

11 TRAFFIC AND TRANSPORTATION

11.1 INTRODUCTION

This chapter provides a Traffic Assessment, which identifies the potential effects of increased road traffic expected as a result of the construction, operation and decommissioning of the proposed Spicer Hill Wind Farm ('the Development'). The chapter assesses the significance of these effects against recognised guidelines and, where required, appropriate mitigation measures are considered. No visitor provision is being proposed for the Development and therefore visitor traffic is not expected or assessed within this chapter.

11.2 METHODOLOGY

11.2.1 Assessment Methodology

The potential traffic effect of the Development was assessed by utilising the following approach:

- Pre-scoping consultations were undertaken with the local highway authority, Barnsley Metropolitan Borough Council to establish a view of regional requirements for the assessments;
- The delivery routes for construction and abnormal loads vehicles were reviewed in order to assess the nature of the road network and determine the effect on road layout, improvements and the overall suitability in accommodating the expected vehicles, particularly the wind turbine delivery vehicles;
- The traffic study area was defined along the access routes to the site to ensure the assessments were robustly undertaken;
- Traffic flow data were acquired and reviewed to assess the traffic conditions and composition along the access routes;
- An outline construction programme and activity schedule was developed to predict the traffic that would be generated during construction of the Development;
- Recognised national assessment guidelines were used as a base for the analysis of data and effect significance;
- An appropriate mitigation strategy was prepared to ensure that any potential traffic effects are kept to a minimum; and
- The operational and future decommissioning effects were then reviewed to establish the effect on the local road network.

11.2.2 Guidance and Policy

The A616 and A628 are Trunk and Strategic roads within Barnsley. Both roads are established HGV routes between the M1 and Manchester. This chapter outlines that these recognised routes will be used by heavy goods vehicles (HGVs).

In undertaking the assessment of the potential transport and traffic effects on the local road network, the following guidance document has been taken into account:

- Guidelines for the Environmental Assessment of Road Traffic, by the Institute of Environmental Management and Assessment (IEMA), 1992 ('the IEMA guidelines').

The 'Guidance on Transport Assessment' by the Department for Transport was also referenced. This Guide sets out the requirements for the undertaking of Transport Assessments and Statements. However, Transport Assessments principally relate to developments that generate significant long-term increases in traffic and travel patterns as a result of their function, such as retail parks, employment and residential developments. The Development does not propose a visitor centre and this chapter confirms that the

Development would not create any significant long-term traffic movements and therefore, a formal Transport Assessment or Statement is not required. However, information normally included within the Transport Statement is provided within this Traffic Assessment. It is considered that the information provided within this chapter is sufficient in addressing the local transport effects of the Development during the construction, operation and decommissioning phases.

11.2.3 Consultation

The local highway authority, Barnsley Metropolitan Borough Council (BMBC), was consulted regarding the access and routing strategy for the wind farm. Discussions identified that although there were no major issues with general access, there was a preference to route construction traffic so that it avoids major settlement areas such as Thurlstone and Penistone as outlined further in this chapter.

The local abnormal loads authorities, *i.e.*, The Highways Agency (Area 12), Network Rail and BMBC Highways and Engineering, were contacted regarding the structural suitability of delivery routes to the wind farm. All authorities have responded that there are no structural issues with the movement of the wind turbine sections¹.

11.2.3.1 Route Review Methodology

To define conditions for the Development in terms of access and transportation, a baseline study comprising of a strategic route review and local delivery route assessment has been carried out for potential routes to the wind farm development site from the M1 motorway.

11.2.3.2 Abnormal Loads and Construction Access

The turbine components would be considered to be abnormal loads when being delivered to the Development site. The abnormal loads would consist of the following, and due to their sizes and weights, would need to be transported on specialist vehicles:

- Turbine blades – 33 metres (m) in length and weighing 6 tonnes;
- Tower sections – up to 26 m long, 4.2 m wide and weighing up to 53 tonnes;
- Generators – 5 m diameter and weighing up to 75 tonnes; and
- Foundation sections – 4.4 m long by 4.4 m wide and weighing 12 tonnes; and

In order to avoid undue disruption to the road network, the Department for Transport and the Highways Agency advise that, where possible, abnormal loads should be directed to the nearest suitable water port. Due to the inland location of the site, several possible ports could be used. Turbine components will be delivered by sea to a suitable port such as Immingham, Hull or Goole and transported via the regional motorway network to Junction 36 or 37 of the M1.

On this basis, this assessment considers the abnormal loads (turbine components) being delivered via the M1. The route for construction and abnormal loads access to the development site from the motorway is illustrated in Figure 11.1 and is detailed below. The access to the development would be via a formalised arrangement along Whitley Road to the north of the existing Royd Moor windfarm.

- From Junction 36 of the M1 proceed south along the A61;
- Turn right (west) onto the A616;
- Turn right (east) onto the A628;
- Turn left (north) onto Royd Lane; and

¹ Vehicles transporting the wind turbine blades, nacelles, tower sections and foundation plates would be considered abnormal loads due to their lengths, widths and weights.

- Proceed to site.

Abnormal loads and overall general construction vehicles would use this route thereby avoiding Penistone and Thurlstone.

The strategic route review involved a detailed site visit along the proposed delivery route in order to identify potential geometric constraints that would affect the manoeuvring of general HGVs and the TDVs accessing the Development, in particular to the blade and tower section TDVs. This review is included within report 0636/02 at Technical Appendix A11.

11.2.3.3 Study Area

The study area was defined as being along the access routes to the site. Based on the character of the road network surrounding the Development site and the expected construction vehicle numbers, the study area was defined as the A616 and A628 east of the Flouch Inn roundabout. The study area was not expanded any further as it is expected that construction traffic would disperse and be integrated within the regional road network (*e.g.* M1 and other highways) without any significant effect.

11.2.3.4 Significance Criteria

The IEMA guidelines suggest that two broad principles be used as a screening process to delimit the scale and extent of the assessment. These are:

"include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and

include any other specifically sensitive areas where traffic flows will increase by 10% or more."

It should be noted that, in non-sensitive areas, traffic increases below 10% are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Therefore where the predicted increase in traffic flow is lower than these thresholds, the effect is considered to be of low magnitude and not significant. However, to ensure a relative assessment in environmental terms the following criteria outlined in Table 11.1 is used.

The sensitivity of the roads has also been defined using IEMA guidelines. These suggest that sensitive areas/receptors are locations experiencing high pedestrian flows, accident black spots, conservation areas and roads in proximity to hospitals. In specific relation to this assessment, strategic roads could be considered as sensitive receptors. Mitigation measures outlined within this chapter aim to address the traffic increases along these roads.

To ensure a robust assessment, a worse-case scenario assuming that 100 percent of the vehicles would use a single route has been utilised, *i.e.*, all traffic (site personnel and construction traffic) would approach the site via one selected route.

It should be noted that these guidelines are mainly directed at developments that, when in operation will generate significant traffic flows that will affect the existing road network. As stated in section 11.5.3, it is envisaged that, once the wind turbines are operational, the amount of traffic associated with the Development will be minimal.

11.3 BASELINE DESCRIPTION

11.3.1 Route and Site Access

The routes to the site were assessed for suitability as detailed in section 11.2.3 above. It was established that the M1 would be suitable for the TDVs and general construction vehicles

without the need of road works. The delivery route assessment identified that minor widening works would be required along the unclassified roads leading to the site. The removal of a central island and street furniture would also be required along the junction of the A628 with Royd Lane at Millhouse Green.

Construction materials would be sourced from local quarries and transported by 20 te heavy goods vehicles (HGVs) to the site. Routes from these quarries will converge on the A616 and A628. It is likely that, where possible, local contractors will be employed during the construction of the wind farm and will approach the site from a variety of routes, depending on their origin. The existing population statistics maps for Yorkshire highlight Penistone and Stocksbridge as the nearest high density centres. In addition, Hollingworth and Glossop have been identified to the west. It is therefore likely that the majority of site personnel would travel to the site via the A616 and A628. To assess a worse case scenario, it is assumed that 100 percent of the (site personnel and construction traffic) vehicles would approach the site via the A616 and A628.

The proposed access to the site during construction will be via Whitley Road.

11.3.2 Sensitive Receptors

A desktop assessment reviewing 1:25,000 Ordnance Survey mapping was undertaken to identify potential sensitive receptors along the selected access route. This was followed up by a site visit to specifically identify any areas of high pedestrian flows and other issues not readily identified by the desktop assessment. No sensitive receptors were identified along the proposed delivery route. The strategic route review identified high pedestrian flows within Penistone and Thurlstone; the access strategy therefore promotes the use of routes avoiding these areas.

Personal Injury Accident data was also requested from the Highways Agency. This identified that there are no existing accident black spots along the delivery route.

11.3.3 Traffic Flows

Base traffic flow data was obtained from the Highways Agency and BMBC at four locations along the access routes to the wind farm. The traffic data was provided in 2007 and 2008 and is summarised in Table 11.2.

Projected baseline traffic flows for the expected year of construction have been calculated from the obtained data by using Department for Transport's National Road Traffic Flows (NRTF) central-growth (all vehicles) factors. Construction of the development would be expected to commence during the year 2011, therefore, in order to predict traffic flow levels during this period, growth factors of 1.040 and 1.027 were respectively applied to base 2007 and 2008 traffic flows. Table 11.3 shows the projected base traffic flows, which have been used for assessing the significance of the effect of increased traffic along the routes.

Table 11.2 – Average 2008 24-hour Weekday Base Traffic Flows

Classification No.	Location	Traffic Volume	
		Total Vehicles	HGVs
A616	Wortley	23534	4777
A616	Stocksbridge	15100	3458
A628	Millhouse Green	6176	779
A628	Daisy Hill Farm	3345	464

Table 11.3 - Projected Traffic Flows

Classification No.	Location	Traffic Volume	
		Total Vehicles	HGVs
A616	Wortley	24169	4906
A616	Stocksbridge	15508	3551
A628	Millhouse Green	6423	810
A628	Daisy Hill Farm	3479	483

11.4 INFORMATION GAPS

In terms of traffic flow information for the highway network surrounding the site, enough information has been obtained to allow an appropriate assessment to be made of the potential traffic effects as a result of the Development.

11.5 ASSESSMENT OF POTENTIAL EFFECTS

11.5.1 Potential Construction Effects

11.5.1.1 Construction Phase

During the six-month construction period, the following will access the site:

- Low loaders and other HGVs to deliver equipment and plant;
- 20-tonne lorries, to deliver/move material and stone for access tracks;
- Flat-bed lorries to deliver control building components;
- Extendable semi-low and platform trailers to deliver turbine components (requiring private or police escort). These are known as Turbine Delivery Vehicles (TDVs);
- Cranes delivered as mobile units and on low-loaders;
- Deliveries of fuel and water by tanker; and
- Construction personnel, by private car, light vehicles or minibus.

The TDVs will constitute abnormal loads during delivery to the site. Once the component has been unloaded, the TDV will be retracted to the size of a standard articulated lorry (approximately 16.5 m in length).

The main erection crane would be in the region of 400 tonnes lifting capacity, however, whilst travelling to site on public highways, the crane would be de-rigged and its axle weights would be within that which is permissible by current legislation. The width of the crane would be approximately 3 m and the crane, de-rigged, would be approximately 18 m long. One smaller assisting crane (of 150 – 300 tonnes) will also be required for the blade erection, and assembling of the main lifting crane. At approximately 24 tonnes, the nacelle would be the heaviest single component; the overall weight of this TDV being in the region of 40-50 tonnes. The longest vehicle that would access the site will be the blade TDV. This vehicle would be approximately 35 m in length.

The total number of off-site vehicle movements² generated during the construction of the wind farm is estimated as 6,456 over a six month period, as shown in Table 11.4. This figure takes account of all construction vehicles generated by the above works during the construction period and assumes an average of 1 construction personnel per vehicle.

Of the 6,456 movements generated, 4,056 are as a result of deliveries and removal of equipment and materials to and from site (HGVs), the remaining 2,400 trips would be generated from the movements of site staff (cars and light vehicles).

As illustrated in Table 11.4, HGV vehicle movements are not uniform throughout the construction period with the peak number of HGVs occurring during month 4 with 993 HGV movements generated. This equates to approximately 50 HGV movements a day.

The peak overall monthly traffic movements also occur during month 4 with 1,393 traffic movements generated, around 70 vehicle movements per day (including site personnel in cars and light vans). It is unlikely that there will be significant increases in traffic during the AM and PM peak periods as routing agreements would seek to reduce the movement of construction vehicles at this time.

These increases in traffic are summarised in Table 11.4.

Table 11.4 - Summary of Traffic Impact

Road	Location	Percentage Increase		10% threshold, applied to non sensitive areas	5% threshold, within sensitive areas
		Totals	HGVs		
A616	Wortley	0.3%	1.0%	Below Threshold	Below Threshold
A616	Stocksbridge	0.4%	1.4%	Below Threshold	Below Threshold
A628	Millhouse Green	1.1%	6.1%	Below Threshold	Below Threshold
A628	Daisy Hill Farm	2.0%	10.3%	Below Threshold	Below Threshold

The increase in overall volume is not considered to be significant in either sensitive or non-sensitive locations. However, it is expected that the traffic along Royd Lane would be considered to be significant due to the existing low levels of traffic. Mitigation measures outlined to the end of this chapter would reduce the impact of these movements.

² One movement equals one arrival or one departure

11.5.1.2 Public Highway Improvements

Following the detailed route assessment, it was identified that a number of improvement works would be required in order to accommodate access by the TDVs. The following general measures would be required:

- Temporary removal of central island and road signs at the junction of the A628 and Royd Lane; and
- Widening at the site access.

These road works would be consented separately under The Roads Act 1984 and agreed with BMBC to ensure that road safety is not compromised. No other offsite highway works were identified by the route assessment.

The site access will be designed to the standards outlined within the DfT Design Manual for Roads and Bridges (DMRB) TD42/95 and would achieve the required visibility splays along Whitley Road. This access will have an over-run area to aid the TDVs manoeuvring and allow them to leave the public highway as quickly and safely as possible (this is illustrated in Figure 3.9).

Table 11.5 - Vehicle Movements During Construction Phase

Activity (Total Arrivals & Departures)	Month/Movements						Total
	1	2	3	4	5	6	
Access tracks, hard standings and compound	527	527	527	527	0	0	2108
Turbine foundations & erection	0	0	216	216	216	0	648
Control building	0	0	0	70	70	0	140
Stone/soil Disposal	220	220	180	180	180	180	1160
Total HGVs per month	747	747	923	993	466	180	4056
Site personnel	400	400	400	400	400	400	2400
Total vehicle movements per month	1147	1147	1323	1393	866	580	6456
Average HGVs per day	37	37	46	50	23	9	
Average Site personnel per day	20	20	20	20	20	20	
Average Total Movements per day	57	57	66	70	43	29	

Note: 1 movement = 1 arrival or 1 departure

11.5.2 Environmental effects

The IEMA guidelines identify that the following environmental effects should be considered when assessing the traffic related to the Development:

- Accidents and safety;
- Air pollution;
- Driver delay;
- Dust and dirt;
- Ecological effects;
- Hazardous loads;
- Heritage and conservation;
- Noise;
- Pedestrian amenity;
- Pedestrian delay;
- Vibration; and
- Visual effects.

Of the above effects, the following would be within the remit of assessments reported within other chapters of this ES, although generally they have been scoped out of those assessments as not significant, and have not been raised as issues during the Scoping process or other consultation:

- Ecological effects;
- Heritage and Conservation;
- Noise; and
- Visual effects.

No hazardous loads are expected during the construction or operational periods of the Development and therefore these are not considered within this assessment.

11.5.2.1 Accidents and Safety

There are no general thresholds for determining the significance of increased traffic on road safety. Professional judgement and experience would be required to determine whether there would be any detrimental effect as a result of the construction traffic.

The average HGVs would be around only four movements per hour. These minimal flows will not have a significant effect on accidents and safety along the delivery routes. Traffic control and the use of a banksman at the site access would minimise the potential of accidents occurring in the area used most intensely by the construction vehicles.

11.5.2.2 Driver Delay

Traffic delays due to increases in flow caused by the construction traffic could occur along the delivery routes to the site. The IEMA guidelines note that *"these delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system"*.

Delays could occur along the Whitley Road during the passing movements between HGVs and cars. However, it is unlikely that four HGVs an hour would result in any significant delays to other road users.

Slow moving abnormal loads (turbine components) could also create delays along the A616. Appropriate times for vehicle movements would be agreed with BMBC and the police to ensure that turbine and concrete deliveries occur outside of peak traffic hours. An

appropriate Traffic Management Plan (TMP) would be agreed between the developer and BMBC. This would include a provision for the HGVs and abnormal load vehicles travelling in convoys to reduce the overall time spent on the public road.

Some delays could occur at the site access points due to turning HGVs. An onsite banksman would be available to assist these vehicles and reduce the time spent manoeuvring between the site and the public road. An escort vehicle would also be utilised during the delivery of the turbine sections.

The overall effect on driver delay will not be significant.

11.5.2.3 Intimidation and Pedestrian Amenity

Traffic volume, composition and speeds, pedestrian footways and crossings all contribute to the level of general pleasantness, fear and intimidation experienced by pedestrians and other vulnerable road users.

The routing of HGVs to the site would seek to avoid the villages of Penistone and Thurlstone. The HGVs accessing the site would average around four movements per hour and will not have a significant effect on fear and intimidation.

11.5.2.4 Pedestrian Delay

Changes in traffic volume, composition and speeds contribute to the ability of pedestrians crossing the road. No major pedestrian routes were identified in the vicinity of the site.

In the event that pedestrians use Whitley Road, the HGVs are unlikely to have an effect on the delay experienced by pedestrians due to the expected low numbers. The overall effect will not be significant.

11.5.2.5 Severance

The IEMA guidelines note that '*Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery*'.

The delivery route utilises established routes used by HGVs. The peak increase in around four HGVs per hour is unlikely to have a significant effect on severance due to the nature of the A616 and A628. The vehicle trips along Royd Lane and Whitley Road are also unlikely to have a significant effect on severance, as any movements of HGVs would only be short termed. Therefore, the effect of severance will not be significant.

11.5.3 Potential Operational Effects

The predicted levels of traffic associated with the operation and maintenance of the wind farm are summarised in Table 11.6 below.

Table 11.6 - Summary of Vehicle Movements During Operation

Activity	Annual Vehicle Movements	Duration
Standard Turbine Servicing	3 visits (30 vehicle movements per annum)	1 visit per turbine, lasting 5 days
Unscheduled Servicing	visits (4 vehicle movements per annum)	1 visit per turbine, lasting 1 day every 18 months
Repairs to turbines	18 visits (36 vehicle movements per annum)	1 visit per turbine approximately every 2 months
Access Track Maintenance	4 visits (8 vehicle movements per annum)	2 vehicles per day for a period of 2 days once a year
Substation maintenance	1 visit (2 vehicle movements per annum)	1 visit per year
Routine site inspections	12 visits (24 vehicle movements per annum)	1 visit per month

Routine site inspections would be undertaken once a month in a four-wheel drive vehicle to ensure that the turbines are operating at their maximum efficiency.

In the unlikely event that all of the above events occur on the same day, vehicle movements would not be expected to exceed 12 movements per day. The effect of the operational traffic falls substantially below the guidance thresholds and will not be significant.

11.5.4 Potential Decommissioning Effects

Decommissioning of the Development would comprise of removal of the facility as described in Chapter 3: *Project Description* of this ES.

The turbines and all associated above ground equipment will be completely removed. Turbine components are likely to be dismantled into smaller sections prior to their removal to ease transport requirements.

At this stage, it is not possible to forecast quantitatively the traffic effect during decommissioning of the Development. This is due to the baseline data no longer being valid 25 years into the future. However, prior to decommissioning of the Development, a further traffic assessment will be undertaken and traffic management procedures agreed with the local authority. The levels of traffic associated with the decommissioning will be lower than those during construction since the concrete turbine bases will be left in situ and access tracks would either be left for use by the landowner or covered with topsoil and no stone would be removed from the site.

The decommissioning effects are likely to be similar in nature to the construction effects but their intensity will be greatly reduced as the majority of the construction traffic is created by the construction of the access tracks, which will mostly remain in place irrespective of decommissioning options and long loads would be cut up and dismantled on site prior to transportation. The decommissioning effects are therefore unlikely to have any significant traffic effects.

11.6 MITIGATION

11.6.1 Construction Mitigation Measures

In order to reduce traffic impacts from construction of the Development, construction personnel would be encouraged to car-share or utilise company shuttles where practicable. This would be estimated to increase the occupancy rate for construction personnel to an

average of around 2.5³ persons per vehicle, equivalent to reducing the number of vehicle movements associated with personnel by approximately 60%.

A traffic management plan will be drawn up by the developer and the relevant contractor, and agreed with BMBC. Potential management measures to mitigate the impacts could include:

- Restrictions and approved access routes for construction vehicles only along the A616 and A628 to avoid Penistone and Thurlstone;
- Removal and replacement of street furniture such as road signs as identified by the route assessment. Appropriate temporary measures would be undertaken to ensure that road safety is not compromised;
- Temporary or permanent road signage along the Whitley Road and Spicer House Lane in the vicinity of the site. These signs would warn road users of HGV traffic;
- Arrangements with Police for escort of turbine loads to the site;
- Advanced notification to the general public warning of turbine component transport movements;
- Informative road signage warning other users of turbine components transport movements and construction traffic;
- Improvements involving road widening and junction visibility improvements at the site access;
- Arrangements for continual road maintenance and cleaning *e.g.* resurfacing following completion of construction and road sweeping along the unclassified road in the vicinity of the site access;
- Specific timing of deliveries outside of peak hours;
- Wheel cleaning / dirt control arrangements at key stages of construction; and
- Provision of temporary signs and traffic control where necessary.

An appropriate police or contractor escort would accompany movement of turbine components from the port of entry, with timings agreed with the local police and BMBC.

The route used to transport turbine components to the site would utilise the nearest appropriate port as directed by the DfT and the selected turbine manufacturer.

11.6.2 Operational Mitigation Measures

As previously identified, the traffic generated during operation and maintenance of the Development will not have a significant effect on the existing road network.

Suitable signage will be erected along the unclassified road advising of the access to the Development. No other specific mitigation measures would be required during operation of the wind farm, due to the low numbers of operational vehicle movements.

Visibility splays at the access would be maintained. Vehicular access within the site will be controlled and adhere to appropriate strategies for public safety. The condition of the access tracks, culverts and other elements will be inspected regularly to reduce the risk of failure that may result in damage to the local environment.

11.6.3 Decommissioning Mitigation Measures

Decommissioning of the Development would comprise the removal of the facility. Turbine components are likely to be dismantled or cut up into smaller sections prior to their removal to ease transport requirements. A traffic management plan would be prepared for the decommissioning process to ensure that traffic impacts at this time are minimised.

³ National Travel Survey 2006

11.7 RESIDUAL EFFECTS

11.7.1 Construction Effects

Given the nature of the increase in traffic being short-term, the mitigation measures described in section 11.6 will ensure that there would be minimal residual effects. A summary justification is as follows:

- Pre-mitigation, the only significant effect identified was for Royd Lane;
- A traffic management plan will minimise the effects by restricting routes and timing;
- The proposed delivery route utilises established traffic routes;
- The increase in traffic during construction would be temporary, and the worst-case (as assessed) would be for a period of approximately two months only.

The environmental effects identified would be managed through the mitigation measures discussed, so ensuring that all effects are, as predicted, not significant.

11.7.2 Operational Effects

There will be residual effects on the existing road network from the operation of the wind farm but they will be negligible and not significant.

11.7.3 Decommissioning Effects

The decommissioning effects should be similar in nature to the construction effects but their intensity will be greatly reduced as the majority of the construction traffic is created by the construction of the access track, which will remain intact, and large structures would be likely to be cut up and dismantled on site prior to transportation. However, a suitable traffic review and traffic management plan would ensure that traffic effects are minimised. Residual effects are likely to be not significant.

11.8 SUMMARY OF EFFECTS

A summary of the potential effects, mitigation and residual effects defined within this chapter are summarised in Table 11.7 below.

Table 11.7 - Summary of Effects

Potential Effect	Mitigation	Residual Effect
Construction Effects		
Short-term increase in number of HGVs on Royd Lane.	Traffic management plan to be agreed. The limited use of vehicle convoys to reduce the effect of pedestrian intimidation/severance. Possible road signage to be agreed with BMBC.	Minor short-term effect.
Short-term increase in overall traffic on A616 and A628	Timings to be scheduled outside of peak traffic hours. Traffic management to be agreed.	No significant effect.
Traffic delays due to abnormal load movement.	Traffic management and timings of deliveries to be agreed with BMBC and local police. Deliveries to be scheduled outside peak traffic hours.	No significant effect.
Operational Effects		
Increase in traffic along A616, A628 and Royd Lane	Appropriate access signage to be agreed with BMBC.	No significant effect.
Decommissioning Effects		
Increase in traffic along A616, A628 and Royd Lane	Management plan to be carried out prior to works being carried out.	As per construction effects.

11.9 STATEMENT OF SIGNIFICANCE

This traffic assessment reviews the traffic conditions within the study area that would be affected during construction of the Development.

A strategic route review was undertaken and identified that minor road works would be required to deliver the wind turbine sections to the site. It also identified that the greater road network is suitable in accommodating the sizes and volume of the expected construction vehicles. These construction vehicles would use established HGV routes to access the site, *i.e.* the A616, A628 and Royd Moor Lane.

This traffic assessment concludes that there would be short-term increases in traffic levels on the delivery routes to the Development. In accordance with the IEMA significance criteria, these increases will be temporary. During the turbine foundation construction, there would be a peak of 70 HGV movements per day across the highway network. The busiest period of construction would be during months 4 and 5 and, although there will be an increase in HGV movements, these levels are less than the increases set out in the significance criteria and therefore the overall effects of traffic movements are not significant.

Abnormal load vehicles would be normally timed during off-peak periods in order to avoid creating delays and contributing to congestion along the A616 and A628. The times of these movements would be agreed with the police and BMBC.

Traffic generated due the operation and maintenance of the Development would be minimal and would have a negligible effect on the traffic levels on the strategic roads or the unclassified roads leading to the site. This would not result in any significant effects.

Mitigation measures such as specific timing of deliveries, travelling in convoys and the use of a banksman would reduce the effect on the road network.

Traffic generated during decommissioning of the Development is likely to be lower than the levels associated with construction and will be the subject of a further traffic management plan. Decommissioning traffic would therefore be not significant. An appropriate traffic assessment would be undertaken prior to the decommissioning of the Development.

Overall, the access and traffic effects associated with the Development will be *not significant*.

