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Chapter 12

Traffic and Transport

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Glossary

Term	Definition
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together by the developer, in a systematic way, a description of the development and information relating to the likely significant environmental effects arising from a Proposed Development
Environmental Impact Assessment Report	A document reporting the findings of the EIA and produced in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 Regulation 5
The Applicant	Fred Olsen Renewables (Ltd)
The Proposed Development	The proposed Scawd Law Wind Farm development
The Proposed Development Area	The development area within the red line site boundary (application area) as shown in Volume 3a Figure 1.2: Site Layout

List of Abbreviations

Abbreviation	Description
AADT	Average Annual Daily Traffic
ALAA	Abnormal Load Access Assessment
AILs	Abnormal Indivisible Loads
DAS	Design and Advisory Services
DfT	Department for Transport
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
HGV	Heavy Goods Vehicle
IEA/IEMA	Institute of Environmental Assessment (now Institute of Environmental Management and Assessment)
LGV	Light Goods Vehicles
NPF	National Planning Framework
SPP	Scottish Planning Policy
SR	Scoping Response
SBC	Scottish Borders Council
TMP	Traffic Management Plan

12.1 STATEMENT OF COMPETENCE

12.1.1 Natural Power's Design and Advisory Services (DAS) team have over 20 years experience in undertaking access assessments, traffic impact assessment, transport studies and traffic management plans for the renewable industry. As well as undertaking these assessments, the DAS team regularly undertake due diligence reviews of 3rd party access studies for project financial closure. The team works closely with developers, turbine suppliers and haulage contractors to keep abreast of the latest developments in turbine component transport.

12.1.2 The DAS team is involved in all stages of wind farm developments from conception, through planning, planning condition discharge, construction and asset management/maintenance. This range provides the team with detailed experience of the various stages and how the traffic related issues follow and influence these stages. This experience is particularly valuable in ensuring that a comprehensive consideration of the traffic and transport impacts of the Proposed Development is provided in this chapter of the Environmental Impact Assessment Report (EIAR).

12.2 INTRODUCTION

12.2.1 This section of the EIAR assesses the effects due to the traffic and transport impacts for the construction of the Proposed Development.

12.2.2 Construction traffic required to construct the wind farm falls into three broad categories; namely Abnormal Indivisible Loads (AILs), Heavy Goods Vehicles (HGVs) and Light Goods Vehicles (LGVs). Each of these is considered below.

12.2.3 The construction of the Proposed Development is expected to last approximately 15 months, from site mobilisation through to installation and commissioning of the turbines, ending with site re-instatement and demobilisation.

12.2.4 The following Figures and Appendices accompany this EIAR chapter:

Appendices:

Appendix 12.1: AIL Route Assessment Report;

Appendix 12.2: Preliminary Traffic Management Plan (TMP);

Figures:

Figure 12.1: Construction Traffic Routing and Traffic Count Locations;

Figure 12.2: Proposed AIL Delivery Route; and

Figure 12.3a-z: AIL Delivery Route, Swept Path Analysis, Pinch Point 01 - 27

12.2.5 The traffic and transport assessment has assessed the traffic impacts associated with the Proposed Development. Material quantities have been determined from the site design and specification as discussed in Chapter 3, augmented with Natural Power's experience of wind farm construction.

12.2.6 In addition, the traffic impacts associated with the abnormal load deliveries were also assessed. An Abnormal Load Access Assessment (ALAA), including swept path analysis at particular pinch points was also prepared. This demonstrates that the proposed AIL route is viable.

12.2.7 The assessment concludes that, with the incorporation of suitable mitigation measures secured through a construction TMP, there will be no significant traffic effects associated with the Proposed Development.

12.2.8 A preliminary TMP has been prepared. The assessment has been based on a number of conservative assumptions that can only be clarified post consent and once a civil contractor is engaged. Hence it is expected a Planning Condition will be applied to the development for a final construction TMP to be prepared and approved by Scottish Borders Council (SBC) post consent and prior to construction works commencing.

12.3 LEGISLATION, POLICY AND GUIDANCE

12.3.1 This section outlines the legislation, policy and guidance that has been taken into account in considering the transport and traffic issues identified and described in this chapter. Detailed consideration of the legislation, energy policy and national and local planning policy is provided in Chapter 2:

- Scotland's Third National Planning Framework (2014), The Scottish Government;
- Scottish Planning Policy (SPP) (2014), The Scottish Government;
- Planning Advice Note (PAN) 75: Transport and Planning (2005), The Scottish Government;
- Onshore Wind Turbines; Online Renewables Planning Advice, The Scottish Government;
- Transport Assessment Guidance (2012), Transport Scotland;
- Guidelines for the Environmental Assessment of Road Traffic (1993), Institute of Environmental Assessment (IEA), now the Institute of Environmental Management and Assessment (IEMA);
- Scottish Borders Local Development Plans (2016 and proposed 2020); and
- SBC Supplementary Guidance, Renewable Energy (2018).

Scotland's Third National Planning Framework

12.3.2 The Scottish National Planning Framework 3 (NPF3) sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole. It sets out the Government's development priorities over the next 20 to 30 years and identifies national developments which support the development strategy. Scotland's NPF 3 was laid in the Scottish Parliament on 23 June 2014.

Scottish Planning Policy

12.3.3 With regard to traffic and transport matters, SPP 2014 notes:

12.3.4 Paragraph 169: *'Proposals for energy infrastructure developments should always take account of spatial frameworks for wind farms and heat maps where these are relevant. Considerations will vary relative to the scale of the proposal and area characteristics but are likely to include (amongst other elements):*

- *impacts on road traffic;*
- *impacts on adjacent trunk roads;*
- *cumulative impacts – planning authorities should be clear about likely cumulative impacts arising from all of the considerations below, recognising that in some areas the cumulative impact of existing and consented energy development may limit the capacity for further development.'*

12.3.5 Paragraph 286: '*Where a new development or a change of use is likely to generate a significant increase in the number of trips, a transport assessment should be carried out. This should identify any potential cumulative effects which need to be addressed.'*

12.3.6 Paragraph 290: *'Development proposals that have the potential to affect the performance or safety of the strategic transport network need to be fully assessed to determine their impact. Where existing infrastructure has the capacity to accommodate a development without adverse impacts on safety or unacceptable impacts on operational performance, further investment in the network is not likely to be required. Where such investment is required, the cost of the mitigation measures required to ensure the continued safe and effective operation of the network will have to be met by the developer.'*

12.3.7 Paragraph 291: *"Consideration should be given to appropriate planning restrictions on construction and operation related transport modes when granting planning permission, especially where bulk material movements are expected, for example freight from extraction operations.'*

Draft NPF 4 Scotland 2045

12.3.8 The Scottish Government published the draft National Planning Framework on the 10th November 2021 and laid it before Parliament at the same time to allow the consultation process and the Parliamentary process to run together.

12.3.9 The draft NPF4 will supersede NPF3 and SPP and Part 3 – National Planning Policy will become part of the statutory development plan.

12.3.10 The planning policy overview provided above is therefore subject to the adoption of the final NPF4 which is expected in early 2023, and the applicant proposes to update the policy position and submit an updated Planning Statement to do so at the appropriate time as part of this application.

PAN 75

12.3.11 Paragraph 41 of PAN 75 notes that:

'All planning applications that involve the generation of person trips should provide information which covers the transport implications of the development. The level of detail will be proportionate to the complexity and scale of impact of the proposal. This will provide an indication of whether a transport assessment should be carried out. As a change of use could result in different travel characteristics a transport assessment should be requested where the change is likely to result in a material change in trips. For smaller developments the information on transport implications will enable local authorities to monitor potential cumulative impact and for larger developments it will form part of a scoping exercise for a full transport assessment. Development applications will therefore be assessed by relevant parties at levels of detail corresponding to their potential impact.'

Onshore Wind Turbines; Online Renewables Planning Advice

12.3.12 The Scottish Government introduced online renewables planning advice in February 2011. This has been updated sine then with the most recent specific advice note regarding onshore wind turbines published in May 2014. The advice note identifies the typical planning considerations in determining applications for onshore wind turbines including landscape impact, impacts on wildlife and ecology, shadow flicker, noise, ice throw, aviation, road traffic impacts, cumulative impacts and decommissioning.

12.3.13 Regarding road traffic impacts, the guidance notes that in siting wind turbines close to major roads, pre-application discussions are advisable. This is particularly important for the movement of large components (abnormal load routing) during the construction period, periodic maintenance and for decommissioning.

Transport Assessment Guidance

12.3.14 The Transport Assessment Guidance has been prepared to assist in the preparation of Transport Assessments for development proposals in Scotland. The planning and transport policy context is set out in SPP which provides an outline of the framework for delivering integration of transport and land use planning, including the requirement for a Transport Assessment, for developments involving significant travel generating uses.

12.3.15 The Transport Assessment Guidance sets out requirements according to the scale of development being proposed. The guidance notes that a Transport Assessment will assist planning authorities to appraise the operational implications of a development and that the environmental impacts of a development proposal are generally outside the remit of the Transport Assessment process.

Guidelines for the Environmental Assessment of Road Traffic (IEMA Guidance)

12.3.16 The IEMA Guidance is for the assessment of the environmental impact of road traffic associated with major new developments. Their purpose is to provide the basis for systematic, consistent and comprehensive coverage for the appraisal of traffic impacts for development projects.

12.3.17 The document includes guidance on how the sensitivity of receptors should be assessed, contains rules to help determine which links in the study area should be considered for detailed assessment and identifies the key impacts that are most important when assessing the magnitude of traffic effects from an individual development.

12.3.18 The IEMA Guidance has been followed in this chapter and provides the basis of the methodology adopted in this assessment.

Scottish Borders Local Development Plans

12.3.19 The current Local Development Plan is dated 2016. The proposed Local Development Plan (2020) is not yet adopted. In terms of traffic and access implications for the Proposed Development, the aims identified in the 2016 Plan generally remain in place for the Proposed Development plan.

Scottish Borders Council Supplementary Guidance, Renewable Energy

12.3.20 Chapter 8, Development Management Considerations, Road and Traffic Implications, notes "During construction, wind energy developments have the potential to generate significant levels of traffic, including abnormal loads associated with transporting the turbine components. The Council expects all proposals to fully consider potential impacts of the development on the Scottish Borders road network in terms of the structural and physical ability of both roads and bridges to accommodate the additional traffic generated and the need to minimise any disturbance to local communities. Should turbine transportation routes require to cross third party land, the applicant should ensure that appropriate agreements are in place to allow access to be achieved. Early contact should be made with the Council's roads planning section in terms of the scope and extent of a Transport Assessment and Construction TMP which would be required to address issues such as routeing, timing of deliveries, community liaison and road infrastructure improvements."

12.4 TRAFFIC AND TRANSPORT METHODOLOGY

12.4.1 The methodology employed in this assessment has been developed from guidance given in the "Guidelines for the Environmental Assessment of Road Traffic" (IEMA 1993). To assess the effects of the additional traffic generated by the Proposed Development, the sequence of steps detailed below has been followed.

- Establishment of baseline traffic conditions;
- Estimate the traffic numbers and routing for the Proposed Development;
- Determine the magnitude of effect to the baseline traffic conditions due to the Proposed Development;
- Undertake a screening test to delimit the scale and extent of the assessment;
- Identify and assess the sensitivity of receptors;
- Synthesise the sensitivity of the receptor with the magnitude of effect to determine the significance of effect; and
- If the significance is elevated, review opportunities to mitigate the effects and re-assess the significance of effect after mitigation.

12.4.2 The maximum turbine dimensions are used as stated in Table 4.4, Chapter 4: Project Description.

Magnitude of Effect

12.4.3 The magnitude of traffic effects is a function of the existing traffic volumes, the percentage increase due to the proposal, the changes in type and the temporal distribution of traffic. The IEMA Guidelines identify magnitude thresholds based on percentage changes in traffic levels as being applicable to severance and intimidation effects. The magnitude of effects arising from the increase in traffic volumes (taken as being either the traffic flow including all vehicles or the HGV traffic flow, whichever is higher) is categorised in Table 12.1.

Table 12.1: Definitions of magnitude of effect criteria

Magnitude	Criteria	Percentage Increase
High	Total loss or major alteration to key elements/features of the baseline conditions	**>90%**
Medium	Partial loss or alteration to one or more key elements/features or the baseline conditions	**> 60-90%**
Low	Minor shift away from baseline conditions	**30-60%**
Negligible	Very slight change from baseline conditions	**<30%**

12.4.4 The determination of the magnitude of the effects was undertaken by reviewing the proposals for the Development, establishing the parameters of the additional road traffic that may cause an effect, and quantifying these effects.

12.4.5 The assessment has considered both the change in magnitude of the effects as well as their absolute levels.

12.4.6 Consideration was given to the composition of the traffic on the road network under both baseline and predicted conditions. For example LGVs generally have less effect on traffic and the road system than HGVs. Within the assessment the estimated numbers of LGV's, HGV's and abnormal load vehicles associated with the Proposed Development have been calculated and the resultant percentage increase in these vehicles compared to baseline conditions established to determine the increase in traffic.

Screening Test

12.4.7 The IEMA Guidelines suggest two general rules are used for establishing the increase in traffic levels that are likely to affect the environmental conditions of the road, and that therefore warrant consideration, namely:

- **Rule 1** - Include highway links where traffic flows would increase by more than 30% (or the number of HGVs would increase by more than 30%).
- **Rule 2** - Include any other specifically sensitive areas where traffic flows would increase by 10% or more (IEA Guidelines Paragraph 3.20 defines sensitive areas as including *"accident blackspots, conservation areas, hospitals, links with pedestrian flows etc.").* Paragraph 3.20 also notes that *"normally it would not be appropriate to consider links where traffic flows have changed by less than 10% unless there is a significant change in the composition of traffic, eg. a large increase in the number of heavy goods vehicles".*

12.4.8 Where the predicted increase in traffic flow is lower than these thresholds, the IEMA Guidelines suggest that the significance of the effects can be stated to be low or insignificant, and further detailed assessments are not warranted. Further guidance is given with regard to certain aspects of traffic effects. These indicate that projected changes in traffic of less than 10% create no discernible environmental effect. The matrix shown in Table 12.2 below has been used for traffic assessment.

Table 12.2: Screening criteria

Rule 1 Exceeded	Rule 2 Exceeded	Further assessment required
Yes	Yes	**Yes**
Yes	No	**Yes**
No	Yes	**Yes**
No	No	**No**

Assessment of Sensitivity

12.4.9 When judging upon the sensitivity of the road to the proposed temporary increase in traffic movements associated with the Proposed Development, a variety of considerations were taken in account including classification of the road, proximity of schools, housing and local amenities and existing traffic management (e.g. roundabouts, passing places etc.).

12.4.10 The sensitivity of the roads on the routes which will be used to access the Proposed Development have been assessed in accordance with the IEMA Guidelines. For the purpose of this assessment, a scale of 'low', 'medium' and 'high' has been used to denote levels of sensitivity (see Table 12.3).

12.4.11 The assessment has considered three categories of receptors, which consist of;

- Public road network and road users;
- Local settlements along the proposed access route(s); and
- Road structure.

12.4.12 The effects on the proposed route and surrounding communities have been assessed with regards to severance, driver and pedestrian delay, safety, pedestrian amenity and fear and intimidation. The effects of factors such as noise and ecological impact are assessed in Chapter 11 and 7 respectively of this EIAR.

Road Network and Road Users

12.4.13 In this Chapter, the sensitivity of the road networks and its users has been determined with respect to its capacity to absorb an increase in traffic. A road with a high capacity to absorb an increase in traffic will have a lower sensitivity to change than a road with little or no capacity to absorb an increase in traffic.

Local Settlements

12.4.14 The effects on the surrounding environment are focussed on the effects on the adjacent settlements in terms of severance, pedestrian delay, pedestrian and cyclist amenity, intimidation and safety.

Severance

12.4.15 Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery and is used to describe the factors that separate people from other people and places. For example, severance may result from the difficulty of crossing a heavily trafficked road.

Pedestrian Delay

12.4.16 Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads and therefore, increases in traffic levels can lead to increases to pedestrian delay. Pedestrian delay will also depend on factors such as level of pedestrian activity, visibility and presence of pedestrian crossing points. For example a settlement with several designated pedestrian crossing points will be less sensitive to increased traffic volumes than a settlement with few or no designated pedestrian crossing points.

Pedestrian and Cyclist Amenity

12.4.17 Pedestrian and cyclist amenity can be broadly defined as the perceived pleasantness of a journey and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic. For example a settlement with wide pavements and segregated cycle lanes will be less sensitive to increased traffic volumes than a settlement with narrow pavements.

Pedestrian Intimidation

12.4.18 Intimidation experienced by pedestrians is dependent on the volume of traffic, its composition, its proximity to people and the perceived lack of protection caused by such factors as pavement widths, traffic speed and vehicle size. For example, a settlement with narrow pavements and no pedestrian guardrails will be more sensitive to increased traffic volumes than a settlement with wide pavements that are lined with pedestrian guardrails.

Safety

12.4.19 Safety is affected by such matters as traffic speed, traffic volumes and complexities in the road structure. For example, a straight road is easier to navigate than a road with several junctions and bends, which can lead to increased safety risk. Similarly, the presence of islands can create locations where pedestrians cross the road rather than using the designated crossing points.

Road Structure

12.4.20 The sensitivity of the road structure has been assessed based on its importance and a visual assessment of its condition. For example, a national route or motorway in good condition will be less sensitive to an increase in traffic flow than a regional route with some physical defects.

12.4.21 Table 12.3 below summarises the sensitivity criteria adopted for the different receptors.

Table 12.3: Receptor Grouping and Sensitivity Criteria

Receptor	Low	Medium	High
Public Road Network and Users	Major or strategic road networks with no junctions, such as motorways, or a road network with suitable capacity to absorb an increase in traffic.	Road networks with some capacity to absorb an increase in traffic.	Road network with little or no capacity to absorb an increase in traffic.
Local Settlements	Local settlements and properties which are set back from the route and/or are located on a single side of the route. No requirement for direct pedestrian access to the road. Good pedestrian facilities (i.e. wide footpaths, barrier provisions, formal crossing facilities).	Local settlements and properties which are near the route and/or potentially on both sides of the route. Limited requirements to cross the road. Adequate pedestrian provisions (i.e. footpaths are available where needed, albeit may be narrow, crossing facilities, some level of barrier provision).	Local settlements and properties directly fronting the route and/or are located on both sides of the route. Facilities and services result in requirement to cross the road. Poor pedestrian provisions (i.e. limited or no footpaths, footpaths narrow, no crossing facilities, no barrier provision). Near to sensitive locations such as hospitals, retirement homes, schools, places of worship, public open spaces and tourist attractions.
Road Structure	Major highways or roads with no obvious physical defects.	Regional highways or roads with some minor physical defects.	Local roads with some physical defects or local roads, infrequently maintained with reoccurring physical defects.

Embedded Mitigation

12.4.22 Embedded mitigation is considered to be measures that have been incorporated into the design of the development. In terms of Traffic and Transport, embedded mitigation is primarily delivered through a TMP. As part of the Traffic and Transport assessment chapter a preliminary TMP has been prepared (Appendix 12.2) and it is expected a Planning Condition will be applied to the development for a final construction TMP to be prepared and approved by SBC post consent and prior to construction works commencing.

12.4.23 To understand the specific traffic effects to be managed in the TMP, this Traffic and Transport chapter assesses the traffic impacts without the TMP mitigation measures in place to establish the traffic effects. This is based on a number of conservative assumptions as set out below. Potential mitigation measures are then discussed and the traffic impacts re-assessed incorporating the mitigation measures to determine the residual traffic effects. The potential mitigation measures are then embedded into the preliminary TMP which will in turn be updated, finalised and approved as part of the Planning Condition for a construction TMP.

Assessment of Significance

12.4.24 The significance of any given effect is taken to be a synthesis of both the magnitude of the effect and the sensitivity of the receptor. Further details are given in Chapter 5: Approach to EIAR and are described in Table 12.4 below.

Table 12.4: Significance matrix

	SENSITIVITY		
MAGNITUDE	**High**	**Medium**	**Low**
High	Major	Major / Moderate	Moderate
Medium	Major / Moderate	Moderate	Low / Moderate
Low	Moderate	Low / Moderate	Low
Negligible	Low / Moderate	Low	Negligible / Low

Note: Only **Major** and **Major / Moderate** assessments of significance are considered significant in terms of the EIA Regulations.

Uncertainties and Assumptions

12.4.25 A range of uncertainties are present with any assessment of traffic effects. With respect to this EIAR, such uncertainties and assumptions are detailed below. These uncertainties are minimised by maintaining conservative assumptions and the provision of estimates based on recent wind farm construction experience.

Existing Traffic Flows

12.4.26 The assessment relies on the availability and accuracy of traffic flow data to establish baseline traffic conditions on the surrounding network. The available data for the major road arteries such as the A72 is reasonably extensive covering a sufficiently broad time frame. This ensures that the baseline traffic conditions derived for these roads are an accurate reflection of actual conditions.

12.4.27 Limited data was available for the minor roads including the B709. Therefore, it was necessary to undertake traffic surveys to establish the baseline traffic conditions. The data from these surveys was utilised to produce typical flow patterns on these roads and provides a reasonable basis for assessment.

Traffic Generation

12.4.28 The estimated traffic generated by the Proposed Development comprises: general construction loads such as bulk materials (HGVs); abnormal loads for turbine components (AILs); and LGVs. Estimates based on the design undertaken as part of the application and the experience of wind farm developments and construction of Natural Power and the Applicant have been used (with conservative assumptions) for each of these components, including:

- Concrete for turbine bases (assumptions have been made as to base sizes and concrete designs using the turbine specifications set out in Chapter 4);
- Geogrids and culverts for access track construction. Assumptions have been made as to the likely number of cross drains and culverts required, as well as watercourse crossings (from assessments in Chapter 9: Hydrology, Geology and Hydrogeology);
- Stone quantities for the construction of crane pads, hardstands, and tracks, based on the design prepared as part of the application and described in Chapter 4: Project Description;
- LGVs (construction worker traffic) for the construction period (it is not possible to exactly determine the likely size of the construction team); and
- The duration and sequencing of the construction period will affect the calculation of traffic intensities. If the actual programme is lengthened the traffic intensities would be lower than those assumed. Conversely, but unlikely, if the construction period were to be shortened the traffic intensities would increase.

Assessment of Traffic Effects

12.4.29 The methods for assessing the likely effects on traffic volumes, delays and trip times are subject to some uncertainty. These methods have been developed by roads authorities and research bodies over a number of decades and have been found to be reasonably representative. However, the actual capacity of a road segment or junction at any given time may differ from the calculated value due to a wide range of reasons.

12.5 CONSULTATION

12.5.1 Table 12.5 below summarises the consultation responses:

Table 12.5: Consultation table

Topic	Addressee	Comment	Addressed in EIAR
Traffic & Transport	Council Roads Planning Service (Scoping response)	I am content that the proposed scope of the Traffic & Transport section will cover the key elements of the proposal from a Roads Planning perspective.	Noted. Addressed in Chapter 12: Traffic & Transport.
Traffic & Transport	SBC	Content with the proposed assessment as detailed in the scoping report.	Noted. Chapter 12: Traffic and Transport contains a Traffic Impact Assessment which looks at the impact of the Proposed Development on the public road network. A preliminary TMP and an AIL Access Assessment is also provided within the chapter.

Scoping Opinion

12.5.2 SBC confirmed they were content with the proposed assessment as detailed in the Scoping Report, which included the following key elements:

- The impact of the Proposed Development on the public road network should be assessed through a Traffic Impact Assessment. A preliminary TMP should be provided to manage the construction phase traffic;
- The proposed the study area for construction traffic (not including AILs) should consider the A72 from Peebles to the Nest Roundabout as the road network beyond these areas disperses via several route options. At the time of the Scoping Report the site access was intended to be from the A72. However, as the site access is now from the B709, the B709 has been included in the assessment area;
- The operational and decommissioning impacts do not need to be considered as the traffic volumes will be significantly less; and
- This Traffic and Transport chapter will include the Traffic Impact Assessment, AIL Access Assessment and a preliminary TMP.

Internal advice for the Scottish Government was provided by Transport Scotland and this did not identify any particular issues to be considered.

Scottish Borders Council

12.5.3 A meeting/call was held with SBC Roads Planning Officer to discuss the Proposed Development and traffic implications. The key outcomes of this meeting/call were:

- It was not considered appropriate to route HGV vehicles along the B7007/B709, avoiding the A72 and Innerleithen as this would be difficult to enforce and impractical based on likely material sources;
- SBC would want to see a worst case scenario assuming all stone had to be imported to the site;
- Routing of traffic from likely material source to site via the most practical route should be considered;
- SBC are implementing the 20 mph speed limit trial and may hold traffic data from that. It was later confirmed there was no traffic data considered of relevance to the study area;
- It was considered beneficial to obtain traffic data for the B709 near the proposed site entrance given the lack of Department for Transport data in that area; and
- No specific sections of the B7007/B709 are known to have structural capacity issues although it was recognised more detailed assessments would need to be undertaken given the likely construction of this road.

12.5.4 SBC Roads Services were contacted in regard to the proposed abnormal route utilising the B7007/B709. They identified 12 bridge structures (including the masonry arch bridge south of the site entrance that would not be subject to abnormal loads) on the B709 and 3 on the B7007 section and confirmed that there were no weight restrictions on them. They noted a number of them were “fairly recent concrete box culverts”. Although no specific concerns were raised, it was highlighted that the structures would need to be assessed depending on the abnormal load weight and loading arrangement.

Midlothian Council

12.5.5 Midlothian Council Road Services were contacted in regard to the proposed abnormal route utilising routes through the council area. They confirmed there were no highway structures under their responsibility of concern for the abnormal loads.

12.6 BASELINE TRAFFIC CONDITIONS

Construction Traffic Routes

General Construction Traffic

12.6.1 With reference to Figure 12.1: Construction Traffic Routing and Traffic Count Locations, general construction traffic and material deliveries will travel to site via the B709, depending on their origin, either from:

- the north from the A7 via the B7007 and B709 following the later section of the AIL route; or
- the south from the A72 via its junction with the B709 within the village of Innerleithen. Traffic from the south via the A72 will be approaching Innerleithen from either the west (Peebles direction) or east (Galashiels direction).

Abnormal Indivisible Loads

12.6.2 An ALAA has been undertaken for the major component deliveries and is included in Appendix 12.1 in Volume 4 of the EIAR. With reference to Figure 12.2, the proposed route for the major component deliveries is as follows:

- From Grangemouth Port join the M9 motorway heading south;
- Follow M9 motorway south and join A720 Edinburgh City Bypass via the M8 motorway and Hermiston Gate interchange;
- Follow A720 Edinburgh City Bypass heading east to Old Craighall Roundabout, continue around the roundabout and head back along the A720 Edinburgh City Bypass heading west;
- Take the A68 turnoff at Millerhill and follow the A68 south to the junction with the B6458;
- Follow B6458, onto B6367 and onto the A7, heading north;
- Follow A7 north to its junction with the B7007;
- Follow the B7007, join the B709 near Garvald Lodge and continue south along the B709; and
- Turn left off the B709 near Colquhar at the new site entrance (333349, 640398) (Main Access).

Road Description

B709 From Innerleithen to Proposed Site Entrance - B709 (south)

12.6.3 The B709 from Innerleithen to the site entrance (circa 4km) runs in a northerly direction from its junction with the A72 in Innerleithen and is maintained by SBC. It is identified as an on-road cycle route not on the National Cycle Network. It would be used for HGV and LGV traffic. It is a single carriageway, two lane road within Innerleithen. As it leaves Innerleithen it reduces to a single carriageway, single lane road. The width of the single lane section varies although it is considered essentially a ‘narrow two lanes’ from Innerleithen north to the golf course (circa 3 km) where two vehicles could pass with care. From the golf course north to the proposed site entrance that will be formed as part of the development (circa 1km), it is considered a ‘single lane’ where vehicles would need to stop and run onto the verge to allow other vehicles to pass (Figure 4.11, Volume 3a).

12.6.4 The geometry of the junction from the A72 to the B709 sits off perpendicular for access from the west (Peebles direction). The turn onto the B709 from the east (Galashiels direction) is more acute.

12.6.5 Within Innerleithen there are footways varying from both sides of the road to one or the other side. On street parking is allowed on the B709 within Innerleithen, with evidence of certain sections being utilised, using up one of the lanes.

12.6.6 South of the golf course the B709 crosses the Leithen Water via a single stone arch bridge on around a 90 degree bend. The bridge narrows down to a single lane over the arch. The B709 runs through Innerleithen Golf Course with the course on either side of the road.

B7007/B709 From A7 to Proposed Site Entrance – B7007/B709 (north)

12.6.7 The B7007 runs for around 10km in a south/south-westerly direction from its junction with the A7 at Middleton Hall to its junction with the B709 near Garvald. It is identified as an on-road cycle route not on the National Cycle Network. It would be used for HGV, LGV and AILs traffic. It is a single carriageway, two lane road with its northern section maintained by Midlothian Council as it runs up to the Moorfoot Hills and its southern section maintained by SBC.

12.6.8 The B709 runs for around 11km in a southerly direction from the junction with the B7007 to the proposed site entrance. It is a single carriageway, two lane road to around 2km south of Dewar Burn at which point it reduces to a single lane road for the remaining circa 8km to the site entrance. The B709 is maintained by SBC.

A72

12.6.9 The A72 runs west to east through the Scottish Borders. It runs through Peebles to the west of the site, Innerleithen, Walkerburn and onto the Nest Roundabout near Caddonfoot to the east of the site. At the Nest Roundabout it heads north-east through Clovenfords and onto Galashiels. It would be used for HGV and LGV traffic. The A72 is single carriageway, two lane and a major road artery for the Borders, being under the maintenance of SBC.

12.6.10 Within Peebles the A72 crosses the Eddleston Water before forming the High Street and running east adjacent to the River Tweed towards Innerleithen. The section of the A72 from Peebles to Innerleithen is clear, straight and open and has benefited from upgrade works, most notably at Cardrona.

12.6.11 The A72 forms the High Street, running through the centre of Innerleithen. The B709, leading to the site entrance from the south, joins the A72 in Innerleithen centre to the west of Leithen Water. The A72 crosses Leithen Water via a bridge on a shallow ‘S’ bend. From Innerleithen the A72 runs easterly to Walkerburn cutting through the valley sides.

12.6.12 The A72 again forms the main throughfare for Walkerburn, crossing the Walker Burn (watercourse) via a shallow ‘S’ bend bridge before rising and cutting into the valley sides. The geometry of the A72 within Walkerburn is considered to be tight with narrow pavements and walls with significant drops in ground level to the south of the road.

12.6.13 From Walkerburn, the A72 runs east to the Nest Roundabout cutting into the valley as it follows the River Tweed. The section of the A72 from Innerleithen to the Nest Roundabout includes sections that are narrow with numerous corners and constrained verges, being poor compared to the Peebles to Innerleithen section.

12.6.14 Overall the condition of the A72 is considered to be good, being well maintained as would be expected given its strategic importance to the Scottish Borders and the Council.

A7

12.6.15 The A7 runs in a southerly direction from the A720 Edinburgh City Bypass at Sheriffhall Roundabout to Galashiels and is a major road artery through southern Scotland. South of Galashiels the A7 is a trunk road running to Carlisle. The AILs would use a 2 km section of the A7 between the B6367 and travelling north to the B7007 at Middleton Hall. HGVs and LGVs may use this route to approach the site area from further afield material sources. The AIL section of the A7 is single carriageway, two lane, and maintained by Midlothian Council.

12.6.16 Overall the condition of the A7 is considered to be good, being well maintained as would be expected given its strategic importance to the south of Scotland.

B6458 and B6367 Linking A68 to A7

12.6.17 The B6458 runs in a south west direction from the A68 near Fala to the B6367 at Tynehead, with the B6367 continuing in a south westerly direction to the A7 near Middleton Hall. The B6458 and B6367 are single carriageway, two lane roads, being under the maintenance of Midlothian Council. It would be used for AIL traffic. The geometry of the road is predominantly straight and open. There are a few tighter bends, including the rail bridge and corner at Tynehead. Overall the condition of the B6458 and B6367 is considered to be good, being well maintained.

M9, A720 and A68

12.6.18 The M9 runs in a south east direction from where AILs would join at Grangemouth to the intersection with the M8 and along a short section to join the A720 Edinburgh City Bypass at Hermiston Gate. The A720 Edinburgh City Bypass runs around the southern extents of Edinburgh and is dual carriageway, two lane. The A68 runs from the A720 at Millerhill Junction in a south eastern direction and is generally a single carriageway, two lane with some sections being three lane. These roads would be used for AIL traffic. They are all trunk roads in good condition being maintained by BEAR (South East) on behalf of Transport Scotland and are considered to have good geometry.

Geographical Scope of Assessment

12.6.19 As discussed in Section 12.7 the distribution of general construction traffic from potential material sources to the site was considered with the A72, B7007 and B709 identified as the primary routes to site. Beyond these routes the general construction traffic would be more dispersed.

12.6.20 The number of AIL deliveries are likely to be limited to one delivery or convoy per day and will not contribute significant vehicle movements. Hence, it is not considered appropriate to assess the percentage increase on baseline traffic numbers that these would cause beyond the primary routes used by the AILs (i.e. B7007 and B709).

12.6.21 The ALAA identified a number of pinch points from the Port of Entry to the site entrance. The proposed modifications works to enable AILs to navigate these pinch points range from oversail over the pavement edge, temporary removal of street furniture, vegetation trimming and clearance to forming temporary overrun areas. The works are considered localised, short term and minor in nature and do not involve significant modifications to the highway network. The type of work being proposed could predominantly be undertaken outwith the highway with, appropriate traffic management. Some modification works will also be required along the B7007 and B709 to facilitate AIL deliveries including along the single lane section of the B709.

12.6.22 Therefore, the geographical scope of the assessment includes the traffic impacts associated with:

- general construction traffic on the A72, B7007 and B709;
- construction of the AIL modification works along the B7007 and B709; and
- the AIL deliveries over the whole AIL route from Port of Entry to the site entrance.

Baseline Traffic Data

12.6.23 Data for the baseline traffic counts on the B709 minor road was taken from a manual traffic count survey conducted by Traffic Data Collection over a 2 week period between 17th April 2021 and 30th April 2021. Two-way Average Daily Traffic Flows for 12 hours (0700 – 1900) during this period were converted to Average Annual Daily Traffic (AADT) Flows.

12.6.24 Data for traffic baseline for the A72 road was taken from the Department for Transport (DfT) website. Two count locations were adopted:

- DfT Count ID 91226 on the A72 west of Innerleithen (2019 data adopted),
- Dft Count ID 10835 on the A72 east of Innerleithen (2019 data adopted).

12.6.25 The most up to date data for the two DfT traffic counters is 2019. This was adopted for the baseline traffic data with no adjustment (growth) figures applied to bring it to the intended construction year. Consideration was given to adjusting the data by applying standard growth factors. However, for the following reasons it was considered more appropriate to maintain the 2019 figures:

- Applying the standard growth factors would result in an increased ADDT figure for the roads. Therefore, any increase in traffic due to the Proposed Development would be measured against this increased AADT figure, resulting in lower percentage increases than presented in this assessment. Therefore, maintaining the latest AADT figures will present a conservative assessment.
- Current transport planning policies are generally all aimed at reducing traffic flows and adopting more sustainable transport methods. It is hoped in future the impact of these policies will result in a reduction in traffic flows. As such it is considered contradictory to forecast increasing traffic flows in the future in which to set as a baseline for the assessment.
- The impact of COVID 19 on traffic flows is unknown at this stage. The temporary change in working patterns during the COVID pandemic (i.e. increased working from home) may become a more permanent state with the potential to reduce traffic flows.

12.6.26 The manual count data was undertaken in 2021 and has been adopted in the assessment. The data was undertaken during COVID, although outside of lockdown restrictions in a period where it is considered traffic flows were approaching more normal levels. As such, the influence of the pandemic on this data is unknown. Therefore, it was not considered appropriate to adjust the traffic data to a 2019 equivalent.

12.6.27 Baseline AADT flows are shown in Table 12.6 below while the traffic count locations considered are shown in Figure 12.1: Construction Traffic Routing and Traffic Count Locations.

Table 12.6: Baseline Traffic Data

COUNT ID	LOCATION	AADT (Total Traffic)	AADT (HGV Traffic)
Manual	B709 at Site Entrance	398	70
91226	A72 West of Innerleithen	8393	250
10835	A72 East of Innerleithen	4849	206

12.7 INITIAL SCREENING ASSESSMENT

Quantification of Development Activities

12.7.1 This section follows the programme of construction elements which has been included in Chapter 4: Project Description (Table 4.3).

12.7.2 Vehicles and equipment would be delivered to site at the commencement of the relevant construction phase and would remain on site until work relating to that stage was completed. Such equipment would include excavators, dump trucks and bulldozers for access track and crane pad earthworks, drainage, turbine foundations and cable installation, cranes for erecting the turbines. An indicative list of the equipment needed is given in Chapter 4: Project Description.

12.7.3 Most vehicles used during the construction activities would be below the width requirement for wide loads, with the exception of the turbine deliveries (nacelle, tower sections and blades). Road axle weights would not exceed regulated levels unless agreed with the relevant authorities.

12.7.4 Each vehicle travelling to the site will generate two "vehicle movements"; one movement to the proposed wind farm and one movement away from the wind farm (i.e. 1 delivery to the wind farm = 2 vehicle movements).

12.7.5 The assessment is based on the Proposed Development and construction programme as set out in the Project Description Chapter 4. The application includes for an on-site borrow pit that would be utilised to source stone for the construction of the earthworks (site tracks, hardstands and crane-pads) and the coarse aggregate for the concrete. To provide a robust and conservative assessment, an allowance has been included for the finished running surface of the tracks, crane pads and substation compound to be constructed from a higher specification imported stone (e.g. Type 1). Similarly, the proposals include for an on-site concrete batching plant given the size of the anticipated turbine foundations (800 m^3 of concrete) as it is anticipated the concrete would be mixed on site to reduce the risks associated with the volumes and supply for these critical structural elements.

12.7.6 **Abnormal Load Deliveries** The number of the abnormal load delivery vehicles has been included within the assessment of general construction traffic to ensure a robust assessment including all vehicles. It is however important to consider the effect of these particular vehicles in isolation, as the effects are quite different to those attributed to general construction traffic, hence their effects on driver delay have also been assessed separately.

12.7.7 Indicative HGV traffic loads for the various phases of the construction operations are as follows:

- **Mobilisation to Site**: Mobilisation to site would involve the transport of plant for the construction works (including dump trucks, dozers/graders, excavators, forklifts), temporary office facilities, welfare units and storage containers, and general construction equipment such as fencing for site compounds and fuel bowsers. Under this scenario, rock crusher/processing plant would also be transported to site to crush and grade material from the borrow pit suitable for use in the construction works. It is estimated up to 56 HGV deliveries (112 movements) would be required for site mobilisation.
- **Offsite AIL Enabling Works**: Based on the ALAA, it is anticipated there will be works required at certain pinch points along the B7007/B709 (north) to facilitate AIL deliveries. Additionally, it is anticipated there will be works required to the single lane section of the B709 between Dewar and the site entrance (c. 8 km). These works are described in the ALAA and will be subject to pre-commencement surveys and final approval by SBC as Roads Authority . An allowance of 264 HGV deliveries (528 movements) has been included for this element.
- **Site Tracks, Crane Pads and Compounds (Earthworks)**: The majority of the stone for the site tracks, crane pads and compounds (temporary construction and substation) would come from the on-site borrow pit and would be transported around site using dump trucks. To provide a conservative approach, it has been assumed the finished running surface of the tracks, crane-pads and substation compound would be topped with a higher quality imported material (i.e. Type 1). For 6.8km of access track, 8 crane-pads and the substation compound it is estimated around 30,500 tonnes of imported stone would be required. Adopting a typical 8 wheeler HGV with 20 tonne carrying capacity, results in around 1,522 HGV deliveries (3,044 movements).
- **Geogrid and Culverts**: An allowance has been included for laying geogrids along the access tracks and crane-pads. Geogrid rolls are generally 4 m wide and therefore it is assumed two geogrids would be required per length of track to provide sufficient width coverage. For 6.8 km of track and 8 crane-pads it is estimated 301 rolls of geogrid at 75 m per roll would be required. It is estimated a total of 18 deliveries would be required (36 movements). Similarly, an allowance has been included for culverts for drainage and pipe crossings at a rate of 1 culvert for every 100 m of track plus an additional allowance for specific locations resulting in an estimate of 76 culverts. It is estimated a total of 2 deliveries would be required (4 movements).
- **Turbine Foundations**: Based upon the proposed tip heights of up to 180m and turbine specification described in Chapter 4. it is estimated a typical gravity foundation design would require up to 800 m^3 of concrete and 1350 tonnes of steel reinforcement. The on-site batching proposed as part of this application will provide the concrete for the foundations. Adopting 15 to 20 tonne carrying capacity, it is estimated 480 HGV deliveries of sand and cement, 72 HGV deliveries of steel reinforcement and 6 HGV deliveries to set up the batching plant would be required. This equates to 558 HGV deliveries (1,116 movements) for the turbine foundations.
- **Met Mast**: The met mast would consist of a concrete foundation (around 128 m^3) and lattice tower brought to site on around 3 HGV's. The timing of constructing the met mast foundation is very flexible and may not be undertaken during the turbine foundation pours when the batching plant is on site. Therefore, we have adopted a conservative approach and assumed the concrete for the met mast foundation would be delivered by ready mix lorries. Therefore, an allowance of 25 HGV deliveries (50 movements) has been included for this element.
- **Substation, including Battery Storage**: The substation would consist of a stoned hardstand area and building to house the wind farm electrical and grid connection equipment and basic office facilities for maintenance staff. Battery storage is also proposed on the substation site. As noted above (Site Tracks, Crane Pads and Compounds), it is assumed the stone for the substation compound would be obtained from the on-site borrow pit with no HGV movements required. Material, such as concrete blocks, roof trusses, roof cladding and windows/doors for the substation building as well as the electrical equipment would need to be brought to site. The proposed battery storage consists of six number containers (similar to shipping containers) and would be transported on a HGV. It is estimated 65 HGV deliveries (130 movements) would be required for the substation building, electrical equipment and battery storage.
- **Turbine Abnormal Loads:** For the size of turbines being considered for the site, the abnormal loads would consist of 3 blade deliveries, up to 4 tower section deliveries, 1 nacelle delivery and 1 hub delivery (9 abnormal load deliveries per turbine). The transport of abnormal loads is undertaken by specialist vehicles designed and manufactured for the purpose of wind turbine component delivery. These vehicles are designed such that following delivery, they can reduce to a standard HGV size. Hence, although they arrive to site as an abnormal load, they leave as a standard HGV. In this assessment, they are included in the HGV numbers although they are referred to as abnormal loads. Hence, there would be 72 abnormal load deliveries (144 movements) for transporting the turbine components to site.
- **Turbine Assembly**: Around 3 HGV deliveries for components that would be fitted within the turbines would be required for each turbine. The cranes (larger 800/1000 tonne and smaller 400/500 tonne crane) for assembling the wind turbines would be brought to site at the start of turbine assembly and remain on site until completion. It is estimated up to approximately 36 HGV deliveries (72 movements) would be required for mobilising and demobilising the cranes. This equates to 36 HGV deliveries (72 movements) at the start of turbine assembly works, 24 HGV deliveries (48 movements) throughout the turbine assembly period and 36 HGV deliveries (72 movements) following completion of turbine assembly.
- **Cable Installation**: Cable installation includes the Low Voltage electrical cables, Supervisory control and data acquisition (SCADA) signalling/control cables and sand associated with the cable bedding and surround in the cable trench. Depending on the ground conditions encountered, it is possible that the sand could be sourced from the site borrow pit. However, this is uncommon on wind farm construction sites and hence sand has been assumed to be imported. It is estimated 6 HGV deliveries would be required for the Low Voltage cables, 3 HGV deliveries for the SCADA cables and 185 HGV deliveries for the sand bedding and surround. This equates to a total of 195 HGV deliveries (390 movements) for the cable installation.
- **Transport of site personnel**: Approximately 20-40 car/van movements per day would be required for the construction personnel and any small deliveries.

12.7.8 Table 12.7 below summarises the HGV movements for the construction.

Table 12.7: Estimated HGV construction traffic volumes

Item	HGV Deliveries	HGV Movements	Notes
Mobilisation to Site	56	112	At start of construction. Demobilisation will occur partially following completion of earthworks, with the remainder following completion of the project.
Offsite AIL Enabling Works	264	528	Allowance included in the assessment.
Site Tracks, Crane Pads and Compounds	1,523	3,046	Import of running surface, rest of stone sourced from on-site borrow pits.

Item	HGV Deliveries	HGV Movements	Notes
Geogrids and Culverts	18	36	
Turbine Foundations	630	1,260	Scenario is based on concrete being batched on site.
Met Mast	25	50	
Substation, including Battery Storage	65	130	
Wind Turbine Abnormal Loads	72	144	These are included in the HGV numbers although referred to as abnormal loads.
Turbine Assembly	36, 24 & 36	72, 48 & 72	36/72 HGVs at start and end of turbine assembly for crane mob/de-mob. 24/48 HGVs throughout turbine assembly period.
Cable Installation	145	390	Sand imported.

12.7.9 The increase in traffic movements that would be generated by the Proposed Development have been assessed against the baseline traffic flow figures for the A72 (east and west), B7007/B709 (north) and B709 (south). The construction of the proposed wind farm is estimated to lead to around 6,000 HGV movements (including AILs) and 11,477 light personnel and LGV movements over the proposed 15 month period (see Table 12.7 below).

12.7.10 Month 7 is expected to generate the most Average Daily Movements (circa 78 combined HGV and LGV movements with circa 39 of those HGV movements and the remaining circa 39 LGV movements).

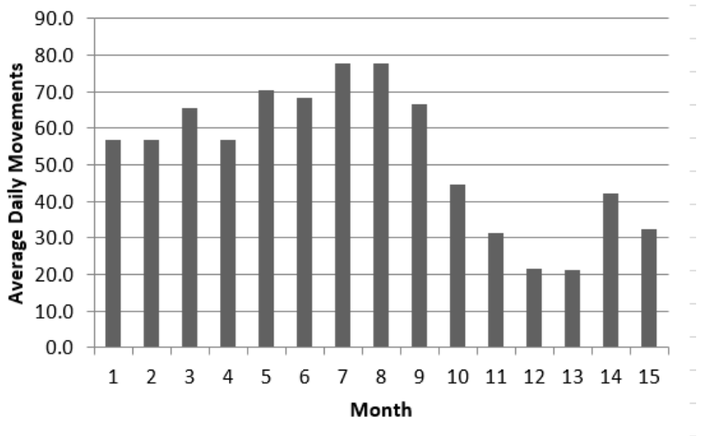

Image 12.1: Scenario 1 - Average daily vehicle movements over proposed 15 month construction period

Table 12.8: Scenario 1 - Predicted vehicle movements during the construction period

Activity	Month															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Heavy Goods Vehicles Movements (including abnormal loads)																
Mobilisation to site	112															112
Met Mast					50											50
Offsite AIL Enabling Works							176	176	176							528
Imported Running Surface	480	380	566	380	380	380	240	240								3046
Geogrids & Culverts	6	6	6	6	4	4	4									36
Turbine foundations (raw material - site mixed)					252	252	252	252	252							1260
Substation							44	44	42							130
Cabling							130	130	130							390
Turbine Abnormal Loads										28	30	30	28	28		144
Turbine Assembly										72	16	16	16	72		192
Demob / Site clearance										50					62	112
Monthly HGV Total Movements	**598**	**386**	**572**	**386**	**686**	**636**	**846**	**842**	**600**	**150**	**46**	**46**	**44**	**100**	**62**	**6000**
Light Vehicle Movements (car, minibuses and small van deliveries)																
General Construction Traffic	650	866	866	866	866	866	866	866	866	866	650	434	434	866	650	11477
Monthly total LGV Movements	**650**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**866**	**650**	**434**	**434**	**866**	**650**	**11477**
Monthly Total Vehicle Movements	1248	1252	1438	1252	1552	1502	1712	1708	1466	1016	696	480	478	996	712	17477
Average Daily Movements (assumes 5 working days per week)	56.7	56.9	65.4	56.9	70.5	68.3	77.8	77.6	66.6	46.2	31.6	21.8	21.7	43.9	32.3	
Average Daily HGV Movements (assumes 5 working days per week)	27.2	17.5	26.0	17.5	31.2	28.9	38.5	38.3	27.3	6.8	2.1	2.1	2.0	4.5	2.8	

Distribution of Construction Traffic

12.7.11 Consideration was given to the likely distribution of construction traffic from material/supply sources to the site, with the following material/supply sources adopted:

- **Plant and office/welfare facilities associated with the mobilisation**. These are likely to come from a variety of sources before joining the A72 either west (Peebles) or east (Nest Roundabout) and travel to site via the A72 and then north up the B709. Therefore, it has been assumed a 50% split east and west on the A72 and 100% on the B709.
- **Offsite AIL Enabling Works.** The offsite enabling works would be required to the B7007/B709 and as such 100% of the vehicle movements have been assigned to the B7007/B709.
- **Site Tracks, Crane Pads and Compounds**. The closest crushed rock quarries to the site are Edston Quarry to the west of Peebles on the A72 (circa 18 km to the site entrance) and Cowieslinn Quarry to the north of Eddleston on the A703 (circa 26 km to the site entrance). Other quarries are further afield and hence are considered less likely to be utilised due to the increased haulage costs. Use of both or either of these quarries would result in traffic joining the A72 at Peebles and travelling to site via the A72 and then north up the B709. Therefore, it has been assumed a 100% on the A72 (west) and 100% on the B709 (south).
- **Geogrid and Culverts**. These are likely to come from a variety of sources before joining the A72 either west (Peebles) or east (Nest Roundabout) and travel to site via the A72 and then north up the B709. Therefore, it has been assumed a 50% split east and west on the A72 and 100% on the B709.
- **Turbine Foundations**. The closest quarry to the site producing sand is Temple Quarry, near Middleton on the A7. As such it is anticipated sand from here is likely to travel to site via the B7007/B709. Lesser quantities of cement will be required, and it is likely these will come from the large scale suppliers located around the southern outskirts of Edinburgh or direct from Dunbar via Edinburgh. While there is the potential for these to come via the A68, A7 or A703, for the purposes of this assessment it has been assumed cement would also travel to site via the B7007/B709. Therefore, 100% of the HGV movements associated with the turbine foundations is assumed to travel along the B7007/B709 to site.
- **Met Mast**. As with turbine foundations, the majority of the HGV movements for the met mast are associated with the foundations. Therefore, it has been assumed 100% of the HGV movements associated with the met mast would be along the B7007/B709 to site.
- **Substation, including Battery Storage**. These could come from a variety of sources before joining the A72 either west (Peebles) or east (Nest Roundabout) and travel to site via the A72 and then north up the B709. Therefore, it has been assumed a 50% split east and west on the A72 and 100% on the B709.
- **Turbine Assembly**. It is assumed these loads would come to site using the B7007/B709 as this is part of the abnormal load route and would be fully verified from a geometry and loading perspective. The ongoing HGV deliveries for items to be fitted within the turbines would arrive along with the abnormal load components at the Port of Entry. Therefore, it has been assumed 100% of the turbine assembly vehicle movements would arrive on site via the B7007/B709.
- **Cable Installation**. As noted with turbine foundations, the closest quarry to the site producing sand is Temple Quarry, near Middleton on the A7. While the electrical and SCADA cables could arrive from a variety of sources (Edinburgh heading south or England heading north), these HGV numbers are low compared to the HGVs associated with the sand. Therefore, it has been assumed 100% of the cable installation vehicle movements would arrive on site via the B7007/B709.
- **LGVs and site personnel**. It is considered these could come from a variety of sources. The largest population centres are to the east (Galashiels, Selkirk) which also have greater number of trade and building supply companies. Therefore, for LGVs and site personnel, it has been assumed:
  - 60% would approach the site from the A72 east at Nest Roundabout and then north on the B709;
  - 30% would approach the site from the A72 west at Peebles and then north on the B709; and
  - 10% would approach the site from the B7007/B709 heading south.

Screening

12.7.12 Applying the distribution of traffic on the A72 (east and west), B7007/B709 (north) and the B709 (south) the resultant percentage increase in traffic versus the baseline is indicated in Table 12.9 below over the 15 month construction duration for the total vehicles and HGV vehicles.

Table 12.9 - Estimated percentage increases in traffic over construction period

Location	Construction Month														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	% Increase in Total Traffic														
A72 (west)	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.3	0.2
A72 (east)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.2
B7007/B709 (north)	0.7	1.0	1.0	1.0	4.4	3.9	7.4	7.4	7.4	2.1	1.3	1.0	1.0	2.1	0.7
B709 (south)	*13.5*	*13.3*	*15.4*	*13.3*	*13.3*	*13.3*	*12.2*	*12.1*	9.4	9.5	6.7	4.5	4.5	8.9	7.4
	% Increase in HGV Traffic														
A72 (west)	9.8	7.0	*10.3*	7.0	6.9	6.9	4.8	4.8	0.4	0.5	0.0	0.0	0.0	0.0	0.6
A72 (east)	1.3	0.1	0.1	0.1	0.0	0.0	0.5	0.5	0.5	0.6	0.0	0.0	0.0	0.0	0.7
B7007/B709 (north)	0.0	0.0	0.0	0.0	*19.6*	*16.4*	**36.2**	**36.2**	**36.2**	6.5	3.0	3.0	2.9	6.5	0.0
B709 (south)	**38.8**	*25.1*	**37.1**	*25.1*	**24.9**	**24.9**	*18.7*	*18.4*	2.7	3.2	0.0	0.0	0.0	0.0	4.0

12.7.13 Assessing against the criteria in Table 12.2, the B7007/B709 (north) and the B709 (south) have exceeded the Rule 1 threshold of 30% increase in HGV traffic. The A72 (west) has exceeded the Rule 2 threshold of 10% increase in HGV traffic. Accordingly, these three links have been taken forward for further assessment.

12.7.14 It should be noted for the B7007/B709 (north) that the increase in traffic numbers and corresponding percentages, exceeds the thresholds during months 5 to 9, with the largest increase being during months 7 to 9. The larger increases in months 7 to 9 is driven by the programmed construction of the AIL enabling works and the import of sand for the cabling works on top of the foundation concrete works.

12.7.15 Referring to Table 12.2, the magnitude of effect of the traffic flow increase on the A72 (east) is considered to be **Negligible** and no further assessment is required.

12.8 DETAILED ASSESSMENT OF EFFECTS

12.8.1 This section assesses the resulting environmental effects for receptors requiring detailed assessment in accordance with Rules 1 and 2 of the IEMA Guidelines, that is highway links where traffic flows would increase by more than 30% and/or specifically sensitive areas where traffic flows would increase by 10% or more.

12.8.2 As identified in Section 12.7.13 above the following highway links were identified meriting further detailed assessment:

- B709 (south);
- A72 (west); and
- B7007/B709 (north).

12.8.3 In addition, the impact of the abnormal loads has also been assessed in further detail.

Assessment of Receptor Sensitivity

12.8.4 A detailed assessment of the receptors on each of the highway links has been undertaken and their sensitivity assessed in accordance with the criteria outlined in Section 12.4. Table 12.10 below summarises the assessment of the sensitivity (L = Low, M = Medium, H = High) for the receptors identified on the applicable highway links.

Table 12.10 Receptor sensitivity assessment

Receptor Description	Effect	L	M	H	Rationale
Public Road Network and Users					
B7007/B709 (north) two lane	Increase in HGV movements		X		Local rural road in good condition with reasonably good geometry. Lightly trafficked with capacity to absorb more traffic. Identified as an on-road route not on the National Cycle Network. Short length of road will limit any vehicle delays.
	Vehicle delays due to increase in traffic	X			
	Safety		X		
B7007/B709 (north) single lane	Increase in HGV movements			X	Local road in reasonable condition but with evidence of dis-repair. 'Wide' single lane but has no formal passing places. Lightly trafficked and would have capacity to absorb more traffic but absence of passing places restricts this 'capacity'. Identified as an on-road route not on the National Cycle Network. Short length of road will limit any vehicle delays.
	Vehicle delays due to increase in traffic	X			
	Safety			X	
A72 (west)	Increase in HGV movements	X			Major road artery that is well maintained reasonably good geometry (west of Innerleithen). Traffic free cycle provision off of A72. Generally considered to have capacity to absorb more traffic.
	Vehicle delays due to increase in traffic	X			
	Safety		X		
B709 (south)	Increase in HGV movements			X	Local road in reasonable condition but with evidence of dis-repair. 'Wide' single lane but has no formal passing places. Lightly trafficked and would have capacity to absorb more traffic but absence of passing places restricts this 'capacity'. Short length of road will limit any vehicle delays. Identified as an on-road route not on the National Cycle Network
	Vehicle delays due to increase in traffic	X			
	Safety			X	
Local Settlements					
Peebles	Severance	X			
A72 (west)	Pedestrian Delay	X			Good pedestrian facilities including wide footpaths, central islands, bus stops and pedestrian crossing. However, A72 forms High Street with numerous shops and businesses fronting road and recognised as a tourist town.
	Pedestrian Amenity		X		
	Pedestrian Fear and Intimidation		X		
	Safety		X		
Innerleithen (A72/B709 south)	Severance		X		Reasonable pedestrian facilities including footpaths and pedestrian crossing. Pavement narrower than Peebles A72 forms High Street with some shops and businesses fronting road. B709 section has mixed footpaths on both or one side, with some sections of narrow footpath. On street parking and residential properties fronting road.
	Pedestrian Delay	X			
	Pedestrian Amenity		X		
	Pedestrian Fear and Intimidation			X	
	Safety			X	
Innerleithen Golf Course (B709 (south)	Severance			X	B709 runs through golf course with no physical separation between road and adjacent course (fairways) or formal crossing points.
	Pedestrian Delay	X			
	Pedestrian Amenity		X		
	Pedestrian Fear and Intimidation			X	
	Safety			X	
The Common (B709 south)	Severance	X			Property set back via access track from the B709. No requirement or facilities for pedestrian access to B709.
	Pedestrian Delay	X			
	Pedestrian Amenity		X		
	Pedestrian Fear and Intimidation		X		
	Safety		X		
Lee / The Ley (B709 south)	Severance	X			Properties set back via long access track from the B709. No requirement or facilities for pedestrian access to B709.
	Pedestrian Delay	X			
	Pedestrian Amenity	X			
	Pedestrian Fear and Intimidation	X			
	Safety	X			
Colquhar (B7007/B709 north)	Severance	X			Property fronting onto B709. No requirement or facilities for pedestrian access to B709.
	Pedestrian Delay	X			
	Pedestrian Amenity			X	
	Pedestrian Fear and Intimidation			X	
	Safety			X	
Leithen Lodge	Severance	X			
	Pedestrian Delay	X			

Receptor Description	Effect	L	M	H	Rationale
(B7007/B709 north)	Pedestrian Amenity	X			Property set back via long access track over Leithen/Glentress Water from the B709. No requirement or facilities for pedestrian access to B709.
	Pedestrian Fear and Intimidation	X			
	Safety	X			
Burnside / Whitehope (B7007/B709 north)	Severance	X			Properties set back via long access track over Glentress Water from the B709. No requirement or facilities for pedestrian access to B709.
	Pedestrian Delay	X			
	Pedestrian Amenity	X			
	Pedestrian Fear and Intimidation	X			
	Safety	X			
Glentress (B7007/B709 north)	Severance	X			Property fronting onto B709. No requirement or facilities for pedestrian access to B709.
	Pedestrian Delay	X			
	Pedestrian Amenity			X	
	Pedestrian Fear and Intimidation			X	
	Safety			X	
Blackhopebyre (B7007/B709 north)	Severance			X	Property fronting onto B709 with buildings both sides of road.
	Pedestrian Delay		X		
	Pedestrian Amenity			X	
	Pedestrian Fear and Intimidation			X	
	Safety			X	
Dewar (B7007/B709 north)	Severance	X			Property set back via access track from the B709. No requirement or facilities for pedestrian access to B709.
	Pedestrian Delay	X			
	Pedestrian Amenity		X		
	Pedestrian Fear and Intimidation		X		
	Safety	X			
Garvald Lodge (B7007/B709 north)	Severance	X			Property fronting onto B709. No requirement or facilities for pedestrian access to B709.
	Pedestrian Delay	X			
	Pedestrian Amenity			X	
	Pedestrian Fear and Intimidation			X	
	Safety			X	
Garvald / Garvald Cottage	Severance	X			Property set back via long access track over Blackhope Water from the B7007. No requirement or facilities for pedestrian access to B709.
	Pedestrian Delay	X			
	Pedestrian Amenity	X			

Receptor Description	Effect	L	M	H	Rationale
(B7007/B709 north)	Pedestrian Fear and Intimidation	X			
	Safety	X			
Road Structure					
A72 (west)	Degradation of highway structure	X			Major road artery that is well maintained, designed to carry vehicle loads and with no obvious physical defects.
B7007/B709 (two lane section)	Degradation of highway structure		X		Local road with no obvious physical defects. Structural capacity may be more limited than A72 and considered unlikely to have similar levels of maintenance.
B709 (single lane section)	Degradation of highway structure			X	Minor rural road with physical defects. Evidence of recurring defects following repair/maintenance. Structural capacity anticipated to be limited.

Assessment of Construction Effects

12.8.5 The B709 (south), the A72 (west) and the B7007/B709 (north) were identified as highway links requiring more detailed assessment. As identified in Table 12.7 the percentage increase in HGV traffic exceeded the thresholds as follows:

- B709 (south) exceeded the 30% threshold with HGV traffic in month 1 and 7 and the 10% threshold for total traffic and HGV traffic in months 1 to 8;
- The A72 (west) exceeded the 10% threshold for HGV traffic in month 3; and
- The B7007/B709 (north) exceeded the 30% threshold for HGV traffic in months 7 to 9 and the 10% threshold for HGV traffic in months 5 and 6.

12.8.6 Based on the criteria in Table 12.1, the following magnitudes of effect have been assigned to the highway links:

- B709 (south): maximum increase of 40%, results in magnitude of Low;
- A72 (west): maximum increase of 10% results in magnitude of Negligible; and
- The B7007/B709 (north): maximum increase of 36% results in a magnitude of Low.

12.8.7 Synthesising the sensitivity and magnitude provides the resultant significance for the B709 (south), A72 (west) and B7007/B709 (north) highway links and associated receptors as detailed in Table 12.11 below.

Table 12.11 Unmitigated significance of effect

Receptor Description	Effect	Sensitivity	Magnitude	Significance
Public Road Network and Users				
	Increase in HGV movements	Medium	Low	Low / Moderate

Receptor Description	Effect	Sensitivity	Magnitude	Significance
B7007/B709 (north) two lane	Vehicle delays due to increase in traffic	Low	Low	Low
	Safety	Medium	Low	Low / Moderate
B7007/B709 (north) single lane	Increase in HGV movements	High	Low	Moderate
	Vehicle delays due to increase in traffic	Low	Low	Low
	Safety	High	Low	Moderate
A72 (west)	Increase in HGV movements	Low	Negligible	Negligible / Low
	Vehicle delays due to increase in traffic	Low	Negligible	Negligible / Low
	Safety	Medium	Negligible	Low
B709 (south)	Increase in HGV movements	High	Low	Moderate
	Vehicle delays due to increase in traffic	Low	Low	Low
	Safety	High	Low	Moderate
Local Settlements				
Peebles A72 (west)	Severance	Low	Negligible	Negligible / Low
	Pedestrian Delay	Low	Negligible	Negligible / Low
	Pedestrian Amenity	Medium	Negligible	Low
	Pedestrian Fear and Intimidation	Medium	Negligible	Low
	Safety	Medium	Negligible	Low
Innerleithen (A72/B709 south)	Severance	Medium	Low	Low / Moderate
	Pedestrian Delay	Low	Low	Low
	Pedestrian Amenity	Medium	Low	Low / Moderate
	Pedestrian Fear and Intimidation	High	Low	Moderate
	Safety	High	Low	Moderate
Innerleithen Golf Course (B709 (south)	Severance	High	Low	Moderate
	Pedestrian Delay	Low	Low	Low
	Pedestrian Amenity	Medium	Low	Low / Moderate
	Pedestrian Fear and Intimidation	High	Low	Moderate
	Safety	High	Low	Moderate
The Common (B709 south)	Severance	Low	Low	Low
	Pedestrian Delay	Low	Low	Low

Receptor Description	Effect	Sensitivity	Magnitude	Significance
	Pedestrian Amenity	Medium	Low	Low / Moderate
	Pedestrian Fear and Intimidation	Medium	Low	Low / Moderate
	Safety	Medium	Low	Low / Moderate
Lee / The Ley (B709 south)	Severance	Low	Low	Low
	Pedestrian Delay	Low	Low	Low
	Pedestrian Amenity	Low	Low	Low
	Pedestrian Fear and Intimidation	Low	Low	Low
	Safety	Low	Low	Low
Colquhar (B7007/B709 north)	Severance	Low	Low	Low
	Pedestrian Delay	Low	Low	Low
	Pedestrian Amenity	High	Low	Moderate
	Pedestrian Fear and Intimidation	High	Low	Moderate
	Safety	High	Low	Moderate
Leithen Lodge (B7007/B709 north)	Severance	Low	Low	Low
	Pedestrian Delay	Low	Low	Low
	Pedestrian Amenity	Low	Low	Low
	Pedestrian Fear and Intimidation	Low	Low	Low
	Safety	Low	Low	Low
Burnside / Whitehope (B7007/B709 north)	Severance	Low	Low	Low
	Pedestrian Delay	Low	Low	Low
	Pedestrian Amenity	Low	Low	Low
	Pedestrian Fear and Intimidation	Low	Low	Low
	Safety	Low	Low	Low
Glentress (B7007/B709 north)	Severance	Low	Low	Low
	Pedestrian Delay	Low	Low	Low
	Pedestrian Amenity	High	Low	Moderate
	Pedestrian Fear and Intimidation	High	Low	Moderate
	Safety	High	Low	Moderate
Blackhopebyre (B7007/B709 north)	Severance	High	Low	Moderate
	Pedestrian Delay	Medium	Low	Low / Moderate
	Pedestrian Amenity	High	Low	Moderate
	Pedestrian Fear and Intimidation	High	Low	Moderate
	Safety	High	Low	Moderate
Dewar (B7007/B709 north)	Severance	Low	Low	Low
	Pedestrian Delay	Low	Low	Low
	Pedestrian Amenity	Medium	Low	Low / Moderate

Receptor Description	Effect	Sensitivity	Magnitude	Significance
	Pedestrian Fear and Intimidation	Medium	Low	Low / Moderate
	Safety	Low	Low	Low
Garvald Lodge (B7007/B709 north)	Severance	Low	Low	Low
	Pedestrian Delay	Low	Low	Low
	Pedestrian Amenity	High	Low	Moderate
	Pedestrian Fear and Intimidation	High	Low	Moderate
	Safety	High	Low	Moderate
Garvald / Garvald Cottage (B7007/B709 north)	Severance	Low	Low	Low
	Pedestrian Delay	Low	Low	Low
	Pedestrian Amenity	Low	Low	Low
	Pedestrian Fear and Intimidation	Low	Low	Low
	Safety	Low	Low	Low
Road Structure				
A72 (west)	Degradation of highway structure	Low	Negligible	Negligible / Low
B7007/B709 (north) two lane	Degradation of highway structure	Medium	Low	Low / Moderate
B7007/B709 (north) single lane	Degradation of highway structure	High	Low	Moderate
B709 (south)	Degradation of highway structure	High	Low	Moderate

12.8.8 For the purpose of assessment under the EIA Regulations, only Major and Major/Moderate significance are considered significant. With reference to Table 12.11, the highest significance is Moderate. It should be further noted that this impact is temporary, occurring during the construction, after which time the impact will cease with traffic returning to essentially the baseline conditions.

Effect of Abnormal Loads

Abnormal Load Transportation

12.8.9 As noted previously, the abnormal load numbers have been included within the assessment of general construction traffic to ensure a robust assessment including all vehicles. It is however important to consider the effect of these particular vehicles in isolation, as the effects are quite different to those attributed to general construction traffic.

12.8.10 The primary impact associated with the transportation of abnormal loads is considered to be driver delays on other road users. The impact on local settlements (i.e. severance, pedestrian, delay, safety, etc) and road structure are not considered to merit further detailed assessment as:

- The duration of an abnormal load delivery through/past the settlement is so short (i.e. a timescale of minutes);
- A significant level of preparation goes into planning these deliveries with the police and local authorities and the management/control measures in place during the delivery (i.e. police escorts, etc); and
- The necessary permits to deliver abnormal loads will not be released from the relevant road authorities until they are satisfied that the road structure is sufficient for the AILs.

12.8.11 The transportation of abnormal loads requires careful planning in consultation with the Local Authority, Police Scotland and Transport Scotland. The anticipated distribution of abnormal loads indicates that abnormal loads would occur over a 5 month period with around 14 vehicle movements per month (peak of 16 movements in one month).

12.8.12 During the period when the loads are being transported there is potentially some effect on driver delays. This effect is increased at junction locations where vehicles in both directions would be required to wait until each load has negotiated the obstacle. There are sections where the abnormal load would use both carriageways while negotiating a pinch point or narrow sections of the road. This possible cause for journey delay to other road users would occur along the route from port to site.

12.8.13 Discussions with Police Scotland will determine the likely traffic management arrangements for these vehicle movements. These will be incorporated into the construction programme and the TMP to be produced by the contractors and will be agreed with the relevant road authorities and Police Scotland prior to commencement of construction. The important details required to be established within the TMP will include determining an acceptable time for transporting abnormal loads and the number of loads it may be possible to transport at one time. It has been assumed that each abnormal load would require an escort of two police vehicles and one haulage company escort vehicle.

12.8.14 Careful management of the timing of the abnormal loads and management of the traffic during abnormal load delivery will minimise driver delay. There are various options available to minimise the impact of journey delay, such as:

- Vehicles could be allowed to overtake the abnormal loads at either existing passing places or on suitable sections of roads in conjunction with escort vehicles managing the traffic flows reducing the risk of any large build-up of traffic. This provision is considered appropriate on the proposed route until the abnormal load reaches the single lane section of the B709.
- Night-time deliveries of the abnormal loads to avoid delays to the general public,
- Scheduling deliveries to avoid peak travel times at sensitive locations (e.g. morning and evening peak on the A720 Edinburgh City Bypass).

12.8.15 A review of the proposed abnormal load route concluded there were sufficient opportunities for the abnormal load convoy to be stopped, enabling any build up of traffic to overtake safely through the provision of the escort vehicles. The exception to this is the 8 km single lane section of the B709.

12.8.16 The traffic data obtained for the B709 near the site entrance indicated an average speed of around 40 km/hr. Applying this to the 8 km single lane section it would take around 12 minutes to travel this section of road. Assuming the abnormal load travels at an average of around 15 km/hr over this section, it would take the abnormal load around 32 minutes. This equates to a driver delay of around 20 minutes for vehicles following the abnormal load.

12.8.17 Oncoming vehicles to the abnormal load could either be stopped at the site entrance and hence would have a delay of around 32 minutes. Alternatively, they could be managed through the use of temporary passing places where oncoming vehicles could pull over to allow the abnormal load convoy to pass, reducing the driver delay to a matter of minutes. As discussed in Section 12.9 below, the provision of temporary passing places on the single lane section of the B709 is recommended as part of the mitigation for the HGV movements associated with the civil works construction of the Proposed Development.

12.8.18 Proactive communication with the local community and road users on the delivery arrangements, dates and timings of the abnormal load deliveries will also provide advance warning to residents on the route and frequent road users. This will enable them to plan their journeys and avoid abnormal load delivery times if possible.

12.8.19 Given the short period for the delivery, the short duration of potential delays and the various mitigation options available to manage these, in Natural Power's professional opinion it is considered the effect on driver delay is not considered significant.

Abnormal Load Modification Works

12.8.20 The construction of the modification works required to facilitate abnormal load deliveries along the B7007 and B709 would have the potential to impact traffic. The HGV movements associated with the construction of these modification works have been included in the assessment of general construction traffic to ensure a robust assessment including all vehicles. However it is important to consider the effect of undertaking these works on the road.

12.8.21 The works to the B7007 and two lane section of the B709 are considered minor. At these locations the roads are two lane and it is considered a lane could be temporarily closed if required using traffic lights to facilitate these works. The baseline traffic flows on the road are so low that in Natural Power's professional experience the impact of a lane closure and traffic light system would be negligible.

12.8.22 The works to the single lane section of the B709 are anticipated to be widening of the road edge in unbound stone at sections where the existing road width is insufficient. Undertaking these widening works on a single carriageway, single lane road will require traffic management measures to manage the effect on driver delays and safety. Therefore, appropriate mitigation measures have been considered further in the following section.

12.9 MITIGATION

12.9.1 The following sections identify the potential measures that could be adopted to mitigate the traffic effects and have been incorporated into the preliminary TMP prepared as part of this Chapter (Appendix 12.2). A final TMP to be approved by the Roads Authorities will be required as part of the suite of proposed planning conditions.

12.9.2 In addition to the impact mitigation, there are several mitigation measures proposed as standard good practice for wind farm construction and would be incorporated into the TMP regardless of the outcome of the traffic impact assessment. As such, these mitigation measures will further mitigate impacts which were determined to be not significant.

12.9.3 The suitability and effectiveness of the mitigation measures would need to be considered in detail to develop a set of traffic control measures. Key to this would be proactive consultation during both the pre-construction and construction stages with the Council and particularly the local community and individuals who will be most affected during the construction period. These consultations should aim to determine the traffic related factors that are of greatest concern to the local community and target appropriate mitigation measures. Throughout the construction period the local community should be kept abreast of the traffic measures so they are aware of and understand HGV numbers, timings, particular busy periods and durations.

12.9.4 The consultations should also clearly set out to the local community how the control measures are being enforced, how the local community can report on non-compliance with the control measures and the associated actions been taken for such non-compliance.

Standard Mitigation and Good Practice Measures

12.9.5 This section details the measures that will be adopted as part of the project as standard good practice to help manage traffic during the construction stage and includes:

- Consultation with the local council road department on all transport issues and to make sure that deliveries do not conflict with other scheduled road works. For the same reason Transport Scotland would also be consulted with reference to trunk roads;
- Public notifications and liaison during the construction phase of planned vehicle movements (i.e. turbine deliveries and timings, HGV numbers, timings, particular busy periods and durations);
- Pre-commencement survey in a format agreeable with the Council and ongoing condition surveys throughout the construction stage to assess the integrity of the road network and provide early indication of damage or wear. A Section 96 wear and tear agreement may be deemed necessary by the Council and will be provided if required as part of the TMP.
- Detailed sequencing of construction activities to reduce HGV vehicle movements and avoid high peak movements.
- Scheduling of HGV deliveries to avoid peak times (e.g. morning, evening, school drop off and pick up times and golf medals and competition events);
- Temporary signage through the peak construction periods to inform construction traffic, public road users and pedestrians of the risks and highlight rights of ways/priorities, particularly with respect to vehicles parked on the B709. This could consider temporary railings along the footpath to provide a physical demarcation between the footpath and the highway;
- Temporary speed restrictions for construction traffic. It is understood the 20 mph speed limit trial in the Borders is currently being assessed to determine whether to retain the limits permanently. However, a temporary speed limit, similar to a construction site of 5 mph or 10 mph, could be introduced for the B709 for construction traffic;
- Temporary road crossings and barriers along the road verge at the most sensitive locations to provide a more physical demarcation/barrier between the road edge and property;

B709 Single Lane Section (north and south)

12.9.6 The single carriageway, single lane section of the B709 from just south of Dewar, past the site entrance and onto Innerleithen was identified as having a high sensitivity to increased HGV movements due to the absence of formal passing places to facilitate the two way movement of traffic.

12.9.7 Although not identified as a significant effect in EIA terms, it is recommended that a series of temporary passing places at inter-visible spacings in agreement with SBC be installed during the construction phase. It is considered this would reduce the sensitivity of the single lane section of the B709 to HGV traffic from its baseline condition of High to Medium.

12.9.8 Similarly, it is recommended that more detailed investigations are undertaken to determine the structural adequacy of the road for the predicted increased HGV traffic volumes. If required, strengthening works such as a tarmac overlay, should be undertaken to improve the structural capacity of the road. It is expected this would be linked into conditions surveys and any Section 96 wear and tear agreements as noted above.

Impact Mitigation

12.9.9 This section details the potential measures proposed to mitigate the impacts identified as being significant.

Abnormal Load Modification Works to B709 Single Lane

12.9.10 The assessment identified the potential effect of the widening works on the single carriageway, single lane section of the B709.

12.9.11 Where the available width of the road is sufficient to provide a safe working area for the works, while enabling traffic to continue to pass through an appropriately managed system (i.e. traffic lights, convoy, etc), this approach would be adopted. It is considered a managed system such as this would offer the least impact to other road users, essentially retaining the single lane baseline flow characteristics of the road.

12.9.12 Where there is insufficient width to provide a safe working area it is considered rolling road closures would be required. The management of these will be confirmed with SBC through the TMP and anticipated to include:

- Advance notification to the local community and property owners along the B709. These will set out the nature of the works and detailed programmes to ensure the local residents are as informed and aware of the works as can be;

- Road signs at suitable locations to advise of the closures, opening times and alternative routes that can be used;
- Road closures scheduled out-with peak periods (i.e. morning and evening commute and school drop off/pick-up);
- Provision to ensure immediate re-opening of the road in the case of an emergency or to allow emergency vehicles to pass through;
- Staggered closures with the road re-opened at set periods throughout the day (e.g. closed 10am to 12pm, open 12pm to 1pm, closed 1pm to 3pm and re-opened until the next morning) to allow local residents access.

12.9.13 It is anticipated the above traffic management measures would also apply when constructing passing places and any strengthening works.

12.10 RESIDUAL EFFECTS

12.10.1 This section re-assesses the traffic effects with the potential mitigation measures outlined above in place to identify their residual effects. As noted previously, many of the mitigation measures proposed are considered standard good practice for wind farm construction.

Construction Residual Effects

Table 12.11 Scenario 1 residual effects

Receptor Description	Effect	Sensitivity		Magnitude of Effect	Residual Effect
		Un-mitigated	Mitigated		
Public Road Network and Users					
B7007/B709 (north) two lane	Increase in HGV movements	Medium	Medium	Low	Low / Moderate
	Vehicle delays due to increase in traffic	Low	Low	Low	Low
	Safety	Medium	Medium	Low	Low / Moderate
B7007/B709 (north) single lane	Increase in HGV movements	High	Low	Low	Low
	Vehicle delays due to increase in traffic	Low	Low	Low	Low
	Safety	High	Medium	Low	Low / Moderate
A72 (west)	Increase in HGV movements	Low	Low	Negligible	Negligible / Low
	Vehicle delays due to increase in traffic	Low	Low	Negligible	Negligible / Low
	Safety	Medium	Medium	Negligible	Low
B709 (south)	Increase in HGV movements	High	Low	Low	Low
	Vehicle delays due to increase in traffic	Low	Low	Low	Low
	Safety	High	Medium	Low	Low / Moderate
Local Settlements					
Peebles A72 (west)	Severance	Low	Low	Negligible	Negligible / Low
	Pedestrian Delay	Low	Low	Negligible	Negligible / Low
	Pedestrian Amenity	Medium	Low	Negligible	Negligible / Low
	Pedestrian Fear and Intimidation	Medium	Low	Negligible	Negligible / Low
	Safety	Medium	Low	Negligible	Negligible / Low
Innerleithen (A72/B709 south)	Severance	Medium	Low	Low	Low
	Pedestrian Delay	Low	Low	Low	Low
	Pedestrian Amenity	Medium	Low	Low	Low
	Pedestrian Fear and Intimidation	High	Low	Low	Low
	Safety	High	Low	Low	Low
Innerleithen Golf Course (B709 (south)	Severance	High	Low	Low	Low
	Pedestrian Delay	Low	Low	Low	Low
	Pedestrian Amenity	Medium	Low	Low	Low
	Pedestrian Fear and Intimidation	High	Low	Low	Low
	Safety	High	Low	Low	Low
The Common (B709 south)	Severance	Low	Low	Low	Low
	Pedestrian Delay	Low	Low	Low	Low
	Pedestrian Amenity	Medium	Low	Low	Low
	Pedestrian Fear and Intimidation	Medium	Low	Low	Low
	Safety	Medium	Low	Low	Low
Lee / The Ley (B709 south)	Severance	Low	Low	Low	Low
	Pedestrian Delay	Low	Low	Low	Low
	Pedestrian Amenity	Low	Low	Low	Low

Receptor Description	Effect	Sensitivity		Magnitude of Effect	Residual Effect
		Un-mitigated	Mitigated		
	Pedestrian Fear and Intimidation	Low	Low	Low	Low
	Safety	Low	Low	Low	Low
Colquhar (B7007/B709 north)	Severance	Low	Low	Low	Low
	Pedestrian Delay	Low	Low	Low	Low
	Pedestrian Amenity	High	Low	Low	Low
	Pedestrian Fear and Intimidation	High	Low	Low	Low
	Safety	High	Low	Low	Low
Leithen Lodge (B7007/B709 north)	Severance	Low	Low	Low	Low
	Pedestrian Delay	Low	Low	Low	Low
	Pedestrian Amenity	Low	Low	Low	Low
	Pedestrian Fear and Intimidation	Low	Low	Low	Low
	Safety	Low	Low	Low	Low
Burnside / Whitehope (B7007/B709 north)	Severance	Low	Low	Low	Low
	Pedestrian Delay	Low	Low	Low	Low
	Pedestrian Amenity	Low	Low	Low	Low
	Pedestrian Fear and Intimidation	Low	Low	Low	Low
	Safety	Low	Low	Low	Low
Glentress (B7007/B709 north)	Severance	Low	Low	Low	Low
	Pedestrian Delay	Low	Low	Low	Low
	Pedestrian Amenity	High	Low	Low	Low
	Pedestrian Fear and Intimidation	High	Low	Low	Low
	Safety	High	Low	Low	Low
Blackhopebyre (B7007/B709 north)	Severance	High	Low	Low	Low
	Pedestrian Delay	Medium	Low	Low	Low
	Pedestrian Amenity	High	Low	Low	Low
	Pedestrian Fear and Intimidation	High	Low	Low	Low
	Safety	High	Low	Low	Low
Dewar (B7007/B709 north)	Severance	Low	Low	Low	Low
	Pedestrian Delay	Low	Low	Low	Low
	Pedestrian Amenity	Medium	Low	Low	Low

Receptor Description	Effect	Sensitivity		Magnitude of Effect	Residual Effect
		Un-mitigated	Mitigated		
	Pedestrian Fear and Intimidation	Medium	Low	Low	Low
	Safety	Low	Low	Low	Low
Garvald Lodge (B7007/B709 north)	Severance	Low	Low	Low	Low
	Pedestrian Delay	Low	Low	Low	Low
	Pedestrian Amenity	High	Low	Low	Low
	Pedestrian Fear and Intimidation	High	Low	Low	Low
	Safety	High	Low	Low	Low
Garvald / Garvald Cottage (B7007/B709 north)	Severance	Low	Low	Low	Low
	Pedestrian Delay	Low	Low	Low	Low
	Pedestrian Amenity	Low	Low	Low	Low
	Pedestrian Fear and Intimidation	Low	Low	Low	Low
	Safety	Low	Low	Low	Low
Road Structure					
A72 (west)	Degradation of highway structure	Low	Low	Negligible	Negligible / Low
B7007/B709 (north) two lane	Degradation of highway structure	Medium	Low	Low	Low
B7007/B709 (north) single lane	Degradation of highway structure	High	Low	Low	Low
B709 (south)	Degradation of highway structure	High	Low	Low	Low

Abnormal Load Modification Works to B709 Single Lane

12.10.2 The impact of the modification works to the single lane section of the B709 were assessed separately as it was recognised the implementation of these works had the potential to cause an effect if not managed appropriately. The traffic management mitigation measures identified are commonly used on single carriageway, single lane roads to enable road upgrades to be undertaken in a safe manner without undue impact. Recognising this and taking cognisance of the very short duration of any modification works in relation to the Proposed Development assessment period, in Natural Power's professional opinion the residual effects would be of Low, which is not considered significant under the EIA Regulations.

12.11 CUMULATIVE IMPACT ASSESSMENT

12.11.1 Other developments in the areas served by the roads assessed herein may generate their own construction, operational and decommissioning traffic (new urban development, shopping centres, quarries, forestry, etc.). The

greatest changes in traffic associated with the Proposed Development will be short term, occurring during the construction phase.

12.11.2 If the construction of another development were to coincide with that of the Proposed Development and was considered to have an unacceptable joint impact, then discussions would be held between developers and other relevant parties (in conjunction with the Roads Authorities) prior to the commencement of the projects, with a view to mitigating any such effects. The measures to be adopted would be enshrined in a robust TMP applying to each development, to ensure that any cumulative effects were avoided (e.g. by staging of deliveries and construction phasing).

Greystone Knowe Wind Farm

12.11.3 An application has been submitted for Greystone Knowe Wind Farm near Heriot. The access for that is identified as being off the A7, south of the B709, B7007 and B6368. The Proposed Development is considered to have limited traffic and on limited sections of the A7 (e.g. the AIL route utilises a 2km section of the A7 from the B6368 to the B7007). The assessment identifies general construction traffic may use the A7 heading south to the B7007/B709 and onto the site entrance and there is the potential for a cumulative impact of this traffic with the Greystone Knowe development. Beyond the A7 the Proposed Development traffic utilises different road networks and should not coincide with the Greystone Knowe development.

12.11.4 A review of the Greystone Knowe traffic assessment has been undertaken and predicted traffic flows for a suitable location on the A7 near the B7007 has been assessed. The Proposed Development traffic flows have been combined with the Greystone Knowe traffic flows and resultant percentage increase in traffic determined as presented in Table 12.12 below.

Table 12.12: Cumulative Traffic Figures with Greystone Knowe Wind Farm

Trip Generation	Baseline Traffic Flows on A7 near B7007		Greystone Knowe Increased Traffic Figures		Greystone Knowe Increase (%)		Proposed Development Added Traffic Figures		Proposed Development Increase Versus Baseline (%)	
	Total	HGV	Total	HGV	Total	HGV	Total	HGV	Total	HGV
Maximum	5280	319	5382	387	1.94	21.42	5411	412	2.4	29
Average			5317	322	0.70	0.94	5328	330	0.9	3.5

Source: Natural Power and Proposed Development – Greystone Knowe Wind Farm: EIA Report, Volume 1

12.11.5 The assessment indicates that the maximum trip generation, assuming peak construction events (e.g. turbine foundations) occurred at the same time, could result in a total traffic increase of 2.4% and a HGV increase of 29%. In accordance with Table 12.1 and Table 12.4 a 29% increase in HGV traffic would result in negligible magnitude and maximum significance of Low/Moderate regardless of the sensitivity of the receptor. This is not a significant effect in EIA terms.

12.11.6 Considering average traffic levels, the percentage increases are less than 10% for both total traffic and HGVs and therefore the effect can be considered negligible.

12.11.7 The Greystone Knowe assessment did not identify any effects that were considered significant in EIA terms.

12.11.8 It is concluded that the potential cumulative effects of the two projects running concurrently would not be significant. If construction timings overlap, consideration could be given to ensure their peak construction events are scheduled to avoid simultaneous use of the A7.

12.12 CONCLUSIONS

12.12.1 The traffic and transport assessment has assessed the traffic impacts associated with the Proposed Development. The assessment considered the most likely construction methods, programme and sequencing against baseline traffic conditions. In addition, the traffic impacts associated with the abnormal load deliveries were also assessed. An ALAA, including swept path analysis at particular pinch points was also prepared demonstrating the viability of the proposed abnormal load route and are included as appendices to this chapter.

12.12.2 The assessment concludes that, with the incorporation of suitable mitigation measures secured through a construction TMP, there will be no significant traffic effects associated with the Proposed Development.

12.12.3 A preliminary TMP has been prepared and is included as an appendix to this chapter (Technical Appendix 12.2). It is expected a Planning Condition will be applied to the development for a final construction TMP to be prepared and approved by SBC post consent and prior to construction works commencing.

12.12.4 In relation to potential cumulative impacts, these are predicted to be not significant, including for the proposed Greystone Knowe development. If the construction of the Proposed Development coincided with another, using the same transport routes, then communication with the other developers would take place with the aim to mitigate effects to a non-significant level. Similarly, if the Greystone Knowe development occurs concurrently it is recommended discussions are undertaken to ensure peak construction events are scheduled to avoid the simultaneous use of the A7. Both these eventualities would be delivered through the construction TMP.

12.13 MITIGATION AND RESIDUAL EFFECTS

12.13.1 In terms of Traffic and Transport, embedded mitigation is primary delivered through a TMP. As part of this chapter, a preliminary TMP has been prepared (Appendix 12.2) and it is expected a Planning Condition will be applied to the development for a final TMP to be prepared and approved by SBC post consent and prior to construction works commencing.

12.13.2 The preliminary TMP includes for the following measures to mitigate the potential traffic impacts associated with the Proposed Development:

- Proactive consultation with Borders Council Roads Authority and the local community and individuals effected by traffic routing to develop and agree mitigation measures as required and as outlined in Section 12.9, including:
  - Temporary pedestrian crossings;
  - Temporary signage to inform both road users and pedestrians;
  - Temporary railings along footpaths/edge of road to provide a physical demarcation to the highway;
  - Temporary speed restrictions.
- Public notifications and liaison during the construction phase of planned vehicle movements (i.e. turbine deliveries and timings, HGV numbers, timings, particular busy periods and durations);
- Improvements to the B709, particularly the single lane section, to facilitate the flow of HGVs, the temporary volume of construction traffic and the AIL deliveries;
- HGV deliveries including, abnormal loads, scheduled to avoid school drop off and pick up times;
- Identification of potential stopping points along the transport route where slower turbine delivery vehicles can pull over to allow queued traffic to pass;
- To reduce risk to pedestrians and road users, abnormal loads should be adequately escorted and appropriate traffic management and signage used;

- It is important that the local council road department is consulted on all transport issues and to make sure that deliveries do not conflict with other scheduled road works. For the same reason Transport Scotland would also be consulted with reference to trunk roads; and
- Pre-commencement survey and ongoing condition surveys throughout the construction stage in a format agreeable with the Council. A Section 96 wear and tear agreement may be deemed necessary by the Council and will be provided if required as part of the TMP.

12.13.3 The residual effects are fully detailed in Section 12.10 for each receptor and the various scenarios assessed. Table 12.16 below summarises the residual effects for Scenario 1 and Scenario 2 in terms of the receptor group and the highest residual effect determined to a receptor within that group.

Table 12.13 Highest residual effect by receptor group

Element	Receptor Group	Highest Residual Effect
Construction HGV traffic	Public Road Network and Users	Low / Moderate
	Local Settlements	Low
	Road Structure	Low

12.13.4 The residual effect of abnormal load deliveries on driver delay was assessed and considered not to be significant.

12.13.5 The residual effect of the modification works to enable abnormal load deliveries was assessed and considered not to be significant.