

## **11 TRAFFIC AND TRANSPORT**

### **11.1 INTRODUCTION**

#### **11.1.1 Terms of Reference for this Chapter**

This chapter has been produced by Mayer Brown Limited and presents an assessment of the likely significant effects due to traffic and transport from construction, operation and decommissioning of the Proposed Development project (henceforth the 'Proposed Development'). The baseline traffic and transport environment around the Proposed Development site is described, potential effects identified, proposed mitigation measures listed and an assessment of the significance of residual effects is made.

The main potential impacts of the proposed development on traffic and transport assets include the following.

- Increased traffic flows (both cars and Heavy Good Vehicles (HGVs)) along principal routes during construction have the potential to increase congestion and the risk of accidents.
- During construction the transport of abnormal indivisible loads could require junction modifications or cause bottlenecks on the network.
- During operation slight increases in vehicle traffic could potentially result in localised effects.

Scoping responses relating to highways issues were received from North Lincolnshire Council (dated 7<sup>th</sup> May 2015) which acknowledged SSE's recognition of a sustainable approach to transportation. Additionally, this opinion stated that a Construction Phase Traffic Management Plan will be required; this will be provided at the appropriate time incorporating input from the construction contractor and the abnormal loads haulier. Further detailed scoping discussions were undertaken with highway officers at North Lincolnshire Council regarding the trip generation and distribution methodology set out herein. Copies of this are included within the Transport Assessment for the site.

The Department of Energy and Climate Change provided a scoping response dated 24<sup>th</sup> July 2015 which makes reference to the North Lincolnshire Council response and the comments provided by the Highways Agency.

#### **11.1.2 The Basis of Assessment including the Realistic Worst Case Scenario**

Assessment has been undertaken using observed traffic counts from local highways undertaken in 2015, as well as staffing numbers and shift patterns provided by SSE plc. To ensure a robust worst case assessment, certain assumptions have been made and agreed with SSE and where necessary with the highway officer at North Lincolnshire Council; these are described below.

There will be 18 new members of staff operating the Proposed Development. These will be split over two 12-hour shifts, to provide 24/7 operation. It is assumed that all operational staff will travel to the site alone by car. All operational staff will use the existing site entrance from the B1392.

There will be up to 500 staff involved in the construction phase, unevenly split over two 12-hour shifts, to provide 24/7 construction. It is assumed that each member of staff will work on average a 40-hour week and will travel to the site by car. SSE has advised, based on company experience at other power station construction projects, that an average car occupancy of 1.5 construction staff per car is appropriate. These staff vehicles will all use the A18 entrance. It is assumed they will be split 25%/75% between the west and east, with staff living locally in Scunthorpe, Doncaster or other local towns and villages during the construction period. Construction workforce car parking will be within a dedicated part of the temporary construction laydown area.

SSE advises that, based upon previous company experience, there will be up to 10 HGVs per hour delivering materials and removing waste from the construction site. These will only operate during the day shift, from 07:00 to 19:00, although it is expected that the majority of these will occur during the earlier part of the day.

As noted in *Section 2.4.6*, consent conditions were imposed for the Consented Development requiring the Company not to route heavy commercial construction traffic via Keadby, except in an emergency, and to construct a new access road by-passing Ealand via Hatfield drain and North Pilfrey bridges. This access route has been constructed and will be utilised by the Company to access the Proposed Development site for construction (see *Figure 2.6*). All heavy commercial construction traffic is therefore assumed to travel from the west, via the A18 and the dedicated site access road. Abnormal oversized loads (up to 10 over the duration of the Proposed Development) will use either the A18 skewed access route directly onto the site access roads or the route via the A161 and along New Trent Street and Bonnyhale Road through Ealand as used in the past for abnormal loads.

Allowance for committed development in the area has been made. Discussions with officers at North Lincolnshire Council indicated that consideration should be given to traffic from the Lincolnshire Lakes project in west Scunthorpe and also the Scunthorpe United Football Club relocation. This is considered to be the worst-case baseline scenario and also addresses cumulative effects.

Traffic figures and routes for the proposed development have been used to inform the air quality and noise assessments of traffic emissions.

### **11.1.3 Consultation**

SSE is carrying out various formal and informal consultation activities as part of the s36 variation application. The formal Scoping Opinion is set out in *Annex B*. As part of the process, consultation responses relevant to transport and traffic were received from the Highways Agency and North Lincolnshire Council and are detailed in *Table 11.1*.

**Table 11.1 Consultation Responses**

Source	Consultee Comment	Response
Highways Agency	<p>The Highways Agency’s primary area of interest is to ensure the continued safe and efficient operation of the Strategic Road Network (i.e. Motorways and Trunk Roads) in England on behalf of the Secretary of State for Transport. The Agency also has an interest in the impact of the transportation of abnormal loads on the strategic road network and necessary mitigation required for any adverse impacts on the operation or integrity of our asset. The required processes for abnormal load movements on the strategic road network must be followed in the construction, maintenance and operation of Keadby II Generating Station.</p> <p>Paragraphs 5.8.3 and 5.8.5 of the scoping report states Guidance on Transport Assessments issued by the Department for Transport in 2007 presents an accepted framework for assessing development and the impact of development upon existing travel methods. This guidance has been superseded by the Department for Communities and Local Government’s [DCLG’s] Planning Practice Guidance on “Travel Plans, Transport Assessments and Statements in decision-taking” although it is appreciated that many of the principles outlined in the GTA will still be relevant. It is also worth noting that the Agency will expect consideration to be given to the principles set out in Circular 02/13 ‘The Strategic Road Network and the Delivery of Sustainable Development.’</p>	<p>A Transport Assessment was produced with consideration to “Travel Plans, Transport Assessment and Statements in decision-taking” and Circular 02/13 to review trip generation during construction and operational phases, including review of abnormal load movements and this has been included as <i>Annex I</i> of this ES. The contractors will make the abnormal load movement application at the appropriate time, post-consent, to agree routing and specific vehicles to be used. This will include usage of the Strategic Road Network, including the M180.</p>
North Lincolnshire Council	<p>There will be an impact on the highway network during the construction phase, this will be minimised through the implementation of and adherence to a Construction Phase Traffic Management Plan and the proposals to route all traffic via the purpose built access road from the A18. The latter will help to minimise the impact of construction traffic on local settlements.</p> <p>It is anticipated that the impact on the highway network during the operational phase will be negligible.</p> <p>The proposed assessment methodology for Traffic and Transport is acceptable and should provide a robust assessment. A Transport Statement and Construction Phase Traffic Management Plan will be required to support any planning application.</p>	<p>Further correspondence was undertaken with highway officers at North Lincolnshire Council to agree the scope of Transport Assessment; a copy of this correspondence is included in Appendix B of the Transport Assessment. A summary of the contents for the Construction Phase Traffic Management Plan is set out in the Transport Assessment, and the full document will be produced at an appropriate time, which is likely to be once a contractor has been appointed. All construction and construction staff vehicles will use the purpose build access road from the A18. All operational staff will use the existing access from the B1392.</p>

#### 11.1.4 **Policy, Legislation and Guidance**

##### *Overview*

This ES has been produced taking into consideration the national, regional and local policy documents.

A Transport Assessment has been produced for the proposals following scoping correspondence with the highway officer at North Lincolnshire Council to determine the area of assessment.

Sustainable travel modes are the key driver of the transport assessment process, with the aim to minimise the numbers of vehicles a development generates by encouraging and improving accessibility to non-car modes of travel such as public transport, walking and cycling. Given the rural location of the Proposed Development, opportunities for operational or construction staff to travel by non-car modes is realistically likely to be limited.

##### *National Policy*

The National Planning Policy Framework (NPPF) supersedes the previous guidance, the Planning Policy Guidance (PPG) and Planning Policy Statement (PPS) of the Government for planning matters in England since March 2012.

The NPPF highlights at paragraph 14 that there is a "presumption in favour of sustainable development" which is a contiguous key theme in development control.

Specifically, when considering traffic and travel, Section 4 of the NPPF considers the promotion of sustainable transport as a vital point in facilitating sustainable development. The Government does, however, highlight at paragraph 29 that "*different policies and measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas*".

All developments that generate significant amounts of movements should be supported by a Transport Assessment.

The NPPF states that local authority development plans and decisions allowing development to be granted should be based upon the following points (summarised from paragraph 32):

- that the opportunities for sustainable transport modes have been taken up depending on the nature and location of the site;
- that safe and suitable access to the site can be achieved for all people;
- that improvements can be undertaken within the transport network that cost effectively limit the significance of the development; and
- development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

## *Local Policy*

The North Lincolnshire Local Plan and the North Lincolnshire Core Strategy comprise part of the Council's development plan of which are a number of policies that address sustainable transportation:

- T2 – Access to Development;
- T6 – Pedestrian Routes and Footpaths;
- T8 – Cyclists and Development;
- T14 – The North Lincolnshire Strategic Road Network (NLSRN);
- T19 – Car parking provision and standards; and
- T24 – Road freight.

The respective policies require a satisfactory access to the development (Policy T2), links to pedestrian routes (policy T6), cycle links with existing/proposed routes and cycle parking facilities (policy T8), managing the use of roads within the NLSRN (policy T14) and ensuring HGVs are excluded from sensitive areas.

### **11.1.5 *Supporting Information for this Chapter***

Information, including the results of baseline surveys and other studies is provided in: Transport Assessment (Mayer Brown; September 2015) as *Annex I* to this ES.

## **11.2 *APPROACH AND METHODOLOGY***

### **11.2.1 *The Project's Area of Influence***

#### *General Traffic Considerations and Routes*

Construction traffic and operational traffic from the Proposed Development are expected to take different routes to the site and will have different levels of impacts.

Operational traffic will use the main site entrance on the B1392, which is used at present by staff to access the Keadby I site. This main entrance leads to a staff and visitor car park. The operational phase will only result in 18 additional staff, with a maximum of eight of these on-site at any one time. Therefore there will only be eight additional vehicles on the highway network in any one hour.

Construction traffic, including both HGVs and staff vehicles, will use the entrances onto the A18, which comprise a perpendicular bridge and a skewed bridge across the Hatfield Waste Drain; these routes both lead to the North Pilfrey bridge which was constructed in 2012. The perpendicular access and bridge across the Hatfield Waste Drain was built to implement the 1993 planning consent for the Consented Development and was used for the majority of vehicles during the building of the wind farm, while the skewed access and bridge route was used to carry oversized abnormal loads into the wind farm site. Abnormal overweight loads are also expected to use either the skewed access route or the route via the A161 and along New Trent Street

and Bonnyhale Road through Ealand as used in the past for abnormal loads; up to ten of these abnormal loads are expected through the build phase.

#### *Other Potential Routes*

Consideration was given by SSE at an early stage for usage of the Sheffield and South Yorkshire Navigation Canal to transport plant and materials. However, the lock gate from the River Trent is small in size, which would limit the ships that could be used, and additionally the tidal nature of the river is likely to constrain the hours during which such deliveries could be undertaken. Adjacent to the site, overhead pylons and gas plant limit the size of ship and lifting material. Additionally there is not a suitable pier at this location, and transshipment onto HGVs would still be required to transport these materials directly to the construction site.

#### *Baseline Data*

Traffic data were collected for the following highway links, as agreed with the highway officer at NLC:

- B1392, south of site entrance and south of canal bridge (near Trent Side / end of Three Rivers);
- B1392, north of site entrance, at northern edge of built up village area (by river/drain where village sign and 30mph signage is located);
- A18 Station Road, at/near bridge over River Trent;
- Althorpe Main Street, south of junction with Kelsey Lane;
- A18, adjacent to windfarm access road junction; and
- A161, link between A18 and M180.

#### *Road Networks to be Included in the Assessment*

The results of these surveys enabled review of the existing traffic flows, to determine the percentage impact of the development on each link, to determine whether it exceeds the thresholds set out below, and hence confirm the area of influence with regard to traffic.

The Institute of Environmental Assessment (IEA) Guidelines <sup>(1)</sup> suggest that assessment of road networks is based upon two broad rules:

- include highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); and
- include any other specifically sensitive areas where traffic flows will increase by 10% or more.

Where the predicted increase in traffic flows is lower than the thresholds, the guidelines suggest the significance of the impacts can be stated to be low or insignificant and further detailed assessments are therefore not warranted.

(1) Institute of Environmental Assessment Guidance Notes – Guidelines for the Environmental Assessment of Road Traffic (1993)

Analysis of the traffic flows expected for both the Proposed Development's construction workforce and the operational traffic on the local highway network has been applied in the development peak hours to the calculated traffic movements in these development phases. It should be noted that the existing traffic movements have been adjusted to include committed development. This is considered to be the worst-case baseline scenario and also addresses cumulative effects.

The realistic worst case scenario, when applied to the background general traffic flows, has been used in order to calculate which links are most likely to experience impacts. The construction traffic flows compared to the background flows have been calculated and are shown in *Table 11.2*. The table addresses the construction phase, as the number of vehicles during this phase are considerably higher than is expected during the operational phase, and the assessed hours are shown for the start and end of the dayshift, when traffic movements from the construction site will be at their highest. All flows are shown as two-way combined traffic movements. Further details of traffic flows and calculations are set out later in this chapter.

**Table 11.2** *Confirming the Area of Influence*

Road Names	Weekday 06:00-07:00		Weekday 19:00-20:00	
	2015 observed flows + committed development + construction trips	% devt. effect upon Link	2015 observed flows + committed development + construction trips	% devt. effect upon Link
A18 King George V bridge	552	+22.4%	763	+15.3%
A18, east of site access	373	+37.1%	415	+32.2%
A18, west of site access	306	+12.5%	348	+10.8%
A161, between A18 and M180	265	+14.1%	268	+14.5%
B1392, south of site	98	0%	150	0%

*Table 11.2* indicates that the greatest potential effects of the proposed development are going to occur on the most direct routes to and from the site, particularly along the A18 to the east of the site. No impact is expected on the B1392 as construction traffic and construction staff vehicles will not be permitted to use this route.

Construction workforce will use the access junction from the A18 in order to travel to and from the development site. This will be controlled through the Construction Traffic Management Plan, with clear instructions being provided to staff. Contact names at SSE will be provided so that residents can inform the company if construction staff are travelling via residential roads, particularly the B1329 and Chapel Lane, to access the construction site. The contractor will have disciplinary procedures in place to deal with members of staff who do not abide by the permitted routing.

## *Heavy Goods Vehicles and Abnormal Indivisible Loads*

It is predicted that there will be up to 10 HGVs travelling to and from the site every hour providing deliveries and collecting materials, during the construction phase. These will travel to and from the west along the A18, using the construction site access road and the North Pilfrey bridge.

Abnormal Indivisible Loads will use the A18 entrance, making use of the skewed access and bridge that was constructed to facilitate development of the Keadby Windfarm. This route accommodated the wind turbine towers, and therefore is able to accommodate large vehicles. Some upgrades to this bridge, including structural improvements, and to the approach tracks from the A18 leading towards the North Pilfrey Bridge are expected to be required to accommodate the multi-axles vehicles that will be required to transport the heavy gas turbines into the site. Indicative swept path analysis has been undertaken for potential AIL vehicles, but this will be reviewed once the heavy hauliers have been appointed and the specific vehicles determined. Any improvements required to the bridges or the access tracks will also be determined at that time.

Alternatively, Abnormal Indivisible Loads may be brought in along the route via the A161 and along New Trent Street and Bonnyhale Road through Ealand as used in the past for abnormal loads.

It is expected that there will be up to ten Abnormal Indivisible Loads during the entire construction period. Abnormal load applications will be applied for by SSE and/or the contractor at the relevant time, and this is likely to result in temporary road closures on specific sections of highway for short periods to ensure the ten abnormal loads are able to safely negotiate this route.

### **11.2.2 Assessment Criteria**

#### *EIA Process Overview*

The methodology used is based upon the likely effects of the proposed development evaluated in accordance with the IEA Guidelines <sup>(1)</sup>.

The methodology considers the effects of the proposed development upon driver delay, accidents and safety, noise and vibration (see *Chapter 8*), pollutant emissions, dust and dirt (see *Chapter 9*), pedestrian delay, pedestrian amenity and community severance.

Assessment of the effects is based upon the following:

- baseline traffic flow data for the local highway network provided from traffic counts undertaken by Traffic Survey Partners in May 2015;
- details of the local transport infrastructure including bus routes, train stations, walking routes and cycle ways;

(1) Institute of Environmental Assessment Guidance Notes – Guidelines for the Environmental Assessment of Road Traffic (1993)



- estimates of traffic generation during construction, operation and decommissioning of the proposed development;
- assessment of routes to be used for the transportation of AILs; and
- capacity assessment of the local highway links.

In terms of the methodology used, the traffic-related effects are based on assessment of the following factors:

- traffic flows;
- driver delay;
- pedestrian delay;
- severance, fear and intimidation;
- accidents and safety;
- pedestrian amenity; and
- hazardous loads (which include AILs).

Professional judgement and modelling software such as PICADY (for the assessment of priority junctions) is used in determining the significance of alterations in traffic flows on the above categories.

Significance of effects is determined through an understanding of the sensitivity of a receptor and the anticipated magnitude of impact. The definition of magnitude and sensitivity in the context of the traffic assessment are discussed in more depth below.

#### *Magnitude of Impacts, Traffic Flows*

The proposed development is expected to result in changes in traffic flow for each of the construction, operation and decommissioning periods.

Large changes in traffic flow can have a significant negative effect due to increased congestion, delays and severance. These effects can be particularly noticeable for large increases in HGV traffic flows.

Changes could also have positive effects if traffic flow is reduced on certain links, or if the development is replacing an existing (higher) generator of traffic flows.

The IEA guidance provides information on how the magnitude of changes in traffic flow should be determined, as shown in *Table 11.3*.

**Table 11.3** *Magnitude of Changes*

<b>Magnitude</b>	<b>Change in total traffic</b>	<b>Description</b>
Negligible	<30%	No discernible change in conditions
Small	30 – 60%	Perceptible change in condition
Medium	60 – 90%	Apparent and noticeable changes to the local conditions
Large	>90%	Considerable change in conditions

### *Delay (Driver and Pedestrian)*

An increase in delay is a negative product of increases in traffic flows, and can be experienced by both drivers (i.e. through additional congestion and queuing at junctions) and pedestrians (i.e. longer waiting times at signalised crossings).

Within the assessment, driver delay will be analysed at the site access using the PICADY junction capacity programme. This package allows junction operation to be modelled, and changes in queuing identified between the existing and proposed situations.

### *Severance, Fear and Intimidation*

The effects of a project's traffic upon pedestrians are commonly referred to as severance. An increase in traffic flow can result in severance being experienced by pedestrians or populations separated from their destination by a significant road or traffic artery. Pedestrians may become intimidated and struggle to find gaps in traffic in order to cross the network to their destination; a situation which could be exacerbated by increases in traffic.

### *Road Safety (Accidents and Safety)*

The alterations in traffic flows may have effects upon the road safety of the local highway network.

A review of the existing accident locations and severity classes has been made, in order to identify any areas where accidents are concentrated, and whether increased / varied traffic flow changes are likely to exacerbate this.

### *Pedestrian Amenity and Cyclist and Public Transport Accessibility*

This is defined by the IEA guidelines as the 'relative pleasantness of a journey', and can be affected by alterations in traffic flow, particularly increases in HGV traffic.

The assessment reviews the pedestrian highway network in the vicinity of the proposed site and considers the effects of the development on pedestrian amenity.

Assessment of the local highway conditions will be based upon the Institution of Highways and Transportation's (IHT) document "Providing for Journeys on Foot" <sup>(1)</sup>.

Additionally, the cyclist infrastructure will be assessed and consideration given to cycling distances from local centres to the proposed development site, based upon the IHT "Cycle-Friendly Infrastructure – Guidelines for Planning and Design" <sup>(2)</sup> and the Department for Transport (DfT) Local Transport Note (LTN) 2/08 regarding "Cycle Infrastructure Design" <sup>(3)</sup>.

(1) Institute of Highways and Transportation – "Providing for Journeys on Foot" (2000)

(2) Institute of Highways and Transportation – "Cycle-Friendly Infrastructure – Guidelines for Planning and Design" (1996)

(3) Department for Transport – Local Transport Note 2/08 – "Cycle Infrastructure Design" (2008)

### *Hazardous and Abnormal Indivisible Loads*

Whilst every effort will be made to minimise effects upon the local road network, the transport of hazardous, bulky and over-sized cargo can be problematic on constrained road networks. A review of the AILs expected by the proposed development has been undertaken.

### *Receptor Sensitivity*

Receptor sensitivity is based upon definitions and information provided within the IEA Guidance which lists sites such as schools, hospitals, places of worship and historic buildings.

These receptors are provisionally reviewed in the evaluation of significance section, to assess whether alterations in traffic flow are likely to affect them.

Receptor sensitivity can be classified as high, medium or low based on the type of user and the impact of alterations in traffic flows has upon this land use type. Examples of each are shown below:

- low, receptors with some sensitivity to traffic flow, such as: places of worship, public open space, listed buildings and residential areas with adequate footway provision;
- medium, receptors include congested junctions, doctor's surgeries, hospitals, roads with narrow footways and un-segregated cycleways; and
- high, receptors which are affected most by changes in traffic flow include schools, colleges, playgrounds, areas of severe congestion, accident blackspots, retirement centres and areas with poor pedestrian separation from roads.

### *Evaluation of Significance*

The evaluation of significance of effects involves the assessment of development-induced changes in traffic flows against baseline flows and professional judgement. Magnitude and sensitivity are considered in combination to evaluate whether an effect is, or is not significant and, if so, its degree of significance (defined in terms of Minor, Moderate or Major). The process is shown in *Table 11.4*.

**Table 11.4 Assessing the Significance of Effects**

Magnitude of Impact		Sensitivity of Receptor		
		Low	Medium	High
Small		Minor	Minor	Moderate
Medium		Minor	Moderate	Major
Large		Moderate	Major	Major

The effects considered as significant within the IEA Guidance are those of moderate or major significance. As an example an effect of moderate significance would be suggested when a receptor of low sensitivity experiences an impact of major magnitude.

## **11.3 BASELINE CONDITIONS**

### **11.3.1 Introduction**

The proposed development site was visited on Thursday 14<sup>th</sup> May 2015, in order to understand the operation of the local highway network and the accessibility of the development site by all modes of transport. This visit included traveling along the private roads that will be used to carry construction traffic from the public highway network.

The information provided in this assessment is from a number of sources:

- traffic surveys undertaken by Traffic Survey Partners in May 2015; and
- Personal Injury Accident data provided by North Lincolnshire Council.

Where appropriate, the assessment has been undertaken by qualitative means, as explained within the methodology section.

### **11.3.2 Baseline Traffic Flows**

#### *Observed Traffic Flows*

Six automatic traffic counters (ATCs) were laid by Traffic Survey Partners from Wednesday 13<sup>th</sup> May to Tuesday 19<sup>th</sup> May 2015 inclusive. Surveys were undertaken during school term time and reflected a neutral time of year.

The locations of these counters were agreed with the highway officer at NLC. The ATCs measured vehicle volumes, speeds and classifications at the following locations:

- B1392, south of site entrance and immediately south of canal bridge;
- B1392, north of site entrance, at northern edge of built up village area (by river/drain where village sign is located);
- A18 Station Road, immediately to west of King George V bridge;
- Althorpe Main Street, south of junction with Kelsey Lane;
- A18, adjacent to windfarm access road junction; and
- A161, link between A18 and M180, near Little Hirst.

The ATC on the A18 adjacent to the windfarm access road was damaged during the survey period, and therefore full results for this location were available only for 13<sup>th</sup> May to 17<sup>th</sup> May.

Additionally, a classified turning count was undertaken at the site entrance on the B1392 between 07:00 and 19:00 on Tuesday 12<sup>th</sup> May 2015. The weather was dry.

The full 2015 datasets relating to the link flows are contained within the Transport Assessment.

### *Committed Development Traffic*

Discussions were undertaken with the highway officer at NLC to determine which committed developments in the vicinity should be considered. The required sites in the vicinity of the M181 west of Scunthorpe comprised:

- Lincolnshire Lakes application 1 – 500 new homes, village centre, car/retirement home, health facility;
- Lincolnshire Lakes application 2 – highway works for new terminating roundabout and east/west link road;
- Lincolnshire Lakes application 3 – commercial park;
- Lincolnshire Lakes application 4 – 3,000 homes, primary school, village centre, care home; and
- Relocation of Scunthorpe United FC football ground – supersedes Lincolnshire Lakes application 3 for same site.

A Transport Assessment was produced by WSP in 2013 to assess the cumulative transport impacts of the four Lincolnshire Lakes planning applications. A further Transport Assessment Supporting Statement was produced by WSP in August 2014, following proposals to reduce the scale of application 1 from 500 to 450 homes, and application 4 from 3,000 units to 2,550 units. Further amendments were proposed to the layout and design of the scheme. No changes were made to the trip generation calculations following these changes, as they were considered to reflect a robust assessment of the proposals.

A Transport Assessment was produced by PSA Design in January 2015 in respect to the planning application for the relocation of the football ground. This scheme replaces the proposals for a commercial park at Lincolnshire Lakes. The Transport Assessment set out the net change in traffic flows compared to the Lincolnshire Lakes commercial park on the same site.

The two Transport Assessments for the committed developments considered the junction of the M181 with the A18, at the western side of Scunthorpe. This was the nearest area to the Proposed Development study area, and generated traffic flows for morning and evening peak hours from the two committed developments for the western link of the A18 have been derived from the relevant Transport Assessments. These flows are summarised in *Table 11.5*, which has used Figures 9.4, 9.5, 9.7 and 9.8 from the WSP TA to determine the Lincolnshire Lakes traffic and Figure 7 from PSA Design TA to calculate the Scunthorpe United football ground traffic.

**Table 11.5** *Committed Traffic on A18 West of M181 (two-way combined)*

<b>Development</b>	<b>AM Peak (08:00-09:00)</b>	<b>PM Peak (17:00-18:00)</b>
Lincolnshire Lakes	+67	+88
Scunthorpe United FC ground	-9	-27
Total committed traffic	+58	+61

No trip generation was undertaken as part of either Transport Assessment for other weekday hours of assessment. As an approximation of the potential trip generation from the committed development at other times, the ATC data for the A18 at King George V bridge have been reviewed. The review

demonstrated that 2.8% of traffic travelled between 06:00 and 07:00, with 4.1% travelling between 19:00 and 20:00. The AM peak accounted for 8.0% of daily traffic. These proportions have been applied to the total committed traffic set out in *Table 11.5* to estimate traffic flows at other times as follows:

- 06:00-07:00 = +20 vehicles;
- 08:00-09:00 = +58 vehicles;
- 17:00-18:00 = +61 vehicles;
- 19:00-20:00 = +30 vehicles; and
- 00:00-24:00 = +725 vehicles.

No further distribution of development traffic to the west of the M181/A18 roundabout was undertaken as part of either Transport Assessment for the committed developments. It is likely that the traffic will distribute through the various local villages including Gunness, Burringham, Althorpe and Keadby, as well as further afield towards Ealand and Crowle. For purposes of assessment within this ES chapter, all of this traffic has been assumed to travel to and from Crowle via the A18 and A161, therefore being within the main study area for construction traffic in particular.

Keadby I was not operational or fully staffed at the time of traffic surveys and therefore the full complement of staff traffic was not measured on the highway network associated with this element. When operational, 25 members of staff would be on-site during the day shift, arriving between 06:00 and 07:00 and departing between 19:00 and 20:00. These staff would all travel to and from the site by car, using the B1392 and travelling from the south. Taking a conservative approach, an additional 25 vehicles have therefore been added as committed traffic on the B1392 south of the site entrance, before being split 25% west and 75% to the east on the A18. This approach fully accounts for the recent return to service of Keadby I.

#### *Total Baseline Traffic Flows*

The observed 2015 traffic flows and the committed traffic flows have been combined to produce baseline flows for review. By testing 2015 flows with the committed traffic, although the committed developments will not be completed for several years, a robust assessment of percentage impacts of the traffic can be determined. This methodology was agreed with the highway officer at NLC. Observed flows are weekday averages from the five days of traffic surveys.

Flows are set out for the following hours:

- 06:00-07:00, reflecting the busiest time for construction and operational arrivals;
- 08:00-09:00, reflecting the morning network peak hour;
- 17:00-18:00, reflecting the evening network peak hour;
- 19:00-20:00, reflecting the busiest time for construction and operational departures; and
- 00:00-24:00, giving average weekday daily flows.

**Table 11.6 2015 Baseline Traffic Link Flows – Weekday 06:00-07:00**

Link	Observed traffic	Committed traffic	Total baseline traffic	HGVs
B1392 south of site	73	25	98	6
B1392 north of site	40	0	40	3
A18 King George V bridge	412	39	451	35
Althorpe Main Street	64	0	64	4
A18, site access	272	26	298	27
A161, between A18 and M180	241	0	241	41

**Table 11.7 2015 Baseline Traffic Link Flows – Weekday 08:00-09:00**

Link	Observed traffic	Committed traffic	Total baseline traffic	HGVs
B1392 south of site	218	0	218	30
B1392 north of site	124	0	124	12
A18 King George V bridge	1,186	58	1,244	100
Althorpe Main Street	231	0	231	16
A18, site access	722	58	780	77
A161, between A18 and M180	542	0	542	74

**Table 11.8 2015 Baseline Traffic Link Flows – Weekday 17:00-18:00**

Link	Observed traffic	Committed traffic	Total baseline traffic	HGVs
B1392 south of site	204	0	204	30
B1392 north of site	141	0	141	7
A18 King George V bridge	1,321	61	1,382	60
Althorpe Main Street	302	0	302	13
A18, site access	753	61	814	46
A161, between A18 and M180	579	0	579	53

**Table 11.9 2015 Baseline Traffic Link Flows – Weekday 19:00-20:00**

Link	Observed traffic	Committed traffic	Total baseline traffic	HGVs
B1392 south of site	125	25	150	10
B1392 north of site	81	0	81	3
A18 King George V bridge	613	49	662	21
Althorpe Main Street	133	0	133	9
A18, site access	314	36	350	14
A161, between A18 and M180	234	0	234	17

**Table 11.10 2015 Baseline Traffic Link Flows – Weekday Daily Traffic**

Link	Observed traffic	Committed traffic	Total baseline traffic	HGVs
B1392 south of site	2,626	50	2,676	289
B1392 north of site	1,582	0	1,582	128
A18 King George V bridge	14,827	763	15,590	1,099
Althorpe Main Street	3,143	0	3,143	185
A18, site access	8,678	737	9,415	842
A161, between A18 and M180	6,004	0	6,004	835

### 11.3.3 Accessibility by Pedestrians

A distance of 2 km, or 25 minute walk at a comfortable speed of 80 m per minute, is generally considered the maximum distance for people to commute on foot. This distance covers the majority of the village of Keadby, both north and south of the power station.

Within the site, a footway is provided from the B1392 to the site security gates and to the main office building. Within the site, pedestrian walkways are provided and are marked out with yellow and green lines. Pedestrians can walk on these without requiring any personal protective equipment (PPE); outside of these walkways, employees and visitors need to wear full PPE including gloves and safety boots.

A footway of varying width is provided on the western side of the B1392. This continues through the village to the south, and then continues southwards along the A18 as far as Crowle Bank Road. Dropped kerbs are provided across some of the minor road junctions. A footway commences on the eastern side of the B1392 after the road crosses the canal. This continues to the A18 junction, and then turns towards the east, passing bus stops and the Althorpe rail station before crossing over the River Trent on the road bridge.



No pedestrian facilities are provided along the A161 between the M180 and the A18, or along the A18 in the vicinity of the site accesses on that road.

In reality, given the nature of the local highway network and the rural location of the village, it is unlikely that large numbers of staff (either construction or operational) would walk to the site, unless they live very locally. The results of the pedestrian surveys showed only four pedestrians in total on the access road through the 12-hour surveyed period, demonstrating little existing travel by foot to or from the power station site.

#### **11.3.4 Accessibility by Cyclists**

A distance of 5 km is generally considered acceptable for most people to consider cycling, although some keen cyclists will travel further than this. Cycle parking is provided on-site, inside the security gates, and showers and lockers are provided within the main office building for use by staff.

An off-road cycle route runs along the towpath next to the Sheffield and South Yorkshire Navigation. This provides a link to and from the west, including the village of Ealand (5 km, 19 minute ride at 260 m per minute), before continuing to Thorne and Doncaster, although its condition is overgrown in places with a poor surface that may make access only possibly by mountain bike. It is understood that NLC has plans to improve this route for cyclists, although timescales are unknown.

There are on-road cycle lanes within Gunness on Doncaster Road between its junction with Neap House Road and the eastern edge of the village, where the 40 mph speed limit through the village increases to the National Speed Limit. This is approximately 3.5 km from the site of Keadby I and II, and therefore is within a suitable cycling distance.

The western edge of Scunthorpe is 5 km from the power station. This will involve cycling along the National Speed Limit section of Doncaster Road, which only confident cyclists are likely to consider. This is the most direct route to Scunthorpe, however; the alternative route via Burringham is approximately 8.5 km, which is further than many cyclists will travel by this mode.

#### **11.3.5 Accessibility by Bus**

The nearest bus stops to the site are on Station Road, south of the Sheffield and South Yorkshire Navigation, approximately 1.1 km or 14 minute walk from the site of the Proposed Development, of which 800 m is within the site. Bus service 25 stops here, providing an hourly link to Scunthorpe.

Additional buses stop at the Althorpe rail station, 2 km from the site. Bus services 90, 360 and 399 stop at this location, each providing services every two hours to Scunthorpe and other surrounding towns.

A summary of the bus services stopping near the site is set out in *Table 11.11*.

**Table 11.11 Bus Services Stopping Near Site (as September 2015)**

Number	Route	Monday - Friday		Saturday	Sunday
		Daytime	Evening		
35	Scunthorpe – Keadby - Amcotts	Hourly	No service	Hourly	No service
90	Crowle - Scunthorpe	Every 2 hours	No service	5 services	No service
360/361	Goole - Scunthorpe	Every 2 hours	No services	3 services	No service
399	Doncaster – Isle of Axholme - Scunthorpe	Every 2 hours	One service	Every 2 hours	No service

**11.3.6 Rail Services**

Althorpe rail station is located 2km from the site of the Proposed Development, around a six minute cycle ride. There is potential therefore for staff members to undertake a multi-modal trip by carrying a bicycle on the train and cycling to the power station. Staff could either leave a bicycle parked at Althorpe station, or could carry a folding bicycle on the train, which would allow them to travel by this mode at both ends of their journey.

Trains stop hourly in each direction, with services running between Scunthorpe and Doncaster, with some continuing to Sheffield. The first arrival from Doncaster is at 07:09 and from Scunthorpe at 05:51, Monday to Friday. The last departure for Doncaster is at 22:26 and for Scunthorpe at 23:12, Monday to Friday. Services run at a similar frequency on Saturdays, and there is no service on Sundays. There is therefore some scope for staff members to travel by this mode of travel, in combination with a cycle journey or potentially being picked up by a colleague.

**11.3.7 Public Transport Conclusion**

It can be concluded that there is some scope for travel by public transport but that given the shift patterns that will be worked by staff at the Proposed Development (expected to be 07:00 to 19:00, and 19:00 to 07:00 as per Keadby I) the limited frequency of services and the distance of these services from the site, it is unlikely that any members of staff will travel by public transport to the site on a regular basis.

**11.3.8 Accident Analysis**

Injury accident data have been provided for the site by the Road Safety team at NLC for the period of February 2010 to February 2015. The study area covers the main routes to be taken by construction traffic, as well as the highway local to the operational site entrance. This included the A161 from Junction of the M180 to the A18 at the Crowle gyratory, the A18 from the Crowle gyratory to the King George V Bridge, and the B1392 from the A18 to the northern edge of Keadby village.

Details for a total of 48 personal injury collisions (PICs) were provided by NLC over the review period, comprising one fatality, ten serious accidents and 37

slight incidents. This includes eight PICs located on the B1450 Burringham Road, outside of the requested study area.

No PICs were recorded at the operational site entrance, or at the construction site entrances on the A18. The study period included the construction phase of the Keadby Wind Farm.

The fatality occurred on the A18 west of Althorpe. One vehicle was involved, with the driver losing control on an icy surface and the vehicle overturning.

Four of the serious PICs occurred over a 2km stretch of the A18 near Althorpe. One occurred when a vehicle slipped on an icy road and collided with another vehicle; a second happened when a driver lost control when overtaking a vehicle. The third resulted from a driver clipping the kerb when moving over to avoid an oncoming vehicle and leaving the carriageway. The final serious incident on this stretch involved a young motorcyclist who drove into the rear of a parked vehicle, having been dazzled by the sun.

There was a small cluster of three PICs at the priority junction of the B1392 with the A18, all of which resulted in slight injuries. Two of these resulted from turning drivers pulling into the path of another vehicle, due to failure to look properly, while the other involved just a single driver who lost control.

A cluster of nine accidents occurred at the Crowle gyratory between the A18 and A161. One of these resulted in serious injuries to a motorcyclist, who was overtaking a car which pulled into its path. Two other incidents at this location involved motorcyclists, one of which lost control when making a turn, and the other occurred when a car entering the junction into the path of the motorcyclist who skidded and lost control. The road layout was listed as a possible contributory factor to one PIC at this location, with failure to look, poor turns, sudden braking and loss of control being common reasons for other injuries at this location. NLC has plans in place to make improvements to this junction with the aim of improving safety for road users, including additional signage and lineage on the westbound approach, new chevrons on the eastbound approach, and a reduction in the speed limit through the junction to 40mph. These works are planned for the financial year 2015-2016. A second phase of works to change the priorities on the northern section of the junction, from Ealand, is proposed although no timetable is yet confirmed.

Two incidents involved cyclists, both being children. Both of these were on Old School Lane, in the southern section of Keadby village, and resulted from the cyclists pulling into the path of cars.

Four of the PICs involved pedestrians. The first resulted in serious injuries to a child pedestrian who walked out from behind a parked car. The second resulted when a person who had been assaulted was lying in the road and was hit by an oncoming vehicle, resulting in slight injuries. These two both occurred on the B1329 Station Road, near Chesswick Avenue. The final two accidents resulted from a car passing too close to a pedestrian and both occurred on Burringham Road.

Only one of the PICs involved a goods vehicle over 7.5t. This happened at the eastern end of the King George V bridge, when an HGV travelling west to

north slowed to give way to oncoming vehicles, and a car travelling behind it collided with the rear of a motorcyclist who was directly behind the HGV. The motorcyclist received slight injuries.

Given the large study area, covering approximately 10km of highways, the number of accidents during the five year analysis period is considered relatively low and there is no definitive pattern linking a proportion of the incidents. The PIC record is equivalent to an average of ten PICs per year, or one per kilometre of highway per year.

There is no record of accidents relating to the construction of the wind farm, which would have had large vehicles using the local highway network, as will the Proposed Development. With the exception of the Crowle gyratory, which NLC is proposing to amend to improve safety, it is concluded that there are currently no highway safety issues in the vicinity of the proposed development.

Careful management of traffic during the construction phase -- for example avoiding the village of Keadby by using the A18 entrance for all construction vehicles and construction staff, with the exception of overweight abnormal loads, and temporary traffic regulation orders if needed -- will reduce the impact of this phase on potentially sensitive areas, where there are pedestrians or cyclists.

#### **11.3.9 Sensitive Receptors**

In order to establish the sensitive receptors surrounding the Site, a desktop study was undertaken, examining local area mapping. In addition information was gained from the site visits, and with consideration to the routes that will be taken by construction and operational traffic. The study area considers the receptors identified in *Table 11.12*.

**Table 11.12 Identified Sensitive Receptors**

Receptor	Location	Sensitivity	Potential impacts
Althorpe and Keadby Primary School	B1392 Station Road, Keadby	High	Operational traffic
Norwood House care home	A18 Station Road, Gunness	High	Operational and construction staff traffic
Crowle Gyrotory (accident “blackspot”)	A18	High	Operational, construction staff, construction traffic, AILs
Road with narrow footways	B1392, Keadby (north of canal near site entrance)	Medium	Operational traffic
New Generation Park	B1392 Station Road, Keadby	Medium	Operational traffic
Unsegregated cycleways	A18, Gunness	Medium	Operational and construction staff traffic
Listed building – King George V bridge	A18, Gunness	Low	Operational and construction staff traffic
Listed building – The Old Rectory	A18, Gunness	Low	Operational and construction staff traffic
Scheduled Monument – Keadby Lock	B1392, Keadby	Low	Operational traffic
Listed building – Syphon carrying South Level Engine Drain under River Torne	A18, near Pilfrey Farm	Low	Operational, construction staff, construction traffic, AILs
Listed building – Syphon carrying Hatfield Waste Drain below North Level Engine Drain	A18, near North Moor Farm	Low	Operational, construction staff, construction traffic, AILs

**11.3.10 Conclusions on Existing Traffic Conditions**

Traffic counts have been undertaken on key road links surrounding the Proposed Development, to determine the area of influence of the project. Flows have been summarised for the network and development peak hours, as well as the full daily flows. Consideration has been given to committed development in the vicinity, as set out by the highway officer at NLC, to include in the baseline flows.

There is some scope for travel to and from the site by non-car modes for construction and operational staff trips. However, given the shift patterns and the proximity of these services, it is expected that in reality the majority of such trips will be by car.

Accident data have been reviewed. The only cluster of accidents suggesting an area of concern is the Crowle gyrotory, for which NLC has plans for safety improvements to reduce the accident risk.

There are a number of sensitive receptors in the vicinity of the development, which potentially could be affected by either construction or operational traffic,

and the impact upon these will be reviewed later in this chapter as appropriate.

## **11.4 ASSESSMENT OF EFFECTS**

### **11.4.1 Introduction**

The purpose of the following section is to identify probable effects with provisional mitigation measures suggested to limit the impacts.

### **11.4.2 Assessment of Effects during Construction**

#### *Overview of Construction Traffic Levels – Staff/contractor Trips*

A peak construction staff complement of 500 has been estimated by SSE. This is a higher level of staffing than was set out in the 1992 Environmental Assessment for the Consented Development, but reflects SSE's experiences at the recently completed combined cycle gas turbine power station at Great Island in County Wexford and their Waste to Energy plant at Ferrybridge.

The maximum figure of 500 would be employed for months seven to thirty of the build programme, with a minimum figure of 300 during the first and last six months. Exact numbers of staff will not be known until a contract is placed.

It is anticipated that construction activities could be carried out 24 hours a day during weekdays, with the probable exception of a two week shutdown over the Christmas and New Year period. Shift hours are likely to be 07:00 to 19:00 and 19:00 to 07:00, so that staff avoid the network peak hours when accessing the site. During periods of 24 hour working, which are likely to be limited to the most intensive periods of the construction programme and during commissioning, there are likely to be more staff on the dayshift than the nightshift. For purposes of assessment it is assumed that three quarters work on the dayshift and one quarter on the nightshift. Staff are assumed to work on average 40 hours a week, generally comprising 3x12-hour shift one week and 4x12-hour shift a second week, although exact scheduling will be determined by the contractors.

On the basis of this assumption, only half of the day or night staff will be on-site at any one time. This equates to 188 day staff and 63 night staff. To ensure a robust assessment, these numbers have been rounded up to 200 and 65, in order to provide full 24/7 cover given shift patterns.

The 1992 Environmental Assessment estimated that 60% of staff would travel by car/van, with an average occupancy of 1.2 people per vehicle. Given the public transport provision and that few construction staff are likely to be living within walking or cycling distance, to ensure a robust assessment it has been assumed that all staff will travel by car or small van to the construction site. A vehicle occupancy of 1.5 has been assumed, based on SSE's experience on other sites, and agreed with the highway officer at NLC. This equates to 133 vehicles arriving for the dayshift between 06:00 and 07:00 and then departing 19:00 to 20:00. These time periods will receive the most impact from traffic.

Staff construction traffic will distribute 25% to and from the west and 75% to and from the east. This distribution has been agreed with the highway officer at NLC and is based on the likely residential locations of staff, including transient contractors. It is also assumed for the purpose of assessment that traffic travelling to and from the west will travel from the M180 via the A161, as this is the quickest route towards Doncaster. All traffic travelling to and from the east will come from Scunthorpe via the A18 (through Gunness), with none directly from the intermediate villages.

Table 11.13 sets out the total vehicular trip generation and distribution from construction staff traffic. These vehicles will all be entering and exiting at the A18 entrance.

**Table 11.13 Trip Generation and Distribution – Construction Staff Traffic**

Time	Arrivals			Departures		
	Total Vehicles	Vehicles from east (75%)	Vehicles from west (25%)	Total Vehicles	Vehicles to east (75%)	Vehicles to west (25%)
06:00-07:00	133	100	33	0	0	0
07:00-08:00	0	0	0	43	32	11
08:00-09:00	0	0	0	0	0	0
17:00-18:00	0	0	0	0	0	0
18:00-19:00	43	32	11	0	0	0
19:00-20:00	0	0	0	133	100	33

*Overview of Construction Traffic Levels – Construction (HGV) trips*

An estimate has been made by SSE based on their experience at other construction projects for power stations that up to ten construction vehicles per hour will be required to access and depart the site to bring materials and plant to and from the Proposed Development. These are assumed to be a mixture of rigid and articulated HGVs, as well as specialised vehicles such as mixers.

Consideration was given by SSE at an early stage to transportation of materials by ship, via the adjacent canal. However, the overhead pylons limit the site of ship and lifting material. Additionally there is not a suitable pier at this location, and transloading onto HGVs would still be required to transport these materials directly to the construction site.

Construction vehicles will only enter or exit the site during the dayshift, between 07:00 and 19:00.

All HGVs will travel to and from the west, via the A18 and the A161, from the M180. They will use the existing entrance gate on the A18 that lead to the North Pilfrey Bridge, and no HGVs will be permitted to travel to or from the east past Althorpe or Keadby.

It is probable that some materials will be transported by ship to ports at Grimsby and Immingham and then brought by HGV via the M180 for the final

section of their journey to Keadby. This particularly applies to the abnormal loads, set out later in this chapter

It should be noted that these are broad assumptions based on SSE experience at other sites and that any extra number of construction vehicles will only be known once a contractor is appointed to the project.

#### *Overview of Construction Traffic Levels – Abnormal Load Trips*

Up to ten abnormal loads are expected through the construction period. These will be used to carry the gas turbine equipment onto the site and therefore are likely to occur in the second half of the construction process. These loads are expected to be transported from the docks to the east of Keadby, at Immingham and Grimsby, along the M180 to Junction 1, where they will access the A18, then travelling east back along the A18. It is currently expected that these loads will access the site via the skewed access off the A18, and bridge over the Hatfield Waste Drain, although final routing will be agreed for these loads post-consent once the exact dimensions of the vehicles to be used has been confirmed.

The initial plans for transporting these abnormal loads, as discussed with officers at North Lincolnshire Council, were to use the AIL route via the A161 and along New Trent Street and Bonnyhale Road through Ealand. This route has been used in the past by National Grid to transport heavy and large loads, prior to construction of the North Piffrey Bridge. However, following the undertaking of indicative swept path analysis for this route, as described below, it has become clear that due to the tight geometry at certain junctions and limited areas of adopted highway, this route may require considerable upgrading to convey the extremely large vehicles required to carry the turbine equipment, dependent on vehicles to be used by the selected contractor.

Abnormal load movement applications will be made at the appropriate time, post-consent, to agree routing and specific vehicles to be used. This may result in temporary closure of specific roads whilst the loads are moved.

Indicative swept path analysis has been undertaken for the following vehicles:

- Turbine 4000F: 28-axle trailer plus two four-axle tractor units – 77.6m length, 6.4m width; and
- Turbine 8000H: 16-axle self-propelled vehicle – 28.5m length, 5.9m width.

The swept path analysis drawings are shown in the Transport Assessment and indicated that as the access route has been used previously for the transportation of wind turbine components, the majority of the widening or route amendment would be required on private land under the control of SSE. Some minor temporary highway amendments may be required in the vicinity of the access bridges from the A18 over the Hatfield Waste Drain.

The swept path analysis undertaken for the access routes is indicative only, as the vehicles used to transport the gas turbines are very specialised and may vary from those tested, once a haulier is appointed. In due course, the hauliers involved with moving these large loads will need to undertake further



assessments of structural conditions and swept path routing, once the vehicles to be used are confirmed.

The full details of any highway amendments required, which could include temporary removal of street furniture (including splitter islands and pedestrian crossing islands, street lights, telegraph poles) and alterations to kerblines, will be established with the local highway authority, the Highways Agency and the local police force once a haulier has been appointed and details of the proposed vehicles have been established. Temporary road closures will be required, to enable the large loads to use oncoming traffic lanes or travel along the opposing side of the carriageway at junctions, with parking prohibited along the access route during the heavy load movements. Advanced warning will be given to residents and the general public about the road closures, and contact details for SSE will be provided so that residents can comment and find out further information.

#### *Analysis of Construction Traffic Impact*

No construction traffic, either heavy vehicles or staff vehicles, is predicted to travel via either Althorpe village or via the B1392. Therefore there will be no impact on those routes. No further assessment of these links has been undertaken in relation to traffic during the construction phase.

Tables 11.14 to 11.18 set out the change in traffic flows on the A18 and A161 during the key time periods. Baseline flows shown in these tables include observed traffic and committed traffic from the Lincolnshire Lakes scheme and the Scunthorpe United football club.

**Table 11.14 2015 Baseline plus the Proposed Development Construction Traffic Link Flows – Weekday 06:00-07:00**

Link	All vehicles			HGV only		
	Total baseline traffic	Construction traffic	Percentage change	Total baseline HGVs	Construction HGVs	Percentage change
A18 King George V bridge	451	100	+22.2%	35	0	0%
A18, east of site access	272	100	+36.7%	27	0	0%
A18, west of site access	272	33	+12.1%	27	0	0%
A161, between A18 and M180	241	33	+13.7%	41	0	0%

**Table 11.15 2015 Baseline plus the Proposed Development Construction Traffic Link Flows – Weekday 08:00-09:00**

Link	Total baseline traffic	All vehicles		Total baseline HGVs	HGV only	
		Construction traffic	Percentage change		Construction HGVs	Percentage change
A18 King George V bridge	1,244	0	0%	100	0	0%
A18, east of site access	722	0	0%	77	0	0%
A18, west of site access	722	20	+2.8%	77	20	+26.0%
A161, between A18 and M180	542	20	+3.7%	74	20	+27.0%

**Table 11.16 2015 Baseline plus the Proposed Development Construction Traffic Link Flows – Weekday 17:00-18:00**

Link	Total baseline traffic	All vehicles		Total baseline HGVs	HGV only	
		Construction traffic	Percentage change		Construction HGVs	Percentage change
A18 King George V bridge	1,382	0	0%	60	0	0%
A18, east of site access	753	0	0%	46	0	0%
A18, west of site access	753	20	+2.7%	46	20	+43.5%
A161, between A18 and M180	579	20	+3.5%	53	20	+37.7%

**Table 11.17 2015 Baseline plus the Proposed Development Construction Traffic Link Flows – Weekday 19:00-20:00**

Link	Total baseline traffic	All vehicles		Total baseline HGVs	HGV only	
		Construction traffic	Percentage change		Construction HGVs	Percentage change
A18 King George V bridge	662	100	+15.1%	21	0	0%
A18, east of site access	314	100	+31.8%	14	0	0%
A18, west of site access	314	33	+10.5%	14	0	0%
A161, between A18 and M180	234	33	+14.1%	17	0	0%

**Table 11.18 2015 Baseline plus the Proposed Development Construction Traffic Link Flows – Weekday daily traffic**

Link	Total baseline traffic	All vehicles		Total baseline HGVs	HGV only	
		Construction traffic	Percentage change		Construction HGVs	Percentage change
A18 King George V bridge	15,590	200	1.3%	1,099	0	0%
A18, east of site access	8,678	200	2.3%	842	0	0%
A18, west of site access	8,678	306	+3.5%	842	240	+28.5%
A161, between A18 and M180	6,004	306	+5.1%	835	240	+28.7%

These results demonstrate that averaged across the full day, the development will have a Negligible environmental impact from traffic (<30% increase in traffic and HGVs).

PICADY assessment is set out within the Transport Assessment for the A18 site access for the start and end of the day shift, when the numbers of vehicles using the access arm will be at their peak, and no issues with capacity were raised: the maximum ratio of flow to capacity was calculated to be 0.233, well below the level of 0.85 at which a junction begins to approach saturation.

Two time periods during the day are predicted to have a Small (between 30% and 60% increase in traffic) environmental impact on certain sections of the highway network:

- A18, east of site entrance – 06:00-07:00 (total traffic);
- A18, east of site entrance – 19:00-20:00 (total traffic);
- A18, west of site entrance – 17:00-18:00 (HGVs); and
- A161, between A18 and M180 – 17:00-18:00 (HGVs).

This means there will be a perceptible change in conditions during these time periods, but this will be temporary and during the construction phase only. The impact will be managed through the Construction Traffic Management Plan. The Small increase in HGV proportions is due to the low background level of HGV traffic on this route – the majority of existing HGVs in this area travelling east/west are likely to be using the M180 rather than the A18 – rather than a high absolute number of new HGVs. The impact elsewhere on the network at all times is below 30% and therefore considered Negligible.

Further consideration is given in the next section to the effects of the environmental impact where this is not Negligible.

#### *Summary of Impacts during Construction*

Consideration has been given to which sensitive receptors will be affected by the Small change in traffic on the A18. Those which will be affected comprise the Crowle gyratory and the syphons on the A18 (listed buildings). The Crowle gyratory is a highly sensitive receptor, due to its accident record, whilst the syphons are low sensitive receptors. The other highly sensitive receptors within the overall study area, being the primary school and care home, are not affected by the development traffic in environmental terms, with no construction traffic past the school and Negligible increase past the care home.

The Crowle gyratory has high sensitivity, and combined with the Small impact of the construction HGV traffic, this results in a Moderate adverse environmental impact on the southern (A161) and eastern (A18) arms for one hour during the evening. This impact will be temporary during the construction period only.

The syphons carrying the South Level Engine Drain and the syphon carrying the Hatfield Waste Drain have low sensitivity, and combined with the Small impact of the construction traffic, this results in a Minor environmental impact of adverse nature, which will be temporary during one hour in the morning and one hour in the evening during the construction period only.

**Table 11.19 Summary of Effects during Construction Period**

Source of Potential Effect	Unmitigated Potential Impact	Mitigation Measures	Residual Effect
Construction Worker Trips	Increased traffic on A18, A161.	All traffic to use A18 entrance (to avoid impact on B1392); shifts start and end outside peak periods	Minor to Moderate increases in traffic at start and end of shift
HGV construction traffic	Increased traffic on A18, A161.	Use of A18 from west only. No traffic permitted on B1392. Construction Traffic Management Plan	Minor or potential Moderate impacts
Abnormal Indivisible Loads	ALLs on A18. Obstruction for normal vehicles. Impacts upon local junctions and requirements for street furniture removal. Disruption to residents through temporary road closures.	Abnormal load routing to be agreed through formal AIL application. Travel of AILs off-peak.	Minor temporary impacts (10 loads expected through whole build process).

**Table 11.20 Assessment versus the IEA Guideline Areas Affected during Construction Period**

IEA Guideline Area	Expected Effect	Preliminary Conclusion	Mitigation Measures
Traffic Flows	Small increase 06:00-07:00, 19:00-20:00. Negligible increase at other times	Traffic flows will increase during construction and operational phases, but sufficient highway capacity.	Shift patterns ensure that high trip generation occurs outside of network peak hours. CTMP to set out routing for construction staff and HGVs.
Driver Delay	Minimal impact, as sufficient highway capacity. Highest increase in traffic will be outside network peak hours.	Delay will not be noticeable at this time of day. PICADY assessment shows junction working well within capacity.	None
Pedestrian Delay	No impact – no pedestrian facilities on the A18 in vicinity of site entrance	No impact	n/a
Severance, Fear and Intimidation	No impact – no pedestrian facilities on the A18 in vicinity of site entrance	No impact	n/a
Accidents and Safety	Opening site access junction will increase risk by increasing traffic movements and potential conflicts.	Increases in traffic flows and HGVs predicted. Good visibility and low passing traffic flows means low risk of accident increase. Temporary during	Reduction in speed limit

		construction only.	
Pedestrian Amenity	No impact – no pedestrians in this area	No impact	N/a
Hazardous Loads	Road closures and junction/highway modifications expected.	Low numbers in comparison to other construction vehicles.	Management plan organised by contractor/haulier. Publicity to local residents at early stage.

### 11.4.3 **Assessment of Effects during Operation**

A total of 18 additional members of staff will be required to operate the Proposed Development, covering 14 shifts over the week. A maximum of eight of these will be on-site at any one time, during the day shift, with shift patterns of 07:00 to 19:00 and 19:00 to 07:00 as per Keadby I. Given the shift patterns, staff members will be travelling to and from the site outside of the usual network peak hours. For purposes of assessment, and based on current travel patterns of staff at the site, it has been assumed that all staff will travel by single occupancy car.

Based on the results of the traffic counts at the site entrance, which demonstrated 93% of arrivals from the south and 97% of departures to the south, and given the low trip generation, it is expected that all of the newly generated operational traffic from the Proposed Development will travel to and from the south.

The percentage impact of the operational traffic on the B1392 south of the site entrance has been set out in *Table 11.21* below.

**Table 11.21 2015 Baseline plus the Proposed Development Operational Traffic Link Flows**

Time period	Total baseline traffic on B1392	Operational traffic	Percentage change
06:00-07:00	98	+8	+8.2%
08:00-09:00	218	0	0%
17:00-18:00	204	0	0%
19:00-20:00	150	+8	+5.3%
00:00-24:00	2,676	+18	+0.7%

Traffic impact on the A18 and other roads in the analysis area will be lower, as the baseline traffic is higher on other links, and therefore further assessment of those links has not been undertaken.

As the change in traffic during operation is below 30%, the magnitude of change is considered to be Negligible and does not warrant further consideration.

## 11.5

### **MITIGATION MEASURES**

The proposed shift patterns for the site ensure that staff will be travelling outside of the network peak hours, which will minimise any potential impacts on highway capacity. There is sufficient capacity within the existing roads to accommodate the staff traffic, in both construction and operational stages, and also the HGV traffic.

A Construction Traffic Management Plan (CTMP) will be provided for the site at the appropriate time. This will include measures such as:

- agreed traffic routing – all HGVs to use A18 entrance, from the west only. All staff to use A18 and not B1392;
- traffic management on Chapel Lane, which will include traffic signals to control vehicles at the crossroad junction between the lane and the access road. Priority will be given to vehicles on Chapel Lane if it is safe to do so;
- staff parking arrangements;
- hours of operation, including restriction to deliveries;
- wheel washing and dust control;
- provision of advisory / advanced signage to direct construction vehicles from M180;
- information to contractors about routing, with potential for disciplinary process for contractors ignoring information;
- membership of any contractors scheme, such as “Considerate Constructors”;
- contact details at SSE for residents to report problems.

In addition, the Company will discuss with North Lincolnshire Council the potential for a reduction in speed limit from National Speed Limit to 40mph in vicinity of A18 site entrance, during construction, to improve safety for contractors and passing vehicles.

The CTMP will assist in reducing the impact of the development on surrounding streets, as well as ensuring that the contractors are aware of their responsibilities and any constraints upon their travel.

When the abnormal loads are to be transported to the site, an abnormal loads movement application will be made to the Highways Agency, by either the contractor or the haulier as appropriate. Temporary road closures will need to be put in place on local roads along the haulage route, and SSE’s public relations team will ensure that local residents are kept informed about these closures and movements. Street furniture, such as lighting columns or telegraph poles, may need to be removed temporarily, and alterations to kerblines may be required to accommodate the swept paths of the required oversized vehicles.

## 11.6

### **CONCLUSIONS**

This chapter on traffic and transport impacts of the Project has been prepared by Mayer Brown Limited. The Proposed Development will be constructed over a three year period, with peak construction staff levels of around 500 employees. Up to 18 new members of staff will be employed during the

operational phase. Construction staff and HGVs will use the existing A18 entrances, including abnormal loads. Operational staff will all use the existing B1392 access.

There is limited opportunity for construction or operational staff to travel by public transport, due to the predicted shift patterns and distance of the Proposed Development from the bus stops and rail station. There are some residential areas within walking or cycling distance, with some dedicated cycle provision, and plans by North Lincolnshire Council to improve the towpath route adjacent to the canal for use by cyclists; therefore members of staff living in these areas may choose to travel by these modes. To ensure a robust assessment, however, it has been assumed for purposes of assessment that all staff in all phases will travel by car. It has been assumed that car sharing will occur during the construction phase.

A review of the historic accident records indicates that there are no existing highway safety concerns in the immediate vicinity of the site, but that there is an accident record at the Crowle Gyratory. NLC is proposing amendments to this junction in the current and next financial year which will assist in improving safety at this location. There will be minimal additional traffic during the operational phase through this junction, due to the low staff numbers required to operate the Proposed Development. Additional construction traffic movements through this junction will be low and those related to staff movements will be outside the peak periods when roads are quiet.

Traffic surveys were undertaken at key locations in the vicinity of the Proposed Development to determine existing traffic flows. Traffic flows from committed development at Lincolnshire Lakes and Scunthorpe United Football Club was included within the baseline calculations, along with estimations of traffic from Keadby I when fully operational.

Construction staff traffic will occur outside the network peak hour, when there is considerable spare capacity to accommodate the increase of up to 133 vehicles at the start and end of the day shift. The impacts of the Project are predicted to be greatest during the construction phase, particularly 06:00-07:00 when dayshift construction staff arrive and 19:00-20:00 when they depart.

Capacity testing of the access junction shows no issues related to queuing as a result of the construction traffic. There will be a Minor environmental impact resulting from the staff traffic, for one hour of the morning and evening, as dayshift staff arrive and depart. Through the day, the impact of construction is predicted to be Negligible.

Construction HGVs will amount to ten vehicles per hour (20 movements) during the dayshift only. This can be accommodated without issues for highway capacity. All HGVs will travel to and from the west along the A18, in order to avoid the residential areas of Keadby and Gunness.

There is predicted to be a Moderate adverse environmental impact on the A18 and A161 for one hour each day, resulting from an increase of greater than 30% in HGV movements. This is due to a low background flow of HGVs, rather than a large absolute increase in these vehicles.



There will be up to ten abnormal loads throughout the build period, carrying gas turbine components to the site. These will be carried by a specialist heavy haulage company and formal abnormal load applications will be made at an appropriate time, which will include further consideration of swept path analysis, highway closures and temporary removal of street furniture. Swept path analysis has been undertaken as part of the Transport Assessment which showed that widening may be required in some places (see *Annex I*).

The predicted operational staff traffic is considered to present a Negligible increase, and will not have an impact on the safety or operation of the local highway network.

A Construction Traffic Management Plan will be provided once a contractor has been appointed, which will set out agreed traffic routing for staff and other vehicles, traffic management, hours of operation, a proposed reduced speed limit on the A18 in the vicinity of the site entrance, and provision of advanced signage.

At the appropriate time, a haulier will be appointed to undertake the movement of the gas turbines. An abnormal loads movement application will be made, and further swept path and structural assessments will be undertaken for the haulage route.

## **11.7**

### ***COMPARISON BETWEEN THE LIKELY SIGNIFICANT EFFECTS OF THE CONSENTED DEVELOPMENT AND PROPOSED DEVELOPMENT***

This ES is required to present the main respects in which it is considered that the likely significant effects on the environment of the Proposed Development would differ from those described in the Environmental Assessment (EA) that was prepared for the Consented Development.

Before making the comparison it is worth reiterating the basis for each assessment.

The main basis for the construction traffic assessment of the Consented Development was as follows.

- Assessment of construction traffic impacts is based on 250 to 300 construction staff at peak.
- It was assumed that 60% of these would travel by private car and the remainder would cycle, walk or arrive by bus.
- An occupancy rate of 1.2 per car was assumed.
- This led to an assumption of 125 to 150 vehicles arriving at the start of the day and 125 to 150 leaving at the end of the day.
- Five to ten HGVs per hour were estimated.
- Up to 40 abnormal loads were estimated.

The main basis for the construction traffic assessment of the Proposed Development was as follows.

- Assessment of construction traffic impacts is based on 500 construction staff at peak.
- Due to the proposed shift working system a maximum of 250 would be present on site over a 24 hour period.
- The 250 would be split unevenly over a day and night shift: 188 day and 63 night.
- For the purposes of assessment those values have been rounded up to 200 and 65 respectively.
- It is assumed all will travel to the site by private car with an occupancy rate of 1.5 (based on other recent SSE project experience).
- On the above basis in the hour before the start of the day shift 133 vehicles will be travelling to the site and in the hour following the end of the day shift 133 vehicles will depart the site.
- Up to 10 HGVs per hour were estimated.
- Up to ten special over-sized loads were estimated.

The numbers estimated for the Consented Development and the Proposed Development are therefore broadly comparable.

The table below makes a comparison between the findings of this EIA for the Proposed Development and those of the 1992 EA to the extent possible.

Topic	Comparison	Result of Variation between Proposed Development and Consented Development
<p>Key: ● = positive change; ○ = neutral; ● = negative change</p>		
<p>General Construction Traffic</p>	<ul style="list-style-type: none"> <li>• The EA of the Consented Development concluded that the surrounding highway network would be able to accommodate the additional 180 construction workers' car movements (150 from the construction of the Consented Development and 30 for the operation of Keadby I) without undue disturbance to local residents.</li> <li>• The EIA of the Proposed Development concludes that construction staff traffic will occur outside the network peak hour, when there is considerable spare capacity to accommodate the increase of up to 133 vehicles at the start and end of the day shift.</li> </ul>	<p>○</p>

Topic	Comparison	Result of Variation between Proposed Development and Consented Development
<p align="center"><b>Key:</b> ● = positive change; ○ = neutral; ● = negative change</p>		
Construction HGVs	<ul style="list-style-type: none"> <li>The EA of the Consented Development assumed passage of HGVs via the village of Ealand and thence along private road to the site as was used for large volumes of traffic involved in the demolition of the Keadby coal-fired power station. The implication from this assessment was that the lesser volumes of traffic for the Consented Development would be acceptable. Subsequently, on the basis of concerns expressed by the Secretary of State in the consent letter (10<sup>th</sup> September 1993) over road safety, consent conditions for a new access road were set (Conditions 4 and 5) and relating to HGV access routes (Conditions 6 and 7).</li> <li>The Traffic Assessment for the Proposed Development is based on specified HGV routes and use of the new access road which was constructed in accordance with the consent conditions for the Consented Development. The assessment concludes that there will be moderate adverse environmental impact on the A18 and A161 for one hour each day, resulting from an increase of greater than 30% in HGV movements. This is due to a low background flow of HGVs, rather than a large absolute increase in these vehicles. A similar conclusion would have been likely from applying the same assessment criteria to the Consented Development. No significant effects on local communities and residents are predicted.</li> </ul>	○
Construction Special Loads	<ul style="list-style-type: none"> <li>Special (or abnormal) loads were assessed in the EA for the Consented Development in terms of a feasible route into the site and reference was made to the need for Department of Transport approval.</li> <li>Special loads have been assessed for the Proposed Development in terms of establishing the feasibility of routing them into the site. Some mitigation may be required dependent on the final plant solution selected and the specific trailers required to facilitate the movement.</li> </ul>	○
Operational Traffic	<ul style="list-style-type: none"> <li>The EA of the Consented Development concluded that operational traffic would have no impacts on the residents of Keadby. It is assumed that this conclusion would apply in regard to other residents and communities locally and further afield.</li> <li>The EIA for the Proposed Development assesses operational traffic as leading to negligible changes to existing flows and therefore requiring no further consideration under the assessment criteria used.</li> </ul>	○