VikingLink

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UK Onshore Scheme

Environmental Statement

Volume 2 Document ES-2-C.09

Chapter 25

Traffic & Transport (Proposed Converter Station)

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Environmental Statement Volume 2			
ES Reference	**Chapter**	**Chapter Title**	
ES-2-A.01	Ch01	Introduction	
ES-2-A.02	Ch02	Development of the UK Onshore Scheme	
ES-2-A.03	Ch03	The UK Onshore Scheme	
ES-2-A.04	Ch04	Environmental Impact Assessment Methods	
ES-2-B.01	Ch05	The Proposed Underground DC Cable	
ES-2-B.02	Ch06	Intertidal Zone	
ES-2-B.03	Ch07	Geology & Hydrogeology	
ES-2-B.04	Ch08	Water Resources & Hydrology	
ES-2-B.05	Ch09	Agriculture & Soils	
ES-2-B.06	Ch10	Ecology	
ES-2-B.07	Ch11	Landscape & Visual Amenity	
ES-2-B.08	Ch12	Archaeology & Cultural Heritage	
ES-2-B.09	Ch13	Socio-economics & Tourism	
ES-2-B.10	Ch14	Traffic & Transport	
ES-2-B.11	Ch15	Noise & Vibration	
ES-2-B.12	Ch16	Register of Mitigation	
ES-2-C.01	Ch17	The Proposed Converter Station	
ES-2-C.02	Ch18	Geology & Hydrogeology	
ES-2-C.03	Ch19	Water Resources & Hydrology	
ES-2-C.04	Ch20	Agriculture & Soils	
ES-2-C.05	Ch21	Ecology	
ES-2-C.06	Ch22	Landscape & Visual Amenity	
ES-2-C.07	Ch23	Archaeology & Cultural Heritage	
ES-2-C.08	Ch24	Socio-economics & Tourism	
ES-2-C.09	**Ch25**	**Traffic & Transport**	
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Appendix 25.4 All Scenarios – Traffic Flows

Appendix 25.5 All Scenarios – Traffic Flow Diagrams (Percentage Increases)

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Glossary & Abbreviations

Glossary of Terms	
Term	**Meaning**
Base Traffic	The existing or future level of traffic, without additional construction traffic added.
Gravity Model	The method of assuming the origin of construction workers, based on the population of surrounding settlements.
Peak Construction Traffic	The highest number of vehicles expected during a certain period of the construction phase.
Traffic Distribution	The method of allocating construction traffic onto the surrounding road network.
Traffic Growth Factor	Applied industry standard traffic growth factor that accounts for background increases in traffic for a future assessment year.
Two-way vehicle movements	The total number of vehicles travelling in both directions as captured at an individual traffic count location.

List of Abbreviation	
Abbreviation	**Meaning**
AIL	Abnormal Indivisible Loads
ATC	Automatic Traffic Count
CDM	Construction Design and Management
CEMP	Construction Environmental Management Plan
CPH&SP	Construction Phase Health and Safety Plan
CTMP	Construction Traffic Management Plan
DC	Direct Current
DCO	Development Consent Order
DfT	Department for Transport
ES	Environmental Statement
HDD	Horizontal Direction Drilling
HGV	Heavy Goods Vehicle
IEMA	Institute of Environmental Management and Assessment
LCC	Lincolnshire County Council
LGV	Light Goods Vehicle
LHA	Local Highway Authority
NGVL	National Grid Viking Link

List of Abbreviation	
Abbreviation	**Meaning**
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRSWA	New Roads and Street Works Act
NTM	National Transport Model
TCA	Temporary Construction Areas
TCC	Temporary Construction Compounds
TCF	Temporary Construction Facilities
TCPA	Town and Country Planning Act
TSRGD	Traffic Signs Regulations and General Directions
ZoI	Zone of Influence

1 Introduction

1.1 Introduction

1.1.1 This chapter has been prepared by AECOM. It reports the results of baseline studies and the assessment of the potential impacts of the proposed converter station (including the proposed Alternating Current (AC) cable route and proposed permanent access road) on traffic and transport. Table 25.1 below sets out the structure of the Environmental Statement (ES) with respect to Traffic & Transport.

1.1.2 Traffic and transport impacts are interrelated with Noise and Vibration impacts, reference should also be made to ES-2-C.10, Volume 2 Chapter 26 and with the cumulative effects; reference ES-2-D.01, Volume 2, Chapter 28.

Table 25.1 Environmental Statement: Traffic and Transport

ES Reference	ES Volume	ES Chapter	Content
ES-2-B.10	2	14	Main Report: Proposed Underground DC Cable
ES-2-C.09	**2**	**25**	**Main Report: Proposed Converter Station**
ES-3-B.01	3	14	Figures: Proposed Underground DC Cable
ES-3-C.01	3	25	Figures: Proposed Converter Station
ES-4-B.10	4	14	Technical Appendices: Proposed Underground Cable
ES-4-C.09	4	25	Technical Appendices: Proposed Converter Station

1.2 Chapter Structure

1.2.1 The remainder of this chapter is structured as follows:

- Section 2. Approach to Assessment. Sets out the discipline specific approach to the assessment in accordance with relevant guidance;
- Section 3. Basis of Assessment. Sets out the key assumptions which have been made in undertaking the impact assessment;
- Section 4. Planning, Policy and Legislative Considerations. Provides a summary of the key points of planning policy and legislation which have been considered as part of the assessment;
- Section 5. Baseline Conditions. Reports the results of desktop and field studies undertaken to establish existing conditions;

- Section 6. Potential Impacts. Identifies the potential impacts on traffic and transport which may occur as result of construction and operation;
- Section 7. Mitigation. Identifies the mitigation which is proposed including measures which are incorporated into the siting, design and construction of the underground cable;
- Section 8. Residual Effects. Reports the residual effects which remain taking into account proposed mitigation and identifies whether these are significant or not;
- Section 9. Cumulative Effects. Identifies the inter-project cumulative effects which may occur in combination with other developments; and
- Section 10. Summary of Assessment. Provides a summary of the key findings of the impact assessment.

2 Approach to Assessment

2.1 Introduction

2.1.1 This section describes the approach to the identification and assessment of traffic and transport impacts resulting from the construction and operation of the proposed converter station, the proposed permanent access road and the proposed AC cable route.

2.2 Summary of Consultation

2.2.1 This section of the report outlines the scoping responses received from Lincolnshire County Council (LCC), in their role as the Local Highway Authority (LHA).

2.2.2 During the preparation of the chapter, consultations have been undertaken with all relevant parties, including the main LHA LCC. Meetings have been held with officers to discuss the scope of assessment.

2.2.3 Table 25.2 summarises the scoping opinion undertaken with relevant statutory and non-statutory consultees in relation to traffic and transport and outlines how and where this has been addressed in this chapter.

Table 25.2 Scoping Opinion (Traffic and Transport)

Consultee	Summary of Comment	How and where addressed
LCC Highways	LCC concluded that the UK Onshore Scoping Report "generally covers the required scope for the Transport Assessment."	The assessments in Chapter 25 which covers the assessment of the proposed converter station have therefore been undertaken in accordance with the methodology as outlined in the UK Onshore Scoping Report, which can then be considered to be an agreed approach with LCC.
LCC Highways	It was agreed with LCC that no operational, longer term or permanent impacts would be expected as part of the proposed converter station site, as once constructed the converter station would only be expected to generate small numbers of cars/LGVs per day, with occasional deliveries supplied by larger vehicles.	Operational impacts have been scoped out of the assessment.

Additional Consultation

2.2.4 On Friday 6 May 2016 AECOM and National Grid Viking Link (NGVL) met with LCC to discuss the transport and traffic elements of the scheme and to gain an understanding of the approach that they would require to any assessment as well as how they would require road crossings to be addressed and to also obtain details of key contacts.

2.2.5 Table 25.3 summarises additional consultation undertaken with relevant statutory and non-statutory consultees in relation to Traffic and Transport and outlines how and where this has been addressed in subsequent chapters of the ES.

Table 25.3 Additional Consultation (Traffic and Transport)

Consultee	Nature of additional consultation	How and where addressed
LCC	Direct liaison regarding the location and timing of Automatic Traffic Count ATC surveys. The proposed extent of the ATC surveys was issued to LCC for agreement prior to the data being collected, and they responded on the 20 July 2016 with 6 additional sites, which were then included in the surveys. The results of the ATCs undertaken in July 2016 were then forwarded to LCC for comment and they responded on 23 November 2016 confirming that they had no comments and that the January 2017 ATC data collection could therefore proceed on the same basis.	LCC have agreed to the location of the ATC surveys that were undertaken during the week commencing 1 August for a period of 1 week with a second set of data being collected during the week commencing 9 January 2017. The baseline traffic data as included in Chapters 14 and 27 the ES Chapter which cover the assessment of the proposed DC cable route and the proposed converter station respectively, have been based upon the agreed ATC data. We would therefore consider that the ATC data collection has been undertaken in full consultation with LCC and based upon an agreed methodology.

Table 25.3 Additional Consultation (Traffic and Transport)		
Consultee	**Nature of additional consultation**	**How and where addressed**
LCC	On 25 May 2016 LCC responded in regard to the proposed converter station site and requested that the permanent access road be slightly relocated and that consideration be given to providing a right turn ghost island.	The permanent access road from the A52 has been relocated and a right turn ghost island has been provided to allow a vehicle turning right to wait safely without impeding a traffic wishing to travel ahead. Addressed through Chapter 27 of the ES Chapter which covers the assessment of the proposed converter station. It is therefore considered that the proposed converter station permanent access road junction has been progressed based upon an agreed approach.
LCC	On the 8 February 2017 AECOM e-mailed LCC to agree the approach to the calculation of the base traffic data from the ATC surveys, and on the 22 February 2017 LCC confirmed their acceptance that the ES Chapter could be based upon an assessment of average weekday traffic flows between 07:00 and 19:00 collected over a 5 day period, Monday to Friday.	The calculation of the baseline traffic data as addressed in Chapters 14 and 27 the ES Chapter which cover the assessment of the proposed DC cable route and the proposed converter station respectively.
LCC	On 26 April 2017 LCC emailed to agree the distribution and assessment methodology for construction traffic generated by the proposed converter station.	Addressed through Chapter 27 of the ES Chapter which covers the assessment of the proposed converter station.

2.3 Scope of Assessment

Spatial Scope

2.3.1 The traffic and transport assessment evaluates the estimated percentage increases in traffic associated with the construction of the proposed permanent access road and the proposed AC cable route on the surrounding local road network.

2.3.2 The zone of influence (ZoI) of the proposed converter station, as it relates to traffic and transport, is defined by those roads where there is the potential for significant impact due to the addition of construction traffic. The site location and ZoI are shown in Figure 25.1.

Temporal Scope

2.3.3 The assessment has only considered the construction phase of development, as the operational period has been scoped out of the assessment, as detailed in Table 25.2.

2.3.4 The general methodology of the assessment can be summarised as follows:

- Set out baseline conditions;
- Identify effect by type in relation to traffic flow and infrastructure;
- Consider effect severity;
- Consider mitigation; and
- Identify residual effect remaining.

2.4 Approach to Assessment

Assessment Guidance

2.4.1 The traffic associated with the proposed converter station has been derived based upon the proposed construction methods for this component. This has then been distributed onto the local highway network with the receptors also identified. The impacts on the following have therefore been considered:

- HGV Construction Traffic;
- Severance;
- Pedestrian/Cycling Amenities; and
- Road Safety.

2.4.2 The potential impacts of traffic related to the proposed converter station, the proposed AC cable route and the permanent access road during the peak period of construction are likely to be temporary in nature, therefore have been assessed as such within the potential impacts section of the report (section 6). No operational, longer term or permanent impacts are expected as part of the construction.

2.4.3 The methodology for this chapter has been informed by the 'Travel Plans, Transport Assessments and Statements' Planning Practice Guidance document (Department for Communities and Local Government, March 2014) (Ref 25-1) and the Institute of Environmental Assessment's (IEA) 'Guidelines for the Environmental Assessment of Road Traffic' (January 1993) (Ref 25.2). It should be noted that since publication, the IEA has become the Institute for Environmental Management and Assessment (IEMA).

2.4.4 The IEA guidelines report is the only document available that sets out a methodology for assessing potentially significant environmental effects where a development is likely to give rise to changes in traffic flows. The IEA guidelines suggest that to determine the scale and extent of the assessment and the level of effect which a given development will have on the surrounding road network, the following two 'rules' should be followed:

- Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
- Include any other specifically sensitive areas (such as schools, hospitals etc.) where traffic flows are predicted to increase by 10% or more.

2.4.5 The significance of each effect is considered against the criteria within the IEA guidelines, where possible. However, the IEA guidelines state that:

'For many effects there are no simple rules or formulae which define the thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed-up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing a change in environmental impact as well as the assessment of the damage to various natural resources.'

2.4.6 In the absence of established significance criteria for traffic and transport effects, professional judgement has been used to assess whether the effects on traffic and transport are considered to be significant. This is carried out using the IEA guidelines to identify the scale and extent of the assessment to be undertaken. The significance falls into two categories - not significant and significant. The latter corresponding to significant effects in accordance with the IEA guidelines.

2.4.7 The IEA guidelines state projected changes in traffic of less than 10% creates no discernible environmental effect, given that daily variations in background traffic flow may fluctuate by this amount, and that a 30% change in traffic flow represents a reasonable threshold for including a highway link within the assessment.

Assessment Criteria

Sensitivity of Receptors

2.4.8 The general criteria for defining the importance or sensitivity of receptors are set out in Table 25.4. Key factors influencing this include:

- The value of the receptor or resource based upon empirical and/or intrinsic factors, for example taking into account any legal or policy protection afforded which is indicative of the receptor or resources' value internationally, nationally or locally; and
- The sensitivity of the receptor or resource to change, for example is the receptor likely to acclimatise to the change. This will take into account legal and policy thresholds which are indicative of the ability of the resource to absorb change.

Table 25.4 Receptor Sensitivity (Traffic and Transport)

Sensitivity	Description
Very High	Schools, colleges, playgrounds, hospitals, retirement homes.
High	Heavily congested junctions, residential properties very close to the carriageway.

Table 25.4 Receptor Sensitivity (Traffic and Transport)	
Sensitivity	**Description**
Medium	Congested junctions, shops/businesses, pedestrians/cyclists, areas of ecological/nature conservation value, residential properties close to the carriageway.
Low	Sites of tourist/visitor attraction, places of worship, residential areas set back from the highway with screening.
Negligible	Those people and places located away from the affected highway link.

Magnitude of Impacts

2.4.9 General criteria for defining the magnitude of an impact are set out in Table 25.5. Key factors influencing this include:

- The physical or geographical scale of the impact, (note that this will be relative to the scale of the receptor or resource affected);
- The duration of the impact - will it be short term, lasting for a few days or weeks, or long term, lasting for a number of years;
- The frequency of the impact - will it occur hourly, daily, monthly or will it be permanent lasting for the duration of the development; and
- The reversibility of the effect - can it be reversed following completion of construction of the development.

Table 25.5 Impact Magnitude Criteria (Traffic and Transport)		
Magnitude	**Description**	**Illustrative Criteria**
High	HGV Construction Traffic	High number of construction vehicles using roads over a protracted period of time. More than a 40% increase for more than 6 months.
	Pedestrians/Cyclists	Limited or no facilities for pedestrians and cyclists with limited crossing facilities and low quality linkages to the local facilities
	Severance	Increase in total traffic flows of 90% and above (or increase in HGV flows over 10% based on the sensitivity of the receptors)
	Road safety	High increase in traffic at known accident locations
Medium	HGV Construction Traffic	Moderate number of construction vehicles using roads over a protracted time period. 16-39% increase for more than 6 months; or More than 40% increase for 3-6 months.
	Pedestrians/Cyclists	Few facilities for pedestrians and cyclists with limited crossing facilities and linkages to the local facilities

Table 25.5 Impact Magnitude Criteria (Traffic and Transport)		
Magnitude	**Description**	**Illustrative Criteria**
	Severance	Increase in total traffic flows of 60-89% (or increase in HGV flows over 10% based on the sensitivity of the receptors)
	Road safety	Moderate increase in traffic at known accident location
Low	HGV Construction Traffic	Small number of construction vehicles using roads over a short period of time. 6-15% Increase for more than 6 months; or Between 31-39% for 3-6 months; or More than 40% increase for less than 3 months.
	Pedestrians/Cyclists	Facilities for pedestrians and cyclists with safe and convenient crossing facilities and good linkages to the local facilities
	Severance	Increase in total traffic flows of 30-59% (or increase in HGV flows over 10% based on the sensitivity of the receptors)
	Road safety	Minor increase in traffic at known accident locations
Negligible	HGV Construction Traffic	Occasional construction vehicles using roads over a short period of time. Less than 5% Increase for more than 6 months; or Between 6-30% increase for 3- 6 months; or Between 31-40% for less than 3 months.
	Pedestrians/Cyclists	Dedicated facilities for pedestrians and cyclists with safe and convenient crossing facilities and good linkages to the local facilities
	Severance	Increase in total traffic flows of 29% or under (or increase in HGV flows under 10%)
	Road safety	Negligible increase in traffic at known accident locations

Assessing the Significance of Effects

2.4.10 The general approach adopted for evaluating the significance of effects taking into account the sensitivity of the receptor and the magnitude of impact is outlined in Table 25.6. The IEA guidelines require the likely significant effects to be identified. Effects predicted to be 'major' or 'moderate' are considered to be **significant** whilst effects predicted to be 'minor' or 'negligible' are considered to be **not significant**.

Table 25.6 Assessment of Significance (Traffic and Transport)					
Magnitude of Impact	Sensitivity or Value of Receptor				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

3 Basis of Assessment

3.1 Proposed Converter Station, Proposed AC Cable Route and Permanent Access Road

3.1.1 Reference should be made to ES-2-C.09, Volume 2 Chapter 19 which provides a full description of the construction and operation of the proposed converter station, the proposed AC cable route and the permanent access road

3.1.2 The remainder of this section, which forms the basis of the assessment is structured as follows:

- Construction Traffic Volumes;
- Construction Programme;
- Construction Traffic Distribution and Assessment; and
- Construction Assumptions.

Construction Traffic Volumes

3.1.3 Information regarding the likely number and types of vehicular trips that will be necessary to construct the proposed converter station, proposed AC cable route and permanent access road has been primarily based on numbers derived for a comparable project in the UK, namely the Interconnexion France-Angleterre 2 (IFA2) electricity interconnector project, also being managed by National Grid. Based on the fact the proposed converter station and permanent access road will be raised above the existing ground level, the related additional fill volumes required have been converted into additional vehicles required. This provides a more robust indication of the number of vehicle movements that would be expected.

3.1.4 This subsequently provides an estimate of the number of vehicular movements that will occur across the construction period. The construction traffic has been allocated across the duration of the construction period. It should be noted that the construction traffic volumes provided are based on realistic worst case estimates, as at this stage the finalised numbers are not available.

3.1.5 Construction trips generated by the proposed converter station have been split into worker trips (assumed as 1 car per worker, which is considered as a worst case scenario as some would be expected to travel using other modes such as car share, public transport etc.) and HGV trips (assuming 1 HGV = 16 tonne Max Articulated vehicle). Some of the generated trips will be larger vehicles such as cranes, transformers etc.

3.1.6 The breakdown of total two-way vehicle movements expected as part of the construction phase, along with those expected in the peak month is summarised in Table 25.7. Construction traffic is provided as a monthly profile, which has then been converted into an average weekly profile by dividing by four (average of four weeks per month). An average daily total has then been

assumed by dividing the weekly total by six (assuming a six day working week, Monday to Saturday). This has been agreed by LCC Highways.

Table 25.7 Estimated Construction Traffic (Two-Way Movements)

Vehicle Type	Construction Phase Total Number	Peak Month – Monthly Total	Peak Month – Daily Total
Cars	31,140	216	39
Max. Articulated HGV	25,057	1220	55
Large Equipment Vehicle	147	33	1
Transformer Vehicle	10	4	Not accounted for in peak month
25ft Crane	2	1	Not accounted for in peak month
100ft Crane	2	1	Not accounted for in peak month
Mobile Platform	2	1	Not accounted for in peak month
Total	**56,360**	**1,476**	**94**

3.1.7 Whilst it is accepted that there will be movements of larger construction vehicles in addition to the HGVs, such as cranes and transformer vehicles, the number of daily movements is expected to be small, therefore has not been considered as part of the assessment.

3.1.8 As part of the assessment, a sensitivity test has been carried out whereby all construction traffic has been uplifted by 20%, which allowed for variations in construction traffic flows and adds to the robustness of the assessment. Further details are provided within the Potential Impacts section.

3.1.9 It should be noted that some works would be carried out overnight, resulting in a small number of associated vehicle movements. As this number would be small, further assessment of traffic outside of the current daytime periods was not considered necessary.

3.1.10 It should also be noted that connection works within the existing Bicker Fen 400 kV Substation would also take place during the construction period. It is expected that traffic movements would be small, therefore have been taken into account as part of the overall traffic movements considered as part of the assessment. Access would be via the working width of the proposed AC cable route, followed by use of a short 150 m section of Vicarage Drove.

Construction Programme

3.1.11 The construction phase is expected to commence in April 2019, with initial works relating to the permanent access road. Once complete, construction of the proposed converter station will

commence, scheduled for January 2020. The proposed converter station is scheduled to be completed by December 2022. A summary of the various elements of the construction phase is provided in Table 25.8.

Table 25.8 Estimated Construction Programme

Construction Phase Element	Start Date	Completion Date	Construction Duration
Proposed Permanent Access Road	April 2019	December 2019	8 months
Proposed Converter Station Site	January 2020	December 2022	34 months
Proposed AC Underground Cable Route	April 2021	September 2022	17 months

3.1.12 Analysis of the month by month traffic profile allowed a peak month for traffic to be derived. It is this month which has been assessed as part of the process. It is the daily trips to and from the site which have been considered in terms of their overall percentage impact on the roads within the ZoI.

3.1.13 Whilst traffic would be expected throughout the construction period, only the peak month for traffic has been assessed with and without uplifted construction traffic, in the summer and winter months. This ensures that a robust realistic worst case traffic scenario is considered.

3.1.14 The two-way daily traffic expected throughout the duration of the construction period is shown graphically in Figure 25.2.

3.1.15 This indicates that the peak month of construction will be Month 39, occurring in 2022, therefore this period has been identified for assessment.

Construction Traffic Distribution and Assessment

Construction Traffic Distribution Methodology

3.1.16 The construction traffic detailed in the above sections has been distributed onto the local road network within the ZoI to facilitate the assessment work.

3.1.17 Traffic distribution diagrams have been produced to aid the process of distributional assignment onto the local road network within the ZoI.

3.1.18 The distribution methodology has been separated into two elements, with one focussing on the distribution of workers and one on the distribution of HGVs during the construction period. Both methodologies have been agreed with LCC Highways.

Car/LGV Traffic Distribution (Workers)

3.1.19 In order to assume a robust traffic distribution of workers travelling to and from the proposed converter station site each day a gravity model has been developed.

3.1.20 It is currently unknown where workers may originate, therefore the distribution of worker origin has been based on the approximate populations of large settlements (>6,000 people) within a 60 minute drive time of the proposed converter station. For those settlements towards the maximum journey time of 60 minutes, a weighting of 0.7 has been applied to reflect the additional distance needed to travel, hence the reduced likelihood of people travelling from that area. This methodology has been agreed with LCC Highways.

3.1.21 **Error! Reference source not found.**Table 25.9 indicates the distribution based on each settlement identified.

Table 25.9 Worker Location Distribution

Town	Population	Distance Weighting	Weighted Population	Distribution %
Louth	16,419	0.7	11,493	2%
Mablethorpe	12,531	0.7	8,772	2%
Skegness	19,579	0.7	13,705	3%
Boston	64,600	1.0	64,600	12%
Kings Lynn	42,800	0.7	29,960	6%
Wisbech	31,573	0.7	22,101	4%
Spalding	28,722	1.0	28,722	5%
Peterborough	183,600	0.7	128,520	24%
Melton Mowbray	27,158	0.7	19,011	4%
Grantham	43,117	1.0	43,117	8%
Horncastle	6,815	1.0	6,815	1%
Oakham	10,922	0.7	7,645	1%
Stamford	21,800	0.7	15,260	3%
Bourne	13,961	1.0	13,961	3%
Sleaford	17,671	1.0	17,671	3%
Newark	27,700	0.7	19,390	4%
Lincoln	130,200	0.7	91,140	17%
Totals	**699,168**	-	**541,883**	**100%**

3.1.22 The above distribution percentages were then applied to the relevant road links within the ZoI in order to carry out the impact assessment. This is summarised in Table 25.10**Error! Reference**

source not found.. Further details are provided in Appendix 25.1, which provides a diagram of the distribution.

Table 25.10 Worker Distribution Percentage by Road Link		
Site Number	**Road Link**	**Distribution %**
60	A52 (Bicker)	70%
63	A52 (Swaton)	30%
24	A52 (Haltoft End)	3%
59	A17 (Wigtoft)	39%
81	A17 (Holbeach Clough)	10%
80	A17 (Long Sutton)	10%
68	A52 (Dembleby)	16%
65	A15 (Folkingham)	3%
57	A17 (Swineshead)	12%
56	A17 (Swineshead Bridge)	12%
55	A17 (Kirkby la Thorpe)	12%
64	A15 (Swarby)	12%
25	A16 (Hilldyke)	4%
99	B1192 Langrick	1%

3.1.23 In summary, when travelling to and from the proposed converter station, traffic would be distributed onto the local road network as follows:

Table 25.11 Resultant Worker Distribution	
Junction	**Route Distribution**
Proposed Converter Station Access	A52 E = 70%
	A52 W = 30%
A17/A52 Roundabout (from A52 E)	A17 N = 12%
	A52 E = 19% (incl. 12% to Boston, 3% to Skegness, 4% to Mablethorpe/Louth etc.)
	A17 S = 39% (incl. 10% to Kings Lynn, 29% to Peterborough/Spalding etc.)
A52/A15 Roundabout (from A52 W)	A15 S = 3%
	A52 W = 16%
	A15 N = 12%

HGV Distribution

3.1.24 A separate methodology has been developed in order to assume a robust distribution of HGVs onto the local road network. This methodology better reflects the locations materials will potentially come from for the proposed converter station (e.g. ports, other local/regional/national sources).

3.1.25 A number of key assumptions have been made, as it is not clear where materials will originate. For the purposes of the assessment, the following has been assumed:

- Boston Port = 17%
- Immingham Port/Grimsby Port = 17%
- King Lynn Port = 17%
- Other Locations = 50% (covering north, west and south areas)

3.1.26 The above distribution percentages were then applied to the relevant road links within the ZoI. This is summarised in Table 25.12**Error! Reference source not found.**. Further details are provided in Appendix 25.2, which provides a diagram of the HGV distribution.

Table 25.12 HGV Distribution Percentage by Road Link

Site Number	Road Link	Distribution %
60	A52 (Bicker)	75%
63	A52 (Swaton)	25%
24	A52 (Haltoft End)	0%
59	A17 (Wigtoft)	17%
81	A17 (Holbeach Clough)	17%
80	A17 (Long Sutton)	17%
68	A52 (Dembleby)	8%
65	A15 (Folkingham)	8%
57	A17 (Swineshead)	25%
56	A17 (Swineshead Bridge)	25%
55	A17 (Kirkby la Thorpe)	25%
64	A15 (Swarby)	8%
25	A16 (Hilldyke)	17%
99	B1192 Langrick	0%

3.1.27 In summary, when travelling to and from the proposed converter station, HGV traffic would be distributed onto the local road network as follows:

Table 25.13 Resultant HGV Distribution	
Junction	**Route Distribution**
Proposed Converter Station Access	A52 E = 75%
	A52 W = 25%
A17/A52 Roundabout (from A52 E)	A17 N = 25%
	A52 E = 33% (incl. 17% to Boston, 17% to Immingham/Grimsby)
	A17 S = 17% (incl. 17% to Kings Lynn)
A52/A15 Roundabout (from A52 W)	A15 S = 8%
	A52 W = 8%
	A15 N = 8%

Construction Traffic Assessment

3.1.28 Construction traffic associated with the proposed converter station, proposed permanent access road and the proposed AC cable route has been distributed onto the local highway network and the impacts of this traffic have been measured against baseline future traffic flows to indicate a percentage increase in traffic as a result. Road links within the ZoI where a traffic count has been undertaken have hence been assessed.

3.1.29 Baseline years of 2019 and 2022 have been chosen as this allows for a degree of flexibility within the construction programme with regard to the timing of the peak month of construction,

3.1.30 The impacts of the construction traffic on the road links within the ZoI have been assessed based on the following scenarios:

- Base 2019 and Base 2022 + Construction Traffic (Summer, Weekday)
- Base 2019 and Base 2022 + Construction Traffic (Summer, Saturday)
- Base 2019 and Base 2022 + Construction Traffic (Winter, Weekday)
- Base 2019 and Base 2022 + Construction Traffic (Winter, Saturday)
- Base 2019 and Base 2022 + Construction Traffic (with 20% uplift) - (Summer, Weekday)
- Base 2019 and Base 2022 + Construction Traffic (with 20% uplift) - (Summer, Saturday)
- Base 2019 and Base 2022 + Construction Traffic (with 20% uplift) - (Winter, Weekday)
- Base 2019 and Base 2022 + Construction Traffic (with 20% uplift) - (Winter, Saturday)

3.1.31 The average daily construction traffic for the peak month generated by the proposed converter station has been subsequently added to the 2019 and 2022 Base two-way traffic flows within the summer and winter periods, using the weekday and Saturday average traffic flows. As previously indicated, the scenarios have also been assessed with a 20% uplift in construction traffic.

Construction Assumptions

3.1.32 A number of assumptions relating to traffic and transport have also been included as part of the assessment. These assumptions are described below.

3.1.33 The identification of impacts within the ZoI has been based upon the following, which was agreed with LCC Highways:

- The period of 07:00-19:00, Monday to Saturday (6-day assessment period) will be assessed, using data collected over a 7-day period, which included five weekdays, one Saturday and one Sunday.
- The impacts of construction traffic will be assessed using traffic count data collected during August 2016 (summer traffic counts) and January/February 2017 (winter traffic counts) to reflect the effects of increased seasonal summer traffic on Lincolnshire's roads.

3.1.34 In terms of construction programme, the permanent access road would be constructed first, with access mainly via the A52, but to construct the bridge over Hammond Beck, a small number of light vehicles will need to use North Ing Drove for access.

3.1.35 When the proposed converter station is constructed, all access would be via the permanent access road.

3.1.36 For the AC underground cable, the working width is to be accessed via a temporary road installed through the proposed converter station site, e.g. there would be no access from the existing local network.

3.2 Design Mitigation

3.2.1 In order to avoid traffic using minor local roads in the vicinity of the proposed site a new permanent access road has been incorporated into the design of the UK Onshore Scheme.

3.2.2 The permanent access road will provide access during the construction of the proposed converter station and proposed AC cable route. Highway improvements would also be included on the A52 itself, with a right turn ghost island and acceleration/deceleration lanes incorporated, designed in accordance with Design Manual for Road and Bridges (DMRB) (Ref 25-4) standards.

4 Planning Policy and Legislative Considerations

4.1 Introduction

4.1.1 The proposed converter station has been considered in the context of a number of national and local planning and transport guidelines and policies. These are summarised in the following sections.

4.2 National Policy Context

4.2.1 The proposed converter station has been considered in the context of a number of national planning and transport guidelines and policies. The following document has been reviewed:

- National Planning Policy Framework (2012) (Ref 25-10);
  - The National Planning Policy Framework (NPPF) was introduced in 2012 and sets out the Governments planning policies for England and it superseded the Planning Policy Guidance Notes. The document aims to contribute to the achievement of sustainable development through the planning system.
  - Paragraph 32 indicates that 'developments should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe'.

4.3 National Legislation Context

4.3.1 The proposed converter station has been considered in the context of national legislation. The following has been reviewed:

- Town and Country Planning Act (1990) (Ref 25-11);
  - The proposals will be submitted under the Town and Country Planning Act (TCPA) and do not constitute a Development Consent Order (DCO).

4.4 Local Policy Context

4.4.1 The proposed converter station has been considered in the context of a number of local planning and transport guidelines and policies. The following documents have been reviewed:

- Lincolnshire Local Transport Plan (2013/14 – 2022/23) (Ref 25-12);
- Boston Borough Local Plan, Adopted 1999 (Saved Policies, 2007) (Ref 25-13);
- South East Lincolnshire Local Plan 2011-2036 (Publication Version, March 2017) (Ref 25-14);
- Central Lincolnshire Local Plan (Adopted, April 2017) (Ref 25-15); and
- South Holland Local Plan 2006 (Saved Policies, 2009) (Ref 25-16).

4.5 Other Guidance Documents

4.5.1 In addition to the above policies and documents, the following guidance documents have been taken into account in the production of the chapter. These have provided guidance for the methodology and design guidelines on which the permanent access road designs have been based.

- Travel Plans, Transport Assessments and Statements – Planning Practice Guidance (Department for Communities and Local Government, March 2014) (Ref 25-1);
- Institute of Environmental Management and Assessment's (IEMA) 'Guidelines for the Environmental Assessment of Road Traffic' – January 1993 (Ref 25-2);
- Design Manual for Road and Bridges (DMRB) (Ref 25-4); and
- DMRB Volume 11, Section 2, Part 5 – HA 205/08 Assessment and Management of Environmental Effects (Ref 25-5).

5 Baseline Conditions

5.1 Study Area

5.1.1 This section provides a description of the ZoI, which is defined by those roads where there is the potential for significant impact due to the addition of construction traffic.

5.1.2 Prediction of construction effects has focused on activities that could directly and indirectly impact on receptors within the defined study area. The ZoI includes those roads which may be utilised during construction, and upon which there is the potential for a significant impact.

5.1.3 Site visits were undertaken in November 2015 and November 2016 to develop a robust understanding of the characteristics of the baseline conditions within the ZoI.

5.1.4 The ZoI covered the key roads surrounding the proposed converter station, proposed AC cable route and proposed permanent access road, namely the A52 between the A15 junction and the A16 north of Boston and the A17 between Sleaford and Hoffleet Stow. The study area is shown in Figure 25.3.

5.2 Existing Highway Network

A52

5.2.1 Access to the proposed converter station site is proposed via a new permanent access road from the A52, a principal A-road. Strategically the road links the A1 at Grantham with Boston to the east. The A52 then continues north east towards Skegness. Close to the proposed converter station the A52 is rural in nature and is single carriageway with the national speed limit applied. Lighting is generally only apparent along the A52, such as the junction with the A17.

5.2.2 Photographs of key locations on the surrounding road network are provided in Appendix 25.6, including a typical section of the A52 near Donington (looking south).

A17

5.2.3 The A17, as shown in Figure 25.3, runs to the east of the proposed converter station, connecting with the A52 at the Donington Road junction. Strategically, the A17 provides an alternative more northerly link with the A1 at Newark, instead of the southern link to the A1 via the A52 at Grantham. South of the proposed converter station site, the A17 travels south to Kings Lynn and provides wider access to northern Norfolk.

5.2.4 At Swineshead Bridge the A17 connects with the A1121, which provides a link to Boston via Hubbert's Bridge. Close to the proposed converter station site the road is rural in nature and is single carriageway with the national speed limit applied. The speed limit drops to 40 mph at Swineshead Bridge, where there is a railway level crossing. Warning signs are present informing

drivers of long/slow vehicles to wait and request permission to cross the railway. North of Swineshead Bridge there is a section of 50 mph limit, before it returns to national speed limit near Heckington. Lighting is mostly only present at major junctions, such as the junction with the A52.

5.2.5 A photograph of a typical section of the A17 between Swineshead Bridge and the A52 junction (looking south) is provided in Appendix 25.6, along with a photograph showing a typical section at Heckington.

A15

5.2.6 The A15 runs west of the proposed converter station site, connecting with the A52 near Osbournby and the A17 at Sleaford. Strategically, the A15 is a key north-south link providing a route from the A1 near Peterborough north to Lincoln and onward to the Humber and Hull via the M180.

5.2.7 Close to the proposed converter station site the road is rural in nature and is a single carriageway with the national speed limit applied. Lighting is generally only present at major junctions, such as the junction with the A17 at Sleaford.

A16

5.2.8 The A16 runs east of the proposed converter station site, connecting with the A17 at the Sutterton Roundabout further north with the A52 in Boston. Strategically, the A16 is a key north-south link providing a route from Peterborough north to Boston and onward to the Humber Ports of Grimsby and Immingham via the Lincolnshire Wolds.

5.2.9 Close to the proposed converter station site the road is rural in nature and is single carriageway with the national speed limit applied. Lighting is generally only present at major junctions, such as Sutterton Roundabout.

A1121

5.2.10 The A1121 runs north of the proposed converter station site, connecting with the A52 west of Boston and the A17 at Swineshead Bridge. The A1121 provides a key westerly route from Boston, via Hubbert's Bridge, to the A17 and onward to the A1.

5.2.11 Close to the proposed converter station the road is rural in nature and is single carriageway with the national speed limit applied. Lighting is generally only present at major junctions, such as the junction with the A17 at Swineshead Bridge.

Other Roads

5.2.12 'B' class roads which connect with the A52 are the B1394, providing access to the villages of Swaton, Helpringham, Little Hale, Great Hale and Heckington, the B1177 which links with

Billingborough, and the B1181 which provides a link between the A52 and A17. From the A17, the B1395 provides a link to North and South Kyme.

5.2.13 Both the A52 and A17 also intersect with a number of unclassified roads which provide access to numerous towns and villages in the local area.

5.3 Baseline Traffic

5.3.1 Baseline traffic conditions were established using Automatic Traffic Counts (ATCs) in agreed locations across Lincolnshire. Locations of the ATCs within the ZoI are shown in Figure 25.3. The numbers refer to the original ATC reference numbers, which have been retained for continuity purposes.

5.3.2 In order to take into account seasonal variations on roads surrounding the proposed converter station, it was agreed with LCC that ATCs should be carried out during a winter and summer month. The summer flows were collected over a 24-hour seven day period between Monday 1 and Sunday 7 August 2016 and the winter flows were collected between Monday 9 and Sunday 15 January 2017. Some of the winter surveys (13 surveys) were delayed until mid-February due to scheduled roadworks and unforeseen circumstances at some locations. The surveys provided two-way flows by direction and were classified by vehicle type, including HGVs.

5.3.3 The ATC locations also formed the receptor locations as part of the assessment. The receptors are described further in Table 25.19.

Summer Month Surveyed Traffic Flows

5.3.4 The surveyed flows for the ATC locations within the ZoI collected during the summer period are shown in Table 25.14 (weekday) and Table 25.15 (Saturday) and in Appendix 25.3. Locations of the ATCs are shown in Figure 25.3.

Table 25.14 2016 Surveyed Two-Way Traffic Flows (Weekday Average 07:00-19:00) - Summer

Site Number	Road Link	Car and LGV	HGV	HGV%	Total Vehicles
57	A17 (Swineshead)	9,981	1,241	11%	**11,222**
60	A52 (Bicker)	5,852	309	5%	**6,161**
63	A52 (Swaton)	4,624	319	6%	**4,943**
64	A15 (Swarby)	4,134	255	6%	**4,389**
55	A17 (Kirkby la Thorpe)	15,930	2,715	15%	**18,645**
56	A17 (Swineshead Bridge)	15,202	1,529	9%	**16,731**
58	A1121 (Hubbert's Bridge)	6,294	395	6%	**6,689**
59	A17 (Wigtoft)	13,935	1,595	10%	**15,530**
61	A16 (Kirton)	14,145	767	5%	**14,912**

Table 25.14 2016 Surveyed Two-Way Traffic Flows (Weekday Average 07:00-19:00) - Summer					
Site Number	Road Link	Car and LGV	HGV	HGV%	Total Vehicles
62	A16 (Algarkirk)	14,617	796	5%	**15,413**
25	A16 (Hilldyke)	7,481	304	4%	**7,786**
24	A52 (Haltoft End)	8,131	311	4%	**8,442**
65	A15 (Folkingham)	3,518	193	5%	**3,711**
68	A52 (Dembleby)	5,397	334	6%	**5,732**
81	A17 (Holbeach Clough)	13,695	1,341	9%	**15,036**
80	A17 (Long Sutton)	15,555	1,490	9%	**17,045**
99	B1192 (Langrick)	6,880	376	5%	**7,257**

Table 25.15 2016 Surveyed Two-Way Traffic Flows (Saturday Average 07:00-19:00) - Summer					
Site Number	Road Link	Car and LGV	HGV	HGV%	Total Vehicles
57	A17 (Swineshead)	9,926	478	5%	**10,404**
60	A52 (Bicker)	5,830	122	2%	**5,952**
63	A52 (Swaton)	4,845	132	3%	**4,977**
64	A15 (Swarby)	3,324	58	2%	**3,382**
55	A17 (Kirkby la Thorpe)	15,675	957	6%	**16,632**
56	A17 (Swineshead Bridge)	14,419	573	4%	**14,992**
58	A1121 (Hubbert's Bridge)	5,119	111	2%	**5,230**
59	A17 (Wigtoft)	13,744	713	5%	**14,457**
61	A16 (Kirton)	14,713	251	2%	**14,964**
62	A16 (Algarkirk)	14,686	288	2%	**14,974**
25	A16 (Hilldyke)	6,727	80	1%	**6,807**
24	A52 (Haltoft End)	9,034	147	2%	**9,181**
65	A15 (Folkingham)	2,709	45	2%	**2,754**
68	A52 (Dembleby)	5,398	127	2%	**5,525**
81	A17 (Holbeach Clough)	14,853	486	3%	**15,339**
80	A17 (Long Sutton)	16,902	503	3%	**17,405**
99	B1192 (Langrick)	6,253	114	2%	**6,367**

5.3.5 From the flows shown in Table 25.14 and Table 25.15, it can be seen that total numbers of flows are generally lower on a Saturday during the surveyed summer month than a weekday, with a lower proportion of HGVs apparent in most cases.

5.3.6 On weekdays a number of the road links have relatively high proportions of HGVs, for example the A17 Kirkby la Thorpe (15%) and A17 Swineshead (11%). This suggests that the key routes surrounding the proposed converter station are already well used by HGVs and are suitable for continued use.

Winter Month Surveyed Traffic Flows

5.3.7 The surveyed flows for the sites within the ZoI collected during the winter period are shown in Table 25.16 (weekday) and Table 25.17 (Saturday) and in Appendix 25.3. Locations of the ATCs are shown in Figure 25.3.

Table 25.16 2016 Surveyed Two-Way Traffic Flows (Weekday Average 07:00-19:00) - Winter

Site Number	Road Link	Car and LGV	HGV	HGV%	Total Vehicles
57	A17 (Swineshead)	7,739	1,336	15%	**9,074**
60	A52 (Bicker)	5,535	327	6%	**5,862**
63	A52 (Swaton)	4,280	230	5%	**4,510**
64	A15 (Swarby)	4,083	239	6%	**4,322**
55	A17 (Kirkby la Thorpe)	13,775	2,630	16%	**16,405**
56	A17 (Swineshead Bridge)	13,744	1,434	9%	**15,178**
58	A1121 (Hubbert's Bridge)	6,594	332	5%	**6,926**
59	A17 (Wigtoft)	11,102	1,768	14%	**12,870**
61	A16 (Kirton)	13,391	822	6%	**14,213**
62	A16 (Algarkirk)	13,290	865	6%	**14,155**
25	A16 (Hilldyke)	7,311	335	4%	**7,646**
24	A52 (Haltoft End)	7,104	362	5%	**7,466**
65	A15 (Folkingham)	3,385	176	5%	**3,561**
68	A52 (Dembleby)	4,548	356	7%	**4,904**
81	A17 (Holbeach Clough)	9,718	1,250	11%	**10,968**
80	A17 (Long Sutton)	11,097	1,429	11%	**12,526**
99	B1192 (Langrick)	6,171	338	5%	**6,509**

5.3.8 Table 25.16 shows that weekday flows during the winter surveyed month are lower than during the summer month within the ZoI. However, the proportion of HGVs is generally higher during the winter surveyed month.

Table 25.17 2016 Surveyed Two-Way Traffic Flows (Saturday Average 07:00-19:00) - Winter					
Site Number	Road Link	Car and LGV	HGV	HGV%	Total Vehicles
57	A17 (Swineshead)	4,976	516	9%	**5,492**
60	A52 (Bicker)	4,120	89	2%	**4,209**
63	A52 (Swaton)	2,564	61	2%	**2,625**
64	A15 (Swarby)	2,907	56	2%	**2,963**
55	A17 (Kirkby la Thorpe)	10,824	819	7%	**11,643**
56	A17 (Swineshead Bridge)	9,057	560	6%	**9,617**
58	A1121 (Hubbert's Bridge)	4,591	89	2%	**4,680**
59	A17 (Wigtoft)	7,729	753	9%	**8,482**
61	A16 (Kirton)	10,446	247	2%	**10,693**
62	A16 (Algarkirk)	10,124	259	2%	**10,383**
25	A16 (Hilldyke)	5,683	96	2%	**5,779**
24	A52 (Haltoft End)	5,664	154	3%	**5,818**
65	A15 (Folkingham)	2,466	42	2%	**2,508**
68	A52 (Dembleby)	3,093	85	3%	**3,178**
81	A17 (Holbeach Clough)	6,652	300	4%	**6,952**
80	A17 (Long Sutton)	7,746	339	4%	**8,085**
99	B1192 (Langrick)	4,669	76	2%	**4,745**

5.3.9 Table 25.17 shows that Saturday flows during the winter surveyed month are lower than on Saturdays during the summer surveyed month within the ZoI.

5.3.10 From the flows shown in Table 25.16 and Table 25.17, it can be seen that flows are generally lower on a Saturday during the surveyed winter month, when compared to weekdays, with a lower proportion of HGVs in most cases.

5.3.11 On weekdays a number of the road links have relatively high proportions of HGVs, for example the A17 Kirkby la Thorpe (16%), A17 Swineshead (15%) and A17 Wigtoft (14%). This suggests that the key routes surrounding the proposed converter station are already well used and potentially suited to HGV use.

Traffic Growth

5.3.12 Surveyed traffic flows collected in 2016 and 2017 have been factored up to the two construction assessment years using the Department for Transport NTM (Ref 25-3) factor adjusted for the Lincolnshire area (this is in accordance with the Travel Plans, Transport Assessments and Statements' Planning Practice Guidance document (Ref 25-1)). This provides the baseline traffic

flows on which the assessments have been established. The growth factors are shown in Table 25.18.

Table 25.18 Locally Adjusted NTM Growth Factors		
Years	Weekday	Saturday
2016 (summer) – 2019	1.018 (1.8%)	1.017 (1.7%)
2016 (summer) – 2022	1.036 (3.6%)	1.035 (3.5%)
2017 (winter) – 2019	1.012 (1.2%)	1.011 (1.1%)
2017 (winter) – 2022	1.030 (3.0%)	1.029 (2.9%)

5.4 Receptor Sensitivity

5.4.1 A number of receptors have been identified where impacts have subsequently been assessed. For the purposes of the assessment, the receptor locations are the same as the locations of the ATC surveys. The locations, along with their baseline sensitivity (following the criteria outlined in Table 25.4) are provided in Table 25.19.

Table 25.19 Receptor Sensitivity				
Receptor Location	ATC Site Location	Sensitivity Rating	Description	Distance from Proposed Converter Station
A52 (Haltoft End)	24	Medium	Residential properties close to the carriageway	20.5 km
A16 (Hilldyke)	25	Very High	School close to the carriageway	18.5 km
A17 (Kirkby la Thorpe)	55	Negligible	People and places located away from the carriageway	12.4 km
A17 (Swineshead Bridge)	56	Medium	Residential properties and shops/businesses close to the carriageway, some congestion	6.8 km
A17 (Swineshead)	57	Low	Residential areas set back from the highway with screening	5.8 km
A1121 (Hubbert's Bridge)	58	Low	Residential areas set back from the highway with screening	10.2 km
A17 (Wigtoft)	59	Low	Residential areas set back from the highway with screening	6.5 km
A52 (Bicker)	60	Low	Residential areas set back from the highway with screening	4.0 km
A16 (Kirton)	61	Negligible	People and places located away from the carriageway	13.2 km

Table 25.19 Receptor Sensitivity				
Receptor Location	ATC Site Location	Sensitivity Rating	Description	Distance from Proposed Converter Station
A16 (Algarkirk)	62	Negligible	People and places located away from the carriageway	10.9 km
A52 (Swaton)	63	Low	Residential areas set back from the highway with screening	5.2 km
A15 (Aswardby)	64	Low	Residential areas set back from the highway with screening	13.8 km
A15 (Folkingham)	65	Medium	Residential properties and shops/businesses close to the carriageway	11.8 km
A52 (Dembleby)	68	Low	Residential areas set back from the highway with screening	15.5 km
A17 (Long Sutton)	80	Negligible	People and places located away from the carriageway	27.3 km
A17 (Holbeach)	81	Low	Residential areas set back from the highway with screening	16.9 km
B1992 (Langrick)	99	Medium	Residential properties and shops/businesses close to the carriageway, some congestion	12.5 km

5.5 Road Safety

5.5.1 Personal injury accidents within the ZoI for the most recent full five-year period available (2011-2015), were obtained from LCC. A detailed assessment of accidents is included below.

5.5.2 A comparison with existing national average accident rates (Lynam et al, 2003) (Ref 25-6) has been undertaken on the road sections described below. Table 25.20 shows the fatal and serious accident densities (e.g. accidents per kilometre) for single carriageway roads in the UK by traffic flow (stated as Annual Average Daily Traffic (AADT) flow). It can be seen that as flow increases, the accident density generally increases.

Table 25.20 National fatal and serious accident densities (accident per km) for single carriageway roads by flow group	
Flow (AADT)	Accident Density (accidents per km)
<5,000	0.14
5,000-10,000	0.23
10,000-20,000	0.35
20,000-40,000	0.46

A52 – B1394 to Station Street (Donington)

5.5.3 The accidents that occurred on the A52 between B1394 and Station Street (Donington) have been identified, as shown in Figure 25.4.**Error! Reference source not found.**

5.5.4 There were a total of 19 accidents on this 7.5 km section during the five year period; details of the accidents that have occurred are shown in Table 25.21:

Table 25.21 A52 Accidents and Severity (2011-2015)

Year	Slight	Serious	Fatal	Total
2011	2	3	1	**6**
2012	4	0	0	**4**
2013	1	1	0	**2**
2014	4	0	1	**5**
2015	1	1	0	**2**
Total	**12**	**5**	**2**	**19**

5.5.5 Around 58% of the accidents occurred in wet road conditions, while the fatal accidents (occurring in 2011 and 2014) had contributory factors that included excessive speed, careless driving and failure to look properly. One of the fatal accidents occurred in wet and foggy conditions, whilst the other involved a motorcycle. The majority of accidents involved more than one vehicle.

5.5.6 On this section over the five year period, there were on average 1.4 fatal or serious accidents per year. Based on the section length of 7.5 km, this provided an accident density of 0.19 accidents per km. This section has an AADT of less than 5,000 vehicles, therefore this rate is slightly above the national average of 0.14 accidents per km for this flow group.

A52 – Station Street (Donington) to A17 Junction

5.5.7 The accidents that occurred on the A52 between Station Street (Donington) and the A17 junction have been identified, as shown in Figure 25.5**Error! Reference source not found.**.

5.5.8 There were a total of 17 accidents on this 5.4 km section during the five year period; details of the accidents that have occurred are shown in Table 25.22:

Table 25.22 A52 Accidents and Severity (2011-2015)

Year	Slight	Serious	Fatal	Total
2011	2	0	0	**2**
2012	6	0	0	**6**
2013	3	1	0	**4**
2014	3	0	0	**3**

Table 25.22 A52 Accidents and Severity (2011-2015)				
Year	Slight	Serious	Fatal	Total
2015	1	1	0	**2**
Total	**15**	**2**	**0**	**17**

5.5.9 Around 65% of the accidents occurred in wet road conditions, while 41% of accidents had a contributory factor of failing to look properly. The majority of accidents involved more than one vehicle.

5.5.10 On this section over the five year period, there were on average 0.4 fatal or serious accidents per year. Based on the section length of 5.4 km, this provided an accident density of 0.07 accidents per km. This section has an AADT of 5,000 – 10,000 vehicles, therefore this rate is well below the national average of 0.23 accidents per km for this flow group.

5.5.11 It should also be noted that there were no accidents of any kind within 1 km of the proposed permanent access road access point from the A52 on the Donington bypass.

A17 – B1181 Mill Lane to A52 Junction

5.5.12 The accidents that occurred on the A17 between B1181 Mill Lane and A52 junction have been identified, as shown in Figure 25.6**Error! Reference source not found.**.

5.5.13 There were a total of 5 accidents on this 2 km section during the five year period; details of the accidents that have occurred are shown in Table 25.23:

Table 25.23 A52 Accidents and Severity (2011-2015)				
Year	Slight	Serious	Fatal	Total
2011	1	0	0	**1**
2012	0	0	0	**0**
2013	1	0	0	**1**
2014	1	0	0	**1**
2015	1	1	0	**2**
Total	**4**	**1**	**0**	**5**

5.5.14 In around 60% of the accidents, a contributory factor was that drivers failed to look properly. Loss of control was also noted as a contributor to 40% of accidents. The majority of accidents involved more than one vehicle.

5.5.15 On this section over the five year period, there were on average 0.2 fatal or serious accidents per year. Based on the section length of 2.0 km, this provided an accident density of 0.1 accidents

per km. This section has an AADT of 10,000 – 20,000 vehicles, therefore this rate is well below the national average of 0.35 accidents per km for this flow group.

A17 – A52 Junction to Swineshead Bridge (A1121 junction)

5.5.16 The accidents that occurred on the A17 between the A52 junction and Swineshead Bridge have been identified, as shown in Figure 25.7**Error! Reference source not found.**.

5.5.17 There were a total of 20 accidents on this 4.8 km section during the five year period; details of the accidents that have occurred are shown in Table 25.24:

Table 25.24 A52 Accidents and Severity (2011-2015)

Year	Slight	Serious	Fatal	Total
2011	2	1	0	**3**
2012	2	1	0	**3**
2013	2	1	0	**3**
2014	2	3	0	**5**
2015	5	1	0	**6**
Total	**13**	**7**	**0**	**20**

5.5.18 In around 60% of the accidents, a contributory factor was that drivers failed to look properly. The majority of accidents involved more than one vehicle. Of the total, 5 of the accidents occurred at the junction with the A1121 at Swineshead Bridge. All had a contributory factor that included failure to look properly.

5.5.19 On this section over the five year period, there were on average 1.4 fatal or serious accidents per year. Based on the section length of 4.8 km, this provided an accident density of 0.29 accidents per km. This section has an AADT of 10,000 – 20,000 vehicles, therefore this rate is below the national average of 0.35 accidents per km for this flow group.

A17 – Swineshead Bridge (A1121 junction) to B1394 junction (Heckington)

5.5.20 The accidents that occurred on the A17 between Swineshead Bridge and the B1394 junction at Heckington have been identified, as shown in Figure 25.8**Error! Reference source not found.**.

5.5.21 There were a total of 36 accidents on this 6.2 km section during the five year period; details of the accidents that have occurred are shown in Table 25.25:

Table 25.25 A52 Accidents and Severity (2011-2015)				
Year	Slight	Serious	Fatal	Total
2011	6	0	0	**6**
2012	7	1	1	**9**
2013	3	0	0	**3**
2014	7	0	0	**7**
2015	6	5	0	**11**
Total	**29**	**6**	**1**	**36**

5.5.22 In a third of the accidents, a contributory factor was that drivers failed to look properly. The majority of accidents involved more than one vehicle. For the fatal accident in 2012, road conditions were wet and no contributory factors were available.

5.5.23 Of the total, 5 of the accidents occurred at the junction with the B1394 at Heckington. The majority had a contributory factor that included failure to look properly.

5.5.24 On this section over the five year period, there were on average 1.4 fatal or serious accidents per year. Based on the section length of 6.2 km, this provided an accident density of 0.23 accidents per km. This section has an AADT of 10,000 – 20,000 vehicles, therefore this rate is below the national average of 0.35 accidents per km for this flow group.

6 Potential Impacts

6.1 Overview of Potential Impacts

Temporary Impacts

6.1.1 This section assesses the temporary impacts of percentage increase in traffic associated with the construction of the proposed converter station, proposed AC cable route and the permanent access road on the surrounding road network and receptors.

6.1.2 The worst case potential impacts of traffic are likely to be temporary in nature (e.g. the peak period of construction), therefore have been assessed as such within this section of the report.

6.1.3 Whilst traffic would be expected throughout the construction period, only the peak month for traffic has been assessed with and without uplifted construction traffic and in the summer and winter months. This ensures that a robust worst case traffic scenario is considered.

6.1.4 It should also be noted that connection works within the existing Bicker Fen 400 kV Substation would also take place during the construction period. It is expected that traffic movements would be small, therefore are considered as part of the overall traffic movements within the assessment.

6.1.5 As described in section 2.4.1, a number of impacts have been specifically assessed. The impacts assessed are as follows:

- HGV Construction Traffic;
- Road Safety;
- Severance; and
- Pedestrian/Cycle Amenities.

6.1.6 The assessment of significance for each of the above elements has been assessed using the criteria set out in Table 25.5.

HGV Construction Traffic Impacts

6.1.7 A summary of the potential effects of the additional HGV traffic generated by the site is provided. It should be noted that the nature of effect is based on the worst case scenario percentage increase in traffic, including the 20% construction traffic uplift.

6.1.8 The most significant traffic impacts will occur in the 2019 assessment year, as in 2022 the base traffic is marginally higher therefore the additional traffic does not have as much of an overall impact. For the purposes of the assessment, it is assumed that the worst case traffic impacts will last longer than 6 months.

6.1.9 Consequently, a percentage change has been calculated to provide an indication of the level of impact generated by the traffic upon the key road links within the ZoI. Appendix 25.4 provides the

full details of the traffic flows and percentage increases. Diagrams showing the percentage traffic increases are shown in Appendix 25.5.

Road Safety Impacts

6.1.10 A summary of the potential effects on road safety during the construction phase has been provided. The magnitude of potential impacts, described in Table 25.5 is summarised below:

- High - High increase in traffic at known accident locations;
- Medium - Moderate increase in traffic at known accident locations;
- Low - Minor increase in traffic at known accident locations; and
- Negligible - Negligible increase in traffic at known accident locations.

Severance Impacts

6.1.11 A summary of the potential effects on severance during the construction phase has been provided. The determination of potential impact magnitude is based on the information in Table 25.6.

Pedestrian/Cycling Impacts

6.1.12 A summary of the potential effects on pedestrians and cyclists during the construction phase has been provided. The magnitude of potential impacts, described in Table 25.5 is summarised below:

- High - Limited or no facilities for pedestrians and cyclists with limited crossing facilities and low quality linkages to the local facilities;
- Medium - Few facilities for pedestrians and cyclists with limited crossing facilities and linkages to the local facilities;
- Low - Facilities for pedestrians and cyclists with safe and convenient crossing facilities and good linkages to the local facilities; and
- Negligible - Dedicated facilities for pedestrians and cyclists with safe and convenient crossing facilities and good linkages to the local facilities.

6.2 HGV Construction Traffic Impacts

6.2.1 **Error! Reference source not found.**Table 25.26 and **Error! Reference source not found.** present summaries of the potential effects of the additional HGV traffic generated by the proposed converter station, permanent access road and proposed AC cable route in the 2019 assessment year.

6.2.2 Tables showing all traffic scenarios are provided in Appendix 25.4.

6.2.3 The traffic impacts during summer and winter do not vary significantly, but due to large variations in HGV traffic on weekdays and Saturdays, both days have been assessed. The worst case

percentage increases have been extracted from either the summer or winter months for the purposes of the overall significance of effect assessment. The assessment year of 2019 with the 20% traffic uplift is fixed as part of the assessment.

Table 25.26 HGV Traffic Impact Significance of Effects (Weekday)

Site	Road Link	Receptor Sensitivity	Traffic % Increase (HGVs)	Magnitude	Significance of Effect
57	A17 (Swineshead)	Low	2.6%	Negligible	**Negligible**
60	A52 (Bicker)	Low	31.6%	Medium	**Minor**
63	A52 (Swaton)	Low	14.3%	Low	**Negligible**
64	A15 (Swarby)	Low	4.5%	Negligible	**Negligible**
55	A17 (Kirkby la Thorpe)	Negligible	1.2%	Negligible	**Negligible**
56	A17 (Swineshead Bridge)	Medium	2.3%	Negligible	**Negligible**
58	A1121 (Hubbert's Bridge)	Low	0%	Negligible	**Negligible**
59	A17 (Wigtoft)	Low	1.3%	Negligible	**Negligible**
61	A16 (Kirton)	Negligible	0%	Negligible	**Negligible**
62	A16 (Algarkirk)	Negligible	0%	Negligible	**Negligible**
25	A16 (Hilldyke)	Low	7.1%	Low	**Negligible**
24	A52 (Haltoft End)	Low	0%	Negligible	**Negligible**
65	A15 (Folkingham)	Medium	6.2%	Low	**Minor**
68	A52 (Dembleby)	Low	3.2%	Negligible	**Negligible**
81	A17 (Holbeach Clough)	Low	1.7%	Negligible	**Negligible**
80	A17 (Long Sutton)	Negligible	1.5%	Negligible	**Negligible**
99	B1192 (Langrick)	Low	0%	Negligible	**Negligible**

Table 25.27 HGV Traffic Impact Significance of Effects (Saturday)

Site	Road Link	Receptor Sensitivity	Traffic % Increase (HGVs)	Magnitude	Significance of Effect
57	A17 (Swineshead)	Low	6.4%	Low	**Negligible**
60	A52 (Bicker)	Low	110.6%	High	**Moderate**
63	A52 (Swaton)	Low	53.8%	Medium	**Minor**
64	A15 (Swarby)	Low	19.4%	Medium	**Minor**

Table 25.27 HGV Traffic Impact Significance of Effects (Saturday)					
Site	Road Link	Receptor Sensitivity	Traffic % Increase (HGVs)	Magnitude	Significance of Effect
55	A17 (Kirkby la Thorpe)	Negligible	4.0%	Negligible	**Negligible**
56	A17 (Swineshead Bridge)	Medium	5.9%	Negligible	**Negligible**
58	A1121 (Hubbert's Bridge)	Low	0%	Negligible	**Negligible**
59	A17 (Wigtoft)	Low	3.0%	Negligible	**Negligible**
61	A16 (Kirton)	Negligible	0%	Negligible	**Negligible**
62	A16 (Algarkirk)	Negligible	0%	Negligible	**Negligible**
25	A16 (Hilldyke)	Low	26.9%	Medium	**Minor**
24	A52 (Haltoft End)	Low	0%	Negligible	**Negligible**
65	A15 (Folkingham)	Medium	25.9%	Medium	**Moderate**
68	A52 (Dembleby)	Low	12.8%	Low	**Negligible**
81	A17 (Holbeach Clough)	Low	7.2%	Low	**Negligible**
80	A17 (Long Sutton)	Negligible	6.4%	Low	**Negligible**
99	B1192 (Langrick)	Low	0%	Negligible	**Negligible**

6.2.4 As shown in Table 25.26, on weekdays the impacts related to HGV construction traffic are expected to be **not significant**.

6.2.5 If deliveries were to take place on a Saturday during periods of peak construction traffic, there would be a significant effect at two receptor locations (A52 Bicker and A15 Folkingham).

6.2.6 However, it is proposed that the majority of HGV movements will take place on weekdays, with Saturdays reserved for traffic movements only if required. Also, works on a Saturday would only constitute around 16% of the total working time during a given six day working week, therefore the impacts would be considered minimal.

6.2.7 The number of traffic movements on a Saturday are also considered very much a worst case scenario.

6.2.8 It should also be noted that the A52 and A15 are primary A-roads, necessary for the construction of the proposed converter station, permanent access road and proposed AC cable route and already carry HGV traffic, therefore both are considered appropriate for this usage.

6.3 Road Safety Impacts

6.3.1 Table 25.28 presents a summary of the potential effects on road safety during the construction phase. At all receptor locations there is expected to be a minor increase in total traffic (less than 5%) at known accident locations, therefore in accordance with the criteria outlined in section 2.4.9, the impact magnitude for the sites has been identified as 'Low'. At all receptors the effects are therefore **not significant**.

Table 25.28 Road Safety Impact Significance of Effects

Site	Road Link	Receptor Sensitivity	Road Safety Impact	Magnitude	Significance of Effect
57	A17 (Swineshead)	Low	Minor increase in overall traffic at known accident locations	Low	**Negligible**
60	A52 (Bicker)	Low			**Negligible**
63	A52 (Swaton)	Low			**Negligible**
64	A15 (Swarby)	Low			**Negligible**
55	A17 (Kirkby la Thorpe)	Negligible			**Negligible**
56	A17 (Swineshead Bridge)	Medium			**Minor**
58	A1121 (Hubbert's Bridge)	Low			**Negligible**
59	A17 (Wigtoft)	Low			**Negligible**
61	A16 (Kirton)	Negligible			**Negligible**
62	A16 (Algarkirk)	Negligible			**Negligible**
25	A16 (Hilldyke)	Low			**Negligible**
24	A52 (Haltoft End)	Low			**Negligible**
65	A15 (Folkingham)	Medium			**Minor**
68	A52 (Dembleby)	Low			**Negligible**
81	A17 (Holbeach Clough)	Low			**Negligible**
80	A17 (Long Sutton)	Negligible			**Negligible**
99	B1192 (Langrick)	Low			**Negligible**

6.4 Severance Impacts

6.4.1 Table 25.30 presents a summary of the potential effects on severance during the construction phase. Tables showing all traffic scenarios are provided in Appendix 25.4.

6.4.2 The traffic impacts during summer and winter do not vary significantly, but due to large variations in HGV traffic on weekdays and Saturdays, both days have been assessed. The worst case percentage increases have been extracted from either the summer or winter months for the purposes of the overall significance of effect assessment. The assessment year of 2019 with the 20% traffic uplift is fixed as part of the assessment.

Table 25.29 Severance Significance of Effects (Weekdays)

Site	Road Link	Receptor Sensitivity	Nature of Effect (% increase in traffic)	Magnitude	Significance of Effect
57	A17 (Swineshead)	Low	Total = 0.5% HGV = 2.6%	Negligible	**Negligible**
60	A52 (Bicker)	Low	Total = 2.8% HGV = 31.6%	Low	**Negligible**
63	A52 (Swaton)	Low	Total = 1.3% HGV = 14.3%	Low	**Negligible**
64	A15 (Swarby)	Low	Total = 0.5% HGV = 4.5%	Negligible	**Negligible**
55	A17 (Kirkby la Thorpe)	Negligible	Total = 0.3% HGV = 1.2%	Negligible	**Negligible**
56	A17 (Swineshead Bridge)	Medium	Total = 0.3% HGV = 2.3%	Negligible	**Negligible**
58	A1121 (Hubbert's Bridge)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**
59	A17 (Wigtoft)	Low	Total = 0.4% HGV = 1.3%	Negligible	**Negligible**
61	A16 (Kirton)	Negligible	Total = 0% HGV = 0%	Negligible	**Negligible**
62	A16 (Algarkirk)	Negligible	Total = 0% HGV = 0%	Negligible	**Negligible**
25	A16 (Hilldyke)	Low	Total = 0.3% HGV = 7.1%	Negligible	**Negligible**
24	A52 (Haltoft End)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**

Table 25.29 Severance Significance of Effects (Weekdays)					
Site	Road Link	Receptor Sensitivity	Nature of Effect (% increase in traffic)	Magnitude	Significance of Effect
65	A15 (Folkingham)	Medium	Total = 0.4% HGV = 6.2%	Negligible	**Negligible**
68	A52 (Dembleby)	Low	Total = 0.5% HGV = 3.2%	Negligible	**Negligible**
81	A17 (Holbeach Clough)	Low	Total = 0.2% HGV = 1.7%	Negligible	**Negligible**
80	A17 (Long Sutton)	Negligible	Total = 0.4% HGV = 1.5%	Negligible	**Negligible**
99	B1192 (Langrick)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**

Table 25.30 Severance Significance of Effects (Saturday)					
Site	Road Link	Receptor Sensitivity	Nature of Effect (% increase in traffic)	Magnitude	Overall Significance of Effect
57	A17 (Swineshead)	Low	Total = 0.8% HGV = 6.4%	Negligible	**Negligible**
60	A52 (Bicker)	Low	Total = 3.9% HGV = 110.6%	Low	**Negligible**
63	A52 (Swaton)	Low	Total = 2.3% HGV = 53.8%	Low	**Negligible**
64	A15 (Swarby)	Low	Total = 0.7% HGV = 19.4%	Low	**Negligible**
55	A17 (Kirkby la Thorpe)	Negligible	Total = 0.4% HGV = 4.0%	Negligible	**Negligible**
56	A17 (Swineshead Bridge)	Medium	Total = 0.5% HGV = 5.9%	Negligible	**Negligible**
58	A1121 (Hubbert's Bridge)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**
59	A17 (Wigtoft)	Low	Total = 0.7% HGV = 3.0%	Negligible	**Negligible**

Table 25.30 Severance Significance of Effects (Saturday)					
Site	Road Link	Receptor Sensitivity	Nature of Effect (% increase in traffic)	Magnitude	Overall Significance of Effect
61	A16 (Kirton)	Negligible	Total = 0% HGV = 0%	Negligible	**Negligible**
62	A16 (Algarkirk)	Negligible	Total = 0% HGV = 0%	Negligible	**Negligible**
25	A16 (Hilldyke)	Low	Total = 0.4% HGV = 26.9%	Low	**Negligible**
24	A52 (Haltoft End)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**
65	A15 (Folkingham)	Medium	Total = 0.5% HGV = 25.9%	Medium	**Moderate**
68	A52 (Dembleby)	Low	Total = 0.8% HGV = 12.8%	Low	**Negligible**
81	A17 (Holbeach Clough)	Low	Total = 0.4% HGV = 7.2%	Negligible	**Negligible**
80	A17 (Long Sutton)	Negligible	Total = 0.4% HGV = 6.4%	Negligible	**Negligible**
99	B1192 (Langrick)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**

6.4.3 As shown in Table 25.29, on weekdays the effects on severance are **not significant**.

6.4.4 If deliveries were to take place on a Saturday during periods of peak construction traffic, there would be a significant effect at one receptor location (A15 Folkingham).

6.4.5 However, it is proposed that the majority of HGV movements will take place on weekdays, with Saturdays reserved for traffic movements only if required. Also, works on a Saturday would only constitute around 16% of the total working time during a given six day working week, therefore the impacts would be considered minimal.

6.4.6 The number of traffic movements on a Saturday are also considered very much a worst case scenario.

6.4.7 It should also be noted that the A15 is a primary A-road, necessary for the construction of the proposed converter station, permanent access road and proposed AC cable route and already carries HGV traffic, therefore is considered appropriate for this usage.

6.5 Pedestrian/Cycling Impacts

6.5.1 Table 25.31 presents a summary of the potential effects on pedestrians and cyclists during the construction phase. At all receptor locations there are limited or no pedestrian/cycling facilities available, therefore in accordance with the criteria outlined in Table 25.5, the impact magnitude for the sites has been identified as 'High'.

Table 25.31 Pedestrian/Cyclist Significance of Effects

Site	Road Link	Receptor Sensitivity	Pedestrian /Cycling Impacts	Magnitude	Overall Significance of Effect
57	A17 (Swineshead)	Low	Limited or no facilities for pedestrians and cyclists with limited crossing facilities and low quality linkages to the local facilities	High	**Moderate**
60	A52 (Bicker)	Low			**Moderate**
63	A52 (Swaton)	Low			**Moderate**
64	A15 (Swarby)	Low			**Moderate**
55	A17 (Kirkby la Thorpe)	Negligible			**Minor**
56	A17 (Swineshead Bridge)	Medium			**Moderate**
58	A1121 (Hubbert's Bridge)	Low			**Moderate**
59	A17 (Wigtoft)	Low			**Moderate**
61	A16 (Kirton)	Negligible			**Minor**
62	A16 (Algarkirk)	Negligible			**Minor**
25	A16 (Hilldyke)	Low			**Moderate**
24	A52 (Haltoft End)	Low			**Moderate**
65	A15 (Folkingham)	Medium			**Moderate**
68	A52 (Dembleby)	Low			**Moderate**
81	A17 (Holbeach Clough)	Low			**Moderate**
80	A17 (Long Sutton)	Negligible			**Minor**
99	B1192 (Langrick)	Low			**Moderate**

6.5.2 When combined with the receptor sensitivity values, this results in a number of the receptors experiencing a 'Moderate' overall significance, e.g. a **significant effect**.

6.5.3 However, it should be noted that there are currently very few pedestrians/cyclists using the roads under assessment and due to the nature of the roads, very few additional pedestrian/cyclist movements would be expected in the future. The works are also expected to be temporary in nature, therefore any significant effects will only be apparent for a limited period.

6.6 Decommissioning Effects

6.6.1 The effects during the decommissioning phase would be no worse than those presented within section 6.5, as decommissioning would essentially be the reverse of the construction period. The impacts would therefore be no worse in scale, nature and duration, with the resultant effects considered likely to be **not significant**.

7 Mitigation

7.1 Overview of Mitigation

Introduction

7.1.1 In order to mitigate some of the potentially significant effects relating to traffic and transport, a number of mitigation measures have been proposed. Mitigation would be secured/delivered through the Outline Construction Environmental Management Plan (CEMP) and Construction Traffic Management Plan (CTMP), which are expected to be secured by planning condition.

HGV Construction Traffic

7.1.2 Mitigation relating to traffic movements associated with the proposed converter station, proposed AC cable route and permanent access road would be focused primarily on HGV traffic, as the additional car/LGV trips will have a negligible impact on future traffic flows. However, the impacts of car/LGV trips could also be mitigated through the encouragement of worker car share.

7.1.3 Based on the assessment criteria of HGV traffic, the only method of reducing the overall significance of effect would be through a reduction in overall HGV traffic during construction (either by reducing the total number required or re-routeing traffic). This will not be possible, hence the residual impacts would remain the same post mitigation, however, there are a number of softer measures that would help to lessen the general impacts of the construction traffic.

7.1.4 The number of HGVs associated with construction is likely to have a potentially adverse, but temporary and isolated effect on the local highway network. Therefore, the programming of such movements could potentially be subject to restrictions during certain periods of the day.

7.1.5 In addition, extensive route planning and analysis was carried out during the assessment of traffic impacts in order to devise the most appropriate route for vehicles travelling to and from the proposed site (e.g. to ensure avoidance of residential and other sensitive areas) as much as possible.

7.1.6 This process involved a detailed assessment of all A-roads, B-roads and unclassified roads in the ZoI to ascertain their suitability for use by HGVs and other large vehicles required.

7.1.7 A desktop review, supported by a site visit, was conducted that identified a number of features on the routes that could potentially affect their suitability, as follows:

- Proximity to settlements;
- Road width;
- Weight restrictions;
- Height restrictions;
- Bridges;

- Level crossings; and
- Other obstacles.

7.1.8 As indicated, a CTMP will also be developed, which would identify how traffic would be managed throughout the duration of the construction period. The CTMP will include the following:

- Location of site and the entry/exit arrangements;
- Traffic routeing plans – defining the routes to be taken by HGVs to the site. For example, prioritising the use of A and B-roads as far as possible, avoidance of Langrick Bridge and other sensitive locations;
- Construction hours and delivery times;
- Strategy for traffic management and measures for informing construction traffic of local access routes, road restrictions, timing restrictions and where access is prohibited;
- Measures to protect the public highway (e.g. wheel wash facilities);
- Measures for the monitoring of the CTMP to ensure compliance from drivers and appropriate actions in the event of non-compliance;
- Mechanism for responding to traffic management issues arising during the works (including concerns raised from the public) including a joint consultation approach with relevant highways authorities;
- Details of traffic management requirements; and
- Strategy for traffic management and measures for informing construction traffic of local access routes, road restrictions (statutory limits: width, height, axle loading and gross weight), timing restrictions (if applicable) and where access is prohibited.

7.1.9 Control measures will include:

- All construction traffic to adhere to the Traffic Route Plans included in the CTMP;
- All vehicles will be able to access and egress the site in a forward gear, with sufficient room off the public highway to allow them to wait without blocking the main carriageway;
- Welfare facilities will be provided so as to minimise the need for off-site trips by staff during the working day;
- At all site accesses, suitable supervision will be provided as required to ensure that traffic is controlled at access points during construction (for example banksman checking road traffic and controlling construction vehicle movements) and mud deposits on the roads are minimised; and
- Where required, traffic signals (in accordance with New Roads and Street Works Act (NRSWA), (Ref 25-7) or stop-go boards will be used to control road traffic. Road signs will conform to Chapter 8 (Traffic Signs Manual, Ref 25-8) and NRSWA.

Road Safety

7.1.10 Whilst the majority of impacts relating to road safety are negligible, the access from the public highway at the A52 would use Banksmen to manage the movement of HGVs on and off the public highway. Warning signage would be provided on the approaches to the access junction.

Pedestrians and Cyclists

7.1.11 As part of a Travel Plan developed for the proposed site, measures such as an internal site layout to accommodate the movement of pedestrian and cyclists would be designed. This would provide benefits within the site, but would not provide benefits to external receptors.

7.1.12 There would however be very few pedestrian/cyclist movements expected as part of the construction phase of the development, which relates to the relatively low number of additional workers expected.

Travel Plan

7.1.13 A Travel Plan would be introduced in order to encourage sustainable travel to the site. The Travel Plan would include measures such as; encouragement of car sharing and public transport usage, better marketing of information and implementation of a Travel Plan Co-ordinator. Where appropriate, a shuttle bus to transport workers to key interchange locations could be introduced.

7.1.14 An important element in ensuring the success of the construction phase and reducing the effects on traffic receptors is effective communication with local communities before and during the construction process, and in particular to inform them of the timing of construction activities and to help alleviate any concerns they may have. To address this National Grid will ensure, in line with NRSWA and any Section 278 Agreements with the Highway Authorities, that the Contractor maintains good communication with affected communities, keeping them informed about the timing and extent of activities which may affect them.

7.1.15 So far as practicable material will be retained on site including the retention of all soils and spoils, therefore minimising the need to move material on and off the site.

7.1.16 It is considered that with the implementation of the above measures, any minor effects on road users during the construction period will be reduced further. Where appropriate, HGVs would access and egress in a forward gear. At all accesses, warning signage will be provided on the approaches to the access junctions.

8 Residual Effects

8.1 Introduction

8.1.1 This section of the report outlines the residual effects of the potential traffic impacts, following the application of mitigation.

8.2 Temporary Impacts

HGV Construction Traffic

8.2.1 Table 25.32**Error! Reference source not found.** and **Error! Reference source not found.Error! Reference source not found.** present summaries of the residual effects of the additional HGV traffic generated by the proposed converter station site on a weekday and a Saturday following the implementation of associated mitigation.

Table 25.32 HGV Traffic Impact Significance of Effects (Weekday) – Residual Effects

Site	Road Link	Receptor Sensitivity	Traffic % Increase (HGVs)	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
57	A17 (Swineshead)	Low	2.6%	Negligible	**Negligible**	**Negligible**
60	A52 (Bicker)	Low	31.6%	Medium	**Minor**	**Minor**
63	A52 (Swaton)	Low	14.3%	Low	**Negligible**	**Negligible**
64	A15 (Swarby)	Low	4.5%	Negligible	**Negligible**	**Negligible**
55	A17 (Kirkby la Thorpe)	Negligible	1.2%	Negligible	**Negligible**	**Negligible**
56	A17 (Swineshead Bridge)	Medium	2.3%	Negligible	**Negligible**	**Negligible**
58	A1121 (Hubbert's Bridge)	Low	0%	Negligible	**Negligible**	**Negligible**
59	A17 (Wigtoft)	Low	1.3%	Negligible	**Negligible**	**Negligible**
61	A16 (Kirton)	Negligible	0%	Negligible	**Negligible**	**Negligible**
62	A16 (Algarkirk)	Negligible	0%	Negligible	**Negligible**	**Negligible**
25	A16 (Hilldyke)	Low	7.1%	Low	**Negligible**	**Negligible**

Table 25.32 HGV Traffic Impact Significance of Effects (Weekday) – Residual Effects						
Site	Road Link	Receptor Sensitivity	Traffic % Increase (HGVs)	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
24	A52 (Haltoft End)	Low	0%	Negligible	**Negligible**	**Negligible**
65	A15 (Folkingham)	Medium	6.2%	Low	**Minor**	**Minor**
68	A52 (Dembleby)	Low	3.2%	Negligible	**Negligible**	**Negligible**
81	A17 (Holbeach Clough)	Low	1.7%	Negligible	**Negligible**	**Negligible**
80	A17 (Long Sutton)	Negligible	1.5%	Negligible	**Negligible**	**Negligible**
99	B1192 (Langrick)	Low	0%	Negligible	**Negligible**	**Negligible**

Table 25.33 HGV Traffic Impact Significance of Effects (Saturday) – Residual Effects						
Site	Road Link	Receptor Sensitivity	Traffic % Increase (HGVs)	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
57	A17 (Swineshead)	Low	6.4%	Low	**Negligible**	**Negligible**
60	A52 (Bicker)	Low	110.6%	High	**Moderate**	**Moderate**
63	A52 (Swaton)	Low	53.8%	Medium	**Minor**	**Minor**
64	A15 (Swarby)	Low	19.4%	Medium	**Minor**	**Minor**
55	A17 (Kirkby la Thorpe)	Negligible	4.0%	Negligible	**Negligible**	**Negligible**
56	A17 (Swineshead Bridge)	Medium	5.9%	Negligible	**Negligible**	**Negligible**
58	A1121 (Hubbert's Bridge)	Low	0%	Negligible	**Negligible**	**Negligible**
59	A17 (Wigtoft)	Low	3.0%	Negligible	**Negligible**	**Negligible**
61	A16 (Kirton)	Negligible	0%	Negligible	**Negligible**	**Negligible**

Table 25.33 HGV Traffic Impact Significance of Effects (Saturday) – Residual Effects						
Site	Road Link	Receptor Sensitivity	Traffic % Increase (HGVs)	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
62	A16 (Algarkirk)	Negligible	0%	Negligible	**Negligible**	**Negligible**
25	A16 (Hilldyke)	Low	26.9%	Medium	**Minor**	**Minor**
24	A52 (Haltoft End)	Low	0%	Negligible	**Negligible**	**Negligible**
65	A15 (Folkingham)	Medium	25.9%	Medium	**Moderate**	**Moderate**
68	A52 (Dembleby)	Low	12.8%	Low	**Negligible**	**Negligible**
81	A17 (Holbeach Clough)	Low	7.2%	Low	**Negligible**	**Negligible**
80	A17 (Long Sutton)	Negligible	6.4%	Low	**Negligible**	**Negligible**
99	B1192 (Langrick)	Low	0%	Negligible	**Negligible**	**Negligible**

8.2.2 As indicated in Table 25.26, the residual effects on weekdays would be **not significant**. If deliveries were to take place on a Saturday during periods of peak construction traffic, the significant effect at two receptor locations (A52 Bicker and A15 Folkingham) would remain post-mitigation.

8.2.3 However, on a Saturday there is much less HGV traffic in the baseline, therefore any increase in HGVs would be substantial. Traffic has been assessed as a typical working day, however, it is proposed that the majority of HGV movements will take place on weekdays, with Saturdays reserved for traffic movements only if required. Also, works on a Saturday would only constitute around 16% of the total working time during a given six day working week, therefore the impacts would be considered minimal.

8.2.4 The number of traffic movements on a Saturday are also considered very much a worst case scenario. Even in this scenario, which assesses the quietest day for baseline flows with peak construction traffic, only two of the seventeen receptor sites would experience residual significant effects.

8.2.5 The measures introduced as part of the CTMP would help to lessen the general impacts of the construction traffic. For example, the use of A and B-roads would be prioritised as far as possible, together with the avoidance of Langrick Bridge and other sensitive locations.

8.2.6 Connection works within the existing Bicker Fen 400 kV Substation would also take place during the construction period. It is expected that traffic movements would be small and are considered as part of the overall traffic movements within the assessment.

Road Safety Impacts

8.2.7 Table 25.34 presents a summary of the residual effects on road safety during the construction phase.

Table 25.34 Road Safety Impact Significance of Effects – Residual Effects

Site	Road Link	Receptor Sensitivity	Road Safety Impact	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
57	A17 (Swineshead)	Low	Minor increase in overall traffic at known accident locations	Low	**Negligible**	**Negligible**
60	A52 (Bicker)	Low			**Negligible**	**Negligible**
63	A52 (Swaton)	Low			**Negligible**	**Negligible**
64	A15 (Swarby)	Low			**Negligible**	**Negligible**
55	A17 (Kirkby la Thorpe)	Negligible			**Negligible**	**Negligible**
56	A17 (Swineshead Bridge)	Medium			**Minor**	**Minor**
58	A1121 (Hubbert's Bridge)	Low			**Negligible**	**Negligible**
59	A17 (Wigtoft)	Low			**Negligible**	**Negligible**
61	A16 (Kirton)	Negligible			**Negligible**	**Negligible**
62	A16 (Algarkirk)	Negligible			**Negligible**	**Negligible**
25	A16 (Hilldyke)	Low			**Negligible**	**Negligible**
24	A52 (Haltoft End)	Low			**Negligible**	**Negligible**
65	A15 (Folkingham)	Medium			**Minor**	**Minor**
68	A52 (Dembleby)	Low			**Negligible**	**Negligible**

Table 25.34 Road Safety Impact Significance of Effects – Residual Effects						
Site	Road Link	Receptor Sensitivity	Road Safety Impact	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
81	A17 (Holbeach Clough)	Low			**Negligible**	**Negligible**
80	A17 (Long Sutton)	Negligible			**Negligible**	**Negligible**
99	B1192 (Langrick)	Low			**Negligible**	**Negligible**

8.2.8 The residual effects at all receptor locations are **not significant**. The two locations identified as having a 'Minor' significance of effect will not be affected by the proposed mitigation, as this will only provide road safety benefits at the site access location itself.

Severance Impacts

8.2.9 Table 25.35**Error! Reference source not found.** presents a summary of the residual effects on severance during the construction phase.

Table 25.35 Severance Significance of Effects (Weekdays) – Residual Effects						
Site	Road Link	Receptor Sensitivity	Nature of Effect (% increase in traffic)	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
57	A17 (Swineshead)	Low	Total = 0.5% HGV = 2.6%	Negligible	**Negligible**	**Negligible**
60	A52 (Bicker)	Low	Total = 2.8% HGV = 31.6%	Low	**Negligible**	**Negligible**
63	A52 (Swaton)	Low	Total = 1.3% HGV = 14.3%	Low	**Negligible**	**Negligible**

Table 25.35 Severance Significance of Effects (Weekdays) – Residual Effects						
Site	Road Link	Receptor Sensitivity	Nature of Effect (% increase in traffic)	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
64	A15 (Swarby)	Low	Total = 0.5% HGV = 4.5%	Negligible	**Negligible**	**Negligible**
55	A17 (Kirkby la Thorpe)	Negligible	Total = 0.3% HGV = 1.2%	Negligible	**Negligible**	**Negligible**
56	A17 (Swineshead Bridge)	Medium	Total = 0.3% HGV = 2.3%	Negligible	**Negligible**	**Negligible**
58	A1121 (Hubbert's Bridge)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**	**Negligible**
59	A17 (Wigtoft)	Low	Total = 0.4% HGV = 1.3%	Negligible	**Negligible**	**Negligible**
61	A16 (Kirton)	Negligible	Total = 0% HGV = 0%	Negligible	**Negligible**	**Negligible**
62	A16 (Algarkirk)	Negligible	Total = 0% HGV = 0%	Negligible	**Negligible**	**Negligible**
25	A16 (Hilldyke)	Low	Total = 0.3% HGV = 7.1%	Negligible	**Negligible**	**Negligible**

Table 25.35 Severance Significance of Effects (Weekdays) – Residual Effects						
Site	Road Link	Receptor Sensitivity	Nature of Effect (% increase in traffic)	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
24	A52 (Haltoft End)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**	**Negligible**
65	A15 (Folkingham)	Medium	Total = 0.4% HGV = 6.2%	Negligible	**Negligible**	**Negligible**
68	A52 (Dembleby)	Low	Total = 0.5% HGV = 3.2%	Negligible	**Negligible**	**Negligible**
81	A17 (Holbeach Clough)	Low	Total = 0.2% HGV = 1.7%	Negligible	**Negligible**	**Negligible**
80	A17 (Long Sutton)	Negligible	Total = 0.4% HGV = 1.5%	Negligible	**Negligible**	**Negligible**
99	B1192 (Langrick)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**	**Negligible**

Table 25.36 Severance Significance of Effects (Saturday) – Residual Effects						
Site	Road Link	Receptor Sensitivity	Nature of Effect (% increase in traffic)	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
57	A17 (Swineshead)	Low	Total = 0.8% HGV = 6.4%	Negligible	**Negligible**	**Negligible**

Table 25.36 Severance Significance of Effects (Saturday) – Residual Effects						
Site	Road Link	Receptor Sensitivity	Nature of Effect (% increase in traffic)	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
60	A52 (Bicker)	Low	Total = 3.9% HGV = 110.6%	Low	**Negligible**	**Negligible**
63	A52 (Swaton)	Low	Total = 2.3% HGV = 53.8%	Low	**Negligible**	**Negligible**
64	A15 (Swarby)	Low	Total = 0.7% HGV = 19.4%	Low	**Negligible**	**Negligible**
55	A17 (Kirkby la Thorpe)	Negligible	Total = 0.4% HGV = 4.0%	Negligible	**Negligible**	**Negligible**
56	A17 (Swineshead Bridge)	Medium	Total = 0.5% HGV = 5.9%	Negligible	**Negligible**	**Negligible**
58	A1121 (Hubbert's Bridge)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**	**Negligible**
59	A17 (Wigtoft)	Low	Total = 0.7% HGV = 3.0%	Negligible	**Negligible**	**Negligible**
61	A16 (Kirton)	Negligible	Total = 0% HGV = 0%	Negligible	**Negligible**	**Negligible**

Table 25.36 Severance Significance of Effects (Saturday) – Residual Effects						
Site	Road Link	Receptor Sensitivity	Nature of Effect (% increase in traffic)	Magnitude	Significance of Effect (Without Mitigation)	Residual Significance
62	A16 (Algarkirk)	Negligible	Total = 0% HGV = 0%	Negligible	**Negligible**	**Negligible**
25	A16 (Hilldyke)	Low	Total = 0.4% HGV = 26.9%	Low	**Negligible**	**Negligible**
24	A52 (Haltoft End)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**	**Negligible**
65	A15 (Folkingham)	Medium	Total = 0.5% HGV = 25.9%	Medium	**Moderate**	**Moderate**
68	A52 (Dembleby)	Low	Total = 0.8% HGV = 12.8%	Low	**Negligible**	**Negligible**
81	A17 (Holbeach Clough)	Low	Total = 0.4% HGV = 7.2%	Negligible	**Negligible**	**Negligible**
80	A17 (Long Sutton)	Negligible	Total = 0.4% HGV = 6.4%	Negligible	**Negligible**	**Negligible**
99	B1192 (Langrick)	Low	Total = 0% HGV = 0%	Negligible	**Negligible**	**Negligible**

8.2.10 As shown in Table 25.35, on weekdays the residual effects would be **not significant**.

8.2.11 If deliveries were to take place on a Saturday during periods of peak construction traffic, there would be a significant effect at one receptor location (A15 Folkingham).

8.2.12 However, it is proposed that the majority of HGV movements will take place on weekdays, with Saturdays reserved for traffic movements only if required. Also, works on a Saturday would only constitute around 16% of the total working time during a given six day working week, therefore the impacts would be considered minimal.

8.2.13 The number of traffic movements on a Saturday are also considered very much a worst case scenario.

8.2.14 It should also be noted that the A15 is a primary A-road, necessary for the construction of the proposed converter station, permanent access road and proposed AC cable route and already carries HGV traffic, therefore is considered appropriate for this usage.

Pedestrian/Cycling Impacts

8.2.15 Table 25.37 presents a summary of the residual effects on pedestrian/cycling during the construction phase.

Table 25.37 Pedestrian/Cyclist Significance of Effects – Residual Effects

Site	Road Link	Receptor Sensitivity	Pedestrian/ Cycling Impacts	Magnitude	Overall Significance of Effect	Residual Significance
57	A17 (Swineshead)	Low	Limited or no facilities for pedestrians and cyclists with limited crossing facilities and low quality linkages to the local facilities	High	**Moderate**	**Minor**
60	A52 (Bicker)	Low			**Moderate**	**Minor**
63	A52 (Swaton)	Low			**Moderate**	**Minor**
64	A15 (Swarby)	Low			**Moderate**	**Minor**
55	A17 (Kirkby la Thorpe)	Negligible			**Minor**	**Negligible**
56	A17 (Swineshead Bridge)	Medium			**Moderate**	**Minor**
58	A1121 (Hubbert's Bridge)	Low			**Moderate**	**Minor**

Table 25.37 Pedestrian/Cyclist Significance of Effects – Residual Effects						
Site	Road Link	Receptor Sensitivity	Pedestrian/ Cycling Impacts	Magnitude	Overall Significance of Effect	Residual Significance
59	A17 (Wigtoft)	Low			**Moderate**	**Minor**
61	A16 (Kirton)	Negligible			**Minor**	**Negligible**
62	A16 (Algarkirk)	Negligible			**Minor**	**Negligible**
25	A16 (Hilldyke)	Low			**Moderate**	**Minor**
24	A52 (Haltoft End)	Low			**Moderate**	**Minor**
65	A15 (Folkingham)	Medium			**Moderate**	**Minor**
68	A52 (Dembleby)	Low			**Moderate**	**Minor**
81	A17 (Holbeach Clough)	Low			**Moderate**	**Minor**
80	A17 (Long Sutton)	Negligible			**Minor**	**Negligible**
99	B1192 (Langrick)	Low			**Moderate**	**Minor**

8.2.16 The impact magnitude for pedestrian/cycling movements is driven by the level of existing amenities available. As there are little or no facilities available at all receptor locations, and very few cyclists/pedestrians are expected as part of the construction, the residual significance has been reduced. In addition, the Travel Plan would deliver softer measures that would help to lessen the significance of effects.

8.2.17 As shown in Table 25.37, the residual effects on pedestrians and cyclists are therefore considered **not significant**.

8.3 Decommissioning Effects

8.3.1 The residual effects during the decommissioning phase would be no worse than those presented within section 8.2, as decommissioning would essentially be the reverse of the construction

period. The impacts would therefore be no worse in scale, nature and duration, with the resultant effects considered likely to be **not significant**.

9 Cumulative Effects

9.1 Introduction

9.1.1 This section considers the inter-project and intra-project cumulative impacts relating to traffic and transport. Reference should be made to the cumulative assessment chapter (ES-2-C.11 Chapter 28) which also identifies the committed developments to be considered within the assessment.

9.2 Scope of Cumulative Assessment (Inter-Project Impacts)

9.2.1 This section considers the inter-project impacts, which relate to other committed developments in the vicinity of the proposed site.

9.2.2 Table 25.38 details the committed developments considered as part of the proposed converter station traffic and transport assessment.

9.2.3 The developments identified within Chapter 29 have been reviewed and only the sites lying within the proposed converter station ZoI have ultimately been included for further assessment.

9.2.4 Further review of relevant documentation relating to the committed developments has been undertaken to ascertain whether there would be any potential traffic impacts generated by these sites. The next stage of the process was to discount sites from the identified list if they were not deemed to generate traffic impacts.

9.2.5 For example, if traffic was not to be generated at the same time as that of the proposed converter station construction period and the volume of traffic was not considered significant, the committed development was omitted from the assessment at this point.

9.2.6 As shown in Table 25.38 two of the committed development sites have been included as part of the traffic and transport assessment. These sites were then assessed further to ascertain their potential effects on the proposed converter station site.

Table 25.38 Cumulative Assessment - Committed Developments

Development Name/ Description	Planning Application Reference Number	Location	Details of Traffic Impacts	Traffic Impacts
Triton Knoll Offshore Wind Farm	-	Within the county of Lincolnshire	The ES chapter outlines the total daily two-way Cars/HGVs expected as part of the scheme.	Yes

Table 25.38 Cumulative Assessment - Committed Developments				
Development Name/ Description	**Planning Application Reference Number**	**Location**	**Details of Traffic Impacts**	**Traffic Impacts**
Heckington Fen Wind Park,	15/0416/S36	Land At Six Hundred Farm Six Hundred Drove East Heckington Lincolnshire	Average of 18 HGV two way movements per day during 52 week construction phase. Maximum of 24 two way car movements per day. No operational impacts assumed.	Yes
Erection of one new grain store	17/0165/FUL	Six Hundreds Farm Buildings Six Hundreds Drove East Heckington Sleaford Lincolnshire PE20 3QA	The planning officer states that the site would not attract or generate large numbers of journeys, and is located to provide opportunities for access by public transport, walking or cycling.	No
Dismantle and rebuild 1.29 km of 11kv overhead lines	B/13/0357	Land adjacent to, Sellars Farm, Sutterton Drove, Amber Hill, Boston, Lincolnshire	No details of traffic movements are provided and the planning officer states that no objections have been made, therefore permission has been granted.	No
Erection of 6no. – 8no. poultry sheds.	S/096/00333/ 16	Laburnum House, Main Road, Langrick, Boston, Lincolnshire. PE22 7AN	Requested that the ES provide further details on types, frequency and number of trips. These details were not available online.	No
Construct a 499kw anaerobic digestion plant	S/096/00870/ 14	Laburnum House, Main Road, Langrick, Boston, Lincolnshire	Chapter 4.27 - 4.29 outlines that during operation of the site, it will not generate additional highway traffic over and above existing activities.	No

Table 25.38 Cumulative Assessment - Committed Developments				
Development Name/ Description	**Planning Application Reference Number**	**Location**	**Details of Traffic Impacts**	**Traffic Impacts**
Erection of 16no. biomass boilers with associated fuel silos to heat existing poultry units.	S/096/01235/14	Langriville Farm, Langrick Road, New York, Lincoln, Lincolnshire. LN4 4XH	LCC Highways comments outline that after review of the proposed planning application it was felt that an additional 16 HGV movements over 45 days or 90 days would not constitute to a significant impact on the surrounding highway network.	No

Cumulative Effects

9.2.7 As indicated in Table 25.38, two of the identified committed developments are expected to generate traffic impacts.

Triton Knoll Offshore Wind Farm

9.2.8 As detailed in Figure 9-13 of the Triton Knoll ES Chapter 9: Traffic and Access (April 2015) (Ref 25-9) it is expected that the Triton Knoll scheme will generate significant levels of traffic during its construction phase.

9.2.9 Based on the anticipated construction programme it is unlikely the peak periods of construction traffic for the proposed converter station and Triton Knoll (typically the main civil engineering works) will coincide.

9.2.10 No cumulative effects are expected to be generated; therefore the cumulative effects of the Triton Knoll scheme are considered to be **not significant**.

Heckington Fen Wind Park

9.2.11 Permission has been granted for the development of Heckington Fen Wind Park (Ref: 15/0416/S36) and subsequently the scheme will generate some traffic movements during its construction period, expected to last between 2017 and 2023.

9.2.12 However, due to the small number of additional daily vehicle movements and the fact that the peak construction period is unlikely to coincide with the peak month of construction of the proposed site, cumulative effects of the Heckington Fen Wind Park scheme are considered to be **not significant**.

9.3 Scope of Cumulative Assessment (Intra-Project Impacts)

9.3.1 This section considers the intra-project impacts, which relate to construction activities concerning the proposed DC cable route.

9.3.2 For the purposes of this assessment, the traffic impacts generated by the proposed converter station, proposed AC cable route, permanent access road and the proposed DC cable route have been combined.

9.3.3 The construction period for the proposed converter station, proposed AC cable route and permanent access is scheduled to take place between 2019 and 2022, however details of the proposed DC cable route construction are to be confirmed.

9.3.4 Although it is unlikely that the peak construction periods will coincide, an assessment has been undertaken to determine the impacts of this scenario, were it to occur.

9.3.5 Only traffic generated by the proposed DC cable route Temporary Construction Facilities (TCFs) closest to the proposed converter station (e.g. Temporary Construction Compound (TCC) P3, Temporary Construction Area (TCA) T13, TCC S6, TCA T14, TCA T15 and TCA T16) have been considered as part of the assessment.

9.3.6 As with the other assessments contained within this chapter, the 2019 assessment year, with a 20% construction traffic uplift has been assumed for the associated converter station traffic. Traffic relating to the proposed DC cable route construction has then been added to indicate the intra-project traffic impacts.

9.3.7 When combined, the impacts on receptors are considered to remain **not significant** on weekdays.

9.3.8 On Saturdays some effects will be significant, although as previously noted, however, it is proposed that the majority of HGV movements will take place on weekdays, with Saturdays reserved for traffic movements only if required. Also, works on a Saturday would only constitute around 16% of the total working time during a given six day working week, therefore the impacts would be considered minimal.

10 Summary of Assessment

10.1 Summary

10.1.1 This chapter reports the results of baseline studies and the assessment of the potential impacts of traffic and transport on the proposed converter station, the proposed AC cable route and the permanent access road.

Overview of Baseline Conditions

10.1.2 This section provides an overview of baseline conditions within the ZoI, which is defined by those roads where there is the potential for significant impact due to the addition of construction traffic.

10.1.3 Prediction of construction effects has focused on activities that could directly and indirectly disrupt receptors within the ZoI. The ZoI includes those roads which are required in order to facilitate the construction of the proposed converter station, and upon which there is the potential for a significant impact.

10.1.4 Site visits were undertaken in November 2015 and November 2016 to develop a robust understanding of the characteristics of the baseline conditions within the ZoI.

10.1.5 The ZoI covered the key roads surrounding the proposed converter station, proposed AC cable route and permanent access road, namely the A52 between the A15 junction and the A16 north of Boston and the A17 between Sleaford and Hoffleet Stow.

10.1.6 Access to the proposed converter station site is proposed via a new permanent access road from the A52, a principal A-road. The A52 then links to a number of other principal A-roads on the strategic road network, such as the A15, A16, A17 and A1. These roads are all considered suitable for use by HGVs.

10.1.7 Baseline traffic has been established using ATCs in agreed locations across Lincolnshire. In order to take into account seasonal variations on roads surrounding the proposed converter station, it was agreed with LCC that ATCs should be carried out during a winter and summer month.

10.1.8 Summer flows were collected over a 24-hour seven day period between Monday 1 and Sunday 7 August 2016 and the winter flows were collected between Monday 9 and Sunday 15 January 2017. The surveys provided two-way flows by direction and were classified by vehicle type, including HGVs.

10.1.9 On weekdays a number of the road links within the ZoI have relatively significant proportions of HGVs, for example the A17 Kirkby la Thorpe (15%) and A17 Swineshead (11%). This suggests that the key routes surrounding the proposed converter station are already well used by HGVs and are suitable for continued use.

10.1.10 Personal injury accidents within the ZoI for the most recent full five-year period available (2011-2015), were obtained from LCC. A comparison with existing national average accident rates (Lynam et al, 2003) (Ref 25-6) was carried out. In the baseline, the key road sections within the ZoI have accident rates generally below the national average for their particular flow groups.

Overview of Residual Effects

10.1.11 In summary, the results of the assessments indicate that impacts at all receptors are likely to be **not significant**, unless works take place on a Saturday, where some significant effects may occur. However, it is proposed that the majority of HGV movements will take place on weekdays, with Saturdays reserved for traffic movements only if required. Also, works on a Saturday would only constitute a maximum of around 16% of the total working time during a given week, therefore the impacts would be considered minimal.

10.1.12 An overview of the residual effects within each specified local authority area related to HGV construction traffic, road safety, severance and pedestrians/cyclists is provided within Table 25.39 **Error! Reference source not found.**to Table 25.41. For HGV construction traffic and severance impacts, the summary tables indicate the residual significance on a weekday.

10.1.13 In addition, the inter-project and intra-project cumulative effects related to traffic and transport are not significant.

Residual Effects in South Holland District Council (SHDC)

10.1.14 A summary of residual effects on receptors in SHDC is provided in Table 25.39.

Table 25.39 Residual Effects (SHDC)

Receptor	Receptor Sensitivity	Assessment Element	Residual Significance	Significant
A17 (Long Sutton)-Site 80	Negligible	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Negligible	No
A17 (Holbeach Clough)-Site 81	Low	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No

Residual Effects in Boston Borough Council (BBC)

10.1.15 A summary of residual effects on receptors in BBC is provided in Table 25.40.

Table 25.40 Residual Effects (BBC)

Receptor	Receptor Sensitivity	Assessment Element	Residual Significance	Significant
A52 (Haltoft End)-Site 24	Low	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No
A16 (Hilldyke)-Site 25	Low	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No
A17 (Swineshead Bridge)-Site 56	Medium	HGV Construction Traffic	Negligible	No
		Road Safety	Adverse, Minor	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No
A17 (Swineshead)-Site 57	Low	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No
A1121 (Hubbert's Bridge)-Site 58	Low	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No
A17 (Wigtoft)-Site 59	Low	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No
A52 (Bicker)-Site 60	Low	HGV Construction Traffic	Adverse, Minor	Yes
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No

Table 25.40 Residual Effects (BBC)				
Receptor	**Receptor Sensitivity**	**Assessment Element**	**Residual Significance**	**Significant**
A16 (Kirton)-Site 61	Negligible	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Negligible	No
A16 (Algarkirk)-Site 62	Negligible	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Negligible	No
B1192 (Langrick)-Site 99	Low	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No

Residual Effects in North Kesteven District Council (NKDC)

10.1.16 A summary of residual effects on receptors in NKDC is provided in Table 25.41.

Table 25.41 Residual Effects (NKDC)				
Receptor	**Receptor Sensitivity**	**Assessment Element**	**Residual Significance**	**Significant**
A17 (Kirkby la Thorpe)-Site 55	Negligible	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Negligible	No
A52 (Swaton)-Site 63	Low	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No
A15 (Swarby)-Site 64	Low	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No

Table 25.41 Residual Effects (NKDC)				
Receptor	**Receptor Sensitivity**	**Assessment Element**	**Residual Significance**	**Significant**
A52 (Dembleby)-Site 68	Low	HGV Construction Traffic	Negligible	No
		Road Safety	Negligible	No
		Severance	Negligible	No
		Pedestrians/Cyclists	Adverse, Minor	No

11 References

Ref 25-1. Department for Communities and Local Government, (March 2014), 'Travel Plans, Transport Assessments and Statements' Planning Practice Guidance document

Ref 25-2. Institute of Environmental Assessment (IEA) (January 1993), 'Guidelines for the Environmental Assessment of Road Traffic'

Ref 25-3. Department for Transport, National Transport Model (NTM)

Ref 25-4. Design Manual for Road and Bridges (DMRB)

Ref 25-5. DMRB Volume 11, Section 2, Part 5 – HA 205/08 Assessment and Management of Environmental Effects

Ref 25-6. National Average Accident Rates document (2003), (Lynam et al)

Ref 25-7. New Roads and Street Works Act (NRSWA), (1991)

Ref 25-8. Traffic Signs Manual (2006)

Ref 25-9. Triton Knoll ES Chapter 9: Traffic and Access (April 2015)

Ref 25-10 National Planning Policy Framework (2012)

Ref 25-11 Town and Country Planning Act (1990)

Ref 25-12 Lincolnshire Local Transport Plan (2013/14 – 2022/23)

Ref 25-13 Boston Borough Local Plan, Adopted 1999 (Saved Policies, 2007)

Ref 25-14 South East Lincolnshire Local Plan 2011-2036 (Publication Version, March 2017)

Ref 25-15 Central Lincolnshire Local Plan (Adopted, April 2017)

Ref 25-16 South Holland Local Plan 2006 (Saved Policies, 2009)

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