

10 TRAFFIC, TRANSPORT AND ACCESS

10.1 Introduction

- 10.1.1 This Chapter sets out the transportation, traffic and access assessment for the proposed Mynydd Maen Wind Farm as described in Chapter 3: Proposed Development and referred to as 'the proposed wind farm'. It considers the effect of the anticipated traffic generated during the construction and operation phases of the proposal.
- 10.1.2 This Chapter sets out the transportation, traffic and access assessment for the proposed Mynydd Maen Wind Farm as described in Chapter 3: Proposed Development and referred to as 'the proposed wind farm'. It considers the effect of the anticipated traffic generated during the construction and operation phases of the proposal.
- 10.1.3 The main transportation effects would occur during the construction phase of the proposed wind farm, and would be associated with the movement of abnormal indivisible loads (ALLs) consistent with turbine component delivery and heavy goods vehicles (HGVs) delivering construction materials.
- 10.1.4 Traffic during operation would be limited to periodic visits by a maintenance team travelling in a 4 x 4 or similar vehicle. There may be an occasional need for HGVs to access the site for maintenance or repairs.
- 10.1.5 The anticipated operational period of the wind farm is 35 years, after which time the turbines would be decommissioned or a new planning application submitted. During decommissioning, most of the components associated with the wind farm would be removed and disposed of.
- 10.1.6 The assessment has been based on guidance given in the Institute of Environmental Assessment's (1993) Guidelines for the Environmental Assessment of Road Traffic and other related technical and planning guidance on traffic assessment, noting the IEA became the Institute of Environmental Management and Assessment (IEMA) following a merger in 1998
- 10.1.7 This Chapter is supported by Figures 10.1-10.3 in Volume 3.

10.2 Scope of Assessment

- 10.2.1 The scope of the traffic, transportation and access assessment was agreed with the Planning & Environment Decisions Wales (PEDW). The scope included:
- Impact on the local highway network during the construction phase;
 - Any short-term junction/highway mitigation to accommodate any abnormal loads;
 - Haul route;
 - Projected daily vehicle type and numbers;
 - Full access details into the site;
 - Swept path analysis of proposed largest vehicle using route and access;
 - Internal parking / loading and unloading areas;
 - Construction staff numbers.
- 10.2.2 The assessment comprises desk-based and site surveys to determine the following:
- The establishment of a preferred access route to the site for abnormal loads and general construction traffic;
 - The anticipated traffic generated by the proposed wind farm during construction and operation;
 - The effect of generated traffic on the preferred route;

- Mitigation measures proposed to address identified effects, including physical modifications to the highway; and
- Proposals for addressing the residual effects.

10.2.3 Site visits have been undertaken to inspect existing access arrangements and characteristics of the road network. This assisted in determining requirements for works that may be necessary to support the movement of abnormal loads associated with turbine component delivery and general construction traffic.

10.3 Policy Context and Guidance

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

- Welsh Government's Technical Advice Note (TAN) 18: Transport.
- Institute of Environmental Management and Assessment (IEMA) Environmental Impact Assessment Guide to: Delivering Quality Development (2016).
- The Welsh Transport and Planning Appraisal Guidance (2017).
- Institute of Environmental Assessment's (1993) Guidelines for the Environmental Assessment of Road Traffic.

10.3.2 Much of the guidance above addresses developments that generate significant increases in travel as a direct consequence of their business, e.g. retail parks. The traffic generated by the proposed wind farm would almost entirely be limited to vehicle movements relating to the construction and decommissioning phases of the proposal. However, in providing the information required in an Environmental Statement, this section addresses the local short-term transport impacts of the proposed wind farm during construction and therefore addresses the issues that would be assessed within a formal transport assessment.

10.3.3 The IEMA Guidelines recommend two rules to be considered when assessing the impact of development traffic on a highway link:

- Rule 1: Include highway links where traffic flows will increase by more than 30 % (or the number of heavy goods vehicles will increase by more than 30 %) and;
- Rule 2: Include any other specifically sensitive areas where traffic flows will increase by more than 10 % or more.

10.3.4 The above guidance is based on knowledge and experience of the environmental effects of traffic. The 30 % threshold is based on research and experience, with less than a 30 % increase generally resulting in imperceptible changes in the environmental effects of traffic. At a basic level, the guidance considers that predicted changes in total traffic flow of less than 10 % create no discernible environmental effect.

10.4 Assessment Methodology

10.4.1 The following effects have been assessed as part of this Chapter:

- The volume of construction traffic on the existing traffic flows along the main access route.
- The disruption to traffic flow and physical effects on the highway caused by the movement of abnormal load vehicles associated with turbine component delivery.
- The impact of construction and operational traffic.

10.4.2 The impact of the construction traffic on the local road network has been derived from the proportional change in vehicular flows on the local road network compared to the existing flows. The Institute of Environmental Management and Assessment (IEMA) Guidelines to the Environmental Assessment of Road Traffic indicates that changes in traffic flow of less than

30 % generally result in slight environmental effects while changes in traffic flows of less than 10 % create no discernible effect.

- 10.4.3 The generated traffic anticipated per day during the construction stages has been estimated and compared to the existing daily traffic flows along the main access route to the site.
- 10.4.4 The effect of abnormal load vehicles has been assessed as a desk-based exercise using swept path analysis to identify areas of overrun and oversail. This has been used to consider required physical modifications to the highway. The traffic and transportation effects during the operational phase of the wind farm have been assessed by considering traffic movements.

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10.5 Data Sources

10.5.1 Data was sourced from the locations presented in **Table 10.1**.

Table 10.1 Summary of Data Sources

Topic	Source of Information
Existing traffic flows	Department for Transport website and Caerphilly County Borough Council
Abnormal loads route	Welsh Government guidance, precedent from other wind farms, site visits, and topographic surveys
Topic	Source of Information
Background mapping	Ordnance Survey plans, LIDAR, aerial photography, and topographic surveys

10.6 HGV Delivery Route

10.6.1 All concrete, aggregate and steel deliveries were assumed to be delivered to the site via the Abercarn Mountain Road, to the west of the site entrance. These deliveries would meet the Abercarn Mountain Road either via Old Pant Road, travelling north-east, or from Hafodyrynys and along Pant Road, travelling south-west.

10.6.2 Once a main contractor has been appointed, the most suitable access route would be confirmed in consultation with the relevant County Borough Councils. However, the preference is to bring HGVs north-east along Old Pant Road.

10.7 Abnormal Load Delivery Route

Public Road Access Study

10.7.2 The access study considered various route options to the site. The aim of the study was to determine the route for the major wind turbine component deliveries to the proposed site with the minimal impact on the road network.

10.7.3 The access study was based on the following assumptions:

- 13 wind turbines with a maximum tip height of 149.9 m would be transported.
- Maximum turbine blade length of up to 57.3 m
- Maximum vehicle height of 5 m.
- Maximum vehicle gross weight of 115 tonnes.
- Trailers with rear steer capacity would be used for deliveries.
- Full road width would be utilised by delivery vehicles (i.e. both carriageways) where necessary.

10.8 Route Selection

10.8.1 In selecting the preferred route to the site, the following criteria have been considered:

- Maximising the use of trunk roads and primary county roads.
- Delivery route used by existing wind farms near to the site.
- Minimising the distance travelled on the public highway.
- Minimising the effect on sensitive receptors such as schools and residential areas.

- Minimising land take and widening works.

10.8.2 The preferred route has been selected on the basis that it fulfils each of the above criteria and is considered to be most suitable for transporting abnormal loads. The preferred abnormal indivisible load (AIL) route is shown in Figure 10.1: Abnormal Load Delivery Route, and is summarised in the following text:

- The abnormal loads would leave the Port of Swansea onto the A483;
- Travel east along the A483 and join the M4 at Junction 42;
- Leave the M4 at Junction 28 onto A467 towards Newbridge;
- Continue along A467 for approximately 16 km until reaching junction with Central Avenue;
- Exit A467, turning onto Central Avenue continuing north-east for approximately 0.6 km and entering roundabout;
- Take second exit at roundabout and continue north-east on Old Pant Road for approximately 1.4 km;

10.8.3 Turn east onto Abercarn Mountain Road (AMR) and continue approximately 1.3 km to the proposed Mynydd Maen Wind Farm site entrance. A swept path analysis of the critical turbine component delivery vehicles has been undertaken. Works to the public highway would largely be limited to the temporary removal of street furniture, with some small areas necessary for accommodation of overrun. The results of the swept path analysis along the public highway are presented in Figure 10.2: Abnormal Load Route from Port to Abercarn Mountain Rd. Widening works may be required along the Abercarn Mountain Road towards the site entrance.

10.8.4 Two new tracks would be constructed adjacent to the AMR in order to avoid narrow sections and tight bends. New section 1 will commence at approximate location E322391, N198361, extend east for 400 m and rejoin the AMR at approximately E322772, N198393. New section 2 will commence at approximate location E323075, N198313, extend east for 200 m and rejoin the AMR at approximately E323238, N198232.

10.9 Consultation

10.9.1 A range of consultation has been undertaken for the site. A summary of the consultee responses in relation to the abnormal load delivery route is provided in **Table 10.2**. Caerphilly County Borough Council provided additional comments on the preferred construction traffic routes.

Table 10.2 Summary of Consultation Responses

Consultee	Summary of Comments	Response/Action Taken
PEDW	Full Transport Assessment to be included with ES. The ES should fully explain and justify the rationale that is used to support the selection of effects for further assessment.	Traffic & Transport chapter to address the 7 receptors outlined within the IEMA's Guidelines for the Environmental Assessment of Road Traffic.
Caerphilly County Borough Council	The traffic and transport assessment which is set out in section 9 of the SR would only assess the construction and operational phases of the development. This is considered to be acceptable along with the	Requested aspects to be scoped in are included within the Traffic & Transport chapter of the Environmental Statement.

Consultee	Summary of Comments	Response/Action Taken
	<p>methodology for the proposed transport assessment.</p> <p>However, for clarity, the following should be considered as part of the assessment:</p> <ul style="list-style-type: none"> • Impact on the local highway network during the construction phase; • Any short-term junction / highway mitigation to accommodate any abnormal loads; • Haul route; • Projected daily vehicle type and numbers; • Full access details into the site; • Swept path analysis of proposed largest vehicle using route and access; • Internal parking / loading and unloading areas; • Construction staff numbers; and • Provision of a construction traffic management plan. 	
<p>Welsh Government</p>	<p>A CTMP will be produced in consultation with all stakeholders, which will include ourselves as M4 highway authority and that for both structures and highways over the River Neath. Travelling weights and dimensions of AIL transportation from the port of Swansea will be important as there are some managed structures on route. I also include standard conditions and lines relating to wind farm developments to manage the transportation route that should be used to inform the AILCTMP. The AILCTMP should include;</p> <ul style="list-style-type: none"> • proposals for transporting AILs from their point of entry to the Welsh trunk road network to the site that minimise any impact on the safety and free flow of trunk road traffic; • management and maintenance of layover areas, junctions, passing places, public rights of way and welfare facilities while AIL deliveries take place • details of temporary signage; • details of any alterations to any works that are carried out to enable AIL movements; • evidence of trial runs that mimic the movement of the worst case AILs along the access route; • number and size of AILs, including loaded dimensions and weights; • number and composition of AIL convoys, including anticipated escort arrangements; • methodology for managing trunk road traffic during AIL deliveries, including 	<p>Following consent and during discharge of conditions, a Construction Traffic Management Plan (CTMP) will be created to address applicable conditions.</p>

Consultee	Summary of Comments	Response/Action Taken
	<p>identification of passing places and holding areas as necessary;</p> <ul style="list-style-type: none"> · convoy contingency plans in the event of incidents or emergencies; · estimated convoy journey durations and timings along the route, including release of forecast traffic queues; · swept path analysis modelling the movement of the worst case AILs at all potential horizontal and vertical constraints along the access route; · proposals for the temporary or permanent modifications required to the highway or its associated infrastructure along the access route and details of how this would be managed; · plans for the reinstatement of any temporary works after completion of the construction phase; · land ownership must be clarified on all drawings showing proposed highway modifications. The developer shall be responsible for the acquisition and reinstatement of all third party land including re-instatement of boundary features; · proposals to liaise with all relevant stakeholders (including the relevant highway and planning authorities, Police, members of the public and local communities, hauliers, developers and landowners) prior to the submission of notifications for AIL deliveries and applications for special orders for AIL deliveries; · consideration of the cumulative impact of other wind farm schemes proposing to use all of part of the same access route and coordination with those schemes where possible; · the appointment and role of a transport coordinator to administer the abnormal indivisible load delivery strategy; · means of control of timing of delivery of AIL movements; · temporary traffic diversions and traffic hold points; · details of banksmen and escorts for abnormal loads; · full details of any highway works associated with the construction of layover areas, passing places and highway improvements including: <ul style="list-style-type: none"> · the detailed design of any works; · geometric layout; · construction methods; 	

Consultee	Summary of Comments	Response/Action Taken
	drainage; and • street lighting.	
Swansea Council	Suitability of the proposed route to be confirmed once Swansea Council receive a formal notification. Haulier (once selected) will submit the notification. Based on the information RES provided Swansea Council don't foresee any issues.	Formal notification to be submitted post consent.
Port of Swansea	Port of Swansea do not envisage problems transporting this size blade/transport via Swansea.	
Network Rail	The proposed route does not affect any Network Rail owned road over rail bridges or tunnels therefore no objection.	N/A
South Wales Trunk Roads	As a general comment the M4 section of the route should be able to accommodate the below, with an appropriate road space booking in place to avoid any traffic management clashes.	N/A

10.10 Baseline Conditions

Existing Traffic Data

10.10.2 Traffic count data for various locations along the preferred delivery route was obtained from the Department of Transport's website of Annual Average Daily Flow (AADF) data, and directly from relevant County Borough Councils. This gives the total daily average number of motor vehicles passing the count points in both directions in 2021 (the most recently available data). The data is summarised on **Table 10.3**. The background traffic flows along this route are unlikely to change materially prior to commencement of the construction of the proposed wind farm.

Table 10.3 Annual Average Daily Flow (AADF) in Both Directions

Road	Location	AADF 2019	% HGVs	AADF 2021	% HGVs
A483	Egress from port onto A483 [E270141, N192986]	37,230	2.83%	29,794	3.40%
A483	Exit at junction 42 onto M4 [E272000, N193440]	35,739	2.83%	28,603	3.39%
M4	Exit at junction 28 [E327826, N185108]	140,367	8.08%	98,496	10.39%
A467 (1)	Between Jt 28 and A468/A467 roundabout [E328000, N186440]	29,663	5.17%	23,341	6.30%
A467 (2)	South A467/Meadowland Dr roundabout [E326750, N188350]	28,988	3.48%	23,191	4.18%
A467 (3)	First location after M4 [E324750, N189440]	27,829	3.49%	22,263	4.18%
A467 (4)	south of Risca [E323900, N190000]	28,988	3.48%	23,191	4.18%
A467 (5)	Abercarn, south of Jt with A472 [E321480, N195000]	20,622	4.05%	16,984	4.65%
A467 (6)	Between A472/A467 roundabout [E321340, N196700]	22,233	3.78%	17,039	3.98%
Central Ave.	Central Avenue - Between A467 Jt & Old pant Rd [E321535, N197102]	-	-	3,411	1.14%

Road	Location	AADF 2019	% HGVs	AADF 2021	% HGVs
Old Pt Rd. (1)	Old Pant Road - Between OPR roundabout & Newlyn Rd. [E321624, N197398]	-	-	3,050	1.97%
Old Pt Rd. (2)	Old Pant Road - Between Hillary Rd & Carolyn Rd [E321640, N197570]	-	-	2,426	2.18%

10.10.3 **Table 10.3 Annual Average Daily Flow (AADF) in Both Directions** compares 2019 data (pre-covid, and where data was available) with the most recently available data from 2021. The purpose of this is to highlight the 2021 data as slightly anomalous due to the reduced traffic volume during the Covid recovery period. The data shows that overall traffic volumes were higher in 2019, however the number of HGVs remained consistent although, with a slight decrease from 2019 to 2021.

10.11 Access for General Construction Traffic

Likely Origins/Destinations

10.11.2 General construction traffic is likely to comprise heavy goods vehicles delivering construction materials, fuel tankers and staff vehicles. A range of general building materials would be required to construct the Mynydd Maen Wind Farm, including concrete and steel for turbine foundations, aggregate for access tracks and crane hardstandings, and power and instrumentation cabling.

10.11.3 Potential borrow pit search areas have been identified and included within the infrastructure layout, and limited site investigation has indicated the presence of shallow rock. The geotechnical investigation results prove rock depth is shallow, however testing has not yet been carried out to confirm the properties of the rock and viability for use in track and hardstand construction. The geotechnical investigation results are contained within the Coal Mining Risk Assessment, Technical Appendix 9.2. Pending further site investigation, the use of site won stone would significantly reduce the volume of stone imported onto the site to construct the site tracks and hardstands and is the preferred option over importing stone to site. Aggregate and ready mixed concrete would be sourced locally. The origin of staff vehicles and fuel tankers supplying the generators and plant on-site during the construction phase is more difficult to predict at this stage.

Assumed Routeing

10.11.4 It is assumed that vehicles from most suppliers based in the area would access the proposed wind farm via the A467 and A472, approaching from either the east and north, or the west. Assessment of the effect of construction traffic on alternative routes has not been undertaken as these routes are considered most likely.

10.11.5 Prior to construction commencing, a Construction Traffic Management Plan (CTMP) would be developed in consultation with the relevant County Borough Councils.

10.12 Site Entrance

10.12.1 A single site entrance on the Abercarn Mountain Road at the location [E323605, N198054] of an existing field entrance has been identified and verified by subsequent site visits. Modification would be required to facilitate the passage of abnormal delivery vehicles, including earthworks. Details are shown in Figure 3.7: Site Entrance. This access would be used by all vehicles accessing and egressing the site.

10.12.2 Details of the construction strategy and temporary traffic management measures for the new access would be included in the CTMP.

10.13 Predicted Effects

Construction Effects

10.13.2 The main transportation effects would occur during the construction stage of the Development. The effects would be caused either by an increase in traffic levels or by physical alterations required to facilitate the passage of abnormal loads.

Vibration

10.13.3 Noise and vibration sources during the construction phase would include increased traffic flows and noise from construction plant. Further details are provided in Chapter 11: Acoustic.

Night-Time Noise

10.13.4 No construction work is anticipated, or planned, to occur at night-time. Should this become necessary as part of the construction process, Caerphilly County Borough Council and Torfaen County Borough Council would be consulted prior to any works.

Driver Severance and Delay

10.13.5 The IEMA Guidelines (1993) advise that “severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery”. The potential for traffic associated with the proposed wind farm to cause severance is assessed on a case-by-case basis. The area of assessment is taken as the turn east at the A467/Central Avenue junction, as this is likely to be the most affected section of the delivery route.

10.13.6 From the A467/Central Avenue junction to the proposed site entrance there are 3 traffic data count points (provided by CCBC), as detailed in **Table 10.3 Annual Average Daily Flow (AADF) in Both Directions**. These points represent locations which would experience the greatest anticipated traffic volume increases as a result of construction activity. The construction traffic volume increases, based on the figures in **Table 10.4 Traffic Movements During Construction Phase of the Wind Farm** and using the anticipated maximum number of vehicle movements per day (180) as outlined in paragraph 10.54, represent 5.3 %, 6 % and 7.4 % increases compared with existing conditions.

10.13.7 It is considered that the expected volume of construction traffic would have a minor effect on the assessment area in terms of driver delay and consequently the effect is deemed to be not significant for all links.

10.13.8 It is noted that the transportation of AILs is likely to cause minor delays to road users due to the need to travel at low speeds and under escort. However, the transportation of AILs to site would be infrequent and is expected to only occur over the course of a few months of the construction period therefore the magnitude of any change would be small. The significance of any driver delay is considered to be minor and therefore not significant.

Pedestrian Delay and Loss of Amenity

10.13.9 An increase in construction traffic can make it more difficult for pedestrians to cross a road. Pedestrians can also experience intimidation and the degree to which this is true is affected by the volume of traffic, the proportion of HGV traffic and its proximity to pedestrians and cyclists.

10.13.10 Information on pedestrian and cyclist numbers are included within the available data sets. Based on the traffic data available for the 3 traffic count points closest to the proposed site entrance, it can be surmised that the number of pedestrians or cyclists that are likely to be impacted by construction traffic is negligible and the magnitude of the effect is considered to be low; therefore, the effect is considered negligible and not significant.

Accidents and Safety

10.13.11 The most sensitive areas of assessment: Central Avenue, Old Pant Road, Pant Road, and Abercarn Mountain Road do not exhibit severe accident hot spots according to Crashmap

data. Given that traffic volumes are not expected to exceed the 10 % threshold, as outlined in paragraph 10.58, any increase in incidents may be considered as low.

Hazardous and Dangerous Loads

10.13.12 There are not anticipated to be any hazardous loads in relation to the proposed development.

Dust and Dirt

10.13.13 IEMA Guidelines (1993) acknowledge that it is not practical to quantify the level of dust and dirt that can be expected from construction traffic associated with a development. Therefore, a quantitative description of the effect on dust and dirt from construction traffic is not provided here.

10.13.14 It is acknowledged that HGVs would have the potential to collect debris on their tyres when accessing the site. This could be transferred to the road surface when vehicles travel away from the site and can be deposited on the road in the form of either dust or dirt depending on weather conditions.

10.13.15 Under the current site access arrangements, it is expected that the Abercarn Mountain Road would be the most affected by any accumulation of dust or dirt as construction traffic would be entering and exiting the site from this road.

10.13.16 A Dust Management Plan would be agreed with the relevant County Borough Council(s) to ensure appropriate dust mitigation measures are in place during the construction phase.

Internal Parking & Construction Staff Numbers

10.13.17 During construction, temporary construction facilities would include parking and storage areas for plant and materials. These facilities would be located within the site boundary or in the adjacent land where necessary.

10.13.18 It is anticipated that during the busiest period of the construction that the maximum number of construction staff on-site would be up to 40.

Wind Farm Traffic Generation

10.13.19 Traffic would be generated by each of the activities given on **Table 10.4**. For each activity an estimate is given of the total number of journeys anticipated and the maximum number of journeys that may conceivably be made in one day. A journey is considered to be a round trip, where a vehicle travels from its origin to the site then back to its origin.

10.13.20 The figures given in **Table 10.4** are estimates for the worst-case delivery scenario, where all stone is imported; there would be days when the activity generates no traffic and days when an activity generates the maximum number of journeys stated. Figures showing the more likely scenario, using site won stone (S/W) from an on-site borrow pit(s), are included in red below the 'Total' journey figures in **Table 10.4 Traffic Movements During Construction Phase of the Wind Farm**.

10.13.21 The construction period is estimated to last approximately 15 months. S Construction work would take place between the hours of 0700-1900 Monday to Friday and 0700-1300 on Saturdays. Outside these hours, work at the Site shall be limited to turbine erection, testing/commissioning works and emergency works. Deliveries may occur outside these times to minimise disruption to local residents.

Table 10.4 Traffic Movements During Construction Phase of the Wind Farm

Phase	Purpose	Vehicle	Approximate No. of journeys	Approximate Max No. of daily Journeys	Approximate Period when Deliveries Occur (assumes 15 months programme)
Site Set-Up	Portacabin delivery	Low loader	5	5	1-2
	Skip delivery	Low loader	5	5	1-2
	Generator delivery	Low loader	2	2	1-2
	Water and fuel tank delivery	Low loader	1	1	1-2
	Excavator delivery	Low loader	2	2	1-3
	Tool container delivery	Low loader	2	2	2-3
	Roller-compact	Low loader	1	1	2-3
	Articulated dumper truck	Low loader	1	1	2-3
Site tracks & hard standings	Stone for site tracks	Tipper lorry	3713	65	1-7
	Stone for control building and substation compounds	Tipper lorry	411	65	1-7
	Stone for construction compound and gatehouse	Tipper lorry	132	65	1-7
	Stone for turning heads	Tipper lorry	29	29	1-7
	Stone for pathways	Tipper lorry	53	53	6-13
	Stone for crane hardstanding	Tipper lorry	4498	65	1-7
Foundation construction	Excavator delivery	Low loader	2	2	3-4
	Misc works	Backhoe loader	2	2	3-4
	Concrete for turbine foundations, piles & transformer plinths	Mixer truck	954	65	3-7
	Steel delivery	Flat bed	26	20	3-7
	Foundation bolts or steel insert delivery	Flat bed	13	13	6-7
	Place foundation bolt cage or steel insert	30t to 50t crane	1	1	6-7

Phase	Purpose	Vehicle	Approximate No. of journeys	Approximate Max No. of daily Journeys	Approximate Period when Deliveries Occur (assumes 15 months programme)
Turbine erection	Tower section delivery	Clamp lift trailer	52	8	11-12
	Blade delivery	Extendible trailer	39	6	11-12
	Nacelle	Low loader	13	2	11-12
	Hub and rotor	Low loader	13	2	11-12
	Drive Train	Low loader	13	3	11-12
	Large crane delivery and removal	1000t to 1200t crane	2	1	11-12
	Crane associated equipment delivery and removal	Low loader	20	10	11-12
	Smaller crane delivery and removal	150t to 200t crane	2	1	11-12
Cable Installation	Cable delivery	Flat bed	7	7	7-8
	Sand delivery	Tipper lorry	175	20	7-8
	Excavator delivery	Low loader	2	1	7-8
	Cable laying	Tele handler	2	1	7-8
Substation and Control Building	Concrete delivery	Mixer truck	36	36	7-8
	Brick delivery	Flat bed	3	3	7-8
	Roofing & Cladding	Flat bed	3	3	9-10
	Switchgear	Flat bed	2	2	9-10
	Misc electrical equipment	Flat bed	3	3	9-10
Reinstatement	Removal of temporary compound & gate house stone	Tipper lorry	484	65	13-15
	Removal of temporary turning head stone	Tipper lorry	132	65	13-15
	Removal of temporary hardstanding stone	Tipper lorry	29	29	13-15
Misc	Waste removal	Skip lorry	1161	65	13-15
	Water/fuel deliveries	Small tanker	130	1	1-15
Site Demobilisation	Portacabin removal	Low loader	130	1	1-15

Phase	Purpose	Vehicle	Approximate No. of journeys	Approximate Max No. of daily Journeys	Approximate Period when Deliveries Occur (assumes 15 months programme)
	Skip removal	Low loader	5	5	14-15
	Generator removal	Low loader	5	5	14-15
	Water and fuel tank removal	Low loader	2	2	14-15
	Roller-compactor	Low loader	1	1	11-12
	Dumper truck	Low loader	1	1	14-15
	Excavator removal	Low loader	2	2	7-15
	Misc works	Backhoe loader	2	2	14-15
TOTAL Heavy Good Vehicles			12325		
TOTAL Heavy Good Vehicles (S/W Stone)			2074		
Site Staff and Deliveries	Staff	Cars & minivans	9750	25	1-15
	Miscellaneous deliveries	Vans	1560	4	1-15
TOTAL Cars & Light Good Vehicles			11310		
TOTAL Cars & Light Good Vehicles (S/W Stone)			9802		
TOTAL VEHICLES			23635		
TOTAL VEHICLES (S/W Stone)			11876		

10.13.22 The total number of vehicle journeys during the 15-month wind farm construction stage is anticipated to be approximately 23,635. However, should site-won stone be used in place of imported stone the number of vehicle journeys would reduce to approximately 11,876 over the construction period.

10.13.23 The greatest number of journeys per day would be generated between months four and nine, as several key activities are planned for this period. Experience has shown that most traffic is generated on days when turbine foundations and transformer bases are poured. Each turbine foundation pour would typically require no more than 60-65 mixer trucks per turbine. As there are 13 proposed turbines, these busy days would only occur 13 times.

10.13.24 The total number of journeys anticipated on a turbine foundation pouring day would be a maximum of 90, allowing for 60 mixer trucks and 5 additional HGVs serving other site activities, and 25 site staff. This equates to a less than 8 % increase in AADF on Old Pant Road, using the data point located at E321640, N197570.

10.13.25 The origin of vehicle traffic would depend on the location of staff accommodation and the source of materials being imported. It is likely that staff would be accommodated across a wide area. The highest volume of traffic would be generated by the requirement for access track and hardstanding aggregate and concrete materials, of which all is assumed to be imported as a worst-case scenario. All concrete, aggregate and steel deliveries were assumed to be delivered from west of the site access on the Abercarn Mountain Road. There is a potential supply of aggregate from the Tarmac Hafod Asphalt Plant, located south of the site entrance on the Abercarn Mountain Road.

10.13.26 The IEMA Guidelines for the Environmental Assessment of Road Traffic states that it should be assumed that anticipated changes in traffic flow of less than 10% would create no discernible environmental effect.

10.14 Physical Effect

10.14.1 Movement of the turbine components as abnormal loads to the site could have a significant effect if not properly managed. Site visits and desktop studies were undertaken to identify the junctions and bends to be analysed.

10.14.2 The potential effect on the physical layout of the public highway along the proposed access route was assessed using swept path analysis. AutoTRACK software was used to model the movement of an extended transport vehicle suitable for a 57.3 m long turbine blade. The analysis was based on Ordnance Survey (OS) MasterMap data and topographic survey undertaken specifically for the Project. The results of the analysis are shown in Figure 10.2: Abnormal Load Route from Port to Abercarn Mountain Rd and Figure 10.3: Abnormal Load Route Abercarn Mountain Road.

10.14.3 It would be necessary to implement temporary works along the access routes, these works would include: temporarily widening the highway onto verges, modifying roundabout central reservations, and constructing entrance/egress points to new tracks. Mitigation measures for these temporary works are outlined in Table 10.5. Any alterations would be agreed in consultation with the relevant authorities.

10.14.4 Works would be required to create the upgraded site access off the Abercarn Mountain Road. The traffic management measures associated with creating a safe system of work and a safe environment for road users would be agreed in consultation with Caerphilly County Borough Council, prior to the commencement of construction. The works would be planned to minimise disruption at this location.

10.15 Operational Effects

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

10.15.2 In terms of the IEMA Guidelines, such a small number of traffic movements and the associated percentage uplift over baseline traffic movements are not significant and therefore no further assessment is required.

10.16 Decommissioning Effects

10.16.1 At the end of the 35 year consent period, the wind farm would be decommissioned, or a new planning permission would be required. All items of plant, including the turbines and associated infrastructure, would be dismantled and removed from site. The number of vehicle movements required would be substantially fewer than the number required during construction.

10.16.2 Prior to decommissioning, a Decommissioning Traffic Management Plan (DTMP) would be developed in consultation with Caerphilly County Borough Council and Torfaen County Borough Council.

10.17 Cumulative Effects

10.17.1 Other proposed developments are in close proximity to the site; namely Mynydd Llanhilleth Wind Farm and Trecelyn Wind Farm. However, the construction of Mynydd Llanhilleth Wind Farm is anticipated to begin in 2025 and so is not likely to overlap with the construction of the proposed Mynydd Maen Wind Farm. Additionally, it is expected that there would be

minimal clash with Mynydd Llanhilleth Wind Farm in terms of access routes for construction traffic.

- 10.17.2 Minimal vehicle trip information was available for the proposed Trecelyn Wind Farm, likely because it is in the early stages of development. Therefore, it can be reasonably concluded that no cumulative effects would arise as a result of the proposed Mynydd Maen Wind Farm development as there are no other developments in the vicinity with the potential to significantly impact on traffic or transport.

10.18 Mitigation and Enhancement

Highway Improvement Works

- 10.18.2 It is anticipated that highway modification works would be required at several locations along the proposed access route in order to accommodate AIL delivery. These works will include: creating socketed signposts, alterations to bollards to allow them to be temporarily removed, and temporary measures to allow potential overrun of traffic islands and roundabout central reservations. All works are shown within the SPA in Figure 10.2: Abnormal Load Route from Port to Abercarn Mountain Rd and Figure 10.3 Abnormal Load Route Abercarn Mountain Road and are summarised in **Table 10.5 Summary of Highway Modification Improvement Works from Port to Abercarn Mountain Rd** and **Table 10.6**.

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Table 10.5 Summary of Highway Modification Improvement Works from Port to Abercarn Mountain Rd

Detail	Easting, Northing	Description of Modification
5	325412, 188991	Traffic furniture relocation likely required, and load bearing surface to be laid.
6	324376, 189618	Lit road sign to be relocated or socketed.
7	321452, 191405	Central reservation requires reprofiling and load bearing surface laid, and two lit road sign to be relocated or socketed. Alternative option to contraflow requires less modification.
8	321873, 193163	Contraflow manoeuvre. Potential central reservation vegetation trimming, signage relocation and traffic furniture relocation likely required.
9	321766, 195795	Contraflow manoeuvre is preferred option. Load bearing surface to be laid on central reservation. Chevrons and lit sign to be relocated or socketed. Vegetation may need to be trimmed.
10	321364, 196545	Contraflow manoeuvre is preferred option. Lit road sign and chevrons to be relocated or socketed.
11	321306, 196785	Two Lampposts to be relocated or socketed. four lit and one unlit road signs to be socketed. Sections of railing will likely require temporary removal. Traffic island bollards to be removed. Load bearing surface to be laid.
14	321611, 197323	Load bearing surface to be laid on central reservation. Vegetation to be removed and trees potentially to be trimmed. Lit road sign to be relocated or socketed, and one marker to be removed.
15	321658, 197601	Traffic furniture may need to be removed.
16	322194, 198038	Four lampposts to be relocated or socketed. Trees to be felled. Ground profiling and load bearing surfacing required on east of road. Fencing to be dropped temporarily, and vegetation to be removed.
17	322289, 198277	Vegetation trimming likely required.

Table 10.6 Summary of Highway Modification Improvement Works on Abercarn Mountain Rd

Detail	Easting, Northing	Description of Modification
1	322380, 198355	Ground reprofiling and load bearing surfacing required. A new access into the field north-east of the junction is required to allow access/egress of the proposed new track, which will require tree felling. Fencing to be removed.
2	322510, 198346	Existing passing bay to be extended.
3	322700, 198403	A new access into the field north of the road is required to allow access/egress of the proposed new track, tree felling will also be required at this location. Fencing to be removed. Wall sections to be dropped, and potential load bearing surfacing needed.
4	322806, 198365	Ground reprofiling and load bearing surfacing required. Vegetation trimming likely required.
5	322981, 198318	Ground reprofiling and load bearing surfacing. New passing place.
6 & 7	323193, 198283	A new access and egress are required for the field south of the road to allow access/egress of the proposed new track. Sections of wall to be removed.
8	323428, 198135	Ground reprofiling and load bearing surfacing. New passing place.
9	323524, 198086	Ground reprofiling and load bearing surfacing.

10.18.3 Passing bays suitable for HGVs are proposed at several locations along Abercarn Mountain Road as a means of reducing disruption to traffic during the construction phase of the proposed wind farm. Figure 10.3: Abnormal Load Route Abercarn Mountain Road shows the locations and proposed dimensions of these passing bays.

10.18.4 It is proposed to upgrade the existing cattle grid and field entrance to facilitate the movement of both abnormal loads and general construction traffic to and from the site. At present the existing site entrance has adequate visibility splays from both directions of access, however the track would need to be upgraded to suit the anticipated load weights and volumes consistent with wind farm construction.

Traffic Flow Mitigation

10.18.5 Various mitigation measures have been included in the design to reduce the anticipated traffic generated from the construction works. It is proposed to source stone from one or more of the borrow pit search areas on-site, significantly reducing the number of stone deliveries to the site. Detailed design of the tracks and hardstandings would aim to achieve a cut/fill balance; any excess spoil would be retained rather than removed from site, thereby avoiding the need for additional HGV trips.

Traffic Management Mitigation

10.18.6 Although the preferred route has been chosen to minimise potential disruption to traffic, the movement of abnormal loads and other construction traffic still has the potential to create an effect on other road users. Therefore, the following mitigation measures are proposed to ensure highway safety:

- Deliveries would be scheduled in consultation with the appropriate authorities to minimise disruption as far as reasonably practicable.
- The police would be notified of the movement of abnormal vehicles and authorisation would be obtained prior to any abnormal vehicle movements. Any movements will comply with legislation regarding the movement of abnormal loads e.g. notice procedures will be accompanied by a police escort where required.
- Maximum of four abnormal vehicles in any one convoy unless agreed beforehand with the relevant authorities.
- Marking of vehicles as long/abnormal loads.
- Warning signs to advise other road users of 'Caution Slow Plant Turning Ahead' would be placed at intervals from both directions along the A467 approaching central avenue from both directions, and at intervals between the A467 /Central Avenue junction and the site entrance during the construction phase.

10.18.7 A CTMP would be agreed with the relevant Highways Authorities and the police prior to any works being carried out and would be implemented during the construction phase in consultation with the relevant authorities.

Video Footage and Road Repairs

10.18.8 Video footage of the pre-construction phase condition of public roads agreed with the Highways Authorities would be recorded around the site entrance and access routes to provide a baseline record of the state of the road prior to any construction work commencing. This would enable any repairs and maintenance work required to the road due to any damage caused by the passing of heavy vehicles associated with the wind farm construction to be identified following the construction phase. The roads would be returned at least to the baseline condition at the end of the construction phase. Any damage caused by wind farm traffic during the construction period that would be hazardous to public traffic would be repaired immediately.

Operational Mitigation & Enhancement

10.18.9 Traffic during operation of the wind farm would be minimal, with weekly maintenance visits by one vehicle. Mitigation should not be required. In the unlikely event of a component failure, a replacement would be brought to the site. This movement would be handled in the same manner as during the construction phase.

Decommissioning Mitigation & Enhancement

10.18.10 Traffic to and from the site would be managed in the same way as during the construction phase. A traffic management plan would be agreed with the relevant Highways Authorities and the police prior to any works being carried out and would be implemented during the decommissioning phase in consultation with the relevant authorities.

10.19 Residual Effects

10.19.1 In general, daily traffic flows along the anticipated construction traffic route would increase by no more than 8 % during peak delivery days in the 15 month wind farm / construction period. The Institute of Environmental Assessment's Guidelines for the Environmental Assessment of Road Traffic states that it should be assumed that anticipated changes in traffic flow of less than 10% would create no discernible environmental effect.

- 10.19.2 The physical works associated with improving the existing access from the Abercarn Mountain Road would have a temporary impact on traffic flows. Temporary traffic management measures would be required to create a safe environment for road users. Through consultation with Caerphilly County Borough Council and implementation of the CTMP the impact would be minimised.
- 10.19.3 The movement of turbine components to site as abnormal loads would create disruption for oncoming traffic and those following the abnormal loads on the delivery route as the vehicles would require the full width of the carriageway at various points. Following traffic would be delayed because the abnormal load convoy is likely to travel more slowly than general traffic, although opportunities for overtaking would be provided where possible. Oncoming traffic would be delayed when held by the police to enable the abnormal loads to pass.

10.20 Conclusion

- 10.20.1 This assessment demonstrates that the construction of the Mynydd Maen Wind Farm would result in a short-term increase in traffic levels on identified sections of the A467, Central Avenue, and Old Pant Road, as well as Pant Road and Abercarn Mountain Road. As there is no traffic count data available for Old Pant Road and Abercarn Mountain Road, this could be a limitation to the traffic assessment, but it is assumed that their respective traffic counts would increase. However, these increases are considered to be insignificant due to the expected low percentage increase in traffic on these roads.
- 10.20.2 A suitable route for transporting abnormal loads has been identified and received no objections from the local Highway Authorities, Network Rail, or South Wales Trunk Road Agent. Abnormal loads would be scheduled to occur during off-peak periods, at times to be agreed with the Police and the local authorities. Therefore there would be **no significant residual effects**.
- 10.20.3 Works to create the upgraded access off the Abercarn Mountain Road would be planned and agreed in a CTMP in consultation with Caerphilly County Borough Council. Implementation of the CTMP would minimise the temporary disruption to road users. Therefore there would be **no significant residual effects**.
- 10.20.4 Traffic generated during decommissioning of the wind farm would be lower than the levels associated with the construction. A Decommissioning Traffic Management Plan (DTMP) would be developed in consultation with Caerphilly County Borough Council. Implementation of the DTMP would minimise the temporary disruption to road users. Therefore there would be **no significant residual effects**.