TRAFFIC AND TRANSPORT 15

15.1 **INTRODUCTION**

15.1.1 **Background and Objectives**

RECEIVED. 79 This chapter assesses the traffic and transport effects of the Project, describes the existing transport network, identifies whether there is any potential for significant effects to arise (both in isolation and in combination with other projects) and outlines any mitigation measures as required. The assessment considers the potential effects during the following phases of the Project:

- Construction of the Project
- Operation of the Project
- Decommissioning of the Project

For developments of this nature, the construction phase is generally the critical impact period associated with worker traffic and delivery of plant and materials. There is the potential for disruption to the road network caused by trenching activities to accommodate electrical cables. The locations on the public road network requiring remedial measures to accommodate the turbine delivery which (will be temporary in nature) are also outlined in this Chapter.

There are separate elements of the works which will have their own separate access routes during the construction phase, these are:

- Haul routes for delivery of turbine components.
- Haul route for crushed stone, concrete, substation components and other materials for the Wind Farm Site.
- Haul route for delivery vehicles leaving the Wind Farm Site.
- Haul routes for the construction of the Grid Connection.

The traffic and transportation of Letter wind farm has been assessed with reference to the 2021 Collett Route Access Survey and Swept Path Analysis completed for Tullynamoyle Wind Farm, County Leitrim. Tullynamoyle Wind Farm is located 6.7km northeast of the Site and is owned by the Developer.

A separate Swept Path Analysis was completed by JOD within Drumkeeran and the turn off to the L-4282 towards the site (See Appendix 15.1). The Swept Path Analysis also includes an assessment of blade oversail (i.e., where the blade protrudes outside the road corridor) so as to identify potential impacts to third party properties. Separate haul routes are

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proposed for other construction materials referred to as the Construction Haul Routes which includes for the transportation of concrete, crushed stone and other materials. The Grid Connection Route is also addressed.

This chapter outlines potential effects of the Project on traffic and transport based on the Swept Path Analysis which has been undertaken for the abnormal loads haul routes also estimates the number of HGV and other traffic movements on the Construction Haul Routes used for materials deliveries and assesses the associated impacts.

Figures are contained in Volume III.

Common acronyms used throughout this EIAR can be found in **Appendix 1.2**. This chapter of the EIAR is supported by Figures provided in Volume III and by the following Appendix documents provided in Volume IV of this EIAR:

• Appendix 15.1: Drumkeeran Swept Path Analysis

15.1.2 Statement of Authority

This chapter has been prepared by Jennings O'Donovan & Partners Limited. It was prepared by Mr. Cavelle Hendry, and Mr. John Banks, and reviewed by Mr. David Kiely.

Cavelle Hendry who is a Project Engineer in Jennings O'Donovan & Partners Limited (JOD) and holds a Bachelor (Hons.) Degree in Civil Engineering from The University of KwaZulu-Natal in South Africa. Cavelle is part of the JOD Renewable Energy team and brings a variety of skills and expertise in his current role. Over the past years he has gained experience as both a site and design engineer in the roads, transportation, and infrastructure engineering sectors.

John Banks who has over 18 years of experience in drafting and designing wind farms has prepared the Swept Path Analysis drawings between the Wind Farm Site access junction off the L-4282 at Drumkeeran, Co. Leitrim.

David Kiely, Director, Jennings O'Donovan & Partners Limited who holds a BE in Civil Engineering from University College Dublin and MSc in Environmental Protection from IT Leitrim. He is a Fellow of Engineers Ireland, a Chartered Member of the Institution of Civil Engineers (UK) and has over 41 years' experience. He has extensive experience in the preparation of EIAR and EIS for environmental projects including Wind Farms, Solar Farms,

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Wastewater Projects and various Commercial Developments. David has also been involved CENED. 79/07. in the construction of over 60 wind farms since 1997.

15.2 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

15.2.1 **Assessment Methodology**

This assessment has involved the following elements, further details of which are provided in the following sections:

- Policy and guidance review
- Desk study, including review of available maps and published information
- Site visit (driving the route) including review of road network to be used
- Undertaking traffic counts of the affected road junctions
- Topographical Survey of potential 'constraints'
- Establishment of Baseline Scenario
- Evaluation of potential effects
- Evaluation of the significance of these effects
- Identification of measures to avoid and mitigate potential effects
- Cumulative assessment in association with other potential development such as existing and permitted development as well as proposed development that could become consented before this application is decided upon
- Evaluation of residual effects following implementation of mitigation measures

15.2.2 Planning Policy and Guidelines/Guidance

In addition to the EIAR standards outlined in Chapter 1: Introduction, the following guidance, guidelines and standards have been used in the preparation of this chapter:

Policy / Author	Title	Policy
Leitrim County Council	Leitrim County Development F 2023-2029	 The CDP states: ILU POL 1 - To support and facilitate the integration of land use with transportation infrastructure, through the development of sustainable compact settlements and promotion of higher residential densities at appropriate locations, well served by public transport to the exten practicable in a rural county with smaller urban centres such as Co. Leitrim. ILU POL 2 - To support the development of a low carbon transport system by continuing to promote modal shift from private car use towards increased use of more sustainable forms of transport such as cycling, walking and public transport in circumstances where alternative options are available.

Table 15.1: Policy and Guidance

Policy / Author	Title	Policy
		 ILU POL 3 - To support the maintenance and optimisation of the county's existing transport infrastructure to ensure its optimal use in line with National Investment Framework for Transport in Ireland's (NIFTI's) modal hierarchy and seek to undertake appropriate traffic management measures to prioritise road users in line with the modal hierarchy. ILU POL 4 - To strengthen inter-regional connectivity, through the improvement of inter-urban road, bus and rail connectivity between the largest urban centres and access to ports and airports, for the movement of both people and goods. ILU POL 5 - To promote the integration of land use and transport planning measures which facilitate sustainable transport planning measures which facilitate sustainable transport and protects. ILU POL 6 - New transport infrastructure projects, including blueways and greenways, that are not already provided for by existing plans/programmes, which have been subject to environmental assessment, or are not already permitted, will be subject to feasibility assessment, considering need, environmental sensitivities as identified in the SEA Environmental Report, and objectives relating to sustainable mobility. Where feasibility is established, a Corridor and Route Selection Process will not be applicable to national roads schemes which are required to be progressed in accordance with statutory processes and TII Publications, including the Project Management Guidelines.
Department of Transport, Tourism and Sport and Department of Environment, Community and Local Government	The Design Manual for Urban Roads and Streets (DMURS)	This document outlines guidelines on the design of urban roads and streets in terms of street networks, street signage, pedestrians and cyclists, carriageways (widths, surfaces, junctions etc.), policies and plans, design process and audits (safety and quality).
Transport Infrastructure Ireland (TII)	Traffic and Transport Assessment Guidelines (PE-PDV-02045, May 2014)	 The guidelines provide guidance for developers, planning authorities and the National Roads Authority (NRA) for: Scoping for traffic and transport assessment for future development and development areas, particularly areas in proximity to national roads, Defining thresholds where studies are recommended to minimise the impact of future proposals on the national road network, Contributing to the provision of sustainable forms of development and better-informed planning decisions.

Policy / Author	Title	Policy
Transport Infrastructure Ireland (TII)	Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions) DN-GEO-03060, June 2023)	Design Standards for Junction Design, excl. major interchanges.
Transport Infrastructure Ireland (TII)	Rural Road Link Design (DN-GEO- 03031 April 2017)	This Standard applies to Single and Dual Carriageway roads (including Motorways) in rural areas. It also applies to single carriageway Urban Relief Roads and Urban Dual Carriageways and Motorways. The Standard shall be used to derive the Design Speed, and the appropriate values of geometric parameters for use in the design of the road alignment. It sets out the basic principles to be used in co- ordinating the various elements of the road layout, which together form the three-dimensional design of the road.
Transport Infrastructure Ireland (TII)	Design Phase Procedure for Road Safety Improvement Schemes (DN- GEO-03030, April 2021)	 This Standard sets out the procedures to be followed for the technical aspects of the Design Phase of the following scheme types: Road Safety Improvement Schemes Urban Road Schemes Road Safety Improvements aspects Local authority general improvement schemes which have not been identified as Road Safety Improvement Schemes, schemes led, funded or partly funded by other agencies, development led schemes and/or community schemes.
Transport Infrastructure Ireland (TII)	Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (PE-PAG-02017, October 2021)	This document provides guidance on the Project of transport models for use in the appraisal of transport infrastructure. The guidance addresses the scoping and construction of transport models which reflect transport demand and supply in a 'Base Year'. It provides guidance on the preparation of future travel demand projections for use in modelling and appraisal.
Transport Infrastructure Ireland (TII)	Expansion Factor for Short Period Traffic Counts (PE-PAG-02039, October 2016)	This document aims to support the conversion of short period traffic counts to annual average daily traffic (AADT).
Transport Infrastructure Ireland (TII)	Road Safety Audit (GE-STY-01024, December 2017)	This Standard outlines the requirements for Road Safety Audits in the management of the national road infrastructure. It sets out the procedures required to implement Road Safety Audits and defines the relevant schemes and stages in the design and construction at which audits shall be undertaken.
Department of the Environment and Local Government and Department of Transport	Traffic Management Guidelines 2003	This document outlines guidelines for traffic management and sustainability, consultation and monitoring, speed management, junctions, vulnerable road users, public transport and parking. The guidelines recommend that consultation is carried out for schemes that involve a long construction period or area. The guidelines outline the relevant legislation governing different types of road works. The guidelines outline safety measures to be taken in the design of roads and junctions. The guidelines outline the arrangements for temporary traffic management where construction and improvement

Policy / Author	Title	Policy
		of roads is taking place and who should be consulted in planning for roadworks and the factors to consider.
Department of Transport, Tourism and Sport	Guidelines for Managing Openings in Public Roads (Second Edition, April 2017)	The document prescribes standards in respect of the work of forming openings, backfilling and the reinstatement of road surfaces and the associated materials to be used on all roads other than National Roads. It also prescribes procedures and requirements in relation to the use of MapRoad Roadworks Licensing (MRL) and its use for all road openings in public roads other than those openings carried out by a road authority.

15.2.3 Scoping Responses and Consultation

Consultation responses are shown in Table 15.2.

Table	15.2:	Consultation	Res	ponses
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Consultee	Type & Date	Summary of Response
Transport Infrastructure Ireland (TII)	Email dated 13 th January 2023	Transport Infrastructure Ireland (TII) will endeavour to consider and respond to planning applications referred to it, given its status and duties as a statutory consultee under the Planning Acts. The approach to be adopted by TII in making such submissions or comments will seek to uphold official policy and guidelines, as outlined in the Section 28 Ministerial Guidelines 'Spatial Planning and National Roads Guidelines for Planning Authorities' (DoECLG, 2012). Regard should also be had to other relevant guidance available at www.TII.ie.
		The issuing of this correspondence is provided as best practice guidance only and does not prejudice TII's statutory right to make any observations, requests for further information, objections or appeals, following the examination of any valid planning application referred.
		National Strategic Outcome 2 of the 'National Planning Framework', includes the objective to maintain the strategic capacity and safety of the national road network. In addition, Chapter 7 'Enhanced Regional Accessibility' of the 'National Development Plan 2021 – 2030', sets out the key sectoral priority of maintaining Ireland's existing national road network to a robust and safe standard for users. This requirement is further reflected in the publication of the 'National Investment Framework for Transport in Ireland' and also the existing Statutory Section 28 'Spatial Planning and National Roads Guidelines for Planning Authorities'.
		With respect to EIAR scoping issues, the recommendations indicated below provide only general guidance for the preparation of an EIAR, which may affect the national road network.
		The developer/scheme promoter should have regard, inter alia, to the following:
		 Consultations should be had with the relevant Local Authority/National Roads Design Office with regard to the locations of existing and future national road schemes.
		 TII would be specifically concerned as to potential significant impacts the development would have on the national road

Consultee	Type & Date	Summary of Response
		network (and junctions with national roads) in proximity to the proposed development, including the potential hau route.
		 The developer should assess visual impacts from existing national roads.
		• The developer should have regard to any EIAR/EIS and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should, in particular, have regard to any potential cumulative impacts.
		 The developer, in preparing EIAR, should have regard to TII Publications (formerly 'DMRB' and the 'Manual of Contract Documents for Road Works').
		 The developer, in preparing EIAR, should have regard to TII's Environmental Assessment and Construction Guidelines, including the 'Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes' (National Roads Authority (NRA), 2006).
		 The EIAR/EIS should consider the' Environmental Noise Regulations 2006' (SI 140 of 2006) and, in particular, how the development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see 'Guidelines for the Treatment of Noise and Vibration in National Road Schemes' (1st Rev., NRA, 2004)).
		It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site, with reference to impacts on the national road network and junctions of lower category roads with national roads. In relation to national roads, TII's 'Traffic and Transport Assessment Guidelines' (2014) should be referred to in relation to proposed development, with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of TII's TTA Guidelines, which addresses requirements for sub-threshold TTA. Any improvements required to facilitate development should be identified. It will be the responsibility of the developer to pay for the costs of any improvements to national roads to facilitate the private development proposed, as TII will not be responsible for such costs.
		The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required.
		 In the interests of maintaining the safety and standard of the national road network, the EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network.
		• TII recommends that that applicant/developer should clearly identify haul routes proposed and fully assess the network to be

Consultee	Type & Date	Summary of Response	A .	
		traversed. Where abnormal 'v separate structure approvals/perf required in connection with th structures on the haul route th Council administrative areas applicant/developer to confirm th any abnormal 'weight' load propo	weight' loads are pro mits and other licences r he proposed haul rou rough all the relevant should be checked t heir capacity to accomr osed.	pposed, may be ute. All County by the modate
		In addition, the haul route should be as accommodate abnormal 'length' loads and	sessed to confirm capa any temporary works re	acity to equired.
		The national road network is managed by Partnership (PPP) Concessions, Motorw Contractors (MMaRC) and local road auth	a combination of Public ay Maintenance and R orities, in association wit	Private enewal th TII.
		The applicant/developer should also con MMaRCs and road authorities over whic ascertain any operational requirements, inc so as to ensure that the strategic function safeguarded.	isult with all PPP Comp th the haul route traver cluding delivery timetablin of the national road net	panies, rses, to ng, etc. twork is
		Additionally, any damage caused to the par road network arising from any temporar movement of abnormal loads (e.g., tearing shall be rectified in accordance with TII Par in this regard shall be agreed with the commencement of any development on sin	vement on the existing n ary works due to the ng of the surface course avement Standards and Road Authority prior te.	national turning e, etc.) details to the
		 It is noted that grid connection proved to connect to the Corderry there are unlikely to be any iss national roads. However, should development, please note, any gr proposals should be developed schemes, as TII will not be response any future relocation of cable catered for in an area of a proprotation should of existing crossings, depth of call 	roposals are indicated as 110kV Substation and a sues to address in rela proposals alter during id connection and cable to safeguard propose nsible for costs associat routing, where proposa osed national road sche be given to routing optio ble laying, etc.	s being as such ation to project routing ed road red with als are eme. In ns, use
		In the context of the existing national road the National Planning Framework Natio 'Enhanced Regional Accessibility', there is strategic capacity and safety of the networ reflected in the National Development I Framework for Transport in Ireland and als 28 Spatial Planning and National Ro Authorities.	ds network, in accordance nal Strategic Outcome is a requirement to maint ork. This requirement is Plan, the National Inve to the existing Statutory Statuto	ce with a no. 2 tain the further estment Section lanning
		There are around 99,000km of roads in Irel which caters for strategic inter-urban trave of this. There is a critical requirement to er safety of the national road network i Government investment already made in safeguarded.	and. The national road ne I, consists of only appro- nsure the strategic capac s maintained and sig the national road net	etwork, x. 5.4% city and nificant work is

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Consultee	Type & Date	Summary of Response
		The provision of cabling along the national road network represents a number of significant implications for TII and road authorities in the management and maintenance of the strategic national road network and TII is of the opinion that grid connection cable routing should reflect the foregoing provisions of official policy and therefore, avoid grid connection routing proposals along national roads. Other consents or licences may be required from the road authority for any trenching or cabling proposals crossing a national road. TII requests referral of all proposals agreed and licensed between the road authority and the applicant which affect the national road network. Cable routing should avoid all impacts to existing TII infrastructure such as traffic counters, weather stations, etc. and works required to such infrastructure shall only be undertaken in consultation with and subject to the agreement of TII. Any costs attributable shall be borne by the applicant/developer. The developer should also be aware that separate approvals may be required for works traversing the national road network.
Leitrim County Council	Email dated 22 nd May 2023.	No specific comments in relation to traffic and transportation.

15.2.4 Study Area

The study area for Traffic and Transport assessment is defined as the Grid Connection Route between the Wind Farm Site and Corderry 110kV, the Wind Farm Site (which accommodates the substation and start of Grid Connection), the Turbine Delivery Route, the haul route for the importation of rock, concrete and other construction materials to the Grid Connection Route and Wind Farm Site primarily from local quarries, disposal of material to licenced waste facilities and lastly separate haul routes for construction delivery vehicles leaving the Wind Farm Site.

The Turbine Delivery Route is shown on **Figure 15.1**, the transportation routes are shown on **Figure 15.2**, the Grid Connection Route are shown on **Figure 15.3** and locations for waste disposal sites for both soil, stone and bituminous products are shown on **Figure 15.4**, the concrete suppliers haul routes in the Project Area are shown on **Figure 15.5** and the location of traffic counts are shown on **Figure 15.6**.

It is proposed that the turbine and electrical components will be delivered via Killybegs Harbour, Co. Donegal. Killybegs Turbine Delivery Route:

- Exit Killybegs Harbour taking the 2nd exit at the roundabout to the Shore Road
- Continue on Shore Road and turn right onto the R263
- Continue on R263 until the road joins to the N56
- At the 1st roundabout near Donegal town, continue on the N56
- 16D. 79/07/2024 At the 2nd roundabout near Donegal town, take the 2nd exit onto the N15
- At the roundabout outside Laghey, continue on the N15
- At the roundabout outside Ballyshannon, continue on the N15
- At the 1st roundabout outside Bundoran, continue on the N15
- At the 2nd roundabout outside Bundoran, continue on the N15
- Continue on N15, then join onto the N4
- Continue on N4 through 4 roundabouts
- Turn left onto R285
- Turn right onto R285
- Turn left onto R280
- Veer left off the R280 and join the L4251, then re-join R280
- Continue on the R280 and turn left onto the L-4282
- Continue on L-4282 until left turn to the Wind Farm Site entrance (see Figure 15.1)

All sub-base, base course and final running layer materials for the access road and Turbine Hardstand construction will require importation. Specific grades of rock fill may be required as fill under Turbine Foundations. The crushed stone as well as rock fill and concrete for Turbine Foundations, concrete blocks for the construction of substation buildings and precast chambers for site cabling will be sourced from one of the local quarries in the area. Concrete, crushed stone and concrete blocks for construction of the Project will come from licenced quarries in the locality such as (see Figure 15.5):

- Harrington Conrete, Ballysadare, Co. Sligo
- Kerrigan Quarries, Dromahair, Co. Leitrim
- David Trotter and Sons Limited, Co. Leitrim
- McManus Quarry, Co. Leitrim
- Drumkeerin Stone, Co. Leitrim

Concrete, crushed stone and concrete blocks for construction of the Project will come from licenced quarries Harrington Concrete and Kerrigan Quarries. Deliveries will approach the site from the north via the N16 or R280 followed by the L-4282, into the site access road. There is also a possibility the deliveries may come from the N4 onto the R280 and then turn into the L-4282, then continuing to the site access road.

The delivery route for general construction traffic, including deliveries and site staff will gain access through Drumkeeran and the existing L-4282 at its junction with the R280.

15.2.5 Desk Study

Desk Studies of the Study Area were largely completed in advance of undertaking the route survey. This involved using Google Maps and Streetview to assess the proposed haul route road network from Killybegs Harbour to the R280/L4282 Junction in Drumkeeran and the Grid Connection Route using the L-4282 and L-8280.

Leitrim County Council were consulted as part of the Scoping process. Leitrim County Council did not have any specific comments in relation to traffic and transport at that stage as per email correspondence received 22nd May 2023 (see **Table 15.2**).

Traffic count data from TII was used to assess the current Baseline Scenario on the N4 in the area¹.

For supplementary background information, Planning Documentation (Environmental Impact Assessment Reports, 2018 and 2020) in relation to Tullynamoyle Wind Farm was reviewed to examine how transportation from the R280 was considered as part of that project and if any traffic count data was available so as to give an indication of background flows.

Data from the TII Traffic counters was used to quantify the traffic on the N4 to the east of Carrick-on-Shannon and on the N16 to the west of Belcoo. Traffic counts from these points were used to provide background traffic volumes on the local public network.

15.2.6 Field Work

The range of wind turbines under consideration, the rotor diameters will vary from 149.5m to 150m. For a typical central hub diameter of 3m, the blade lengths will be 57.2m. No additional works are required to facilitate their transportation, nor any further impacts predicted.

¹ Transport Infrastructure Ireland (2023). *Traffic Count Data*. Available at <u>https://www.tii.ie/roads-tolling/operations-and-maintenance/traffic-count-data/</u>. [Accessed on 10/08/23]

The distance between Killybegs Harbour and the Site is c. 156.2km

A morning traffic count was undertaken at the R280/L-4282/R200 junction during peak 79/07/202 morning traffic from 8:00am to 9:00am.

15.2.7 Evaluation of Potential Effects

The baseline environment is described in Section 15.3. The available data will then be utilised to identify and categorise potential effects likely to affect the national and local road network used for the Turbine Delivery Routes, the Construction Haul Routes, and the Grid Connection as a result of the Project.

The Environmental Protection Agency's Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022) for the assessment of effects requires that likely effects are described with respect to their extent, magnitude, type (i.e. negative, positive or neutral) probability, duration, frequency, reversibility, and transboundary nature (if applicable). The descriptors used in this Environmental Impact Assessment Report (EIAR) are those set out in EPA (2022) 'Glossary of Impacts'.

Effects may be categorised as follows:

- Direct: where the existing traffic and transport environment in proximity to the Proposed Development is altered, in whole or in part.
- Indirect: where the traffic and transport environment beyond the Proposed • Development is altered by activities related to the construction or operation of the Proposed Development.
- No Effect: where the Proposed Development has neither negative nor positive effect upon the traffic and transport environment.

15.2.8 Sensitivity

The sensitivity of the local transport infrastructure has been identified utilising the criteria outlined within the Transport Infrastructure Ireland (TII) Guidance. These criteria are outlined within Table 15.3 below.

Importance	Description
High	Receptors of greatest sensitivity to changes in traffic flow including: People whose livelihood depends upon unrestricted movement within their environment including commercial drivers and companies who employ them, local residents, schools and colleges.

Table 15.3: Receptor Sensitivity

Importance	Description
Medium	Traffic flow sensitive receptors including: People who habitually pass through the area, but whose livelihoods are not dependent on free access. Would also generally include congested junctions, community services, parks, businesses with roadside frontage and recreation facilities.
Low	Receptors with some sensitivity to changes in traffic flow: People who occasionally use the road network. Would also include public open spaces, nature conservation areas, listed buildings, tourist attractions, residential roads with adequate tootway provision and churches.
Negligible	Receptors with very low sensitivity to traffic flows: People not sensitive to transport effects. Would also refer to receptors that are sufficiently distant from the affected roads and junctions.

Table 15.4 below provides the general approach to determining the importance and sensitivity of a resource or receptor based on The Institute for Environmental Management and Assessment (IEMA) Guidelines² as it is not conveyed in the TII Guidelines. The assessment of environmental impacts arising from road traffic is not an exact science and a degree of professional judgement is required. The definitions set out in **Table 15.4** below are generally applied. This will partially define the magnitude and significance criteria set out in the sections below, while applying thresholds quoted in the IEMA Guidance. Sensitive receptors are generally areas with key facilities associated with high footfall.

Table 15.4:	Determining the	e Importance	/ Sensitivity	of Receptor

Importance/Sensitivity of Receptor	Resource	Receptor
High	Traffic flows on highway network near schools, colleges, hospitals playgrounds, accident blackspots, retirement homes and roads without footways that are used by pedestrians.	Residents/workers travelling to and from work on foot and by vehicle, school children, leisure walkers.
Medium	Traffic flows at congested junctions and on highway network near shopping areas with roadside frontage, roads with narrow footways, unsegregated cycleways, community centres, parks, recreation facilities.	Residents/workers travelling to and from work on foot and by vehicle, school children, leisure walkers, people visiting shops etc.
Low	Traffic flows adjacent to places of worship, public open space, nature conservation areas, listed buildings, tourist attractions and residential areas with adequate footway provision.	Residents/workers travelling to these places.
Very Low	Receptors with low sensitivity to traffic flows and those sufficiently distant from affected roads and junctions.	Residents/workers travelling by foot or by vehicle.

²The Institute of Environmental Management and Assessment (1993), Guidelines for the Environmental Assessment of Road Traffic

15.2.9 Magnitude

The magnitude of potential impacts has been defined in accordance with the criteria provided in the 2002 EPA publication 'Guidelines on the information to be contained in Environmental Impact Statements' as outlined within **Table 15.5**.

The Institute for Environmental Management and Assessment (IEMA) Guidelines contains two broad principles to determine the scale and extent of an assessment, which are:

- Principle 1 include road links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles is predicted to increase by more than 30%).
- Principle 2 include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

If the predicted increase is lower than these thresholds, then the effects can be considered to be low or not significant. If the increases are above the thresholds, then the increase can potentially be significant and assessment is required.

On roads where existing traffic levels are generally low e.g. on local roads such as those on the Turbine Delivery Route between the R280 and Site and the local roads, L-4282 and L-8280, which are to accommodate the grid connection, increase in traffic flow during construction are likely to be higher than the IEMA Guideline thresholds and in such cases it is necessary to consider the overall increase in traffic flows and the capacity of the road before making a conclusion on effects.

In this case, the R280 has been used successfully for the construction of Tullynamoyle Wind Farm, which currently has 15 operational turbines.

The IEMA Guidelines acknowledge that there are no commonly agreed thresholds for judging the magnitude of change for the effects assessed, with the exception of severance, for which IEMA suggests thresholds of 30%, 60% and 90% for slight, moderate and substantial impacts respectively.

For the most robust approach, the built-up area thresholds in line with the IEMA guidance have been used to guide assessments of magnitude of change. However, a level of professional judgement has been applied to arrive at a set of common thresholds for ascertaining the magnitude of impact. In respect of the environmental effects of traffic, magnitude, based on increase in total vehicular traffic and/or HGV traffic has been determined on the following basis:

- High considerable deterioration / improvement in local circumstances (total traffic flows of +/-90%).
- Medium readily apparent change in conditions (total traffic flows of $+/-60 \text{ }^{\circ}90\%$).
- Low perceptible change in conditions of circumstances (total traffic flows of +230 60%).
- Very Low no discernible change in conditions (total traffic flows of less than +/- 30%).

Table 15.5: Magnitude of Change

Magnitude of Effect	Description
Significant	The Proposed Development could result in a change of length or duration to the current traffic routes or schedules which could result in hardship.
Moderate	The Proposed Development could result in delays or the need to reschedule which may cause inconvenience.
Slight	The Proposed Development could occasionally cause minor modifications to routes, or slight delays in current schedules, or on activities in the short-term.
Imperceptible	The Proposed Development does not cause an effect on movement of road traffic above normal levels.

15.2.10 Significance of Effects

A combination of the magnitude of the impact under consideration and the sensitivity or value of the receiving environment / receptor, as set out in **Table 15.4** can be used in considering the overall significance of an effect. The general approach adopted for classifying effects is outlined in **Table 15.6**. A Major Moderate effect is seen as '**significant**'. A Minor or Negligible effect is seen as '**not significant**'.

Magnitude of Impact Sensitivity/Value of Receptor High Medium Very Low Low Moderate Minor High Major Major Medium Major Moderate Minor Negligible Low Moderate Minor Negligible Negligible Very Low Minor Negligible Negligible Negligible

Table 15.6: Significance of Effects

15.3 BASELINE DESCRIPTION

15.3.1 Site Location, Context and the Project

Separate haul routes are proposed for abnormal turbine components, civil construction material and components for the Wind Farm, and various elements of the Grid Connection. Each are described below.

The Turbine Delivery Route is shown in **Figures 15.1**. Thee proposed Construction Haul Routes (crushed stone, concrete, concrete blocks and precast units) will come from the quarries as shown on **Figure 15.5**. The Grid Connection Route is shown on **Figure 15.3**. Disposal routes for soil and stone excavated for the Grid Connection are snown in **Figure 15.4**.

It is proposed that the turbine nacelles, tower hubs and rotor blades will be landed at Killybegs Harbour, County Donegal. From there they will be transported to the N56 some 4.0km northeast of the harbour. The route primarily follows the national road network namely the N56, N15, N4, R285 and R280 before turning left onto the local road L-4282 towards the Wind Farm Site entrance.

Whilst a final choice of turbine type for the Development has yet to be made, the vehicle used for the Swept Path Analysis is the largest associated with the turbines currently being considered (see **Chapter 2: Project Description**, **Section 2.5.2** for further details). The Swept Path Analysis has been completed for a turbine with 117m rotor diameter, which has a blade length of 57.2m. This is the longest blade length of all the turbines currently under consideration and would have the greatest potential impact on road passage requirements. As the shortest blade under consideration would be 57.2m. No additional works are required to facilitate their transportation nor are any further impacts predicted.

While a detailed assessment of the route is presented in this chapter and associated appendices, it should be noted that the route from Killybegs to Drumkeeran was used for the transport of turbine components to the Tullynamoyle wind farm. To confirm the suitability of any changes to the roadway or to street furniture along the route between EIAR and preconstruction, a further survey of the route will be undertaken using a transport vehicle prior to the delivery of turbine components to Site.

For the civils works during construction, crushed stone materials for the running surfaces of the Wind Farm Site access roads and Turbine Hardstands will be sourced from one of the local authorised quarries in the area. Ready-mix concrete for Turbine Foundation construction and Wind Farm Substation will also be sourced from one of the local authorised quarries. The local quarries are located to the south of Drumkeeran, south of Killargra, north-west of Manorhamilton, or in Gelnfarne as described in **Section 15.2.4** above. HGVs from any of these quarries will use the same routes between the R280 and the Wind Farm Site. The proposed Construction Haul Routes are outlined in **Figure 15.2**. Other material deliveries will use standard HGVs and use the local, national and regional road network.

For the Grid Connection, traffic for the delivery of crushed stone, ducting, cables and precast components and for the removal of spoil will access the Grid Connection Route from the Corderry 110kV Substation southwards along the L-8280 and joining the L-4282 towards the Wind Farm Site. The L-8280, L-4282 and R280 will be used for deliveries to the Grid Connection to be constructed within the L-8280 and L-4282.

Workers employed on the Wind Farm Site will generally use the R280 and the Construction Haul Routes to reach the sites.

15.3.2 Sensitive Receptors

The Wind Farm Site is generally served by the R280 which runs between Drumkeeran and Carrick-On-Shannon. The R280 is approximately 2.5km to the east of the Site and has a speed limit of 100km / hour (hr).

Receptors considered as having 'high' sensitivity are primarily premises which are directly on the N56, N15, N4, R285, R280, L-4251 and L-4282 which have significant potential to generate traffic.

Between Killybegs Harbour and the Wind Farm Site, the sensitive receptors are assessed in **Table 15.7**.

Receptor	Sensitivity	Reasons/Comments
LYIT School of Tourism, Killybegs, Co. Donegal	Medium	Located adjacent to Shore Road after leaving Killybegs Harbour
Various businesses in Killybegs including Gallagher Brothers Fish Merchants Limited	Medium	Located in close proximity to Shore Road leaving Killybegs Harbour and R263 through Killybegs town
Killybegs Community Hospital, Killybegs, Co. Donegal	High	Local hospital adjacent to R263 in Killybegs town
St. Catherine's Vocational School, Killybegs, Co. Donegal	Medium	Secondary school with direct access to the R263
Circle K and Top Service Stations, Killybegs, Co. Donegal	Medium	Service stations and shops with direct access to the R263
Pelagia Feed (Ireland) Ltd., Killybegs, Co. Donegal	Low	Commercial business with direct access to the R263
Topline McGuiness Store, Bruckless, Co. Donegal	Very Low	Home improvement store with access adjacent to the N56

Table 15.7: Sensitivit	y of Receptors – Turbir	e Delivery Route
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Receptor	Sensitivity	Reasons/Comments
Glenstone Quarry, Bruckless, Co. Donegal	Low	Stone quarry with access adjacent to the N56
Church of St Joseph and St Conal, Bruckless, Co. Donegal	Medium	The church is located along the N56 and fronts onto the Haul Route with parking across the road. Some mass attendees are highly likely to use the N56 to get to the church and increased traffic on the road may affect access and egress from the church car park.
Various businesses in Bruckless including Bruckless Community Centre	Low	Businesses exit directly on to the N56
Various business, private dwellings and factories in Dunkineely including Charles Vial (Fish Merchant) Limited	Low	Businesses and private dwellings on both sides of the N56 in close proximity.
Dunkineely National School, Co. Donegal	Medium	National school with direct access to the N56
Naomh Ultan GAA Club, Dunkineely, Co. Donegal	Medium	GAA club and large car park adjacent to the N56
Kennedy Supplies, Inver, Co. Donegal	Low	Commercial business with direct access on to N56
McMonagle Marble & Granite, Mountcharles, Co. Donegal	Low	Commercial business with direct access on to N56
Various businesses near Mountcharles	Low	N56 bypasses majority of Mountcharles town
Various businesses near Doonan Court including NCT Donegal Town, Holmes Service Station and Herron Auto	Medium	Commercial business with direct access on to N56
Four Masters GAA, Drumcliff, Co. Donegal	Low	GAA club and car park adjacent to the N56
Various businesses and private dwellings around Donegal town	Very Low	Loop road avoids Donegal town businesses and private dwellings in the area
The Primary Care Centre, Drumlonagher, Co. Donegal	Medium	The hospital is located adjacent to the N56, off the Drumlonagher roundabout. Access is away from haul route but increased traffic volume is likely
Donegal County Council, Drumlonagher, Co. Donegal	Low	The county council is located adjacent to the N56, off the Drumlonagher roundabout. Access is away from haul route but increased traffic volume is likely
St. Eunan's National School, Laghy, Co. Donegal	High	Primary school with direct access on to the N15
Various businesses in Laghey including Roadstone Laghey	Low	Commercial businesses with direct access to the N15
Roadstone Ballintra, Co. Donegal	Low	Stone quarry with direct access to the N15

Receptor	Sensitivity	Reasons/Comments
Patrick McCaffrey & Sons, Ballymagrorty Irish, Co. Donegal	Low	Stone quarry with direct access to the N15
Various businesses and private residences in Ballyshannon area including Kilbarron National School	Very Low	Road bypasses businesses and residences with no direct access to the N15
Various private residences on outskirts of Bundoran, Co. Donegal	Very Low	Road bypasses businesses and residences with no direct access to the N15
Various private residences and Topaz service station, Tullaghan, Co. Donegal	Low	Commercial businesses and residences with direct access to the N15
Various businesses and Cliffoney National School, Cliffoney, Co. Sligo	High	Businesses and a national school with direct access to the N15
Various self-catering accommodations and Scoil Bhríde Carns National School, Carns, Co. Sligo	High	Self-catering accommodations and a national school with direct access to the N15
St. Molaise Gaels GAA Club, Grange, Co. Sligo	Low	GAA club and car park adjacent to the N56
Scoil Naomh Molaise, Grange, Co. Sligo	Medium	Primary school with access behind the Church of Mary Immaculate in Grange village
Various businesses including SuperValu, Circle K Service Station and SF Engineering in Grange	Low	Commercial businesses with direct access to the N15
Grange Post Primary School and North Sligo Sports Centre	Low	Secondary school with access back from N15 and grange village
Drumcliffe Family Practice, Drumcliff, Co. Sligo	High	Hospital with direct access to the N15
Davis' Restaurant & Yeats Tavern, Drumcliff, Co. Sligo	Low	Bar & restaurant with direct access to the N15
Drumcliffe Church & W.B Yeats' Grave, Drumcliff, Co. Sligo	Medium	Church, graveyard and popular tourist attraction with direct access to the N15.
Various businesses in Rathcormack including Certa service station	Low	Commercial businesses with direct access to the N15
St. Colmcille Church, Rathcormack, Co. Sligo	Medium	Church and car park with direct access to the N15. Some mass attendees are highly likely to use the N15 to get to the church and increased traffic on the road may affect access and egress from the church car park.
Rathcormack National School, Rathcormack, Co. Sligo	High	Primary school with direct access to the N15
Various businesses and private dwellings in north Sligo town	Low	Haul route passes in close proximity to access roads for various businesses and housing estates in north Sligo town

Receptor	Sensitivity	Reasons/Comments
Sligo Bus/Train station and various business in vicinity to Sligo bypass road	Low	Bypass road with several junctions to businesses and access in Sligo town
Kingsbridge Sligo Private Hospital, Co. Sligo	Very Low	Hospital with access on opposite side of road. Can only be accessed when approaching from the south
Summerhill College, Co. Sligo	Medium	Secondary school and car park with direct access to the Summerhill roundabout
Connolly's Volkswagen Sligo, Co. Sligo	Very Low	Car dealer adjacent to slip road off N4
Crossna Community Centre, Cleen, Co. Roscommon	Medium	Community Centre with direct access to the R285
Strabraggan National School, Co. Roscommon	High	School with direct access to the R280
St. Patrick's Church, Tarmin, Co. Leitrim	Medium	Church with direct access to the R280
ST Brigid's N.S Primary School, Drumkeeran, Co. Leitrim	High	School with direct access to the L4251
Various businesses and private dwellings through Drumkeeran Co. Roscommon	High	Businesses and private dwellings entering, transiting and exiting Drumkeeran village.

For the civil works construction haul route to the Wind Farm Site, the sensitive receptors are assessed in **Table 15.8**.

Table 15.8: Sensitivity of Receptors – Construction Haul Route to Site

Receptor	Sensitivity	Reasons/Comments
Various businesses and	High	Businesses and private dwellings entering, transiting and exiting
private dwellings through		Drumkeeran village.
Drumkeeran Co. Leitrim.		
		Direct access to the L-4282 and R280.

For the civil works construction haul route away from site to the R280, the sensitive receptors are assessed in **Table 15.9**.

Table 15.9: Sensitivity of Receptors – Construction Haul Route Away from Site

Receptor	Sensitivity	Reasons/Comments
Various businesses and	High	Businesses and private dwellings entering, transiting and exiting
private dwellings through		Drumkeeran village.
Drumkeeran Co. Leitrim.		
		Direct access to the L-4282 and R280.

For the Grid Connection works and the construction haul routes to these areas, the sensitive receptors are assessed in **Table 15.10**.

Table 15.10: Sensitivity of Receptors – Grid Connection Haul Routes

Receptor	Sensitivity	Reasons/Comments	KCA
Agricultural Landholdings,	High	Direct access onto L-4282 and L-8280	N.
Residences on L-4282,			·O. · 70
and L-8280			

For works within the Site, the sensitive receptors are assessed in Table 15.11.

Table 15.11: Sensitivity of Receptors – Wind Farm Site

Receptor	Sensitivity	Reasons/Comments
Workers cutting turf in the Wind Farm Site	High to Low	Coordination with local communities required to enable continued
Wind Faim Sile		

15.3.3 Road Access to the Site

15.3.3.1 Turbine Haul Route

The Turbine Delivery Route will primarily be on the National Primary Roads shown in **Figure 15.1**. These include the N56, N15, N4. These roads vary in terms of width, number of lanes and types of junctions.

Leaving Killybegs Harbour, the Shore Road is followed running parallel to the harbour until joining the R263. The R263 transits through the business and residential areas of Killybegs. The speed limit is 50km/h within Killybegs town. After the speed limit increases to 60km/h and then 80km/h. At Straleeney the R263 merges into the N56 and the speed limit increases to 100km/h.

Following the N56, the road is broadly the same until the 1st roundabout outside Donegal town. Between Straleeney and Donegal town, the road does narrow and slows when transiting areas of higher population density such as Bruckless, Dunkineely and Doonan Court, given the presence of existing on street car parking and roadside dwellings or businesses. Taking the bypass around Donegal avoids most business and residential areas of Donegal town however the 2nd roundabout encountered will have a higher concentration of traffic given its proximity to businesses and services.

Continuing onwards south, Laghey is the next populated area approached. A primary school and some businesses front on to the N15 in Laghey however the road is substantially wide. Further south, the N15 bypasses several populated areas, namely Ballintra, Ballyshannon and Bundoran. Entering Co. Leitrim, the road narrows and slows in Cliffoney with a primary school and several businesses with on street parking. Grange is a similar village further southwest but with a higher population density. Again, a primary school and several businesses with on street parking narrow the road.

Across Drumcliff and Rathcormack, traffic will be slowed due to the primary care centre, Drumcliff church & W. B Yeats' Grave, St Colmcille Church and Rathcormack National School nearby the road. Further south the N15 converges with the N4 at the bridge crossing the Garavogue River. The road widens to a dual lane for the duration along the N4 also. There are number of traffic lights and junctions along the Sligo bypass but passage should be relatively easy. Beyond the Summerhill roundabout, the road widens further to dual carriageway.

Thereafter the route turns left to join the R285 followed by a right turn towards Keadew, and continuing straight to turn left to join the R280, thereafter keep left on the L-4251 and then continue on the R280 towards Drumkeeran.

Following the R280 northwards, the road is broadly similar up to the left turn at the L-4282 at Drumkeeran towards the Wind Farm Site. The road does slow and narrow with bends. However no major modifications or upgrades are expected to this part of the haul route.

Turbine delivery vehicles will exit the R280 turning left on to the L-4282 (see Photo 15.1).



Photo 15.1 - R280 and L-4282 Junction

Continuing along the L-4282 the haul route passes by a few private dwellings (see **Photo 15.2**). Consideration should be taken of school opening hours as access may be restricted with cars parked on both sides of the road.



Photo 15.2 – Local Road L-4282

15.3.3.2 Construction Haul Route to Site

From the R280, trucks will follow the L-4282 in a westly direction to the Site.

For the quarries in the area, trucks will approach from the R280 and then follow the Construction Haul Route to the Wind Farm Site as detailed above.

The L-4282 towards the Wind Farm Site varies in width from c. 4-5m, generally with verges each side (see **Photo 15.3**). It has a general speed limit of 80km/h.



Photo 15.3 – Local Road L-4282 Road Condition



Photo 15.4 – Local Road L-4282 Speed Limit



Photo 15.5 – Local Road L-4282 Residential Houses



Photo 15.6 – Local Road L-4282 Site Entrance

15.3.3.3 Construction Haul Route Away From Site

The Construction Haul Route away from Site will follow the same path as the construction haul route to Site.

15.3.3.4 Roads On Grid Connection Route

Leaving the wind farm site, the grid route will follow L4282 in an easterly direction for a distance of approx. 652m, before veering left to join the L8280. From here the grid connection will continue in a general northerly direction for approx. 5.6km before joining the existing Corderry 110kV Substation. The grid connection route will traverse seven existing bridges and water crossings along the L8280. Of the 6.3km, some 6.260km will be buried within the existing roadway with the remaining 40m consisting of overhead lines.

Of the total length of 6.4km, the majority will be within public roads. The L-8280 and L-4282 are reasonably narrow at c.3 - 4m with sporadic private dwellings along the route.

15.3.4 Delivery Vehicle Specification

Delivery of wind turbine components will be carried out using oversized vehicles. Two different types of loads will arise, very long loads for turbine blades and wide/high loads for tower bottom sections. The longest vehicle used during deliveries will be for the rotor blades and will be approximately 7m long articulated vehicle with a trailer length of 62.4m and a 14.1m overhang for the blade. An indicative delivery vehicle schematic is shown in **Plate 15.1** below. The Tullynamoyle Swept Path Analysis assesses the extent of obstacles to be removed (e.g. tree pruning) or relocated (street furniture or poles) or the extent of any

potential oversail into private lands associated with blade transportation. It was based on the use of a 57.2m blade which is the longest blade for the range of turbines under consideration. No additional works are required to facilitate their transportation and no further impacts are predicted.



Plate 15.1: Turbine Delivery Vehicle for Turbine Rotor Blades

The widest and tallest turbine delivery vehicle in relation to the ground will be for the turbine tower sections. The bottom tower section will be 4.69m wide which is 0.14m wider than the blade delivery vehicle. These dimensions will be similar for the range of turbines under consideration. They are 4.435m tall which is 1.035m taller than the blade delivery vehicle and 0.335m taller than the hub delivery vehicle. This vehicle is shown in **Plate 15.2** below.

For the tower sections associated with the range of turbines under consideration, no additional works outside of those required for the blades are required to facilitate their transportation and no further impacts are predicted.

It is noted that the route has been used for the delivery of turbine components to nearby wind farms and the specifications in terms of height and width of vehicles is similar.



Plate 15.2: Turbine Tower Section Delivery Vehicle

Delivery of other materials to the Wind Farm Site for the construction of the Wind Farm will be undertaken using standard HGVs, the largest of which is expected to be a 16.5m standard axle articulated vehicle.

A Blade Lifter will be used for transporting blades through Drumkeeran town which is a narrow haul route. The Blade lifter then will navigate through the R280/L-4282/R200 junction onto the L-4282 and making its way to the site entrance. The first use of the

hydraulic blade lifter for transporting wind turbines blades in Ireland was use for transport Ballincurry Wind Turbines, Co Tipperary. It was used for transporting blades through towns and narrow haul route to site. The blade can be lifted and rotated while in transport and only . 79107,202× overhead ESB & Eir cables had to be temporarily removed.

15.3.5 Existing Traffic Volumes

15.3.5.1 TII DATA

TII count traffic continuously³ on the N4 at Drumdoney, southeast of Castlebaldwin (Station Id: TMU N04 170.0 E), see Figure 15.6. The Average Annual Daily Traffic (AADT) volume on the road was recorded to be 6.886 vehicles in 2019 (2020 and 2021 values are less due to Covid Restrictions) as outlined in **Table 15.12**. From this figure, in 2019, the number of HGVs was 386 with light vehicles making up the remaining 6,500 of the total of 6,886. For 2022, the AADT was slightly lower than in 2019 (6,717 vehicles) and the number of HGV was lower at 369.

Table 15.12: TII Traffic Data

Station Id. TMU N04 170.0 E Description: N04 Between Castlebaldwin and Boyle, Dromdoney, Co. Sligo.								
Year	AADT	% HGV	Coverage					
2022	6,717	5.5%	100.0%					
2021	5,629	6.4%	100.0%					
2020	4,937	7.2%	100.0%					
2019	6,886	5.6%	98.1%					

As would be expected, there is no specific traffic data from TII for the local roads in the vicinity of the Wind Farm Site as TII's counters are located only on National roads.

The classified traffic counts were carried out during the morning and evening peak hour traffic periods to record maximum traffic levels on the road network. The classified traffic counts were carried out at the following locations:

R280 / L-4282 / R200 Junction

15.3.5.2 Traffic Counts at R280 / L-4282 / R200 Junction

A short period traffic count was carried out at the R280/L-4282/R200 junction on Wednesday 05th July 2023. The count was carried out between the hours of 08:00 and 09:00 during the morning period. The location of the traffic count is shown on Figure 15.6. The layout of the junction is shown on Photo 15.7.

³ https://trafficdata.tii.ie/publicmultinodemap.asp



Photo 15.7 – R280/ L-4282/ R200 Junction Layout

Turning movements at the junction are shown on **Figure 15.3** during the AM period. The arrows show the direction of travel with the total count of traffic movements.



Plate 15.3: Junction Turning Movements at R280/ L-4282/ R200

The Annual Average Daily Traffic (AADT) values for each of the R280/ L-4282 and R200 roads were calculated using TII Publication PE-PAG-02039 "Expansion Factors for Short Period Traffic Counts". This document provides a mechanism to convert short-term traffic

count data to AADT. The study area is located within the West region. From Appendix A of PE-PAG-02039, the proportion of the 24-hour traffic occurring during the period 08:00 – 09:00 is 0.077.

For the R280, the traffic movements northbound is 70 (13+55+2) and the southbound total 111 (92+15+4) The total of the two counts is 181. The 24-hour estimate is therefore 2479 (181/0.073) vehicles.

For the L-4282 and the period 08:00 - 09:00, the traffic movements correspond to all directions and total 4 (2+2+0). The 24-hour estimate is therefore 55 (4/0.073).

For the R200 and the period 08:00 - 09:00, the traffic movements correspond to all directions and total 15 (7+9+0). The 24-hour estimate is therefore 219 (16/0.073).

The survey was carried out on a Wednesday. From Appendix B of PE-PAG-02039 the daily traffic flow is 0.98 times the Weekday Average Day Traffic (WADT). Multiplying the 2479, 55 and 219 values derived above by 0.98 gives the weekly average daily traffic values of 2430 for the R280, 54 for the L-4282 and 215 for the R200.

The final calculation is to convert to AADT by factoring for month of year. The traffic count was carried out in July. From Appendix C of PE-PAG-02039, the factor for conversion for the Border (West) region is 0.88. Thus, the AADT for the R280 is 2138 while the AADT for the L-4282 is 47 and R200 is 189.



Plate 15.4: Movements Numbered at R280/ L-4282/ R200

The above **Plate 15.4** indicates the movement numbers which is used to develop **Table 15.13** below.

Type of	Movement	Movement	Movement	Movement	Movement	Movement
Vehicle	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
08.00 to 09.00						
Cars	3	69	1	2	0	0
Vans & LGV's	3	17	1	0	0	0
Trucks	1	6	0	0	0	4
Articulated Trucks	0	0	0	0	0	0
Buses	0	0	0	0	0	0
Motorbikes	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0
Totals	7	92	2	2	0	4
Veh.s/Minute	0.12	1.53	0.03	0.03	0.00	0.07
% Heavy Veh.s	14%	7%	0%	0%	0%	100%
Type of	Movement	Movement	Movement	Movement	Movement	Movement
Vehicle	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12
08.00 to 09.00						
Cars	2	42	8	14	0	10
Vans & LGV's	0	10	0	1	0	3
Trucks	0	2	1	0	0	0
Articulated Trucks	0	0	0	0	0	0

Table 15.13: R280/L-4282/R200 Junction – Existing Traffic Flows – 05th July 2023

Type of	Movement	Movement	Movement	Movement	Movement	Movement
Vehicle	No. 7	No. 8	No. 9	No. 10	A lo. 11	No. 12
Buses	0	1	0	0	Ċ,	0
Motorbikes	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0 0
Totals	2	55	9	15	0	713
Veh.s/Minute	0.03	0.92	0.15	0.25	0.00	0.22
% Heavy Veh.s	0%	0%	0%	0%	0%	0%

15.3.6 Predicted Future Traffic Volumes

TII publication "Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand projections, PE-PAG-02017, October 2021 can be used to predict future growth in traffic volumes across Ireland. Traffic volumes are predicted to increase in the coming years (predictions are for the period 2016 to 2030) when construction of the Project is likely to take place. **Table 15.14** shows the multiplier for County Leitrim under different growth rate scenarios.

Table 15.14: Traffic Annual Growth Predictions Formulae (Multipliers) for County Leitrim 2016to 2030

County	Low Sensitivity Growth Rate		Central (Growth Rate	High Sensitivity Growth Rate		
	LV	HV	LV	HV	LV	HV	
Leitrim	1.0044	1.0299	1.0060	1.0313	1.0090	1.0348	

LV = Light Vehicles, HV = Heavy Vehicles

Under the high sensitivity scenario, using the 2016 to 2030 growth factors as a worse-case scenario, the growth factor for 2026 is 1.0090 for light vehicles and 1.0348 for heavy vehicles the number of light vehicles on the R280 will increase to 1,991 in 2026 from the 2023 AADT of 1,973 and heavy vehicles to 160 in 2026 from 154 in 2023.

The recorded traffic figures show that, in 2026, the R280/ L-4282/ R200 Junction is predicted to be running at 2,400 AADT, which is approximately 20.6% of its capacity and therefore has the capacity to accommodate additional traffic in the future.

Table 15.15 shows the multiplier for County Leitrim under different growth rate scenarios from 2040 to 2050. By 2065, under the high sensitivity scenario, the growth factor for 2050 is 1.0257 for heavy vehicles. According to the TII publication "Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand projections, PE-PAG-02017, October 2021, no traffic growth beyond 2050 should be assumed unless specifically agreed with TII.

The recorded traffic figures show that, in 2050, the R280/ L-4282/ R200 Junction is predicted to be running heavy vehicles at 189 AADT at this junction, 3.3% increase from 183 AADT recorded in 2023.

Table 15.15: Traffic Annual Growth Predictions Formulae (Multipliers) for County Leftrim 2040 to 2050

County	Low Sensitivity Growth Rate		Central (Growth Rate	High Sensitivity Growth Rate		
	LV	HV	LV	HV	LV	HV	
Leitrim	0.9927	1.0140	0.9971	1.0157	1.0029	1.0257	

LV = Light Vehicles, HV = Heavy Vehicles

The estimated capacity of the R280 regional primary road is based on Table 6.1 of the TII publication DN-GEO-03031 – Rural link design which provides a table of recommended rural road layouts and capacities for each cross section. The R280 roadway at the L-4282/ R200 junction at the turnaround location is similar to a Type 1 single (7.3m) Carriageway which has a guidance capacity of 11,600 AADT for level of service D.

Table 15.16 below highlights the projected AADT values from 2023 to 2026 of the junctions affected in relation to the capacity of the current existing roadway.

Junction	AADT (2023)	AADT (2026)	Capacity (AADT)	Capacity of roadway in 2026
R280	2138	2150	5000	43%
L4282	47	48	5000	1%
R200	189	203	5000	4%

Table 15.16: Projection Summary of affected Junctions AADT from 2023 to 2026

15.3.7 Accident Statistics

The Road Safety Authority publish tables on "Road Casualties and Collisions in Ireland" each year. The last published table is for 2016.

Statistics are divided into those occurring "Inside Built-up Areas" and those occurring "Outside Built-up Areas". **Table 15.17** below presents a summary of accidents for the N4 for the years 2013 to 2016.

Year	Inside	Build Up	Areas		Outside Built-Up Areas			C.	Overall	Collision
	F	SI	MI	Total	F	SI	МІ	Tota	Total	Rate per km
2016	0	2	21	23	6	2	55	63	86 0	0.43
2015	1	0	10	11	4	3	41	48	59	7_0.30
2014	0	1	8	9	2	2	36	40	49	0.25
2013	0	0	22	22	4	6	35	45	67	0.06

 Table 15.17: Summary of Accidents for the N4 for the years 2013 to 2016

F = Fatal

SI = Significant Injuries

MI - Minor Injuries

For the N4, historical accidents were more prevalent outside built-up areas than inside them.

15.4 PROPOSED WORKS

15.4.1 Wind Farm Construction Phase

The construction period of the Project is anticipated to take approximately 14-15 months. The majority of HGV deliveries to Site will take place during Turbine Foundation, Turbine Hardstands and Site access track upgrade works. During this period, there will be trips associated with the arrival and departure of construction staff and with the delivery of crushed rock for Site access roads as well as reinforcing steel and ready-mix concrete for Turbine Foundations. Stone for Site roads and Turbine Hardstands will be sourced from the on-site borrow pit.

Staff trips will mainly be made using cars and vans, while deliveries of steel, concrete, and rock and construction materials will be made by HGVs. The majority of deliveries will be during the first half of the construction period. It is important to note that it is anticipated that ready-mix concrete and hardcore materials will be sourced from local quarries in the area.

It is expected that construction hours will be between 07:00 and 19:00 Monday to Friday and 08:00 – 13:00 on Saturdays with no working on Sundays or on Bank or Public Holidays unless agreed otherwise with Leitrim County Council (e.g. for concrete works for foundations which may start before 07:00).

Some special deliveries such as turbine components and concrete for Turbine Foundations are likely to be required to be delivered outside of these times in consultation with Leitrim County Council.

15.4.2 Turbine Component Haul Route

The abnormal loads between Killybegs Harbour and the Wind Farm Site, works will be required to facilitate the delivery of turbine components. Some of these will be relatively minor in nature for example temporary removal of street furniture and signage. These works may have a slight, negative, temporary effect on residents, businesses and road users due to the increased noise and vibration resulting from construction activities and increased journey times and delays due to temporary traffic management. However, these effects will be confined to a very short period during the construction phase, prior to the delivery of the turbine components and hence, are not predicted to have a significant effect. Once works have been completed, the works will be reinstated in accordance with the requirements of the relevant County Councils. The extent of works has been determined by reference to the haul route assessment between Killybegs Harbour and the Site access. **Table 15.18** presents a summary of the works required on the turbine component haul routes.

Table 15.18: Works Required on Killybegs Turbine Delivery Route to the Site (with refere	ence
to Tullynamoyle Route Access Survey, December 2021)	

Reference Point in Collett Report	Potential Constraint	Works Description
6.6.1	Roundabout exiting Killybegs Harbour	Visual inspection indicates that modifications to street furniture will be required at this location.
6.6.2	Splitter island on R263 in Killybegs	Visual inspection indicates that the loaded vehicle will navigate utilising manual rear steering.
6.6.3	Splitter island on R263 in Killybegs	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.6.4	S-bend in Bruckless	Visual inspection indicates the loaded blade component will navigate this location utilising manual steering.
6.6.5	Left hand bend on N56 after junction with Bruckless pier	Visual inspection indicates the loaded blade component will navigate this location utilising manual steering.
6.7.1	Splitter island on n56	Visual inspection indicates the loaded components will be required to contraflow this splitter island.
6.7.2	N56/R925 roundabout	Visual inspection indicates the loaded blade component will navigate this location utilising manual steering.
6.7.3	N56 / N15 / R267 roundabout	Visual inspection indicates the loaded blade component will navigate this location utilising manual steering.
6.7.4	N15 / R267 roundabout	Road sign on the nearside of the roundabout entry to be removed.
6.8.1	N15 / R231 roundabout	Visual inspection indicates the loaded blade component will navigate this location utilising manual steering.
6.9.1	N15 / R267 roundabout	Road sign on the nearside of the roundabout entry to be removed.
6.9.2	N15 / R267 roundabout	Visual inspection indicates the loaded blade component will navigate this location utilising manual steering.

Reference Point in Collett Report	Potential Constraint	Works Description
6.10.1	Splitter island at entry to Cliffony	Street furniture on splitter island to be removed at this location
6.10.2	Splitter island in Cliffony	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.10.3	Splitter island in Cliffony	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.10.4	Splitter island at exit from Cliffony	Street furniture on splitter island to be removed.
6.10.5	Splitter island at entry to Grange	Street furniture on splitter island to be removed.
6.10.6	Splitter islands in Grange	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.10.7	Splitter island in Grange	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.10.8	Splitter island exiting Grange	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.11.1	Splitter island on N15	Street furniture on splitter island to be removed.
6.11.2	Splitter island at entry to Rathcormack	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.11.3	Splitter island in Rathcormack	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.11.4	Splitter island in Rathcormack	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.11.5	Splitter island at exit from Rathcormack	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.11.6	Splitter island at entry to Sligo	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.11.7	Splitter island on N15 at Sligo	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.11.8	Splitter island on N15 at Sligo	Street furniture on splitter island to be removed.
6.11.9	Splitter island in Sligo at top garage	Visual inspection indicates that the loaded vehicle will navigate this location without any issues.
6.11.10	Splitter island on N15 at Circle K garage	Street furniture on splitter island to be removed.
6.12.1	Splitter island on N15 at grange	Visual inspection indicates that the loaded vehicle will navigate utilising manual steering.
6.13.1	N4 / R290 roundabout	Visual inspection indicates that the loaded vehicle will navigate utilising manual steering.
6.13.2	N4 / N17 roundabout	Visual inspection indicates that the loaded vehicle will navigate utilising manual steering.
6.14.1	N4 roundabout at Castlebaldwin	Road signs on the entry splitter island and on the central island of the roundabout are to be removed.
6.15.1	N4/R285 junction	Road signs on the entry splitter island and on the central island of the roundabout are to be removed.

Reference Point in Collett Report	Potential Constraint	Works Description
6.15.2	Left bend on R285	Third party land will be required on the nearside of the bend. Wall and fence on the nearside to be removed. Trees to be oned on both sides of the road.
6.15.3	Left bend on R285	Third party land will be required on the nearside of the bend. And fence on the nearside to be removed. Trees to be pruned on both sides of the road.
6.15.4	Right bend on R285	Trees to be pruned on both sides of the road.
6.15.5	Left bend on R285	Trees to be pruned on both sides of the road.
6.15.6	Left bend on R285	Wall on the nearside is to be removed. Trees to be pruned on both sides of the road.
6.15.7	Right bend on R285	Trees to be pruned on both sides of the road. Hedgerow on the offside to be removed.
6.15.8	Bridge and left bend on R285	Third party land will be required on the nearside of the bend. Wall and fence on the nearside to be removed. Trees to be pruned on both sides of the road.
6.15.9	Right bend on R285	Third party land will be required on the offside of the bend. Wall on the offside to be removed. Bank to be lowered on the offside. Pole on the offside to be removed. Road sign on both sides of the road to be removed. Pruning required on the offside.
6.15.10	Right bend on R285	Third party land will be required on the nearside of the bend. Widening will be required within third party land. Road sign and pole on the nearside to be removed. Hedgerow on the nearside to be removed.
6.15.11	R285/R284 junction	Road widening will be required splitter island. Loaded components are to use to slip land on the offside. End of the lane is to be opened up to allow access onto R285. Trees to be pruned on the offside of the road.
6.15.12	R285/R280 junction	Third party land will be required on the offside. The land has already been secured to allow the loaded vehicles to drive behind the pub building and navigate the junction. Trees, telegraph poles and road signs will require removal as per the swept path analysis. Ditch to be covered and hedgerow to be removed.
6.16.1	R280/Miner's way junction	Road widening will be required on the nearside of the junction. The whole length of the road will require upgrading to the turbine manufacturers specification. Road signs and poles on the nearside to be removed. Trees to be pruned on the nearside of the road.
6.16.2	Right bend on Miner's way	Road widening will be required on the nearside of the junction. The whole length of the road will require upgrading to the turbine manufacturers specification. Ditch to be covered on the nearside Trees to be pruned on the offside of the road.
6.16.3	Miners' way/R280 junction in Drumkeeran	No issues at this location.

Sligo

From **Table 15.18** above, it is evident that temporary works are required between Killybegs Harbour and the L-4282 turn-off towards the Wind Farm Site. These are shaded in "Orange" in **Table 15.18**. However, some works related to road levelling are required at certain areas 79/07/202 along the route – these are shaded in red in Table 15.18.

Construction Haul Route to Site 15.4.3

No upgrade works are necessary to the R280 and L-4282 to facilitate the delivery of materials. However, passing bays will be constructed to allow traffic to flow at all times (see Section 15.6 Mitigation Measures).

A condition survey of the road will be carried out prior to commencement of construction and another post-construction. The Developer will lodge a bond with Leitrim County Council prior to commencement of construction in the amount to be agreed with the Council for the possible repair/upkeep of the road. During the construction period, the road will be inspected weekly by the Developer's Resident Engineer. The Contractor will be instructed to repair any defects within the following two weeks. At the end of the construction period, any further defects will be remedied to the satisfaction of relevant County Councils.

15.4.4 **Grid Connection**

No road upgrade works are proposed to the L-4282 and L-8280 to facilitate the delivery of materials. A confirmatory condition survey of the L-4282 and L-8280 roads will be carried out prior to commencement of construction and another post-construction. The Developer will lodge a bond with Leitrim County Council prior to commencement of construction in the amount to be agreed with the Council for the possible repair/upkeep of the road. During the construction period, these roads will be inspected weekly by the Developer's Resident Engineer and the Contractor will be instructed to repair any localised defects within the following four weeks. At the end of the construction period, any further defects will be remedied to the satisfaction of Leitrim County Council.

The Grid Connection trenches, joint bays and link boxes will be installed in from the on-site substation to Corderry 110kV substation. Some 6.4km of trenching of the Grid Connection (double circuit) which is 0.6m wide and 2m apart, will be laid within the route. The Grid Connection Route is largely underlain by Dergvone Shale Formation with a transition to Carraun Shale Formation in proximity to Corderry 110kV substation.

The joint bays and associated communication chambers/link boxes will be laid within the L-4282 and L-8280 local roads. These local roads will be reinstated (temporary and permanent) in accordance with "Guidelines for Managing Openings in Public Roads", Department of Transport, Tourism and Sport, Second Edition (Rev. 1), April 2017. The L-4282 and L-8280 will require full/half width resurfacing as part of the permanent reinstatement to be carried out once commissioning of the onsite substation is complete.

The Grid Connection Route works will consist of the installation of ducts in excertated trenches. The double circuit Grid Connection will be laid on the L-4282 and L-8280. The trenches will accommodate power cables enclosed within HDPE ducts with a minimum separation distance of 880mm between power circuits. The Grid Connection and trench is 600mm wide for the single circuit and the depth will be 1,315mm.

15.4.5 Wind Farm Internal Access Roads

Within the Site, existing access tracks will require reinforcement. One borrow pit will be utilised during construction. The borrow pit will provide excavated material to provide fill for the roads, hardstands, upfill to foundations and the temporary compound. The borrow pit will be excavated only as required. The use of an on-site borrow pit will reduce the need to transport material to the Site.

Access to the area will be via the site entrance to the south of the Site. The southern branch will give access to all of the turbines from T1 to T4. There will be a new internal site access road constructed which will connect the north wing turbines to the south wing turbines of the Site.

15.5 ASSESSMENT OF POTENTIAL EFFECTS

15.5.1 HGV Deliveries

The estimated timescale for the completion of the construction phase is 15 months, inclusive of all works to site access road, access routes, substation building, erection and commissioning of turbines, and Grid Connection works.

Tables 15.19 to **Table 15.22** present a summary of the estimated HGV abnormal load deliveries of materials required to construct the Wind Farm, the turbine delivery route improvement works and the Grid Connection.

It is estimated that 840m³ of structural concrete and 60m³ of blinding concrete will be required for each Turbine Foundation and that an additional 122.4m³ will be required for the substation building and plinths and other miscellaneous works. This gives a total volume of concrete of 3,722m³. Based on 6m³ per concrete truck, some 620 loads will be required.

It is estimated that 90t of reinforcing steel will be required for each Turbine Foundation and that an additional 60t will be required for the Wind Farm Substation. These total 420t. At 20t/load, some 21 deliveries of reinforcing steel will be required.

For the proposed area of new Wind Farm Site Road of 8,730m² (see **Chapter 2: Project Description**, Section 2.5.5, 1,746m long x 5m wide), some 5,762m³ of imported cushed stone will be required for a 150mm finishing layer and up to 510mm subbase.

To ensure that there is a 5m road width maintained throughout the internal Wind Farm route, an additional 1.5m width will be added to the existing 3m track, therefore 828m of existing track will require 820m³ of imported crushed stone.

For the total Turbine Hardstand area of 17,200m² (see **Chapter 2: Project Description**, **Section 2.5.3**), some 1,720m³ of imported stone will be required for the finishing layer and 4,000m³ for the subbase of the Turbine Hardstand area. These total 12,302m³. At 12m³/load, some 1,025 deliveries will be required.

Depending on the soil/rock profile, imported crushed stone (engineering fill) may be required under Turbine Foundations as upfill. Excavations will be generally shallow (3.20m depth for Turbine Foundations). Allowing 1m per foundation, then 2,043m³ is required. At 12m³/load, some 171 loads are required.

For the on-site substation, rock will be imported for the build-up layers. The volume of imported stone required is 3,717m³. At 12m³/load, some 310 loads are required.

For the on-site substation, most of the deliveries will be crushed stone, building materials, electrical switchgear and equipment. However, there will be a transformer (20kV) which can be accommodated on the Construction Haul Routes.

The total felling area is estimated at 2 ha to facilitate the access roads, civil works, site compounds, borrow pits and Turbine Hardstands. The total volume of wood is estimated at 500 tonnes. This is equivalent to 22 loads. Allowing for part loads, voids etc., the total allowance is for 5 loads over a 5 day period equivalent to 5 loads per day.

Very little waste is envisaged from the construction phase and likely to result from offcuts of timber, electrical cables and packaging. These materials will be segregated on site and removed to a licensed recycling facility once a load accumulates. On average, 1 load/month is envisaged.

It is estimated that during civil construction, approximately 2,432 HGV loads will be delivered to the Project. Much of these deliveries will be over the 6-month period between months 8 to 13 (see **Table 15.23** for Indicative Delivery Programme). This equates to approximately 447 loads per month or an average of 22 to 23 loads per day. The peak number of deliveries per day will occur during the concrete pour for Turbine Foundation construction. An estimated 140 concrete deliveries will be required per Turbine Foundation as the entire concrete pour has to be placed within 8-10 hours. Some other materials will also be delivered on such days, so a realistic estimation of peak deliveries is approximately 300 deliveries per day (for at least 14 separate days in the construction programme when the Turbine Foundations will be poured). On these concrete pour days, some 14-18 deliveries per hour will be required.

A summary of estimated loads for the Civil/Electrical Construction Works is presented in **Table 15.19**.

Table	15.19:	HGV	and	Abnormal	Load	Deliveries	-	Associated	with	Civil/Electrical
Const	ruction	Works								

Materials	Quantity	No. of Deliveries
Site Establishment and Removal	15	15
Concrete	3,722m ³	620
Reinforcing Steel	420t	21
Substation Building and electrical equipment	-	30
Other – Geotextile Mats, Tools, Fencing, Forestry etc.	-	25
Wind Farm Internal Cabling Materials incl. bedding	-	200
Imported Crushed Stone (engineering fill) as Upfill to Foundations	2,043m ³	171
Imported Crushed Stone for Substation	3,717m ³	310
Imported Crushed Stone for Site Access Roads and Turbine Hardstands	12,302m ³	1025
Waste – 1 container/month		15
Total		2,432

Turbine components will be delivered to the Wind Farm Site over a period of approximately 34 – 36 weeks after civil works are completed. It is estimated that approximately 138 loads of turbine components and crane parts will be delivered during this period. The majority of these loads will be classified as abnormal loads, and the relevant approvals and permits will be obtained by the turbine supplier or its appointed haulage contractor before deliveries take place.

The expected number of HGV deliveries for turbine components are based on specifications from the potential turbine manufacturers, on best estimates of trips generated by similar sized windfarms and previous experience in windfarm planning and civil construction. These figures are likely to vary to some degree depending on the individual lengths of tower sections offered by different manufacturers, but not to the extent that impacts are likely to be significantly changed. A summary of the estimated HGV loads to the Wind Farm Site associated with wind turbine components is presented in **Table 15.20**.

Following completion of the construction works, it is estimated that approximately 12 loads will be needed to remove all temporary equipment (e.g. cranes) and materials used on site e.g. Wind Farm Site Temporary Construction Compound, fencing, cabins, storage containers, bridge etc.

The total number of loads associated with the turbine delivery routes is estimated at 138.

Table 15.20: HGV and Abnormal Load Deliveries – Associated with Wind Turbine Components using the R280 and L-4282.

Materials	Quantity	No. of Deliveries
Site Establishment and Removal	12	12
Miscellaneous Deliveries for Temporary Bridge (fencing, silt fencing, silt busters, drainage, sumps etc.) incl. Removal	30	30
Anchor Cages & Foundation Templates	5	5
Tower Sections	-	16
Nacelles	4	4
Rotor Blades	12	12
Transformers, Panels and Cabling	-	8
Tools etc.	-	1
Crane Deliveries to Site, including ballast, booms, etc. and removal of same	2 Cranes	50
Total		138

For the Grid Connection works, it is assumed that 1.125m³ of concrete blinding is required per joint bay and 0.16m³ per communication/link chamber. These will require 18.78m³ lean mix concrete or 3 loads at 6m³ per load.

Some 39 loads of precast components are required for joint bay walls and roof slabs as well as complete communication and link chambers.

For joint bay floor slabs, some 60.59m³ concrete is required which is equivalent to 10 loads.

For 20 kV cables, 630mm² aluminium, the weight per km of cable is 9.886t. For a total length of 6.4km, the weight will be 170t and will require 10 loads. Allowing another load for fibre optic cables brings the total to 11 loads.

Having 5 ducts in a trench, of which 6.4km for the Grid Connection cable. There are 5 cables in a trench, therefore 32km (6.4km x 5 No.) of ducting will be required. The ducting required is typically delivered in 6m lengths, typically 3km of ducting per load. Thus, some 11 loads are required.

Excavations in roads for trenches, joint bays, link and communication chambers is estimated to yield 246m³ of road surfacing which can be recycled, by adding bitumen, and reused for temporary restoration of trenches. However, it is likely that some supplementary quantity of new road surfacing is required for temporary reinstatement – allow 28 loads (for bitumen and supplementary bitumen macadam). Some of the road surfacing that will be removed will be transported to a bitumen licensed waste facility such as Kerrigan Quarries located in Killarga. The surfacing of roads in the West will be limited to a narrow summertime window. For final reinstatement, full width road reinstatement will be required in accordance with the requirements of "Guidelines for Managing Openings in Public Roads" – Second Edition, April 2017, Dept of Transport, Tourism and Sport. Some 1,178m³ or 99 loads is required. A further 10 loads have been allowed for entrances and regulating the road profile. This will bring the total for road surfacing to some 136 loads.

For trenches in roads within private lands for both Grid Connection, all material excavated for trenches and chambers cannot be reused so as to comply with EirGrid's Functional Specification and will be disposed of off-site to a licenced facility. Excluding road surfacing, the volume of such material is estimated at 5,273m³ for the Grid Connection Trench and 452m³ for the joint bays, link boxes and communication boxes. The trench dimensions are based on 0.6m to 0.725m wide and varying depths from 1.315m deep. An allowance is also included for chambers. This will generate some 477 loads.

For trenches within private lands, selected excavated material can be used as trench backfill up to c.42% of overall trench volume. For land in control of the applicant, excess material will be re-graded over the track/trench route.

Some 0.390m³ of lean mix concrete is required per linear metre of trench. This will give a requirement for 2,506m³ of lean mix concrete which is equivalent to some 418 deliveries to site for the complete Grid Connection Route.

Some 0.345m³ of crushed stone is required per metre of trench in roads. This will give a requirement for 2,217m³ or some 185 loads.

A summary of the total estimated loads associated with the Grid Connection is presented 107/202× as Table 15.21.

Table 15.21: HGV Load Deliveries -	- Associated with	Grid Connection V	Vorks
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Materials	Quantity	No. of Deliveries
Site Establishment and Removal	30	30
Concrete Blinding for Joint Bays, Comms Chambers and Link Boxes	18.78m ³	3
Concrete for Floors of Joint Bays	60.59m ³	10
Pre-cast Concrete Joint Bays and Communication Chambers	39 No.	39
Other – Steel mesh, Geotextiles, Silt Fencing, Fencing, Danger	7	7
Tape, etc.		
Grid Connection Cables	170t	10
Grid Connection Ducting	32,000m	11
Disposal of Excavated Materials from trenches in Public Roads	5,725m ³	1445
Lean Mix Concrete for Trenches	2,506m ³	418
Crushed Stone for Trenches in Public Roads	2,217m ³	185
Road Surfacing	1,178m ³	99
Total		2,257

Table 15.22 shows an indicative potential breakdown of loads delivered to site over a 15month period. The total number of loads is estimated at 4,827.

Table 15.22: Indicative HGV and Abnormal Load Deliveries Over 15 Month Construction Period for the Wind Farm

Activity		Month													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Site Establishment/ Fencing off	57														
Internal Access Road Upgrade & Construction		256	256	256	257										
Substation & Compound Construction				77	77	78	78								
Substation Electrical Works									5	5	5	5	5	5	
Substation Commissioning										10					

Activity		Month													
	1	2	3	4	5	6	7	8	9	10	110	12	13	14	15
Excavation & Construction of Turbine Foundations & Hardstands		123	123	123	123	123	123	123	123			Ŕ			0
Internal Cabling Installation								3	2	2					8
Turbine Delivery and Erection										69	69				
Grid Connection									451	451	451	451	451		
Energisation														1	
Turbine Commissioning														2	2
Site Restoration														3	3
Total Loads	57	379	379	456	457	201	201	126	581	537	525	456	456	11	5

Based on the indicative timetables outlined above the peak times for HGV deliveries will be in months 2 to 9 when the Turbine Foundations will be constructed, Turbine Hardstands and the Wind Farm Site roads will be finished in imported stone and the Grid Connection works will be ongoing. This is estimated to result in a maximum of 581 trips each month with an average of 27 HGV trips per day in this period. Peak deliveries are expected to be during the period of concrete pours for Turbine Foundations when there will be approximately 140 loads per Turbine Foundation. If two Turbine Foundations are poured per month, then the balance of the loads in the busiest month would be 201 loads or 10 loads per day over the remaining days of the month.

15.5.2 Staff/Worker Traffic

For the Wind Farm construction phase, a peak workforce of 76 persons are anticipated on the sites. There will be peaks and troughs in the numbers, with the peak workforce during the general site works.

In addition to the on-site construction workforce, additional construction staff will be required for the cable laying works and the turbine haul route works. One gang is envisaged for the haul route works while two-three will be required for the Grid Connection. At each location off site, a maximum of 10 construction staff are anticipated including traffic management operatives. Thus, up to 76 workers could be employed at peak times. The 76 workers will generally travel to the sites via light vehicle (LY) (i.e. car or small van) assuming 2 persons per vehicle, or 38 trips to and 38 trips from the sites per day. This is 16D. 79/07/2028 made up of:

- 20 trips each way to/from Wind Farm Site.
- 5 trips each way to/from haul route improvement works.
- 13 trips each way to/from grid construction works.

15.5.3 Predicted Additional Traffic on Roads During Construction Phase, Magnitude and Significance of Impacts

Based on the analysis in Section 15.5.1 above, Table 15.23 below has been prepared which summarises the peak additional HGV deliveries per road element while Table 15.24 provides a summary of the peak additional traffic movements.

Table 15.23: Summary of Peak Additional HGV / Abnormal Load Deliveries to Site Per Road Element

Node	Road	Civil & Electrical	Turbine	Grid	Total
Killybegs to R280/L- 4282/R200 Junction	R280	2362	138	0	2500
R285/R280 Junction	R285	76	138	0	214
N4/R285 Junction	N4	76	138	0	214
L-4282	L-4282	2359	138	1128	3628
L-8280	L-8280	0	0	1127	1127

Table 15.24: Summary of Peak Additional HGV / Abnormal Traffic Movements on Roads

Node	Road	Total No. Of Deliveries	Peak Deliveries/ Month	Peak Deliveries/ Day	Staff	Peak Traffic Movements/ Day	
Killybegs to R280/L- 4282/R200 Junction	R280	2500	581	114	57	227	

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Node	Road	Total No. Of Deliveries	Peak Deliveries/ Month	Peak 🏠 Deliveries/ Day	Staff	Peak Traffic Movements/ Day
R285/R280 Junction	R285	214	356	10	6	79 19
N4/R285 Junction	N4	214	356	10	6	Light A
L-4282	L-4282	3628	581	165	76	330
L-8280	L-8280	1127	537	52	27	102

According to the TII publication – National Roads Network Indicators 2019, The Volume to Capacity (V/C) Ratio is used to relate the AADT volume carried on a section of road to its daily operational capacity.

The magnitude of change is summarised within **Table 15.25** below.

The numbers of HGVs generated by the Project (330 movements per day at peak) could be considered as a significant increase on the numbers of HGVs which are predicted to use the existing R280 in 2026, which is predicted to be 160 movements per day (See **Section 15.3.6**). However, the construction stage traffic movements between Killybegs Harbour and the R280/L-4282/R200 Junction (N56, N15, N4, R285 and R280) will be at 227 movements (114 deliveries) per day, resulting in 1507 AADT of HGV. Assuming that the majority of the route between R280 and the L-4282/R200 junction has a carriageway width of 7.3m and is classified as a type 1 road, the capacity of 11,600 AADT is used as per **Table 6.1** of the TII publication DN-GEO-03031 – Rural link design, the change of HGV would be 33.6%. The magnitude of change is considered as being "Low" (see **Section 15.2.9**).

For the turbine delivery routes between the Killybegs Harbour and the R280/L-4282/L-8280 junction, an additional 227 traffic movements per day will arise during this activity. The R280 is classified as a type 3 road, the capacity of 5000 AADT is used as per **Table 6.1** of the TII publication DN-GEO-03031 – Rural link design. Adding a further 227 traffic movements to the predicted 2026 traffic movements of 160 AADT (see **Table 15.16**), resulting to 2835 AADT. The flows would increase by 23.1% which, in terms of magnitude, are considered as being "Very Low" (see **Section 15.2.9**).

For the haul route between the R285/R280 Junction, an additional 19 traffic movements per day will arise during this activity. Assuming that the majority of the route has a carriageway width of 7.3m and is classified as a type 1 road, the capacity of 11,600 AADT is used as per

Table 6.1 of the TII publication DN-GEO-03031 – Rural link. Adding a further 19 traffic movements to the 2026 traffic movements of 160 AADT, resulting to 378 AADT, the flows would increase by 1.9% which, in terms of magnitude, are considered as being "Low" (see **Section 15.2.9**).

For the haul route between the N4/R285 junction, an additional 19 traffic movements per day will arise during this activity. Assuming that the majority of the route has a carriageway width of 7.3m and is classified as a type 1 road, the capacity of 11,600 AADT is used as per Table 6.1 of the TII publication DN-GEO-03031 – Rural link. Adding a further 19 traffic movements to the 2026 traffic movements of 160 AADT, resulting to 378 AADT, the flows would increase by 1.9% which, in terms of magnitude, are considered as being "Low" (see **Section 15.2.9**).

For the construction haul route between the L-8280 Junction, an additional 390 traffic movements per day will arise during this activity. The L-8280 carriageway is classified as a type 3 road, the capacity of 5000 AADT is used as per Table 6.1 of the TII publication DN-GEO-03031 – Rural link design. Adding a further 102 traffic movements to the 2026 traffic movements of 160 (see **Table 15.16**), resulting to 1205 AADT, the flows would increase by 10.3% which, in terms of magnitude, are considered as being "Very Low" (see **Section 15.2.9**).

Node	Road	Sensitivity	Magnitude	Significance of Effects	Duration
Killybegs to R280/L-4282/R200 Junction	R280	Very Low to High	Very Low	Negligible to Minor	Short Term
R285/R280 Junction	R285	Very Low to High	Very Low	Negligible to Minor	Short Term
N4/R285 Junction	N04	Medium to Low	Very Low	Negligible	Short Term
L-4282	L-4282	Medium to Low	Low	Negligible to Minor	Short Term
L-8280	L-8280	Medium to Low	Very Low	Negligible to Minor	Short to Long Term

Table 15.25: Magnitude and Significance of Impacts

The widening works to turbine delivery route R285, R280, and L-4282 will have a 'high' impact and need mitigation including road closures for all expect local traffic.

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Therefore, the effects on the local road network (including turbine delivery route, and Construction Haul Routes) can be predicted to be direct, negative, negligible to high (depending on the section of road as detailed in **Section 15.5.3**) but short-term in nature. The Grid Connection may have a high impact as there is potential to close the road when trenches are excavated and backfilled.

15.5.4 Works on the Turbine Delivery Routes

As outlined in **Table 15.18**, works will be required at a number of locations along the Turbine Delivery Route. These works may cause some short-term disruption to local road users. However, these effects will be confined to a relatively short period during the construction phase, prior to the delivery of turbine components and hence are not predicted to have a significant effect. Street furniture will be adjusted (where necessary) such that it is socketed into the ground. Street furniture will be removed daily in advance of turbine delivery (which will occur at night) and be replaced immediately following the passage of the abnormal vehicles such that daytime traffic can continue as normal. Once works have been completed, the effect will be positive due to the improvements to parts of the widened roadway which will be of benefit to local road users with bends/verges having been widened and junctions improved.

15.5.5 Works on the Grid Connection

For the Grid Connection, the works will be constructed within the L-4282 and L-8280 over a total length of c.6.4km. The construction of a trench and joint bays will effectively close the road to vehicular traffic. Formal road closures will be required. The effects on local residents and farmers who live close to these local roads can be predicted to be low to moderate but short-term in nature. The reinstated surface (full or half width) is likely to provide a degree of improvement. Trenching and ducting would typically be 60-120m per day. Assuming an average rate of 90m/d, 450m/week, the cumulative time periods of road closure would amount to c. 26 weeks.

15.5.6 Light Vehicles/Vans and Construction Personnel

The number of staff on the site will vary according to the phase of works, peaking at up to approximately 76 during Turbine Foundation construction. It is expected that the majority of workers will arrive on-site in mini-buses and crew vehicles which are used to transport teams of workers from the various contractors. Vehicle sharing will be actively encouraged to reduce vehicular movements.

It is expected that a maximum of 25-30 vehicles will visit the sites on a daily basis during the peak construction period (Turbine construction). This is estimated to be an increase of

5.6% on the AADT estimate for the R280. Parking for staff will be provided at the Site Temporary Construction Compound. No parking will be allowed for construction workers on the public road network. A number of additional unscheduled visits may be required throughout the construction period for site inspections, site meetings, and unforeseen circumstances. The predicted effect is negligible to low due to the relatively low increase in traffic over the baseline situation.

15.5.7 Air Quality

Good local air quality is essential for the health and quality of life of residents along the Turbine Delivery Route. Transport accounts for a significant proportion of pollutants in the atmosphere namely, CO₂ emissions, nitrogen dioxide (NO₂) and particulate matter (PM₁₀). NO₂ emissions can also be harmful to vegetation and ecosystems in the vicinity of the Turbine Delivery Route. The increase in traffic movements on the local road network will be over a short-term period and therefore the effect of the Project on air quality will be imperceptible. See **Chapter 10: Air and Climate**.

15.5.8 Noise and Vibration

There is likely to be some noise and vibration from HGV movements along the Construction Haul Routes and turbine delivery route on the local roads, L-4282 and L-8280 which can cause disturbance to residents living along these roads as the roads are generally not busy. The baseline scenario is that the area is relatively quiet with no major sources of noise and vibration. Due to the relatively low number of trips generated per day, the restrictions on working hours and the short-term nature of the construction phase, the effects of noise and vibration are not predicted to be significant. Mitigation measures are discussed in **Section 15.6** and in **Chapter 11: Noise**.

15.5.9 Pedestrians and Vulnerable Road Users

Pedestrian amenity and intimidation can occur where there are large changes to traffic flow and composition. The local roads from the R280 do not have pedestrian footpaths as there is no significant pedestrian traffic in the area. The effect on pedestrian safety is therefore considered to be a potentially high impact of short-term duration.

15.5.10 Driver Delay

The R280 is estimated to be at 20.6% of its capacity in 2026 with HGV and LGV traffic. The Project takes it to 70% considering peak movements. From the traffic counts, the roads to the sites are operating below their capacity and therefore significant effects in relation to driver delay are not envisaged from the Project.

There is potential for some driver delay on the Killybegs Turbine Delivery Route during the construction of road widening works and the delivery of abnormal load components. Abnormal load deliveries will be timed to take place outside of peak times, possibly at night, and therefore the potential effects are not considered to be significant.

There is potential for driver delay on the Grid Connection Route and Construction Haul Routes during its construction and during the deliveries of materials/removal of surplus spoil.

All the above have the potential to be moderate/high for local residents but will be short term in nature.

15.5.11 Severance

Severance is caused when a community is perceived to be physically divided by traffic. Local roads on the Turbine Delivery Route and Grid Connection Route will affect the community in terms of increase in traffic within the construction phase. There are isolated houses which could not be considered to be settlements that could be separated by increased traffic levels and therefore the effects cannot be considered to be potentially significant.

Road closures have the potential to cause severance to residents on the L-4282 and L-8280 during Grid Connection works. Road closures will be such that residents can access/egress their properties although there may be minor delays. Accordingly, such severance will be minor and of short duration.

15.5.12 Mud and Debris on the Local Road Network

HGVs leaving the sites have the potential to transport mud, stones or other debris from the sites to the local road network on wheels of the vehicles. This could cause nuisance to local road users or damage to vehicles from loose debris. This effect can be predicted to be direct, negative, minor and short-term in nature confined to the initial decommissioning and construction phases only and will be subject to mitigation measures. Mitigation measures are also discussed in **Section 15.6** and in **Chapter 10: Air Quality and Climate**.

15.5.13 Effects on Road Network during Construction Phase

Traffic numbers during construction are outlined in **Section 15.5.1**. As the roads are estimated to have sufficient spare capacity, the overall potential effect on the local roads is

15.5.14 Operational Phase – Traffic

During the operation of the Wind Farm, the turbine manufacturer, the Transmission System Operator (TSO) (EirGrid), the Wind Farm operator and a service company will carry out regular maintenance of the wind turbines, Wind Farm Substation and Wind Farm Site infrastructure on a weekly basis. A car or van will normally be required for these routine inspections. Under normal circumstances the operation of the Wind Farm would require 1-2 visits to the site per week by trained personnel and/or accompanied visitors. In addition, operation and monitoring activities will be carried out remotely with the aid of computers connected via a telephone broadband link. Weekly routine inspection and preventative maintenance visits will be necessary to provide for the smooth and efficient running of the Wind Farm. In the case of a major fault e.g. breakdown of a turbine component, larger machinery, including possibly mobile cranes, will require access to the site. Typically, once every 5 years, paintwork may need to be touched up on turbines and the blades cleaned. A Mobile Elevating Work Platform (MEWP) will be used for such activities.

The Grid Connection will, following commissioning, be taken in charge by ESB Networks and no regular ongoing maintenance is predicted. Due to the strict requirements of EirGrid's Functional Specification, the level of supervision normally provided by the Developer and by EirGrid, and the extent of testing prior to commissioning, the probability of the occurrence of faults on 20kV cable connections is very low. However, should a fault occur, it would most likely be within a joint bay which could be exposed and the joint repaired over 3-4 days.

15.5.15 Traffic Impact During Decommissioning Phase

During decommissioning, it is envisaged that the total volume of HGV traffic will be relatively small compared to the construction period on the basis that the Site Access Tracks will remain in place to serve ongoing turbary activity and the Turbine Hardstands will be allowed to revegetate into the surrounding habitat with only the turbines being removed from site for recycling/reconditioning. This phase could be expected to last approximately 12-24 weeks. The effect is predicted to be an imperceptible effect on traffic.

15.5.16 Road Safety Audit

A Road Safety Audit is required for all National Road Schemes. TII Publication GE-STY-01024, Dec. 2017 sets out two categories of scheme:

- Road Scheme A scheme which results in new road construction or permanent change to the existing road or roadside layout.
- Development Scheme A Scheme which results in a change to the road or roadside layout that is indicated and/or executed for commercial or private development.

The Construction phase impacts identified in this Chapter will be short-term associated with deliveries of materials to site. No new junctions are being provided as part of the Project and there will not be any permanent change that will have a material impact on the safety and free flow of traffic.

15.6 MITIGATION MEASURES

15.6.1 Construction Phase

The potential effects of the construction of the Project have been identified as being potentially high but temporary in nature. The following mitigation measures are recommended:

- A Traffic Management Plan (TMP) has been developed (see Management Plan 7 attached to the CEMP). Prior to construction and once the Contractors have confirmed their suppliers, the TMP will be updated in consultation with Leitrim County Council and An Garda Síochána as necessary. All drivers will be made aware of the location and presence of schools and other sensitive receptors at an induction session prior to construction activities taking place and will be made aware of the speed limits of the various roads on the route which are contained in the TMP. This is to ensure compliance with speed limits and school drop off and pick-up zones.
- A Blade Lifter will be used for transporting blades through towns and narrow haul route to site. This will be used for transporting blades through Drumkeeran town which is a narrow haul route. The Blade lifter then will navigate through the R280/L-4282/R200 junction onto the L-4282 and making its way to the site entrance.
- All significant traffic likely to be generated by the Wind Farm will be during the construction of the Development and will be temporary in nature. It is envisaged that the construction period for the Wind Farm will span a 15-month period with the underground cable being installed over a concurrent 5-month period. The constructionphase Traffic Management Plan will mitigate these impacts.
- Use special transporter vehicles with rear wheel steering in delivery of wind turbine components to ensure safe transportation and manoeuvrability on the roads.
 Extendable transporter vehicles will be retracted on return journeys.

- Prior to delivery of abnormal loads i.e. turbine components, the Developer or their representatives, will consult with An Garda Síochána and Leitrim County Council Roads Departments to discuss the requirement for a Garda escort.
- The Developer will confirm the intended timescale for deliveries and every effort will be made to avoid peak times such as school drop off times, church services, sporting events, peak traffic times where it is considered this may lead to unnecessary disruption.
- Abnormal loads are likely to travel at night and outside the normal construction times as may be required by An Garda Síochána. Due to the distance between Killybegs Harbour and the Site of c.156.2km, the journey is achievable within a 4–5-hour timeframe. Accordingly, locations for resting will not be required. Local residents along the affected route will be notified of the timescale for abnormal load deliveries.
- The Developer will lodge a bond with Leitrim County Council prior to commencement of construction in the amount to be agreed with the Council for the possible repair/upkeep of the roads. During the construction period, these roads will be inspected weekly by the Developer's Resident Engineer and the Contractor will be instructed to repair any defects within the following two weeks. At the end of the construction period, any further defects will be remedied to the satisfaction of Leitrim County Council.
- Wheel cleaning equipment will be used at the exit to the Site to prevent any mud and/or stones being transferred from site to the public road network. All drivers will be required to see that their vehicle is free from dirt and stones prior to departure from the construction sites.
- The sites' entry points will also be appropriately signed. Access to the Wind Farm Site
 will be controlled by on site personnel and all visitors will be asked to sign in and out of
 the site by security / site personnel on entering and exiting the site. All site visitors will
 undergo a site induction covering Health and Safety issues at the Site Temporary
 Construction Compound will be required to wear appropriate Personal Protective
 Equipment (PPE) while on-site.
- In addition, any dust generating activities will be minimised where practical during windy conditions, and drivers will adopt driving practices to minimise the creation of dust. Where conditions exist for dust to become friable, techniques such as damping down of the potentially affected areas will be employed.
- To reduce dust emissions, vehicles transporting crushed stone will be covered during both entrance and egress to the site.
- A survey of the Killybegs Turbine Delivery Route will be undertaken prior to commencement to identify if any new overhead lines or broadband lines will need to be

lifted along the route to allow abnormal loads such as tower sections and nacelles to be delivered.

- During the construction phase, clear construction warning signs will be placed on the L-4282, L-8280, R200 and R280 as necessary, which will advise road users of the presence of a construction site and of the likelihood of vehicles entering and exiting the site or road construction areas. This will help improve road safety.
- Works on public roads on the Turbine Delivery Route and Grid Connection will be strictly in accordance with "Guidance for the Control and Management of Traffic at Road Works – 2nd Edition 2010" as well as "Traffic Signs Manual 2010-Chapter 8- Temporary Traffic Measures and Signs at Roadworks".
- Road Closures will be obtained for Grid Connection works on narrow public roads with passing bays available. A number of options are available in some areas for diverting traffic that will allow flexibility during construction. For the Grid Connection works within the L-4282 and L-8280, passing bays can be utilised. While traffic diversions are in place, local access will be maintained at all times. All access points (domestic, business, farm) will be considered when finalising the proposed road closures and diversions. Additional measures such as local road widening, traffic shuttle systems and 'Stop-Go' systems will also be considered subject to agreement with Leitrim County Council and Mayo County Council. Road closures will be scheduled in consultation with local residents and the Contractor shall endeavour to avoid times of high agricultural activity e.g. silage cutting.
- The widening/straightening of haul route L-4282 is proposed to be completed in advance of road closures.
- Road Opening Licences will be obtained for the Grid Connection trench and chambers within public roads as well as for the widening of public roads.
- All vehicles using or while in operation at the Site shall either have roof mounted flashing beacons or will use their hazard lights.
- A speed limit of 25km/h shall apply to all vehicles within the Site.
- Provide a footpath adjacent to the upgraded carriageway where works are being undertaken. This footpath should provide a safe method of permitting pedestrians to access the pre-existing carriageway at the terminations of the works.
- Ensure all visibility envelopes are kept clear of high vegetation.
- Provide visibility splays set back a suitable distance from the yield line.

15.6.2 Operational Phase

Effects during operation have been assessed as being imperceptible. However, it is still important that any effect is minimised as for as is possible. Therefore, the following measures are recommended:

- All vehicles using the Site shall either have roof mounted flashing beacons or will use their hazard lights.
- A speed limit of 25km/h shall apply to all vehicles within the Site.
- Signage shall be maintained throughout the operational period.
- Road surfaces shall be inspected on a quarterly basis and any remedial works identified will be carried out within one month of the inspection.
- Vehicle operators will be suitable qualified.
- Prior to the commencement of the construction phase of the Project, a detailed Traffic Management Plan will be prepared by the Contractor for agreement with the relevant local authorities and An Garda Síochána.

15.6.3 Decommissioning Phase

As the turbine blades can be cut into manageable lengths on decommissioning, there is no requirements to re-use the turbine supply haul route for decommissioning. Thus, all decommissioning related traffic will use the L-4282 and R280.

The Developer is applying for a consent for an operational period of 40 years for the Wind Farm. Cranes of similar size to those used for construction will disassemble each wind turbine using the same crane Turbine Hardstands. The towers, blades and all components will then be removed from the Site and reused, recycled, or disposed of in a suitably licenced facility. The wind turbine transformers will also be removed from the Site. There is potential to reuse wind turbine components, while others can be recycled.

Underground cables will be removed while the ducting will be left in-situ. The foundations and upstand sections will remain in-situ.

All site access roads, Turbine Hardstanding areas and drainage will be left in situ for future use.

It is intended that all above ground components and underground cabling (ducting left insitu) will be removed from the Wind Farm Site as part of the decommissioning of the Wind Farm. The following elements are included in the decommissioning phase:

• Wind turbines dismantling and removal off the Site.

- Underground cabling removal (ducting left in-situ).
- Turbine Foundation backfilling following dismantling and removal of wind turbines (any excavated material, will be re-instated / foundations that protrude above ground level will be backfilled with soil -underground reinforced concrete remaining in-situ).
- Transport route accommodation works.

Any structural materials suitable for recycling will be disposed of and sent to a licenced facility. The financial costs of decommissioning, at current material values, will be more than met by the recycling value of the wind turbine components.

Prior to wind turbine removal, due consideration will be given to any potential impacts arising from these operations. Potential impacts are likely to be similar to that of the construction phase, to an equal or lesser extent. Some of the potential issues could include:

- Potential disturbance by the presence of cranes, HGVs, and personnel on-site
- Time of year and timescale (to be outside sensitive periods).

The Development will comprise the installation of two battery storage units positioned within the Site. These units will house lithium-ion (li-ion) battery arrays. These batteries will be used due to their proven track record with high life cycle, with an expected life cycle of 4,500 cycles equating to 15 years of use which is the usable life of the battery technology proposed for the Site. Decommissioning of the battery storage units will include the removal of the units from the Site. This will require the use of a fixed crane and articulated Heavy Goods Vehicles (HGVs). Removal will enable the recycling of the units on the open market, or the repositioning to an alternative site.

Given the nature and small amount of infrastructure required for the battery storage units, it is considered unlikely that any impacts would occur from the decommissioning works. All decommissioning works will be carried out in accordance with best practice and legislation at the time of decommissioning.

Prior to the decommissioning work, a comprehensive plan will be drawn up and submitted to the relevant planning authority for written agreement. The plan will take account of the findings of this EIAR and the contemporary best practice at that time, to manage and control the component removal and ground reinstatement.

If these alternatives are not viable then the process equipment would be decommissioned; all plant, machinery and equipment will be emptied and dismantled to be sold or recycled or, where these are not possible, disposed of through a licenced waste contractor. If required, all machinery will be cleaned prior to removal and all necessary measures implemented to prevent the release of contaminants. All waste will be removed from the facility and recycled wherever possible; disposal operations will be controlled by licenced waste contractors. The buildings and infrastructure would be retained and repurposed.

15.7 CUMULATIVE EFFECTS

15.7.1 Construction Phase

Chapter 2: Project Description sets out the existing and proposed wind farms within 20km of the Site.

Appendix 2.3 includes a List of Projects for Cumulative Assessment. Much of the non-wind planning permissions relate to:

- Dwelling houses
- Extensions to dwelling houses
- Agriculture buildings
- Sports/Recreation facilities
- School Extensions

In terms of their scale, it is considered that the construction of the dwelling houses or extensions to dwelling houses or the agricultural buildings or the sports/recreation facilities or the school extensions would only have a negligible to minor localised impact on traffic should their construction be concurrent with the Project.

Outlined in **Table 15.26** below are the wind farms within 20km of the Wind Farm Site. The nearest operational wind farms are the Letter Wind Farm. The nearest operational wind farm is Garvagh Glebe Wind Farm which is located approximately 920m to the south-west of the Site.

Wind Farm	Status	No. of Turbines	Approximate Distance to the Site Boundary	Direction from the Development
Altagowlan	Operational	9	4.6km	South-East
Black Banks (I & II)	Operational	12	1.4km	South-West
Carrane Hill	Operational	4	4.0km	South-West
Carrickeeny	Operational	4	18.9km	North-West
Corrie Mountain	Operational	8	3.2km	South-East

Table 15.26: Wind Farms within 20km of the Proposed Turbines

Wind Farm	Status	No. of Turbines	Approximate Distance to the Site Boundary	Direction from the Development	
Croagh*	In-Planning	10	2.4km	West	
Derrysallagh (Kilronan II)	Operational	10	6.2km	South-West	
Faughary	Operational	3	19.1km	North	
Garvagh Glebe	Operational	13	920m	South-Wast	
Geevagh	Operational	6	5.7km	South-West	
Kilronan	Operational	10	9.3km	South	
Moneenatieve I & II	Operational	5	2.9km	South-East	
Seltannavenny	Operational	2	6.7km	South-East	
Spion Kop	Operational	2	4.2km	South-East	
Tullynahaw	Operational	11	5.7km	South-East	
Tullynamoyle I, II & III	Operational	15	7.1km	North-East	
Tullynamoyle (V)	Consented under planning application P19/26	4	6.9km	North-East	
Tullynamoyle (V)	Consented by An Bord Pleanála under case reference (PI12.312895)	4	6.6km	North-East	

* Croagh Wind Farm was recently refused planning permission by An Bord Pleanála (23/10/2023). However, for the purposes of a comprehensive appraisal, it has been included in the cumulative assessment for the chapters within this EIAR as the decision has the potential to be appealed and overturned.

Cumulative effects from the Project and other developments in the area can occur during the construction phase. There could also be cumulative effects should blades need to be replaced in an operational wind farm during the construction phase. However, in the unlikely event of such a scenario the replacement blades would have a 3-4 month lead time and deliveries can be co-ordinated. It would not lead to significant effects. Wind farms do not generate a significant amount of traffic during operation as outlined in **Section 15.5.13**.

If the construction phases of the consented but not yet constructed windfarms were to overlap, then there is potential for cumulative effects on the road network from construction traffic and turbine delivery. Accordingly, any cumulative impact will be limited and is considered as being slight to moderate and of short duration.

It is possible that a blade (or set of blades) could require replacement if damaged for example by lightning on the nearby Wind Farms. Should this coincide with the construction period for the Wind Farm then there is the potential for cumulative transport affects. However, these are considered as being of low probability, slight impact and of short RCEIVED. duration.

15.7.2 Operational Phase

The level of maintenance traffic is normally 1-2 visits per week per wind farm and during the servicing of the Wind Farm, the level of maintenance traffic will be 5-6 visits per week for a month, per year. Traffic during the operation periods of Letter Wind Farm as well as neighbouring sites will be low and in the range of 0 - 10 trips per day. The effect is rated as being insignificant.

15.7.3 Decommissioning

The Developer is applying for a consent for an operational period of 40 years for the wind Farm.

Prior to wind turbine removal, due consideration will be given to any potential impacts arising from these operations. Potential impacts are likely to be similar to that of the construction phase, to an equal or lesser extent.

Accordingly, only slight impacts over those assessed in **Section 15.5.14** are predicted and it is unlikely that any significant cumulative impacts will arise.

15.8 **RESIDUAL EFFECTS OF THE PROJECT**

15.8.1 **HGV Deliveries**

On the Turbine Delivery Route, there is likely to be a slight, negative, short-term residual effect on the national road network with an increase in traffic volumes on the roads and works at a number of locations as outlined in Table 15.18. During times when specific widening works are being undertaken on local roads the impacts will be high, negative, short-term. However, with the mitigation outlined, these will be minimised and the resurfaced roads will produce a positive residual benefit.

In terms of the Construction Haul Routes, the Project is likely to have a minor residual effect on the local road network given increased traffic volumes on the road network are unavoidable. However, with the mitigation outlined, these will be minimised and the resurfaced roads will produce a positive residual benefit.

In terms of the Grid Connection, the Development is likely to have a high negative, shortterm impact on local roads which will accommodate the Grid Connection. However, with the

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mitigation measures as outlined, these will be minimised and the resurfaced roads will CEILED produce a positive residual benefit.

15.8.2 **Operational Phase Residual Effects**

There will be no residual effects during the operational phase of the Wind Fam, as only occasional light vehicles and MEWP's are envisaged to visit the Wind Farm Site during operation for routine checking and maintenance.

15.8.3 **Decommissioning Phase Residual effects**

On the Turbine Delivery Route, there is likely to be a slight, negative, short-term residual effect on the road network with an increase in traffic volumes on the roads and works at a number of locations as outlined in Table 15.18, assuming the turbine components are transported back to Killybegs Harbour. Instances where bends are widened along the route will be a slight positive residual effect of high probability. Local roads will be widened as outlined in Section 15.4.2.

Effects during the decommissioning phase have been assessed to be small compared to the construction phase if Turbine Hardstand areas are left in place and revegetated. In this case, the effect can be assessed as being imperceptible.

If the Turbine Hardstanding areas are removed, then effects can be assessed as likely to be similar to those experienced during the construction phase as being a slight negative, direct short-term and high probability effect.

15.9 MONITORING

The local road network near the site used to transport construction materials will be monitored during construction so that any damage caused by construction traffic associated with the Project can be identified and maintenance works carried out as soon as practicable to avoid issues for other road users and the local population of the area.

Any extensive repairs, such as full road width resurfacing, required to the local road network arising from damage caused by traffic associated with the Project will be carried out once construction activities have ceased on-site. The monitoring will be undertaken by the Owner's Engineer to be appointed by the Developer for the construction stage in conjunction with the Local Authority Roads Area Engineer on the L-4282, L8280 and R280.

The appointed Contractor will be responsible for seeing that HGV drivers travelling to and from the site obey the designated speed limits, rules of the road and that they only use the designated Construction Haul Route. This will be undertaken through regular toolbox talks 79/07/202 for drivers during the construction of the Project.

15.10 SUMMARY OF SIGNIFICANT EFFECTS

This section has assessed the significance of potential effects of the Project on traffic and transport. The construction stage of the Project has generally been assessed as having the potential to result in effects of a negative, high, direct, short-term, high probability effect or lower (depending on the road element) during the construction phase only. After mitigation, the residual effects have been assessed as moderate, negative and short-term in nature or lower (depending on the road element as detailed in **Section 15.8**). There will be a positive residual effect from local roads and junctions having been widened along the turbine component haul route and from the resurfacing of these local roads which will accommodate the Grid Connection.

The operational stage impacts are considered as being imperceptible for the Wind Farm.

The decommissioning stage impacts are considered as being slight, negative, direct, high probability and short-term in nature. Potential cumulative effects as detailed in Section 15.7 were assessed as being slight to moderate, negative, short-term and low probability in nature.

Given that only potential effects classified as significant effect or greater are considered "significant" in terms of national legislation, the potential effects of the Project on traffic and transport are considered to be **not significant**.

15.11 STATEMENT OF SIGNIFICANCE

This assessment has identified that the potential effects of the Project on traffic and transport are considered to be **not significant**, given the mitigation measures embedded in the design and proposed for the implementation of the Project.