

12 Access, Traffic & Transport

Introduction

- 12.1 This chapter considers the potential access, traffic and transport effects associated with the construction and operation of the North Lowther Energy Initiative (the 'Proposed Development') on the surrounding public road network and sensitive receptors. The chapter includes:
- a description of the assessment methodology and significance criteria used in completing the assessment;
 - the current baseline traffic and transport conditions;
 - identification and assessment the likely environmental effects associated with increased traffic levels;
 - identification and description of the mitigation measures proposed to address any significant effects; and
 - assessment of any residual effects post mitigation implementation.
- 12.2 Planning policies of relevance to this assessment are provided in **Chapter 5: Policy Context**. Noise and vibration effects associated with construction traffic are covered in detail in **Chapter 11: Noise**.
- 12.3 The Access, Traffic and Transport chapter has been undertaken by SYSTRA Ltd and is supported by:
- **Appendix 12.1: Abnormal Loads Assessment; and**
 - **Appendix 12.2: Construction Traffic Management Plan (CTMP).**

Scope of the Assessment

Effects Assessed in Full

- 12.4 The assessment is made with reference to the Development, as described in **Chapter 4: Scheme Description**.
- 12.5 Within the study area (described in paragraphs 12.14 to 12.19) the following traffic and transport effects have been considered:
- effects on the road network as a result of traffic generated by the construction of the Development;
 - effects of transporting abnormal loads to the Development¹; and
 - potential cumulative traffic and transport effects associated with windfarms and other developments (committed or in planning) which may utilise the same road network during construction of the Development.
- 12.6 The assessment is structured around the consideration of potential environmental effects related to traffic and transport as identified by the IEMA Guidelines (further details on the methodology are provided in paragraphs 12.9 to 12.11 below):
- noise;
 - visual effect;
 - severance;
 - driver delay;

- pedestrian delay and amenity;
- accidents and safety;
- hazardous loads; and
- dust and dirt.

- 12.7 Visual effects and noise are addressed in **Chapter 6: Landscape and Visual Amenity** and **Chapter 11: Noise** respectively. No hazardous loads are associated with the Development therefore this effect has not been assessed.

Effects Scoped Out

- 12.8 On the basis of the desk based study undertaken, the professional judgement of the EIA team, experience from other relevant projects, and feedback received from consultees, the following topic areas have been 'scoped out' of detailed assessment as proposed in the Scoping Report (January 2016):
- The effects of traffic associated with the operational stage. Once the Development is operational, the amount of traffic generated will be minimal and will relate to the maintenance of wind turbines only. Vehicles used for maintenance are likely to be utility vehicles (typically 4x4s or light goods vehicles (LGVs)). There may, on rare occasions, be the need for heavy goods vehicle (HGV) access to the wind turbines. It is estimated that in the worst-case scenario, operational vehicles equate to no more than 10 utility vehicles a month and two HGVs per month. With respect to traffic and transport, the operational stage of the Development is therefore not assessed in this chapter.
 - Whilst not contained within the Scoping Report, the effect of construction related vehicles on the road network, with respect to traffic flows both in isolation and cumulatively, is considered highly unlikely to be significant. Therefore, it is considered that detailed junction capacity assessments are not required and have subsequently not been carried out.
 - Whilst not referred to specifically in the Scoping Report, as noted above, no hazardous loads are associated with the Development therefore this has been scoped out.

Assessment Methodology

Legislation and Guidance

- 12.9 In undertaking the assessment of potential traffic and transport effects on the road network and sensitive receptors, the following guidance documents have been referred to:
- Institute of Environmental Management and Assessment (IEMA), "Guidelines for the Environmental Assessment of Road Traffic (1993)" ('the IEMA Guidelines');ⁱ
 - Institute of Highways and Transportation (IHT), "Guidelines for Traffic Impact Assessment (1998)"ⁱⁱ; and
 - Department for Transport (DfT), "Design Manual for Roads and Bridges (DMRB)"ⁱⁱⁱ.
- 12.10 The methodology used in this assessment adheres to that set out in the IEMA Guidelines. The guidelines suggest that to determine the scale and extent of the assessment and the level of effect the Development will have on the surrounding road network, the following two 'rules' should be followed:
- Rule 1 - Include road links where flows are predicted to increase by more than 30% (10% if affecting a sensitive area) or where the number of HGVs is predicted to increase by more than 30%; and
 - Rule 2 - Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.
- 12.11 Rules 1 and 2 are used to determine whether or not a full assessment of effects on routes within the study area is required as a result of intensification of road traffic.
- 12.12 The IEMA Guidelines (paragraph 2.5) state that sensitive receptors to traffic include: hospitals, churches, schools and historical buildings. The study area and sensitive receptors are described in detail below.

¹ Indivisible turbine components need to be transported to the Development Area from the selected Port of Entry via the public road network in the form of abnormal loads. Abnormal loads are defined by the Department for Transport (DfT) as a vehicle with: a weight of more than 44,000kg; an axle load of more than 10,000kg for a single non-driving axle and 11,500kg for a single axle; a width of more than 2.9m; and a rigid length of more than 18.65m. This definition is also used by Police Scotland. Abnormal loads may require a police escort and will likely restrict traffic along the route for a short duration of time.

Consultation

12.13 In undertaking the assessment, consideration has been given to the scoping responses and other consultation undertaken as detailed in **Table 12.1**.

Table 12.1: Consultation Responses

| Consultee and Date | Scoping/Other Consultation | Issue Raised / Comment | Response/Action Taken |
|--|---|---|---|
| Dumfries & Galloway Council (DGC) Roads Service 15 th March 2016 | Post-Scoping Meeting with Roads Officer | <ol style="list-style-type: none"> DGC Roads Officer advised that approval should be obtained from DGC Bridges and Structure Unit on the use of the B740 and B797 due to potential constraints. The access routes should be assessed in full and the extent of any necessary works identified and accompanied by swept path analysis. The ES should detail the volume of aggregate and vehicle movements associated with the use of onsite borrow pits so that any effects on importing aggregate, if necessary, can be assessed. A Traffic Management Plan is to be agreed in writing with the police and roads authorities. | <ol style="list-style-type: none"> SYSTRA has consulted with DGC as part of the EIA to obtain specific views on the use of these routes. Access reports including swept path analysis have been prepared by SYSTRA. This information will be a Technical Appendix to the ES. This Chapter contains a full breakdown of the expected vehicle movements associated with the potential requirement to import stone / aggregates. A CTMP is included as a Technical Appendix 12.2. |
| South Lanarkshire Council (SLC) 4 th March 2016 | Formal Scoping Consultation | <ol style="list-style-type: none"> SLC expressed concerns in relation to the access routes to site due to bridges, cattle grids and culverts. SLC stated that transporting abnormal loads to Access Points A, B and C (access to the south of Wanlockhead) will be in conflict with National Cycle Route 74. SLC expressed concerns associated with the lack of footways through Leadhills village. SLC has also recommended a structural assessment of the houses through Leadhills that are close to the road which may be affected by vehicle movements. SLC has requested that a CTMP is undertaken to support the application. SLC has requested that an Abnormal Loads Assessment is undertaken along the route to site. | <ol style="list-style-type: none"> SLC's Structures Section will be consulted at the application stage regarding the widths and load carrying capacity of each structure. Access Point C (to the south of Wanlockhead) is no longer being considered. Any measures to mitigate effects on the routes to Access Points A and B will be outlined in the emerging CTMP. These issues are related to Access Point C which is no longer being considered. A CTMP is included as a Technical Appendix to this chapter. An Abnormal Loads Assessment is included as Technical Appendix 12.1. |
| South Lanarkshire Council (June 2016) | Other Consultation | A meeting was held with SLC Roads in June 2016 following receipt of the scoping response to discuss roads and access matters. The locations of the traffic counters within SLC boundaries were agreed at this meeting. | Traffic counters deployed in summer 2016. |
| Transport Scotland 23 rd February 2016 | Formal Scoping Consultation | Transport Scotland has not expressed any issues or significant concerns associated with the proposed methodology. | N/A |

| Consultee and Date | Scoping/Other Consultation | Issue Raised / Comment | Response/Action Taken |
|---|-----------------------------|---|--|
| Leadhills Community Council 23 rd February 2016 | Formal Scoping Consultation | Raised concerns in relation to Access Option C in relation to safety, noise and disturbance caused by construction traffic. | Access Option C is no longer proposed. |
| Wanlockhead Village Council 24 th February 2016 | Formal Scoping Consultation | Raised concerns in relation to Access Option C in relation to safety, noise and disturbance caused by construction traffic. | Access Option C is no longer proposed. |

Study Area

- 12.14 The study area for the assessment of traffic and transport has been predicated on the potential access points to the Development Area and the proposed routes to these accesses from the external road network. To determine appropriate routes to the Development Area, a detailed assessment of the surrounding road network has been undertaken. This involved a comprehensive desk based study and multiple site visits to fully understand the surrounding road network, to identify potential sensitive receptors, and to highlight potential pinch points which could restrict abnormal loads.
- 12.15 The Abnormal Loads Assessment has been prepared on the basis of abnormal load vehicles routing to site from the strategic road network via the M74 trunk road (T), the B7078 and the B740 towards the Development Area access points. The route is illustrated on **Figure 12.1**.
- 12.16 In addition to the abnormal loads, there is also a need to transport general construction materials (concrete, aggregates, pipes, cabling, etc.) to the Development Area and to remove forestry in standard HGVs. The route for general construction traffic will depend on the source of the materials required. This assessment will consider the effects of HGVs following the same route as the abnormal loads and a route from the A76 (T) to the south of the Development.
- 12.17 Traffic will also be generated by workers commuting to / from the Development. This is primarily restricted to the construction stage only. However, the operational stage will also generate traffic, albeit a negligible volume given the nature of windfarm developments. Such visits will be for maintenance purposes and generally made in small vehicles.
- 12.18 Based on the above, the study area has been identified using the assessment thresholds within the IEMA Guidelines as an aide and is indicated by **Figure 12.2**. The study area is as follows:
- The B7078 – between the junction with the B740 and Junction 13 of the M74 (T);
 - The B740; and
 - The A76 (T) between Kirkconnel and Enterkinfoot.
- 12.19 Within the study area the settlements of Sanquhar and Kirkconnel are considered as Sensitive Receptors in the assessment given that they are populated areas that have one or more of the characteristics outlined in paragraph 12.11. Although not a sensitive receptor in line with the guidelines in paragraph 12.12, traffic movements through Crawfordjohn are considered within the assessment. Rule 2 (10% change in traffic flows) will therefore be applied at these locations as per the IEMA Guidelines.
- ### Desk Based Research and Data Sources
- 12.20 The traffic and transport study area characteristics have been determined by a desk based assessment, multiple site visits during 2015 and 2016, commissioned Automatic Traffic Counts (ATC) and publicly available Annual Average Daily Flow (AADF) data. Described below is the source of the traffic count information at each of the road links identified in the study area. These are also indicated by **Figure 12.3**.
- 24-hour ATC survey undertaken Monday 5th – Sunday 11th September 2016;
 - 24-hour ATC survey undertaken Monday 5th – Sunday 11th September 2016;
 - AADF available from Department for Transport's (DfT) website. Counter number 50747; and
 - AADF available from DfT's website. Counter number 30753.

Assessing Significance

- 12.21 The sensitivity to change in traffic levels of any given road segment or junction is generally assessed by considering the residual capacity of the network under existing conditions. Where there is a high degree of residual capacity, the network may readily accept and absorb an increase in traffic and therefore the sensitivity may be said to be low. Conversely, where the existing traffic levels are high compared to the road capacity, there is little spare capacity, and the sensitivity to any change in traffic levels will be considered to be high.
- 12.22 The magnitude of traffic effects is a function of the existing traffic volumes, the percentage increase and change due to a development, changes in the type of traffic and the temporal distribution of traffic (day of week, time of day). The determination of magnitude has been undertaken by reviewing the Development, establishing the parameters of the road that may be affected and quantifying these effects utilising IEMA Guidelines and professional judgement.
- 12.23 Consideration has been given to the composition of the traffic on the road network, under both existing and proposed conditions. For example LGVs have less effect on traffic and the road system than HGVs. Similarly, HGVs can have less effect than abnormal load vehicles, depending on the frequency of the abnormal loads.
- 12.24 The criteria that have been used to make judgements on the sensitivity of the receptor(s) and the magnitude of change are presented in **Table 12.2** and **Table 12.3** respectively.

Table 12.2: Receptor Sensitivity

| Receptor Sensitivity / Importance | Description |
|-----------------------------------|--|
| High | <p>People whose livelihood depends upon unrestricted movement within their environment; this includes commercial drivers and the companies who employ them.</p> <p>Local residents whose daily activities depend upon unrestricted movement within their environment.</p> <p>Receptors such as schools, colleges and accident hotspots i.e. users who would be very sensitive to high traffic flows.</p> |
| Medium | <p>People who pass through or habitually use the area but whose livelihood is not wholly dependent on free access.</p> <p>Receptors such as congested junctions, hospitals, cemeteries and conservation areas.</p> |
| Low | <p>Occasional users of the road network. Receptors such as public open space and residential areas.</p> <p>Areas with trunk road or A class roads constructed to accommodate significant HGV volumes.</p> |
| Negligible | <p>Users not sensitive to transport effects. Includes very small settlements and roads with no significant settlements including new strategic trunk roads or motorways.</p> |

Table 12.3: Magnitude of Effect

| Magnitude | Description |
|------------|--|
| Large | <p>The proposals could result in a significant change in terms of length and / or duration to the present traffic routes or schedules or activities, which may result in hardship.</p> <p>Generally a rule of >90% change in traffic is considered a large magnitude.</p> |
| Medium | <p>The proposals could result in changes to the existing traffic routes or activities such that some delays or rescheduling could be required, which cause inconvenience.</p> <p>Generally a rule of 60 – 90% change in traffic is considered a medium magnitude.</p> |
| Small | <p>The proposals could occasionally cause a minor modification to routes, or a very slight delay in present schedules, or on activities in the short term.</p> <p>Generally a rule of 30 – 60% change in traffic is considered a small magnitude.</p> |
| Negligible | <p>No effect on movement of road traffic above normal levels.</p> <p>Generally a rule of <30% change in traffic is considered a negligible magnitude.</p> |

- 12.25 As a guide to inform the assessment, but not as a substitute for professional judgement, criteria for determining the significance of traffic related effects are set out in **Table 12.4**. This is based on combining the magnitude of the effect with the receptor sensitivity.

Table 12.4: Significance Criteria

| Sensitivity of Receptor | Magnitude of Effect | | | |
|-------------------------|---------------------|------------|------------|------------|
| | Large | Medium | Small | Negligible |
| High | Major | Major | Moderate | Minor |
| Medium | Major | Moderate | Minor | Negligible |
| Low | Moderate | Minor | Negligible | Negligible |
| Negligible | Minor | Negligible | Negligible | Negligible |

- 12.26 Effects are categorised as major, moderate, minor or negligible. Major or moderate effects are considered to be **Significant** in the context of the EIA Regulations. Minor or negligible effects are considered **Not Significant**.

Assessment Limitations

- 12.27 All necessary information required to inform the assessment has been able to be collected. ATC data for the B740 and the B7078 was collected during September 2016; September is considered to be a 'neutral' month in terms of traffic volumes and patterns (without school holidays/public holidays).

Existing Conditions

- 12.28 The baseline traffic and transport characteristics of the study area have been determined by a comprehensive desk based assessment and multiple site visits undertaken by SYSTRA in 2015 and 2016. The following paragraphs detail the baseline conditions.

A76 (T)

- 12.29 The A76 (T) forms part of the strategic trunk road network and runs from the A77 in the west to the A75 at Dumfries. The road is of a good geometric standard and, within the vicinity of the Development, is a two-way single carriageway road with an approximate width of 7.3m.
- 12.30 The speed limit of the road varies, depending on the location, between the National Speed Limit (60mph) and 30mph through nearby settlements including Sanquhar and New Cumnock. No formal cycleways or street lighting are provided, however footways of approximately 1.5m-2m wide are provided within Sanquhar.
- 12.31 Direct residential frontage exists along the A76 (T) at Sanquhar and New Cumnock as well as a number of access roads which form priority junctions with the A76 (T).
- 12.32 No abnormal loads will use the A76 (T), however, a proportion of general construction HGVs are likely to access the Development Area via the A76 (T).

B740

- 12.33 The B740 forms part of the local road network and provides a link between the A76 (T) at the north-west of Sanquhar centre to the B7078 at the west of Junction 13 of the M74 (T). The B740 provides access to the small settlement of Crawfordjohn and will form a key access route to site for both abnormal loads and general construction traffic (it is important to note that if they route via the A76 they will not need to pass through Crawfordjohn). The proposed access points at locations A and B will link directly with the B740 around 11km and 16km to the south-west of the junction with the B7078 respectively.
- 12.34 The width and standard of the road varies depending on the location but can be generalised as approximately 6m wide. There are generally no footways provided along the length of the road. The speed limit of the road varies, depending on the location, between the National Speed Limit (60mph) and 30mph through settlements.

B7078

- 12.35 The B7078 provides a link between Junction 13 of the M74 (T) and the B740 and is part of the local road network. National Cycle Route 74 runs adjacent to the B7078, although is segregated from traffic along the section between Junction 13 and the B740, and continues to the A702 to the east and to Kirkmuirhill to the west via Lesmahagow. There are no footways along the section of the B7078 to be utilised by the Development traffic, however, there is an off-road cyclepath running parallel to the road, forming part of the National Cycle Network (NCN) Route 74, which pedestrians are permitted to use.
- 12.36 Between the B740 in the west and Junction 13 of the M74 (T) in the east, the width of the road is approximately 7.3m and is subject to a National Speed Limit (60mph).
- 12.37 A section of the B7078 will be utilised by all abnormal loads and any general construction HGVs coming from the north routing to either site access point.

Baseline Traffic Flows

- 12.38 **Table 12.5** indicates the two-way Average Annual Daily Traffic Flow (AADF) in the study area and the percentage of traffic which is classified as HGVs.

Table 12.5: Study Area Traffic Flows

| Counter Location | DMRB Road Capacity (vehicles/24hr) ² | AADF | HGV | Percentage HGV |
|--------------------------------|---|-------|-----|----------------|
| 1. B740 | 43,200 | 518 | 50 | 10% |
| 2. B7078 | 57,600 | 692 | 74 | 11% |
| 3. A76(T) – west of Kirkconnel | 72,000 | 3,304 | 561 | 17% |
| 4. A76(T) – Enterkinfoot | 72,000 | 3,607 | 729 | 20% |

- 12.39 Traffic data for Counter Locations 3 and 4 has been sourced from the DfT website. Data is available from 2000-2015. For the purposes of this assessment, the growth trend over a ten year period i.e. 2006-2015 has been reviewed and on the basis of the trends and professional judgement, a NRTF (National Roads Traffic Forecast) low growth factor has been applied to all traffic flows to create a baseline scenario that is representative for the year 2020 when construction is anticipated to commence.

Road Safety

- 12.40 The Crash Map website^{iv} has been utilised to determine the number of accidents that have occurred in the previous five years (2012-2016) within the study area. The results of this process are indicated by **Table 12.6** with additional commentary provided on serious accidents.

Table 12.6: Accident Statistics

| Counter Location | Slight | Serious | Fatal | Comment |
|--------------------------------|--------|---------|-------|--|
| 1. B740 | 4 | 1 | | Serious accident occurred approximately 4.7km to the north-east of the junction with the A76(T) in 2015. |
| 2. B7078 | - | - | - | - |
| 3. A76(T) – west of Kirkconnel | 3 | 2 | - | One serious accident occurred to the west of Kirkconnel in 2012 and one in the centre of Kirkconnel in 2013. |
| 4. A76(T) – Enterkinfoot | 2 | - | - | - |

- 12.41 **Table 12.6** indicates that between 2012 and 2016 there were nine slight and three serious accidents within the study area. There were no fatal accidents recorded during this period.

The 'Do Nothing' Scenario

- 12.42 If the Development is not implemented then it is likely that there will be no significant changes to the traffic and transport situation in the vicinity of the Development, other than changes to background traffic as a result of general growth and fluctuating coal mining and forestry activities which are prominent in the area.

NLEI Design Considerations

- 12.43 The Development will be accessed via two access points on the B740 (Access A and B). Details of the access junctions are included within **Chapter 4**. The location of the two access points are indicated by **Figure 12.2** and detailed below:
- Access Point A: B740 – south side of the road approximately 11km to the south-west of the junction with the B7078. General construction traffic and abnormal loads will exit the M74 trunk road (T) at Junction 13 before utilising the B7078 and B740.
 - Access Point B: B740 – east side of the road approximately 6.3km to the north-east of the junction with the A76 near Sanquhar village centre. Construction traffic will also exit the M74 (T) at Junction 13 and utilise the B7078 and B740.
- 12.44 During the Scoping Stage and as outlined in the Scoping Report, an additional access point, Access Point C, was also considered. Access Point C was proposed from the west side of the B797 approximately 13.3km to the south-west of the M74 (T) at Abington. Construction traffic would require to exit the A74 (M)(T) at Junction 13 before utilising the A702 Edinburgh Road and the B797 through Leadhills and Wanlockhead. Following discussions with SLC, DGC and TS, and taking account of feedback received during public consultation, it was concluded that Access Point C would not be used given the topographical challenges at the east of the Development Area and problems associated with manoeuvring abnormal loads through the settlements of Leadhills and Wanlockhead. Therefore, Access Point C was discounted and is no longer proposed.
- 12.45 Accessing the Development Area via Access Points A and B is the preferred option for the following key reasons:
- The proposed route for abnormal loads vehicles from the M74 (T) onto the B7078 and B740 to access the Development Area via Access Point A or B requires minimal upgrades compared to alternative routes, as the Abnormal Loads Assessment in **Appendix 12.1** demonstrates in more detail. Although the preferred route passes through the small settlement of Crawfordjohn, it avoids a greater number of potentially sensitive receptors (i.e. the villages of Abington, Leadhills and Wanlockhead) that would be affected if Access Point C was used.
 - Access Point A is an existing timber haulage route therefore will require minimal upgrading works and is currently suitable for use by HGVs. As a result, this reduces the amount of stone required for access tracks and the overall effect of constructing the access tracks.

Access Arrangements for Abnormal Loads

- 12.46 There are a number of suitable ports in central Scotland including Ayr, Glasgow and Grangemouth. The Abnormal Loads Assessment has been prepared on the basis of abnormal load vehicles routing to site from the strategic road network via the M74 trunk road (T), utilising the B7078 and the B740 towards access points A and B.
- 12.47 A full Abnormal Loads Assessment has been undertaken which identified a number of 'pinch points' on the proposed route to site. A swept path analysis has been undertaken at pinch points where there is potential for the load to over-run or over-sail beyond the normal carriageway boundaries. The Abnormal Loads Assessment is presented as **Appendix 12.1** and it contains a number of proposed mitigation measures on the route to site. In relation to mitigation at the pinch points, it has been identified that a by-pass route through a field will be required at Crawfordjohn to pass through an existing "s" bend section of the B740. The location of this pinch point and the Preliminary Design of the mitigation measures are indicated by in **Appendix 12.1 Annex C**. There is also a bridge structure on the B740

² This includes HGVs albeit that these are not allocated a specific portion of the total.

("Birkcleugh" Bridge) where upgrading works will be required to accommodate the abnormal loads. This could involve mitigation measures up to the replacement of the bridge to ensure that it is up to a standard required to accommodate the loads associated with the Development. It is considered possible that this bridge will require some degree of structural upgrading regardless of whether the Development proceeds. A number of other smaller mitigation measures have been identified but overall the route is considered feasible for delivery of abnormal loads.

Assessment of Effects

Construction Effects

Predicted Construction Effects

- 12.48 The construction period represents the greatest intensification in traffic although it is important to note that this intensification is temporary in nature and will vary depending on the construction stage and requirements. The parameters and assumptions used to inform this chapter have been designed to represent a robust and worst-case scenario, where practical.
- 12.49 The construction traffic associated with the Development will comprise construction workers, HGVs / LGVs carrying construction materials and plant, and abnormal loads carrying the main wind turbine components.
- 12.50 There is expected to be between 40 and 60 personnel working onsite at any one time. It is important to note that the number of personnel onsite will vary during the construction process. In general, work hours are expected to be between 07:00 to 19:00 on weekdays and 07:00 to 13:00 on Saturdays which means that staff will generally arrive and depart outside the peak hours associated with the surrounding road network (typically 08:00 to 09:00 and 17:00 to 18:00). Turbine delivery, erection and commissioning activities may take place outwith these hours depending on weather conditions or the requirements of the authorities responsible for authorising abnormal loads movements.
- 12.51 Estimates of traffic generation associated with the construction phase of the Development have been calculated from first principles and consider the following activities:
- delivery and removal of plant / materials (including forestry felling activities) in relation to site mobilisation and set up of site compound;
 - delivery of aggregates and geotextile materials to construct site access roads;
 - delivery of roadstone wearing course for access tracks and hardstanding areas;
 - delivery of concrete or raw materials to batch concrete onsite;
 - delivery of steel reinforcement;
 - delivery of base rings for turbines;
 - delivery of transformers and switchroom equipment;
 - delivery of sand bedding for cabling;
 - delivery of cabling for turbines;
 - delivery of turbine components (including abnormal loads);
 - delivery and removal of cranes for turbine erection;
 - miscellaneous deliveries; and
 - construction worker travel movements.
- 12.52 To calculate a robust scenario, information was gathered regarding the materials required for construction and the size of average loads associated with the construction vehicles. An indicative programme for the construction activities is included within **Chapter 4** while **Table 12.7** includes an estimate of construction vehicle numbers required for each task that will generate HGV / abnormal load movements in relation to the activities outlined in construction programme.

Table 12.7: Estimated No. of HGV / Abnormal Load Trips during Construction

| Construction Task | Vehicle Type | Approximate No. of Loads |
|--|--------------------------|--------------------------|
| 1. Site Establishment | 20t HGV | 60 |
| 2. Forestry felling | 20t HGV | 600 |
| 3. Delivery of Plant & Equipment | 20t HGV | 90 |
| 4. Import aggregate for tracks* | 20t HGV | 9,000 |
| 5. Delivery of Steel (Turbines) | 20t HGV | 88 |
| 6. Delivery of Steel (Substation) | 20t HGV | 10 |
| 7. Delivery of Offsite Concrete (Turbines) | 6m3 Concrete Wagon (HGV) | 3,873 |
| 8. Delivery of Offsite Concrete (Substation) | 6m3 Concrete Wagon (HGV) | 176 |
| 9. Delivery of Sand | 20t HGV | 296 |
| 10. Delivery of Cables | Low Loader (HGV) | 56 |
| 11. Delivery of Cranes | Abnormal loads | 40 |
| 12. Delivery of Control Building | 20t HGV | 10 |
| 13. Delivery of Turbines | Abnormal loads | 315 |
| 14. Delivery of transformer & substation equipment | 20t HGV | 20 |
| 15. Removal of Plant & equipment | 20t HGV | 90 |
| 16. Site Removal | 20t HGV | 60 |
| 17. General site supplies | 20t HGV | 960 |
| Total (One-way) trips | | 15,744 |
| Total (Two-way) trips | | 31,488 |

*assumes 40% stone requirements are imported to the Development Area.

- 12.53 It is the intention of NLEI Ltd to win the majority of the stone requirement from on-site borrow pits which will significantly reduce requirement for the 9,000 HGV trips identified in **Table 12.7** which are associated with importing aggregates. This will therefore result in a notable reduction in the number of HGV total trips overall. However, for the purposes of this assessment, a realistic maximum case scenario has been adopted which assumes 40% of stone will be sourced off-site thus representing a robust case in terms of vehicle movements. It is however likely that a high proportion of the required stone can be sourced from on-site borrow pits.
- 12.54 In addition to the construction vehicles indicated by **Table 12.7**, it is anticipated that there will be 80-120 two-way daily private car trips to the Development associated with construction staff. This equates to a maximum of 60 arrivals and 60 departures at the start and end of the working day. These private car trips have been included in the assessment of construction effects.
- 12.55 The construction of the Development will take approximately 24 months. Using the indicative construction programme, the number of construction trips that are anticipated to visit the Development Area for each month of the construction period has been calculated and is indicated by **Table 12.8**. For the purposes of this assessment it is assumed that all vehicles associated with the construction of the Development are HGVs or abnormal loads, thus providing a robust assessment as there will be a number of LGVs.

Table 12.8: Estimated No. of HGV (Including Abnormal Load) Trips per Month

| Task | Month | | | | | | | | | | | | | | | | | | | | | | | | Totals |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|--------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| 1. | 40 | 20 | | | | | | | | | | | | | | | | | | | | | | | 60 |
| 2. | 4 | | 74 | 74 | 74 | 74 | 74 | 74 | 74 | 78 | | | | | | | | | | | | | | | 600 |
| 3. | 45 | 45 | | | | | | | | | | | | | | | | | | | | | | | 90 |
| 4.* | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | 750 | | | | | | | | | | | | | 9,000 |
| 5. | | | | | | | | | 22 | 22 | 22 | 22 | | | | | | | | | | | | | 88 |
| 6. | | 10 | | | | | | | | | | | | | | | | | | | | | | | 10 |
| 7. | | | | | | | | | 105 | 105 | 407 | 407 | 407 | 407 | 407 | 407 | 407 | 407 | 407 | | | | | | 3,873 |
| 8. | | | 44 | 44 | 44 | 44 | | | | | | | | | | | | | | | | | | | 176 |
| 9. | | | | | | | | | | | 148 | 148 | | | | | | | | | | | | | 296 |
| 10. | | | | | | | | | | | 28 | 28 | | | | | | | | | | | | | 56 |
| 11.** | | | | | | | | | | | | | 10 | 10 | | | | | | | | | 10 | 10 | 40 |
| 12. | | | | | | | | 10 | | | | | | | | | | | | | | | | | 10 |
| 13.** | | | | | | | | | | | | | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | | | | 315 |
| 14. | | | | | | | | | | | | | | | | 10 | 10 | | | | | | | | 20 |
| 15. | | | | | | | | | | | | | | | | | | | | | | | 45 | 45 | 90 |
| 16. | | | | | | | | | | | | | | | | | | | | | | | 20 | 40 | 60 |
| 17. | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 960 |
| Total (One-way) trips | 879 | 865 | 908 | 908 | 908 | 908 | 874 | 864 | 991 | 995 | 1,395 | 1,395 | 492 | 492 | 482 | 492 | 492 | 482 | 482 | 75 | 75 | 40 | 115 | 135 | 15,744 |
| Total (Two-way) trips | 1,758 | 1,730 | 1,816 | 1,816 | 1,816 | 1,816 | 1,748 | 1,728 | 1,982 | 1,990 | 2,790 | 2,790 | 984 | 984 | 964 | 984 | 984 | 964 | 964 | 150 | 150 | 80 | 230 | 270 | 31,488 |

*assumes 40% of stone requirements are imported to the Development Area.

**trips associated with these tasks are abnormal loads.

- 12.56 The construction site may be operational 12 hours a day therefore vehicles could be arriving or departing at any time during this period.
- 12.57 **Table 12.8** indicates that the HGV trips are relatively well spread out over the duration of the construction period. Months 11 and 12 have the highest number of trips associated with the importation of stone for the construction of the access track network and the delivery of concrete. Months 20 to 24 are very light in terms of HGV trips when compared with the stone/ concrete importation period.
- 12.58 With regard to the movement of abnormal load vehicles, **Table 12.8** indicates that abnormal loads will be transported over 11 months of the 24 month construction period. It is noted that no abnormal load movements occur during the two peak traffic months. Assuming 35 one-way abnormal load vehicle trips per month, this equates to approximately 9 one-way trips per week (which can occur 7 days a week). It is noted that abnormal load vehicles will retract to the size of an HGV for their return journey once the loads have been delivered to the destination, therefore two-way movements have not been considered. The schedule of movements of abnormal loads will be agreed upon following discussions with the hauliers and Police Scotland to ensure the least effect on the road network as possible. Given the relatively low number of vehicles, the short duration for which abnormal load vehicles will be on the local road network and that the schedule will be carefully managed, it is not anticipated that this number of abnormal load vehicles will give rise to any significant environmental effects. As a result, no further assessment of the effect of abnormal load vehicles has been undertaken in this section, however, the cumulative effect of abnormal load movements in the area is considered in the cumulative section of this chapter.
- 12.59 The worst-case months with regard to an increase in traffic levels are Months 11 and 12 with 2,790 two-way HGV movements respectively. Assuming 4 weeks per month, this equates to approximately 698 two-way HGVs per week (approximately 349 inbound and 349 outbound). Month 11 is therefore used to assess the traffic related environmental effects of the Development on the study area. It is important to note that this represents a robust and worst-case scenario. The estimate of HGV movements assumes that 40% of stone requirements are imported; however, there is the possibility that a high proportion of stone could be sourced on-site which will reduce the number of HGV movements. These estimates also take account of forestry felling activities.
- 12.60 The daily vehicle trip generation for Month 11 is estimated to be 127 two-way trips (assuming 5.5 days per week). This equates to approximately 10 two-way HGV trips per hour (5 inbound and 5 outbound) assuming a 12 hour working day. It is important to note that this represents a minimal number of trips over a temporary period, however the significance of the traffic effect is assessed in the following section in accordance with relevant regulations and guidance.
- 12.61 To assess the effect of construction traffic it is necessary to determine the distribution of generated trips. As identified earlier in this chapter, all abnormal loads will route to the Development Area via the M74 (T), B7078 and B740, accessing the Development Area by either Point A or B. As the origin of the construction materials is currently unknown, a scenario whereby 100% of general construction HGVs reaching the Development Area via the same route as the abnormal loads is included as a worst-case assessment.
- 12.62 Another scenario whereby 30% of general construction HGVs route to the Development Area via the A76 (T) through either Kirkconnel (approaching from the west) or Enterkinfoot and Sanquhar (approaching from the east / south-east) onto the B740 has also been assessed. This is based on the assumption that a proportion of construction materials could be sourced from these areas as it is noted that there are a number of quarries to the south of the Development. All construction traffic will route along the B740 coming from either the north or south towards site access Point A or B.
- 12.63 In the event of 30% of general construction traffic routing to the Development Area from the A76 (T), this will, in turn, reduce the amount of HGVs routing via the B7078 (and through Crawfordjohn) to 70% which equates to approximately 89 HGVs daily. Consequently, it is important to note the scenario assessed is a worst-case for each road link and these traffic effects could not occur simultaneously i.e. an increase in construction traffic on one road link results in an equivalent decrease in road traffic on the other road links. The only exception to this is that traffic along the B740 will always be 100% given that both site access are location on this road, although 100% will not necessarily route through Crawfordjohn as the B740 approaches the Development from two directions.
- 12.64 Staff vehicle trips have also been considered and distributed across the road network within the study area, represented by the four ATC locations, as shown in **Table 12.9** below. The scenario for the purposes of a realistic case assessment comprises 100% of all staff trips passing ATC 1, as staff will move between the two site accesses A and B, either side of this ATC. The scenario also assumes, 50%

of staff travel to the Development from the north (via ATC 2), as well as 100% from the south, split 50/50 coming from each direction along the A76 (T) via ATC 3 or ATC4, considering locations of the potential workforce (i.e. Ayr to the west and Dumfries to the south-east). It is noted that this scenario totals 150% of trips (split 50% each across the three ATC 2, 3 and 4), which is considered to represent a robust maximum case assessment for each ATC location as, for example, if 40% of staff travel to the Development Area from either direction along the A76 (T), (40% via ATC 3 and 40% via ATC4) then there will be only 20% of staff trips coming from the north along the B7078 and through Crawfordjohn (via ATC2). It is anticipated that staff will travel to the Development Area by private car. **Table 12.9** below indicates the percentage of HGV trips and staff trips that will be distributed over each location during the worst-case month.

Table 12.9 Construction Traffic / Staff Distribution During Worst-Case Months (Months 11 and 12)

| Counter Location | % Distribution of HGVs | No. of Daily Two-way HGV Trips | % Distribution of Staff | No. of Daily Two-way Staff Trips | Total no. of Daily Two-way Vehicles |
|---------------------------------|------------------------|--------------------------------|-------------------------|----------------------------------|-------------------------------------|
| 1. B740 | 100% | 127 | 100% | 120 | 247 |
| 2. B7078 | 100% | 127 | 50% | 60 | 187 |
| 3. A76 (T) – west of Kirkconnel | 30% | 38 | 50% | 60 | 98 |
| 4. A76 (T) – Enterkinfoot | 30% | 38 | 50% | 60 | 98 |

- 12.65 **Table 12.10** details daily percentage increases associated with the construction of the Development at traffic counter locations within the study area. Counter locations are illustrated by **Figure 12.3**.

Table 12.10: Construction Traffic on Routes within Study Area during Worst-Case Month³

| | ATC 1 – B740 | ATC 2 – B7078 | ATC 3 – A76 west of Kirkconnel | ATC 4 – A76 at Enterkinfoot |
|--|--------------|---------------|--------------------------------|-----------------------------|
| Existing AADF | 518 | 692 | 3,304 | 3,607 |
| Existing HGV Count | 50 | 74 | 561 | 729 |
| Existing HGV % | 10% | 11% | 17% | 20% |
| Month 11 (worst-case) Total Daily Traffic Flow | 247 | 187 | 98 | 98 |
| Month 11 (worst-case) HGV Daily Traffic | 127 | 127 | 38 | 38 |
| Existing AADF + Month 11 (worst-case) Total Daily Traffic | 765 | 879 | 3,402 | 3,705 |
| Existing HGV Count + Month 11 HGV Traffic | 177 | 201 | 599 | 767 |
| Percentage increase in Total Traffic due to the Development | 48% | 27% | 3% | 3% |
| Percentage increase in HGVs due to the Development | 254% | 172% | 7% | 5% |

- 12.66 **Table 12.10** indicates that the increase in HGVs associated with the Development at ATC Location 1 will exceed the 30% traffic increase threshold for both total traffic and HGVs as stated within the IEMA Guidelines triggering the requirement for a detailed assessment of effects at this location.
- 12.67 At ATC Location 2, it is anticipated that there will be a 27% increase in total traffic on the B7078 road and a 172% increase in HGVs as a result of the Development. The percentage increase in HGVs therefore exceeds the 30% increase in HGVs and requires a full assessment of effects to be undertaken.

³ It should be noted that month 12 has the same traffic movements as month 11 and is therefore also the 'worst-case' month.

12.68 **Table 12.10** indicates that along the strategic trunk road network at ATC Locations 3 and 4 there could be a 3% increase in total traffic and a 7% and 5% increase respectively in HGVs associated with the Development. This level of effect is considered to be negligible and therefore no further assessment of effects relating to the A76 (T) has been undertaken.

12.69 Whilst **Table 12.10** demonstrates a 48% increase in total traffic at ATC Location 1, it should be noted that the effect on the village of Crawfordjohn will be significantly less than this given that not all of the staff trips that use the B740 will route through the village. It is estimated that approximately 50% of staff will route through Crawfordjohn whilst the other 50% will originate from the south-west. This will equate to a maximum of 60 two-way staff car trips (30 at the start and 30 end of the working day) through Crawfordjohn. As a result, the effects of private car traffic on Crawfordjohn are considered to be negligible and are not assessed further.

12.70 The effects associated with increased HGV traffic identified in the IEMA Guidelines are addressed in the following paragraphs for Locations 1 and 2.

Severance

12.71 The IEMA Guidelines advise that "Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery".

12.72 The potential for traffic associated with the Development to cause severance is assessed on a case by case basis using professional judgement where non negligible traffic increases are predicted on roads through residential settlements.

12.73 Increased severance can result in the isolation of areas of a settlement or individual properties. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. Severance effects could equally be applied to residents, motorists or pedestrians.

ATC Location 1 (B740)

12.74 Referring to the indicators in **Table 12.3**, the magnitude of change in HGVs at ATC Location 1 is regarded as large. Along the majority of the B740 there are isolated properties with the exception of the small settlement of Crawfordjohn. An estimated 127 HGVs routing through Crawfordjohn per day equates to approximately 10 HGVs per hour on a temporary basis. With reference to the receptor sensitivity descriptions in **Table 12.2**, the sensitivity of ATC Location 1, and therefore the B740 and the settlement of Crawfordjohn, can be considered to be negligible as there are no hospitals, churches, schools or historical buildings in the area. When the magnitude of the effect is combined with the receptor sensitivity, the significance of the effect can be assessed in accordance with **Table 12.4** and is considered to be minor. It can be concluded that the temporary increase of 10 HGVs per hour will have a minor effect on severance along the B740 which is classified as **not significant**.

ATC Location 2 (B7078)

12.75 At ATC Location 2 which encompasses the B7078, the magnitude of change is considered to be medium as per **Table 12.3**. The sensitivity of the B7078 can be described as negligible given that there are no significant settlements with sensitive features adjacent to the road and the road is not part of the strategic trunk road network. Combining medium magnitude with negligible sensitivity will result in a negligible effect which can be considered as **not significant**.

Driver Delay

12.76 Some driver delay may be experienced when construction traffic is accessing the Development Area. The IEMA Guidelines advise "delays are only likely to be significant when the traffic on the network surrounding the Development is already at, or close to, the capacity of the system".

12.77 Traffic delay to non-development traffic can occur at several points on the network surrounding the Development site including:

- at the Development entrances where there will be additional turning movements;
- at intersections along the local road network which might be affected by increased traffic; and
- at side roads where the ability to find gaps in traffic may be reduced, thereby lengthening delays.

12.78 It is noted that there are no significant areas of congestion within the study area at this point in time.

ATC Location 1 (B740)

12.79 At ATC Location 1, there is a 122% increase in HGVs which is considered as being of large magnitude as it exceeds a 90% change. The sensitivity of ATC Location 1 is considered to be negligible given that the B740 is not at or close to capacity even with the increase in volume associated with the Development traffic (43,200 capacity and 756 AADF including development traffic). Furthermore, given the low AADF, it is not anticipated that 10 additional HGVs per hour (as a worst-case) will have a significant effect on driver delay within Crawfordjohn. By combining the large magnitude with the negligible sensitivity of the receptor, it can be concluded that driver delay effects will be minor and **not significant** at this location.

ATC Location 2 (B7078)

12.80 While the magnitude of change in HGV traffic is classified as medium at this location, the B7078 is a good standard single carriageway road and therefore has a large carrying capacity (57,600 two-way movements per day) which is not currently operating anywhere near to full capacity (813 AADF including development traffic). Consequently, the sensitivity of ATC Location 2 to driver delay is classified as negligible. When the magnitude of change is combined with the sensitivity of the receptor, it can be concluded that driver delay effects at ATC Location 2 are negligible and **not significant**.

Pedestrian Delay and Amenity

12.81 Traffic volumes, traffic composition, traffic speed, the existence of pedestrian footways and the existence of pedestrian crossings all contribute to the level of general pleasantness, fear, intimidation and delay experienced by pedestrians and other vulnerable road users.

ATC Location 1 (B740)

12.82 Although the magnitude of change in traffic levels is large based on the >90% change assumption, it is not expected that pedestrians will be present along the B740 near to the Development Area accesses as there are no settlements or footways in this area. However, it is expected that there may be some pedestrians in the small settlement of Crawfordjohn approximately 8km – 10km to the north of the Development Area access points.

12.83 The magnitude of change in HGV traffic is large as per the guidance in **Table 12.3**. During the worst-case months with regard to traffic increases (months 11 and 12), it is anticipated that 127 two-way HGV trips will route along the B740 and could route through Crawfordjohn. The 127 two-way HGV trips per day equates to 10 two-way HGVs per hour of the working day. It is noted that this scenario also represents a worst-case increase in traffic as it is expected that a proportion of HGVs may route to the Development Area via the south avoiding Crawfordjohn altogether. This level of increased traffic is therefore relatively low and not anticipated to create any pedestrian delay or reduced amenity in Crawfordjohn. The sensitivity of Crawfordjohn is considered to be negligible as there are no hospitals, churches, schools or historical buildings in the area, and any effects on pedestrian delay and amenity will be minor (at worst-case) and are **not significant** in accordance with **Table 12.4**.

ATC Location 2 (B7078)

12.84 The magnitude of change in the level of HGV traffic is classified as medium at ATC Location 2. However, ATC Location 2 and the B7078 as a whole have a negligible sensitivity to pedestrian delay and amenity as there are no settlements or sensitive features along this section of road. There is only one isolated property with direct frontage onto the B7078 which HGV traffic will pass, however there is a segregated cyclepath running alongside the B7078 which can be utilised by pedestrians to allow them (and cyclists) to travel relatively unaffected by vehicles on the road. It is noted that the B7078 forms part of the NCN Route 74, however, the segregated cyclepath allows this route to be relatively unaffected by changes in traffic levels. By combining the medium magnitude of change with the negligible sensitivity, it can be concluded that the effects on pedestrian delay and amenity will be negligible and **not significant** at ATC Location 2 in accordance with **Table 12.4**.

Accidents and Safety

12.85 The most recently available accident data for the roads within the study area has been provided in **Table 12.6** for the period between 2012 and 2016. The data indicates that a total of 12 accidents have occurred within the study area, the majority of which were slight and none of which were fatal.

12.86 It is estimated that 16,464 vehicles will access the Development (15,744 HGVs plus 720 staff vehicles over the 24 month construction period). An approximate calculation has been undertaken to quantify the level of accident risk that could be expected due to an increase in traffic associated with the

Development. The likelihood of an accident occurring is commonly expressed in accidents per million vehicle-km. Accidents that are appraised in relation to transport are predominantly those in which personal injury is sustained by those involved (personal injury accidents (PIAs)).

12.87 Whilst it is acknowledged that there are varying road characteristics along the length of the routes within the study area, for the purpose of this calculation it has been assumed that the length of road is approximately 26km which encompasses the length of the B740 and the B7078 between the junction with the M74 (T) and the junction with the B740. This section of road can be classified as 'rural good single carriageway' in accordance with the criteria set out in DMRB⁴. This encompasses ATC Locations 1 and 2.

12.88 Accident rates from DMRB for this standard of road are:

- Rural good single carriageway (typical of many non-motorway Trunk Roads): 0.190 Personal Injury Accidents (PIA) per million vehicles/km.

12.89 Assuming a two-way trip on the 26km route for each 16,464 vehicles, a total distance travelled of 856,128km is obtained. Based on the rate above, this suggests a PIA of 0.16 during the construction phase. It is considered that the magnitude of this change is negligible but receptor sensitivity to accidents and safety is always considered as high. When combined, the effect can be classified as minor and **not significant** for the roads within the study area.

Dust and Dirt

12.90 IEMA Guidelines acknowledge that it is not practical to quantify the level of dust and dirt that can be anticipated from development traffic. Therefore a quantitative description of dust and dirt effects from construction traffic is not provided here.

12.91 It is acknowledged that HGVs have the potential to collect debris on their tyres when accessing the Development. This could be transferred to the road surface when vehicles travel away from the Development and can be deposited on the road in the form of either dust or mud depending on weather conditions.

12.92 For all locations, the magnitude of change is considered to be small as standard good practice working methods will be put in place to minimise dust from vehicles (use of wheel washes and covering any loads likely to generate dust) and the sensitivity of the receptors is considered to be low. The overall significance of the environmental effect of dust and dirt within the study area is assessed as negligible and therefore **not significant** in accordance with **Table 12.4**.

12.93 An assessment of dust effects from construction activities, which incorporates those associated with traffic, is provided in **Chapter 14: Other Issues**.

Mitigation

12.94 The assessment does not predict any significant effects (without mitigation). As a result, no mitigation is required to address predicted effects associated with traffic and transport. Notwithstanding this, the following mitigating measures are proposed as 'good practice' to ensure the any effects are minimised as far as possible within the study area and it is assumed will be a condition to any consent for the Development.

Construction Traffic Management Plan

12.95 The CTMP identifies measures to reduce the number of construction vehicles through construction programming/routing. The CTMP also identifies measures to reduce and manage construction staff travel by private car, particularly single occupancy trips. The CTMP will be developed during the detailed design phase of the project. The framework CTMP is included within **Appendix 12.2** and includes measures to manage traffic movements such as the following:

- Immediately upon commencement, all deliveries, operatives and visitors to the Development Area will report to the security gate. This will be communicated to all early works contractors at their pre-start meeting.

- The main contractor will develop a logistics plan highlighting the access point for the project, loading bay, pedestrian/vehicular segregation, welfare, storage, security and material handling that will be enforced following full site establishment.
- All contractors will be provided with a site induction pack containing information on delivery routes and any restrictions on routes.
- It is an option to restrict construction HGV traffic between the network peak hours which are generally 08:00-09:00 and 16:00-18:00 Monday to Friday if necessary.
- The construction material 'lay down' areas will allow for a staggered delivery schedule throughout the day, avoiding peak and unsociable hours (i.e. before 07:00 and after 22:00).
- An integral part of the progress meetings held with all trade contractors is the delivery schedule proforma. In line with the recommendations of this study, all contractors will be required to give details of proposed timing of material deliveries to the Development Area. At this stage they will be given a specific area for delivery.
- The CTMP and the control measures therein will be included within all trade contractor tender enquiries to ensure early understanding and acceptance/compliance with the rules that will be enforced on this project.
- Under no circumstances will HGVs be allowed to lay-up in surrounding roads. All personnel in the team will be in contact with each other and site management who in turn will have mobile and telephone contact with the subcontractors.
- The maintenance of roads in a clean and safe condition.

Dilapidation Survey

12.96 As part of the CTMP, Dilapidation Surveys for the B740 road are proposed as a measure to monitor and mitigate the general wear and tear effects of an increased amount of HGV traffic along the B740 as a result of the construction of the Development.

12.97 The scope of the Dilapidation Survey will be agreed with DGC, SLC and the Contractor. The survey could consider (but is not limited to) the following aspects:

- operation of the route;
- nature and type of road users;
- road surface condition / road edge condition and verge condition;
- condition of any structures within the road boundary;
- constraints to visibility;
- identification of any special areas of interest, e.g. pinch points; and
- where alterations will be made to the road network as a consequence of the Development.

12.98 The survey will likely take the form of a detailed 'walk over' of the B740 in the vicinity of Access Points A and B, with photographs depicting the general condition of the B740 and a video survey taken from a vehicle for the whole length of the B740. These actions will take place before the construction period commences, during construction (if circumstances dictate) and after the construction period is over to assess any changes in condition.

Assessment of Residual Effects

Residual Construction Effects

12.99 Subject to the successful implementation and monitoring of a CTMP, it is considered that any residual effects associated with the construction phase will be of a temporary nature and the magnitude of change will be negligible given that prior to mitigation, all effects are considered as not significant. As a result, the residual effects after implementation of a CTMP are considered to be **not significant**.

⁴ Design Manual for Roads and Bridges (2002) Volume 6, Section 1, 'Road Geometry Links'

Assessment of Cumulative Effects

12.100 Cumulative effects have been assessed for other developments which may utilise any sections of the road network required for the Development. A review of available data from the Traffic and Transport chapters within the relevant ESs provided the following information:

Glenmuckloch Windfarm (consented)

12.101 Glenmuckloch Windfarm Ltd has received planning approval for an 8 turbine windfarm north of Kirkconnel. It is not clear when construction of this windfarm will commence, however, based on the information provided within the ES chapter the only overlap with construction traffic routes is the use of the A76 (T).

Glenmuckloch Pumped Storage Hydro (consented)

12.102 In 2016, Scottish Government granted Glenmuckloch Pumped Storage Hydro Ltd consent for a pumped storage hydro scheme of up to 400MW on the site of the former Glenmuckloch open cast coal mine to the north-west of Kirkconnel. The Non-Technical Summary for the Development states that the A76 (T) will be used by HGVs for transporting materials during the construction phase. As a worst-case scenario, traffic flows may increase by 14% and the report concludes that no major issues relating to traffic and access are anticipated. The construction of Glenmuckloch pumped storage scheme could have some overlap with the construction of the Development, however, the only road link used by both developments is the A76 (T).

Sandy Knowe Windfarm (consented)

12.103 Sandy Knowe Windfarm Ltd has received planning consent for a 24 turbine windfarm approximately 1.7km south-west of Kirkconnel. It is not clear when construction will commence, however, the route identified for abnormal loads and general construction traffic uses the A76 (T) only.

Twentyshilling Hill Windfarm (consented)

12.104 In 2014, Element Power was granted planning permissions to construct a 9 turbine windfarm approximately 4.5km south of Sanquhar. The Development is on hold until further notice therefore Twentyshilling Hill has not been considered in terms of cumulative effects.

Sanquhar Community Windfarm (consented)

12.105 Consent for a windfarm of 9 turbines located approximately 7km south-east of Sanquhar was granted in 2013. The ES for Sanquhar Windfarm indicates that there will be little to no overlap with the Development in terms of the abnormal loads route or the general construction traffic route. Only a small section of the A76 (T) to the west of Kirkconnel could be used by both Sanquhar Community windfarm and the Development.

Hare Hill Windfarm Extension (consented)

12.106 Scottish Power Renewables received approval in 2014 for an extension of 39 turbines to Hare Hill Windfarm. Hare Hill extension requires use of the A76 (T) mainly and there is no overlap with the Development in the use of the B740 or B7078.

Harryburn (pre-application stage)

12.107 RWE Innogy UK has submitted scoping for up to 27⁵ turbines on land approximately 1.3km east of the settlement of Leadhills. The application and accompanying ES has not yet been submitted for Harryburn, however, it is understood that that abnormal loads will route to the site via the M74 (T) onto the A702 southwards to reach the B7040 to the site access. The Scoping Report does not indicate what routes general construction HGVs may take, however, as traffic surveys were proposed on the A702 and B7040 it can be assumed that Harryburn windfarm will not have an effect on the B7078 or B740 road links utilised for the Development.

Summary of Cumulative Effects

12.108 Whilst it cannot be confirmed at this stage, as to when each development's construction phase will commence, the assessment indicates that the only route within the study area with the potential to experience cumulative effects is the A76 (T). The use of the B740 and B7078 for the Development is not

anticipated to be in conflict with any other committed developments in the area as there are no known planned or consented windfarms currently proposing to use these delivery routes.

12.109 The CTMP for the Development will commit to ensuring that peak construction periods for other developments in the area will not overlap with the peak construction period of the Development. Furthermore, the CTMP will ensure that there is communication with other construction sites to minimise effects and that larger traffic generating activities (such as stone importation or concrete pours) are phased to avoid overlap where practicable. It is also possible to conclude that the access routes for general traffic and abnormal loads are generally different while traffic effects on the wider road network (including the A76) will be diluted. It is noted that the A76 strategic trunk road network has a large carrying capacity which is capable of accommodating short-term increases in traffic and HGV levels. On this basis, cumulative effects are considered as **not significant**.

Summary of Significant Effects

12.110 On the basis of the findings of the assessment on access, traffic and transport, this chapter concludes that effects of increased traffic as a result of the construction of the Development are not deemed to be significant given that they represent a temporary change which can be accommodated by the existing road network within the study area, prior to mitigation. Implementation of a CTMP will ensure efficient transportation of construction materials to minimise the effects and disruption to the local area, and a Dilapidation Survey will ensure that general wear and tear effects of the B740 are mitigated appropriately. The assessment also concludes that no significant cumulative effects are predicted during construction of the Development. On this basis, no significant residual access, traffic and transport effects are predicted for the construction or operation of the Development.

ⁱ Institute of Environmental Management and Assessment (IEMA), "Guidelines for the Environmental Assessment of Road Traffic (1993)" ('the IEMA Guidelines');

ⁱⁱ Institute of Highways and Transportation (IHT), "Guidelines for Traffic Impact Assessment (1998)"

ⁱⁱⁱ Department for Transport (DfT), "Design Manual for Roads and Bridges (DMRB)".

^{iv} www.crashmap.co.uk

⁵ It is understood the final layout consists of 17 turbines.