

**KYPE MUIR EXTENSION**

**Planning Application**

**ENVIRONMENTAL STATEMENT**

## 13. TRAFFIC & TRANSPORTATION

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### SUMMARY

Existing traffic data was collected to establish a base point for assessing the traffic impact during the construction phase of the Development. This was projected to future levels to allow a comparison to be made of the impact on the local road network with the addition of construction traffic.

The maximum traffic impact associated with construction of the wind farm is predicted to occur in months 16 and 20 of the construction programme. During these months, an average of 76 HGV movements are predicted per day and it is estimated that there will be a further 42 car and light van movements per day to transport construction workers travelling to and from the site.

The construction traffic will result in a temporary increase of traffic flows within the study area. During the construction of the wind farm the associated traffic impacts are predicted to be greatest on the Lambhill Road and the B743 south of Strathaven.

Due to the volume of additional construction traffic movements associated with the Development, no significant capacity issues are expected on any of the roads within the study area.

With the implementation of mitigation measures such as an appropriate traffic management plan and suitable liaison with the Council, the residual traffic and transportation effects are temporary and have been assessed as having a minor effect which is not significant in terms of the EIA Regulations.

### INTRODUCTION

- 13.1 This chapter sets out the policy context, describes the scope of the assessment, details the proposed access, traffic and transport arrangements associated with the construction, operation and decommissioning phases of the Development. It also describes the current baseline traffic and route conditions, describes measures to mitigate against identified impacts and provides an assessment of the residual impact of the Development.
- 13.2 The main traffic and transport effects relating to the Development would be associated with the movements of Heavy Goods Vehicles (HGVs) transporting construction material such as aggregates, cement and steel, and the movements of abnormal loads required to deliver wind turbine components during the construction phase.
- 13.3 The decommissioning phase would involve fewer trips on the network than the construction phase, as elements of infrastructure such as access tracks and electrical connections would be left in place, adding to local infrastructure.

### SCOPE OF ASSESSMENT

#### Study Area

- 13.4 The study area which has been agreed with the Council (via telephone discussion in June 2014) comprises the parts of the public road network that could be used by construction and operational traffic accessing the Site. The study area is identical to that which was previously agreed, and used, in relation to the assessment

undertaken for the consented Kype Muir Wind Farm. Access to the Development is proposed from the B743, via the access route already approved in relation to the consented Kype Muir Wind Farm. The roads identified as forming the likely route to Site by abnormal loads and construction traffic are the A71, A70, A723, A726 B743 and Lambhill Road.

### Scoping and Consultation

- 13.5 A thorough consultation exercise relating to access, traffic and transport effects was undertaken in August 2014. A summary of the consultation responses is included in Table 13.1.

**Table 13.1: Issues Identified During Consultation**

Consultee	Summary of Response	Where & How Addressed
The Council Traffic/Roads Service	Scope to be consistent with that previously agreed in relation to the consented Kype Muir Wind Farm.	The survey locations previously assessed for the consented Kype Muir Wind Farm have been re-surveyed and an assessment undertaken of the potential impact associated with the Development.

## POLICY, LEGISLATION & GUIDANCE

- 13.6 A review of relevant transport policies, current legislation and guidance has been undertaken as part of this assessment and is summarised as follows:
- Scottish Planning Policy;
  - Glasgow and Clyde Valley Strategic Development Plan;
  - South Lanarkshire Local Plan Policy 16 – Travel and Transport;
  - South Lanarkshire Council Local Transport Strategy;
  - IEMA Guidelines for the Environmental Assessment of Road Traffic, 1993; and
  - Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Appraisal: and
  - Design Manual for Roads and Bridges (DMRB) Volume 15 Economic Assessment of Road Schemes – Section 1 NESAs Manual.

## METHODOLOGY

### Desk Study

- 13.7 The baseline review focuses on the nature of the surrounding road infrastructure and the level of traffic that uses it. It has been informed by desktop studies and consultation, comprising the following:
- Review of responses to the EIA Scoping Report;
  - Collection of traffic flow data;

- Review of any roads hierarchy promoted in relevant Local Transport Strategies;
- Identification of sensitive junction locations;
- Identification of constraints to the roads network, with or without height/width/weight restrictions;
- Identification of areas of road safety concerns;
- Identification of other traffic sensitive receptors in the area (routes, communities, buildings etc);
- Review of Ordnance Survey (OS) plans to derive a local area roads network; and
- Consideration of potential supply locations for construction materials, if not available on-site, to inform extent of local area roads network to be considered in the assessment.

### **Field Survey**

- 13.8 Field surveys have also been undertaken to further enhance the understanding of the road network in the study area and to identify potential constraints on the network, including:
- Visual inspection of all roads identified in the study area network;
  - Photographic/video record of any constraints; and
  - Traffic counts to determine existing traffic flows on the surrounding road network.

### **Impact Assessment Methodology**

#### *Receptor Sensitivity*

- 13.9 The receptors that may be subject to any traffic impacts arising from the construction of the Development include settlements along the turbine delivery route and construction traffic routes. These settlements are classified by size, function, presence of school and community facilities, traffic calming or traffic management measures, vehicles speed limits and position on the roads hierarchy, using the criteria identified in Table 13.2 below. This classification is based upon subjective judgement and relative sensitivity to the potential traffic impacts of the Development.
- 13.10 Identification of receptor sensitivity requires the definition of both baseline conditions and estimation of conditions for the appropriate year of assessment. Each receptor will have a different value and level of sensitivity to change. Table 13.2 provides descriptions of receptor sensitivity based on DMRB guidelines HA 205/08 'Assessment and Magnitude of Environmental Effects'.
- 13.11 For many effects there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed up by data or quantified information where possible.

**Table 13.2: Receptor Sensitivity**

Sensitivity	Description
High	Typically receptors with high importance and rarity on an international and national scale and with limited potential for substitution. To include large rural settlements containing a high number of community and public services and facilities, areas with traffic control signals, waiting and loading restrictions, traffic calming measures and minor rural roads not constructed to accommodate frequent use by HGV traffic.
Medium	Typically receptors with high or medium importance and rarity on a regional scale and with limited potential for substitution. To include intermediate sized rural settlements containing some community or public facilities and services, areas with some traffic calming or traffic management measures and local A or B class roads, capable of regular use by HGV traffic.
Low	Typically receptors with low or medium importance and rarity on a local scale (on-site or neighbouring the site). To include small rural settlements with few community or public facilities or services, areas with little or no traffic calming or traffic management measures and trunk or A-class roads, constructed to accommodate significant HGV composition.
Negligible	Typically receptors with little importance and rarity. To include very small settlements and roads with no adjacent settlements including new strategic trunk roads or motorways that would be little effected by additional traffic and suitable for abnormal loads.

*Magnitude of Effect*

- 13.12 The IEMA Guidelines (1995) identify general thresholds in terms of the extent of assessment based on traffic flow increases more than 30%, or in particularly sensitive areas, 10%. The guidelines also suggest that 30%, 60% and 90% changes in traffic levels should be considered as “slight, moderate and substantial” impacts respectively with regard to severance and intimidation. It is also generally considered that traffic flow increases of less than 10% create no discernible environmental impact given that daily variation in background traffic flow may vary by this amount. Based on these guidelines and perceptions, the magnitude of traffic impacts can be estimated using the criteria in Table 13.3.

**Table 13.3: Magnitude of Impact**

High	Medium	Low	Negligible
>90% increase in traffic	60% - 90% increase in traffic	30% - 60% increase in traffic	0% - 30% increase in traffic

*Significance of Effect*

- 13.13 To determine the overall significance of the effects, the results from the receptor sensitivity and effect magnitude classifications are correlated and classified using the scale summarised in Table 13.4.

**Table 13.4: Significance of Effect**

<b>Sensitivity</b> <b>Magnitude</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>Negligible</b>
<b>High</b>	Major	Major	Moderate	Minor
<b>Medium</b>	Major	Moderate	Minor	Negligible
<b>Low</b>	Moderate	Minor	Negligible	Negligible
<b>Negligible</b>	Minor	Negligible	Negligible	Negligible

- 13.14 For the purposes of assessing significant effects, under the terms of the EIA Regulations, this matrix provides a guide subject to professional judgement. For example, the introduction of a low number of additional HGV movements on a route that is currently subject to low numbers of HGV trips is recorded as being highly statistically significant, even though the numbers of additional trips could be just five to ten additional vehicles. Despite the fact that additional traffic volumes may be exceptionally low, the effect may be statistically high. However, it is not necessarily significant in terms of the EIA Regulations. Effects are considered to be significant for the purposes of the EIA Regulations where the effect is classified as being of equal to or greater than moderate significance.
- 13.15 The DMRB guidelines also make reference to the need to take account of the difference between permanent and temporary effects. Permanent impacts will be more significant than temporary impacts as temporary impacts may only occur during a single phase of the project construction. All transport and access effects will be temporary and occur only during the construction and decommissioning phases.

## **BASELINE CONDITIONS**

### **Current Baseline**

#### *Local Road Network*

- 13.16 The A70 is a non-trunk strategic route with the section in the vicinity of the site linking Cumnock with the M74. The road is single carriageway in its entirety.
- 13.17 The A71 is a non-trunk strategic route with the section in the vicinity of the site linking Strathaven with the M74. The A723 is a non-trunk strategic route with the section in the vicinity of the site linking Hamilton with Strathaven. The A726 is a non-trunk strategic route with the section in the vicinity of the site linking East Kilbride with Strathaven. All three roads are single carriageway in their entirety.
- 13.18 The B743 is a main distributor road linking Strathaven with Muirkirk. The road is single carriageway in its entirety.
- 13.19 Lambhill Road is a minor rural road linking the B743 to Lambhill Steading. The road is currently single track in its entirety although it will be significantly upgraded by Banks Renewables as part of the works related to the consented Kype Muir Wind Farm.
- 13.20 The average link capacities for the various links within the study area have been estimated using detail within Chapter 3 of the NESAs Manual. The theoretical capacities (Vehicles per hour in each direction) are detailed below:
- A70 – around 10,800 vehicles per 12 hours;

- A71 – around 10,800 vehicles per 12 hours;
- A723 – around 10,800 vehicles per 12 hours;
- A726 – around 10,800 vehicles per 12 hours;
- B743 – around 10,800 vehicles per 12 hours; and
- Lambhill Road – around 1,680 vehicles per 12 hours.

### *Traffic Volumes*

13.21 As part of the scoping discussions, eight sites were identified that would allow an accurate estimate of the potential impact of the construction phase to be made. To gauge existing usage, Automatic Traffic Count (ATC) surveys were commissioned at the following locations:

- A70 West of Muirkirk;
- A70 East of Muirkirk;
- A71 West of Strathaven;
- A71 East of Strathaven;
- A723 North of Strathaven;
- A726 North of Strathaven;
- B743 South of Strathaven; and
- Lambhill Road.

13.22 The locations of the traffic count sites are illustrated in Technical Appendix 13.1. For each location, seven days worth of count data was collected during September 2014 with the exception of Lambhill Road where count data was taken from March 2011.

13.23 The traffic counters used allowed the traffic flows to be split into vehicle classes as well into overall directional traffic volume. The vehicle classes reported in the survey are as follows:

- Motorcycles and pedal cycles;
- Cars;
- Lights – this classification covers light goods vehicles (up to 3.5 tonne) and cars with trailers/caravans;
- Other Goods Vehicles – Class 1 (OGV1) and buses; this classification covers smaller commercial vehicles between 3.5 tonnes and 7.5 tonnes and includes rigid two and three axle trucks and articulated trucks up to three axles as well as buses and coaches; and
- Other Goods Vehicles – Class 2 (OGV2); this classification covers all heavy goods vehicles with four or more axles.

13.24 Table 13.5 summarises the weekday traffic data collected at the eight sites.

**Table 13.5: Existing Traffic Conditions**

Survey Location	Time Period	Cycles, Cars & Lights	OGV 1	OGV 2	Total
A70 West of Muirkirk	12 Hour Flow	2727	479	109	3315
	24 Hour Flow	3393	554	127	4075
A70 East of Muirkirk	12 Hour Flow	1257	313	102	1672
	24 Hour Flow	1531	361	123	2015
A71 West of Strathaven	12 Hour Flow	2903	719	148	3770
	24 Hour Flow	3510	831	175	4517
A71 East of Strathaven	12 Hour Flow	5697	620	46	6363
	24 Hour Flow	6862	721	56	7639
A723 North of Strathaven	12 Hour Flow	3283	391	13	3687
	24 Hour Flow	3974	442	16	4432
A726 North of Strathaven	12 Hour Flow	5697	620	46	6363
	24 Hour Flow	6862	721	56	7639
B743 South of Strathaven	12 Hour Flow	844	177	13	1034
	24 Hour Flow	1059	205	15	1280
Lambhill Road	12 Hour Flow	60	3	5	68
	24 Hour Flow	71	3	7	80

*Traffic Speeds*

13.25 The ATC surveys were also used to collect speed statistics. The five day average and 85th percentile speeds observed at each count location are summarised below in Table 13.6.

**Table 13.6: Observed Traffic Speeds**

Survey Location	Average Speed (MPH)	85th Percentile Speed	Speed Limit
A70 West of Muirkirk	29.6	33.4	30
A70 East of Muirkirk	36.9	44.8	60
A71 West of Strathaven	51.7	60.6	60
A71 East of Strathaven	43.1	49.8	60
A723 North of Strathaven	44.85	52.1	60
A726 North of Strathaven	43.1	49.8	60
B743 South of Strathaven	53.6	63.2	60
Lambhill Road	22.5	-	60



### Accident Data

- 13.26 Road traffic accident data was obtained for the four years from the start of 2009 to the end of 2012 along the full extent of the abnormal loads route from the M74 to the site access and the full extent of the B743.
- 13.27 No accidents were recorded on Lambhill Road with two accidents recorded on the B743 between the A71 and Lambhill Road.
- 13.28 Table 13.7 below provides a summary of the injury accidents recorded on the routes for the four year period.

**Table 13.7: Accident Statistics**

Severity			No Vehicles / Peds		Vehicle Types							Road Feature		Surface Condition			Lighting	
Slight	Serious	Fatal	Single	Multiple	Car + Car	Car + Motorcycle	Cycle + LGV	Car + LGV	Car + HGV	Car	Other	Junction	Bend	Frost /Ice/Snow	Dry	Wet or Damp	Daylight	Darkness
30	5	0	18	17	12	1	1	1	1	13	6	14	6	7	11	17	29	6

### Future Baseline

- 13.29 Construction of the Development could be completed by 2020 if consent is granted. For the purpose of this assessment, a 24 month construction period has been assumed.
- 13.30 However, it should be noted that any lengthening in the programme will have a reduced impact on the surrounding road network in overall trip generation terms.
- 13.31 To assess the likely impacts during the construction phase, base year traffic flows were determined by applying the National Road Traffic Forecast (NRTF) high growth factors to the surveyed traffic flows. Applying high NRTF growth factors provides a robust assessment as they represent higher than average growth when considering link capacities. The NRTF high growth factor between the survey year (2014) and the year of construction completion (2020) is 1.0991 and 1.588 in relation to Lambhill Road where the survey date was 2011.
- 13.32 2020 Base (existing traffic + growth) traffic conditions are indicated in Table 13.8.

**Table 13.8: 2020 Base Traffic Conditions (Weekday Average Two-Way Flows)**

Survey Location	Time Period	Cycles, Cars & Lights	OGV 1	OGV 2	Total
A70 West of Muirkirk	12 Hour Flow	2997	526	120	3643
	24 Hour Flow	3730	609	140	4479
A70 East of Muirkirk	12 Hour Flow	1382	344	112	1837
	24 Hour Flow	1683	396	135	2215
A71 West of Strathaven	12 Hour Flow	3190	790	163	4143
	24 Hour Flow	3858	914	192	4964
A71 East of Strathaven	12 Hour Flow	6261	682	50	6993
	24 Hour Flow	7542	792	62	8396
A723 North of Strathaven	12 Hour Flow	3608	429	15	4052
	24 Hour Flow	4368	486	18	4871
A726 North of Strathaven	12 Hour Flow	6261	682	50	6993
	24 Hour Flow	7542	792	62	8396
B743 South of Strathaven	12 Hour Flow	928	194	14	1136
	24 Hour Flow	1164	226	17	1407
Lambhill Road	12 Hour Flow	70	3	6	79
	24 Hour Flow	82	3	8	93

### Modifying Influences

13.33 Background traffic growth between 2014 and the 2020 year of construction completion is likely to be the only modifying influence on the baseline conditions.

### Information Gaps

13.34 In line with standard procurement practice, a contractor and supply-chain for materials will not be selected prior to the Development receiving consent. Consequently, the information presented in this chapter is necessarily indicative and based on worst case assumptions in terms of predicted traffic flows. The proposed routes, vehicles and other arrangements provided are based on experience of previous projects.

### DESIGN EVOLUTION

13.35 The baseline studies have had no influence on the design of the Development from a transport and access perspective due to construction traffic routes agreed in relation to the consented Kype Muir Wind Farm.

### ASSESSMENT OF EFFECTS

13.36 Potential traffic and transport impacts associated with the Development would be related to traffic movements during the construction period. During construction, vehicles would access the Site to transport construction staff, deliver construction materials (aggregates, cement, steel bar etc), plant items and turbine components. The decommissioning phase would involve fewer trips on the network than the construction phase as elements of infrastructure such as foundations, access tracks and electrical connections would be left in place.

## Construction Phase

- 13.37 The assessment has been undertaken in accordance with the IEMA 'Guidelines for Environmental Impact Assessment'. These guidelines express that the separate 'Guidelines for the Environmental Assessment of Road Traffic' should be used to characterise the environmental traffic and transport effects (including off-site effects) and the assessment of significance of new developments. The guidelines are intended to complement professional judgement and the experience of trained assessors.
- 13.38 The perception of changes in traffic is dependent upon a wide range of factors including its volume, speed, function and its composition (e.g. percentage of HGVs). Therefore, the assessment of the environmental impacts of traffic requires a number of stages, namely:
- Determination of existing and forecast traffic levels and characteristics;
  - Determining the time period suitable for assessment;
  - Determining the year of assessment; and
  - Identifying the geographical boundaries of assessment.
- 13.39 In accordance with the IEMA Guidelines, the assessment was undertaken on road links where:
- Traffic flows are predicted to increase by more than 30% (or where the total number of heavy goods vehicles is predicted to increase by more than 30 %); and
  - Traffic flows are predicted to increase by 10% or more in any other specifically sensitive areas.
- 13.40 The assessment presents the potential impacts of construction traffic, and identifies those which may result in significant effects.
- 13.41 The potential impacts identified as important in the guidelines, when assessing the traffic impacts from an individual development, are listed below and have been considered in this assessment:
- Severance – this is the perceived division that can occur within a community when it becomes separated by a major traffic artery resulting from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. The Manual of Environmental Appraisal (MEA) sets out a range of indicators for determining the significance of the relief from severance with changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively;
  - Driver delay – 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;
  - Pedestrian delay – the delay to pedestrians, as with driver delay, is likely only to be significant when the traffic on the network surrounding the development is at, or close to, the capacity of the system;
  - Pedestrian amenity – broadly defined as the relative pleasantness of a journey and considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic. The MEA suggests that a tentative

threshold for judging the significance of changes in pedestrian amenity would be where traffic flow (or its lorry component) is halved or doubled;

- Fear and intimidation – a further impact traffic may have on pedestrians is fear and intimidation due to the proximity resulting from factors such as narrow pavement width. There are no commonly agreed thresholds for estimating levels of danger, or fear and intimidation, from known traffic and physical conditions;
- Accidents and safety – professional judgement will be used to assess the implications of local circumstances, or factors which elevate or lessen risks of accidents; and
- Dust and dirt – there are no simple formulas to predict the levels of dust and dirt which might arise although an estimation of the likely construction volumes will be useful background to provide an informed decision.

### **Operational Period**

- 13.42 Once operational, the volume of traffic movements would be minimal, although regular visits would be made for maintenance checks using 4x4 vehicles.
- 13.43 Consideration may have to be given to the very rare abnormal load movement to deliver replacement components, although any required mitigation to allow for this would be determined at the time. In any case, such instances are rare and would be agreed with the Council.

### **Decommissioning Phase**

- 13.44 No consideration of possible decommissioning impacts has been included as part of this assessment. At the end of the Development's operational life, there may be an impact on the local road network due to the movements of HGVs associated with the removal of equipment and materials. However, the number of vehicle movements is anticipated to be far lower than that predicted for construction as foundations would be left in place and as such the construction phase is the only phase with the potential to result in significant impacts.

### **Micro-siting**

- 13.45 No adverse transportation impacts are expected as a result of the micro-siting of borrow pits, turbine foundations or access tracks.

### **Cumulative Effects**

- 13.46 There are a number of schemes that are either consented or within the planning system in the area surrounding the Development, including the consented Kype Muir Wind Farm and Dungavel Wind Farm.
- 13.47 For the purposes of this assessment it is assumed that there will be no overlap in the construction periods between Kype Muir and the Development. This however may be subject to change as the construction programmes for the sites are developed in greater detail and it is also dependent on external facts such as grid connection dates. Should there be any overlap in construction periods, a briefing report detailing any impact and associated mitigation will be undertaken and provided to the Council.
- 13.48 Dungavel Wind Farm is also likely to be operational prior to work commencing on the Development. None of the other sites currently within the planning system are likely to utilise the proposed access route to the Development within the same timescale.

- 13.49 It is considered extremely unlikely that peak movements for any other schemes within the area constructed during the same period would occur at the same time due to differing grid connection dates, progress through the planning system and the limited capacity of surrounding quarries.
- 13.50 The Council did not request that any other schemes were taken into account as part of the access, traffic and transport impact assessment. No cumulative impact assessment was therefore undertaken for this Chapter.

## MITIGATION

- 13.51 The primary mitigation measure to help minimise the effects of construction traffic was the careful consideration of the road network to identify a preferred route to and from the Development access junction. This considered physical characteristics of the roads network and the number and location of potentially sensitive receptors along the various routes.

### Mitigation and Monitoring

#### *Mitigation by Design*

- 13.52 Access to the Development is proposed from the B743, via the access route already approved in relation to the consented Kype Muir Wind Farm (ES22 – Route Access for Abnormal Loads). Lambhill Road will be upgraded to 6m wide running width and a number of bridges along the route will be upgraded to accommodate the proposed loads as part of the Kype Muir Wind farm works.

#### *Mitigation During Construction*

- 13.53 During the construction phase, Banks Renewables will set up a community liaison group to ensure that there is dialogue with the local community. The latest information relating to traffic movements associated with vehicles accessing the Site will be communicated to local communities. This would be agreed with the Roads Authority.
- 13.54 The following measures would be implemented in terms of site operation and maintenance during the construction phase:
- All materials delivery lorries (dry materials) would be sheeted to reduce dust and stop spillage on public roads;
  - Specific training and disciplinary measures would be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway; and
  - Wheel wash facilities would be established at the Site entrance.
- 13.55 Technical Appendix 3.4 (Draft Construction Management Plan) would set out measures to be put in place to reduce the impact of noise, dust and excessive speed.
- 13.56 Drivers would be required to pass through sensitive areas at low speed. Vehicles would be fitted with identification numbers to allow the public to identify any vehicles that may be speeding or causing specific issues .
- 13.57 A detailed Traffic Management Plan (TMP) prepared post-consent will set out measures to help reduce delays encountered with abnormal load transport for drivers. This will include measures such as timing deliveries during off-peak periods. Other measures such as advance warning signs will help drivers consider non-

impacted routes as alternatives for their journeys. The TMP will also address any pedestrian delay and amenity issues that may arise, although none are anticipated.

- 13.58 A road sweeper will also be deployed on Lambhill Road and the sections of the B743 to ensure that the road is kept clean and free running.

#### *Mitigation During Operation*

- 13.59 The access point onto the public road network (at the B743) will be well maintained and regularly monitored to ensure that no debris is carried onto public roads by any maintenance traffic, although only a very small number of maintenance trips are predicted.

## **RESIDUAL EFFECTS**

### **Introduction**

- 13.60 This section considers the level of sensitivity of the local road network to the increase in vehicle movements associated with the construction phase following the introduction of mitigation measures. It then considers the likely magnitude of impacts assuming the mitigation proposed above is implemented in full. These are then combined to arrive at a determination of whether or not a significant effect in EIA terms is anticipated.

- 13.61 The assessment is based upon the following assumptions:

- The majority of stone associated with the construction of the Site access tracks, crane pads and hard standings is likely to be won from on-site borrow pits although in order to account for the worst case in transportation terms it has been assumed that all stone will be imported. The volume of imported stone required to construct the on-site track network has been estimated based on information contained in Chapter 4 (Construction, Operation & Decommissioning) at 96,202m<sup>3</sup>, which equates to 9,620 trucks (19,240 movements);
- Forestry removal is estimated in Chapter 15 (Forestry) at 8,723 tonnes, which equates to 349 forestry trucks (698 movements);
- The volume of concrete per turbine is estimated in Chapter 4 (Construction, Operation & Decommissioning) at 8,100m<sup>3</sup>, which equates to 1,350 Mixer Trucks (2,700 movements);
- Steel reinforcement relating to the turbine foundation is estimated in Chapter 4 (Construction, Operation & Decommissioning) at 864 tonnes, which equates to 29 Trucks (58 movements);
- Sand would be imported to the Site to allow backfilling of the cable trenches running adjacent to the access tracks – total volume of sand required is estimated to be 11,215m<sup>3</sup>, which equates to 897 Tipper Trucks (1,794 movements);
- Construction traffic requirements are estimated and are largely based on the construction materials information provided in Chapter 4 (Construction, Operation & Decommissioning);
- Due to the nature of materials and plant required on-site, the majority of vehicles utilised would be HGV;
- The construction phase is estimated to be 24 months duration, with construction deliveries phased;

- Assumes 42 vehicles average per day for construction employees/staff, over a 5 day week, for 96 week construction phase; and
- All mitigation as outlined above is implemented in full.

13.62 Of the construction, operation and decommissioning phases, the greatest traffic volumes are associated with the construction phase. The decommissioning phase involves fewer trips on the network than the construction phase as elements of infrastructure such as access tracks would be left in place.

13.63 The worst case transport scenario is therefore the construction phase and the following quantitative assessment of traffic impacts concentrates on that element of the Development's life. It should be considered however that the construction impacts are temporary in nature.

#### **Derivation of Development Traffic**

13.64 During the 24 month construction phase, the following traffic would require access to the site:

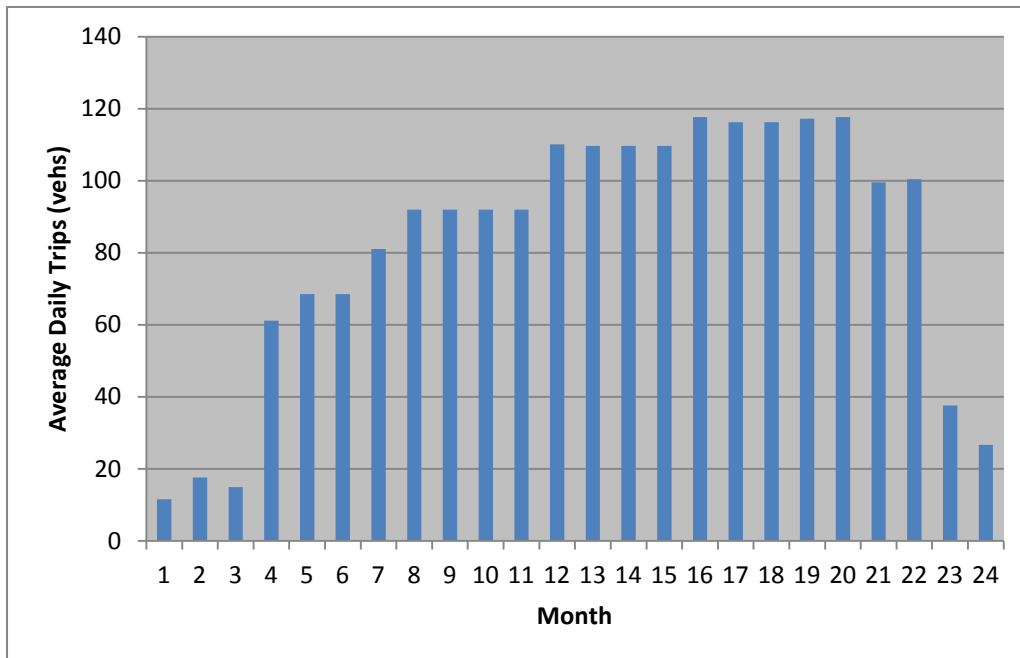
- Staff transport, either cars or staff minibuses;
- Construction equipment and materials, deliveries of machinery and supplies such as cement;
- Abnormal loads consisting of the wind turbine sections and also a heavy lift crane; and
- Abnormal load escort vehicles.

13.65 The estimated construction programme associated with the Development has been provided by Banks Renewables.

13.66 A standard construction programme for an 18 turbine site was used to convert the total movements for each trip type to average monthly traffic flows. To enable comparison of the estimated 2019 baseline traffic flows with total volumes including predicted construction traffic, the monthly data was converted to average daily flows for each month and the peak period for construction traffic determined. This is summarised in the following paragraphs.

13.67 The average daily construction trips across the construction programme is illustrated in Graph 13.1.

**Graph 13.1 Average Daily Construction Trips**



### **Development Traffic Distribution**

13.68 The distribution of trips associated with the Development on the network would vary depending on the types of load being transported.

13.69 General deliveries and staff are assumed to be distributed in line with the combined traffic flows on the main routes collected during the traffic surveys as follows:

- A70 West of Muirkirk – 16.2%;
- A70 East of Muirkirk – 8.9%;
- A71 West of Strathaven – 19.0%;
- A71 East of Strathaven – 17.1%;
- A723 North of Strathaven – 7.8%;
- A726 North of Strathaven – 17.1%;
- B743 South of Strathaven – 74%; and
- Lambhill Road – 100%.

13.70 Concrete deliveries are sourced from local ready mix sites wherever possible resulting in the following distribution:

- A70 East of Muirkirk – 20%;
- A71 East of Strathaven – 60%;
- A726 North of Strathaven – 20%;
- B743 South of Strathaven – 80%; and
- Lambhill Road – 100%.

13.71 The proposed distributions are the same as that used in the now consented Kype Muir Wind Farm Transport Assessment.



- 13.72 Abnormal loads would originate from Glasgow and ultimately access the Site via the A71, B743 and Lambhill Road. Crane trips would access the Site via the same route as the abnormal loads.
- 13.73 Imported stone is sourced from Dunduff Quarry at Kirkmuirhill, Boghead and access the Site via the A71, B743 and Lambhill Road.

#### **Traffic Impact Assessment**

- 13.74 The 2019 Base traffic data was combined with the peak daily construction traffic flows to estimate the total trips on the study network during the peak of the construction phase. This was then distributed across the network.
- 13.75 Table 13.9 illustrates the peak weekday construction traffic flow; Table 13.10 the weekday and 2019 Base plus peak construction traffic (Total) flows and Table 13.11 the weekday and percentage increase in 2019 Total traffic over 2019 Base traffic.

**Table 13.9: Weekday Construction Traffic (Weekday Average Two-Way Flows)**

Survey Location	Time Period	Cycles, Cars & Lights	OGV 1	OGV 2	Total
A70 West of Muirkirk	12 Hour Flow	7	0	1	8
	24 Hour Flow	7	0	1	8
A70 East of Muirkirk	12 Hour Flow	4	0	3	7
	24 Hour Flow	4	0	3	7
A71 West of Strathaven	12 Hour Flow	8	1	1	10
	24 Hour Flow	8	1	1	10
A71 East of Strathaven	12 Hour Flow	10	1	54	65
	24 Hour Flow	10	1	54	65
A723 North of Strathaven	12 Hour Flow	3	0	1	4
	24 Hour Flow	3	0	1	4
A726 North of Strathaven	12 Hour Flow	7	0	2	9
	24 Hour Flow	7	0	2	9
B743 South of Strathaven	12 Hour Flow	34	2	71	107
	24 Hour Flow	34	2	71	107
Lambhill Road	12 Hour Flow	42	2	74	118
	24 Hour Flow	42	2	74	118

**Table 13.10: Total Weekday Traffic Flows (Weekday Average Two-Way Flows)**

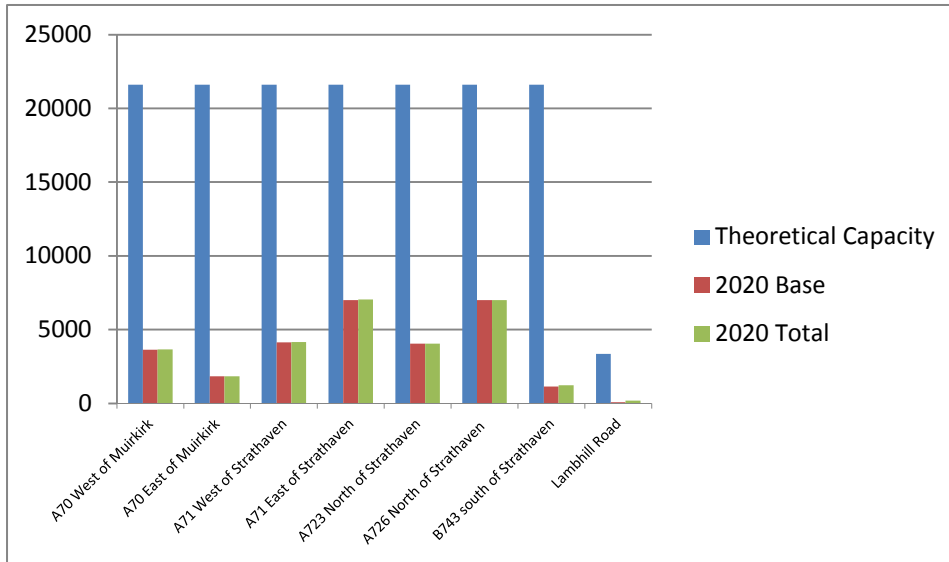
Survey Location	Time Period	Cycles, Cars & Lights	OGV 1	OGV 2	Total
A70 West of Muirkirk	12 Hour Flow	3004	526	121	3651
	24 Hour Flow	3737	609	141	4487
A70 East of Muirkirk	12 Hour Flow	1386	344	115	1844
	24 Hour Flow	1687	396	138	2222
A71 West of Strathaven	12 Hour Flow	3198	791	164	4153
	24 Hour Flow	3866	915	193	4974
A71 East of Strathaven	12 Hour Flow	6271	683	104	7058
	24 Hour Flow	7552	793	116	8461
A723 North of Strathaven	12 Hour Flow	3611	429	16	4056
	24 Hour Flow	4371	486	19	4875
A726 North of Strathaven	12 Hour Flow	6268	682	52	7002
	24 Hour Flow	7549	792	64	8405
B743 South of Strathaven	12 Hour Flow	962	196	85	1243
	24 Hour Flow	1198	228	88	1514
Lambhill Road	12 Hour Flow	112	5	80	197
	24 Hour Flow	124	5	82	211

**Table 13.11: Percentage Increase 2019 Base v 2019 Total (Weekday Average Two-Way Flows)**

Survey Location	Time Period	Cycles, Cars & Lights	OGV 1	OGV 2	Total
A70 West of Muirkirk	12 Hour Flow	0.2%	0.0%	0.8%	0.2%
	24 Hour Flow	0.2%	0.0%	0.7%	0.2%
A70 East of Muirkirk	12 Hour Flow	0.3%	0.0%	2.7%	0.4%
	24 Hour Flow	0.2%	0.0%	2.2%	0.3%
A71 West of Strathaven	12 Hour Flow	0.3%	0.1%	0.6%	0.2%
	24 Hour Flow	0.2%	0.1%	0.5%	0.2%
A71 East of Strathaven	12 Hour Flow	0.2%	0.1%	107.3%	0.9%
	24 Hour Flow	0.1%	0.1%	87.1%	0.8%
A723 North of Strathaven	12 Hour Flow	0.1%	0.0%	6.8%	0.1%
	24 Hour Flow	0.1%	0.0%	5.7%	0.1%
A726 North of Strathaven	12 Hour Flow	0.1%	0.0%	4.0%	0.1%
	24 Hour Flow	0.1%	0.0%	3.2%	0.1%
B743 South of Strathaven	12 Hour Flow	3.7%	1.0%	512.7%	8.2%
	24 Hour Flow	2.9%	0.9%	425.9%	6.6%
Lambhill Road	12 Hour Flow	60.4%	57.5%	1277.2%	149.8%
	24 Hour Flow	51.0%	57.5%	912.3%	127.3%

13.76 A comparison of the theoretical capacity identified in paragraph 13.19 versus the estimated '2019 Future Year Traffic Base Traffic Flow + Construction Phase Trips' 12-hour flows for the links in the network is illustrated in Graph 13.2.

**Graph 13.2 Theoretical Capacity Comparison**



- 13.77 The impact review was undertaken for weekday conditions and the results indicate that the greatest impact of construction traffic will be on the B743 and Lambhill Road. However, this reflects the low number of trips and particular HGV trips on this section of the road network. There is also a large increase in OGV 2 traffic on A71 East of Strathaven although the overall increase in HGV traffic is less than 10% on this link. As the total HGV value does not exceed the 30% threshold, no further assessment is considered warranted. The comparison of development traffic flows with theoretical link capacities indicates that there is considerable spare capacity on the local road network and no link capacity issues associated with the construction traffic would be anticipated.
- 13.78 With reference to the IEMA Guidelines, total traffic flows are predicted to increase by more than 30% on Lambhill Road with total HGV flows predicted to increase by more than 30% on the B743 and these are considered to be the key links.
- 13.79 The IEMA rules are guidelines and are open to professional judgement as set out in the document. In the case of the more sensitive links it is worth noting the numerical increase in flows as well as the percentage impact.
- 13.80 HGV traffic levels are projected to increase on the B743/Lambhill Road although HGV flows are extremely low on these links. The maximum number of additional HGV movements per day is 76 and this is considered relatively low when spread over the course of a day.
- 13.81 The predicted uplift in HGV traffic will only occur during a 20 week period with average HGV levels across the 17 month programme around 65% of the peak. The predicted uplift in HGV traffic is therefore classed as a short term temporary impact.
- 13.82 The impacts of statistical significance are restricted to the B743/Lambhill Road. No impacts on the other links included within the assessment are considered high enough to warrant further assessment as the percentage increase in total traffic is less than 30% as outlined in Table 13.11.

## Receptor Sensitivity

- 13.83 The main receptors along the critical section of the B743 are the section of the B743 within Strathaven and a number of individual residential properties along the B743. These receptors are considered to have a Medium sensitivity due to their position on a B-class route capable of regular use by HGV traffic. There are limited receptors along Lambhill Road as this route will be upgraded in relation to the consented Kype Muir Wind Farm and is therefore considered to have a Low sensitivity,

## Impact Magnitude and Identification of Significant Effects

- 13.84 A route evaluation has been carried out for the key sections of the route against the various environmental criteria identified in the IEMA Guidelines (as summarised in paragraph 13.40).
- 13.85 The residual effects for the various environmental criteria are described below and summarised in Table 13.14.

### *Severance/Fear and Intimidation*

- 13.86 The increase in traffic flow affecting receptors along the B743/Lambhill Road is summarised in Table 13.9. The severance/fear and intimidation impact is estimated to be negligible at the receptors along the route due to the low volumes of overall traffic (paragraph 13.73).

### *Driver/Pedestrian Delay*

- 13.87 There is the potential for limited driver delay during the movement of the abnormal loads although this would only occur over a short period during the construction phase. Details of abnormal load movements would be communicated to the public through measures set out in the TMP described in paragraph 13.51 minimising the impact on driver delay.
- 13.88 The link capacity of the B743/Lambhill Road as illustrated in Graph 13.1 indicates that there is considerable spare capacity along this link and the driver/pedestrian delay impact is therefore estimated to be negligible at the receptors along the route.

### *Pedestrian Amenity*

- 13.89 The magnitude of the impact on pedestrian amenity has been considered in terms of the threshold described in paragraph 13.40. Therefore, based on the estimated two-way percentage increases in HGV traffic summarised in Table 13.11, the threshold for changes to pedestrian amenity have been reached on both the B743 and Lambhill Road. With the exception of the first 250m of the B743, neither the B743 nor Lambhill Road has any pedestrian facilities and is subject to extremely limited pedestrian movements due to the rural nature of the route. With the mitigation measures in place through implementation of the CMP including managing the speed of construction vehicles along this section of the route the pedestrian amenity impact is likely to be Minor.

### *Accidents and Safety*

- 13.90 Accident data was analysed along the B743/Lambhill Road section of the route with only two accidents recorded over the last four years.
- 13.91 There is limited potential for any impact in relation to accidents and safety in relation to the transport of turbine components as abnormal loads will be fully escorted at all times. The accidents and safety impact is therefore estimated to be negligible at the

receptors along the route. The safety of construction traffic movements will be carefully managed through the CMP and TMP with improved passing opportunities introduced along the single track sections of the route. With the mitigation measures in place the accidents and safety impact is likely to be negligible.

*Dust and Dirt*

- 13.92 There are no specific guidelines to determine magnitude of impact of dust and dirt although its impact is likely to be limited to the immediate vicinity of the site access junctions. With mitigation proposed through the CMP to ensure the covering of vehicles and provision of a wheel wash facility, the dust and dirt impact is likely to be negligible.

**Table 13.14 Summary of Residual Construction Traffic Impacts**

Likely Significant Effects	Mitigation Proposed	Means of Implementation	Outcome/Residual Effects
Severance/Fear & Intimidation	<p>Measures such as numbering of all construction vehicles would be instigated and strict adherence to speed limits would be required by all vehicles. Drivers would be fully briefed to ensure that they are aware of pedestrian crossings along the route.</p> <p>Abnormal load movements would be fully escorted and movements would be controlled using a detailed TMP.</p>	TMP	No significant residual effects anticipated
Driver Delay	<p>Details of abnormal load movement times would be communicated to local residents along with signage along the route to allow other users to avoid the route during planned movements thus minimising the impact of driver delay.</p> <p>A community liaison group would also be set up to facilitate communication with the local community.</p>	TMP	No significant residual effects anticipated
Pedestrian Delay	None proposed due to limited impact	N/A	No residual effects anticipated
Pedestrian Amenity	Drivers will be required to pass through sensitive areas at low speed and vehicles will be fitted with identification numbers.	TMP	No significant residual effects anticipated
Accidents and Safety	Abnormal loads would be fully escorted at all times.	TMP	No significant residual effects anticipated
Dust and Dirt	A wheel wash facility would be provided onsite and all lorries carrying bulk materials would be sheeted in order to prevent dust and dirt.	TMP	No significant residual effects anticipated

## STATEMENT OF SIGNIFICANCE

13.93 This chapter has assessed the likely significance of effects of the traffic associated with the Development during the construction phase. Based on existing traffic data, the estimated volume of construction traffic, the methodology outlined, the implementation of mitigation measures such as an appropriate TMP and suitable liaison with the relevant authorities, an assessment of the residual effect has been made. The residual traffic and transport effects are temporary and have been assessed as having a minor effect which is not significant in terms of the EIA Regulations.

## REFERENCES

Institute of Environmental Management and Assessment – Guidelines for the Environmental Assessment of Road Traffic, 1993;

Design manual for Roads and Bridges (DMRB) Volume 11 Environmental Appraisal.

Department for Transport – National Road Traffic Forecast, 1997;

Department for Transport – Design Manual for Roads and Bridges – ‘Assessment and Magnitude of Environmental Effects’, 2008;

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South Lanarkshire Local Plan, 2009;

South Lanarkshire Council Local Transport Strategy, 2013.