Chapter 12 – Traffic and Transport

Introduction

12.1 This chapter considers the potential access and traffic impacts associated with the construction, operation and decommissioning of the proposed Wind Farm. It considers:

- the type and volume of traffic generation related to the proposed Wind Farm; and
- the potential environmental effects that may arise from traffic associated with the proposed Wind Farm.

12.2 The chapter concludes by assessing the significance of the projected traffic increases in light of identified thresholds of significance.

12.3 The proposed access from the public highway will use the consented access track for the Lochluichart Wind Farm off the A835 north of the site (at approximately 233645E, 870715N). This access junction has been assessed as being appropriate for the proposed vehicles as part of the EIA for the Lochluichart scheme, and will reduce impacts associated with creating an alternative access from the public highway. An earlier application took access from the A835 east of the site (approximately 240000E, 863628N), using a forestry access track. The proposed scheme is preferable to this initial scheme as it reduces the need for two accesses from the A835 to the same area of the hillside, will reduce visual impact associated with creating two access tracks, and will result in a shorter ‘off-highway’ route for vehicles. Site preparation (Forestry operations) for the proposed scheme will use an alternative access to the site, from the A832 at approximately 235828E, 863603N. This access will only be used for forestry operations as part of the site preparation works. An existing track is present at this location.

Key Matters

- access route for abnormal loads;
- access route for construction vehicles;
- impact of construction traffic on the local highway network; and
- proposed mitigation measures to minimise environmental impacts.

Methodology

12.4 A methodical approach was adopted whilst undertaking the assessment for the proposed Wind Farm as outlined below.

Consultations

12.5 As part of the scoping exercise, consultation was undertaken with the Highland Council to identify the preferred turbine delivery route. The Highland Council’s Roads department requested that a structural assessment of all bridges along the agreed route be carried out. Subsequently, the following authorities were contacted to ascertain the suitability of the proposed route:

- Northern Constabulary;
- British Waterways;
- Transerv (working on behalf of Transport Scotland); and
- Network Rail.

12.6 Consultation responses have been received from all parties except British Waterways.

12.7 The Highland Council confirmed that a maximum axle loading of 15 tonne per axle would be required to allow abnormal loads to cross the Smelter Road Bridge in Invergordon.

12.8 Transerv, Network Rail and the Northern Constabulary have confirmed they have no issues or objections to the proposed abnormal load access route.

12.9 The Highland Council and Scottish Natural Heritage commented that the use of the shared access would be preferable in terms of habitat disturbance and visual impact to the area around the proposed Wind Farm, than creating a second access to the site.

Legislation and Guidance

12.10 The transport and traffic issues described in the following planning advice and guidance documents have been taken into account in this assessment:

- Scottish Planning Policy (SPP): Transport (Paragraphs 165-181);
- Planning Advice Note (PAN) 75: Transport and Planning; and

Scottish Planning Policy (SPP)

12.11 Paragraphs 168 notes:

A transport assessment should be carried out where a change of use or new development is likely to result in a significant increase in the number of trips. The output from transport assessments can also identify potential cumulative effects of development which need to be addressed. Planning permission should not be granted for significant travel generating uses in locations which would encourage reliance on the private car and where:

- direct links to walking and cycling networks are not available or cannot be made available,
- access to public transport networks would involve walking more than 400m,
- it would have a detrimental effect on the capacity of the strategic road and/or rail network, or
- the transport assessment does not identify satisfactory mechanisms for meeting sustainable transport requirements.

Recent developments, sites allocated for development in existing plans and unimplemented planning permissions should not set a precedent for the allocation of development sites in unsustainable locations.’

PAN 75: Planning for Transport

12.12 Paragraphs 40 and 41 of PAN75 relate to the production of Transport Assessments. Reference to SPP17 has been superseded by SPP.

‘SPP17 requires a transport assessment to be produced for significant travel generating developments. Transport Assessment is a tool that enables delivery of policy aiming to integrate transport and land use planning…’
12.19 This chapter identifies that access to the proposed Wind Farm would be taken from the consented Lochluichart Wind Farm access. E.ON is working closely with Eneco and Infinergy, the owners and developers of the Lochluichart site, to plan construction activities such that there would be no conflicting traffic and transport activities.

12.20 E.ON intends to remove trees from the site by a forestry haul road, entering the public road network south of the site, onto the A832, by Corriemoillie Farm. This aspect of the operations is classed as Forestry Operations and therefore does not require planning permission as permitted development; however, the vehicles on the public road network as a result of these forestry operations have been included in this assessment. In this assessment, these operations are classed as Site Preparation rather than construction.

**Assessment of Significance**

12.21 As mentioned above in Paragraph 12.13, the IEMA Guidelines for the Environmental Assessment of Road Traffic (1993) state that two broad rules of thumb can be used as a screening process to delimit the scale and extent of the assessment.

12.22 The IEMA guidelines identify general thresholds for traffic flow increases of 10% and 30%. Where the predicted increase in traffic flows is lower than the thresholds, the guidelines suggest the significance of the effects can be stated to be low or insignificant and further detailed assessments are not warranted. However, to ensure a relative assessment of the increase in road traffic in environmental terms the following criteria outlined in Table 12.1 and 12.2 are used to determine magnitude of impact and receptor sensitivity respectively.

**TABLE 12.1 MAGNITUDE OF IMPACT CRITERIA**

<table>
<thead>
<tr>
<th>Change in Traffic Flow</th>
<th>Magnitude of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in total traffic or HGV flows over 90%</td>
<td>Major</td>
</tr>
<tr>
<td>Change in total traffic or HGV flows of 60 - 90%</td>
<td>Moderate</td>
</tr>
<tr>
<td>Change in total traffic or HGV flows of 30 – 60%</td>
<td>Minor</td>
</tr>
<tr>
<td>Change in total traffic or HGV flows of less than 30%</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

**TABLE 12.2 RECEPTOR SENSITIVITY**

<table>
<thead>
<tr>
<th>Receptor Sensitivity</th>
<th>Receptor Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
<td>Receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, accident blackspots, retirement homes, urban/residential roads without footways that are used by pedestrians. (Paragraph 2.5 IEMA Guidelines, 1993)</td>
</tr>
<tr>
<td>Moderate</td>
<td>Traffic flow sensitive receptors including: congested junctions, doctors’ surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, un-segregated cycleways, community centres, parks, recreation facilities.</td>
</tr>
<tr>
<td>Minor</td>
<td>Receptors with some sensitivity to traffic flow: places of worship, public open space, nature conservation areas, listed buildings, tourist attractions and residential areas with adequate footway provision.</td>
</tr>
<tr>
<td>Negligible</td>
<td>Receptors with low sensitivity to traffic flows and those sufficiently distant from affected roads and junctions.</td>
</tr>
</tbody>
</table>

12.23 The magnitude of change and the sensitivity of the receptor are then compared to determine overall significance.

**TABLE 12.3 DETERMINATION OF SIGNIFICANCE OF EFFECTS**

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1 Institute of Environmental Assessment: Guidance Notes No.1 – Guidelines for the Environmental Assessment of Road Traffic (1993)
Chapter 12 – Traffic and Transport

12.24 Potential effects are therefore concluded to be of major, moderate, minor or negligible significance. Major and moderate significance represent effects considered to be significant in terms of the EIA guidance.

Baseline Description

12.25 This section considers the proposed access routes to the Corriemoillie Wind Farm. These comprise routes for abnormal loads, ‘normal’ construction traffic including HGVs, and construction workers.

Routes and Access

Site Access

12.26 The proposed access route into the site takes access from the A835 at Grid Reference 233645E, 870715N. The access point on the A835 is the same as that consented for the Lochluichart Wind Farm scheme.

12.27 Within the site itself, new tracks would be created to access the turbine locations. The indicative locations of these are shown on Figure 1.2. Where possible, the existing forestry tracks will be used within the site, which will need to be widened. Where this is not possible, such as to link the consented Lochluichart track to the site, the proposed new tracks were assessed 100 metres either side to allow for micrositing.

Site Preparation/Forestry Operations Route

12.28 The proposed access into the site for forestry vehicles (and no other vehicles) will be from the A832 at approximately 235828E, 863603N. There is an existing forestry track at this point. It is expected that forestry vehicles may travel to a biomass plant in Invergordon – though other routes may also be followed. However, the ‘worst case’ Invergordon route will be used as it has the potential to conflict with the abnormal load route to be followed by Lochluichart turbines from Invergordon port. Forestry vehicles will therefore be assessed as travelling along the following route (shown in green on Figure 12.1):

- Travel West on A9 from Invergordon;
- From A9, head west on A835;
- At junction with A832 at Gorstan, turn left along the A832; and
- Follow the A832 to site access.

Abnormal Load Route

12.29 Turbine components (abnormal loads) would most likely be delivered by sea to the Port of Invergordon and transported to the site via the A9 and A835. The details of the route are as follows (shown in orange on Figure 12.1):

- From the Port of Invergordon, head east along the B817 to Saltburn;
- At signalised junction with unclassified road, turn left;
- At priority junction at Smelter Industrial Estate, turn right;
- At priority junction with A9 turn left;
- At roundabout with A835 at Tore, take fourth exit;
- At junction with A832 at Gorstan, continue along the A835; and
- Follow the A835 to site access.

Construction Traffic Route

12.30 The abnormal loads route described above provides the most suitable route as it avoids communities and utilises large, well maintained roads. The route is the same as the route consented to be used to transport similar abnormal loads to Lochluichart Wind Farm.

Construction Worker Route

12.31 It is envisaged that stone for construction would be obtained from on-site borrow pits and water taken from on site sources. All other materials would be imported to the site. Although their origin is not known, it is assumed that all or part of the following route would be used (shown in red on Figure 12.1):

- From A9, head west on A835;
- At junction with A832 at Gorstan, continue along the A835; and
- Follow the A835 to site access.

Sensitive Receptors

12.34 In order to establish the sensitive receptors along the routes to the site, a desktop study was undertaken, examining Ordnance Survey 1:50,000 maps. This study identified a school in the town of Contin (approximately 12 kilometres southeast of the site), which appears to front the A835. As shown by Table 12.2, this constitutes a ‘major’ sensitive receptor.

Study Area

12.35 The study area consists of the following roads:

- A832 from Gorstan to Achnasheen;
- A896 from Achnasheen to Kinlochevie;
• A890 from Achnasheen to Coulags;
• A835 from Tore to Lochdrum; and
• A9 from Tore to Invergordon.

12.36 The study area was limited to the above as it is expected that beyond this area the construction traffic flows would have dissipated onto the wider road network without any significant effect. This chapter therefore considers the likely increases in traffic along these routes.

12.37 Assessments considering the impact of the increased traffic flows have been undertaken at six locations along these routes where traffic count information was available. These assessment locations are illustrated by Figure 12.1.

Personal Injury Accident Review

12.38 Personal injury accident data has been obtained from The Highland Council for the 36 months preceding May 2009. This information identified that there were 117 reported accidents within the study area, 27 of which resulted in serious injuries whilst seven resulted in fatal injuries. The majority, 83 accidents, resulted in slight injuries.

Baseline Traffic Counts

12.39 The Highland Council supplied baseline traffic count data for the following locations:
• A832 from Gorstan to Achnasheen;
• A896 from Achnasheen to Kinlochewe; and
• A890 from Achnasheen to Coulags.

12.40 Further traffic flow data, for the A835 and A9 were obtained from Transport Scotland’s traffic flow database. The traffic flows supplied by The Highland Council and Transport Scotland are summarised in Table 12.4. No detailed breakdown of specific HGV volumes was recorded within the information provided.

<table>
<thead>
<tr>
<th>Site on Figure 12.1</th>
<th>Location</th>
<th>Survey Year</th>
<th>Traffic Flow (Vehicles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A832 – Gorstan to Achnasheen</td>
<td>2008</td>
<td>1,679 AAWT</td>
</tr>
<tr>
<td>2</td>
<td>A835 – Aultguish</td>
<td>2007</td>
<td>1,610 AADT</td>
</tr>
<tr>
<td>3</td>
<td>A835 – Contin to Garve</td>
<td>2007</td>
<td>2,942 AADT</td>
</tr>
<tr>
<td>4</td>
<td>A9 – Evanton Bypass</td>
<td>2007</td>
<td>13,250 AADT</td>
</tr>
<tr>
<td>5</td>
<td>A896 – Achnasheen to Kinlochewe</td>
<td>2006</td>
<td>802 AAWT</td>
</tr>
<tr>
<td>6</td>
<td>A890 – Achnasheen to Strathcarron</td>
<td>2005</td>
<td>975 AAWT</td>
</tr>
</tbody>
</table>

12.41 The anticipated start year for main construction of the proposed Wind Farm is 2012, with site preparation beginning in 2011 – however, this is dependent on the construction programme of Lochluichart Wind Farm. The construction programme estimates the duration of construction activity to be approximately 12 months, with a potential increase to 15 months. There will be tree felling activities (site preparation) before the main body of the construction begins, for approximately 8 months (with a potential range of 6-12 months) – however, these trees will be removed by a separate forestry haul route – not the shared access route, and will then follow the route on the public highway described in paragraph 12.28. Therefore the total time period for site preparation (forestry operations) and construction will be 18 to 27 months – but is likely to be 20 months.

12.42 To enable the likely impacts during site preparation and construction to be assessed, base year traffic flows for 2012 have been calculated by applying the Department for Transport (DfT) National Road Traffic Forecast 1997 (NRTF) central-growth (all vehicles) factors to the base traffic flows.

12.43 Table 12.5 summarises the growth factors and the projected 2012 base year traffic flows.

<table>
<thead>
<tr>
<th>Assessment point</th>
<th>Location</th>
<th>Survey Year</th>
<th>Growth factor</th>
<th>Assessment Year AADT / AAWT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A832 – Gorstan to Achnasheen</td>
<td>2008</td>
<td>1.062</td>
<td>1,783 AAWT</td>
</tr>
<tr>
<td>2</td>
<td>A835 – Aultguish</td>
<td>2007</td>
<td>1.078</td>
<td>1,736 AADT</td>
</tr>
<tr>
<td>3</td>
<td>A835 – Contin to Garve</td>
<td>2007</td>
<td>1.078</td>
<td>3,171 AADT</td>
</tr>
<tr>
<td>4</td>
<td>A9 – Evanton Bypass</td>
<td>2007</td>
<td>1.078</td>
<td>13,206 AADT</td>
</tr>
<tr>
<td>5</td>
<td>A896 – Achnasheen to Kinlochewe</td>
<td>2006</td>
<td>1.095</td>
<td>878 AAWT</td>
</tr>
<tr>
<td>6</td>
<td>A890 – Achnasheen to Strathcarron</td>
<td>2005</td>
<td>1.113</td>
<td>1,085 AAWT</td>
</tr>
</tbody>
</table>

Site Preparation/ Forestry Operations Traffic Generation

12.44 Before the construction programme starts, there would be approximately 8 months of forest felling and removal. Vehicles for these forestry operations would follow the same route as construction vehicles and abnormal loads, except access to the site will be taken from the A832 to the south of the site rather than along the “shared” access.

12.45 The site preparation is likely to overlap with the construction work associated with the Lochluichart Wind Farm. As such the traffic generation is considered in the Cumulative Assessment section of this Chapter.

12.46 In order to prevent conflict with construction vehicles for the Lochluichart scheme, liaison between the developers of both proposed Wind Farms will take place to ensure forestry vehicles do not use the route (to Invergordon) when turbines for the Lochluichart scheme are scheduled.

12.47 Site preparation is estimated to take 8 months, though a range of 6 to 12 months is possible. Site preparation will generate up to 66 deliveries (132 movements) per month over the eight...
month period. Deliveries will be scheduled to avoid times when turbines for Lochluichart will be using the abnormal load route.

**Construction Traffic Generation**

12.48 During the indicative twelve month construction period, the following traffic would require access to the site:

- low loaders and HGVs, to deliver equipment and plant;
- flat-bed lorries, to deliver substation and transformer components;
- semi-low extendable trailers, to deliver turbine components (abnormal loads requiring escort);
- cranes, delivered on low-loaders;
- fuel tankers to supply diesel to construction plant;
- HGVs with regular deliveries of construction materials i.e. concrete, steel reinforcement bars, aggregates etc; and
- private car, light van or minibus transporting construction personnel.

**Abnormal Loads Trip Generation**

12.49 An abnormal load movement is defined as a vehicle in excess of 18.65 metres in length or 2.9 metres in width or 44 tonnes in weight. The hubs, nacelles and foundation plates would be transported on articulated vehicles up to 34 metres in length and up to 5 metres (nacelle diameter) in width.

12.50 Turbine tower sections up to 36 metres in length would be transported on ‘clamp’ style trailers requiring a vehicle up to 47.07 metres in overall length. Turbine blades (47.5 metres in length) would require a vehicle of approximately 51 metres overall length.

12.51 The vehicles used to transport turbine components would constitute abnormal loads only on the delivery phase of the journey since the extendible trailers are retracted to the size of a standard articulated vehicle (16.5 metres) during the return leg. Each delivery of turbine components therefore consists of one abnormal load movement on the inbound journey to site and one HGV movement on the return journey.

12.52 Turbine erection is likely to last for approximately 12 weeks. During that period up to 171 abnormal loads of wind turbine components would be delivered to the site, incorporating:

- 57 tower sections;
- 19 nacelles;
- 57 turbine blades;
- 19 blade hubs; and
- 19 base rings.

12.53 Other wind turbine loads such as foundation plates and ancillary items, would also be delivered during this period.

12.54 The number of abnormal loads would not be affected as a result of the amendment in the access location.

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**Heavy Goods Vehicles (Construction and Abnormal Loads) Trip Generation**

12.55 Table 12.6 outlines the estimated HGV trip generation in line with the construction programme. It is estimated that approximately 1,345 (2,690 two-way movements) HGV deliveries (including abnormal loads) would occur during the construction of the proposed Wind Farm. The HGV figure predominantly consists of deliveries for the hardstandings, construction compound, substation, and the turbine and anemometer mast foundations.

12.56 Over the entire construction period, it is expected that on average, 6 HGV deliveries (12 movements) would be made each day. Certain concrete pouring operations require a continuous delivery of materials. However, concrete would be batched on site, reducing the need for deliveries for foundation production.

12.57 Table 12.6 identifies that the most intense period of construction would be in Month 4, during which several activities would be undertaken. During this period, 9 HGV deliveries (18 movements) would occur each day.

**Table 12.6: Construction Programme and associated vehicle movements (all figures are approximate)**

<table>
<thead>
<tr>
<th>Task</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
<th>M10</th>
<th>M11</th>
<th>M12</th>
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<td>Site access tracks</td>
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<td>21</td>
<td>21</td>
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<tr>
<td>Temporary construction compound</td>
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<td>40</td>
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<tr>
<td>Onsite water crossings</td>
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<td>Wind turbine foundation installations</td>
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<td>Final works</td>
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<td>Fuel</td>
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<td>Cabins and amenities</td>
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<tr>
<td>Turbine Erection Cranes Delivery</td>
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<td>Turbine Delivery</td>
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<td>Switchgear</td>
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</tbody>
</table>
Chapter 12 – Traffic and Transport

<table>
<thead>
<tr>
<th>Month</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
<th>M10</th>
<th>M11</th>
<th>M12</th>
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</thead>
<tbody>
<tr>
<td>Total Deliveries per Month</td>
<td>55</td>
<td>137</td>
<td>62</td>
<td>180</td>
<td>152</td>
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<td>133</td>
<td>93</td>
<td>126</td>
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<td>64</td>
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<tr>
<td>Total Deliveries per Day</td>
<td>3</td>
<td>7</td>
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<td>9</td>
<td>8</td>
<td>8</td>
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<td>5</td>
<td>7</td>
<td>3</td>
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<tr>
<td>Total Movements per Day</td>
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<td>14</td>
<td>6</td>
<td>18</td>
<td>16</td>
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<td>14</td>
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<tr>
<td>Construction Personnel</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Per Month (persons)</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td></td>
</tr>
<tr>
<td>Movements Per Day</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td>76</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Figures may not sum due to rounding. Daily figures calculated assuming a 20 day working month.

Construction Worker Trip Generation

12.58 During the construction phase of the development, a maximum of 60 workers are expected to be on site at once. This equates to approximately 14,400 workers accessing the site over the 12 month construction period (1,200 worker days per month).

12.59 Statistics from the Department for Transport’s National Travel Survey 2006 show typical car occupancy levels for construction personnel average 1.6 persons per vehicle. On this basis, an average of 76 construction worker vehicle trips will be made to the site each day (38 inbound, 38 outbound). These trips are likely to be made in cars, light vans, 4x4s and minibuses.

Summary of assumptions

Route

12.60 The route taken by site preparation vehicles (forestry operations) is expected to be from Invergordon via the A9, A835 and A832.

12.61 The route taken by abnormal loads is expected to be from Invergordon Port, from the A9, via the A835.

12.62 The HGVs for construction deliveries are also expected to route to the site from the A9, via the A835.

12.63 Construction workers are anticipated to arrive via a variety of routes from local towns and villages, where they will either be living or boarding. For the purpose of this assessment, it is assumed that they utilise all routes to the site equally.

Site Preparation (Forestry Operations) Timing, Duration and Trip Generation

12.64 The site preparation period would last approximately eight months, with the potential to extend to 12 months. It is intended to begin forestry operations in late 2011, with all operations using a forestry haul road to the south of the site – no vehicles will use the shared access with Lochluichart during this stage.

12.65 Forestry operations will generate up to 66 deliveries (132 movements) per month over the eight month period. Deliveries will be scheduled to avoid times when turbines for Lochluichart will be using the abnormal load route.

Construction Phase Timing and Duration

12.66 The indicative construction programme estimates the overall construction period would last approximately twelve months, with the potential to extend to fifteen months. Indicative timings of traffic generating activities are set out in Table 12.6. The timing of works commencing is dependent on construction works at Lochluichart having ceased – there will be no cumulative use of the shared access track by construction vehicles associated with the two schemes. No vehicles in the construction phase will use the forestry haul route onto the A832.

Abnormal Loads Trip Generation

12.67 Abnormal load trip generation is described in paragraph 12.49. Approximately 171 abnormal load trips for the purposes of turbine component delivery would be made over a twelve week period.

Abnormal Loads Trip Timing and Duration

12.68 If required, abnormal loads could travel in convoys. The overall distance from port to site using the proposed abnormal load route is approximately 71 kilometres. If required by Northern Constabulary, several stops would be made along the way to allow overtaking and thereby reducing delays to other vehicles. It is therefore not possible to estimate an overall journey time.

12.69 Movement of abnormal loads would be agreed with the appropriate authorities and if required could be scheduled to occur off-peak to minimise any delays to other road users.

HGV (Construction and Abnormal Load) Trip Generation

12.70 Plant, equipment and temporary buildings would be required to colonise and establish the construction site compound at the outset and to demobilise it upon completion.

12.71 During construction, HGV deliveries would include components such as cables, transformers and other components of the proposed Wind Farm infrastructure together with construction materials i.e. reinforcing steel bars and aggregate.

12.72 Some stone required for construction of new access tracks, upgrading of existing tracks and construction of hard standing areas, would be sourced from on site borrow pits, therefore minimising the quantum of HGV traffic generated by the construction of the development. It may be required to import some stone. Concrete would be batched on site, thereby further minimising the HGV traffic generation associated with the construction of the development.

12.73 On average, approximately 6 HGVs (12 movements) would access the site each day over the 12 month construction period. This assumes a 20 day working month. The most intense period of construction would be during Month 4, at which time an average of 9 HGV deliveries (18 movements) would be expected to occur each day.

Construction Worker Transport

12.74 It is expected that the construction workforce would generate no more than 76 two-way movements over the course of a typical day.
Assessment of Effects

12.75 This section identifies the likely vehicle movements and considers the likely impact associated with the construction and operation of the proposed Wind Farm on the local road network. Site preparation activities are considered in the Cumulative Effect section (paragraph 12.90).

Route

12.76 It is proposed that the majority of the delivery type movements would occur via the A9 and the A835. The construction traffic is not expected to have a detrimental effect on these roads, due to their highly trafficked and well maintained nature. Most forestry and construction workers are expected to be employed or reside locally and would therefore travel from local towns and villages.

Upgrades to the Public Road

12.77 Any required upgrades to the proposed route would be conditioned through a legal agreement, post planning. Therefore, the required detail of any upgrades would be provided at that point. However, the consented Lochlucht Wind Farm permits the use of abnormal loads on the same proposed route between Invergordon and the Corriemoillie Wind Farm development. As such the route has previously been deemed acceptable for similar abnormal loads activity.

On-Site Access Tracks

12.78 New site tracks and hardstanding areas would be created to the specification of the turbine manufacturer. Existing site tracks (forestry tracks) would be improved wherever possible with replacement and re-grading of the running surface.

12.79 The nature of the peat on site, and other engineering constraints would also inform the nature and exact location of the tracks to ensure stability under the required loadings. Routes would therefore be finalised at the detailed design stage.

Traffic Flows

12.80 HGVs and construction personnel vehicles would respectively average 12 and 76 two-way vehicle movements per day equating to 88 total two-way vehicle movements on average per day at the site over the entire 12 month construction period.

12.81 Table 12.7 summarises the peak traffic impact during construction at the assessment points in 2012 and describes their significance in terms of the increase in traffic volumes. These effects are also summarised in Figure 12.1.

12.82 It is expected that during the peak month of construction that an average of 18 two-way HGV movements and 76 personal two-way construction worker vehicle trips would occur each day. This equates to a total of 1,880 two-way vehicle movements during the month, assuming that there are 20 construction days during this month.

12.83 Table 12.7 identifies that the peak impact on the agreed assessment locations would result in a maximum traffic impact of less than 4%. It should be noted that the peak vehicular impact associated with the Wind Farm construction schedule on the baseline situation is less than 2% on five of the six assessed links and the significance of the effect at all assessment points is considered negligible.

<table>
<thead>
<tr>
<th>Assessment Point</th>
<th>Location</th>
<th>2012 Baseline Traffic</th>
<th>Peak Impact</th>
<th>Significance of Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A832 – Gorstan top Achnasheen</td>
<td>1,783</td>
<td>1.42%</td>
<td>Negligible</td>
</tr>
<tr>
<td>2</td>
<td>A835 – Aultguish</td>
<td>1,736</td>
<td>3.96%</td>
<td>Negligible</td>
</tr>
<tr>
<td>3</td>
<td>A835 – Contin to Garve</td>
<td>3,171</td>
<td>1.37%</td>
<td>Negligible</td>
</tr>
<tr>
<td>4</td>
<td>A9 – Evanton Bypass</td>
<td>13,206</td>
<td>0.19%</td>
<td>Negligible</td>
</tr>
<tr>
<td>5</td>
<td>A896 – Achnasheen to Kinlochewe</td>
<td>878</td>
<td>1.44%</td>
<td>Negligible</td>
</tr>
<tr>
<td>6</td>
<td>A890 – Achnasheen to Strathcarron</td>
<td>1,085</td>
<td>1.18%</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

Sensitive Receptors

12.84 A School in Contin on the A835 was identified as a sensitive receptor located along the vehicle routes to the site (paragraph 12.34).

12.85 On the basis of Table 12.7 above the proposed development would have a negligible traffic impact of the A835 at Contin. In accordance with the significance of effect criteria (Table 12.3), this level of impact is considered to be of negligible significance.

Potential Effects

12.86 In terms of the thresholds outlined by the IEMA Guidelines, Table 12.7 illustrates that there would be a not significant effect on the access routes in terms of traffic flows.

12.87 The increases in HGV traffic have the potential to result in the following environmental impacts:

- **Traffic noise and vibration** - the potential traffic noise impact on residential receptors in the vicinity of the site would be temporary in nature and very small scale given the distance from receptors. This issue is considered further in Chapter 11 Noise;

- **Disruption and driver delay** - the effects of delay to other road users would mainly be apparent during the movement of abnormal loads as a result of their large size and low speed rather than their numbers. Whilst on the A9, these movements would have less of an impact on driver delay, due to the A9 having more than one lane. The abnormal load vehicles would be undertaken outside of peak traffic hours and it is likely that several abnormal load vehicles would move simultaneously in convoy to reduce the overall disruption. If required, the abnormal load vehicles could pull over to the side of the road at a suitably safe location to allow other road users to overtake, thereby minimising driver delay. Such mitigation would be agreed with the Council, as described below in 12.76-12.82;
Increased risk of accidents - any increase in traffic numbers has the theoretical potential to increase the risk of accidents. Ordinarily, marginal increases in vehicle numbers would be considered to have a negligible effect on safety since the increases are within average day to day variation in traffic levels. However, there is a potential for impacts on safety as a consequence of driver frustration related to the movement of abnormal loads. Measures to control and ameliorate the potential for issues of driver frustration to arise are described in the mitigation measures within this chapter;

Severance, Intimidation and Pedestrian Delay - an increase in vehicle numbers, particularly HGVs through towns and villages, could result in additional delays to pedestrians wishing to cross the road i.e. severance. HGV traffic, particularly abnormal loads, can reduce the amenity of pedestrian routes in towns and villages to the extent that pedestrians feel intimidated by the traffic. Due to the rural and pedestrian free nature of the A835 and A9, there is expected to be negligible effect on severance, intimidation and pedestrian delay on these routes, except possibly where the route passes through towns and villages adjacent to the roadway. There is a potential for these effects to be felt in the towns and villages which the construction workers pass through; however, the increase in traffic caused by the developments in these locations is relatively small and therefore unlikely to contribute to these effects;

Dust and dirt - HGVs have the potential to distribute dust and dirt from the construction site onto the local road network. These effects would be most pronounced in the immediate vicinity of the site entrance. The potential for road soiling to occur would be controlled by appropriate measures such as wheel cleaning and road sweeping; and

Visual effects - the movements of high-sided vehicles could be considered visually intrusive. This effect would be short-term and only occur during the construction period.

Operation

12.88 It is predicted during the normal operational phase there would be an increase in traffic of no more than 10 vehicle movements per day. This would principally constitute five movements of light vehicles for daily maintenance, with very occasional abnormal loads associated with replacement blades or gearboxes. This represents a negligible increase in traffic movements on the assessed routes. These traffic movements would fall substantially below the IEMA Guidelines for significance, i.e. a 10% increase in sensitive areas and a 30% increase for other locations are considered significant. Hence, traffic movements associated with the operational phase of the proposed Wind Farm are considered to be of negligible significance.

Decommissioning

12.89 Prior to decommissioning, anticipated to be 25 years from the date of formal commissioning, a further traffic assessment would be carried out and traffic management procedures agreed with the appropriate authorities. The levels of traffic associated with decommissioning are likely to be lower than those required during construction as some of the proposed Wind Farm infrastructure may be left in situ, as described in Chapter 3 (e.g. turbine foundations). It is therefore expected that the traffic impacts are likely to be lower in comparison to the construction period and based on the current baseline traffic flows.

Cumulative Effects

Site Preparation

12.90 Access to the proposed wind farm during the site preparation stage will be from the A832 (via the A9 and A835), along an existing forestry haul road (at approximately 235828E, 863603N). This stage of operations will take place from late 2011, when construction of Lochluichart Wind Farm will still be ongoing, and will last for approximately 6 months. During this time, no vehicles will use the "shared" access which the Lochluichart vehicles will use. Therefore, the only roads around the site with vehicles for both schemes will be the A835 south of Garve, and the A9 to Invergordon. Liaison between E.ON and the constructors of Lochluichart will ensure that conflict of forestry vehicles with turbine components bound for Lochluichart will not occur.

12.91 The tree felling is anticipated to require a total of 527 forestry vehicles to access the site over the 8 month period, equating to 66 vehicles per month. On that basis the tree felling would on average result in 3 vehicles per day accessing the site, or 6 two-way vehicle movements (3 inbound and 3 outbound). In addition, up to 6 members of staff would be on-site during the tree felling resulting in up to 12 two-way vehicle movements per day (6 inbound and 6 outbound).

12.92 The tree felling will overlap with construction works relating to the Lochluichart Wind Farm and as such the cumulative impact of these activities has been considered. Whilst the tree felling activities would use a different access junction to the Lochluichart Wind Farm, the cumulative impact on the local road network has been considered.

12.93 On the basis that the main construction of the Corriemoillie Wind Farm would follow on after the construction of the Lochluichart Wind Farm, for the purposes of a robust assessment it has been assumed that the tree felling would overlap with the final 8 months of construction of the Lochluichart Wind Farm.

12.94 The construction traffic associated with the Lochluichart Wind Farm during the final 8 months of its construction, Months 4 to 11, has been extracted from the ES submitted alongside the planning application for the Lochluichart Wind Farm. Table 12.8 below sets out the cumulative impact of the Lochluichart Wind Farm and the Corriemoillie tree felling.

<table>
<thead>
<tr>
<th>TABLE 12.8 Cumulative Impact - Daily Two-way Traffic Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
<tr>
<td>Corriemoillie Tree Felling (HGVs)</td>
</tr>
<tr>
<td>Corriemoillie Tree Felling (Staff)</td>
</tr>
<tr>
<td>Cumulative Impact</td>
</tr>
</tbody>
</table>
12.95 A comparison of the cumulative impact presented in Table 12.8 with the traffic impact during the construction of the Corriemoillie Wind Farm, as shown in Table 12.6, shows that during the period of overlap in construction of the Lochluichart and Corriemoillie Wind Farms the traffic flow generated will be lower than during the main construction of the Corriemoillie Wind Farm. As such no further consideration of the cumulative impact is considered necessary.

12.96 The proposed ‘shared’ access to the north is an alternative to an access from the A835 to the east of the site. Were this access taken, the combined extended period of use of the Lochluichart track would be avoided, and the increased period of disturbance of the few properties along the A835 (between the two accesses) would be avoided. However, the use of the Lochluichart access removes the traffic disturbance associated with establishing a new junction onto the A835, as well as visual effects associated with having two tracks to the site rather than one. The overall distance travelled by vehicles would be slightly longer using the Lochluichart track, though the distance of ‘off public highway’ travel is reduced from approximately 6.5 kilometres to approximately 2 kilometres. The amount of new track required to be constructed is also substantially smaller (approximately 300 metres rather than 945 metres). The originally proposed access track would also require widening, whereas the Lochluichart track will be constructed to accommodate abnormal turbine loads.

12.97 Therefore the overall cumulative effect of the track development is considered to be decreased by the ‘shared’ access, rather than the construction of an entirely separate access to the Corriemoillie site.

12.98 No other cumulative traffic effects are foreseen.

Mitigation

12.99 This section considers the likely mitigation measures that would be implemented in order to minimise the traffic and transport impacts of construction, operation and decommissioning of the proposed Wind Farm.

Site Preparation Mitigation Measures

12.100 The potential effects associated with the proposed Wind Farm site preparation traffic would be minimised through the utilisation of an existing forestry haul road, which avoids taking access using the A835, to minimise impacts on this road (as a result of the ongoing Lochluichart Wind Farm construction). Discussion between the two site managers will ensure that wherever possible vehicles associated with the forestry operations do not conflict with vehicles bringing abnormal loads to the Lochluichart site. Such a conflict could otherwise have the potential to occur on the A835 south of Garve to Invergordon. This mitigation will be covered by the Traffic Management Plan mentioned in Paragraph 12.102.

Construction Mitigation Measures

12.101 The potential effects associated with the proposed Wind Farm construction traffic would be minimised through the utilisation wherever possible of existing access tracks within the site, as described in Chapter 3. The shared access will also avoid the need for vehicles to maintain two access tracks, though as rock would be sourced from on site borrow pits, the number of vehicles on the public highway involved in constructing the access track will be negligible.

12.102 Prior to construction of the proposed Wind Farm, a draft Traffic Management Plan would be prepared and submitted to The Highland Council for consideration following consultation with the Council and other stakeholders such as the Northern Constabulary. The developer and appointed contractor would finalise this traffic management plan with The Highland Council and adhere to its details during the construction of the wind farm. The traffic management plan would typically include consideration of the following:

- Appropriate Police or contractor escort to accompany movement of turbine components from the port of entry, at times to be agreed with the local authorities and police where appropriate;
- Advanced notification to the general public warning of turbine component transport movements;
- Informative road signage warning other users of forthcoming turbine component transport and construction traffic movements as described in Chapter 3;
- Arrangements for regular road maintenance and cleaning, e.g. road sweeping in the vicinity of the site access point as necessary;
- Specific routing of abnormal loads to avoid peak seasonal traffic within The Highlands and along the A9 and A835;
- Specific timing of deliveries outside of peak traffic hours;
- Wheel cleaning / dirt control arrangements at key stages of construction; and
- Provision of temporary signs and traffic control where necessary.

12.103 The implementation of a traffic management plan and routing strategy would aim to minimise the movement of construction vehicles during the morning and evening peak traffic hours when the road network is typically at its busiest.

12.104 Statistics from the Department for Transport’s National Travel Survey 2006 show typical car occupancy levels for construction personnel averages around 1.6 persons per vehicle, which reduces the number of light vehicles by half. In order to reduce traffic impacts associated with the construction of the proposed Wind Farm, construction personnel would be encouraged to car-share or utilise company shuttles where practicable.

Operation mitigation measures

12.105 No mitigation measures are anticipated to be required during operation of the proposed Wind Farm, due to the low numbers of operational vehicle movements. If replacement turbine components were required, transport arrangements for abnormal loads and appropriate mitigation would be agreed with the local authorities in advance.

Decommissioning mitigation measures

12.106 A Traffic Management Plan would be prepared and agreed with the local authorities for the decommissioning process to ensure traffic impacts at this time are minimised.

Residual Effects

12.107 The mitigation measures described above, and the short-term nature of the increase in traffic, would result in minimal residual environmental effects in terms of traffic and transport. This is justified by:

- Use of a traffic management plan and routing agreements to minimise any impacts during both construction and decommissioning; and
• The effects associated with traffic in the operational phase being insignificant.

Summary of Effects

12.108 This assessment concludes that the construction of the proposed Wind Farm would result in a temporary increase in traffic levels on the A9, A835, A832, A890 and A896. In accordance with the significance criteria detailed in Table 12.3, these increases are considered to be minor or negligible and as such not significant.

12.109 A route for transporting abnormal loads, such as turbine components, was identified and consulted upon. Subsequent to the consultations, a preferred route was determined.

12.110 Abnormal loads would be scheduled to occur during off-peak periods, at times to be agreed with the Northern Constabulary and The Highland Council in order to minimise delays to other road users.

12.111 Traffic generated during the operation and maintenance of the proposed Wind Farm would be minimal and would not result in any significant effects.

12.112 Traffic generated during decommissioning of the proposed Wind Farm is likely to be lower than the levels associated with its construction. It would be the subject of a further traffic assessment and management plan at the appropriate time. The effects are not expected to be significant.

12.113 Overall effects on the public highway will be reduced by taking access from an existing access track used for the consented Lochluichart Wind Farm (to be constructed prior to Corriemoillie). There will therefore be no requirement to create a new access onto the A835, as well as reducing distance to be travelled on the access track and minimising additional visual impact caused by creating two tracks rather than one. All forestry operations (and no construction operations) will take access onto the public road using a forestry haul road onto the A832.

12.114 Table 12.8 summarises the potential effects, likely mitigation measures and residual effects during construction, operation and decommissioning.

<table>
<thead>
<tr>
<th>TABLE 12.8 Summary of Effects, Mitigation and Residual Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential Effects</strong></td>
</tr>
<tr>
<td>Site Preparation (Forestry Operations)</td>
</tr>
<tr>
<td>Increase in traffic along the A832, A835, A896, A890 and A9</td>
</tr>
<tr>
<td>Increase in traffic past the School in Contin on the A835</td>
</tr>
<tr>
<td>Increased risk of accidents and impact on road safety</td>
</tr>
<tr>
<td>Potential cumulative increase in traffic on A835 and A9 as a result of Corriemoillie</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in traffic along the A832, A835, A896, A890 and A9</td>
</tr>
<tr>
<td>Increase in traffic past the School in Contin on the A835</td>
</tr>
<tr>
<td>Potential traffic delays by abnormal loads on the A835</td>
</tr>
<tr>
<td>Potential traffic delays by abnormal loads on the A9</td>
</tr>
<tr>
<td>Increased risk of accidents and impact on road safety</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in traffic along the A835</td>
</tr>
<tr>
<td>Increase in traffic along the A9</td>
</tr>
<tr>
<td>Increased risk of accidents and impact on road safety</td>
</tr>
<tr>
<td>Potential replacement of large turbine components</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Decommissioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential increases in HGV traffic on surrounding road network</td>
</tr>
</tbody>
</table>
Statement of Significance

12.115 This Traffic and Transport chapter has assessed the likely significance of effects of the traffic associated with the proposed Wind Farm during site preparation, construction, operation and decommissioning. With the implementation of mitigation measures such as an appropriate traffic management plan and suitable liaison with The Highland Council, the residual traffic and transport effects are temporary and have been assessed as having an impact of negligible significance.

References

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

Department for Transport - Transport Statistics Bulletin: National Travel Survey 2006

Department for Transport - National Road Traffic Forecast, 1997

Planning Advice Note (PAN) 75: Planning for Transport

Scottish Planning Policy Guidance: Transport (Paragraphs 165-181)