Galloper Wind Farm Project

Environmental Statement – Chapter 25: Traffic and Transport

October 2011

Document Reference – 5.2.25

Galloper Wind Farm Limited

Document title	Galloper Wind Farm Project Environmental Statement – Chapter 25: Traffic and Transport
Document short title	Galloper Wind Farm ES
Document Reference	5.2.25
Regulation Reference	APFP Regulations, 5(2)(a)
Version	12
Status	Final Report
Date	October 2011
Project name	Galloper Wind Farm Project
Client	Galloper Wind Farm Limited
Royal Haskoning Reference	9V3083/R01/303424/Exet

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Date/initials approval		KH	01.11.2011

CONTENTS

25 TRAFFIC AND TRANSPORT

25.1 Introduction

25.1.1 This Chapter of the Environmental Statement (ES) assesses the potential impacts of the onshore electrical connection for Galloper Wind Farm (GWF) upon traffic and transport.

25.1.2 This assessment considers the expected traffic increases associated with the construction, operation and decommissioning of GWF in relation to the potential effects on the existing road network (driver delay at road junctions), highway safety and pedestrian safety. The potential effects on the existing road network are based on the findings of a standalone Transport Assessment. A full copy of this assessment is provided as **Appendix 25.A**.

25.1.3 Noise and air impacts associated with traffic are considered separately within **Chapter 26 Noise** and **Chapter 27 Air Quality**.

25.2 Guidance and Consultation

Policy and guidance

25.2.1 National Policy Statements (NPS) provide the primary basis on which the Infrastructure Planning Commission (IPC) is required to make its decisions. In preparing this chapter the following NPS were reviewed:

- Overarching National Policy Statement (NPS) for Energy (EN-1) (DECC, 2011a);
- NPS for Electricity Network Infrastructure (EN-5) (DECC, 2011b).

25.2.2 The specific assessment requirements for traffic and transport, as detailed within the NPSs, are repeated in the following paragraphs. Where any part of the NPS guidance has not been followed within this assessment, it is stated after the NPS text and a justification provided. In all other cases the assessment requirements suggested within the NPSs have been applied to this assessment.

25.2.3 The National Policy Statement (NPS) for Electricity Networks Infrastructure (EN-5) is the primary decision-making guidance document for the Infrastructure Planning Commission (IPC) on nationally significant electricity network infrastructure in England and Wales. Whilst this document does not specifically consider traffic and transport impacts, the Overarching NPS for Energy (EN-1) does contain generic requirements for assessment of impacts arising from traffic associated with the design, construction and operation of renewable energy infrastructure. Those of relevance to this assessment are set out in the following paragraphs.

25.2.4 Paragraph 5.13.3 states: '*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 guidance, or any successor to such methodology*'.

A Transport Assessment is provided as **Appendix 25.A** and reported within this Chapter.

25.2.5 Paragraph 5.13.4 states '*Where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts'*.

GWF will not require any permanent operational staff to be based on site. As such, an operational travel plan is not deemed necessary. A construction traffic management plan will be developed when a principal contractor has been appointed. This assessment presents the principles that will be incorporated within the construction traffic management plan.

25.2.6 The Transport Assessment (potential impacts upon the existing road network - as presented within **Appendix 25.A**) was undertaken following the generic guidelines as set out in the Department for Transport's document 'Guidance on Transport Assessment' (2007).

25.2.7 The 'Guidelines for the Environmental Assessment of Road Traffic' produced by the Institute of Environmental Assessment (IEA, 1993) have also been used to establish the assessment methodology.

25.2.8 The Institution of Highways & Transportation (1999) Rural Safety Management has been used to establish the intervention levels for accidents on rural roads.

Consultation

25.2.9 As part of ongoing consultation, key stakeholders were invited to respond to a scoping document produced as part of the EIA process (GWFL, 2010). **Table 25.1** summarises issues that were highlighted by the consultees in the IPC Scoping Opinion (IPC, 2010) and indicates which sections of the assessment address each issue.

25.2.10 Further consultation was undertaken through formal Section 42 consultation under the Planning Act 2008 (see **Chapter 7 Consultation**) via the submission of a Preliminary Environmental Report (PER). Community consultation under Section 47 has also been carried out in parallel with the Section 42 statutory consultation. The process for community consultation is set out in a Statement of Community Consultation (SoCC) (see **Chapter 7**). **Table 25.1** also summarises issues that were highlighted throughout the consultation period.

25.2.11 Full details of responses received are presented in the IPC Scoping Opinion report (IPC, 2010) and the Consultation Report that accompanies the DCO for this application.

Table 25.1: Summary of consultation and issues

Date	Consultee	Summary of issue	Section where addressed
December 2009	Suffolk County Council – as Highways Authority	Agreement over the scope of the Transport Assessment.	Details of the approach are presented within Section 25.3.
August 2010	IPC / Suffolk County Council (Scoping Opinion)	The ES should take account of the location of public rights of way, including footpaths, bridleways and byways, and should clearly set out any impacts on them, including within the wider area.	Considered within Chapter 24 Land Use, Tourism And Recreation.
June 2011	Highways Agency (Section 42)	The impact on the strategic road network is unlikely to be significant and accordingly the Highways Agency has no comment.	Noted
June 2011	Public Exhibitions (Section 42)	Sizewell Road is already a racetrack in the early morning and late afternoon as many workers are leaving the sites of Sizewell A & B. We would suggest that the necessary traffic calming devices are put in place.	Traffic calming measures (temporary speed restrictions) along Lover's Lane and Sizewell Gap will be incorporated as part of a Construction Code of Practice - See Section 25.6.
July 2011	Theberton and Eastbridge Parish Council (Section	We disagree that traffic generation would have a "minor adverse affect" on	The assessment shows that there will be no driver delays on the proposed

Date	Consultee	Summary of issue	Section where addressed
	42)	the local area. Theberton lies on the main connecting road from the A12 to Sizewell and the construction traffic will have a major impact on our village. How do you propose to mitigate this situation?	route as a result of the proposed construction traffic. The maximum traffic increase will be 340 additional vehicle movements, which represents an increase of approximately 5% on top of existing traffic flows at Theberton. IEA guidelines indicate that increases below 10% are negligible on pedestrian safety. Refer to Section 25.6 onwards.
July 2011	Town Clerk - Leiston-cum-Sizewell Town Council (Section 42)	The transport of soil, aggregate and cement into the site for Gabbard sub station caused chaos along Abbey Lane. A definite transport policy will need to be put in place for that phase of Galloper.	A Construction Traffic Management Plan will be developed to ensure that lorry deliveries are phased to avoid peak times. See Section 25.6.
July 2011	Leiston Community High School (Section 47)	Concerns regarding the additional construction traffic, and the safety of young people coming to/from school.	Traffic calming measures along Lover's Lane and Sizewell Gap will be incorporated as part of the Construction Code of Practice. Traffic increases on other parts of the construction vehicle route will be below 10%. See Section 25.6.

25.3 Methodology

Study area

25.3.1 In completing the transport assessment, a study area was defined within which detailed assessments of road type and condition, junctions, traffic flows, vehicle counts, and historical accident data were undertaken.

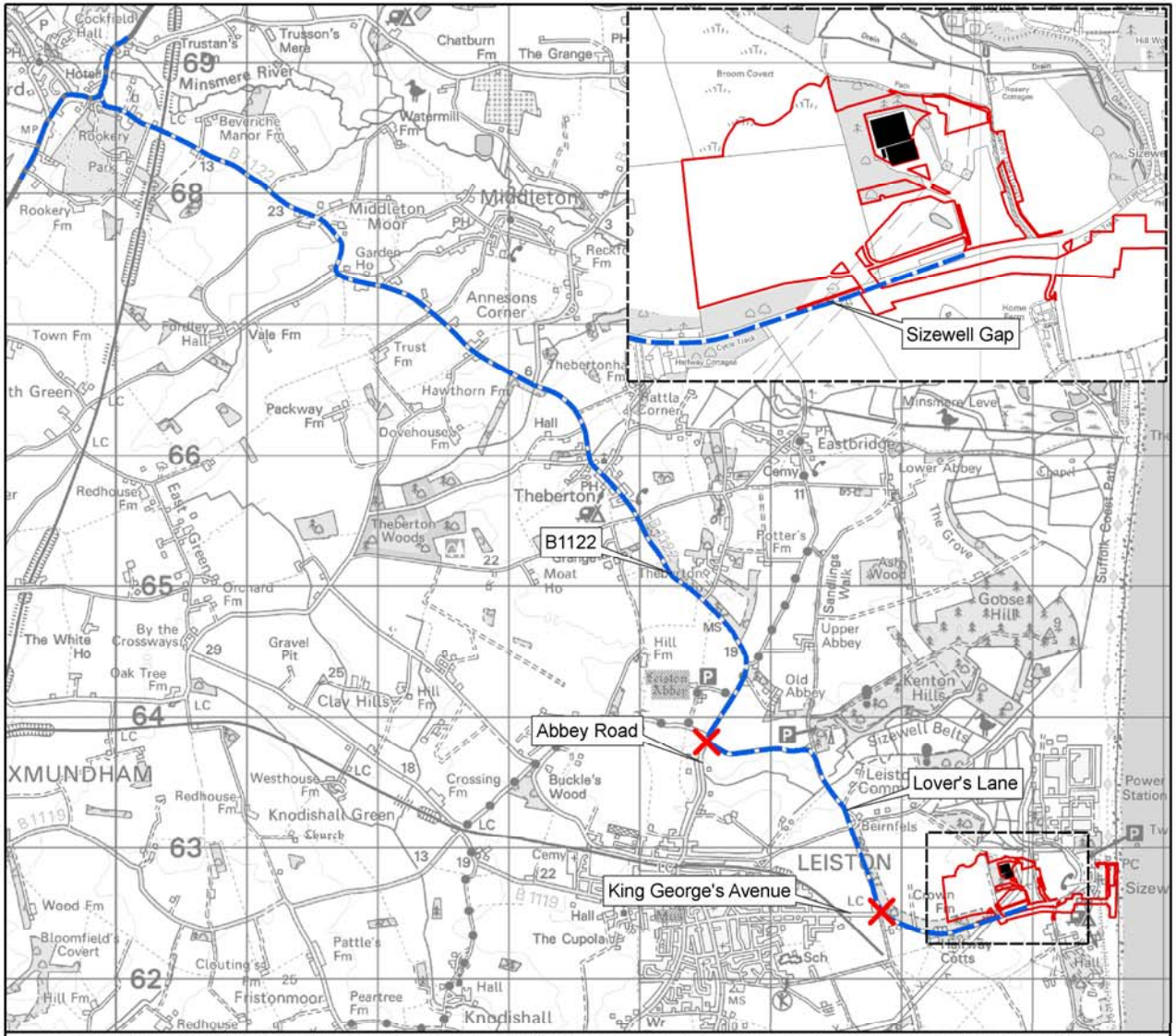
25.3.2 The study area is based upon the proposed route that will be taken for traffic movements related to construction of the substation and associated onshore works, and has been developed in consultation with the Local Highway Authority (LHA), this being Suffolk County Council.

25.3.3 The study area is defined as a corridor following the B1122 Middleton Road from its junction with the A12 at Yoxford towards Leiston, turning east onto Lover's Lane and then onto Sizewell Gap to the existing Greater Gabbard Offshore Wind Farm (GGOWF) substation site access, approximately 800m west of Sizewell village and the coast. This corridor is the proposed construction traffic route from the A12 to Sizewell, which has been enforced through previous planning conditions for the construction of Sizewell B and the GGOWF onshore development. It is also the enforced route for the Sizewell B Dry Fuel Store, which is due to begin construction in 2012. The proposed construction traffic route is shown on **Figure 25.1**.

Characterisation of the existing environment

25.3.4 To inform the characterisation of the existing environment, data has been collated from a number of sources:

- Traffic count data for the local road network;
- Accident data from Suffolk County Council;
- Outputs of trip generation calculations for the proposed works;
- Existing traffic flow data for relevant routes and junctions;
- Automatic vehicle speed data for relevant routes; and
- A swept path analysis of the proposed construction traffic route (for abnormal loads).



Galloper Wind Farm Onshore Development Footprint/Order Limits
Greater Gabbard Onshore Substation
Proposed Construction Traffic Route
Location of priority junction

N

0 250 500 1,000 Metres 0 0.25 0.5 1 Kilometres

UK Offshore Development		
Figure 25.1		
Proposed construction traffic route		
Drawing Number: GWF_413_R6		Rev: 6
Date: 27/10/11	Created: LW	Checked: JA
Scale: 1:50,000	Page: A4	
Datum: OSGB36	Projection: British National Grid	

Assessment of impacts

Traffic generation

25.3.5 The assessment of traffic has assumed the worst case scenario that the most intensive period of construction traffic (the substation build – including the GWF compound and the transmission compound) could occur over a 12 month period. However, it is more likely that the individual elements of the onshore works would actually be more staggered and occur over a longer timeframe. For the assessment of the substation build extending beyond 12 months the reported impacts would be expected to reduce. Further details on the worst case scenario are provided within **Section 25.5**.

25.3.6 The anticipated number of vehicle movements that would be generated as a result of the onshore works were assessed using a transport modelling package called TEMPRO. As well as modelling the projected impacts of traffic directly attributable to the construction works, the software considers the increase in baseline traffic over the intervening period, i.e. a reflection of the annual growth in the number of vehicles on British roads.

25.3.7 Traffic modelling projections were created for the following future scenarios:

- Construction Peak Phase – 2014 worst case scenario - This model takes account of the expected peak in transport movements during the construction of the onshore works, and assumes both substation compounds will be constructed within a single year (2014); and
- Construction complete - 2015 scenario - This model simulates the post construction period and the start of the operational phase of the project, which has a reasonable probability of occuring in 2015.

25.3.8 The traffic modelling projections take into account all expected traffic associated with other developments in the area, i.e. Sizewell A decommissioning, the operation of Sizewell B and the proposed Sizewell B Dry Fuel Store, to provide a comprehensive understanding of the traffic environment. Proposals for new nuclear development in the area (Sizewell C) are limited at this stage and there are no details of potential traffic generation; however the construction of Sizewell C is not expected to begin until 2017 at the earliest and therefore is very unlikely to overlap with the most intense activity associated with GWF. As such, the cumulative impacts have been taken into account within the model when considering construction impacts.

25.3.9 2014 assumes a worst case construction scenario for traffic levels along the route in question. Should the construction peak phase be delayed to 2015 or later, residual traffic levels are actually anticipated to be slightly lower due to the ongoing decommissioning works at Sizewell A and the predicted year-on-year reduction in staff numbers associated with that activity.

25.3.10 Best practice guidance (IEA, 1993) recommends that assessment of road traffic is undertaken for highway links where traffic flows will increase by more than 30% or on specifically sensitive links where flows increase by 10% or more.

Abnormal loads

25.3.11 Abnormal loads were not considered as part of the traffic model simulations given the need to ensure they occur outside of peak hours and with minimal impacts upon the surrounding transport networks. Abnormal loads have been considered within a dedicated swept path analysis, of the proposed construction traffic route, which is discussed in **Section 25.6**.

Highway safety

25.3.12 To facilitate an analysis of highway safety, three years of accident data from 2005-2008 has been obtained from Suffolk County Council. The Institution of Highways & Transportation publication "Rural Safety Management" November 1999 has been used to establish the intervention levels for rural roads of a similar nature. This suggests that for rural single carriageway roads accident rates of $30x10^8$ veh-km for A roads, $44x10^8$ veh-km for B roads and $46x10^8$ veh-km for C roads are considered as an intervention level and therefore significant.

25.3.13 The accident rate for the proposed construction traffic route (and sample lengths of the A12 linking the nearest settlements) has been calculated in accordance with the IHT guidelines using the following formula.

$$Accident.rate = \frac{Number.of.accidents.in.3.years}{(3 \times length.of.link.km) \times (Traffic.flow.vehicles.per.year)}$$

Pedestrians

25.3.14 Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads. In general terms, increases in traffic levels are likely to lead to increases in pedestrian delay. However, given the range of local factors and conditions that can influence pedestrian delay, the IEA does not recommend that thresholds be used as a means to establish the significance of pedestrian delay (IEA, 1993).

25.3.15 Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. It may result from the difficulty of crossing a heavily trafficked existing road for example, or as a result of a physical barrier created by the road itself. However, there are no predictive formulae which give simple relationships between traffic factors and levels of severance. Nevertheless, **Table 25.2** presents the impact magnitude for traffic flow increases that is suggested within IEA guidance (IEA, 1993).

Table 25.2 Impact magnitude for traffic increases on pedestrian severance

Magnitude	Total traffic increase
High	61% - 90%
Medium	31% - 60%
Low	11% - 30%
Negligible	<10%

25.3.16 Pedestrian amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic. The IEA guidelines note that changes in pedestrian amenity may be considered to be significant where the traffic is halved or doubled.

25.3.17 The scale of fear and intimidation experienced by pedestrians is dependant on the volume of traffic, its HGV composition, its proximity to people or the lack of protection caused by such factors as narrow pavement widths. There are no commonly recognised thresholds for traffic related fear; however pedestrian amenity is considered to be negatively impacted when there is a significant increase in HGV flows. Typically this equates to a doubling of flows to register an impact (IEA, 1993). **Table 25.3** provides an indication of the magnitude associated with increased HGV flows.

Table 25.3 Impact magnitude for HGV increases on pedestrian amenity

Magnitude	HGV increase (%)
High	200%
Medium	150%
Low	100%
Negligible	<100%

Impact significance

25.3.18 **Table 25.4** provides a summary of the process identifying how the significance of an impact can be derived, based on an understanding of the receptor's sensitivity and an assessment of the magnitude of the effect. This summary table is indicative and represents what in reality is a complex process of investigation and determination.

Table 25.4 Significance matrix

Value / Sensitivity	Magnitude				
	High	**Medium**	**Low**	**Negligible**	**No change**
International	Severe	Major	Moderate	Minor	Neutral
National	Major	Moderate	Minor	Minor	Neutral
Regional	Moderate	Minor	Minor	Negligible	Neutral
Local	Minor	Minor	Negligible	Negligible	Neutral
Negligible	Minor	Negligible	Negligible	Neutral	Neutral

Note: Shaded cells (red to yellow) indicate the magnitude of anticipated impacts, ranging from severe to neutral (no impact)

25.4 Existing Environment

25.4.1 Traffic associated with the construction and operation of the onshore elements of the GWF development will travel to and from the site on a pre-determined route as outlined in on **Figure 25.1** and presented in more detail below.

25.4.2 The proposed route for construction traffic has been developed in consultation with the LHA to minimise adverse impacts upon surrounding transport infrastructure and local residents. The route, originating at the A12 just to the east of Yoxford, will follow the B1122 Middleton Road towards the village of Theberton where it becomes Leiston Road and then Abbey Road. Approximately 1km north of Leiston, a left turn takes the proposed route eastbound onto Lover's Lane (U2822), passing Leiston Common and Halfway Cottages to Crown Farm from which point onwards it is known as Sizewell Gap (C228).

25.4.3 The A12 is the closest primary route to the study area and the proposed works, and runs in an approximately SSW-NNE direction between London and Great Yarmouth.

25.4.4 The national speed limit applies on the B1122 apart from 30mph restrictions along Yoxford Road (between Littlemoor Street and Mill Street), through the village of Theberton, and also on the approach to the junction with Lover's Lane near Leiston Abbey.

25.4.5 Initial sections of the B1122 are generally considered to be in a good condition, with a road width between 5.6m and 7.1m wide. Modifications have been made to Lover's Lane (to facilitate works associated with earlier developments at Sizewell) to permit increased vehicle sizes and volume of movements, for example at the junction with Sandy Lane adjacent to Leiston Common.

25.4.6 Lover's Lane varies between 5.9m and 6.2m wide, increasing to 9.4m on a number of bends and a 60mph speed limit. For the majority of its length, the road is not kerbed. Near to Halfway Cottages this road is known as Sizewell Gap and has a 40mph restriction between approximately Halfway Cottages and Sizewell Hall road. There is also a cycle lane running along the southern side of Lover's Lane.

25.4.7 The existing access to the GGOWF substation will be used for the GWF substation and associated works and is situated on the north side of Sizewell Gap approximately 450m east of Halfway Cottages. Access to the onshore transition bays would be from the south side of Sizewell Gap, 100m further east. Access to the beach works will be via the Sizewell beach car park.

25.4.8 The proposed cable corridor crosses both Sizewell Hall access road (U2838) and Sizewell Gap between its landfall at Sizewell beach and the connection to the GWF substation. At both these road crossings it is proposed that the cable will be drilled beneath the roads to avoid the need for road closures.

25.4.9 The proposed construction traffic route avoids the centre of Leiston in order to minimise impacts on that part of the road network and on pedestrians within Leiston.

25.4.10 The local road network provides a key link to Leiston and Sizewell from the closest primary route (A12). It is also a key link to a number of other small villages including Theberton and Middleton. As such, the proposed construction traffic route is considered to be of regional sensitivity to changes in traffic.

Traffic counts and modelling (refer to **Appendix 25.A** for further details)

25.4.11 In order to assess the traffic related effects on the local road network a number of activities were undertaken to determine:

- The existing traffic flows and transport network expected to be affected between the A12 and Sizewell;
- The existing and committed traffic demand on that network; and
- The forecast traffic and travel demand during construction.

25.4.12 To facilitate this assessment, reference was made to traffic count data captured during October and November 2008 (reported within British Energy Generation Ltd, 2010). This data includes peak six hour turning counts at points along the proposed construction traffic route for a weekday and Saturday. The data is augmented by five Suffolk County Council permanent Automatic Traffic Counter (ATC) sites. The methodology employed reflects that laid out in the Department for Transport's Guidance on Transport Assessment (2007), capturing normal flow traffic conditions on a mid-week (i.e. neutral) day and taking account of holiday periods in tourist areas.

25.4.13 Data from ATCs were utilised to 'factor up' the pm peak hour total traffic and HGV counts to Annual Average Weekday Traffic (AAWT - five day average daily flows) and Annual Average Daily Traffic (AADT - seven day average flows) for the assessment years (2014 and 2015).

25.4.14 **Table 25.5** details the baseline traffic flows for the baseline year of 2008.

Table 25.5 Baseline traffic flows along the proposed construction traffic route for 2008

	2008 Baseline Traffic Data							
	Total	HGV	AAWT	AADT	AAWT HGV	AADT HGV	AAWT HGV	AADT HGV
Location	Peak hr		18hr	24hr	18hr	24hr	% HGV	% HGV
A12 South of Yoxford	1133	35	13389	13277	972	811	7	6.1
A12 North of Yoxford	818	38	9667	9585	1055	881	11	9.2
B1122 Middleton Rd East of Yoxford	289	16	3428	3328	575	480	17	14.4
B1122 Theberton to Leiston	550	15	6524	6334	539	450	8	7.1
Lover's Lane	227	6	2497	2336	114	95	5	4.1
Sizewell Gap	394	8	4334	4055	152	127	4	3.1

25.4.15 Additional manual traffic counts were also undertaken in 2010 at key junctions along the proposed construction traffic route. The traffic counts took place at the following locations:

- The junction of Abbey Road (B1122) and Lover's Lane;
- The junction of Lover's Lane and Sizewell Gap and King Georges Avenue;

- Sizewell Gap in the vicinity of the proposed site access; and
- Just west of Sizewell village at the junction of the Sizewell power station access road and Sizewell Gap.

25.4.16 The traffic counts were carried out on Wednesday 10th February 2010 between the hours of 0630 and 0900 and again from 1700 to 1900. These times were chosen so that an assessment could be made of the peak traffic flows over a 24 hour period. Peak flows occurred between the hours of 0730 and 0830 for the morning peak and between 1700 and 1800 for the afternoon peak.

25.4.17 Collated traffic flow figures were then fed into a transport modelling programme (PICADY - Priority Intersection Capacity and Delay) in order to determine the operating conditions under existing traffic levels for the 'Priority Junctions[1]' at Abbey Road and Lover's Lane, and King Georges Avenue and Lover's Lane. Outputs are described in terms of 'RFC' (Reference of Flow to Capacity) which determines, as a proportion, the observed traffic flows compared to the road's capacity. Typically, a figure greater than 0.85 is indicative of a traffic problem (i.e. junction is already at 85% of its capacity). The second indicator is 'Queue' which assesses the maximum queue length, in terms of numbers of vehicles, over a given period (nominally 15 minutes).

25.4.18 The junction between Lover's Lane and Abbey Road, following assessment, was determined to have sufficient capacity for additional traffic movements, arising from daily fluctuations in volume and projected growth in vehicle numbers into the near future. **Table 25.6** summarises the outputs of the modelling. Maximum queue figures indicate that this junction is at 10% of its capacity in the AM peak and 70% of its capacity in the PM peak, i.e. well below the 85% which is indicative of a potential traffic issue. 'Delay' indicates the time in seconds that vehicles have to wait at the junction at current traffic levels.

Table 25.6 Summary of junction modelling between Abbey Road and Lover's Lane

Network link	Weekday morning ('AM') Peak (0730 – 0830)			Weekday afternoon ('PM') Peak (1600 – 1700)		
	RFC	Queue (no. of cars)	Delay (seconds)	RFC	Queue (no. of cars)	Delay (seconds)
Lover's Lane	0.071	0.1	1.1	0.066	0.1	1.0
Abbey Road	0.062	0.1	1.3	0.399	0.7	9.8

[1] The location of priority junctions was agreed with the LHA, and their locations are shown on **Figure 25.1**.

25.4.19 An assessment was also undertaken using PICADY for data collected at the junction of King Georges Avenue and Lover's Lane, due east of Leiston. **Table 25.7** summarises the outputs of the modelling. Maximum queue figures indicate that this junction is at 70% of its capacity in the AM peak and 0% of its capacity in the PM peak indicating available capacity for short-term (i.e. weekly) fluctuations in traffic volumes as well as longer-term traffic growth.

Table 25.7 Summary of junction modelling between King Georges Avenue and Lover's Lane

Network link	Weekday morning ('AM') Peak (0730 – 0830)			Weekday afternoon ('PM') Peak (1600 – 1700)		
	RFC	Queue (no. of cars)	Delay (seconds)	RFC	Queue (no. of cars)	Delay (seconds)
King Georges Av	0.423	0.7	10.4	0.032	0.0	0.5
Lover's Lane.	0.039	0.0	0.6	0.048	0.0	0.7

Other traffic data used to develop the baseline environment (refer to **Appendix 25.A** for further details)

Sizewell A decommissioning traffic

25.4.20 Sizewell A power station ceased generating electricity on the 31st December 2006, at which point decommissioning began. However some operational staff will remain up until 2019 when the facility will enter a 'care and maintenance' phase. Sizewell A employed over 500 people when fully operational and it is anticipated that the workforce will gradually reduce to almost zero by 2019. Therefore, the number of staff still working at Sizewell A during the construction of the GWF onshore works is estimated to be 250 (refer to **Table 25.8**) .

25.4.21 Additionally, the Sizewell A Decommissioning ES (British Nuclear Group, 2005) details the expected number of Heavy Goods Vehicle (HGV) movements associated with the period leading up to 2019 (the 'care and maintenance preparation' phase of the project). The ES reports a maximum of 54 associated HGV movements per day although the times at which this peak will be reached are not clarified.

25.4.22 **Table 25.8** shows the expected daily vehicle movements related solely to Sizewell A care and maintenance preparation, for the three modelled scenarios; the figures are exclusive of movements associated with the proposed onshore works for GWF.

Table 25.8 Anticipated daily one-way vehicle movements associated with Sizewell A

2014 'peak' construction phase for GWF	Construction compete - 2015
250 staff trips	200 staff trips
54 HGV trips	45 HGV trips
304 total trips	**245 total trips**

25.4.23 The peak hour vehicle movements (i.e. between 0730 and 0830 and between 1600 and 1700) have been calculated based upon manual counts of all vehicles entering the site during October 2004 (as reported in the Sizewell A decommissioning ES). The manual counts were taken for hourly periods, on the hour, and fed into model simulations for the future project phases. The projected vehicle number peaks associated with Sizewell A only, for the 2014 assume worst case 'peak construction' phase, are shown in **Table 25.9**.

Table 25.9 Modelled peak time vehicle movements associated with Sizewell A only, for 2014

Time	Cars	HGV's	Total
Vehicles entering Sizewell A site			
0730 - 0830	88	6	**94**
1600 - 1700	3	1	**4**
Vehicles exiting Sizewell A site			
0730 - 0830	4	1	**5**
1600 - 1700	93	4	**97**

25.4.24 Similarly, modelling simulations were run for the 2015 'GWF construction complete' scenario. The anticipated reduction in staff numbers as the site progresses through its care and maintenance preparation phase of decommissioning are reflected in the model output as shown in **Table 25.10**.

Table 25.10 Modelled peak time vehicle movements associated with Sizewell A only, for 2015

Time	Cars	HGV's	Total
Vehicles entering Sizewell A site			
0730 - 0830	68	5	**73**
1600 - 1700	2	1	**3**
Vehicles exiting Sizewell A site			
0730 - 0830	4	1	**5**
1600 - 1700	71	1	**72**

Sizewell B operational traffic

25.4.25 Sizewell B is fully operational and is expected to remain so until 2035. The plant is operational 24 hours a day and employs in the region of 525 full time staff. Data on the volume of traffic generated by Sizewell A and B is taken from the Sizewell A Decommissioning ES and was recorded using an ATC (Automatic Traffic Count) loop located at the main entrance to both power stations recording daily and hourly totals over a seven day period, again in October 2004. Vehicle type (car or HGV) is not differentiated in the data.

25.4.26 The vehicle movements associated with the Sizewell A manual counts (October 2004) were then subtracted from the automated traffic counts to show movements associated with Sizewell B in isolation. The highest number of movements was recorded on the Wednesday of the survey week which is taken as a representative 'worst case' scenario for peak vehicle numbers. Peak time vehicle movements, associated with Sizewell B, are shown in **Table 25.11**.

Table 25.11 Peak time vehicle movements attributable to Sizewell B (2004)

Time	Vehicles entering	Vehicles exiting	Total
Morning peak hours			
0730 - 0830	222	10	**232**
Afternoon peak hour			
1600 - 1700	7	274	**281**

25.4.27 These peak hour figures for Sizewell B are assumed to be constant throughout the proposed GWF works.

Greater Gabbard Offshore Wind Farm

25.4.28 The construction workforce for GGOWF had an average of 45 workers per day (data provided by Greater Gabbard Offshore Wind Farm Ltd – February 2011). This has been included within the present day baseline traffic numbers, but given that the GGOWF construction phase will be completed during 2011 these traffic numbers are not expected to be relevant to the assumed the worst case scenario construction year for GWF (2014).

Predicted traffic growth (refer to **Appendix 25.A** for further details)

25.4.29 Regional growth in traffic levels will increase baseline vehicle numbers against which the assessments and projections are carried out. Using TEMPRO 6.2 software, traffic growth figures have been calculated for each of the future scenarios as shown in **Table 25.12**. The wider focus of the projections undertaken by this software mean longer morning and evening peak times are quoted, reflecting county- and region-wide patterns in commuting.

Table 25.12 Projected growth in 'background' traffic levels for future scenarios

Year of assessment	Traffic growth factor	
	Weekday AM peak period (0700 - 0859)	Weekday PM peak period (1600 - 1859)
2014 'worst case construction phase'	1.0348	1.0404
2015 'construction complete'	1.0432	1.0498

25.4.30 A range of uncertainties must be borne in mind when considering projected future traffic growth. Numerous factors can influence vehicle levels at local, regional and national levels and over a range of timescales. Such factors may include changes to road layouts and junctions, the construction of new routes or bypasses, presence or absence of schools, shops and medical facilities, new housing developments, and issues such as fuel prices and availability of sustainable transport.

25.4.31 A delay in the proposed programme of works (i.e. slippage into the following years) is not expected to result in any additional impact in terms of vehicle numbers and traffic flows. Should the peak construction phase fall during 2015 or later, rather than 2014, whilst set against marginally increasing background traffic levels, there will be a net reduction in traffic levels associated with Sizewell A as it is decommissioned.

Accident data

25.4.32 Accident data provided by Suffolk County Council for the extent of the proposed route were analysed. This enabled the identification of any accident hotspots within the study area and in proximity to the proposed development. Accident data were provided for the period 2005 to 2008. The data indicated that there were a total of 30 personal injury accidents along, and in the vicinity of, the proposed construction route during the three year period of analysed data.

25.4.33 Out of the 30 accidents, 19 were classified as slight injury, 9 were classified as serious and 2 were fatal. This data has been used to assess the accident rate and to compare the relative safety of the construction traffic route to national benchmarks.

25.4.34 Vehicle speed data provided by automatic counts undertaken by Suffolk County Council have been analysed, and are summarised in **Table 25.13**. The Middleton Road and Leiston Road sections of the B1122 have national speed restrictions (60mph), whilst localised sections of the route have 30mph and 40mph limits depending upon highway characteristics and local settlements.

Table 25.13 Mean traffic speeds along the proposed access route

Location	Mean traffic speed (mph)	85th percentile speed (mph)
A12 south of Yoxford	37.5	43.5
B1122 east of Yoxford	51.4	48.9
B1122 south of Theberton	35.8	42.2
Lover's Lane	No data available	No data available
Sizewell Gap	No data available	No data available

25.4.35 Observed 85th percentile speeds along the B1122 were recorded at their highest along the Middleton Road section of the route where they varied between 47mph and 50mph (60mph limit). South of Theberton, the 85th percentile speed varied between 40mph and 44mph (60mph limit – following 30mph limit through Theberton itself). As such, average vehicle speeds fall within the accepted Association of Chief Police Officers (ACPO) limits.

Public and sustainable transport infrastructure (refer to **Appendix 25.A** for further details)

25.4.36 A review of the local public transport network was undertaken in order to assess the options available for utilising more sustainable modes of transport during the construction process.

25.4.37 The availability of public transport in and around the study area is limited, as would be expected given the rural nature of the site. The Saxmundham to Leiston service (No. 195) extends its route to Sizewell village twice daily on weekdays. Other than this service, the nearest regularly serviced bus stop is in the centre of Leiston (High Street), a distance of 1.8 miles or approximately 30 minutes walk to Sizewell. An overview of local bus services is provided in **Table 25.14**.

Table 25.14 Overview of public transport (bus) services in the vicinity of the proposed access route

Service No.	Route/destination	Frequency	Stop location
64	Ipswich – Woodbridge – Saxmundham – Leiston - Aldeburgh	Hourly (not 24hrs)	Leiston High Street
165	Ipswich – Woodbridge – Melton - Leiston	3 trips per day	Leiston High Street
196	Saxmundham – Yoxford – Middleton - Leiston	1 trip per day	Leiston High Street
563	Norwich – Brooke – Saxmundham – Leiston - Aldringham	1 trip on Thursdays only	Leiston High Street
626	Aldringham – Leiston – Middleton - Lowestoft	1 trip on Tuesdays only	Leiston High Street

25.4.38 It is not anticipated that existing local bus services would offer a viable option for construction staff travelling to and from the site given the distance to Leiston High Street, the frequency of services, and the times of day that they operate.

25.4.39 Direct travel by rail to the site is not considered to provide a viable option for construction staff. Sizewell power station does utilise a rail link (a spur of the Lowestoft to Ipswich line from Saxmundham) for transporting fuel flasks which terminates to the east of Leiston. However, there are currently no provisions for passenger services along the spur. The closest passenger station is Saxmundham, 6.4 miles west of Leiston, and roughly a 30 minute cycle ride from the construction site. As detailed in **Table 25.13**, the No. 64 bus service links Leiston with Saxmundham station.

25.4.40 Saxmundham station is served by National Express East Anglia with trains operating on the Ipswich to Lowestoft route. Services run approximately hourly (in both directions) throughout the week, and onward connections to London Liverpool Street are possible with a change in Ipswich.

25.4.41 A footway runs along the south side of Sizewell Gap and continues along King Georges Avenue in the direction of Leiston. The footway is not lit to the east beyond the developed extent of Leiston. Guidance provided by the Institute for Highways and Transportation suggests that a maximum distance for walking to work is 2km. The proposed construction site lies approximately 2.4km east of the centre of Leiston and therefore options for walking are considered to be limited when considering the distance and lack of street lighting.

25.4.42 Cycling provision is better than would be expected in a comparable rural area, primarily due to the cycle way (albeit unlit) which runs along Sizewell Gap between Leiston and Sizewell village. A journey of 5km is widely considered in local and national guidance to be a 'reasonable' commuting distance by bicycle and one where cycling could reasonably replace a car journey for commuters. This is reflected in Planning Policy Guidance (PPG) document 13 (Transport) where local authorities are encouraged to facilitate a modal shift away from drive-alone vehicles and towards more sustainable modes of transport such as cycling.

25.5 Assessment of Impacts – Worst Case Definition

25.5.1 Within the onshore development footprint appreciable flexibility is only permitted within the GWF compound, transmission compound and onshore cable corridor. Flexibility within the two compounds applies to equipment / building location and the finished floor level. Since this assessment considers the impact of the entire footprint of both compounds this flexibility is not relevant to the traffic and transport assessment.

25.5.2 Flexibility within the cable corridor permits the permanent works to lie within a defined overall extent of the temporary works. Since this assessment considers the impact of the entire temporary works, and there is no distinction between that temporary or permanent nature, the flexibility is not relevant to this assessment.

25.5.3 The most intensive periods of traffic generation will be associated with the construction of the GWF compound and the transmission compound. These are referred to together as the 'GWF substation' but represent two distinct construction elements. Each compound is expected to have a construction period of 12 months (i.e. 24 months in total); however it is possible that both elements could be constructed at the same time. As such, the assessment of traffic has assumed the worst case scenario that both sets of construction traffic will be present during a single 12 month period.

25.5.4 Full details on the range of flexibility being considered by GWFL are provided in **Chapter 5 Project Details**. The proposed onshore development footprint is as presented in **Figure 1.3**.

25.6 Assessment of Impacts during Construction

Construction traffic context - Heavy Good Vehicles

25.6.1 Standard operational hours on the construction site will be from 0700 to 1900; taking into account an additional one hour start up and shut down period for fuelling, site preparation etc, which will be adopted throughout the construction period. However, a normal working day for the majority of site staff falls between 0730 and 1700, with the associated journeys taking place during the peak times identified.

25.6.2 **Table 25.15** presents a breakdown of the HGV movements predicted during the proposed GWF onshore works.

Table 25.15 Anticipated vehicle movements associated with GWF onshore works

Activity*	Deliveries	Two-way movements
Site preparation	1315	2630
Substation** construction	2650	5300
Onshore cabling	300	600
Transition bays	30	60
HDD works	100	200
Site demobilisation	213	426
TOTAL	**3608**	**7216**

* Some of these activities will overlap.

** This includes the construction of both the GWF and transmission compounds and associated infrastructure, e.g. sealing end compounds.

25.6.3 The most intensive period of HGV movements will take place during the substation construction phase. The average HGV activity during an assumed worst case 12 month period will be approximately 2.5 HGV movements per hour. A breakdown of this period is provided within Table **25.16**.

25.6.4 There will, however, be periods of increased HGV movements associated with a number of continuous concrete pours required for the substation build. Six of these are expected for the internal roads within the substation site, three for the GWF compound transformer bays, and two for the transmission compound super grid transformer bays and bunding.

25.6.5 The pours associated with the substation roads will each last for approximately 5 hours, and typically require 20-30 lorry deliveries (40-60 lorry movements), approximating to between 8 and 12 lorry movements per hour.

25.6.6 The three pours associated with the substation transformer bays will each last for up to 18 hours, and will require 40 lorry deliveries (80 lorry movements), i.e. 4.5 lorry movements per hour.

25.6.7 The two pours associated with the super grid transformer bay will each last for up to 8 hours, and will require 60 lorry deliveries (120 lorry movements), i.e. 15 lorry movements per hour.

Table 25.16 Substation HGV movement breakdown

Activity	Total HGV movements	Duration	Daily Average	Daily Max.	Hourly average	Hourly max
Internal roads	280	6 days (5 hours each pour)	46.7	60	9.34	12
Transformer bays	240	3 days (18 hours each pour)	80	80	4.5	4.5
Super grid transformer bay	240	2 days (8 hours each pour)	120	120	15	15
Remaining Activities	4540	52 week period	17.5	24	2.2	3
Total	**5300**	**52* weeks**	**20.4**	**144**	**2.5**	**15**

* assumed worst case substation construction period

25.6.8 The average number of HGV movements per hour during this period will be approximately 2.5. There will be 11 days when lorry numbers will significantly increase due to the requirement of concrete pours. The maximum number of HGV movements is not expected to exceed 144 per day (i.e. 72 deliveries), and this will only occur during two days of the most intense assumption of a 12 month substation construction.

25.6.9 In order to assess the potential impact on the local road network, this peak value of 144 HGV movements has been used as the worst case scenario.

Construction traffic context - all vehicles

25.6.10 In addition to HGV deliveries, the number of construction staff required for the onshore works are estimated to average between 40 and 50 per day, with increases anticipated at certain stages of the works. Construction and commissioning of the substation (2014 worst case scenario) will require the greatest number of workers, estimated to be between 85 and 95 staff. The 90th percentile figure of 90 workers has subsequently been used to determine resultant traffic levels.

25.6.11 As such, the highest anticipated traffic numbers (which will only potentially be experienced on two days during the assumed worst case scenario 12 month substation construction) comprise:

- 90 return trips for construction staff (180 movements overall);
- 72 HGV deliveries (144 movements overall); and

- 8 abnormal loads deliveries (16 movements overall).

25.6.12 This indicates a maximum of 340 vehicle movements.

25.6.13 The projected increases in all traffic associated with the construction of GWF, i.e. both car and HGV traffic, are presented within **Table 25.17**. This shows the expected average daily traffic flows along the proposed construction traffic route for 2014 (the assessed year of the substation build) with and without the GWF construction traffic. Both average and maximum increases in traffic are presented. Maximum construction traffic levels represent the most intensive construction traffic period, which will only be experienced during the most intensive concrete pours. **Table 25.17** also shows the expected average increase in construction traffic, i.e. the expected increase in traffic levels for the rest of the substation build.

Table 25.17 Baseline traffic flows ('without construction') and baseline plus peak construction traffic flows ('with construction') on the assessed road network

	2014 (TEMPRO growth)				2014 (assumed worst case)				
	Base Flow				Base Flow + Development			Percentage Increase (%)	
	AAWT	AAWT HGV	AAWT HGV		AAWT	AAWT HGV	AAWT HGV		
Location	18hr	18hr	% HGV		18hr	18hr	% HGV	AAWT	AAWT HGV
A12 South of Yoxford	13660	991	7.3	Max	13984	1101	7.9	2.4	11.1
				Av	13770	1011	7.3	0.8	2.0
A12 North of Yoxford	9862	1076	10.9	Max	10186	1186	11.6	3.3	10.2
				Av	9972	1096	11.0	1.1	1.9
B1122 Middleton Rd	3497	587	16.8	Max	3821	697	18.2	9.3	18.7
				Av	3607	607	16.8	3.1	3.4
B1122 Leiston Road	6656	550	8.3	Max	6980	660	9.5	4.9	20.0
				Av	6766	570	8.4	1.7	3.6
Lover's Lane	2547	117	4.6	Max	2871	227	7.9	12.7	94.0
				Av	2657	137	5.2	4.3	17.1
Sizewell Gap	4422	155	3.5	Max	4746	265	5.6	7.3	71.0
				Av	4532	175	3.9	2.5	12.9

25.6.14 To accurately assess the impact of the assumed worst case 2014 peak construction period, staff commuter journeys have been inputted into the model occurring during the AM and PM peaks (between 0730 and 0830 and between 1600 and 1700). Vehicle movements associated with the construction process (i.e. deliveries of plant and materials) have been distributed evenly throughout the working day. It is assumed that abnormal loads will not arrive during the AM or PM peaks.

Construction traffic context - vehicular access

25.6.15 Vehicular access for the onshore works will be via the existing junction on Sizewell Gap. The layout for the junction and access was designed for the GGOWF onshore works.

25.6.16 The largest abnormal loads will be the delivery of two 400/132kV voltage super grid transformers, weighing in the region of 170 tonnes each. Consideration of condition, alignment, and other route constraints such as railway bridges and buildings has been considered through a swept path analysis (Allelys Heavy Haulage, 2011). The analysis was undertaken in agreement with the Highways Agency, Local Highway Authority (SCC) and Network Rail who have confirmed that the proposed route is suitable for this type of abnormal load. Abnormal load movements will need to take place outside of peak hours. The exact timing of deliveries will be agreed with the appropriate police authorities but will be timed to avoid adverse impacts upon existing traffic levels. The need to undertake any works at the weekend will be kept to an absolute minimum. A localised swept path analysis has also been carried out to confirm that the kerbline on the existing GGOWF bellmouth does not need to be amended.

Construction traffic context - projected vehicle movements

25.6.17 **Table 25.18** presents the projected numbers of all vehicle trips associated with GGOWF, Sizewell A decommissioning, Sizewell B operation and GWF construction / operation over the present day and two future scenarios (2014 and 2015) during the AM peak. **Table 25.19** presents the projected figures for the PM peak.

25.6.18 These figures also include the estimated vehicle movements attributable to the construction of the Sizewell B Dry Fuel Store. Figures related to this development present a worst-case scenario of both a delay in the Dry Fuel Store construction (construction is scheduled to be complete during 2013) and that the traffic related to the construction would all arrive and depart during the AM and PM peak periods.

25.6.19 Abnormal loads will not arrive during the identified ‘peak hours’ and as such have not been included within the assessment. The 99 arrivals for the GWF onshore works will be comprised of the estimated 90 construction staff arrivals plus 9 HGV deliveries (of the 72 expected daily during peak construction); the latter comprising the 9 departures during the morning peak.

Table 26.18 Projected vehicle movements for future scenarios (all sites) for AM peak

Weekday Morning Peak Hours (0730 – 0830)						
Land parcel	**2010 'present day' scenario**		**2014 'worst case construction phase' scenario**		**2015 'construction complete' scenario**	
	Arr	**Dep**	**Arr**	**Dep**	**Arr**	**Dep**
GGOWF onshore works	45	-	-	-	-	-
GWF onshore works	-	-	99	9	-	-
Sizewell A decommissioning	150	9	94	5	73	5
Sizewell B ongoing operation	222	10	222	10	222	10
Sizewell B Dry Fuel Store	-	-	35	2	-	-
Total (each way)	**417**	**19**	**450**	**43**	**295**	**15**
Total movements	**436**		**493**		**310**	

Table 26.19 Projected vehicle movements for future scenarios (all sites) for PM Peak

Weekday Afternoon Peak Hours (1600 – 1700)						
Land parcel	**2010 'present day' scenario**		**2014 'worst case construction phase' scenario**		**2015 'construction complete' scenario**	
	Arr	**Dep**	**Arr**	**Dep**	**Arr**	**Dep**
Greater Gabbard onshore works	-	45	-	-	-	-
GWF onshore works	-	-	9	99	-	-
Sizewell A C&M preparation	5	154	4	97	3	72
Sizewell B ongoing operation	7	274	7	274	7	274
Sizewell B Dry Fuel Store	-	-	2	35	-	-
Total (each way)	**12**	**473**	**22**	**505**	**10**	**346**
Total movements	**485**		**527**		**356**	

25.6.20 The figures presented in **Tables 25.18** and **25.19** show that traffic associated with the proposed GWF substation construction works will peak in the assessment year (2014) at the height of construction works, and then fall to zero following completion of the construction phase. This is set against an overall trend of reducing traffic levels along the proposed construction traffic route owing to the completion of works related to GGOWF and ongoing reductions in staff numbers as preparations for the Sizewell A 'care and maintenance' decommissioning phase progress.

Driver delay at priority junctions

25.6.21 To assess the impact of the proposed development, a comparison of baseline vehicle trips during the identified peak periods was undertaken (refer to **Section 25.4** for details of how the baseline model was developed). This compared the existing flows with the identified vehicle trips for the 2014 'Worst Case Construction' scenario and 2015 'Construction Complete' scenario.

25.6.22 To assess the impact of the proposed development on the two key local junctions within the study area (i.e. the proposed construction traffic route) during construction, those junctions have been reappraised. The junctions assessed are:

- Abbey Road and Lover's Lane (B1122 north of Leiston); and
- King Georges Avenue and Lover's Lane (due east of Leiston and at the start of Sizewell Gap).

2014 'Worst Case Construction Phase' scenario

25.6.23 The junction of Abbey Road and Lover's Lane has been assessed against the background of theoretical capacity using the computer program PICADY (used for all model runs). **Table 25.18** summarises the results of the modelling exercise for the 2014 'Worst Case Construction Phase' scenario for traffic conditions during each of the identified AM and PM weekday peak hours respectively.

25.6.24 The results in **Table 25.20** indicate that the existing junction will continue to operate with minimal use of the theoretical capacity (refer to **Table 25.5** for baseline figures), and with no discernable queuing under the proposed development traffic flows.

25.6.25 **Table 25.21** summarises the results of the modelling exercise for the 2014 'Worst Case Construction Phase' scenario for the junction of King Georges Avenue and Lover's Lane. Outputs of the modelling indicate that the junction would continue to operate well within theoretical capacity (refer to **Table 25.5** for baseline figures) and also within the optimum threshold (0.85) with no discernible queuing.

Table 25.20 Impact of proposed works upon Lover's Lane and Abbey Road junction

2014 'worst case construction phase' scenario						
Network link	Weekday AM peak period (07.30-08.30)			Weekday PM peak period (16.00-17.00)		
	RFC*	Queue (no. of cars)	Delay (seconds)	RFC	Queue (no. of cars)	Delay (seconds)
Lover's Lane	0.060	0.1	0.9	0.373	0.6	12.7
Abbey Road	0.059	0.1	1.3	0.029	0.0	1.2

* RFC – Reference of Flow to Capacity

Table 25.21 Impact of proposed works upon Lover's Lane and King Georges Avenue junction

2014 'worst case construction phase' scenario						
Network link	Weekday AM peak period (07.30-08.30)			Weekday PM peak period (16.00-17.00)		
	RFC*	Queue (no. of cars)	Delay (seconds)	RFC	Queue (no. of cars)	Delay (seconds)
King Georges Avenue	0.388	0.6	9.1	0.016	0.0	0.2
Lover's Lane	0.044	0.0	0.7	0.053	0.1	0.8

* RFC – Reference of Flow to Capacity

25.6.26 The results of the junction capacity analysis demonstrate that vehicle movements generated by the proposed GWF onshore works can be comfortably accommodated at these priority road junctions. The analysis also demonstrates an anticipated reduction in vehicle movements within the study area against the 2010 baseline, attributable to reducing staff numbers at Sizewell A and completion of construction works associated with GGOWF.

25.6.27 Given that these junctions will continue to operate with minimal use of their theoretical capacity, and with no discernable queuing under the proposed development traffic flows, the magnitude of the impact is considered as negligible. Given that the sensitivity of the road network is regional, an effect of **negligible significance** to driver delay at priority junctions is predicted.

Highway safety

25.6.28 The accident rate for the proposed construction traffic route (and sample lengths of the A12 linking the nearest settlements) has been calculated in accordance with the IHT guidelines (IHT, 1999) using the following formula.

$$Accident.rate = \frac{Number.of\ .accidents.in.3.years}{(3 \times length.of\ .link.km) \times (Traffic.\ flow.vehicles.per.year)}$$

25.6.29 The calculated accident rate for each of the links is summarised in **Table 25.22**.

Table 25.22 Construction traffic route accident rates

Link	No. of Accidents 2005-2008	Accidents/year	Annual Average Daily Traffic	km	Accident rate per 10^8 veh - km	Intervention threshold per 10^8 veh - km
A12 South of Yoxford	7	2.33	13276.69	9.1	5	30
A12 North of Yoxford	8	2.67	9585.46	8.9	9	30
B 1122 Middleton Road	1	0.33	3328.11	4.2	7	44
B1122 Leiston Road	9	3.00	6333.78	4.6	28	44
Lover's Lane	1	0.33	2497.00	2.2	17	46
Sizewell Gap	4	1.33	4054.82	1.7	53	46

25.6.30 From this data, it could be concluded that Sizewell Gap has an accident rate considered to be above the intervention threshold (53 compared to 46) and therefore significant. Further examination of the causation factors for each accidents has been undertaken to establish if there is a pattern emerging that could be exacerbated by the introduction of construction traffic.

25.6.31 Four accidents have occurred on Sizewell Gap in the three year period under consideration, which are summarised within **Table 25.23**.

Table 25.23 Sizewell Gap accident summary

Ref:	Description	Time
L0001265	Single vehicle loss of control – icy road	21:00 hrs, Saturday
L00013915	Vehicle loses control and hits stationary vehicle	21:35 hrs, Monday
L00013813	Vehicle overtakes stationary refuse truck and collides with oncoming vehicle	10:00 hrs, Friday
L00014116	Single motorcycle loses control on bend and hits pedestrian on footpath	Time not given, Thursday

25.6.32 This information indicates that there is no pattern to the accidents occurring on Sizewell Gap. The two 'loss of control' accidents have occurred outside the construction shift hours so it is considered the development will have no additional impact on this type of accident (possible inappropriate speeds on low traffic roads).

25.6.33 Therefore it is considered that construction traffic will have **no impact** on highway safety.

Pedestrians

Pedestrian severance

25.6.34 **Table 25.17** demonstrates that the maximum increase in total traffic flow is 12.7% at Lover's Lane during the most intensive construction period and below 10% on the rest of the proposed construction route during the most intensive period. IEA guidelines suggest that only changes in traffic flow of 30% or more are likely to produce changes in pedestrian severance (IEA, 1993). An increase above 10% is considered a low magnitude effect. At all other locations the increase in traffic is below 10% and represents a negligible magnitude effect during the most intensive construction period. Average traffic increases, i.e. outside of the concrete pours, are well below 10% and represent an effect of negligible magnitude along the whole construction traffic route.

25.6.35 As such, a **minor adverse impact** is predicted, with regard to pedestrian severance along Lover's Lane, but only during the most intensive construction period. A **negligible impact** is predicted throughout the rest of the proposed construction traffic route, and associated with the expected average traffic increases due to construction (outside of the peak construction period).

Pedestrian amenity

25.6.36 Pedestrian amenity is also negatively impacted when there is a significant increase in HGV flows. Typically this equates to a doubling of flows to register an impact.

25.6.37 **Table 25.17** indicates that Lover's Lane experiences a 94% increase and Sizewell Gap a 71% increase during maximum construction activity, i.e. activity associated with the small number of concrete pours. Whilst below 100% these are conservatively considered sufficient to constitute a doubling of HGV flows and represent a low magnitude effect. At all other road links the effect is significantly lower and considered to represent a negligible effect on pedestrian amenity. These effects are expected to only occur for two days during the construction phase, the average HGV increases are much lower with the highest predicted to be 17% along Lover's Lane, which falls well below the threshold level to register an impact.

25.6.38 The proposed construction traffic route is considered to be of regional importance. As such, a **minor adverse impact** upon pedestrian amenity is predicted along Lover's Lane and Sizewell Gap, but only during the most intensive concrete pours (expected to be experienced for no more than two days during the assumed worst case scenario 12 month substation construction). Along the remainder of the proposed construction traffic route the effect is assessed as **negligible**.

25.6.39 Outside of the most intensive construction activity (the continuous concrete pours) a **negligible impact** is predicted to pedestrian severance along the proposed construction traffic route.

Mitigation and residual impacts

25.6.40 A Construction Traffic Management Plan[2] will be developed in consultation with Suffolk County Council as part of an overall Construction Code of Practice which will be enforceable through the Development Consent Order. This will include the following measures:

- Phasing deliveries to ensure that HGV movements are evenly spread through the day to avoid unnecessary traffic congestion;
- Ensuring HGVs and abnormal loads use the prescribed construction traffic route;
- Providing details of how the agreed construction traffic route will be identified for deliveries and how this will be monitored to ensure that traffic does not choose alternative routes;
- Timing of continuous pours (in consultation with the local community and Suffolk County Council) to avoid known periods of peak traffic activity and to avoid major community activities; and
- Introduction of traffic calming measures (speed restrictions) along Lover's Lane and Sizewell Gap, to minimise pedestrian severance. This is in line with suggestions received from local residents during formal consultation.

25.6.41 The implementation of these measures will not reduce the actual traffic numbers, and a **minor adverse residual impact** is expected to remain with respect to pedestrian severance.

25.6.42 However, traffic calming measures, whilst not physically reducing HGV numbers during the most intensive period of construction, are considered to influence the potential magnitude of the effect on pedestrian amenity. Given that HGV increases are actually just below the threshold to register an impact, the addition of traffic calming measures is considered to add more

[2] An operational Travel Plan is not deemed necessary given that there will be no permanent staff based at the site.

confidence that the HGV increases actually represent a negligible magnitude effect on pedestrian amenity as detailed in **Table 25.3**. As such, a **negligible residual impact** is predicted upon pedestrian amenity during the most intensive construction activity (a concrete pour expected to last no more than two consecutive days). All other traffic impacts will remain as **negligible/no effect**.

25.7 Assessment of Impacts during Operation

25.7.1 The proposed onshore element of GWF will not require any staff to be permanently based on site during its operational phase. The substation and associated infrastructure will be controlled remotely from operations centres outside of the area, which will oversee all monitoring and operation activity for both GWF and GGOWF.

25.7.2 Therefore, it is not anticipated that these onshore works will result in any increase in traffic volumes once the scheme becomes operational other than those associated with infrequent maintenance works. Routine maintenance inspections will occur at pre-determined periods (often on an annual or longer basis) based upon the maintenance regimes of the installed equipment; transformers, switchgear and capacitors. It is envisaged that the maintenance works will normally only require site visits by Light Goods Vehicles. Any major equipment failure necessitating removal will require the use of suitable mobile cranes. These occasional trips have not been incorporated into the traffic models since they are only likely to occur infrequently. As such, **no impacts** are expected during operation.

25.8 Assessment of Impacts during Decommissioning

25.8.1 When GWF is decommissioned it will adhere to any future or modified legislation relevant at that time. The specific onshore decommissioning processes are expected to include:

- Export cables between the landfall and the substation site will be disconnected and left in situ;
- Any equipment installed within the onshore transition bays will remain in situ, unless otherwise agreed with the relevant planning authority;
- The above ground substation assets (comprising the GWF compound and the transmission compound) will be dismantled and removed from site;
- The substation foundations will be removed to 1m below ground level; and
- The landform will be retained.

25.8.2 The dismantling of the main building structures will require large numbers of HGV movements. However, there will not be any requirement for the peak

HGV movements that were associated with the continuous concrete pours during the construction phase as removal would be on a more disparate basis. A significant proportion of any imported earthworks would also not be removed during decommissioning.

25.8.3 As such, any effects would be of a similar nature to those expected for the average construction traffic, rather than the peak construction traffic. As such, any impacts upon traffic and transport are anticipated to be **negligible** during decommissioning. Provided that a Traffic Management Plan is developed, and agreed with Suffolk County Council, capturing the measures outlined in **Section 25.6.40** this will ensure that a **negligible residual impact** is observed during the decommissioning of GWF.

25.9 Inter-relationships

25.9.1 **Table 25.24** summarises those inter-relationships that are considered of relevance to traffic and transport and identifies where within the ES these other topics have been considered.

25.9.2 **Chapter 28 Inter-relationships** provides a more detailed holistic overview of the potential impacts that may manifest on traffic and transport receptors who are also subject to other impacts.

Table 25.24 Traffic and transport inter-relationships

Inter-relationship	Section where addressed	Linked Chapter
The relationship between traffic delay and traffic noise upon local residents	Section 26.6	Chapter 26 Noise
The relationship between traffic delay and traffic related air quality upon local residents	Section 27.6	Chapter 27 Air quality

25.10 Cumulative Impacts

25.10.1 The unmitigated impacts identified during the construction of GWF (**Section 25.6**) that have the potential to result in cumulative effects comprise:

- Minor adverse impact with respect to pedestrian severance and amenity due to increased traffic during the peak construction period (during the continuous concrete pours).

25.10.2 No impacts with effects above negligible are anticipated for the operational and decommissioning phases of the project as per **Sections 25.7** and **25.8**.

GWF construction and other onshore activities

25.10.3 Other onshore activities in the study area include the GGOWF onshore electrical connection, Sizewell B Dry Fuel Store, proposed new nuclear development (Sizewell C) and the decommissioning of Sizewell A.

GGOWF onshore electrical connection

25.10.4 The construction of GGOWF will be completed in 2011/2012 and as such there will be no overlap with the construction phase of GWF. Therefore there will be no cumulative impact associated with the construction of GWF and the construction of GGOWF.

Sizewell B Dry Fuel Store

25.10.5 The construction of the Sizewell B Dry Fuel Store has the potential for the following relevant impacts (British Energy Generation Ltd, 2010):

- Minor adverse impact with respect to pedestrian severance due to increased traffic during the peak construction period (during the continuous concrete pours); and
- Moderate adverse impact with respect to pedestrian amenity due to increased traffic during the peak construction period (during the continuous concrete pours).

25.10.6 The Sizewell B Dry Fuel Store has a construction programme lasting 12 months between 2012 and 2013 (British Energy Generation Ltd, 2010). Should this construction phase slip to 2014 there is the potential for an overlap with the assessed GWF construction period.

25.10.7 Both developments have brief periods of intensive HGV movements (associated with continuous concrete pours). Should these periods overlap this could further increase the overall traffic and HGV traffic during these intensive periods, potentially affecting pedestrian severance and amenity.

Pedestrian severance

25.10.8 The Sizewell B Dry Fuel Store reports an increase in total traffic of 13.6% at Lover's Lane (British Energy Generation Ltd, 2010) associated with its most intensive construction period (five days of continuous concrete pours). Should this overlap with the 17% traffic increase associated with GWF's most intensive period this would lead to an increase in traffic above 30% which would represent an effect of medium magnitude based on the criteria set out in **Table 25.2**.

25.10.9 Traffic increases along other parts of the proposed construction route would also be elevated above the 10% threshold representing a low magnitude effect.

25.10.10 As such, a potential **minor adverse cumulative impact** upon pedestrian severance may be expected along much of the proposed construction traffic route, should the most intensive periods of construction activity of GWF and Sizewell B Dry Fuel Store overlap.

Pedestrian amenity

25.10.11 The Sizewell B Dry Fuel Store ES reports an increase in HGV traffic of 240% at Lover's Lane, and 180% at Sizewell Gap, associated with the five days of continuous concrete pours (British Energy Generation Ltd, 2010). Should this overlap with the 94% HGV increase at Lover's Lane and 71% HGV increase at Sizewell Gap associated with GWF's most intensive period this would lead to a total HGV increase well in excess of the 200% threshold as detailed in **Table 25.3**.

25.10.12 HGV increases along other parts of the proposed construction route would also be elevated above the 100% threshold representing a low magnitude effect.

25.10.13 As such, a potential **moderate adverse cumulative impact** may be expected at Lover's Lane and Sizewell Gap should the most intensive periods of construction activity (the continuous concrete pours) associated with GWF and Sizewell B Dry Fuel Store overlap. Along other parts of the proposed construction traffic route a potential **minor adverse cumulative impact** upon pedestrian amenity may be expected.

Mitigation and residual impacts

25.10.14 The development of detailed Traffic Management Plans for both developments will ensure that any requirement for intensive HGV movements will be agreed beforehand with Suffolk County Council and the local community to ensure that these periods do not overlap. As such, the residual impacts would be expected to remain as reported for construction, i.e. a **minor adverse residual impact** associated with pedestrian severance, and a **negligible residual impact** associated with pedestrian amenity is expected.

Sizewell A decommissioning

25.10.15 The decommissioning of Sizewell A has the potential for the following relevant impacts (British Nuclear Group, 2005):

- Slight adverse impact upon pedestrian safety at the junction between Lover's Lane and King George's Avenue during the decommissioning activities.

25.10.16 The main decommissioning activity associated with the decommissioning of Sizewell A is programmed to take place between 2009 and 2019 (British Nuclear Group, 2005).

25.10.17 GWF and Sizewell A decommissioning both have brief periods of intensive HGV movements. Should these periods overlap this could further increase the overall traffic and HGV traffic during these intensive periods, potentially affecting pedestrian severance.

Pedestrian severance

25.10.18 The Sizewell A decommissioning ES reports an increase in total traffic of 4.9% at the junction between Lover's Lane and King George's Avenue. Should these overlap with the 17% traffic increase associated with GWF's most intensive period this would lead to an total increase in traffic below the threshold of 30%. However combined with Sizewell B Dry Fuel Store traffic this would be above 30% but remain an effect of medium magnitude based on the criteria set out in **Table 25.2**.

25.10.19 As such, a potential **minor adverse cumulative impact** upon pedestrian severance on Lover's Lane may be expected should the most intensive periods of construction activity of GWF, Sizewell A decommissioning and Sizewell B Dry Fuel Store overlap.

Sizewell C

25.10.20 This proposed development is expected to be located to the north of the existing Sizewell power station infrastructure and is expected to result in a significant volume of associated traffic. Construction is not expected to begin on Sizewell C until approximately 2017 at the earliest. Should the GWF onshore construction works extend beyond 2017 there is the potential for a cumulative impact upon traffic and transport receptors. Given the absence of any details of the Sizewell C proposals it is not possible to undertake a quantitative assessment of this potential cumulative impact at this stage. However, it is highly unlikely that the periods of peak traffic activity for GWF and Sizewell C would overlap.

25.11 Monitoring

25.11.1 Construction traffic will be monitored through the implementation of a construction Traffic Management Plan, which will ensure that construction traffic uses the agreed construction traffic route and that HGV deliveries are phased throughout the day.

25.11.2 No other traffic monitoring is proposed.

25.12 Summary

25.12.1 **Table 25.25** provides a summary of the predicted impacts associated with the construction, operation and decommissioning of GWF, upon the local transport network.

Table 25.25 Summary

Description of Impact	Impact	Potential Mitigation Measures	Residual impact
Construction Phase			
Driver delay at priority junctions	Negligible	A construction Traffic Management Plan will be developed in agreement with Suffolk County Council (the Highways Authority). This will include: • Ensure that HGV movements are evenly spread through the day; • Ensuring HGVs and abnormal loads use the prescribed construction traffic route; • Timing of continuous pours to avoid known periods of peak traffic activity and to avoid major community activities; and • Introduction of traffic calming measures (speed restrictions) along Lover's Lane and Sizewell Gap.	Negligible
Pedestrian severance –peak construction period	Minor adverse		Minor adverse
Pedestrian severance (during the rest of construction)	Negligible		Negligible
Pedestrian amenity – peak construction period	Minor adverse		Negligible
Pedestrian amenity (during the rest of construction)	Minor adverse		Negligible
Reduction in Highway safety	No effect	n/a	n/a
Operation Phase			
Operational impacts	No impact	n/a	n/a
Decommissioning Phase			
Decommissioning	Negligible	A decommissioning Traffic Management	Negligible

Description of Impact	Impact	Potential Mitigation Measures	Residual impact
impacts		Plan will be developed in agreement with Suffolk County Council (the Highways Authority).	

25.12.2 The unmitigated impacts identified during the construction (**Section 25.6**), operation (**Section 25.7**), and decommissioning phases (**Section 25.8**) of GWF that have the potential to result in cumulative effects comprise:

- Minor adverse impact with respect to pedestrian severance and amenity associated with increased total traffic and increased HGV traffic during the construction of GWF.

25.12.3 Should the most intensive traffic periods of GWF, Sizewell B Dry Fuel Store and Sizewell A decommissioning overlap this will result in a potential **moderate adverse cumulative impact** upon pedestrian amenity and a **minor adverse cumulative impact** upon pedestrian severance.

25.12.4 The development of detailed Traffic Management Plans for all three developments will ensure that any requirement for intensive HGV movements will be agreed beforehand with Suffolk County Council and the local community to ensure that these periods do not overlap and that residual impacts revert to those reported for the construction phase. As such, a **minor adverse cumulative residual impact** associated with pedestrian severance, and a **negligible cumulative residual impact** associated with pedestrian amenity is expected.

25.13 References

Allelys Heavy Haulage (2011) Abnormal Indivisible Load Investigations and Route Inspection – Transportation of 240MVA 400/132kV Transformers to Leiston Substation

British Energy Generation Ltd (2010). Sizewell B Dry Fuel Store Environmental Statement.

British Nuclear Group (2005) Sizewell A Nuclear Power Station Environmental Statement

Department of Energy and Climate Change (2011a) Overarching National Policy Statement (NPS) for Energy (EN-1)

Department of Energy and Climate Change (2011b) NPS for Electricity Network Infrastructure (EN-5)

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Institute of Environmental Assessment (1993) Guidelines for the Environmental Assessment of Road Traffic

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