CHAPTER 13: TRAFFIC AND TRANSPORT

Figures (Volume 3)

Technical Appendices (Volume 4)

13. Traffic and Transport

13.1 Executive Summary

13.1.1 An assessment of traffic and transport effects on the public road network associated with Cloiche Wind Farm (the Proposed Development) has been undertaken.

13.1.2 The assessment considers the impacts during the construction phase of the Proposed Development, when volumes of traffic generation are anticipated to be at their greatest due to the delivery of equipment and construction materials. In line with IEMA guidelines, severance, driver delay, pedestrian delay, pedestrian amenity, fear and intimidation as well as accidents and safety have been evaluated in isolation for the Proposed Development. Additionally, these receptors were evaluated cumulatively considering other committed and in-planning wind farms to produce a worst-case scenario. The operational phase of the Proposed Development is not anticipated to have any significant impacts on the public road network as a result of the low levels of traffic that are forecast and has therefore not been assessed.

13.1.3 The preferred access strategy relating to abnormal load access is detailed within the accompanying Technical Appendix 13.2: Route Survey Report. The preferred access strategy proposes that all turbine blade loads would originate from Kyle of Lochalsh and access the site via the A87 to Invergarry then the A82 to Fort Augustus before following the same route as HGV traffic on the B862 road, entering the site entrance from the west. All other turbine components would be delivered to Corpach and would also access the site via the A82 from the south and the B862.

13.1.4 Traffic volumes as a result of construction activities are likely to increase on the public roads approaching the site. Traffic volumes are not anticipated to increase by more than 10% on any roads except for the B862. The anticipated total traffic volumes are projected to be well within the capacity of the roads in question and the environmental effect is considered not to be significant providing that suitable mitigation measures such as a comprehensive CTMP (Construction Traffic Management Plan) is implemented.

13.1.5 For the purposes of the cumulative assessment, it has been assumed that all construction programmes for committed developments; Millennium South, Aberarder and Dell Wind Farms, as well as in-planning development; Glenshero coincide with the Proposed Development. Although, this is highly unlikely, the cumulative assessment considered the worst-case scenario. The results indicate that when considering the cumulative construction phases, the total amount of traffic does not increase on the A82 and A87 by more than 10%. The predicted increase in traffic flows on the B862 relate to the Proposed Development and the effects of cumulative developments, Glenshero and Dell. Total HGV traffic movement flows would increase by more than 30% on the A82. Although, the total volume of traffic movements is not anticipated to increase by more than 10%.

13.1.6 Total traffic and HGV traffic movements are anticipated to increase by over 30% on the B862 at Fort Augustus. The B862 is a receptor of medium sensitivity designed to accommodate general traffic and HGV movements between primary destinations. However, the road has also previously been used and was upgraded during the construction of Stronelairg Wind Farm. The significance of any cumulative effects is considered to be minor and can be mitigated through the implementation of CTMPs associated with each individual development. The overlap of peak construction activities is considered unlikely due to likely capacity constraints on construction material, turbine manufacturer and logistics supply chains.

13.1.7 When considering theoretical worst case overlap of the peak periods associated with the construction programmes of other developments within the cumulative assessment, the effects are not considered to be significant.

13.2 Introduction

13.2.1 This Chapter considers the potential traffic and transport effects associated with Cloiche Wind Farm (the Proposed Development).

13.2.2 The assessment focusses on the construction phase of the Proposed Development as the worst-case scenario for traffic generation.

13.2.3 The specific objectives of the Chapter are to:

- Describe the traffic and transportation baseline;
- Describe the assessment methodology and significance criteria used in completing the impact assessment;
- Describe the potential effects, including direct, indirect and cumulative effects; and
- Assess the residual effects remaining following the implementation of mitigation.

13.2.4 This Chapter is supported by the following technical appendices:

- Technical Appendix 13.1: Transport Assessment; and
- Technical Appendix 13.2: Route Survey Report.

13.2.5 Technical Appendix 13.1 includes a Framework Construction Traffic Management Plan with Technical Appendix 13.2 detailing traffic management measures specific to the movement of abnormal loads.

13.2.6 The assessment has been carried out by WYG Environment Planning Transport Limited, part of the WYG Group in accordance with the Institute of Environmental Assessment (now Institute of Environmental Management and Assessment (IEMA)) Guidelines for the Environmental Assessment of Road Traffic. All staff contributing to this Chapter have undergraduate and/or postgraduate degrees in relevant subjects, have professional transport assessment experience, and hold professional membership of the Chartered Institute of Logistics and Transport.

13.3 Scope of Assessment

Study Area

13.3.1 The study area includes sections of the public road network which would be used to access the Proposed Development Site (the Site) by construction and operational traffic, as agreed with the roads authorities. The study area has been identified through a review of the likely routes for abnormal loads and between suppliers of equipment and materials and the Site. It is considered that it should include:

- A82 between Inverness and Fort William;
- A87 between Invergarry and Kyle of Lochalsh; and
- B862/B861 between Fort Augustus and Inverness.

13.3.2 The preferred abnormal load access strategy is the same delivery route utilised for the operational Stronelairg Wind Farm. The component parts of proposed turbines, in particular the blade components are larger than those previously transported along the proposed delivery and, subject to detailed design review and trial runs, additional modifications would be required to the road network such as vegetation clipping or

clearance and street furniture removal. Details of the abnormal load access strategy and associated road network modifications are detailed in Technical Appendix 13.2 Route Survey Report.

Consultation Reponses

13.3.3 The Scoping Opinion for The Proposed Development has identified key issues to be considered within the assessment. Issues of relevance to Traffic and Transport are outlined in **Table 13.1**.

Table 13.1: Scoping and Consultation Responses relevant to Traffic and Transport

Consultee	Consultation Response	Comment / Action Taken
Transport Scotland (TS)	In terms of abnormal loads, the details required would include a report which considers the movement of abnormal loads including swept path analysis and potential mitigation measuresrequired at pinch points along the route.	The Chapter is supported by Technical Appendix 13.2 Route Survey Report which details the abnormal load route, swept path analysis and associated mitigation.
	Transport Scotland would ask that potential trunk road related environmental impacts such as driver delay, pedestrian amenity, severance, safety etc are considered and assessed where appropriate taking into account IEMA guidelines.	An assessment of impact on traffic and transport has been undertaken in line with IEMA guidelines and is included in section 13.7 of this Chapter and supporting appendices.
	It is accepted that impacts associated with operation and decommisioning are to be scoped out.	Noted.
	Having reviewed the information contained within your detailed scoping letter, we can confirm that your approach to the assessment of environmental impacts of the proposed wind farm is appropriate as is the approach to assessing abnormal loads access.	Noted.
The Highland Council (THC)	A Transport Asssessment (TA) within the EIAR will be required.	The Chapter is supported by Technical Appendix 13.1: Transport Assessment.
	All access routes proposed for use by abnormal loads, suppliers of equipment and materials should be identified having been investigated in order to establish their feasibility and method to establish a preferred route.	The Chapter is supported by Technical Appendix 13.2: Route Survey Report which details the abnormal load route selection process with details of access routes relating to other deliveries contained within the Chapter.
	Determine the traffic generation, distribution and impact of the proposed construction traffic.	An assessment of impact on transport is included in section 13.7 of this Chapter and supporting appendices.
	Cumulative impacts with other developments in progress including	An assessment of the cumulative impact on transport is included in

Consultee	Consultation Response	Comment / Action Taken
	renewable energy projects should be undertaken.	section 13.10 of this Chapter and supporting appendices.
	The Transport Assessment should include a framework Construction Traffic Management Plan (CTMP) aimed at minimising the impact of construction traffic.	Technical Appendix 13.1: Transport Assessment provides a framework CTMP with Technical Appendix 13.2 providing further details of traffic management measures sepcific to abnormal load movement.

13.4 Legislation, Policy and Guidance

13.4.1 A review of relevant traffic and transport planning policies has been undertaken and summarised below. The review provides the basis for the wider development context of energy proposals.

National Policy and Guidance

National Planning Framework 3

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

Scottish Planning Policy

13.4.3 In relation to transport and access matters, Scottish Planning Policy (SPP) notes:

13.4.4 "Where a new development or a change of use is likely to generate a significant increase in the number of trips, a transport assessment should be carried out. This should identify any potential cumulative effects which need to be addressed; and

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

Planning Advice Notice (PAN) 75

13.4.5 PAN75: Planning for Transport provides advice on the requirements for Transport Assessments as follows:

"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."

"All planning applications that involve the generation of person trips should provide information which covers the transport implications of the development. The level of detail will be proportionate to the complexity and scale of the impact of the proposal. For smaller developments the information on transport implications will enable local

authorities to monitor potential cumulative impact and for larger developments it will form part of a scoping exercise for a full transport assessment. Development applications will therefore be assessed by relevant parties at levels of detail corresponding to their potential impact."

Onshore Wind Turbines; Online Renewables Planning Advice (May 2014)

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

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

Transport Assessment Guidance 2012

13.4.8 The main objective of this Transport Scotland guidance document is to assist in the preparation of Transport Assessments for development proposals in Scotland. The planning and transport policy context is set out in SPP which provides an outline of the framework for delivering integration of transport and land use planning, including the requirement for a Transport Assessment, for developments involving significant travel generating uses.

13.4.9 Transport Assessment Guidance sets out requirements according to the scale of development being proposed.

Guidelines for the Environmental Assessment of Road Traffic, IEMA, 1993

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

Local Policy

The Highland Council Local Transport Strategy 2010

13.4.11 The Local Transport Strategy (LTS) sets out the Council's transport policies within the study area. It refers to the road network across rural areas being characterised by 'winding single carriageway roads with passing places'. Reference is also made to the additional pressure that can be placed on sub-standard roads. The LTS also mentions the many bridges which are subject to weight restrictions in the Local Authority area. The LTS states that "*where possible, the Council, through its Lifeline Bridges programme will invest in the bridges to maintain access either by removing weight restrictions or reducing the weight restriction effect of HGV vehicles*." The aim of the Lifeline Bridges programme is to assist the economy of the area by allowing the efficient transport of essential goods and services and providing for industries that are heavily dependent on large vehicle transport.

13.5 Methodology

Method of Baseline Characterisation

13.5.1 The methodology adopted in this assessment has involved the following key stages:

- Determine baseline conditions;
- Review the Proposed Development to identify potential effects including any cumulative effects;
- Evaluate significance;
- Identify mitigation; and
- Assess residual effects.

Desk Study

13.5.2 The baseline review focuses on the nature of the surrounding road infrastructure and the level of traffic that uses it. It has been informed by the following:

- Review of the Scoping Opinion;
- Collection of traffic flow data;
- Review of roads hierarchy;
- Identification of sensitive junction locations;
- Identification of constraints to the roads network, with or without height/width/weight restrictions;
- Identification of areas of road safety concerns;
- Identification of other traffic sensitive receptors in the area (routes, communities, buildings etc.);
- Review of Ordnance Survey (OS) plans to derive a local roads network; and
- Consideration of potential supply locations for construction materials to inform the extent of roads network to be considered in the assessment.

Field Study

13.5.3 Automatic Traffic Count (ATC) surveys to determine existing traffic flows and speeds on the surrounding road network were undertaken in September 2019 to further enhance the understanding of the road network in the study area.

13.5.4 Site visits were undertaken as part of the Abnormal Indivisible Load (AIL) route assessment which considered potential constraints to the movement of AILs in terms of height, width and weight restrictions.

Methodology for the Assessment of Effects from Construction

Criteria for Assessing the Sensitivity of Receptors

13.5.5 In terms of transport and access impacts, the receptors are the users of the roads within the study area and the locations through which those roads pass.

13.5.6 The IEMA Guidelines document includes guidance on how the sensitivity of receptors should be assessed. Using that as a base, professional judgement was used to develop a classification of sensitivity for users based on the characteristics of roads and locations. This receptor sensitivity classification is summarised in Table 13.2.

Table 13.2: Classification of Receptor Sensitivity

Receptor value/sensitivity	Receptor Type	
	Users of Roads	**Users of Locations**
High	Where the road is a minor rural road, not constructed to accommodate frequent use by Heavy Goods Vehicles (HGV's). Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.	Where a location is a large rural settlement containing a high number of community and public services and facilities.
Medium	Where the road is a local A or B class road, capable of regular use by HGV traffic. Includes roads where there is some traffic calming or traffic management measures.	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Low	Where the road is Trunk or A-class, constructed to accommodate general and HGV traffic moving between primary destinations. Includes roads with little or no traffic calming or traffic management measures.	Where a location is a small rural settlement, few community or public facilities or services.
Negligle	Where roads have no adjacent settlements. Includes new strategic trunk roads that would be little affected by additional traffic and suitable for Abnormal Indivisible Load (AILs) and new strategic trunk road junctions capable of accommodating AILs.	Where a location includes individual dwellings or scattered settlements with no facilities.

13.5.7 Where a road passes through a location, users are considered subject to the highest level of sensitivity defined by either the road or location characteristics.

Criteria for Assessing the Magnitude of Change

13.5.8 The following rules, also taken from the IEMA Guidelines were used to determine which links within the traffic and transport study area should be considered:

- **Rule 1** – include highway links where traffic flows are predicted to increase by more than 30 % (or where the number of HGVs is predicted to increase by more than 30 %).
- **Rule 2** – include any other specifically sensitive areas (such as schools, hospitals, congested junctions etc.) where traffic flows are predicted to increase by 10 % or more.

13.5.9 The IEMA Guidelines identify the key impacts that are most important when assessing the magnitude of traffic impacts from an individual development: the impacts and levels of magnitude are discussed below:

- **Severance** – the IEMA Guidance states that, "severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery." Further, "Changes in traffic of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' [or minor, moderate and major] changes in severance respectively". However, the Guidelines acknowledge that "the measurement and prediction of severance is extremely difficult" (Para 4.28).
- **Driver delay** – the IEMA Guidelines note that these delays are only likely to be "significant [or major] when the traffic on the network surrounding the development is already at, or close to, the capacity of the system" (Para 4.32).
- **Pedestrian Delay** – the delay to pedestrians, as with driver delay, is likely only to be major when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. An increase in total traffic of approximately 30 % can double the delay experienced by pedestrians attempting to cross the road and would be considered 'major'.
- **Pedestrian Amenity** – the IEMA Guidelines suggest that a tentative threshold for judging the significance of changes in pedestrian amenity is where the traffic flow (or its lorry component) is halved or doubled (Para 4.39). It is therefore considered that a change in the traffic flow of -50 % or +100 % would produce a 'major' change in pedestrian amenity.
- **Fear and intimidation** – there are no commonly agreed thresholds for estimating levels of fear and intimidation, from known traffic and physical conditions. However, as the impact is considered to be sensitive to traffic flow, changes in traffic flow of 30 %, 60 % and 90 % are regarded as producing 'minor', 'moderate' and 'major' changes in fear and intimidation respectively.
- **Accidents and safety** – professional judgement would be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents.

Criteria for Assessing Cumulative Effects

13.5.10 Traffic associated with operational wind farms and other development currently using the road network, and therefore flows, are captured in baseline traffic surveys or extracted from the online Department for Transport (DFFT) database of count sites (https://roadtraffic.dft.gov.uk/).

13.5.11 Cumulative developments identified as having an impact on the road network within the study area during their respective construction periods have been considered in a cumulative assessment. This assessment considers developments which are either committed or subject to valid planning applications and is carried out on the assumption that the peak period of construction for these developments, would coincide with that of the Proposed Development. Traffic flow information for relevant developments is extracted from documentation submitted with the planning applications.

Criteria for Assessing Significance of Impact

13.5.12 To determine the overall significance of the effects, the results from the receptor sensitivity and impacts magnitude assessment are correlated and classified using a scale

set out in Table 2.4 of Volume 11, Section 2, Part 5 of Design Manual for Roads and Bridges DMRB and summarised in Table 13.3.

Table 13.3: Significance of Effect

Receptor Sensitivity	Magnitude of Impact			
	Major	**Moderate**	**Minor**	**Negligible**
High	**Major**	**Major**	**Moderate**	Negligible
Medium	**Major**	**Moderate**	Minor	Negligible
Low	**Moderate**	Minor	Minor	Negligible
Negligible	Negligible	Negligle	Negligible	Negligible

13.5.13 In terms of the Environmental Impact Assessment (EIA) Regulations, effects are considered significant where they are assessed to be major or moderate (show as bold in Table 13.3.).

Assumptions and Limitations

13.5.14 In line with standard practice, daily baseline traffic flows have been developed from the average traffic flows collected over the course of a week-long count survey in September 2019 (11 September – 17 September). Although it is possible that the flows may over or under represent the baseline annual average daily flow, this is considered a robust approach because surveys were undertaken during an average period in terms of vehicle movements and no incidents likely to affect traffic flow were reported over the course of the surveys.

13.5.15 To ensure a robust assessment of the likely impacts during the construction phase, four years of National Road Traffic Forecast (NRTF) high growth was applied to the surveyed traffic movements. High growth is substantially higher than the levels of growth generally experienced in the area and is considered to adequately cover for any developments not individually accounted for.

13.5.16 Construction traffic flows associated with cumulative developments, including those committed and subject to valid planning applications were included when calculating cumulative effects. The assessment is carried out on the assumption that the peak period of construction for all developments would occur simultaneously. This is considered a very robust assumption.

13.5.17 For the purposes of this assessment, it is assumed that all staff and construction traffic will be generated from outside the study area. This is a robust assumption as it is likely that some staff will originate within the traffic and transport study area and their movements will not therefore impact on all roads under consideration.

13.5.18 Based on the distribution of the local population and settlements in the study area, 75 % of staff trips were assumed to originate from towns accessed via the A82 north of Invermoriston, 20% via the A82 south of Invergarry and 5% via the A87 west of Invergarry.

13.5.19 It is assumed that all HGV traffic will be required to use the B862 west of the Site access and that this will also be the preferred access route for all other traffic. In order to assess a worst-case scenario, it has been assumed for the purpose of this assessment that all traffic will approach the Site from the west on the B862.

13.6 Baseline

Current Baseline

Extent of the Study Area

13.6.1 The study area for the traffic and transport assessment was identified through a review of the likely routes between suppliers of equipment and materials and the site including the preferred abnormal delivery route. The study area is defined as the public roads which would be used during the construction phase to access the Proposed Development and is shown in Figure 13.1 and includes:

- A82 between Inverness and Fort William;
- A87 between Invergarry and Kyle of Lochalsh;
- B862 between Fort Augustus and Inverness.

13.6.2 The B862 between Fort Augustus and Inverness is a local road managed by THC, while the A82 and A87 are strategic trunk roads managed by Transport Scotland and its managing agent Bear Scotland.

13.6.3 The B862 is a two-way rural single carriageway road subject to the national speed limit except where it passes through settlements including the section east of Fort Augustus where the speed limit reduces to 30mph. The road provides access to small hamlets and dwellings in the study area and provides an alternative route towards Inverness avoiding the A82.

13.6.4 The A87 is a two-way rural single carriageway road subject to the national speed limit except where it passes through settlements including Invergarry, where the speed limit reduces to 40mph and Kyle of Lochalsh where the speed limit reduces to 30mph.

13.6.5 The A82 runs south to north between Glasgow and Inverness with a mixture of rural sections subject to the national speed limit and urban sections including through Fort William and Fort Augustus where the speed limit drops to 30mph.

Existing Traffic Movements

13.6.6 To determine the existing road usage, Automatic Traffic Count (ATC) surveys were commissioned at two sites situated on the B862 within Fort Augustus and immediately west of the existing Glen Doe access junction for one week in September 2019. In addition, 2018 Annual Average Daily Traffic Flow (AADT) data for four sites was extracted from the online DFT database of count sites. The locations of the traffic count sites are illustrated on Figure 13.1 and are as follows:

- 1 – A82 south of Invergarry (Count Point 40762);
- 2 – A82 north of Invergarry (Count Point 10760);
- 3 – A82 south of Invermoriston (Count Point 50707); and
- 4 – A87 south of its junction with the A887 (Count Point 30776).

13.6.7 The existing weekday traffic flows at each count site are summarised into cars and Light Goods Vehicles (LGV) and HGVs in Table 13.4.

Table 13.4: Existing Traffic Conditions (Weekday Average Two Way Flows)

Survey Location	Cars & LGV's	HGV's	Total
A82 south of Invergarry (DFT)	3962	364	4326
A82 north of Invergarry (DFT)	2883	263	3146
A82 south of Invermoriston (DFT)	2442	237	2679
A87 south of its junction with the A887 (DFT)	1480	109	1589
B862 west of Glen Doe site access (Commissioned)	683	265	948
B862 Fort Augustus (Commissioned)	591	217	808

Existing Vehicle Speeds

13.6.8 The ATC sites used to provide traffic volume data on the B862 between Fort Augustus and the Glen Doe site access were also used to collect speed statistics. The two-way five-day average and 85th percentile speeds observed at the count locations are summarised in Table 13.5.

Table 13.5: Speed Summary (Weekday Average Two Way Flows)

Survey Location	Average Speed (MPH)	85th Percentile Speed (MPH)	Speed Limit (MPH)
B862 west of Glen Doe site access (Commissioned)	31.9	32.2	30
B862 Fort Augustus (Commissioned)	21.7	28.6	30

13.6.9 The speed survey data indicates that the average and 85th percentile speeds immediately east of Fort Augustus are below the speed limit. However, the speed survey data from the site immediately west of the Glen Doe site access suggests that both the average and 85th percentile speeds are greater than the speed limit.

Accident History

13.6.10 WYG obtained road traffic accident data from the Stats 19 national accident using sources – www.crashmap.uk and https://www.cyclestreets.net/collisions for the study area roads covering the five years to the end of 2018.

13.6.11 A detailed summary of the personal injury accidents recorded within the study area road network is presented in Technical Appendix 13.1: Transport Assessment, for the five-year period which indicate that:

- Over the 239 km (two way) network reviewed, out of a total of 197 accidents, an average of 39 accidents occurred every year;
  - 76% of the accidents are classified as slight;
  - 21% of accidents are classified as serious; and
  - 3% of accidents are classified as fatal.
- Accidents were spread evenly across the network with no common locations or causes identified.

Footpath and Cycle Network

13.6.12 A review of foot and cycle paths that may be affected by the movement of construction traffic was undertaken.

13.6.13 THC's web page[1] indicates that close to the Site, Core Path IN16.01 (Kilchuimen Burial Ground and River Tarff), IN16.06 (Campsite to Fort Augustus by Caledonian Canal), IN16.17 (Fort Augustus Abbey loop), IN16.05 (Caledonian Canal from Bridge of Oich to Fort Augustus) and IN16.04 (Caledonian Canal to A82 by church) all connect in to either the A82 or B862 approximately 2.8km west of the Site entrance. However, none of these core paths cross any of these roads which will be used by construction traffic. A footway is provided along a section east side of the B862 linking between Core Paths IN16.01 and IN16.17 which also forms a signed walking route and is likely to be utilised by users of these routes.

13.6.14 The B862 forms part of the National Cycle Route 78 and there are also walking routes located near the site entrance such as the South Loch Ness Trail, Loch Ness 360 Trail and Monadhliath Way.

13.6.15 Further details of walking routes, core paths and National Cycle Route is provided in Chapter 15: Land Use and Recreation (see also Figure 15.1).

Future Baseline

Traffic Flows

13.6.16 It is anticipated that the construction period would last 36 months, as described in Chapter 3: Description of Development. For the purpose of this assessment, it is assumed that the construction start date is 2023 (subject to consents and approvals being granted). On this basis, it is estimated that the peak period of construction generating the greatest volume of traffic would occur in 2024. Any lengthening in the programme would reduce the peak period trip generation.

13.6.17 Base year traffic flows were determined by applying a National Road Traffic Forecast (NRTF) factor to the surveyed traffic flows. 2024 growth factors were applied to the existing traffic flows, the year where construction traffic is projected to be at its peak.

13.6.18 The NRTF high growth factor for 2018 to 2024 is 1.0838. This factor was applied to the 2018 DFT/Transport Scotland data and to estimate the 2024 traffic flows. The NRTF high growth factor for 2019 to 2024 is 1.0679 and this was applied to the 2019 ATC data.

13.6.19 The estimated future year baseline traffic movements are shown in Table 13.6.

Table 13.6: 2024 Future Year Baseline Traffic Conditions (Weekday Average Two Way Flows)

Survey Location	Cars & LGV's	HGV's	Total
A82 south of Invergarry (DFT)	4294	395	4689
A82 north of Invergarry (DFT)	3125	285	3410
A82 south of Invermoriston (DFT)	2647	257	2904

[1] https://www.highland.gov.uk/info/1225/countryside_farming_and_wildlife/161/outdoor_access/4

Survey Location	Cars & LGV's	HGV's	Total
A87 south of its junction with the A887 (DFT)	1604	118	1722
B862 west of Glen Doe site access (Commissioned)	729	287	1017
B862 Fort Augustus (Commissioned)	631	232	863

Summary of Sensitive Receptors

13.6.20 Table 13.7 provides a summary of the receptors identified as being sensitive to the Proposed Development and which have been 'scoped-in' to the assessment, together with a justification for their inclusion.

Table 13.7: Summary of Receptor Sensitivity

Receptor (Users of Road or Location)	Sensitivity	Justification
A82	Low	Trunk or A-class road constructed to accomodate general and HGV traffic between primary destinations.
A87	Low	Trunk or A-class road constructed to accomodate general and HGV traffic between primary destinations.
B862	Medium	B-class road capable of use by HGV traffic having been used in the construction of Glendoe Hydroelectric Scheme and Stronelairg Wind Farm.
Settlements on the B862 including White Bridge, Lyne of Gorthleck and Dores	Low	Small rural settlements with limited services.
Fort Augustus	Medium	Intermediate sized rural settlement which is a popular tourist area with several facilities and services.
Invermoriston	Low	Small rural settlement with limited services.
Drumnadrochit	Medium	Intermediate sized rural settlement which is a popular tourist area with several facilities and services.
Spean Bridge	Low	Small rural settlement with limited services.

13.7 Potential Effects

Development Traffic Generation

13.7.1 During the assumed 36-month construction programme, it is anticipated the following vehicle types will require regular access to the Site from the public road:

- staff transport, cars, vans and staff minibuses (cars and LGV);
- construction equipment and materials, deliveries of machinery and supplies such as concrete raw materials (HGV);
- AILs consisting of the wind turbine components, transformer components and heavy lift crane(s); and
- escort vehicles for AIL deliveries, cars and LGV.

13.7.2 Except for the turbine components, most traffic would be normal construction plant and would include grading tractors, excavators, high capacity cranes, forklifts and dumper trucks. Most would arrive at the site on HGVs.

13.7.3 The turbines would be delivered to Site in component sections and assembled on-Site. The nacelle, hub, drive train, blade sections and tower sections are classified as AILs due to their weight and/or length, width and height when loaded.

13.7.4 The turbine components can be delivered on a variety of transport platforms with typical examples illustrated in Technical Appendix 13.2.

13.7.5 In addition to the turbine deliveries, two or more high capacity erection cranes will be needed to offload some components and erect the turbines. The cranes are likely to be mobile cranes with a capacity up to 1,000 tonnes that would be escorted by boom and ballast trucks to allow full mobilisation on-site. Smaller erector cranes would also be present to allow the assembly of the main cranes and to facilitate overall erection of the turbines.

Construction Traffic Movements

13.7.6 The assessment is based upon information provided by the Applicant and developed from experience of other wind farms of a similar scale which is detailed in Section 6 of Technical Appendix 13.1.

13.7.7 The candidate turbine used in the route assessment, represents the most onerous component dimensions likely to be transported to the Site.

13.7.8 The greatest number of vehicle movements are associated with staff and the importation of raw materials relating to the production of concrete for turbine foundations. For the purposes of this assessment it was assumed that all material will be delivered from off-site quarries. An exception has been made for aggregate materials used to construct the wearing course of access tracks, crane hardstandings and foundations for the temporary construction compounds and electrical control building which will be taken from borrow pits on site. It was also assumed that concrete will be batched on-site at the identified batching plant area used during the construction of Stronelairg Wind Farm.

13.7.9 To enable comparison of the estimated future year baseline traffic movements with total volumes including predicted construction traffic, average daily two-way movements for each month assuming a 22-day working month for deliveries were determined. Traffic movements were also split by vehicle type in line with the baseline data and the peak period for construction traffic determined. The final daily construction profile by activity is set out in Annex B of Technical Appendix 13.1 and summarised in Table 13.8.

Table 13.8: Daily Construction Traffic Movements (Weekday Average Two Way Flows)

Vehicle Type	Month									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Car/LGV	8	8	8	34	34	34	59	59	59	76
HGV	7	7	7	10	9	9	10	10	10	14
Total	15	15	16	44	43	43	69	69	69	90
Vehicle Type	**Month**									
	11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Car/LGV	76	76	76	76	76	87	87	87	87	87
HGV	14	14	14	14	14	18	18	18	18	18
Total	90	90	90	90	90	105	105	105	105	105
Vehicle Type	**Month**									
	21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Car/LGV	87	87	87	87	87	87	87	45	45	45
HGV	18	18	18	18	18	18	18	6	7	7
Total	105	105	105	105	105	105	105	51	52	51
Vehicle Type	**Month**									
	31	**32**	**33**	**34**	**35**	**36**				
Car/LGV	17	17	17	8	8	8				
HGV	2	2	2	8	8	8				
Total	19	19	19	16	16	16				

13.7.10 The maximum traffic movements associated with construction of the Proposed Development are predicted to occur during months 16 to 27 of the programme. During these months, an average of 18 HGV movements is predicted per day and it is estimated that there would be a further 87 car and minibus / LGV movements per day to transport construction workers to and from the Site.

Development Traffic Routing/Distribution

13.7.11 The origin of vehicle traffic would depend on the location of staff accommodation and the source of materials being imported. It is likely that staff would be accommodated across a wide area. The highest volume of traffic would be generated by the requirement for concrete materials, elements of which would be imported. There are several potential concrete plants near the Site including Breedon and Leiths Scotland both situated at Fort William and Tarmac Dunain Mains Quarry Inverness and Mid Lairgs Quarry south of Inverness. Full details of the assumed distribution are set out in Section 6 of Technical Appendix 13.1.

13.7.12 HGV traffic would be required to use the A82 and B862 from its junction with the A82 then access the Site from the west via the B862 making a right turn. All HGV traffic would only use the B862 to the west of the access and would be forced to turn left out of the site due to the low standards of the road to the east. The choice of HGV route was based on identifying the most suitable route between the Site access and the primary Trunk or A-Class road network. The chosen route was identified as the most suitable route to achieve this avoiding impact on other potentially sensitive receptors including Farr and

Stratherrick Primary Schools located north of the Site on the B862 and B861 respectively. This was also the chosen route during the construction of Stronelairg Wind Farm.

13.7.13 All turbine blade loads would originate from Kyle of Lochalsh and access the site via the A87 to Invergarry then the A82 to Fort Augustus before following the same route as HGV traffic. All other turbine components would be delivered to Corpach and would also access the site via the A82 from the south.

Predicted Impact

13.7.14 To estimate the total trips on the road network within the study area during the construction phase, daily construction traffic flows were combined with the future year baseline traffic data. The resulting figures were compared with the weekday future year baseline traffic.

13.7.15 Table 13.9 summarises the daily peak construction traffic (Months 16 to 27) at the various locations within the study area and Table 13.10 summarises the future year baseline plus peak construction traffic (total) flows.

Table 13.9: Weekday Peak Construction Traffic (Daily Average Two Way Flows)

Survey Location	Cars & LGV's	HGV's	Total
A82 south of Invergarry (DFT)	18	6	25
A82 north of Invergarry (DFT)	24	8	32
A82 south of Invermoriston (DFT)	63	9	72
A87 south of its junction with the A887 (DFT)	6	2	7
B862 west of Glen Doe site access (Commissioned)	87	18	105
B862 Fort Augustus (Commissioned)	87	18	105

Table 13.10: Total Weekday Traffic (Daily Average Two Way Flows)

Survey Location	Cars & LGV's	HGV's	Total
A82 south of Invergarry (DFT)	4312	401	4713
A82 north of Invergarry (DFT)	3149	293	3442
A82 south of Invermoriston (DFT)	2710	266	2976
A87 south of its junction with the A887 (DFT)	1610	120	1730
B862 west of Glen Doe site access (Commissioned)	816	305	1121
B862 Fort Augustus (Commissioned)	718	249	967

13.7.16 Table 13.11 shows the percentage increase in total traffic over future year baseline traffic.

Table 13.11: Percentage Increase in Total Traffic Generation v Future Year Baseline (Daily Average Two Way Flows)

Survey Location	Cars & LGV's	HGV's	Total
A82 south of Invergarry (DFT)	0.43%	1.65%	0.53%
A82 north of Invergarry (DFT)	0.77%	2.92%	0.95%
A82 south of Invermoriston (DFT)	2.38%	3.66%	2.49%
A87 south of its junction with the A887 (DFT)	0.35%	1.55%	0.43%
B862 west of Glen Doe site access (Commissioned)	11.92%	6.17%	10.29%
B862 Fort Augustus (Commissioned)	13.77%	7.65%	12.13%

13.7.17 The results in Table 13.11 indicate that during construction of the Proposed Development, neither total nor HGV traffic flows are predicted to increase by more than 30% on the A82 or A87. Users of the A82 and A87 are considered receptors of low sensitivity. With reference to rule 1 of the IEMA Guidelines, no further assessment of these receptors is required. In addition, neither total nor HGV traffic flows are predicted to increase by more than 10% on these road links. As such, rule 2 does not apply and no further assessment is required in respect of these receptors.

13.7.18 During construction of the Proposed Development, total traffic movements may increase by more than 10% on the B862 between Fort Augustus and the Site access junction. While the effects would be temporary and short-term in duration, these links have been taken forward to an assessment of effect significance.

13.7.19 Table 13.12 summarises the potential effects (as identified in the IEMA Guidelines) and predicted magnitude of the impact from increases in traffic movements on the B862 situated to the west of the Site access junction with no mitigation in place.

Table 13.12: Assessment of Construction Effects (B862 west of Site access)

Receptor	Potential Impact	Magnitude of Impact	Significance of Effect
Users of/residents adjacent to B862	Severance	Minor	The change in total traffic is not anticipated to exceed 30% and is therefore assessed as minor. However, the impact would be temporary and traffic and pedestrian movements are not observed to be high. The significance is assessed as **minor**.
	Driver Delay	Minor	Some delay to drivers may occur during the movement of construction vehicles. While the road is a public road, traffic flows are low, and the road is not close to capacity. The significance is assessed as **minor**.
	Pedestrian Delay	Minor	Pedestrians could experience delay if their movements conflict with those of construction, and particularly AIL traffic. While total volumes may increase by over 10%, the road is not close to capacity, pedestrian movements are not observed to be high with no formal pedestrian infrastructure; the significance is assessed as **minor**.

Receptor	Potential Impact	Magnitude of Impact	Significance of Effect
	Pedestrian Amenity	Minor	Pedestrians could experience delay if their movements conflict with those of construction, and particularly AIL traffic. While total volumes may increase by over 10%, the road is not close to capacity, pedestrian movements are not observed to be high with no formal pedestrian infrastructure; the significance is assessed as **minor**.
	Fear and Initimidation	Minor	The change in total traffic is not anticipated to exceed 30% and is therefore assessed as minor. As general traffic and pedestrian flows are also low, the significance is considered **minor**.
	Accidents and Safety	Minor	There is potential for impact on safety due to potential conflict between HGVs and other traffic and pedestrians. As general traffic and pedestrian flows are low, the significance is considered **minor**.

13.7.20 Before the introduction of mitigation, it is not considered that any significant effects would arise for users of the B862.

Potential Operational Impacts

13.7.21 It is predicted that during the operation of the Proposed Development there will be up to two vehicle movements per week for maintenance purposes. Also, there could be occasional abnormal load movements to deliver replacement components in the event of a major component failure.

13.7.22 In terms of the IEMA Guidelines, such a small number of traffic movements and the associated percentage uplift over baseline traffic movements are not significant and this is not considered any further.

Potential Decommissioning Effects

13.7.23 Prior to decommissioning of the site, likely to be 25 years from commissioning, a traffic assessment would be undertaken, and appropriate traffic management procedures would be followed.

13.7.24 The decommissioning phase would result in fewer trips on the road network than the construction phase as it is likely that elements of infrastructure such as access tracks and electrical cables would be left in place and components could be broken up on-site to allow transport by reduced numbers of standard HGVs.

13.7.25 As decommissioning would result in fewer vehicle trips on the road network than the construction phase, assuming the baseline has not substantially changed, the significance of any effects would not be greater than those identified for the construction phase. It can therefore be assumed that the assessment of the construction phase covers the worst-case scenario for the decommissioning phase.

13.8 Mitigation

Mitigation During Construction

General Construction Traffic

13.8.1 During the construction period, a community liaison group would be set up to disseminate information and take feedback. The Applicant would maintain a project website that would be regularly updated to provide the latest information relating to traffic movements associated with vehicles accessing the Site. This would be agreed with THC.

13.8.2 The following measures would be implemented during the construction phase through the CTMP (see Technical Appendix 13.1):

- All materials on delivery lorries (dry materials) would be sheeted to reduce dust and stop spillage on public roads;
- Specific training and disciplinary measures would be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- Wheel wash facilities would be established at the Site entrance;
- Working hours will be limited to between 0700 and 1900 Monday to Saturday though deliveries would be prohibited after 1400 on a Saturday save for AIL component delivery which could take place outside these hours;
- Avoidance of transit through the rural communities identified during arrival and departure times of schools;
- Police escorts would be utilised for the movement of AIL with the aim of having several vehicles in convoy to minimise the disruption caused to road users. Abnormal load escorts would also warn oncoming vehicles of approaching loads and will pull vehicles over to allow the convoy to pass. They would also pull the convoy over at predetermined locations allowing vehicles to pass reducing the risk of any large build-up of traffic;
- Appropriate traffic management measures would be put in place at the A82/B862 junction and along the B862 to avoid conflict with general traffic, subject to the agreement of THC;
- Appropriate traffic management measures would be put in place at the site access junction. Typical measures would include speed limit, HGV turning and crossing signs and/ or banksmen at the site access and warning signs; and
- Provision of construction updates on the project website and a newsletter to be distributed to residents within an agreed distance of the Site.

13.8.3 All drivers would be required to attend an induction to include:

- A safety briefing;
- The need for appropriate care and speed control;
- A briefing on driver speed reduction agreements (to slow site traffic at sensitive locations);
- Identification of specific sensitive areas;
- Identification of the specified route; and
- The requirement not to deviate from the specified route.

13.8.4 Video footage of the pre-construction phase condition of the AIL access route and the construction vehicles route would be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline will allow identification of any change in the road condition during the construction stage of the Proposed Development. Any necessary repairs would be coordinated with THC and any damage caused by traffic associated with the Proposed Development during the construction period that would be hazardous to public traffic would be repaired as soon as possible.

13.8.5 Damage to road infrastructure caused directly by construction traffic will be made good and street furniture that is removed on a temporary basis would be fully reinstated.

13.8.6 There will be a daily road edge review and debris and mud would be removed from the carriageway using an on-site road sweeper to keep the road clean and safe.

Mitigation During Operation

13.8.7 Site entrance roads would be well maintained and monitored.

Mitigation During Decommissioning

13.8.8 Like the construction phase, a CTMP would be prepared for the decommissioning phase.

13.9 Residual Effects

13.9.1 This section considers the assessment of traffic effects following the incorporation of the mitigation measures identified above.

Residual Construction Effects

13.9.2 An evaluation of the potential effects of the increase in traffic on the local roads to be used as part of the route for construction traffic has been undertaken. This considered the traffic effects on different environmental receptors identified in the IEMA Guidelines with no mitigation in place (see Tables 13.12 and 13.13). It concluded that there would be no significant effects resulting from the construction phase. As such, no significant residual effects are anticipated.

Residual Operational Effects

13.9.3 No significant operational effects were identified.

Residual Decommissioning Effects

13.9.4 No significant decommissioning effects were identified.

13.10 Cumulative Effects

13.10.1 Consideration was given to the cumulative impact of the Proposed Development in combination with other developments that are both committed and subject of valid planning applications which would impact on the study area. It was considered that committed developments, Aberarder and Millennium South Wind Farms as well as in-planning developments, Glenshero and Dell Wind Farms should be included in the assessment. Culachy, Beinn Mhor, Cnoc An Eas, and Druim Ba Wind Farms were not included having been refused planning consent.

13.10.2 It is highly unlikely that the construction programmes for the Proposed Development and the identified wind farms would coincide. However, for the purposes of this assessment

it was assumed that the peak periods of the construction programmes would overlap and as such, the cumulative assessment has considered the worst-case scenario.

13.10.3 Peak period traffic flows for these other developments were extracted from planning documentation and added to the future year flows where they impact on the study area. Table 13.13 illustrates the weekday traffic flows associated with the four cumulative developments, Table 13.14 the Total Cumulative Traffic Flows (baseline traffic plus Proposed Development and cumulative developments) and Table 13.15 the percentage increase in cumulative traffic over baseline traffic.

Table 13.13: Cumulative Development Peak Construction Traffic (Weekday Average Two-Way Flows)

Survey Location	Cars & LGV's	HGV's	Total
A82 south of Invergarry (DFT)	144	103	247
A82 north of Invergarry (DFT)	128	86	214
A82 south of Invermoriston (DFT)	88	93	181
A87 south of its junction with the A887 (DFT)	48	31	79
B862 west of Glen Doe site access (Commissioned)	220	152	372
B862 Fort Augustus (Commissioned)	220	152	372

Table 13.14: Total Cumulative Traffic Flows (Weekday Average Two-Way Flows)

Survey Location	Cars & LGV's	HGV's	Total
A82 south of Invergarry (DFT)	4456	504	4960
A82 north of Invergarry (DFT)	3276	379	3656
A82 south of Invermoriston (DFT)	2798	359	3157
A87 south of its junction with the A887 (DFT)	1658	151	1809
B862 west of Glen Doe site access (Commissioned)	1036	457	1493
B862 Fort Augustus (Commissioned)	938	401	1340

Table 13.15: Percentage Increase Cumulative vs Future Year Baseline (Weekday Average Two-Way Flows)

Survey Location	Cars & LGV's	HGV's	Total
A82 south of Invergarry (DFT)	3.78%	27.75%	5.80%
A82 north of Invergarry (DFT)	4.86%	33.09%	7.22%
A82 south of Invermoriston (DFT)	5.70%	39.87%	8.73%
A87 south of its junction with the A887 (DFT)	3.35%	27.79%	5.02%
B862 west of Glen Doe site access (Commissioned)	42.08%	59.10%	46.89%
B862 Fort Augustus (Commissioned)	48.63%	73.24%	55.24%

13.10.4 The results indicate that when considering the cumulative construction phases, the total amount of traffic does not increase on the A82 and A87 by more than 10%. The predicted increase in traffic flows on the B862 relate to the Proposed Development and the effects

of cumulative developments, Glenshero and Dell Wind Farms. Total HGV traffic movement flows would increase by more than 30% on the A82. Although, the total volume of traffic movements is not anticipated to increase by more than 10%.

13.10.5 Total traffic and HGV traffic movements are anticipated to increase by over 30% on the B862 at Fort Augustus. The B862 is a receptor of medium sensitivity designed to accommodate general traffic and HGV movements between primary destinations. However, the road has also previously been used during the construction of Stronelairg Wind Farm. Therefore, the significance of any cumulative effects is considered to be minor and can be mitigated through the implementation of CTMPs associated with each individual development. The overlap of peak construction activities is considered unlikely due to likely capacity constraints on construction material, turbine manufacturer and logistics supply chains.

13.11 Conclusion

13.11.1 The Proposed Development will lead to increased traffic volumes on sections of the A82, A87 and the B862 subject to the movements of construction traffic.

13.11.2 Fort Augustus was identified as a location of medium sensitivity, being an intermediate sized rural settlement, which is a popular tourist area with several facilities and services. The implementation of the specified CTMP is likely to reduce the impact on this community by construction traffic.

13.11.3 No significant construction effects were identified for the A82 or A87 as neither total nor HGV traffic flows are anticipated to increase by more than the relevant threshold of 30%.

13.11.4 During construction of the Proposed Development, total traffic movements may increase by more than 10% on the B862 to the west of the Site access, a receptor of medium sensitivity. However, no significant construction effects were identified upon further assessment. Notwithstanding, mitigation measures are proposed to minimise conflict between construction traffic and all road users. A summary of potential effects and associated mitigation is contained in Table 13.16.

13.11.5 No significant operational or decommissioning effects were identified.

Table 13.16: Summary of Potential Effects

Description of Effects	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/Adverse		Significance	Beneficial/Adverse
Severance	Minor	Adverse	Implementation of CTMP, application of speed limits and restricted delivery approach routes. AIL movements controlled through TMP, traffic management and restricted delivery hours.	Minor	Adverse
Driver Delay	Minor	Adverse	Implementation of CTMP, application of	Minor	Adverse

Description of Effects	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/Adverse		Significance	Beneficial/Adverse
			speed limits and restricted delivery approach routes. AIL movements controlled through TMP, traffic management and restricted delivery hours.		
Pedestrian Delay	Minor	Adverse	Implementation of CTMP, traffic management and restricted delivery hours.	Minor	Adverse
Pedestrain Amenity	Minor	Adverse	Implementation of CTMP and application of speed limits. AIL movements controlled through TMP, traffic management and restricted delivery hours.	Minor	Adverse
Fear and Intimidation	Minor	Adverse	Implementation of CTMP and application of speed limits. AIL movements controlled through TMP, traffic management andrestricted delivery hours. A newsletter drop would be carried out at intervals during construction to inform the public/local residents of up-coming activities that may affect them. The project website would also be updated regularly.	Minor	Adverse
Accidents and Safety	Minor	Adverse	Appropriate management of	Minor	Adverse

Description of Effects	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/Adverse		Significance	Beneficial/Adverse
			movement of AILs, traffic management measures along access route. Implementation of CTMP and TMP.		

13.12 References

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