Chapter 11

Traffic and Transport

Contents

Glossary

Term	Definition
ES	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
North section	Section of development located north of Bryn settlement, within Penhydd forestry block.
South section	Section of development located south of Bryn settlement, within Bryn forestry block.
Site boundary	The area within which the proposed development will be located.
The proposed development	Y Bryn Wind Farm development.

List of Abbreviations

Abbreviation	Description
AADT	Average Annual Daily Traffic
AIL	Abnormal Indivisible Loads
BCBC	Bridgend County Borough Council
BoP	Balance of Plant
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
ES	Environmental Statement
HGV	Heavy Goods Vehicle
IEA/IEMA	Institute of Environmental Assessment (now Institute of Environmental Management and Assessment)
LGV	Light Goods Vehicles
LV	Low voltage
mph	Miles per hour
Natural Power	Natural Power Consultants Ltd
NPTCBC	Neath Port Talbot County Borough Council
SCADA	Supervisory cables and data acquisition
SWTRA	South Wales Trunk Road Authority
TAN	Technical Advice Note
TIA	Traffic Impact Assessment
TMP	Traffic Management Plan
WelTAG	Welsh Transport Appraisal Guidance

11.1 INTRODUCTION

11.1.1 This chapter of the Environmental Statement (ES) assesses the impacts and potential effects on traffic and transport as a result of the construction of the proposed development.

11.1.2 Construction traffic required to construct the wind farm falls into three broad categories; namely Abnormal Indivisible Loads (AILs), Heavy Goods Vehicles (HGVs) and Light Goods Vehicles (LGVs).

11.1.3 Natural Power Consultants Ltd (Natural Power) is the author of this chapter and carried out the overall assessment, and Pell Frischmann acted as lead on the AIL route and documentations relating to this route.

11.1.4 The construction of the proposed development is expected to last approximately 24 months, from site mobilisation through to installation and commissioning of the turbines, ending with site re-instatement and demobilisation.

11.1.5 The following appendices and figure accompany this ES chapter:

- Appendices in Volume 3 of the ES:
  - Appendix 11.1: Preliminary Traffic Management Plan (TMP) (HGV's / LGV's); and
  - Appendix 11.2: AIL TMP.
- Figure in Volume 2 of the ES:
  - Figure 11.1: Construction Traffic Highways Links.

11.1.6 The traffic and transport assessment assesses the traffic impacts associated with the proposed development. The assessment considered two scenarios against baseline traffic conditions:

- Scenario 1 – Expected Construction. This scenario was based on the most likely construction methods, programme and sequencing. This scenario considered stone to be sourced on site and all foundation concrete would be produced at on-site batching plants, stone required for foundation concrete has been assumed to be imported; and
- Scenario 2 – Worst Case Construction. This scenario is a worst case scenario which assumes the top layer of stone would need to be imported onto site and all foundation concrete would be imported to site in ready mix lorries.

11.1.7 In addition to the two scenarios noted above, the traffic impacts associated with the abnormal load deliveries were also assessed. An AIL Route Survey including swept path analysis at particular pinch points has been prepared demonstrating the viability of the proposed abnormal load route.

11.1.8 Separate preliminary TMPs for HGV's and AIL's are also prepared. The assessment is based on a number of conservative assumptions around the construction programme/sequencing, source of stone and concrete deliveries. These assumptions can only be clarified post consent once the turbine supplier and Balance of Plant (BoP) contractors are engaged. Therefore, it is expected a planning condition will be applied to the development for a final combined construction TMP to be prepared for approval by South Wales Trunk Road Authority (SWTRA), Neath Port Talbot County Borough Council (NPTCBC) and Bridgend County Borough Council (BCBC) post consent and prior to construction works commencing.

11.1.9 The assessment concludes that, with the incorporation of suitable mitigation measures secured through a construction TMP there will be no significant traffic effects associated with the proposed development.

11.2 LEGISLATION, POLICY AND GUIDANCE

11.2.1 This section outlines the legislation, policy and guidance that has been reviewed. The transport and traffic issues described in the following planning advice and guidance documents is taken into account in this assessment, for full details refer to Chapter 2: Legal and Policy Context of the ES.

- The Wales Transport Strategy (2021), The Welsh Government[1];
- Planning Policy Wales, Technical Advice Note 18: Transport (TAN 18) (March 2007), Welsh Assembly Government[2];
- Welsh Transport Appraisal Guidance (WelTAG) (2017), Welsh Government[3];
- Guidelines for the Environmental Assessment of Road Traffic (1993), Institute of Environmental Assessment (IEA), now the Institute of Environmental Management and Assessment (IEMA);
- Neath Port Talbot Council, Joint Local Transport Plan 2015-2020[4];
- Bridgend County Borough, Local Transport Plan 2015-2030[5]; and
- Highways Act (1980)[6].

Legislation, Policy and Guidance Summary

11.2.2 Much of the above policy and guidance deals principally with developments that generate significant increases in travel as a direct consequence of their function (e.g. retail parks, housing, etc.) and measures to implement a more sustainable transport solution. The traffic generated by the proposed development will almost entirely be limited to vehicle movements during the construction phase. As such, the impact of traffic from the proposed development is temporary and of a short-term duration when compared to developments such as retail parks where the traffic impact can be permanent and for a long duration of typically a 60-year design span[7].

11.3 CONSULTATION

Scoping Direction

11.3.1 The Planning Inspectorate provided a scoping direction in response to the proposed development's scoping report. The following key elements were noted in the scoping report in relation to traffic and transport:

- The impact of the proposed development on the public road network should be assessed using the latest guidance, including the Guidelines for the Environmental Assessment of Road Traffic (IEMA 1993);
- The study would consider effects during construction, operation and decommissioning; and
- The traffic and transport chapter will include the Traffic Impact Assessment (TIA) and a preliminary TMP.

11.3.2 Full copy of the scoping report and scoping direction can be found in Appendix 3 in Volume 3 of this ES.

[1] Welsh Government, (2021). *Llwybr Newydd: the Wales transport strategy 2021.* Available from - https://gov.wales/llwybr-newydd-wales-transport-strategy-2021 [Accessed 29/03/2023]

[2] Welsh Government, (2007). *Technical advice note (TAN) 18: transport.* Available from - https://gov.wales/technical-advice-note-tan-18-transport [Accessed 29/03/2023]

[3] Welsh Government, (2021). *Welsh transport appraisal guidance (WelTAG).* Available from - https://gov.wales/welsh-transport-appraisal-guidance-weltag [Accessed 29/03/2023]

[4] Neath Port Talbot Council, (ND). *Joint Local Transport Plan.* Available from - https://www.npt.gov.uk/1461 [Accessed 29/03/2023]

[5] Bridgend County Borough Council, (2015). Local Transport Plan 2015 – 2030. Available from - https://www.bridgend.gov.uk/media/4087/bridgend-ltp-wg-approved-version-may-2015-2030.pdf [Accessed 29/03/2023]

[6] Crown and database, (2023). *Highways Act 1980.* Available from - https://www.legislation.gov.uk/ukpga/1980/66 [Accessed 29/03/2023]

[7] HM Treasury The Green Book Section 2.18.

South Wales Trunk Road Authority (SWTRA)

11.3.3 Meetings were held with representatives from SWTRA and the Department for Economy and Infrastructure in September 2020 and January 2022. During consultation draft information was shared including an AIL route survey and design of the proposed M4 slip road. The principle of creating a new slip road was agreed, provided that the final design for the junction should be in accordance with the Design Manual for Roads and Bridges (DMRB), and would need approval by SWTRA via a suitably worded planning condition

Neath Port Talbot County Borough Council

11.3.4 NPTCBC policy for wind farms recommends that planning permission is not determined until such time as a TMP for the access route to the site has been agreed with the Highway Authority.

Bridgend County Borough Council

11.3.5 The methodology for determining the impact of the development is to be considered.

11.3.6 It was stated that the threshold of 30% noted in the Guidelines for the Environmental Assessment of Road Traffic (IEMA 1993) was not acceptable and that an increase of 5% traffic on the highway network would constitute a material planning consideration needing further analysis.

11.3.7 BCBC policy for wind farms recommends that planning permission is not determined until such time as a TMP for the access route to the site has been agreed with the Highway Authority.

11.3.8 A meeting was held between Natural Power and BCBC[8] to discuss the thresholds; the key outcome was that Natural Power would identify any areas of concern if that arise and apply mitigation measures through the TMP as necessary.

11.4 TRAFFIC AND TRANSPORT METHODOLOGY

11.4.1 The methodology employed in this assessment is developed from guidance given in the 'Guidelines for the Environmental Assessment of Road Traffic' (IEMA 1993). To assess the effects of the additional traffic generated by the proposed development the sequence of steps detailed has been followed.

- Establishment of baseline traffic conditions;
- Estimate the traffic numbers and routing for the proposed development;
- Determine the magnitude of impact to the baseline traffic conditions due to the proposed development;
- Undertake a screening test to delimit the scale and extent of the assessment;
- Identify receptors potentially affected by the traffic associated with the proposed development,
- Assess the sensitivity of receptors with best practice embedded mitigation considered;
- Synthesise the sensitivity of the receptor with the magnitude of impact to determine the significance of effect; and
- If the significance is elevated, review opportunities to implement impact mitigation measures and re-assess the significance of effect.

11.4.2 Consideration was given to the construction, operation and decommissioning phases of the proposed development.

11.4.3 When considering the magnitude of the impact it should be recognised that the traffic generated by the proposed development would be short term due entirely to vehicle movements relating to the construction phase of the proposed development. Following completion of the construction phase, traffic levels will return to their baseline conditions as the impact of vehicle movements during the operational phase, largely LGVs, is deemed to be negligible within the context of baseline traffic.

11.4.4 The method of decommissioning would be agreed with the relevant planning authority as outlined in Chapter 5: Project Description of this ES. In line with current practice all turbine components, including blades, nacelles and towers would be removed from the site. If not to be re-used, turbine components would likely be cut to manageable sizes on site to allow use of HGVs. Above ground infrastructure would be removed with foundations generally removed to around 1 m below ground level, with the remainder left in-situ. Therefore, the HGV movements would be less than during the construction period. The decommissioning would be likely to take place over a similar time period shown. Baseline traffic flows on all of the affected roads may have altered by the end of the up to 50-year lifetime of the wind farm leading to the possibility of a different effect on the roads for HGV traffic. It is envisaged that the decommissioning would result in lesser effects than those identified for this assessment and no further assessment has been undertaken. Decommissioning would be managed in accordance with a decommissioning plan to be agreed with relevant authorities at the time.

11.4.5 As such this assessment will consider the effects during the construction phase only.

Magnitude of Impact

11.4.6 The magnitude of traffic impact is a function of the existing traffic volumes, the percentage increase due to the proposed development and changes in type of traffic. The IEMA Guidelines identify magnitude thresholds based on percentage changes in traffic levels as being applicable to severance and intimidation effects. The magnitude of impacts arising from the increase in traffic volumes (taken as being either the traffic flow including all vehicles or the HGV traffic flow, whichever is higher) is categorised in Table 11.1.

Table 11.1: Definitions of magnitude of impact criteria

Magnitude	Criteria	Percentage Increase
High	Total loss or major alteration to key elements/features of the baseline conditions	**>90%**
Medium	Partial loss or alteration to one or more key elements/features or the baseline conditions	**>60-90%**
Low	Minor shift away from baseline conditions	**>30-60%**
Negligible	Very slight change from baseline conditions	**>0-30%**

11.4.7 The determination of the magnitude of the impacts is undertaken by reviewing the proposed development, establishing the parameters of the additional road traffic that may cause an impact, and quantifying these impacts.

Screening Test

11.4.8 The IEMA Guidelines suggest two general rules for establishing the increase in traffic levels that are likely to affect the environmental conditions of the road, and that therefore warrant consideration, namely:

- **Rule 1** - Include highway links where traffic flows would increase by more than 30% (or the number of HGVs would increase by more than 30%); and
- **Rule 2** - Include any other specifically sensitive areas where traffic flows would increase by 10% or more. (IEMA Guidelines Paragraph 3.20 defines sensitive areas as including' *accident blackspots, conservation areas, hospitals, links with pedestrian flows etc.').* Paragraph 3.20 also notes that *'normally it would not be appropriate to consider links where traffic flows have changed by less than 10% unless there is a significant change in the composition of traffic, e.g. a large increase in the number of heavy goods vehicles'.*

[8] Meeting held with Leigh Tuck, Senior Transportation Development Control Officer on 17/05/2021.

11.4.9 Where the predicted increase in traffic flow is lower than these thresholds, the IEMA guidelines suggest that further detailed assessments are not warranted.

11.4.10 The matrix shown in Table 11.2 is used for traffic assessment.

Table 11.2: Screening criteria

Rule 1	Rule 2	Further assessment required
Yes	Yes	**Yes**
Yes	No	**Yes**
No	Yes	**Yes**
No	No	**No**

Receptor Identification

11.4.11 The IEMA Guidelines identifies receptors that may be sensitive to changes in the traffic conditions resulting from the proposed development. A review of the surrounding area and consultation with the Local Authority has been undertaken to identify receptors potentially affected by the proposed development. For the purposes of this assessment, receptors have been grouped as detailed in Table 11.3.

Table 11.3: Receptor Classification

Receptor Group	Receptors
Settlements	Pedestrians, cyclists, sensitive locations (hospitals, churches, schools), rural properties adjacent to road.
Road Network & Users	Road structure, drivers, cyclists.

Embedded Mitigation

11.4.12 Embedded mitigation is considered to be measures that have been incorporated into the design of the development. In terms of traffic and transport, embedded mitigation is primarily delivered through a TMP. As part of the traffic and transport assessment chapter, preliminary TMPs have been prepared (Appendix 11.1 and 11.2) and it is expected a planning condition will be applied to the development for a final construction TMP to be prepared post consent and prior to construction works commencing.

11.4.13 A TMP should be tailored to suit the requirements of the proposed development. Embedded mitigation are good practice measures which would be detailed in the TMP, regardless of the outcomes of the TIA and are included in the proposed development when determining the sensitivity of receptors. Where traffic effects are assessed as being significant, then impact mitigation measures will be considered to reduce the effects to acceptable levels. Impact mitigation measures will then be detailed in the TMP in addition to the adopted embedded mitigation.

11.4.14 Embedded mitigation measures adopted in the TMP and in the proposed development for the assessment of receptor sensitivity include:

- Scheduling of HGV deliveries to avoid peak times;
- Temporary signage to direct HGV drivers to the proposed development and advise of routes not permitted;
- Temporary signage, including use of variable message signs, to inform both drivers and pedestrians of risks and highlight rights of ways/ priorities;
- Reduced speed limits;
- Scheduling of construction activities, with focus on concrete and AIL deliveries to reduce deliveries whilst key activities are occurring;
- Trial run for AIL movements prior to commencement of construction;
- Proactive consultation with highway authorities and police to co-ordinate AIL deliveries; and
- Proactive consultation with the local highway authorities, the local community and individuals who will be most affected during the construction period.

Assessment of Sensitivity

11.4.15 The IEMA Guidelines provides guidance on how the various traffic impacts affect receptors but does not provide explicit values for the sensitivity of receptors. Using the IEMA Guidelines as a basis, professional judgement and experience was used to develop a classification of the sensitivity of the receptors to the potential traffic impacts, taking account of the embedded mitigation. A scale of 'low', 'medium' and 'high' has been used in this assessment.

11.4.16 Table 11.4 details the receptors and criteria used to assess their sensitivity with respect to the traffic impacts. The effects of factors such as noise and ecological impact are assessed in Chapter 12 and 6 respectively of this ES.

Table 11.4: Sensitivity of Receptor Criteria

Receptor Group	Impact	Low	Medium	High
Settlements	Severance	Settlement with no or limited facilities. Adequate walkways, wide, interconnected, providing adequate separation between pedestrians and traffic. Designated pedestrian crossing points to link walkways, pedestrians and facilities.	Settlement with some and key facilities. Pedestrian walkways, narrow in places, gaps to interconnectivity and limited separation between pedestrians and traffic. No formal designated pedestrian crossing points, may have traffic islands.	Settlement with a wide range of facilities. No or limited pedestrian walkways, narrow with no separation between pedestrians and traffic. No designated pedestrian crossings points.
Road Network & Users	Driver Delay	Major or strategic road networks such as motorways, or a road network with suitable capacity to absorb an increase in traffic. No capacity issues raised by Roads Authority.	Road networks with some capacity to absorb an increase in traffic. Capacity issues identified at specific junctions or specific times of day.	Road network with little or no capacity to absorb an increase in traffic. Capacity issues identified at multiple junctions or extended periods of the day.
Settlements	Pedestrian Delay	Settlement with little pedestrian activity. Designated pedestrian crossing points.	Settlement with some pedestrian activity. Informal pedestrian crossing points such as traffic islands.	Settlement with high pedestrian activity. No pedestrian crossing points.
Road Network & Users and Settlements	Pedestrian and Cyclist Amenity	Settlement with little pedestrian or cycle activity. Wide footpaths, segregated cycle lanes.	Settlement with some pedestrian and cycle activity. Popular cycle route, not on the National Cycle Network. Footpaths narrow in places. Non segregated cycle lanes or wide road	Settlement with high pedestrian and cycle activity. Route on the National Cycle Network. No or limited footpaths. No cycle lanes or road width

Receptor Group	Impact	Low	Medium	High
			with sufficient space for cyclists.	narrow with limited space for cyclists.
Settlements	Pedestrian Intimidation	Settlement with little pedestrian activity. Wide footpaths, space or guardrails providing separation to traffic.	Settlement with some pedestrian activity. Footpaths narrow in places, some guardrails providing separation to traffic.	Settlement with high pedestrian activity. Footpaths narrow and no separation to traffic.
Road Network & Users and Settlements	Safety	Major road with limited junctions and hazards designed to current standards. Space of physical segregation between traffic, cyclists and pedestrians. No serious or fatal accidents from previous 5 years of data.	More localised roads with some junctions and hazards (bends, constrained geometry, sections of poor visibility). No physical segregation between traffic and cyclists and pedestrians. No fatal accidents from previous 5 years of data.	Road with several junctions and hazards (sharp bends, constrained geometry, poor visibility). No segregation between traffic and cyclists and pedestrians. Fatal accident(s) from previous 5 years of data. Near to sensitive locations such as hospitals, retirement homes, schools, places of worship, public open spaces and tourist attractions.
Road Network & Users	Road Structure	Major roads with no obvious physical defects and well maintained. Visual inspections suggest designed to current standards with good road foundation.	Regional roads with some minor physical defects being maintained. Visual inspections suggest adequate design and road foundation.	Local roads with some physical defects or local roads, infrequently maintained with reoccurring physical defects. Visual inspections suggest poor design and road foundation (e.g. floating road).

Assessment of Significance

11.4.17 The significance of any given effect is taken to be a synthesis of both the magnitude of the impact and the sensitivity of the receptor. The criteria used in determining significance is set out in Table 11.5.

Table 11.5: Significance of Effect

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

Note: Only **Major** and **Major** / **Moderate** significance are considered significant.

Impact Mitigation

11.4.18 Where the assessment identifies impacts considered significant, then specific impact mitigation measures will be developed. The significance of effect will then be re-assessed with the incorporation of the impact mitigation. The impact mitigation measures will then be incorporated into the preliminary TMP for adoption in the proposed development.

Uncertainties and Assumptions

11.4.19 A range of uncertainties are present with any assessment of traffic effects. With respect to this ES, such uncertainties and assumptions are detailed. These uncertainties are minimised by maintaining conservative assumptions and the provision of estimates based on recent wind farm construction experience.

Existing Traffic Flows

11.4.20 The assessment relies on the availability and accuracy of traffic flow data to establish baseline traffic conditions on the surrounding network.

11.4.21 The available data for the M4, A4107, A4063 and B4282 is considered extensive, covering a broad time frame. This ensures that the baseline traffic conditions derived for these roads is an accurate reflection of actual conditions.

11.4.22 In the absence of Department for Transport (DfT) data at Goytre Road, NPTCBC provided results of a speed survey undertaken in 2016, this has been considered in the assessment.

Traffic Generation

11.4.23 The estimated traffic generated by the proposed development comprises general construction loads (HGV's) such as bulk materials; abnormal loads for turbine components; and LGVs. Traffic numbers have been calculated based on the design undertaken as described in Chapter 5: Project Description, along with Natural Power and the applicants experience of wind farm development and construction.

Assessment of Traffic Effects

11.4.24 The methods for assessing the likely traffic effects are based upon IEMA guidance as noted in paragraph 11.4.1. In assessing the traffic effects a level of professional judgment and experience is applied in line with the IEMA guidelines and therefore, predicted effects should not be considered as absolute.

11.5 BASELINE TRAFFIC CONDITIONS

Construction Traffic Routes

Abnormal Indivisible Loads (AIL)

11.5.1 An AIL Route Survey has been undertaken for the major component deliveries and is included in Appendix 11.2 of the ES. The preferred route for the major component deliveries is as follows:

- From Swansea Port, loads would depart the port and access the A483 Fabian Way (Eastbound) using a contraflow manoeuvre;
- Loads would proceed eastbound and would join the M4 at Junction 42;
- Loads would proceed on the M4 until the site access junction; and
- Loads would depart the M4 and would continue to site using private, purpose-built access tracks.

11.5.2 The AIL route assumes a Port of Entry at Swansea and generally utilises trunk roads. The final approved AIL route will not be known until the turbine supplier is appointed and they have in turn reached contractual agreements with the port, sea freight/shipping company and a road haulier.

11.5.3 Swansea has been used for previous wind farm component deliveries and is considered to have sufficient facilities to handle deliveries of the turbines being considered for the proposed development. There are other ports that could also accommodate the turbine deliveries and if adopted this would change the wider proposed AIL route, however the proposed site entrance and final approach from the M4 travelling eastwards would remain.

General Construction Traffic

11.5.4 General construction traffic and material deliveries will travel to site via the A4107, B4282 and A4063 depending on their origin.

11.5.5 There are three different site access points which are proposed for AIL's, HGV and LGVs accessing and egressing from the site. These are outlined here, see also Figure 11.1.

11.5.6 Several other site access locations were considered, however were discounted. These are discussed in Chapter 4.

Access Point 1 – Purpose Built Diverge Slip Road from M4 for AIL Deliveries

11.5.7 Access Point 1 is located to the south of the south section of proposed development, this access point is for AIL deliveries only. AILs will exit the M4 via a purpose built diverge. Once unloaded the delivery vehicles will be reduced in size to HGVs and will exit the site from one of the alternative access points. No vehicles will exit the site from the proposed M4 diverge.

11.5.8 Whilst falling outside of the scope of this assessment of the construction of the wind farm, the potential for disruption as a result of the construction of the proposed diverge slip road on users of the M4 is recognised. At the current time it is not fully understood how the connection between the M4 and the wind farm track will be made or the traffic management required, these matters will be considered in the context of the additional consent required under the Highways Act. This is a matter that will be covered by a planning condition developed in consultation with the relevant authorities. However it is assumed that the construction works will be undertaken from the proposed development rather than the M4. There will be no vehicular traffic associated with the construction of the proposed diverge slip road exiting from the M4.

Access Point 2 – B4282

11.5.9 Located on the B4282 between Bryn and Maesteg settlements, south of the north section of the proposed development, at this location it will be possible for construction traffic to access or egress the north section of the site.

11.5.10 Traffic to this access point will either travel from the M4 Junction 40 along Highway Link A and Highway Link B; or alternatively traffic will arrive from Highway Link C and Highway Link D.

Access Point 3 – Goytre Road

11.5.11 Highway Link E on Figure 11.1 has been assumed as the route to access point 3, located to the west of the south section of proposed development, this access point is for traffic entering or exiting the south section of the site and is the nearest access from the M4. Traffic exiting M4 Junction 40 will then travel along Dyffryn Road and Goytre Road before entering the site. This access point is assumed to be used for limited HGV / LGV deliveries due to the distance of the construction compound areas from the access point.

Road Description

A4107 (Afan Valley Road)

11.5.12 The A4107 is a local authority-maintained road which runs from south-west near M4 Junction 40, north-east through NPTCBC area to Cymer. It is located to the west of both the north and south sections of the proposed development site boundary. The A4107 is a two-lane single carriageway and a local route for the area. The geometry of the road is considered to generally be constrained with tight corners. Reduced speed limit to 40 miles per hour (mph) applies to the majority of the route.

11.5.13 The overall condition of the A4107 to the west of the proposed development is considered to be good with minimal potholes or upgrades required.

11.5.14 The A4107 between Abergwynfi and Treorchy was closed in 2019 due to a landslide.

B4282 (Maesteg Road)

11.5.15 The B4282 is a local authority-maintained road which runs from west to east between the north section and south section. To the west of access point 2 the road is in NPTCBC area, to the east of access point 2 the road is within BCBC area.

11.5.16 The B4282 is a two-lane single carriageway and a local route for the area. The geometry of the road is considered to generally be constrained with tight corners.

11.5.17 The overall condition of the B4282 is showing signs of deterioration with areas of potholes.

A4063 From Tondu to Maesteg

11.5.18 The A4063 is a local authority-maintained road which runs from north to south, through several residential areas from Cymer to Tondu. The road is located to the east of the proposed development. The road is located within BCBC area.

11.5.19 The A4063 is a two-lane single carriageway and a local route for the area. The geometry of the road is considered to generally be constrained with tight corners. National Speed Limit generally applies with reduced speed through sections.

11.5.20 The overall condition of the A4063 is reasonable with areas of deterioration.

Dyffryn Road / Goytre Road

11.5.21 Goytre Road is a local authority-maintained road which runs from the M4 Junction 40 to Goytre. The road is located within NPTCBC area.

11.5.22 Goytre Road is a two-lane single carriageway and a local route for the area. The geometry of the road is considered to generally be constrained with tight corners.

11.5.23 The overall condition of the Goytre Road is reasonable with limited signs of deterioration.

Baseline Traffic Data

11.5.24 Data for the baseline traffic count on the Goytre Road was taken from a traffic count provided by NPTCBC. The data was collected to inform a speed survey conducted between 02/12/2016 – 15/12/2016 and recorded the average number of vehicles in a 24-hour period. Using 'The COBA Manual' the traffic data has been converted into comparable Average Annual Daily Traffic Flow, with growth factors then applied to bring to the baseline year of 2019. HGV volumes were not available for this location, and as such, an assumption has been made on the HGV flows based upon the surrounding area data and the nature of the route, then applied to the traffic assessment baseline flow.

11.5.25 Data for the remaining locations was taken from the DfT website. The most up to date data for the DfT traffic counters is 2019 and 2020. As the various data sources is for different years, the baseline has been progressed upon the year 2019. The existing DfT 2019 flows have been used where available and the remaining Goytre Road flows adjusted using growth figures to bring to the year of 2019. This approach removes the year 2020 from the assessment including any uncertainty surrounding the pandemic.

11.5.26 The data was not adjusted to the year of construction as the impact of COVID 19 on traffic flows is unknown at this stage. The temporary change in working patterns during the COVID pandemic (i.e. increased working from home) may become a more permanent state with the potential to reduce traffic flows.

11.5.27 Table 11.6 shows the annual average traffic flows used in the assessment.

Table 11.6: Annual average traffic flows

Count Point Ref.	Location	Year	Annual Average Daily Traffic (Total Traffic)	Annual Average Daily Traffic (HGV Traffic)	Annual Average Daily Traffic (Total Traffic)	Annual Average Daily Traffic (HGV Traffic)	Annual Average Daily Traffic (Total Traffic)	Annual Average Daily Traffic (HGV Traffic)	% HGV's
30655	Link A A4107 (Goytre Road to B4282)	2019	5997	62	N/A	N/A	5997	62	1.0
950829	Link B & DB4282	2019	9145	131	N/A	N/A	9145	131	1.4
622	Link C A4063	2019	6968	72	N/A	N/A	6968	72	1.0
1136	Link E (Goytre Road)	2016	1555	0	1649	0	1888	24.0	0.5

Source: DfT Road Traffic Statistics

11.6 INITIAL SCREENING ASSESSMENT

Quantification of Development Activities

11.6.1 Vehicles and equipment will be delivered to site at the commencement of the relevant construction phase and will remain on site until work relating to that stage are completed. Such equipment will include excavators, dump trucks and bulldozers and cranes for erecting the turbines. An indicative list of the equipment needed is given in Chapter 5: Project Description, of the ES.

11.6.2 Each vehicle travelling to the site will generate two 'vehicle movements'; one movement to the proposed wind farm and one movement away from the wind farm i.e. 1 delivery to the wind farm = 2 vehicle movements.

11.6.3 The application includes provision for onsite borrow pits that would be utilised to source stone for the construction of the access tracks and hardstands. It is anticipated these will provide sufficient quantities and quality of stone for the proposed development.

11.6.4 Similarly, given the size of the anticipated turbine foundations (~1200 m^3 of concrete) it is anticipated the concrete would be mixed on site to reduce the risks associated with the volumes and supply for these critical structural elements. This chapter assesses both the expected scenario of all stone being site won and concrete on-site batched, along with the worst-case scenario which assumes the top 150 mm of stone would need to be imported and all concrete foundations would need to be brought to site in ready mix lorries.

11.6.5 Most vehicles used during the construction activities will be below requirement for wide loads, with the exception of the turbine deliveries, and possibly the 800/1000 and 400/500 (or less) tonne cranes, which would be used for the erection of the turbines.

11.6.6 The M4 motorway is a high-capacity trunk road with average annual daily flow of 24,233 in an Eastbound direction. The number of AIL deliveries associated with the proposed development is expected to be four AIL deliveries per evening, (comprising two journeys of two AILs in convoy) plus support vehicles, and as such the impacts associated with the delivery of the AILs are considered negligible and therefore removed from this assessment.

11.6.7 The AIL route survey identified a number of pinch points from the Port of Entry to the site entrance. The proposed modification works to enable AIL loads to navigate these pinch points include oversail of the pavement edge, temporary removal of street furniture, vegetation trimming and forming a new diverge slip road from the M4 motorway. With the exception of the proposed M4 diverge slip road and realigned B4282 access junction, the works are considered temporary and minor in nature and do not involve significant modifications to the highway network.

11.6.8 Given the potential for a variation to the route to be adopted, the minor nature of the modifications works, with the exception of the M4 diverge slip road, and the short duration of the modification works (particularly with reference to the overall proposed development assessment period), it is not considered appropriate to assess the potential traffic impacts associated with the construction of all the pinch point modification works identified. However, traffic delay is considered in the AIL TMP (Appendix 11.2).

Construction Traffic Generation

11.6.9 The predicted number of construction traffic vehicle movements has been developed based on design information from the preparation of the ES as described in Chapter 5 and Natural Power and the applicants' experience of wind farm construction. The assessment includes vehicle movements from the following construction activities with predicted movements detailed in Table 11.7.

- **Mobilisation to Site**: Mobilisation to site will involve the transport of plant for the construction works (including dump trucks, dozers/graders, excavators, forklifts), temporary office facilities, welfare units and storage containers, and general construction equipment such as fencing for site compounds and fuel bowsers. Rock

crusher/processing plant will also be transported to site to crush and grade material from the borrow pits suitable for use in the construction works;

- **Forestry –** Forestry includes for the advance works undertaken to either keyhole felling or clear felling an area prior to construction activities commencing, further details are noted in Chapter 13: Forestry of the ES;
- **AIL Enabling Works (M4 Diverge Slip Road and Access Track):** Based on the AIL Route Survey it is anticipated there will be works required at certain pinch points along the route. Construction of a diverge slip road from the M4 and associated track to the proposed development boundary is also required, see Appendix 11.2;
- **Site Tracks, Crane Pads and Compounds (Stone)**:
  - Scenario 1: it is envisaged that all of the stone for the site tracks, crane pads and compounds (temporary construction and substation) would come from the on-site borrow pits and would be transported around site using dump trucks. This includes stone required for the concrete batching plant platforms. Stone for the turbine foundation concrete would be imported; and
  - Scenario 2: it is envisaged that the majority of the stone for the site tracks, crane pads and compounds (temporary construction and substation) would come from the on-site borrow pits and would be transported around site using dump trucks. Under this scenario, it has been assumed the finished running surface of the tracks, crane-pads and substation compound would be imported;
- **Geogrid and Culverts**: An allowance has been included for laying geogrids along the new and upgraded access tracks and crane-pads. Geogrid rolls are generally 4 m wide and therefore it is assumed two geogrids will be required per length of new track and one geogrid required for existing track which is to be widened to provide sufficient width coverage. Similarly, an allowance has been included for culverts for drainage and pipe crossings;
- **Turbine Foundations**: Based upon the proposed tip heights it is estimated a typical gravity foundation design will require up to 1200 m^3 of concrete and 162 tonnes of steel reinforcement. The HGV movements required for steel reinforcement delivery would apply to both scenarios;
  - Scenario 1: it is envisaged that concrete for the foundation will be batched on-site. Due to the risks associated with the logistics, travel time and criticality of foundation concrete, it is considered unlikely ready-mix concrete will be adopted for the project. In this scenario importing will be dry materials only with aggregate assumed as site won and water for mixing sourced naturally on-site; and
  - Scenario 2: In order to present a worst-case this assessment assumes ready-mix concrete;
- **Turbine Tower Sections**: Turbines with a hub height of up to 175 m would most likely be hybrid towers. This is due to the diameter of lower tower sections being approximately six meters which is in excess of what can be transported along the trunk road network where structures are present. The top two steel tower sections will be transported as AILs with the lower comprising concrete sections delivered by HGV;
- **Turbine Abnormal Loads:** For the size of turbines being considered for the site, the abnormal loads will consist of 3 blade deliveries, up to 5 steel tower section deliveries, 1 nacelle delivery and 1 hub delivery (10 abnormal load deliveries per turbine). The transport of abnormal loads is undertaken by specialist vehicles designed and manufactured for the purpose of wind turbine component delivery. These vehicles are designed such that following delivery, they can reduce to a standard HGV size. Hence, although they arrive to site as an abnormal load, they leave as a standard HGV. The number of the abnormal load movements has been included within the assessment of general construction traffic to ensure a robust assessment including all vehicles. The effects of abnormal load deliveries are quite different to those attributed to general construction traffic and hence these specific effects have also been assessed separately;
- **Turbine Assembly**: Around 4 HGV deliveries for items that will be fitted within the turbines would be required for each turbine. The cranes (larger 1000 tonne and smaller 500 tonne crane) for assembling the wind turbines will be brought to site at the start of turbine assembly and remain on site until completion;
- **Meteorological Masts**: The meteorological masts (if installed) would consist of a concrete foundation (around 200 m^3) and lattice tower. The timing of constructing the meteorological mast foundation is very flexible and may not be undertaken during the turbine foundation pours when the batching plant is on site. Therefore, a conservative approach has been adopted and assumed the concrete for the meteorological mast foundation would be delivered by ready mix lorries;
- **Substation and associated Construction Compound/ Battery Storage area (excluding platform)**: The substation will consist of a crushed stoned hardstand area and building to house the wind farm electrical and grid connection equipment and basic office facilities for maintenance staff. Battery storage is also proposed on the substation site. HGV values for the delivery of the stone to form the platforms is included in 'Site Tracks, Crane Pads and Compounds' above. Material, such as concrete blocks, roof trusses, roof cladding and windows/doors for the substation building as well as the electrical equipment will need to be brought to site. The battery storage may consist of 15 number battery containers (similar to shipping containers) and 14 power conversion 'skids' which will be transported by HGV;
- **Cable Installation**: Cable installation includes the Low Voltage (LV) electrical cables, supervisory cables and data acquisition (SCADA) signalling/control cables and sand associated with the cable bedding and surround in the cable trench. Depending on the ground conditions encountered, it is possible that the sand could be sourced from site borrow pits, however, this is uncommon on wind farm construction and hence sand is assumed to be imported;
- **Demobilisation / Site Reinstatement:** Reinstatement of all construction phase working areas, removal of all plant from site; and
- **Transport of site personnel**: Approximately 40-80 car/van movements per day would be required for the construction personnel and any small deliveries, based on worst-case assumptions of no car sharing. These have also been included in the assessment.

11.6.10 Table 11.7 summarises the HGV movements for the expected construction phase.

Table 11.7: Estimated HGV construction traffic volumes

Item	Load Size	HGV Movements Scenario 1	HGV Movements Scenario 2	Notes
Mobilisation to Site		142	142	At start of construction. Demobilisation will occur partially following completion of earthworks, with the remainder following completion of the project.
Forestry	30 m^3	2054	2054	
AIL Enabling Works	20 t	2328	2600	Scenario 1 assumes all stone sourced from onsite borrow pits. Scenario 2 assumes the top 150 mm layer of stone is imported.
Site Tracks, Crane Pads and Compounds	20 t	0	7496	Scenario 1 assumes all stone sourced from onsite borrow pits. Scenario 2 assumes the top 150mm layer of stone is imported.
Geogrids and Culverts	20 t	54	54	
Turbine Foundations (Concrete)	20t / 6 m^3	6398	7200	Based upon a 1200 m^3 foundation Scenario 1 assumes import of material for onsite batching.

Item	Load Size	HGV Movements Scenario 1	HGV Movements Scenario 2	Notes
				Scenario 2 assumes import of ready-mix concrete.
Turbine Foundations (Steel)	20 t	390	390	
Turbine Concrete Tower Sections		224	224	For towers up to 175 m hub height only, remaining tower sections will be AIL.
Turbine Abnormal Loads		192	192	These are included in the HGV numbers although referred to as abnormal loads.
Turbine Assembly		288	288	HGVs at start and end of turbine assembly for crane mob/de-mob. HGVs throughout turbine assembly period.
Meteorological Mast	6 m^3	160	160	
Substation, including Battery Storage		584	584	
Cable Installation		1726	1726	Sand imported.
Demobilisation / Site Reinstatement		142	142	

11.6.11 Table 11.8 summarises the total traffic movements generated by the proposed development which will be assessed against the baseline traffic flow figures for the A4107, B4282, A4063 and Goytre Road over the proposed 24-month construction period.

Table 11.8: Total traffic movements generated (generated from Tables 11.10, 11,11 and 11.12)

	Scenario 1	Scenario 2
HGV movements, including AIL's, excluding ready mix concrete movements	14,682	16,052
Light personnel and LGV movements	32,894	32,894
HGV ready-mix concrete movements	0	7,200
Total	47,576	56,146

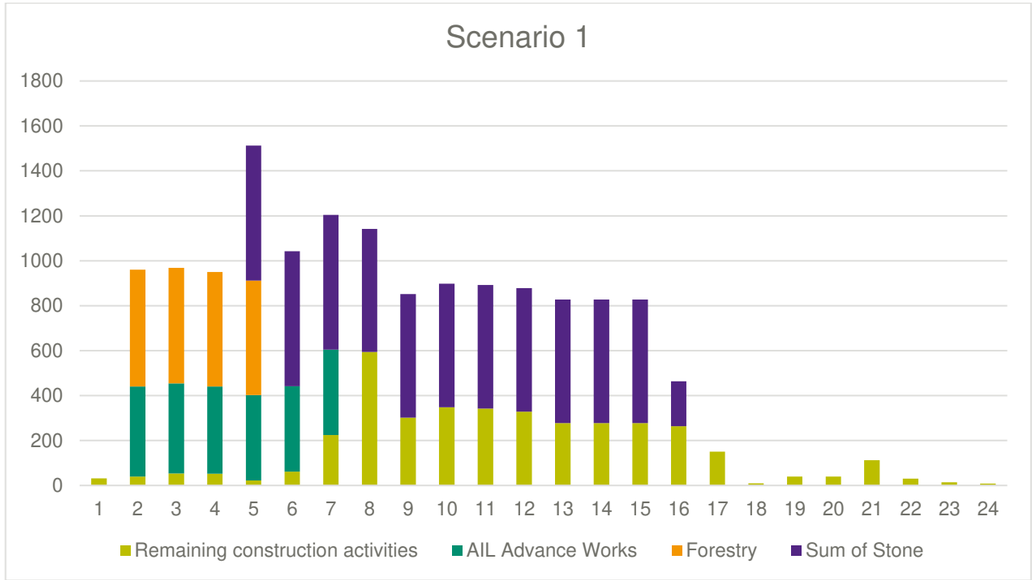
11.6.12 It is expected that the highest average daily HGV movements will occur in month 5 under scenario 1 and month 4 under scenario 2, see Table 11.9.

Table 11.9: Peak average daily movements

	Month 4		Month 5	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
HGV movements	44	76	68	74
LGV movements	72	72	92	92
Total movements	116	148	160	166

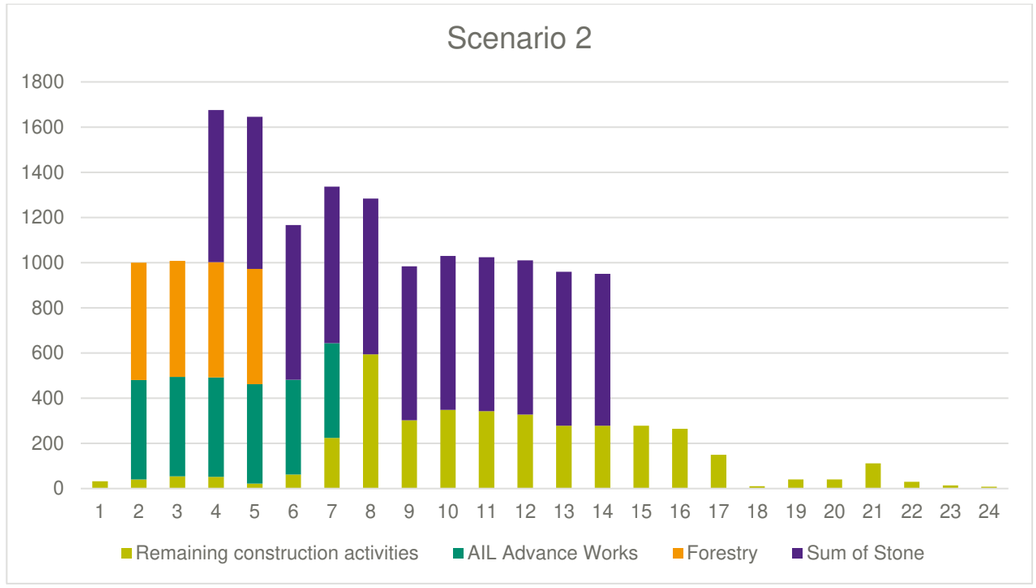
11.6.13 Charts 11.1 and Chat 11.2 illustrate this distribution of traffic over the 24-month construction period. Scenario 1: Expected Case includes for the delivery of materials required through the construction period for the on-site batching of concrete. Scenario 2: Worst Case; the turbine foundation numbers only include for reinforcement deliveries as it is not considered appropriate to simply distribute HGV numbers for ready-mix concrete pours for the foundations over a month duration. Concrete pours for turbine foundations typically take place over a single day and hence the estimated 1200 m^3 of concrete for a foundation would be delivered by HGVs within typically a 10–12-hour period. Therefore, the effect of this is discussed separately in paragraph 11.6.23.

Chart 11.1: Scenario 1 Average monthly vehicle movements over proposed 24-month construction period



Source: Natural Power

Chart 11.2: Scenario 2 Average monthly vehicle movements over proposed 24-month construction period



Source: Natural Power

Table 11.10: Predicted vehicle movements during the construction period (HGVs and abnormal loads)

Activity	Month																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Heavy Goods Vehicles Movements (including abnormal loads)																									
Mobilisation to site	32	40	40	30																					142
Forestry		520	514	510	510																				2054
AIL Enabling Works		400 (440)	400 (440)	388 (440)	380 (440)	380 (420)	380 (420)																		2328 (2600)
Access / site tracks				0 (270)	0 (270)	0 (270)	0 (280)	0 (280)	0 (280)	0 (280)	0 (280)	0 (280)	0 (280)	0 (270)											0 (3040)
Geogrids & Culverts				8	8	8	10	10	10																54
Cabling							160	160	160	160	160	160	160	160	160	146	140								1726
Crane Hard-Standing				0 (250)	0 (250)	0 (260)	0 (260)	0 (258)	0 (250)	0 (250)	0 (250)	0 (250)	0 (250)	0 (250)											0 (2778)
Substation, Energy Compound and all Misc Hardstands				0 (154)	0 (154)	0 (154)	0 (152)	0 (152)	0 (152)	0 (152)	0 (152)	0 (152)	0 (152)	0 (152)											0 (1678)
Substation			14	14	14	14	14	14	16	16	16	16	16	16	16	16									212
Energy storage compound											62	62	62	62	62	62									372
Wind monitoring equipment										56	54	50													160
Turbine foundations (Steel)						40	40	40	40	40	40	30	30	30	30	30									390
Turbine Foundation (Concrete)					600 (0)	600 (0)	600 (0)	548 (0)	550 (0)	550 (0)	550 (0)	550 (0)	550 (0)	550 (0)	550 (0)	200 (0)									6398 (0)
Crane Delivery / Demobilisation								72													72				144
Turbine Precast Concrete Tower Deliveries								224																	224
Turbine Abnormal Loads								64	64	64															192
Turbine Assembly								10	12	12	10	10	10	10	10	10	10	10	10	10	10				144
Site Reinstatement / Demobilisation																			30	30	30	30	14	8	142
Monthly HGV Total Movements																									
Scenario 1 - Stone is majority site won with on-site batching	**32**	**960**	**968**	**950**	**1512**	**1040**	**1204**	**1142**	**852**	**898**	**892**	**878**	**828**	**828**	**828**	**464**	**150**	**10**	**40**	**40**	**112**	**30**	**14**	**8**	**14682**
Scenario 2 - Import of running layer	**32**	**1000**	**1008**	**1676**	**1646**	**1166**	**1336**	**1284**	**984**	**1030**	**1024**	**1010**	**960**	**950**	**278**	**264**	**150**	**10**	**40**	**40**	**112**	**30**	**14**	**8**	**16052**

Table 11.11: Predicted vehicle movements during the construction period (light vehicles)

Light Vehicle Movements (car, minibuses and small van deliveries)																								
Month	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**Total**
Forestry LGV	0	380	300	300	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1280
General Construction Traffic	866	866	1300	1300	1732	1732	1732	1732	1732	1732	1732	1732	1732	1732	1732	1732	1732	866	866	866	866	434	434	434	31614
Monthly total LGV Movements	**866**	**1246**	**1600**	**1600**	**2032**	**1732**	**1732**	**1732**	**1732**	**1732**	**1732**	**1732**	**1732**	**1732**	**1732**	**1732**	**1732**	**866**	**866**	**866**	**866**	**434**	**434**	**434**	**32894**

Table 11.12: Scenario 1 and Scenario 2 total vehicle movements

Scenario 1	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**Total**
Monthly Total Vehicle Movements	898	2206	2568	2550	3544	2774	2936	2874	2584	2630	2624	2610	2560	2560	2560	2196	1882	876	906	906	978	464	448	442	47576
Average Daily Movements (assumes 5 working days per week)	40.8	100.3	116.7	115.9	161.1	126.1	133.5	130.6	117.5	119.5	119.3	118.6	116.4	116.4	116.4	99.8	85.5	39.8	41.2	41.2	44.5	21.1	20.4	20.1	
Average Daily HGV Movements (assumes 5 working days per week)	1.5	43.6	44.0	43.2	68.7	47.4	54.7	51.9	38.7	40.8	40.5	39.9	37.6	37.6	37.6	21.1	6.8	0.5	1.8	1.8	5.1	1.4	0.6	0.4	
Scenario 2	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**Total**
Monthly Total Vehicle Movements	898	2246	2608	3276	3678	2898	3068	3016	2716	2762	2756	2742	2692	2682	2010	1996	1882	876	906	906	978	464	448	442	48946
Average Daily Movements (assumes 5 working days per week)	40.8	102.1	118.5	148.9	167.2	131.7	139.5	137.1	123.5	125.5	125.3	124.6	122.4	121.9	91.4	90.7	85.5	39.8	41.2	41.2	44.5	21.1	20.4	20.1	
Average Daily HGV Movements (assumes 5 working days per week)	1.5	45.5	45.8	76.2	74.8	53.0	60.7	58.4	44.7	46.8	46.5	45.9	43.6	43.2	12.6	12.0	6.8	0.5	1.8	1.8	5.1	1.4	0.6	0.4	

Note 1: Brackets indicate numbers under Scenario 2: Worst Case

Note 2: The distributed turbine foundation numbers under Scenario 2 include only for reinforcement as it is not considered appropriate to distribute/average ready-mix concrete deliveries over a monthly basis as each pour would be undertaken in a day.

Distribution of Construction Traffic

11.6.14 Consideration is given to the likely distribution of construction traffic from material/supply sources to the proposed development. There are various stone and concrete suppliers located in proximity. Even for those sources located to the east of the proposed development, it is considered most likely that they will travel along the M4 to site and therefore will exit at Junction 40, rather than departing at Junction 36 and travelling north via Maesteg.

11.6.15 It is proposed that a purpose built diverge slip road be constructed directly from the M4 for the AIL load delivery. Therefore, it is considered that 100% of AIL delivery traffic will enter the south section via Access Point 1, with then 38% using Access Point 2 to enter the north section.

11.6.16 The Construction TMP will aim to control the HGV routes as far as reasonably practicable to ensure minimal disruption is caused.

11.6.17 The distribution of construction traffic routes to each access point, see Figure 11.1, for both HGV's and LGV's is assumed as:

11.6.18 55% of total construction traffic would utilise Link A and Link B;

11.6.19 40% of total construction traffic would utilise Link C and Link D;

11.6.20 5% of total construction traffic would utilise Link E;

11.6.21 no HGV's or LGV's will be permitted to enter Access Point 1; and

11.6.22 No vehicles will be permitted to egress from Point 1.

Screening

11.6.23 Applying the distribution of traffic as noted in Paragraph 11.6.17, the resultant percentage increase in traffic versus the baseline is indicated in Table 11.13, over the 24-month construction duration for the total vehicles and HGV vehicles.

Table 11.13: Estimated percentage increases in traffic over construction period for both scenarios

Scenario 1	Construction Month																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Highway Link	% Increase in Total Traffic																							
A	0.4	0.9	1.1	1.1	1.5	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.9	0.8	0.4	0.4	0.4	0.4	0.2	0.2	0.2
B	0.2	0.5	0.6	0.6	0.9	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.1
C	0.1	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
D	0.1	0.3	0.4	0.3	0.5	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
E	0.1	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Highway Link	% Increase in HGV Traffic																							
A	1.3	**38.7**	**39.0**	**38.3**	**61.0**	**42.0**	**48.5**	**46.0**	**34.4**	**36.2**	**36.0**	**35.4**	**33.4**	**33.4**	**33.4**	**18.7**	6.0	0.4	1.6	1.6	4.5	1.2	0.6	0.3
B	0.6	**18.3**	**18.5**	**18.1**	**28.9**	**19.9**	**23.0**	**21.8**	**16.3**	**17.1**	**17.0**	**16.8**	**15.8**	**15.8**	**15.8**	8.9	2.9	0.2	0.8	0.8	2.1	0.6	0.3	0.2
C	0.2	5.7	5.8	5.6	9.0	6.2	7.2	6.8	5.1	5.3	5.3	5.2	4.9	4.9	4.9	2.8	0.9	0.1	0.2	0.2	0.7	0.2	0.1	0.0
D	0.4	**13.3**	**13.4**	**13.2**	**21.0**	**14.5**	**16.7**	**15.9**	**11.8**	**12.5**	**12.4**	**12.2**	**11.5**	**11.5**	**11.5**	6.4	2.1	0.1	0.6	0.6	1.6	0.4	0.2	0.1
E	0.8	**23.3**	**23.5**	**23.1**	**36.7**	**25.3**	**29.3**	**27.8**	**20.7**	**21.8**	**21.7**	**21.3**	**20.1**	**20.1**	**20.1**	**11.3**	3.6	0.2	1.0	1.0	2.7	0.7	0.3	0.2

Scenario 2	Construction Month																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Highway Link	% Increase in Total Traffic																							
A	0.4	0.9	1.1	1.4	1.5	1.2	1.3	1.3	1.1	1.2	1.1	1.1	1.1	1.1	0.8	0.8	0.8	0.4	0.4	0.4	0.4	0.2	0.2	0.2
B	0.2	0.6	0.6	0.8	0.9	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.1
C	0.1	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
D	0.1	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
E	0.1	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Highway Link	% Increase in HGV Traffic																							

A	1.3	**40.3**	**40.6**	**67.6**	**66.4**	**47.0**	**53.9**	**51.8**	**39.7**	**41.5**	**41.3**	**40.7**	**38.7**	**38.3**	**11.2**	**10.6**	6.0	0.4	1.6	1.6	4.5	1.2	0.6	0.3
B	0.6	**19.1**	**19.2**	**32.0**	**31.4**	**22.3**	**25.5**	**24.5**	**18.8**	**19.7**	**19.5**	**19.3**	**18.3**	**18.1**	5.3	5.0	2.9	0.2	0.8	0.8	2.1	0.6	0.3	0.2
C	0.2	5.9	6.0	9.96	9.8	6.9	7.9	7.6	5.8	6.1	6.1	6.0	5.7	5.6	1.7	1.6	0.9	0.1	0.2	0.2	0.7	0.2	0.1	0.0
D	0.4	**13.9**	**14.0**	**23.3**	**22.8**	**16.2**	**18.5**	**17.8**	**13.7**	**14.3**	**14.2**	**14.0**	**13.3**	**13.2**	3.9	3.7	2.1	0.1	0.6	0.6	1.6	0.4	0.2	0.1
E	0.8	**24.3**	**24.5**	**40.7**	**40.0**	**28.3**	**32.5**	**31.2**	**23.9**	**25.0**	**24.9**	**24.5**	**23.3**	**23.1**	6.8	6.4	3.6	0.2	1.0	1.0	2.7	0.7	0.3	0.2

Note: Numbers in bold indicate those months where the threshold (see Paragraph 11.4.8) has been exceeded

11.6.24 Assessing against the criteria in Paragraph 11.4.8 none of the routes exceed the rule 1 threshold. Links A, B, D & E exceed the rule 2 threshold of 10% increase in HGV traffic in both Scenario 1 and Scenario 2, see Table 11.2. Accordingly, each of the links have been taken forward for further assessment. Referring to Table 11.2, the magnitude of effect of the traffic flow increase on Link C is considered to be **Negligible** in both Scenario 1 and Scenario 2 and no further assessment is required.

Table 11.14: Months during which Rule 2 Threshold is exceeded

Location	Scenario 1	Scenario 2
Link A	Months 2 – 16	Months 2 – 16
Link B	Months 2 – 15	Months 2 – 14
Link D	Month 2 – 15	Months 2 – 14
Link E	Month 2 – 16	Months 2 – 14

Magnitude of Impact

11.6.25 Paragraph 11.6.19 identified Links A, B, D E as a highway link requiring more detailed assessment. As identified in Table 11.15 the percentage increase in HGV traffic exceeded the thresholds with associated magnitude of impact as indicated in Table 11.2.

Table 11.15: Magnitude of Impact

Highway Link	Scenario	Maximum increase in HGV traffic flows	Magnitude of Impact
Link A	1	61 %	Medium
	2	68 %	Medium
Link B	1	29 %	Negligible
	2	32%	Low
Link D	1	21%	Negligible
	2	23%	Negligible
Link E	1	37 %	Low
	2	41%	Low

11.6.26 It can be seen in Table 11.15 that the resultant magnitude of impact differs between Scenario 1 and Scenario 2 for Link B only, the remainder are the same in both Scenarios. Whilst the increase in traffic movements differs between the two scenarios, the resultant magnitude of impact does not. As such, **the assessment continues using the Scenario 2 magnitude of impact**.

Magnitude of Turbine Foundation Concrete Pours

11.6.27 As noted earlier, the above Scenario 2 numbers do not include for the concrete foundation pours. For a 1,200 m^3 foundation it is anticipated 200 HGV deliveries (400 movements) will be required over a single 10–12-hour period. Depending upon the turbine location and availability of batching plants any of the access routes may be used for the delivery. Each route has been noted in Table 11.16 with the resultant percentage increase to Average Annual Daily Traffic (AADT) which occurs during this activity. With 18 foundations, this increase in traffic will occur on 18 separate days over the 24 -month foundation construction period.

Table 11.16: Traffic increase during turbine foundation pours

Location	Turbine Foundation Pour Movements	Resultant increase of traffic as %	Resultant increase of HGV traffic as %	Magnitude of Impact
Link A	400	7 %	645 %	High
Link B	400	4 %	305 %	High
Link C	400	3 %	131 %	High
Link D	400	4 %	305 %	High
Link E	400	21 %	4277%	High

11.6.28 Although the impacts resulting from the turbine foundation concrete pours are infrequent and over a very short period, the concrete foundation pours have been taken forward for further assessment.

11.7 DETAILED ASSESSMENT OF EFFECTS

11.7.1 This section assesses the resulting environmental effects for receptors requiring detailed assessment in accordance with rules 1 and 2 of the IEMA Guidelines, that is highway links where traffic flows would increase by more than 30% and/or sensitive areas where traffic flows would increase by 10% or more.

11.7.2 As identified in Paragraph 11.6.21 all the highway links were identified as meriting further detailed assessment.

11.7.3 The effect of the turbine concrete foundation pours and the abnormal loads have also been assessed in further detail.

Identification and Assessment of Receptor Sensitivity

11.7.4 A detailed assessment to identify the receptors and assess their sensitivity on each of the highway links has been undertaken. Table 11.17 details the assessment of the sensitivity (L = Low, M = Medium, H = High) for the receptors identified on the applicable highway links.

Table 11.17 Receptor sensitivity assessment

Receptor Description	Impact	L	M	H	Rationale
Public Road Network and Users					
Link A A4107 to Junction with B4282	Driver Delay	X			No capacity issues raised. No cycle provisions however alternative traffic-free route available adjacent to link on the National Cycle Network. Local road with junctions and bends, no fatal accidents recorded within previous 5 years. Two lane local road in good condition with reasonably good geometry.
	Cyclist Amenity	X			
	Safety	X			
	Road Structure	X			
Link B B4282 Junction with A4107 to Access Point 2	Driver Delay	X			No capacity issues raised. No cycle provisions currently available. Local road with junctions and bends, a fatal and serious accident have been recorded within previous 5 years, however with the inclusion of embedded mitigation such as HGV movements outside of peak times and provision of signage the sensitivity is reduced. Two lane local road in good condition with reasonably good geometry, reduced speed limit along lengths.
	Cyclist Amenity	X			
	Safety		X		
	Road Structure	X			
Link D B4282 Maesteg to Access Point 2	Driver Delay		X		Capacity issues identified in Maesteg town centre at signalised junction during peak hours, however with the inclusion of embedded mitigation such as HGV movements being limited to outside of peak times the sensitivity is reduced. Limited cyclist facilities currently available, Local road with junctions and bends, no serious of fatal accident(s) recorded within 5 years. Two lane local road in good condition.
	Cyclist Amenity	X			
	Safety	X			
	Road Structure	X			
Link E Goytre Road to Access Point 5	Driver Delay			X	Limited capacity to absorb increase in traffic due to on-street parking, restricted carriageway width at cemetery and reduced carriageway width to north of Goytre with no passing places. Minimum cycle activity. No fatal accidents within 5 years.
	Cyclist Amenity	X			
	Safety		X		
	Road Structure		X		
Local Settlements					
Bryn	Severance	X			Reasonable pedestrian facilities including narrow footpaths on one side or both, bus stops and a pedestrian crossing. Pedestrian guardrail located
	Pedestrian Delay	X			
	Pedestrian Amenity	X			
	Pedestrian Fear and Intimidation	X			on junctions. On street parking and residential properties fronting road. Reduced speed limit to 20 mph through Bryn. With the inclusion of embedded mitigation such as HGV movements being restricted to outside of peak hours and signage to advise of priority, the sensitivity is reduced.
	Safety	X			
Cwmafan	Severance	X			Reasonable pedestrian facilities including wide footpaths, bus stop and pedestrian crossings. Residential properties fronting road.
	Pedestrian Delay	X			
	Pedestrian Amenity	X			
	Pedestrian Fear and Intimidation	X			
	Safety	X			
Caerhendy	Severance	X			Limited pedestrian facilities with footpaths on one side. On street parking. Residential properties in elevated position from road. With the inclusion of embedded mitigation such as HGV movements being restricted to outside of peak hours and signage to advise of priority, the sensitivity is reduced.
	Pedestrian Delay	X			
	Pedestrian Amenity	X			
	Pedestrian Fear and Intimidation	X			
	Safety	X			
Llettyharri	Severance	X			Reasonable pedestrian facilities through north end of settlement including wide footpaths on both sides and bus stop. Residential properties fronting road and on street parking. South end of settlement minimum pedestrian facilities. Residential properties elevated from road, on street parking. With the inclusion of embedded mitigation such as HGV movements being restricted to outside of peak hours and signage to advise of priority, the sensitivity is reduced.
	Pedestrian Delay	X			
	Pedestrian Amenity	X			
	Pedestrian Fear and Intimidation	X			
	Safety	X			
Pen-y-cae	Severance	X			Reasonable pedestrian facilities including wide footpaths and bus stop. Footpaths on one side and both sides. Residential properties fronting road, on street parking. With the inclusion of embedded mitigation such as HGV movements being restricted to outside of peak hours and signage to advise of priority, the sensitivity is reduced.
	Pedestrian Delay	X			
	Pedestrian Amenity	X			
	Pedestrian Fear and Intimidation	X			
	Safety	X			
Maesteg	Severance	X			Reasonable pedestrian facilities including wide footpaths, bus stops and pedestrian crossings. Neath Road forms High Street with numerous shops and businesses fronting road. Footpaths on both sides. On street parking and residential properties fronting road.
	Pedestrian Delay	X			
	Pedestrian Amenity	X			
	Pedestrian Fear and Intimidation	X			
	Safety	X			

Receptor Description	Impact	L	M	H	Rationale
					With the inclusion of embedded mitigation such as HGV movements being restricted to outside of peak hours and signage to advise of priority, the sensitivity is reduced.
Goytre	Severance		X		Reasonable pedestrian facilities including wide footpaths on both sides, bus stops and traffic calming with pedestrian crossings. On street parking and residential properties fronting road on both sides.
	Pedestrian Delay		X		
	Pedestrian Amenity		X		
	Pedestrian Fear and Intimidation			X	
	Safety			X	

Assessment of Construction Phase Effects

11.7.5 Synthesising the magnitude and sensitivity provides the resultant significance for these highway links and associated receptors and is reported in Table 11.18.

Table 11.18: Assessment of construction effects

Receptor Description	Impact	Duration	Magnitude	Sensitivity	Effect	Significance
Public Road Network and Users						
Link A A4107 to Junction with B4282	Driver Delay	Temporary	Medium	Low	Moderate / Minor	Not significant
	Cyclist Amenity	Temporary	Medium	Low	Moderate / Minor	Not significant
	Safety	Temporary	Medium	Low	Moderate / Minor	Not significant
	Road Structure	Temporary	Medium	Low	Moderate / Minor	Not significant
Link B B4282 Junction with A4107 to Access Point 2	Driver Delay	Temporary	Low	Low	Minor	Not significant
	Cyclist Amenity	Temporary	Low	Low	Minor	Not significant
	Safety	Temporary	Low	Medium	Moderate / Minor	Not significant
	Road Structure	Temporary	Low	Low	Minor	Not significant
Link D B4282 Maesteg Access Point 2	Driver Delay	Temporary	Negligible	Medium	Minor	Not significant
	Cyclist Amenity	Temporary	Negligible	Low	Minor / Negligible	Not significant
	Safety	Temporary	Negligible	Low	Minor / Negligible	Not significant
	Road Structure	Temporary	Negligible	Low	Minor / Negligible	Not significant
	Driver Delay	Temporary	Low	High	Moderate	Not significant
Link E Goytre Road to Access Point 5	Cyclist Amenity	Temporary	Low	Low	Minor	Not significant
	Safety	Temporary	Low	Medium	Moderate / Minor	Not significant
	Road Structure	Temporary	Low	Medium	Moderate / Minor	Not significant
Local Settlements						
Bryn (Link B)	Severance	Temporary	Low	Low	Minor	Not significant
	Pedestrian Delay	Temporary	Low	Low	Minor	Not significant
	Pedestrian Amenity	Temporary	Low	Low	Minor	Not significant
	Pedestrian Fear and Intimidation	Temporary	Low	Low	Minor	Not significant
	Safety	Temporary	Low	Low	Minor	Not significant
Cwmafan (Link A)	Severance	Temporary	Medium	Low	Moderate / Minor	Not significant
	Pedestrian Delay	Temporary	Medium	Low	Moderate / Minor	Not significant
	Pedestrian Amenity	Temporary	Medium	Low	Moderate / Minor	Not significant
	Pedestrian Fear and Intimidation	Temporary	Medium	Low	Moderate / Minor	Not significant
	Safety	Temporary	Medium	Low	Moderate / Minor	Not significant
Caerhendy (Link A)	Severance	Temporary	Medium	Low	Moderate / Minor	Not significant
	Pedestrian Delay	Temporary	Medium	Low	Moderate / Minor	Not significant
	Pedestrian Amenity	Temporary	Medium	Low	Moderate / Minor	Not significant
	Pedestrian Fear and Intimidation	Temporary	Medium	Low	Moderate / Minor	Not Significant
	Safety	Temporary	Medium	Low	Moderate / Minor	Not Significant
Llettyharri	Severance	Temporary	Medium	Low	Moderate / Minor	Not significant

Receptor Description	Impact	Duration	Magnitude	Sensitivity	Effect	Significance
(Link A)	Pedestrian Delay	Temporary	Medium	Low	Moderate / Minor	Not significant
	Pedestrian Amenity	Temporary	Medium	Low	Moderate / Minor	Not significant
	Pedestrian Fear and Intimidation	Temporary	Medium	Low	Moderate / Minor	Not Significant
	Safety	Temporary	Medium	Low	Moderate / Minor	Not Significant
Pen-y-cae (Link A)	Severance	Temporary	Medium	Low	Moderate / Minor	Not significant
	Pedestrian Delay	Temporary	Medium	Low	Moderate / Minor	Not significant
	Pedestrian Amenity	Temporary	Medium	Low	Moderate / Minor	Not significant
	Pedestrian Fear and Intimidation	Temporary	Medium	Low	Moderate / Minor	Not significant
	Safety	Temporary	Medium	Low	Moderate / Minor	Not significant
Maesteg (Link D)	Severance	Temporary	Negligible	Low	Minor / Negligible	Not significant
	Pedestrian Delay	Temporary	Negligible	Low	Minor / Negligible	Not significant
	Pedestrian Amenity	Temporary	Negligible	Low	Minor / Negligible	Not significant
	Pedestrian Fear and Intimidation	Temporary	Negligible	Low	Minor / Negligible	Not significant
	Safety	Temporary	Negligible	Low	Minor / Negligible	Not significant
Goytre (Link E)	Severance	Temporary	Low	Medium	Moderate / Minor	Not significant
	Pedestrian Delay	Temporary	Low	Medium	Moderate / Minor	Not significant
	Pedestrian Amenity	Temporary	Low	Medium	Moderate / Minor	Not significant
	Pedestrian Fear and Intimidation	Temporary	Low	High	Moderate	Not significant
	Safety	Temporary	Low	High	Moderate	Not significant

11.7.6 Only effects which are Major and Major / Moderate are considered significant. With reference to Table 11.18, the highest significance is Moderate.

Assessment of Turbine Foundation Concrete Pours Effect

11.7.7 Table 11.15 noted the magnitude of impact for each of the highway links to be High when used during turbine foundation pours (Scenario 2: ready-mix concrete).

11.7.8 With 18 foundations, this increase in traffic will occur on 18 separate days over the eight-month foundation construction period, equating to less than three days per month. The affected links will change based upon the turbine foundation location in the proposed development, meaning no link will experience the increase in ready mix concrete trucks on all 18 occasions. Given the criticality of the foundation pours and the number of HGV movements involved it is expected no other site works will be undertaken on a foundation pour day to ensure concrete deliveries through the site road network remain un-interrupted.

11.7.9 Import of concrete for the turbine foundations has been adopted for the project under Scenario 2 to consider a worst-case scenario. Due to the risks associated with the logistics, travel time and criticality of foundation concrete, it is considered unlikely ready-mix concrete will be adopted for the project and the application includes for an on-site batching plant for these reasons.

11.7.10 Should the import of ready-mix concrete be adopted for the project then the receptor sensitivity for each highway link is considered to be Medium. With the magnitude of impact of High, based upon the assessment criteria in Table 11.5 the resultant effect associated would be considered to be significant.

Assessment of Abnormal Load Transportation

11.7.11 The abnormal load numbers are included within the assessment to ensure a robust appraisal including all vehicles. It is however important to consider the effect of these particular vehicles in isolation, as the effects are different to those attributed to general construction traffic.

11.7.12 The methodology set out in the IEMA Regulations defines the traffic effects as a function of the increase in traffic flows. In Natural Powers' professional opinion, such a methodology does not fully address the effects of abnormal load deliveries as the number of abnormal loads is typically quite low and therefore does not trigger volume increases in traffic requiring assessment.

11.7.13 The primary impact associated with the transportation of abnormal loads is considered to be driver delays on other road users. The other impacts (i.e. severance, pedestrian, delay, safety, etc) are not considered to merit further detailed assessment as:

- The duration of an abnormal load delivery through/passing the settlement is so short (i.e. a timescale of minutes);
- A significant level of preparation goes into planning these deliveries with the police and local authorities and the management/control measures in place during the delivery (i.e. police escorts, etc);
- Prior to any abnormal load delivery, the structural capacity of the road and bridges/culverts would be assessed, and any strengthening works implemented. The necessary permits to deliver abnormal loads would not be released from the relevant road authorities until they are satisfied that this aspect has been fully addressed; and
- Prior to any abnormal load delivery, a trial run of the route is undertaken to confirm the abnormal loads can negotiate the route.

11.7.14 As part of the ES an AIL Route Survey was undertaken to assess the abnormal load delivery route from Swansea to the proposed development (refer to Appendix 11.2) and the key findings are:

- 5 pinch points are identified requiring further consideration ranging from contra-flow manoeuvres through junctions to clearance of vegetation to negotiate the pinch point;

- A new diverge slip road will only be available for inbound abnormal load traffic and will be controlled by a trunk road agent approved contractor. The diverge has been designed to ensure that loads do not oversail live carriageway lanes, see Appendix 11.2; and
- The AIL Route Survey concludes that various road modifications, structural reviews and interventions are required to successfully access the site. If these are undertaken, access to the consented wind farm site is considered feasible.

11.7.15 The transportation of abnormal loads requires careful planning in consultation with the local planning authority and South Wales Police. The anticipated distribution of abnormal loads indicates that abnormal loads delivery will occur over a (non-consecutive) 12-week period with a peak vehicle movement of two AIL components delivered per convoy, with two convoys being transported each night.

11.7.16 During the period when the loads are being transported there is potentially some effect on driver delays. This effect is increased at junction locations where vehicles in both directions will be required to wait until each load has negotiated the obstacle. There are sections where the abnormal load will use both carriageways while negotiating a pinch point or narrow sections of the road. This possible cause for journey delay to other road users will occur along the route from port to site.

11.7.17 Discussions with South Wales Police will determine the likely traffic management arrangements for these vehicle movements. These will be incorporated into the construction programme and the TMP to be produced by the contractors will be agreed with the relevant road authorities and South Wales Police prior to commencement of construction. The important details required to be established within the TMP will include determining an acceptable time for transporting abnormal loads and the number of loads it may be possible to transport at one time. It has been assumed that each abnormal load will require an escort of two police vehicles and one haulage company escort vehicle.

11.7.18 Careful management of the timing of the abnormal loads and management of the traffic during abnormal load delivery will minimise driver delay. Refer to Appendix 11.2 for estimates on driver delay which is expected.

11.7.19 Proactive communication with the local community and road users on the delivery arrangements, dates and timings of the abnormal load deliveries will also provide advance warning to residents on the route and frequent road users. This will enable them to plan their journeys and avoid abnormal load delivery times if possible.

11.7.20 Given the short period for the delivery, the short duration of potential delays and the various mitigation options available to manage these, in Natural Power's professional opinion it is considered the effect on driver delay is considered not significant.

11.8 MITIGATION

11.8.1 As noted previously, the assessment includes for embedded mitigation delivered through the TMP.

11.8.2 Where no effects were assessed as Major or Major / Moderate significance, no further impact mitigation measures are required.

Impact Mitigation

Turbine Foundation Concrete Pours

11.8.3 Turbine Foundation Concrete Pours effects applicable to Scenario 2: Worst case; were considered significant by the assessment, and this section details the measures proposed to mitigate the impacts.

11.8.4 It is recognised that importing concrete for turbine foundation pours (ready mix) will have an impact due to the large numbers of HGVs required and concentrated within a 10–12-hour period, despite this being an infrequent event (i.e., only 18 times over an 8-month period) distributed across the highway links.

11.8.5 The most important mitigation measure will be the proactive consultation with the local community to provide advance warning of when concrete pours are scheduled. The detail of how this information is delivered to the local community will be agreed as part of the TMP. As a minimum it is expected to include signage on the road to be used advising of dates for concrete pours well in advance of the scheduled dates and direct notification (i.e. letter drops, face to face, SMS, etc) to the individual properties ahead of concrete pours.

11.8.6 With the incorporation of the above impact mitigation measures the sensitivity of concrete deliveries associated with the wind turbine foundations will be reduced to Low. Based upon the criteria in Table 11.4 the resultant effect is Moderate which is considered not significant.

11.9 CUMULATIVE EFFECTS INCLUDING NON-WIND

11.9.1 Other developments in the areas served by the roads assessed herein may generate their own construction, operational and decommissioning traffic (other wind farms, new urban development, shopping centres, quarries, forestry, etc.). The greatest changes in traffic associated with the proposed development will be short term, occurring during the construction phase.

11.9.2 Natural Power reviewed the list of cumulative developments, including non-wind, to determine if any fell within the zone of influence for traffic and transport. The zone of influence was defined as developments which assumed the use of the same links as would be utilised by the proposed development and would result in an increased traffic movement on those links. The process scoped out all developments with the exception of proposed development Wildfox Resort.

11.9.3 It is estimated that for a duration of 6 months both the proposed development and Wildfox Resort construction phases would overlap, with both contributing to traffic on the A4063. The consented Wildfox Resort has not assessed the construction phase traffic volumes and therefore no construction data is available to inform the HGV movements anticipated for the Wildfox Resort development.

11.9.4 However, construction traffic data relating to the Wildfox Resort would increase our baseline numbers resulting in a reduced impact being found for traffic movement associated with the proposed development. Therefore, Natural Power have not included these traffic figures in the assessment to ensure a conservative approach to the potential traffic impacts.

11.9.5 It is accepted that if other future developments were to coincide with that of the proposed development and was considered to have an unacceptable joint impact, then discussions would be held between developers and other relevant parties (in conjunction with the roads authorities) prior to the commencement of the projects, with a view to mitigating any such effects. The measures to be adopted would be enshrined in a robust TMP applying to each development, to ensure that any cumulative effects were avoided (e.g. by staging of deliveries and construction phasing).

11.10 CONCLUSIONS

11.10.1 The traffic and transport assessment has assessed the traffic impacts associated with the proposed development. The assessment considered the most likely construction methods, programme and sequencing of two scenarios against baseline traffic conditions: both a realistic scenario using site won stone, with the exception of stone being imported for turbine foundation concrete, along with use of on-site batching plants (scenario 1) and a worst-case scenario which assumes the top 150 mm layer of all stone would need to be imported onto site and all foundation concrete would need to be brought to site in ready mix lorries (scenario 2).

11.10.2 The traffic impacts associated with the turbine foundation concrete pour required under Scenario 2 was assessed along with Abnormal Load deliveries. An AIL Route Survey, including swept path analysis at particular locations was also prepared demonstrating the viability of the proposed abnormal load route and is included as an appendix to this chapter (Appendix 11.2).

11.10.3 The assessment concludes that, with the incorporation of embedded mitigation measures and impact mitigation measures secured through a construction TMP, there will be no resultant significant traffic effects associated with the proposed development.

11.10.4 A preliminary TMP (HGV's / LGV's) has been prepared and included as an appendix to this chapter (Appendix 11.1). The assessment is based on a number of conservative assumptions around the construction programme/sequencing, source of stone and concrete deliveries. These assumptions can only be clarified post consent. Hence it is expected a planning condition will be applied to the development for a final construction TMP to be prepared and approved by NPTCBC and BCBC post consent and prior to construction works commencing.

11.10.5 In relation to potential cumulative impacts, these would be dependent on whether other developments are constructed concurrently. If the construction of the proposed development coincided with another, using the same transport routes, then communication with the other developers will take place with the aim to mitigate effects to a non-significant level. This will be delivered through the construction TMP.

11.11 MITIGATION AND RESIDUAL EFFECTS

11.11.1 In terms of traffic and transport, embedded mitigation is primarily delivered through a TMP. As part of the traffic and transport assessment a preliminary TMP (HGV's / LGV's) has been prepared (Appendix 11.1) and it is expected that a planning condition will be applied to the development for a final TMP to be prepared and approved by NPTCBC and BCBC post consent and prior to construction works commencing.

11.11.2 The Preliminary TMP (HGV's / LGV's) includes for the following measures to mitigate the potential traffic impacts associated with the proposed development:

- Proactive consultation with SWTRA, NPTCBC, BCBC and the local community affected by traffic routing to develop and agree mitigation measures as required and as outlined in Section 11.8, including:
  - Temporary signage to inform both drivers and pedestrians;
  - Temporary speed restrictions; and
- Public notifications and liaison during the construction phase of planned vehicle movements (i.e. turbine deliveries and timings, HGV numbers, timings, particular busy periods and durations);
- The condition, structure and capacity of the delivery routes should be assessed for the intended vehicle deliveries and numbers and any upgrade provisions (i.e. temporary formal passing places, tarmac overly strengthening, condition monitoring and remedial/repair works and responsibilities) agreed with NPTCBC / BCBC;
- Application for a temporary reduction in speed limit on part of the B4282;
- HGV deliveries scheduled to avoid peak times;
- To reduce risk to pedestrians and road users, abnormal loads should be adequately escorted and appropriate traffic management and signage used;
- It is important that the local planning authority road departments are consulted on all transport issues and to make sure that deliveries do not conflict with other scheduled road works. For the same reason SWTRA would also be consulted with reference to trunk roads; and
- Consideration of a pre-commencement survey in a format agreeable with the local planning authorities.

11.11.3 The effects are fully detailed in Table 11.18 for each receptor assessed. Table 11.19 summarises the residual effects in terms of the receptor group and the highest residual effect determined to a receptor within that group.

Table 11.19: Highest effect by receptor group

Receptor Group	Highest Residual Effect
Public Road Network and Users	Moderate
Local Settlements	Moderate / Minor

11.11.4 The effect of the turbine foundation concrete pours, should ready mix concrete be adopted rather than the intended on-site batching plant, is assessed and considered significant without any mitigation, however with impact mitigation applied the effects are considered to be not significant.

11.11.5 The residual effects of abnormal load deliveries on driver delay are assessed and considered to be not significant.