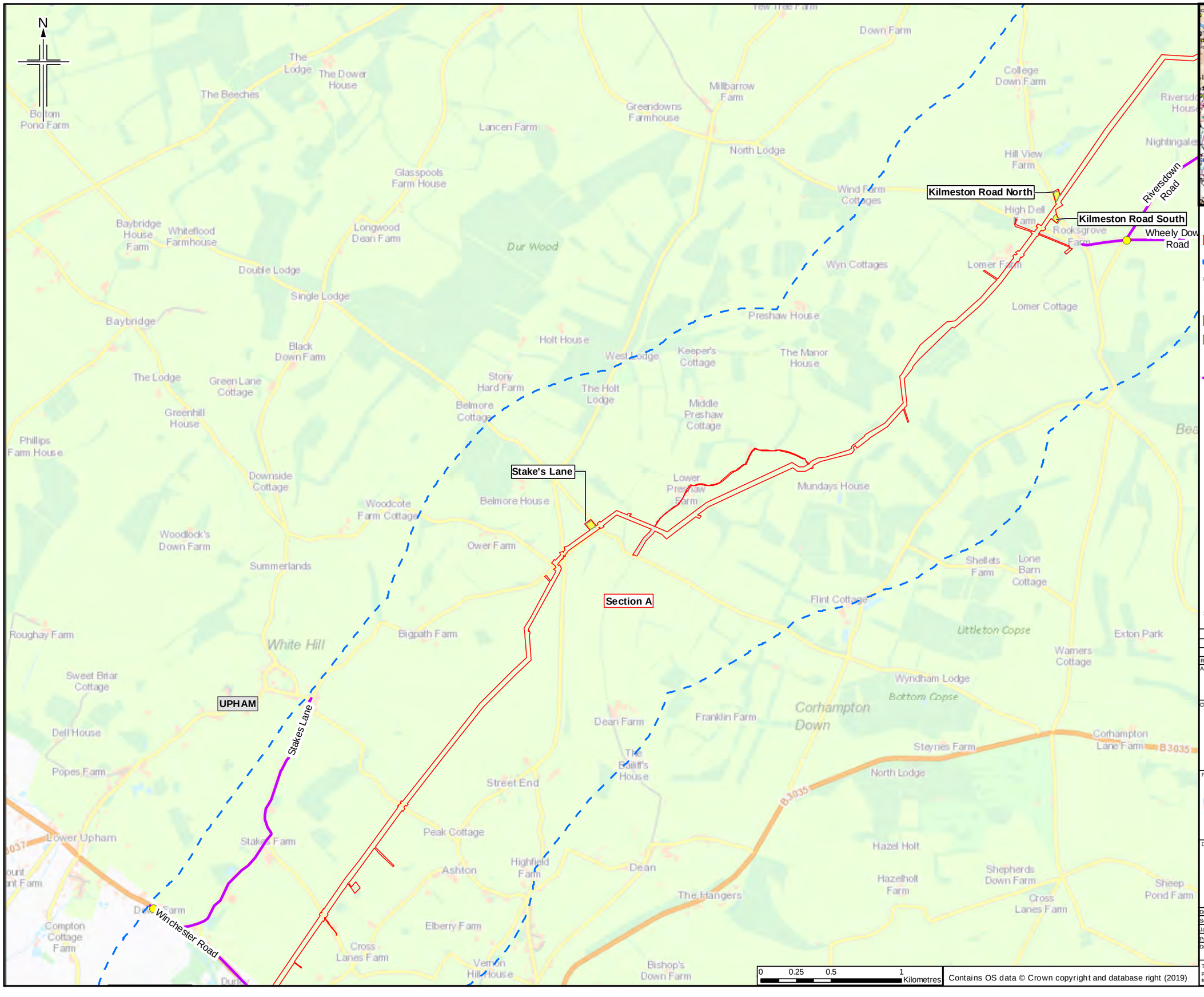
Esso Petroleum Company, Limited
Ermyn House,
Ermyn Way,
Leatherhead,
Surrey,
KT22 8UX

Project
Esso
Southampton to London Pipeline Project

Drawing title
TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:25,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003	
Drawing number	Figure A1 Sheet 1 of 15	Rev 0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



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Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays part of Section A

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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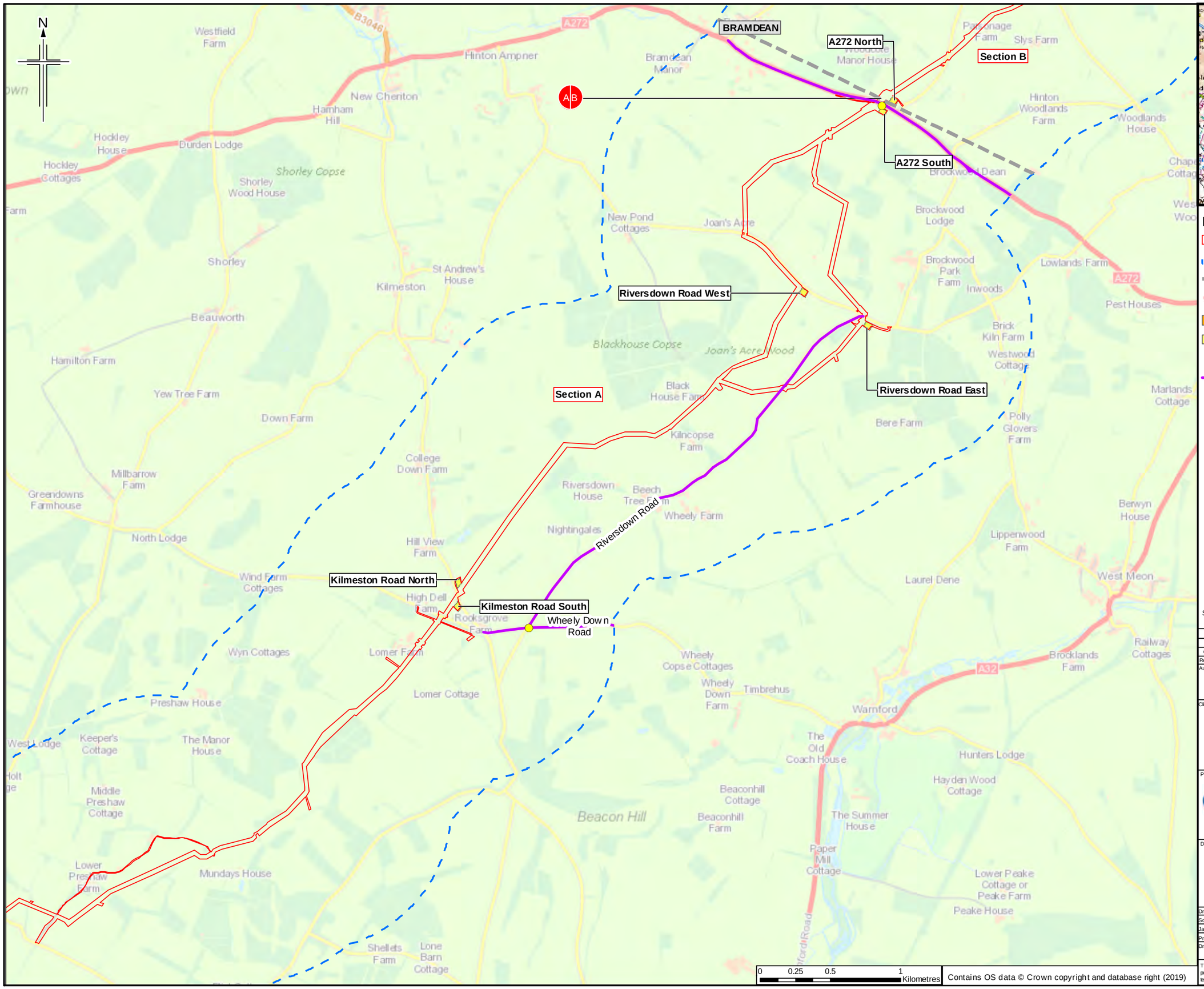
Drawing title

TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003		
Drawing number	Figure A1 Sheet 2 of 15	Rev	0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays parts of Section A and Section B

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Check'd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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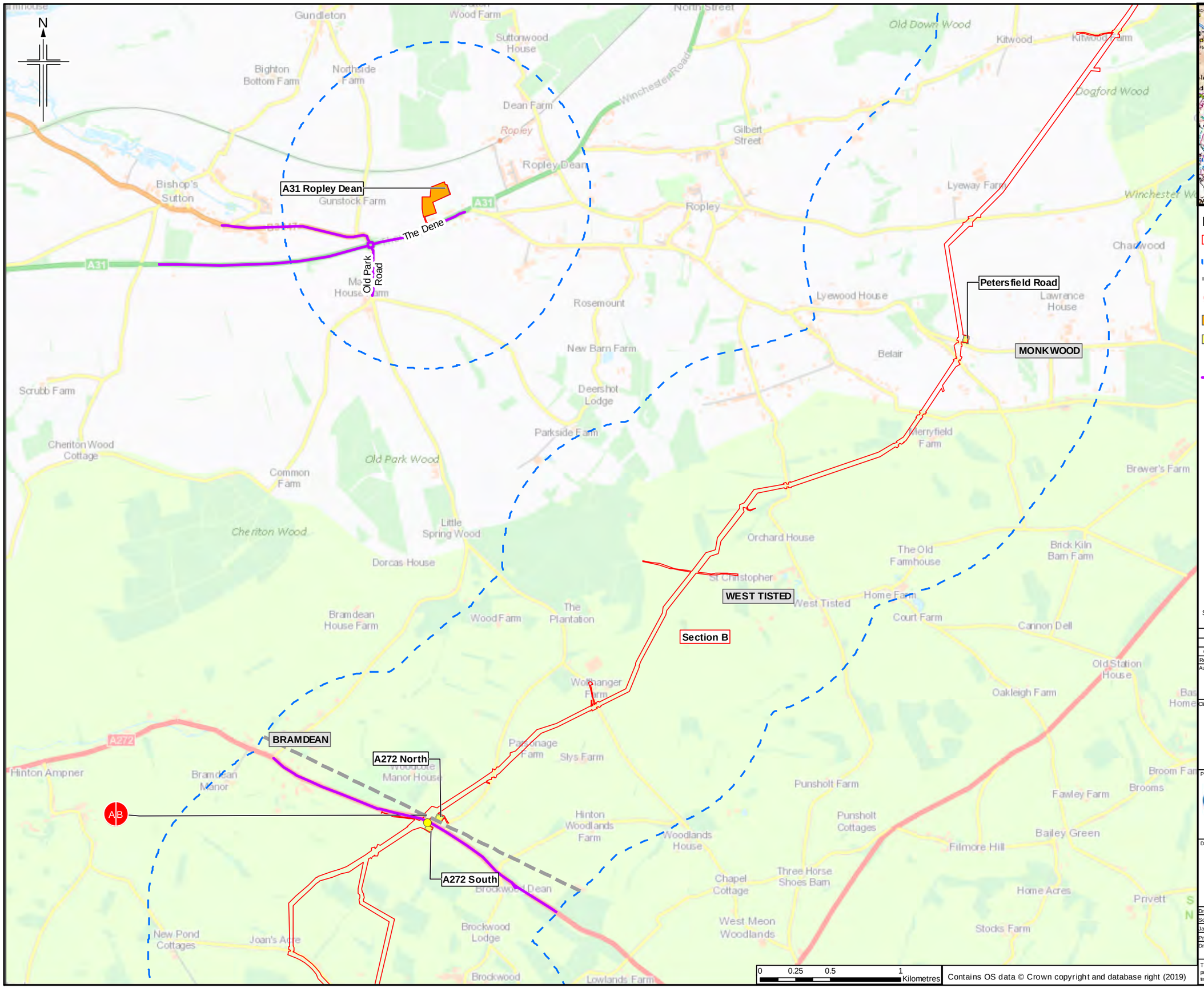
Drawing title

TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:25,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003	
Drawing number	Figure A1 Sheet 3 of 15	Rev 0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



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Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays parts of Section A and Section B

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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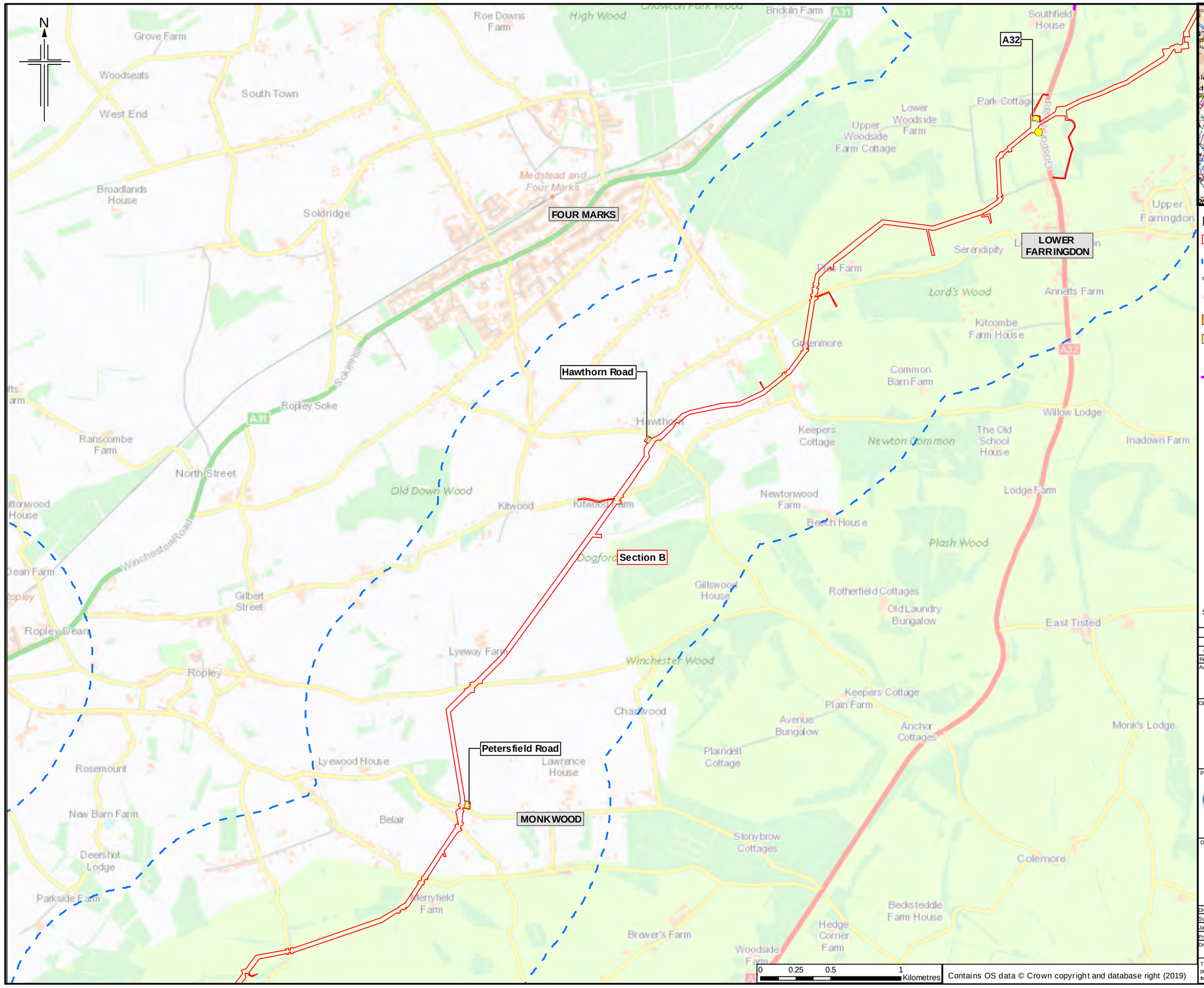
Drawing title

TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003		
Drawing number	Figure A1 Sheet 4 of 15	Rev	0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays part of Section B

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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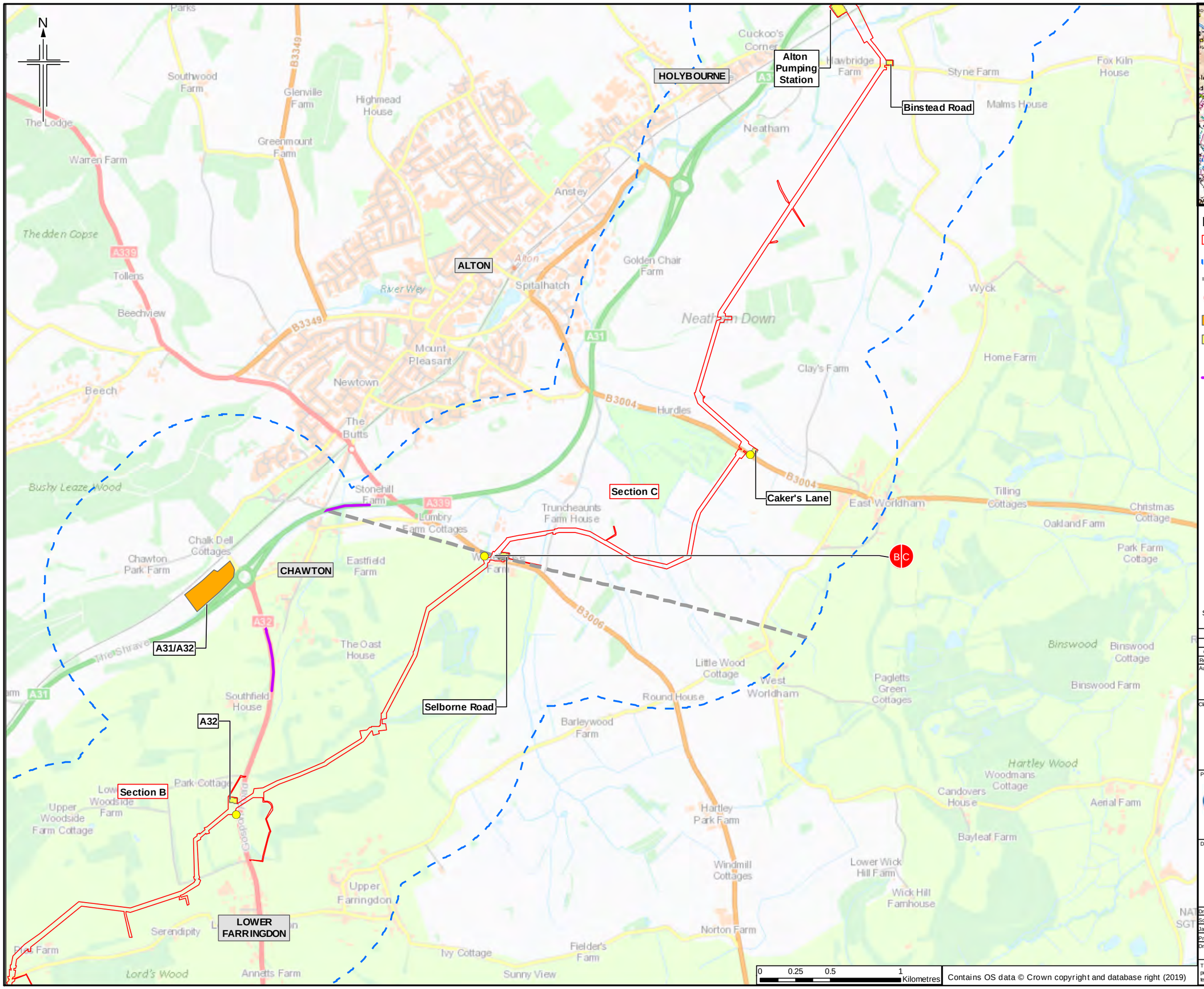
Drawing title

TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003		
Drawing number	Figure A1 Sheet 5 of 15	Rev	0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays parts of Section B and Section C

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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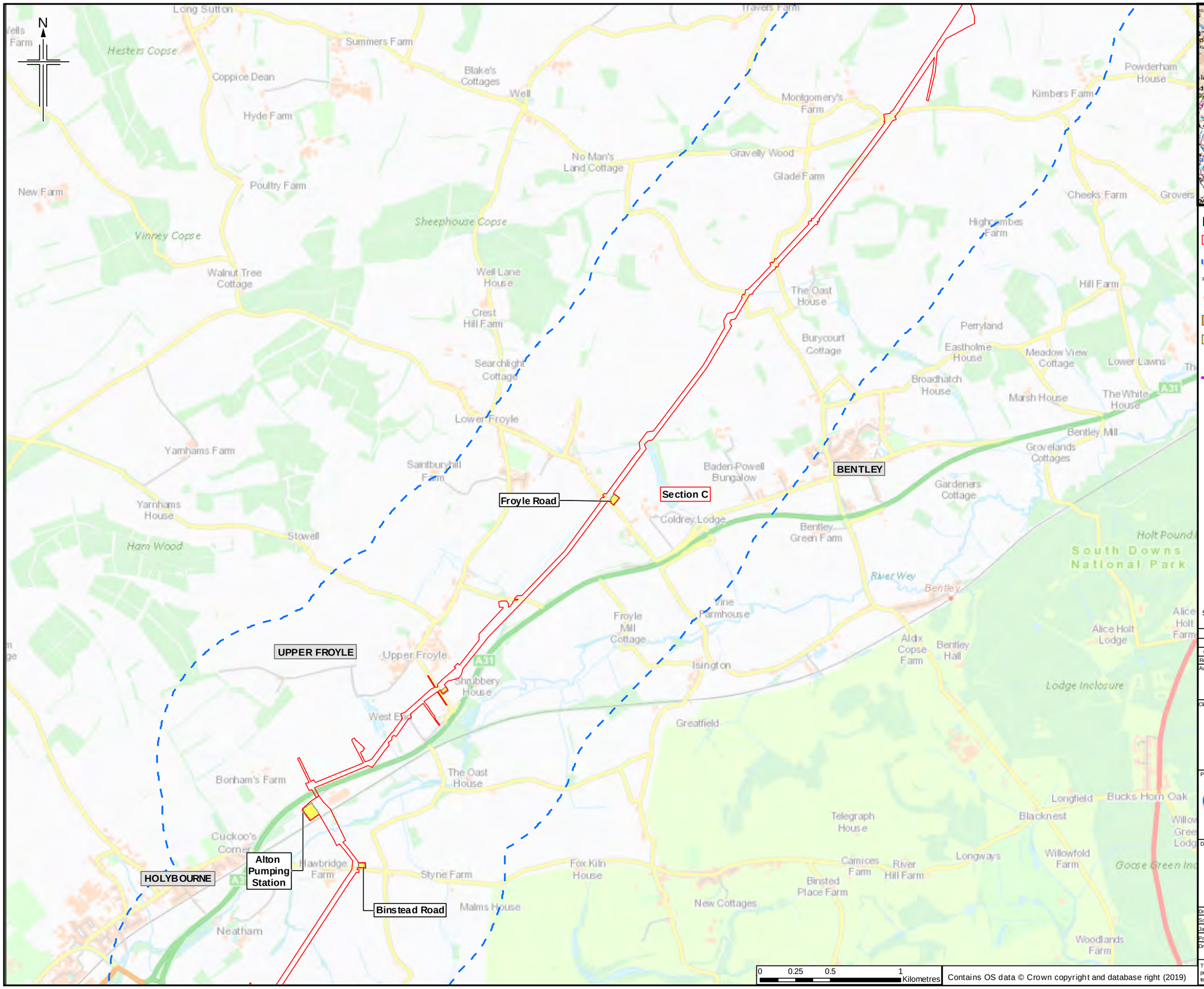
Drawing title

TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue
Scale	1:25,000 @ A3 — DO NOT SCALE
Jacobs No.	B2325300
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003
Drawing number	Figure A1 Sheet 6 of 15 — Rev 0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



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Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays part of Section C

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Check'd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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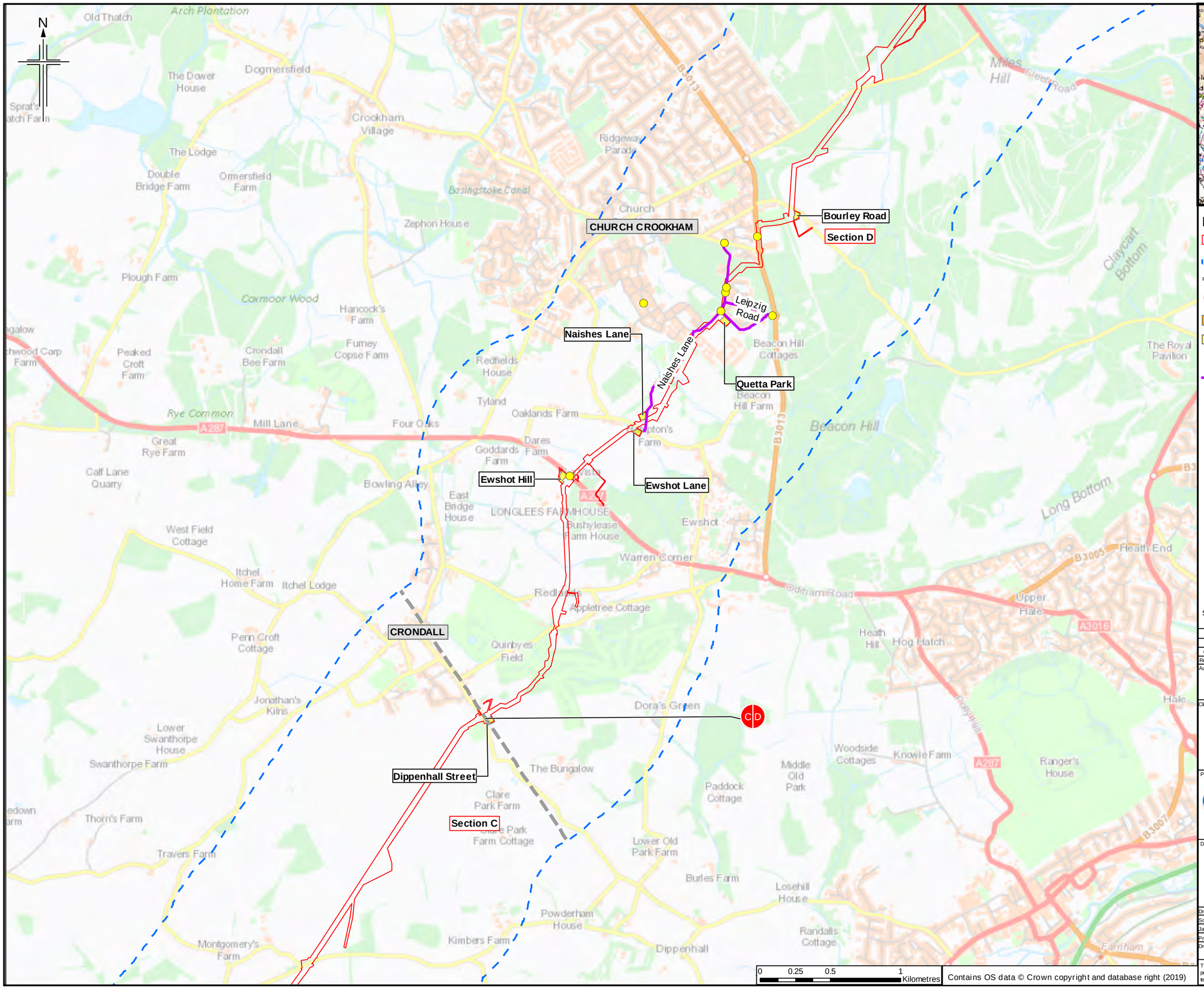
Drawing title
TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:25,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003	
Drawing number	Figure A1 Sheet 7 of 15	Rev 0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



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Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays parts of Section C and Section D

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Check'd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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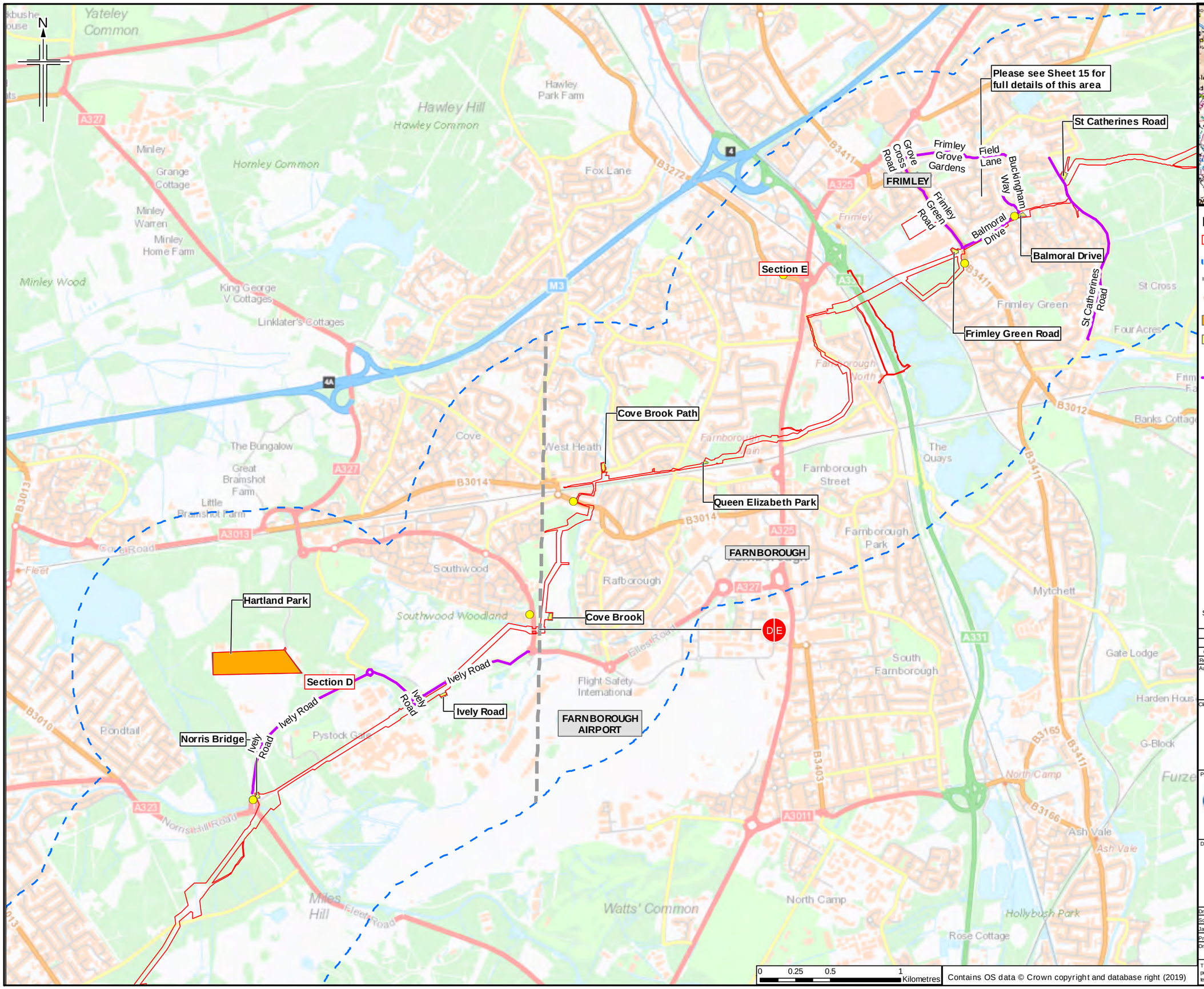
Drawing title

TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B232300		
ProjectWise No.	B232300-JAC-000-ENV-DRG-001003		
Drawing number	Figure A1 Sheet 8 of 15	Rev	0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



0 0.25 0.5 1 Kilometres

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Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays parts of Section D and Section E

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Check'd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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Esso Southampton to London Pipeline Project

Drawing title
TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue
Scale	1:25,000 @ A3 — DO NOT SCALE
Jacobs No.	B2325300
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003
Drawing number	Figure A1 Sheet 9 of 15
Rev	0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

N

M3 Junction 3 New Road

Halebourne Lane

LIGHTWATER

Section F

Red Road

Guildford Road

The Maultway

E F

Please see Sheet 15 for full details of this area

Section E

St Catherines Road

Frimley Grove Gardens

FRIMLEY

Field Lane

Buckingham Way

Frimley Green Road

Balmoral Drive

Balmoral Drive

St Catherines Road

Deepcut Bridge Road

MOD Deepcut Bridge Road

Frimley Green Road

Bagshot Heath

Deer Rock Hill

Olddean Common

Paschal Wood

Bagshot

B3029

New Road

New Road

M3

A30

South Lodge

Turf Hill

B3015

A30

Crawley Hill

M3

A325

Heatherside

Frimley Green

St Cross

Four Acres

Frimhurst Farm

Heatherhurst Grange

Old Windmill Hill

Mainstone Hill

Loveland's Hill

Westend Common

Sunny Acres

Lucas Green

Western Lodge

Parkwood Farm

Glanfield Manor

Greenmeads

Old House Farm

Broadway Green Farm

Halebourne Cottage

Oakmead House

Higher Park Farm

Outfall Cottages

Hookstone Farm

Bagshot Road

Briar House

Parklands Farm

West End

Donkey Town

Burnstubb Farm

Beldam Bridge Farm

Lucas Green

Holly Cottage

Woodcote

Furze Farm

Heatherleigh

Bisley

Stafford Lake Farm

A322

Hawthorn Cottage

Ranfurly Lodge

Bisley Camp

Sheet's Heath

Brookwood House

Sheet's Heath

Brookwood

St Columba's

Fieldview Cottage

Headland House

The Cottage

Brookwood

Bagshot Road

0 0.25 0.5 1 Kilometres

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Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays parts of Section E and Section F

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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Project

Esso Southampton to London Pipeline Project

Drawing title

TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:25,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003	
Drawing number	Figure A1 Sheet 10 of 15	Rev 0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

N

Flir Clump West

Windsor Road

Flir Clump East

Section F

M3 Junction 3 New Road

Halebourne Lane

LIGHTWATER

CHOBHAM

Guildford Road

New Road

New Road

Red Road

0 0.25 0.5 1 Kilometres

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Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays part of Section F

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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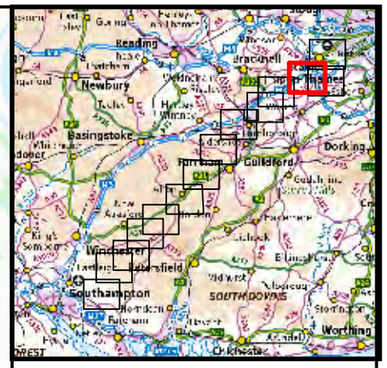
Project
Southampton to London Pipeline Project

Drawing title
TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003		
Drawing number	Figure A1 Sheet 11 of 15	Rev	0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays parts of Section F, Section G and Section H

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Check'd	Rev'd	Apprv'd
0	8/05/2019	For Issue	LW	NS	HT	SH

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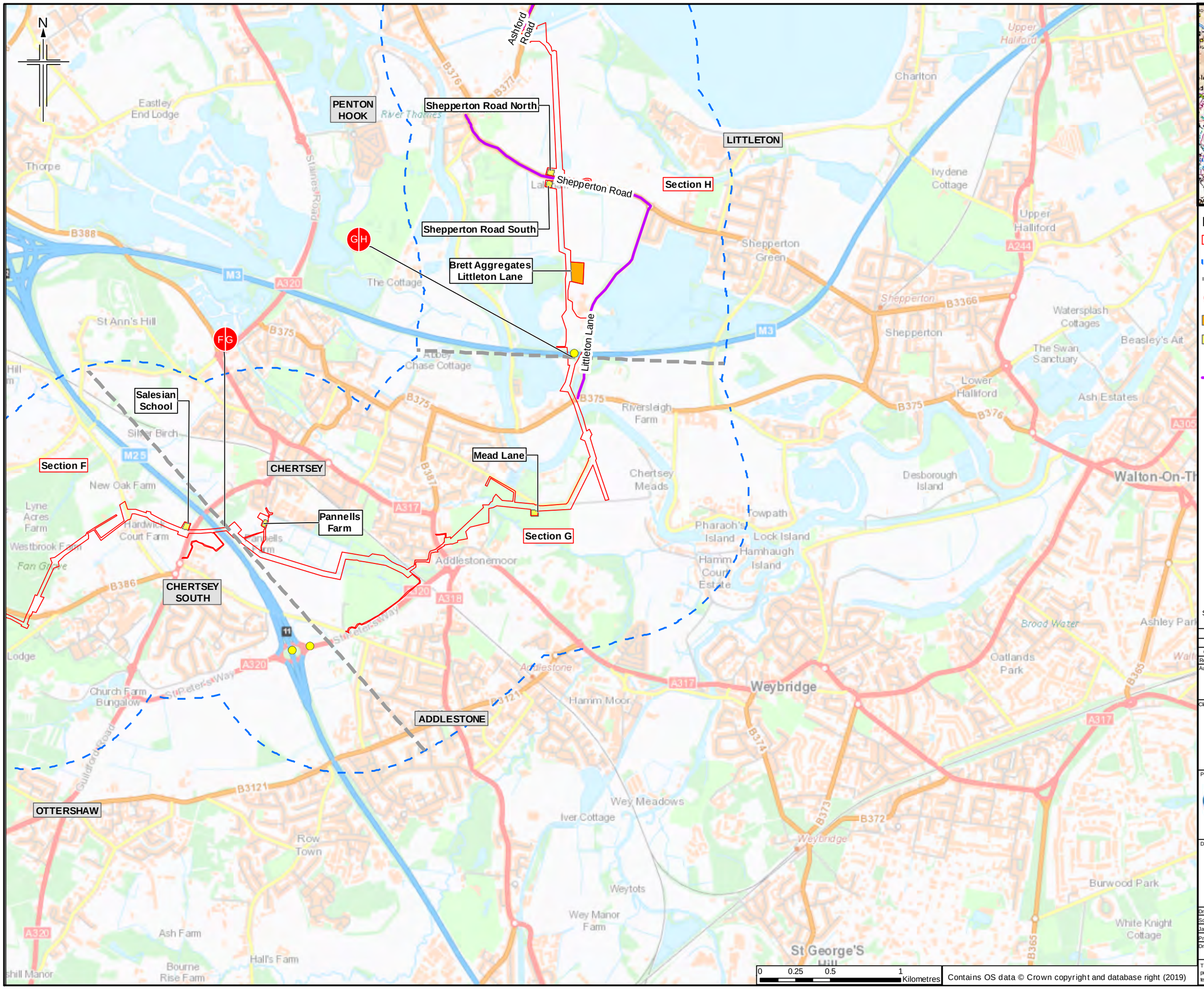
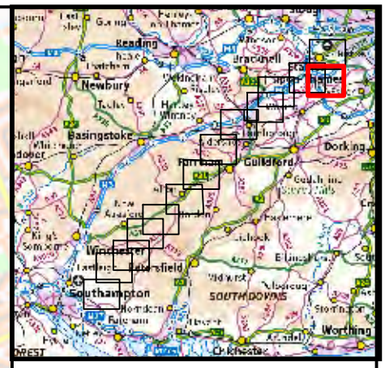
Drawing title

TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003		
Drawing number	Figure A1 Sheet 12 of 15	Rev	0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.





Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays parts of Section F, Section G and Section H

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Check'd	Rev'd	Apprv'd
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Drawing title

TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:25,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003	
Drawing number	Figure A1 Sheet 13 of 15	Rev 0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

0 0.25 0.5 1 Kilometres

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Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays part of Section H

Rev.	Rev. Date	Purpose of revision	Orig'd	Chck'd	Rev'd	Apprv'd
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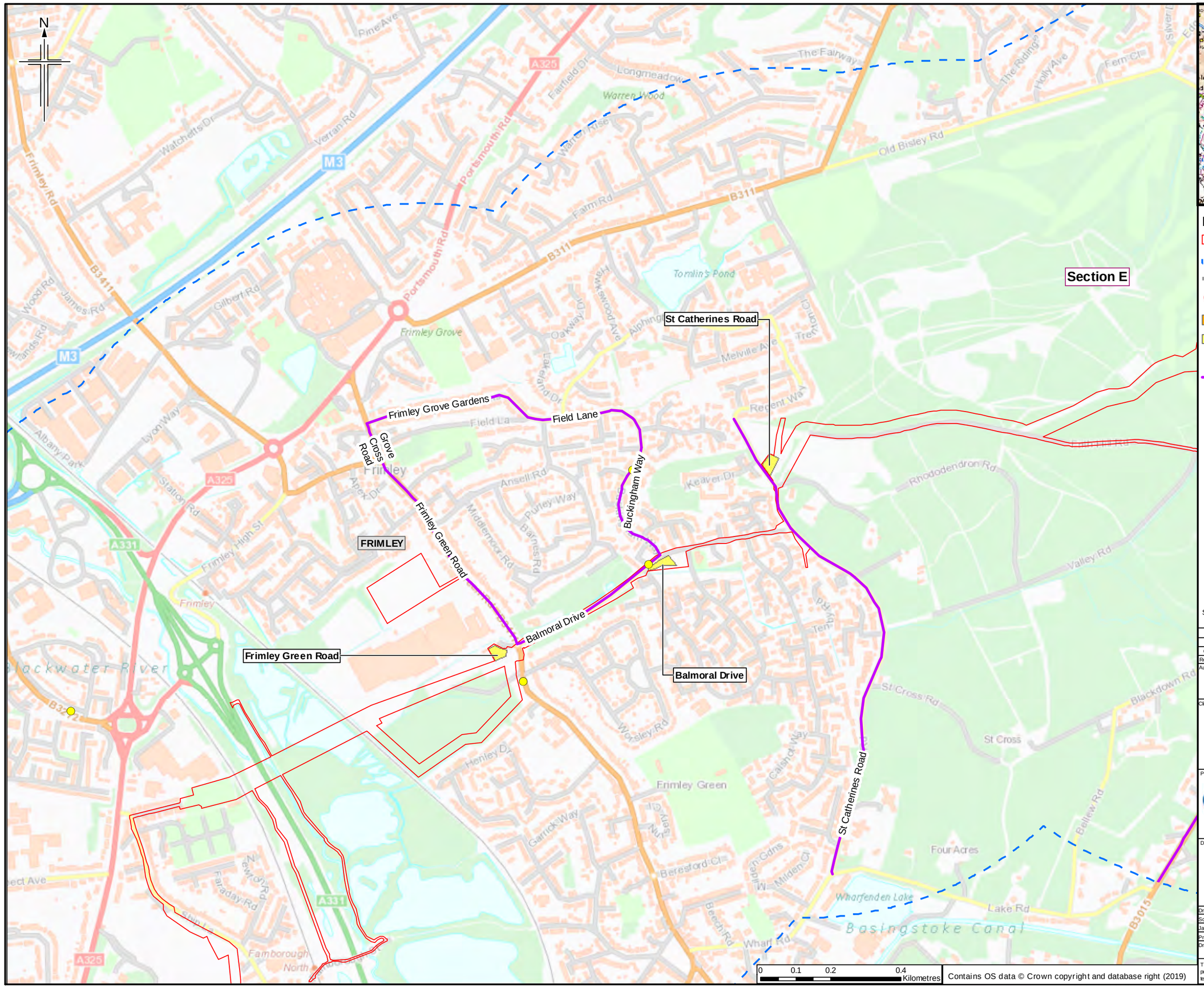
Esso — Southampton to London Pipeline Project

Drawing title

TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003		
Drawing number	Figure A1 Sheet 14 of 15	Rev	0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



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Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Logistics hub
- Construction compound
- Key Junction
- Key link

Sheet displays zoomed in area within Section E

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Check'd	Rev'd	Apprv'd
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Esso
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Drawing title
TRANSPORT ASSESSMENT
KEY LINKS AND JUNCTIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:10,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001003	
Drawing number	Figure A1 Sheet 15 of 15	Rev 0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

N

ESSO WEST LONDON STORAGE FACILITY

ALTON PUMPING STATION

BOORLEY GREEN

Section A

Section B

Section C

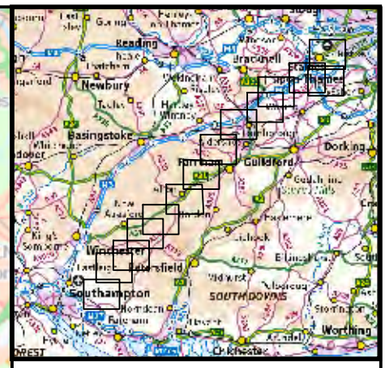
Section D

Section E

Section F

Section G

Section H



Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	27/03/2019	For Issue	LW	NS	HT	SH

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Drawing title

TRANSPORT ASSESSMENT
COLLISIONS AND TEMPORARY DIVERSIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:250,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004	

Drawing number: Figure A2 Key Plan — Rev 0

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0 2.5 5 10 Kilometres

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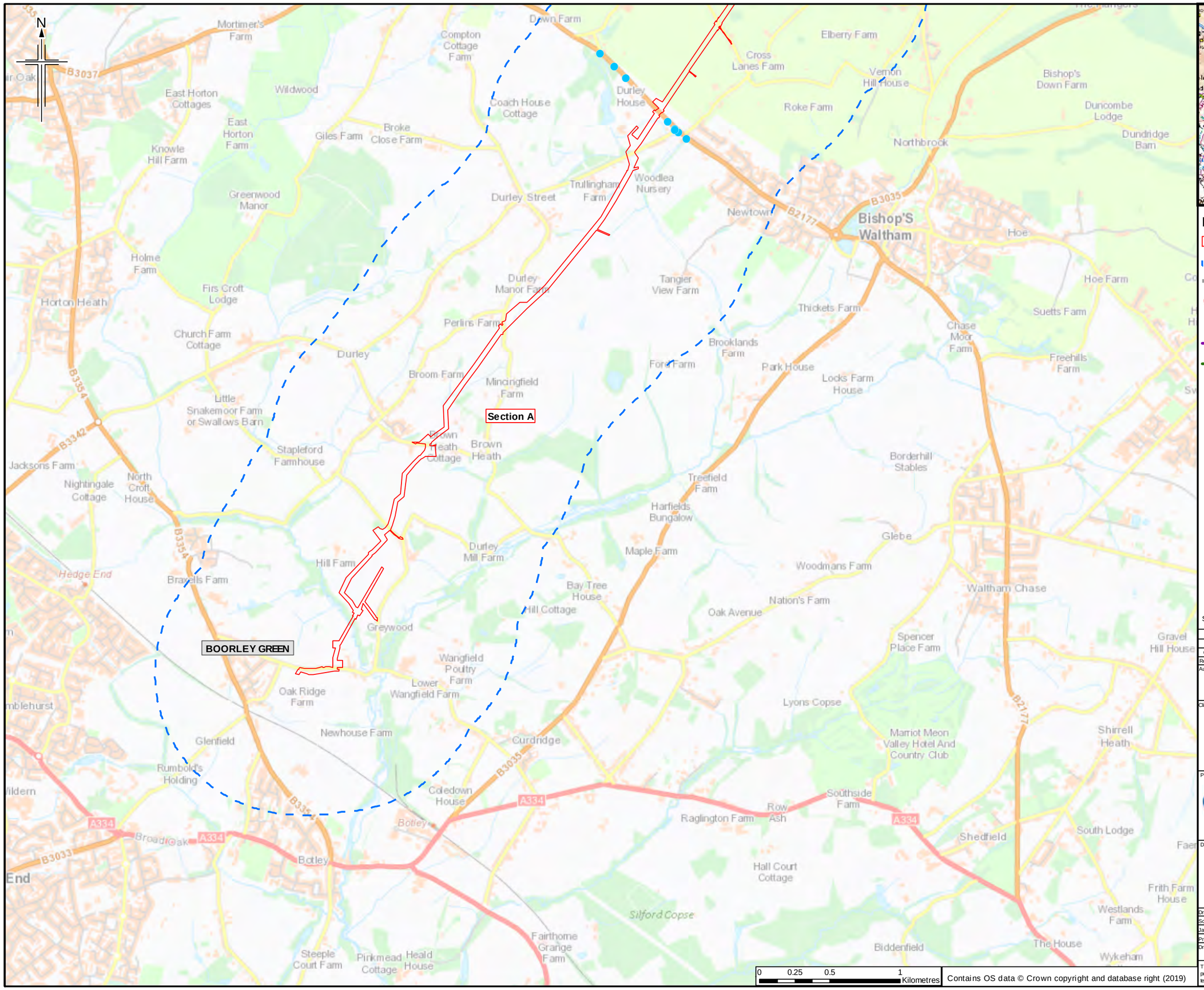

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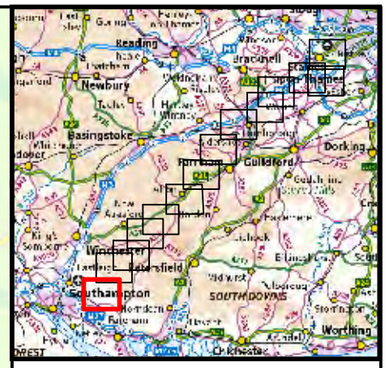

Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays part of Section A

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	27/03/2019	For Issue	LW	NS	HT	SH

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APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004		
Drawing number	Figure A2 Sheet 1 of 14	Rev	0

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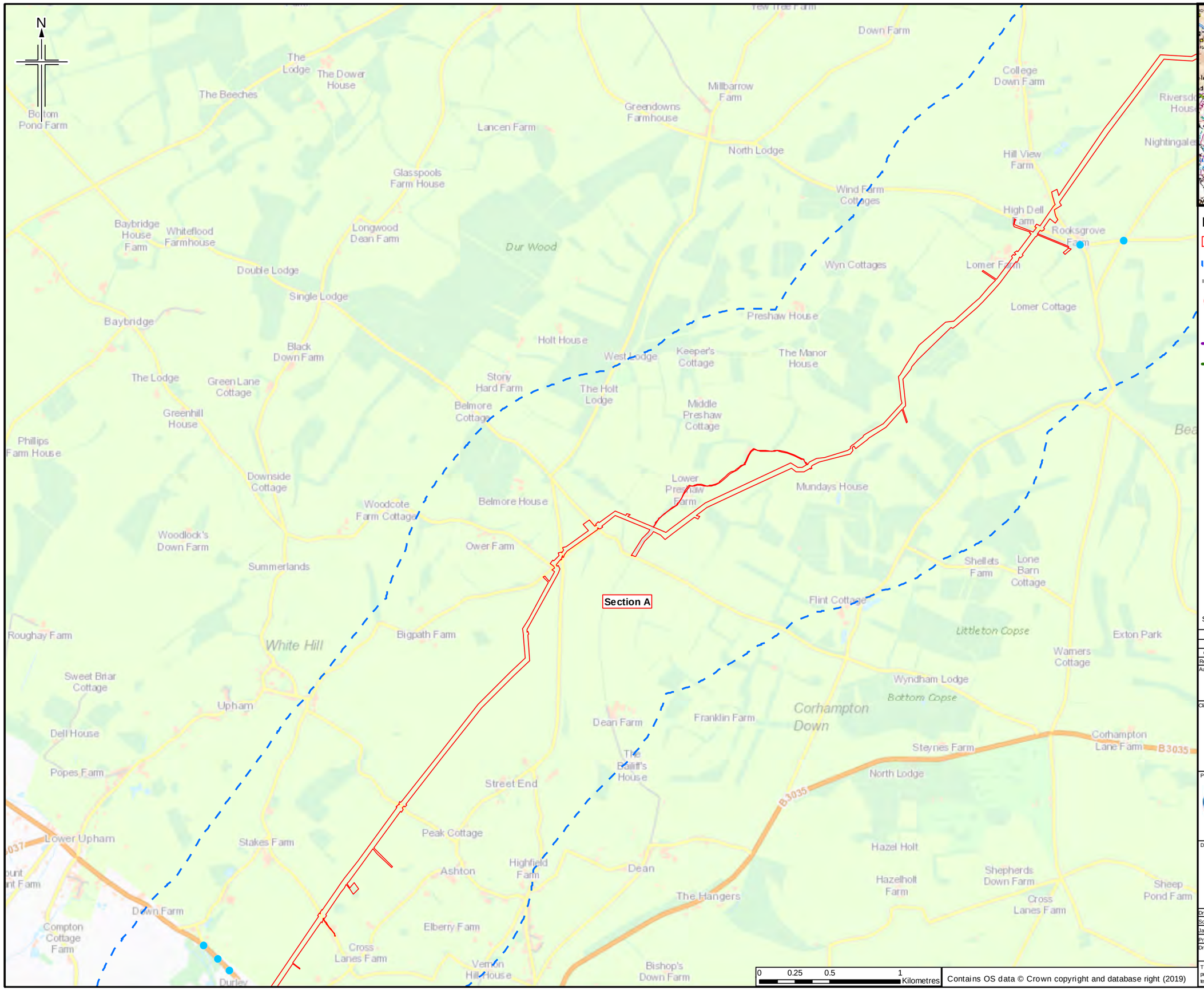
N
Bottom Pond Farm
The Beeches
The Lodge
The Dower House
Lancen Farm
Greendowns Farmhouse
Millbarrow Farm
Down Farm
College Down Farm
North Lodge
Glasspools Farm House
Hill View Farm
Wind Farm Cottages
High Dell Farm
Rocksgrove Farm
Baybridge House Farm
Whiteflood Farmhouse
Longwood Dean Farm
Dur Wood
Wyn Cottages
Lomer Farm
Lomer Cottage
Double Lodge
Single Lodge
Baybridge
Preshaw House
Holt House
West Lodge
Keeper's Cottage
The Manor House
Black Down Farm
The Lodge
Green Lane Cottage
Story Hard Farm
The Holt Lodge
Belmore Cottage
Middle Preshaw Cottage
Greenhill House
Phillips Farm House
Downside Cottage
Lower Preshaw Farm
Mundays House
Woodcote Farm Cottage
Belmore House
Woodlock's Down Farm
Ower Farm
Summerlands
Shellets Farm
Lone Barn Cottage
Section A
Flint Cottage
Roughay Farm
White Hill
Bigpath Farm
Littleton Copse
Exton Park
Warners Cottage
Sweet Briar Cottage
Wyndham Lodge
Bottom Copse
Upham
Dean Farm
Franklin Farm
Corhampton Down
Dell House
Steynes Farm
Corhampton Lane Farm
B3035
Popes Farm
The Bailiff's House
North Lodge
Street End
Lower Upham
Stakes Farm
Peak Cottage
Hazel Holt
Ashton
Highfield Farm
Dean
Shepherds Down Farm
Hazelholt Farm
The Hangers
Sheep Pond Farm
Cross Lanes Farm
Down Farm
Compton Cottage Farm
Elberry Farm
Cross Lanes Farm
Vernon Hill House
Bishop's Down Farm
Durley
0
0.25
0.5
1
Kilometres
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Legend
Order Limits
Order Limits 1km buffer
Section break
Section break
Collision record
Diversion route
Road closure
Sheet displays part of Section A
0
27/03/2019
For Issue
LW
NS
HT
SH
Rev.
Rev. Date
Purpose of revision
Orig/Dwn
Checkd
Rev'd
Apprv'd
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TRANSPORT ASSESSMENT
COLLISIONS AND TEMPORARY DIVERSIONS
APFP Reg.(2009) 5(2)(o)
Drawing Status
For Issue
Scale
1:25,000 @ A3
DO NOT SCALE
Jacobs No.
B2325300
ProjectWise No.
B2325300-JAC-000-ENV-DRG-001004
Drawing number
Figure A2 Sheet 2 of 14
Rev
0
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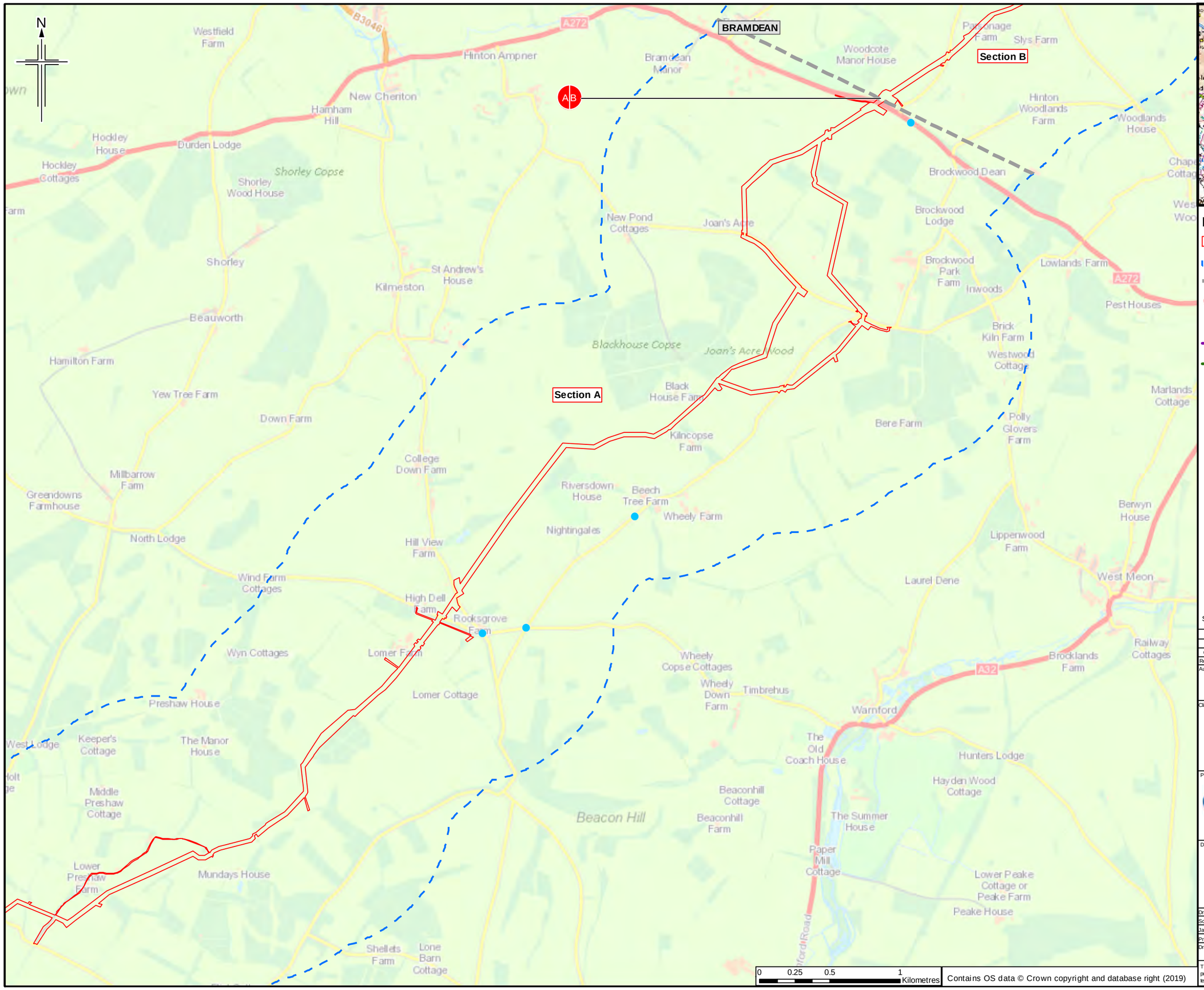

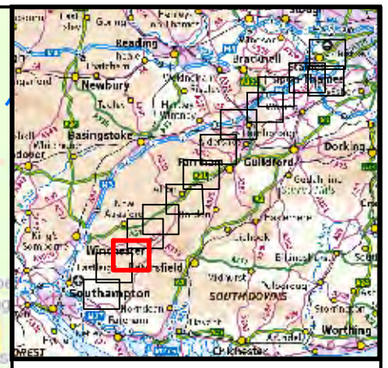

Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays parts of Section A and Section B

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
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Drawing title

TRANSPORT ASSESSMENT
COLLISIONS AND TEMPORARY DIVERSIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004		

Drawing number: Figure A2 Sheet 3 of 14 — Rev 0

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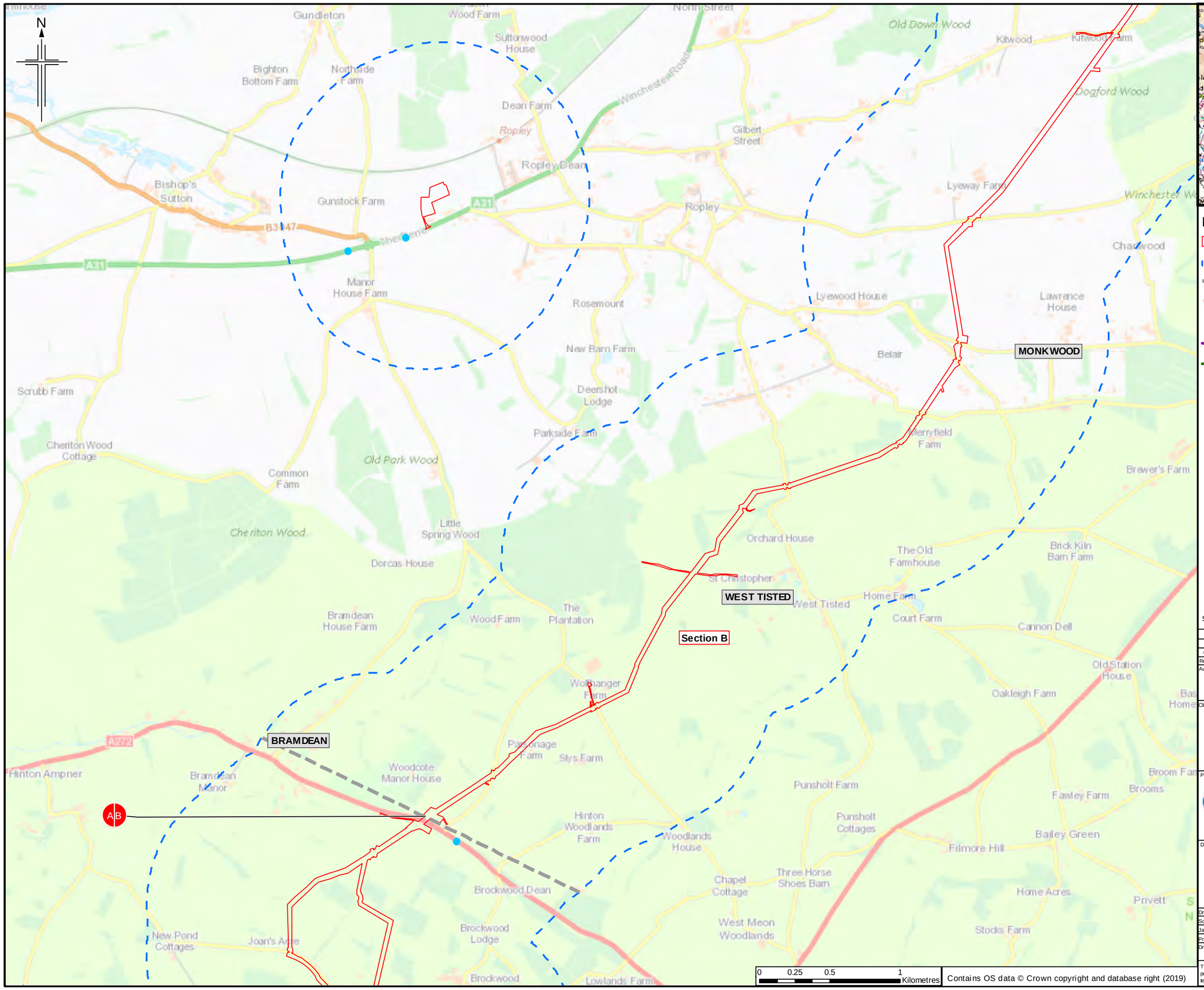

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Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays parts of Section A and Section B

Rev.	Rev. Date	Purpose of revision	Orig'd/Dwn	Checkd	Rev'd	Appr'd
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Drawing title

TRANSPORT ASSESSMENT
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APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004		
Drawing number	Figure A2 Sheet 4 of 14	Rev	0

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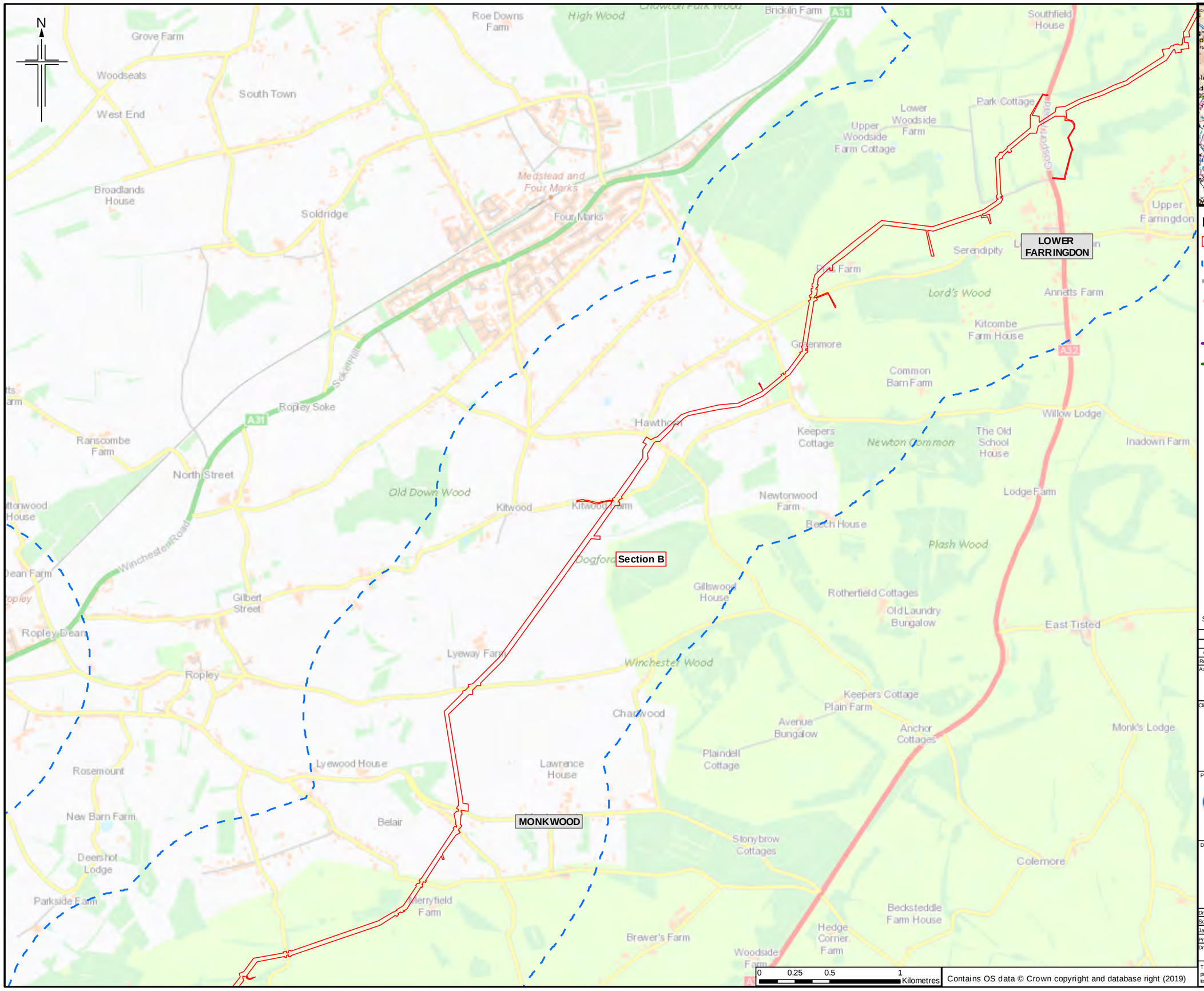

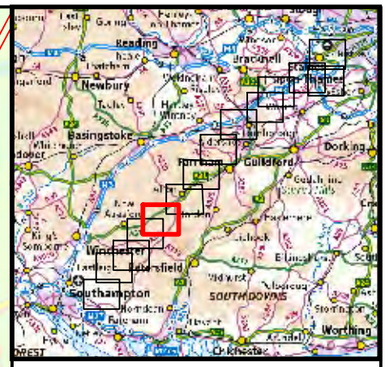

Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays part of Section B

Rev.	Rev. Date	Purpose of revision	Orig'd/Dwn	Checkd	Rev'd	Apprv'd
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Drawing title

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APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:25,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004	
Drawing number	Figure A2 Sheet 5 of 14	Rev 0

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N

BOURNE

CHAWTON

LOWER FARRINGDON

Section B

Section C

B C

Alton

Anstey

Spitalhatch

River Wey

Mount Pleasant

Newtown

The Butts

Beech

Beechview

Tollens

Warren Farm

The Lodge

Thedden Copse

Southwood Farm

Glenville Farm

Greenmount Farm

Highmead House

Parks

Cuckoo's Corner

Havbridge Farm

Styne Farm

Fox Kiln House

Malms House

Neatham

Golden Chair Farm

Neatham Down

Wyck

Home Farm

Clay's Farm

Hurdles

Bushy Leaze Wood

Stonehill Farm

Lumbry Farm Cottages

Truncheaunts Farm House

Chalk Dell Cottage

Chawton Park Farm

Eastfield Farm

Wheatsheaf Farm

The Oast House

Southfield House

Park Cottage

Upper Woodside Farm Cottage

Lower Woodside Farm

Gosport Road

Upper Farringdon

Serendipity

Rad Farm

Lord's Wood

Annetts Farm

Ivy Cottage

Fielder's Farm

Sunny View

Norton Farm

Windmill Cottages

Hartley Park Farm

Lower Wick Hill Farm

Wick Hill Farmhouse

Bayleaf Farm

Hartley Wood

Woodmans Cottage

Candovers House

Aerial Farm

East Worldham

Tilling Cottages

Oakland Farm

Christmas Cottage

Park Farm Cottage

Binswood

Binswood Cottage

Binswood Farm

Pagletts Green Cottages

West Worldham

Little Wood Cottage

Round House

Barleywood Farm

Theakhrave

A31

A339

A32

B3349

B3004

B3006

0 0.25 0.5 1 Kilometres

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Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays parts of Section B and Section C

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	27/03/2019	For Issue	LW	NS	HT	SH

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Drawing title

TRANSPORT ASSESSMENT
COLLISIONS AND TEMPORARY DIVERSIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:25,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004	

Drawing number: Figure A2 Sheet 6 of 14 — Rev 0

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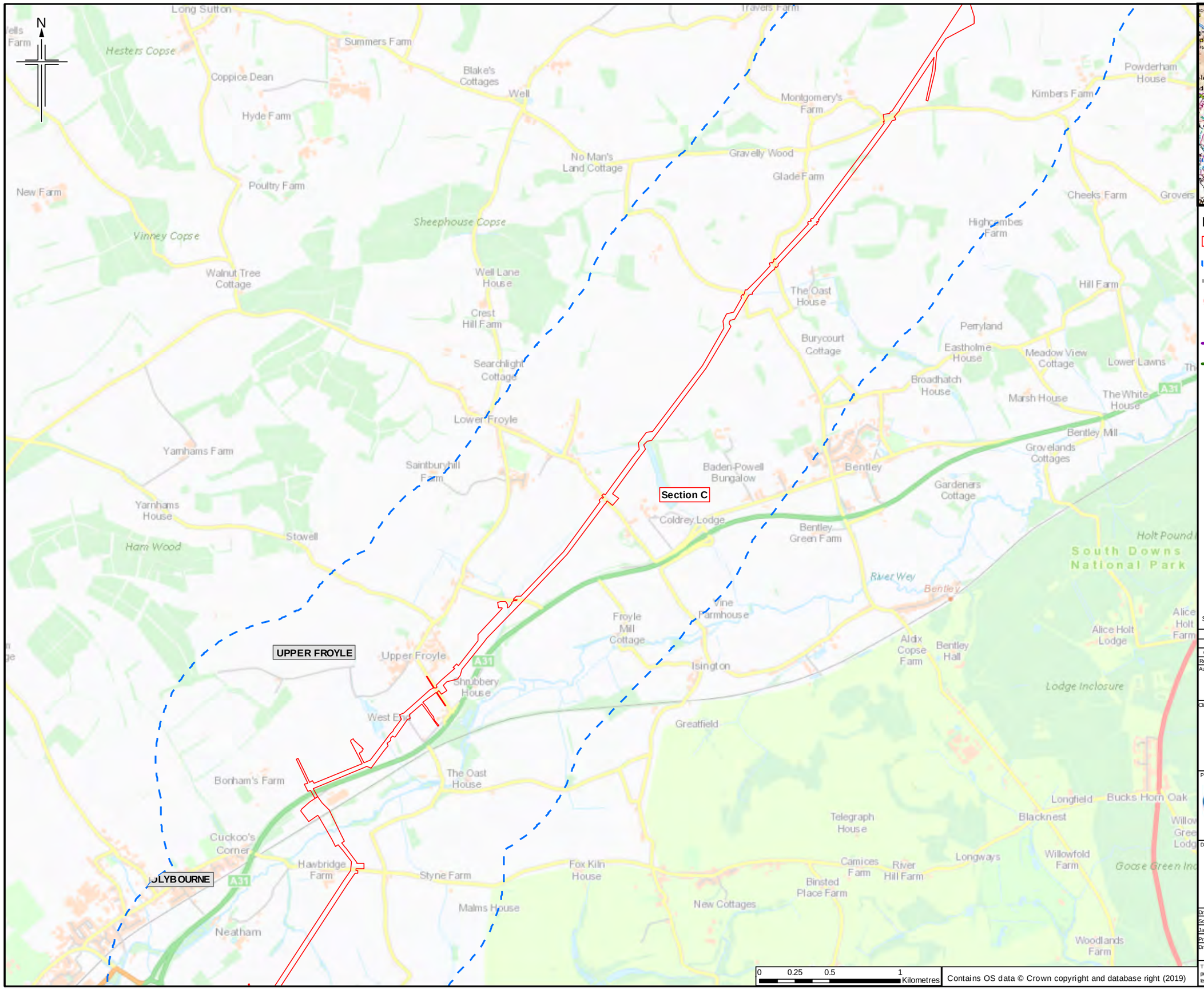

Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays part of Section C

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Check'd	Rev'd	Apprv'd
0	27/03/2019	For Issue	LW	NS	HT	SH

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Drawing title

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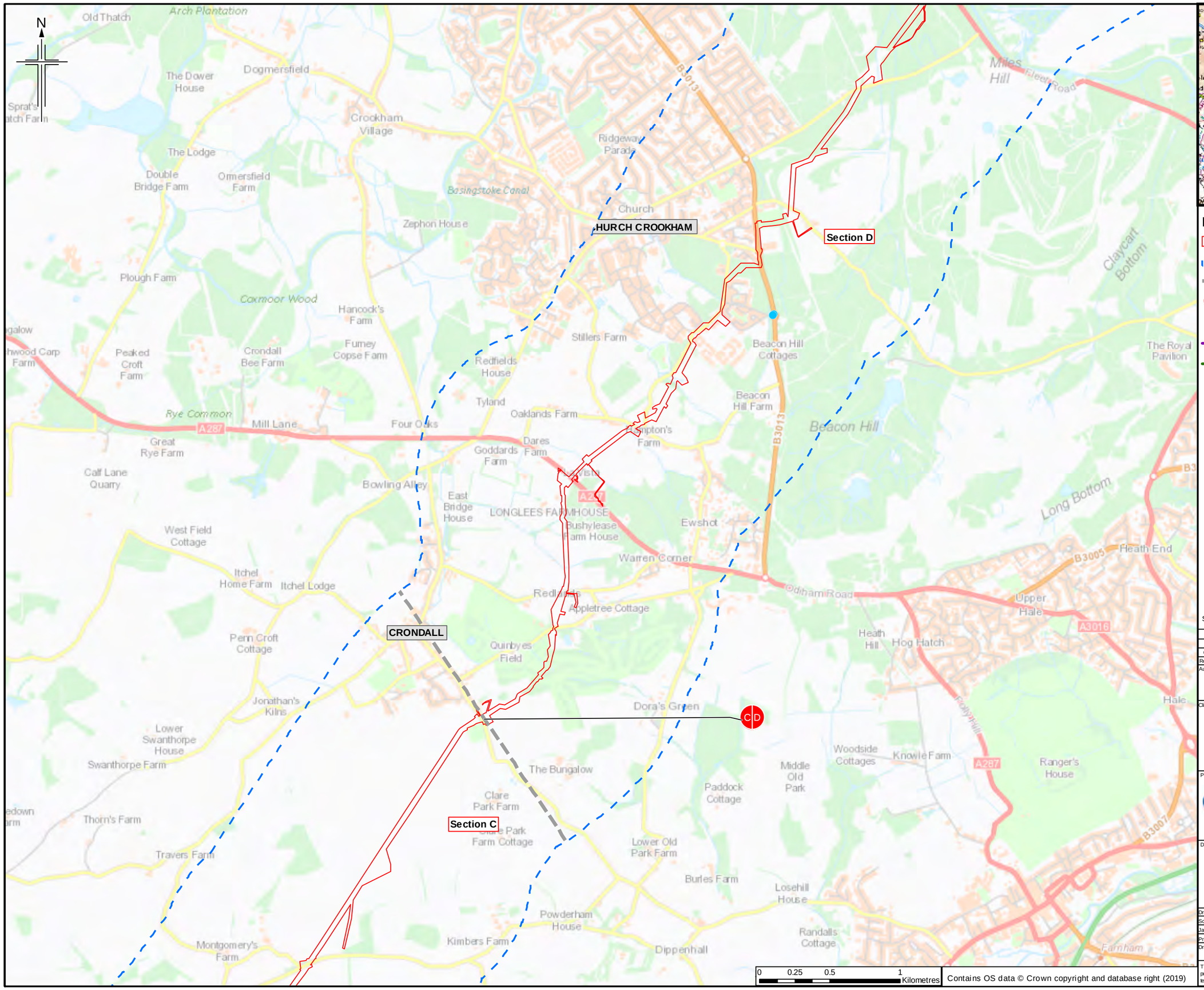
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:25,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004	
Drawing number	Figure A2 Sheet 7 of 14	Rev 0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays parts of Section C and Section D

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	27/03/2019	For Issue	LW	NS	HT	SH

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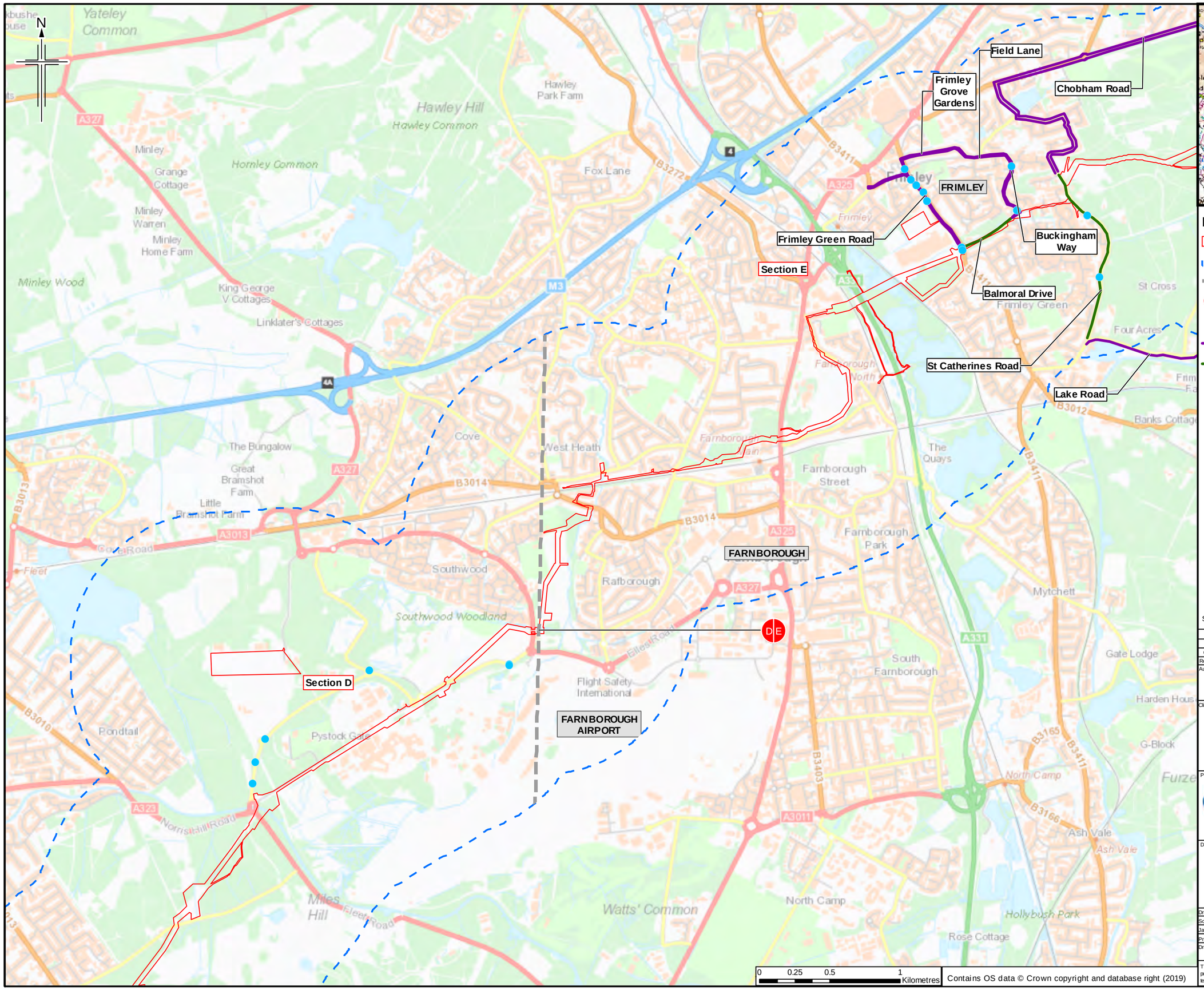
Drawing title

TRANSPORT ASSESSMENT
COLLISIONS AND TEMPORARY DIVERSIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004		
Drawing number	Figure A2 Sheet 8 of 14	Rev	0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays parts of Section D and Section E

Rev.	Rev. Date	Purpose of revision	Orig'd/Dwn	Check'd	Rev'd	Apprv'd
0	27/03/2019	For Issue	LW	NS	HT	SH

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Drawing title

TRANSPORT ASSESSMENT
COLLISIONS AND TEMPORARY DIVERSIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:25,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004	
Drawing number	Figure A2 Sheet 9 of 14	Rev 0

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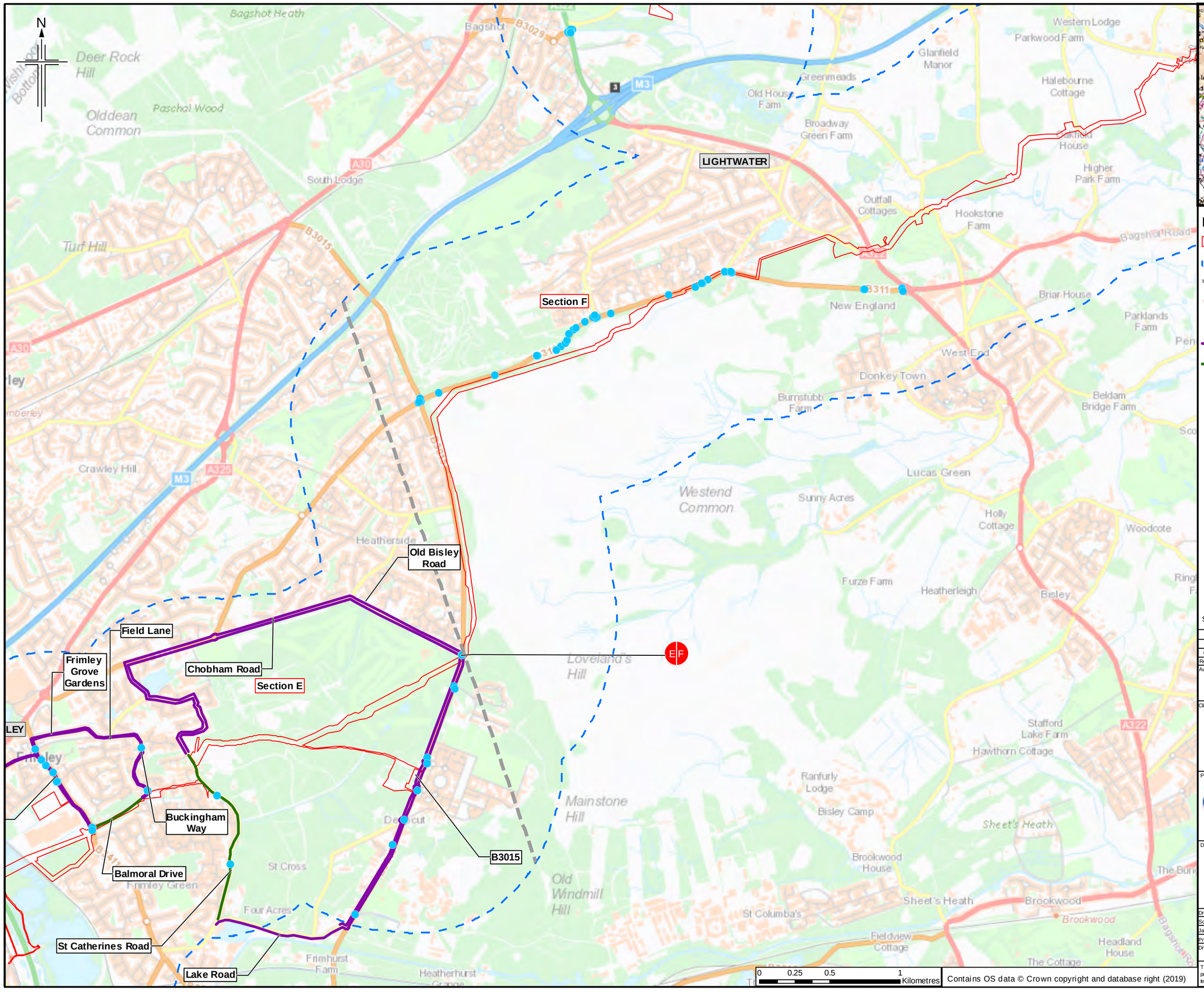

Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays parts of Section E and Section F

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
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Drawing title

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APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004		
Drawing number	Figure A2 Sheet 10 of 14	Rev	0

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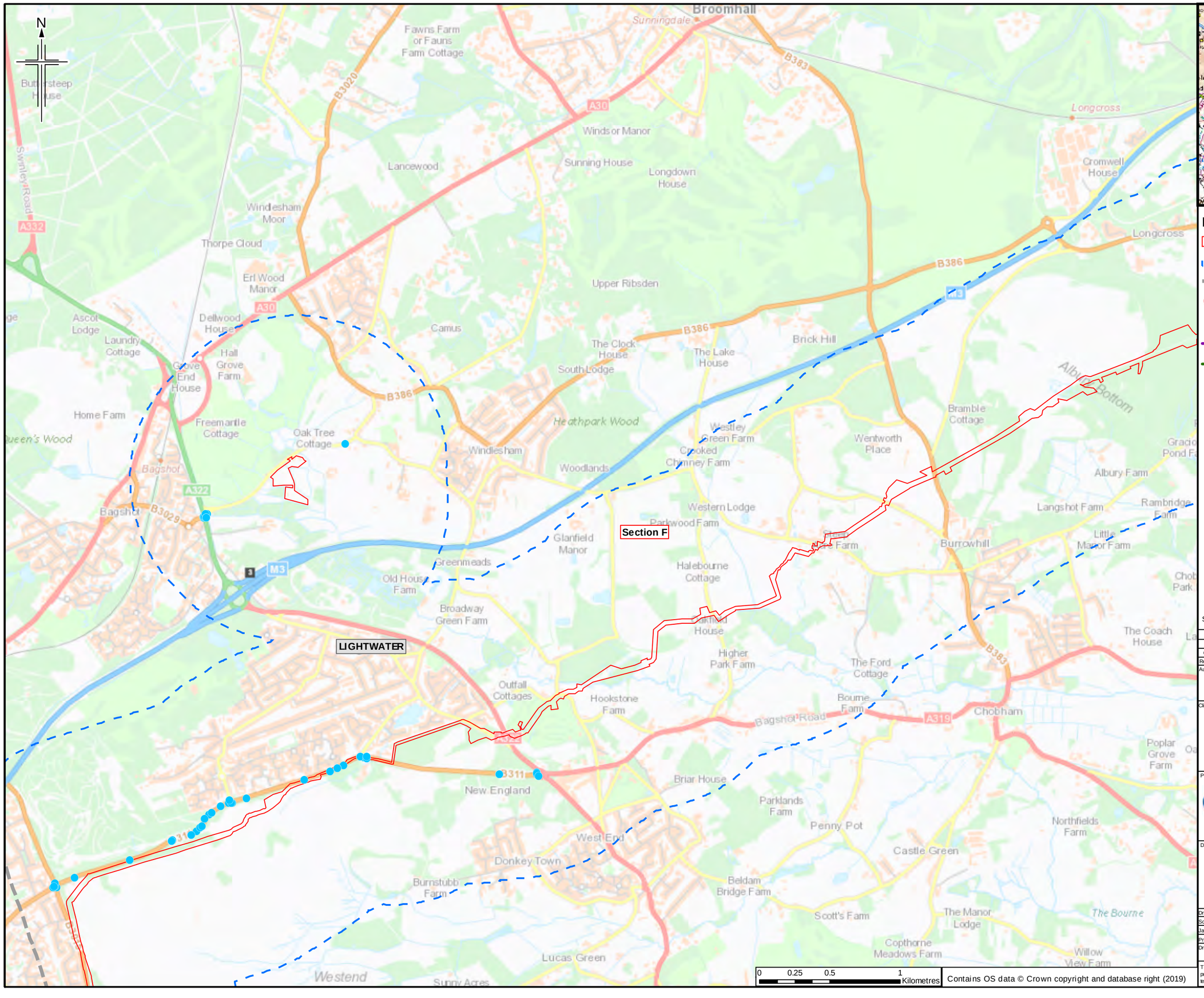

Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays part of Section F

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
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Drawing title

TRANSPORT ASSESSMENT
COLLISIONS AND TEMPORARY DIVERSIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004		
Drawing number	Figure A2 Sheet 11 of 14	Rev	0

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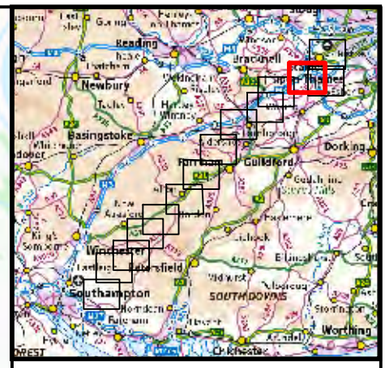

Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays parts of Section F, Section G and Section H

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Check'd	Rev'd	Apprv'd
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Drawing title

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APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue	
Scale	1:25,000 @ A3	DO NOT SCALE
Jacobs No.	B2325300	
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004	
Drawing number	Figure A2 Sheet 12 of 14	Rev 0

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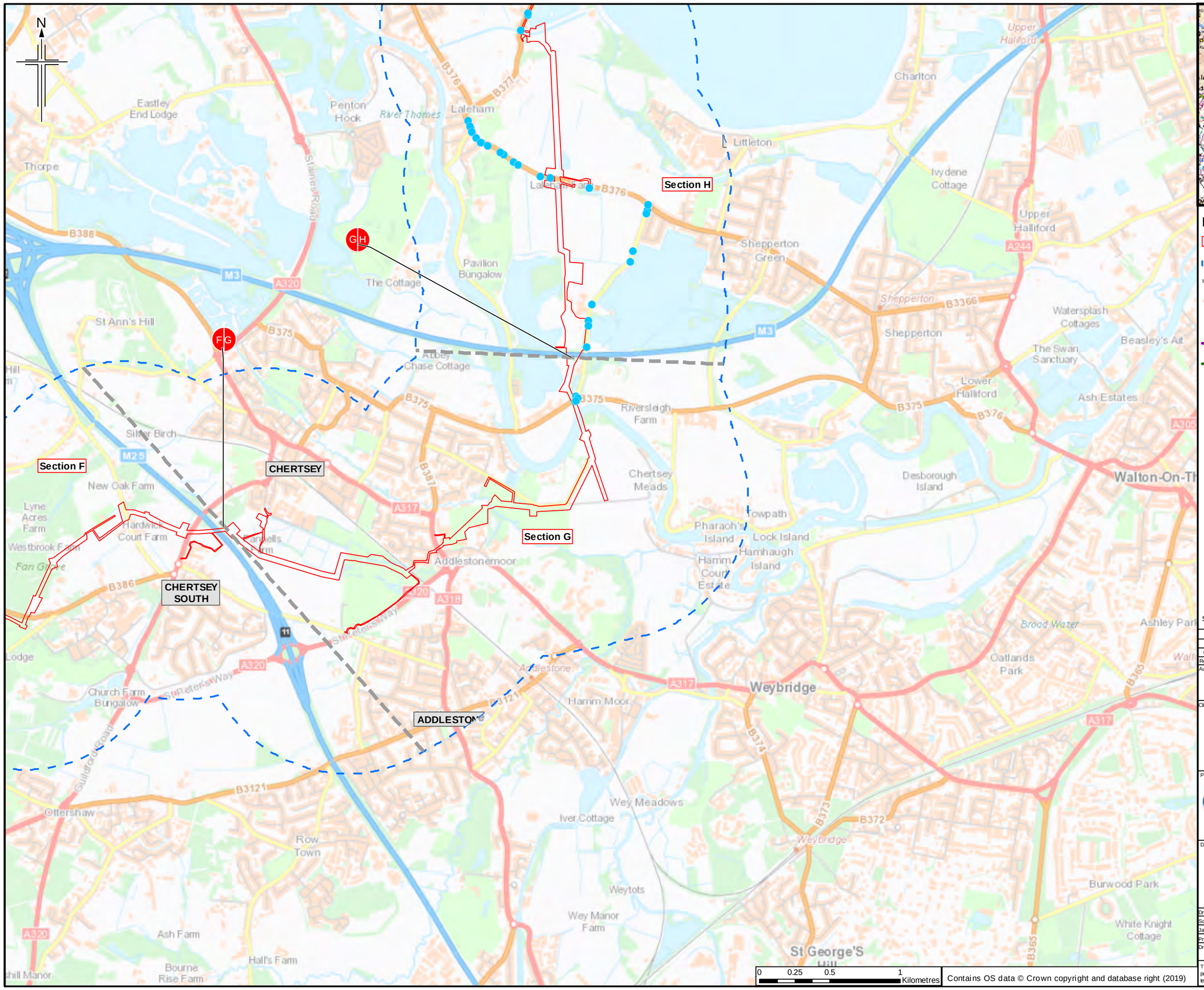

Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays parts of Section F, Section G and Section H

Rev.	Rev. Date	Purpose of revision	Orig'Dwn	Checkd	Rev'd	Apprv'd
0	27/03/2019	For Issue	LW	NS	HT	SH

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Project

Esso — Southampton to London Pipeline Project

Drawing title

TRANSPORT ASSESSMENT
COLLISIONS AND TEMPORARY DIVERSIONS
APFP Reg.(2009) 5(2)(o)

Drawing Status	For Issue		
Scale	1:25,000 @ A3	DO NOT SCALE	
Jacobs No.	B2325300		
ProjectWise No.	B2325300-JAC-000-ENV-DRG-001004		
Drawing number	Figure A2 Sheet 13 of 14	Rev	0

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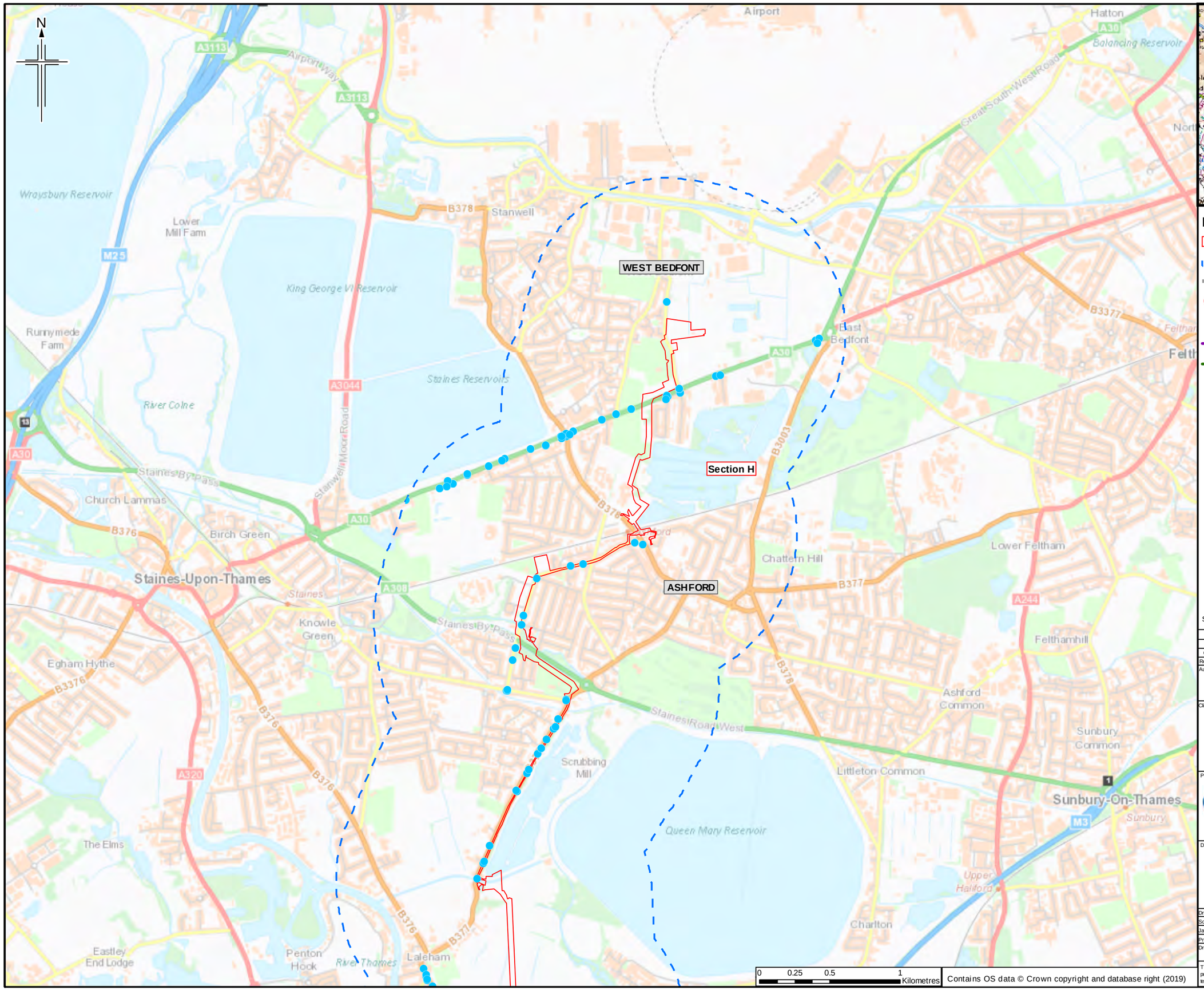

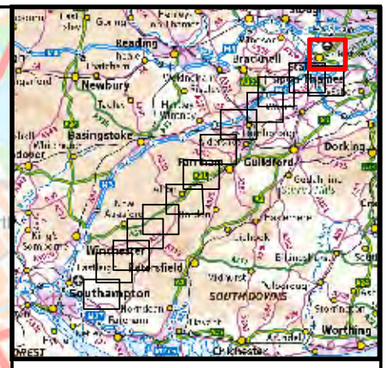

Legend

- Order Limits
- Order Limits 1km buffer
- Section break
- Section break
- Collision record
- Diversion route
- Road closure

Sheet displays part of Section H

Rev.	Rev. Date	Purpose of revision	Orig'd/Dwn	Check'd	Rev'd	Apprv'd
0	27/03/2019	For Issue	LW	NS	HT	SH

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Appendix 2 Project Traffic Demand and Management

2.1 Introduction

2.1.1 This appendix sets out the assessment assumptions that have been used within the Transport Assessment and the resulting traffic demand. These may be subject to change as the project is developed in more detail. The assumptions were adopted to provide a robust assessment of the project.

Overarching Principles

2.1.2 The overarching assessment assumptions are set out in Table A2.1.

Table A2.1: Key Assessment Assumptions

Assumption	Rural	Urban
Total number of sections (A-H)	Eight in total	
Pipe length laid per week	450m	90m
Excavated spoil taken off-site	Limited	Yes
Standard construction working	Monday – Saturday 07:00 to 19:00	
Typical Pipe length	12m	3-6m
	Where trenchless crossings are involved, the pipe length would depend on the location and size of the launch area.	
Road closures for open cut crossings of carriageways	Up to three working days, Class B roads and lower. For the 'road closures' to be implemented, traffic diversions will be in operation. These diversions will be agreed with the relevant Highways department.	
Traffic Management	Traffic signals to be provided where pipe is laid along or adjacent to carriageways. Mostly two-way working.	
Staff per work front	10 staff	10 staff
People/ car (to logistics hubs)	1	1
Workforce place of residence	Unknown	

2.2 Locations Considered as Part of the Assessment

2.2.1 The Transport Assessment Scoping Report included in Appendix 3, set out the criteria for the assessment. This stated that the assessment would include sections of road where effects would be generated for four consecutive weeks (28 days) or more. Table A2.2 sets out the roads that met this criterion at the time of the assessment along with the type of traffic control that is assumed.

Table A2.2: Assessed Locations

Location	Work Section	Type	Total Length of Road Affected (Metres)	Estimated Duration of Works (Weeks)	Traffic Control
Naishes Lane	E	Urban	656	7	Traffic Management
Balmoral Drive	F	Urban	37	5	Diversion
St. Catherine's Road	F	Urban	110	5	Diversion
B311 Red Road	F	Urban	570	7	Traffic Management
Ashford Road	H	Urban	1,310	15	Traffic Management
Woodthorpe Road	H	Urban	725	9	Traffic Management
[1] *St. Catherine's Road is assumed to be completed at a slower rate than the standard 90 metres per week*					

2.3 Traffic Demand Generation

Assumptions for traffic demand generation

2.3.1 The assumptions used to calculate project traffic demand are provided in Table A2.3.

Table A2.3: Assumptions for Traffic Demand Generation

Id	Assumption	Value
1)	Duration in months for setup of logistics hubs	Three months
2)	Duration in months for reinstatement of logistics hubs	Three months
3)	Workers per logistics hub during construction except for Brett Aggregates	10 people
4)	Brett Aggregates Logistics Hub workers during construction	20 people
5)	Workers per construction compound during construction	Five people
6)	Car occupancy for construction workers	One (driver only)
7)	All workers drive to logistics hubs prior to onward travel via minibus	-
8)	Construction programme based on months	
9)	Average weeks assumed per month	4.33 weeks
10)	Working days per week	Six days
11)	Work schedule: see Table 3.4	-
12)	Each compound assumed to be active (including setup, operation and reinstatement) for the full construction of its related pipeline section	-
13)	Work fronts served by each active construction compound	One work front

Id	Assumption	Value
14)	Workers per work front during construction	10 people
15)	Logistics hubs are only in use when the construction compounds they serve are also in use	-
16)	Minibus to each construction compound for workers based there during construction	One minibus
17)	Minibus to each construction compound for workers at work fronts	One minibus
18)	Number of construction compounds per Section.	Section A: 11 Section B: 4 Section C: 6 Section D: 8 Section E: 8 Section F: 12 Section G: 2 Section H: 7
19)	Construction workers arrive at their place of work before 07:00 and depart after 19:00	-
20)	All traffic to and from Construction Compounds travels via logistics hubs	-
21)	Project vehicle classes used are (see Appendix A for further detail): • Car; • Minibus; • LGV; • OGV1; and • OGV2.	-

Table A2.4: Number of Compounds Served by Each Logistics Hub

Logistics Hub	Pipeline Sections	A	B	C	D	E	F	G	H	Total
A31 Ropley Dean	A & B	6	2	-	-	-	-	-	-	**8**
A31/A32 Northfield Lane	A, B & C	6	2	4	-	-	-	-	-	**12**
Hartland Park	C, D & E	-	-	2	6	8	-	-	-	**16**
MoD Deepcut	D	-	-	-	2	-	-	-	-	**2**
New Road Windlesham	F & G	-	-	-	-	-	12	2	-	**14**
Brett Aggregates	H	-	-	-	-	-	-	-	7	**7**
Notes: *Number of compounds rounded up to nearest whole*										

Table A2.5: Two-way HGVs Associated With the Setup and Reinstatement of Logistics Hubs

HUB Location	Set Up Hardstanding Material HGV Movements	Removal of Hardstanding Material HGV Movements
A31 Ropley Dean	120	120
A31/A32 Northfield Lane	496	496
Hartland Village	60	60
MoD Deepcut Bridge Road	30	30
New Road Windlesham	1,325	1,325
Brett Aggregates Yard	836	836

Table A2.6: Daily One-way Traffic Demand for Logistics Hub Setup and Reinstatement

Logistics Hub	Car	Minibus	LGV	OGV1	OGV2	Total
A31 Ropley Dean	10	0	0	0	11	**21**
A31/A32 Northfield Lane	10	0	0	0	38	**48**
Hartland Park	10	0	0	0	4	**11**
MoD Deepcut	10	0	0	0	1	**11**
New Road Windlesham	10	0	0	0	88	**98**
Brett Aggregates	10	0	0	0	28	**38**

2.3.2 Where there is traffic demand associated with an activity, but daily traffic demand is calculated as less than one vehicle per day for each of the vehicle classes in Table A2.3, the demand is rounded up to one vehicle.

Logistics Hub Operation

2.3.3 Logistics hubs would operate during installation of the pipeline. One-way traffic demand for the operation of each logistics hub is presented in Table A2.7. Minibuses are not included in this traffic demand because they are instead associated with the compounds that they serve.

Table A2.7: Daily One-way Traffic Demand for Logistics Hub During Installation

Logistics Hub	Compounds Served	Car	Minibus	LGV	OGV1	OGV2	Total
A31 Ropley Dean	12	130	0	6	0	5	**141**
A31/A32 Northfield lane	8	190	0	6	0	5	**201**
Hartland Park	16	250	0	5	0	3	**258**
MoD Deepcut	2	40	0	5	0	3	**48**
New Road Windlesham	14	220	0	20	0	4	**244**
Brett Aggregates	7	185	0	4	0	3	**192**

Compounds

2.3.4 Daily traffic demand for compounds is the same for setup and reinstatement as for operation of the compounds during installation of the pipeline.

2.3.5 Based on the specific demand provided for a selection of 14 construction compounds and using the assumptions set out in Table A2.3, an average traffic demand for a construction compound was calculated. This is provided in Table A2.8. There is no car demand because all cars are driven to the logistics hubs, with onward travel to the compounds via minibus.

Table A2.8: Daily One-way Traffic Demand for a Typical Construction Compound

Vehicle Class	One-way Demand
Car	0
Minibus	2
LGV	1
OGV1	1
OGV2	2
Total	**6**

2.3.6 Traffic demand for compounds used in the assessment of project traffic is based on the average where demand for a specific compound is not known. For compounds where specific traffic demand is available this was incorporated into the calculation of total traffic demand.

Traffic Demand Over Time

2.3.7 Traffic demand was calculated for the project as a total and at each logistics hub over the course of the project to determine likely peak traffic demand.

Total Project Traffic

2.3.8 Total project traffic would peak in month 13, predominantly comprising light vehicles (see Illustration 11.1) that are associated with the logistics hubs. These would be the cars associated with the construction worker commute. This means that the main traffic generation is associated with the logistics hubs (see Illustration 11.2).

Illustration 11.1: Total Project One-Way Traffic by Month and Class

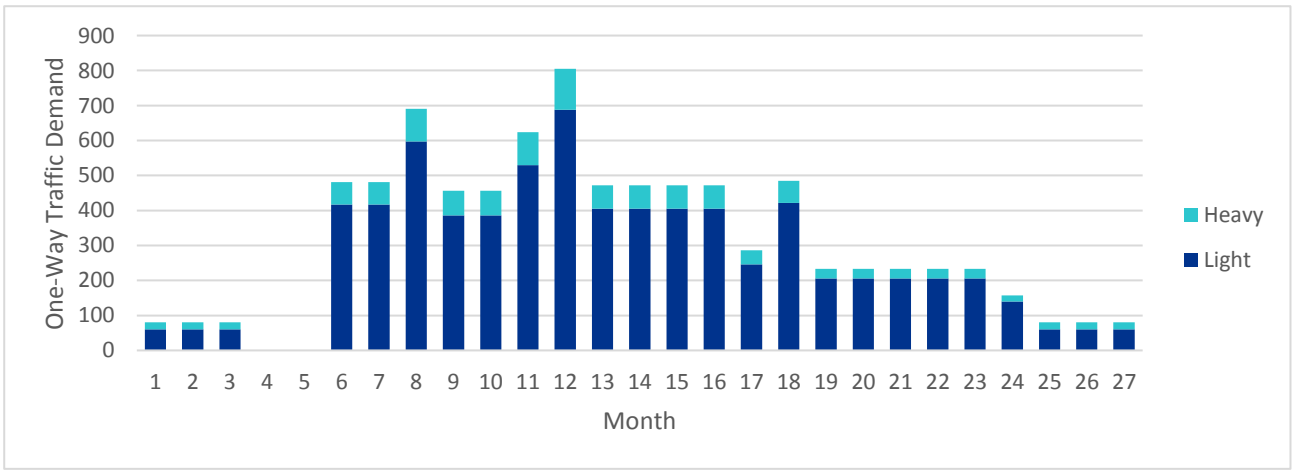
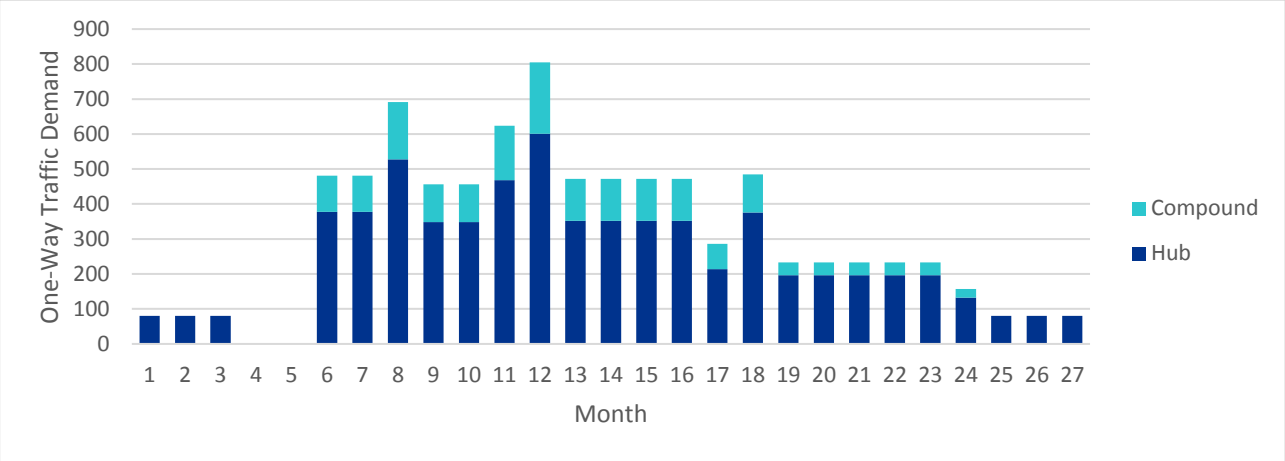


Illustration 11.2: Total Project One-Way Traffic by Month and Destination



2.3.9 Based on the information used to derive total project traffic demand, peak month total daily two-way traffic is provided in Table A2.9 with light vehicles comprising car, minibus and LGV and heavy vehicles comprising OGV1 and OGV2. The five-day average reflects Monday to Friday with the seven-day average reflecting Monday to Sunday.

Table A2.9: Two-way 5-day Average and 7-day Average Total Traffic Demand

Class	Two-way Weekday Demand	Two-way Average (Monday-Sunday)
Light	1,376	1,179
Heavy	234	201
Total	**1,610**	**1,380**

Logistics Hubs Project Traffic

2.4 Basis of Assessment

2.4.1 Traffic demand at each logistics hub was calculated, including the compound traffic that would route to and from each logistics hub. One-way traffic demand for each logistics hub is illustrated in Illustration 11.3 to Illustration 11.8. These show that the greatest traffic demand is generated at Hartland Park, but for a period of only two months. New Road Windlesham is the location where the traffic demand is higher than 200 one-way vehicles for the longest period (10 months).

2.4.2 Logistics hubs were used for this comparison because they would be the locations at which the greatest traffic demand is generated on the road network and therefore give an indication of the potential for traffic impacts.

Illustration 11.3: Ropley Dean One-Way Traffic Demand

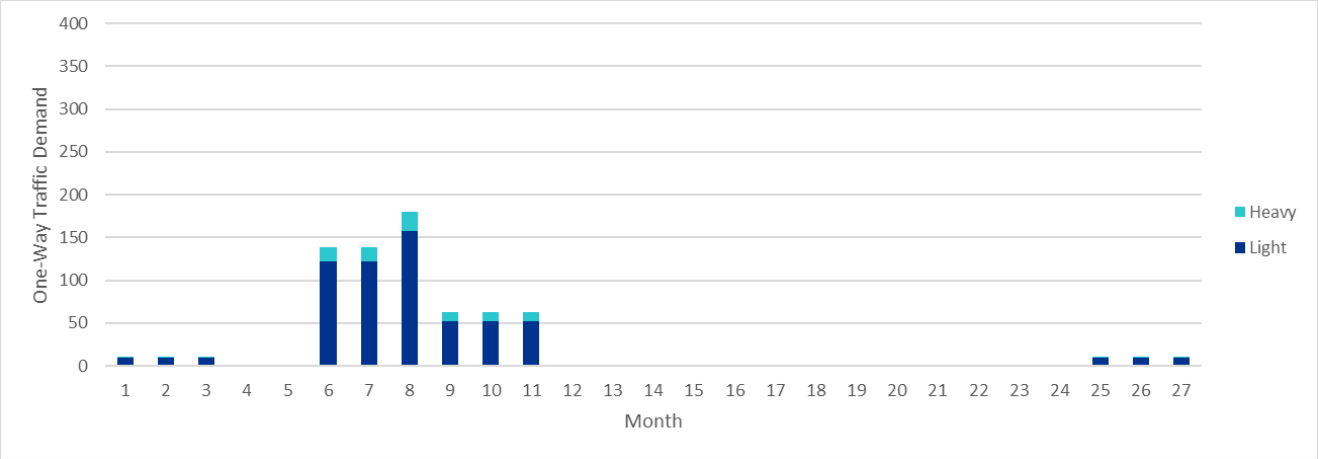


Illustration 11.4: A31/A32 Northfield Lane One-Way Traffic Demand

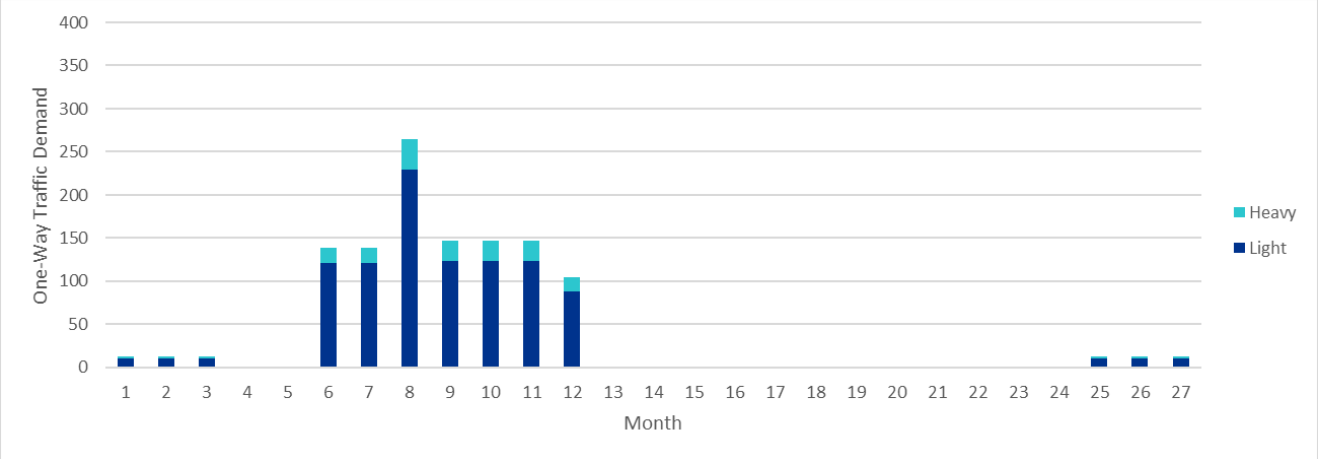


Illustration 11.5: Hartland Park One-Way Traffic Demand

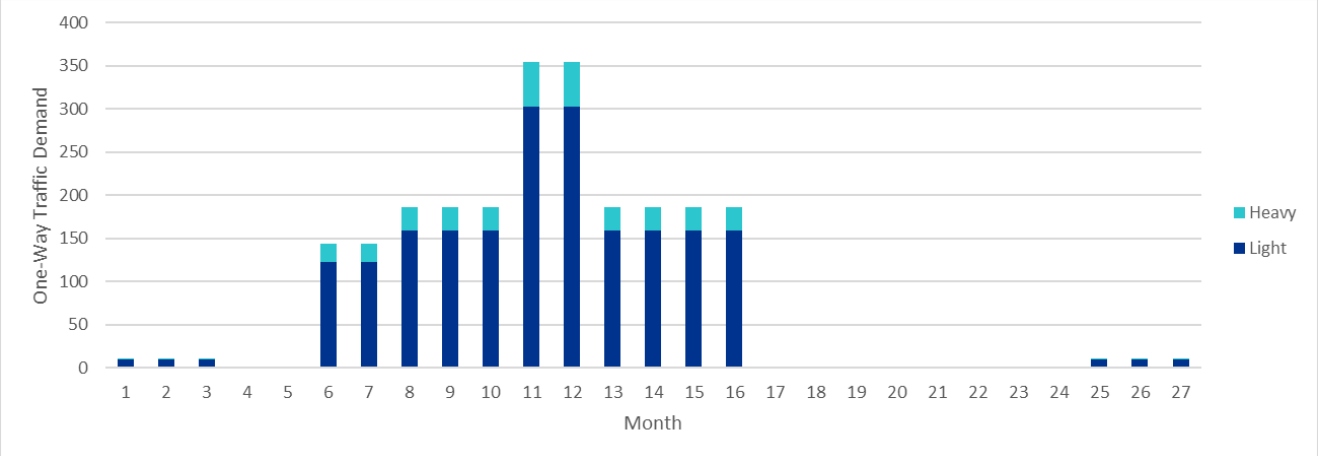


Illustration 11.6: MoD Deepcut One-Way Traffic Demand

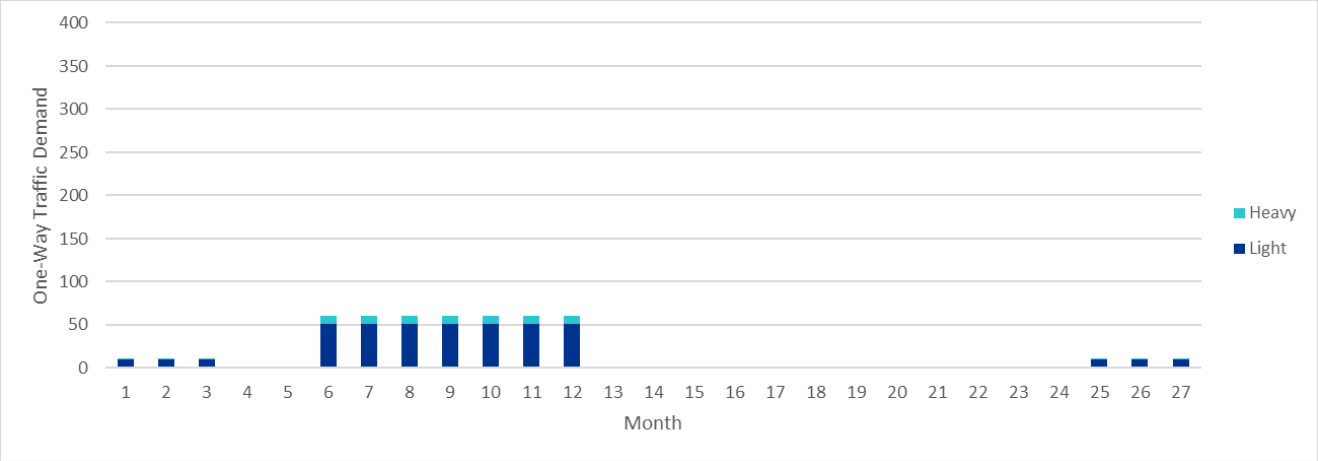


Illustration 11.7: New Road Windlesham One-Way Traffic Demand

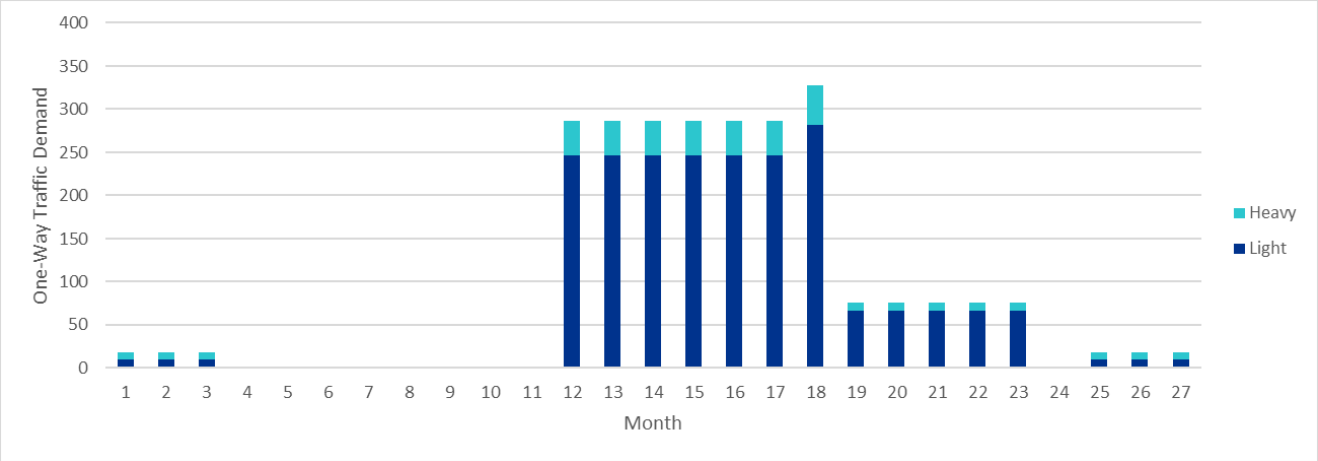
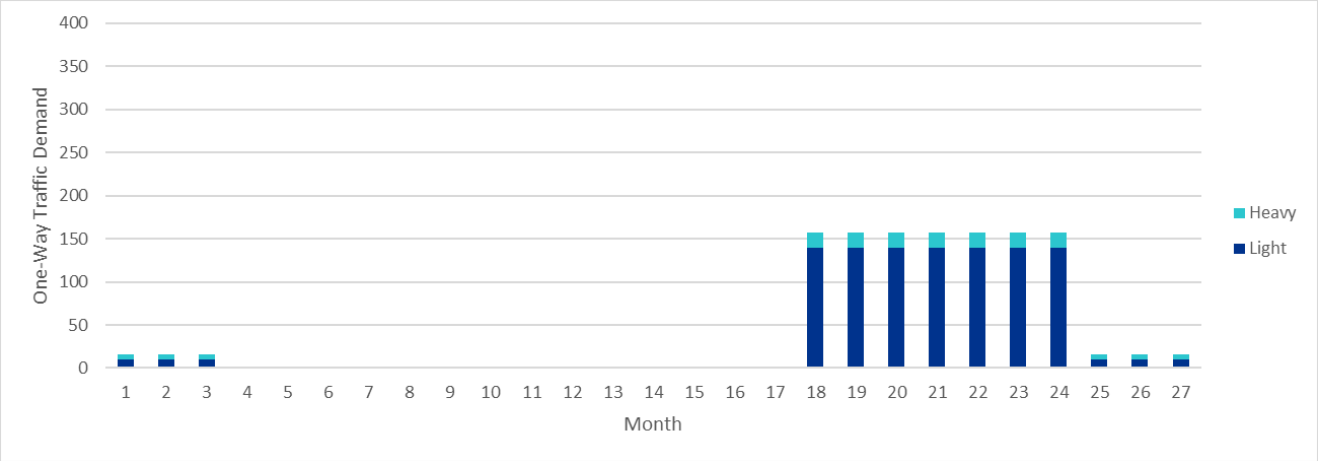


Illustration 11.8: Brett Aggregates One-Way Traffic Demand



2.4.3 Based on the information used to derive project traffic demand at each hub, the maximum two-way traffic at each logistics hub is summarised in Table A2.10. Also included in Table A2.10 is the average two-way traffic demand over the duration of the project, which is generally less than half of the peak-month traffic demand.

Table A2.10: Two-way Five-day Average and Seven-day Average Logistics Hub Traffic Demand

Logistics Hub	Class	Peak month Five-day average	Peak month Seven-day average	Peak Yr AAWT	Peak Yr AADT
A31 Ropley Dean	Light	315	270	93	80
	Heavy	46	39	15	13
	Total	**361**	**309**	**108**	**93**
A31/A32 Northfield Lane	Light	459	393	156	134
	Heavy	70	60	26	22
	Total	**529**	**453**	**182**	**156**
Hartland Park	Light	606	519	301	258
	Heavy	102	87	51	44
	Total	**708**	**606**	**352**	**302**
MoD Deepcut	Light	102	87	60	51
	Heavy	18	15	11	9
	Total	**120**	**102**	**71**	**60**
New Road Windlesham	Light	564	483	189	162
	Heavy	92	79	34	29
	Total	**656**	**562**	**223**	**191**
Brett Aggregates	Light	270	231	163	140
	Heavy	34	29	23	20
	Total	**304**	**260**	**186**	**160**

2.4.4 Traffic flows from nearby traffic count locations were used to determine the change arising from the worst year AADT in Table A2.10. This comparison is provided in Table A2.11 and (with AAWT in Table A2.12), shows that the greatest increase in AADT associated with logistics hubs is 3% at New Road Windlesham.

Table A2.11: Change in AADT at Logistics Hubs

Hub	Count Point Location	2022 AADT	Peak Year Project Only AADT	AADT 2022 With Project	Change
A31 Ropley Dean	A31 Alresford Bypass	12,849	93	12,942	1%
A31/A32 Northfield Lane	A31 Alton Bypass	26,810	156	26,966	1%
Hartland Park	Ively Road	10,971	302	11,273	3%
MoD Deepcut	Deepcut Bridge Road	7,517	60	7,577	1%
New Road Windlesham	New Road Windlesham	5,944	191	6,135	3%
Brett Aggregates	B376 Shepperton Road	15,048	160	15,208	1%

Table A2.12: Change in AAWT at Logistics Hubs

Hub	Count Point Location	2022 AAWT	Peak Year Project Only AAWT	AAWT 2022 With Project	Change
A31 Ropley Dean	A31 Alresford Bypass	13,850	108	13,958	1%
A31/A32 Northfield Lane	A31 Alton Bypass	28,682	182	28,864	1%

Hub	Count Point Location	2022 AAWT	Peak Year Project Only AAWT	AAWT 2022 With Project	Change
Hartland Park	Ively Road	11,648	352	12,000	3%
MoD Deepcut	Deepcut Bridge Road	8,274	71	8,345	1%
New Road Windlesham	New Road Windlesham	6,799	223	7,022	3%
Brett Aggregates	B376 Shepperton Road	16,238	186	16,424	1%

2.4.5 Table A2.11 and Table A2.12 present a worst case by assuming that all project traffic routes past a single location on the transport network, which is the location that the traffic data were available for. In practice traffic would quickly disperse, particularly those vehicles with greatest route choice. As an example of this, the traffic at the Brett Aggregates Logistics Hub would be able to access the public road network via both B376 Shepperton Road and via Littleton Lane. Further to this, any traffic using B376 Shepperton Lane would be able to turn either eastbound or westbound while vehicles with a gross weight of less than 18 tonnes are also able to head both northbound and southbound along Littleton Lane. Some vehicles would also be able to access their intended destination using haul roads and so would not be required to travel on the public road network.

2.5 Assessment of Project Traffic

2.5.1 The traffic demand presented in Section 10.3 suggests that traffic effects from project traffic are unlikely:

- two-way light vehicle movements primarily consist of cars, which would be arriving before 07:00 and departing after 19:00, outside the standard network peak periods;
- the highest HGV AADT at a logistics hub is forecast to be approximately 90 vehicles across 12 hours, approximately eight two-way HGVs per hour, less than one every five minutes. This is forecast for a period of two months; and
- a review of 2022 Future Baseline traffic flows located close to the logistics hubs indicates that the greatest change in AADT is 3% (see Table A2.11). On this basis there would not be significant changes in existing traffic flows because a change of 30% or greater is required for this.

2.5.2 The conclusions set out above suggest that the project traffic demand is sufficiently low that it does not need to be included in the assessment of project effects on the transport network.

2.6 Traffic Management for Existing Road Users

Principles of Assessment

1. Traffic management would use temporary signals, primarily two-way control;
2. Temporary traffic signals are assumed to have 120 metres between signal heads, at only one location per route at any one time. Approximately one half of the

carriageway would be required to be closed to general traffic with temporary signing required to UK standards;

3. Temporary traffic management and diversions are assumed to be in place for the durations set out in Table A2.2; and

4. Diversions would also require a signed diversion route, to enable drivers to easily navigate between each end of the temporary road closure

Appendix 3 Transport Assessment Scoping Report

Appendix 4 Traffic Data Collection

Table A4.1: Traffic Data Collection Summary

Location	Source	Type	Availability	Collection Year
A272	DfT	Hourly flows	Existing	2007
A32	DfT	Hourly flows	Existing	2007
B3006 Selbourne Road	DfT	Hourly flows	Existing	2009
B3004 Caker Lane	Hampshire County Council	Automatic Traffic Count	Existing	2008
B3013 Beacon Hill Road	Hampshire County Council	Automatic Traffic Count	Existing	2018
A31 Alresford Bypass	DfT	Hourly flows	Existing	2007
A287 Ewshot Hill	DfT	Hourly flows	Existing	2007
B3014 Cove Road	Hampshire County Council	Automatic Traffic Count	Existing	2015
A327 Ively Road	DfT	Hourly flows	Existing	2007
A325 Farnborough Road	DfT	Hourly flows	Existing	2006
A331	DfT	Hourly flows	Existing	2007
Naishes Lane	Surrey County Council	Automatic Traffic Count	Commissioned	2018
Jubilee Drive	Surrey County Council	Automatic Traffic Count	Commissioned	2018
Leipzig	Surrey County Council	Automatic Traffic Count	Commissioned	2018
Hampton Close/ Sandy Lane/ Jubilee Drive/ Naishes Lane	Surrey County Council	Manual Classified Turning Count	Commissioned	2018
Naishes Lane/ Kukri Gardens	Surrey County Council	Manual Classified Turning Count	Commissioned	2018
Naishes Lane/ Wakesford Park	Surrey County Council	Manual Classified Turning Count	Commissioned	2018
Maddoxford Lane	Hampshire County Council	Automatic Traffic Count	Existing	2014
B2177 Winchester Road	DfT	Hourly flows	Existing	2007
B377 Ashford Road	DfT	Hourly flows	Existing	2008
B3411 Frimley Green Road/ Balmoral Drive/ S C Johnson	Surrey County Council	Manual Classified Turning Count	Commissioned	2018
B311 Red Road/ Lightwater Road	Surrey County Council	Manual Classified Turning Count	Commissioned	2018
B3015 The Maultway/ Old Bisley Road/	Surrey County Council	Manual Classified Turning Count	Commissioned	2018

Location	Source	Type	Availability	Collection Year
B3015 Deepcut Bridge Road				
A322 Lightwater Bypass	Department for Transport	Hourly flows	Existing	2006
A31/A32	Department for Transport	Hourly flows	Existing	2002
A317 St. Peter's Way	Department for Transport	Hourly flows	Existing	2007
B3015 Deepcut Bridge Road/ Minorca Road	Hampshire County Council	Manual Classified Turning Count	Commissioned	2018
Ambleside Road	Hampshire County Council	Automatic Traffic Count	Commissioned	2018
Briar Avenue	Hampshire County Council	Automatic Traffic Count	Commissioned	2018
Balmoral Drive	Hampshire County Council	Automatic Traffic Count	Commissioned	2018
Buckingham Way	Hampshire County Council	Automatic Traffic Count	Commissioned	2018
B377 Fordbridge Road	Hampshire County Council	Automatic Traffic Count	Commissioned	2018
Woodthorpe Road/ Stanwell Road/ Station Approach/ Clarendon Road	Hampshire County Council	Manual Classified Turning Count	Commissioned	2018
Stanwell Road/ Woodthorpe Road	Hampshire County Council	Manual Classified Turning Count	Commissioned	2018
Woodthorpe Road/ Chesterfield Road	Hampshire County Council	Manual Classified Turning Count	Commissioned	2018
B376 Shepperton Road	Surrey County Council	Automatic Traffic Count	Existing	2014
M25	DfT	Hourly flows	Existing	2008
A308 Staines Bypass	DfT	Hourly flows	Existing	2007
M3	DfT	Hourly flows	Existing	2008
B383 Windsor Road	DfT	Hourly flows	Existing	2009
(Old) Ively Road	Hampshire County Council	Automatic Traffic Count	Existing	2016
New Road Windlesham	Hampshire County Council	Automatic Traffic Count	Existing	2016
Wheely Down Road	Hampshire County Council	Automatic Traffic Count	Existing	2003
Wintershill	Hampshire County Council	Automatic Traffic Count	Existing	2013
A30	DfT	Hourly flows	Existing	

Appendix 5 Journey Times

Table A5.1: General Information For Journey Time Routes

Link	SATURN Link Type	Direction 1	Direction 2	Length (Metres)
Naishes Lane	Small Town 90% development	Northbound	Southbound	445
Balmoral Drive	Small Town 90% development	Eastbound	Westbound	890
B3411 Frimley Green Road	Small Town 90% development	Northbound	Southbound	780
Buckingham Way	Small Town 90% development	Northbound	Southbound	1,270
Balmoral Drive diversion route	Small Town 90% development	Northbound	Southbound	2,050
B311 Red Road	Rural S10 (Typical)	Eastbound	Westbound	2,400
B377 Ashford Road	Small Town 90% development	Northbound	Southbound	1,500
Woodthorpe Road	Small Town 90% development	Eastbound	Westbound	1,400

Table A5.2: Baseline 2018 Journey Time Information

Link	AM				PM			
	Passenger Car Units (PCUs)		Journey Times (Seconds)		Passenger Car Units (PCUs)		Journey Times (Seconds)	
	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2
Naishes Lane	134	134	35	35	54	54	34	34
Balmoral Drive	185	185	67	67	288	288	67	67
B3411 Frimley Green Road (a)	534	586	64	65	649	632	66	66
Buckingham Way (b)	131	257	99	99	163	125	99	98
Balmoral Drive diversion route (a+b)			163	164			165	165
B311 Red Road	166	714	186	209	220	907	187	228
B377 Ashford Road	510	518	123	123	253	262	117	117
Woodthorpe Road	368	443	111	113	401	441	112	113

Table A5.3: 2022 Future Baseline Journey Time Information

Link	AM				PM			
	Passenger Car Units (PCUs)		Journey Times (Seconds)		Passenger Car Units (PCUs)		Passenger Car Units (PCUs)	
	Direction 1	Direction 2	Direction 1	Direction 1	Direction 2	Direction 2	Direction 1	Direction 2
Naishes Lane	141	141	35	35	57	57	34	34
Balmoral Drive	193	193	67	67	301	301	68	68
B3411 Frimley Green Road (a)	565	619	65	66	684	666	67	67
Buckingham Way (b)	136	267	99	99	170	130	99	99
Balmoral Drive diversion route (a+b)			163	165			166	165
B311 Red Road	173	745	187	212	229	947	187	233
B377 Ashford Road	533	541	123	124	264	274	117	118
Woodthorpe Road	369	443	111	113	402	441	112	113

Table A5.4: 2022 With Project Journey Time Information

Link	AM				PM			
	Passenger Car Units (PCUs)		Journey Times (Seconds)		Passenger Car Units (PCUs)		Journey Times (Seconds)	
	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2
Naishes Lane	140	140	35	35	57	57	34	34
Balmoral Drive	0	0	67	67	0	0	67	67
B3411 Frimley Green Road (a)	758	813	69	71	985	967	77	76
Buckingham Way (b)	433	453	102	102	366	431	101	102
Balmoral Drive diversion route (a+b)			171	173			178	178
B311 Red Road	173	745	187	212	229	947	187	233

Link	AM				PM			
	Passenger Car Units (PCUs)		Journey Times (Seconds)		Passenger Car Units (PCUs)		Journey Times (Seconds)	
	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2
B377 Ashford Road	533	541	123	124	264	274	117	118
Woodthorpe Road	369	443	111	113	402	441	112	113

Appendix 6 Collisions and Safety

6.1 The latest five years of publicly available STATS19 data, between 1 January 2013 and 31 December 2017 inclusive, were used. A summary of the collisions at each location are provided in this appendix.

Traffic Management

Naishes Lane

Table A6.1: Total Collisions Along Naishes Lane

Collision Severity	Number of Collisions	Percentage
Fatal	0	0%
Serious	0	0%
Slight	2	100%
Total	**2**	**100%**

Balmoral Drive

Table A6.2: Total Collisions Along Balmoral Drive

Collision Severity	Number of Collisions	Percentage
Fatal	0	0%
Serious	1	33%
Slight	2	67%
Total	**3**	**100%**

Balmoral Drive Diversion

Table A6.3: Total Collisions Along Balmoral Drive Diversion

Collision Severity	Number of Collisions	Percentage
Fatal	0	0%
Serious	3	30%
Slight	7	70%
Total	**10**	**100%**

St. Catherine's Road

Table A6.4: Total Collisions Along St. Catherine's Road

Collision Severity	Number of Collisions	Percentage
Fatal	0	0%
Serious	0	0%

Collision Severity	Number of Collisions	Percentage
Slight	2	100%
Total	**2**	**100%**

B311 Red Road

Table A6.5: Total Collisions Along B311 Red Road

Collision Severity	Number of Collisions	Percentage
Fatal	1	2%
Serious	14	27%
Slight	36	71%
Total	**51**	**100%**

B377 Ashford Road

Table A6.6: Total Collisions Along B377 Ashford Road

Collision Severity	Number of Collisions	Percentage
Fatal	0	0%
Serious	5	26%
Slight	16	76%
Total	**21**	**100%**

Woodthorpe Road

Table A6.7: Total Collisions Along Woodthorpe Road

Collision Severity	Number of Collisions	Percentage
Fatal	0	0%
Serious	1	6%
Slight	16	94%
Total	**17**	**100%**

Appendix 7 Potentially Affected Bus Routes

7.1 In these tables 'Day' is 07:00-19:00, with 'Night' being 19:00-07:00, the Night period captures the hours when construction workers would be commuting. These time periods do not imply that the bus service is in operation for all hours of each period.

Table A7.1: Bus Routes Potentially Affected by Traffic Management and Diversions

Route Number	Period	Weekday Frequency Per Hour	Saturday Frequency Per Hour	Sunday Frequency Per Hour
Naishes Lane				
10	Day	1	2	No service
	Night	No service	No service	No service
610	Day	1 a day	No service	No service
	Night	No service	No service	No service
Balmoral Drive				
11	Day	1	1	No service
	Night	No service	No service	No service
Balmoral Drive diversion				
3	Day	2	2	<1
	Night	1	1	No service
11	Day	1	1	No service
	Night	No service	No service	No service
85	Day	One a day	No service	No service
	Night	No service	No service	No service
St. Catherine's Road				
11	Day	1	1	No service
	Night	No service	No service	No service
48	Day	Three a day	No service	No service
	Night	No service	No service	No service
85	Day	One a day	No service	No service
	Night	No service	No service	No service
B311 Red Road				
84	Day	<1	<1	No service
	Night	No service	No Service	No service
500	Day	<1	2 a day	No service
	Night	No service	No service	No service
B377 Ashford Road				
290	Day	3	3	3
	Night	3	3	3
458	Day	2	8	10
	Night	No service	No service	No service
571	Day	One a day on Monday, Wednesday and Friday only	No service	No service

Route Number	Period	Weekday Frequency Per Hour	Saturday Frequency Per Hour	Sunday Frequency Per Hour
	Night	No service	No service	No service
572	Day	Twice a day	No service	No service
	Night	No service	No service	No service
574	Day	One a day on Tuesday and Thursday only	No service	No service
	Night	No service	No service	No service
656	Day	One a day, school days	No service	No service
	Night	No service	No service	No service
695	Day	One a day	No service	No service
	Night	No service	No service	No service
813	Day	One a day	No service	No service
	Night	No service	No service	No service
Woodthorpe Road				
117	Day	3	3	2
	Night	3	3	2
667	Day	Two a day, school days	No service	No service
	Night	No service	No service	No service

Logistics Hubs

Table A7.2: Bus Routes Potentially Affected by Logistics Hubs

Route Number	Period	Weekday Frequency Per Hour	Saturday Frequency Per Hour	Sunday Frequency Per Hour
A31, Ropley Dean				
64	Day	2	2	1
	Night	1	1	No service
64X	Day	One a day	No service	No service
	Night	No service	No service	No service
67	Day	<1	Four a day	No service
	Night	No service	No service	No service
240	Day	Four a day, Monday to Thursday	No service	No service
	Night	No service	No service	No service
623	Day	One a day	No service	No service
	Night	No service	No service	No service
A31/ A32 Northfield Lane				
38	Day	1	1	No service
	Night	No service	No service	No service
64	Day	2	2	1
	Night	1	1	No service

Route Number	Period	Weekday Frequency Per Hour	Saturday Frequency Per Hour	Sunday Frequency Per Hour
Hartland Park				
No service				
MoD Deepcut				
11	Day	1	1	No service
	Night	No service	No service	No service
48	Day	One a day	No service	No service
	Night	No service	No service	No service
85	Day	One a day, school days	No service	No service
	Night	No service	No service	No service
New Road, Windlesham				
500	Day	<1	Two a day	No service
	Night	No service	No service	No service
Brett Aggregates				
458	Day	2	5	8
	Night	No service	No service	No service
574	Day	One a day on Tuesdays and Thursdays	No service	No service
	Night	No service	No service	No service
656	Day	One a day, school days	No service	No service
	Night	No service	No service	No service
695	Day	One a day	No service	No service
	Night	No service	No service	No service
813	Day	One a day	No service	No service
	Night	No service	No service	No service

Construction Compounds

Table A7.3: Bus Routes Potentially Affected by Construction Compounds (Sections A and H)

Route Number	Period	Weekday Frequency Per Hour	Saturday Frequency Per Hour	Sunday Frequency Per Hour
Maddoxford Lane				
X5	Day	<1	No service	No service
	Night	No service	No service	No service
X15	Day	Two a day	No service	No service
	Night	No service	No service	No service
Bluestar 3	Day	1	1	Four a day
	Night	1	1	No service
Gregory Lane				
X10	Day	1	0.5 (1 bus per 2 hours)	No service
	Night	No service	No service	No service

Route Number	Period	Weekday Frequency Per Hour	Saturday Frequency Per Hour	Sunday Frequency Per Hour
Wintershill				
X10	Day	1	0.5 (1 bus per 2 hours)	No service
	Night	No service	No service	No service
69	Day	2	2	No service
	Night	No service	No service	No service
691	Day	Three a day, college days	No service	No service
	Night	No service	No service	No service
692	Day	Two a day, college days	No service	No service
	Night	No service	No service	No service
B2177 Winchester Road				
X10	Day	1	0.5 (1 bus per 2 hours)	No service
	Night	No service	No service	No service
69	Day	2	2	No service
	Night	No service	No service	No service
691	Day	Three a day, college days	No service	No service
	Night	No service	No service	No service
692	Day	Two a day, college days	No service	No service
	Night	No service	No service	No service
Stakes Lane				
69	Day	2	2	No service
	Night	No service	No service	No service
691	Day	Three a day, college days	No service	No service
	Night	No service	No service	No service
692	Day	Two a day, college days	No service	No service
	Night	No service	No service	No service
Wheely Down Road				
67	Day	<1	4 a day	No service
	Night	No service	No service	No service
X17	Day	Two a day on Wednesdays	No service	No service
	Night	No service	No service	No service
Riversdown Road				
No service				
A272				
67	Day	<1	Four a day	No service

Route Number	Period	Weekday Frequency Per Hour	Saturday Frequency Per Hour	Sunday Frequency Per Hour
	Night	No service	No service	No service
M3 to B376 Brett Aggregates (B376 Shepperton Road)				
458	Day	2	5	8
	Night	No service	No service	No service
574	Day	One a day on Tuesday and Thursday	No service	No service
	Night	No service	No service	No service
656	Day	One a day, school days	No service	No service
	Night	No service	No service	No service
695	Day	One a day	No service	No service
	Night	No service	No service	No service
813	Day	One a day	No service	No service
	Night	No service	No service	No service
Ashford Station to Ashford Community Centre				
117	Day	3	3	2
	Night	3	3	2
667	Day	Two a day, school days	No service	No service
	Night	No service	No service	No service
West London Terminal, Ashford Sports Ground				
116	Day	5	5	3
	Night	3	3	3
203	Day	3	3	2
	Night	3	3	2
216	Day	3	3	2
	Night	3	3	2
400	Day	Three a day, four a day on school days	No service	No service
	Night	No service	No service	No service
442	Day	<1	<1	No service
	Night	<1	<1	No service
555	Day	8	8	8
	Night	1	1	1
570	Day	One a day on a Monday, Wednesday and Friday only	No service	No service
	Night	No service	No service	No service
655	Day	One a day, school days	No service	No service
	Night	No service	No service	No service
667	Day	One a day, school days	No service	No service
	Night	No service	No service	No service
A30 to Ashford Sports Ground				
116	Day	5	5	3

Route Number	Period	Weekday Frequency Per Hour	Saturday Frequency Per Hour	Sunday Frequency Per Hour
	Night	3	3	3
203	Day	3	3	2
	Night	3	3	2
216	Day	3	3	2
	Night	3	3	2
400	Day	Three a day, four a day on school days	No service	No service
	Night	No service	No service	No service
442	Day	<1	<1	No service
	Night	<1	<1	No service
555	Day	8	8	8
	Night	1	1	1
570	Day	One a day on a Monday, Wednesday and Friday only	No service	No service
	Night	No service	No service	No service
655	Day	One a day, school days	No service	No service
	Night	No service	No service	No service
667	Day	One a day, school days	No service	No service
	Night	No service	No service	No service
A30 to Orchard Way				
116	Day	5	5	3
	Night	3	3	3
203	Day	3	3	2
	Night	3	3	2
216	Day	3	3	2
	Night	3	3	2
400	Day	Three a day, four a day on school days	No service	No service
	Night	No service	No service	No service
442	Day	<1	<1	No service
	Night	<1	<1	No service
555	Day	8	8	8
	Night	1	1	1
570	Day	One a day on a Monday, Wednesday and Friday only	No service	No service
	Night	No service	No service	No service
655	Day	One a day, school days	No service	No service
	Night	No service	No service	No service
667	Day	One a day, school days	No service	No service
	Night	No service	No service	No service

Appendix 8 Locations Excluded from Assessment

Location of Road	Reason for Excluding
Section A – Boorley Green to Bramdean	
Crows Nest Lane	Under four-week criteria
Willows End	Under four-week criteria
Maddoxford Lane	Under four-week criteria
Unnamed Road	Under four-week criteria
Netherhill	Under four-week criteria
Gregory Lane	Under four-week criteria
Mincingfield Lane	Under four-week criteria
Wintershill	Under four-week criteria
B2177 Winchester Road	Under four-week criteria
Cross Lane	Under four-week criteria
Peak Lane	Under four-week criteria
Bigpath Lane	Under four-week criteria
Belmore	Under four-week criteria
Stakes Lane	Under four-week criteria
Lower Preshaw Lane	Under four-week criteria
Unnamed Road	Under four-week criteria
Wheely Down Farm Lane	Under four-week criteria
Kilmeston Road	Under four-week criteria
Riversdown Road east	Under four-week criteria
Riversdown Road south	Under four-week criteria
Brockwood Bottom	Under four-week criteria
A272	Under four-week criteria
Section B – Bramdean to South of Alton	
Tithelands Lane	Under four-week criteria
Uncle Bill's	Under four-week criteria
Stapley Lane	Under four-week criteria
Soames Lane	Under four-week criteria
Petersfield Road	Under four-week criteria
Lyeway Lane	Under four-week criteria
Kitwood Lane	Under four-week criteria
Hawthorn Road	Under four-week criteria
Headmore Lane	Under four-week criteria
Brightstone Lane	Under four-week criteria
Woodside Lane	Under four-week criteria
A32	Under four-week criteria
B3006 Selbourne Road	Under four-week criteria
Section C – South of Alton to Crondall	
B3004 Caker Lane	Under four-week criteria

Location of Road	Reason for Excluding
Binsted Road	Under four-week criteria
A31	Under four-week criteria
West End	Under four-week criteria
Unnamed Road	Under four-week criteria
Gid Lane	Under four-week criteria
Froyle Road	Under four-week criteria
Isnage Farm Lane	Under four-week criteria
Hole Lane	Under four-week criteria
Dippenhall Road	Under four-week criteria
Dippenhall Street	Under four-week criteria
Section D – Crondall to Farnborough	
Heath Lane	Under four-week criteria
Redlands Lane	Under four-week criteria
A287 Ewshot Hill	Under four-week criteria
Ewshot Lane	Under four-week criteria
Naishes Lane (at Junction with Ewshot Lane)	Under four-week criteria
Naishes Lane (at Junction with Jubilee Drive)	Under four-week criteria
Jubilee Drive	Under four-week criteria
B3013 Beacon Hill Road	Under four-week criteria
Sandy Lane	Under four-week criteria
Bourley Road	Under four-week criteria
Aldershot Road	Under four-week criteria
A323 Fleet Road	Under four-week criteria
Old Ively Road	Under four-week criteria
Ively Road	Under four-week criteria
A327 Ively Road	Under four-week criteria
Section E – Farnborough to Bisley and Pirbright Ranges	
B3014 Cove Road	Under four-week criteria
Stake Lane	Under four-week criteria
Prospect Road	Under four-week criteria
A325 Farnborough Road	Under four-week criteria
A311 Blackwater Valley Road	Under four-week criteria
Ship Lane (north)	Under four-week criteria
Ship Lane (south)	Under four-week criteria
Ringwood Road	Under four-week criteria
A331 North	Under four-week criteria
Sandringham Way (east)	Under four-week criteria
Sandringham Way (west)	Under four-week criteria
Pevensey Way	Under four-week criteria
Berkeley Crescent	Under four-week criteria
Section F – Bisley and Pirbright Ranges to M25	

Location of Road	Reason for Excluding
B3015 The Maultway	Pipeline being constructed in verge
A322 Lightwater Bypass	Under four-week criteria
Guildford Road	Under four-week criteria
Blackstroud Lane East	Under four-week criteria
Halebourne Lane	Under four-week criteria
Windlesham Road	Under four-week criteria
Steep Hill	Under four-week criteria
Accommodation Lane	Under four-week criteria
B383 Windsor Road	Under four-week criteria
B386 Longcross Road	Under four-week criteria
Hardwick Lane	Under four-week criteria
Section G – M25 to M3	
A320 Guildford Road East	Under four-week criteria
A320 Guildford Road West	Under four-week criteria
M25	Under four-week criteria
The Knoll	Under four-week criteria
Chertsey Road	Under four-week criteria
Mead Lane	Under four-week criteria
B375 Chertsey Road	Under four-week criteria
Littleton Lane	Under four-week criteria
Section H – M3 to West London Terminal storage facility	
M3	Under four-week criteria
B376 Shepperton Road	Under four-week criteria
B377 The Broadway	Under four-week criteria
Kingston Road	Under four-week criteria
Staines Bypass	Under four-week criteria
Stanwell Road minor	Under four-week criteria
B378 Stanwell Road (north)	Under four-week criteria
B378 Stanwell Road (south)	Under four-week criteria
Church Road	Under four-week criteria
Staines Road	Under four-week criteria
Short Lane	Under four-week criteria

Appendix 9 LinSig Journey Time Assessment

9.1 Traffic models of the temporary traffic management locations were completed using the software program LinSig V3,2,40,0. LinSig models traffic signals and the effect of traffic signals on traffic capacities and queuing. Delays associated with traffic management were assessed using 2022 Future Baseline traffic flows with the 120-metre work front adopted as the length of traffic management in place. The output of the LinSig models are provided in this appendix.

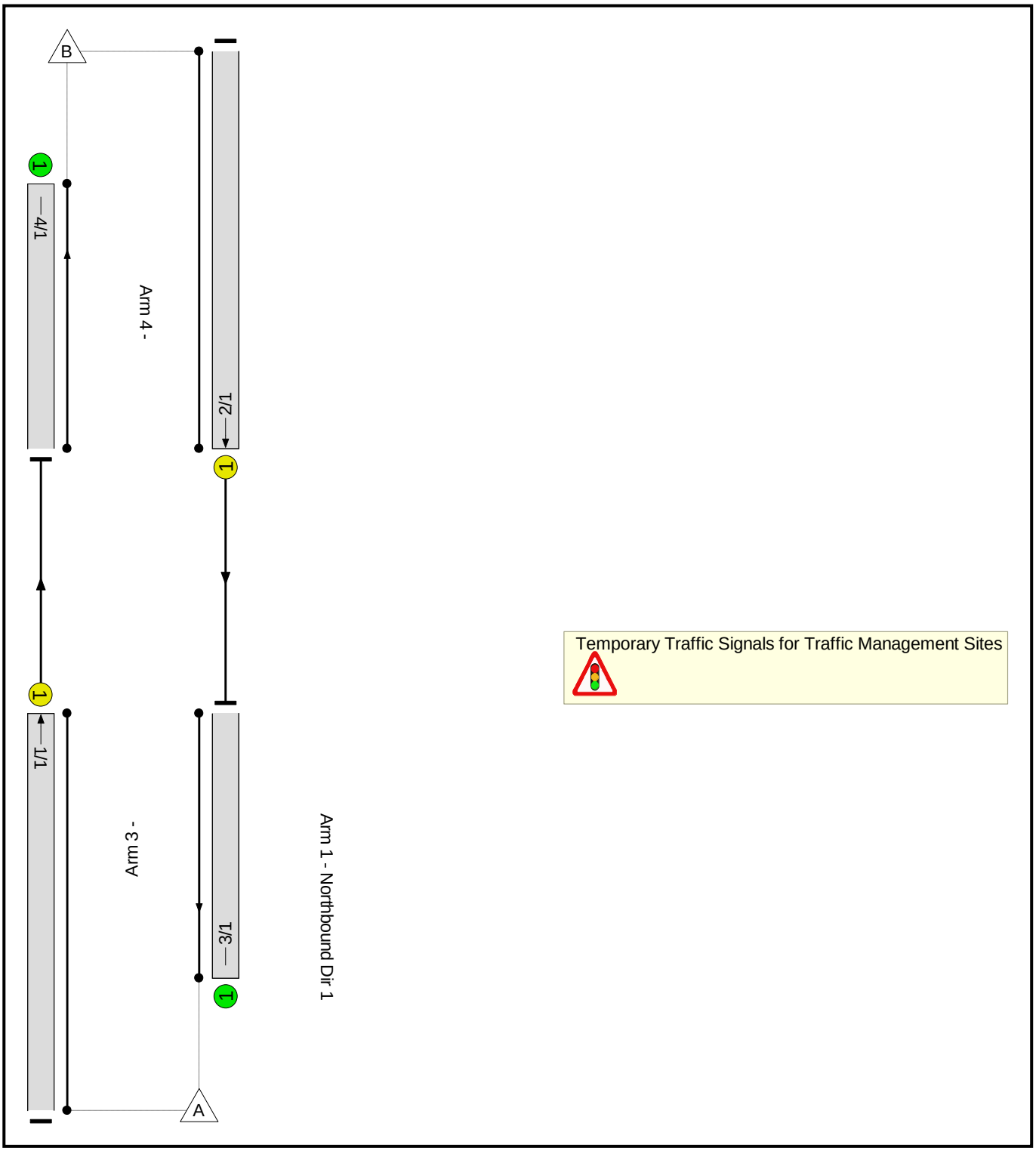
Naishes Lane and Woodthorpe Road

Full Input Data and Results

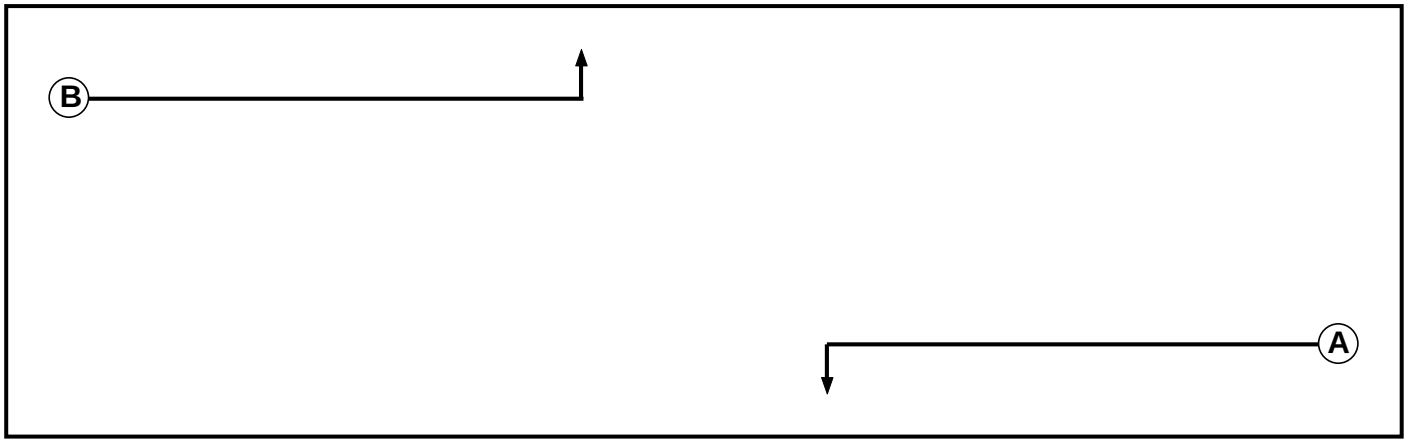
User and Project Details

Project:	**SLP**
Title:	**Temporary Signals at Traffic Management Locations**
Location:	Naishes Lane & Woodthorpe Road
Client:	Esso Petroleum Company Limited
Design Layout Ref:	No drawing was used for this model
Model Purpose:	Temporary Traffic Signals
Model Assumptions:	1. 120m between signal heads. Intergreen of 120m = 18 seconds - based on the TAL 1/06 guideline Cycle time = 116 seconds - based on 2x18 second intergreens, and 2x 40 second green time from 'An Introduction to the Use of Portable Vehicular Signals', Department for Transport, 2016. 2. Assumed lane width of 3m 3. B311 Red Road has not been allocated an even split of 40 second green time due to the imbalance of traffic demand. Direction A to B was given a short minimum green time to allow for the imbalanced traffic demand, and bring the junction under capacity. 4. • Woodthorpe Road : Dir 1 = NB, Dir 2 = SB • Naishes Lane : Dir 1 = NB, Dir 2 = SB 5. • Direction 1 is modelled as travelling from Zone A to Zone B • Direction 2 is modelled as travelling from Zone B to Zone A 6. Traffic flows were sourced from the SLP Network Assessor used to inform the TA/ ES 7. Assumed to use a two-stage arrangement based on professional judgement; and 8. This model assesses the 2022 Future Baseline scenario.
Additional detail:	
File name:	SLP Temporary Traffic Signals Woodthorpe Road Naishes Lane.lsg3x
Author:	Siobhan Fisher
Company:	Jacobs
Address:	Jacobs House, Sitka Drive, Shrewsbury, SY2 6LG

Network Layout Diagram



Phase Diagram



Phase Input Data

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

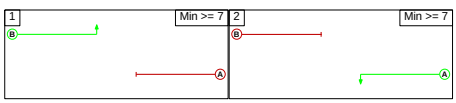
Phase Intergreens Matrix

		Starting Phase	
		A	B
Terminating Phase	A		18
	B	18	

Phases in Stage

Stage No.	Phases in Stage
1	B
2	A

Stage Diagram



Phase Delays

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

Prohibited Stage Change

	To Stage		
From Stage		1	2
	1		18
	2	18	

Give-Way Lane Input Data

Junction: Temporary Traffic Signals for Traffic Management Sites
There are no Opposed Lanes in this Junction

Lane Input Data

Junction: Temporary Traffic Signals for Traffic Management Sites												
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 (Northbound Dir 1)	U	B	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 4 Ahead	Inf
2/1 (Southbound Dir 2)	U	A	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 3 Ahead	Inf
3/1	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'Woodthorpe Road - 2022 Future Baseline - AM Peak'	08:00	09:00	01:00	
2: 'Woodthorpe Road - 2022 Future Baseline - PM Peak'	17:00	18:00	01:00	
3: 'Naishes Lane - 2022 Future Baseline - AM Peak'	08:00	09:00	01:00	
4: 'Naishes Lane - 2022 Future Baseline - PM Peak'	17:00	18:00	01:00	

Scenario 1: 'Woodthorpe Road - 2022 Future Baseline - AM Peak' (FG1: 'Woodthorpe Road - 2022 Future Baseline - AM Peak', Plan 1: 'Single Cycle')
Traffic Flows, Desired
Desired Flow:

		Destination		
		A	B	Tot.
Origin	A	0	364	364
	B	437	0	437
	Tot.	437	364	801

Traffic Lane Flows

Lane	Scenario 1: Woodthorpe Road - 2022 Future Baseline - AM Peak
Junction: Temporary Traffic Signals for Traffic Management Sites	
1/1	364
2/1	437
3/1	437
4/1	364

Lane Saturation Flows

Junction: Temporary Traffic Signals for Traffic Management Sites								
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 (Northbound Dir 1)	3.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1915	1915
2/1 (Southbound Dir 2)	3.00	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1915	1915
3/1	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf

Scenario 2: 'Woodthorpe Road - 2022 Future Baseline - PM Peak' (FG2: 'Woodthorpe Road - 2022 Future Baseline - PM Peak', Plan 1: 'Single Cycle')
Traffic Flows, Desired
Desired Flow:

		Destination		
		A	B	Tot.
Origin	A	0	396	396
	B	435	0	435
	Tot.	435	396	831

Traffic Lane Flows

Lane	Scenario 2: Woodthorpe Road - 2022 Future Baseline - PM Peak
Junction: Temporary Traffic Signals for Traffic Management Sites	
1/1	396
2/1	435
3/1	435
4/1	396

Lane Saturation Flows

Junction: Temporary Traffic Signals for Traffic Management Sites								
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 (Northbound Dir 1)	3.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1915	1915
2/1 (Southbound Dir 2)	3.00	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1915	1915
3/1	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf

Scenario 3: 'Naishes Lane - 2022 Future Baseline - AM Peak' (FG3: 'Naishes Lane - 2022 Future Baseline - AM Peak', Plan 1: 'Single Cycle')
Traffic Flows, Desired
Desired Flow:

		Destination		
		A	B	Tot.
Origin	A	0	135	135
	B	135	0	135
	Tot.	135	135	270

Traffic Lane Flows

Lane	Scenario 3: Naishes Lane - 2022 Future Baseline - AM Peak
Junction: Temporary Traffic Signals for Traffic Management Sites	
1/1	135
2/1	135
3/1	135
4/1	135

Lane Saturation Flows

Junction: Temporary Traffic Signals for Traffic Management Sites								
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 (Northbound Dir 1)	3.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1915	1915
2/1 (Southbound Dir 2)	3.00	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1915	1915
3/1	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf

Scenario 4: 'Naishes Lane - 2022 Future Baseline - PM Peak' (FG4: 'Naishes Lane - 2022 Future Baseline - PM Peak', Plan 1: 'Single Cycle')
Traffic Flows, Desired
Desired Flow:

		Destination		
		A	B	Tot.
Origin	A	0	55	55
	B	55	0	55
	Tot.	55	55	110

Traffic Lane Flows

Lane	Scenario 4: Naishes Lane - 2022 Future Baseline - PM Peak
Junction: Temporary Traffic Signals for Traffic Management Sites	
1/1	55
2/1	55
3/1	55
4/1	55

Lane Saturation Flows

Junction: Temporary Traffic Signals for Traffic Management Sites								
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 (Northbound Dir 1)	3.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1915	1915
2/1 (Southbound Dir 2)	3.00	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1915	1915
3/1	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf

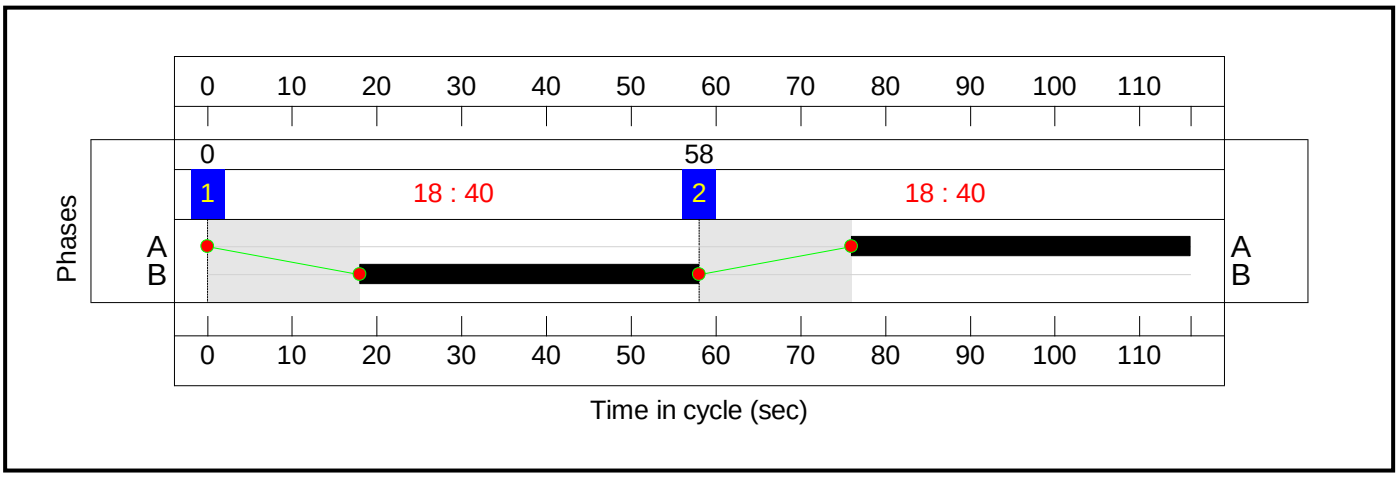
Scenario 1: 'Woodthorpe Road - 2022 Future Baseline - AM Peak' (FG1: 'Woodthorpe Road - 2022 Future Baseline - AM Peak', Plan 1: 'Single Cycle')

Stage Sequence Diagram

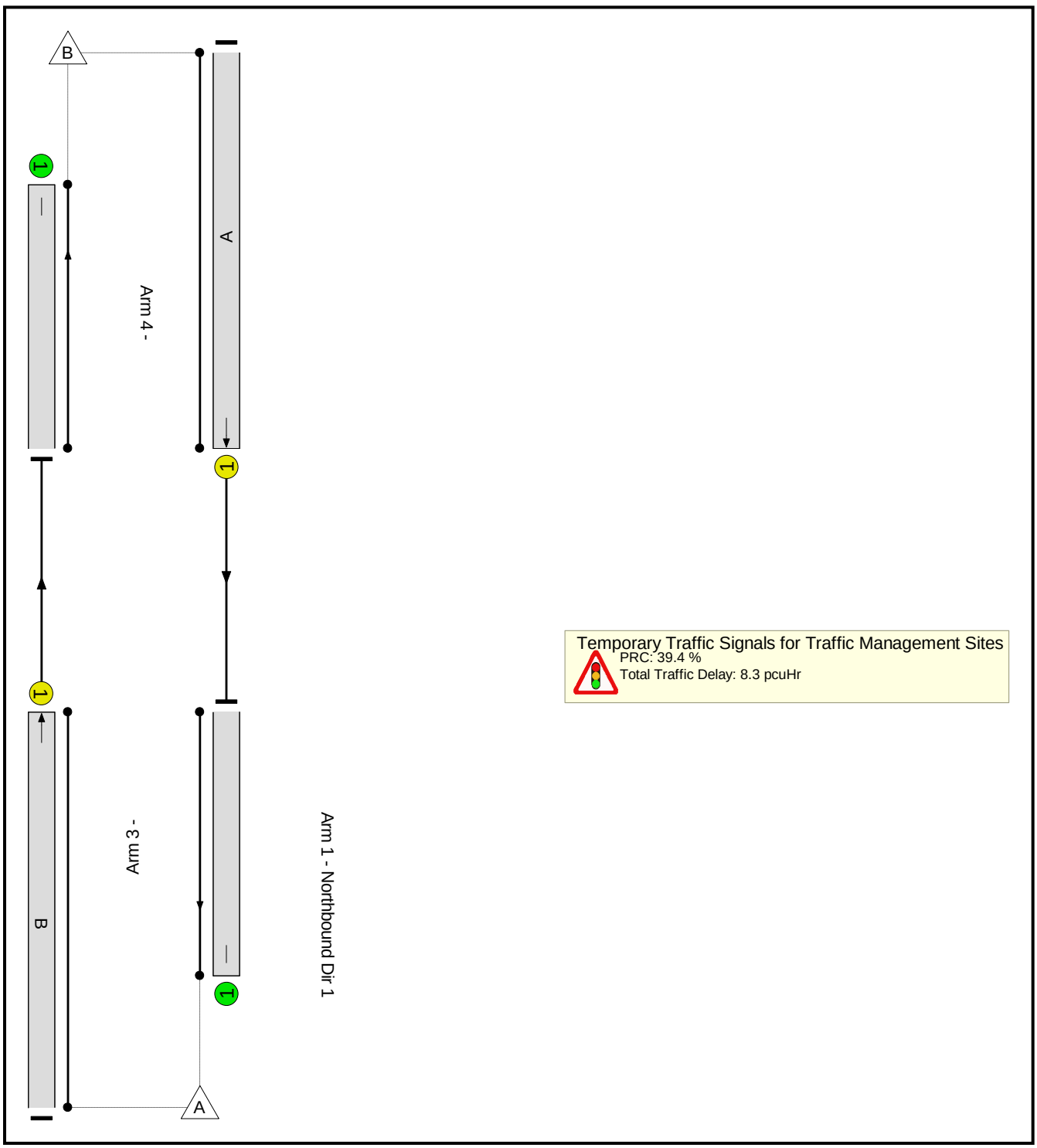
Stage Timings

Stage	1	2
Duration	40	40
Change Point	0	58

Signal Timings Diagram



Network Layout 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: Temporary Signals at Traffic Management Locations	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**64.6%**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**64.6%**
1/1	Northbound Dir 1 Ahead	U	N/A	N/A	B		1	40	-	364	1915	677	53.8%
2/1	Southbound Dir 2 Ahead	U	N/A	N/A	A		1	40	-	437	1915	677	64.6%
3/1		U	N/A	N/A	-		-	-	-	437	Inf	Inf	0.0%
4/1		U	N/A	N/A	-		-	-	-	364	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners in Gaps (pcu)	Turners When Unopposed (pcu)	Turners in Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Temporary Signals at Traffic Management Locations	**-**	**-**	**0**	**0**	**0**	**6.8**	**1.5**	**0.0**	**8.3**	**-**	**-**	**-**	**-**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**0**	**0**	**0**	**6.8**	**1.5**	**0.0**	**8.3**	**-**	**-**	**-**	**-**
1/1	364	364	-	-	-	3.0	0.6	-	3.6	35.7	9.3	0.6	9.9
2/1	437	437	-	-	-	3.8	0.9	-	4.7	38.9	11.8	0.9	12.7
3/1	437	437	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	364	364	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 39.4 Total Delay for Signalled Lanes (pcuHr): 8.32 Cycle Time (s): 116
PRC Over All Lanes (%): 39.4 Total Delay Over All Lanes(pcuHr): 8.32

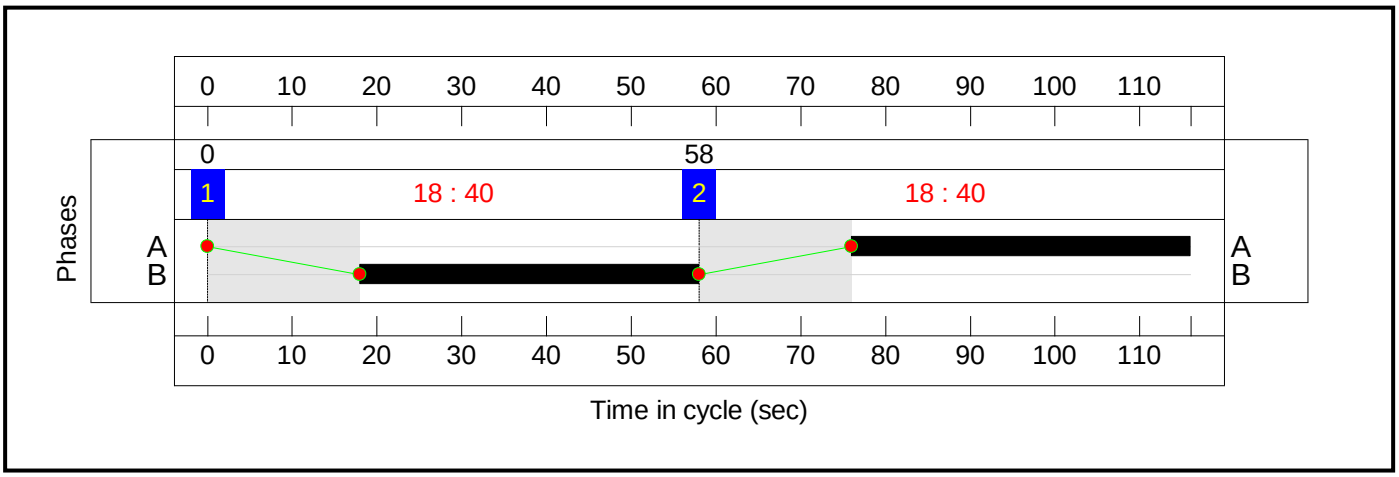
Scenario 2: 'Woodthorpe Road - 2022 Future Baseline - PM Peak' (FG2: 'Woodthorpe Road - 2022 Future Baseline - PM Peak', Plan 1: 'Single Cycle')

Stage Sequence Diagram

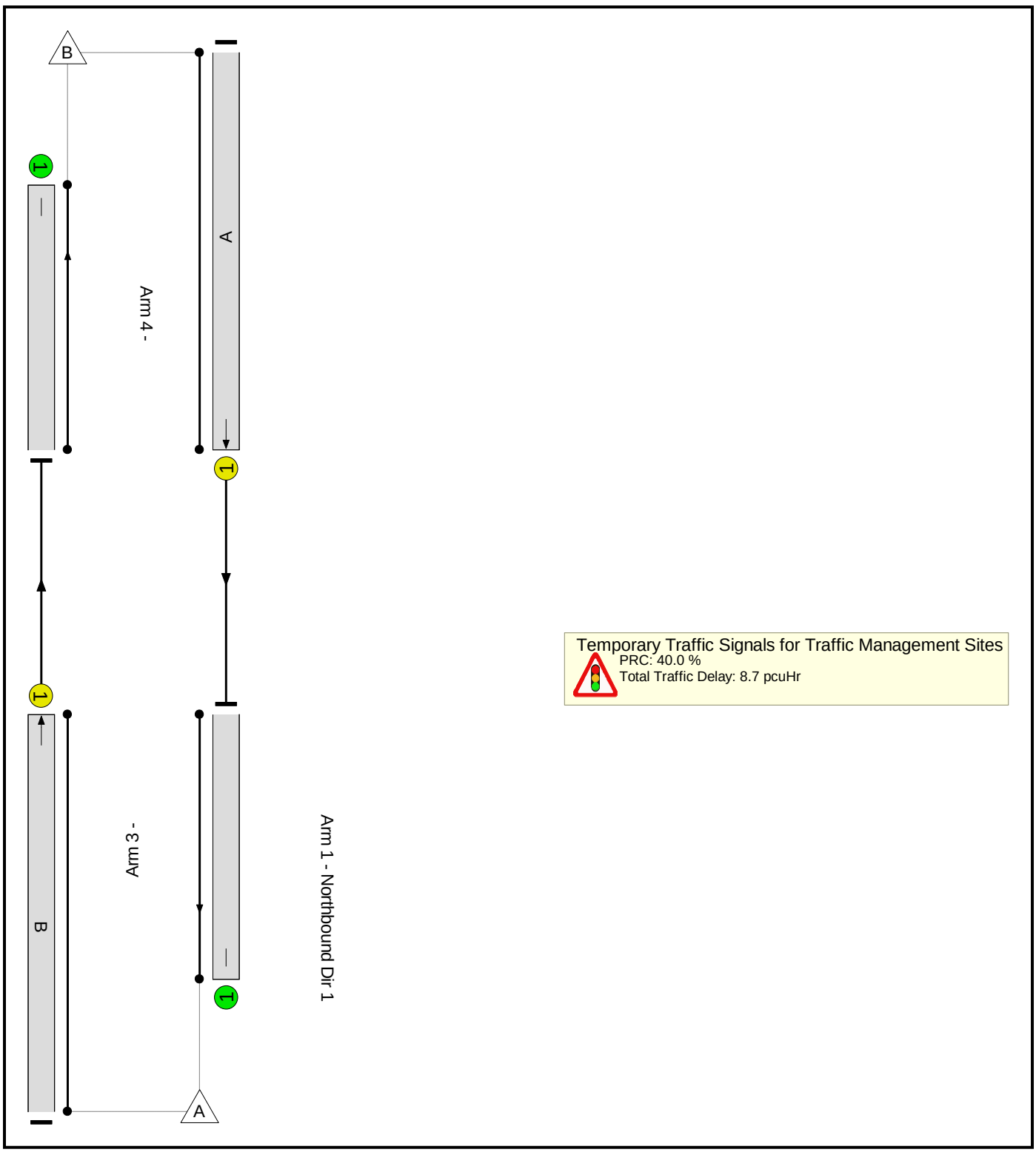
Stage Timings

Stage	1	2
Duration	40	40
Change Point	0	58

Signal Timings Diagram



Network Layout 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: Temporary Signals at Traffic Management Locations	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**64.3%**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**64.3%**
1/1	Northbound Dir 1 Ahead	U	N/A	N/A	B		1	40	-	396	1915	677	58.5%
2/1	Southbound Dir 2 Ahead	U	N/A	N/A	A		1	40	-	435	1915	677	64.3%
3/1		U	N/A	N/A	-		-	-	-	435	Inf	Inf	0.0%
4/1		U	N/A	N/A	-		-	-	-	396	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners in Gaps (pcu)	Turners When Unopposed (pcu)	Turners in Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Temporary Signals at Traffic Management Locations	**-**	**-**	**0**	**0**	**0**	**7.2**	**1.6**	**0.0**	**8.7**	**-**	**-**	**-**	**-**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**0**	**0**	**0**	**7.2**	**1.6**	**0.0**	**8.7**	**-**	**-**	**-**	**-**
1/1	396	396	-	-	-	3.4	0.7	-	4.1	36.9	10.3	0.7	11.0
2/1	435	435	-	-	-	3.8	0.9	-	4.7	38.8	11.7	0.9	12.6
3/1	435	435	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	396	396	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 40.0 Total Delay for Signalled Lanes (pcuHr): 8.75 Cycle Time (s): 116
PRC Over All Lanes (%): 40.0 Total Delay Over All Lanes(pcuHr): 8.75

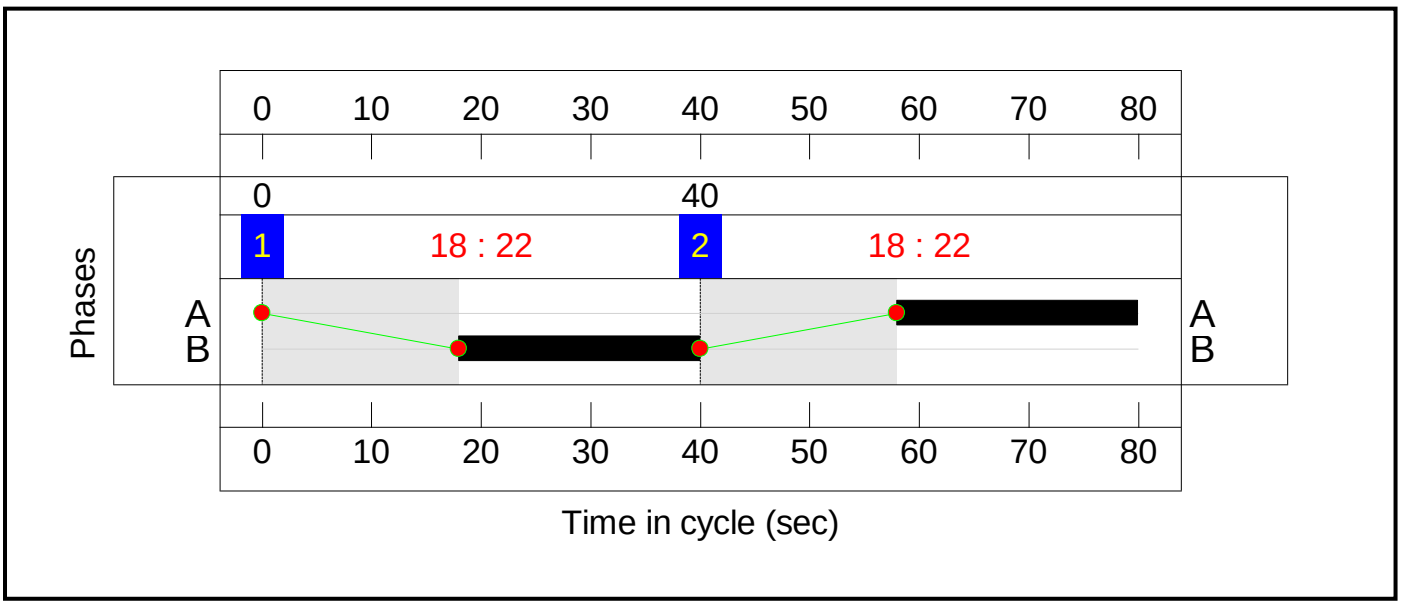
Scenario 3: 'Naishes Lane - 2022 Future Baseline - AM Peak' (FG3: 'Naishes Lane - 2022 Future Baseline - AM Peak', Plan 1: 'Single Cycle')

Stage Sequence Diagram

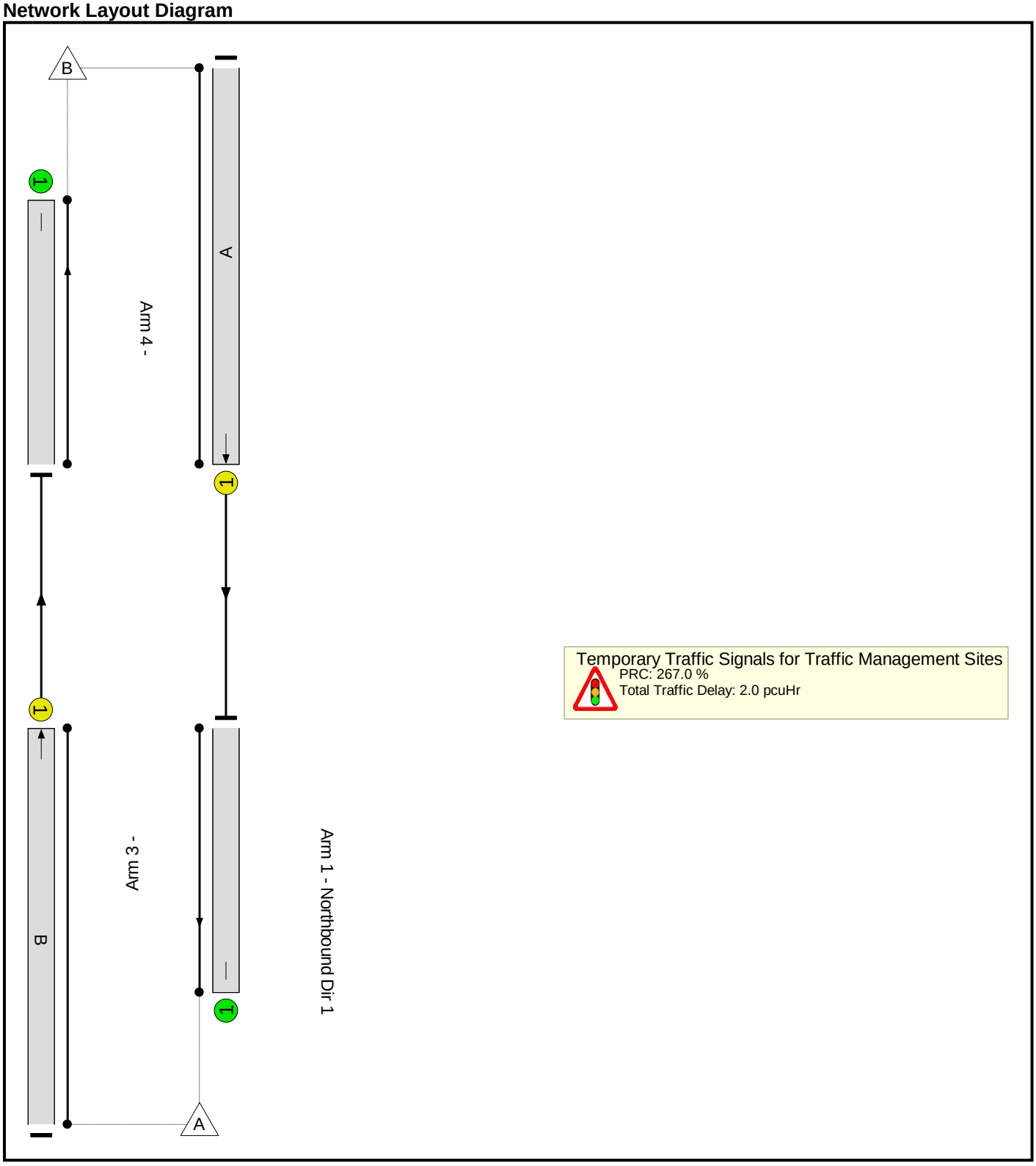
Stage Timings

Stage	1	2
Duration	22	22
Change Point	0	40

Signal Timings Diagram



Network Layout 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: Temporary Signals at Traffic Management Locations	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**24.5%**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**24.5%**
1/1	Northbound Dir 1 Ahead	U	N/A	N/A	B		1	22	-	135	1915	551	24.5%
2/1	Southbound Dir 2 Ahead	U	N/A	N/A	A		1	22	-	135	1915	551	24.5%
3/1		U	N/A	N/A	-		-	-	-	135	Inf	Inf	0.0%
4/1		U	N/A	N/A	-		-	-	-	135	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners in Gaps (pcu)	Turners When Unopposed (pcu)	Turners in Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Temporary Signals at Traffic Management Locations	**-**	**-**	**0**	**0**	**0**	**1.6**	**0.3**	**0.0**	**2.0**	**-**	**-**	**-**	**-**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**0**	**0**	**0**	**1.6**	**0.3**	**0.0**	**2.0**	**-**	**-**	**-**	**-**
1/1	135	135	-	-	-	0.8	0.2	-	1.0	26.2	2.3	0.2	2.4
2/1	135	135	-	-	-	0.8	0.2	-	1.0	26.2	2.3	0.2	2.4
3/1	135	135	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	135	135	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 267.0 Total Delay for Signalled Lanes (pcuHr): 1.96 Cycle Time (s): 80
PRC Over All Lanes (%): 267.0 Total Delay Over All Lanes(pcuHr): 1.96

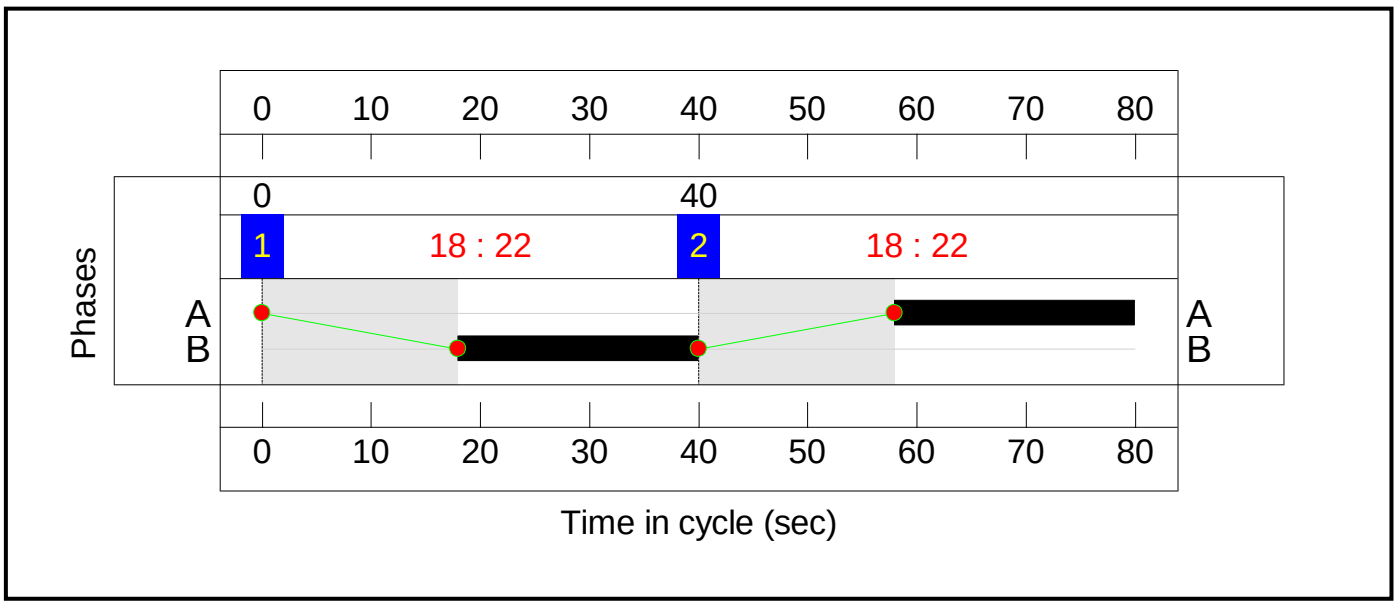
Scenario 4: 'Naishes Lane - 2022 Future Baseline - PM Peak' (FG4: 'Naishes Lane - 2022 Future Baseline - PM Peak', Plan 1: 'Single Cycle')

Stage Sequence Diagram

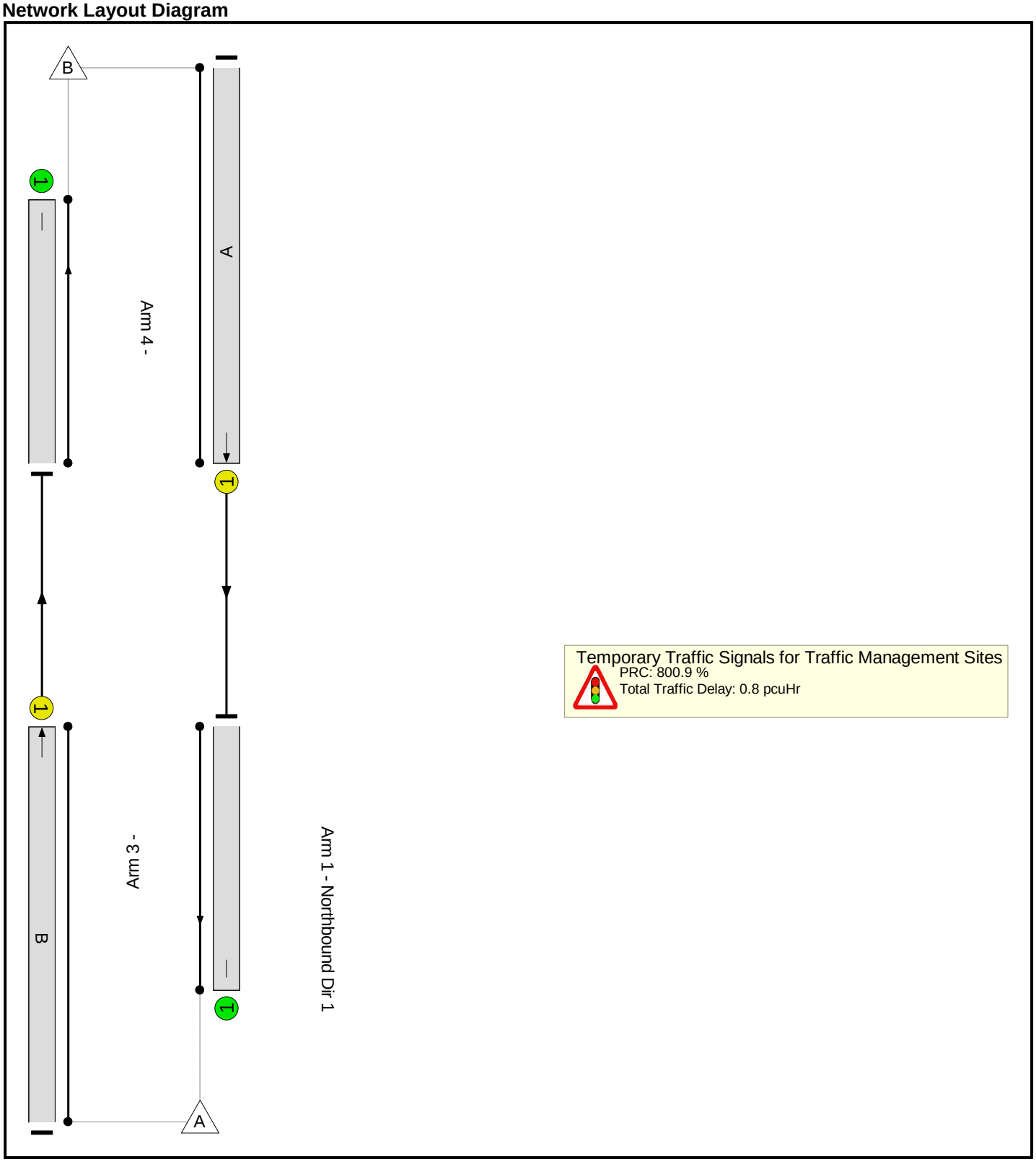
Stage Timings

Stage	1	2
Duration	22	22
Change Point	0	40

Signal Timings Diagram



Network Layout 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: Temporary Signals at Traffic Management Locations	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**10.0%**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**10.0%**
1/1	Northbound Dir 1 Ahead	U	N/A	N/A	B		1	22	-	55	1915	551	10.0%
2/1	Southbound Dir 2 Ahead	U	N/A	N/A	A		1	22	-	55	1915	551	10.0%
3/1		U	N/A	N/A	-		-	-	-	55	Inf	Inf	0.0%
4/1		U	N/A	N/A	-		-	-	-	55	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners in Gaps (pcu)	Turners When Unopposed (pcu)	Turners in Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Temporary Signals at Traffic Management Locations	**-**	**-**	**0**	**0**	**0**	**0.6**	**0.1**	**0.0**	**0.8**	**-**	**-**	**-**	**-**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**0**	**0**	**0**	**0.6**	**0.1**	**0.0**	**0.8**	**-**	**-**	**-**	**-**
1/1	55	55	-	-	-	0.3	0.1	-	0.4	24.6	0.9	0.1	0.9
2/1	55	55	-	-	-	0.3	0.1	-	0.4	24.6	0.9	0.1	0.9
3/1	55	55	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	55	55	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 800.9 Total Delay for Signalled Lanes (pcuHr): 0.75 Cycle Time (s): 80
PRC Over All Lanes (%): 800.9 Total Delay Over All Lanes(pcuHr): 0.75

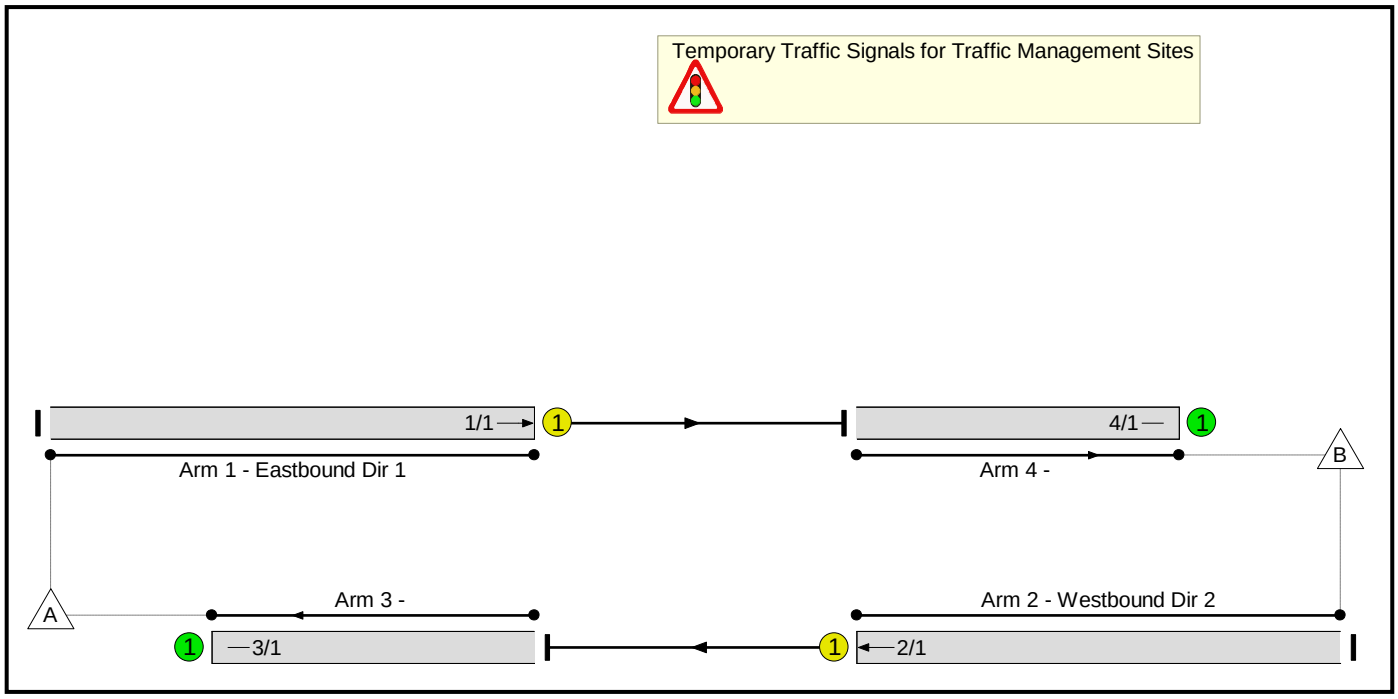
B311 Red Road and Ashford Road

Full Input Data and Results

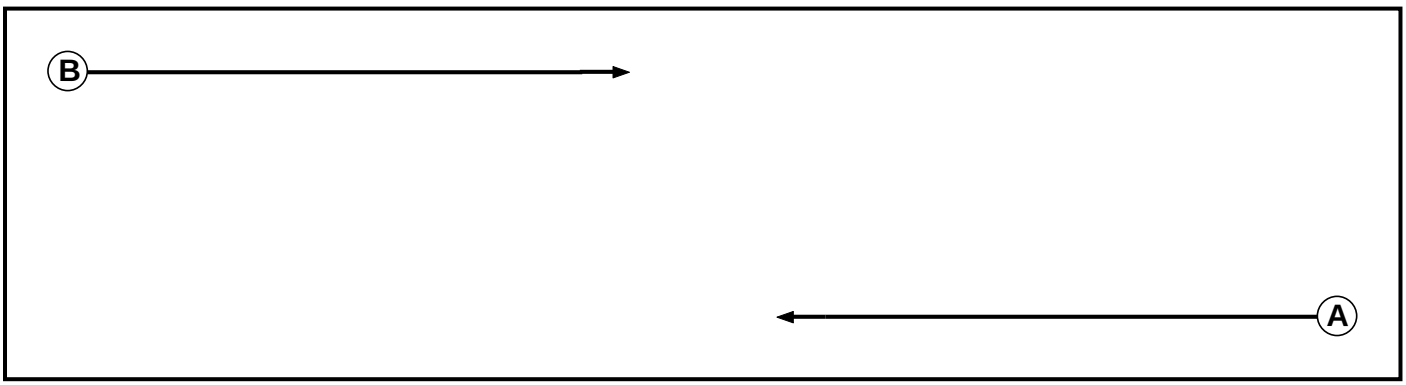
User and Project Details

Project:	**SLP**
Title:	**Temporary Signals at Traffic Management Locations**
Location:	B311 Red Road & Ashford Road
Client:	Esso Petroleum Company Limited
Design Layout Ref:	No drawing was used for this model
Model Purpose:	Temporary Traffic Signals
Model Assumptions:	1. 120m between signal heads. Intergreen of 120m = 18 seconds - based on the TAL 1/06 guideline Cycle time = 116 seconds - based on 2x18 second intergreens, and 2x 40 second green time from 'An Introduction to the Use of Portable Vehicular Signals', Department for Transport, 2016. 2. Assumed lane width of 3m 3. B311 Red Road has not been allocated an even split of 40 second green time due to the imbalance of traffic demand. Direction A to B was given a short minimum green time to allow for the imbalanced traffic demand, and bring the junction under capacity. 4. • B311 Red Road: Dir 1 = EB, Dir 2 = WB • Ashford Road: Dir 1 = EB, Dir 2 = WB 5. • Direction 1 is modelled as travelling from Zone A to Zone B • Direction 2 is modelled as travelling from Zone B to Zone A 6. Traffic flows were sourced from the SLP Network Assessor used to inform the TA/ ES 7. Assumed to use a two-stage arrangement based on professional judgement; and 8. This model assesses the Future Baseline 2022 scenario.
Additional detail:	
File name:	SLP Temporary Traffic Signals B311 Red Road Ashford Road.lsg3x
Author:	Siobhan Fisher
Company:	Jacobs
Address:	Jacobs House, Sitka Drive, Shrewsbury, SY2 6LG

Network Layout Diagram



Phase Diagram



Phase Input Data

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

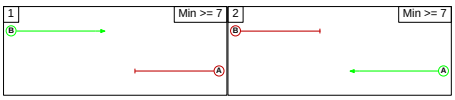
Phase Intergreens Matrix

	Starting Phase		
Terminating Phase		A	B
	A		18
	B	18	

Phases in Stage

Stage No.	Phases in Stage
1	B
2	A

Stage Diagram



Phase Delays

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

Prohibited Stage Change

	To Stage		
From Stage		1	2
	1		18
	2	18	

Give-Way Lane Input Data

Junction: Temporary Traffic Signals for Traffic Management Sites
There are no Opposed Lanes in this Junction

Lane Input Data

Junction: Temporary Traffic Signals for Traffic Management Sites												
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 (Eastbound Dir 1)	U	B	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 4 Ahead	Inf
2/1 (Westbound Dir 2)	U	A	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 3 Ahead	Inf
3/1	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'B311 Red Road - 2022 Future Baseline - AM Peak'	08:00	09:00	01:00	
2: 'B311 Red Road - 2022 Future Baseline - PM Peak'	17:00	18:00	01:00	
3: 'Ashford Road B377 - 2022 Future Baseline - AM Peak'	08:00	09:00	01:00	
4: 'Ashford Road B377 - 2022 Future Baseline - PM Peak'	17:00	18:00	01:00	

Scenario 1: 'B311 Red Road - 2022 Future Baseline - AM Peak' (FG1: 'Red Road - 2022 Future Baseline - AM Peak', Plan 1: 'Single Cycle')
Traffic Flows, Desired
Desired Flow:

		Destination		
		A	B	Tot.
Origin	A	0	171	171
	B	736	0	736
	Tot.	736	171	907

Traffic Lane Flows

Lane	Scenario 1: Red Road - 2022 Future Baseline - AM Peak
Junction: Temporary Traffic Signals for Traffic Management Sites	
1/1	171
2/1	736
3/1	736
4/1	171

Lane Saturation Flows

Junction: Temporary Traffic Signals for Traffic Management Sites								
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 (Eastbound Dir 1)	3.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1915	1915
2/1 (Westbound Dir 2)	3.00	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1915	1915
3/1	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf

Scenario 2: 'B311 Red Road - 2022 Future Baseline - PM Peak' (FG2: 'Red Road - 2022 Future Baseline - PM Peak', Plan 1: 'Single Cycle')
Traffic Flows, Desired
Desired Flow:

		Destination		
		A	B	Tot.
Origin	A	0	227	227
	B	936	0	936
	Tot.	936	227	1163

Traffic Lane Flows

Lane	Scenario 2: Red Road - 2022 Future Baseline - PM Peak
Junction: Temporary Traffic Signals for Traffic Management Sites	
1/1	227
2/1	936
3/1	936
4/1	227

Lane Saturation Flows

Junction: Temporary Traffic Signals for Traffic Management Sites								
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 (Eastbound Dir 1)	3.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1915	1915
2/1 (Westbound Dir 2)	3.00	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1915	1915
3/1	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf

Scenario 3: 'Ashford Road B377 - 2022 Future Baseline - AM Peak' (FG3: 'Ashford Road B377 - 2022 Future Baseline - AM Peak', Plan 1: 'Single Cycle')
Traffic Flows, Desired
Desired Flow:

		Destination		
		A	B	Tot.
Origin	A	0	513	513
	B	521	0	521
	Tot.	521	513	1034

Traffic Lane Flows

Lane	Scenario 3: Ashford Road B377 - 2022 Future Baseline - AM Peak
Junction: Temporary Traffic Signals for Traffic Management Sites	
1/1	513
2/1	521
3/1	521
4/1	513

Lane Saturation Flows

Junction: Temporary Traffic Signals for Traffic Management Sites								
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 (Eastbound Dir 1)	3.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1915	1915
2/1 (Westbound Dir 2)	3.00	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1915	1915
3/1	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf

Scenario 4: 'Ashford Road B377 - 2022 Future Baseline - PM Peak' (FG4: 'Ashford Road B377 - 2022 Future Baseline - PM Peak', Plan 1: 'Single Cycle')
Traffic Flows, Desired
Desired Flow:

		Destination		
		A	B	Tot.
Origin	A	0	255	255
	B	264	0	264
	Tot.	264	255	519

Traffic Lane Flows

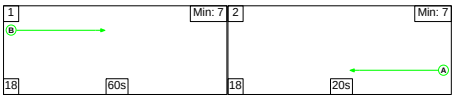
Lane	Scenario 4: Ashford Road B377 - 2022 Future Baseline - PM Peak
Junction: Temporary Traffic Signals for Traffic Management Sites	
1/1	255
2/1	264
3/1	264
4/1	255

Lane Saturation Flows

Junction: Temporary Traffic Signals for Traffic Management Sites								
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 (Eastbound Dir 1)	3.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1915	1915
2/1 (Westbound Dir 2)	3.00	0.00	Y	Arm 3 Ahead	Inf	100.0 %	1915	1915
3/1	Infinite Saturation Flow						Inf	Inf
4/1	Infinite Saturation Flow						Inf	Inf

Scenario 1: 'B311 Red Road - 2022 Future Baseline - AM Peak' (FG1: 'Red Road - 2022 Future Baseline - AM Peak', Plan 1: 'Single Cycle')

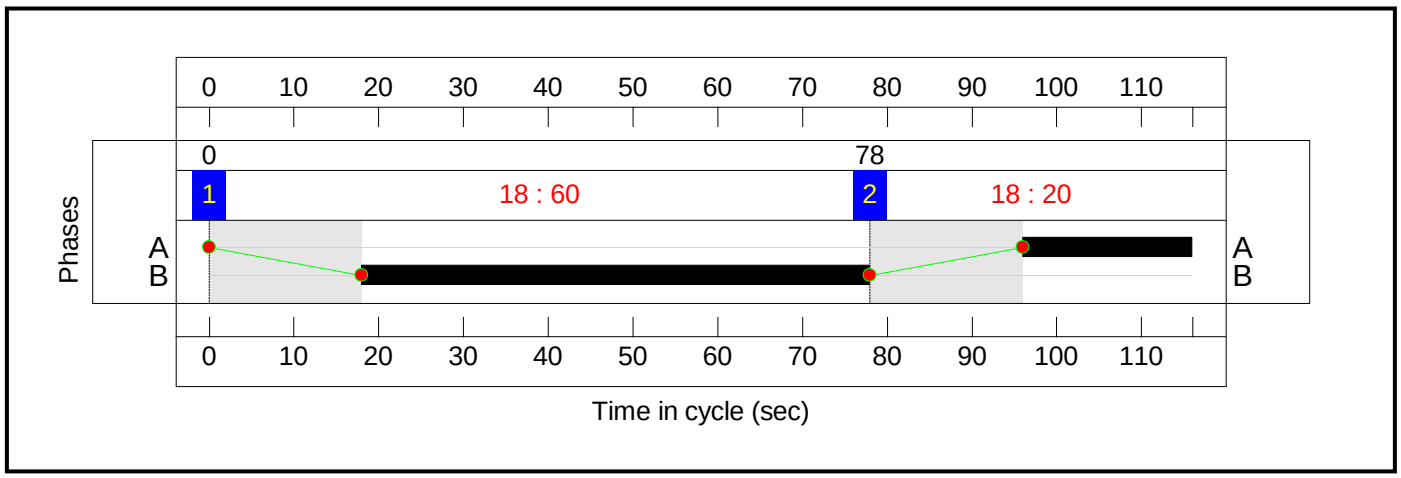
Stage Sequence Diagram



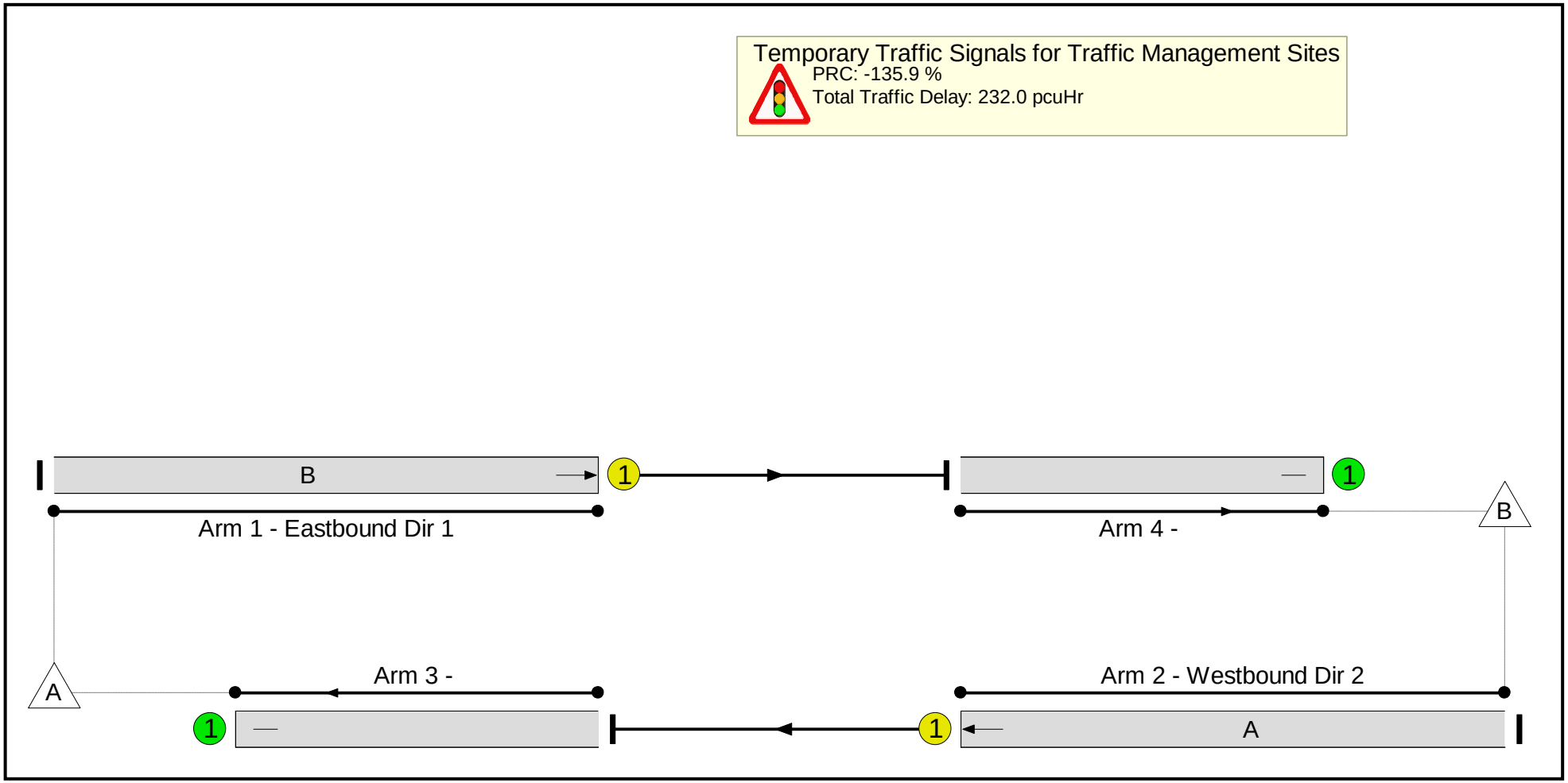
Stage Timings

Stage	1	2
Duration	60	20
Change Point	0	78

Signal Timings Diagram



Network Layout Diagram



Network Results

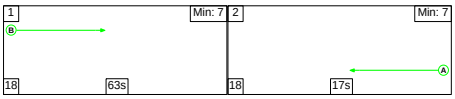
Item	Lane Description	Lane Type	Controller Stream	Position in Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Temporary Signals at Traffic Management Locations	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**212.3%**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**212.3%**
1/1	Eastbound Dir 1 Ahead	U	N/A	N/A	B		1	60	-	171	1915	1007	17.0%
2/1	Westbound Dir 2 Ahead	U	N/A	N/A	A		1	20	-	736	1915	347	212.3%
3/1		U	N/A	N/A	-		-	-	-	736	Inf	Inf	0.0%
4/1		U	N/A	N/A	-		-	-	-	171	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners in Gaps (pcu)	Turners When Unopposed (pcu)	Turners in Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Temporary Signals at Traffic Management Locations	**-**	**-**	**0**	**0**	**0**	**36.3**	**195.7**	**0.0**	**232.0**	**-**	**-**	**-**	**-**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**0**	**0**	**0**	**36.3**	**195.7**	**0.0**	**232.0**	**-**	**-**	**-**	**-**
1/1	171	171	-	-	-	0.7	0.1	-	0.8	16.5	2.9	0.1	3.0
2/1	736	347	-	-	-	35.7	195.6	-	231.3	1131.2	48.2	195.6	243.8
3/1	347	347	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	171	171	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -135.9 Total Delay for Signalled Lanes (pcuHr): 232.05 Cycle Time (s): 116
PRC Over All Lanes (%): -135.9 Total Delay Over All Lanes(pcuHr): 232.05

Scenario 2: 'B311 Red Road - 2022 Future Baseline - PM Peak' (FG2: 'Red Road - 2022 Future Baseline - PM Peak', Plan 1: 'Single Cycle')

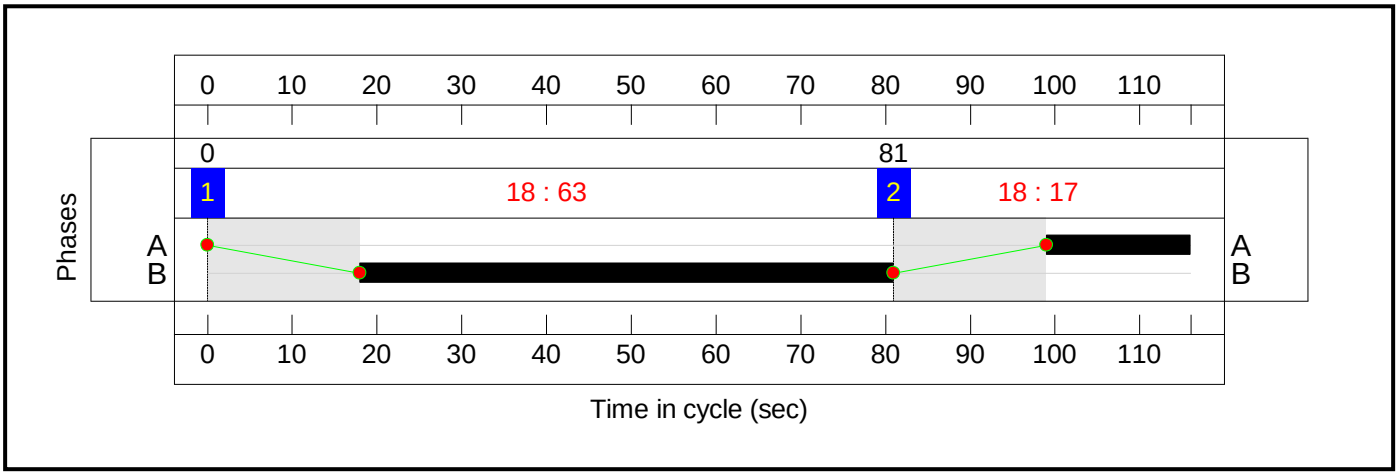
Stage Sequence Diagram



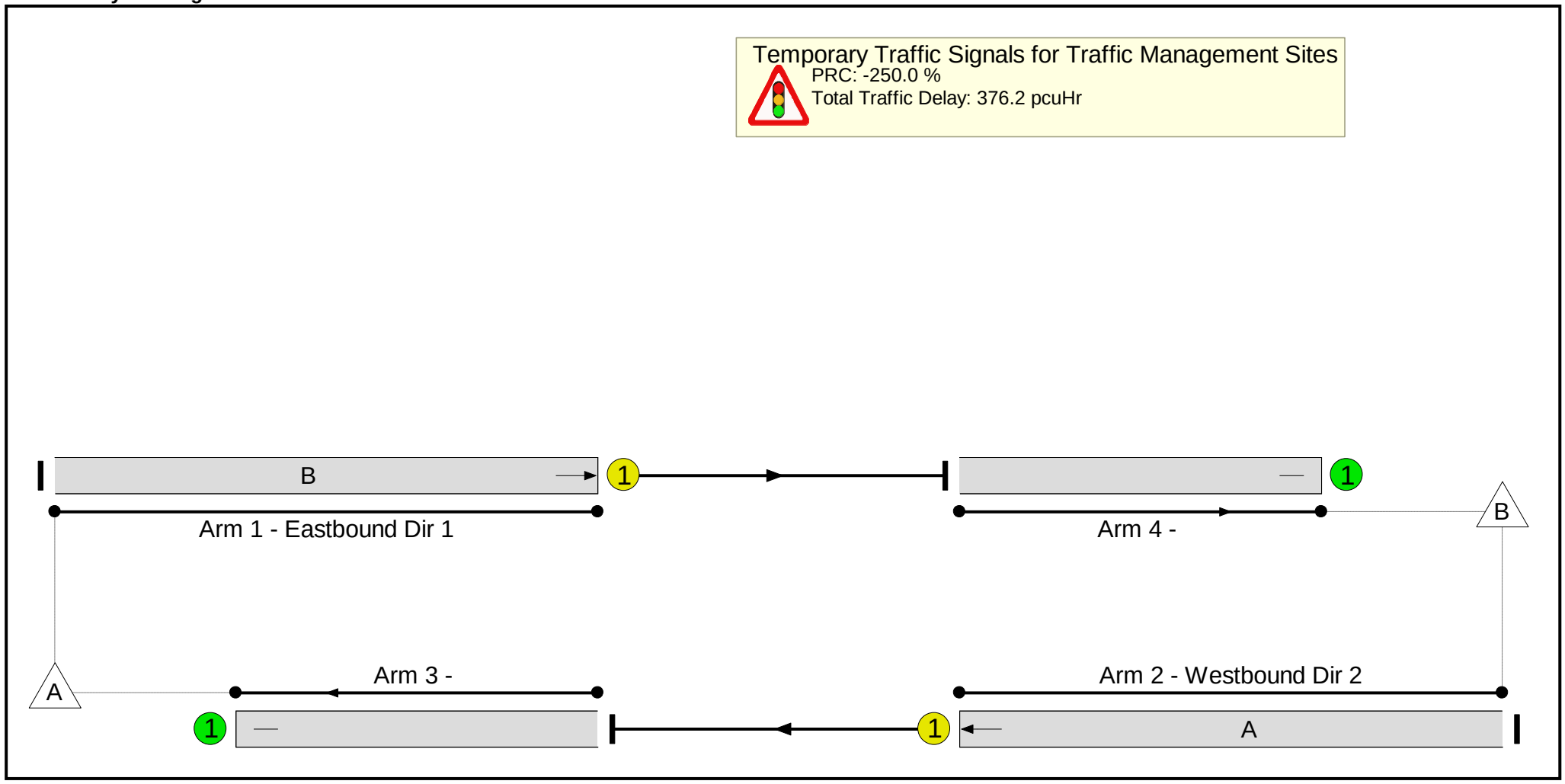
Stage Timings

Stage	1	2
Duration	63	17
Change Point	0	81

Signal Timings Diagram



Network Layout Diagram



Network Results

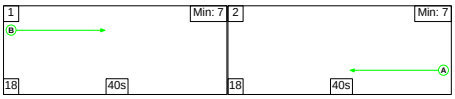
Item	Lane Description	Lane Type	Controller Stream	Position in Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Temporary Signals at Traffic Management Locations	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**315.0%**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**315.0%**
1/1	Eastbound Dir 1 Ahead	U	N/A	N/A	B		1	63	-	227	1915	1057	21.5%
2/1	Westbound Dir 2 Ahead	U	N/A	N/A	A		1	17	-	936	1915	297	315.0%
3/1		U	N/A	N/A	-		-	-	-	936	Inf	Inf	0.0%
4/1		U	N/A	N/A	-		-	-	-	227	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners in Gaps (pcu)	Turners When Unopposed (pcu)	Turners in Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Temporary Signals at Traffic Management Locations	**-**	**-**	**0**	**0**	**0**	**55.9**	**320.3**	**0.0**	**376.2**	**-**	**-**	**-**	**-**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**0**	**0**	**0**	**55.9**	**320.3**	**0.0**	**376.2**	**-**	**-**	**-**	**-**
1/1	227	227	-	-	-	0.8	0.1	-	1.0	15.4	3.7	0.1	3.8
2/1	936	297	-	-	-	55.1	320.2	-	375.2	1443.1	70.6	320.2	390.7
3/1	297	297	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	227	227	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -250.0 Total Delay for Signalled Lanes (pcuHr): 376.19 Cycle Time (s): 116
PRC Over All Lanes (%): -250.0 Total Delay Over All Lanes(pcuHr): 376.19

Scenario 3: 'Ashford Road B377 - 2022 Future Baseline - AM Peak' (FG3: 'Ashford Road B377 - 2022 Future Baseline - AM Peak', Plan 1: 'Single Cycle')

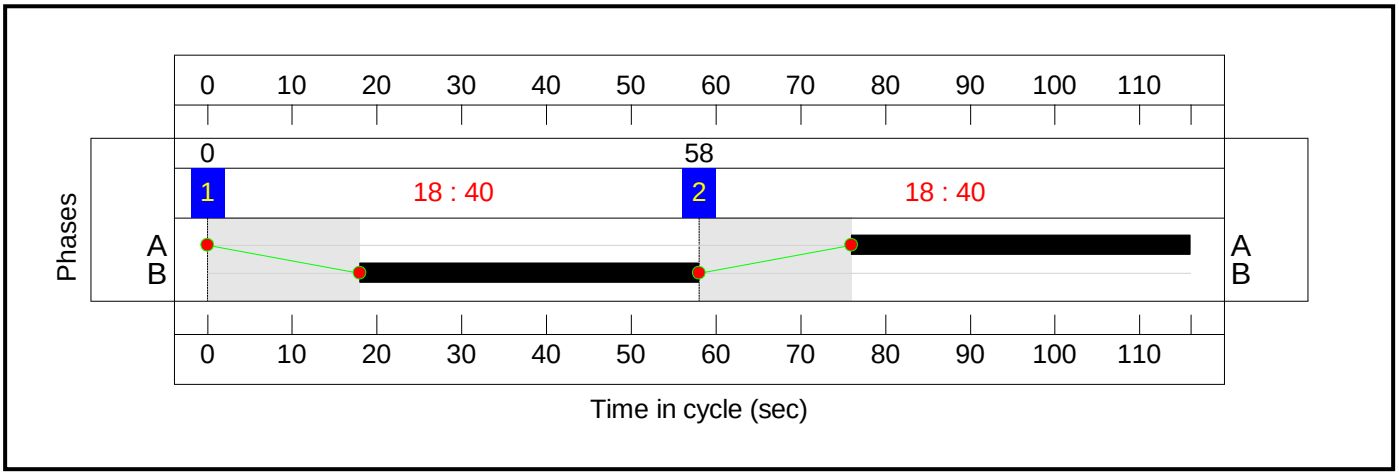
Stage Sequence Diagram



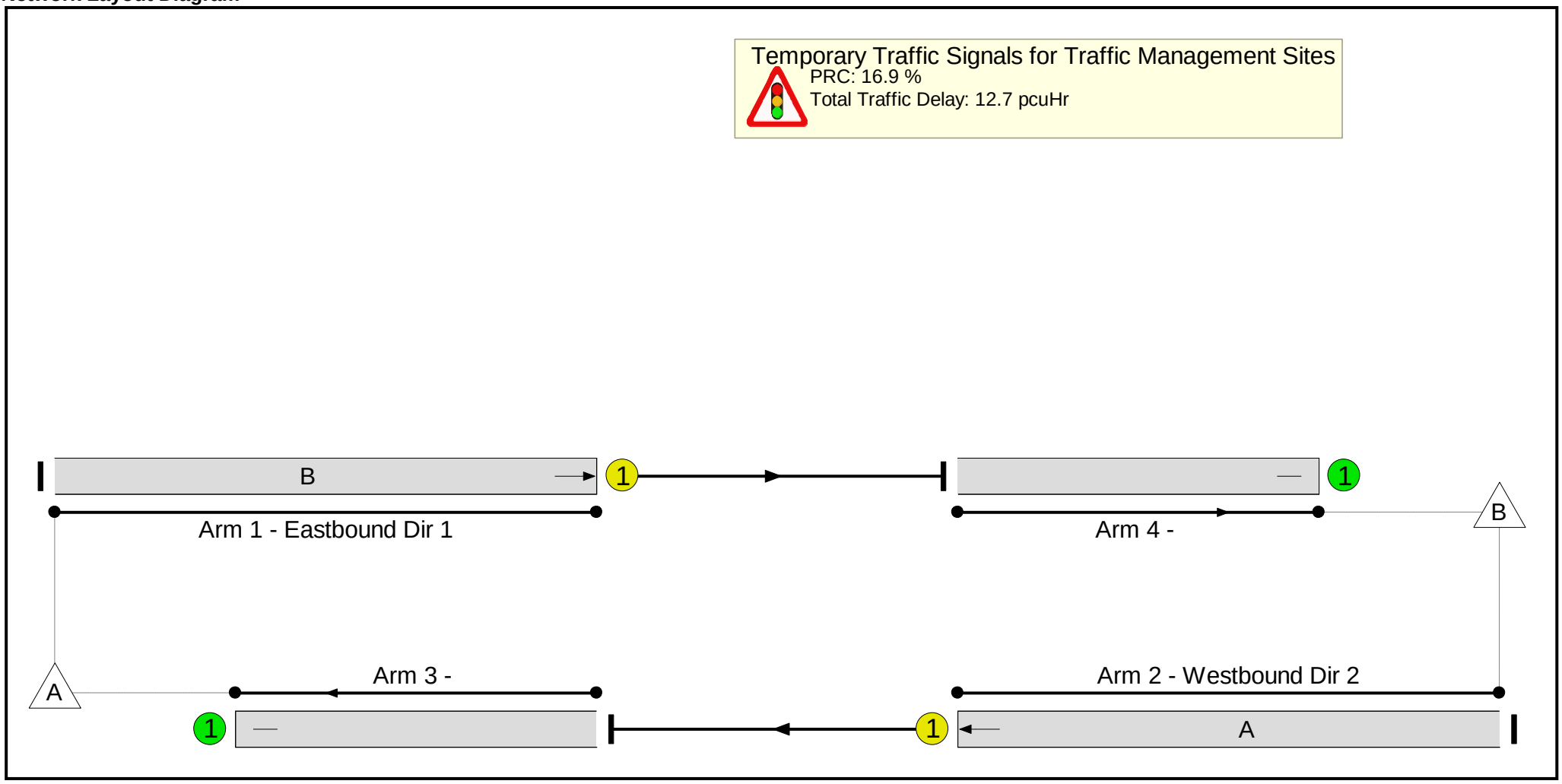
Stage Timings

Stage	1	2
Duration	40	40
Change Point	0	58

Signal Timings Diagram



Network Layout Diagram



Network Results

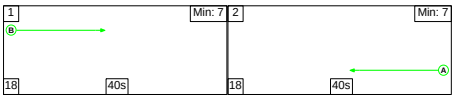
Item	Lane Description	Lane Type	Controller Stream	Position in Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Temporary Signals at Traffic Management Locations	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.0%**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.0%**
1/1	Eastbound Dir 1 Ahead	U	N/A	N/A	B		1	40	-	513	1915	677	75.8%
2/1	Westbound Dir 2 Ahead	U	N/A	N/A	A		1	40	-	521	1915	677	77.0%
3/1		U	N/A	N/A	-		-	-	-	521	Inf	Inf	0.0%
4/1		U	N/A	N/A	-		-	-	-	513	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners in Gaps (pcu)	Turners When Unopposed (pcu)	Turners in Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Temporary Signals at Traffic Management Locations	**-**	**-**	**0**	**0**	**0**	**9.5**	**3.2**	**0.0**	**12.7**	**-**	**-**	**-**	**-**
Temporary Traffic Signals for Traffic Management Sites	**-**	**-**	**0**	**0**	**0**	**9.5**	**3.2**	**0.0**	**12.7**	**-**	**-**	**-**	**-**
1/1	513	513	-	-	-	4.7	1.5	-	6.3	43.9	14.5	1.5	16.1
2/1	521	521	-	-	-	4.8	1.6	-	6.5	44.6	14.9	1.6	16.5
3/1	521	521	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	513	513	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 16.9 Total Delay for Signalled Lanes (pcuHr): 12.71 Cycle Time (s): 116
PRC Over All Lanes (%): 16.9 Total Delay Over All Lanes(pcuHr): 12.71

Scenario 4: 'Ashford Road B377 - 2022 Future Baseline - PM Peak' (FG4: 'Ashford Road B377 - 2022 Future Baseline - PM Peak', Plan 1: 'Single Cycle')

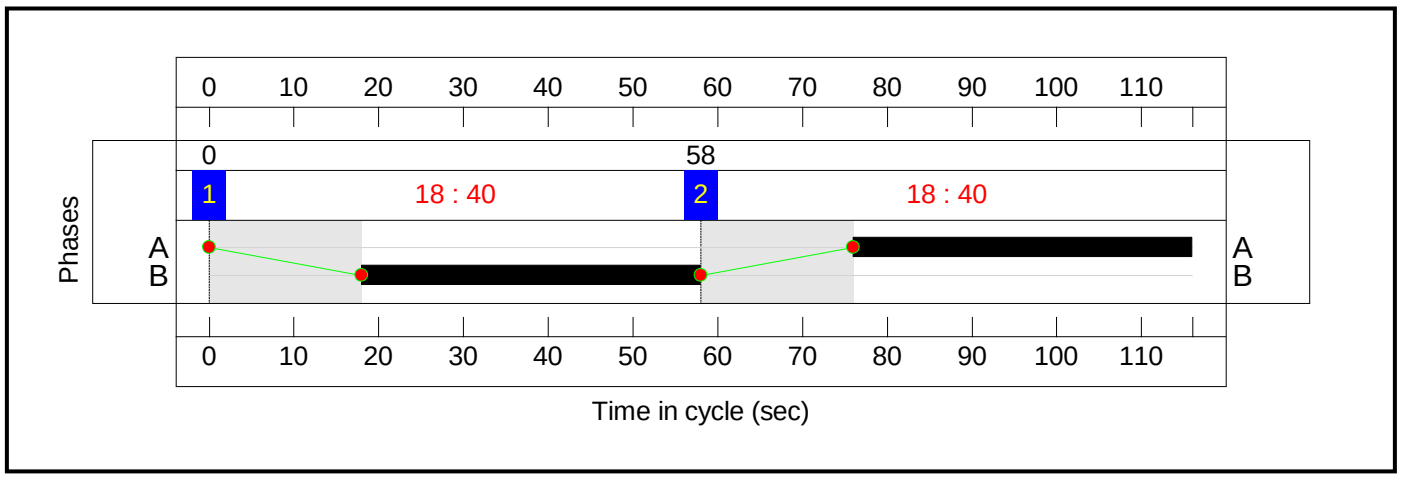
Stage Sequence Diagram



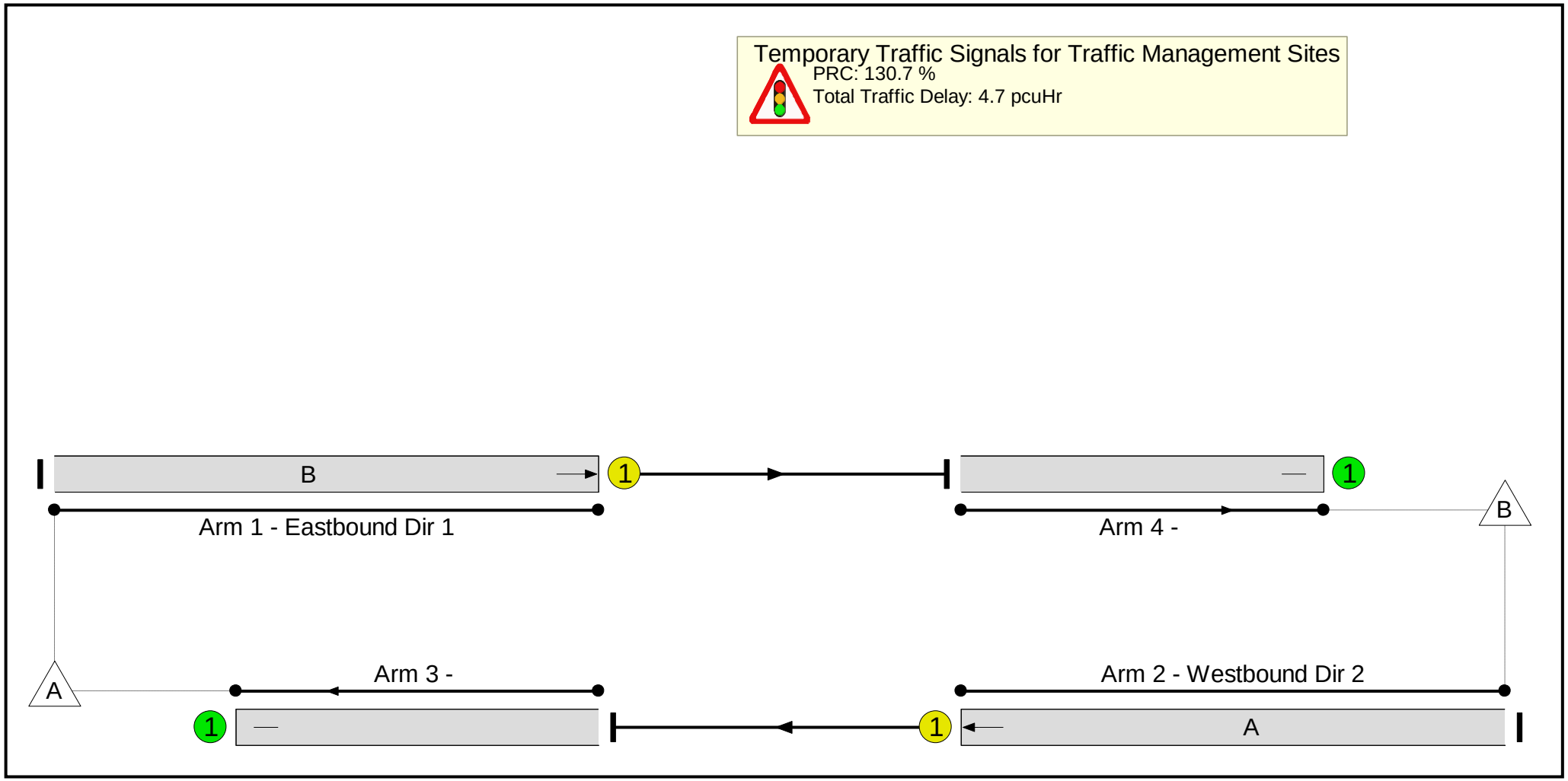
Stage Timings

Stage	1	2
Duration	40	40
Change Point	0	58

Signal Timings Diagram



Network Layout 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: Temporary Signals at Traffic Management Locations	-	-	**N/A**	-	-		-	-	-	-	-	-	**39.0%**
Temporary Traffic Signals for Traffic Management Sites	-	-	**N/A**	-	-		-	-	-	-	-	-	**39.0%**
1/1	Eastbound Dir 1 Ahead	U	N/A	N/A	B		1	40	-	255	1915	677	37.7%
2/1	Westbound Dir 2 Ahead	U	N/A	N/A	A		1	40	-	264	1915	677	39.0%
3/1		U	N/A	N/A	-		-	-	-	264	Inf	Inf	0.0%
4/1		U	N/A	N/A	-		-	-	-	255	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners in Gaps (pcu)	Turners When Unopposed (pcu)	Turners in Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Temporary Signals at Traffic Management Locations	-	-	**0**	**0**	**0**	**4.0**	**0.6**	**0.0**	**4.7**	-	-	-	-
Temporary Traffic Signals for Traffic Management Sites	-	-	**0**	**0**	**0**	**4.0**	**0.6**	**0.0**	**4.7**	-	-	-	-
1/1	255	255	-	-	-	2.0	0.3	-	2.3	32.2	6.1	0.3	6.4
2/1	264	264	-	-	-	2.1	0.3	-	2.4	32.5	6.3	0.3	6.6
3/1	264	264	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	255	255	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): 130.7 Total Delay for Signalled Lanes (pcuHr): 4.67 Cycle Time (s): 116
PRC Over All Lanes (%): 130.7 Total Delay Over All Lanes(pcuHr): 4.67