CONTENTS

INTRODUCTION

12.1 This Chapter considers the environmental impacts that are potentially significant where the Proposed Development is likely to result in increased traffic flows. It sets out the assessment methodology adopted, existing conditions in the study area, proposed best practice methods and predicted effects prior to, and following, the application of mitigation measures to reduce potentially adverse effects on the road infrastructure, road users and local communities.

12.2 Potentially significant traffic related environmental effects may result from two forms of potential impacts:

- the transport configurations made for the movement of turbine components (including blades, tower sections, generator and nacelle), transported as abnormal loads. Abnormal loads are those which exceed the length, weight or height criteria defined in *'Abnormal Load Movements – A brief guide to Notification and Authorisation requirements'* (Transport Scotland, June 2007); and
- the import of general construction materials transported via *'conventional'* heavy goods vehicles (HGVs) and low loaders.

12.3 The assessment detailed within this Chapter is based around worst case assumptions made for the purpose of forming a robust assessment of the Proposed Development within the parameters identified in **Chapter 3: Description of the Development**.

12.4 This Chapter does not focus on the transport configurations made for the movement of wind turbine components. The routes have been considered in the separate Abnormal Indivisible Load Route Survey (AILRS) document prepared by Pell Frischmann (**Technical Appendix 12.1)**, which includes swept path analysis and a detailed review of the preferred routes for access; the findings from the report have been reviewed to inform this Chapter.

12.5 During operation, the Proposed Development would generate regular maintenance trips, which are not anticipated to lead to any variation in the baseline traffic flows beyond that of every day fluctuation. Given that there is a 40 year lifetime for the Proposed Development, the focus of the assessment within this Chapter is the construction phase.

12.6 Planning policies of relevance to this assessment are provided in **Technical Appendix 4.1: Legislation, Planning Policy and Guidance**.

12.7 The traffic impact assessment and the reporting required for the preparation of this Chapter has been undertaken by SLR Consulting Ltd.

SCOPE AND CONSULTATION

12.8 THC provided pre-application advice, dated 06 April 2021. This included reference to the transport assessment methodology, abnormal load assessment, CTMP, impact on the trunk road network and active travel/outdoor access.

12.9 A Scoping Report was submitted by SLR to THC in August 2022. Scoping responses containing comments relating to traffic and transport were obtained from THC (Transport Planning Team and Access Officer), dated 21 September 2022 within the Scoping Response received in October 2022.

Consultation

12.10 A summary of the key points from the relevant scoping response and details of how comments have been addressed in the EIA Report are provided in **Table 12-1**.

Table 12-1: Key Issues

Consultee	Summary of Key Issues	Where Addressed in Chapter
THC (Transport Planning Team)	Identify all Council maintained roads likely to be affected by the various stages of the development and consider in detail the impact of development traffic on these roads	From **paragraphs 12.20 to 12.25**
	Cumulative impact with any other developments in progress or committed, including other renewable energy projects, should be considered.	From **paragraphs 12.65 to 12.68**
	A detailed review of the preferred route to the site for AIL's, to include swept path assessment and consideration of any structures along the route shall be undertaken. A trial run to demonstrate suitability of the route will be required.	AILRS – **Technical Appendix 12.1**
	The proposed route for general construction traffic should be identified and reviewed.	**Paragraphs 12.47 to 12.64**
	A Construction Traffic Management Plan (CTMP) will be required prior to commencement.	**Technical Appendix 12.2: Framework CTMP**
	The proposed access onto A850 should be clearly detailed on dimensioned drawings related to OS data; and include confirmation of geometry, construction and drainage as well as junction visibility splays.	Detail provided in **TA12.1**.
	Traffic generation and distribution of the proposals will be required throughout construction and operation periods. An assessment of the impacts of proposed traffic, and the current traffic flows.	From **paragraphs 12.86 to 12.161**
THC (Access Officer)	A plan detailing existing non-motorised public access footpaths, bridleways and cycleways on the site, proposed public access provision during construction and after completion, and the impacts of the development on core paths should be submitted as part of the EIAR.	Included in **Chapter 14: Socio-economics and Land Use** and on **Figure 14.3.**

12.11 Where relevant, the issues raised by each consultee have been used to develop the scope of assessment and identify any specific matters that warrant more detailed analysis.

Effects Scoped Out

Operational Effects

12.12 It is estimated that the operational phase of the Proposed Development would generate no more than five vehicular trips in any one average day. Typical duties onsite would include routine maintenance, such as safety checks, and repairing faults. These visits would normally require light vans or similar vehicles and would use the same routes as those used during construction.

12.13 The trips generated by the operational activities onsite would be no greater than those expected and accounted for in the background variations to the existing traffic flows. As such negligible traffic flows would be indistinguishable from normal daily traffic flows and therefore assessment of operational effects has been scoped out of this assessment.

Decommissioning Effects

12.14 The Proposed Development has been designed with an operational life of up to 40 years. At the end of this period or before time if necessary, the turbines would be decommissioned or an application may be submitted to repower the site. The decommissioning period would take up to a year. The decommissioning approach is to be agreed with THC and other regulatory bodies through the preparation and agreement of a Decommission and Restoration Plan (DRP). It is currently anticipated that the decommissioning of the proposed scheme would comprise the following elements which would lead to future traffic movements:

- dismantling and removal of turbine components;
- top 1m of the turbine foundation removed with the excavated foundation reprofiled and reseeded;
- crane hardstandings and access tracks to remain in situ to avoid disturbing the land further, allowing natural revegetation;
- equipment within substation removed for reuse or recycling with the building demolished and all materials reused; and
- the top 1m of the substation compound foundations would be removed and disposed of, with the excavated hardstanding reprofiled.

12.15 Trip generation associated with these activities would not exceed the average level of trip generation assessed for the construction phase and it is likely to be considerably lower. Therefore, the decommissioning phase of the Proposed Development has been scoped out of this assessment.

APPROACH AND METHODS

12.16 This Chapter takes an appropriate and topic specific approach to assessment of the Proposed Development as described within **Chapter 3**. The approach for the assessment of site access, traffic and transport effects has been to define the level of traffic anticipated to access the Proposed Development during its construction phase, calculated from first principles and distributed over an anticipated construction programme.

12.17 The effects of the construction phase traffic have then been assessed against the measured baseline in terms of existing traffic levels and then compared to standard practice criteria within

paragraphs 12.49 to 12.56.

12.18 The assessment is detailed against two worst case assumptions:

- all construction materials are assumed to be sourced from offsite locations (i.e. outside of the application site boundary), including all aggregate required for track construction. This will ensure that the estimated level of trip generation has been considered as a worst case with the maximum number of vehicles predicted for construction materials. In reality some aggregate is anticipated to be sourced from onsite borrow pits; and
- future traffic increases associated with the Proposed Development are measured against existing traffic flows, with no allowance for any growth in baseline traffic, thus ensuring that the highest level of impact has been assessed.

12.19 A second scenario has been assessed where it is assumed that a large proportion of the required aggregate would be won from the onsite borrow pits with all additional construction materials assumed to be sourced offsite. The Borrow Pit Appraisal (**Technical Appendix 3.2**) does confirm that the majority of aggregate required for the construction of the wind farm could be won onsite.

Study Area

12.20 The site (as defined by the application boundary) is located on moorland within the administrative boundary of THC, approximately 3km to the south of the settlement of Edinbane approximately 8km to the east of Dunvegan and approximately 7km to the north of Struan on the Isle of Skye. The site would be accessed via a purpose-built track from the A850 located approximately 2km west of Edinbane and 356m east and opposite the road to Greshornish. This is the same access to the existing Ben Aketil Wind Farm, which would then route via the consented Ben Sca Wind Farm site access track to reach the main area of the Proposed Development.

12.21 The operational Ben Aketil Wind Farm is located to the west of the site, and operational Edinbane Wind Farm is directly east of the site.

12.22 There are several residential properties and crofts located to the south and south west of the site which extend down to the A863 and Loch Caroy; the closest being approximately 2.1km from the nearest proposed turbine (T8). The settlement of Edinbane is located approximately 3km to the north, Dunvegan approximately 8km to the west, Balmeanach approximately 2.5km to the south and Struan approximately 7km to the south.

12.23 The study area defined for this assessment is shown on **Figure 12.1**; it comprises the A850 to the east of the site access junction, past Edinbane to the junction with the A87; the initial south bound section of the A87 has also been included. Since the proposed access route would be from the north and east, Balmeanach, Struan and Dunvegan would not be affected by construction traffic movements.

12.24 The study area has been defined based on the sections of road network likely to see the greatest effects associated with traffic generated by the Proposed Development. The study area includes the sections of road nearest to the Proposed Development site access junction. As vehicles travel away from the Proposed Development, they would be distributed across the wider highway network. Beyond the study area, professional judgement suggests that effects relating to site access, traffic and transport would be unlikely to be significant. As such the study area is limited to the A850 east of the Proposed Development and the A87; the numbers of light vehicles travelling

on the A863 would be minimal and so on the basis of professional judgement the A863 is not included in the assessment.

A850

12.25 The A850 extends in an east/west direction from the junction with the A87, past Knott and Edinbane on to Dunvegan, connecting with the A863 at Dunvegan. It is a rural road which provides access to a number of settlements with the presence of some scattered properties directly on the A850, including residential dwellings, B&Bs and a church fronting the road to the east. The A850 is subject to the national speed limit of 60mph throughout its length within the site access, traffic and transport study area. Road markings are present, although worn in places, and the road supports a single carriageway of approximately 5.5m in width. There are also numerous laybys and passing areas throughout its length.

Information and Data Sources

12.26 To determine the baseline conditions against which the effects of the Proposed Development have been assessed, continuous data from 24-hour automatic traffic counters (ATCs) were obtained from 28 January to 03 February 2023. The ATC's captured vehicle flows and speeds along the A850 near Edinbane (eastbound and westbound), and along the A850 near Drumuie (northbound and southbound). The locations of the two counters are shown on **Figure 12.2**.

12.27 Additionally, road traffic collision (RTC) data for the most recent five-year period from 2018 to 2022 has been obtained from Transport Scotland; this was the available data at the time of the request in March 2023. The locations of the recorded injury accidents are shown on **Figure 12.3**.

12.28 An understanding of the existing situation and baseline conditions within the study area has been established through a visual inspection of the road network via a desktop study using tools available on the Internet, as follows:

- Crashmap website - https://www.crashmap.co.uk/; and
- Google Earth Pro.

Assessment Methods

12.29 The likely significance of the potential effects from the Proposed Development that relate to site access, traffic and transport have been determined by considering the magnitude of change in traffic movements and the sensitivity of the receptors which would be affected by these changes. This has been undertaken in accordance with the IEMA guidance (1993) and standard good practice, based on the experience of the assessor.

12.30 The IEMA guidance suggests that a day-to-day traffic flow variation of + or – 10% is to be expected in the baseline situation and that projected traffic flow increases of less than 10% would be imperceptible to the general public and would create no discernible environmental impact. Therefore, increases in traffic levels below 10% are considered insignificant.

12.31 Based on the IEMA guidance, the following factors have been identified as being the most discernible potential environmental effects likely to arise from changes in traffic movements. These are therefore considered in the assessment as potential effects which may arise from changes in

traffic flows resulting from the Proposed Development:

- driver severance and delay – the potential delays to existing drivers and their potential severance from other areas;
- community severance and delay – the potential severance to communities and the delays to movements between communities;
- noise and vibration – the potential effect caused by additional traffic on sensitive receptors, which in this case relate to residential properties near to the road (see also **Chapter 13: Noise**);
- vulnerable road users and road safety – the potential effect on vulnerable users of the road (e.g. pedestrians/cyclists);
- hazardous and dangerous loads – the potential effect on road users and local residents caused by the movement of abnormal loads; and
- dust and dirt – the potential effect of dust, dirt and other detritus being brought onto the road.

12.32 In addition to the effects listed above, human health effects are considered in transport terms in reference to pedestrians within the vulnerable road user and road safety effects.

12.33 The significance of the likely effect has been determined by consideration of the sensitivity of receptors to change, taking account of the specific issues relating to the study area, and then the magnitude of that change.

Sensitivity of Receptor

12.34 The potential sensitivity of receptors to change in traffic levels has been determined by considering the study area and the presence of receptors in relation to each potential impact.

12.35 The IEMA guidelines provide two thresholds when considering predicted increase in traffic, whereby a full assessment of the impact is required:

- where the total traffic would increase by 30% or more (10% in sensitive areas); and/or
- where the HGV traffic would increase by 30% or more (10% in sensitive areas).

12.36 In this context, the IEMA guidance does not define a sensitive area and therefore the assessor has made a judgement based on experience and the nature of the study area. Each receptor has been assessed individually to determine its sensitivity and the assessment criteria chosen are shown in **Table 12-2**.

Table 12-2 Receptor Sensitivity

Impact	Low Sensitivity	Medium Sensitivity	High Sensitivity
Driver severance & delay	Road network not affected	Road network not experiencing congestion at peak times	Road network experiencing congestion at peak times
Road Safety	High sensitivity receptor		
Community severance & delay	Limited presence of existing communities severed by road	Presence of existing communities with a moderate level of existing severance (subjective assessment)	Presence of existing communities with existing severance (subjective assessment)
Noise	Limited sensitive receptors	Presence of sensitive receptors near to the road	Presence of sensitive receptors adjacent to the road
Vulnerable road users	High sensitivity receptor		
Wider disruption due to dangerous loads	No hazardous or dangerous loads on the road network	Some hazardous or dangerous loads on the road network. Loads are legally permitted on UK roads	Abnormal and oversized loads to use road network
Dust and dirt	Limited presence of sensitive receptors (subjective assessment)	Low to medium presence of sensitive receptors (subjective assessment)	High presence of sensitive receptors (subjective assessment)

Magnitude of Impact

12.37 The magnitude of impact or change has been considered according to the criteria defined in Table **12-3**.

Table 12-3: Magnitude Criteria

	Negligible	Minor	Moderate	Major
Driver severance & delay	<10% increase in traffic	Quantitative assessment of road capacity based on existing traffic flows and predicted future traffic levels		
Community severance & delay	<10% increase in traffic	<30% increase in traffic	<60% increase in traffic	>60% increase in traffic
Noise	<25% increase in traffic	>25% increase in traffic. Quantitative assessment based on predicted increase in traffic against measured baseline (see **Chapter 13**)		
Vulnerable road users	<10% increase in	Qualitative assessment of existing provision and future traffic levels		

	Negligible	Minor	Moderate	Major
	traffic			
Road Safety	<10% increase in traffic	Qualitative assessment of existing accident records and predicted increases in traffic.		
Dangerous loads	0% increase in traffic	<30% increase in traffic	<60% increase in traffic	>60% increase in traffic
Dust and dirt	<10% increase in traffic	<30% increase in traffic	<60% increase in traffic	>60% increase in traffic

Significance of Effect (Potential Effects)

12.38 Sensitivity and magnitude of change as assessed under the detailed criteria have then been considered collectively to determine the potential effects and their significance. The collective assessment is a considered assessment by the assessor, based on the likely sensitivity of the receptor to the change (e.g. is a receptor present which would be affected by the change), and then the magnitude of that change. Effects of 'major' and 'moderate' significance are considered to be 'significant' in terms of the EIA Regulations.

Potential Cumulative Effects

12.39 In accordance with the Pre-Application response and scoping response, an assessment of the cumulative effect on the study area of all relevant developments, including local wind farms, within a 15km radius of the site (either in the planning system, consented or under construction – see **Figure 7.14**) which may utilise the same access routes as the Proposed Development has been undertaken.

Operational Cumulative Effects

12.40 As the operational impact of the Proposed Development on the study area is indiscernible, the operational cumulative effects have not been assessed.

Mitigation

12.41 Mitigation measures are considered as part of construction good practice and seek to offset any effects which have been assessed as significant.

Residual Effects

12.42 Following consideration of mitigation measures, an assessment of the residual effects has been made. Residual impacts are those likely to occur after mitigation measures have been incorporated into the scheme. Potential residual impacts include general wear and tear to roads and verges as a result of increased traffic, and temporary road closures caused by abnormal load deliveries.

Statement of Significance

12.43 A statement of significance is provided at the end of the Chapter which provides a summary of the complete assessment for each receptor, taking into consideration any proposed mitigation measures, and it reports the significance of the residual effects in compliance with the EIA Regulations.

Assumptions, Limitations and Confidence

12.44 The assessment of the potential impacts to the baseline traffic relies on the accuracy of the traffic flow data. The traffic counts have been undertaken by an experienced survey company (Kestrel Surveys) and the available Department for Transport (DfT) data are considered to be reliable.

12.45 The potential effects of seasonality have not been included as part of this Chapter's assessment. This is discussed further in the Framework Construction Traffic Management Plan (CTMP) (**Technical Appendix 12.2**) Section 4.

12.46 The route review and assessment of abnormal load delivery (**Technical Appendix 12.1)** has been completed by Pell Frischmann. It is assumed that the information reported in the AILRS document is accurate and that the findings and recommendations are relevant and suitable.

BASELINE CONDITIONS

12.47 This section details the baseline conditions that exist in the study area in relation to the existing road network, existing traffic flows and the current safety of the study area.

Current Baseline

Existing Road Network

12.48 The study area for this assessment has been defined as the A850 extending east from the site access junction to the A87, approximately 13km to the east, to include a small section of the south bound A87. A full description of this road is provided in **paragraph 12.25**.

12.49 The existing site access comprises a small gated junction from the A850 approximately 365m east and opposite the road to Greshornish. This access and track were previously constructed and utilised for the construction of the adjacent Ben Aketil Wind Farm and continue to be used for operational maintenance vehicle access. The approach to the main development area will continue south east, via the consented Ben Sca Wind Farm access track.

Existing Traffic Flows

12.50 Baseline traffic flows have been obtained using Automatic Traffic Counters (ATC) for two locations as shown on **Figure 12.2**. The first was located on the A850 east of the site access from the 28 January to 03 February 2023. The second ATC was obtained between 20 and 26 January 2023 along the A87, approximately 1km from the junction with the A850.

12.51 The data from the traffic surveys are provided in **Technical Appendix 12.3.** A summary of the average weekday (07:00 to 19:00) traffic obtained from ATCs is provided in **Table 12-4**. The data includes directional and two-way flows.

Table 12-4: A87 Average Weekday 24 Hour Traffic Flows

Northbound			Southbound			Two-Way		
Total	HGV	%HGV	Total	HGV	%HGV	Total	HGV	%HGV
1336	20	2%	1340	24	2%	2676	44	2%

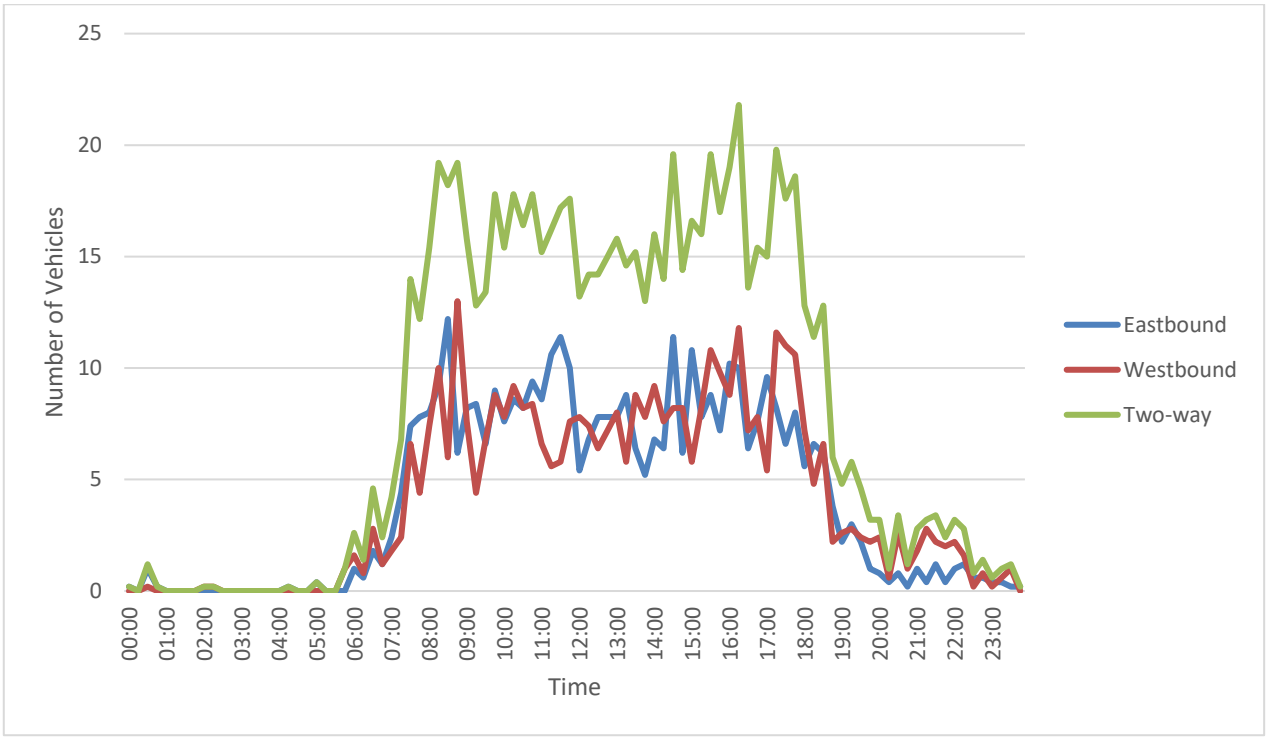
Table 12-5: A850 Average Weekday 24 Hour Traffic Flows

Eastbound			Westbound			Two-Way		
Total	HGV	%HGV	Total	HGV	%HGV	Total	HGV	%HGV
399	5	1%	400	5	1%	799	10	1%

12.52 **Table 12-4** shows that the A87 east of the site access junction supports an almost equal number of vehicles travelling both southbound and northbound during an average weekday; HGVs make up 2% of the total traffic on the A87 on an average weekday. Further to this as shown in **Table 12-5**, the flows on the A850 have been recorded to show that there are also similar levels of total traffic in each direction; HGVs make up 1% of the total recorded traffic.

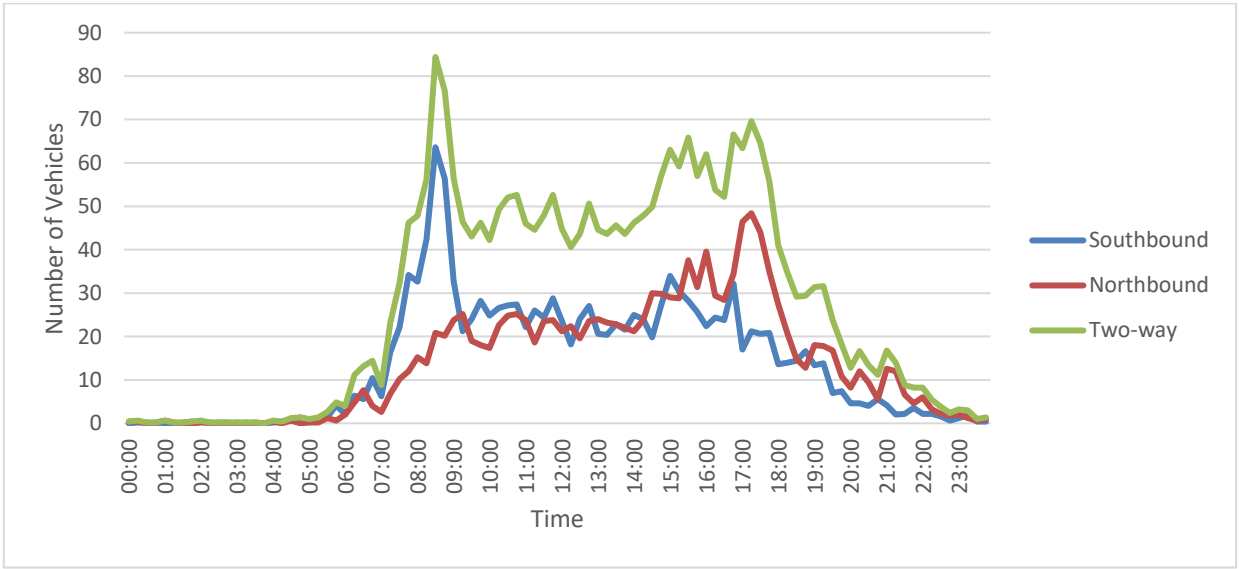
12.53 Traffic flow profiles showing the eastbound and westbound traffic flows on the A850, and the northbound and southbound traffic flows on the A87 over a 24 hour period have been plotted on **Chart 12-1** and **Chart 12-2.** The data plotted have been obtained from an average of weekday vehicle numbers recorded at the traffic count location described in **paragraph 12.50**.

Chart 12-1: A850 - 24 Hour Average Weekday Traffic Profile (All Vehicles)



12.54 **Chart 12-1** shows that traffic flows along the A850 east of the site access junction near Edinbane village show little fluctuation in either direction (eastbound and westbound). Traffic flows remain between 5-10 vehicles per hour on average throughout the busier 12-hour period from 07:00 to 19:00. There are no distinct and clear peak periods in either direction, with the highest flows in both direction occurring between 08:00 and 09:00, recorded as 12 vehicles eastbound and 13 vehicles westbound.

Chart 12-2: A87 - 24 Hour Average Weekday Traffic Profile (All Vehicles)



12.55 **Chart 12-2** shows that traffic flows along the A87 display a greater degree of fluctuation with two distinct peaks from 08:00-09:00 and 16:30-17:30. The largest flow of vehicles was recorded in the

southbound direction with 64 vehicles recorded at 08:30; the largest flow northbound was recorded as 48 vehicles at 17:15. The profile of traffic on the A87 would suggest that there is a commuter flow of traffic that heads south during the morning and north during the evening.

Seasonality Traffic Flows

12.56 It is recognised that the Isle of Skye experiences significant fluctuations in traffic associated with visitor numbers, in particular during the summer months. The DfT traffic flow data does not provide monthly flows, only an averaged yearly figure, and so it has not been possible to discuss the impact of tourism, seasonal or otherwise, on the base situation on the highway network within the study area.

Network Capacity Performance

12.57 The capacity performance of the A850 and the A87 have been calculated from Design Manual for Roads and Bridges, Volume 5, Section 1 TA 46/97, and compared against the existing 24-hour baseline traffic flows. The spare capacity has then been calculated and presented in **Table 12-6**. The A850 has been calculated to have a theoretical spare capacity of 94% while the A87 has been calculated to have a theoretical capacity of 85%.

Table 12-6: Existing Road Capacity

Road	Baseline Flow (24-hr)	Capacity	Spare Capacity	Spare Capacity %
A850	799	14,891	14,092	94%
A87	2,676	18,360	15,684	85%

Accident Records

12.58 A review of the Personal Injury Accident (PIA) records within the study area has been carried out using data obtained from Transport Scotland for the most recent five-year period covering 2018 to 2022. The locations of recorded accidents are shown on **Figure 12-3**.

12.59 The data includes the location, severity and number of vehicles and casualties involved in each accident; additional details including the vehicle type, weather/road conditions and the potential reasoning for cause of accident have not been provided.

12.60 The accident analysis is used to inform the review of the proposed route where any deficiencies in the road layout and condition may be identified.

12.61 For clarification, those accidents recorded which result in slight injury indicate that the victim was likely to suffer from slight shock with occurrences of sprains or bruises from the accident, whereas a serious accident accounts for breakages, lacerations, concussion, or hospital admittance. **Table 12-7** presents a summary of accident data obtained for the A850.

Table 12-7: Five-year Accident Data Summary (2018 to 2022)

S/No	Location	Severity			No. of Casualties	No. of Vehicles involved	Date
		Slight	Serious	Fatal			
1.	A850/ A87 Junction	1			1	2	06/11/20
2.	Along A850 opposite Skeabost Golf course	1			2	1	14/05/22
3.	Along A850 between Skeabost Bridge & A850/ Glen Bernisdale Road priority junction	1			2	2	29/10/19
4.	Along A850 between Skeabost Bridge & A850/ Glen Bernisdale Road priority junction	1			3	3	01/11/21
5.	A850/ Bernisdale Road priority junction		1		1	1	07/02/20
6.	Along A850 between A850/ Glen Bernisdale Road priority junction & A850/ Park Bernisdale Road priority junction		1		1	1	22/09/18
7.	Along A850 between Treaslane River Bridge and A850/ Park Bernisdale Road priority junction	1			1	1	23/01/19
8.	Along A850 300 meters north of the Treaslane River Bridge	1			2	1	23/01/19
9.	Along A850 near Arnisort Church	1			1	1	09/08/18
10.	Along A850 1.9km southwest of the junction of Ben Aketil Forest Trail (site Access) with A850	1			1	1	23/06/20
11.	Along A850 2km southwest of the junction of Ben Aketil Forest Trail (site Access) with A850	1			1	1	02/02/20
Total		**9**	**2**	**0**	**16**	**15**	

12.62 A total of 11 PIA were recorded along A850 within the period considered. Nine of these PIAs resulted in slight injury and two resulted in serious injury. No fatal accidents were recorded within

the study area. Two injury accidents were within proximity of the site access along A850. Both incidents were classified as slight injury accidents and occurred approximately 2km from the priority junction of the site access road with the A850 in the south western direction towards Dunvegan.

12.63 In both of these accidents located close to the site access, no other vehicle was involved and the incident resulted in slight injury to the casualty. The first incident was recorded on 02 February 2020 and the second was recorded on 23 June 2020. Whereas no clear inferences can be made regarding causative factors, the fact that a single vehicle was involved may relate to a range of factors, to include mechanical issues, human error, technical issues or weather related problems.

Existing Road Network Performance

12.64 An assessment of the existing baseline situation has been undertaken. The following may be concluded:

- the existing road network has a low percentage of HGVs and would be expected to support an increase;
- the study area has a low accident record; and
- there are no further improvement works that have been proposed to the roads within the study area.

Cumulative Situation

12.65 **Chapter 5: Environmental Impact Assessment** provides further information on the cumulative sites in the vicinity of the Proposed Development as shown on **Figure 7.14**. Cumulative effects have been considered for the construction period for the following cumulative wind farm sites as agreed with THC (as per consultation on 31 January 2023). Each site has been reviewed to determine whether the construction periods could coincide with the Proposed Development construction timetable.

12.66 The cumulative sites which have been considered as part of this assessment are:

- Ben Sca Wind Farm and Extension (consented): The wind farm will be located directly to the north west of the Proposed Development. The consented wind farm includes the construction of seven turbines (at 135m tip) and an extension consisting of two turbines (at 149.9m tip). The Ben Sca Wind Farm will be accessed via the same existing access as proposed for the Proposed Development, which was used for the Ben Aketil Wind Farm off the A850. Construction vehicles will travel via the A850 onto the site. Construction is likely to begin in late 2024/early 2025 with construction works being undertaken within a 12-month time period. Since construction vehicles for both wind farms would use the same access point and Ben Aketil Wind Farm access track, it is possible that vehicles would overlap within the highway network. It is however anticipated that the operational phase of the Ben Sca Wind Farm Extension would generate a maximum of five vehicle trips on an average day which is considered to have an insignificant impact in combination with the Proposed Development.

- Glen Ullinish Wind Farm (consented): This wind farm would see 11 turbines constructed with access to the site obtained via the A863. The location of this site is likely to see construction vehicles, including AILs, travel via the A87 to Sligachan then the A863 to the site entrance. It

is anticipated that there will be no impact to the upper section of the A87 or to the A850, however due to potentially conflicting construction programmes it is possible that vehicles from the Glen Ullinish Wind Farm would see some overlap on the wider highway network with the Proposed Development. This is considered to be an insignificant increase to the highway baseline as vehicles will dissipate the further from the sites they travel, therefore these vehicles would be considered a part of normal everyday traffic flow fluctuations and needs no further assessment. The delivery AILs has the potential to result in significant impacts to the wider highway network, should the deliveries for the two sites occur at the same time. This is unlikely to happen as the deliveries would be coordinated with THC and each would be scheduled separately. It is noted that Glen Ullinish II Wind Farm, which would replace Glen Ullinish Wind Farm, is at scoping stage (at 31 January 2023) and may be submitted to the ECU within a similar timescale to this application. Currently there is no information publicly available on construction vehicle numbers to inform an assessment, although it is assumed that the access route would be from the south as per Glen Ullinish. Should Glen Ullinish II become an application which receives consent it would be considered in combination with the Proposed Development at that time.

- Beinn Mheadhonach (consented): The proposal consented development at Beinn Mheadhonach would see four wind turbines constructed on land to the east of the A863, north of Drynoch (a five turbine development redesign to replace this was being considered at scoping stage at 31 January 2023). Access for the consented development (and likely also the redesign wind farm) would be via the A863; therefore it is anticipated that there would be no impact to the upper section of the A87 or to the A850.

12.67 It is acknowledged that there are several other proposed wind farm developments within the vicinity of the site which could interact with the Proposed Development construction period if they were consented. However as at 31 January 2023 (when the cumulative list was agreed with THC) these are all at scoping stage and information relation to construction vehicle movements is not publicly available to inform a cumulative transport assessment. Should any of these wind developments become applications which receives consent they would be considered in combination with the Proposed Development at that time. The CTMP (**Technical Appendix 12.2**) discusses the potential for construction timescales to overlap and how the Principal Contractors from each development would need to liaise closely with one another and THC to ensure that significant effects were not experienced on the road network. The wind developments at scoping stage which may use the same construction route at the Proposed Development are:

- Ben Aketil Repowering and Extension Wind Farm;
- Ben Crokaig Wind Farm;
- Edinbane – Land at 4 Edinbane;
- Edinbane Repowering Wind Farm; and
- Waternish Wind Farm.

12.68 The review of the permitted and pending wind farms likely to impact on the Proposed Development study area has identified that there may be cumulative effects anticipated as a result of the combined construction impacts from the Ben Sca Wind Farm and its Extension.

THE PROPOSED DEVELOPMENT (FUTURE BASELINE)

Introduction

12.69 The Proposed Development is described fully in **Chapter 3**.

Site Access and Onsite Tracks

12.70 An existing access track and bellmouth junction, currently serving the Ben Aketil Wind Farm would provide access directly from the A850, with access then taken along the consented Ben Sca Wind Farm track to the site. Minor upgrades and widening would be required to allow the transportation of longer blades than for previously transported components to the site. It is proposed that a new spur would be created from the Ben Sca access track as shown on **Figure 3.1a-b**.

12.71 Up to 13.5km of onsite access tracks would be required to provide access to the wind turbines, substation, and construction compound. Up to 9.4km[1] of new track would be created and 2.3km of consented track and 1.8km of existing track would be used.

12.72 Tracks would be unpaved and constructed of a graded local stone with a typical running width of 5m (wider on bends and at junctions) plus potential ditches and banks. Additionally, nine turning heads would be constructed. It is proposed that the majority of the stone required for construction of the tracks and hardstanding areas could be won from borrow pits.

Turbines and Turbine Foundations

Foundations

12.73 Turbine foundations would be designed to accommodate the final choice of turbines and to suit site specific ground conditions. The final design specification for each foundation would depend on the findings of detailed ground investigation of the land on which each turbine would be located. Turbine foundations would be constructed in reinforced concrete, with concrete batched on site using imported cement and imported aggregates where higher grade material is required.

Turbine Components

12.74 Wind turbines would be delivered in component parts, assumed to be up to eight per turbine, and are treated as abnormal loads.

12.75 The proposed abnormal load route to the site is shown on **Figure 12.4** and is assessed within **Technical Appendix 12.1**. In summary the route would begin at the Port of Kyle of Lochalsh and end on the A850 (at the site entrance). The approach to the site would be taken via the A87 trunk road and the A850-Dunvegan Road. A similar route has previously been employed for construction of the neighbouring Edinbane and Ben Aketil Wind Farms and has been assessed within the ES Chapter prepared to support the Ben Sca Wind Farm.

[1] 9.4km is worst case maximum length of new track required assuming Option B of Figure 3.1.

Construction Programme

12.76 An indicative 18 month construction programme has been prepared and is set out in the construction timeline shown in **Chapter 3** and in **Table 12-8.** For the purposes of this assessment it is assumed that construction is likely to begin in 2025. The main construction works will be undertaken during months 6 to 12. The final seven months of the construction programme would comprise wind turbine delivery and erection, with road and site restoration.

Table 12-8: Indicative Construction Programme

Construction Activity	Months																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Site establishment																		
Access Road Improvements																		
Forest clearance																		
Haul road to borrow pits																		
Access tracks, crane pads																		
Turbine & met mast foundations																		
Substation/storage civil works																		
Cable delivery & installation																		
Crane delivery & demobilisation																		
Turbine delivery & erection																		
Wind Farm Commissioning																		
Reinstatement / Restoration																		

12.77 The construction working hours for the Proposed Development would be 07:00 to 19:00 Monday to Friday and 07:00 to 16:00 on Saturdays. It should be noted that out of necessity some activities, for example abnormal load deliveries, concrete deliveries during foundation pours and also the lifting of the turbine components, may occur outside the specified hours stated. These activities would not be undertaken without prior approval from THC.

Proposed Development – Construction Materials

12.78 The Proposed Development would require the transportation of a range of construction materials

to the site. The key elements of construction work which would result in trip generation have been summarised in **Table 12-9**.

Table 12-9: Construction Activities Requiring Vehicle Trips

Key Work Element	Details and Assumptions	Conventional HGVs	Abnormal Loads
Site Establishment	Delivery of site cabins and plant for construction activities at commencement of construction and later removal from site.	Yes	No
Borrow Pit	Delivery of plant associated with establishing the borrow pit.	Yes	No
Access track upgrade and Construction	Up to 9.4km of new onsite track, including turning heads.	Yes	No
Turbine foundations and Crane Hardstandings,	Delivery of plant associated with construction of crane hardstandings. Delivery of plant and materials including concrete, aggregate and reinforcement materials for turbine foundations.	Yes	No
Control Building and Substation Compound	Delivery of material for construction of building foundations, structure and finishings. Delivery of electrical equipment.	Yes	Yes
Electrical Installation	Delivery of sand and cables to connect turbines to substation.	Yes	No
Wind Turbine Delivery	Delivery of turbine components to site. Bringing in of crane equipment to erect turbines. Includes escort vehicles associated with movement of abnormal loads.	Yes	Yes

12.79 The precise quantities of construction materials required for the Proposed Development would depend on the presence and productivity of onsite borrow pits.

12.80 While there are up to four proposed borrow pits on site, a robust assessment of a worst case scenario is to be included, with the assumption that a greater volume of material is imported to site. Therefore, to accurately assess the potential impact of the transportation of construction materials to the site, two scenarios have been modelled, these are:

- **Scenario 1:** All construction materials are assumed to be sourced from offsite locations, including all aggregate required for concrete and track construction and upgrade, thus ensuring that the estimated level of trip generation is considered as a worst case (quarry locations are shown within **Figure 12.5** and due to the locations all construction vehicles would utilise the same route as AILs); and
- **Scenario 2:** A proportion of aggregate for track formations and subbases is assumed to be sourced from the proposed four onsite borrow pits with all higher grade aggregate assumed to be sourced offsite.

12.81 It should be noted that Scenario 1 is highly unlikely as a significant amount of the aggregate is

anticipated to be won onsite.

12.82 An estimation of the aggregate material quantities for all elements of the Proposed Development has been made. **Table 12-10** provides a summary of the material quantities (aggregates only) required on site.

Table 12-10: Estimated Aggregate Material Quantities for Proposed Development

Proposed Infrastructure	Volume of Aggregate Required (m^3)	Approximate Tonnages of Aggregate Required
Site Tracks (excavated)	28,212	56,424
Turning Heads	12,375	24,750
Turbine bases (formation only)	2,645	5,290
Aggregate for Turbine Concrete[2]	2,970	5,200
Fill above turbine bases (Backfill)	13,310	26,620
Hardstandings	25,840	51,680
Aggregate for Met Mast Concrete	73	128
Substation	1,050	2,100
Temporary Construction Compound	4,000	8,000
Total	**90,475**	**180,192**

12.83 Scenario 2 is the more realistic scenario whereby onsite borrow pits are taken into account with aggregate extraction. The borrow pits are expected to extract a total amount of material which exceeds the amount required for importation in the worst case scenario (Scenario 1). Between 20-40% of the aggregate required on site would be required to be a higher quality and grade, which the material from the borrow pits may not provide. As such, for Scenario 2, it is assumed that 40% of the total aggregate would be imported.

12.84 Using the figures from **Table 12-10** the aggregate volume for each scenario is as follows:

- Scenario 1 – 180,192t aggregate imported; and
- Scenario 2 –72,077t aggregate imported.

12.85 **Table 12-11** provides material quantities for all other non-aggregate materials; these materials are applicable to both scenarios. Concrete batching production would take place onsite in-situ; the

[2] It is assumed that $1m^3$ of concrete requires 1 tonne of aggregate. Aggregate required for concrete assumed at 1.75 tonne per $1m^3$. Other aggregate assumed at 2 tonne per m^3.

cement and sand have been included in the material quantities below. Water for the concrete batching would be sourced onsite.

Table 12-11: Estimated Material Quantities for Both Scenarios (Excluding Aggregate)

Infrastructure		Material Quantities	
Turbine & Met Mast Foundations	Installation 6N Structural Fill	1,973m^3	3,946t
	Blinding	283m^3	566t
	Installation of Can/Bolts	10no	
	Reinforcement	639t	
	Plinth Shutter	18.6m^3	37.2t
	Base Slab Perimeter Shutter	43.7m^3	87.4t
	Ducts (200mm diameter)	60no	
	Ducts (75mm diameter)	60no	
	Transformer Plinths	10no	
	Step Plinth	10no	
Electrical Connection	Sand Layer – 6m x 3m x 3,400m	680m3	1,360t
	Cable – Drums hold 500m	3,778m	8 drums
Cement Sand	10 turbines 5,200m3 concrete Met mast 128m3 concrete For mixing concrete	1,865t 5,328t	
Control Building	Reinforcement	43t	
Substation Compound	Imported type 1 running surface	571m3	1,142t
	Imported 6F2 Capping	1,143m3	2,286t
	Class 1C1 Roadbox bulk fill	2,857m3	5,714t
	Class 1 general fill	7,649m3	15,298t

Trip Generation

HGV Trip Generation

12.86 The total number of HGV trips predicted to arise during the construction phase of the Proposed Development has been calculated based on the estimated material quantities provided in **Table 12-11**. These have then been doubled to provide the two-way movements that would occur from delivery and then returning vehicles, as shown in **Table 12-12** and **Table 12-13**.

Table 12-12 Total Number of HGV Trips (Aggregates)

Item	Load Size	Scenario 1		Scenario 2	
		No. of loads	Two-way	No. of loads	Two-Way
Access Tracks	20t	2,821	5,642	1,128	2,256
Turning heads	20t	1,238	2,476	495	990
Turbine Bases – formation only	20t	265	530	106	212
Aggregate for Turbine Concrete	20t	260	520	104	208
Fill Above Turbine Bases	20t	1,331	2,662	532	1,064
Hardstandings	20t	2,584	5,168	1,034	2,068
Aggregate for Met Mast Concrete	20t	6	12	3	6
Substation compound	20t	105	210	42	84
Temporary Construction Compound	20t	400	800	160	320
Total		**9,010**	**18,020**	**3,604**	**7,208**

Table 12-13 Total Number of HGV Trips (Non-aggregates)

Item		Load Size	No of Loads	Two-Way
Turbine Foundations	Installation 6N Structural Fill	20t	197	394
	Blinding	20t	28	56
	Installation of Can/Bolts	-	1	2
	Reinforcement	20t	32	64
	Plinth Shutter	-	1	2
	Base Slab Perimeter Shutter	-	1	2
	Ducts (200mm diameter)	-	1	2
	Ducts (75mm diameter)	-	1	2
	Transformer Plinths	-	10	20
	Step plinth	-	10	20
Electrical Connection	Sand layer – 6m x 3m x 3,400m	20t	68	136
	Cable – drums hold 500m	-	8	16
Temporary Welfare Facilities		-	4	8
Cement Sand		20t 20t	93 266	186 532

Item		Load Size	No of Loads	Two-Way
Control Building	Reinforcement	20t	3	6
Substation Compound	Imported Type 1 running surface	20t	57	114
	Imported 6F2 capping	20t	114	228
	Class 1C1 Roadbox bulk fill	20t	286	572
	Class 1 General Fill	20t	765	1,530
Total Loads/Two-way Movements			**1,946**	**3,892**

12.87 The two-way movements for HGVs have been spread over the construction programme according to the relevant activity, for both Scenario 1 and Scenario 2. The total two-way trip generation has been divided by the number of construction working days in each month (assumed 26) to provide daily two-way trip generation as shown in **Table 12-14** and **Table 12-15** for the two Scenarios.

12.88 The key construction activities have been simplified to facilitate the application of the HGV numbers to each month of the programme (the final 6 months, not included, are reserved for the delivery of the turbines and for the commission of the turbines):

- site establishment and restoration – this includes the first phases of the construction period, to include site establishment and access road improvements forest clearance It has been assumed the use of some aggregates will be included here. This also includes the deliveries associated with the management compound (welfare cabins etc);
- access tracks, hardstandings and turning heads – this will require the majority of aggregates for the tracks. This has been applied to the two separate scenarios;
- turbine and met mast foundations – turbine bases, structural fill and ballast required for the turbine bases (aggregates), reinforcement bars, turbine transition element, concrete, formwork, earthing materials and all other materials required for the construction of turbine foundations. The delivery of the turbines is not included here.
- substation construction – this covers all materials and equipment associated with the construction of the substation including the aggregate, building materials and HV equipment;
- concrete – materials for concrete batching production in-situ, including the cement, aggregate and sand which would be imported; and
- cabling – electrical connection materials.

Table 12-14: Scenario 1 Daily Two-Way HGV Trip Generation by Construction Month

Activity	1	2	3	4	5	6	7	8	9	10	11	12
Site establishment	18	18	18									
Access tracks and hardstandings/crane pads			70	70	70	70	70	70	70			
Turbine and met mast foundations								33	33	33	33	33
Substation and electrical works							26	26	26	26		
Concrete							12	12	12	12		
Cable laying										2	2	2
TOTAL	**18**	**18**	**88**	**70**	**70**	**70**	**108**	**141**	**141**	**73**	**35**	**35**

Table 12-15: Scenario 2 Daily Two-Way HGV Trip Generation by Construction Month

Activity	1	2	3	4	5	6	7	8	9	10	11	12
Site establishment	7	7	7									
Access tracks and hardstandings/crane pads			31	31	31	31	31	31	31			
Turbine and met mast foundations								16	16	16	16	16
Substation and electrical works							24	24	24	24		
Concrete							9	9	9	9		
Cable laying										2	2	2
TOTAL	**7**	**7**	**38**	**31**	**31**	**31**	**64**	**80**	**80**	**51**	**18**	**18**

HGV Trip Generation Summary

12.89 The majority of construction activities would incur HGV trip generation which would be spread over the majority of the first 12 months of the construction phase, as defined in the construction programme, with the final six months predominantly comprising turbine deliveries and light vehicle trips for snagging and restoration activities, followed by takeover.

12.90 The maximum level of two-way trip generation for Scenario 1 would occur in months 8 and 9, with 141 two-way movements per day . These peak months occur when the material imports for the different construction activities coincide. The Proposed Development will utilise some of the tracks that are yet to be constructed for the Ben Sca Wind Farm.

12.91 The maximum level of two-way trip generation for Scenario 2 would also occur in months 8 and 9, with 80 two-way movements.

12.92 **Table 12-16** provides a summary of the two-way trip generation for the worst case day (maximum trip generation) and an average hour for both scenarios.

Abnormal Loads Trip Generation

12.93 Each wind turbine typically consists of up to eight abnormal load deliveries: three blades, three tower sections and the nacelle and generator. Other loads would be associated with the delivery of the hub, cranes and drilling rigs, which would not be considered to be AILs, these however would be delivered at a similar time. Towers would be carried in a 4+7 clamp adaptor style trailer, whereas loads such as the hub, nacelle housing and top towers would be carried on a six axle step frame trailer. All components would be transported under suitable traffic management procedures. Where constraints are extreme, loads would be transferred onto a Goldhofer blade lifting trailer. This trailer has the ability to lift blades up to a maximum angle of 60 degrees, lifting blades over potential constraints and shortening the length plan view.

12.94 On the premise that the 80 components would be delivered in convoys of three, the AILs could be completed over 27 days. Over the four month period allocated for the erection of the turbines, this would equate to an average of approximately two days of deliveries per week.

12.95 To ensure a robust assessment, it has been assumed that three abnormal load transport vehicles would deliver components on a day during the 'worst case' month, with an additional two HGV deliveries included for the crane and drilling rigs; this gives an additional five HGV deliveries. Both Scenarios 1 and 2 include the AILs.

Light Vehicle Trip Generation

12.96 Light vehicles of which consist of smaller vehicles such as cars and vans, which would typically be associated with the workforce, have also been calculated to provide total two-way vehicle movements predicted to arise from the Proposed Development. It is envisaged that a maximum of 40 personnel would be required on the site at any one time. Based on the conservative assumption that 20% of workers would car share, this would equate to 32 vehicle trips per day (64 two-way movements per day).

Accumulative Trip Generation

12.97 **Table 12-16** provides the calculated daily and hourly two-way movements for both Scenarios 1 and 2, with the HGVs and AIL (5no) included. To ensure a robust assessment of the impacts, the light vehicles have been included within the average hour, although in reality these would be likely to arrive and depart separately.

Table 12-16: Trip Generation Summary (Two-way)

	Scenario 1			Scenario 2		
	HGV/AIL	Lights	Total	HGV/AIL	Lights	Total
Daily	146	64	210	8	64	149
Average hour	12	32	44	7	32	39

Trip Distribution

12.98 All construction vehicles would enter the site from the east having travelled the length of the A850 from the junction with the A87. Should all of the aggregates be sourced from outside of the site, the material would be transported from one or both of two existing quarries; these are shown on **Figure 12.5**. The quarries are both located to the south of the Proposed Development, and would be accessed via the A850 and via the A87.

12.99 Other construction and delivery vehicles will travel via the A87 to the A850, where they will head west to the site access.

12.100 Light vehicle trip generation would see a maximum of 64 two way trips each day during the worst case months for each Scenario. It is assumed that the majority of light vehicles will travel to site via the A87 and the A850, however a small number may travel along the A863 from more local locations. As such it has been assumed that 80% of light vehicles will travel to and from the A850 east and 20% will travel via the A850 west.

ASSESSMENT OF EFFECTS

12.101 The Proposed Development has been designed to include a range of measures to mitigate potential effects. Included within this are the design of the site entrance to include radii and width suitable for ease of abnormal indivisible load access. All such measures are described fully in **Chapter 3**.

Construction Effects

Assumptions of the Assessment – Proposed Development

12.102 The assessment has been undertaken under the assumption that good construction practice would be deployed, including the following:

- all vehicles delivering plant and materials to the site would be roadworthy, maintained and sheeted as required;
- suitable traffic management would be deployed for the movement of HGVs and other site

traffic;

- banksmen and police escort would be deployed for the movement of abnormal loads as required; and
- HGV loads would be managed to ensure that part load deliveries would be minimised where possible, to limit the overall number of loads.

12.103 The predicted increases in traffic levels against the baseline levels have been calculated in this section, and then an assessment of the significance of the effect has been made against the criteria described in **Tables 12-2** and **12-3**.

12.104 The IEMA guidelines provide two thresholds when considering predicted increases in traffic, whereby a full assessment of impact would be required:

- where the total traffic would increase by 30% or more (10% in sensitive areas); and/or
- where the HGV traffic would increase by 30% or more (10% in sensitive areas).

12.105 Although there are residential properties present within the study area, these are not considered to be sensitive receptors as they are not in close proximity to the road. In addition, there are no key sensitive receptors located close to the roads within the study area, and therefore the threshold of 30% has been applied.

12.106 The construction working hours for the Proposed Development would be 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays other than in exceptional circumstances. It should be noted that out of necessity some activity, for example abnormal load deliveries and the lifting of the turbine rotors, may need to occur outside the specified hours stated, although they would not be undertaken without prior approval from THC. The impact of the Proposed Development has been assessed over the average weekday period, for both Scenario 1 and 2.

12.107 **Table 12-17** shows the predicted daily total and HGV traffic increases for the scenario 1 and 2. The baseline traffic flows are those observed on an average weekday over a 24 hour period.

Table 12-17: Predicted Daily Increases in Traffic (Average Weekday)

	Road Link	Baseline		Development		Baseline + Development		Increase %	
		Total	HGVs	Total	HGVs	Total	HGVs	Total	HGVs
Scenario 1	A850	799	10	210	146	1,009	156	26%	1,460%
	A87	2,676	44	197	146	2,873	190	7%	332%
Scenario 2	A850	799	10	149	85	948	95	19%	850%
	A87	2,676	44	136	85	2,812	129	5%	193%

Table 12-18: Capacity of the A87 and A850 with Development

Road	Baseline Flow (24-hr)	Capacity	Development (worst case)	Spare Capacity	Spare Capacity %
A850	799	14,891	210	13,882	93%
A87	2,676	18,360	197	15,487	84%

Traffic Increase Summary

12.108 The results above show that all percentage increases in total traffic volumes are below the IEMA thresholds (i.e. an increase of 30%) with a 26% maximum increase on the A850 and 7% maximum increase on the A87; however the increase in HGV traffic along the A850 and A87 are in exceedance of the IEMA thresholds.

12.109 The largest increase would be where the total traffic flows increase by 26% (1,460% HGV increase) for a worst case day on the A850.

12.110 In summary, while total traffic levels are within the IEMA thresholds of a 30% increase to traffic flows along the A850 east of the site access point, HGV trip generation would be significantly increased for both the scenarios. However, the theoretical capacity of the A87 and the A850 is demonstrated to be more than sufficient in **Table 12-18**.

Potential Effects

Effect on Driver Severance and Delay

12.111 The IEMA guidance states that severance is the perceived division when a community becomes separated by a road, with factors that result in the separation of people from the places they want and need to access. The IEMA guidance states that there are a number of factors which determine driver severance and delay; these include delay caused by additional turning vehicles and additional parked cars at the site, delays at junctions due to increased traffic, as well as delays at side roads due to reduced gaps in the oncoming traffic.

12.112 There are no major urban areas within the study area and there are a limited number of junctions where an increase in vehicles would have an impact on junction capacity. As such, the receptors within the study area are considered to have a **low sensitivity**.

12.113 **Table 12-16** shows that a maximum of 210 two-way vehicle movements would be added to the daily flow on the A850 and 197 two-way vehicles movements would be added to the daily flow on the A87. These additional vehicles would result in an additional 18 vehicles per hour (two-way) on the A850 and an additional 16 per hour on the A87.

12.114 The capacity performance of the A850 (refer to **paragraph 12.57**) determined that existing traffic levels on this road are substantially below the maximum theoretical capacity of the road with 94% spare capacity; the additional traffic on the 'maximum' day has a limited impact on the spare capacity. This demonstrates that the impact of the Proposed Development on driver severance on the A850 would have a minor magnitude.

12.115 Similarly the A87 has been shown to have an existing theoretical spare capacity of 85%; the additional construction traffic associated with the Proposed Development would result in a reduction to 84%. This demonstrates that the impact of the Proposed Development on driver severance on the A87 would have a minor magnitude.

12.116 Using the criteria outlined in **Tables 12-2** and **12-3**, driver severance and delay is considered to be of low sensitivity as the road network would be affected but would not generally be experiencing congestion, and so the potential overall effects are assessed as minor and not significant (just over 30% vehicular increase on the local highway but well within the maximum theoretical capacity of the road network).

Effect on Road Safety

12.117 There are no general thresholds used when determining the significance of increased traffic on highway safety, therefore professional judgement is required to identify the potential road safety effects associated with the cumulative construction phase. The IEMA guidance confirms that existing road accident rates and professional judgement are needed to assess the implications of the cumulative construction traffic. It should be noted that this assessment does not constitute a road safety audit.

12.118 The accidents recorded within the study area are discussed in **paragraphs 12.58 to 12.63**. A total of 11 injury accidents were recorded within the study area. Nine of these accidents resulted in slight injury and two resulted in serious injury; there were no fatal accidents recorded within the study area. While any instances of injury accidents are unwelcome, 11 accidents over five years indicates that there are no serious issues with road safety. The receptors within the Study Area will have a low sensitivity to any road safety impacts.

12.119 While the predicted number of HGV movements would be significantly greater than the threshold set out in **Table 12-3** for both Scenario 1 and Scenario 2 on the A850, it has been confirmed that the additional vehicles would be easily accommodated within the available capacity of the road. The flows on the A87 are not predicted to exceed the threshold. Both routes have previously been used for the transportation of materials associated with other wind farm developments nearby. In addition it has been demonstrated that both the A850 and the A87 have suitable theoretical capacity to accommodate additional traffic without significant impacts. Additionally, deliveries of large components such as those required for the substation and turbines would be moved under suitable traffic management procedures, including the provision of banksmen at the site access junction and appropriate warning signage, as set out in the CTMP (**Technical Appendix 12.2**). As such, the impacts on road safety within the Study Area would have minor magnitude.

12.120 In summary, the Proposed Development would create a significant increase to HGV traffic levels within the study area but these levels would remain well within the design capacity of the local road network. While any number of injury accidents are considered to be unsatisfactory, the accident records for the Study Area are relatively low, with 11 accidents occurring over the five-year study period.

12.121 The increase in vehicle numbers resulting from the Proposed Development traffic generation are therefore considered to be minor and not significant in terms of the EIA Regulations

Effect on Community Severance

12.122 The IEMA guidance identifies community severance as *"the perceived division that can occur within*

a community when it becomes separated by a major traffic artery". As an example, a road that passes through a community such as a town or village, where perhaps amenities are located on one side of the road and residential properties are located on the other side, causes severance to the movements between those places. The degree of severance depends on the traffic levels on the road and the presence of adequate crossing opportunities.

12.123 All HGVs and the majority (80%) of light vehicles will travel on the A850 to the east of the site and on the A87. Along this route there are residential properties dispersed within the study area with few small clusters of property. Aside from various bed and breakfast hotels and a single church, there are no amenities fronting or in close proximity to the road; the majority of residential properties are set a good distance back from the road. There are very few locations along the A850 where communities are separated by the road. Therefore the receptors within the study area will have **low sensitivity** to community severance.

12.124 It has been demonstrated that the A87 has the capacity to accommodate additional traffic and that A87 will not experience an increase from the baseline of more than 30%. The A850 has also been shown to have capacity for additional traffic with less than a 30% increase in total traffic. While the baseline will increase by 26% with Scenario 1, the increase is less in Scenario 2; as such there would be a minor magnitude of impact.

12.125 In accordance with the significance criteria in **Tables 12-2** and **12-3**, community severance has been classified as a low sensitivity receptor and the magnitude of effects from the Proposed Development on community severance would be minor. The potential for community severance effects for the study area are minor and not significant.

Effects on Noise and Vibration

12.126 The effects from noise can be high in relation to sensitive receptors such when residential properties are located close to the road. Noise has been classified as having low sensitivity in the study area as there are very few residential properties located close to either the A850 or the A87.

12.127 As shown in **Table 12-3**, the IEMA Guidelines state that an increase in noise due to an increase in traffic of less than 25% is deemed negligible noise impact to receptors, with anything greater than 25% requiring a quantitative assessment.

12.128 For the A850, the maximum traffic increase predicted for the Proposed Development would result in a 26% increase vehicle movements per day for Scenario 1 and 19% increase vehicle movements per day for Scenario 2. The increase for Scenario 1 is just above the 25% threshold, and any impacts would be temporary in nature and so can be considered to be short term. Hence, the traffic noise effects are considered to have the potential for a low magnitude of impact within the study area.

12.129 Therefore, the overall effects are considered to be minor and not significant in terms of the EIA Regulations.

12.130 The full environmental effects of noise and vibration are assessed in **Chapter 13**.

Effects on Vulnerable Road Users

12.131 Vulnerable road users are not exclusively referenced within the IEMA guidance however this is often considered separately where the presence of vulnerable road users is confirmed. Vulnerable road users are defined as road users most at risk from road traffic (pedestrians, particularly children

and older adults or disabled people, cyclists, horse riders, and motorcyclists).

12.132 Vulnerable road users are considered to be a high sensitivity receptor according to the assessment criteria detailed in **Table 12-2**. The impact of traffic on vulnerable road users would be most significant within settlements along the proposed access routes where the presence of vulnerable road users, such as pedestrians and cyclists, is greatest.

12.133 On the A850 the percentage increase in total traffic would be 26% for Scenario 1 and 19% for Scenario 2. For the A87, the increase in total traffic would remain below 10%. As confirmed in **Table 12-17**, the percentage increase in HGVs would be greater than 100% for both roads in Scenario 1 and Scenario 2.

12.134 The majority of trip generation from the Proposed Development would arise from 20 tonne HGVs. Consequently, there would be a potential increase to vulnerable road users during the construction period. The sensitivity of receptors is considered to be high, as vulnerable road users are likely to have a low capacity to adapt to any impacts; due to the temporary nature of the impact, the magnitude of impact is minor.

12.135 The overall effect on vulnerable road users for both Scenario 1 and 2 is therefore considered to be minor and not significant over the life of the construction period in terms of the EIA Regulations.

Impact Caused by Movement of Abnormal Loads

12.136 The access route report for abnormal loads is provided in **Technical Appendix 12.1**. The assessments undertaken for the transportation of the AILs has demonstrated a feasible route coming direct from the Port of Kyle of Lochalsh along the A87 and onto the A850 to the site entrance. The route is considered suitable for such movements, subject to localised temporary works at junctions to facilitate movements. Any modifications to junction layouts would be confirmed through a trial run and further surveys, and any modifications or works required to accommodate abnormal loads would be discussed with THC and the necessary consents and permits would be obtained in advance of any works or delivery periods.

12.137 It should be noted that storage of such AILs is not suitable in the Port of Kyle of Lochalsh harbour, and therefore would be transported to a suitable storage location, such as Broadford Airfield, which is to be confirmed. This means that more AILs would be expected between the Port of Kyle of Lochalsh and the storage location which would allow preferential timings for AILs travelling north to the site.

12.138 Transportation of the turbine equipment would lead to the following effects:

- the rolling closures of roads and footways causing temporary driver and pedestrian delay; and
- the perceived effect to pedestrians and vulnerable road users caused by the movement of large turbine components in close proximity to property and infrastructure.

12.139 The severity of these impacts is considered as follows:

- delays to drivers due to lane/road closures would be inevitable, though abnormal loads could travel in convoy as described above and movements may be timed so as to avoid the peak hours. Abnormal load movements occurring outside of the peak hours would have a

temporary minor adverse effect; and

- the perceived effect to residents is subjective and it is likely that the transport of abnormal loads close to properties could lead to local objection due to issues with disruption and delays. Residential properties/sensitive receptors within the study area include sparsely scattered properties along the A850 east of the site access junction.

12.140 In line with Table 12.2 the sensitivity to abnormal loads is expected to be high. However, the route for the delivery of turbine components is not excessive and does not pass through large populated areas; it is also important to note that the abnormal load movements would occur over a short period of time. As such there will be a minor magnitude of impact. There would be an unavoidable impact associated with the delivery of turbine components and so the significance of the effect would be moderate adverse on turbine delivery days.

Effects due to Dust and Dirt

12.141 The movements of construction traffic to and from the site would have the potential to bring dust and dirt and other detritus onto the highway. Sensitive receptors within the study area include a small number of residential properties along the A850, many amongst B&Bs and also a small church. The majority of properties are set back a good distance from the road, therefore residential receptors which may experience dust and dirt have been classified as low sensitivity receptors.

12.142 HGVs are likely to create the greatest impact in terms of impact of dust and dirt and HGV traffic is anticipated to considerably increase on the A850 for the worst case day for both scenarios with a predicted average day increases over 100%, as confirmed in **Table 12-17** Despite this, the site is relatively remote from the public highway, and would be accessed via an approximately 3km length access track, reducing the risk of dust and dirt being transported onto the highway. In addition, the impacts would be temporary and so the magnitude of impact is minor.

12.143 The increase in HGVs during the Proposed Development construction phase has the potential to result in effects which are assessed as minor and not significant in terms of the EIA Regulations.

Mitigation

12.144 The assessment has been undertaken under the assumption that general good construction practice would be deployed, as detailed in **paragraph 12.102**.

12.145 Turbine deliveries would be undertaken in consultation with the relevant roads authorities, including THC, Transport Scotland and Police Scotland and could include movements during the night which would reduce effects on road users at busier daytime periods. Deliveries would be scheduled where possible to avoid peak times of the day and school opening/closing times. The peak summer tourist month will also be avoided.

12.146 A CTMP would be in place to actively mitigate the effects discussed above and a Framework CTMP has been prepared at this stage and submitted as part of the planning application to outline the mitigation measures recommended during the construction stage. This is provided as **Technical Appendix 12.2**.

12.147 The purpose of the Framework CTMP is to provide preliminary details of proposed traffic management measures and associated interventions that would be implemented during the construction phase of the Proposed Development in order to minimise disruption and ensure

safety.

12.148 The CTMP will ensure that the timing of every abnormal load delivery is communicated to all parties to raise public awareness. The CTMP will also take into account the changes to highway network use during peaks associated with the tourist season, working to minimise disruption associated with deliveries. For this reason, in the event that planning permission is forthcoming the Framework CTMP would be reviewed to ensure that the tourist season is taken into account including the seasonal tourist traffic. Measures to mitigate any impacts during the busier peak season would include the transport of abnormal loads during the night, coordination with the police to ensure optimum management of deliveries and the use of a lay-down area or lay down areas.

12.149 The Framework CTMP will be supplemented with additional information as appropriate by the applicant's appointed contractor(s), prior to commencement of construction activities. Should consent be granted, the Framework CTMP would be updated to a CTMP, the content of which would be agreed with THC through consultation and enforced via a planning condition. The CTMP would be used during the construction phase of the Proposed Development to ensure traffic to, from and on the site is properly managed. It is possible that a collaborative approach with the assessed cumulative sites may be incorporated as part of the CTMP at a later date.

12.150 In addition to the use of general good practice an Abnormal Load Traffic Management Plan (ATMP) would be drawn up to secure permissions for the movement of abnormal loads, and would include details of any required temporary widening and other road improvement measures, together with detailed consideration of vehicle swept paths, loadings, structural assessments (where required) and temporary street furniture removal details. The document would be prepared in consultation with the Roads Authority, Transport Scotland and the emergency services, including Police Scotland. An element of preparation of the ATMP would be a trial run, which would be undertaken in consultation with the Roads Authority and any other statutory bodies required; the required permissions would be obtained as identified in the ATMP.

12.151 Information, with regards to abnormal loads, would be provided to local residents and users of amenities to alleviate disruption and delays.

12.152 Mitigation measures to reduce the potential for dust and dirt to make its way on to the local highway network would be undertaken including the cleaning of vehicle wheels during wet periods and the sheeting of aggregate lorries.

Residual Construction Effects

12.153 Residual effects are those that would still occur after mitigation measures have been incorporated into the scheme. Potential residual effects are likely to be those associated with delivery if the abnormal loads and resultant temporary road closures. On minor roads this may be more apparent as traffic flows are usually likely to be limited to private vehicles.

12.154 Significant residual effects in relation to the Proposed Development are unlikely as although the increase in HGV traffic along the A850 east of the site access to the A87 will see a percentage increase greater than the 30% threshold for both Scenario 1 and Scenario 2, the road would operate within its expected capacity.

Cumulative Effects

12.155 **Chapter 5** provides further information on the approach to cumulative sites in the assessment process.

12.156 To assess the impacts associated with an accumulation of construction traffic, the timing of surrounding wind farms has been considered. Wind farms which are currently within the planning system (not scoping), have been given planning permission and are within 40km of the site are included in the assessment.

12.157 The predicted maximum daily two-way generation on the A850 has been included. **Table 12-19** assumes the worst-case trip generation month for all the wind farms would occur at the same time.

Table 12-19 Cumulative Wind Farm Sites

Wind Farm	Status	No. of Turbines	Distance from Site	Direction from Site	A850 Daily Traffic (two-way)
Ben Sca Wind Farm and Extension	Approved	9	0.7km	North west	151
Beinn Mheadhonarch	Approved	4	9km	South East	None on A850
Glen Ullinish Wind Farm	Approved	11	2.8km	South east	None on A850
Total					**151**

12.158 **Table 12-19** shows that a maximum of 151 two-way trips would be added to the A850 should the identified developments be constructed at the same time. As previously discussed, the A850 currently operates significantly below capacity. With the addition of the cumulative assessment movements stated in **Table 12-18**, the A850 would still operate significantly below capacity.

12.159 In the event that construction of the Proposed Development and any of the identified cumulative wind farm schemes occur concurrently, this would not lead to any additional environmental effect in transportation terms, beyond that already assessed, provided that:

- abnormal load movements are programmed in conjunction with Police Scotland and the Roads Authorities (THC and TS) so as not to occur on the same day; and
- days of specific high density traffic movement (e.g. concrete pour days) are programmed so as not to occur on the same day (to be enforced through inclusion as a factor within the CTMP, and to be agreed with Police Scotland and the Roads Authority accordingly).

SUMMARY OF PREDICTED EFFECTS

Proposed Development

12.160 The effects associated with the Proposed Development are summarised in **Table 12-20**.

Table 12-20: Summary of Predicted Effects (Pre Mitigation)

Type	Duration	Sensitivity	Magnitude	Significance
Noise & vibration	Temporary	Low	Minor	Not significant
Driver severance & delay	Temporary	Low	Minor	Not significant
Community severance & delay	Temporary	Low	Negligible	Not significant
Vulnerable road users	Temporary	Moderate	Minor	Not significant
Road safety	Temporary	Low	Minor	Not significant
Hazardous & dangerous loads	Temporary	Moderate	Minor	Not significant
Dust & dirt	Temporary	Low	Minor	Not significant

12.161 Following the assessment of traffic impacts, the significance of potential effects that could occur during construction both before and after proposed mitigation measured are presented in **Table 12-21**.

Table 12-21: Summary of Predicted Effects (Pre and Post Mitigation)

Potential Impact	Pre-Mitigation		Proposed Mitigation/Enhancement	Post-Mitigation Residual Effects	
	Magnitude	Significance		Magnitude	Significance
Noise & vibration	Minor	Not significant	Traffic Management Plan for the movement of abnormal loads. Trial Run for abnormal loads prior to commencement of construction. Road condition survey (including assessment of existing structures as appropriate) prior to the commencement of construction and a similar assessment following completion of the works. Provision of information to local residents and users of amenities, to involve the community in the safe operation of the Traffic Management Plan and to alleviate stress and anxiety. Good construction practices including wheel wash and careful loading.	Minor	Not significant
Driver severance & delay	Minor	Not significant		Minor	Not significant
Community severance & delay	Negligible	Not significant		Negligible	Not significant
Vulnerable road users	Minor	Not significant		Minor	Not significant
Road safety	Minor	Not significant		Minor	Not significant
Hazardous & dangerous loads	Moderate	Not significant		Minor	Not significant
Dust & dirt	Minor	Not significant		Minor	Not significant

STATEMENT OF SIGNIFICANCE

12.162 Scenario 1 has been included to test the very worst case scenario expected. However it has been confirmed that a significant amount of aggregate material will be available within the site from the borrow pits and so Scenario 2 has been included to present an assessment of the more realistic situation.

12.163 Taking account of all the potential effects that are likely to arise, it is considered that the Proposed Development would lead to an insignificant adverse effect in terms of site access, traffic and transportation for both Scenario 1 and Scenario 2.

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