11 Traffic and Transport

Executive Summary

This Chapter considers the potential effects of the Proposed Development on Traffic and Transport during the construction, operation, and decommissioning phases of the Proposed Development, considering three categories of receptor:

- traffic flows in the surrounding Study Area;
- local road users; and
- local residents.

The Proposed Development will lead to a temporary increase in traffic volumes on the Study Area during the construction phase. Traffic volumes will fall considerably outside the peak period of construction, which is anticipated to be in month ten of the programme. During month ten, there will be a total of 192 two way vehicle movements per day, comprising 144 two-way Heavy Goods Vehicles (HGV) movements and 48 two-way car / Light Goods Vehicles (LGV) movements.

This would equate to approximately 16 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile i.e. vehicles distributed evenly across the day.

This increase will be temporary and will only occur during the construction phase.

An assessment of likely significant effects associated with increased traffic during construction using Institute of Environmental Management and Assessment (IEMA) guidelines has been undertaken. Prior to the implementation of mitigation, a **Major** and **Significant** effect is predicted on the following sensitive receptors:

- A85 Users at the Site access;
- A84 Users south of Lochearnhead;
- Drummond Estate Boat Hire / jetty / camping area;
- Lochearnhead and Auchraw; and
- Core Path / Path Users within the Site.

With the implementation of a comprehensive Construction Traffic Management Plan (CTMP), Abnormal Indivisible Load (AIL) Transport Management Plan, together with appropriate signage and path management plan (if required), the traffic effects would be transitory in nature and appropriate mitigation measures are proposed to reduce the potential impacts to minor and **not significant**. No long-term detrimental transport or access issues would be associated with the construction phase of the Proposed Development.

No capacity issues are expected on any of the roads within the Study Area due to the additional construction traffic movements associated with the Proposed Development, as background traffic movements are relatively low, the links are of a good standard and appropriate mitigation is proposed. The effects of construction traffic would be temporary in nature and not permanent.

A review of the road network has been undertaken to assess the feasibility of transporting turbine components to the Site and no significant issues have been noted that cannot be overcome. Small scale

and temporary remedial works are required at a number of locations along the identified delivery route. Further details are provided in **Technical Appendix 11.1:Transport Assessment (EIAR Volume 4).**

Traffic levels during the operational phase of the Proposed Development will be low, with two to three vehicles per week for maintenance purposes. Traffic levels during the decommissioning of the Proposed Development will be lower than those associated with the construction phase as some elements may be left in-situ and others broken up onsite.

11.1 Introduction

11.1.1 This Chapter considers the likely significant effects on Traffic and Transport associated with the construction, operation and decommissioning of the Proposed Development. The specific objectives of the Chapter are to:

- describe the Traffic and Transport baseline;
- describe the assessment methodology and significance criteria used in completing the impact assessment;
- describe the potential effects, including direct, indirect and cumulative effects;
- describe the mitigation measures proposed to address likely significant effects; and
- assess the residual effects remaining following the implementation of mitigation.

11.1.2 The assessment has been carried out by Stephen Cochrane, an Associate Director within the Traffic and Transport team at Pell Frischmann. He has over 21 years' experience in the traffic and transportation industry and over 16 years' experience in the production of EIA transport Chapters (and associated studies) for onshore wind farms and other energy generation and distribution projects in Scotland and the UK. Stephen is a Chartered Member of the Chartered Institute of Logistics and Transport (CMILT) and a Member of the Chartered Institution of Highways and Transportation (MCIHT).

11.1.3 The technical reviewer of the traffic and transport assessment is Gordon Buchan BEng (Hons), MSC, CMILT, FCIHT, Sector Director for Energy at Pell Frischmann. He has over 27 years of undertaking the transport assessments associated with new developments and has worked on renewable energy and energy distribution projects across the UK, Ireland and Northern Europe.

11.1.4 This Chapter is supported by the Figures (**EIAR Volume 2**) and Technical Appendices (TAs)(**EIAR Volume 4**) listed in **Table 11-1**, which are referenced throughout the Chapter.

Table 11-1: Supporting Figures and Technical Appendices

Document Location	Document Description
Figure 11.1: Study Area	Figure showing the site location and the Study Area assessed within the Chapter.
Figure 11.2: Traffic Count Locations	Figure showing the location of traffic surveys which have been used within the assessment.
Figure 11.3: Personal Injury Accident Plan	Figure showing the location of personal injury accidents on the Study Area in the vicinity of the Proposed Development.
Figure 11.4: Abnormal Indivisible Load Route	Figure showing the proposed access route for Abnormal Indivisible Load (AIL) vehicles.
Technical Appendix 11.1: Transport Assessment	Technical Appendix setting out key transport and access issues associated with the Proposed Development, including trip generation and information on AILs.

11.2 Assessment Methodology and Significance criteria

Scope of Assessment

11.2.1 The following effects were identified at the scoping stage for consideration in this assessment:

- Direct effects during construction on traffic flows in the surrounding Study Area;
- Direct effects upon local road users; and
- Direct effects on local residents as a result of increased traffic.

11.2.2 Where the predicted magnitude of change to baseline conditions of roads within the Study Area meet the criteria set out in the IEMA guidance[1] a review of the effects on severance, driver delay, pedestrian delay, non-motorised user amenity, fear and intimidation, road safety, road safety audits and large loads has been undertaken.

11.2.3 The Chapter assesses cumulative effects as arising from the addition of the Proposed Development to other cumulative developments, which are the subject of a consented planning application. Operational, under construction and consented developments are considered as part of the baseline. Developments close to the end of their operational life will be included as part of the baseline to present *'worst case scenario*'.

11.2.4 The assessment is based on the Proposed Development as described in **Chapter 2: Development Description** (**EIAR Volume 2**).

11.2.5 The scope of the assessment has been informed by consultation responses summarised in **Table 11.2** and the following guidelines/policies:

- Institution of Environmental Management and Assessment (IEMA) '*Guidelines for Environmental Impact Assessment*' (2005)[2];
- Institute of Environmental Assessment, Guidelines for the Environmental Assessment of Road Traffic (1993)[3];
- Environmental Assessment of Traffic and Movement (IEMA), (2023)[4];
- LA104, Environmental assessment and monitoring, the Design Manual for Roads and Bridges (DMRB) (2020)[5];
- National Planning Framework 4 (NPF4) (2023)[6];
- Planning Advice Note (PAN) 75 (1995)[7];
- Table 2.2 of Volume 11, Section 2, Part 5 of the Design Manual for Roads and Bridges (DMRB) (2008)[8];
- Design Manual for Roads and Bridges, Volume 15, Part 5 "*The NESA Manual*" (2013)[9];
- Transport Assessment Guidance (2012)[10];
- Onshore Wind Turbines, Online Renewables Planning Advice (May 2014)[11];
- Scottish Government, Onshore Wind Policy Statement (December 2022)[12]; and
- Perth & Kinross Council Local Development Plan 2 (LDP2) (2019)[13].

[1] Institute of Environmental Management & Assessment (2023) -Environmental Assessment of Traffic and Movement
[2] The Institution of Environmental Management and Assessment (2005) Guidelines for Environmental Impact Assessment
[3] The Institution of Environmental Management and Assessment. (1993) Guidelines for the Environmental Assessment of Road Traffic
[4] Institute of Environmental Management and Assessment (2023) Environmental Assessment of Traffic and Movement
[5] Highways England, Transport Scotland, Welsh Government & Department for Infrastructure (2020), LA104, Environmental assessment and monitoring, the Design Manual for Roads and Bridges (DMRB)
[6] Scottish Government. (2014) National Planning Framework 4: Available at: https://www.transformingplanning.scot/national-planning-framework/
[7] Scottish Government. Planning Advice Note (PAN) 75. Available at: https://www.gov.scot/publications/planning-advice-note-pan-75-planning-transport/,
[8] Table 2.2 of Volume 11, Section 2, Part 5 of the Design Manual for Roads and Bridges (DMRB) (2008)
[9] Design Manual for Roads and Bridges, Volume 15, Part 5 "The NESA Manual" (2013)
[10] Transport Scotland (2012), Transport Assessment Guidance
[11] Scottish Government (2014), Onshore Wind Turbines: Planning Advice
[12] Scottish Government (2022), Onshore Wind: Policy Statement
[13] Perth and Kinross Council (2019) Adopted Local Development Plan 2 (LDP2)

Consultation

11.2.6 **Table 11-2** below summarises the consultation undertaken throughout the EIA process, including Scoping and further pre-application consultation, relevant to Traffic and Transport.

Table 11-2: Consultation Responses

Organisation and Type of Consultation	Response	How Response has been Considered
Perth & Kinross Council – Scoping Response	PKC generally concurs with the conclusions and assessment methodology proposed. The use of low national growth forecast figures is acceptable given the location and that the primary predicted impacts are expected in the short to medium term, within the initial phase of development. PKC considers a construction traffic management plan with an associated abnormal load management plan to be the primary tools in assessing any impacts.	Comment noted, assessment has been undertaken in line with the proposed methodology outlined in the scoping report. Information in relation to the Construction Traffic Management Plan (CTMP) and Abnormal Indivisible Loads (AIL) Management Plan are included within **TA 11.1 (EIAR Volume 4)**.
	PKC is not aware of any significant traffic generating committed development schemes in proximity to this development but would be happy to further review this upon request. Such information might be more tailored as the construction traffic management plan is progressed.	Comment noted, a review of potential cumulative schemes has been undertaken in **TA 11.1 (EIAR Volume 4)**.
Stirling Council – Scoping Response	I (Neil Pirrie, transport officer) can advise that the proposed Drummond Estate Wind Farm (previous name of the Proposed Development) is accessed via the trunk road network, and as such I have no comment to make. I'd suggest the applicant liaise with Transport Scotland, via their Management Agent; Bear Scotland, so that the transport implications of the proposals can be fully considered.	Comment noted, we can confirm that the scoping exercise has included Transport Scotland and liaison with Bear Scotland on the movement of AILs. Further consultation will take place following the Proposed Development being granted planning consent.
Transport Scotland – Scoping Response	Transport Scotland would state that any proposed changes to the trunk road network must be discussed and approved (via a technical approval process) by the appropriate Area Manager. We would advise that 1:500 scale plans of the proposed junction should be submitted with the application, together with visibility splay plans, to allow the principle and standard of the junction to be assessed. A Stage 1 Road Safety Audit should also be undertaken for the proposals and submitted with the plans. The detail of the access can be discussed with the Area Manager for the A85(T) who is Neil McFarlane (neil.macfarlane@transport.gov.scot).	Comment noted. Drawings for the proposed Site access junction and a Stage 1 Road Safety Audit (RSA) are included in **TA 11.1 (EIAR Volume 4)**. as **Annex A** and **Annex B** respectively.

Organisation and Type of Consultation	Response	How Response has been Considered
	Chapter 10 of the SR presents the proposed methodology for the assessment of Traffic and Transport. This indicates that the thresholds as indicated within the Institute of Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic are to be used as a screening process for the assessment. It also states that potential environmental impacts such as severance, accidents and safety, pedestrian amenity, pedestrian delay and driver delay etc will be considered and assessed where the IEMA Guideline thresholds for further detailed assessment are breached. These specify that road links should be taken forward for detailed assessment if: • Traffic flows will increase by more than 30%, or • The number of HGVs will increase by more than 30%, or • Traffic flows will increase by 10% or more in sensitive areas. This approach is considered acceptable, and we are content that no further assessment is required if the above thresholds are not exceeded.	Comments noted. The assessments has been undertaken as per the 'IEMA' Guidelines.
	The SR states that base traffic count data will be obtained from the Department for Transport (DfT) and Traffic Scotland databases for the A84(T) and A85(T). New ATC surveys will be undertaken on the A822 to the south of Crieff and on the A823 north of Gleneagles and at the site access junction. The surveys will be commissioned and deployed for one week to record classified traffic data for a neutral month.	Comments noted. New traffic surveys were undertaken on the A85 only. Additional surveys were not considered necessary for the assessment as DfT and Transport Scotland data was available for all other links within the Study Area. All data was sourced from the DfT and Transport Scotland databases for the same year (2023) to ensure that a consistent approach was used.
	In addition, future year baseline traffic flows will be determined through the use of Low National Road Traffic Forecast (NRTF) growth factors. Transport Scotland considers the above methodology to be satisfactory.	Comment noted and Low Growth factors have been applied as part of the assessment.
	It is noted that any impacts associated with the operational phase of the development are to be scoped out of the EIAR. We would consider this to be acceptable in this instance.	Comment noted.
	The SR states that the transport route for AIL access will be fully considered in the application and will be informed by a site visit, undertaken as part of the AIL route survey. This	Comment noted, a full Route Survey Report is included as **Annex C** in **TA 11.1 (EIAR Volume 4)**.

Organisation and Type of Consultation	Response	How Response has been Considered
	survey will also review general road infrastructure and other relevant points. This is considered appropriate; however, we would add that Transport Scotland will require to be satisfied that the size of turbines proposed can negotiate the selected route and that transportation will not have any detrimental effect on structures within the trunk road route path. A full Abnormal Loads Assessment report should be provided as a technical appendix to the EIAR that identifies key pinch points on the trunk road network. Swept path analysis should be undertaken and details provided with regard to any required changes to street furniture or structures along the route.	

11.2.7 Full details of all consultation undertaken is provided in **TA 1.2: Consultation Register (EIAR Volume 4)**.

Potential Effects Scoped Out

11.2.8 On the basis of the desk and field survey work undertaken, the professional judgement of the EIA team, experience from other relevant projects and policy guidance and standards, and feedback received from consultees, the following topic areas have been '*scoped out*' of detailed assessment, as proposed in the Scoping Report:

- Operational Phase: The traffic effects during the operational phase of the Proposed Development are likely to be insignificant as expected traffic flows will be up to two vehicle movements per week, far below the recognised thresholds for triggering a formal transport assessment. As such, the effects during the operational phase are scoped out of the assessment.
- Decommissioning Phase: The traffic effects during the decommissioning phase can only be fully assessed closer to that period, 50 years on from the completion of the Site. As elements of the Proposed Development are likely to remain in-situ (such as cable trenches, access tracks, etc), the traffic flows associated with the decommissioning works will be lower than those associated with the construction phase. The construction phase therefore represents a worst case assessment and as such, no further assessment of the decommissioning phase has been considered at this point in time and has been scoped out of the assessment.

Method of Baseline Characterisation

Extent of the Study Area

11.2.9 The Study Area has been based on those roads that are expected to experience increased traffic flows associated with the construction of the Proposed Development. The geographic scope was determined through a review of the other developments in the area, Ordnance Survey (OS) plans and an assessment of the potential origin locations of construction staff and supply locations for construction materials.

11.2.10 Access for construction materials would be from the east and west on the A85. Where feasible, local materials will be sourced which will avoid traffic impacting on local communities as far as practicable.

11.2.11 The likely Port of Entry (POE) used for the discharging of wind turbine components will be the Forth Ports Grangemouth Docks. AILs would likely route to the Site via the North Shore Road, A904, M9, A84 and A85 through to the Site access junction. Full details of the AIL route are provided within **Annex A** of **TA 11.1 (EIAR Volume 4)**.

11.2.12 Based on the above, the Study Area for the assessment has therefore been assumed to be:

- The A85 between Crieff and Crianlarich;
- The A822 between the A9 and the A85;
- The A823 between the A9 and its junction with the A822 to the south of Muthill; and
- The A84 between Doune and Lochearnhead.

11.2.13 Effects associated with construction traffic generated by the Proposed Development would be most pronounced in close proximity to the Site and on the final approaches to the Site. As vehicles travel away from the Proposed Development, they would disperse across the wider road network, thus diluting any potential effects. It is therefore expected that the effects relating to construction traffic are unlikely to be significant beyond the Study Area identified above.

11.2.14 This Study Area includes areas of material supply (quarries, etc), the Site access junctions, the trunk road network and the construction material and abnormal load delivery routes. It is also of sufficient size to include the main areas of workforce accommodation during the construction period.

11.2.15 The Study Area is shown in **Figure 11.1 (EIAR Volume 2)**.

Desk Study

11.2.16 To inform the baseline assessment and to establish the nature of the surrounding road and footway infrastructure, the following desktop reviews have been undertaken:

- Relevant transport planning policy;
- Accident data;
- Sensitive locations;
- Any other traffic sensitive receptors in the area (core paths, routes, communities, etc.);
- Ordnance Survey (OS) plans;
- Potential origin locations of construction staff and supply locations for construction materials to inform extent of local area roads network to be included in the assessment; and
- Constraints to the movement of AILs through a Route Survey including swept path assessments.

Field Survey

11.2.17 Field surveys were also undertaken in February and June 2024 and comprised:

- A detailed site visit to review the potential access routes and potential constraints;
- Collection of traffic flow and speed data at one location on the A85.

Method of Assessment

Criteria for Assessing the Sensitivity of Receptors

11.2.18 The IEMA '*Guidelines for Environmental Impact Assessment*' (2005) notes that the separate IEMA Guidelines should be used to characterise the environmental traffic and transport effects (offsite effects) and the assessment of significance of major new developments. Recent guidance published by the IEMA,

namely '*Environmental Assessment of Traffic and Movement*' (2023) ("2023 IEMA Guidelines") provides an update to the previously used guidance, '*Guidelines for the Environmental Assessment of Road Traffic*' (1993) document, that should be used to characterise the environmental traffic and transport effects (off-site effects) and the assessment of significance of major new developments. The guidelines intend to complement professional judgement and the experience of trained assessors.

11.2.19 In terms of traffic and transport impacts, the receptors are the users of the roads within the Study Area and the locations through which those roads pass.

11.2.20 The 2023 IEMA Guidelines include 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 is summarised in **Table 11-3**.

Table 11-3: Classification of Receptor Sensitivity

Receptor	Sensitivity			
	High	**Medium**	**Low**	**Negligible**
Users of Roads	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs. Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.	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 the road is Trunk or A-class, constructed to accommodate significant HGV composition. Includes roads with little or no traffic calming or traffic management measures.	Where roads have no adjacent settlements. Includes new strategic trunk roads that would be little affected by additional traffic and suitable for Abnormal Loads and new strategic trunk road junctions capable of accommodating Abnormal Loads.
Users / Residents of Locations	Where a location is a large rural settlement containing a high number of community and public services and facilities.	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.	Where a location is a small rural settlement, few community or public facilities or services.	Where a location includes individual dwellings or scattered settlements with no facilities.

11.2.21 Where a road passes through a location, road users (pedestrian, cyclists, drivers, etc.) are considered subject to the highest level of sensitivity defined by either the road or location characteristics.

Criteria for Assessing the Magnitude of Change

11.2.22 The following rules, also taken from the 2023 IEMA Guidelines are used to determine which links within the Study Area should be considered for detailed assessment:

- **Rule 1** – include highway links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles (HGVs) is predicted to increase by more than 30%); and
- **Rule 2** – include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

11.2.23 Examples of sensitive areas are presented in the 2023 IEMA Guidelines as hospitals, churches, schools, historical buildings and tourist attractions etc. These locations are to be assessed in relation to "*Rule 2*".

11.2.24 The 2023 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 advises that, "*The Department for Transport has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30 %, 60 % and 90 % are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively. Although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established through planning case law. However, caution needs to be observed when applying these thresholds as very low baseline flows are unlikely to experience severance impacts even with high percentage changes in traffic*." (Para 3.16). The Guidelines acknowledge that changes in traffic flows should be used cautiously, stating that "*the assessment of severance should pay full regard to specific local conditions, e.g. sensitivity of adjacent land uses, prevalence of vulnerable people, whether or not crossing facilities are provided, traffic signal settings, etc*." (Para 3.17).
- **Driver delay** – the IEMA Guidelines note that these delays are only likely to be "*significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system*" (Para 3.20).
- **Pedestrian delay** (incorporating delay to all non-motorised users) – the IEMA Guidance advises that "*pedestrian delay and severance are closely related effects and can be grouped together. Changes in the volume, composition or speed of traffic may affect the ability of people to crossroads. In general, increases in traffic levels are likely to lead to greater increases in delay. Delays will also depend on the general level of pedestrian activity, visibility and general physical conditions of the development site*." (Para 3.24). Furthermore, the guidance advises that *"…it is not considered wise to set down definitive thresholds. Instead, it is recommended that the competent traffic and movement expert use their judgement to determine whether pedestrian delay constitutes a significant effect*." (Para 3.26).
- **Non-motorised user amenity** - the IEMA Guidance advises that, "*The 1993 Guidelines suggest that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or HGV component) is halved or doubled. Although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established through planning case law*." (Para 3.30).
- **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 sensitive to traffic flow, changes in traffic flow of 30 %, 60 % and 90 % are regarded as producing minor, moderate and substantial changes respectively in the guidelines. (Para 2.19). As such, this has been used to assess the potential impacts associated with construction activities around fear and intimidation on people in close proximity to the proposed development.
- **Road safety** – professional judgement would be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents. In line with the IEMA Guidance, those areas of collision clusters would be subject to detailed review.
- **Road safety audits** – It would be proposed to undertake any necessary Road Safety Audits (RSA) post consent and it is considered that this can be secured via a planning condition.
- **Large loads** – The movement of the AILs associated with the construction of the Proposed Development have been considered in full, within a separate route survey assessment (see **Annex C** of **TA 11.1 (EIAR Volume 4)**), which identifies physical mitigation measures required to

accommodate the predicted loads. Additional mitigation in terms of addressing potential impacts on sensitive receptors are included as standard within the mitigation proposals in Section 11.6.

11.2.25 While not specifically identified as a more vulnerable road user, cyclists are considered in similar terms to pedestrians.

11.2.26 It is not anticipated that any vehicle movements will be carrying hazardous loads (with the exception of small amounts of fuel for the construction plant and compound generators) to or from the Site during the construction phase.

Criteria for Assessing Cumulative Effects

11.2.27 In traffic and transport terms, only developments that have been consented can be assumed to be committed developments.

11.2.28 The use of National Road Traffic Forecast (NRTF) low growth factors for background traffic is considered robust for addressing smaller, non-significant traffic generation caused by smaller developments within the Study Area. As such, a robust assessment case has been provided in this report.

Criteria for Assessing Significance

11.2.29 Table 3.7 of LA104 Environmental Assessment Methodology of the Design Manual for Roads and Bridges (DMRB) sets out four levels against which the magnitude of these impacts should be assessed – major, moderate, minor and negligible. The impacts and levels of magnitude are as follows:

- Major: These effects are considered to be material in the decision-making process;
- Moderate: These effects may be important but are not likely to be material factors in decision making. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a receptor;
- Minor: These effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but are important in improving the subsequent design of the project; and
- Negligible: No effects or those that are imperceptible.

11.2.30 The predicted significance of the effect was determined through a standard method of assessment based on professional judgement, considering both sensitivity and magnitude of change as detailed in **Table 11-4**.

Table 11-4: Significance Criteria

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

11.2.31 Significance is categorised as major, moderate, minor or negligible. Effects judged to be of major or moderate significance are considered to be significant within the context of the EIA Regulations and require mitigation.

11.2.32 Where an effect could be one of major / moderate or moderate / minor significance, professional judgement is used to determine which option should be applicable. Effects judged to be of minor or negligible significance are considered not significant in the context of EIA Regulations.

Embedded Mitigation

11.2.33 The Site layout allows for the use of on-site borrow pits to provide material for the creation of the access tracks, hardstandings and compound bases. It is estimated that these can provide sufficient material for the construction of up to 95% of the aggregate requirements for the Site; however, to ensure that a robust assessment is undertaken, it has been assumed that 50% of stone material for capping and 50% of stone material for fill will be delivered to the Site. It is assumed that stone material will be delivered from local quarries as detailed in **TA 11.1 (EIAR Volume 4)**.

11.2.34 Batching of concrete for use on-site is considered feasible and economic and facilities to enable this are being provided at the Proposed Development. The assessment, has, however, taken into consideration the importation of 100% of concrete batching materials.

Assumptions and Limitations

11.2.35 The following main assumptions have informed the assessment of effects in this Chapter:

- A construction programme of 18 months has been assumed.
- 50% of aggregate materials will be imported to the Site, with the remaining 50% won onsite from the proposed borrow pits (note, the onsite borrow pit assessment identifies that the majority of material can be won onsite, however, to ensure that a suitably robust assessment has been undertaken, the aforementioned assumption has been used to inform the production of this Chapter).
- 100% of concrete will be batched onsite meaning only raw materials to prepare the concrete i.e. cement powder, water and sand / aggregates will be imported.
- The year of construction is assumed to be 2030 and has been used for the basis of the assessment within this Chapter.

11.2.36 Further details on assumptions made, including construction traffic routing and distribution and where raw material will be sourced, is included in **TA 11.1 (EIAR Volume 4)**.

11.2.37 Limitations to the assessment are as follows:

- The assessment is based upon average traffic flows in one month periods. During the month, activities at the Site may fluctuate between one day and another. It is not possible to fully develop a day by day traffic flow estimate as no Balance of Plant (BoP) contractor has been appointed and external factors can impact upon activities on a day by day basis (weather conditions, availability of materials, time of year, etc).
- Assumptions on the original points for materials have been made to provide a worst-case assessment scenario. Should these origin points change, the effects on the Study Area may alter to those presented in the assessment.
- Construction material estimates set out in **TA 11.1** (**EIAR Volume 4**) are based on past experience of what is likely to be required for a project of this size and are considered to be appropriate for enabling a robust assessment of effects to be made.

11.2.38 It is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of likely significant environmental effects on Traffic and Transportation.

11.3 Baseline Conditions

Current Baseline

Active Travel Network

11.3.1 There are no dedicated pedestrian facilities in the immediate vicinity of the Site, reflecting its rural setting. Further away from the Proposed Development in the wider Study Area, there are pedestrian facilities within the smaller settlements, as detailed below:

- Auchraw:
  - Sections of footway on one or both sides of the A85 carriageway, including drop kerbs and tactile paving at some locations.
- Lochearnhead:
  - Sections of footway on one or both sides of the A84 and A85 carriageways, including drop kerbs and tactile paving at some locations.
- St Fillans:
  - Sections of footway on one or both sides of the A85 carriageway.

11.3.2 Within the larger settlements, including Crieff, Dunblane, Callander, Muirton, Muthill and Doune, there are footways on one side or both sides of the carriageways. In addition, there are dedicated signal-controlled crossing points, drop kerbs and pedestrian refuge islands for pedestrians. The level of pedestrian infrastructure is commensurate with the scale of the local settlements and their relative rural setting.

11.3.3 There are a significant number of Core Paths and other path networks in the vicinity of the Proposed Development and within the wider Study Area. A review of the PKC Core Path network map[14] and the Loch Lomond and The Trossachs National Park (LLTNP) network map[15] have been undertaken and a summary of those within the Site boundary or in the immediate vicinity of the Site are detailed in **Table 2** in **TA 11.1 (EIAR Volume 4)**, while **Figure 7** in the same document shows the wider Core Path network.

Road Access

11.3.4 The A85 is a trunk road in Scotland, providing a continuous route linking the east and west coasts at Oban and Dundee respectively. Between Crieff and Crianlarich it is a single carriageway road with one lane operating in each direction and is mainly subject to the national speed limit out with settlements, where it reduces to 30 miles per hour (mph) or 20 mph. Between Crieff and Crianlarich, the road is maintained by Bear Scotland (North West Trunk Roads) on behalf of Transport Scotland (TS).

11.3.5 The A822 road runs through Perthshire, from the A9 at Greenloaning, rejoining the A9 at Dunkeld. It passes through the town of Crieff and intersects the A85 and A823. Between the A9 and the A85 at Crieff, the road is a single carriageway road with one lane operating in each direction and is mainly subject to

[14] Perth and Kinross Council, Core Path Plan: https://www.pkc.gov.uk/article/15439/Core-Paths-Plan-interactive-map [Accessed September 2024]
[15] Loch Lomond and The Trossachs National Park Plan: https://www.lochlomond-trossachs.org/plan-your-visit/map-downloads/ [Accessed September 2024]

the national speed limit out with settlements, where it reduces to 40 mph or 30 mph. The road is maintained by PKC.

11.3.6 The A823 road runs from Crieff to Dunfermline, connecting with the A822 and A823(M) respectively. Between the A9 and its junction with the A822 to the south of Muthill, the road is a single carriageway road with one lane operating in each direction. The road is mainly subject to the national speed limit out with settlements, where it reduces to 30 mph. The road is maintained by PKC.

11.3.7 The A84 is a trunk road in Scotland, linking Stirling in the south with Lochearnhead in the north. Between Doune and Lochearnhead it is a single carriageway road with one lane operating in each direction and is mainly subject to the national speed limit out with settlements, where it reduces to 30 mph. Between Doune and Lochearnhead, the road is maintained by Bear Scotland (North West Trunk Roads) on behalf of TS.

11.3.8 The Agreed Timber Route Map[16] has been developed by The Timber Transport Forum who are a partnership of the forestry and timber industries, local government, national government agencies, timber hauliers and road and freight associations. One of the key aims of the forum is to minimise the impact of timber transport on the public road network, on local communities and the environment and a way of achieving this is to categorise the roads leading to forest areas in terms of their capacity to sustain the likely level of timber haulage vehicles i.e., HGVs. The routes are categorised into four groups, namely; 'Agreed Routes', 'Consultation Routes', 'Severely Restricted Routes' and 'Excluded Routes'.

11.3.9 'Agreed Routes' are categorised as routes used for timber haulage without restriction as regulated by the Road Traffic Act 1988. A-roads are classified as 'Agreed Routes' by default unless covered by one of the other road classifications. Those links classed as 'Consultation Routes' are categorised as a route which is key to timber extraction, but which are not up to 'Agreed Route' standard. Consultation with the local authority is required, and it may be necessary to agree limits of timing, allowable tonnage etc. before the route can be used. B-roads are classified as 'Consultation Routes' by default unless covered by one of the other classifications. 'Severely Restricted Routes' are not normally to be used for timber transport in their present condition. These routes are close to being Excluded Routes. Consultation with the local authority is required prior to use. Finally, 'Excluded Routes' should not be used for timber transport in their present condition. These routes are either formally restricted, or are close to being formally restricted, to protect the network from damaging loads.

11.3.10 All the roads within the Study Area form part of the agreed route network used for the extraction of timber and are therefore regularly used by HGV traffic.

Existing Traffic Conditions

11.3.11 In order to assess the impact of development traffic on the Study Area, an Automatic Traffic Count (ATC) was undertaken on the A85 in close proximity to the Site access, over a seven-day period in June 2024 (17th to 23rd June). To complement the ATC surveys, existing traffic count data was obtained from the Department for Transport (DfT) [17] database and the TS[18] database, with 2023 data utilised.

[16] https://timbertransportforum.org.uk/ [Accessed August 2024]
[17] https://roadtraffic.dft.gov.uk/#6/55.254/-11.096/basemap-regions-countpoints [Accessed August 2024]
[18] https://ts.drakewell.com/multinodemap.asp [Accessed August 2024]

11.3.12 The traffic count sites used were as follows:

1. A85 at the Site access (ATC);
2. A85 north of Lochearnhead (TS count site reference ATC06002);
3. A85 east of Crianlarich (TS count site reference ATC06001);
4. A85 east of St Fillans (TS count site reference ATC00001);
5. A822 north of Muthill (DfT count site reference: 40928);
6. A822 at Braco (DfT count site reference: 10927);
7. A823 north of Muirton (DfT count site reference: 50945);
8. A84 south of Lochearnhead (TS count site reference ATC06003); and
9. A84 at Doune (DfT count site reference: 765).

11.3.13 DfT and TS traffic data allow the traffic flows to be split into vehicle classes. The data was summarised into Cars/ LGV and HGVs (all goods vehicles >3.5tonnes gross maximum weight). A NRTF low growth factor was applied to the DfT survey data, to bring the traffic data up to the base year of 2024. The NRTF low growth factor for 2023 to 2024 is 1.005. These sites were identified, via professional judgement as being areas where sensitive receptors on the access routes would be located.

11.3.14 **Figure 11.2** (**EIAR Volume 2**)shows the location of the ATC, DfT and TS survey points, while **Table 11-5** summarises the Annual Average Daily Traffic (AADT) traffic data collected and used in this assessment.

Table 11-5: 24-Hour Two-Way Average Traffic Data (2024)

Site ID	Survey Location	Cars & LGV	HGV	Total
1	A85 at the Site access	1,101	385	1,485
2	A85 north of Lochearnhead	3,199	802	4,001
3	A85 east of Crianlarich	3,017	378	3,395
4	A85 east of St Fillans	1,640	286	1,927
5	A822 north of Muthill	4,509	109	4,618
6	A822 at Braco	3,004	91	3,095
7	A823 north of Muirton	1,158	54	1,212
8	A84 south of Lochearnhead	3,186	371	3,557
9	A84 at Doune	6,680	375	7,055

11.3.15 The ATC and TS survey locations which provided traffic volume data were also used to obtain speed statistics. The two-way seven-day average and 85th percentile speeds observed at the count sites are summarised in **Table 11-6**.

Table 11-6: Speed Summary (2024)

Site ID	Survey Location	Data Source	Mean Speed (mph)	85%ile Speed (mph)	Speed Limit (mph)
1	A85 at the Site access	ATC	40.1	45.2	50
2	A85 north of Lochearnhead	TS**	42.2	55.3	60
3	A85 east of Crianlarich	TS**	31.8	37.2	30
4	A85 east of St Fillans	TS**	50.7	58.1	60
5	A822 north of Muthill	DfT	-	-	-
6	A822 at Braco	DfT	-	-	-

Site ID	Survey Location	Data Source	Mean Speed (mph)	85%ile Speed (mph)	Speed Limit (mph)
7	A823 north of Muirton	DfT	-	-	-
8	A84 south of Lochearnhead	TS**	47.6	53.8	60
9	A84 at Doune	DfT	-	-	-

** No speed data available from DfT database*

*** Speed information obtained in October 2024*

11.3.16 Speed information from the **Table 11.6**, suggests that the recorded speeds are broadly being adhered to within the Study Area, with only the Location 3 on the A85 east of Crianlarich being above the posted speed limit. A review of this location has shown that the permanent traffic counter is located immediately after the transition from the national speed limit to the 30 mph speed limit. As such, it will be capturing people accelerating out of the 30 mph zone and people slowing down on entering it. Police Scotland may wish to consider enforcement spot checks in this area, if deemed necessary.

Personal Injury Accident Review

11.3.17 Personal Injury Accident (PIA) data for the five-year period covering January 2018 to December 2022 was obtained from the online resource CrashMap[19] which uses data collected by the police about road traffic crashes occurring on British roads, where someone is injured. TS Guidance[20] requires an analysis of the PIA on the road network in the vicinity of any development to be undertaken for at least the most recent 3-year period, however, to ensure a suitably robust review has been undertaken, five-years' worth of data has been included.

11.3.18 The statistics are categorised into three categories, namely "*slight*", "*serious*" and "*fatal*". Given the scale of the Study Area, the PIA review has been undertaken on the A85 within the Study Area, for the section between Crieff and Lochearnhead, which will be subject to all construction vehicles associated with the Proposed Development. The locations and severity of the recorded accidents within this section of the Study Area are summarised in **Table 11-7**, while **Figure 11-3 (EIAR Volume 2)** shows their locations.

Table 11-7: Personal Injury Accident Summary

Location	Slight	Serious	Fatal	HGV Incidents
The A85 between Crieff and Lochearnhead	9	14	1	4
Total	9	14	1	4
Percentage	37.5%	58.3%	4.2%	-

11.3.19 A summary analysis of the incidents indicates that:

- A total of 24 accidents were recorded within this section of the Study Area within the five-year period;
- Of those 24 accidents, seven were classed as "*slight*", 14 as "*serious*" and one as "*fatal*";
- The single fatality occurred on the A85 approximately 850 m to the east of the proposed Site access location. This was a single vehicle accident (motorcycle) and occurred on a slight bend on the carriageway, with the vehicle leaving the road and crashing down an embankment. The accident occurred at approximately 19:50 on a section of road where there is no street lighting present and trees lining both sides of the carriageway;

[19] https://www.crashmap.co.uk [Accessed September 2024]

[20] https://www.transport.gov.scot/media/4589/planning_reform_-_dpmtag_-_development_management__dpmtag_ref__17__-__transport_assessment_guidance_final_-_june_2012.pdf

- Of the 24 recorded accidents, eleven of them involved motorcycles, with seven of these being single vehicle accidents, while the other four accidents involved multiple vehicles. All the accidents were recorded as "*serious*", with the exception of the aforementioned fatality;
- Two accidents involved a pedal cycle, one "*slight*" and one "*serious*". The "*serious*" accident resulted in an injury;
- Four of the recorded accidents involved HGVs, all of which were "*slight*". All of the HGV accidents involved one or more cars;
- No recorded accidents involved a pedestrian;
- Four of the recorded accidents involved young drivers (17-20), with three recoded as "*slight*" and one as "*serious*"; and
- The majority of accidents occurred at junctions or bends on the carriageway.

11.3.20 In general, there are no clusters of PIAs at any location in the Study Area or high numbers of accidents involving HGVs for example. The majority of PIAs recorded occurred at or on approach to junctions / access to properties, where there is an increased interaction between vehicles and on bends. It is however acknowledged that there has been a reasonably high number of accidents involving motorcycles with four occurring at the same location, which could be attributed to the fact the local road network is used by a high number of tourists, including those undertaking motorcycle touring holidays.

11.3.21 Based on the information available, it has been established that there are no specific road safety issues within the immediate vicinity of the Proposed Development or within the Study Area that currently require to be addressed or would be exacerbated by the construction of the Proposed Development.

Future Baseline

11.3.22 Construction of the Proposed Development is estimated to commence during 2030 if consent is granted and is anticipated to last approximately 18 months depending on weather conditions and ecological considerations.

11.3.23 To assess the likely effects during the construction, base year traffic flows were determined by applying a NRTF low growth factor to the surveyed traffic flows. The NRTF low growth factor for 2024 to 2030 is 1.031. These factors were applied to the survey data to estimate the 2030 base traffic flows, as shown in **Table 11-8**. This forecast forms the baseline for the assessment of traffic and transport related effects within this Chapter.

Table 11-8: 24-Hour Two-Way Average Traffic Data (2030)

Site ID	Survey Location	Cars & LGV	HGV	Total
1	A85 at the Site access	1,135	397	1,531
2	A85 north of Lochearnhead	3,298	827	4,125
3	A85 east of Crianlarich	3,111	390	3,500
4	A85 east of St Fillans	1,691	295	1,986
5	A822 north of Muthill	4,649	112	4,761
6	A822 at Braco	3,097	94	3,191
7	A823 north of Muirton	1,194	56	1,250
8	A84 south of Lochearnhead	3,285	382	3,667
9	A84 at Doune	6,887	386	7,274

Committed Development

11.3.24 A review of the PKC online planning portal[21] and the Scottish Government's Energy Consents Unit portal[22] was undertaken within **TA 11.1 (EIAR Volume 4)** to identify any consented developments within the vicinity of the Proposed Development which would generate significant traffic within the Study Area and should be considered as part of a cumulative assessment within the Chapter.

11.3.25 No onshore wind farm developments or other potentially significant traffic generating developments were identified that should be considered as part of any cumulative assessment of construction effects within this Chapter.

11.4 Summary of Sensitive Receptors

11.4.1 A review of sensitive receptors has been undertaken within the Study Area. **Table 11.9** details the receptors and their sensitivities for use within the following assessment. A justification for the sensitivity has also been provided, based upon the details contained in **Table 11.3**.

Table 11-9: Summary of Identified Sensitive Receptors

Receptor	Sensitivity	Justification
A85 Users	Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition.
A822 Users	Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition.
A823 Users	Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition.
A84 Users	Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition.
Residents on the A85 (outwith towns and villages)	Negligible	Where a location includes individual dwellings or scattered settlements with no facilities.
Residents on the A822 (outwith towns and villages)	Negligible	Where a location includes individual dwellings or scattered settlements with no facilities.
Residents on the A823 (outwith towns and villages)	Negligible	Where a location includes individual dwellings or scattered settlements with no facilities.
Residents on the A84(outwith towns and villages)	Negligible	Where a location includes individual dwellings or scattered settlements with no facilities.
Crianlarich Residents	Low	Where a location is a small rural settlement, few community or public facilities or services.
Lochearnhead Residents	Low	Where a location is a small rural settlement, few community or public facilities or services.
Auchraw Residents	Low	Where a location is a small rural settlement, few community or public facilities or services.
St Fillans Residents	Low	Where a location is a small rural settlement, few community or public facilities or services.

[21] https://planningapps.pkc.gov.uk/online-applications/search.do?action=simple&searchType=Application [Accessed September 2024]
[22] https://www.energyconsents.scot/ApplicationSearch.aspx?T=1 [Accessed September 2024]

Receptor	Sensitivity	Justification
Comrie Residents	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Crieff Residents	High	Where a location is a large rural settlement containing a high number of community and public services and facilities.
Muthill Residents	Low	Where a location is a small rural settlement, few community or public facilities or services.
Braco Residents	Low	Where a location is a small rural settlement, few community or public facilities or services.
Greenloaning Residents	Low	Where a location is a small rural settlement, few community or public facilities or services.
Gleneagles Village Residents	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Muirton Residents	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Strathyre Residents	Low	Where a location is a small rural settlement, few community or public facilities or services.
Callander Residents	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Doune Residents	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Core Path / Path Users within or close to the Site	High	Minor paths used by walkers and cyclists, not constructed to accommodate HGV traffic flows

11.4.2 As previously noted in the '**Criteria for Assessing the Sensitivity of Receptors'** section of the Chapter, examples of sensitive areas are presented in the IEMA Guidelines as locations which include hospitals, churches, schools, historical buildings tourist attractions for example. Based on these indicators which are stated within the IEMA Guidelines, the following locations within the Study Area have been identified as sensitive areas in this assessment:

- Glen Dochart Holiday Park on the A85 (tourist attraction / accommodation);
- Drummond Estate Boat Hire / jetty / camping area (tourist attraction);
- Lochearnhead and Auchraw (tourist attraction / accommodation / places of worship);
- Loch Earn Sailing Club (tourist attraction);
- St Fillans (places of worship / tourist attractions);
- Comrie (places of worship / tourist attractions / hospital / school);
- Crieff (places of worship / tourist attractions / hospital / schools / historical buildings);
- Drummond Castle Gardens on the A822 (tourist attraction);
- Muthill (places of worship / tourist attractions / nursery);
- Braco (places of worship / tourist attractions / school);
- Gleneagles Village (tourist attractions);
- Auchterarder (places of worship / tourist attractions / schools / hospital);
- Balquhidder Braes Holiday Park on the A84 (tourist attraction / accommodation);
- Immervoulin Caravan and Camping Park on the A84 (tourist attraction / accommodation);
- Callander (places of worship / tourist attractions / hospital / schools / historical buildings); and
- Doune (places of worship / tourist attractions / schools / hospital).

11.4.3 These locations are therefore subject to '*Rule 2*' of the IEMA Guidelines which requires a full assessment of effects if the locations are subject to a total traffic increase of 10% or more. All other locations within the Study Area are subject to '*Rule 1*' and are assessed if total traffic flows (or HGV flows) on highway links increase by more than 30%.

11.5 Assessment of Likely Effects

Construction Effects

11.5.1 The assessment is based upon the construction effects that may occur within the Study Area during the 18-month construction programme. To assess the effects, it is necessary to determine the likely traffic generation associated with the Proposed Development during the peak construction month.

11.5.2 During the 18-month construction period, the following traffic will require access to the Site:

- staff transport, in either cars or staff minibuses;
- construction equipment and materials, deliveries of machinery and supplies such as concrete batching materials and crushed rock;
- abnormal loads consisting of the wind turbine sections and a heavy lift crane; and
- components relating to the battery energy storage system (BESS) and associated infrastructure.

11.5.3 Average monthly traffic flow data was used to establish the construction trips associated with the Proposed Development and these are detailed in the Transport Assessment provided as **TA 11.1 (EIAR Volume 4)**. The trip estimates have been based upon first principle estimates of traffic movements to and from the Site, having established the likely volumes of construction materials, resources and components.

11.5.4 Except for the turbine components, most traffic will be HGVs and normal construction plant, including grading tractors, excavators, high-capacity cranes, forklifts and dumper trucks. Most will arrive at the Site access junction on low loaders.

11.5.5 The turbines are delivered in component sections for transport and will be assembled within the turbine array. The nacelle, hub, drive train, blade, tower sections are classified as AILs due to their weight and/or length, width and height when loaded. The components can be delivered on a variety of transport platforms with typical examples illustrated in **TA 11.1 (EIAR Volume 4)**.

11.5.6 In addition to the turbine deliveries, up to two high-capacity erection cranes will be needed to offload components and erect the turbines. The cranes are likely to be mobile cranes with a capacity up to 1,000 tonnes that will be escorted by boom and ballast trucks to allow full mobilisation onsite. Smaller erector / assist cranes will also be present to allow the assembly of the main cranes and to ease overall erection of the turbines.

11.5.7 The resulting traffic generation profile is presented in **TA 11.1 (EIAR Volume 4)**. The maximum traffic effect associated with construction of the Proposed Development is predicted to occur in month ten of the construction programme. During this month, there will be a total of 192 vehicle movements per day, comprising 144 two-way HGV movements and 48 two-way car / LGV movements.

11.5.8 This would equate to approximately 16 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile i.e. vehicles distributed evenly across the day.

11.5.9 It should however be noted that the above is based on the assumption that 50% of aggregate materials would be imported to the Site from nearby quarries and should therefore be considered an over estimate of the number of HGV movements that will travel to and from the Site during the peak month of activity. The current estimates are that the onsite borrow pits will be able to provide up to 95% of the onsite aggregate requirements. Should that be the case there would be a total of 78 vehicle movements per day, comprising 30 two-way HGV movements and 48 two-way car / LGV movements.

11.5.10 This would equate to approximately seven two-way total vehicles movements or three two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile i.e. vehicles distributed evenly across the day.

11.5.11 The distribution of development traffic on the network will vary depending on the types of loads being transported, however the majority of construction traffic associated with the Proposed Development will generally approach from the west on the A85, originating via the A84 to the south or A85 to the northwest. The full assumptions for the distribution of construction traffic during the peak month are presented in **TA 11.1 (EIAR Volume 4)**.

11.5.12 All AIL traffic will access from the proposed Port of Entry (POE) at the Forth Ports Grangemouth Docks, utilising sections of proven AIL routes used during the construction of other wind farms in the area and within the central belt.

11.5.13 For the purposes of preparing this Chapter and **TA 11.1 (EIAR Volume 4)**, it has been assumed that all AIL traffic will access from the Proposed Development Site via the following route:

- Loads would exit the Port of Grangemouth onto North Shore Road;
- Loads will proceed to the M9 via the A904, joining the motorway at Junction 6;
- Loads will continue on the M9 until Junction 10, where they would depart the motorway and join the A84 westbound;
- Loads would continue on the A84, passing through Doune, Callander and Balquidder;
- At the junction with the A85 in Lochearnhead, loads will turn right onto the A85 eastbound; and
- Loads will pass through Lochearnhead before turning left into a purpose built access junction.

11.5.14 The above route is shown in **Figure 11.4 (EIAR Volume 2)**.

11.5.15 Following the distribution and assignment of traffic flows to the Study Area network, the resultant daily traffic during the peak of construction in month ten, is summarised in **Table 11.10**. Note where road links show no assignment of traffic flows, this is due to no construction traffic associated with the peak month routing to the Site via this route.

Table 11-10: Peak Construction Daily Traffic (month ten)

Site ID	Survey Location	Cars & LGV	HGV	Total
1	A85 at the Site access	48	144	192
2	A85 north of Lochearnhead	-	10	10
3	A85 east of Crianlarich	-	10	10
4	A85 east of St Fillans	44	2	46
5	A822 north of Muthill	-	2	2
6	A822 at Braco	-	2	2
7	A823 north of Muirton	-	2	2
8	A84 south of Lochearnhead	6	134	140
9	A84 at Doune	6	8	14

Please note minor variances due to rounding may occur.

11.5.16 The construction traffic was compared against the future baseline traffic to estimate the increase in traffic associated with this phase of the Proposed Development. **Table 11.11** illustrates the potential traffic impact at the peak of construction activity during month ten.

Table 11-11: Peak Construction Daily Traffic (month ten)

Site ID	Survey Location	Cars & LGV	HGV	Total Traffic	Cars & LGV % Increase	HGV % Increase	Total Traffic % Increase
1	A85 at the Site access	1,183	541	1,723	4.23%	36.30%	12.54%
2	A85 north of Lochearnhead	3,298	837	4,135	0.00%	1.21%	0.24%
3	A85 east of Crianlarich	3,111	400	3,510	0.00%	2.57%	0.29%
4	A85 east of St Fillans	1,735	297	2,032	2.60%	0.68%	2.32%
5	A822 north of Muthill	4,649	114	4,763	0.00%	1.79%	0.04%
6	A822 at Braco	3,097	96	3,193	0.00%	2.12%	0.06%
7	A823 north of Muirton	1,194	58	1,252	0.00%	3.57%	0.16%
8	A84 south of Lochearnhead	3,291	516	3,807	0.18%	35.05%	3.82%
9	A84 at Doune	6,893	394	7,288	0.09%	2.07%	0.19%

11.5.17 The total traffic movements are predicted to increase by a maximum of 12.54 % on the A85, where the proposed Site access junction is located and as such all construction traffic will use. On the rest of the Study Area, the highest total traffic increase is 3.82 %, which occurs on the A84 south of Lochearnhead.

11.5.18 **Table 11.11** shows that highest HGV traffic movements increase will occur on the A85, where it is estimated to increase by 36.30%. To put the increase into perspective, the A85 will see an additional 144 HGV movements per day or 12 HGV movements per hour over the course of a typical 12-hour shift. This is not considered significant in terms of overall traffic flows.

11.5.19 The next highest HGV traffic movement increase would occur on the A84 to the south of Lochearnhead, with a 35.05% increase which will see an additional 134 HGV movements per day, or 11 HGV movements per hour over the course of a typical 12-hour shift. This is not considered significant in terms of overall traffic flows.

11.5.20 A review of existing theoretical road capacity has been undertaken using The NESA Manual, formerly part of the Design Manual for Roads and Bridges, Volume 15, Part 5. The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the Study Area. The results are summarised in **Table 11.12**.

Table 11-12: 2030 Peak Traffic Flow Capacity Review

Site ID	Survey Location	2030 Baseline Flow	2030 Base + Development Flows	Theoretical Road Capacity (12hr)	Spare Road Capacity %
1	A85 at the Site access	1,531	1,723	21,600	92.0%
2	A85 north of Lochearnhead	4,125	4,135	21,600	80.9%
3	A85 east of Crianlarich	3,500	3,510	28,800	87.8%
4	A85 east of St Fillans	1,986	2,032	21,600	90.6%
5	A822 north of Muthill	4,761	4,763	21,600	77.9%
6	A822 at Braco	3,191	3,193	21,600	85.2%
7	A823 north of Muirton	1,250	1,252	21,600	94.2%
8	A84 south of Lochearnhead	3,667	3,807	28,800	86.8%
9	A84 at Doune	7,274	7,288	21,600	66.3%

11.5.21 The results indicate there are no road capacity issues with the addition of construction traffic associated with the Proposed Development and significant spare capacity exists within the trunk and local road network to accommodate all construction phase traffic.

11.5.22 In accordance with the IEMA Guidelines Rules 1 and 2, detailed assessment is required on the following identified sensitive receptors included in **Table 11.9** or the specifically sensitive locations highlighted in **Section 11.4.2**.

- Rule 1:
  - A85 Users at the Site access (Low Sensitivity);
  - A85 Residents (outwith towns and villages) (Negligible Sensitivity);
  - A84 Users south of Lochearnhead (Low Sensitivity); and
  - A84 Residents (outwith towns and villages) (Negligible Sensitivity).
- Rule 2:
  - Drummond Estate Boat Hire / jetty / camping area (High Sensitivity); and
  - Lochearnhead and Auchraw (High Sensitivity).

11.5.23 In addition to the above, given that there are Core Paths and other paths located within the Site, which are noted as sensitive receptors in **Table 11.9**, as a worst-case assessment it is assumed that traffic impacting on these paths will be an increase of over 100 %, and therefore a further assessment has also been undertaken on them.

11.5.24 The summary of construction phase effects is presented in **Table 11.13**.

Table 11-13: Construction Phase Effects Summary

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
A85 Users at the Site access	Severance	Negligible	Minor / Negligible (Not Significant)	The character of the road and surrounding area, whereby there are limited pedestrian facilities or places residents would be crossing for example would suggest that interactions would be expected to be minimal. With regards to potential impacts on other road users, the predicted increase in HGV traffic is 36.30% which while statistically significant, is due to the low level of existing HGV traffic on the road. The overall increase in traffic is forecast to be only 12.54% which is in the region of daily traffic variations. When looking at the theoretical road capacity of the road in **Table 11.12**, it can be seen that there is 92.0% spare capacity. The base plus development trips accounts for a total of 1,723 vehicular trips, assuming the majority of these occurred between 07:00 and 19:00 for example, this would equate to approximately 144 vehicle movement per hour, which is not considered significant for a road of this standard. This would be further reduced if spread across the whole day. Specifically in relation to the Proposed Development, the peak of construction activity is expected to occur

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
				in month ten when there will be a total of 192 vehicle movements per day, comprising 144 two-way HGV movements and 48 two-way car / LGV movements. This would equate to approximately 16 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. In the absence of mitigation, the effect of severance is therefore considered to be minor.
	Driver Delay	Negligible	Minor / Negligible (Not Significant)	When considering the effects purely in numerical terms based on the assessment criteria, there is ample spare capacity on the road (92.0%) with the addition of construction traffic. This however does not take cognisance of the character of the road and the potential for other road users to become frustrated by the increase in traffic, in particular HGVs. It should however be noted that it is estimated that only an additional 192 two-way vehicle movements (96 inbound and 96 outbound) would occur in a typical day during the construction phase. Given that there is significant spare capacity on the road, driver frustration would be expected to be minimal. In the absence of mitigation, the effect on driver delay is therefore considered minor.
	Pedestrian Delay	Negligible	Minor / Negligible (Not Significant)	With the exception of the Core Path that runs parallel to the A85 in the vicinity of the Site access, there are no pedestrian facilities located along the A85 at this location within the Study Area. The effect on pedestrian delay is therefore considered to be negligible.
	Non-motorised User Amenity	Minor	Minor (Not Significant)	With regards to potential impacts on non-motorised user amenity, the predicted increase in HGV traffic is 36.30% which while statistically significant, is due to the low level of existing HGV traffic on the road. The overall increase in traffic is forecast to be only 12.54%. The base plus development trips accounts for a total of 1,723 vehicular trips, assuming the majority of these occurred between 07:00 and 19:00 for example, this would equate to approximately 144 vehicle movement per hour, which is not considered significant for a road of this standard. This would be further reduced if spread across the whole day. The increase of 192 vehicle movements per day would be unlikely to affect non-motorised user amenity. The effect on non-motorised user amenity is therefore considered to be minor.
	Fear & Intimidation	Negligible	Minor / Negligible	With regards to potential impacts on other road users, the predicted increase in HGV traffic is 36.30% which

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
			(Not Significant)	while statistically significant, is due to the low level of existing HGV traffic on the road. The overall increase in traffic is forecast to be only 12.54%. When looking at the theoretical road capacity of the road in **Table 11.12**, it can be seen that there is 92.0% spare capacity. The base plus development trips accounts for a total of 1,723 vehicular trips, assuming the majority of these occurred between 07:00 and 19:00 for example, this would equate to approximately 144 vehicle movement per hour, which is not considered significant for a road of this standard. This would be further reduced if spread across the whole day. Specifically in relation to the Proposed Development, the peak of construction activity is expected to occur in month ten when there will be a total of 192 vehicle movements per day, comprising 144 two-way HGV movements and 48 two-way car / LGV movements. This would equate to approximately 16 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. In the absence of mitigation, the effect of fear and intimidation is therefore considered to be minor.
	Road Safety	Minor	Minor (Not Significant)	Three accidents were recorded on the A85 at this location within the Study Area over the last 5-year period. Two were serious PIAs and one was a fatality. Two of the accidents occurred on bends (including the fatality), both of which were single vehicle accidents and one occurred at a junction, which was a two vehicle accident. The character of the road could lead to driver frustration, however and cognisance of this will be included within the proposed mitigation measures. Therefore, the effect of road safety is considered minor.
	Large Loads	Major	Moderate / Minor (Significant)	It is anticipated that the Proposed Development will require 45 AIL convoys to be delivered to Site over a four month period. These loads will be delivered in convoys of three AILs per convoy and will be accompanied by three escort vehicles and Police escort. The effect is therefore considered moderate.
A85 Residents (outwith towns and villages)	Severance	Negligible	Negligible (Not Significant)	The character of the road and surrounding area, whereby there are limited pedestrian facilities or places residents would be crossing for example would suggest that interactions would be expected to be minimal. The peak of construction activity is expected to occur in month ten when there will be a total of 192 vehicle

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
				movements per day at this location, comprising 144 two-way HGV movements and 48 two-way car / LGV movements. This would equate to approximately 16 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. This level of traffic is highly unlikely to have an impact on the severance of residents living in stand-alone properties at this location. In the absence of mitigation, the effect of severance is therefore considered to be negligible.
	Driver Delay	Negligible	Negligible (Not Significant)	When considering the effects purely in numerical terms based on the assessment criteria, there is ample spare capacity on the road (92.0%) with the addition of construction traffic. This however does not take cognisance of the character of the road and the potential for other road users to become frustrated by the increase in traffic, in particular HGVs. It should however be noted that it is estimated that only an additional 192 two-way vehicle movements (96 inbound and 96 outbound) would occur in a typical day during the construction phase at this location. Given that there is significant spare capacity on the road, driver frustration would be expected to be minimal on those residents looking to enter and exit their properties within the Study Area. In the absence of mitigation, the effect on driver delay is therefore considered negligible.
	Pedestrian Delay	Negligible	Negligible (Not Significant)	With the exception of the Core Path that runs parallel to the A85, there are no pedestrian facilities located along the A85 (outwith settlements) at this location within the Study Area. The effect on pedestrian delay is therefore considered to be negligible.
	Non-motorised User Amenity	Minor	Minor / Negligible (Not Significant)	With regards to potential impacts on non-motorised user amenity, the predicted increase in HGV traffic is 36.30% which while statistically significant, is due to the low level of existing HGV traffic on the road. The overall increase in traffic is forecast to be only 12.54%. The base plus development trips accounts for a total of 1,723 vehicular trips, assuming the majority of these occurred between 07:00 and 19:00 for example, this would equate to approximately 144 vehicle movement per hour, which is not considered significant for a road of this standard. This would be further reduced if spread across the whole day. The increase of 144 vehicle movements per day at this location would be unlikely to affect non-motorised user amenity.

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
				The effect on non-motorised user amenity is therefore considered to be minor.
	Fear & Intimidation	Negligible	Negligible (Not Significant)	The character of the road and surrounding area, whereby there are limited pedestrian facilities or places residents would be crossing for example would suggest that interactions would be expected to be minimal. The peak of construction activity is expected to occur in month ten when there will be a total of 192 vehicle movements per day at this location, comprising 144 two-way HGV movements and 48 two-way car / LGV movements. This would equate to approximately 16 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. This level of traffic is highly unlikely to have an impact on the severance of residents living in stand-alone properties at this location. In the absence of mitigation, the effect of fear and intimidation is therefore considered to be negligible.
	Road Safety	Minor	Minor / Negligible (Not Significant)	Three accidents were recorded on the A85 in the last 5-year period, with the closest to the Site access being 850 m to the east. Of the three accidents two were serious PIAs and one was a fatality (the closest to the Site). Two of the accidents occurred on bends (including the fatality), both of which were single vehicle accidents and one occurred at a junction, which was a two vehicle accident. The character of the road could lead to driver frustration, however and cognisance of this will be included within the proposed mitigation measures. Therefore, the effect of road safety is considered minor.
	Large Loads	Major	Minor (Not Significant)	It is anticipated that the Proposed Development will require 45 AIL convoys to be delivered to Site over a four month period. These loads will be delivered in convoys of three AILs per convoy and will be accompanied by three escort vehicles and Police escort. The effect is therefore considered minor.
A84 Users south of Lochearnhead	Severance	Negligible	Minor / Negligible (Not Significant)	The character of the road and surrounding area, whereby there are limited pedestrian facilities or places residents would be crossing for example would suggest that interactions would be expected to be minimal. With regards to potential impacts on other road users, the predicted increase in HGV traffic is 35.05% which while statistically significant, is due to the low level of

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
				existing HGV traffic on the road. The overall increase in traffic is forecast to be only 3.82% which is in the region of daily traffic variations. When looking at the theoretical road capacity of the road in **Table 11.12**, it can be seen that there is 86.8% spare capacity. The base plus development trips accounts for a total of 3,807 vehicular trips, assuming the majority of these occurred between 07:00 and 19:00 for example, this would equate to approximately 317 vehicle movements per hour, which is not considered significant for a road of this standard. This would be further reduced if spread across the whole day. Specifically in relation to the Proposed Development, the peak of construction activity is expected to occur in month ten when there will be a total of 140 vehicle movements per day at this location, comprising 134 two-way HGV movements and 6 two-way car / LGV movements. This would equate to approximately 12 two-way total vehicles movements or 11 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. In the absence of mitigation, the effect of severance is therefore considered to be minor.
	Driver Delay	Negligible	Minor / Negligible (Not Significant)	When considering the effects purely in numerical terms based on the assessment criteria, there is ample spare capacity on the road (86.8%) with the addition of construction traffic. This however does not take cognisance of the character of the road and the potential for other road users to become frustrated by the increase in traffic, in particular HGVs. It should however be noted that it is estimated that only an additional 140 two-way vehicle movements (70 inbound and 70 outbound) would occur in a typical day during the construction phase at this location. Given that there is significant spare capacity on the road, driver frustration would be expected to be minimal. In the absence of mitigation, the effect on driver delay is therefore considered minor.
	Pedestrian Delay	Negligible	Minor / Negligible (Not Significant)	With the exception of the Core Paths (which are addressed separately later in this table) and NCN Route 7 that runs parallel to the A84, both of which are for the most part off-road routes, there are no pedestrian facilities located along the A84 (outwith settlements) at this location within the Study Area. The effect on pedestrian delay is therefore considered to be negligible.

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
	Non-motorised User Amenity	Minor	Minor (Not Significant)	With regards to potential impacts on non-motorised user amenity, the predicted increase in HGV traffic is 35.05% which while statistically significant, is due to the low level of existing HGV traffic on the road. The overall increase in traffic is forecast to be only 3.82%. The base plus development trips accounts for a total of 3,807 vehicular trips, assuming the majority of these occurred between 07:00 and 19:00 for example, this would equate to approximately 317 vehicle movement per hour, which is not considered significant for a road of this standard. This would be further reduced if spread across the whole day. The increase of 140 vehicle movements per day at this location would be unlikely to affect non-motorised user amenity. The effect on non-motorised user amenity is therefore considered to be minor.
	Fear & Intimidation	Negligible	Minor / Negligible (Not Significant)	With regards to potential impacts on other road users, the predicted increase in HGV traffic is 35.05% which while statistically significant, is due to the low level of existing HGV traffic on the road. The overall increase in traffic is forecast to be only 3.82%. When looking at the theoretical road capacity of the road in **Table 11.12**, it can be seen that there is 86.8% spare capacity. The base plus development trips accounts for a total of 140 vehicle movements per day at this location, comprising 134 two-way HGV movements and 6 two-way car / LGV movements. This would equate to approximately 12 two-way total vehicles movements or 11 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. In the absence of mitigation, the effect of fear and intimidation is therefore considered to be minor.
	Road Safety	Minor	Minor (Not Significant)	The agreed Study Area for the PIA assessment did not include the A84 at this location. Notwithstanding this, as with the previously assessed A85, the character of the road could lead to driver frustration, and cognisance of this will be included within the proposed mitigation measures. Therefore, the effect of road safety is considered minor.
	Large Loads	Major	Moderate / Minor (Significant)	It is anticipated that the Proposed Development will require 45 AIL convoys to be delivered to Site over a four month period. These loads will be delivered in convoys of three AILs per convoy and will be accompanied by three escort vehicles and Police escort. The effect is therefore considered moderate.

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
A84 Residents (outwith towns and villages)	Severance	Negligible	Negligible (Not Significant)	The character of the road and surrounding area, whereby there are limited pedestrian facilities or places residents would be crossing for example would suggest that interactions would be expected to be minimal. The peak of construction activity is expected to occur in month ten when there will be a total of 140 vehicle movements per day at this location, comprising 134 two-way HGV movements and 6 two-way car / LGV movements. This would equate to approximately 12 two-way total vehicles movements or 11 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. This level of traffic is highly unlikely to have an impact on the severance of residents living in stand-alone properties at this location. In the absence of mitigation, the effect of severance is therefore considered to be negligible.
	Driver Delay	Negligible	Negligible (Not Significant)	When considering the effects purely in numerical terms based on the assessment criteria, there is ample spare capacity on the road (86.8%) with the addition of construction traffic. This however does not take cognisance of the character of the road and the potential for other road users to become frustrated by the increase in traffic, in particular HGVs. It should however be noted that it is estimated that only an additional 140 two-way vehicle movements (70 inbound and 70 outbound) would occur in a typical day during the construction phase at this location. Given that there is significant spare capacity on the road, driver frustration would be expected to be minimal on those residents looking to enter and exit their properties within the Study Area. In the absence of mitigation, the effect on driver delay is therefore considered negligible.
	Pedestrian Delay	Negligible	Negligible (Not Significant)	With the exception of the Core Paths and NCN Route 7 that runs parallel to the A84, both of which are for the most part off-road routes, there are no pedestrian facilities located along the A84 (outwith settlements) at this location within the Study Area. The effect on pedestrian delay is therefore considered to be negligible.
	Non-motorised User Amenity	Minor	Minor / Negligible (Not Significant)	With regards to potential impacts on non-motorised user amenity, the predicted increase in HGV traffic is 35.05% which while statistically significant, is due to the low level of existing HGV traffic on the road. The overall increase in traffic is forecast to be only 3.82%. The base plus development trips accounts for a total of 3,807 vehicular trips, assuming the majority of

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
				these occurred between 07:00 and 19:00 for example, this would equate to approximately 140 vehicle movement per hour, which is not considered significant for a road of this standard. This would be further reduced if spread across the whole day. The increase of 140 vehicle movements per day at this location would be unlikely to affect non-motorised user amenity. The effect on non-motorised user amenity is therefore considered to be minor.
	Fear & Intimidation	Negligible	Negligible (Not Significant)	The character of the road and surrounding area, whereby there are limited pedestrian facilities or places residents would be crossing for example would suggest that interactions would be expected to be minimal. The peak of construction activity is expected to occur in month ten when there will be a total of 140 vehicle movements per day at this location, comprising 134 two-way HGV movements and 6 two-way car / LGV movements. This would equate to approximately 12 two-way total vehicles movements or 11 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. This level of traffic is highly unlikely to have an impact on the severance of residents living in stand-alone properties at this location. In the absence of mitigation, the effect of fear and intimidation is therefore considered to be negligible.
	Road Safety	Minor	Minor / Negligible (Not Significant)	The agreed Study Area for the PIA assessment did not include the A84 at this location. Notwithstanding this, as with the previously assessed A85, the character of the road could lead to driver frustration, and cognisance of this will be included within the proposed mitigation measures. Therefore, the effect of road safety is considered minor.
	Large Loads	Major	Minor (Not Significant)	It is anticipated that the Proposed Development will require 45 AIL convoys to be delivered to Site over a four month period. These loads will be delivered in convoys of three AILs per convoy and will be accompanied by three escort vehicles and Police escort. The effect is therefore considered minor.
Drummond Estate Boat Hire / jetty / camping area	Severance	Negligible	Minor (Not Significant)	The character of the road and surrounding area, whereby there are limited pedestrian facilities or places residents would be crossing for example would suggest that interactions would be expected to be minimal.

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
				The peak of construction activity is expected to occur in month ten when there will be a total of 192 vehicle movements per day at this location, comprising 144 two-way HGV movements and 48 two-way car / LGV movements. This would equate to approximately 16 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. This level of traffic is highly unlikely to have an impact on the severance of residents living in stand-alone properties at this location. Given the use of this location by tourists and other recreational users, specific reference should be included within the CTMP to ensure potential impacts on vulnerable road users are appropriately mitigated. In the absence of mitigation, the effect of severance is therefore considered to be negligible.
	Driver Delay	Negligible	Minor (Not Significant)	When considering the effects purely in numerical terms based on the assessment criteria, there is ample spare capacity on the road (92.0%) with the addition of construction traffic. This however does not take cognisance of the character of the road and the potential for other road users to become frustrated by the increase in traffic, in particular HGVs. It should however be noted that it is estimated that only an additional 192 two-way vehicle movements (96 inbound and 96 outbound) would occur in a typical day during the construction phase at this location. Given that there is significant spare capacity on the road, driver frustration would be expected to be minimal on those residents looking to enter and exit their properties within the Study Area. In the absence of mitigation, the effect on driver delay is therefore considered minor.
	Pedestrian Delay	Negligible	Minor (Not Significant)	With the exception of the Core Path that runs parallel to the A85 (which are addressed separately later in this table), there are no pedestrian facilities located along the A85 (outwith settlements) at this location within the Study Area. The effect on pedestrian delay is therefore considered to be minor.
	Non-motorised User Amenity	Minor	Moderate / Minor (Not Significant)	With regards to potential impacts on non-motorised user amenity, the predicted increase in HGV traffic is 36.30% which while statistically significant, is due to the low level of existing HGV traffic on the road. The overall increase in traffic is forecast to be only 12.54%. The base plus development trips accounts for a total of 1,723 vehicular trips, assuming the majority of these occurred between 07:00 and 19:00 for example,

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
				this would equate to approximately 144 vehicle movement per hour, which is not considered significant for a road of this standard. This would be further reduced if spread across the whole day. The increase of 144 vehicle movements per day at this location would be unlikely to affect non-motorised user amenity. The effect on non-motorised user amenity is therefore considered to be minor.
	Fear & Intimidation	Negligible	Minor (Not Significant)	The character of the road and surrounding area, whereby there are limited pedestrian facilities or places residents would be crossing for example would suggest that interactions would be expected to be minimal. The peak of construction activity is expected to occur in month ten when there will be a total of 192 vehicle movements per day at this location, comprising 144 two-way HGV movements and 48 two-way car / LGV movements. This would equate to approximately 16 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. This level of traffic is highly unlikely to have an impact on the severance of residents living in stand-alone properties at this location. The increase in total traffic would be 12.54% at this location and changes in flows less than 30% are considered minor. In the absence of mitigation, the effect of fear and intimidation is therefore considered to be minor.
	Road Safety	Moderate	Major / Moderate (Significant)	Three accidents were recorded on the A85 at this location within the Study Area over the last 5-year period. Two were serious PIAs and one was a fatality. Two of the accidents occurred on bends (including the fatality), both of which were single vehicle accidents and one occurred at a junction, which was a two vehicle accident. There does not however appear to be any specific trends or high number of accidents involving HGVs. The character of the road could lead to driver frustration however and the increase of vehicles turning at the site access junctions could lead to an increase in potential conflicts. As such, cognisance of HGV traffic would be included within the proposed mitigation measures. Therefore, the effect of road safety is considered major.
	Large Loads	Major	Major (Significant)	It is anticipated that the Proposed Development will require 45 AIL convoys to be delivered to Site over a four month period. These loads will be delivered in

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
				convoys of three AILs per convoy and will be accompanied by three escort vehicles and Police escort. The effect is therefore considered major.
Lochearnhead and Auchraw	Severance	Negligible	Minor (Not Significant)	There are some pedestrian facilities within the two settlements, commensurate with their rural setting. For the most part amenities, and places where people will visit are on one side of the carriageway, meaning that there are limited places where people would be crossing for example would suggest that interactions would be expected to be minimal. The peak of construction activity is expected to occur in month ten when there will be a total of 150 vehicle movements per day at this location, comprising 144 two-way HGV movements and 6 two-way car / LGV movements. This would equate to approximately 13 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. This level of traffic is highly unlikely to have an impact on the severance of residents living in stand-alone properties at this location. Given that there will be a number of residents, tourists and other recreational users, specific reference should be included within the CTMP to ensure potential impacts on vulnerable road users are appropriately mitigated. In the absence of mitigation, the effect of severance is therefore considered to be minor.
	Driver Delay	Negligible	Minor (Not Significant)	When considering the effects purely in numerical terms based on the assessment criteria, there is ample spare capacity on the roads through these locations, ranging from 80.9% to 92.0% with the addition of construction traffic. This however does not take cognisance of the character of the road and the potential for other road users to become frustrated by the increase in traffic, in particular HGVs. It should however be noted that it is estimated that only an additional 150 two-way vehicle movements (75 inbound and 75 outbound) would occur in a typical day during the construction phase at this location. Given that there is significant spare capacity on the road, driver frustration would be expected to be minimal on those residents looking to enter and exit their properties within the Study Area. In the absence of mitigation, the effect on driver delay is therefore considered minor.
	Pedestrian Delay	Negligible	Minor (Not Significant)	The peak of construction activity is expected to occur in month ten when there will be a total of 150 vehicle

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
				movements per day at this location, comprising 144 two-way HGV movements and 6 two-way car / LGV movements. This would equate to approximately 13 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. This level of traffic is highly unlikely to cause pedestrian delay. Given the use of this location by residents, tourists and other recreational users, specific reference should be included within the CTMP to ensure potential impacts on vulnerable road users are appropriately mitigated. In the absence of mitigation, the effect of severance is therefore considered to be minor.
	Non-motorised User Amenity	Minor	Moderate / Minor (Not Significant)	With regards to potential impacts on non-motorised user amenity, the predicted increase in HGV traffic is between 35.05% and 36.30% depending on which road within these areas is being used. While statistically significant, is due to the low level of existing HGV traffic on the road. The overall increase in traffic is forecast to be between 3.82% and 12.54%. The increase of 150 vehicle movements per day at this location would be unlikely to affect non-motorised user amenity. The effect on non-motorised user amenity is therefore considered to be minor.
	Fear & Intimidation	Negligible	Minor (Not Significant)	The peak of construction activity is expected to occur in month ten when there will be a total of 150 vehicle movements per day at this location, comprising 144 two-way HGV movements and 6 two-way car / LGV movements. This would equate to approximately 13 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile. This level of traffic is highly unlikely to have an impact on the fear of people at this location within the Study Area. The increase in total traffic would be between 3.82% 12.54% at this location and changes in flows less than 30% are considered minor. In the absence of mitigation, the effect of fear and intimidation is therefore considered to be minor.
	Road Safety	Moderate	Major / Moderate (Significant)	Three accidents were recorded on the A85 at this location within the Study Area over the last 5-year period. Two were serious PIAs and one was a fatality. Two of the accidents occurred on bends (including the fatality), both of which were single vehicle accidents and one occurred at a junction, which was a two vehicle accident.

Receptors	Potential Effect	Magnitude of Change	Significance of Effect	Comment
				The character of the road could lead to driver frustration, however and cognisance of this will be included within the proposed mitigation measures. Therefore, the effect of road safety is considered major.
	Large Loads	Major	Major (Significant)	It is anticipated that the Proposed Development will require 45 AIL convoys to be delivered to Site over a four month period. These loads will be delivered in convoys of three AILs per convoy and will be accompanied by three escort vehicles and Police escort. The effect is therefore considered major.
Core Path / Wider Path Users	Severance	Major	Major (Significant)	The presence of construction traffic within the Site where there was previously minimal traffic could lead to a severance of some of the path network. The effect is therefore considered to be major.
	Driver Delay	Not applicable	Not applicable	Not applicable
	Pedestrian Delay	Moderate	Major / Moderate (Significant)	Pedestrians could experience delays if their movements interact with construction traffic along the path network which would be minimal prior to the construction phase. The impact is therefore considered moderate.
	Non-motorised User Amenity	Major	Major (Significant)	The presence of traffic flows along a location where there would have been no/low traffic prior to the construction phase would affect the amenity of the path network for users. The effect is therefore considered major.
	Fear & Intimidation	Major	Major (Significant)	The presence of traffic flows along a location, where there would have been no/low traffic prior to the construction phase, could cause fear and intimidation of the path network for users. The effect is therefore considered major.
	Road Safety	Moderate	Major / Moderate (Significant)	There is potential to impact the safety of the path users interacting with construction delivery vehicles. It is anticipated that Site specific speed limits will be adhered to within the Site boundary. The impact is therefore considered moderate.
	Large Loads	Major	Major / Moderate (Significant)	There is potential to impact the safety of the path users interacting with AIL delivery vehicles. The effect is therefore considered major..

11.5.25 The assessment suggests that the following receptors are considered likely to experience Significant effects in accordance with the EIA Regulations, prior to the application of mitigation measures:

- A85 Users at the Site access;
- A84 Users south of Lochearnhead;
- Drummond Estate Boat Hire / jetty / camping area;

- Lochearnhead and Auchraw; and
- Core Path / Path Users within the Site.

11.5.26 It should be noted that the impacts relate solely to the peak of construction activities and that the construction period is short lived and the effects are temporary in nature. Whilst it is acknowledged that other months within the construction programme may cause Significant effects, these would be less than those assessed and for which mitigation measures have been proposed.

11.6 Additional Mitigation during Construction

Construction Traffic Management Plan (CTMP)

11.6.1 The following measures will be implemented during the construction phase through the CTMP, secured via a deemed planning permission condition:

- Agree AIL route modifications and improvements with PKC, TS and other relevant stakeholders. Works which will be required to facilitate turbine deliveries are outlined in the Route Survey Report (RSR), which is presented in **Annex C** of **TA 11.1 (EIAR Volume 4)**;
- Where possible, the detailed design process will minimise the volume of material to be imported to Site to help reduce HGV numbers;
- A Staff Travel Plan, including transport modes to and from the worksite (including pick up and drop off times);
- A Transport Management Plan for AIL deliveries;
- All materials delivery lorries (dry materials) should be sheeted to reduce dust and stop spillage on public roads;
- Specific training and disciplinary measures should be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- Wheel cleaning facilities may be established at the Site entrance, depending on the views of TS;
- Normal Site working hours will be limited to between 0700 and 1900 Monday to Friday and 0700 and 1400 on Saturdays though component delivery and turbine erection may take place outside these hours i.e. depending on when police escort is available;
- Appropriate traffic management measures will be put in place on the A85 leading through to the Site, to avoid conflict with general traffic, subject to the agreement of TS. Typical measures will include HGV turning and crossing signs and / or banksmen at the Site access and warning signs;
- Provide construction updates on the project website, social media feeds and a newsletter to be distributed to residents within an agreed distance of the Site;
- Adoption of a voluntary reduced speed limits, for example on the A85 and A84 and at other locations to be agreed with TS;
- All drivers will be required to attend an induction to include:
  - A toolbox talk safety briefing;
  - The need for appropriate care and speed control;
  - A briefing on driver speed reduction agreements (to slow Site traffic at sensitive locations through the villages); and
  - Identification of the required access routes and the controls to ensure no departure from these routes.

Offsite Mitigation

11.6.2 TS may request that an agreement to cover the cost of abnormal wear and tear on its road network is made. Video footage of the pre-construction phase condition of the abnormal loads access route and the construction vehicles route will be recorded to provide a baseline of the condition of the road prior to any construction work commencing. This baseline will provide evidence of any change in the road condition during the construction phase. Any necessary repairs will be coordinated with TS. Any damage caused by traffic associated with the Proposed Development during the construction period, which would be hazardous to public traffic, would be repaired.

11.6.3 Damage to road infrastructure caused directly by construction traffic will be remediated, and street furniture that is removed on a temporary basis will be fully reinstated.

11.6.4 There will be a regular road condition review, and any debris and mud will be removed from the carriageway using an on-site road sweeper to ensure road safety for all road users.

Specific AIL Mitigation

11.6.5 There are a number of traffic management measures that could help reduce the effect of AIL convoys. All AIL deliveries will be undertaken at appropriate times (to be discussed and agreed with the local authority, TS and the police) with the aim to minimise the effect on the local road network. It is likely that the abnormal load convoys will travel in the early morning periods before peak times while general construction traffic will generally avoid the morning and evening peak periods.

11.6.6 The majority of potential conflicts between construction traffic and other road users will occur with abnormal load traffic. General construction traffic is not likely to come into conflict with other road users as the vehicles are smaller and road users are generally more accustomed to them.

11.6.7 Potential conflicts between the abnormal loads and other road users can occur at a variety of locations and circumstances. The main potential conflicts are likely to occur:

- On sections of single carriageway road or narrow road sections, for example on the A85 and A84;
- At locations where there are significant changes in the horizontal alignment of the carriageway, requiring the loads to use the full carriageway width;
- Where traffic turns at a road junctions, requiring other traffic to be restrained on other approach arms;
- At locations where blade components may require to be lowered or raised when blade lifting trailer is being used; and
- In locations where high speeds of general traffic are predicted.

11.6.8 Advance warning signs will be installed on the approaches to the affected road network. Information signage could be installed to help improve driver information and allow other road users to consider alternative routes or times for their journey (where such options exist).

11.6.9 The location and numbers of signs will be agreed post consent and would form part of the wider traffic management proposals for the Proposed Development.

11.6.10 Information on the wind turbine convoys will be provided to local media outlets such as local papers and local radio to help assist the public. Information will relate to expected vehicle movements from the POE

through to the Site access junction. This will assist residents becoming aware of the convoy movements and may help reduce any potential conflicts.

11.6.11 The Applicant will also ensure information was distributed through its communication team via the project website, local newsletters, and social media.

11.6.12 A police escort will be required to facilitate the delivery of the predicted AILs. The police escort will be further supplemented by a civilian pilot car to assist with the escort duty. It is proposed that an advance escort will warn oncoming vehicles ahead of the convoy, with one escort staying with the convoy at all times. The escorts and convoy will remain in radio contact at all times where possible.

11.6.13 The abnormal loads convoys will be no more than three AILs long, or as advised by the police, to permit safe transit along the delivery route and to allow limited overtaking opportunities for following traffic where it is safe to do so.

11.6.14 The times in which the convoys will travel will need to be agreed with Police Scotland who have sole discretion on when loads can be moved.

AIL Transport Management Plan

11.6.15 An Abnormal Load Transport Management Plan will be prepared to cater for all movements to and from the Proposed Development Site. This will include:

- Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates, and agreeing communication protocols and lay over areas to allow overtaking;
- A diary of proposed delivery movements to liaise with the communities to avoid key dates such as local events;
- A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic; and
- Proposals to establish a construction liaison group to ensure the smooth management of the project / public interface with the applicant, the construction contractors, the local community, and if appropriate, the police forming the committee. This committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.

A Staff Travel Plan

11.6.16 A Staff Travel Plan will be deployed where necessary, to manage the arrival and departure profile of staff and to encourage sustainable modes of transport, especially car-sharing. A package of measures could include:

- Appointment of a Travel Plan Coordinator (TPC);
- Provision of public transport information;
- Mini-bus service for transport of Site staff;
- Promotion of a car sharing scheme;
- Car parking management; and
- Restrictions on parking, for example on the public road network and verges in the vicinity of the Site entrance.

Recreation and Outdoor Access Plan (ROAP)

11.6.17 Within the Site, consideration has been given to pedestrians and cyclists alike due to potential interactions between construction traffic and users of the Core Paths. A Path Planning Study will be conducted post consent and will be secured through a planning condition if deemed necessary. Findings from the study will be used to formulate a set of measures into an ROAP if required. A Draft ROAP is provided in **TA 12.2 (EIAR Volume 4).**

11.6.18 Users of the Core Paths / paths will be separated from construction traffic through the use of barriers. Crossing points will be provided where required, with path users having right of way and temporary diversions will be provided where necessary. Appropriate Traffic Signs Manual Chapter 8[23] compliant temporary road signage will be provided to assist at these crossings for the benefit of all users.

11.6.19 The principal contractor will ensure that speed limits are always adhered to by their drivers and associated subcontractors. This is particularly important within close proximity to the Core Paths, Rights of Way and at crossing points. Advisory speed limit signage will also be installed on approaches to areas where path users may interact with construction traffic.

11.6.20 Signage will be installed on the Site exits that makes drivers aware of local speed limits and reminding drivers of the potential presence of pedestrians and cyclists in the area. This will also be emphasised in the weekly toolbox talks.

11.6.21 No scoping response has been received from The British Horse Society, however measures implemented on similar schemes will be given consideration as part of the Proposed Development. These measures are predominantly focused around the interactions between HGV traffic and horses. Horses are normally nervous of large vehicles, particularly when they do not often meet them. Horses are flight animals and will run away in panic if really frightened. Riders will do all they can to prevent this but, should it happen, it could cause a serious accident for other road users, as well as for the horse and rider.

11.6.22 The main factors causing fear in horses in this situation are:

- something approaching them, which is unfamiliar and intimidating;
- a large moving object, especially if it is noisy;
- lack of space between the horse and the vehicle;
- the sound of air brakes; and
- anxiety on the part of the rider.

11.6.23 The British Horse Society has previously recommended the following actions that will be included in the Site training for all HGV staff:

- on seeing riders approaching, drivers must slow down and stop, minimising the sound of air brakes, if possible;
- if the horse still shows signs of nervousness while approaching the vehicle, the engine should be shut down (if it is safe to do so);
- the vehicle should not move off until the riders are well clear of the back of the HGV;
- if drivers are wishing to overtake riders, please approach slowly or even stop in order to give riders time to find a gateway or lay by where they can take refuge and create sufficient space between the

[23] https://assets.publishing.service.gov.uk/media/5a74adeaed915d7ab83b5ab2/traffic-signs-manual-chapter-08-part-01.pdf

horse and the vehicle. Because of the position of their eyes, horses are very aware of things coming up behind them; and

- all drivers delivering to the Site must be patient. Riders will be doing their best to reassure their horses while often feeling a high degree of anxiety themselves.

11.7 Assessment of Residual Construction Effects

11.7.1 The identification of residual construction effects considers the assessment of traffic effects following the incorporation of the identified mitigation measures above. An evaluation of the potential effects of the temporary increase in traffic on the Study Area roads used for the construction traffic has been undertaken, with the results provided below:

- A85 Users at the Site access – **Not Significant**;
- A84 Users south of Lochearnhead – **Not Significant**;
- Drummond Estate Boat Hire / jetty / camping area – **Not Significant**;
- Lochearnhead and Auchraw – **Not Significant**; and
- Core Path / Path Users within the Site – **Not Significant**.

11.7.2 A summary of the assessment of residual effects, including the proposed mitigation measures is presented in **Table 11.14**.

11.7.3 The assessment confirms the temporary construction stage effects will be minor in nature and they will be **not significant**, following the implementation of a comprehensive CTMP, AIL Transport Management Plan, together with onsite route signage and an ROAP, which will incorporate any required temporary re-routing of Core Paths (if required) or temporary barriers to protect users from construction activities. The traffic effects are transitory in nature and appropriate mitigation measures are proposed to reduce the potential impacts. No long-term detrimental transport or access issues are associated with the construction phase of the Proposed Development.

11.8 Monitoring

Construction Phase Monitoring

11.8.1 Site entrance roads will be maintained and monitored during the construction phase of the Proposed Development. This will be done as part of the CTMP and will involve monitoring the Site access junction and public road network in the vicinity of the Site to ensure mud and debris from construction activities are not tracked on to the road network. Furthermore, monitoring of the public road network will be undertaken as part of the road conditions surveys, that will likely be required as part of the planning conditions attached to the consent.

Operation Phase Monitoring

11.8.2 During the operational life of the Proposed Development, regular maintenance will be undertaken to keep the Site access track drainage systems fully operational and to ensure there are no run-off issues onto the public road network.

11.9 Summary

11.9.1 The Proposed Development will lead to a temporary increase in traffic volumes on the Study Area during the construction phase. Traffic volumes will fall considerably outside the peak period of construction, which is anticipated to be in month ten of the programme. During month ten, there will be a total of 192

vehicle movements per day, comprising 144 two-way HGV movements and 48 two-way car / LGV movements.

11.9.2 This would equate to approximately 16 two-way total vehicles movements or 12 two-way HGV movements per hour, across a typical 12-hour day, assuming a flat traffic profile i.e. vehicles distributed evenly across the day. This increase will be temporary and will only occur during the construction phase.

11.9.3 No capacity issues are expected on any of the roads within the Study Area due to the additional construction traffic movements associated with the Proposed Development, as background traffic movements are relatively low, the links are of a good standard and appropriate mitigation is proposed. The effects of construction traffic would be temporary in nature and would be transitory.

11.9.4 With the implementation of a comprehensive CTMP, together with appropriate signage and path management plan (if required). The traffic effects would be transitory in nature and appropriate mitigation measures are proposed to reduce the potential impacts. No long-term detrimental transport or access issues would be associated with the construction phase of the Proposed Development.

Table 11-14: Summary of Potential Significant Effects

Likely Significant Effect	Mitigation Proposed	Means of Implementation	Outcome/ Residual Effect
Construction			
A85 Users at the Site access			
Large Loads	AIL TMP proposals	Via a condition of consent. AIL TMP to be agreed with PKC and TS prior to movement of AILs.	Minor (Not significant)
A84 Users south of Lochearnhead			
Large Loads	AIL TMP proposals	Via a condition of consent. AIL TMP to be agreed with PKC and TS prior to movement of AILs.	Minor (Not significant)
Drummond Estate Boat Hire / jetty / camping area			
Road Safety	CTMP and ROAP proposals	Via a condition of consent. CTMP and ROAP to be agreed with PKC and TS prior to construction activities commencing.	Minor (Not significant)
Large Loads	AIL TMP proposals	Via a condition of consent. AIL TMP to be agreed with PKC and TS prior to movement of AILs.	Minor (Not significant)
Lochearnhead and Auchraw			
Road Safety	CTMP and ROAP proposals	Via a condition of consent. CTMP and ROAP to be agreed with PKC and TS prior to construction activities commencing.	Minor (Not significant)
Large Loads	AIL TMP proposals	Via a condition of consent. AIL TMP to be agreed with PKC and TS prior to movement of AILs.	Minor (Not significant)
Core Path / Path Users within the Site			
Severance	CTMP and ROAP proposals	Via a condition of consent. CTMP and ROAP to be agreed with PKC and TS prior to construction activities commencing.	Minor (Not significant)
Pedestrian Delay	CTMP and ROAP proposals	Via a condition of consent. CTMP and ROAP to be agreed with PKC and TS prior to construction activities commencing.	Minor (Not significant)

Likely Significant Effect	Mitigation Proposed	Means of Implementation	Outcome/ Residual Effect
Non-motorised User Amenity	CTMP and ROAP proposals	Via a condition of consent. CTMP and ROAP to be agreed with PKC and TS prior to construction activities commencing.	Minor (Not significant)
Fear & Intimidation	CTMP and ROAP proposals	Via a condition of consent. CTMP and ROAP to be agreed with PKC and TS prior to construction activities commencing.	Minor (Not significant)
Road Safety	CTMP and ROAP proposals	Via a condition of consent. CTMP and ROAP to be agreed with PKC and TS prior to construction activities commencing.	Minor (Not significant)
Large Loads	AIL TMP proposals	Via a condition of consent. AIL TMP to be agreed with PKC and TS prior to movement of AILs.	Minor (Not significant)