

# 12 Traffic and Transportation

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# 12 Traffic and Transport

## 12.1 Executive Summary

- 12.1.1 The Proposed Development has the potential to affect the surrounding transport network during its construction, operation and decommissioning phases. During construction, potential effects could arise from traffic travelling to and from the site delivering materials and plant. The Applicant expects all these vehicles to arrive at and depart from the site via Junction 11 of the M74, with the exception of timber related traffic and any pre-construction Site Investigation (SI) traffic that will use the Station Road access. The effects of the additional traffic estimated to be generated during the construction of the Proposed Development have been assessed and considered to be negligible. No mitigation is proposed, but 'good practice' measures will be implemented.
- 12.1.2 The Proposed Development will generate only the occasional maintenance or inspection vehicle during its operational period and the effects of this traffic are also considered to be negligible. The number of vehicles generated during the decommissioning of the Proposed Development is considered to be less than during construction and is also therefore considered to be negligible.
- 12.1.3 Potential cumulative effects could arise from the traffic generated by the Proposed Development and other consented developments. However, the traffic estimated to be generated by the Proposed Development is relatively small compared to the total of that estimated to be generated by the consented developments. Furthermore, the traffic generated during the construction of the Proposed Development is expected to last for only around a year after which the Proposed Development will be fully operational and traffic volumes will reduce. The cumulative effects arising from the Proposed Development and the other consented developments is considered to be negligible.

## 12.2 Introduction

- 12.2.1 This chapter sets out the traffic and transport aspects of the Proposed Development. Specifically, this chapter:
- Describes the method used to assess the potential traffic and transport effects of the Proposed Development;
  - Describes the existing transport network in the vicinity of the Proposed Development;
  - Explains the traffic and transport effects of the Proposed Development (both in isolation and in combination with other developments) and determines the level and significance of these effects; and
  - Identifies any measures required to mitigate these effects.

- 12.2.2 Some timber will be required to be removed from the site prior to/in tandem with construction commencing. This timber will be removed via the existing permitted forestry access route to Station Road at Douglas West. This timber is approaching maturity and, in the absence of the Proposed Development, would be removed from the site via the Station Road access point in any event, in line with the currently Approved Forest Plan (refer to Chapter 16 Forestry). Therefore, the transport movements associated with the forestry removal to facilitate the Proposed Development are not considered further in this assessment.

## 12.3 Legislation, Policy and Guidelines

### ***Legislation***

- 12.3.1 There is no relevant legislation specific to the assessment of traffic and transport effects arising from the Proposed Development.

## **Planning Policy**

12.3.2 Scottish Planning Policy (SPP) was published in 2014. It sets out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land. SPP states the following in regard to the consideration of the transport effects arising from energy development:

*"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:*

[...]

- *impacts on road traffic;*
- *impacts on adjacent trunk roads;"*

12.3.3 SLC's LDP includes a policy on renewable energy, which refers to their Supplementary Guidance document on renewable energy. That document states:

*"The construction of wind energy developments can have significant short term impacts on the road network. Access for construction traffic must not compromise road safety, residential amenity or cause significant permanent damage to the environment. Applicants must provide an assessment of the traffic impact during both the construction and operational periods and demonstrating suitability of the transport routes for delivering turbine and other components from their source."*

## **Guidance**

12.3.4 The Institute of Environmental Assessment's (IEA) Guidelines for the Environmental Assessment of Road Traffic (1993) is used for the assessment of environmental impacts of road traffic associated with major new developments, irrespective of whether the sites are to be subject to formal EIA or not. The guidelines suggest that two broad principles can be used as a screening process to delimit the scale and extent of the assessment. These are:

- Rule 1 - Include highway links where traffic flows would increase by more than 30% (or the number of Heavy Goods Vehicles (HGV) would increase by more than 30%); and
- Rule 2 - Include any other specifically sensitive areas where traffic flows would increase by 10% or more. (Paragraph 3.20 of the guidelines defines sensitive areas as including accident black spots, conservation areas, hospitals, links with pedestrian flows etc.)

12.3.5 Where the predicted increase in traffic is lower than these thresholds, the level of the effects can be stated to be low or negligible (and not significant) and further detailed assessments are not warranted. Furthermore, it should be noted that traffic increases below 10% are generally accepted to be insignificant as no discernible environmental effects are expected and baseline daily variations in background traffic flow may fluctuate by this amount in any event.

## **12.4 Consultation**

12.4.1 SLC and Transport Scotland (the road authority for the M74) were consulted to agree the scope of the assessment of the Proposed Development (refer to Appendix 4.1). Their responses are summarised in Table 12.1 below.

**Table 12.1 – Summary of Consultation Responses**

| Consultee | Response  | Comment   |
|-----------|---|---|
| SLC       | Traffic and Transport chapter should include swept path analysis to ensure that the delivery of the larger components can be accommodated within the public road. | Swept path assessments are included in Appendix 12.1. |

| <b>Consultee</b>   | <b>Response</b>   | <b>Comment</b>   |
|--------------------|---|--|
| Transport Scotland | Submitted scope considered to be acceptable. Transport Scotland also require an Abnormal Loads Assessment to be provided, to ensure the larger blade size can be accommodated at the trunk road junctions. The assessment should contain swept path analysis to identify the nature of any mitigation that may be required including physical works and the temporary removal of any street furniture | Assessment prepared in line with scope proposed to Transport Scotland. Full Abnormal Load Assessment will be provided prior to turbine deliveries commencing (once final turbine model is selected), but swept path assessments for maximum component sizes are included in Appendix 12.1. |

## 12.5 Assessment Methodology and Significance Criteria

### ***Consultation***

12.5.1 Consultation with the appropriate roads authorities was undertaken as described in section 12.4 above. This consultation described the scope and method proposed to undertake the assessment.

### ***Study Area***

12.5.2 The impact of the Proposed Development was assessed by comparing the predicted increases in traffic arising from the construction and operation of the Proposed Development against the two rules set out in the IEA Guidelines mentioned above. The Applicant advises that traffic arising from the construction of the Proposed Development is likely to come from and go to points accessed via the M74 to the north. All wind farm construction traffic, including all wind turbine components, will access the site via the existing private access road from J11 of the M74. Hence the study area was informed by the routes likely to be taken by vehicles to and from the Proposed Development and covers the following sections of road (refer to Figure 12.1):

- The M74 between junctions 10 and 11.
- The B7078 between the eastern roundabout at Junction 11 and the slip road to the northbound M74.

### ***Potential Effects***

12.5.3 Where the increase in predicted traffic breaches either of the two rules from the Guidelines for the Environmental Assessment of Road Traffic above, the guidance suggests that further assessment should be made of the effects of this additional traffic on matters such as:

- Noise;
- Vibration;
- Visual effects;
- Severance;
- Driver delay;
- Pedestrian delay;
- Pedestrian amenity;
- Fear and intimidation;
- Accidents;

- Hazardous loads;
  - Air pollution;
  - Dust and dirt;
  - Ecological effects; and
  - Heritage and conservation areas.
- 12.5.4 The potential effects of noise to be generated by the Proposed Development are considered in Chapter 9 in this EIA Report and ecological effects are considered in Chapter 7. In specific reference to traffic, visual effects, air pollution, dust and dirt, effects on heritage and conservation areas and hazardous loads arising from traffic impacts are not considered to be applicable and have not been considered further.
- 12.5.5 The potential effects on the issues of severance, driver delay, pedestrian delay, pedestrian amenity, fear and intimidation and accidents are considered further in this chapter.

#### **Severance**

- 12.5.6 The guidance notes that severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. The guidance states that the measurement and prediction of severance is extremely difficult but notes that issues to be considered include road width, traffic flow, traffic speeds, the availability of crossing facilities and the number of movements that are likely to cross the affected road. The guidance states that increases in traffic flows of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively. The guidance notes, however, that these were derived from studies of major changes in traffic flow and should be used cautiously.

#### **Driver delay**

- 12.5.7 Driver delay arises from the additional traffic generated by a development imposing additional delays on existing general traffic. The guidance notes that these delays are only likely to be significant when the traffic on the road network around the site is already at, or close to, capacity.

#### **Pedestrian delay**

- 12.5.8 Pedestrian delay relates to the additional delay imposed on pedestrians wishing to cross a road by the additional traffic generated by a development. The guidance notes that it is not considered prudent to set down any thresholds for the assessment of pedestrian delays but that practitioners should use their judgment in determining where pedestrian delay is a significant impact.

#### **Pedestrian amenity**

- 12.5.9 Pedestrian amenity relates to the relevant pleasantness of a journey and is affected by vehicle flow, traffic composition and pavement width. A tentative threshold for considering significance of changes in pedestrian amenity is when traffic flow (or its HGV components) is halved or doubled.

#### **Fear and intimidation**

- 12.5.10 The scale of fear and intimidation experienced by pedestrians is dependent on the volume of traffic, its HGV composition, its proximity to people or the lack of protection caused by such factors as narrow pavement widths. However, there are no commonly agreed thresholds to determine the significance of the effects. The IEA guidelines referred to above do, however, include some suggested thresholds for assessing if fear and intimidation require to be assessed further. The thresholds are based on using 18-hour traffic flows, calculating the average traffic flow per hour then assessing using the following bandings:
- Extreme: more than 1,800 vehicles per hour.
  - Great: 1200 – 1800 vehicles per hour.

- Moderate: 600 – 1200 vehicles per hour.

### **Accidents**

12.5.11 The assessment of accidents relates to the potential for the traffic generated by a development to cause an increase in the personal injury accident rate along sections of the road network subject to the additional traffic generated by the development. The guidance notes that an assessment of existing accident rates can be made by inspecting highway authority data and that professional judgement will be required to assess the implications of local circumstances.

### ***Significance criteria***

12.5.12 The environmental effects from the Proposed Development have been assessed in the following terms:

- Beneficial - Meaning that they produce environmental benefits in transportation terms, i.e. where overall traffic flows or percentage HGV decrease, or there are improved facilities for pedestrians, cyclists or public transport users.
- Negligible - Meaning that changes are too small to meaningfully measure.
- Adverse - Meaning that they produce environmental disbenefits in transportation terms, i.e. where overall traffic flows or percentage HGV increase, or there are reductions in facilities for pedestrians, cyclists or public transport users.

12.5.13 Beneficial and adverse effects are further characterised as:

- Minor - Localised changes in traffic flows/patterns.
- Moderate - Limited changes in traffic flows/patterns.
- Major - Considerable change in traffic flows/patterns.

12.5.14 Based on the above, Table 12.2 below sets out the terminology used to describe the significance scale.

**Table 12.2 – Significance Terminology**

| <b>Significance Scale</b> | <b>Description</b>   |
|---------------------------|--|
| Major beneficial          | Change that would delay the need for planned modification to off-site infrastructure   |
| Moderate beneficial       | Increased perception of changing conditions that may delay the need for considering planned modifications to off-site infrastructure |
| Minor beneficial          | Perception of changing conditions, e.g. reduction in delay   |
| Negligible                | No perceptible change  |
| Minor adverse             | Perception of changing conditions, e.g. increase in delay  |
| Moderate adverse          | Increased perception of changing conditions that may require consideration of modifications to off-site infrastructure               |
| Major adverse             | Change requiring consideration of modifications to off-site infrastructure   |

### ***Sensitive receptors***

12.5.15 The IEA Guidelines advise that it is useful to identify particular groups or locations which may be sensitive to changes in traffic conditions. The following summarises the sensitivity of various potential receptors:

- High: Sensitive groups, including children, elderly and disabled. Sensitive locations, e.g. hospitals, schools, and accident 'black-spots';
- Medium: pedestrians, cyclists;
- Low: vehicles drivers; and
- Negligible: n/a.

12.5.16 However, judgement has been applied when assessing the sensitivity of receptors. For example, a section of road subject to pedestrian flows, but with facilities to aid pedestrians crossing the road can be considered to have a lower sensitivity than a section subject to the same flows but without facilities for pedestrians to cross the road.

### ***Impact magnitude***

12.5.17 The IEA Guidelines recognise that quantitative assessment alone will not be fully encompassing. They state "*for many effects there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed up by data or quantified information where possible*". Also, where baseline traffic flows are low, it is possible to derive unrealistic determinations of significance when relying on purely numerical thresholds. Accordingly, professional judgement has been applied to assess the significance of the effects.

12.5.18 An impact magnitude scale in respect of each subject has been defined, with thresholds having been derived with reference to the IEA Guidelines and professional judgement. The impact magnitude scale is summarised in Table 12.3 below.

**Table 12.3 – Impact Magnitude Scale**

| Subject               | Impact Magnitude  |  |  |  |
|-----------------------|---|--|--|--|
|                       | High  | Medium   | Low  | Negligible   |
| Severance             | Change in road link traffic flow of over 90%  | Change in road link traffic flow of 60% to less than 90% | Change in road link traffic flow of 30% to less than 60% | Change in road link traffic flow of less than 30%            |
| Pedestrian Delay      | Judgement based on the individual characteristics of sections of road.  |  |  |  |
| Pedestrian Amenity    | Judgement based on the individual characteristics of sections of road with change in total traffic flows or HGV flows of more than 100% |  |  | Change in total traffic flows or HGV flows of less than 100% |
| Fear and Intimidation | Change to Extreme   | Change to Great  | Change to Moderate                                       | Change remains below Moderate threshold                      |
| Driver Delay          | Judgement based on operation of surrounding road network  |  |  |  |
| Accidents             | Judgement based on accident data  |  |  |  |

### ***Effect significance***

12.5.19 An 'effect matrix' based on the impact magnitude and receptor sensitivity is set out in Table 12.4 below. If severance is taken as an example, a change of traffic classified as being low on the impact magnitude scale would have a different impact on individual receptors i.e. negligible on drivers as they are classified as low sensitivity receptors but would result in minor to moderate effects on pedestrians as they are medium sensitivity receptors.

**Table 12.4 – Effect Significance**

| Impact Magnitude | Sensitivity of Receptor |                   |                   |            |
|------------------|-------------------------|-------------------|-------------------|------------|
|                  | High                    | Medium            | Low               | Negligible |
| High             | Major                   | Major             | Moderate          | Negligible |
| Medium           | Major                   | Moderate          | Minor to moderate | Negligible |
| Low              | Moderate                | Minor to moderate | Negligible        | Negligible |
| Negligible       | Negligible              | Negligible        | Negligible        | Negligible |

- 12.5.20 The effects are either long or short term, typically with the effects of construction traffic deemed short term and those associated with the operational stages of the Proposed Development as long term.
- 12.5.21 For the purposes of this assessment, the significance of effects was assessed on the basis of the above guidance and also on the specific local characteristics of the road network using professional judgement and experience of similar developments.

#### ***Site visit***

- 12.5.22 The transport network around the Proposed Development was visited on Tuesday 31 July 2018 and Monday 15 October 2018. The site visit recorded information on the nature of the transport network around the Proposed Development.

## **12.6 Baseline Conditions**

#### ***Transport network***

- 12.6.1 With the exception of forestry-related traffic and any pre-construction SI work, as explained in paragraphs 12.1.1 and 12.2.2, the Proposed Development will access the public road network at the western roundabout of Junction 11 of the M74. This roundabout also provides access to two further private accesses, the B7078 to the north and the B7078 to the east. The B7078 to the north is a single carriageway road with one lane in each direction. It provides a route to the northbound M74 and the B7078 continues northwards to Lesmahagow. There is a footway on the eastern side of the northern leg of the B7078 which continues on to the eastern leg of the B7078. There are no developments taking access from the B7078 between the roundabout and the access to the M74.
- 12.6.2 The B7078 to the east of the western roundabout passes underneath the M74 and forms a roundabout with a leg of the B7078 to the south and the slip road from the southbound M74. There is a footway on the northern side of the B7078. This footway continues on the eastern side of the roundabout and then continues on the eastern side of the B7078 to the south of the roundabout.
- 12.6.3 The B7078 to the south of Junction 11 of the M74 is a dual carriageway which extends southwards for around 2 km to Junction 12 of the M74. There is a continuous foot and cycleway along the eastern side of this section of the B7078, but no footway along the western side. A road leads from this section of the B7078 to Douglas Water to the east, which provides access to a small number of dwellings. There is a service station on the western side of the B7078 accessed from a priority junction on the B7078. A new slip road into, and out of, an emerging industrial development has also recently been constructed on the eastern side of the B7078, opposite the service station.
- 12.6.4 The footway on the eastern side of the B7078 forms part of SLC's Core Path network as does the private access leading to the south of Junction 11 of the M74. The footway alongside the B7078 within the study area forms part of National Cycle Network (NCN) Route 74.

### **Traffic flows**

- 12.6.5 Baseline traffic flows on the roads in the study area were taken from data published by the Department for Transport (DfT) for the M74. Peak period traffic counts at the two roundabouts with the B7078 at Junction 11 of the M74 were taken from the Transport Assessment submitted with the planning application for the M74 Heat & Power Park Proposed Mixed Use Scheme (CL/17/0157). Data from an Automatic Traffic Counter (ATC) installed on the B7078 between Junctions 11 and 12 of the M74 was used to factor the data from the peak hour data from the two roundabouts. Figure 12.1 shows the location of the traffic counts.
- 12.6.6 The observed traffic flows are shown in Table 12.5 below. All the traffic flows were observed in the year 2017. These traffic flows represent the average traffic flows during the period 0700 – 1900 Monday to Friday, which is the period during which construction of the Proposed Development has been assumed to take place. The data from the DfT was aggregated to Annual Average Daily Traffic (AADT) flows and a factor (derived from data from the ATC) was applied to these flows to convert them to average flows over the period 0700 – 1900 Monday to Friday.

**Table 12.5 – Observed 2017 Traffic Flows**

| Road  | Average Traffic Flow 0700 – 1900 Monday to Friday |           |
|---|---|-----------|
|   | All Vehicles                                      | HGVs Only |
| M74 Junctions 10 -11  | 29,750  | 7,100     |
| B7078 between eastern and western roundabouts at Junction 11                    | 3,500   | 450       |
| B7078 between western roundabout at Junction 11 and slip road to northbound M74 | 3,300   | 400       |

- 12.6.7 The document '*TA 46/97 Traffic Flow Ranges for Use in the Assessment of New Rural Roads*' (forming part of the Design Manual for Roads and Bridges and published in February 1997) suggests that the capacity of a road with one lane in each direction (such as the B7078 north of the Proposed Development, i.e. not the dualled section to the south) would be around 13,000 vehicles per day and that of a two lane motorway (such as the M74) would be up to 41,000 vehicles per day. Comparing the observed traffic flows in Table 12.5 above with the capacities from TA 46/97 shows that each section of road is operating well within its daily capacity.
- 12.6.8 The baseline traffic flows were converted to estimated traffic flows for the year 2021, the year in which construction of the Proposed Development has been assumed to commence. The traffic flows were converted using a factor from the National Road Traffic Forecasts (NRTF) dataset. A 'high' growth factor of 1.061 was applied to the M74 traffic flows and a 'low' growth factor of 1.033 was applied to the B7078 traffic flows. The resulting traffic flows are shown in Table 12.6 below.

**Table 12.6 – Estimated 2021 Baseline Traffic Flows**

| Road   | Average Traffic Flow 0700 – 1900 Monday to Friday |           |
|--|---|-----------|
|  | All Vehicles                                      | HGVs Only |
| M74 Junctions 10 -11   | 31,550  | 7,500     |
| B7078 between eastern and western roundabouts at Junction 11         | 3,600   | 450       |
| B7078 between western roundabout at Junction 11 and slip road to M74 | 3,400   | 450       |

## **Accidents**

- 12.6.9 Data on Injury-causing accidents for the roads in the study area was identified from the 'Crashmap' website. Data for the last three full years (2015 to 2017) was extracted and is summarised in Table 12.7 below.

**Table 12.7 – Accident Data**

| Road   | Accident details  |
|--|---|
| M74 Junctions 10 -11   | 13/12/2017 – slight accident involving one vehicle<br>21/09/2017 – slight accident involving one vehicle<br>26/07/2017 – slight accident involving two vehicles<br>10/01/2016 – slight accident involving one vehicle<br>30/01/2016 – slight accident involving three vehicles<br>13/03/2015 – serious accident involving one vehicle<br>09/01/2015 – slight accident involving one vehicle<br>29/11/2015 – slight accident involving one vehicle |
| B7078 between eastern and western roundabouts at Junction 11         | No accidents recorded   |
| B7078 between western roundabout at Junction 11 and slip road to M74 | No accidents recorded   |

## **Receptor Sensitivity**

- 12.6.10 The sensitivity of nearby receptors to changes in traffic flow arising from the Proposed Development has been assessed based on the above baseline information and is summarised in Table 12.8 below.

**Table 12.8 - Receptor Sensitivity**

| Road   | Receptor sensitivity by potential effect                   |                  |                    |                       |                                 |  |
|--|--|------------------|--------------------|-----------------------|---------------------------------|--|
|  | Severance  | Pedestrian delay | Pedestrian amenity | Fear and intimidation | Driver Delay                    | Accidents  |
| M74 Junctions 10 -11   | Negligible. No pedestrian activity on the motorway.        |                  |                    |                       |                                 |  |
| B7078 between eastern and western roundabouts at Junction 11       |  |                  |                    |                       | Negligible given spare capacity | Negligible as not a section of road with atypically high accident rates. |
| B7078 between western roundabout at Junction 11 & slip road to M74 | Negligible. Little pedestrian activity along this section. |                  |                    |                       |                                 |  |

12.6.11 No sensitive receptors have been identified. Hence each of the sections of road in the study area has been assessed against ‘Rule 1’ from the guidelines mentioned above and so each section of road has been assessed further only if the Proposed Development increases traffic over the baseline by 30% or more (or the number of HGVs increases by 30% or more).

## 12.7 Potential Effects

12.7.1 The Proposed Development will have the potential to affect the transport network during its construction, operation and decommissioning. Potential effects will arise from additional traffic on the road network and are identified for each phase below.

### ***Construction***

12.7.2 The Proposed Development will generate traffic movements during construction as, for example, HGVs deliver plant and materials and construction operatives arrive at and depart from the site. As mentioned in paragraph 12.2.2, the timber required to be removed to allow the construction of the Proposed Development would be removed anyway and the traffic effects arising from it have not been considered further in this assessment.

12.7.3 An indicative programme for the construction of the Proposed Development is provided in Chapter 3. This shows that construction is expected to last for a year. The amount of materials required to be delivered to the Proposed Development has been calculated for each of the tasks shown in the programme in Chapter 3. The calculation assumes a ‘worst case scenario’ that all of the stone required for construction of the project is imported to the site. The Applicant has however included a borrow pit search area within the Proposed Development which is aimed at reducing the amount of stone required to be imported, which in turn will reduce external traffic flows to and from the Proposed Development.

12.7.4 The number of HGV movements (i.e. a vehicle arriving, unloading and departing would equate to two movements – one as it arrives and another as it departs) estimated for each task in the construction programme is shown in Table 12.9 below, along with the average number of HGVs per working day (assuming 20 working days per month).

**Table 12.9 – Estimated HGV movements**

| Task                                    | Duration (days) | Total loads | Average loads per working day | Average movements per working day* |
|---|-----------------|-------------|-------------------------------|------------------------------------|
| Mobilisation                            | 20              | 30          | 2                             | 3                                  |
| Access tracks to site/compound /laydown | 20              | 600         | 30                            | 60                                 |
| Access tracks on site                   | 100             | 6,450       | 65                            | 129                                |
| Crane Hard standings 1-13               | 60              | 2,340       | 39                            | 78                                 |
| Foundations 1-13                        | 80              | 2,340       | 29                            | 59                                 |
| On-site cabling                         | 40              | 129         | 3                             | 6                                  |
| Off-site Cabling                        | 40              | 250         | 6                             | 13                                 |
| Substation Works                        | 60              | 60          | 1                             | 2                                  |
| Substation Commissioning                | 40              | 0           | 0                             | 0                                  |
| Turbine Delivery 1- 13                  | 60              | 130         | 2                             | 4                                  |
| Turbine Erection 1- 13                  | 80              | 112         | 1                             | 3                                  |

| Task                   | Duration (days) | Total loads | Average loads per working day | Average movements per working day* |
|------------------------|-----------------|-------------|-------------------------------|------------------------------------|
| Commission /Test 1- 13 | 80              | 0           | 0                             | 0                                  |

(\*Note one load = two movements (one arrival and one departure). Numbers may not add up exactly due to rounding.)

- 12.7.5 The data in Table 12.9 above shows that the construction of the access tracks would be the activity that would generate the most HGV movements. The peak number of HGV movements during each phase depends on the overlap of construction activities and the HGV movements in Table 12.9 above have been allocated to the activities in the construction programme shown in Table 3.6. The total number of HGV movements during each month in the construction programme is shown in Table 12.10 below.

**Table 12.10- HGV movements Indicative Construction Programme**

| Task                                       | Average HGV movements per day per month* |     |     |     |     |    |    |   |   |    |    |    |
|--|--|-----|-----|-----|-----|----|----|---|---|----|----|----|
|  | 1  | 2   | 3   | 4   | 5   | 6  | 7  | 8 | 9 | 10 | 11 | 12 |
| Mobilisation                               | 3  |     |     |     |     |    |    |   |   |    |    |    |
| Access & Site Tracks                       | 189                                      | 129 | 129 | 129 | 129 |    |    |   |   |    |    |    |
| Foundations                                |  | 59  | 59  | 59  | 59  |    |    |   |   |    |    |    |
| On-site Cabling                            |  |     |     | 6   | 6   |    |    |   |   |    |    |    |
| Substation works                           |  |     |     | 2   | 2   | 2  |    |   |   |    |    |    |
| Substation commissioning                   |  |     |     |     | 0   | 0  |    |   |   |    |    |    |
| Crane Hardstanding                         |  |     |     | 78  | 78  | 78 |    |   |   |    |    |    |
| Off-site Cabling                           |  |     |     |     |     | 13 | 13 |   |   |    |    |    |
| Turbine Delivery                           |  |     |     |     |     |    | 4  | 4 | 4 |    |    |    |
| Turbine Erection                           |  |     |     |     |     |    | 3  | 3 | 3 | 3  |    |    |
| Commissioning & Testing                    |  |     |     |     |     |    |    | 0 | 0 | 0  | 0  |    |
| Site Reinstatement                         |  |     |     |     |     |    |    |   | 0 | 0  | 0  | 3  |
| <b>Total two-way HGV movements per day</b> | 192                                      | 188 | 188 | 274 | 274 | 93 | 20 | 7 | 7 | 3  | 0  | 3  |

(\*Note a movement refers to an arrival or a departure, so a vehicle arriving, unloading and departing would equate to two movements. Numbers may not add up exactly due to rounding.)

- 12.7.6 The data in Table 12.10 above shows that months four and five in the construction programme would be the busiest with an average of 274 daily HGV movements. However, it is only for the first five months of the year-long construction programme that more than 100 two-way HGV movements per day are expected. Furthermore, for the final five months of the programme, a negligible number of daily HGV movements can be expected.

- 12.7.7 In addition to HGV movements, there would be car and light van movements generated by construction operatives arriving at and departing from the site. It is estimated that there would normally be around 60 construction operatives on site, increasing to 80 during turbine erection and commissioning. These have been assumed to equate to 40 and 54 car and light van movements per day respectively. During the peak months for HGV movements (months four and five of the construction programme) an additional 40 daily car and light van movements can be expected.

- 12.7.8 The turbine components are likely to be delivered by ship to King George V dock in Glasgow and transported by road to the Proposed Development. The route from King George V Dock to Junction 11 of the M74, as shown in Figure 3.6, has been used for the transport of wind turbine components for other projects in the area previously and has proven to be acceptable. The route

from King George V Dock involves passing through three roundabouts on the exit from the dock, turning left at a signalised junction then joining the M8 at Junction 26. The route then leaves the M8 to join the M74 and remains on the M74 until Junction 11.

- 12.7.9 A swept path assessment of a vehicle carrying a 76 m long blade has been carried out for each of the above junctions. These swept path drawings are shown in the drawings in Appendix 12.1, which show that the manoeuvres are feasible though some temporary removal of street furniture would likely be required at a number of locations. The drawing illustrating the manoeuvre at Junction 11 of the M74 shows that works would be required to the western and eastern roundabouts to provide a running surface for the vehicle wheels to ensure that the delivery of the larger components can be accommodated within the public road. Full details of these works would be provided to and agreed with the road authorities prior to commencement of construction. Other turbine components would be less onerous for transport than the blades; the tower sections, for example, will be segmented for ease of transport.
- 12.7.10 The increase in traffic arising from the Proposed Development has been compared to the baseline traffic flows shown in Table 12.6 above. The comparison is based on the peak number of daily HGV movements during months four and five of the construction period (274 HGV movements) and 40 car and light van movements, so a total of 314 vehicle movements. This represents a robust assessment, as the Proposed Development would generate fewer vehicle movements during the remaining months of the year-long construction period. The comparison is presented in Table 12.11 below.

**Table 12.11 – Increases in Traffic Arising from Proposed Development**

| Road   | Baseline average<br>Traffic Flow 0700<br>– 1900 Monday to<br>Friday |              | Additional traffic during<br>peak months of<br>construction of Proposed<br>Development |           | Increase arising from<br>Proposed Development |           |
|--|---|--------------|--|-----------|---|-----------|
|  | All<br>Vehicles   | HGVs<br>Only | All Vehicles   | HGVs Only | All Vehicles                                  | HGVs Only |
| M74 Junctions 10 - 11  | 31,550  | 7,500        | 314  | 274       | 1%  | 4%        |
| B7078 between eastern and western roundabouts at Junction 11         | 3,600   | 450          | 314  | 274       | 9%  | 61%       |
| B7078 between western roundabout at Junction 11 and slip road to M74 | 3,400   | 450          | 314  | 274       | 9%  | 61%       |

- 12.7.11 The sections of road in the study area were assessed against ‘Rule 1’ mentioned in paragraph 12.3.4 above, whereby they were to be considered further if the traffic arising from the Proposed Development caused increases in traffic (or of HGVs) of 30% or more. The data in Table 12.11 above shows that the two short sections of the B7078 would experience a temporary increase in HGVs of around 61% for a short period of approximately 2 months. An assessment has therefore been made of the effects on Severance, Pedestrian Delay, Pedestrian Amenity, Fear and Intimidation, Driver Delay and Accidents on these sections of road arising from the traffic estimated to be generated during the construction of the Proposed Development.

### **Severance**

- 12.7.12 The increases in traffic arising from the construction of the Proposed Development would represent a low impact magnitude based on the scale in Table 12.3 above. The sensitivity of this receptor to severance was considered to be negligible (see Table 12.8 above) and hence the effect on severance can be considered to be **negligible** as per the matrix in Table 12.4 above.

### **Pedestrian Delay**

- 12.7.13 The increases in traffic arising from the construction of the Proposed Development was considered to represent a negligible impact magnitude, given the lack of demand for pedestrians to cross this short section of the B7078. The sensitivity of this receptor to pedestrian delay was considered to be negligible (see Table 12.8 above) and hence the effect on pedestrian delay can be considered to be negligible as per the matrix in Table 12.4 above.

### **Pedestrian Amenity**

- 12.7.14 The increases in traffic arising from the construction of the Proposed Development would represent a negligible impact magnitude based on the scale in Table 12.3 above, as the change in traffic or HGV flows arising from the Proposed Development would be less than 100%. The sensitivity of this receptor to pedestrian amenity was considered to be negligible (see Table 12.8 above) and hence the effect on pedestrian amenity can be considered to be **negligible** as per the matrix in Table 12.4 above.

### **Fear and Intimidation**

- 12.7.15 The total daily traffic flows on the B7078 between the two roundabouts, including that from the construction of the Proposed Development, would equate to around 3,914 vehicles (traffic flows north of the western roundabout would be lower). Averaged over 18 hours, that would equate to 217 vehicles per hour, which is lower than 600 vehicles per hour, the lower threshold of the 'Moderate' range. The increases in traffic arising from the Proposed Development would therefore represent a negligible impact magnitude based on the scale in Table 12.3 above. The sensitivity of this receptor to fear and intimidation was considered to be negligible (see Table 12.8 above) and hence the effect on fear and intimidation can be considered to be **negligible** as per the matrix in Table 12.4 above.

### **Driver Delay**

- 12.7.16 The additional traffic arising from the construction of the Proposed Development amounts to, at most, 314 vehicle movements per day. Of these movements around 40 are expected to be car and light vehicles associated with staff. Half of these 40 movements could be expected to arrive at the start of the working day and the remaining half could be expected to leave at the end of the working day. Thus, there would be around 20 car and light vehicle movements at these times and these are unlikely to cause a noticeable additional delay to other users of the transport network.

- 12.7.17 The remaining 274 vehicle movements are HGVs and these will occur throughout the working day. If these HGV movements were concentrated in the twelve-hour period 07:00 to 19:00, that would translate to 23 HGV movements per hour. Again, these are unlikely to cause a noticeable delay to other users of the transport network.

- 12.7.18 The effects of the Proposed Development on driver delay have therefore been considered to be **negligible**.

### **Accidents**

- 12.7.19 No accidents have been recorded on the sections of the B7078 in the study area in the period 2015 to 2017. The additional traffic arising from the construction of the Proposed Development is considered to represent a negligible impact magnitude in accident rates. The sensitivity of these sections of the B7078 to accidents are considered to be negligible and hence the Proposed Development is considered to have a **negligible** effect on accident rates.

### **Summary**

12.7.20 The traffic arising from the construction of the Proposed Development is of relatively short duration and is considered to have a **negligible** effect on the operation of the surrounding transport network.

### **Operation**

12.7.21 During its operation, the Proposed Development will generate only the occasional maintenance or inspection vehicle. These are likely to result in minimal vehicle movements each month that will be imperceptible on the wider road network. The effects of the operation of the Proposed Development on the surrounding transport network are therefore considered to be **negligible**.

### **Decommissioning**

12.7.22 The effects from decommissioning of the Proposed Development are likely to be similar to and less than those predicted for construction, as some infrastructure (such as certain access tracks, certain hardstandings, and below ground foundations) will be left in place. Therefore, the overall effects are anticipated to be lower than that envisaged for the construction phase and there would therefore be **negligible** effects on the transport network during decommissioning.

## **12.8 Mitigation**

12.8.1 Even though the predicted impacts arising from the Proposed Development have been assessed as being negligible, the following good practice measures will be adopted prior to and during the construction of the Proposed Development:

- preparation and implementation of a Construction Traffic Management Plan;
- use of the agreed access routes to the site will be enforced by the developer, and all principal and sub-contractors;
- at locations where slow moving abnormal load traffic is considered likely to cause a road hazard it is recommended that escorted traffic is complemented by advance publicity and temporary signage where necessary;
- wheel washing is proposed in the vicinity of the site compound to reduce the risk of transferring any mud onto the road and to suppress any dust;
- all site vehicles will be parked off-road and as discretely as possible;
- preparation and implementation of a Public Access Strategy to mitigate any potential conflict between site traffic during construction and the local path network;
- once final loads and transport configurations are known, an updated review of maximum axle loadings on structures along the access routes;
- similarly, an updated review of clear heights;
- updated abnormal load route assessment will be undertaken for the final candidate turbine components prior to construction;
- confirmation that there are no roadworks or closures that could affect the passage of the loads;
- confirmation that there are no underground services on the access route that would be at risk from any abnormal loads; and
- confirmation that the relevant Police / escort authorities are satisfied with the route being used and that the appropriate roads authorities have been further contacted regarding the proposed loads and route.

- 12.8.2 A trial run of the abnormal load deliveries will be undertaken using the proposed load trailer and a scaffold to represent the load dimensions to confirm that the loads can be safely accommodated.
- 12.8.3 During the operational phase of the Proposed Development a very low number of vehicle movements each month are expected for maintenance and inspection activities. No mitigation or monitoring measures are proposed for this phase of the Proposed Development.
- 12.8.4 The mitigation measures set out for the construction phase will also be implemented, where relevant, during the decommissioning stage of the Proposed Development.

## 12.9 Residual Effects

- 12.9.1 The residual effects on the transport network arising from the construction, operation and decommissioning of the Proposed Development will be **negligible**.

## 12.10 Cumulative Assessment

- 12.10.1 A number of wind farm developments are proposed in the area surrounding the Proposed Development site. Construction traffic routeing to and from the following wind farms is expected to use the same part of the road network as the Proposed Development:
  - Douglas West
  - Poneil
  - Dalquhandy (including the Revised Dalquhandy)
  - Cumberhead (including the Revised Cumberhead)
  - Glentaggart
  - Kennoxhead
  - Broken Cross
  - Penbreck
  - Repowered Hagshaw Hill (in planning)
- 12.10.2 The construction programmes for these potential cumulative developments are not yet known and so it cannot be said with any certainty whether any of them would be constructed at the same time as the Proposed Development. However, the potential for cumulative effects with the traffic from the Proposed Development arises only on the M74 north of Junction 11 and the very short section of the B7078 between the eastern roundabout at Junction 11 and the slip road to the northbound M74 at Junction 11 – a length of around 500 m with no sensitive receptors.
- 12.10.3 The assessment of the traffic effects of the Proposed Development in isolation concluded that the increases in traffic would be negligible on these sections of road. Any additional traffic from other consented wind farms in the locality on these sections of the road network at the same time as traffic from the Proposed Development is also likely to cause only negligible increases in traffic, given the capacity of the M74 and the short stretch of the B7078 which would be affected. Any potential cumulative effects would also be temporary and relatively short in duration.
- 12.10.4 Also, the traffic assessment for the Proposed Development has been undertaken on the basis of ‘worst case’ trip generation whereby all stone for internal road construction would be imported to the site. However, a borrow pit search area has been included within the Proposed Development which should significantly reduce the volume of stone, and in turn number of HGV movements, required to be imported to the site.
- 12.10.5 There are also the following other developments planned in the area which could affect traffic volumes on the roads in the study area:
  - Coalburn – Residential Development for around 650 homes (CL/13/0334);

- Newmains Home Farm, Douglas – Mixed Use including around 50 homes (CL/14/0415);
- Happendon Wood (formerly Poniel Area D) – Commercial (Class 6) development of around 17,375 m<sup>2</sup> (CL/14/0034 and CL/16/0471);
- Poneil Area A - 120,770 m<sup>2</sup> of Commercial (Class 6) (CL/10/0180);
- Dewars (formerly Poniel Area B) – additional bonded warehousing (CL/17/0003); and
- M74 Heat & Power Park Proposed Mixed Use Scheme (CL/17/0157)

12.10.6 The planning application for the M74 Heat and Power Park included a Transport Assessment which estimated traffic movements on the roads in the study area arising from the M74 Heat and Power Park and the other proposed developments listed above. These traffic movements were estimated for the weekday AM and PM peak hours and are shown in Table 12.11 below.

**Table 12.12 – Increases in Traffic Arising from Committed Developments**

| Road   | Additional weekday traffic arising from Committed Developments |              |
|--|--|--------------|
|  | AM peak hour   | PM peak hour |
| M74 Junctions 10 -11   | 946  | 883          |
| B7078 between eastern and western roundabouts at Junction 11         | 1241   | 1056         |
| B7078 between western roundabout at Junction 11 and slip road to M74 | 497  | 867          |

12.10.7 The planning application for the M74 Heat and Power Park was approved and the consultation response from SLC's roads officers stated:

*"The traffic analysis that was undertaken by the applicant concluded that the development will not have a significant impact on the existing road network, and there is no requirement for any off-site junction improvement works."*

12.10.8 In addition to the traffic movements highlighted in Table 12.12 above, the Proposed Development could be expected to generate around 20 car and light van vehicle and 23 HGV movements during each of the weekday AM and PM peak hours during the peak months of the year-long construction period. The total of around 43 vehicle movements during each peak hour is a relatively small amount in the context of the potential additional traffic from the committed developments mentioned in Table 12.12 above. The traffic generated during the construction of the Proposed Development is of relatively short duration, and when considered in combination with the traffic from the above committed developments, is therefore unlikely to alter the conclusions of the SLC roads officers quoted above.

## 12.11 Summary

- 12.11.1 The Proposed Development has the potential to affect the surrounding transport network during its construction, operation and decommissioning. During construction, potential effects could arise from traffic travelling to and from the site delivering materials and plant. No additional effects from timber-related traffic are expected as a result of the Proposed Development, over and above that which would occur under routine forest management, as timber removal from the site would occur irrespective of the Proposed Development.
- 12.11.2 The Applicant expects all wind farm construction traffic to arrive at and depart from the site via the M74 to the north of Junction 11. The effects of the additional traffic estimated to be generated during the construction of the Proposed Development have been assessed and considered to be negligible. No formal mitigation is proposed, but 'good practice' measures will be implemented.

- 12.11.3 The Proposed Development will generate only the occasional maintenance or inspection vehicle during its operation and the effects of this traffic are also considered to be negligible. The number of vehicles generated during the decommissioning of the Proposed Development is considered to be less than during construction and is also considered to be negligible.
- 12.11.4 Potential cumulative effects could arise from the traffic generated by the Proposed Development and other consented developments in the local area. However, the traffic estimated to be generated by the Proposed Development is relatively small compared to that estimated to be generated by the consented developments. Furthermore, the traffic generated during the construction of the Proposed Development is expected to last for only around a year after which the Proposed Development will be operational and traffic volumes will reduce. The cumulative effects arising from the Proposed Development and the other consented developments is considered to be negligible.

**Table 12.13– Summary Table**

| Description of Effect                        | Significance of Potential Effect |                     | Mitigation Measure   | Significance of Residual Effect |                     |
|--|----------------------------------|---------------------|--|---------------------------------|---------------------|
|  | Significance                     | Beneficial/ Adverse |  | Significance                    | Beneficial/ Adverse |
| <b>During Construction / Decommissioning</b> |                                  |                     |  |                                 |                     |
| Severance                                    | Negligible                       | Adverse             | None Proposed (but good practice measures would be employed) | Negligible                      | Adverse             |
| Pedestrian delay                             |                                  |                     |  |                                 |                     |
| Pedestrian amenity                           |                                  |                     |  |                                 |                     |
| Fear and intimidation                        |                                  |                     |  |                                 |                     |
| Driver delay                                 |                                  |                     |  |                                 |                     |
| Accidents                                    |                                  |                     |  |                                 |                     |
| <b>During Operation</b>                      |                                  |                     |  |                                 |                     |
| Severance                                    | Negligible                       | Adverse             | None Proposed  | Negligible                      | Adverse             |
| Pedestrian delay                             |                                  |                     |  |                                 |                     |
| Pedestrian amenity                           |                                  |                     |  |                                 |                     |
| Fear and intimidation                        |                                  |                     |  |                                 |                     |
| Driver delay                                 |                                  |                     |  |                                 |                     |
| Accidents                                    |                                  |                     |  |                                 |                     |
| <b>Cumulative Effects</b>                    |                                  |                     |  |                                 |                     |
| Severance                                    | Negligible                       | Adverse             | None Proposed  | Negligible                      | Adverse             |
| Pedestrian delay                             |                                  |                     |  |                                 |                     |
| Pedestrian amenity                           |                                  |                     |  |                                 |                     |
| Fear and intimidation                        |                                  |                     |  |                                 |                     |
| Driver delay                                 |                                  |                     |  |                                 |                     |
| Accidents                                    |                                  |                     |  |                                 |                     |

## **12.12 References**

Institute of Environmental Assessment (1993). Guidelines for the Environmental Assessment of Road Traffic.

Transport Scotland (2012) Transport Assessment Guidance.

Design Manual for Roads and Bridges (DMRB) Volume 5, Section 1, Part 2 'TA 46/97 Traffic Flow Ranges for Use in The Assessment of New Rural Roads'

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