# Chapter 12 Traffic and Transport

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## List of Abbreviations

| Abbreviation | Description |
|---|---|
| **ADT** | Average Daily Traffic |
| **AADT** | Average Annual Daily Traffic |
| **AIL** | Abnormal Indivisible Load |
| **AILAA** | Abnormal Indivisible Load Access Assessment |
| **BoP** | Balance of Plant |
| **EIAR** | Environmental Impact Assessment Report |
| **HGV** | Heavy Goods Vehicle |
| **IEMA** | Institute of Environmental Management and Assessment |
| **LGV** | Light Good Vehicle |
| **LV** | Low Voltage |
| **PAN** | Planning Advice Note |
| **Rbt** | Roundabout |
| **SBC** | Scottish Borders Council |

| | |
|---|---|
| **SCADA** | Supervisory Control and Data Acquisition |
| **TMP** | Traffic Management Plan |

# Glossary

| Abbreviation | Definition |
|---|---|
| **The Applicant** | Fred. Olsen Renewables Limited |
| **EIA Regulations** | The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. |
| **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 of 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 |
| **Natural Power** | The lead consultant EIA co-ordinator is: Natural Power Consultants Limited |
| **Proposed Development** | The proposed Lees Hill Renewable Energy Park as described in Chapter 4, Volume 2 of this EIAR |
| **Proposed Development Site** | The project development area within the site boundary as shown in Figure 1.2, Volume 3a. |

# 12. Traffic and Transport

## 12.1. Introduction

12.1.1. This chapter of the Environmental Impact Assessment Report (EIAR) assesses the potential effects due to the traffic and transport impacts which result from the construction, operation and decommissioning of the Proposed Development.

12.1.2. Construction traffic required to construct the Proposed Development 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.

12.1.3. The construction of the Proposed Development is expected to last approximately 18 months, from site mobilisation through to installation and commissioning of the turbines and solar farm, ending with site re-instatement and demobilisation.

12.1.4. The following Appendices and Figures accompany this EIAR chapter:

12.1.5. Appendices:

- Technical Appendix 12.1: Preliminary Traffic Management Plan (TMP), Volume 4; and
- Technical Appendix 12.2: AIL Access Assessment (AILAA), Volume 4.
- Technical Appendix 12.3: Offsite Accommodation Works Impact Assessment

12.1.6. Figures:

- Figure 12.1: Construction Traffic Routing and Traffic Count Locations, Volume 3a.
- Figure 12.2: TA 12.3 (Appendix A): Pinch Point Phase 1 Survey Locations
- Figure 12.3: TA 12.3 (Appendix B): Pinch Point Phase 1 Survey Results 2022

12.1.7. The traffic and transport assessment has assessed the traffic impacts associated with the Proposed Development. A worst-case scenario has been assessed, which assumes all stone would be imported onto site and all foundation concrete would need to be brought to site in ready mix lorries. In reality, the import of stone may be reduced as the Proposed Development also includes several onsite borrow pits, to take advantage of any site-won stone, and onsite concrete batching plants, for the mixing of concrete within the Proposed Development.

12.1.8. Material quantities have been determined from the site design and specification as discussed in Chapter 4 (Volume 2), augmented with Natural Power's experience of wind farm and solar farm construction.

12.1.9. In addition, the traffic effects associated with the AIL deliveries were also assessed. An AILAA, including swept path analysis at particular pinch points, was prepared, refer to Technical Appendix 12.2, Volume 4. This demonstrates that the proposed AIL route is viable.

12.1.10. 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 Principal 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.

### *Summary of Significant Effects*

12.1.11. 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. Legislation, Policy and Guidance

12.2.1. This section outlines the legislation, policy and guidance that has been reviewed. The transport and traffic issues identified and described in the following planning advice and guidance documents have been taken into account in this assessment.

- Scotland's Fourth National Planning Framework (2023), 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 Council Local Development Plans (2016 and proposed 2020); and
- Scottish Borders Council Supplementary Guidance, Renewable Energy (2018).

### *Legislation, Policy and Guidance Summary*

12.2.2. Much of the above policy and guidance deals principally with developments that generate significant increases in travel as a direct consequence of their function (e.g. retail parks, housing) and measures to implement a more sustainable transport solution. The traffic generated by the Proposed Development will almost entirely be limited to vehicle movements during the construction phase. As such, the effects of traffic from the Proposed Development will be temporary and of a short-term duration as opposed to developments such as retail parks where the traffic effects can be permanent and for a long duration of typically a 60-year design span.

12.2.3. In addition, given the nature of the construction phase traffic there is little or no scope for changing to alternative modes of transport.

## 12.3. Method of Assessment

### *Study Area*

12.3.1. The study area for the traffic and transport assessment covers the Proposed Development and the highway links accessing the Proposed Development as presented in Figure 12.1: Construction Traffic Routing and Traffic Count Locations, Volume 3a.

### *Methodology*

12.3.2. 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 impact to the baseline traffic conditions due to the Proposed Development;
- Undertake a screening test to delimit the scale and extent of the assessment;
- Identify receptors potentially affected by the traffic associated with the Proposed Development;
- Assess the sensitivity of receptors with best practice embedded mitigation considered;

- Synthesise the sensitivity of the receptor with the magnitude of impact to determine the significance of effect; and
- If the effect is significant, review opportunities to implement impact mitigation measures and re-assess the significance of effect.

12.3.3. Consideration has been given to the construction, operation and decommissioning phases of the Proposed Development.

12.3.4. When considering the magnitude of the impact it is recognised that the traffic generated by the Proposed Development would be short term due to vehicle movements relating to the construction phase of the Proposed Development. Following completion of the construction phase and during the operational phase, traffic levels will return to their baseline conditions as vehicle movements will be primarily cars and LGVs. It is envisaged that there will be no impact or effect due to negligible additional vehicle movements within the context of baseline traffic.

12.3.5. The method of decommissioning would be agreed with the relevant planning authority as outlined in Chapter 4: Project Description of the EIAR, Volume 2. In line with current practice all turbine components, including blades, nacelles and towers would be removed from the site. If not to be re-used, turbine components would likely be cut to manageable sizes on site to allow use of HGVs. Solar modules and frames would be removed from site. Above ground infrastructure would be removed with foundations generally removed to around 1 m below ground level, with the remainder left in-situ. Therefore, the HGV movements would be less than during the construction period. The decommissioning would likely take place over a similar time period as shown for the construction phase. Baseline traffic flows on all of the affected roads are likely to have altered significantly by the end of the up to 35-year lifetime of the Proposed Development leading to the possibility of a different effect on the roads for HGV traffic. It is envisaged that the decommissioning would result in lesser effects than those identified for this assessment and no further assessment has been undertaken. Decommissioning would be managed in accordance with a decommissioning plan agreed in advance with relevant authorities.

12.3.6. As such this assessment will consider the effects during the construction phase only.

### *Magnitude of Impact*

12.3.7. The magnitude of traffic impact is a function of the existing traffic volumes, the percentage increase due to the Proposed Development and changes in type of traffic. The IEMA Guidelines identify magnitude thresholds based on percentage changes in traffic levels as being applicable to severance and intimidations effects. The magnitude of impacts 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 impact 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 | >0-30% |

12.3.8. The determination of the magnitude of the impacts is undertaken by reviewing the Proposed Development, establishing the parameters of the additional road traffic that may cause an impact and quantifying these impacts.

### *Screening Test*

12.3.9. 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 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".*

12.3.10. Where the predicted increase in traffic flow is lower than these thresholds, the IEMA Guidelines suggest that further detailed assessment is not warranted.

12.3.11. The matrix shown in Table 12.2 is used to determine which links require further 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 |

### *Receptor Identification*

12.3.12. The IEMA Guidelines identifies receptors that may be sensitive to changes in the traffic conditions resulting from the Proposed Development. A review of the surrounding area has been undertaken to identify receptors potentially affected by the Proposed Development. For the purposes of this assessment, receptors have been grouped as detailed in Table 12.3.

**Table 12.3: Receptor classification**

| Receptor group | Receptors |
|---|---|
| Road Network & Users | Driver delay, pedestrian and cyclist amenity, safety, road structure |
| Settlements | Severance, pedestrian delay, pedestrian intimidation, safety |

### *Embedded Mitigation*

12.3.13. 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 (Technical Appendix 12.1, Volume 4) and it is expected that a planning condition will be applied to the planning consent for a final construction TMP to be prepared post consent and prior to construction works commencing.

12.3.14. The TMP will be tailored to suit the requirements of the Proposed Development. Embedded mitigation includes best practice measures which would be detailed in the TMP, regardless of

the outcomes of the traffic and transport assessment and are included in the Proposed Development when determining the sensitivity of receptors. Where traffic effects are assessed as being significant, then additional mitigation measures will be considered to reduce the effects. Additional mitigation measures will then be detailed in the TMP in addition to the adopted embedded mitigation.

12.3.15. Embedded mitigation measures adopted in the TMP and in the Proposed Development for the assessment of receptor sensitivity include:

- Scheduling of HGV deliveries to avoid peak times;
- Temporary signage to direct HGV drivers to the Proposed Development and advise of routes not permitted;
- Temporary signage to inform both drivers and pedestrians of risks and highlight rights of ways /priorities;
- Temporary localised reductions of speed limits;
- Scheduling of construction activities, with focus on concrete and AIL deliveries to reduce deliveries whilst key activities are occurring;
- Trial run for AIL deliveries prior to commencement of construction;
- Proactive consultation with local roads authorities and police to co-ordinate AIL deliveries;
- Proactive consultation with the local Roads Authorities and local community who will be most affected during the construction period.

12.3.16. Embedded mitigation for the AIL deliveries are detailed in the preliminary TMP, see Technical Appendix 12.1, Volume 4.

### *Assessment of Sensitivity*

12.3.17. The IEMA Guidelines provides guidance on how the various traffic impacts affect receptors but does not provide explicit values for the sensitivity of receptors. Using the IEMA Guidelines as a basis, professional judgement and experience was used to develop a classification of the sensitivity of the receptors to the potential traffic impacts, taking account of the embedded mitigation. A scale of 'low', 'medium' and 'high' has been used in this assessment.

12.3.18. Table 12.4 details the receptors and criteria used to assess their sensitivity with respect to the traffic impacts. The effects of factors such as noise and ecological impact are assessed in Chapter 11 Noise, Volume 2 and Chapter 7 Ecology, Volume 2 of this EIAR respectively.

**Table 12.4: Receptor grouping and sensitivity criteria**

| Receptor Group | Impact | Low | Medium | High |
|---|---|---|---|---|
| **Road Network & Users** | Driver Delay | Major or strategic road networks such as motorways, or a road network with suitable capacity to absorb an increase in traffic. No capacity issues raised by Roads Authority. | Road networks with some capacity to absorb an increase in traffic. Capacity issues identified at specific junctions or specific times of day. | Road network with little or no capacity to absorb an increase in traffic. Capacity issues identified at multiple junctions or extended periods of the day. |
| **Road Network & Users and Settlements** | Pedestrian and Cyclist Amenity | Settlement with little pedestrian or cycle activity. Wide | Settlement with some pedestrian and cycle activity. | Settlement with high pedestrian and cycle activity. Route |

| Receptor Group | Impact | Low | Medium | High |
|---|---|---|---|---|
| | | footpaths, segregated cycle lanes. | Popular cycle route, not on the National Cycle Network. Footpaths narrow in places. Non segregated cycle lanes or wide road with sufficient space for cyclists. | on the National Cycle Network. No or limited footpaths. No cycle lanes or road width narrow with limited space for cyclists. |
| **Road Network & Users and Settlements** | Safety | Major road with limited junctions and hazards designed to current standards. Space of physical segregation between traffic, cyclists and pedestrians. No serious or fatal accidents from previous 5 years of data. | More localised roads with some junctions and hazards (bends, constrained geometry, sections of poor visibility). No physical segregation between traffic and cyclists and pedestrians. No fatal accidents from previous 5 years of data. | Road with several junctions and hazards (sharp bends, constrained geometry, poor visibility). No segregation between traffic and cyclists and pedestrians. Fatal accident(s) from previous 5 years of data. Near to sensitive locations such as hospitals, retirement homes, schools, places of worship, public open spaces and tourist attractions. |
| **Road Network & Users** | Road Structure | Major roads with no obvious physical defects and well maintained. Visual inspections suggest designed to current standards with good road foundation. | Regional roads with some minor physical defects being maintained. Visual inspections suggest adequate design and road foundation. | Local roads with some physical defects or local roads, infrequently maintained with reoccurring physical defects. Visual inspections suggest poor design and road foundation (e.g. floating road). |
| **Settlements** | Severance | Settlement with no or limited facilities. Adequate walkways, wide, interconnected, | Settlement with some key facilities. Pedestrian walkways, narrow | Settlement with a wide range of facilities. No or limited pedestrian |

| Receptor Group | Impact | Low | Medium | High |
|---|---|---|---|---|
| | | providing adequate separation between pedestrians and traffic. Designated pedestrian crossing points to link walkways, pedestrians and facilities. | in places, gaps to interconnectivity and limited separation between pedestrians and traffic. No formal designated pedestrian crossing points, may have traffic islands. | walkways, narrow with no separation between pedestrians and traffic. No designated pedestrian crossings points. |
| **Settlements** | Pedestrian Delay | Settlement with little pedestrian activity. Designated pedestrian crossing points. | Settlement with some pedestrian activity. Informal pedestrian crossing points such as traffic islands. | Settlement with high pedestrian activity. No pedestrian crossing points. |
| **Settlements** | Pedestrian Intimidation | Settlement with little pedestrian activity. Wide footpaths, space or guardrails providing separation to traffic. | Settlement with some pedestrian activity. Footpaths narrow in places, some guardrails providing separation to traffic. | Settlement with high pedestrian activity. Footpaths narrow and no separation to traffic. |

### *Assessment of Significance*

12.3.19. The significance of any given effect is taken to be a synthesis of both the magnitude of the impact and the sensitivity of the receptor. The criteria used in determining significance is set out in Table 12.5 below.

**Table 12.5: Significance matrix**

| | Magnitude of Change | | | |
|---|---|---|---|---|
| **Sensitivity** | **High** | **Medium** | **Low** | **Negligible** |
| **High** | Major | Major/Moderate | Moderate | Moderate/Minor |
| **Medium** | Major/Moderate | Moderate | Moderate/Minor | Minor |
| **Low** | Moderate | Moderate/Minor | Minor | Minor/Negligible |

12.3.20. Effects deemed to be significant for the purpose of the Environmental Impact Assessment Regulations are those which are described as 'Major' and Major/Moderate'. However, other factors may have to be considered including the duration and the reversibility of the effect. In these cases, 'Moderate' effects may also be deemed as significant. Whether they do so shall be determined by a qualitative analysis of the specific impact and will be based on professional judgement.

### *Additional Mitigation*

12.3.21. Where the assessment identifies effects considered significant, then additional mitigation measures will be proposed. The significance of effect will then be assessed with the

incorporation of the additional mitigation. The additional mitigation measures will then be incorporated into the preliminary TMP for adoption in the Proposed Development.

### *Uncertainties and Assumptions*

12.3.22. A range of uncertainties are present with any assessment of traffic effects. With respect to this EIAR, such uncertainties and assumptions are outlined below. These uncertainties are minimised by maintaining conservative assumptions and the provision of estimates based on recent wind farm and solar farm construction experience. Uncertainties and assumptions include AIL delivery route, candidate turbine, source of materials, concrete batching, construction programme and traffic flows.

### *Existing Traffic Flows*

12.3.23. The assessment relies on the availability and accuracy of traffic flow data to establish baseline traffic conditions on the surrounding network.

12.3.24. Traffic counts were undertaken on the links within the geographical assessment area, shown on Figure 12.1: Construction Traffic Routing and Traffic Count Locations, Volume 3a.

#### *Traffic Generation*

12.3.25. The estimated traffic generated by the Proposed Development comprises general construction loads (HGVs) such as bulk materials; AILs for turbine components; and LGVs. Traffic numbers have been calculated based on the design as described in Chapter 4 Project Description, Volume 2, along with Natural Power's and the Applicant's experience of wind farm and solar farm development and construction.

#### *Assessment of Traffic Effects*

12.3.26. The methods for assessing the likely traffic effects are based upon IEMA guidance. In assessing the traffic effects, a level of professional judgement and experience is applied in line with the IEMA guidelines and therefore predicted effects should not be considered as absolute.

## 12.4. Consultation

12.4.1. Table 12.6 below summarises the outcome of the scoping opinions received regarding the Proposed Development scoping report.

**Table 12.6: Consultation table**

| Consultee | Scoping Comment | Response |
|---|---|---|
| Transport Scotland | We note that the thresholds as indicated within the Institute of Environmental Management and<br>Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic are to be used as a screening process for the assessment. Transport Scotland is in agreement with this approach. | Noted. |
| | Transport Scotland would request that the junction of the A68(T)/ A697 be included within the threshold assessment to help determine the potential for environmental impacts associated with increased traffic. | The assessment has been developed based upon IEMA and the trunk road related environmental effects have been considered. |
| | Transport Scotland will require to be satisfied that the size of turbines proposed can negotiate the selected route and that their transportation will not have any detrimental effect on structures within the trunk road route path. | Swept path analysis for turbine movements has been included in the AILAA (Technical Appendix 12.2, Volume 4) |
| | The SR indicates that an Abnormal Loads Assessment report will be provided with the EIAR, which will include swept path drawings. We would state that this should identify key pinch points on the trunk road network with details provided with regard to any required changes to street furniture or structures along the route. | Key pinch point locations and swept path analysis for turbine movements has been included in the AILAA (Technical Appendix 12.2, Volume 4) |
| Scottish Borders Council (SBC) | "I am content with the proposed assessment methodology.<br>Careful consider should be given to any vehicular movements where the development is shown as straddling the public road resulting in vehicles travelling straight across a public road." | Swept path analysis for turbine movements has been included in the AILAA (Technical Appendix 12.2, Volume 4) |

12.4.2. Table 12.7 summarises the post-scoping consultation undertaken.

**Table 12.7: Post scoping consultation table**

| Consultee | Consultation detail | Response |
|---|---|---|
| Transport Scotland (June 2023) | We are aware of some traffic count data available on the DfT road traffic website for this area (see map below), if Transport Scotland or SBC do not have data for these locations available, would use of the DfT data be acceptable? | No data was provided. To ensure a representative baseline traffic data, traffic surveys were commissioned at each link for use in the assessment. |
| Transport Scotland (June 2023) | The scoping opinion requests for "the junction of the A68(T)/ A697 be included within the threshold assessment to help determine the potential for environmental impacts associated with increased traffic". To satisfy this request we propose to include the A68 between Oxton and the roundabout as a link taken forward for assessment using IEMA Guidelines. Would this be an acceptable approach? | No response received. Assessment developed on proposed approach. |

## 12.5. Baseline

### *Construction Traffic Routes*

#### *Abnormal Indivisible Loads*

12.5.1. An AILAA has been undertaken for the major component deliveries and is included in Technical Appendix 12.2, Volume 4 of the EIAR.

12.5.2. The preferred route for the major component deliveries can be seen in Appendix A of Technical Appendix 12.2, Volume 4 and is as follows:

- From Rosyth Dockyard the loads would head east onto Keith Road, St Margaret Way and King Malcolm Drive/B981, from where the loads would join the Ferrytoll Gyratory;
- Loads would take the 3rd exit onto the A9000, then onto the M90 ramp travelling south towards Edinburgh;
- From the M90 the loads would take the exit towards M8/Glasgow/Edinburgh/A8/Airport/A89/Broxburn and merge onto M9;
- At Junction 2 the loads would exit onto the M8;
- At Hermiston Gait Roundabout the loads would take the 3rd exit onto the A720 ramp to City Bypass/A720;
- The loads would follow the A720 until the Old Craighall Junction with the A1 where they would turn back and travel south on the A720 and exit at the A720/A68 junction onto the A68;
- Loads would turn left onto A697;
- Loads would turn left onto the B6456 towards the site access point.

12.5.3. The AIL route assumes a Port of Entry at Rosyth and generally utilises trunk roads. The final approved AIL route will not be known until the turbine supplier is appointed.

### *General Construction Traffic*

12.5.4. The distribution of general construction traffic from potential material sources to the site was considered along the A68, A697, A6105 and B6456. Beyond these routes the general construction traffic would be more dispersed.

12.5.5. There is a single site entrance point proposed for use by AILs, HGVs and LGVs. This is located on the B6456 to the west of Choicelee. See Figure 12.1, Volume 3a.

12.5.6. Traffic surveys were undertaken in June 2023 to establish the baseline traffic conditions. The ADT volumes from the surveys were used as the baseline with growth factors applied to project to the year 2028. Growth factors were established from TEMPro Version 8.0 using NTEM regional datasets.

12.5.7. Table 12.8 shows the projected 2028 traffic flows used in the assessment with their corresponding location, see Figure 12.1, Volume 3a.

**Table 12.8: Baseline Traffic Data**

| Count ID | Location | ADT (Total Traffic) | ADT (HGV Traffic) |
|---|---|---|---|
| **Traffic Count 1** | Link A -A68 Oxton to Roundabout (Rbt) with A697 | 1470 | 235 |
| **Traffic Count 2** | Link B -A697 Rbt with A68 to Whiteburn | 1028 | 71 |
| **Traffic Count 3** | Link C - B6456 Whiteburn to Site Entrance | 481 | 65 |
| **Traffic Count 4** | Link D - A697 Whiteburn to Greenlaw | 1374 | 278 |
| **Traffic Count 5** | Link E - A6105 Greenlaw to Choicelee | 883 | 52 |
| **Traffic Count 6** | Link F - B6456 Choicelee to Site Entrance | 504 | 150 |

## 12.6. Initial Screening Assessment

### *Quantification of Development Activities*

12.6.1. Vehicles and equipment will be delivered to site at the commencement of the construction phase and will remain on site until works relating to that stage are completed. Such equipment will include excavators, dump trucks and bulldozers and cranes for erecting the turbines.

12.6.2. Each vehicle travelling to the site will generate two 'vehicle movements'; one movement to the Proposed Development and one movement away from the Proposed Development i.e. 1 delivery to the Proposed Development = 2 vehicle movements.

12.6.3. The exception to this is for the AIL vehicles due to the special nature of these vehicles. These arrive to the Proposed Development as an AIL. They are then reduced in length and operate as a standard HGV for their departure from site. In this assessment each AIL delivery constitutes a single movement, with the corresponding departure from site assessed as a single HGV movement.

12.6.4. The application includes provision for onsite borrow pits that would be utilised to source stone for the construction of the access tracks and hardstands. It is anticipated these will provide sufficient quantity (~90,000m$^3$) and quality of stone for the Proposed Development (see Technical Appendix 9.3, Volume 4).

12.6.5. Similarly, given the size of the anticipated turbine foundations (~948 m$^3$ of concrete per turbine) 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.

12.6.6. However, this Chapter assesses the unlikely worst-case scenario of all stone being imported and all concrete foundations needing to be brought to site in ready mix lorries.

12.6.7. Most vehicles used during the construction activities will be below the requirement for wide loads, with the exception of the turbine deliveries, the substation transformer and possibly the 800/1000 and 400/500 (or less) tonne cranes, which would be used for the erection of the turbines.

### *Construction Traffic Generation*

12.6.8. The predicted number of construction traffic vehicle movements has been developed based on design information from the preparation of the EIAR as described in Chapter 4 Project Description, Volume 2 and Natural Power's and the Applicant's experience of wind farm, solar farm and battery storage construction. The assessment includes vehicle movements from the following construction activities with predicted movements detailed in Table 12.10.

- **Mobilisation to Site**: Mobilisation to site will 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. Rock crusher/processing plant will also be transported to site to crush and grade material from the borrow pits suitable for use in the construction works.
- **Construction compound**: The construction compound will consist of a crushed stoned hardstand area and temporary office and welfare facilities for construction staff. The hardstand area will include temporary storage containers and car parking space.
- **Site Tracks, Crane Hardstandings and Compounds (Stone)** - In order to assess a worst case scenario, it is assumed that all of the stone for the site tracks, crane hardstandings and compounds (substation and battery storage) would be imported and transported around site using dump trucks.
- **Geogrid and Culverts**: An allowance has been included for laying geogrids along the new and upgraded access tracks and crane hardstandings. Geogrid rolls are generally 4 m wide and therefore it is assumed two geogrids will be required per length of new track and one geogrid required for existing track which is to be widened to provide sufficient width coverage. Similarly, an allowance has been included for culverts for drainage and pipe crossings.
- **Turbine Foundations**: Based upon the proposed tip heights it is estimated a typical gravity foundation design will require up to 948 $m^3$ of concrete and 90 tonnes of steel reinforcement each. It is envisaged that concrete for the foundation will be batched on-site. Due to the risks associated with the logistics, travel time and criticality of foundation concrete, it is considered unlikely that ready-mix concrete will be adopted for the project. Therefore, importing will be dry materials only with aggregate assumed as site won and water for mixing sourced naturally on-site. **However, in order to present a worst case scenario this assessment assumes ready-mix concrete will be imported.**
- **Turbine Tower Sections**: The tower sections will be transported as AILs.
- **Turbine AILs:** For the size of turbines being considered for the site, the AILs will consist of 3 blade deliveries, up to 5 steel tower section deliveries, 1 nacelle delivery and 1 hub delivery (10 AIL deliveries per turbine). The transport of AILs 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 AIL, they leave as a standard HGV. The number of the AIL movements has been assessed separately however the associated HGV movements when departing the site have been included within the assessment of general construction traffic. The effects of AIL deliveries are quite different to those attributed to general construction traffic and hence these specific effects have also been assessed separately.

- **Turbine Assembly**: HGV deliveries for items that will be fitted within the turbines would be required for each turbine. The cranes (larger 1000 tonne and smaller 500 tonne crane) for assembling the wind turbines will be brought to site at the start of turbine assembly and remain on site until completion.
- **Substation (excluding platform)**: The substation will consist of a crushed stoned hardstand area and building to house the wind farm electrical and grid connection. HGV values for the delivery of the stone to form the platforms is included in 'Site Tracks, Crane Pads and Compounds' above. Material, such as concrete blocks, roof trusses, roof cladding and windows/doors for the substation building as well as the electrical equipment will need to be brought to site.
- **Wind Farm Cable Installation**: Cable installation includes the Low Voltage (LV) 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 site borrow pits, however, this is uncommon on wind farm construction and hence sand is assumed to be imported.
- **Battery Storage area (excluding platform):** Battery storage on a crushed stone hardstand area is also proposed adjacent to the substation site. HGV values for the delivery of the stone to form the platforms is included in 'Site Tracks, Crane Pads and Compounds' above. The battery storage may consist of battery containers (similar to shipping containers) and power conversion 'skids' which will be transported by HGV. Materials such as security fencing will need to be brought to site.
- **Solar Farm:** Installation includes the delivery and erection of solar panels onto mounting structures. HGV values for the delivery of the stone to form tracks is included in 'Site Tracks, Crane Pads and Compounds' above.
- **Demobilisation / Site Reinstatement:** Reinstatement of all construction phase working areas, removal of all plant from site.
- **Transport of site personnel**: Approximately 40-80 car/van movements per day would be required for the construction personnel and any small deliveries, based on worst-case assumptions of no car sharing. These have also been included in the assessment.

12.6.9. Table 12.9 summarises the HGV movements for the expected construction phase.

**Table 12.9: Estimated HGV construction traffic volumes**

| Item | HGV Movements | Notes |
|---|---|---|
| Mobilisation to Site | 64 | |
| Construction Compound | 496 | |
| Tracks | 7288 | Assessment is based on all stone being imported using 8 wheeler HGV with 20 tonne carrying capacity |
| Hardstands and platforms | 11952 | Assessment is based on all stone being imported using 8 wheeler HGV with 20 tonne carrying capacity |
| Turbine Foundations | 1968 | Assessment is based on concrete being imported |
| Substation | 1252 | |
| Cable Installation | 412 | Sand imported. |
| Wind Turbine Abnormal Loads | 60 | 60 AIL movements for deliveries to the proposed development. These have been assessed separately. |
| Wind Turbine Abnormal Loads | 60 | 60 HGV movements for vehicles departing site, these are included in the overall HGV numbers. |
| Erection of Turbines | 416 | 176 HGVs at start and end of turbine assembly for crane mob/de-mob.<br>240 HGVs throughout turbine assembly period to support turbine installation |
| Battery Storage | 144 | |
| Solar Panel Installation | 622 | |
| Solar Cable Installation | 690 | |
| Solar Fencing and CCTV | 98 | |
| Demobilisation | 64 | |

12.6.10. Table 12.10 summarises the total traffic movements generated by the Proposed Development which will be assessed against the baseline traffic flow figures for the A68, A697, A6105 and B6456 over the proposed 18-month construction period.

**Table 12.10: Total Proposed Development traffic movements**

| Total traffic movements | |
|---|---|
| Proposed Development HGV movements excluding ready mix concrete movements | 23,630 |
| Proposed Development Light personnel and LGV movements | 23,400 |
| Proposed Development HGV ready-mix concrete movements | 1,896 |
| Proposed Development AIL movements | 60 |
| **Total** | **48,986** |

12.6.11. It is expected that the Proposed Development highest average daily HGV movements will occur in month 10, see Table 12.11.

**Table 12.11: Peak average daily movements**

| Peak average daily movements | |
|---|---|
| Proposed Development HGV movements excluding ready mix concrete movements | 107 |
| Light personnel and LGV movements | 59 |
| **Total** | **166** |

## 12.7. Cumulative Effects

12.7.1. Other developments in the areas served by the roads assessed herein may generate their own construction, operational and decommissioning traffic (other wind farms, new urban development, shopping centres, etc.). The greatest changes in traffic associated with the Proposed Development will be short term, occurring during the construction phase.

12.7.2. In the absence of the Proposed Development, it is anticipated that there will be continuous traffic growth along the various traffic routes that would be used by this development. These links will experience increased traffic flows from other development pressures, tourism traffic and population growth.

12.7.3. In order to quantify this background growth on these links, the list of cumulative developments has been reviewed, (see Technical Appendix 6.4, Volume 4 of the EIAR), to determine if any fall within the zone of influence for traffic and transport. The zone of influence is defined as other committed developments that generate significant traffic volumes which have a traffic statement or traffic assessment in the public domain that evidences the use of the same links as would be utilised by the Proposed Development concurrently and would result in a cumulative increase in traffic movement on those links at the same time as the Proposed Development.

12.7.4. The process scoped out all wind developments with the exception of the following:

- Dunside Wind Farm
  - Application for consent under Section 36 of the Electricity Act 1989 and deemed planning permission under section 57(2) of the Town and Country Planning (Scotland) Act 1997, of up to 15 wind turbines, up to tip height of 220 m, located approximately 14 km from the Proposed Development. Dunside wind farm has an estimated earliest year

of construction identified as 2026. This is providing consent is granted within estimated timeframes and with construction of the wind farm anticipated to take approximately 19 months. With the construction of the Proposed Development estimated to commence in 2028, traffic linked with both developments could have a cumulative impact on associated roads.

- Ditcher Law Wind Farm
  - Ditcher Law wind farm is an application for consent under Section 36 of the Electricity Act 1989 and deemed planning permission under section 57(2) of the Town and Country Planning (Scotland) Act 1997 for a proposed wind farm development located approximately 24km from the Proposed Development. Ditcher Law is not yet a consented development but rather at the preliminary stages where a scoping report has been submitted. This is a 9 turbine site up to 200m tip height and as there is no mention of the construction stage at this interim period, this development has been excluded from the cumulative assessment.
- Longcroft Wind Farm
  - This is a proposed 24 turbine site located approximately 18km west of the Proposed Development. Longcroft wind farm is not yet a consented development but rather at the preliminary stage of scoping and has therefore been excluded from the cumulative assessment.

12.7.5. Dunside Wind Farm was identified as a development which may have cumulative effects on the Proposed Development traffic and transport assessment. Available data has been reviewed to source programme and predicted traffic movements and these have been incorporated into the assessment.

12.7.6. To ensure the assessment is demonstrating a worst-case scenario, Dunside Wind Farm predicted construction traffic movements have been inserted into the programme such that the predicted peak months for both developments coincide. The likelihood of this occurring is considered to be low but is considered to be of sufficient possibility to be worthy of assessment of both projects together rather than assessing the Proposed Development alone.

12.7.7. There are various factors for both Dunside Wind Farm and the Proposed Development which could result in a considerable reduction in HGV movements. The use of borrow pits on either or both developments would reduce or possibly remove the need for importation of stone and batched concrete (ready mix) which would significantly lower the HGV movements. Offsetting the peak construction months for the two developments would also result in a lower cumulative percentage increase in traffic movements. It is considered likely that at least some of these reductions will occur, but no allowance has been made for this in order to ensure a worst-case scenario has been assessed.

12.7.8. Table 12.12 and Table 12.13 illustrate this distribution of traffic over the Proposed Development 18-month construction period. The turbine foundation numbers only include for reinforcement deliveries as it is not considered appropriate to simply distribute HGV numbers for ready-mix concrete pours for the foundations over a month duration. Concrete pours for turbine foundations typically take place over a single day and hence the estimated 948 $m^3$ of concrete for a foundation would be delivered by HGVs within typically a 10–12-hour period. Therefore, the effect of this is discussed separately in Paragraph 12.7.1512.7.15.

**Table 12.12: Predicted vehicle movements during the construction period**

| Activity | Month | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Mobilisation & Site Establishment | 64 | | | | | | | | | | | | | | | | | |
| Construction Compound Set-up | | 496 | | | | | | | | | | | | | | | | |
| Tracks | | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 700 | 700 | 638 | | | | | | | |
| Hardstands and Platforms | | | 1400 | 1400 | 1400 | 1200 | 1200 | 1200 | 1200 | 1200 | 952 | 800 | | | | | | |
| Turbine foundations | | | | | | | | | | 18 | 18 | 18 | 18 | | | | | |
| Substation Compound & Control Building | | | | | | | | | | 314 | 314 | 314 | 310 | | | | | |
| Cabling & Electrical Works | | | | | | | | | | | 140 | 140 | 132 | | | | | |
| AIL vehicles departing site as HGVs | | | | | | | | | | | | | | 30 | 30 | | | |
| Crane delivery / demobilisation | | | | | | | | | | | | | 88 | | | | 88 | |
| Erection of Turbines | | | | | | | | | | | | | | 80 | 80 | 80 | | |
| BESS | | | | | | | 36 | 36 | 36 | 36 | | | | | | | | |
| Solar Panel Delivery and installation | | | | | | | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 62 | | | | |
| Solar cable delivery and installation | | | | | | | | | | | 116 | 116 | 116 | 116 | 116 | 110 | | |
| Solar Fencing and CCTV | | | | | | | | | | | | | | 34 | 34 | 30 | | |

| Activity | Month | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Commissioning & Testing | | | | | | | | | | | | | | | | | | |
| Site Restoration & Demobilisation | | | | | | | | | | | | | | | | | | 64 |
| Proposed Development HGV Total Monthly Movements | 64 | 1246 | 2150 | 2150 | 2150 | 1950 | 2066 | 2066 | 2016 | 2348 | 2258 | 1468 | 744 | 322 | 260 | 220 | 88 | 64 |
| Dunside WF HGV Total Monthly Movements | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 |
| Total Cumulative HGV Monthly Movements | 1560 | 2742 | 3646 | 3646 | 3646 | 3446 | 3562 | 3562 | 3512 | 3844 | 3754 | 2964 | 2240 | 1818 | 1756 | 1716 | 1584 | 1560 |

*Note The distributed turbine foundation numbers include for reinforcement only as it is not considered appropriate to distribute / average ready-mix concrete deliveries over a monthly basis as each pour would be undertaken in a day.*

**Table 12.13: Predicted vehicle movements during the construction period (Cars & LGVs)**

| Activity | Month | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Proposed Development LGV Total Monthly Movements | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 | 1300 |
| Dunside WF LGV Total Monthly Movements | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 | 924 |
| Total Cumulative LGV Monthly Movements | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 | 2224 |

**Table 12.14: Total cumulative vehicle movements**

| Activity | Month | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Total Monthly Vehicle Movements | 3784 | 4966 | 5870 | 5870 | 5870 | 5670 | 5786 | 5786 | 5736 | 6068 | 5978 | 5188 | 4464 | 4042 | 3980 | 3940 | 3808 | 3784 |
| Average Daily Total Vehicle Movements | 172 | 226 | 267 | 267 | 267 | 258 | 263 | 263 | 261 | 276 | 272 | 236 | 203 | 184 | 181 | 179 | 173 | 172 |
| Average Daily Total HGV Movements | 71 | 57 | 98 | 98 | 98 | 89 | 94 | 94 | 92 | 107 | 103 | 67 | 34 | 15 | 12 | 10 | 4 | 3 |

### *Distribution of Construction Traffic*

12.7.9. Consideration is given to the likely distribution of construction traffic from material/supply sources to the Proposed Development. There are various stone and concrete suppliers located in proximity. It is considered most likely that suppliers will travel along the A68/A697/B6456 or alternatively along the A697/A6105/B6456 to the site access.

12.7.10. For assessment purposes, to provide a worst case scenario, it has been assumed that 100% of all vehicles will use each link when accessing the Proposed Development.

12.7.11. The Construction TMP will aim to control the HGV routes as far as reasonably practicable to ensure minimal disruption is caused.

### *Screening*

12.7.12. Applying a scenario distribution split of 100 % of traffic utilising each link, the resultant percentage increase in traffic versus the baseline is indicated in Table 12.15, over the 18-month construction duration for the total vehicles and HGV vehicles.

Table 12.15: Estimated cumulative percentage increase in traffic over construction phase

| | % Increase in Total Traffic per month | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** |
| **Link** | | | | | | | | | | | | | | | | | | |
| **Link A - A68** | 12 | 15 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 19 | 18 | 16 | 14 | 12 | 12 | 12 | 12 | 12 |
| **Link B - A697** | 17 | 22 | 26 | 26 | 26 | 25 | 26 | 26 | 25 | 27 | 26 | 23 | 20 | 18 | 18 | 17 | 17 | 17 |
| **Link C - B6456** | 36 | 47 | 56 | 56 | 56 | 54 | 55 | 55 | 54 | 57 | 57 | 49 | 42 | 38 | 38 | 37 | 36 | 36 |
| **Link D - A697** | 13 | 16 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 20 | 20 | 17 | 15 | 13 | 13 | 13 | 13 | 13 |
| **Link E - A6105** | 7 | 13 | 18 | 18 | 18 | 17 | 17 | 17 | 17 | 19 | 18 | 14 | 11 | 8 | 8 | 8 | 7 | 7 |
| **Link F - B6456** | 12 | 23 | 31 | 31 | 31 | 29 | 30 | 30 | 30 | 33 | 32 | 25 | 18 | 14 | 14 | 14 | 13 | 12 |
| | **% Increase in HGV Traffic per month** | | | | | | | | | | | | | | | | | |
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** |
| **Link** | | | | | | | | | | | | | | | | | | |
| **Link A - A68** | 30 | 53 | 71 | 71 | 71 | 67 | 69 | 69 | 68 | 74 | 73 | 57 | 43 | 35 | 35 | 33 | 31 | 30 |
| **Link B - A697** | 100 | 175 | 233 | 233 | 233 | 220 | 228 | 228 | 224 | 246 | 240 | 189 | 143 | 116 | 114 | 110 | 101 | 100 |
| **Link C - B6456** | 110 | 193 | 256 | 256 | 256 | 242 | 250 | 250 | 247 | 270 | 264 | 208 | 157 | 128 | 126 | 121 | 111 | 110 |
| **Link D - A697** | 25 | 45 | 60 | 60 | 60 | 56 | 58 | 58 | 57 | 63 | 61 | 48 | 37 | 30 | 29 | 28 | 26 | 25 |
| **Link E - A6105** | 6 | 109 | 189 | 189 | 189 | 171 | 181 | 181 | 177 | 206 | 198 | 129 | 65 | 28 | 25 | 19 | 8 | 6 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Link F - B6456** | 2 | 38 | 65 | 65 | 65 | 59 | 62 | 62 | 61 | 71 | 68 | 44 | 22 | 10 | 9 | 7 | 3 | 2 |

*Note: Numbers in bold in grey cells indicate those months where the threshold (see Paragraph 12.3.9) has been exceeded*

12.7.13. Assessing against the criteria in Paragraph 12.3.9, on the sensitivity testing basis of 100 % of construction vehicles using each link, Link C and Link F exceed the Rule 1 threshold. All links exceed the Rule 2 threshold of 10 % increase in HGV traffic. Accordingly, all links have been taken forward for further assessment.

**Table 12.16: Months during which the Rule 1 and Rule 2 thresholds are exceeded**

| Link | Rule 1 | Rule 2 |
|---|---|---|
| Link A - A68 | N/A | Months 1 - 18 |
| Link B - A697 | N/A | Months 1 - 18 |
| Link C - B6456 | Months 1 - 18 | Months 1 - 18 |
| Link D - A697 | N/A | Months 1 - 18 |
| Link E - A6105 | N/A | Months 2 - 16 |
| Link F - B6456 | Months 3 – 5, 7, 8, 10 & 11 | Months 2 - 13 |

### *Magnitude of Impact*

12.7.14. Paragraph 12.7.13 12.7.13 identified all the assessment links as highway links requiring more detailed assessment. As identified in Table 12.16 the percentage increase in HGV traffic exceeded the thresholds with associated magnitude of impact as indicated in Table 12.1.

**Table 12.17: Magnitude of Impact**

| Link | Maximum Increase in HGV traffic flows (%) | Magnitude of Impact |
|---|---|---|
| Link A - A68 | 74 | Medium |
| Link B - A697 | 246 | High |
| Link C - B6456 | 270 | High |
| Link D - A697 | 63 | Medium |
| Link E - A6105 | 206 | High |
| Link F - B6456 | 71 | Medium |

### *Magnitude of Change; Turbine Foundation Concrete Pours Delivery*

12.7.15. As noted in Paragraph 12.7.812.7.8, the assessment does not include for the concrete foundation pours. For a 948 $m^3$ foundation it is anticipated 158 HGV deliveries (316 movements) will be required over a single 10–12-hour period. Each link has been noted in Table 12.18 with the resultant percentage increase to Average Annual Daily Traffic (AADT) which occurs during this activity. With 6 foundations, this increase in traffic will occur on 6 separate days over the 18 -month foundation construction period.

Table 12.18: Traffic increase during turbine foundation pours

| Link | Turbine foundation pour movements | Resultant increase of traffic as % | Resultant increase of HGV traffic as % | Magnitude of Impact |
|---|---|---|---|---|
| Link A - A68 | 316 | 21% | 135% | High |
| Link B - A697 | 316 | 31% | 444% | High |
| Link C - B6456 | 316 | 66% | 489% | High |
| Link D - A697 | 316 | 23% | 114% | High |
| Link E - A6105 | 316 | 36% | 611% | High |
| Link F - B6456 | 316 | 63% | 210% | High |

12.7.16. Although the impacts resulting from the turbine foundation concrete pours are infrequent and over a very short period, the concrete foundation pours have been taken forward for further assessment.

### *Magnitude of change: AIL Deliveries*

12.7.17. AIL numbers for the delivery of components have been included within the assessment to ensure a robust assessment of all vehicles. As outlined in paragraph 12.6.8, for each turbine there will be 10 AIL deliveries required, therefore 60 deliveries in total. It is anticipated that there would be a maximum of 3 AIL deliveries per day. Each link has been noted in Table 12.19 with the resultant percentage increase to AADT which occurs during this activity.

12.7.18. 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 two month period with around 30 vehicle deliveries per month.

Table 12.19: Traffic increase during AIL delivery

| Link | AIL delivery | Resultant increase of traffic as % | Resultant increase of HGV traffic as % | Magnitude of Impact |
|---|---|---|---|---|
| Link A - A68 | 3 | 1% | 1% | Negligible |
| Link B - A697 | 3 | 1% | 4% | Negligible |
| Link C - B6456 | 3 | 1% | 5% | Negligible |

12.7.19. Although the magnitude of impact resulting from the AIL deliveries is found to be negligible, AIL deliveries have been taken forward for further assessment.

## 12.8. Assessment of potential 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 sensitive areas where traffic flows would increase by 10% or more.

12.8.2. As outlined in Paragraph 12.7.13 all links were identified as meriting further detailed assessment.

### *Identification and assessment of Receptor Sensitivity*

12.8.3. A detailed assessment to identify the receptors and assess their sensitivity on each of the highway links has been undertaken. Table 12.20 details the assessment of the sensitivity (L = Low, M = Medium, H = High) for the receptors identified on the applicable highway links.

**Table 12.20: Receptor sensitivity assessment**

| Receptor Description | Impact | L | M | H | Rationale |
|---|---|---|---|---|---|
| Public Road Network and Users | | | | | |
| Link A - A68 | Driver Delay | X | | | No capacity issues raised |
| | Cyclist Amenity | X | | | No cycle provisions currently available |
| | Safety | | X | | Local road reasonably straight, no fatal accidents, 1 serious incident and 2 slight incidents recorded within previous 5 years |
| | Road Structure | X | | | No physical defects apparent |
| Link B - A697 | Driver Delay | X | | | No capacity issues raised |
| | Cyclist Amenity | X | | | No cycle provisions currently available |
| | Safety | | X | | Local road with bends, no fatal accidents, 3 serious incidents and 7 slight incidents recorded within previous 5 years |
| | Road Structure | X | | | No physical defects apparent |
| Link C - B6456 | Driver Delay | X | | | No capacity issues raised |
| | Cyclist Amenity | X | | | No cycle provisions currently available |
| | Safety | | X | | Local road, reasonably straight. No fatal or serious accidents, 1 slight incident recorded within previous 5 years.<br>Near to school. |
| | Road Structure | X | | | No physical defects apparent |
| Link D - A697 | Driver Delay | X | | | No capacity issues raised |
| | Cyclist Amenity | X | | | No cycle provisions currently available |
| | Safety | | | X | Local road, reasonably straight. 1 fatal accident and 2 slight incidents recorded within previous 5 years. |
| | Road Structure | X | | | No physical defects apparent |
| Link E - A6105 | Driver Delay | X | | | No capacity issues raised |
| | Cyclist Amenity | X | | | No cycle provisions currently available |
| | Safety | X | | | Local road reasonably straight, no accidents or incidents recorded within previous 5 years |
| | Road Structure | X | | | No physical defects apparent |

| Receptor Description | Impact | L | M | H | Rationale |
|---|---|---|---|---|---|
| Link F - B6456 | Driver Delay | X | | | No capacity issues raised |
| | Cyclist Amenity | X | | | No cycle provisions currently available |
| | Safety | X | | | Local road reasonably straight, no accidents or incidents recorded within previous 5 years |
| | Road Structure | X | | | No physical defects apparent |
| Local Settlements | | | | | |
| Westruther (Link D - B6456) | Severance | | X | | Reasonable pedestrian facilities including narrow footpaths on each side through part of the settlement.<br>Residential properties set back from the road.<br>Crossing of road will be required for access to school. |
| | Pedestrian Delay | X | | | |
| | Pedestrian Amenity | X | | | |
| | Pedestrian Fear and Intimidation | | X | | |
| | Safety | | X | | |

### *Assessment of Construction Phase Effects*

12.8.4. Synthesising the magnitude and sensitivity provides the resultant significance for these highway links and associated receptors and is reported in Table 12.21.

**Table 12.21: Assessment of cumulative construction effects**

| Receptor Description | Impact | Duration | Sensitivity | Magnitude | Effect | Significance |
|---|---|---|---|---|---|---|
| Public Road Network and Users | | | | | | |
| Link A - A68 | Driver Delay | Temporary | Low | Medium | Moderate/Minor | Not Significant |
| | Cyclist Amenity | Temporary | Low | Medium | Moderate/Minor | Not Significant |
| | Safety | Temporary | Medium | Medium | Moderate | Not Significant |
| | Road Structure | Temporary | Low | Medium | Moderate/Minor | Not Significant |
| Link B - A697 | Driver Delay | Temporary | Low | High | Moderate | Not Significant |
| | Cyclist Amenity | Temporary | Low | High | Moderate | Not Significant |
| | Safety | Temporary | Medium | High | Major/Moderate | **Significant** |
| | Road Structure | Temporary | Low | High | Moderate | Not Significant |
| Link C - B6456 | Driver Delay | Temporary | Low | High | Moderate | Not Significant |
| | Cyclist Amenity | Temporary | Low | High | Moderate | Not Significant |
| | Safety | Temporary | Medium | High | Major/Moderate | **Significant** |
| | Road Structure | Temporary | Low | High | Moderate | Not Significant |
| Link D - A697 | Driver Delay | Temporary | Low | Medium | Moderate/Minor | Not Significant |
| | Cyclist Amenity | Temporary | Low | Medium | Moderate/Minor | Not Significant |
| | Safety | Temporary | High | Medium | Major/Moderate | **Significant** |
| | Road Structure | Temporary | Low | Medium | Moderate/Minor | Not Significant |
| Link E - A6105 | Driver Delay | Temporary | Low | High | Moderate | Not Significant |
| | Cyclist Amenity | Temporary | Low | High | Moderate | Not Significant |
| | Safety | Temporary | Low | High | Moderate | Not Significant |
| | Road Structure | Temporary | Low | High | Moderate | Not Significant |
| Link F - B6456 | Driver Delay | Temporary | Low | Medium | Moderate/Minor | Not Significant |

| Receptor Description | Impact | Duration | Sensitivity | Magnitude | Effect | Significance |
|---|---|---|---|---|---|---|
| | Cyclist Amenity | Temporary | Low | Medium | Moderate/Minor | Not Significant |
| | Safety | Temporary | Low | Medium | Moderate/Minor | Not Significant |
| | Road Structure | Temporary | Low | Medium | Moderate/Minor | Not Significant |
| Local Settlements | | | | | | |
| Westruther (Link D - B6456) | Severance | Temporary | Medium | Medium | Moderate | Not Significant |
| | Pedestrian Delay | Temporary | Low | Medium | Moderate/Minor | Not Significant |
| | Pedestrian Amenity | Temporary | Low | Medium | Moderate/Minor | Not Significant |
| | Pedestrian Fear and Intimidation | Temporary | Medium | Medium | Moderate | Not Significant |
| | Safety | Temporary | High | Medium | Major/Moderate | **Significant** |

12.8.5. Only effects which are Major and Major/Moderate are considered significant. With reference to Table 12.21, there are four receptors achieving these levels of effect and as such require additional mitigation measures. It should be noted that this level of effect is temporary, occurring only during the worst-case assumptions for the construction phase, after which time traffic will return to the baseline conditions.

### *Assessment of Turbine Foundation Concrete Pour Effect*

12.8.6. Table 12.18 noted the magnitude of impact for each of the highway links to be High when used during turbine foundation pours.

12.8.7. With 6 foundations, this increase in traffic will occur on 6 separate days over the months (10-13) of foundation construction period, equating to less than two days per month. Given the criticality of the foundation pours and the number of HGV movements involved it is expected no other site works will be undertaken on a foundation pour day to ensure concrete deliveries through the site road network remain un-interrupted.

12.8.8. Import of ready-mix concrete for the turbine foundations has been adopted to consider a worst-case scenario. Due to the risks associated with the logistics, travel time and criticality of foundation concrete, it is considered unlikely ready-mix concrete will be adopted for the project and the Proposed Development includes an on-site batching plant for these reasons.

12.8.9. To consider a worst case, should the import of ready-mix concrete be adopted for the Proposed Development then the receptor sensitivity for each highway link is considered to be Medium. With the magnitude of impact of High, based upon the assessment criteria in Table 12.5 the resultant effect associated would be considered to be significant.

### *Assessment of AIL Delivery*

12.8.10. Table 12.19: Traffic increase during AIL deliverynoted that the magnitude of impact for the AIL deliveries is below the threshold for assessment, therefore were not required to be taken forward for assessment.

12.8.11. Details of the route and anticipated areas of upgrade works to accommodate both overrun and oversail is included in the AILAA in Technical Appendix 12.2, Volume 4.

12.8.12. The primary effect associated with the transportation of AILs is considered to be driver delay on other road users. In addition to magnitude of impact being below the threshold for assessment, the effects on local settlements (i.e. severance, pedestrian, delay, safety) and road structure are not considered to merit further detailed assessment for the following reasons:

- The duration of an AIL delivery through/past the settlement is short (i.e. a timescale of minutes).
- A significant level of preparation goes into planning these deliveries with the police and local authorities and there are management/control measures in place during the delivery (e.g. police escorts).
- Prior to any AIL delivery, the structural capacity of the road and bridges/culverts would be assessed, and any strengthening works implemented. The necessary permits to deliver AILs would not be released from the relevant road authorities until they are satisfied that this aspect has been fully addressed.

12.8.13. Some driver delay can be expected to occur on routes due to the slow movement of AIL deliveries between the port of delivery and the Proposed Development. Where safe to do so, AILs will occasionally stop to allow traffic to pass if necessary. A total of 60 AILs associated with turbine delivery, are anticipated. These will be distributed over a series of 20 nights, based upon convoy deliveries of three vehicles per night, during months 14 and 15. Due to the overall limited number of loads across the construction programme resulting

in a low magnitude of impact, and the short term nature of this phase of works, the anticipated effect of AIL deliveries on driver delay would be considered to be not significant.

## 12.9. Additional mitigation

12.9.1. As noted previously, the assessment includes for embedded mitigation delivered through the construction TMP. Additional mitigation has been considered where effects were assessed as Major or Major/Moderate significance; this addition mitigation will also be delivered through the construction TMP.

12.9.2. The above assessment indicated there would be four receptors experiencing temporary effects considered as significant.

### *Accidents & Safety*

12.9.3. Links B, C, and D were identified as having significant effects resulting from medium or high sensitivity to increased HGV movements due to accident rates currently experienced on these links.

12.9.4. Additional mitigation measures available to reduce the sensitivity (and thereby reduce the significance of effect) are:

- Temporary signage through peak construction periods to inform both drivers and pedestrians of the risks and highlight construction traffic routes and priorities;
- Temporary speed restriction for construction traffic travelling along links; and
- Consultation with Dunside Wind Farm developers to minimise high vehicle activities occurring simultaneously.

12.9.5. The resultant significance level of effects with these temporary measures would be considered moderate and therefore not significant.

### *Settlements*

12.9.6. Westruther was identified as having a high sensitivity to increased HGV movements on safety. Measures to mitigate the sensitivity would be available, including:

- Temporary pedestrian crossings points at key locations within the settlement;
- Temporary footpath barriers or bollards to provide delineation between footpath and carriageway; and
- Temporary signage through peak construction periods to inform both drivers and pedestrians of the risks.

12.9.7. The suitability and effectiveness of the additional mitigation measures would need to be considered in detail so as to develop a set of effective traffic control measures. Key to this would be proactive consultation during both the pre-construction and construction stages with the local authority and particularly, the local community or communities who would 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.

12.9.8. It is considered these temporary measures would reduce the sensitivity of the receptors and therefore reduce the significance level of effects to moderate and to not significant.

### *Turbine Foundation Concrete Pours*

12.9.9. It is intended that the concrete for the turbine foundations will be batched on-site, utilising materials from the borrow pits. This would result in significantly fewer HGVs on the surrounding road network than would result from importing concrete. However, for the purposes of a worst-case scenario assessment, it has been assumed that all concrete will be imported to site.

12.9.10. Turbine foundation concrete pours effects were considered significant in the worst-case scenario assessment, and this section details the measures proposed to mitigate the impacts.

12.9.11. It is recognised that importing ready-mix concrete for turbine foundation pours will have an impact due to the large numbers of HGVs required and concentrated within a 10–12-hour period, despite this being an infrequent event (i.e. only six times over a 4-month period).

12.9.12. Given the criticality of the foundation pours and the number of HGV movements involved it is expected no other site works will be undertaken on a foundation pour day to ensure concrete deliveries through the site road network remain un-interrupted.

12.9.13. The most important mitigation measure will be the proactive consultation with the local community to provide advance warning of when concrete pours are scheduled. The detail of how this information is delivered to the local community will be agreed as part of the construction TMP. As a minimum, it is expected to include signage on the road to be used advising of dates for concrete pours well in advance of the scheduled dates and direct notification (e.g. letter drops, face to face, SMS) to the individual properties ahead of concrete pours.

12.9.14. With the incorporation of the above additional mitigation measures the sensitivity of concrete deliveries associated with the wind turbine foundations will be reduced to Low. Based upon the criteria in Table 10.6 the resultant significance level of effect is Moderate which is considered to be not significant.

## 12.10. Residual Effects

12.10.1. The significance levels of effects are fully detailed in Table 12.21 for each receptor assessed. Table 12.22 summarises the residual effects (post additional mitigation as described in Section 12.9) in terms of the receptor group and the highest residual effect determined for a receptor within that group.

**Table 12.22: Highest effect by receptor group**

| Receptor Group | Highest Residual Effect |
|---|---|
| Public Road Network and Users | Moderate |
| Local Settlements | Moderate |

12.10.2. The residual effects on these receptor groups are concluded to be not significant.

12.10.3. The effect of the turbine foundation concrete pours, should ready-mix concrete be adopted rather than the intended on-site batching plant, was assessed and considered significant without any mitigation. However, with additional mitigation applied as described in Section 12.9.13, the effects are considered to be not significant.

## 12.11. Conclusion

12.11.1. The traffic and transport assessment has assessed the traffic impacts and effects associated with the Proposed Development. The assessment considered the most likely construction methods, programme and sequencing against baseline traffic conditions. A worst-case scenario was considered which assumes all stone would be imported onto site and all foundation concrete would need to be brought to site in ready mix lorries.

12.11.2. Although there are two main routes to the Proposed Development which construction traffic could use, the link assessment was undertaken on a sensitivity testing basis, whereby the links on both routes were assessed to consider the impact of carrying 100% of the construction traffic.

12.11.3. The assessment considered the predicted construction traffic from Dunside Wind Farm due to its proximity to the Proposed Development. The likelihood of both developments occurring simultaneously at peak flows is considered to be low but of sufficient possibility to be worthy of assessment of both projects together.

12.11.4. A preliminary TMP has been prepared and included in Technical Appendix 12.1, Volume 4. The assessment is based on a number of conservative assumptions around the construction programme/sequencing, source of stone and concrete deliveries. These assumptions can only be clarified post consent. Hence, it is expected that the Proposed Development will be subject to a planning condition for a final construction TMP to be prepared and approved by SBC post consent and prior to construction works commencing.

12.11.5. The traffic effects associated with the turbine foundation concrete pours was assessed.

12.11.6. The traffic impact associated with the AIL delivery was below the threshold for assessment. deemed an AILAA, including swept path analysis at particular locations was prepared demonstrating the viability of the proposed AIL route and is included as an appendix to this chapter (Technical Appendix 12.2, Volume 4).

12.11.7. The assessment concludes that, with the incorporation of embedded mitigation measures and additional mitigation measures secured through a construction TMP, there will be no residual significant traffic effects associated with the Proposed Development either alone or in combination with other relevant projects.

## 12.12. Statement of Competence

12.12.1. 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 third-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.

12.12.2. The DAS team is involved in all stages of wind farm and solar 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 for the current planning stage where the traffic impacts and preliminary TMP will be picked up and further refined during planning condition discharge and into construction.

**Table 12.23: Statement of competence**

| Discipline | Consultant | Companyt | Experience |
|---|---|---|---|
| Design, Traffic and Transport<br>Civil Infrastructure Design | Mhairi Bowley | Natural Power Consultants | Responsible for providing a range of services throughout all stages of a project lifecycle, Mhairi has provided consultancy services on a variety of large-scale renewable energy projects across the UK. These services include feasibility studies, EIARs, pre-construction and construction services, with expertise in transport assessments and civil infrastructure design.<br>Mhairi has specialist knowledge of traffic and transport related assessments, including abnormal load route assessments (incl. swept path analysis), working closely with experienced haulage contractors, and traffic impact assessments for inclusion within EIARs, in line with the latest UK and local transport guidance. In addition, Mhairi is experienced in provision of civil infrastructure design, specialising in large scale wind farm projects, and acting as Principal Designer (Construction, Design and Management Regulations 2015) across the renewable energy sector, including for the proposed development. |