17 TRAFFIC AND TRANSPORT

17.1 INTRODUCTION

17.1.1 Background and Objectives

This chapter assesses the likely significant effects of traffic associated with the Proposed Development on the public road network and on sensitive receptors in the vicinity of the Proposed Development, describes the existing public road and junction network, identifies whether there is any potential for significant effects to arise (both in isolation and in combination with other developments) and outlines the mitigation measures that will be implemented to avoid, reduce, or offset any potential significant effects that might arise.

The assessment considers the potential effects during the following phases of the Proposed Development:

- Construction of the Proposed Development
- Operation of the Proposed Development
- Decommissioning of the Proposed Development

For developments of this nature, the construction phase is generally the critical effect 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:

- Haul routes for delivery of turbine components, referred to as the Turbine Delivery Route (TDR)
- Haul routes for crushed stone, concrete, substation components and other materials for the Proposed Development site, referred to as the Construction Haul Route (CHR)
- Haul routes for the construction of the Grid Connection, referred to as the Grid Connection Route (GCR)

A Swept Path Analysis has been carried out on the TDRs for the abnormal loads associated with turbine components to identify areas for road widening or for the removal of street furniture and signs. The Swept Path Analysis also includes an assessment of blade oversail (i.e., where the blade protrudes from the rear of the delivery vehicle) to identify potential impacts to third-party properties. Separate delivery routes will be used

for other construction materials referred to as the CHR which includes the route for the Proposed Development Site.

This chapter outlines the potential effects of the Proposed Development on traffic and transport based on the baseline line traffic flows from classified traffic counts, traffic generated by the Proposed Development and the Swept Path Analysis, which has been undertaken for the abnormal loads along the TDRs. It also estimates the number of HGV and other traffic movements on the CHR used for material deliveries and assesses the associated effects.

To confirm the suitability of any changes to the roadway or to street furniture along the route between EIAR and pre-construction, a further survey of the route will be undertaken using a transport vehicle prior to the delivery of turbine components to the Proposed Development site.

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, Planning Drawings (**6289-TIR-AT-BA-00B** to **6289-TIR-AT-BA-021**), and by the following Appendix documents provided in Volume IV of this EIAR:

- **Appendix 17.1: Turbine Delivery Route Delivery Report**
- **Appendix 17.2: Palmerstown Bridge Structural Assessment Report**

Planning permission is being sought by the Developer for:

- Construction of 16 no. Vestas V117 (4.3 MW) IEC IIA – T wind turbines. This specific model with a blade tip height of 135 m, was selected as the candidate turbine and its associated parameters were used to determine the significant environmental effects associated with the Proposed Development. No flexibility in terms of turbines dimensions is sought as part of the application for Planning Permission
- Construction of permanent Turbine Hardstands and Turbine Foundations
- Change the use of a residential site and vacant dwelling to a Permanent Operations Compound consisting of an operations office, storage area and staff parking
- Construction of two Temporary Construction Compounds with associated temporary site offices, parking areas and security fencing
- Installation of 1 no. (35-year life cycle) meteorological mast with a height of up to 80 m and a 4 m lightning pole on top

- Development of 17 no. permanent onsite spoil deposition areas
- Construct 5 no. new permanent site entrances as described in the EIAR **Chapter 17: Traffic and Transport** and **Figure 2.1**.
- Upgrade 9 no. existing site entrances as described in the EIAR **Chapter 17**: **Traffic and Transport** and **Figure 2.1.**
- Works for new and upgraded entrances include clearing visibility splays of vegetation, widening the entrances to allow HGVs turn onto local public roads and the R314, excavation to solid formation level, installation roadside drainage features, placing entrance sub-base with rockfill materials, placing capping level and providing surface dressing where necessary.
- Road construction works within the Wind Farm Site consisting of the construction of approximately 9.64 km of new Site Access Tracks through the Wind Farm Site. The upgrading of 1.76 km of private Access Tracks and 1.58 km of public roads within the Wind Farm Site, road verge widening, hedge trimming and all associated infrastructure and drainage works as described in EIAR **Chapter 17: Traffic and Transport** and the **Turbine Delivery Route Report Appendix 17.1.**
- Forestry felling of approximately 31.86 ha of coniferous forest will be required to facilitate the construction of the Proposed Development. For the purposes of this Proposed Development, the Developer commits that the location of any replanting (alternative afforestation) associated with the Proposed Development will be greater than 10 km from the Wind Farm Site and also outside any potential hydrological pathways of connectivity i.e. outside the catchment within which the Proposed Development is located. The extent of felling required to be licensed for the purpose of giving effect to the Proposed Development can only be determined once planning permission for the Proposed Development has been granted. It will be a condition of the felling licence that an equivalent area of land required to be felled shall be replanted. The felling will be subject to a separate planning application which, in practical terms, can only be made once planning permission for the Proposed Development has been granted.
- All associated site development works including berms, landscaping, and soil excavation.
- Development of an internal site drainage network and sediment control systems.
- Construction of 1 no. 110 kV electrical substation including 2 no. control buildings with welfare facilities, all associated electrical plant and equipment, security fencing and gates, all associated underground cabling, wastewater holding tank, and all ancillary structures and works (the 'Wind Farm substation').

- Installation of battery arrays located within container units (20 no. units) and associated electrical plant for grid stabilisation adjacent to the Onsite Substation building (with up to 150 MW storage capacity) with surrounding palisade fence 2.65 m in height;
- All associated underground electrical and communications cabling connecting the wind turbines to the Wind Farm substation.
- All works associated with the permanent connection of the Wind Farm to the national electricity grid comprising of a 110 kV underground cable system in permanent cable ducts from the proposed, Wind Farm substation, in the townland of Barroe to the existing Tawnaghmore substation at the Killala Business Park.

The EIAR assesses the Project which includes the Proposed Development as outlined above; it includes improvements and temporary accommodation requirements to the existing public road infrastructure to facilitate delivery of abnormal loads and turbine delivery.

A full description of the Proposed Development is provided in **Chapter 2: Development Description.**

17.1.2 Statement of Authority

This chapter has been prepared by Cavelle Hendry with the assistance of Michael Garvey of Jennings O'Donovan & Partners Limited (JOD) and reviewed my Mr. David Kiley of JOD.

Cavelle Hendry holds a BSc. (Hons) in Civil Engineering and a Diploma in Project Management. Cavelle is a valued member of the JOD Renewable Energy team, bringing over 9 years of diverse experience to his role. He has worked as both a site engineer and design engineer, gaining extensive expertise in the roads, transportation, and infrastructure engineering sectors. His project portfolio includes Design-Bid-Build and Design/Build projects in both South Africa and Ireland, showcasing his adaptability and broad technical skill set. Cavelle also contributed to the preparation of this chapter.

Michael Garvey holds a B.Eng. in Civil Engineering and a diploma in Project management. He is an experienced Chartered Professional Engineer (Ontario - Engineers Canada) with over 18 years of client-side and contractor/consultant experience on various Major Multi-Discipline Infrastructure Projects. Experienced in all stages of project life cycles from inception to operations. Projects varied from Design/Build, EPC, EPCM and P3 projects in Ireland, Australia, and North America.

The wind farm design and swept path analysis of the turbine components for the TDR between the R315 (outside Ballina town) and the Proposed Development Site as well as drawings showing the extent of widening works on this route was prepared by John Banks, who has over 18 years of experience in drafting and designing Proposed Developments. The Chapter has been reviewed by Mr. David Kiely of JOD. Mr. Kiely has 43 years' experience in the civil engineering and environmental sector. He has obtained a bachelor's degree in civil engineering and a Masters in Environmental Protection, has overseen the construction of over 50 wind farms and has carried out numerous soils and geology assessments for EIAR's. He has been responsible in the overall preparation of in excess of 60 EIA Reports (EIAR's).

17.1.3 Site Location, Context, and the Development

The Proposed Development is located ~14.5 km northwest of Ballina Town, ~5.2 km northwest of the village of Killala and ~4 km east of Ballycastle village in north Co. Mayo. The Wind Farm Site is located ~10.5 km east of the county border between Mayo and Sligo. The Redline Boundary extends to 108.06 ha. The Wind Farm Site is accessed via local public roads which branch off the R314 which joins Killala in the southeast to Ballycastle in the northwest. These local public roads serve numerous dwellings and associated farm buildings scattered in lands surrounding the Wind Farm Site.

The Wind Farm Site is located within the townland of Ballymurphy, Ballynaleck, Barnhill Lower, Barnhill Upper, Barroe, Billoos, Carn, Carrickanass, Carrowmore, Castlelackan Demesne, Castletown, Conaghra, Glebe, Lackanhill, Lecarrowntemple, Lissadrone East and Lissadrone West.

The GCR, which extends over a length of 13.55 km is in the townlands of Barroe and onto the townlands of Carrad More, Tawnaghmore Upper, Rathbaun, Carrickanass, Cloonavarry, Doonamona, Rathcash, Castlereagh, Rathowen West, Rathowen East, Magherabrack, Cloonawillin, Killala, Mullafarry, Lisglennon, Tawnaghmore Lower, Ballinteean and Carrowreagh.

Temporary works along the TDR will be required to accommodate the delivery of the turbine components. These temporary works are included as part of this application and are assessed as part of this Traffic and Transport Chapter.

Improvement of nine existing entrances off local roads, one off L-5173, one off L-5179, two off the local road L-5187-47, two off the local L-5187-22 and three off the L-21147-0, all to include localised widening of the road and creation of a splayed entrance to facilitate the delivery of abnormal loads and turbine component deliveries.

Construction of five new site entrances off local roads, one off the L-31143, one off the L-51791-23, one off the L-31142-0, two off the L-31142-0, and one off the L-5179-22, all to include localised widening of the road and creation of a splayed entrance to facilitate the delivery of abnormal loads and turbine component deliveries.

Upgrade works on the turbine delivery route to include the following:
Localised widening along the L-5187-47, L-31142-0, L5187-22-0, L-5187-47, L21147-0, and roads to a width of 4.5m and the widening of junctions at the crossroads R314 and L-51731 crossroads in the townland of Billoos.

The Proposed is detailed in **Section 2.3** of **Chapter 2: Development Description**.

The location and layout of the Proposed Development is shown on **Figure 1.1** and **Figure 1.2**. The GCR is shown on **Figure 2.2**. The turbine components for the Proposed Development will be shipped to either Killybegs Harbour, Galway Port or Foynes. The turbine components will be transported on the public road network using abnormal load vehicles between the chosen port and the Wind Farm Site. The proposed TDR options to the Wind Farm Site are shown in **Figure's 2.7 - 2.9**. The location of material suppliers in the vicinity of the Proposed Development is shown in **Figure 17.8**.

17.1.4 Scoping Responses and Consultation

The Applicant contacted relevant stakeholders as part of the scoping process during the design of the Proposed Development. Consultation responses are shown in **Table 17.1**.

Table 17.1: Consultation Responses

Consultee	Type & Date	Summary of Response	Response to Consultee
Mayo County Council	Meeting dated 18th August 2023	• There appears to no single site boundary. The redline site boundary appears to be a series of groups of turbines & single turbines linked along the public road. The public roads cannot form part of the site boundary.	Addressed by this EIAR / Chapter.

Consultee	Type & Date	Summary of Response	Response to Consultee
		• The site layout is in the form of dispersed turbines throughout the landscape and does not conform to the layouts identified in the Draft Revised Wind Energy Development Guidelines of 2019. The larger turbines are highly visible from the N Coast Road which is a Scenic Route & has Designated Scenic Views and The development plan objective is that development should not impinge in any significant way on the character, integrity and distinctiveness of the area. Some of the smaller turbines are also partially visible (photomontage) The visual impact of the turbines is still a consideration within the "Preferred" and "Open for Consideration" zones. The RES was written in 2011 when turbine size, height and rotor dia. were much smaller and had less visual impact. Commencement of a new RES is to be prepared in the coming months. The larger turbines are located in Landscape Policy Area 1 where it is unlikely that the visual impact of windfarms can be ameliorated. • The turbines will be visible of the turbines to/from the Céide Fields which is on the tentative UNESCO Tentative World Heritage Site. The development plan seeks to protect the Céide Fields from inappropriate development. The full extent of the Céide Fields archaeology site is unknown and may reach as far as the windfarm site. • The use of narrow county roads for the protracted length of proposed Turbine Delivery Route will be problematic given their generally poor structural	

Consultee	Type & Date	Summary of Response	Response to Consultee
		condition and restricted carriageway width. The traffic generated by the development (construction materials, labour-force, turbine deliveries etc) will cause serious disruption to local road users. Palmerstown Bridge is a Protected Structure in the County Development Plan. It an objective of the development plan to Note of Meeting as agreed with Mayo County Council. Date: 29th August 2023 Protect those structures in the RPS together with the integrity of their character and setting. The setting of bridge is affected by the land-take for the road widening haulage. • MCC is not in favour of laying electricity cables in the road carriageway. • Given the proximity of the proposal to SACs & SPAs AA will probably be required. • An EIAR will be required given the project is in excess of the EIA threshold in the Planning & Development Regs 2001-2022. MCC would not be in favour of such a proposal at this location.	No road widening or lantake will take place at Palmerstown Bridge This is common practice and in line with EirGrid Functional Specifications.
Mayo County Council	Meeting dated 9th March 2026	• BESS Any buildings in a BESS require a fire safety certificate. 2 no. access points are required. Minimum 6m spacing between units is required. Some operational guidelines are available for US, NI & UK US require 500m exclusion zone. Current thinking is to let them burn out in the event of thermal runaway. Risk of toxins consult EPA & HSA. • Mayo County Development Plan 2022 - 2028	Complete a Fire Safety Report Update Design with two Entrances Refer to HSA for Scoping

Consultee	Type & Date	Summary of Response	Response to Consultee
		Mayo indicated that he had read the council's submission of 30/10/2025 to ACP on the previous proposal for 16 no. turbines on this site and as the current proposal was identical the council's comments were unlikely to change. The review of the council's Renewable Energy Strategy would likely be published before ACP made a decision on any application and that lands once considered acceptable for wind energy, as identified in the Renewable Energy Strategy 2011-2022 may now not be suitable for such development owing to the significant heights of modern turbines and scale of development being proposed. • Visual Impact Visual Impact In principle, only the turbines located within Tier 1 Preferred lands are considered acceptable in principle i.e. turbines AT02-AT04 incl. The principal consideration on the acceptability of those turbines in Tier 2 lands i.e - Open for Consideration, turbines AT06, AT 09-AT 11 incl. and AT 13-AT16 incl. will depend on their visual impact on sensitive or vulnerable landscapes, listed highly scenic routes, scenic routes, scenic viewing points and scenic routes (as defined in the Landscape Appraisal for Co. Mayo). It was noted that there are now 5 turbines AT01, AT05-AT07 incl. and AT 12 located outside Tier 1or Tier 2 lands, as opposed to 3 in the previous iteration of the scheme. The site layout is in the form of dispersed turbines throughout the landscape and does not conform to the layouts identified in Conclusion. The view of Mayo County Council toward this proposed development is expressed fully in its submission to ACP Ref.: PAX16. 323778 and the applicant is advised to address the issues raised in that report Mayo	Refer to Chapter 4 Planning Policy Chapter Refer to Chapter 12 Landscape and Visuals

Consultee	Type & Date	Summary of Response	Response to Consultee
		County Council is not in favour of the proposed development at this location. In the context of the visual sensitivity of the area and the, coastal landscapes MCC does not consider the proposal suitable at this location.	
		• Wild Atlantic Way The location of the proposed site is highly visible from several designated Discovery Points along the Wild Atlantic Way touring route. The large scale and highly visible nature of the proposed development has the potential to negatively impact the unique coastal landscape and sensitive natural environment in this area.	Refer to Chapter 12 Landscape and Visuals & Chapter 5 Population and Human Health
		• Archaeology Correct mapping is the legally printed RMP maps. Historic Environment Viewer (HEV) used but not accurate transcription of RMP. Need to show wind farm site, the grid connection route (GCR) and the Turbine Delivery Route (TDR) superimposed on the relevant RMP maps.	Refer to Chapter 14 Cultural Heritage & Chapter 5 Population and Human Health
		• Roads The scale of proposed development impacting on the locality, including a wider issue relating to exceptional abnormal loads and effect on wider infrastructure and activities along delivery routes is significant. Management of the scale and issues arising is considered difficult and warrants high level consideration as a whole.	The items noted during the Meeting with Mayo Co have been covered in Chapter 17 Traffic and Transport and the CEMP.
		• Tourism The exceptional scenic, archaeological, and cultural significance of Ballycastle, the Céide Coast, and Downpatrick Head renders the area unsuitable for industrial scale windfarms.	Refer to Chapter 12 Landscape and Visuals & Chapter 5 Population and Human Health

17.2 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

17.2.1 Assessment Methodology

This assessment of the effects on the traffic generated by the Proposed Development on the existing public road network and its sensitive receptors has been carried out using the following methodology:

- Policy and guidance review
- Desk study, including review of available maps and published information
- Site visit (driving the route) including review of the road network to be used
- Topographical Survey of potential constraints
- Establishment of Baseline Scenario using classified traffic counts
- 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

Traffic generated by existing developments, permitted developments and known proposed plans and projects are cumulatively assessed in the Traffic and Transport chapter of the EIAR. This includes plans and projects that are pending a decision from the planning authority, An Bord Pleanála and other known projects which are in the advanced stages of being prepared to be submitted for planning. A summary of the analysis is provided in this chapter.

17.2.2 Planning Policy and Guidelines/Guidance

This assessment has been prepared and carried out in accordance with the standards outlined in Chapter 1, Introduction of the EIAR and the guidance contained in the documents shown in **Table 17.2**.

Table 17.2: Policy and Guidance

Policy / Author	Title	Policy
Mayo County Council	Mayo County Development Plan 2022-2028	The CDP states: "**MTP 1:** To support sustainable travel in the county by ensuring future population and employment growth predominantly takes place in urban areas which will warrant provision of public transport services." "**MTP 2:** To support and facilitate the integration of land use with transportation infrastructure, through the development of sustainable compact settlements which are well served by public transport." "**MTP 3:** To support and facilitate any 'Smarter Travel' initiatives that will improve sustainable transportation within the county, including public transport, electric and hybrid vehicles, car clubs, public bike schemes, improved pedestrian and cycling facilities, as appropriate. "**MTP 4:** To work with the NTA and Bus Eireann to make all existing public transport services throughout the county more accessible for wheelchair users and those with disabilities and require that proposals for new transport infrastructure are subject to an Accessibility Audit." "**MTP 5:** To ensure new development areas and employment land-uses are permeable for walking and cycling and are laid out in such a way as to facilitate the operation of and access to public transport by residents and employees." "**MTP 6:** To ensure that the layout and design of new developments provide for bus stops, passenger waiting facilities, and bus turning and service regulatory layover facilities, as required." "**MTO 1:** To prepare and commence implementation of, Local Transport Plans (LTP), in conjunction with the National Transport Authority and relevant stakeholders, for Ballina, Castlebar and Westport, and other settlements, where appropriate."
Department of Transport, Tourism and Sport and	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).

Policy / Author	Title	Policy
Department of Environment, Community and Local Government		
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.
Transport Infrastructure Ireland (TII)	Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions) DN-GEO-03060, June 2017)	Design Standards for Junction Design, excl. major interchanges.
Transport Infrastructure Ireland (TII)	Rural Road Link Design (DN-GEO-03031 June 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

Policy / Author	Title	Policy
		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, May 2019)	This document provides guidance on the development 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 2012	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 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.

17.2.3 Study Area

The Study Area for Traffic and Transport Assessment is focused on the public road network, its associated junctions and sensitive receptors which will be used by traffic generated by the Proposed Development during the following activities which are based on professional judgement and experience of similar projects:

- Transportation of building materials and electrical components.
- Transportation of granular materials for Site Access Tracks and Turbine Hardstand construction.
- Transportation of concrete and steel reinforcement for the construction of Turbine Foundations.
- Enabling works at junctions and pinch points on the public network to facilitate the swept path of abnormal load vehicles delivering turbine components along the TDR between Port and the Wind Farm Site off the R314 and R315.
- Work associated with the GCR to the national electricity grid, which will be via an underground cable connection to the existing Tawnaghmore 110 kV substation located in Killala Business Park.
- Traffic associated with the operation and maintenance of the Proposed Development during the 35-year operational life, subject to planning permission being granted
- Traffic associated with the decommissioning of the Proposed Development.

17.2.4 Desk Study

An initial desk study of the area was completed in advance of undertaking the route survey. This involved examining the TDRs utilised by existing wind farms in the locality (Killala Community Wind Farm, Oweninny Wind Farm Phase 1 & 2). These are assessed in detail in **Appendix 17.1 Turbine Delivery Route Report**.

On examination of these windfarms, three separate TDRs were identified:

- **TDR Option 1** – Killybegs Harbour, County Donegal to the Wind Farm Site (**Figure 17.1**). The route from Killybegs Harbour to Ballina Town has been previously utilized for the transportation of turbine components for the following wind farms: Oweninny Wind Farm Phase I (55 m blades) and Phase II (57.5 m blades), Sheskin Wind Farm (57.3 m blades), and Killala Community Group Wind Farm (49 m blades).
- **TDR Option 2** – Galway Port, County Galway to the Wind Farm Site (**Figure 17.2**). The route from Galway Port to Ballina Town previously assessed and considered as a potential TDR by the granted Oweninny Wind Farm Phase III. A swept path analysis using a 57.5 m blade was carried out as part of the Oweninny Wind Farm Phase III assessment.

- **TDR Option 3** – Foynes Port, County Limerick to the Wind Farm Site (**Figure 17.3**). Foynes is being used by Derrinlough wind farm, Co. Offaly (under construction) to transport turbine components (towers) for 180 m tip height turbines. A portion of this route is shared with the Proposed Tirawley Wind Farm, travelling east from the port to Limerick City, then north to Galway on the M18. This leg of the route has been modified for turbine components. The route from Foynes Port to Ballina Town previously assessed and considered as a potential TDR by the granted Oweninny Wind Farm Phase III. A swept path analysis using a 57.5 m blade was carried out as part of the Oweninny Wind Farm Phase III assessment.

For the purposes of this EIAR, the TDR has been delineated into three stages i.e., Legs:

- **The First Leg** of the TDR travels from the ports to Ballina Town, Co. Mayo (**Figure 17.1 to 17.3**).
- **The Second Leg** of the TDR travels north from Ballina Town along the R315 and local public roads to the Wind Farm Site (**Figure 17.4**).
- **The Final Leg** of the TDR travels along the local public roads and Site Access Track's to each turbine's final location within the Wind Farm Site. At the Wind Farm Site, the turbines are accessed via multiple Site Entrance points. For the purposes of this assessment and the EIAR, the Final Leg of the TDR was divided into two distinct routes: Blue and Orange.
  - Blue route depicts the TDR for 4 turbines (AT01 - AT04), Met Mast, the Onsite Substation and Battery Energy Storage System (BESS), refer to (**Figure 17.5**).
  - Orange Route depicts the TDR for 12 turbines (AT05 to AT16), refer to (**Figure 17.6**).

The initial segment (the First Leg) of TDR options were not assessed in detail in this chapter, as it they been previously evaluated and employed by other operating wind farms in the region of the Wind Farm Site. This segment has already undergone modifications, including alterations to roundabouts, junctions, and roadside infrastructure, along with necessary upgrades, to facilitate the delivery of turbine components.

The three TDR options assessed, all share a common final section from Ballina Town to the Wind Farm Site. The TDR assessment for this Proposed Development has focused on the route from Ballina Town to the Wind Farm Site (Second Leg) and the public roads within the Wind Farm Site (Final Leg) (**Appendix 17.1**).

Mayo County Council were consulted in person by the Applicant on the 18th of August 2023 and again on the 9th March 2026 regarding the use of the public road network for haul routes to proposed Wind Farm Site. Traffic count data from the TII traffic counter on the N59 near Corballa as used to inform the location and duration of classified traffic counts carried out on the local road network.

17.2.5 Field Work

A Preliminary Route Assessment was carried out in February 2023 and reviewed and updated with the revised 16 turbine site layout in March 2026 for the Second and Final Leg of the TDR. The route was assessed for the Vestas V117 turbine and their associated components. This route was assessed by a two-person team, and the various junctions and constraints were photographed.

The V117 turbine blade, measuring 57.2 m, will be the longest component transported from port to the Wind Farm Site. Lidar Survey data was used, and a detail Swept Path Analysis using Autodesk AutoCAD Vehicle Tracking was undertaken by JOD using a 57.2 m blade for the V117 turbine. The Swept Path Analysis identify 19 locations (Pinch Points) that would require alterations to facilitate the delivery of the turbine components to the Wind Farm Site refer to **Drawings TIR-AT-BA-001 to 021** (Note that drawing numbers **TIR-AT-BA-015** and **TIR-AT-BA-016** are obsolete and deleted from the drawing pack).

The findings of this assessment are summarised in the TDR Report **Appendix 17.1**. Traffic counts were carried out at Palmerstown Bridge on the R314 (location shown on **Plate 17.2**) on Friday, 30th June 2023 and reviewed against the revised 16 turbine layout in March 2026. This location was chosen as the primary survey spot as all the local road network utilised by the Proposed Development converge here.

17.2.6 Evaluation of Potential Effects

The baseline environment is described in **Section 17.4**. The available data was utilised to identify and categorise potential effects likely to affect the national and local road network used for the TDR and CHR as a result of the Proposed Development.

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.

17.2.7 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 17.3** below:

Table 17.3: Receptor Sensitivity

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.
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 footway 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 17.4 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) Guidelines[1] as it is not conveyed in the TII Guidelines. The assessment of environmental effects arising from road traffic is not an exact science and a degree of professional judgement is required. The definitions set out in **Table 17.4** below

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

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 17.4: Determining the 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.

17.2.8 Magnitude

The magnitude of potential effects has been defined in accordance with the criteria provided in the 2022 EPA publication 'Guidelines on the information to be contained in Environmental Impact Statements' as outlined within **Table 17.5**.

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.

The Traffic and Transport Assessment Guidelines (PE-PDV-02045, TII, May 2014) was developed to assess the potential effects of major developments on the national road network during their operation. These guidelines are applicable to the national roads relevant to the Proposed Development and have been used to assess the effects of the construction, operation and decommissioning phases of the Proposed Development on the N56, N15, N5, N4, N59, N26, N83, N17, N58, N67, N69, N18.

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 effects respectively.

For the most robust approach, the built-up area thresholds in line with the IEMA guidance have been used to guide assessments of the 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 the 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 – 90%).
- Low – perceptible change in conditions of circumstances (total traffic flows of +/- 30 – 60%).
- Very Low — no discernible change in conditions (total traffic flows of less than +/- 30%).

Table 17.5: Magnitude of Change

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

17.2.8.1 Significance of Effects

A combination of the magnitude of the effect under consideration and the sensitivity or value of the receiving environment / receptor, as set out in **Table 17.4** can be used in considering the overall significance of an effect. The general approach adopted for classifying effects is outlined in **Table 17.6**. A Major Moderate effect is seen as 'significant'. A Minor or Negligible effect is seen as 'not significant'.

Table 17.6: Significance of Effects

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

17.3 BASELINE DESCRIPTION

17.3.1 Sensitive Receptors

The Wind Farm Site is generally served by the R314 which runs between the towns of Ballina and Ballycastle. The R314 is used to get access to the Wind Farm Site and has a speed limit of 100 km / hour (hr).

Receptors considered as having 'high' sensitivity are primarily premises which are directly on the N56, N15, N5, N4, N59, N26, N83, N17, N58, N67, N69, N18, N17, R315 and R314 which have significant potential to generate traffic.

Between Ballina and the Wind Farm Site, the sensitive receptors are assessed in **Table 17.7**.

Table 17.7: Sensitivity of Receptors – Turbine Delivery Route from Ballina to the Wind Farm Site

Receptor	Sensitivity	Reasons/Comments
Queenan Kitchens, Ballina, Co. Mayo	Medium	Located adjacent to N59 after leaving Ballina town.
Ardagh Agri Services Limited, Ballina, Co. Mayo	Medium	Located adjacent to N59 after leaving Ballina town.
Mickey O'Boyles Pub, Ballymanagh, Co. Mayo	Medium	Located adjacent to N59 after leaving Ballina town.
Ardagh GAA Club, Carrowcrin, Co. Mayo	Medium	Located adjacent to L-1108 after leaving N59, in Carrowcrin.
Various private residences in Cloonkee area, Co. Mayo	Medium	Located adjacent to L-1008 Ballyneety.
Hygiene Products, Fairfield Upper, Crossmolina, Co. Mayo	Medium	Located adjacent to the L-1108 Ballyglass.
Michell Oil, Ardvarney, Garranard, Co. Mayo	Medium	Located adjacent to R315.
Moygownagh GAA & Community Centre, Knockaculleen, Moygownagh, Co. Mayo	Medium	Located adjacent to R315 in Maygownagh.
Defibrillator Moygownagh, Knovkaculleen, Belville, Co. Mayo	Medium	Located adjacent to R315 in Belville.
Private residences in Fallgarve, Co. Mayo	High	Located adjacent to the R315 in Fallgarve.
Private residences in Doonanarroo, Co. Mayo	High	Located adjacent to the R315 in Doonanarroo.
Kilfian GAA Club, Ratheskin, Co. Mayo	High	Located adjacent to R315 in Ratheskin
Saint Bridget's Holy Well, Ballyduane, Co. Mayo	High	Located adjacent to R315 in Ballyduane
Private residences in Creevesbeg, Co. Mayo	High	Located adjacent to the R315 in Creevesbeg.
Private residences in Annagh Beg, Co. Mayo	High	Located adjacent to the R315 in Annagh Beg.
Céide Fields Visitor Centre, Glenurla, Mayo	Medium	Located 8km northwest of Ballycastle off the R314, the visitor centre features an Atlantic-facing viewing platform. Large components using the TDR will typically be delivered at night, causing brief, temporary disruptions limited to the construction and decommissioning phases.

Table 17.8: Sensitivity of Receptors – Construction Haul Route from Ballina to the Wind Farm Site

Receptor	Sensitivity	Reasons/Comments
Adrain P Bourke and Company, Ballina, Co. Mayo	Medium	Located adjacent to R314 after leaving Ballina town.
The Mulberry Tree Learning Centre, Ballina, Co. Mayo	Medium	Located adjacent to R314 after leaving Ballina town.
Culleens National School, Ballina, Co. Mayo	Medium	Located in close proximity to R314 leaving Ballina town.
Various private residences in Laghtadawannagh area, Ballina, Co. Mayo	Medium	Located adjacent to R314 after leaving Ballina town.
Various private residences in Coonealcauraun area, Ballina, Co. Mayo	Medium	Located adjacent to Local public road after leaving R314 near Rathroeen Laugh
Various private residences in Ballinaleck area, Ballina, Co. Mayo	Medium	Located adjacent to Local public road in Ballinaleck
Various private residences in Coolcran and Rathowen East area, Ballina, Co. Mayo	Medium	Located adjacent to L-1107-99 in Coolcran and Rathowen East
Various private residences in Rathcash, Ballina, Co. Mayo	Medium	Located adjacent to L-5177-0 in Rathcash
St. Patrick's College, Ballina, Co. Mayo	Medium	Located adjacent to R314 in Carn
Private residences in Barroe, Co. Mayo	High	Located adjacent to the L-31143-0 in Barroe
Private residences in Barnhill Upper, Co. Mayo	High	Located adjacent to L-5179-0 in Barnhill Upper
Private residences in Barnhill Lower, Co. Mayo	High	Located adjacent to L-5179-23 in Barnhill Lower
Private residences in Ballymurphy, Co. Mayo	High	Located adjacent to L-5179-0 in Ballymurphy
Private residences in Lissadrone East, Co. Mayo	High	Located adjacent to L-31142-0 in Lissadrone East
Private residences in Lissadrone West, Co. Mayo	High	Located adjacent to L-31142-0 in Lissadrone West
Private residences in Lecarrowntemple, Co. Mayo	High	Located adjacent to L-31142-0 in Lecarrowntemple
Private residences in Conaghera, Co. Mayo	High	Located adjacent to L-5187-22 in Conaghera
Private residences in Conaghera, Co. Mayo	High	Located adjacent to L-51873-0 in Conaghera

Receptor	Sensitivity	Reasons/Comments
Private residences in Lacken Hill, Co. Mayo	High	Located adjacent to L-5187-47 in Lacken Hill
Private residences in Lackanhill, Co. Mayo	High	Located adjacent to L-21147-0 in Lackanhill
Private residences in Lissadrone, Co. Mayo	High	Located adjacent to L-21149-0 in Lissadrone

For the CHR to the Wind Farm Site, the sensitive receptors are assessed in **Table 17.9**:

Table 17.9: Sensitivity of Receptors – Civil Construction Haul Route from the Local Quarries to the Wind Farm Site

Receptor	Sensitivity	Reasons/Comments
St. Patrick's College, Ballina, Co. Mayo	Medium	Direct access onto R314

For the GCR, the sensitive receptors are assessed in **Table 17.10**:

Table 17.10: Sensitivity of Receptors – Grid Connection

Receptor	Sensitivity	Reasons/Comments
Killala Business Park, Tawnaghmore Upper, Co. Mayo	High	Located adjacent to R314 in Tawnaghmore Upper
Killala Rock, Co. Mayo	High	Located adjacent to Local public road in Mullaferry
Mullaferry Quarry, Co. Mayo	High	Located adjacent to Local public road in Mullaferry
Various private residences in Coolcran and Rathowen East area, Co. Mayo	Medium	Located adjacent to L-1107-99 in Rathowen East
Various private residences in Rathcash, Co. Mayo	Medium	Located adjacent to L-5177-0 in Rathcash
St. Patrick's College, Carn, Co. Mayo	Medium	Located adjacent to R314 in Carn

For works within the Wind Farm Site, the sensitive receptors are assessed in **Table 17.11:**

Table 17.11: Sensitivity of Receptors – Within the Proposed Development Site

Receptor	Sensitivity	Reasons/Comments
Workers cutting turf in the Proposed Development Site	High to Low	Coordination with local communities required to enable continued access to harvest turf
Vehicles using public roads	High to Low	Use of Traffic Mitigation measures highlighted in the Traffic Management Plan

17.3.2 Road Access to the Wind Farm Site

Access to the Wind Farm Site will be from a total of 14 entrances, 5 new and 9 existing, refer to **Table 17.12, Site Entrance Description**. Each entrance will open out onto a local road, (speed limit 60 km to 80 km) and will be constructed or upgraded to accommodate the swept path of abnormal load vehicles accessing the Wind Farm Site during the delivery of turbine components. Visibility splays of 70 m to 160 m will be available from a 3.0 m setback in accordance with TII specifications and with the Mayo County Development Plan. The junctions will be a stop-controlled junction with priority for public traffic. The location of the Wind Farm Site entrance junctions is shown in **Figure 2.1.**

Table 17.12: Site Entrance Description

Site Entrance Description				
No.	**Entrance**	**Access To**	**Description**	**Road Class**
1	Existing	AT02, AT03, AT04 and Met Mast	Turn Left off the L5173 onto Site Access Track	Local
2	New	AT01, TCC, Onsite Substation and BESS	Turn right off L51791, travel south along local road L31143, then turn right onto Site Access Track	Local
3	Existing	AT05, AT06	Turn right off local L5179 road, then onto Site Access Track	Local
4	New	AT07, AT08,	Turn left off local road L5179-23 onto Site Access Track	Local
5	New	AT07, AT08,	Turn left off local road L-5179-0 onto Site Access Track to AT07, AT08 Turn right off local road L-5179-0 onto local road L-311420 onto Site Access Track to AT09 and AT10.	Local
6	New	AT09, AT10	Turn left off local road L31142-0 onto Site Access Track	Local
7	Existing	AT13, AT14	Turn left off local road L5187-47, then right on access track.	Local
8	Existing	AT11	Turn left off local road L5187-47 onto Site Access Track	Local
9	New	AT12	Turn right off local road L5187-47 onto Site Access Track	Local
10	Existing	TCC	Turn left off local road L5187-47 onto Site Access Track	Local
11	Existing	Operations Building	Turn right off local road L5187-47 onto Site Access Track	Local
12	Existing	Site Access Track, Entrance 13	Turn right off local L21147-0 road onto Site Access Track	Local

Site Entrance Description				
No.	**Entrance**	**Access To**	**Description**	**Road Class**
13	Existing	Site Entrance 14	Exit Site Access Track at Site Entrance 13, continue north across width of local road to Site Entrance 14	Local
14	Existing	Abandoned Quarry, AT15, AT16	Continue north across width of local road from Site Entrance 13 to 14 and onto Site Access Track	Local

17.3.2.1 Turbine Delivery Route

The 3 TDRs as described in **Section 17.3.4** were assessed for turbine delivery from Killybegs Harbour, Galway port and Foynes Port, taking the relevant national roads towards the Wind Farm Site. The below is a direction summary for each option from the ports to the Wind Farm Site:

First Leg

- Exit Killybegs Port; At the roundabout take the 2nd onto Shore Road/R263 (700 m)
- Turn right onto the R263 (3.1 km)
- Continue on the N56 (23 km)
- At the roundabout, take the 2nd exit and stay on N56 (2.3 km)
- At Drumlonagher Roundabout, take the 2nd exit onto N15 (3.7 km)
- At Tullyearl Roundabout, take the 1st exit and stay on N15 (17 km)
- At Erne Roundabout, take the 1st exit and stay on N15 (6.4 km)
- At Drumacrin Roundabout, take the 1st exit and stay on N15 (4.3 km)
- At Tullaghan Roundabout, take the 1st exit and stay on N15 (31.9 km)
- Continue onto N4 (1.4 km)
- At Summerhill Roundabout, take the 2nd exit and stay on N4 (5.2 km)
- Use the left lane to take the N59 ramp to Ballina (280 m)
- Continue onto N59 (1.8 km)
- At the roundabout, take the 3rd exit and stay on N59 (260 m)
- At the roundabout, take the 2nd exit and stay on N59 (49.5 km)
- Turn left onto Bunree Rd. (850 m)
- Turn right onto Healy Terrace/R294 (750 m)
- Continue straight on Tone St onto Garden St
- Continue straight on Garden St onto McDermot St
- Continue onto Gurteens/L1119 (650 m)
- At the roundabout, continue straight (75 m)

- Continue onto N59 (4.2 km)

Second Leg

Refer Figure 17.4 for route map:

- Turn right onto L1108 Ballymanagh (550 m)
- Take L1108 Cloonkee and L1108 Ballyneety to R315 (7.8 km)
- Turn right onto R315 (8.7 km)
- Take Annagh Beg Rd. to Billoos junction on the R314 (4.1 km)

Final Leg

From here take the final leg route options to desired turbines locations:

– The Blue Route: AT01 to AT04 and Met Mast (**Ref** to **Figure 17.5**)

– The Orange Route: AT05 to AT16 (**Ref** to **Figure 17.6**)

Refer to **Section 17.4.2.2** for Final Leg detail.

TDR Option 2 Galway Port Turbine Delivery Route:

- Exit the Port of Galway onto Lough Atalia Road
- Exit the Port of Galway and turn onto Lough Atalia Rd. (1.4 km)
- Lough Atalia Rd. turns slightly right and becomes College Rd/R339 (1.3 km)
- Turn right onto Tuam Rd/R336 (2.3 km)
- Continue onto N83 (25.9 km)
- At the roundabout, take the 1st exit onto N17 heading to Claremorris (4.1 km)
- At the roundabout, take the 1st exit and stay on N17 heading to Claremorris/Sligo (24.4 km)
- Continue straight to stay on N17 (30.6 km)
- At the roundabout, take the 2nd exit (270 m)
- Use the left lane to merge onto N5 via the ramp to Westport/Swinford (27 km)
- Turn right and continue on the N58 (11.3 km)
- Turn left onto Chapel Rd/N26 and continue to follow the N26 (15.5 km)
- Turn left onto Lord Edward St/N59 and continue to follow the N59 (1.8 km)
- At the roundabout, take the 2nd exit and continue onto the N59 (4.2 km)

Second Leg

- Turn right onto L1108 Ballymanagh (550 m)
- Take L1108 Cloonkee and L1108 Ballyneety to R315 (7.8 km)

- Turn right onto R315 (8.7 km)
- Take Annagh Beg Rd. to Billoos junction on the R314 (4.1 km)

Final Leg

- From here take the final leg route options to desired turbines locations:
  - The Blue Route: AT01 to AT04 and Met Mast
  - The Orange Route: AT05 to AT16

Refer to **Section 17.4.2.2** for Final Leg detail.

TDR Option 3 Foynes Port Turbine Delivery Route:

- Exit the Port of Foynes onto the N69
- At the junction with N18, Turn left onto N18
- At Kilbreckan junction, continue straight and join the M18
- At Caraunduff, continue straight and join the M17
- At the junction with the N83, continue straight onto the N83
- At the roundabout in Tuam, take the 2nd exit onto the N17
- At the roundabout north of Tuam, take the 1st exit onto the N17
- At the roundabout south of Charlestown, take the 2nd exit onto the road towards N5
- Continue on N5 for 1.4 km to the junction towards the L-1331
- At the junction, turn left onto the L-1331 towards Charlestown
- At the junction in Charlestown, turn left onto the N5
- At the junction on the N5, continue turn right towards Foxford.
- At the junction in Foxford, continue straight on the N26.
- Continue on O'Rahilly St., then turn right onto the Bury St, and continue on the N59.
- Continue on N59, then turn left on the L-1108 to Maygownagh.
- Continue on the L-1108, then turn right onto the R315 in Maygownagh.
- Continue on the R315, then at Annagh Beg, turn right on the unnamed road towards the site entrance.
- Continue on the unnamed road until the Wind Farm Site Entrance.

Second Leg

- Turn right onto L1108 Ballymanagh (550 m)
- Take L1108 Cloonkee and L1108 Ballyneety to R315 (7.8 km)
- Turn right onto R315 (8.7 km)
- Take Annagh Beg Rd. to Billoos junction on the R314 (4.1 km)

Final Leg

- From here take the final leg route options to desired turbines locations:
  - The Blue Route: AT01 to AT04
  - The Orange Route: AT05 to AT16

Refer to **Section 17.4.2.2** for Final Leg detail.

17.3.2.2 Turbine Delivery Route – Final Leg

Blue Route

The Blue Route (**Figure 17.5**) provides direction for the delivery of turbine components for wind turbines AT01 – AT04 from the cessation point of the Second Leg at TDR Annagh Beg junction to their final destination.

Directions for the delivery of turbine components for wind turbine AT01:

- Continue straight from the cessation point of the Second Leg TDR, through the Annagh Beg junction located on the R314 east onto the L51792
- Turn right onto the L51791, continue for 615 m
- Turn Left onto the L31143, continue for 656 m
- Turn left into the Wind Farm Site using **Site Entrance 2** (**Figure 2.1**) to wind turbine AT01's final destination.

Directions for the delivery of turbine components for wind turbine AT02, AT03 & AT04:

- At the cessation point of the Second Leg TDR, turn right at the Annagh Beg junction south onto the R314
- Continue on the R314 for 721 m and turn right onto the L51731 for 347 m
- Turn right into the Wind Farm Site using **Site Entrance 1** (**Figure 2.1**) to wind turbines AT02 through AT04's final destination.

Orange Route

The Orange Route (**Figure 17.6**) provides direction for the delivery of turbine components for wind turbines AT05 to AT16 from the cessation point of the Second Leg TDR at Annagh Beg junction to their final destination.

Directions for the delivery of turbine components for wind turbine AT05 and AT06:

- Continue straight from the cessation point of the Second Leg TDR, through the Annagh Beg junction located on the R314 east onto the L51792
- Turn left onto the L51791, continue north for 530 m

- Turn left into the Wind Farm Site using **Site Entrance 3** (**Figure 2.1**) to wind turbine AT05 and AT06's final destination.

Directions for the delivery of turbine components for wind turbine AT07 and AT08:

- Continue straight from the cessation point of the Second Leg TDR, through the Annagh Beg junction located on the R314 east onto the L51792
- Turn right onto the L51791, continue north for 530 m
- Turn left into the Wind Farm Site using **Site Entrance 4** (**Figure 2.1**)

Directions for the delivery of turbine components for wind turbine AT09 and AT10:

- Utilise the same route for wind turbines AT07 and AT08 as far as **Site Entrance 5** (**Figure 2.1**)
- At **Site Entrance 5**, continue north on the L31142 for 636 m and turn left onto Site Access Track.

Directions for the delivery of turbine components for wind turbine AT11 to AT12:

- Turn left off local road L31142-0 onto local road L5187-47
- Turn left off local road L5187-47 onto AT11 Site Access Track using **Site Entrance 8** (**Figure 2.1**)
- Utilise the same route for wind turbine AT12 as far as **Site Entrance 9** (**Figure 2.1**)
- At **Site Entrance 9**, continue west on the L1587 for 337 m to **Site Entrance 10** for Site Compound and **Site Entrance 11** for Operations Building, all located along the L5187-22.

Directions for the delivery of turbine components for wind turbines AT13 & AT14:

- Utilise the same route for wind turbines AT11 and AT12 as far as **Site Entrance 7** (**Figure 2.1**)
- At **Site Entrance 8**, continue west on the L31142 for 236 m
- Turn left off the L31142 onto **Site Entrance 7** into AT13 and AT14.

Directions for the delivery of turbine components for wind turbines AT15 and AT16:

- Utilise the same route for wind turbines AT11 to 14 traveling East from **Site Entrance 7** on the L5187-47as far as **Site Entrance 12** (**Figure 2.1**).
- At Site Entrance 12 travel north to **Site Entrance 13** for 636 m, onto the L21147-0.
- Continue along Site Access Track to **Site Entrance 13** (**Figure 2.1**)
- Continue north across the width of the L21148 to **Site Entrance 14** (**Figure 2.1**) to wind turbines AT15 and AT16's final destination.

17.3.2.3 Roads on Grid Connection Route

The Grid Connection runs between the 110 kV Onsite Substation and the Tawnaghmore 110 kV Substation located in Killala Business Park, Killala. The GCR from the Onsite Substation traverses the L-31143 east to the L-1114, then south westerly on the L-1114 to the R314. The GCR follows the R314 southeasterly towards Palmerstown Bridge. At Palmerstown Bridge, Horizontal Directional Drillings (HDD) will be required to cross the river. The GCR then follows a short section on the R314 and then turns right onto the L-5177. Leading eastwards, the GCR will be laid within sections of the L-5176, then to the L-1107 southwards. The route then turns left onto the L-1111 before heading north onto left - L-5147 and the R314 before turning left into the Killala Business Park in an easterly direction for approximately 1 km to join the Tawnaghmore substation. Of the total length of c.13.55 km, the majority will be within public roads. The L-5177, L-1114, L-5176-0, L-1107-, L-1111 and the L-5147 are reasonably narrow at c. 3 – 4 m with sporadic private dwellings along the route.

17.3.3 Delivery Vehicle Specification

Delivery of road construction materials, concrete for Turbine Foundations, building materials, drainage, ducting and cables will be carried out using standard heavy goods vehicles (HGV). Delivery of turbine components will be carried out using specialist abnormal load vehicles. Two different types of loads will arise, very long loads for turbine blades and wide/high loads for turbine tower sections. Turbine blades measuring 57.128 m for the V117 will be delivered on an extendable semitrailer, one per trailer. Following delivery to the Wind Farm Site, the trailer will be retracted for the return trip. An indicative blade delivery vehicle schematic is shown in **Plate 17.1** below. The Swept Path Analysis (refer to **Appendix 17.2**) assesses the need for road verge strengthening, removal or relocation of obstacles (e.g. tree pruning or Street Furniture) and or the extent of any potential oversail into private lands associated with blade transportation. The analysis was based on Vestas V117 turbine.

The widest and tallest turbine delivery vehicle will be for the turbine tower sections. The turbine tower section needs a clearance width 4.5 m to 5 m minimum drivable width on a straight road with a maximum gradient of 14%. The tower is 4.5 m tall which is 0.2 m taller than the laden hub height (4.3 m). The top and section views of this vehicle is shown in **Plate 17.1**.

Indicative transport for top tower section:

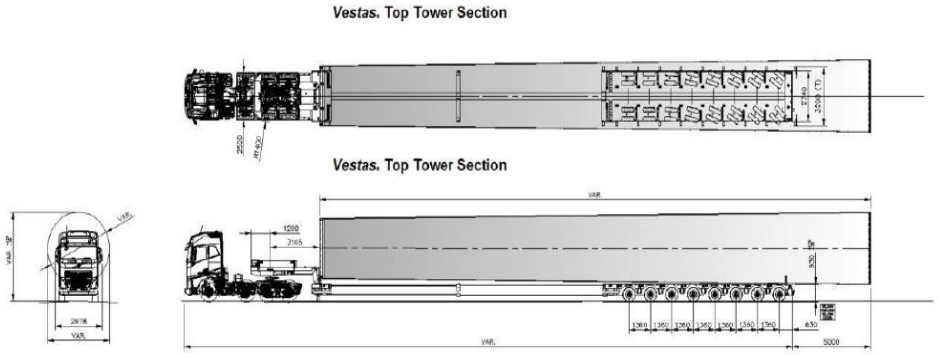

Figure 14-12

Indicative transport for bottom/mid tower sections:

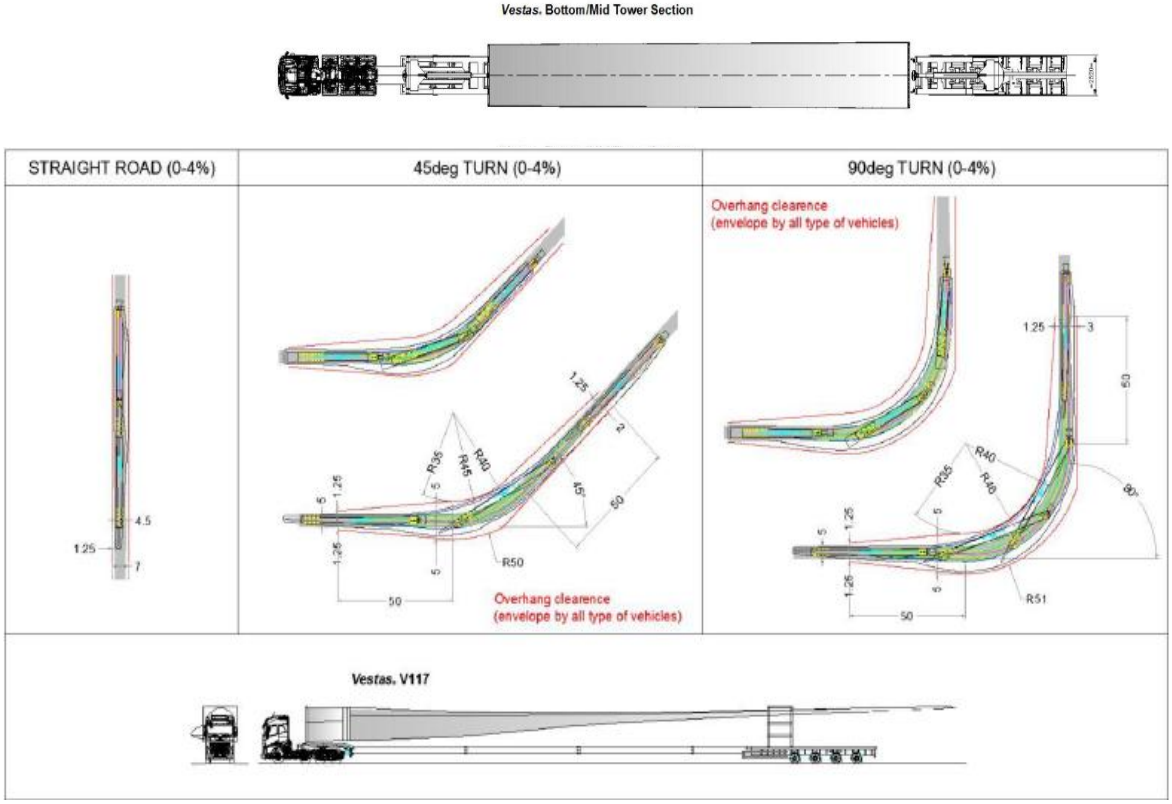

Plate 17.1: Turbine Tower Section Delivery Vehicle

All material deliveries will have a maximum axle load of up to 12 tonnes per axle, and a maximum total truck weight 65 tonnes approx. The main crane for turbine erection will have a maximum axle loading of 12 tonnes per axle and a maximum total weight of 100 tonnes approx. Vehicles delivering counterweights for the crane will have a maximum axle loading of up to 12 tonnes per axle. The transport vehicles used for transportation of components may differ from those shown above depending on the haulage contractor's preferences.

17.3.4 Existing Traffic Volumes

The R314 is the main route between Ballina and the Proposed Development Site. This is a regional road and as would be expected, there is no specific traffic data from Traffic Infrastructure Ireland (TII) for this road or local public roads in the vicinity as TII's counters are located only on National roads. Thus, this was necessary to carry out traffic counts.

Jennings O'Donovan & Partners carried out classified traffic counts at one location on the R314 at Palmerstown Bridge. This location was chosen as it is close to the Wind Farm Site and where all the local public roads utilised by the Wind Farm Site converge. This location was used to determine baseline traffic volumes and junction capacity on the public road network which will be directly affected by construction traffic during the wind farm construction period. 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.

17.3.4.1 Transport Infrastructure Ireland DATA

In order to determine trends on the public road network, data was taken from the nearest available TII Data Station along the N59 between Sligo and Ballina Traffic Station TMU N59 040.0 S (**Table 17.14**), below is a summary.

TII conduct traffic counts continuously[2] on the N59 at Rathglass, north-east of Corballa (Station Id: TMU N59 040.0 S). The Average Annual Daily Traffic (AADT) volume on the road was recorded to be 4,042 vehicles in 2019 (2020 and 2021 values are less due to Covid Restrictions) as outlined in **Table 17.14**. From this table, in 2019, the number of HGVs was 125 with light vehicles making up the remaining 3,916 of the totals of up to 4,692 in 2025. For 2025, while the AADT was slightly higher in 2025 than in 2019 (4,692 vehicles), the number of HGV was similar at 145.

Table 17.14: TII Traffic Data

Station Id. TMU N59 040.0 S Description: N59 Between Sligo and Ballina, Corballa, Co. Mayo			
Year	**AADT**	**% HGV**	**Coverage**
2026	4,478	3.1%	30.3%
2025	4,692	3.1%	99.6%
2022	4,172	3.8%	100%
2021	3,626	4.1%	100.0%
2020	3,283	4.5%	100.0%
2019	4,042	4.8%	99.7%
2018	3,903	4.0%	99.7%

[2] https://trafficdata.tii.ie/publicmultinodemap.asp

17.3.4.2 Traffic Counts at R314 / Unnamed Rd Junction

A short period traffic count was carried out at the R314/ Unnamed rd. junction on Friday 30th June 2023. The count was carried out between the hours of 08:00 and 09:00 during the morning period and 16:30 and 17:30 for the afternoon period. The location of the traffic count is shown on **Plate 17.2**. The layout of the junction is shown on **Plate 17.3** and **Plate 17.4**.

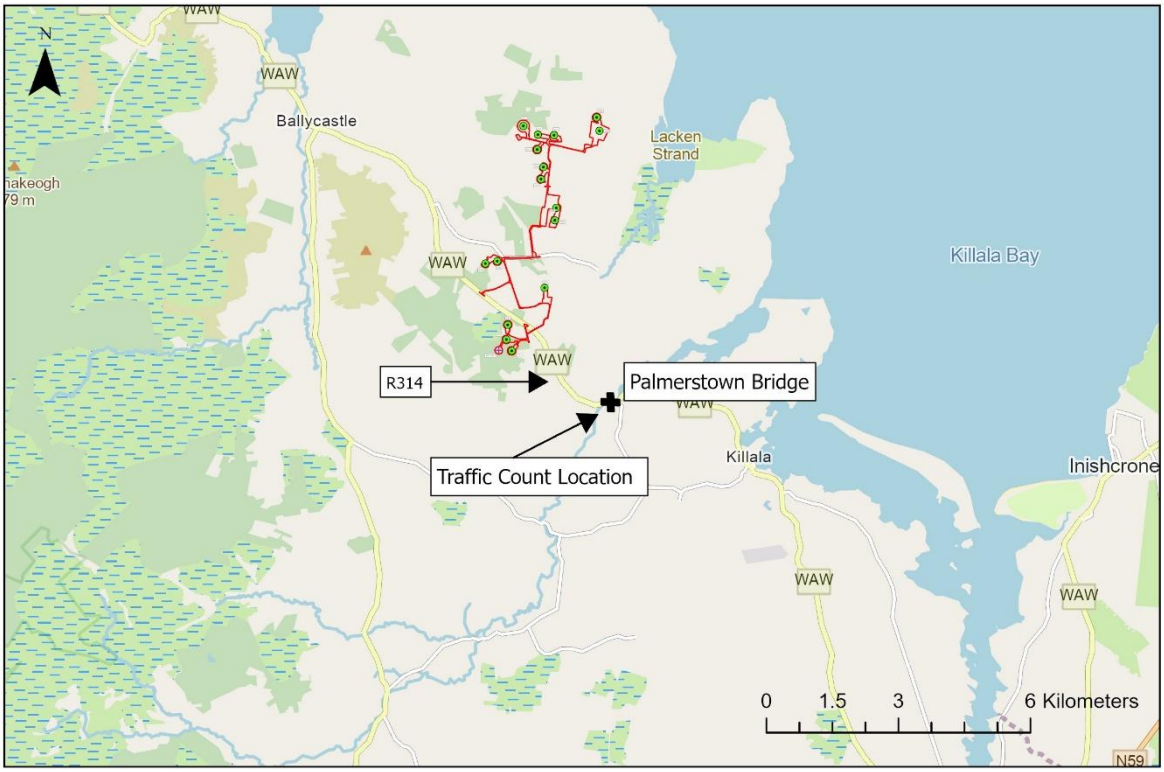

Plate 17.2: **R314/Local Road Junction Layout Map**

Plate 17.3: **R314/Local Road Junction Layout (Westbound)**

Turning movements at the junction are shown on **Plate 17.4** and the classification of vehicles is shown **Table 17.17** below. The total amount of turning movements can be seen in **Plate 17.5** during the AM period (08:00 am to 09:00 am) and in **Plate 17.7** during the PM period (16:30 pm to 17:30 pm). The arrows show the direction of travel with the total count of traffic movements.

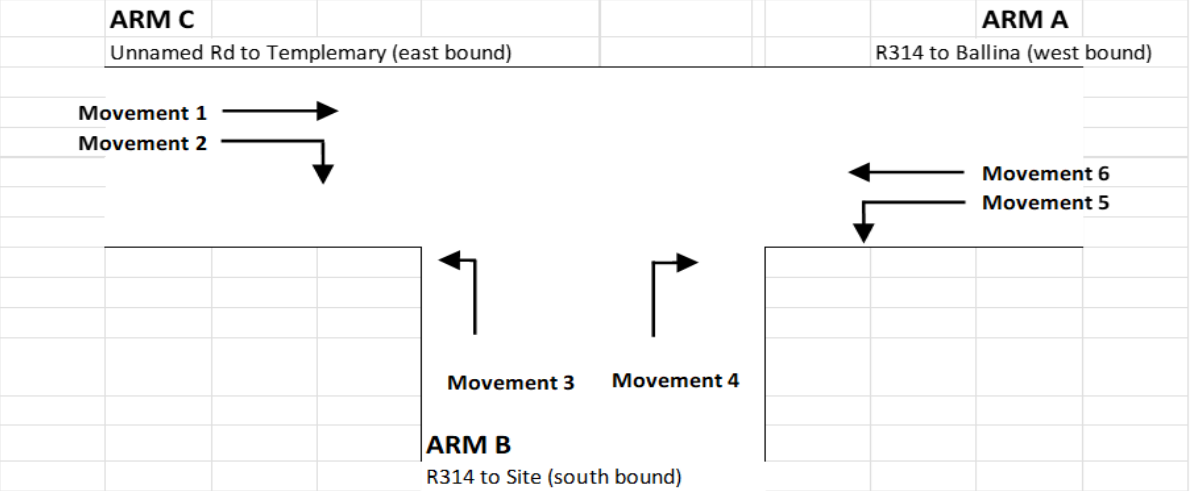

Plate 17.4: Junction Turning Movements at R314/Local Road

Table 17.17: R314/Local public road Junction – Existing Traffic Flows – 30th June 2023

Type of Vehicle	Movement No. 1	Movement No. 2	Movement No. 3	Movement No. 4	Movement No. 5	Movement No. 6
08.00 to 09.00						
Cars	20	2	0	49	9	4
Vans & LGV's	2	0	0	8	5	1
Trucks	1	0	0	0	4	1
Articulated Trucks	0	0	0	1	0	0
Buses	0	0	0	1	0	0
Motorbikes	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0
Totals	**23**	**2**	**0**	**59**	**18**	**6**
Veh.s/Minute	**0.38**	**0.03**	**0.00**	**0.98**	**0.30**	**0.10**
% Heavy Veh.s	**0.04**	**0.00**	**0.00**	**0.03**	**0.22**	**0.17**
16.30 to 17.30						
Cars	16	6	2	48	55	22
Vans & LGV's	4	2	2	13	20	4

Type of Vehicle	Movement No. 1	Movement No. 2	Movement No. 3	Movement No. 4	Movement No. 5	Movement No. 6
Trucks	0	0	0	5	2	0
Articulated Trucks	0	0	0	0	0	0
Buses	1	0	0	1	0	1
Motorbikes	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0
Totals	**21**	**8**	**4**	**67**	**77**	**27**
Veh.s/Minute	**0.35**	**0.13**	**0.07**	**1.12**	**1.28**	**0.45**
% Heavy Veh.s	**0.05**	**0.00**	**0.00**	**0.09**	**0.03**	**0.04**

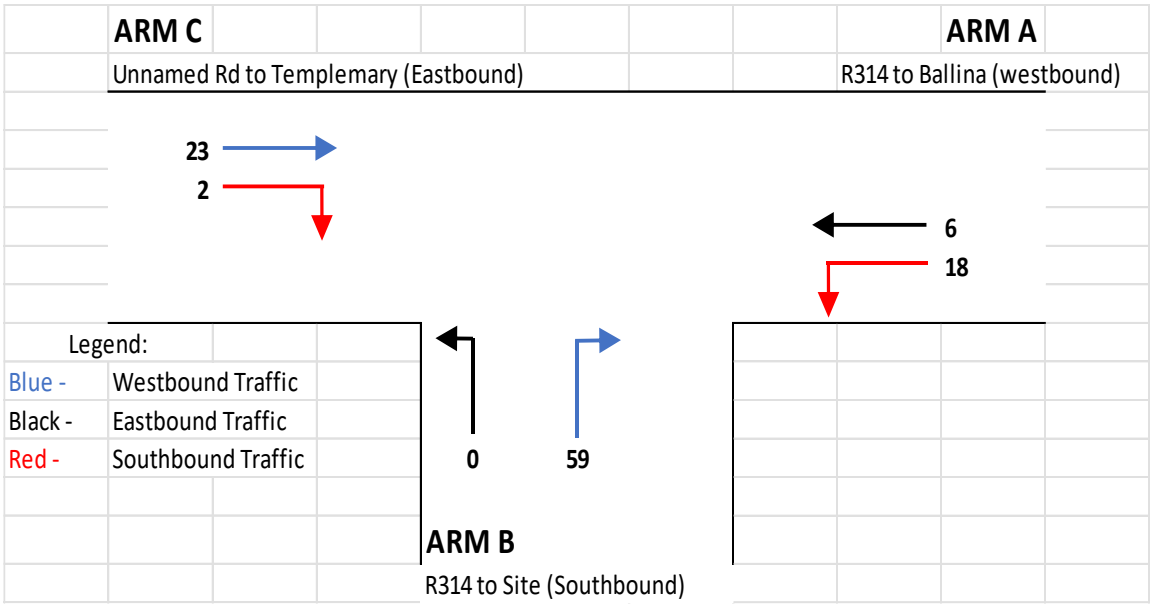

Plate 17.5: Junction Turning Movements at R314/ Local Road – AM Period.

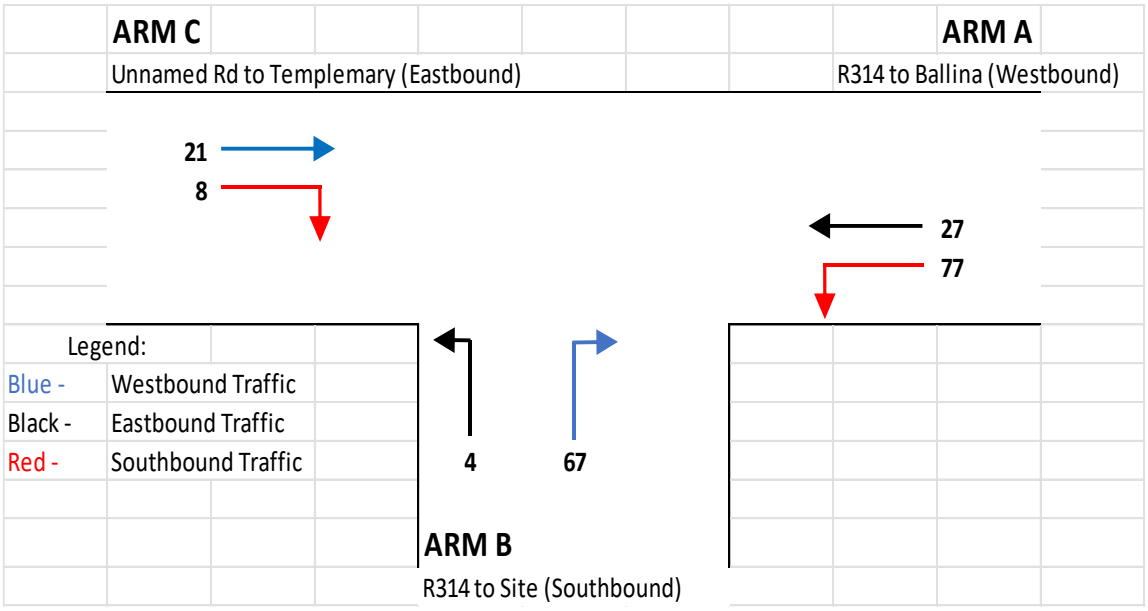

Plate 17.6: Junction Turning Movements at R314/ Local Road – PM Period.

17.3.4.3 Existing Traffic Flows on the R314 and the Unnamed Local Road

The Annual Average Daily Traffic (AADT) values for each of the R314 and the local public road 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 to 09:00 is 0.077 and 16:30 to 17:30 is 0.095.

17.3.4.4 24-Hour Flow Estimations

The first step to determining the AADT is to determine the 24-Hour Flow Estimations at the Junction. For the R314 and local public road, the traffic movements towards the eastbound (Unnamed Rd to Templemary) direction total 6 (0+6) for the AM period and a total 31 (27+4) for the PM period and towards the westbound (R314 to Ballina) direction, a total of 82 (23+59) for the AM period and 88 (21+67) for the PM period (See below **Plate 17.7, AM Traffic Flow Diagram and Plate 17.9, PM Traffic Flow Diagram**).

The total of the counts towards the eastbound and westbound directions in the AM period are as follows:
88 (6+82) is the total traffic for the AM period in both eastbound and westbound directions. The 24-hour estimate is therefore 1143 (88/0.077) vehicles for the AM period.

The total of the counts towards the eastbound and westbound directions in the PM period are as follows:
119 (31+88) is the total traffic for the PM period in both eastbound and westbound directions. The 24-hour estimate is therefore 260 (20/0.095) vehicles for the PM period.

The total of the counts towards the southbound (R314 to Wind Farm Site) direction in the AM period are as follows:
The traffic movements correspond to the southbound (R314 to Wind Farm Site) totals 20 (18+2) for the AM period. The 24-hour estimate is therefore 260 (20/0.077) for the AM period.

The total of the counts towards the southbound (R314 to Wind Farm Site) direction in the PM period are as follows:
The traffic movements corresponding to the southbound (R314 to Wind Farm Site) totals 85 (77+8) for the PM period. The 24-hour estimate is therefore 895 (85/0.095) for the PM period.

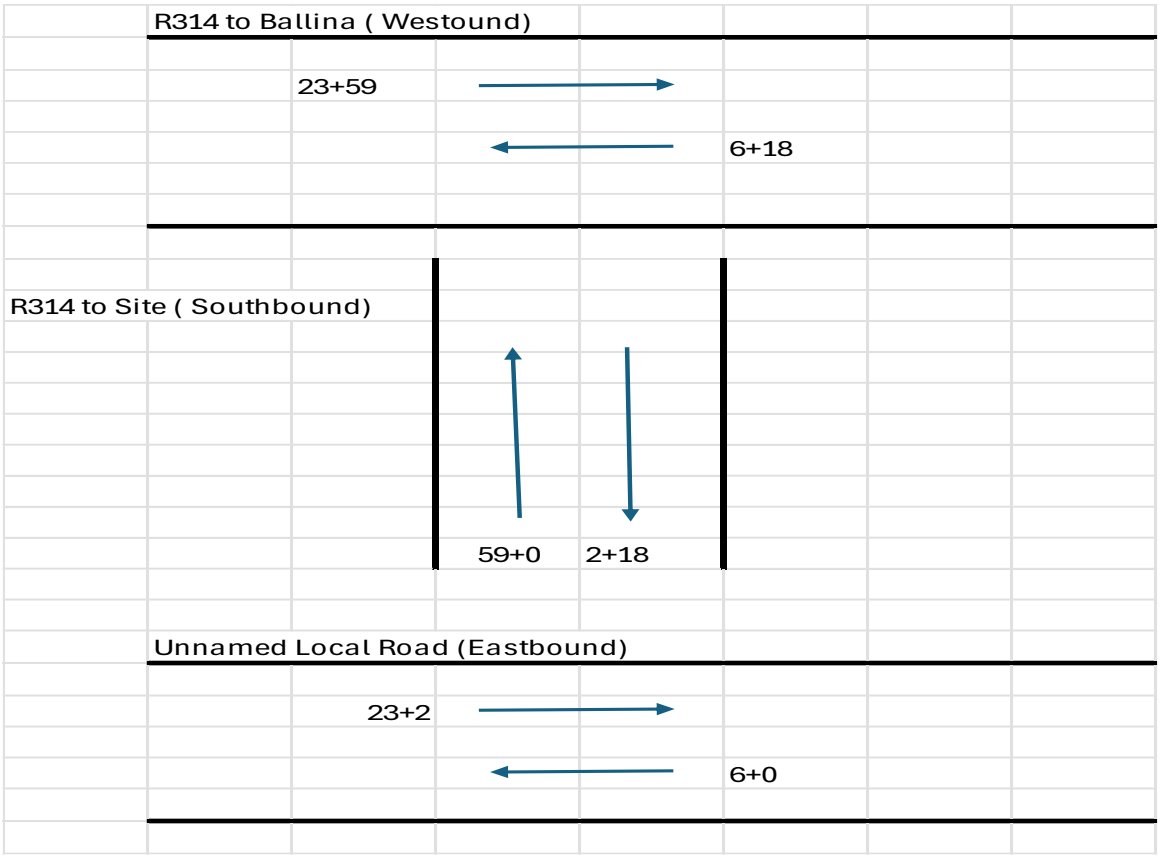

Plate 17.7: AM Traffic Flow

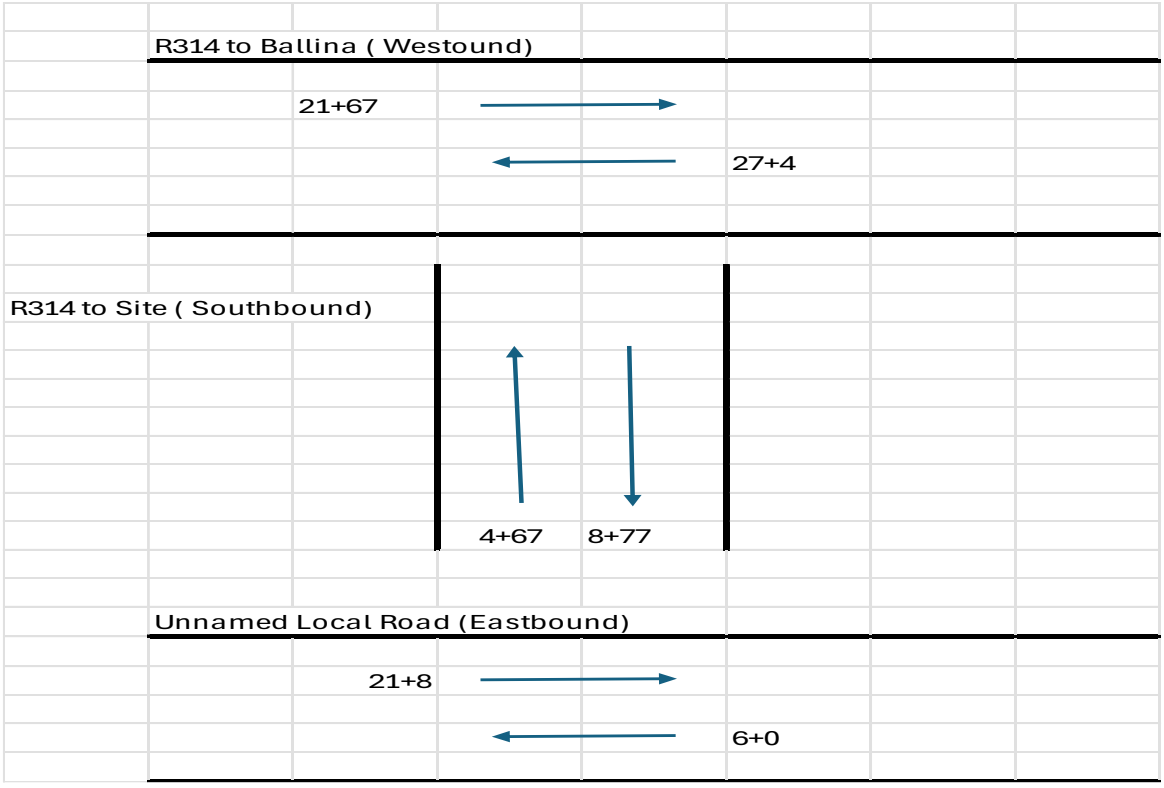

Plate 17.8: PM Traffic Flow

17.3.4.5 WADT Index Factors

The survey was carried out on a Friday. From Appendix B of PE-PAG-02039, the daily traffic flow is 0.87 times the Weekday Average Day Traffic (WADT). Multiplying the 1143 (east and west bound AM period) and 260 (southbound AM period) values derived above by 0.87 gives the weekly average daily traffic values of 994 for the eastbound and westbound directions (Unnamed Road to Templemary and R314 to Ballina) and 226 for the southbound direction (R314 to/away from site) in the AM periods. Multiplying the 1253 (east and west bound PM period) and 895 (southbound PM period) values derived above by 0.87 gives the weekly average daily traffic values of 1090 for the east and west bound directions (Unnamed Road to Templemary and R314 to Ballina) and 778 for the southbound directions (R314 to site) in the PM period.

17.3.4.6 AADT Index Factors

The final calculation is to convert to AADT by factoring for month of year. The traffic count was carried out in June. From Appendix C of PE-PAG-02039, the factor for conversion for the West region is 0.96. Thus, the AADT for the east and westbound directions (Unnamed Road to Templemary and R314 to Ballina) is 955 while the AADT for the north and south bound directions (R314 to Wind Farm Site) is 217 for the AM period and the AADT for the east and west bound directions (Unnamed Road to Templemary and R314 to Ballina) road is 1046 while the AADT for the southbound directions (R314 to Wind Farm Site) is 747 for the PM period.

The classified traffic counts from 30th June 2023 (see **Table 17.17**), together with **Plate 17.6 Junction Turning Movements** at **R314**, show that HGV traffic on the R314 accounts for less than 1% of the total traffic volume using the road.

17.3.5 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 Proposed Development is likely to take place. **Table 17.18** shows the multiplier for County Mayo under different growth rate scenarios.

Table 17.18: Traffic Annual Growth Predictions Formulae (Multipliers) for County Mayo 2016 to 2030

County	Low Sensitivity Growth Rate		Central Growth Rate		High Sensitivity Growth Rate	
	LV	HV	LV	HV	LV	HV
Mayo	1.0111	1.0314	1.0127	1.0330	1.0161	1.0364

LV = Light Vehicles, HV = Heavy Vehicles

Assuming that construction will take place in 2027, under the high sensitivity scenario, using interpolation, the growth factor for 2030 is 1.0161 for light vehicles and 1.0364 for heavy vehicles the number of light vehicles on the R314 towards the Wind Farm Site entrance will increase to 1,733 AADT in 2030 from the 2023 AADT of 1,706 AADT and heavy vehicles to 91 AADT in 2027 from 88 AADT in 2023.

The recorded traffic figures show that, in 2027 Construction Phase, the R314 at the Palmerstown Bridge Junction is predicted to be running at 1,864 AADT at this junction, which is approximately 37.3% of its capacity and therefore has the capacity to accommodate additional traffic in the future.

Table 17.19 shows the multiplier for County Mayo under different growth rate scenarios from 2040 to 2050. Assuming that the operational phase will end in 2062, under the high sensitivity scenario, using interpolation, the growth factor for 2050 is 1.0290 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 number of heavy vehicles on the R314 at the Proposed Development access intersection will increase to 95 in 2050 from the 2040 AADT of 93.

The recorded traffic figures show that, in 2050 Operational Phase, the R314 is predicted to be running heavy vehicles at 95 AADT at this junction, which is approximately 1.9% of its capacity and 8% increase from 88 AADT recorded in 2023.

Table 17.19: Traffic Annual Growth Predictions Formulae (Multipliers) for County Mayo 2040 to 2050

County	Low Sensitivity Growth Rate		Central Growth Rate		High Sensitivity Growth Rate	
	LV	HV	LV	HV	LV	HV
Mayo	1.0005	1.0173	1.0026	1.0192	1.0097	1.0290

LV = Light Vehicles, HV = Heavy Vehicles

The estimated capacity of the R314 national 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 R314 at the turnaround location is similar in section to a 5.0 m Type 3 single carriageway. A Type 3 carriageway has a guidance capacity of 5,000 AADT for level of service D.

Table 17.20 below highlights the projected AADT values from 2023 to 2027 of the junctions affected in relation to the capacity of the current existing roadway.

Table 17.20: Projection Summary of affected Junctions AADT from 2023 to 2027

Junction	AADT (2023)	AADT (2027)	Capacity (AADT)	Capacity of roadway in 2027
R314/Local public road	1794	1864	5000	37.3%

17.3.6 Accident Statistics

The Road Safety Authority publish tables[3] on "Road Casualties and Collisions in Ireland" each year. The last published table is for 2016.

Statistics are divided into those occurring "Collisions" and those occurring "Casualties".

Table 17.21 below presents a summary of traffic collisions and casualties for Co. Mayo for the year 2016.

Table 17.21: Summary of Traffic Collisions and Casualties for Co. Mayo for the year 2016

Year	Collisions			Total	Casualties			Total
	F	I	Total %		F	SI	Total %	
2016	4	134	2.3	138	4	209	2.7	213

F = Fatal

I = Injuries

Total % = Compared to 2016 population of 131,000 and 81,000 registered motor vehicles for Co. Mayo.

[3] https://www.rsa.ie/docs/default-source/about/road-casualties-and-collisions-in-ireland-2016---tables.pdf?Status=Master&sfvrsn=de40c7e9_3

17.4 PROPOSED WORKS

17.4.1 Proposed Development Construction Phase

The construction period of the Proposed Development is anticipated to take approximately 21 months. The majority of HGV deliveries to Proposed Development Site will take place during Turbine Foundation, Turbine Hardstands and Proposed Development 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 proposed Site Access Tracks as well as, reinforcing steel and ready-mix concrete for Turbine Foundations. All of the stone for Proposed Development Site Access Tracks and Turbine Hardstands will be imported.

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 07:00 – 13:00 on Saturdays with no working on Sundays or on Bank or Public Holidays unless agreed otherwise with Mayo County Council (e.g. for concrete works for foundations which may start before 07:00 on weekdays only).

Some special deliveries such as turbine components are also likely to be required to be delivered outside of these times in consultation with Mayo County Council.

17.4.2 Turbine Component Haul Route

Works on the turbine supply routes are described in detail in the TDR report included in **Appendix 17.1.** For abnormal loads between Killybegs Port and the Proposed Development Site, Galway Port and the Proposed Development Site, and Foynes Port and the Proposed Development 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 from Ballina towards the Proposed Development Site has been determined by reference to the swept path analysis drawings (see **Appendix 17.1** for Swept Path Analysis Drawings prepared for the turbine TDR between Ballina and the Wind Farm Site)**.**

17.4.3 Civil Construction Haul Route

No upgrade works are necessary to the R314 to facilitate the delivery of materials. There will be no need for passing bays, as the R314 is wide enough to facilitate HGV deliveries and will allow traffic to flow at all times.

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 Mayo 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.

17.4.4 Grid Connection

The area of construction and activity for the Grid Connection which is c. 13.55 km in length will be localised and transient in nature as it moves along the route. The Grid Connection trenches, joint bays and link boxes will be installed in Local and Reginal Roads L-31143, L-1114, R314, L-5177, L-5176, L-1107, L-1111, L-1116 and the L-5147.

Eighteen joint bays and eighteen associated communication chambers/link boxes will be laid within the third-party lands associated with the Proposed Development Site and the local roads (see Drawings Included in **Volume III**). These local and regional 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 R314, L-31143, L-1114, L-5177, L-5176, L-1107, L-1111, L-1116 and the L-5147, where road widths are greater than 4.5 metres and the works are confined to one half of the road, then the surface dressing shall only be applied over a half road width. Where the road widths are less than 4.5 metres, surface dressing should be applied over the full road width. The resurfacing as part of the permanent reinstatement is to be carried out once the commissioning of the Wind Farm Onsite Substation is complete.

The trenches will accommodate power cables enclosed within HDPE ducts. A fibre communications cable will also be installed to allow communication between the Proposed Development and 110 kV Substation. The trenching, joint bay, and HDD methodology can be found in **Sections 2.6.12, 2.6.13** and **2.6.14**. The Grid Connection trench is 600 mm wide for the single circuit and the depth will be 1,315 mm.

17.4.5 Wind Farm Site Internal Site Access Tracks

Within the Wind Farm Site there are a number of Site Access Tracks. There will be no borrow pits utilised during construction and all construction material will be imported to Wind Farm Site. A detailed summary of the Site Access Tracks and maps are contained in the **Section 5.1.3** and **Figures 9 - 12** of the TDR Report (**Appendix 17.1**).

17.5 ASSESSMENT OF POTENTIAL EFFECTS

17.5.1 HGV Deliveries

The estimated timescale for the completion of the construction phase is 21 months, inclusive of all works to Site Access Tracks, substation buildings, erection and commissioning of Turbines, and Grid Connection works.

Tables 17.22 to **Table 17.23** present a summary of the estimated HGV abnormal load deliveries of materials required to construct the Proposed Development, the turbine component TDR improvement works and the Grid Connection.

It is estimated that 840 m^3 of structural concrete and 80 m^3 of blinding concrete will be required for each Turbine Foundation and that an additional 1,228 m^3 will be required for the GIS substation building and plinths, BESS footings, Met Mast foundation and other miscellaneous works. This gives a total volume of concrete of 15,948 m^3. Based on 8 m^3 per concrete truck, some 1,994 loads will be required.

It is estimated that 90 t of reinforcing steel will be required for each Turbine Foundation, and that an additional 130 t will be required for the substation, met mast foundation and miscellaneous works. These total 1,570 t. At 25 t/load, some 63 deliveries of reinforcing steel will be required.

The Proposed Total Spoil to be removed is 157,785 m^2 all of which will remain on site and reused for landscaping or permanently stored at on-site spoil disposition areas **Refer to Figure 2.5 Site Layout Map**

For the proposed area of Site Access Tracks and road verge widenings see **Chapter 2: Development Description**, **Section 2.6.15**

- New Site Access Tracks total area of 43,389 m^2
- Upgraded Access Tracks total area of 3,526 m^2
- Upgraded Public Roads inside proposed redline total area of 3,156 m^2
- Upgrade Public Roads outside proposed Redline total area of 1,802 m^2

Imported crushed stone will be required for a 350 mm finishing layer. Such that there is a 4.5 m track width maintained throughout the internal Site Access Tracks and Upgraded Local Roads within the Wind Farm an additional 1.5 m width will be added to the existing 3 m track, therefore:

- A Total of 51,873 m^2 for access track will require between 18,155m^3 of imported crushed stone.

The total Turbine Hardstand area is broken down as follows:

- Turbine Hardstands – (Main Crane Hardstand Area) is 26,000 m^2
- Turbine Hardstands Foundations is 5,863 m^2
- Assist Crane Pads (Temporary) is 5,980 m^2

A combined total of 37,843 m^3 of imported stone. Of which 11,352 m^3 will be the finishing layer and 26,490m^3 for the subbase of the Turbine Hardstand area. At 12 m^3/load, some 3,153 deliveries of imported crushed stone for Site Access Track and Turbine Hardstands will be required.

For the 110 kV substation on the Wind Farm Site, rock will be imported to sites for the build-up layers. For the Substation Compound area (see **Chapter 2: Development Description**, **Section 2.6.16**), the volume of imported stone required is 502 m^3. At 12 m^3/load, some 42 loads are required.

For the BESS compound of 6,360 m^2 (see **Chapter 2: Development Description**, **Section 2.6.11**), the volume of imported stone required is required 1,908 m^3. At 12 m^3/load, some 159 loads are required.

For the substation, most of the deliveries will be crushed stone, building materials, electrical switchgear and equipment. However, there will be a large transformer (110 kV/33 kV) which will be an abnormal load but can be accommodated on the TDR for the oversized components and the smaller components and materials the CHR.

The total felling area is estimated at 31.864 ha for the Wind Farm Site. The total volume of timber is estimated at 15,932 m^3. This is equivalent to 14,486 tonnes. This is equivalent to 547 loads. Allowing for part loads, voids etc., the total allowance is for 15 loads over a 36 - day period equivalent to 15 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 4,957 HGV loads will be delivered to the Proposed Development. Much of these deliveries will be over an 11-month period between months 2 to 12 (see **Table 17.25** for Indicative Delivery Programme). This equates to approximately 450 loads per month or an average of 18 to 20 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 245 deliveries per month (assuming 2 foundations are poured per month). 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 17.22**.

Table 17.22: HGV and Abnormal Load Deliveries – Associated with Civil/Electrical Construction Works

Materials	Quantity	No. of Deliveries
Concrete	15,948 m^3	1,994
Reinforcing Steel	1,570 t	63
Substation Building and electrical equipment	-	60
Other – Geotextile Mats, Tools, Fencing etc.	-	50
Proposed Development Internal Cabling Materials incl. bedding	-	400
Imported Crushed Stone (engineering fill) as Upfill to Foundations	11,352 m^3	649
Imported Crushed Stone for Substation, 600 mm thick	502 m^3	29
Imported Crushed Stone for BESS Compound, 300 mm thick	1,908 m^3	109
Imported Crushed Stone for Site Access Track and Turbine Hardstands including road widening for Turbine Delivery	18,155 m^3	1,038
Tree Felling	14,486 t	547

Materials	Quantity	No. of Deliveries
Waste – 1 container/month		18
Total		**4,957**

Turbine components will be delivered to the Wind Farm Site over a period of approximately 10 – 12 weeks after civil works are completed. It is estimated that approximately 290 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. A summary of the estimated HGV loads to the Proposed Development Site associated with wind turbine components is presented in **Table 17.23**.

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. Proposed Development site TCC, fencing, cabins, storage containers etc.

The total number of loads associated with the turbine component TDR is estimated at 290.

Table 17.23: HGV and Abnormal Load Deliveries – Associated with Wind Turbine Components

Materials	Quantity	No. of Deliveries
Site Establishment and Removal	24	24
Miscellaneous Deliveries (fencing, silt fencing, silt busters, drainage, Met Mast, sumps etc.) incl. Removal	30	30
Anchor Cages & Foundation Templates	18	18
Tower Sections	-	84
Nacelles	18	18
Rotor Blades	54	54
Transformers, Panels and Cabling	-	8
Tools etc.	-	1
Crane Deliveries to Site, including ballast, booms, etc. and removal of same	2 Cranes	50

Materials	Quantity	No. of Deliveries
Ducting and Miscellaneous Deliveries to Turbine Delivery Route	3	3
Total		**290**

For the Grid Connection works, it is assumed that 1.125 m^3 of concrete blinding is required per joint bay and 0.16 m^3 per communication/link chamber. These will require 26.01 m^3 lean mix concrete or 3 loads at 6 m^3 per load. The locations of joint bays are shown on the Proposed Grid Route Detail Drawings **Refer to Planning Drawing No 6289-PL-GR-1201 to 1214**.

Some 14 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 67.75 m^3 concrete is required which is equivalent to 11 loads. For 110 kV cables, 630 mm^2 aluminium, the weight per km of cable is 9.886t. For a total length of 13.55 km, the weight will be 268 t and will require 14 loads. Allowing another load for fibre optic cables brings the total to 15 loads.

Having 5 ducts in a trench, some 67.75 km (13.55 km x 5 ducts) of ducting is required which is typically delivered in 6 m lengths, typically 3 km of ducting per load. Thus, some 23 loads are required.

Excavations in roads for trenches, joint bays, link and communication chambers is estimated to yield 511 m^3 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 58 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 Heat Systems Ltd located in Claremorris. The surfacing of roads in the northwest is to 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 2,470 m^3 or 274 loads are 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 342 loads for road resurfacing.

For trenches in roads within private lands for the 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 11,235 m^3 based on 0.6 m wide trench and 1.315 m deep. An allowance is also included for chambers. This will generate some 936 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 0.390 m^3 of lean mix concrete is required per linear metre of trench. This will give a requirement for 5,285 m^3 of lean mix concrete which is equivalent to some 881 deliveries to site for the complete GCR.

Some 0.345 m^3 of crushed stone is required per metre of trench in roads. This will give a requirement for 4,675 m^3 or some 390 loads.

A summary of the total estimated loads associated with the Grid Connection is presented as **Table 17.24**.

Table 17.24: HGV Load Deliveries – Associated with Grid works

Materials	Quantity	No. of Deliveries
Concrete Blinding for Joint Bays, Comms Chambers and Link Boxes	26.01 m^3	3
Concrete for Floors of Joint Bays	67.5 m^3	11
Pre-cast Concrete Joint Bays and Communication Chambers	14	14
Other – Steel mesh, Geotextiles, Silt Fencing, Fencing, Danger Tape, etc.	7	7
Grid Connection Cables	268 t	15
Grid Connection Ducting	67,750 m	23
Disposal of Excavated Materials from trenches in Public Roads	11,235 m^3	936
Lean Mix Concrete for Trenches	5,285 m^3	881
Crushed Stone for Trenches in Public Roads	4,675 m^3	390
Road Surfacing	2470 m^3	342
Total		**2,622**

Table 17.25 shows an indicative potential breakdown of loads delivered to site over a 21-month period. The total number of HGV loads is estimated at 11,022 as broken down below;

- All Access Track work and Turbine Hardstands = 3,153
- Turbine Component Abnormal Load Deliveries = 290
- Associated with Civil/Electrical Construction Works (BESS, Substation,) = 4,957
- HGV Load Deliveries Associated with Grid works = 2,622

Table 17.25: Indicative HGV and Abnormal Load Deliveries over 21 Month Construction Period for the Proposed Development

Activity	Month																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Site Establishment/ Fencing	26	26	27																		
Internal Access Road Upgrade & Construction		300	300	300	300	300	300	300	300	300	300										
Substation & Compound Construction		21	21	21	21	22	22	22													
Substation Electrical Works									7	7	7	7	7	7	6	6	6				
Substation Commissioning																1	1				
Excavation & Construction of Turbine Foundations & Turbine Hardstands		472	479	569	569	589	489	489	489												
Proposed Development Internal Cabling Installation										85	85	85	85	85	85	85					
Turbine Delivery and Erection												52	52	52	50	50					
Grid Connection												327	327	327	327	327	327	327	327		
Energisation																	25	25	25		
Turbine Commissioning																			3	3	2
Site Restoration																		28	3	3	2
Totals	26	819	827	890	890	911	811	811	796	392	392	471	471	471	468	469	359	380	358	6	4

Based on the indicative timetables outlined above the peak times for HGV deliveries will be in months 2 to 11 when the Turbine Foundations will be constructed, Turbine Hardstands and the Wind Farm Site Access Tracks will be finished in imported stone and the Grid Connection works will be ongoing. This is estimated to result in a maximum of 853 trips each month with an average of 39 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 61 loads per Turbine Foundation. If four Turbine Foundations are poured per month, then the balance of the loads in the busiest month would be 573 loads or 26 loads per day over the remaining days of the month.

17.5.2 Staff/Worker Traffic

For the Proposed Development construction, a peak workforce of 50-70 persons are anticipated on the sites. There will be peaks and troughs in the numbers, with the peak workforce during the general site works.

Construction staff will be required for the cable laying works and the TDR works. One gang is envisaged for the Turbine Delivery Route works while two-three will be required for the Grid Connection. It is envisaged that up to 50-70 workers could be employed at peak times. The 50-70 workers will generally travel to the sites via light vehicle (LV) (i.e. car or small van) assuming 2 persons per vehicle, or 35 trips to and 35 trips from the sites per day. This is made up of:

- 35 trips each way to/from Wind Farm Site.
- 10 trips each way to/from TDR improvement works.
- 25 trips each way to/from Grid Connection construction works.

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

Based on the analysis in **Section 17.5** above, **Table 17.26** below has been prepared which summarises the peak additional HGV deliveries per road element while **Table 17.27** provides a summary of the peak additional traffic movements.

Table 17.26: Summary of Peak Additional HGV / Abnormal Load Deliveries to Site Per Road Element

Node	Road	Civil & Electrical	Turbine	Grid	Total
Exiting Ballina/L-1110-117 Junction	R314	381	279	508	1168
L-1110-87/ L-1107-99 Junction	L-1110-117 and L-1110-87	381	279	310	970
L-1107-99/ L-5176-0 Junction	L-1107-99	381	279	707	1367
L-5177-0/ R314 at Palmerstown Bridge	L-5177-0 and L-5176-0	381	279	905	1565
R314/ Site Entrance	R314	1918	470	112	2500

Table 17.27: 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
Exiting Ballina/L-1110-117 Junction	R314	1168	432	20	50	25
L-1110-87/ L-1107-99 Junction	L-1110-117 and L-1110-87	970	613	28	70	35
L-1107-99/ L-5176-0 Junction	L-1107-99	1367	613	28	70	35
L-5177-0/ R314 at Palmerstown Bridge	L-5177-0 and L-5176-0	1565	613	28	70	35
R314/ Site Entrance	R314	2500	613	28	70	35

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 17.28** below.

The numbers of HGVs generated by the Proposed Development which is 150 movements per day at peak (1,319 AADT) could be considered as a significant increase on the numbers of HGVs which are predicted to use the existing R314 in 2027, which is predicted to be 91 AADT (see **Section 17.4.5**). Assuming that the majority of the CHR between the R314 at Palmerstown Bridge and the Wind Farm Site entrance that has a carriageway width of 7.3 m 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 12.1%. The magnitude of change is considered as being "Very Low" (see **Section 17.3.8**).

For the CHR between the L-5177-0/ R314 Junction at Palmerstown Bridge, an additional 150 traffic movements per day (1,319 AADT) will arise during this activity. The L-1107-99 carriageway maintains an average width of 5 m and is classified as a type 3 road, the capacity of 5,000 AADT is used as per Table 6.1 of the TII publication DN-GEO-03031 – Rural link design. Adding a further 150 traffic movements to the predicted 2027 traffic movements of 91 AADT (See **Section 17.4.5**), resulting to 1,400 AADT. The flows would increase by 28.2% which, in terms of magnitude, are considered as being "Very Low" (see **Section 17.3.8**).

For the route between the L-1107-99/ L-5176-0 Junction, an additional 150 traffic movements (1,319 AADT) per day will arise during this activity. Assuming that the majority of the route has a carriageway width of 5 m and is classified as a type 3 road, the capacity of 5,000 AADT is used as per Table 6.1 of the TII publication DN-GEO-03031 – Rural link design. Adding a further 150 traffic movements to the predicted 2027 traffic movements of 91 AADT (See **Section 17.4.5**), resulting to 1400 AADT. The flows would increase by 28.2% which, in terms of magnitude, are considered as being "Very Low" (see **Section 17.3.8**).

For the CHR between the L-1110-87/ L-1107-99 Junction, an additional 150 traffic movements (1,319 AADT) per day will arise during this activity. Assuming that the majority of the route has a carriageway width of 5m and is classified as a type 3 road, the capacity of 5,000 AADT is used as per Table 6.1 of the TII publication DN-GEO-03031 – Rural link design. Adding a further 150 traffic movements to the predicted 2,027 traffic movements of 91 AADT (See **Section 17.4.5**), resulting to 1400 AADT. The flows would increase by 28.2% which, in terms of magnitude, are considered as being "Very Low" (see **Section 17.3.8**).

For the CHR between the Ballina and the R314/L-1110-117 Junction, an additional 50 traffic movements (440 AADT) per day will arise during this activity. The R314 carriageway maintains an average width of 5.0 m and is classified as a type 3 road, the capacity of 5,000

AADT is used as per Table 6.1 of the TII publication DN-GEO-03031 – Rural link design, the change of HGV would be 10.6%. The magnitude of change is considered as being "Very Low" (see **Section 17.3.8**).

Table 17.28: Magnitude and Significance of Effects

Node	Road	Sensitivity	Magnitude	Significance of Effects	Duration
Exiting Ballina/L-1110-117 Junction	R314	Very Low to High	Very Low	Negligible to Moderate	Short Term
L-1110-87/ L-1107-99 Junction	L-1110-117 and L-1110-87	Low	Very Low	Negligible	Short Term
L-1107-99/ L-5176-0 Junction	L-1107-99	Low	Very Low	Negligible	Short Term
L-5177-0/ R314 at Palmerstown Bridge	L-5177-0 and L-5176-0	Medium to Low	Very Low	Negligible	Short Term
R314/ Site Entrance	R314	Medium to Low	Very Low	Negligible	Short Term

The works to TDR and Grid Connection Works on the R314, L-31143, L-1114, R314, L-5177, L-5176, L-1107, L-1111, L-1116 and the L-5147 will have a 'high' effect and require mitigation including road closures for all except local traffic.

Therefore, the effects on the local and regional road network (including TDRs, CHRs from Site can be predicted to be direct, negative and negligible (depending on the section of road as detailed in **Section 17.5.3**) but short-term in nature. The GCR may have a high effect as there is potential to close the road when trenches are excavated and backfilled.

17.5.4 Works on the Turbine Delivery Route

As outlined in the TDR Report in **Appendix 17.1**, works will be required at a number of locations along the TDR from Ballina to the Wind Farm Site. 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. The R315 and R314 and the local public roads will be widened in some places and resurfaced. Once works have been completed, the effect will be positive due to the improvements to parts of the road network particularly the ones noted in **Section 17.2.3**

of this chapter. The improvements will be of benefit to local road users with bends/verges having been widened and junctions improved.

17.5.5 Works on the Grid Connection

For the Grid Connection, the works will be constructed mostly within the verge of the carriageway, the road carriageway, or third-party lands over a total length of c.13.55 km. 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 residents and farmers who live close to these local public roads can be predicted to be very low but short-term in nature. The reinstated surface (full width) is likely to provide a degree of improvement. Trenching and ducting would typically be 60 -120 m per day. Assuming an average rate of 90 m/d, 450 m/week, the cumulative time periods of road closure would amount to c. 130 days.

17.5.6 Light Vehicles/Vans and Construction Personnel

The number of staff on the sites will vary according to the phase of works, peaking at up to approximately 150 during Turbine Foundation construction. It is expected that the majority of workers will arrive onsite 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 75 vehicles will visit the sites daily during the peak construction period (Turbine Foundation construction). This is estimated to be an increase of 12.1% on predicted levels for 2027 on the R314 and an increase of 28.2% on the AADT estimate for the L-5177-0,5176-0, L-1107-99, L-1110-87 and L-1110-117. Parking for staff will be provided at the Proposed Development Site Temporary Site 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 due to the relatively low increase in traffic over the baseline situation.

17.5.7 Air Quality

Good local air quality is essential for the health and quality of life of residents along the TDR. Transport accounts for a significant proportion of pollutants in the atmosphere namely, CO_2 emissions, nitrogen dioxide (NO_2) and particulate matter (PM_{10}). NO_2 emissions can also be harmful to vegetation and ecosystems in the vicinity of the TDR. The increase in traffic movements on the local road network will be over a short-term period and therefore the effect of the Proposed Development on air quality will be imperceptible.

17.5.8 Noise and Vibration

There is likely to be some noise and vibration from HGV movements along the TDR on the regional road and local roads, R314 which can cause disturbance to residents living along these roads as the roads are generally not busy. During the construction, operation and decommissioning phases, the summary of effects are deemed to be not significate. Noise during construction of the Proposed Development and decommissioning will be managed to comply with best practice, legislation and guidelines current at that time so that effects remain not significant.

Mitigation measures are discussed in **Section 17.6** and in **Chapter 11: Noise**.

17.5.9 Pedestrians and Vulnerable Road Users

Pedestrian amenity and frustration can occur where there are large changes to traffic flow and composition. The local roads from the N59 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.

A school is located along the R314 and fronts onto the TDR. Students of Culleen National school and St. Patricks College are likely to use the TDR on their journey to the school although given the age of children attending the school and the lack of pedestrian infrastructure on the local road network in the area, they are likely to be accompanied by parents / guardians with the majority likely to be arriving by car. There is potential for significant effects with mitigation measures required to see that potential effects are reduced (see **Section 17.6**).

17.5.10 Driver Delay

The R314 is estimated to be at 37.3% of its capacity in 2027 with HGV and LGV traffic for the Proposed Development taking it to 60.0% 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 on the R314 are not envisaged from the Proposed Development.

There is potential for some drivers delay on the turbine component TDR 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 GCR during its construction and during the deliveries of

materials/removal of surplus spoil. All the above have the potential to be moderate/high for residents but will be short term in nature.

17.5.11 Severance

Severance is caused when a community is perceived to be physically divided by traffic. Local roads on the turbine component TDR, and GCR 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-31143, L-1114, R314, L-5177, L-5176, L-1107, L-1111, L-1116, L-5147 and the local road network within the Proposed Development noted in **Section 17.4.2** during GCR work 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.

17.5.12 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 17.7** and in **Chapter 10: Air Quality and Climate**.

17.5.13 Effects on Road Network during Construction Phase

Traffic numbers during construction are outlined in **Section 17.6.1**. As the roads are estimated to have sufficient spare capacity, the overall potential effect on the local roads is assessed to be a moderate, negative effect of short-term duration and high probability during construction of the Proposed Development.

17.5.14 Operational Phase – Traffic

During the operation of the Proposed Development, the turbine manufacturer, the Transmission System Operator (TSO) (EirGrid), the Proposed Development operator and a service company will carry out regular maintenance of the Proposed Development's wind turbines, Onsite 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 Proposed Development would require 1-2 visits to the Wind Farm 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 Proposed Development. 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, following commissioning, will be taken in charge of by EirGrid 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 110 kV 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.

17.5.15 Traffic Effect 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 forestry and agriculture 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. With the Site Access Tracks and Turbine Hardstands are left in place and revegetated, the effect is predicted to be an imperceptible effect on traffic.

17.5.16 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 effects 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 Proposed

Development and there will not be any permanent change that will have a material effect on the safety and free flow of traffic.

17.6 MITIGATION MEASURES

17.6.1 Construction Phase

The potential effects of the Proposed Development have been identified as being short-term in nature and associated with the construction and decommissioning stages. Effects during operation have been assessed as being imperceptible and hence mitigation measures are not needed during that phase of the Proposed Development. However, it is still important that any effect is minimised as far as possible. Therefore, the following mitigation measures are recommended:

- A Traffic Management Plan (TMP) has been developed (see **Management Plan No. 7** attached to the **CEMP**). Prior to construction and once the Contractors have confirmed their suppliers, the TMP will be updated in consultation with and Mayo County Council and An Garda Síochána as necessary. HGV trips will be scheduled to avoid times when drop offs and pick-ups generally take place at schools. 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.
- All significant traffic likely to be generated by the Proposed Development will be during the construction of the Proposed Development and will be temporary in nature. It is envisaged that the construction period for the Proposed Development will span a 21-month period with the underground cable being installed over a concurrent 12-month period. The construction-phase Traffic Management Plan will mitigate these effects.
- 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 Applicant or their representatives, will consult with An Garda Síochána and Mayo 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

Port, Galway Port and Foynes Port and the Proposed Development site, the journey is achievable within a 4 - 6 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 Mayo 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 Mayo County Council.
- Wheel cleaning equipment will be used at the exit to the Proposed Development 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 Proposed Development site will be controlled by onsite 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 Wind Farm Site TCC and will be required to wear appropriate Personal Protective Equipment (PPE) while onsite.
- 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 TDR 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 R314, L-5177-0,5176-0, L-1107-99, L-1110-87, L-1110-117 and L-1111-0 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 TDR and GCR 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 works within the L-31143, L-1114, R314, L-5177, L-5176, L-1107, L-1111, L-1116 and the L-5147, passing bays can be utilised if necessary. 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 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 the TDR on the R315, L51732, L5179, R314, L31143, L51791, L5179-23, L51731, L31142, L5187, L5187-47 and the L21147 is proposed to be completed in advance of road closures.
- Road Closures on the R314, L-5177-0,5176-0, L-1107-99, L-1110-87, L-1110-117 and L-1111-0 will be required during construction. Each road will be closed as required and for as short a time possible. Only one road will be closed at a time so as not to disrupt local traffic i.e. one road will close and the other left open to detour vehicles within the local road network.
- 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 Proposed Development Site shall either have roof mounted flashing beacons or will use their hazard lights.
- A speed limit of 25 km/h shall apply to all vehicles within the Proposed Development 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-exiting 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.
- Provide signage opposite each entry arm.
- Provide a uniform radius from the roundabout entry to the exit.
- Reinstate any speed limit signs removed by the works.
- Redesign this arm or roadside treatment to enable road users to differentiate this private access from the public ones.

17.6.2 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 Wind Farm Site shall either have roof mounted flashing beacons or will use their hazard lights.
- A speed limit of 25 km/h shall apply to all vehicles within the Wind Farm 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.

17.6.3 Decommissioning Phase

As the turbine blades can be cut into manageable lengths on decommissioning, there is no requirements to re-use the TDR for decommissioning. Thus, all decommissioning related traffic will use the R314, L-5177-0,5176-0, L-1107-99, L-1110-87, L-1110-117 and L-1111-0 as well as the local road network within the Proposed Development noted in **Section 17.4.2.**

The Developer is applying for a consent for an operational period of 35 years for the Proposed Development. 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 Wind Farm Site and reused, recycled, or disposed of in a suitably licenced facility. The wind turbine transformers will also be removed from the Wind Farm 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 Wind Farm Site Access Tracks, 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 in-situ) will be removed from the Wind Farm Site as part of the decommissioning of the Proposed Development. The following elements are included in the decommissioning phase:

- Wind turbines dismantling and removal off the Wind Farm 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 effects arising from these operations which are mentioned in this EIAR (see **Section 17.7.2**). Potential effects 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 onsite
- Time of year and timescale (to be outside sensitive periods).

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.

17.7 CUMULATIVE EFFECTS

17.7.1 Construction Phase

Section 2.4.3, **Table 2.1** of **Chapter 2: Development Description** sets out the existing and proposed wind farm developments within 20 km of the Proposed Development Site.

The Mayo County Council Planning portal was accessed to check planning permissions (bigger than a one-off house and within the last 5 years) granted within a 10 km of the Proposed Development (**Section 2.4.4**, **Table 2.2** of **Chapter 2: Development Description**).

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, extensions to dwelling houses, agricultural buildings, the sports/recreation facilities or the school extensions would only have a negligible to minor localised effect on traffic should their construction be concurrent with the Proposed Development.

Other proposed developments close to Wind Farm Site are the Killala Energy Hub (6.91 km south-east of the Wind Farm Site) and Biomass Peaking plant (7.10 km south-east of the Wind Farm Site) both located in Killala Business Park. The proposed Glenora wind farm development is located 6.9 km west of the Wind Farm Site, and the proposed Keerglen wind farm development is located 6.5 km southwest of the Wind Farm Site.

Cumulative effects from the Proposed Development and other developments in the area can occur during the construction phase. There could also be cumulative effects should blades need to be replaced 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. The Proposed Development does not generate a significant amount of traffic during operation as outlined in **Section 17.6.13**.

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 effect 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 Proposed Developments. Should this coincide with the construction period for the Proposed Development, then there is the potential for cumulative transport affects. However, these are considered as being of low probability, slight effect and of short duration.

17.7.2 Operational Phase

The level of maintenance traffic is normally 1 - 2 visits per week per Proposed Development and during the servicing of the Proposed Development, the level of maintenance traffic will be 5 - 6 visits per week for a month, per year.

Traffic during the operation periods of the Proposed Development as well as neighbouring sites will be low, and the effect is rated as being insignificant.

17.7.3 Decommissioning

The Developer is applying for a consent for an operational period of 35 years for the Proposed Development.

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

Accordingly, only slight effects over those assessed in **Section 17.6.15** are predicted and it is unlikely that any significant cumulative effects will arise.

17.8 RESIDUAL EFFECTS OF THE DEVELOPMENT

17.8.1 HGV Deliveries

On the TDR, 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 **Appendix 17.1 – Tirawley Turbine Delivery Report**. 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 CHR and TDR, the Proposed Development 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 GCR, the Proposed Development is likely to have a high negative, short-term effect on local Public Roads which will accommodate the Grid Connection. However, with the mitigation measures as outlined, these will be minimised and the resurfaced roads will produce a positive residual benefit.

17.8.2 Operational Phase Residual Effects

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

17.8.3 Final Decommissioning Phase Residual Effects

On the TDR, 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 **Appendix 17.1 – Tirawley Turbine Delivery Report**, assuming the turbine components are transported back to Killybegs Port, Galway Port or Foynes Port. 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 17.5.2**.

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 and potentially turned into wet heath habitat rather than removed from the Wind Farm Site. 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.

17.9 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 Proposed Development 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 Proposed Development will be carried out once construction activities have ceased onsite. 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 R314, R315, L-1108, L-5177-0, L-5176-0, L-1107-99, L-1110-87, L-1110-117 and L-1111-0 including the local road network within the Proposed Development as outlined in **Section 17.4.2**.

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 CHR. This will be undertaken through regular toolbox talks for drivers during the construction of the Proposed Development.

17.10 SUMMARY OF SIGNIFICANT EFFECTS

This section has assessed the significance of potential effects of the Proposed Development on traffic and transport. The construction stage of the Proposed Development has been assessed as having the potential to result in effects of a negative, low, 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 low, negative and short-term in nature or lower (depending on the road element as detailed in **Section 17.9**). There will be a positive residual effect from local roads and junctions having been widened along the TDR and from the resurfacing of these local roads which will accommodate the Grid Connection.

The operational stage effects are considered as being imperceptible for the Proposed Development. The decommissioning stage effects are considered as being slight, negative, direct, high probability and short-term in nature. Potential cumulative effects as detailed in **Section 17.8** 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 Proposed Development on traffic and transport are considered to be not significant.

17.11 STATEMENT OF SIGNIFICANCE

This assessment has identified that the potential effects of the Proposed Development on traffic and transport are considered to be not significant, given the mitigation measures embedded in the design of the Proposed Development.