Southampton to London Pipeline Project

Volume 6

Environmental Statement (Volume D) Appendix 13.1: Traffic and Transport Technical Note

Application Document: 6.4

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

May 2019

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Appendix 13.1 Traffic and Transport Technical Note

1.1 Introduction

1.1.1 Traffic and transport impacts are those that would be caused by the proposed development on the transport network, which can be applied to any mode of travel.

1.1.2 For this project the potential for impacts from traffic and transport arises because of:

- traffic generated by the project, such as the construction workforce; and
- the impacts of works within roads which would require traffic diversions.

1.1.3 There would be no impacts on travel by surface and underground rail and by air, therefore these are scoped out of the assessment. Impacts on walking and cycling are also scoped out of the Environmental Statement (ES) but included in the Transport Assessment (**application document 7.4**) and in Chapter 13 People and Communities.

1.1.4 Chapter 2 Regulatory and Policy Context sets out the overarching policy relevant to the project including the Overarching National Policy Statement for Energy (EN-1). EN-1 contains the following paragraph relating to traffic and transport which has been considered within this appendix:

1.1.5 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 / Web TAG methodology stipulated in Department for Transport guidance, or any successor to such methodology. Applicants should consult the Highways Agency and Highways Authorities as appropriate on the assessment and mitigation*.'

1.2 Approach and Methods

1.2.1 The approach to assessment is based on guidance set out in Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Management and Assessment (IEMA), (1993)). WebTAG guidance (referred to in paragraph 1.1.5 above) is not appropriate for pipeline projects however, highway authorities were consulted on the scope of the Transport Assessment and the links with this Technical Note.

1.2.2 The scope of the traffic and transport assessment has been informed by the Scoping Opinion, provided by the Planning Inspectorate in September 2018, on behalf of the Secretary of State, following the submission of the Scoping Report (Esso, 2018).

1.2.3 Table 1.1 summarises the scope of the assessment for traffic and transport. This table includes the references (for example ID 4.6.1) to the relevant paragraph response from the Planning Inspectorate in the Scoping Opinion. The boxes shaded in grey are the matters that have been confirmed as scoped out of the assessment following the feedback from the Planning Inspectorate.

Table 1.1: Matters Scoped in and out of Assessment (Grey Shading Indicates Matters Scoped Out)

Receptor	Matter/Potential Effect	Conclusion in the SR (July 2018)	Comments from the Planning Inspectorate in the Scoping Opinion (September 2018)
Traffic flows during construction	In rural areas	Scoped out	ID 4.11.7 On the basis that the potential effects will be temporary (2-3 days) the Planning Inspectorate agrees that this matter can be scoped out of the impact assessment within the Environmental Statement (ES). **Scoped out.**
	In urban areas	Scoped out	ID 4.11.9 The Scoping Report lacks information on the anticipated traffic flows and locations, displaced traffic effects, and cumulative effects. The ES should clearly present the predicted construction traffic movements for the Proposed Development and assess the likely significant effects associated with traffic flows, journey times and collisions and safety, on relevant receptors. The ES should also consider those aspect chapters and matters that are affected by the traffic and transport assessment. The Applicant should seek to agree the approach to the assessment with the relevant consultation bodies. **Scoped in.**
	Heavy Duty Vehicles (HDVs) in urban areas	Scoped out	
Journey times	In rural areas	Scoped out	ID 4.11.7 On the basis that the potential effects will be temporary (2-3 days) the Inspectorate agrees that this matter can be scoped out of the impact assessment within the ES. **Scoped out.**
	Private motor vehicles in urban areas	Scoped in	**Scoped in.**
	Buses in urban areas	Scoped in	**Scoped in.**
	Cycling	Scoped out	ID 4.11.10 The Planning Inspectorate agrees that significant effects are unlikely and this matter can be scoped out of the impact assessment within the ES. **Scoped out.**
Collisions and safety	In rural areas	Scoped out	ID 4.11.7 On the basis that the potential effects will be temporary (2-3 days) the Inspectorate agrees that this matter can be scoped out of the impact assessment within the ES. **Scoped out.**
	In urban areas	Scoped in	**Scoped in.**
Severance and pedestrian delay	Around rural work sites	Scoped out	ID 4.11.8 The Planning Inspectorate agrees that this matter can be scoped out of the assessment due to the very low likelihood of significant effects occurring due to any potential effects being temporary (2-3 days). On this basis, the Inspectorate agrees this matter can be scoped out of the impact assessment within the ES. **Scoped out.**
	Around urban sites	Scoped out	ID 4.11.11 The Planning Inspectorate agrees that this matter can be scoped out of the assessment due to the very low likelihood of significant effects occurring due to any potential effects being temporary (2-3 days). On this basis, the Inspectorate agrees this matter can be scoped out of the impact assessment within the ES. **Scoped out.**

Receptor	Matter/Potential Effect	Conclusion in the SR (July 2018)	Comments from the Planning Inspectorate in the Scoping Opinion (September 2018)
Traffic during operation	Whole pipeline	Scoped out	ID 4.11.13 The Traffic and Transportation Appendix states that operational traffic is likely to be less than 1 vehicle per day. On this basis it is unlikely for significant effects to occur and the Inspectorate agrees this matter can be scoped out of the impact assessment within the ES. **Scoped out.**

1.2.4 In addition to the points noted in Table 1.1 the Planning Inspectorate also raised the following comments to consider within the assessment. These are set out below, along with the project response to how these have been addressed.

- (ID 4.11.19) No justification for using a 2km study area is included within the Scoping Report. The study area should be based on the anticipated extent of potential impacts. The Inspectorate advises that the Applicant makes effort to agree the extent of the study area with the relevant consultation bodies.
  - The study area was finalised based on available information for logistics hubs and construction compounds and with the traffic management and diversion locations based on the criteria confirmed in Section 1.4.
- (ID 4.11.20) The Applicant should seek to agree the traffic management strategy and the proposed mitigation measures with the relevant highway authorities and include the traffic management strategy within the ES.
  - Meetings have been held with Hampshire and Surrey Councils to discuss traffic management proposals. These have factored into the assumptions in this Technical Note. A Construction Traffic Management Plan (CTMP) would be produced. The contractor(s) would then implement measures within the CTMP (G110).
- (ID 4.11.16) An assessment describing the potential effects of transporting materials and waste to and from site should be included in the appropriate chapters within the ES, where these effects could be significant.
  - These project activities have been included in project trip generation, outlined in Section 1.3, and therefore are explicitly considered in this assessment.

1.2.5 The scope of the assessment, as set out in the Scoping Report (Esso, 2018), is based on a threshold of impacts exceeding four weeks before they may become significant. This is based on good practice from other projects. Therefore, impacts with a shorter duration were scoped out of the assessment.

1.2.6 Impacts in rural areas were scoped out. No significant operational effects have been identified, therefore operational effects were also scoped out.

1.2.7 Impacts in urban areas were scoped in for journey times of general road users and public transport users and impacts on collisions and safety. The Scoping Opinion (ID 4.11.9) also requested that impacts on traffic flows should be scoped in, particularly at locations where there would be additional congestion because of the project. Based on this, the scope of the assessment comprises:

- changes in traffic flows;
- changes in journey times for general traffic and for public transport users; and
- collisions and safety.

Limitations to Assessment

1.2.8 There was insufficient information available to assess the St Catherine's Road location using the method described in Section 1.4. Therefore, a qualitative assessment was undertaken by an experienced transport planning professional, taking into account road characteristics and expected traffic flows. This is considered to be an appropriate level of detail to identify any likely significant transport impacts at this location.

1.3 Design Basis and Activities

1.3.1 Following a summary of the baseline, the assessment of impacts is based on two scenarios:

- 2022 Future Baseline – which forecasts trip demand on the transport network including committed development but with no project traffic; and
- 2022 With Project – which incorporates the '2022 Future Baseline' adjusted for temporary diversions/traffic management associated with the project.

1.3.2 The construction schedule assumed for this assessment is set out in the Transport Assessment with main installation of the pipeline assumed to start in 2021. 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 at this time in the construction programme. Consequently, 2022 is the most appropriate year to use based on the construction programme.

Study Area

1.3.3 A 2km study area was originally used in the Scoping Report (Esso, 2018), prior to further development of the project. Following the release of further project details, the study area was finalised based on available information for logistics hubs and construction compounds and with the traffic management and diversion locations based on the criteria confirmed in Section 1.4.

Data Gathering

1.3.4 Existing traffic data was obtained from the Department for Transport (DfT), Surrey County Council and Hampshire County Council. In addition, traffic surveys were commissioned for the project and were undertaken by Hampshire County Council and Surrey County Council. Further detail is provided in the Transport Assessment (**application document 7.5**).

Mobilisation and Construction Traffic Demand

1.3.5 Overarching assumptions that determine the project traffic demand and management of traffic affected by the project are summarised in Table 1.2. The sections are used

for identification and calculation purposes only and do not infer any constraints on the construction process.

Table 1.2: 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 techniques 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 would be in operation. These diversions would be agreed with the relevant highways authority.	
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	

1.3.6 Up to six logistics hubs would be established in locations close to the strategic road network, to reduce the impacts of construction traffic on local roads. The logistics hubs would serve as points for accepting deliveries and storage of pipe. Each of the hubs would provide a pipe laydown area, secure plant storage area, bunded fuel storage, single-storey offices, staff welfare facilities and a vehicle parking area.

1.3.7 Peak project traffic demand is assumed to occur at the entrance and exit to the logistics hubs. This is because it is assumed for the purposes of the assessment, note that construction staff would arrive at the logistics hubs for onward travel to their working destination while construction materials would be delivered to the logistics hubs for onward delivery to the construction compounds and, in some cases, work fronts. It is assumed that construction workers' onward travel from the logistics hubs would be via minibus or other higher occupancy vehicle such as a combi vehicle.

1.3.8 To determine if there would be likely significant impacts generated by project traffic, a sifting exercise was completed. This included consideration of the traffic implications of transporting materials and waste to and from site. The sifting exercise used two-way logistics hub traffic demand and the Future Baseline traffic flow. This exercise, showing the change in Annual Average Daily Traffic (AADT), is presented in Table 1.3. The change in AADT associated with the project traffic demand is no more than three percent. This is because the AADT generally exceeds 10,000 vehicles and the project traffic demand is not more than approximately 300 two-way vehicles on average during the peak year from traffic demand at each location. On this basis, there would not be significant changes in existing traffic flows because a change of 30% or greater is required for this (IEMA,1993).

1.3.9 The project traffic demand is sufficiently low that it is unlikely to result in significant impacts, based on the assessment criteria for this project, and therefore does not require further assessment within the ES. This is considered in further detail in the Transport Assessment.

Table 1.3: Change in Annual Average Daily Traffic at Logistics Hubs

Hub	Count Point Location	2022 AADT	Peak Year Project Only AADT	AADT With Project	Change
A31, Ropley Dean	A31 Alresford Bypass	12,849	93	12,942	1%
A31/A32 Junction Northfield Lane, Alton	A31 Alton Bypass	26,810	156	26,966	1%
Hartland Park Village, Farnborough	Ively Road	10,971	302	11,273	3%
Ministry of Defence (MoD) land: Deepcut Bridge Road, Frimley Green	B3015 Deepcut Bridge Road	7,517	60	7,577	1%
M3 Junction 3: New Road, Windlesham	New Road Windlesham	5,944	191	6,135	3%
Brett Aggregates, Littleton Lane, Shepperton	B376 Shepperton Road	15,048	160	15,208	1%

Works within Roads

1.3.10 The scope of the assessment, as set out in the Scoping Report (Esso, 2018), is based on a threshold of impacts exceeding four weeks before they may become significant. Therefore, impacts with a shorter duration were scoped out of the assessment. 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 (Table 1.4).

1.3.11 A more detailed list of additional locations that were considered is provided in the Transport Assessment (**application document 7.5**).

Table 1.4: Assessed Locations with the Potential for Significant Impacts

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

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

1.3.12 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.

1.3.13 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. Approximately one half of the carriageway would be required to be closed to general traffic with temporary signing required to UK standards. Diversions would be in place where temporary road closures are assumed. These would require signed diversion routes to enable drivers to easily navigate between each end of a temporary road closure. Further detail is provided in the Transport Assessment (**application document 7.5**).

1.3.14 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 Authority, 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 authorities at Hampshire and Surrey Councils.

1.3.15 The Balmoral Drive diversion is assumed to 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 and safety. The temporary road closure and diversion powers are set out in the draft Development Consent Order (DCO).

1.3.16 The St. Catherine's Road diversion is assumed to follow Lake Road, B3015 Deepcut Bridge Road, Old Bisley Road, Alphington Avenue and Regent Way.

1.3.17 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.

Design and Good Practice Measures

1.3.18 This Technical Note contains a number of project commitments to reduce impacts on the environment. These are indicated by a reference number like this (G20). Good practice measures are set out in the Register of Environmental Actions and Commitments (REAC) in Chapter 16 and secured through DCO requirements such as the Code of Construction Practice.

1.3.19 Chapter 4 Design Evolution provides a summary of the environmental considerations that have influenced the design through this process, with iterative updates and improvements to reach the fixed design submitted for development consent. The embedded design measures have been built into the designs, for example adjustment of the Order Limits to avoid a sensitive feature. One example specifically relevant to this chapter is that trenchless techniques are to be used for all crossings of trunk roads, motorways and railways (O4).

1.3.20 The good practice measures that are most relevant to traffic and transport are listed in Table 1.5. These are applicable to all areas unless stated otherwise. The following

assessment is based on these good practice measures being in place. In most cases these would apply to construction traffic, assessment of which is scoped out of the ES. The measures that directly impact on the assessment undertaken in this Technical Note are G110 and G111. These measures inform the traffic management and diversion assumptions incorporated into this assessment.

Table 1.5: Good Practice Commitments

Reference	Commitment	Benefit to
G5	Construction would take place during the 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 HDD; where daytime working would be excessively disruptive to normal traffic operation; cleaning/testing of the pipeline; or overnight traffic management measures.	Traffic flows
G15	Wheel washing would be provided at all logistics hubs and large compound access points 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 HDV drivers to relevant 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	Traffic flows, journey times and collisions and safety

	• provide measures for the monitoring of the CTMP and details of appropriate actions in the event of non-compliance.	
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

1.4 Method of Assessment

Derivation of Traffic Flows, Journey Times and Collision Information

1.4.1 A detailed description of the assessment of traffic flows, journey times and collisions is set out in the Transport Assessment (**application document 7.5**). It is briefly set out here for reference.

Traffic Flows

1.4.1 Baseline traffic flows were collated from a variety of sources including publicly available information from the DfT 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 provided sufficient traffic data to enable the assessment of the project.

1.4.2 At some locations factors were required to generate 24-hour and weekend data. This enabled the calculation of Annual Average Daily Traffic (AADT) flows. To generate traffic growth factors, TEMPro and NTEM were used for light vehicles and Road Traffic Forecasts (RTF) for heavy vehicles (see Table 1.6 for vehicle definitions). These were used to establish a common existing baseline of 2018 and to generate the 2022 Future Baseline.

1.4.3 Committed development is assumed to be incorporated in the TEMPro and RTF growth factors.

1.4.4 Project traffic was calculated based on demand information. Assessment assumptions for trip generation and distribution have sought to create a realistic worst case and account for all those activities set out in detail in the Transport Assessment (**application document 7.5**).

1.4.5 The average day (seven-day average) traffic flows used for this appendix, for locations where there may be likely significant impacts for more than four weeks, are based on Future Baseline traffic only because project traffic is not expected to significantly increase traffic flows (see Section 1.3).

Journey Times

1.4.6 Journey times for diversions were calculated using SATURN speed flow curve equations for peak hours in each direction for an average day. Delays associated with traffic management were assessed using LinSig with 120m adopted as the length of traffic management in place. Traffic flows used for the assessment of diversions consider the AM and PM peak weekday traffic flow for the Future Baseline and With Project scenarios. The percentage of Heavy Duty Vehicles (HDVs) used in the journey

time calculations, derived by combining HGVs and buses, is based on the 18-hour weekday average.

1.4.7 To represent a consistent worst case, 08:00 and 17:00 were selected as the AM and PM peak hours for the bi-direction peak hour assessment.

1.4.8 The calculation of journey times using speed flow curves requires the conversion of traffic flows to Passenger Car Units. The conversion factors for these are provided in Table 1.6 for reference.

Table 1.6: Conversion Factors for Passenger Car Units

Vehicle Class	Vehicle Type	Conversion Factor
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

Collisions

1.4.9 Publicly available STATS19 collision data for 1 January 2013 to 31 December 2017 were used, the last five years for which data were available at the time of writing. Collisions were identified within 25 metres of the assessed roads. Based on previous experience, collision clusters were identified where there were four or more collisions within 50 metres over a period of five years.

1.4.10 The change to traffic volume and composition was considered to determine the potential for significant 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. This included the use of calculating collisions per 100 million vehicle kilometres (100 MVK) for assessed locations.

Assessment Criteria

1.4.11 Assessment of the impacts listed in Table 1.1 was undertaken using the sensitivity and magnitude criteria set out below.

Sensitivity of Receptors

1.4.12 The sensitivity of receptors (the road users, incorporating private vehicles and bus users) is determined using the scale set out in Table 1.7. The value, importance or rarity relates to the transport infrastructure or service being used while sensitivity refers to the users themselves.

Table 1.7: Sensitivity Criteria

Sensitivity	General Criteria
High	Of value, importance or rarity on a national scale, and with very limited potential for substitution; and/or Very sensitive to change, or has little capacity to accommodate a change.

Sensitivity	General Criteria
Medium	Of value, importance or rarity on a regional scale, and with limited potential for substitution; and/or Moderate sensitivity to change, or moderate capacity to accommodate a change.
Low	Of value, importance or rarity on a local scale; and/or Not particularly sensitive to change, or has considerable capacity to accommodate a change.
Negligible	Of value, importance or rarity on a very local scale; and/or Not sensitive to change, or has very considerable capacity to accommodate a change.

Magnitude Changes to Traffic Flows

1.4.13 Change in traffic flows was assessed based on thresholds of 30%, 60% and 90% in Guidelines for the Environmental Assessment of Road Traffic. The changes to traffic flows was calculated for the weeks when this would occur for total traffic and change in HDVs (Table 1.8).

Table 1.8: Criteria for Magnitude of Assessment for Change in Traffic Flows

Change in Journey Time	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

Magnitude Changes to Journey Times

1.4.14 Changes to journey times, as set out in the Scoping Report (Esso, 2018), are most likely to result from traffic diversions required for the project. These were based on Future Baseline traffic forecasts with diversion routes in place for the With Project scenario (Table 1.9).

1.4.15 Both an AM and PM weekday (Monday to Friday) peak hour were assessed for each diversion. Both directions were assessed where the diversion is bi-directional. To represent a consistent worst case, 08:00 and 17:00 were selected as the AM and PM peak hours. Where traffic management is proposed rather than a diversion, an assessment of the delay associated with temporary signals was completed. The delay associated with the traffic management was then combined with the Future Baseline free-flow journey times.

Table 1.9: Criteria for Magnitude of Assessment for Change in Journey Times

Change in Journey Time	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

1.4.16 An assessment of journey times for public transport was completed using these changes in magnitude and replicating the method used for the assessment of journey times for private vehicles. The assessment is based on bus passenger sensitivity to change and that bus routes have little capacity to accommodate a change in journey time and route while maintaining a consistent level of service.

Magnitude Changes to Collisions and Safety

1.4.17 A qualitative approach was taken for the assessment of collisions and safety. 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). In particular, impacts at collision clusters were considered. The change in total collisions based on the collisions per million vehicle kilometres was also used to inform the assessment. See Table 1.10 for the change criteria for traffic flows.

Table 1.10: Criteria for Magnitude of Assessment for Change Collision and Safety

Change Assessed at Collision Cluster Location	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

Application of Sensitivity and Magnitude

1.4.18 Impact significance was determined taking both the sensitivity and magnitude into account, using the matrix approach provided in Section 6.4 of Chapter 6 Overview of Assessment. Impacts reported in this ES are adverse unless otherwise stated and are considered to result in 'likely significant effects' in the context of the EIA Regulations when of moderate significance or above.

Basis of Comparison

1.4.19 Annual Average Weekday Traffic (AAWT) and AADT were the basis of the Future Baseline assessment. AAWT, reported for the 18-hour period 06:00 to 00:00, reflects five-day (Monday to Friday) annual average traffic. Annualised averages were not used for the 2022 With Project traffic flows and journey times assessments because the annualisation of the traffic flows would not accurately reflect the likely impact during the duration of the diversion and traffic management.

1.4.20 Table 1.11 confirms the different types of traffic flows used in this assessment to compare the impact of Future Baseline and With Project.

Table 1.11: Basis of Comparison

Assessment Type	Future Baseline	With Project
Traffic Flows	AADT	With Diversion Average Day
Journey Times	AAWT (peak hours)	With Diversion Average Weekday
Collisions	AADT	With Diversion AADT

1.5 2018 Baseline Conditions

Determination of Sensitivity

1.5.1 Based on the criteria in Table 1.7 the sensitivity of receptors at each location is confirmed in Table 1.12. A guide to the application of these sensitivities alongside the magnitude of change is provided in Section 6.3 of Chapter 6 Overview of the Assessment.

Table 1.12: Sensitivity at each Assessed Location

Location	Sensitivity	Reason
Naishes Lane	Negligible	Residential distributor road
Balmoral Drive	Negligible	Residential distributor road
Balmoral Drive diversion route	Low	Partially a local distributor road
B311 Red Road	Low	Local distributor road
B377 Ashford Road	Low	Local distributor road
Woodthorpe Road	Low	Local distributor road
Public transport journey times	High	Very sensitive to change

Traffic flows

1.5.2 Table 1.13 presents the 24-hour AADT, number and percentage of HDVs for the Baseline.

Table 1.13: Baseline Traffic Flows

Route	AADT	HDV	HDV %
Naishes Lane	1,600	64	4%
Balmoral Drive	5,186	125	2%
Balmoral Drive diversion	6,556	210	3%
B311 Red Road	4,585	56	1%
B377 Ashford Road	6,451	244	4%
Woodthorpe Road	7,302	106	1%

Bus services

1.5.3 Bus services along each of the locations where traffic management or diversions are proposed for longer than four weeks are included in Table 1.14. In this table '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. Further detail relating to bus services is provided in the Transport Assessment (**application document 7.5**).

Table 1.14: Bus Services That Use Affected Roads

Route Number	Period	Weekday Frequency	Saturday Frequency	Sunday Frequency
Naishes Lane				
10	Day	1.5/hour	2.5/hour	No service
	Night	No service	No service	No service
610	Day	1/day	No service	No service
	Night	No service	No service	No service
Balmoral Drive				
No Bus services	Day	No service	No service	No service
	Night	No service	No service	No service
St. Catherine's Road				
No Bus services	Day	1/hour	1/hour	No service
	Night	No service	No service	No service
B311 Red Road				
84	Day	<1/hour	<1/hour	No service
	Night	No service	No Service	No service
500	Day	<1/hour	2/day	No service
	Night	No service	No service	No service
B377 Ashford Road				
574	Day	1/day on Tuesdays and Thursdays only	No service	No service
	Night	No service	No service	No service
Woodthorpe Road				
117	Day	3/hour	3/hour	2/hour
	Night	3/hour	3/hour	2/hour
667	Day	2/day, school days	No service	No service
	Night	No service	No service	No service

Journey Times

1.5.4 Table 1.15 presents the peak hour (08:00 and 17:00) bi-directional Baseline journey times in seconds.

Table 1.15: Baseline Journey Times

Route	Direction 1	Direction 2	AM Peak (Seconds)		PM Peak (Seconds)	
			Direction 1	Direction 2	Direction 1	Direction 2
Naishes Lane	Northbound	Southbound	35	35	34	34
Balmoral Drive	Eastbound	Westbound	67	67	67	67
Balmoral Drive diversion	Northbound	Southbound	163	164	165	165
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

Collisions

1.5.5 The information presented in this section is based upon more detailed analysis provided in the Transport Assessment (**application document 7.5**). Table 1.16 presents the Baseline 2018 collisions. Collision clusters are described below.

Naishes Lane

1.5.6 The total number of collisions over five years, along Naishes Lane was two. Analysis of collision data shows that no clusters exist along Naishes Lane.

Balmoral Drive

1.5.7 The total number of collisions over five years, along Balmoral Drive was three. Analysis of collision data shows that no collision clusters were identified along Balmoral Drive.

Balmoral Drive Diversion

1.5.8 The total number of collisions over five years, along Frimley Green Road and Buckingham Way was ten. Analysis of collision data shows that collision clusters were not identified along Frimley Green Road and Buckingham Way.

B311 Red Road

1.5.9 The total number of collisions over five years, along B311 Red Road was 51. Analysis of collision data shows that there were four collision clusters along B311 Red Road:

- 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, however, 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 in vehicles already on, and joining the roundabout, colliding.
- 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 there.
- 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 there.

B377 Ashford Road

1.5.10 The total number of collisions over five years, along the B377 Ashford Road was 21. Analysis of collision data shows that there were two main collision clusters along the B377:

- 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, however, 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, however, there was no clear indication that the collisions have a common cause.

Woodthorpe Road

1.5.11 The total number of collisions over five years, along Woodthorpe Road was 17. Analysis of collision 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, however there is no clear indication that the collisions have a common cause.

Table 1.16: Baseline Collisions (2013 to 2017)

Route	AADT	Average Yearly Collisions	Severity % Slight/Serious/ Fatal	Collision Rate (100 MVK)	Cluster
Naishes Lane	1,600	0.40	100/ 0/ 0	92.6	No
Balmoral Drive	5,186	0.60	67/ 33/ 0	38.0	No
Balmoral Drive diversion route	6,556	2.00	70/ 30/ 0	29.9	No
B311 Red Road	4,585	10.20	71/ 27/ 2	167.0	Yes
B377 Ashford Road	6,451	4.20	76/ 24/ 0	83.2	Yes
Woodthorpe Road	7,302	3.40	94/ 6/ 0	79.0	Yes

1.6 2022 Future Baseline

Traffic flows

1.6.1 Table 1.17 presents the 24-hour AADT, number and percentage of HDVs for the Future Baseline.

Table 1.17: Future Baseline Traffic Flows

Route	AADT	HDV	HDV %
Naishes Lane	1,688	65	4%
Balmoral Drive	5,401	128	2%
Balmoral Drive Diversion	6,902	215	3%
B311 Red Road	4,779	58	1%
B377 Ashford Road	6,717	250	4%
Woodthorpe Road	7,344	106	1%

Journey Times

1.6.2 Table 1.18 presents the peak hour (08:00 and 17:00) bi-directional Future Baseline journey times in seconds. This is used for the assessment of both private vehicles and for buses.

Table 1.18: Future Baseline Journey Times

Route	Lengths (Metres)	Direction 1	Direction 2	AM Peak (Seconds)		PM Peak (Seconds)	
				Direction 1	Direction 2	Direction 1	Direction 2
Naishes Lane	445	Northbound	Southbound	35	35	34	34
Balmoral Drive	860	Eastbound	Westbound	67	67	68	68
Balmoral Drive diversion route	2,050	Northbound	Southbound	163	165	166	165
B311 Red Road	2,400	Eastbound	Westbound	187	212	187	233
B377 Ashford Road	1,500	Northbound	Southbound	123	124	117	118
Woodthorpe Road	1,400	Eastbound	Westbound	111	113	112	113

Collisions and Safety

1.6.3 Table 1.19 presents the Future Baseline collisions. Due to the negligible change in annual collisions compared with the Baseline, it is not expected that there would be a change in collisions at clusters.

Table 1.19: Future Baseline Collisions

Route	AADT	Collisions (Average Year)
Naishes Lane	1,688	0.42
Balmoral Drive	5,401	0.62
Balmoral Drive diversion route	6,902	2.11
B311 Red Road	4,779	10.63
B377 Ashford Road	6,717	4.37
Woodthorpe Road	7,344	3.42

1.7 2022 'With Project'

Traffic Flows

1.7.1 Table 1.20 presents the 24-hour AADT, number and percentage of HDVs for With Project. The AADT is used in the assessment of collisions with the Average Day used for the comparison of traffic flows.

Table 1.20: With Project Traffic Flows

Route	AADT	HDV	HDV %	Average Day	HDV	HDV %
Naishes Lane	1,688	65	4%	1,688	65	4%
Balmoral Drive	4,882	116	2%	0	0	-
Balmoral Drive diversion	7,421	228	3%	12,303	343	3%
B311 Red Road	4,779	58	1%	4,779	58	1%
B377 Ashford Road	6,717	250	4%	6,717	250	4%

Route	AADT	HDV	HDV %	Average Day	HDV	HDV %
Woodthorpe Road	7,344	106	1%	7,344	106	1%

Journey times

1.7.2 Table 1.21 presents the peak hour (08:00 and 17:00) bi-directional With Project journey times in seconds. This is used for the assessment of both private vehicles and for buses.

Table 1.21: With Project Journey Times

Route	Direction 1	Direction 1	AM Peak (Seconds)		PM Peak (Seconds)	
			Direction 1	Direction 2	Direction 1	Direction 2
Naishes Lane	Northbound	Southbound	66	66	64	64
Balmoral Drive	Eastbound	Westbound	67	67	67	67
Balmoral Drive diversion route	Northbound	Southbound	171	173	173	178
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

Collisions and Safety

1.7.3 Table 1.22 presents the With Project collisions.

Table 1.22: With Project Collisions

Route	Average Weekday	Collisions (Average Year)
Naishes Lane	1,688	0.42
Balmoral Drive	4,882	0.56
Balmoral Drive diversion route	7,421	2.26
B311 Red Road	4,779	10.63
B377 Ashford Road	6,717	4.37
Woodthorpe Road	7,344	3.42

1.8 Assessment of Impacts

1.8.1 As noted in Limitations to Assessment paragraph 1.2.8, there was insufficient information available to assess the St Catherine's Road location using the method described in Section 1.4. 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 significant 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.

Traffic Flows

1.8.2 Table 1.23 presents the changes in 24-hour AADT, number and percentage of HDVs between Future Baseline and With Project.

Table 1.23: Future Baseline and With Project Traffic Flow Change

Route	Future Baseline AADT	Future Baseline HDV	With Project Average Day Total	With Project Average Day HDV	Total Difference	HDV Difference	Total % Change	HDV % Change
Naishes Lane	1,688	65	1,688	65	0	0	0%	0%
Balmoral Drive	5,401	128	0	0	-5,401	-128	-100%	-100%
Balmoral Drive diversion route	6,902	215	12,303	343	5,401	128	78%	60%
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%

1.8.3 Because there would be no road users on Balmoral Drive, no-one would benefit from the decrease in traffic flows. To reflect this, for both total traffic and HDVs, the reduction in traffic flows along Balmoral Drive, which has a negligible sensitivity and a high magnitude of change would result in a beneficial impact of negligible significance for five weeks.

1.8.4 The increase in traffic flows along the Balmoral Drive diversion route, which has a low sensitivity, represents medium magnitude of change resulting in an impact of minor significance for five weeks.

1.8.5 At all other assessed locations, with sensitivity no greater than low, there is no change in traffic flow, generating a negligible magnitude of change. This results in likely significant impacts for the remaining routes.

Journey Times

1.8.6 Table 1.24 presents the absolute and percentage change in AM peak journey times between Future Baseline and With Project. Table 1.25 presents the absolute and percentage change in PM peak journey times between Future Baseline and With Project.

Table 1.24: Future Baseline and With Project AM Journey Times

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

Table 1.25: Future Baseline 2022 and With Project PM Journey Times

Route	Future Baseline (Seconds)		With Project (Seconds)		Difference (Seconds)		% Change	
	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2
Naishes Lane	34	34	64	64	30	30	87%	87%
Balmoral Drive (compared with Balmoral Drive diversion)	68	68	173	178	106	111	156%	164%
B311 Red Road	187	233	229	310	42	77	22%	33%
B377 Ashford Road	117	118	155	155	38	37	32%	31%
Woodthorpe Road	112	113	156	155	44	42	39%	37%

1.8.7 Based on the sensitivity and magnitude criteria set out in Section 1.4, Table 1.26 confirms the sensitivity and magnitude at each assessed location. Because the magnitude is the same in each direction, each route has been assessed for the AM and PM peaks only, not for each direction. Changes in journey time of approximately 30 seconds are a small magnitude of change because this is consistent with the delay that could be experienced at a single junction during normal network conditions.

Table 1.26: Journey Time Sensitivity/Magnitude

Route	Private Vehicles		Bus Users	
	AM Peak	PM Peak	AM Peak	PM Peak
Naishes Lane	Negligible/Small	Negligible/Small	High/Small	High/Small
Balmoral Drive (compared with Balmoral Drive diversion)	Negligible/Large	Negligible/Large	Not applicable, there are no bus routes along Balmoral Drive	

Route	Private Vehicles		Bus Users	
	AM Peak	PM Peak	AM Peak	PM Peak
B311 Red Road	Low/Negligible	Low/Small	High/Negligible	High/Small
B377 Ashford Road	Low/Small	Low/Small	High/Small	High/Small
Woodthorpe Road	Low/Small	Low/Small	High/Small	High/Small

1.8.8 The short term duration of the works and low sensitivity to short changes in route for private vehicles means that it is reasonable to consider that the impact experienced by many road users would be negligible. This is based on professional judgement and therefore represents a slight variation from the matrix in Chapter 6. The short term nature of the works was also taken into consideration for the assessment of bus users. When taking this into consideration alongside the sensitivity and magnitude the likely significant impacts are shown in Table 1.27.

Table 1.27: Journey Time Assessment of Impact Significance

Route	Private Vehicles		Bus Users	
	AM Peak	PM Peak	AM Peak	PM Peak
Naishes Lane	Negligible	Negligible	Negligible	Negligible
Balmoral Drive (compared with Balmoral Drive diversion)	Negligible	Negligible	Not applicable, there are no bus routes along Balmoral Drive	
B311 Red Road	Negligible	Negligible	Negligible	Negligible
B377 Ashford Road	Negligible	Negligible	Negligible	Negligible
Woodthorpe Road	Negligible	Negligible	Minor	Minor

Collisions and Safety

1.8.9 Table 1.28 summarises the absolute and percentage change in collisions (average per year) between the 2022 Future Baseline and 2022 With Project. As the greatest change in collisions is a decrease of 10% (a negligible magnitude of change), there are no likely significant impacts.

1.8.10 Due to the negligible magnitude of change in collisions per average year, the number and location of collision clusters is not expected to change compared with the Future Baseline.

Table 1.28: Future Baseline 2022 and With Project 2022 Collisions Change

Route	Collisions (100 MVKM)	Future Baseline		With Project		Difference Yearly Collisions (%)
		AADT	Average Yearly Collisions	AADT	Average Yearly Collisions	
Naishes Lane	92.6	1,688	0.42	1,688	0.42	0%
Balmoral Drive	38.0	5,401	0.62	4,882	0.56	-10%
Balmoral Drive diversion route	29.9	6,902	2.11	7,421	2.26	7%
B311 Red Road	167.0	4,779	10.63	4,779	10.63	0%
B377 Ashford Road	83.2	6,717	4.37	6,717	4.37	0%
Woodthorpe Road	79.0	7,344	3.42	7,344	3.42	0%

1.9 Mitigation

1.9.1 There are no significant impacts expected on traffic and transport, therefore no mitigation measures have been identified.

1.10 Residual Impacts (with Mitigation)

1.10.1 The residual impacts for traffic and transport are set out in Table 1.29, which also confirms that there are no significant impacts.

Table 1.29: Residual Traffic and Transport Impacts

	Significant
Traffic Flows	
Balmoral Drive diversion impact of minor significance	No
Journey Times	
Woodthorpe Road impact of minor significance	No
Collisions and Safety	
No residual impacts	No

1.11 Summary

1.11.1 This technical note has presented the results of the assessment of likely significant impacts of the project on the transport network. These impacts are associated with those activities that would occur later in the construction programme. As a result, 2022 was selected as the Future Baseline year.

1.11.2 Based on the thresholds in the Scoping Report (Esso, 2018), all impacts in rural areas and impacts in urban areas with a duration of four weeks or less were scoped out. Project traffic demand was subsequently shown to cause a negligible change in traffic flows and was therefore scoped out.

1.11.3 Following a summary of the baseline of the assessment, the impact on traffic flows, journey times, and collision and safety, in two scenarios was presented:

- 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.

1.11.4 The assessment assumed that the likely significant impacts associated with St. Catherine's Road would not be greater than those associated with the closure and diversion of traffic from Balmoral Drive.

1.11.5 The traffic flow assessment identified no locations with likely significant impacts.

1.11.6 The bi-directional journey time assessment identified no locations with likely significant impacts.

1.11.7 The collision assessment identified no locations with likely significant impacts.

References

Esso (2018). Southampton to London Pipeline Project: Scoping Report (Volume 1). Planning Inspectorate Reference Number EN070005. July 2018.

Department for Transport (2004). TAL 2/04 Rural traffic calming: Bird Lane, Essex.

Institute of Environmental Management and Assessment (1993). Guidelines for the Environmental Assessment of Road Traffic. pp.15-16.