15 TRAFFIC AND TRANSPORT

15.1 INTRODUCTION

15.1.1 Background and Objectives

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

- Construction
- Operation
- Decommissioning

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

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

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

A Swept Path Analysis has been carried out on the Haul Routes for the abnormal loads associated with turbine components so as to identify ones 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 outside the road corridor) so as to identify potential impacts to third party properties. A separate haul route is proposed for other construction materials referred to as the Construction Haul Routes which includes the route for both the Wind Farm Site and Hydrogen Plant Site.

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

Figures are contained in **Volume III**.

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

- **Appendix 15.1: Collett Route Survey Report of November 2022 and March 2023**
- **Appendix 15.2: Swept Path Analysis Drawings**
- **Appendix 15.3: Road Safety Audit**

15.1.2 Statement of Authority

This chapter of the EIAR has been prepared by David Kiely, Director, Jennings O'Donovan & Partners Limited who holds a BE in Civil Engineering from University College Dublin and MSc in Environmental Protection from IT Sligo. He is a Fellow of Engineers Ireland, a Chartered Member of the Institution of Civil Engineers (UK) and has over 39 years' experience. He has extensive experience in the preparation of EIAR and EIS for environmental projects including Wind Farms, Solar Farms, Wastewater Projects and various Commercial Developments. David has also been involved in the construction of over 60 wind farms since 1997.

This chapter has also been prepared by Kenneth Dunne, Project Engineer in Jennings O'Donovan & Partners Limited (JOD) who holds a Bachelor (Hons.) Degree in Mechanical Engineering from National University of Ireland Galway. Kenneth is part of the JOD Renewable Energy team and has worked on a variety of projects within JOD including onshore wind farm design, wind turbine swept path analysis and traffic management plans for sewerage scheme upgrades. Previous to JOD he has gained substantial experience in the oil and gas industry as a project engineer and brings those skills and expertise to his current role.

Cavelle Hendry who is a Project Engineer in Jennings O'Donovan & Partners Limited (JOD) and holds a Bachelor (Hons.) Degree in Civil Engineering from The University of KwaZulu-Natal in South Africa has also been involved in preparing this chapter. Cavelle is part of the

JOD Renewable Energy team and brings a variety of skills and expertise in his current role. Over the past years he has gained experience as both a site and design engineer in the roads, transportation, and infrastructure engineering sectors.

The Collett Route Survey Reports for wind turbines were reviewed by Steven Mangham of Collett & Son, Halifax, West Yorkshire, UK. Collett & Son owns a fleet of over 60 vehicles and 100 trailers and is one of the main transport contractors who deliver wind turbine components to locations in Ireland. They also provide consultancy services in relation to the assessment of turbine haul routes. Mr. Mangham also oversaw the preparation of the Swept Path Analysis drawings for the turbine haul route between Killybegs Harbour and the Wind Farm Site, and the haul route between Galway Port and the Wind Farm Site, near Ballina. He led the survey team for the survey of 03rd February 2023 and 13th April 2023.

Mr. Mangham who is part of the Collett & Son team has a BTech in Civil Engineering from Leeds College of Building and a BSc in Civil Engineering from Leeds Beckett University. He has been employed by Collett & Son for over 12 years and is their Consultancy Manager. He has been involved in transport assessments for over 250 wind farms in the UK and for over 40 wind farms in Ireland.

Collett & Son also prepared the Swept Path Analysis drawings between Killybegs Port, Co. Donegal and the Wind Farm Site access junction off the L-5137-9 at Firlough, Co. Mayo, and the Swept Path Analysis drawings between Galway Port and the Wind Farm Site.

15.2 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

15.2.1 Assessment Methodology

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

- Policy and guidance review
- Desk study, including review of available maps and published information
- Site visit (driving the route) including review of road network to be used
- Topographical Survey of potential 'constraints'
- Establishment of Baseline Scenario
- Evaluation of potential effects
- Evaluation of the significance of these effects
- Identification of measures to avoid and mitigate potential effects

- Cumulative assessment in association with other potential development such as existing and permitted development as well as proposed development that could become consented before this application is decided upon
- Evaluation of residual effects following implementation of mitigation measures

15.2.2 Planning Policy and Guidelines/Guidance

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

Table 15.1: Policy and Guidance

Policy / Author	Title	Policy
Sligo County Council	Sligo County Development Plan 2017-2023	The CDP states: "**SP-TRA-1:** Support the creation of an integrated and environmentally-sound transport system, in particular with regard to accessibility and choice of transport, with a quality intercity bus and rail service, alongside the promotion of cycle facilities and pedestrian movements." **"SP-TRA-2:** Make optimal use of existing transportation infrastructure by using traffic management in order to reduce travel times and congestion." **"SP-TRA-3:** Encourage the shift from car use to more environmentally-friendly modes of transport and ensure the provision of quality interchange facilities between road, rail, bus and bicycle in relevant settlements." **"SP-TRA-4:** Plan for the future traffic and transportation needs in Sligo and ensure that new development does not compromise the expansion of rail, road and cycling corridors in the County. Proposed road realignment/improvement lines, road corridors and national cycle route corridors shall be preserved free from development that would prejudice the implementation of the schemes." **"SP-TRA-5:** Promote improved access to and sustainable development and operation of Sligo Port and Sligo Airport (Strandhill) and subject to compliance with the Habitats Directive." **"SP-TRA-6:** Facilitate and encourage the provision of adequate car-parking facilities in Sligo City and the County's towns and villages." **"SP-TRA-7:** Facilitate the roll-out of charging infrastructure for electric vehicles, in line with the National Renewable Energy Action Plan's target for 10% of Ireland's vehicles to be electric by 2020."
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

Policy / Author	Title	Policy
		Proposed 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 Department of Environment, Community and Local Government	The Design Manual for Urban Roads and Streets (DMURS)	This document outlines guidelines on the design of urban roads and streets in terms of street networks, street signage, pedestrians and cyclists, carriageways (widths, surfaces, junctions etc.), policies and plans, design process and audits (safety and quality).
Transport Infrastructure Ireland (TII)	Traffic and Transport Assessment Guidelines (PE-PDV-02045, May 2014)	The guidelines provide guidance for developers, planning authorities and the National Roads Authority (NRA) for: • Scoping for traffic and transport assessment for future development and development areas, particularly areas in proximity to national roads, • Defining thresholds where studies are recommended to minimise the impact of future proposals on the national road network, • Contributing to the provision of sustainable forms of development and better-informed planning decisions.
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

Policy / Author	Title	Policy
		geometric parameters for use in the design of the road alignment. It sets out the basic principles to be used in co-ordinating the various elements of the road layout, which together form the three-dimensional design of the road.
Transport Infrastructure Ireland (TII)	Design Phase Procedure for Road Safety Improvement Schemes (DN-GEO-03030, April 2021)	This Standard sets out the procedures to be followed for the technical aspects of the Design Phase of the following scheme types: • Road Safety Improvement Schemes • Urban Road Schemes • Road Safety Improvements aspects • Local authority general improvement schemes which have not been identified as Road Safety Improvement Schemes, schemes led, funded or partly funded by other agencies, development led schemes and/or community schemes.
Transport Infrastructure Ireland (TII)	Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (PE-PAG-02017, May 2019)	This document provides guidance on the Proposed 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.

15.2.3 Scoping Responses and Consultation

Consultation responses are shown in **Table 15.2**.

Table 15.2: Consultation Responses

Consultee	Type & Date	Summary of Response	Response to Consultee
Transport Infrastructure Ireland (TII)	Email dated 5th January 2021	With respect to EIAR Scoping issues, the recommendations indicated below provide only general guidance for the preparation of EIAR, which may affect the National Roads Network. The developer should have regard, inter alia, to the following: • Consultations should be had with the relevant Local Authority/National Roads Design Office, with regard to locations of existing and future national road schemes in the vicinity of the subject development site. • TII would be specifically concerned as to potential significant impacts the Proposed Development would have on the existing national road network (and junctions with national roads) in the proximity of the proposed development. • The developer should assess visual impacts from existing national roads. • The developer should have regard to any Environmental Impact Statement and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the areas concerned. The developer should, in particular, have regard to any potential cumulative impacts. • The developer, in preparing EIAR, should have regard to TII Publications (formerly DMRB and the Manual of Contract Documents for Road Works). • The developer, in preparing EIAR, should have regard to TII's Environmental Assessment and Construction Guidelines, including the 'Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes' (National Roads Authority (NRA), 2006). • The EIAR should consider the 'Environmental Noise Regulations 2006' (SI 140 of 2006) and, in particular, how the Proposed Development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see 'Guidelines for the Treatment of Noise and Vibration in National Road Schemes' (1st Rev., NRA, 2004)). • It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site, with reference to impacts on the national road network and junctions of lower category roads with national roads. TII's 'Traffic and Transport Assessment Guidelines' (2014) should be referred to in relation to proposed development, with	Addressed by this EIAR / Chapter. Addressed in Chapter 12 Addressed in this Chapter Addressed in this Chapter Addressed in Chapter 13 Addressed in Chapter 11

Consultee	Type & Date	Summary of Response	Response to Consultee
		potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of the TII TTA Guidelines, which addresses requirements for sub-threshold TTA. • The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required. • In the interests of maintaining the safety and standard of the national road network, the EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network. • In relation to haul route identification, the applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed. Separate structure approvals/permits and other licences may be required in connection with the proposed haul route, including where temporary modification to the road network may be required. Consultation with relevant PPP Companies and MMaRC Contractors may also be required. All structures on the haul route should be checked by the applicant/developer, to confirm their capacity to accommodate any abnormal load proposed, including abnormal weight load. • In relation to cabling and potential connecting routing, the scheme promoter should note the locations of existing and future national road schemes and develop proposals to safeguard proposed road schemes. In the context of existing national roads, alternatives to the provision of cabling along the national road network such as alternative routing or the laying of cabling in private lands, should be considered, in the interests of safeguarding the investment in and the potential for future upgrade works to the national road network. The cabling routing should avoid all impacts to existing TII infrastructure, such as traffic counters, weather stations, etc. and works required to such infrastructure shall only be undertaken in consultation with and subject to the agreement of TII. Any costs attributable shall be borne by the applicant/developer. The developer should also be aware that separate approvals may be required for works traversing the national road network and motorway network. Notwithstanding, any of the above, the developer should be aware that this list is non-exhaustive, thus site and development specific issues should be addressed in accordance with best practice.	Addressed in Section 15.5.15 of this Chapter Addressed in this Chapter Addressed in this Chapter Noted
Mayo County Council	Letter dated 3rd August 2021. Report from from Alan DiLucia S.E.P. Planning Section	The following are the comments from the roads department. 1. An assessment of the structural capacity of the local road network adjacent to the proposed windfarm site will need to be undertaken to determine its suitability/capacity to carry the construction traffic associated with the Proposed Development. This will require Falling Weight Deflectometer (FWD) and Visual assessments,	

Consultee	Type & Date	Summary of Response	Response to Consultee
		2. Structural road pavement improvements identified in the FWD and Visual Surveys will be required in advance of any construction and again following completion, if required. 3. The proposal to construct the Grid Connection along the local road network is not acceptable as it has the potential to undermine the structural capacity of the roads concerned. A private wayleave should be secured. 4. Section 9.6 of the Scoping report suggests "There is unlikely to be a requirement for any significant additional strengthening and widening of the public road network along the haul route". This may be the case for National and Regional Roads but would comprise of weak subgrades. The improvements identified must be undertaken in advance of any construction works commencing. 5. Any pavement damage caused by construction traffic / activities must be repaired to the satisfaction of Mayo County Council on and on-going basis	
Sligo County Council	29th June 2022 and 4th July 2022	SCC had no specific comments in relation to traffic and transport.	

15.2.4 Study Area

The study area for Traffic and Transport assessment is defined as the Grid Connection Route between the Wind Farm Site and Moy - Glenree 110kV OHL, the Wind Farm Site (which accommodates the substation and start of Grid Connection), the Turbine Delivery Routes, the Hydrogen Plant Site, the 110kV Interconnector cable between the Wind Farm and the Hydrogen Plant, the haul route for the collection of green hydrogen, the haul route for the importation of rock, concrete and other construction materials to the Grid Connection Route, Hydrogen Plant Site and Wind Farm Site primarily from local quarries, and lastly a separate haul routes for construction delivery vehicles leaving the Wind Farm Site.

The Killybegs Turbine Delivery Route is shown on **Figure 15.1a,** the Galway Turbine Delivery Route is shown on **Figure 15.1b**, the Construction Haul Routes are shown on **Figure 15.2**, the Grid Connection Route and Interconnector Route are shown on **Figure 15.3** and locations for waste disposal sites for both soil and stone are shown on **Figure 15.4**, the concrete suppliers haul routes in the Project Area are shown on **Figure 15.5** and the location of traffic counts are shown on **Figure 15.6.**

It is proposed that the turbine and electrical components will be delivered via Killybegs Port, Co. Donegal or via Galway Port, Co. Galway. The following routes is proposed and is discussed in further detail in **Appendix 15.1**:

Killybegs Turbine Delivery Route:

- Exit Killybegs Port taking the 2nd exit at the roundabout to the Shore Road
- Continue on Shore Road and turn right onto the R263
- Continue on R263 until the road joins to the N56
- At the 1st roundabout near Donegal town, continue on the N56
- At the 2nd roundabout near Donegal town, take the 2nd exit onto the N15
- At the roundabout outside Laghey, continue on the N15
- At the roundabout outside Ballyshannon, continue on the N15
- At the 1st roundabout outside Bundoran, continue on the N15
- At the 2nd roundabout outside Bundoran, continue on the N15
- Continue on N15, then join onto the N4
- At the roundabout near Sligo town, take 2nd exit continuing on the N4
- Take slip road off N4 and turn right to join the N59
- At the 1st roundabout in Ballysadare, take the 3rd exit and continue on the N59
- At the 2nd roundabout in Ballysadare, take the 2nd exit and continue on the N59
- Continue on N59, then turn left at Stokane onto the L-2604
- Continue on L-2604, L-5137-0 and L-5137-9 until left turn to the Wind Farm Site entrance (see **Figure 15.1a)**

Galway Turbine Delivery Route:

- Exit the Port of Galway onto Lough Atalia Road
- At the junction with R339, Turn right onto College Rd
- At Connolly Avenue junction, turn left towards Taum Road
- At the junction with R336, turn right onto Tuam Road
- At the junction with the N83, continue straight onto the N83
- At the roundabout prior to Tuam, take the 1st 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 right onto the N17
- At the junction in Tobercurry, continue straight on the R294
- At the junction, rejoint the N17
- At the roundabout south of Collooney, take the 1st exit and go contraflow onto the N4
- At the second roundabout, take the 2nd exit to continue to go contraflow on the N4
- At the contraflow slipway at the N4/N59, take the slipway and joint the N59
- At the 1st roundabout in Ballysadare, take the 3rd exit and continue on the N59

- At the 2nd roundabout in Ballysadare, take the 2nd exit and continue on the N59
- Continue on N59, then turn left at Stokane onto the L-2604
- Continue on L-2604, L-5137-0 and L-5137-9 until left turn to Wind Farm Site entrance (see **Figure 15.1b**)

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

- Killala Rock Quarry, Killala
- Coolturk Quarries Ltd., Crossmolina
- Maloney Quarries, Swinford
- Harrington Concrete & Quarry, Kilkelly
- Frank Harrington Limited, Abbeytown
- Liam Scott Developments, Easky
- Molloy Concrete Limited, Ballina

These quarries will also be the source of crushed stone and concrete for widening works to the Turbine Delivery Route (N59 junctions, L-5137-0, L-5137-9 and L-2604-0), construction haul routes (L-6612, L-1102, L-5136-0, L-5137-9 and L-2604-0) Grid Connection works (L-2604-0, L-5136-0, L-5137-9 and L-1102) and Hydrogen Plant Construction Haul Routes (L-6612-1), and the Interconnector between the Wind Farm and Hydrogen Plant (L-5137-9, L-5136-0, L-1102, L-6612 and L-6612-1).

The delivery routes proposed primarily use the national road network from Co. Donegal to Co. Mayo bypassing densely populated areas such as Donegal town, Ballyshannon and Bundoran and the national road network from Co. Galway to Co. Mayo bypassing densely populated areas such as Galway and Charlestown.

For all quarries, trucks will approach the study area using the N59 before turning on to the L-6612, followed by the L-5136-0, and then the L-5137-9 on approach to the Wind Farm Site entrance as shown in **Figure 15.2**.

The Hydrogen Plant Construction Haul Route will make use of a haul route separate to the Wind Farm Construction Haul Routes detailed previously. Importing and exporting materials and components for the Hydrogen Plant will use the N59 and will turn on to the L-6612-1 for a short distance before joining an access road to be constructed as part of the Proposed Development.

Existing felled wood from forestry felling will be removed from site once all the civil works are complete, which will accommodate for the construction of the Wind Farm Substation. Wests Timber located on the outskirts of Ballina along the N59 is a possible suitable location to deposit any forestry felling. The proposed route for transporting wood would be utilising the Construction Haul Away route (Green line) shown on **Figure 15.2** and following the N59 approx. 8 km southwest before turning left into West Timbers.

The proposed Grid Connection Route runs parallel to a section of the haul routes (see **Figure 15.3**). Leaving the Wind Farm Site, the Grid Connection Route will follow a short section of the L-5137-9, followed by the L-5136-0 and then joining the L-1102, continuing southwards for a distance of 3.3 km towards Bunnyconnellan. The Grid Connection Route is proposed to leave the L-1102 and enter private lands a short distance before breaking ground and looping-in to the existing Moy - Glenree 110kV overhead line.

A large portion of excavated material from the Wind Farm Site will be classified as peat and will be moved to the restoration areas. The non-peat material excavated from trenches in public roads will be disposed of to a licenced facility while in-situ excavated road surfacing material will be recycled. General soil waste will be transported to one or more of the following licensed facilities (see **Figure 15.4**):

- Frank Harrington Limited (Sligo) ULC, Abbeytown, Ballysadare, Co. Sligo
- Mangan Concrete & Haulage Ltd., Ballynalynagh Crossmolina Co Mayo
- Coolturk Quarries Ltd., Coolturk, Crossmolina, Co. Mayo
- Harrington Concrete & Quarries, Gortnafolla Turlough Co. Mayo

Soil and stone spoil from road widening on the Turbine Delivery Route will be disposed of to the same facilities.

Excavated road surfacing materials will be recycled and used for temporary reinstatement of trenches. Bitumen and supplementary road surfacing for trench reinstatement can be sourced from Frank Harrington Limited (Sligo) ULC, Abbeytown, Ballysadare, Co. Sligo or Harrington Concrete & Quarries, Gortnafolla Turlough Co. Mayo.

Grid Connection construction traffic will be serviced via the N59 at Corballa along the construction haul route to the Wind Farm Site, Hydrogen Plant Site and construction haul away route from the Wind Farm Site and Hydrogen Plant Site as shown in **Figure 15.2**.

The Interconnector Connection traffic will also be serviced via the N59 at Corballa along the construction haul route to the Wind Farm Site, Hydrogen Plant Site and construction haul away route from the Wind Farm Site and Hydrogen Plant Site as shown in **Figure 15.2**. Traffic will be allowed to use the constructed passing bays along the L-6612-1, L-6612, L-1102 and L-5136-0.

The Wind Farm Site is historically a cutover blanket bog with an extensive network of bog tracks which were laid to provide access to turf cutting plots. Turf harvesting activities for domestic use still occur to date and coordination with local communities will take place to enable continued access to harvest turf.

15.2.5 Desk Study

Primary Route Assessments for the turbine component haul routes were completed by Collett & Sons Ltd., Halifax, U.K. who are specialists in the transportation of wind turbine components. This is included in **Appendix 15.1**.

Desk studies of the Study Area were largely completed in advance of undertaking the route survey. This involved using Google Maps and Streetview to assess the proposed haul routes road network from Killybegs Port to the Wind Farm Site and Galway Port to the Wind Farm Site. The Construction Haul Routes were assessed in a similar manner as was potential traffic associated with the Grid Connection Route.

Sligo and Mayo County Councils were consulted as part of the scoping process. Sligo County Council did not have any specific comments in relation to traffic and transport at that stage. They subsequently corresponded via emails dated 29th June 2022 and 4th July 2022 (see **Table 15.2**).

Traffic count data from TII was used to assess the current Baseline Scenario on the N59 in the area.

For supplementary background information, Planning Documentation (Environmental Impact Statement, July 2011) in relation to Carrowleagh Kilbride wind farm was reviewed to examine how transportation from the N59 northeast of Ballina was considered as part of that project and if any traffic count data was available to give an indication of background flows.

15.2.6 Field Work

A Preliminary Route Assessment was carried out in February 2023 for the turbine delivery route between Killybegs Port and the Wind Farm Site and in April 2023 for the turbine delivery route between Galway Port and the Wind Farm Site, and both routes were assessed for a 76.58 m blade length using a Siemens SG 155 Super Wing Carrier.

In each case, the route was assessed by a two-person team and the various junctions and constraints were photographed. A copy of each report is included in **Appendix 15.1**.

For the range of wind turbines under consideration, the rotor diameters will vary from 149 m to 155 m. For a typical central hub diameter of 3 m, the blade lengths will range from 73 m to 76.58 m. In terms of turbine transportation, the effects of transporting a 76.58 m blade (maximum blade length under consideration) will be similar to those of 73 m. No additional works are required to facilitate their transportation, nor any further impacts predicted.

A topographical survey of areas of potential works between the N59, the Wind Farm Site, Hydrogen Plant Site, turbine delivery route and on the Construction Haul Routes that was undertaken during April 2022 by Digital Land Surveyors Ltd. The points surveyed are as follows:

- Turbine Delivery Route (N59, L-2604-0, L-5137-0 and L-5137-9 junction to the Wind Farm Site)
- Construction Haul Away Route (the Wind Farm Site and Hydrogen Plant Site to the N59 and L-1102 junction)
- Hydrogen Plant Route (N59 and L-6612-1 to proposed Hydrogen Plant Site and surrounding private lands)
- Construction Haul Route (N59 and L-6612 to the Wind Farm Site and Hydrogen Plant Site via L-5136-0 road to L-5137-9)
- Wind Farm Site
- Hydrogen Plant Site

This fieldwork enabled the haul route drawings to be prepared by JOD (see Planning **Figure 15.1a, Figure 15.1b** and **Figure 15.2**).

Traffic counts (see **Section 15.3.5**) were carried out at the N59/L-2604-0 junction, N59/L-1102 junction, L-6612/L-1102 and L-5137-9/Wind Farm Site entrance (locations shown on **Figure 15.6**) on Tuesday, 14th December 2021.

15.2.7 Evaluation of Potential Effects

The baseline environment is described in **Section 15.3**. The available data will then be utilised to identify and categorise potential effects likely to affect the national and local road network used for the turbine delivery routes, the Construction Haul Routes, haul route transporting Green Hydrogen and the Grid Connection 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.

15.2.8 Sensitivity

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

Table 15.3: 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:

Importance	Description
	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 15.4 below provides the general approach to determining the importance and sensitivity of a resource or receptor based on The Institute for Environmental Management and Assessment (IEMA) Guidelines[1] as it is not conveyed in the TII Guidelines. The assessment of environmental impacts arising from road traffic is not an exact science and a degree of professional judgement is required. The definitions set out in **Table 15.4** below are generally applied. This will partially define the magnitude and significance criteria set out in the sections below, while applying thresholds quoted in the IEMA Guidance. Sensitive receptors are generally areas with key facilities associated with high footfall.

Table 15.4: Determining the 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.

15.2.9 Magnitude

The magnitude of potential impacts 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 15.5**.

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

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 Project and have been used to assess the construction, operation and decommissioning phases of the Proposed Development of the N56, N15, N4 and N59.

On roads where existing traffic levels are generally low e.g. on local roads such as those on the Construction Haul Routes between the N59 and Wind Farm Site or those public roads which are to accommodate the Grid Connection, an increase in traffic flow during construction is likely to be higher than the IEMA Guideline thresholds and in such cases, it is necessary to consider the overall increase in traffic flows and the capacity of the road before making a conclusion on effects.

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

For the most robust approach, the built-up area thresholds in line with the IEMA guidance have been used to guide assessments of 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 15.5: Magnitude of Change

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

15.2.10 Significance of Effects

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

Table 15.6: 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

15.3 BASELINE DESCRIPTION

15.3.1 Site Location, Context and the Proposed Development

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

The proposed Killybegs Turbine Delivery Route and Galway Turbine Delivery Route are shown in **Figures 15.1** and **15.2** and the proposed Construction Haul Routes (crushed

stone, concrete, concrete blocks and precast units) will come from the quarries as shown on **Figure 15.5**. Incidental building materials will be sourced from Ballina. The Grid Connection Route is shown on **Figure 15.3**. Disposal routes for soil and stone excavated for the Grid Connection are shown in **Figure 15.4**.

For utilising the Killybegs Turbine Delivery Route, it is proposed that the turbine nacelles, tower hubs and rotor blades will be landed at Killybegs Port, County Donegal. From there they will be transported to the N56 some 4.0 km northeast of the harbour. The route primarily follows the national road network namely the N56, N15, N4 and N59 before turning left onto the local road L-2604-0 towards the Wind Farm Site entrance.

For utilising the Galway Turbine Delivery Route, it is proposed that the turbine nacelles, tower hubs and rotor blades will be landed at Galway Port, County Galway. From there they will be transported to the N83 some 3.0 km north of the harbour. The route primarily follows the national road network namely the N83, N17, N5, N4 and N59 before turning left onto the local road L-2604-0 towards the Wind Farm Site entrance.

Whilst a final choice of turbine type for the Proposed Development has yet to be made, the vehicle used for the Swept Path Analysis is the largest associated with the turbines proposed (see **Chapter 2: Project Description**, **Section 2.2** for further details). The Swept Path Analysis has been completed for a turbine with 155 m rotor diameter, which has a blade length of 76.58 m. This is the longest blade length of all the turbines currently under consideration[2] and would have the greatest potential impact on road passage requirements. As the shortest blade under consideration would be 73 m, the swept paths would be only marginally different and the effects will be similar to the 76.58 m blade. No additional works are required to facilitate their transportation nor are any further impacts predicted.

While a detailed assessment of the route is presented in this chapter and associated appendices, it should be noted that the route from Killybegs to the Wind Farm Site was used for the transport of turbine components to the Oweninny Phase 1, Oweninny Phase 2, Killala, Black Lough, Bunnyconnellan and Carrowleagh wind farms which used vehicles with similar clearance specifications in terms of height and width. 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 Wind Farm Site.

[2] The GE5.3-158 has a larger blade overall but has a two-part construction and so will not be as long for transportation purposes.

For the civils works during construction, crushed stone materials for the running surfaces of the Wind Farm Site access roads and Turbine Hardstands will be sourced from one of the local authorised quarries in the area. Ready-mix concrete for Turbine Foundation construction and Wind Farm Substation and Hydrogen Plant Substation foundations will also be sourced from one of the local authorised quarries. The local quarries are located to the west in Ballysadare, the west in Crossmolina or the south in Turlough as described in **Section 15.2.4** above. HGVs from any of these quarries will use the same routes between the N59 and the Wind Farm Site and Hydrogen Plant Site. The proposed Construction Haul Routes are outlined in **Figure 15.2**. Other material deliveries will use standard HGVs and use the local, national and regional road network.

For the Grid Connection, traffic for the delivery of crushed stone, ducting, cables and precast components and for the removal of spoil will access the Grid Connection Route from the N59 eastwards along the L-6612, L-1102, L-5136-0 and L-5137-9 towards the Wind Farm Site. The L-6612, L-5136-0 and L-5137-9 will be used for deliveries to the Grid Connection to be constructed within the L-1102, L-5136-0 and L-5137-9.

For the Interconnector, traffic for the delivery of crushed stone, ducting, cables and precast components and for the removal of spoil will access the Interconnector Route from the N59 eastwards along the L-6612-1 to the Hydrogen Plant Site and along the L-6612, L-1102, L-5136-0 and L-5137-9 towards the Wind Farm Site. The L-6612, L-5136-0 and L-5137-9 will be used for deliveries to the Interconnector to be constructed within the L-1102, L-5136-0 and L-5137-9.

Workers employed on the Wind Farm Site and Hydrogen Plant Site will generally use the N59 and the Construction Haul Routes to reach the sites.

15.3.2 Sensitive Receptors

The Wind Farm Site and Hydrogen Plant Site is generally served by the N59 which runs between Ballina and Ballysadare. The N59 is approximately 7 kilometres (km) to the northwest of the Wind Farm Site and 0.6 kilometres (km) to the northwest of the Hydrogen Plant 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 N59, N4, N15, N83, N17, N5, N56, L-2604-0, L-5137-0, L-5137-9, L-5136-0, L-6612, L-6612-1 and L-1102 which have significant potential to generate traffic.

Between Killybegs Port and the Wind Farm Site and Galway Port and the Wind Farm Site, the sensitive receptors are assessed in **Table 15.7a and Table 15.7b.**

Table 15.7a: Sensitivity of Receptors – Killybegs Turbine Delivery Route

Receptor	Sensitivity	Reasons/Comments
LYIT School of Tourism, Killybegs, Co. Donegal	Medium	Located adjacent to Shore Road after leaving Killybegs Harbour
Various businesses in Killybegs including Gallagher Brothers Fish Merchants Limited	Medium	Located in close proximity to Shore Road leaving Killybegs Harbour and R263 through Killybegs town
Killybegs Community Hospital, Killybegs, Co. Donegal	High	Local hospital adjacent to R263 in Killybegs town
St. Catherine's Vocational School, Killybegs, Co. Donegal	Medium	Secondary school with direct access to the R263
Circle K and Top Service Stations, Killybegs, Co. Donegal	Medium	Service stations and shops with direct access to the R263
Pelagia Feed (Ireland) Ltd., Killybegs, Co. Donegal	Low	Commercial business with direct access to the R263
Topline McGuiness Store, Bruckless, Co. Donegal	Very Low	Home improvement store with access adjacent to the N56
Glenstone Quarry, Bruckless, Co. Donegal	Low	Stone quarry with access adjacent to the N56
Church of St Joseph and St Conal, Bruckless, Co. Donegal	Medium	The church is located along the N56 and fronts onto the Haul Route with parking across the road. Some mass attendees are highly likely to use the N56 to get to the church and increased traffic on the road may affect access and egress from the church car park.
Various businesses in Bruckless including Bruckless Community Centre	Low	Businesses exit directly on to the N56
Various business, private dwellings and factories in Dunkineely including Charles Vial (Fish Merchant) Limited	Low	Businesses and private dwellings on both sides of the N56 in close proximity.
Dunkineely National School, Co. Donegal	Medium	National school with direct access to the N56
Naomh Ultan GAA Club, Dunkineely, Co. Donegal	Medium	GAA club and large car park adjacent to the N56
Kennedy Supplies, Inver, Co. Donegal	Low	Commercial business with direct access on to N56
McMonagle Marble & Granite, Mountcharles, Co. Donegal	Low	Commercial business with direct access on to N56
Various businesses near Mountcharles	Low	N56 bypasses majority of Mountcharles town

Receptor	Sensitivity	Reasons/Comments
Various businesses near Doonan Court including NCT Donegal Town, Holmes Service Station and Herron Auto	Medium	Commercial business with direct access on to N56
Four Masters GAA, Drumcliff, Co. Donegal	Low	GAA club and car park adjacent to the N56
Various businesses and private dwellings around Donegal town	Very Low	Loop road avoids Donegal town businesses and private dwellings in the area
The Primary Care Centre, Drumlonagher, Co. Donegal	Medium	The hospital is located adjacent to the N56, off the Drumlonagher roundabout. Access is away from haul route but increased traffic volume is likely
Donegal County Council, Drumlonagher, Co. Donegal	Low	The county council is located adjacent to the N56, off the Drumlonagher roundabout. Access is away from haul route but increased traffic volume is likely
St. Eunan's National School, Laghy, Co. Donegal	High	Primary school with direct access on to the N15
Various businesses in Laghey including Roadstone Laghey	Low	Commercial businesses with direct access to the N15
Roadstone Ballintra, Co. Donegal	Low	Stone quarry with direct access to the N15
Patrick McCaffrey & Sons, Ballymagrorty Irish, Co. Donegal	Low	Stone quarry with direct access to the N15
Various businesses and private residences in Ballyshannon area including Kilbarron National School	Very Low	Road bypasses businesses and residences with no direct access to the N15
Various private residences on outskirts of Bundoran, Co. Donegal	Very Low	Road bypasses businesses and residences with no direct access to the N15
Various private residences and Topaz service station, Tullaghan, Co. Donegal	Low	Commercial businesses and residences with direct access to the N15
Various businesses and Cliffoney National School, Cliffoney, Co. Sligo	High	Businesses and a national school with direct access to the N15
Various self-catering accommodations and Scoil Bhríde Carns National School, Carns, Co. Sligo	High	Self-catering accommodations and a national school with direct access to the N15
St. Molaise Gaels GAA Club, Grange, Co. Sligo	Low	GAA club and car park adjacent to the N56
Scoil Naomh Molaise, Grange, Co. Sligo	Medium	Primary school with access behind the Church of Mary Immaculate in Grange village
Various businesses including SuperValu, Circle	Low	Commercial businesses with direct access to the N15

Receptor	Sensitivity	Reasons/Comments
K Service Station and SF Engineering in Grange		
Grange Post Primary School and North Sligo Sports Centre	Low	Secondary school with access back from N15 and grange village
Drumcliffe Family Practice, Drumcliff, Co. Sligo	High	Hospital with direct access to the N15
Davis' Restaurant & Yeats Tavern, Drumcliff, Co. Sligo	Low	Bar & restaurant with direct access to the N15
Drumcliffe Church & W.B Yeats' Grave, Drumcliff, Co. Sligo	Medium	Church, graveyard and popular tourist attraction with direct access to the N15.
Various businesses in Rathcormack including Certa service station	Low	Commercial businesses with direct access to the N15
St. Colmcille Church, Rathcormack, Co. Sligo	Medium	Church and car park with direct access to the N15. Some mass attendees are highly likely to use the N15 to get to the church and increased traffic on the road may affect access and egress from the church car park.
Rathcormack National School, Rathcormack, Co. Sligo	High	Primary school with direct access to the N15
Various businesses and private dwellings in north Sligo town	Low	Haul route passes in close proximity to access roads for various businesses and housing estates in north Sligo town
Sligo Bus/Train station and various business in vicinity to Sligo bypass road	Low	Bypass road with several junctions to businesses and access in Sligo town
Kingsbridge Sligo Private Hospital, Co. Sligo	Very Low	Hospital with access on opposite side of road. Can only be accessed when approaching from the south
Summerhill College, Co. Sligo	Medium	Secondary school and car park with direct access to the Summerhill roundabout
Connolly's Volkswagen Sligo, Co. Sligo	Very Low	Car dealer adjacent to slip road off N4
Various businesses and private dwellings through Ballysadare, Co. Sligo	High	Businesses and private dwellings entering, transiting and exiting Ballysadare village. Ballysadare bridge is a concentration point for majority of N59 traffic
St. Marys College, Ballysadare, Co. Sligo	Medium	Secondary school with direct access to the N59
St. Johns National School Ballysadare, Co. Sligo	Medium	Primary school with direct access to the N59
Munster Joinery Depot, Ballysadare, Co. Sligo	Low	Commercial business with direct access to the N59
St. Brigid's Catholic Church, Ballysadare, Co. Sligo	Low	Church and car park with direct access to the N59
Esso service station and nearby self-catering accommodation, Beltra, Co. Sligo	Low	Commercial businesses with direct access to the N59

Receptor	Sensitivity	Reasons/Comments
St. Patrick's GAA Club, Skreen/Dromard, Co. Sligo	Low	GAA club with car park and community centre with direct access to the N59
Skreen Family Practice, Co. Sligo	Medium	Hospital with access to the N59
St. Adamnan's Catholic Church, Skreen, Co. Sligo	Low	Church and car park with direct access to the N59
Homeland Agri, Skreen, Co. Sligo	Low	Commercial business with direct access to the N59
Church of the Immaculate Conception, Templeboy, Co. Sligo	Low	Church and car park with direct access to the N59
St Farnan's GAA Club, Templeboy, Co. Sligo	Low	GAA club and car park with direct access to the N59
St Mary's Kilmacshalgan, Dromore-West, Co. Sligo	Very Low	Unused church with direct access to the N59
Various businesses through Dromore West, Co. Sligo	Low	Businesses on both sides of the road with direct access to the N59
Hilltop Service Station, Culeens, Co. Sligo	Low	Business with direct access to the N59
Stokane National School, Stokane, Co. Sligo	Medium	Primary school with direct access to the L-2604-0
Private dwellings, Stokane, Co. Sligo	Low	Private dwellings with direct access and close proximity to the L-2604-0

Table 15.7b: Sensitivity of Receptors – Galway Turbine Delivery

Receptor	Sensitivity	Reasons/Comments
Various businesses in Galway including The Galmont Hotel	Medium	Located on Lough Atalia Road and the R336 after leaving Galway Port
Circle K Station and Top Oil, Galway, Co. Galway	Medium	Service stations and shops with direct access to the R339 and R336
Galway Community College, Galway, Co. Galway	High	Local College adjacent to R339 in Galway
Various business in Galway, Co. Galway	Medium	Businesses with direct access to the N83
Corinthians RFC, Newvillage, Co. Galway	Medium	Local rugby club adjacent to N83 in Newvillage
Various businesses in Claregalway, Co. Galway	Medium	Commercial businesses with direct access to the N83
Various businesses in Glashroe, Co. Galway	Medium	Commercial businesses with direct access to the N83
Kilclooney Cemetery in Clonacurry, Co. Galway	Low	Cemetery with access adjacent to the N17
Milltown National School, Co. Galway	Medium	National school with direct access to the N17
Milltown Community Council, Co. Galway	Medium	Communicty Council with direct access to the N17

Receptor	Sensitivity	Reasons/Comments
Various business in Ballidine, Co. Mayo	Medium	Businesses with direct access to the N17
St. Joseph's Church, Ballidine, Co. Mayo	Medium	Church and car park with direct access to the N17. Some mass attendees are highly likely to use the N17 to get to the church and increased traffic on the road may affect access and egress from the church car park.
Barnacarrol Childcare Service in Claremorris, Co. Mayo	Medium	Preschool with direct access to the N17
Top Oil Service Station, Kilkelly, Co. Mayo	Medium	Service station and shops with direct access to the N17
Harrington Concrete and Quarry, Kilkelly, Co. Mayo	High	Concrete and Quarry with direct access to the N17
Various business in Charlestown, Co. Mayo	Medium	Businesses with direct access to the N17
TubberCurry Health Centre & Day Care Centre in Tobercurry, Co. Sligo	High	Health Centre with direct access to the N17
Various business in Tobercurry, Co. Sligo	Medium	Businesses with direct access to the N17
Ballinacarrow National School, Co. Sligo	Medium	National school with direct access to the N17
Ss Fechin and Lassara Catholic Church, Rockfield, Co. Sligo	Medium	Church and car park with direct access to the N17. Some mass attendees are highly likely to use the N17 to get to the church and increased traffic on the road may affect access and egress from the church car park.
Owenmore Gaels GAA Club, Collooney, Co. Sligo	Low	GAA club and car park adjacent to the N17
Connolly's Volkswagen Sligo, Co. Sligo	Very Low	Car dealer adjacent to slip road off N4
Various businesses and private dwellings through Ballysadare, Co. Sligo	High	Businesses and private dwellings entering, transiting and exiting Ballysadare village. Ballysadare bridge is a concentration point for majority of N59 traffic
St. Marys College, Ballysadare, Co. Sligo	Medium	Secondary school with direct access to the N59
St. Johns National School Ballysadare, Co. Sligo	Medium	Primary school with direct access to the N59
Munster Joinery Depot, Ballysadare, Co. Sligo	Low	Commercial business with direct access to the N59
St. Brigid's Catholic Church, Ballysadare, Co. Sligo	Low	Church and car park with direct access to the N59
Esso service station and nearby self-catering accommodation, Beltra, Co. Sligo	Low	Commercial businesses with direct access to the N59
St. Patrick's GAA Club, Skreen/Dromard, Co. Sligo	Low	GAA club with car park and community centre with direct access to the N59
Skreen Family Practice, Co. Sligo	Medium	Hospital with access to the N59

Receptor	Sensitivity	Reasons/Comments
St. Adamnan's Catholic Church, Skreen, Co. Sligo	Low	Church and car park with direct access to the N59
Homeland Agri, Skreen, Co. Sligo	Low	Commercial business with direct access to the N59
Church of the Immaculate Conception, Templeboy, Co. Sligo	Low	Church and car park with direct access to the N59
St Farnan's GAA Club, Templeboy, Co. Sligo	Low	GAA club and car park with direct access to the N59
St Mary's Kilmacshalgan, Dromore-West, Co. Sligo	Very Low	Unused church with direct access to the N59
Various businesses through Dromore West, Co. Sligo	Low	Businesses on both sides of the road with direct access to the N59
Hilltop Service Station, Culeens, Co. Sligo	Low	Business with direct access to the N59
Stokane National School, Stokane, Co. Sligo	Medium	Primary school with direct access to the L-2604-0
Private dwellings, Stokane, Co. Sligo	Low	Private dwellings with direct access and close proximity to the L-2604-0

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

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

Receptor	Sensitivity	Reasons/Comments
Ard Chuan Equestrian Centre, Corballa, Co. Sligo	Medium	The equestrian centre has direct access onto the L-6612 however it is set back from the road and separated by dense forestry
Agricultural Landholdings, Farmsteads and Private Residences on L-6612, L-5136-0 and L-2604-0	High	Direct access onto L-6612, L-5136-0 and L-2604-0

For the civil works construction haul route away from site to the N59, the sensitive receptors are assessed in **Table 15.9**.

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

Receptor	Sensitivity	Reasons/Comments
Agricultural Landholdings, Farmsteads and Private Residences on L-1102, L-5136-0 and L-2604-0	High	Direct access onto L-1102, L-5136-0 and L-2604-0
St Joseph's Church, Corballa, Co. Sligo	Low	Church with roadside carparking nearby the N59 and L-1102 junction

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

Table 15.10: Sensitivity of Receptors – Grid Connection, Interconnector and Haul Routes

Receptor	Sensitivity	Reasons/Comments
Agricultural Landholdings, Farmsteads and Private Residences on L-2604-0, L-5136-0, L-6612, L-6612-1 and L-1102	High	Direct access onto L-2604-0, L-5136-0, L-6612, L-6612-1 and L-1102

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

Table 15.11: Sensitivity of Receptors – Wind Farm Site

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

For works to the Hydrogen Plant, the sensitive receptors are assessed in **Table 15.12**.

Table 15.12: Sensitivity of Receptors – Hydrogen Plant Site Haul Route

Receptor	Sensitivity	Reasons/Comments
Private Residence on L-6612-1	High	Direct access onto L-6612-1 with proposed access road running alongside/through private land

15.3.3 Road Access to the Site

15.3.3.1 Turbine Haul Route

The Killybegs Turbine Delivery Route will primarily be on the National Primary Roads shown in **Figure 15.1a**. These include the N56, N15, N4 and N59. These roads vary in terms of width, number of lanes and types of junctions outlined in the Collett Primary Route Assessment for the Wind Farm (November 2022).

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

Following the N56, the road is broadly the same until the 1st roundabout outside Donegal town. Between Straleeney and Donegal town, the road does narrow and slows when

transiting areas of higher population density such as Bruckless, Dunkineely and Doonan Court, given the presence of existing on street car parking and roadside dwellings or businesses. Taking the bypass around Donegal avoids most business and residential areas of Donegal town however the 2nd roundabout encountered will have a higher concentration of traffic given its proximity to businesses and services.

Continuing onwards south, Laghey is the next populated area approached. A primary school and some businesses front on to the N15 in Laghey however the road is substantially wide. Further south, the N15 bypasses several populated areas, namely Ballintra, Ballyshannon and Bundoran.

Entering Co. Sligo, the road narrows and slows in Cliffoney with a primary school and several businesses with on street parking. Grange is a similar village further southwest but with a higher population density. Again a primary school and several businesses with on street parking narrow the road.

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

The Galway Turbine Delivery Route will primarily be on the National Primary Roads shown in **Figure 15.1b**. These include the N83, N17, N5, N4 and N59. These roads vary in terms of width, number of lanes and types of junctions outlined in the Collett Primary Route Assessment for the Wind Farm (March 2023).

Leaving Galway Port, the Lough Atalia Road is followed until joining the R339 on College road. The R339 transits through the business and residential areas of Galway. The speed limit is 50 km/h within Galway town. At the N6/R336 junction, the R336 merges into the N83 and the speed limit increases to 100 km/h.

Following the N83, the road is broadly the same until the 1st roundabout in Farrannamartin, exiting onto the N17. At the north of Tuam, the exit onto the N17 is followed all the way to Charlestown.

Continuing onwards north, Tobercurry is the next populated area approached. A primary school and some businesses front on to the N17 in Tobercurry.

Entering Co. Sligo, the road slows in Ballynacarrow with a primary school and businesses with on street parking.

Further north at the roundabout south of Collooney, the N17 ends and the 1st exit is taken onto the N4. The road widens to a dual lane for the duration along the N4.

Thereafter both routes merge and follow the same path to the Wind Farm Site. To join the N59, a slip road is taken off the N4 followed by a right turn and passing under the N4 heading towards Ballysadare. Ballysadare is navigated via two roundabouts through the village. Given the presence of private dwellings, various businesses and schools, the lane widths and turn radius' are restrictive.

Following the N59 westwards, the road is broadly similar up to the left turn at Stokane towards the Wind Farm Site. The road does slow and narrow around small villages such as Beltra, Drumard, Skreen, Templeboy and Dromore West. However no major modifications or upgrades are expected to this part of the haul route.

Turbine delivery vehicles will exit the N59 turning left on to the L-2604-0 (see **Photo 15.1**).

Photo 15.1 – N59 and L-2604-0 Junction

Continuing along the L-2604-0 the haul route passes by a few private dwellings and a primary school (see **Photo 15.2**). Consideration should be taken of school opening hours as access may be restricted with cars parked on both sides of the road.

Photo 15.2 – Local Road L-2604-0 – Stokane National School

The road after the school is broadly similar up to the Wind Farm Site. The road is narrow without any hard shoulders and passes by several private dwellings. There are 4 watercourse crossings observed along the route with one being quite narrow with stone walls near the road edge (see **Photo 15.3**).

Photo 15.3 – Local Road L-2604-0 – Bridge

15.3.3.2 Construction Haul Route To Site

From the N59, trucks would follow the L-6612, L-1102, L-5136-0 and L-5137-9 in an easterly direction to the Wind Farm Site and Hydrogen Plant Site.

For the quarries in the area, trucks would approach from the N59 and then follow the Construction Haul Route to the Wind Farm Site and Hydrogen Plant Site as detailed above.

The L-6612 towards the Wind Farm Site and Hydrogen Plant Site varies in width from c. 4-5 m, generally with verges each side (see **Photo 15.4**). It has a general speed limit of 80 km/h. A short distance away from the N59 there is a narrow bridge approx. 2.5 m wide (see **Photo 15.5**). Further along the L-6612 joins the L-1102 adjacent to a disused school (see **Photo 15.6**). The remainder of the route varies in width from 3-5 m along the L-5136-0 and L-5137-9 before approaching the Wind Farm Site.

Photo 15.4 – Local Road L-6612

Photo 15.5 – Bridge along Local Road L-6612

Photo 15.6 – L-6612/L-1102 Junction Near Disused School

15.3.3.3 Construction Haul Route Away From Site

The construction haul route away from the Wind Farm Site and Hydrogen Plant Site follows a slightly different path compared to the construction haul to site route. The haul away construction route follows the path along the L-5137-9 northwest of the Wind Farm Site and towards the L-5136-0 and L-1102. The route then follows the L-1102 past the disused school and continues to the N59. It has a general speed limit of 80 km/h.

15.3.3.4 Roads On Grid Connection Route

The Grid Connection begins in vicinity of the tie in towers beneath the existing Moy to Glenree OHL, north of Bunnyconnellan. The Grid Connection Route begins on private lands and traverses in a westerly direction along a permanent access road for 375 m to join the L-1102. Leading northwards the Grid Connection Route will be laid within sections of the L-1102, then to the L-5136-0 eastwards followed by a short section on the L-5137-9 for a total distance of 5.925 km. There is then 300 m section to the Wind Farm Site, forestry roads and connecting to the substation. Along the L-1102, horizontal directional drillings (HDD) will be required across the Srafaungal river, Fidduan stream, Glenree stream and Loughnagore watercourse.

Of the total length of 6.6 km, the majority (approx. 5.925 m) will be within public roads. The L-5137-9, L-5136-0 and L-1102 are reasonably narrow at c.3 – 4 m with sporadic private dwellings along the route.

15.3.3.5 Hydrogen Plant and Interconnector Route

The Hydrogen Plant access route begins at the N59 / L-6612-1 junction (see **Photo 15.7**). The route follows a very short section of the L-6612-1 passing adjacent to a private dwelling before crossing through an area of that private dwelling into the nearby field and continuing on an access road to be constructed (see **Photo 15.8**).

Photo 15.7 – N59 / L-6612-1 Junction

Photo 15.8 – L-6612-1 Access Road Location

The Interconnector will be laid in conjunction with the Grid Connection until the L-5136-0/L-1102 junction, here it will be laid northwards to the L-1102/L-6612 junction and then laid eastwards following to the L-6612/L-6612-1 junction. The Interconnector will be laid on the L-6612-1 to the Hydrogen Plant substation which is approximately 520 m.

15.3.4 Delivery Vehicle Specification

Delivery of wind turbine components will be carried out using oversized vehicles. Two different types of loads will arise, very long loads for turbine blades and wide/high loads for tower bottom sections. The longest vehicle used during deliveries will be for the rotor blades and will be approximately 7 m long articulated vehicle with a trailer length of 62.4 m and a

14.1 m overhang for the blade. An indicative delivery vehicle schematic is shown in **Figure 15.7** below. The Swept Path Analysis (see **Appendix 15.2**) assesses the extent of obstacles to be removed (e.g. tree pruning) or relocated (street furniture or poles) or the extent of any potential oversail into private lands associated with blade transportation. It was based on the use of a 76.58 m blade which is the longest blade for the range of turbines under consideration. The outcome would be similar for a 73 m blade which is the shortest blade for the range of turbines under consideration. No additional works are required to facilitate their transportation and no further impacts are predicted.

Figure 15.7: Turbine Delivery Vehicle for Turbine Rotor Blades (SG155)

The widest and tallest turbine delivery vehicle in relation to the ground will be for the turbine tower sections. The bottom tower section will be 4.69 m wide which is 0.14 m wider than the blade delivery vehicle. These dimensions will be similar for the range of turbines under consideration. They are 4.435 m tall which is 1.035 m taller than the blade delivery vehicle and 0.335 m taller than the hub delivery vehicle. This vehicle is shown in **Figure 15.8**.

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

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

A survey of the Haul Route has been undertaken by Collett & Sons (see **Appendix 15.1**) to identify the extent of works required.

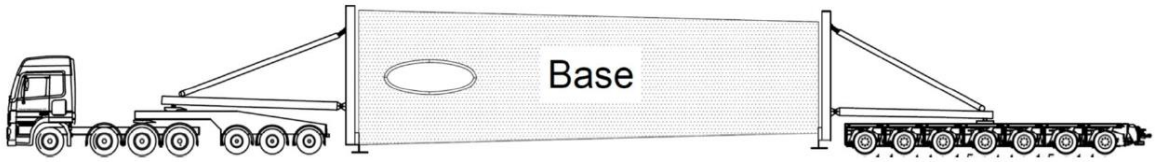

Figure 15.8: Turbine Tower Section Delivery Vehicle (SG155)

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

15.3.5 Existing Traffic Volumes

15.3.5.1 TII DATA

TII count traffic continuously[3] on the N59 at Rathglass, northeast of Corballa (Station Id: TMU N59 040.0 S), see **Figure 15.6**. 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 15.13**. From this figure, in 2019, the number of HGVs was 194 with light vehicles making up the remaining 3,847 of the total of 4,042. For 2022, while the AADT was slightly higher than in 2019 (4,172 vehicles), the number of HGV was lower at 159.

Table 15.13: TII Traffic Data

Station Id. TMU N59 040.0 S Description: N59 Between Sligo and Ballina, Corballa, Co. Mayo			
Year	**AADT**	**% HGV**	**Coverage**
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%

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

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

- N59 / L-2604-0 Junction
- Wind Farm Site access road / L-5137-9 Junction
- L-6612 / L-1102 Junction
- L-6612 / L-6612-1 Junction
- Hydrogen Plant Site access road / L-6612-1 Junction

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

15.3.5.2 Traffic Counts at N59 / L-2604-0 Junction

A short period traffic count was carried out at the N59/L-2604-0 junction on Tuesday 14th December 2021. The count was carried out between the hours of 08:00 and 09:00 during the morning period. The location of the traffic count is shown on **Figure 15.6**. The layout of the junction is shown on **Photo 15.14**.

Photo 15.14 – N59 / 2604 Junction Layout

Turning movements at the junction are shown on **Figure 15.9** during the AM period. The arrows show the direction of travel with the total count of traffic movements.

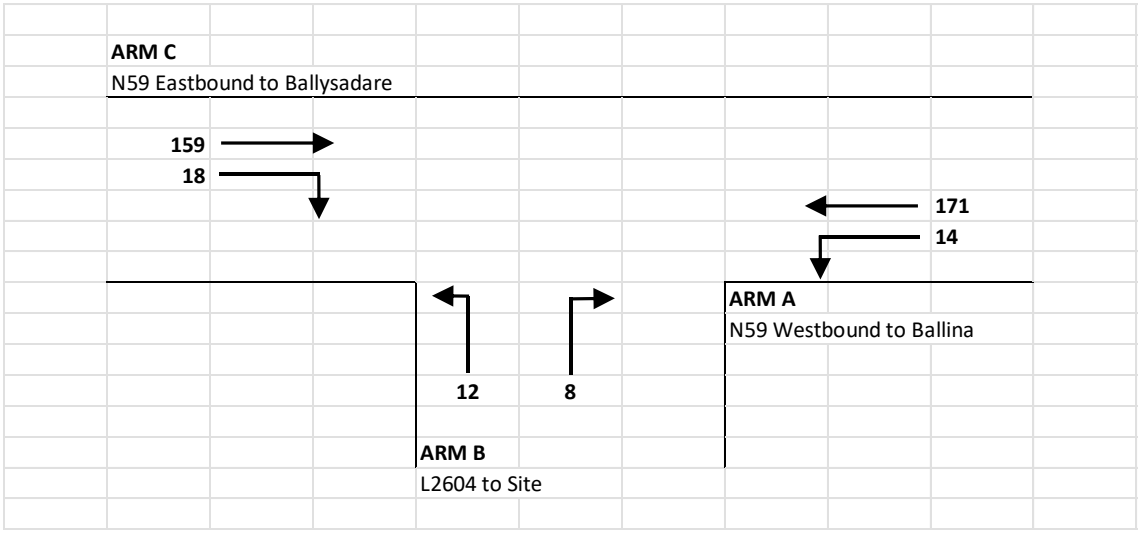

Figure 15.9: Junction Turning Movements at N59/2604

The Annual Average Daily Traffic (AADT) values for each of the N59 and the L-2604-0 roads were calculated using TII Publication PE-PAG-02039 "Expansion Factors for Short Period Traffic Counts". This document provides a mechanism to convert short-term traffic count data

to AADT. The study area is located within the West region. From Appendix A of PE-PAG-02039, the proportion of the 24-hour traffic occurring during the period 08:00 – 09:00 is 0.055 – 0.077. For the purpose of this assessment, the average value of 0.066 is considered.

For the N59, the traffic movements eastbound total 177 (159+18) and the westbound total 185 (171+14). The total of the two counts is 362. The 24-hour estimate is therefore 5485 (362/0.066) vehicles.

For the L-2604-0 and the period 08:00 – 09:00, the traffic movements correspond to all directions and total 52 (18+12+8+14). The 24-hour estimate is therefore 788 (52/0.066).

The survey was carried out on a Tuesday. From Appendix B of PE-PAG-02039 the daily traffic flow is 0.98 times the Weekday Average Day Traffic (WADT). Multiplying the 4701 and 675 values derived above by 0.98 gives the weekly average daily traffic values of 5375 for the N59 and 788 for the L-2604-0.

The final calculation is to convert to AADT by factoring for month of year. The traffic count was carried out in December. From Appendix C of PE-PAG-02039, the factor for conversion for the West region is 1.09. Thus, the AADT for the N59 is 5859 while the AADT for the L-2604-0 is 842.

15.3.5.3 Traffic Counts at L-5137-9 / Wind Farm Site Entrance

A short period traffic count was carried out on the L-5137-9 near the proposed Wind Farm Site entrance on Tuesday 14th October 2021. The junction location will be used during the construction of the Wind Farm. The counts were carried out between the hours of 08:00 and 09:00. The location of the traffic count is shown on **Figure 15.6**. The layout of the junction is shown on **Photo 15.15**.

Photo 15.15 – L-5137-9 / Wind Farm Site Entrance Junction Layout

Turning movements at the junction are shown on **Figure 15.10** during the AM period. The arrows show the direction of travel with the total count of traffic movements.

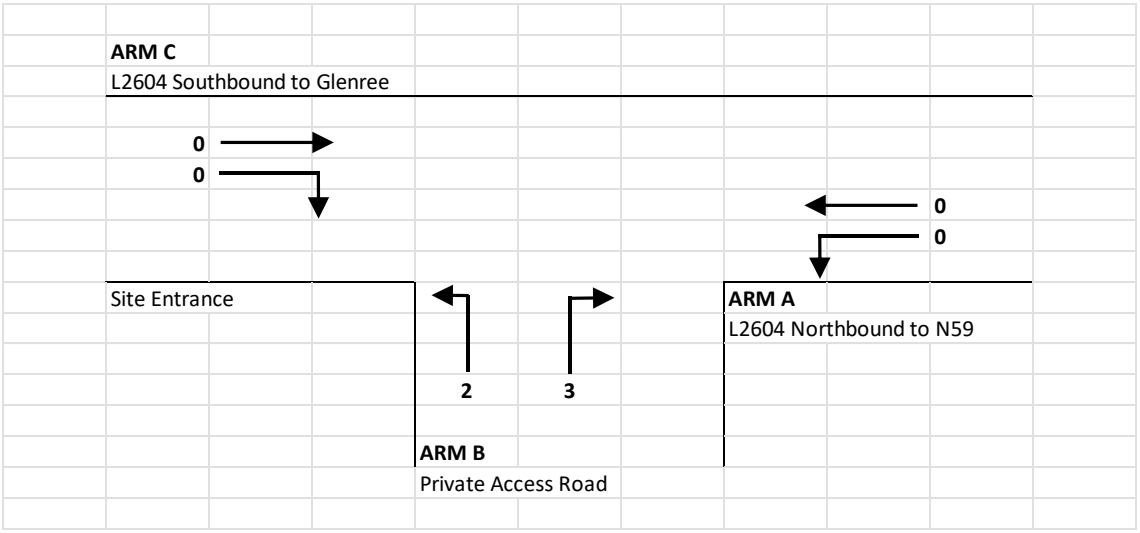

Figure 15.10: Junction Turning Movements at L-5137-9/Wind Farm Site Entrance

The Annual Average Daily Traffic (AADT) was calculated using TII Publication PE-PAG-02039 "Expansion Factors for Short Period Traffic Counts". Traffic movements along the L-5137-9 at the proposed Wind Farm Site entrance were 5 vehicles during the 08:00 – 09:00 period. The 24-hour Expansion Factor from Appendix A of PE-PAG-02039 for 08:00 – 09:00 is 0.066. Thus, the estimated 24-hour flow is 76 (5/0.066). Multiplying by 0.98 (as per Appendix B of PE-PAG-02039) gives the weekly average daily flow of 74. Again, the factor in Appendix C of PE-PAG-02039 for month of year is 1.09, such that the AADT for the L-5137-9 is 81.

15.3.5.4 Traffic Counts at L-6612 / L-1102 Junction

A short period traffic count was carried out at the L-2604-0/L-1102 junction on Tuesday 14th October 2021. The junction location will be used during the construction of the Wind Farm. The counts were carried out between the hours of 14:00 and 15:00. The location of the traffic count is shown on **Figure 15.6**. The layout of the junction is shown on **Photo 15.16**.

Photo 15.16 – L-6612 / L-1102 Junction Layout

Turning movements at the junction are shown on **Figure 15.11** during the PM period. The arrows show the direction of travel with the total count of traffic movements.

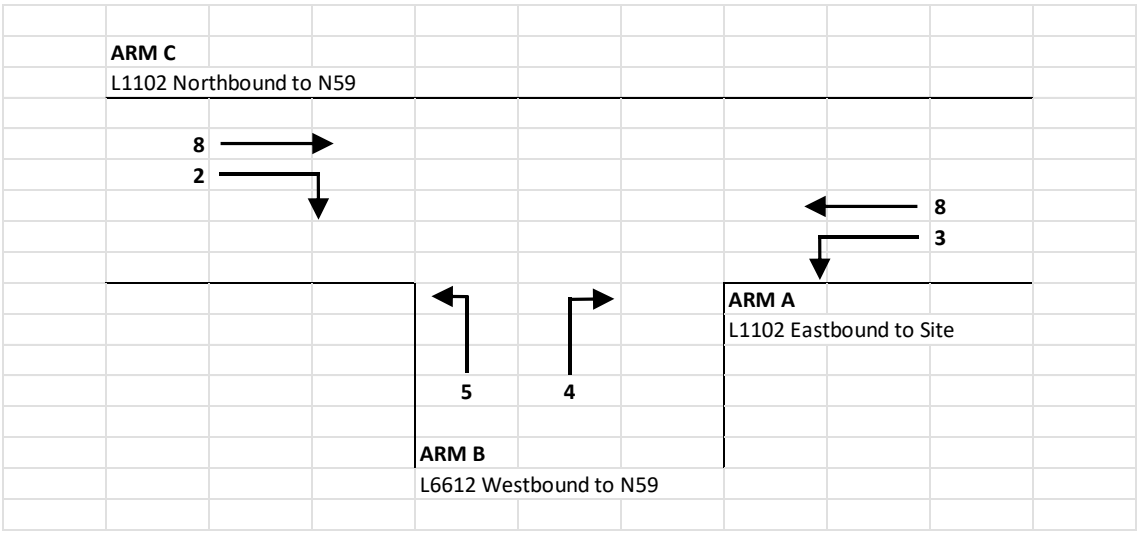

Figure 15.11: Junction Turning Movements at L-6612 / L-1102

The Annual Average Daily Traffic (AADT) was calculated using TII Publication PE-PAG-02039 "Expansion Factors for Short Period Traffic Counts". Traffic movements along the L-

1102 and L-6612 were 23 and 14 vehicles respectively during the 14:00 – 15:00 period. The 24-hour Expansion Factor from Appendix A of PE-PAG-02039 for 14:00 – 15:00 is 0.07. Thus, the estimated 24-hour flow along the L-1102 and L-6612 is 348 (23/0.066) and 212 (14/0.066) respectively. Multiplying by 0.98 (as per Appendix B of PE-PAG-02039) gives the weekly average daily flow of 342 and 208 respectively. Again, the factor in Appendix C of PE-PAG-02039 for month of year is 1.09, such that the AADT for the L-1102 is 372 and the L-6612 is 227.

15.3.5.5 Traffic Counts at N59 / L-1102 Junction

A short period traffic count was carried out at the N59/L-1102 junction on Tuesday 14th October 2021. The junction location will be used during the construction of the Wind Farm. The counts were carried out between the hours of 14:00 and 15:00. The location of the traffic count is shown on **Figure 15.6**. The layout of the junction is shown on **Photo 15.17**.

Photo 15.17 – N59 / L-1102 Junction Layout

Turning movements at the junction are shown on **Figure 15.12** during the PM period. The arrows show the direction of travel with the total count of traffic movements.

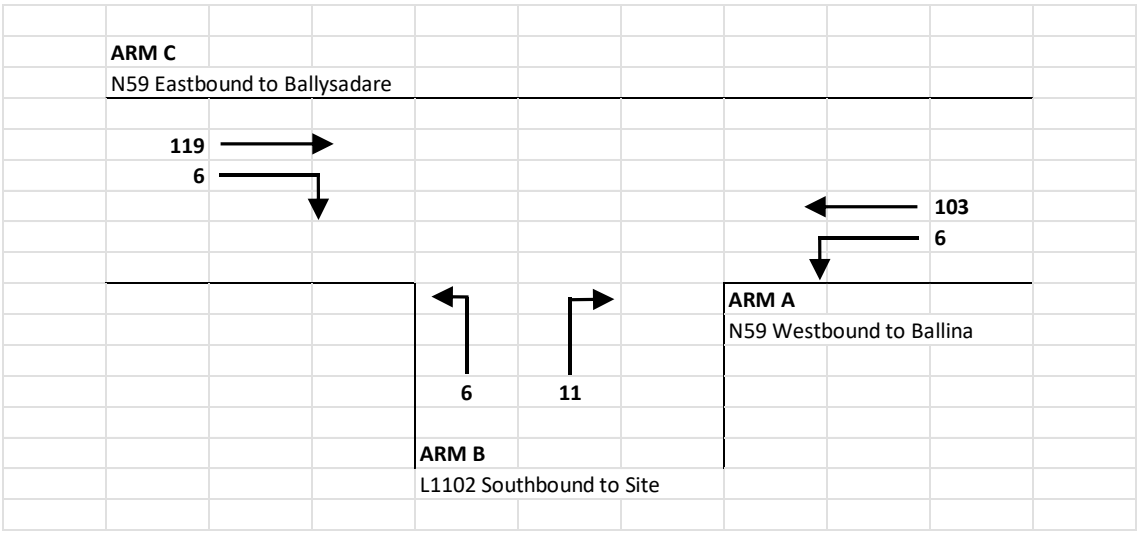

Figure 15.12: Junction Turning Movements at N59 / L-1102

The Annual Average Daily Traffic (AADT) was calculated using TII Publication PE-PAG-02039 "Expansion Factors for Short Period Traffic Counts". Traffic movements along the N59 and L-1102 were 239 and 29 vehicles respectively during the 14:00 – 15:00 period. The 24-hour Expansion Factor from Appendix A of PE-PAG-02039 for 14:00 – 15:00 is 0.07. Thus, the estimated 24-hour flow along the N59 and L-1102 is 3621 (239/0.066) and 439 (29/0.066) respectively. Multiplying by 0.98 (as per Appendix B of PE-PAG-02039) gives the weekly average daily flow of 3549 and 431 respectively. Again, the factor in Appendix C of PE-PAG-02039 for month of year is 1.09, such that the AADT for the N59 is 3868 and the L-1102 is 469.

15.3.5.6 Traffic Counts at N59 / L-6612-1 Junction

A short period traffic count was carried out at the N59/L-6612-1 junction on Wednesday 25th January 2023. The junction location will be used during the construction and operation of the Hydrogen Plant. The counts were carried out between the hours of 08:00 and 09:00. The layout of the junction is shown on **Photo 15.18**.

Photo 15.18 – N59 / L-6612-1 Junction Layout

Turning movements at the junction are shown on **Figure 15.13** during the AM period and **Figure 15.14**. The arrows show the direction of travel with the total count of traffic movements.

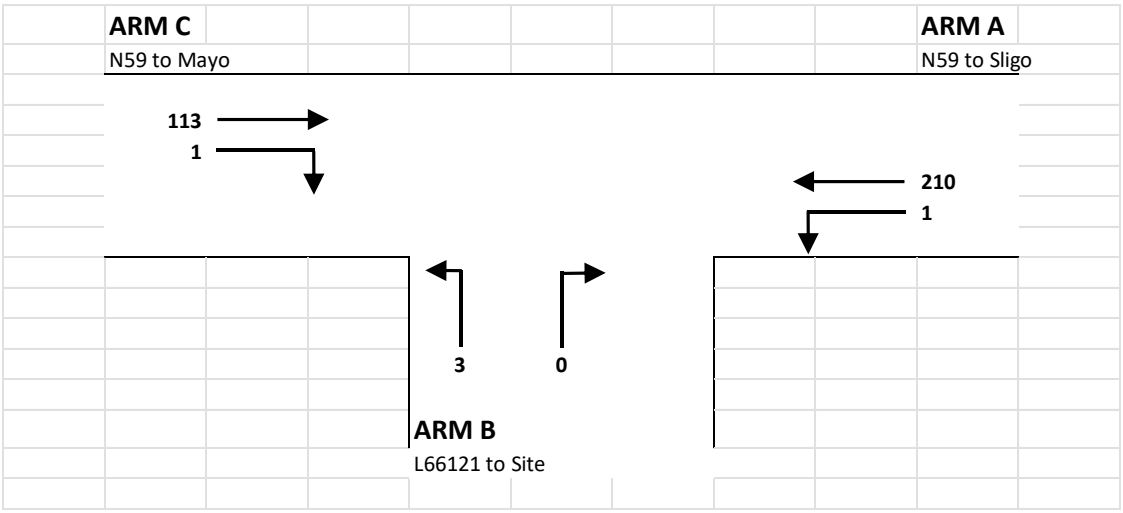

Figure 15.13: Junction Turning Movements at N59 / L-6612-1 – AM Period

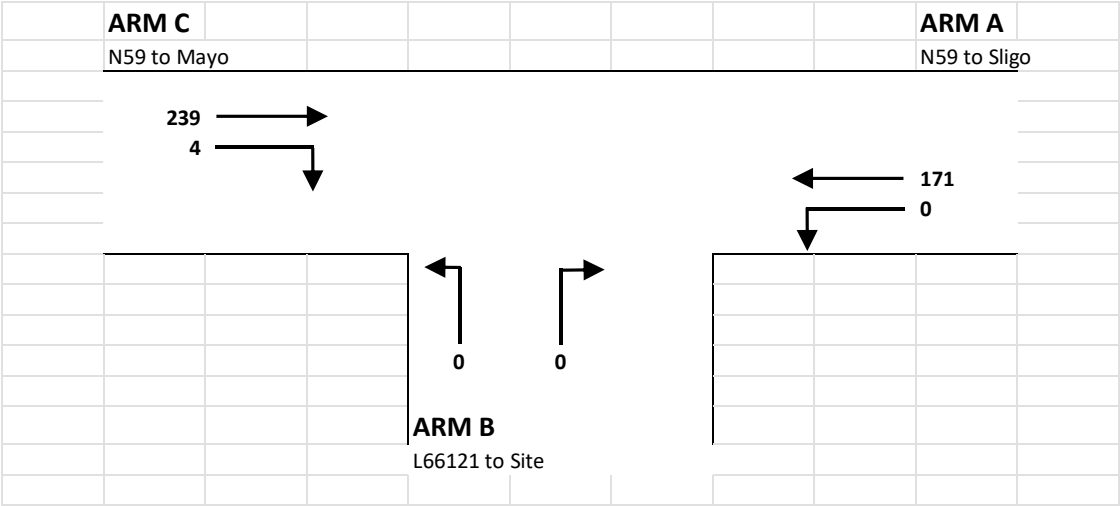

Figure 15.14: Junction Turning Movements at N59 / L-6612-1 – PM Period

The Annual Average Daily Traffic (AADT) was calculated using TII Publication PE-PAG-02039 "Expansion Factors for Short Period Traffic Counts". Traffic movements along the N59 and L-6612-1 were 325 and 5 vehicles respectively during the 08:00 – 09:00 period and 414 and 4 vehicles respectively during the 17:00 – 18:00 period. The 24-hour Expansion Factor from Appendix A of PE-PAG-02039 for 08:00 – 09:00 is 0.066 and for 17:00 – 18:00 is 0.095. Thus, the estimated 24-hour flow along the N59 and L-6612-1 is 4924 (325/0.066) and 76 (5/0.066) respectively for the AM period and 4358 (414/0.095) and 42 (4/0.095) respectively for the PM period. Multiplying by 0.96 (as per Appendix B of PE-PAG-02039) gives the weekly average daily flow of 4727 and 73 respectively for the AM period and 4184 and 40 respectively for the PM period. Again, the factor in Appendix C of PE-PAG-02039 for month of year is 1.18, such that the AADT for the N59 is 5578 and the L-6612-1 is 86 considering the AM period and the AADT for the N59 is 4937 and the L-6612-1 is 48 considering the PM period.

The classified traffic counts from 25th January 2023 (see **Table 15.14**) show that HGV traffic on the L-6612-1 accounts for less than 1% of the total traffic volume using the road.

Table 15.14: L-6612-1 Hydrogen Plant Site Access Junction – Existing Traffic Flows – 25th January 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	2	163	0	2	93	0
Vans & LGV's	1	40	0	1	18	1
Trucks	0	4	0	0	1	0
Articulated Trucks	0	2	0	0	1	0
Buses	0	1	0	0	0	0

Type of Vehicle	Movement No. 1	Movement No. 2	Movement No. 3	Movement No. 4	Movement No. 5	Movement No. 6
Motorbikes	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0
Totals	**3**	**210**	**0**	**3**	**113**	**1**
Veh.s/Minute	**0.05**	**3.50**	**0.00**	**0.05**	**1.88**	**0.02**
% Heavy Veh.s	**0.000**	**0.033**	**0.000**	**0.000**	**0.018**	**0.000**
05.00 to 06.00						
Cars	0	137	0	0	197	3
Vans & LGV's	0	30	0	0	40	1
Trucks	0	3	0	0	2	0
Articulated Trucks	0	1	0	0	0	0
Buses	0	0	0	0	0	0
Motorbikes	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0
Totals	**0**	**171**	**0**	**0**	**239**	**4**
Veh.s/Minute	**0.00**	**2.85**	**0.00**	**0.00**	**3.98**	**0.07**
% Heavy Veh.s	**0.000**	**0.023**	**0.000**	**0.000**	**0.008**	**0.000**

15.3.6 Predicted Future Traffic Volumes

TII publication "Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand projections, PE-PAG-02017, October 2021 can be used to predict future growth in traffic volumes across Ireland. Traffic volumes are predicted to increase in the coming years (predictions are for the period 2016 to 2030) when construction of the Proposed Development is likely to take place. **Table 15.15** shows the multiplier for County Sligo under different growth rate scenarios.

Table 15.15: Traffic Annual Growth Predictions Formulae (Multipliers) for County Sligo 2016 to 2030

County	Low Sensitivity Growth Rate		Central Growth Rate		High Sensitivity Growth Rate	
	LV	HV	LV	HV	LV	HV
Sligo	1.0133	1.0307	1.0147	1.0323	1.0178	1.0357

LV = Light Vehicles, HV = Heavy Vehicles

Under the high sensitivity scenario, using interpolation, the growth factor for 2026 is 0.2181 for light vehicles and 0.2219 for heavy vehicles the number of light vehicles on the N59 at the Hydrogen Plant access intersection will increase to 5,928 in 2026 from the 2023 AADT of 4,865 and heavy vehicles to 157 in 2026 from 133 in 2023.

The recorded traffic figures show that, in 2026, the N59 at the L-1102 Junction is predicted to be running at 6,100 AADT at this junction, which is approximately 52.5% of its capacity and therefore has the capacity to accommodate additional traffic in the future.

For the purposes of this assessment, a date of 2026 was selected as the start of the operational phase for the Hydrogen Plant. **Table 15.16** shows the multiplier for County Sligo under different growth rate scenarios from 2040 to 2050. By 2065, under the high sensitivity scenario, using interpolation, the growth factor for 2050 is 1.0268 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 N59 at the Hydrogen Plant access intersection will increase to 833 in 2050 from the 2040 AADT of 411.

The recorded traffic figures show that, in 2050, the N59 is predicted to be running heavy vehicles at 833 AADT at this junction, which is approximately 7.2% of its capacity and 16% increase from 133 AADT recorded in 2023.

Table 15.16: Traffic Annual Growth Predictions Formulae (Multipliers) for County Sligo 2040 to 2050

County	Low Sensitivity Growth Rate		Central Growth Rate		High Sensitivity Growth Rate	
	LV	HV	LV	HV	LV	HV
Sligo	1.0018	1.0154	1.0041	1.0171	1.0107	1.0268

LV = Light Vehicles, HV = Heavy Vehicles

The estimated capacity of the N59 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 N59 at the turnaround location is similar in section to a 7.3 m Type 1 single carriageway. A Type 1 carriageway has a guidance capacity of 11,600 AADT for level of service D (approaching unstable flow) while at the turn off to join the L-6612-1, L-1102, L-5137-9 and L-2604-0, it is similar to a Type 3 single (6.0 m) Carriageway which has a guidance capacity of 5,000 AADT for level of service D. The intersections of the L-6612, L 1102, L-5137-9 and L 2604 and Wind Farm access road will be similar to a Type 3 single (6.0 m) carriageway which has a guidance capacity of 5,000 AADT for level of service D.

Table 15.17 below highlights the projected AADT values from 2023 to 2026 of the junctions affected in relation to the capacity of the current existing roadway.

Table 15.17: Projection Summary of affected Junctions AADT from 2023 to 2026

Junction	AADT (2023)	AADT (2026)	Capacity (AADT)	Capacity of roadway in 2026
N59	5021	5928	11600	51%
N59/L-2604-0	720	850	5000	17%
N59/L-1102	442	522	5000	10%
N59/L-6612-1	74	87	5000	2%
L-5137-9/WF Access	69	81	5000	2%
L-6612/L-1102	350	413	5000	8%

15.3.7 Accident Statistics

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

Statistics are divided into those occurring "Inside Built-up Areas" and those occurring "Outside Built-up Areas". **Table 15.18** below presents a summary of accidents for the N59 for the years 2013 to 2016.

Table 15.18: Summary of Accidents for the N59 for the years 2013 to 2016

Year	Inside Build Up Areas			Total	Outside Built-Up Areas			Total	Overall Total	Collision Rate per km
	F	SI	MI		F	SI	MI			
2016	1	1	10	12	0	7	21	28	40	0.13
2015	1	3	9	13	1	8	24	33	46	0.15
2014	0	0	12	12	2	4	22	28	40	0.13
2013	0	1	12	13	0	2	23	25	38	0.10

F = Fatal

SI = Significant Injuries

MI – Minor Injuries

For the N59, historical accidents were more prevalent outside built-up areas than inside them.

15.4 PROPOSED WORKS

15.4.1 Wind Farm and Hydrogen Plant Construction Phase

The construction period of the Proposed Development is anticipated to take approximately 21 months. The majority of HGV deliveries to Wind Farm Site and Hydrogen Plant Site will take place during Turbine Foundation, Turbine Hardstands, Wind Farm Site access track upgrade works, the excavation for the underground water storage tank at the Hydrogen Plant site and construction of the electrolyser building. During this period, there will be trips

associated with the arrival and departure of construction staff and with the delivery of crushed rock for Wind Farm Site access roads as well as reinforcing steel and ready-mix concrete for Turbine Foundations. All of the stone for Wind Farm Site roads 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 Sligo and Mayo County Councils (e.g. for concrete works for foundations which may start before 07:00).

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

15.4.2 Turbine Component Haul Route

Works on the turbine delivery routes are described in detail in the haul route reports included in **Appendix 15.1.** For abnormal loads between Killybegs Port and the Wind Farm Site and Galway Port and the Wind Farm Site, works will be required to facilitate the delivery of turbine components. Some of these will be relatively minor in nature for example temporary removal of street furniture and signage. These works may have a slight, negative, temporary effect on residents, businesses and road users due to the increased noise and vibration resulting from construction activities and increased journey times and delays due to temporary traffic management. However, these effects will be confined to a very short period during the construction phase, prior to the delivery of the turbine components and hence, are not predicted to have a significant effect. Once works have been completed, the works will be reinstated in accordance with the requirements of the relevant County Councils. The extent of works has been determined by reference to the Collett Report of November 2022 (see **Appendix 15.1** for Swept Path Analysis Drawings prepared by Collett for that part of the haul route between Killybegs Port and the Wind Farm Site access), and Collett Report of March 2023 (see **Appendix 15.1** for Swept Path Analysis Drawings prepared by Collett for that part of the haul route between Galway Port and Wind Farm Site access)**. Table 15.19** and **Table 15.20** presents a summary of the works required on the

turbine component haul routes. Photographs of each location are included in the Collett Report of November 2022 and March 2023.

Table 15.19: Works Required on Killybegs Turbine Delivery Route to the Wind Farm Site

Reference Point in Collett Report	Potential Constraint	Works Description
1	Killybegs Harbour	Discharge quay and potential storage area.
2	2nd exit at Shore road roundabout	Road widening on the entry splitter island. Street furniture to be removed. Fence on nearside to be removed.
3	Splitter island on R263	Flexi bollards on splitter island to be removed.
4	Splitter island on R263	No issues at this location
5	Left bend on R263	Pruning required on offside.
6	Right bend at R263/N56 Junction	No issues at this location
7	Right bend on N56	Road widening is required on the nearside. Pruning on both sides of the road.
8	Right bend on crest on N56	Vertical Analysis required. Trees on nearside to be pruned to allow oversail.
9	Left bend on crest on N56	Vertical Analysis required.
10	Left bend on N56 in Bruckless	Third party land is required on the nearside. Fence and boundary features on the nearside to be removed.
11	Left bend on N56	Telegraph pole, tree and road sign to be removed. Pruning required on the nearside.
12	Right bend on N56	No issue at this location.
13	Right bend on N56	Road widening is required. Utility poles to be removed. Pruning required on both sides of the road.
14	Left bend on N56	Third party land is required on the nearside. Utility pole is to be removed. Fence and vegetation to be removed. Pruning is required on the nearside.
15	N56 through Dunkineely	Parking to be restricted during deliveries.
16	Right bend on Crest on N56	Vertical analysis required.
17	Splitter island on N56	Street furniture to be removed.
18	N56/R925 roundabout	No issues at this location.
19	N56/N15 roundabout	Road widening required. Street furniture to be removed. Small trees to be removed. Pruning on the offside is required.
20	N15/R267 roundabout	Road widening required. Street furniture to be removed.
21	N15/R231 roundabout	Road widening required. Street furniture to be removed.

Reference Point in Collett Report	Potential Constraint	Works Description
22	N15/R267 roundabout	Road widening required. Street furniture to be removed.
23	N15/r267 roundabout	Road widening required. Street furniture to be removed.
24	Entry splitter island at Cliffony	Street furniture to be removed.
25	Splitter islands on N15 trough Cliffony	Street furniture to be removed.
26	Exit splitter island on N15 at Cliffony	Street furniture to be removed.
27	Entry Splitter island on N15 at Grange	Street furniture to be removed.
28	Splitter island on N15 at Grange	Street furniture to be removed.
29	Splitter island on N15 at Grange	Street furniture to be removed.
30	Splitter island on N15 at Grange	Street furniture to be removed.
31	Splitter island on N15 at Grange	Street furniture to be removed.
32	Splitter island on N15 at Grange	Street furniture to be removed.
33	Splitter island on N15 at Grange	Street furniture to be removed.
34	Splitter island on N15 at Grange	Street furniture to be removed.
35	Splitter island on N15 at Grange	Street furniture to be removed.
36	Exit Splitter island on N15 at Grange	Street furniture to be removed.
37	Entry splitter island on N15 at Rathcormac	Street furniture to be removed.
38	Splitter island on N15 at Rathcormac	Street furniture to be removed.
39	Splitter island on N15 at Rathcormac	Street furniture to be removed.
40	Splitter island on N15 at Rathcormac	Street furniture to be removed.
41	Splitter island on N15 at Rathcormac	Street furniture to be removed.
42	Splitter island on N15 at Rathcormac	Street furniture to be removed.
43	Splitter island on N15 at Rathcormac	Street furniture to be removed.
44	Splitter island on N15 at Sligo	No issues at this location.
45	Splitter island on N15 at Sligo	Street furniture to be removed.
46	Splitter island on N15 at Sligo	No issues at this location.
47	Splitter island on N15 at Sligo	Street furniture to be removed.
48	Splitter island on N15 at Sligo	Street furniture to be removed.

Reference Point in Collett Report	Potential Constraint	Works Description
49	N4 roundabout	Road widening required. Street furniture to be removed.
50	N4/N59 Junction	Road widening required. Street furniture to be removed.
51	Left bend on N59	Pruning required on both sides of the road.
52	Right bend on N59	Pruning required on both sides of the road.
53	Left bend on N59	All overhead lines from transhipment point to the other transhipment point are to be removed.
54	Splitter island on N59	Street furniture to be removed.
55	Mini roundabout on N59 in Ballysadare	Overhead cables to be removed.
56	Section through Ballysadare	Overhead cables to be removed.
57	N59/R290 mini roundabout	Overhead obstructions to be removed.
58	Left bend on crest on N59 at Ballysadare	Vertical analysis required. Overhead cables to be removed.
59	Splitter island on N59 at Ballysadare	Street furniture to be removed.
60	Left bend on N59	Third party land on the nearside junction. Trees and fence to be removed. Cables to be removed if blade is still on the lift adapter.
61	Left bend on N59	No issues at this location.
62	Right bend on N59	No issues at this location.
63	Left bend on N59	Pruning required on both sides of the road.
64	Right bend on N59	Pruning required on both sides of the road.
65	Right bend on N59	No issues at this location
66	Crest on N59	Vertical analysis required.
67	Crest on N59	Vertical analysis required.
68	Left bend on N59	Pruning required on both sides of the road.
69	Crest on N59	Vertical analysis required.
70	Crest on N59	Vertical analysis required.
71	Left bend on N59	Pruning required on offside of the road.
72	Right bend on N59	Pruning required on both sides of the road.
73	Splitter island on N59 at Dromore West	Street furniture to be removed.
74	Splitter island on N59 at Dromore West	Street furniture to be removed.
75	Splitter island on N59 at Dromore West	Street furniture to be removed.
76	Splitter island on N59 at Dromore West	Street furniture to be removed.

Reference Point in Collett Report	Potential Constraint	Works Description
77	Crest and dip on N59	Vertical analysis required.
78	N59/L-2604-0 Junction	Third party land on the nearside junction. Trees and vegetation to be removed. Street furniture to be removed

From **Table 15.19** above, it is evident that temporary works are required between Killybegs Port and the N59 turn-off towards the Wind Farm Site. These are shaded in "Orange" in **Table 15.19**. However, some works related to road levelling are required at certain areas along the route – these are shaded in red in **Table 15.19**.

Table 15.20: Works Required on Galway Turbine Delivery Route to the Wind Farm Site

Reference Point in Collett Report	Potential Constraint	Works Description
1	The Port Of Galway	Discharge quay and potential storage area.
2	Dock Street/Lough Atalia Road Junction	Street furniture to be removed.
3	Lough Atalia Bridge	No issues at this location.
4	Splitter island on R339	Road sign, bollard and traffic signals are to be removed.
5	R339/R338 Junction	Contraflow manoeuvre required.
6	Splitter island on R339	Flexi bollards are to be flattened
7	R339/Connolly Avenue Junction	Traffic signal to be removed.
8	R336 Junction	Road widening required with 2 lamp posts to be removed.
9	R336/N6/N83 Junction	No issues at this location.
10	Splitter Island on N83	No issues at this location.
11	Splitter Island on N83 at Knockdoe	Street furniture to be removed.
12	Splitter Island on N83 at Knockdoe	Street furniture to be removed.
13	Splitter Island on N83 at Knockdoe	Street furniture to be removed.
14	Splitter Island on N83 at Knockdoe	Street furniture to be removed.
15	Splitter Island on N83 at Knockdoe	Street furniture to be removed.
16	Splitter Island on N83 at Knockdoe	Street furniture to be removed.

Reference Point in Collett Report	Potential Constraint	Works Description
17	Splitter Island on N83 at Knockdoe	Street furniture to be removed.
18	Splitter Island on N83 at Knockdoe	Street furniture to be removed.
19	1st Exit onto N17	Road widening is required. Street furniture to be removed.
20	Splitter island on 1st Exit onto N17	Street furniture to be removed and 2 lamp posts.
21	Splitter island on N17 at Milltown	Street furniture to be removed.
22	Splitter island on N17 at Milltown	Street furniture to be removed.
23	Left bend on N17 in Milltown	Street furniture is to be removed and tree pruning is required.
24	Left bend on N17 in Milltown	No issues at this location.
25	Left bend on N17 in Milltown	No issues at this location.
26	Splitter island on N17 in Milltown	Street furniture to be removed.
27	Right bend on N17 at Milltown	No issues at this location.
28	Splitter island on N17 at Ballindine	Street furniture to be removed.
29	Splitter island on N17 at Ballindine	Street furniture to be removed.
30	Splitter island on N17 at Ballindine	Flexi Bollards to be removed.
31	Splitter island on N17 at Ballindine	Flexi Bollards to be removed.
32	Splitter island on N17 at Ballindine	Street furniture to be removed.
33	Splitter island on N17 at Ballindine	Street furniture to be removed.
34	Splitter island on N17 at Ballindine	Street furniture to be removed.
35	2nd Exit at Charlestown roundabout	Contraflow manoeuvre required, third-party land required, road widening required and street furniture to be removed.
36	Turn right at N5/Unnamed Road	Road widening is required. Lamp post to be removed and tree pruning is required.
37	Turn left at N5/Unnamed Road	Earthworks and tree removal are required.
38	Turn left on Unnamed Road Junction with L-1331	Telegraph pole and Street furniture to be removed. Tree pruning is required.
39	Turn right at L-1331/N5 Junction in Charlestown	Street furniture and bollards to be removed. Tree pruning is is required.
40	Splitter island on R294 at N17/R294 Tobercurry Junction	No issues at this location.
41	Right bend on R294 in Tobercurry	No issues at this location.

Reference Point in Collett Report	Potential Constraint	Works Description
42	Left hand bend on R294 in Tobercurry	No issues at this location.
43	R294/N17 Junction in Tobercurry	Road widening required. Street furniture to be removed.
44	1st exit onto N4 in Collooney – Contraflow lane	No issues at this location.
45	N4/R290 Roundabout – continue straight on contraflow Lane	Street furniture to be removed.
46	Exit from N4 to N59 – using contraflow slipway	No issues at this location.
47	Left bend on N59	Pruning required on both sides of the road.
48	Right bend on N59	Pruning required on both sides of the road.
49	Left bend on N59	All overhead lines from transhipment point to the other transhipment point are to be removed.
50	Splitter island on N59	Street furniture to be removed.
51	Mini roundabout on N59 in Ballysadare	Overhead cables to be removed.
52	Section through Ballysadare	Overhead cables to be removed.
53	N59/R290 mini roundabout	Overhead obstructions to be removed.
54	Left bend on crest on N59 at ballysadare	Vertical analysis required. Overhead cables to be removed.
55	Splitter island on N59 at Ballysadare	Street furniture to be removed.
56	Left bend on N59	Third party land on the nearside junction. Trees and fence to be removed. Cables to be removed if blade is still on the lift adapter.
57	Left bend on N59	No issues at this location.
58	Right bend on N59	No issues at this location.
59	Left bend on N59	Pruning required on both sides of the road.
60	Right bend on N59	Pruning required on both sides of the road.
61	Right bend on N59	No issues at this location
62	Crest on N59	Vertical analysis required.
63	Crest on N59	Vertical analysis required.
64	Left bend on N59	Pruning required on both sides of the road.
65	Crest on N59	Vertical analysis required.
66	Crest on N59	Vertical analysis required.
67	Left bend on N59	Pruning required on offside of the road.
68	Right bend on N59	Pruning required on both sides of the road.

Reference Point in Collett Report	Potential Constraint	Works Description
69	Splitter island on N59 at Dromore West	Street furniture to be removed.
70	Splitter island on N59 at Dromore West	Street furniture to be removed.
71	Splitter island on N59 at Dromore West	Street furniture to be removed.
72	Splitter island on N59 at Dromore West	Street furniture to be removed.
73	Crest and dip on N59	Vertical analysis required.
74	N59/L-2604-0 Junction	Third party land on the nearside junction. Trees and vegetation to be removed. Street furniture to be removed

From **Table 15.20** above, it is evident that temporary works are required between Galway Port and the N83 turn-off towards the Wind Farm Site. These are shaded in "Orange" in **Table 15.20**. However, major works related to road widening are required at certain areas along the route – these are shaded in red in **Table 15.20**.

15.4.3 Construction Haul Route To Site

No upgrade works are necessary to the L-6612 and L-1102 to facilitate the delivery of materials. However, passing bays will be constructed to allow traffic to flow at all times (see **Section 15.6 Mitigation Measures**). There are third party lands required for the Construction Haul Routes for the passing bays to be constructed.

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 Sligo and 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.

15.4.4 Grid Connection and Interconnector

No road upgrade works are proposed to the L-1102 to facilitate the delivery of materials. A confirmatory condition survey of the L-6612, L-1102, L-5136-0 and L-5137-9 roads will be carried out prior to commencement of construction and another post-construction. The Developer will lodge a bond with Sligo County Council and 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, these roads will be inspected weekly by the Developer's Resident Engineer and the Contractor will be instructed to repair any localised defects within the following four weeks. At the end of the construction period, any further defects will be remedied to the satisfaction of Mayo County Council and Sligo County Council.

The Grid Connection trenches, joint bays and link boxes will be installed in local roads L-1102 and L-5136-0. Some 5,925 m of trenching of the Grid Connection (double circuit) which is 0.6 m wide and 2 m apart, will be laid within these roads (c.300 m and c.375 m will also be installed on Wind Farm Site roads and private land respectively). The single circuit Interconnector trenches from the Wind Farm Site and Hydrogen Plant Site will be 0.6 m wide and will include joint bays on the L-6612-1, L-6612 and L-1102. The Wind Farm Site and Hydrogen Plant Site is underlain by the Carboniferous Ballina limestone Formation which is characterised by dark fine-grained limestone and shale. No rock excavation is envisaged when laying the cables.

Sixteen joint bays and sixteen associated communication chambers/link boxes references JB-01A, JB-01B, JB-02B, JB-02A, JB-03B, JB-03A, JB-04B, JB-04A, JB-05B, JB-05A, JB-06B, JB-06A, JB-07B, JB-07A, JB-08B and JB-08A will be laid within these local roads (see TLI Drawings 05806-DR-211, 05806-DR-212, 05806-DR-213 and 05806-DR-214 in included in **Volume III**). There are also 7 joint bays that will be installed for the Interconnector along the L-6612-1, L-6612, L-1102 and L-5136-0. These local roads will be reinstated (temporary and permanent) in accordance with "Guidelines for Managing Openings in Public Roads", Department of Transport, Tourism and Sport, Second Edition (Rev. 1), April 2017. The L-6612, L-5136-0 and L-5137-9 will require full width resurfacing as part of the permanent reinstatement to be carried out once commissioning of the Wind Farm Substation is complete. The L-1102 yields a road width of 5.3 m and will require half width resurfacing as part of the permanent reinstatement to be carried out once commissioning of the Wind Farm Substation is complete.

The Interconnector Route utilizes the Forestry and Wind Farm access roads to exit the Wind Farm Site boundary, continuing in a northwest direction for approximately 440 m prior to joining the public roadway via the L-5137-9 local road, following it north for a short section of c. 7 m. The route diverges onto the L-5136-0 local road, wherein it remains with a north western heading for approximately 2670 m. The route then encounters a T-junction, where it proceeds turning right onto the L-1102 local road which it follows northwest for approximately 405 m. At this point the Interconnector Route keeps left onto the adjoining L-

6612 local road. The Interconnector Route continues northwest along the L-6612 local road for approximately 300 m before the Interconnector Route reaches the L-6612/L-5131 Crossroads. The Interconnector Route continues west through the crossroads, remaining within the L-6612 local road for an additional 2470 m. Along the L-6612 local road, the Interconnector Route encounters a bridge over the Brusna River. The proposed traversal method of this bridge crossing is an HDD (Horizontal Directional Drilling) undercrossing (Reference drawing 05806-DR-258), due to the aforementioned bridge being incapable of supporting the proposed 110 kV connection as it contains insufficient cover. The Interconnector Route then changes direction, heading southwest via the L-6612-1 local road for the final section of the route within the public roadway, c. 355 m in length. The Interconnector Route leaves the public roadway, utilizing the Hydrogen Plant access road, traveling southeast for approx. 955 m before reaching the Hydrogen Plant Substation location.

The Grid Connection Route works will consist of the installation of ducts in three excavated trenches. The double circuit Grid Connection and single circuit Interconnector will be laid on the L-5136-0 and L-5137-9, which is c 3.13 km in length. The trenches will accommodate power cables enclosed within HDPE ducts with a minimum separation distance of 880 mm between power circuits. A fibre communications cable will also be installed to allow communication between the Wind Farm and Hydrogen Plant. The Interconnector requires one HDD to enable crossing under an existing watercourse. The trenching, joint bay and HDD methodology is the same as the grid connection and details can be found in **Sections 2.6.12, 2.6.13 and 2.6.14**. The Grid Connection and Interconnector trench is 600 mm wide for the single circuit and 725 mm for the triple circuit and the depth will be 1,315 mm.

15.4.5 Wind Farm Internal Access Roads

Within the Wind Farm Site, existing access tracks will require reinforcement. No borrow pits will be utilised during construction and all construction material will be imported to Wind Farm Site.

The northern branch will give access to turbines T7 and T9, with the northwestern and north eastern branch giving access to T6 and T8 respectively. The western branch will give access to T4, and the eastern branch will give access to T13 and T12. The southern branch will give access to turbines T1 and T10, with the southwestern and south eastern branch giving access to T2, T3 and T11 respectively. There will be a new internal access road constructed that will connect the north wing turbines to the south wing turbines of the Wind Farm Site.

15.5 ASSESSMENT OF POTENTIAL EFFECTS

15.5.1 HGV Deliveries

The estimated timescale for the completion of the construction phase is 21 months, inclusive of all works to site access road, access routes, substation buildings, Hydrogen Plant, erection and commissioning of turbines, Interconnector and Grid Connection works.

Tables 15.20 to **Table 15.23** present a summary of the estimated HGV abnormal load deliveries of materials required to construct the Wind Farm, the Hydrogen Plant, the turbine delivery route improvement works and the Grid Connection.

It is estimated that 840 m^3 of structural concrete and 60 m^3 of blinding concrete will be required for each Turbine Foundation and that an additional 1435 m^3 will be required for the substation buildings and plinths, Hydrogen Plant foundation and other miscellaneous works. This gives a total volume of concrete of 13,136 m^3. Based on 6 m^3 per concrete truck, some 2,189 loads will be required.

It is estimated that 90t of reinforcing steel will be required for each Turbine Foundation and that an additional 285t will be required for both substations, Hydrogen Plant foundation and miscellaneous works. These total 1,455t. At 20t/load, some 73 deliveries of reinforcing steel will be required.

For the proposed area of new Wind Farm Site road of 5,954 m^2 (see **Chapter 2: Project Description**, Section 2.5.5, 1,323 m long x 4,5 m wide), some 3,929 m^3 of imported crushed stone will be required for a 150 mm finishing layer and up to 510 mm subbase.

To ensure that there is a 4.5 m road width maintained throughout the internal Wind Farm route, an additional 1.5 m width will be added to the existing 3 m track, therefore 8,772 m of existing track will require 8,684 m^3 of imported crushed stone.

For the total Turbine Hardstand area of 46,800 m^2 (see **Chapter 2: Project Description**, **Section 2.5.3**), some 4,680 m^3 of imported stone will be required for the finishing layer and 13,000 m^3 for the subbase of the Turbine Hardstand area. These total 17,680 m^3. At 12 m^3/load, some 1474 deliveries will be required.

Depending on the soil/rock profile, imported crushed stone (engineering fill) may be required under Turbine Foundations as upfill. Excavations will be generally shallow (c. 2.5 – 2.85 m depth for Turbine Foundations). Allowing 1 m per foundation, then 6,640 m^3 is required. At 12 m^3/load, some 554 loads are required.

For the Wind Farm Substation and Hydrogen Plant Substation, rock will be imported for the build-up layers. For the site area of 26,687 m^2 (see **Chapter 2: Project Description**, **Section 2.5.8**), the volume of imported stone required is 5,338 m^3. At 12 m^3/load, some 1,112 loads are required.

For the Wind Farm Substation and Hydrogen Plant 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 Construction Haul Routes.

The total felling area is estimated at 5.83 ha for the Wind Farm Substation. The total volume of wood is estimated at 2,410 m^3. This is equivalent to 1,084 tonnes. This is equivalent to 55 loads. Allowing for part loads, voids etc., the total allowance is for 10 loads over a 6 day period equivalent to 10 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 6,857 HGV loads will be delivered to the Proposed Development. Much of these deliveries will be over the 11-month period between months 2 to 12 (see **Table 15.23** for Indicative Delivery Programme). This equates to approximately 296 loads per month or an average of 13 to 15 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 150 deliveries per day (for at least 14 separate days in the construction programme when the Turbine Foundations will be poured). On these concrete pour days, some 14-18 deliveries per hour will be required.

A summary of estimated loads for the Civil/Electrical Construction Works is presented in **Table 15.21**.

Table 15.21: HGV and Abnormal Load Deliveries – Associated with Civil/Electrical Construction Works

Materials	Quantity	No. of Deliveries
Site Establishment and Removal	25	25
Concrete	13,136 m^3	2,189
Reinforcing Steel	1,455t	73
Substation Building and electrical equipment	-	60
Other – Geotextile Mats, Tools, Fencing etc.	-	50
Wind Farm Internal Cabling Materials incl. bedding	-	400
Hydrogen Plant Materials	-	50
Imported Crushed Stone (engineering fill) as Upfill to Foundations	6,639 m^3	554
Imported Crushed Stone for Substation	13,344 m^3	1112
Imported Crushed Stone for Site Access Roads and Turbine Hardstands	30,294 m^3	2524
Waste – 1 container/month		21
Total		**7,058**

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 177 loads of turbine components and crane parts will be delivered during this period. The majority of these loads will be classified as abnormal loads and the relevant approvals and permits will be obtained by the turbine supplier or its appointed haulage contractor before deliveries take place.

The expected number of HGV deliveries for turbine components are based on specifications from the potential turbine manufacturers, on best estimates of trips generated by similar sized windfarms and previous experience in windfarm planning and civil construction. These figures are likely to vary to some degree depending on the individual lengths of tower sections offered by different manufacturers, but not to the extent that impacts are likely to be significantly changed. A summary of the estimated HGV loads to the Wind Farm Site associated with wind turbine components is presented in **Table 15.22**.

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

The total number of loads associated with the turbine delivery routes is estimated at 880.

Table 15.22: HGV and Abnormal Load Deliveries – Associated with Wind Turbine Components using the N59 and L-2604-0

Materials	Quantity	No. of Deliveries
Site Establishment and Removal	24	24
Miscellaneous Deliveries for Temporary Bridge (fencing, silt fencing, siltbusters, drainage, sumps etc.) incl. Removal	30	30
Anchor Cages & Foundation Templates	14	14
Tower Sections	-	52
Nacelles	13	13
Rotor Blades	39	39
Transformers, Panels and Cabling	-	8
Tools etc.	-	1
Crane Deliveries to Site, including ballast, booms, etc. and removal of same	2 Cranes	50
Road Widening on Turbine Haul Route – Soil Disposal	2,200 m^3	184
Crushed Stone for Widening and Strengthening of Turbine Haul Route	4,690 m^3	391
Road Surfacing for Turbine Haul Route	1,420t	71
Ducting and Miscellaneous Deliveries to Turbine Haul Route	3	3
Total		**880**

For the Grid Connection and Interconnector 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 29.7 m^3 lean mix concrete or 5 loads at 6 m^3 per load. The locations of joint bays are shown on TLI Drawing No. 05806-DR-214 included in **Volume III: Figures**.

Some 23 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 97.23 m^3 concrete is required which is equivalent to 17 loads.

For 110 kV cables, 630 mm^2 aluminium, the weight per km of cable is 9.886t. For a total length of 21 km (13 km for the Grid Connection and 8 km for the Interconnector), the weight will be 208t and will require 18 loads. Allowing another load for fibre optic cables brings the total to 19 loads.

Having 5 ducts in a trench, of which 13 km for the Grid Connection cable and 8 km for the Interconnector. There are 5 cables in a trench, therefore 105 km (21 km x 5 No.) of ducting will be required. The ducting required is typically delivered in 6 m lengths, typically 3 km of ducting per load. Thus, some 35 loads are required.

Excavations in roads for trenches, joint bays, link and communication chambers is estimated to yield 784 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 65 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 North West will be limited to a narrow summertime window. For final reinstatement, full width road reinstatement will be required in accordance with the requirements of "Guidelines for Managing Openings in Public Roads" – Second Edition, April 2017, Dept of Transport, Tourism and Sport. The L-6612, L-1102 and L-5136-0 roadways presents a width of c. 4.3 m, 5.3 m and 3.9 m respectively. Some 2110 m^3 or 176 loads is required. A further 10 loads have been allowed for entrances and regulating the road profile. This will bring the total for road surfacing to some 251 loads.

For trenches in roads within private lands for both Grid Connection and Interconnector, 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 16,806 m^3 for the Grid Connection Trench and 538 m^3 for the joint bays, link boxes and communication boxes. The trench dimensions are based on 0.6 m to 0.725 m wide and varying depths from 1.315 m deep. An allowance is also included for chambers. This will generate some 1,445 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 8,190 m^3 of lean mix concrete which is equivalent to some 1365 deliveries to site for the complete Grid Connection Route and Interconnector Route.

Some 0.345 m^3 of crushed stone is required per metre of trench in roads. This will give a requirement for 7,245 m^3 or some 604 loads.

A summary of the total estimated loads associated with the Grid Connection is presented as **Table 15.23**.

Table 15.23: HGV Load Deliveries – Associated with Grid and Interconnector Works

Materials	Quantity	No. of Deliveries
Site Establishment and Removal	30	30
Concrete Blinding for Joint Bays, Comms Chambers and Link Boxes	29.7 m^3	5
Concrete for Floors of Joint Bays	97.23 m^3	17
Pre-cast Concrete Joint Bays and Communication Chambers	23	23
Other – Steel mesh, Geotextiles, Silt Fencing, Fencing, Danger Tape, etc.	7	7
Grid and Interconnector Connection Cables	208t	19
Grid and Interconnector Connection Ducting	21,000 m	35
Disposal of Excavated Materials from trenches in Public Roads	17,344 m^3	1445
Lean Mix Concrete for Trenches	8,190 m^3	1365
Crushed Stone for Trenches in Public Roads	7,245 m^3	604
Road Surfacing	3,014 m^3	251
Total		**3,801**

Table 15.24 and **Table 15.25** shows an indicative potential breakdown of loads delivered to site over a 21-month period. The total number of loads is estimated at 11,739.

Table 15.24: Indicative HGV and Abnormal Load Deliveries Over 21 Month Construction Period for the Wind Farm

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	7	13	12																		
Internal Access Road Upgrade & Construction		437	437	437	438	438															
Substation & Compound Construction		21	21	21	21	21	21	21													
Substation Electrical Works									4	3	3	3	3	3	3	3	3				
Substation Commissioning																1	1				
Excavation & Construction of Turbine Foundations & Turbine Hardstands		217	217	262	317	317	317	317	318	318	318										
Wind Farm Internal Cabling Installation										30	30	28	28	28	28	28					
Turbine Delivery and Erection												36	36	36	36	36					

Activity	Month																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Grid Connection													263	263	263	263	263				
Energisation																		1			
Turbine Commissioning																			3	3	2
Site Restoration																		3	3	3	2
Totals	7	688	687	720	776	776	338	338	322	351	351	67	469	469	469	470	407	4	6	6	4

Table 15.25: Indicative HGV and Abnormal Load Deliveries Over 21 Month Construction Period for the Hydrogen Plant

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	12																				
Contractor Compound and Welfare Facilities	100																				
Hydrogen Plant Site Preparation including drainage		95	95	95																	
Site Access Road		15	15	15																	
Excavations and installation for underground storage tank		342	342	342	342	342	342	343													
Electrolyser building construction					70	70	70	70	70	70	70	70	70	70	70	75					
Ancillary buildings and Hydrogen Plant Substation construction							50	50	50	50	50	50	50	50	50	58					
Installation of outdoor plant and equipment															50	50	50	50			
Installation of the Wind Farm interconnector							114	114	114	114	114	114	114	114	114	121					
Delivery of equipment and installation															98	98	98	98			
Testing and Commissioning																		33	33	33	33

Activity	Month																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Site Restoration																			4	3	3
Totals	112	110	110	177	137	138	302	302	234	234	234	234	234	234	382	402	148	181	37	36	36

Based on the indicative timetables outlined above the peak times for HGV deliveries will be in months 2 to 12 when the Turbine Foundations will be constructed, Turbine Hardstands and the Wind Farm Site roads will be finished in imported stone and the Grid Connection works will be ongoing. This is estimated to result in a maximum of 914 trips each month with an average of 42 HGV trips per day in this period. Peak deliveries are expected to be during the period of concrete pours for Turbine Foundations when there will be approximately 140 loads per Turbine Foundation. If two Turbine Foundations are poured per month, then the balance of the loads in the busiest month would be 634 loads or 29 loads per day over the remaining days of the month.

15.5.2 Staff/Worker Traffic

For the Wind Farm and Hydrogen Plant construction phase, a peak workforce of 100 - 150 persons are anticipated on the sites. There will be peaks and troughs in the numbers, with the peak workforce during the general site works.

In addition to the on-site construction workforce, additional construction staff will be required for the cable laying works and the turbine haul route works. One gang is envisaged for the haul route works while two-three will be required for the Grid Connection. At each location off site, a maximum of 10 construction staff are anticipated including traffic management operatives. Thus, up to 150 workers could be employed at peak times.

The 150 workers will generally travel to the sites via light vehicle (LV) (i.e. car or small van) assuming 2 persons per vehicle, or 75 trips to and 75 trips from the sites per day. This is made up of:

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

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

Based on the analysis in **Section 15.5.1** above, **Table 15.26** below has been prepared which summarises the peak additional HGV deliveries per road element while **Table 15.27** provides a summary of the peak additional traffic movements.

Table 15.26: Summary of Peak Additional HGV / Abnormal Load Deliveries to Site Per Road Element

Node	Road	Civil & Electrical	Turbine	Grid	Total
Killybegs or Galway to N59/L-2604-0 Junction	N59	0	210	0	210
N59/L-2604-0 Junction	N59	1997	0	0	1997
L-5137-9 to Windfarm access road	L-5137-9	0	856	0	856
N59/L-1102 Junction	L-1102	5990	0	2634	8624
N59/L-6612-1 Junction	L-6612-1	7126	856	2634	10616
L-6612-1/L-6612 Junction	L-6612	7126	856	2634	10616
L-6612/L-1102 Junction	L-1102	7126	856	2634	10616
L-1102/L-5136-0 Junction	L-5136-0	7126	856	2634	10616

Table 15.27: 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
Killybegs/Galway to N59/L-2604-0 Junction	N59	210	210	20	90	50
N59/L-2604-0 Junction	N59	1997	356	20	90	50
L-5137-9 to Windfarm access road	L-5137-9	856	356	15	90	40

Node	Road	Total No. Of Deliveries	Peak Deliveries/ Month	Peak Deliveries/ Day	Staff	Peak Traffic Movements/ Day
N59/L-1102 Junction	L-1102	8624	939	150	150	390
N59/L-6612-1 Junction	L-6612-1	2972	290	150	150	300
L-6612-1/L-6612 Junction	L-6612	5736	677	150	150	390
L-6612/L-1102 Junction	L-1102	10616	1062	150	150	390
L-1102/L-5136-0 Junction	L-5136-0	10616	1062	150	150	390

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

The magnitude of change is summarised within **Table 15.28** below.

The numbers of HGVs generated by the Proposed Development (390 movements per day at peak) could be considered as a significant increase on the numbers of HGVs which are predicted to use the existing N59 in 2026, which is predicted to be 157 movements per day (See **Section 15.3.6**). However, the construction stage traffic movements between Killybegs Port or Galway Port and the L-2604-0 Junction (N56, N83, N15, N17, N5, N4 and N59) will be at 50 movements (20 deliveries) per day, resulting in 207 AADT of HGV. Assuming that the majority of the route between Killybegs Port or Galway Port and the L-2604-0 junction 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 4.1%. The magnitude of change is considered as being "Very Low" (see **Section 15.2.9**).

For the turbine delivery routes between the L-2604-0, L-5137-0, L-5137-9 and the Wind Farm Site entrance, an additional 40 traffic movements per day will arise during this activity. The L-2604-0, L-5137-0 and L-5137-9 carriageway maintains an average width of 3.5 m – 4 m and is classified as a type 3 road, the capacity of 5000 AADT is used as per Table 6.1 of the TII publication DN-GEO-03031 – Rural link design. Adding a further 40 traffic movements to the predicted 2026 traffic movements of 81 AADT (See **Table 15.17**), resulting to 121 AADT. The flows would increase by 2.4% which, in terms of magnitude, are considered as being "Very Low" (see **Section 15.2.9**).

For the construction haul route between the N59/L-1102 Junction, an additional 390 traffic movements per day will arise during this activity. Assuming that the majority of the route 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. Adding a further 390 traffic movements to the 2026 traffic movements of 4322 AADT, resulting to 4712 AADT, the flows would increase by 40.6% which, in terms of magnitude, are considered as being "Low" (see **Section 15.2.9**).

For the construction haul route between the N59/L-6612-1 junction, an additional 300 traffic movements per day will arise during this. The predicted flows for the N59/L-6612-1 junction for 2026 is 6,100 AADT (See **Section 15.3.6**). This is 52.5% of the guidance capacity of 11,600 AADT. Adding a further 300 traffic movements, the flows would increase to 6,400 AADT which is well within the guidance capacity of 11,600 AADT, in terms of magnitude, are considered as being "Low" (see **Section 15.2.9**).

For the construction haul route between the L-6612/L-1102 Junction, an additional 390 traffic movements per day will arise during this activity. The L-1102 and L-6612 carriageway maintains an average width of 5.3 m and 4.3 m respectively, and is classified as a type 3 road, the capacity of 5000 AADT is used as per Table 6.1 of the TII publication DN-GEO-03031 – Rural link design. Adding a further 390 traffic movements to the 2026 traffic movements of 413 (See **Table 15.17**), resulting to 803 AADT, the flows would increase by 16.1% which, in terms of magnitude, are considered as being "Very Low" (see **Section 15.2.9**).

For the construction haul route between the N59/L-6612-1 junction, an additional 390 traffic movements per day will arise during this activity. The L-6612-1 carriageway maintains an average width of 3.1 m and is classified as a type 3 road, the capacity of 5000 AADT is used as per Table 6.1 of the TII publication DN-GEO-03031 – Rural link design. Adding a further 390 traffic movements to the 2026 traffic movements of 87 AADT (See **Table 15.17**), resulting to 477 AADT, the flows would increase by 9.5% which, in terms of magnitude, are considered as being "Very Low" (see **Section 15.2.9**).

Table 15.28: Magnitude and Significance of Impacts

Node	Road	Sensitivity	Magnitude	Significance of Effects	Duration
Killybegs or Galway to N59/L-2604-0 Junction	N59	Very Low to High	Low	Negligible to Moderate	Short Term

Node	Road	Sensitivity	Magnitude	Significance of Effects	Duration
N59/L-2604-0 Junction	N59	Very Low to High	Low	Negligible to Minor	Short Term
L-5137-9 to Wind Farm access road	L-5137-9	Medium to Low	Very Low	Negligible	Short Term
N59/L-1102 Junction	L-1102	Medium to Low	Low	Negligible to Minor	Short Term
N59/L-6612-1 Junction	L-6612-1	Medium to Low	Low	Negligible to Minor	Short to Long Term
L-6612-1/L-6612 Junction	L-6612	Low	Very Low	Negligible	Short Term
L-6612/L-1102 Junction	L-1102	Very Low	Very Low	Negligible	Short Term
L-1102/L-5136-0 Junction	L-5136-0	Very Low	Very Low	Negligible	Short Term

The widening works to turbine delivery route L-2604-0, L-5137-0 and L-5137-9, Grid Connection works in the L-5137-9, L-5136-0 and L-1102, with the Interconnector in the L-6612-1, L-6612, L-1102, L-5136-0 and L-5137-9 route will have a 'high' impact and need mitigation including road closures for all except local traffic.

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

15.5.4 Works on the Turbine Delivery Routes

As outlined in **Table 15.19** and **Table 15.20**, works will be required at a number of locations along the Killybegs Turbine Delivery Route and Galway Turbine Delivery Route. These works may cause some short-term disruption to local road users. However, these effects will be confined to a relatively short period during the construction phase, prior to the delivery of turbine components and hence are not predicted to have a significant effect. Street furniture will be adjusted (where necessary) such that it is socketed into the ground. Street furniture will be removed daily in advance of turbine delivery (which will occur at night) and be replaced immediately following the passage of the abnormal vehicles such that

daytime traffic can continue as normal. The L-2604-0, L-5137-0 and L-5137-9 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 L-2604-0, L-5137-0 and L-5137-9 which will be of benefit to local road users with bends/verges having been widened and junctions improved.

15.5.5 Works on the Grid Connection and Interconnector

For the Grid Connection, the works will be constructed within the L-5137-9, L-5136-0 and L-1102 over a total length of c.6.7 km. The Interconnector will be laid within the L-6612-1, L-6612, L-1102, L-5136-0 and L-2604-0 over a total length of c.8.0 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 local residents and farmers who live close to these local roads can be predicted to be low to moderate but short-term in nature. The reinstated surface (full 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. 26 weeks.

15.5.6 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 50 during Turbine Foundation construction. It is expected that the majority of workers will arrive on-site in mini-buses and crew vehicles which are used to transport teams of workers from the various contractors. Vehicle sharing will be actively encouraged to reduce vehicular movements.

It is expected that a maximum of 25-30 vehicles will visit the sites on a daily basis during the peak construction period (Turbine and Hydrogen Plant Foundation construction). This is estimated to be an increase of 0.8 % on predicted levels for 2026 on the N59 and an increase of 7.8% on the AADT estimate for the L-1102. Parking for staff will be provided at the Wind Farm Site Temporary Construction Compound and Hydrogen Plant Site Temporary Construction Compound. No parking will be allowed for construction workers on the public road network. A number of additional unscheduled visits may be required throughout the construction period for site inspections, site meetings, and unforeseen circumstances. The predicted effect is negligible to low due to the relatively low increase in traffic over the baseline situation.

15.5.7 Air Quality

Good local air quality is essential for the health and quality of life of residents along the Haul Route. 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 Haul Route. 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. See **Chapter 10: Air and Climate**.

15.5.8 Noise and Vibration

There is likely to be some noise and vibration from HGV movements along the Construction Haul Routes and turbine delivery route on the local roads, L-2604-0, L-5137-0, L-5137-9, L-6612, L-6612-1, L-1102 and L-5136-0 which can cause disturbance to residents living along these roads as the roads are generally not busy. The baseline scenario is that the area is relatively quiet with no major sources of noise and vibration. Due to the relatively low number of trips generated per day, the restrictions on working hours and the short-term nature of the construction phase, the effects of noise and vibration are not predicted to be significant. Mitigation measures are discussed in **Section 15.6** and in **Chapter 11: Noise**.

15.5.9 Pedestrians and Vulnerable Road Users

Pedestrian amenity and intimidation can occur where there are large changes to traffic flow and composition. The local roads from the 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 L-2604-0 and fronts onto the Turbine Delivery Route. Students of Stokane National school are likely to use the haul route 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 15.6**).

15.5.10 Driver Delay

The N59 is estimated to be at 52.4% of its capacity in 2026 with HGV and LGV traffic. The Proposed Development takes it to 70% considering peak movements. From the traffic counts, the roads to the sites are operating below their capacity and therefore significant effects in relation to driver delay are not envisaged from the Proposed Development.

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

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

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

15.5.11 Severance

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

Road closures have the potential to cause severance to residents on the L-1102, L-6612-1, L-6612 and L-5136-0 during Grid Connection and Interconnector works. Road closures will be such that residents can access/egress their properties although there may be minor delays. Accordingly, such severance will be minor and of short duration.

15.5.12 Mud and Debris on the Local Road Network

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

15.5.13 Effects on Road Network during Construction Phase

Traffic numbers during construction are outlined in **Section 15.5.1**. As the roads are estimated to have sufficient spare capacity, the overall potential effect on the local roads is assessed to be a moderate, negative effect of short-term duration and high probability during construction of the Proposed Development.

15.5.14 Operational Phase – Traffic

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

The Hydrogen Plant has been designed so that it can be in operation 24 hours a day, seven days a week and will be manned with a dedicated team providing maintenance and servicing. Site specific management systems and operating procedures will be developed in accordance with industry procedures and policies.

There will be a maximum of 26 tube trailers filled with gaseous hydrogen and then transported away from the plant everyday (see **Section 15.7.2**). Typically, regular staff will be using the facility on an on-going basis and staff parking has been incorporated in to the design. Approximately 10 cars can be allowed for as working traffic to the Hydrogen Plant. This means that the N59 at the L-6612-1 Junction is predicted to be running at 618 AADT at this junction, which is approximately 5.3% of its capacity and therefore has the capacity to accommodate the Hydrogen Plant operational traffic. The effect of traffic associated with the operation of the Hydrogen Plant on the existing public road network will be imperceptible due to the type of traffic and the low volume of traffic generated during operation.

The Grid Connection will, following commissioning, be taken in charge 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 110kV cable connections is very low. However, should a fault occur, it would most likely be within a joint bay which could be exposed and the joint repaired over 3-4 days.

15.5.15 Traffic Impact During Decommissioning Phase

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

15.5.16 Road Safety Audit

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

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

A road safety audit was carried out between 24th June 2022 to 6th October 2022 that is accordance with TII Publication GE-STY-01024, Dec. 2017.

The following was the outcome of the outstanding items resulting from the stage 1 audit:

Provision for pedestrians

Problem: The existing local road does not benefit from separate footpaths. Therefore, pedestrian traffic shares the carriageway with other motorised users.

Hazard: The amendments to the carriageway provides greater width and straighter alignments than existing and is likely to convey greater numbers of large vehicles, possibly at higher speeds. Pedestrians struck by high speed large vehicles are at greater risk of injury.

Recommendation: 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.
The design team could investigate if the historic road could be repurposed for this use.

N59 – Swept Paths

Problem: The swept paths indicate the left turning HGV is required to cross the N59 centreline.

Hazard: Impact with northbound N59 traffic may result.

Recommendation: Redesign the junction to ensure crossing of the centreline is not required by left turning vehicles.

Forward Visibility

Problem: Some of the visibility splays shown on the drawing are outside of the carriageway surface. There is risk that vegetation will grow to restrict visibility.

Hazard: Users with insufficient visibility may errantly strike other road users or debris on the carriageway.

Recommendation: Ensure all visibility envelopes are kept clear of high vegetation

Visibility at Roundabout

Problem: The visibility splays shown on the drawing are taken from the yield lines at the roundabout.

Hazard: The front of the vehicle will need to enter the circulatory carriageway in order for the driver's eye to sit on the visibility line shown. Impact with vehicles on the circulatory carriageway may result.

Recommendation: Provide visibility splays set back a suitable distance from the yield line.

Roundabout Central Island – Signage (1)

Problem: Incorrect signage is shown for the roundabout central island. Sign RUS 001 gives instruction to Keep Left of the sign only. Users unfamiliar with the area may believe the signage arrangement is advising of a bend in the road and may not slow sufficiently.

Hazard: Vehicle loss of control or impact with circulatory traffic may result.

Recommendation: Replace the RUS 001 sign with RUS 006.

Roundabout Central Island – Signage (2)

Problem: There are only 3 sets of chevron/Turn Left signs proposed for the roundabout central island, but the roundabout has 4 entry arms. The signage should face each entry arm.

Hazard: Users approaching the roundabout may have insufficient advanced warning to comprehend the junction type. Overshoot collisions may result.
Recommendation: Provide signage opposite each entry arm.

Roundabout Entry Curves

Problem: The entry / exit curves do not have a uniform radius. Trailing wheels of long vehicles may over-run the verge and drag detritus onto the carriageway surface.
Hazard: Following vehicles may skid / lose control on this detritus.
Recommendation: Provide a uniform radius from the roundabout entry to the exit.

Speed Limits

Problem: The proposed works are likely to require removal of the existing speed limit signage. The drawings do not indicate replacement / relocation of the signs.
Hazard: Users may drive at inappropriate speeds for the road conditions and lose control.
Recommendation: Reinstate any speed limit signs removed by the works.
The following are the problems at specific locations found during the audit:

Roundabout Central Island – Road markings

Problem: Incorrect road markings are indicated for the perimeter of the central island. The RRM 017 is a 200 mm wide solid line. Road markings generally have less skid resistance than the road surfacing material.
Hazard: Powered two wheeled vehicles may over-run the wide line and skid / lose control.
Recommendation: Replace the RRM017 with RRM001.

Access to Dwelling House

Problem: The access to the dwelling house off the roundabout has a similar look to all the other exits. There is a risk that general public vehicles will errantly depart the roundabout on this arm.
Hazard: Vehicles entering this arm may not expect the very tight bend immediately within the property lands. Vehicle loss of control may result.
Recommendation: Redesign this arm or roadside treatment to enable road users to differentiate this private access from the public ones.

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

The Operational phase of the Hydrogen Plant will be long-term associated with the deliveries of the green hydrogen produced on site, however the impact on the safety and free flow of traffic from the HVG is "very low".

15.6 MITIGATION MEASURES

15.6.1 Construction Phase

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

- A Traffic Management Plan (TMP) has been developed (see Management Plan 7 attached to the CEMP). Prior to construction and once the Contractors have confirmed their suppliers, the TMP will be updated in consultation with Sligo County Council 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, particularly at Stokane on the L-2604-0. 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 Wind Farm will be during the construction of the Proposed Development and will be temporary in nature. It is envisaged that the construction period for the Wind Farm 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 impacts.
- Use special transporter vehicles with rear wheel steering in delivery of wind turbine components to ensure safe transportation and manoeuvrability on the roads. Extendable transporter vehicles will be retracted on return journeys.
- Prior to delivery of abnormal loads i.e. turbine components, the Developer or their representatives, will consult with An Garda Síochána and Sligo County Council 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

and the Wind Farm Site of c.148 km, the journey is achievable within a 4-5 hour timeframe and the distance between Galway Port and the Wind Farm Site of c 178 km, the journey is achievable within a 5-6 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 Sligo County Council and 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 Sligo County Council and Mayo County Council.
- Wheel cleaning equipment will be used at the exit to the Wind Farm Site and Hydrogen Plant Site to prevent any mud and/or stones being transferred from site to the public road network. All drivers will be required to see that their vehicle is free from dirt and stones prior to departure from the construction sites.
- The sites' entry points will also be appropriately signed. Access to the Wind Farm Site and Hydrogen Plant Site will be controlled by on site personnel and all visitors will be asked to sign in and out of the site by security / site personnel on entering and exiting the site. All site visitors will undergo a site induction covering Health and Safety issues at the Wind Farm Site Temporary Construction Compound and Hydrogen Plant Temporary Construction Compound and will be required to wear appropriate Personal Protective Equipment (PPE) while on-site.
- In addition, any dust generating activities will be minimised where practical during windy conditions, and drivers will adopt driving practices to minimise the creation of dust. Where conditions exist for dust to become friable, techniques such as damping down of the potentially affected areas will be employed.
- To reduce dust emissions, vehicles transporting crushed stone will be covered during both entrance and egress to the site.
- A survey of the Killybegs Turbine Delivery Route and Galway Turbine Delivery Route will be undertaken prior to commencement to identify if any new overhead lines or broadband lines will need to be lifted along the route to allow abnormal loads such as tower sections and nacelles to be delivered.
- During the construction phase, clear construction warning signs will be placed on the L-2604-0, L-5137-0, L-5137-9, L-1102, L-6612-1, L-6612 and L-5136-0 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 Killybegs Turbine Delivery Route and Galway Turbine Delivery Route, Grid Connection and Interconnector 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 and Interconnector 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. When the Interconnector is under construction on the L-6612, then the L-1102 may be utilized to divert traffic. For the Grid Connection works within the L-1102 and L-5136-0, passing bays can be utilised. While traffic diversions are in place, local access will be maintained at all times. All access points (domestic, business, farm) will be considered when finalising the proposed road closures and diversions. Additional measures such as local road widening, traffic shuttle systems and 'Stop-Go' systems will also be considered subject to agreement with Sligo County Council and Mayo County Council. Road closures will be scheduled in consultation with local residents and the Contractor shall endeavour to avoid times of high agricultural activity e.g. silage cutting.
- The widening/straightening of haul route L-2604-0, L-5137-0 and L-5137-9 is proposed to be completed in advance of road closures.
- The L-1102 and the L-6612-1 shall not be closed at the same time i.e. one should remain open while the other is closed.
- 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 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.
- 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.
- Replace the RUS 001 sign with RUS 006.
- 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.
- Replace the RRM017 with RRM001.
- Redesign this arm or roadside treatment to enable road users to differentiate this private access from the public ones.

15.6.2 Operational Phase

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

- All vehicles using the 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.
- While production of green hydrogen is expected to be a 24 hour a day process, the Developer intends to restrict tube trailers from entering and leaving the premises between the hours of 7:00 and 19:00 as part of a wider traffic management plan. The movement of transportation of hydrogen will comply with The European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) Regulations 2011 to 2021, as amended, Directive 2008/68/EC, Directive 2010/35/EU and the "Agreement Concerning the International Carriage of Dangerous Goods by Road" (ADR).
- Appropriate safety signage will be placed on all tube trailers.
- Vehicles will regularly be inspected for damage, leaks or equipment malfunction and maintained in good working order.
- Tube trailers cylinders will have fitted temperature and pressure sensors that can be monitored remotely.
- Vehicle operators will be suitable qualified.
- Detailed telematics monitor vehicle and driver performance to ensure road safety.
- Cylinders will undergo extensive testing, including, cycling tests in which they are pressurized and depressurized many more times than they would be during their lifetime to make sure that they meet these performance requirements. Hydraulic stress testing to test the strength of the cylinders is performed.
- A detailed Emergency Response Plan (ERP) for the operational phase of the Hydrogen Plant, to cover health and safety emergencies as well as environmental emergencies,

as part of the H&S Plan will be developed. This ERP shall be activated in the event of an emergency such as an accident, fire, spillage etc. and will provide details on who is required to be notified, first aid facilities and closest hospitals.

- Prior to the commencement of the construction phase of the Proposed Development, a detailed Traffic Management Plan will be prepared by the Contractor for agreement with the relevant local authorities and An Garda Síochána.

15.6.3 Decommissioning Phase

As the turbine blades can be cut into manageable lengths on decommissioning, there is no requirements to re-use the turbine supply haul route for decommissioning. Thus, all decommissioning related traffic will use the L-2604-0, L-5137-0 and L-5137-9.

The Developer is applying for a consent for an operational period of 40 years for the Wind Farm. Cranes of similar size to those used for construction will disassemble each wind turbine using the same crane Turbine Hardstands. The towers, blades and all components will then be removed from the 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 roads, Turbine Hardstanding areas and drainage will be left in situ for future use.

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

- Wind turbines dismantling and removal off the 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 impacts arising from these operations. Potential impacts are likely to be similar to that of the construction phase, to an equal or lesser extent. Some of the potential issues could include:

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

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.

It is the intention that the Hydrogen Plant will continue operations indefinitely. The source of electricity for the Hydrogen Plant would change upon the decommissioning of the Wind Farm and be changed to one of the following options:

- Subject to planning consents, the repowering of the Wind Farm.
- Reinforced electricity network with a corporate Power Purchase Agreement with a green electricity producer.
- Connection to an offshore wind power generator off the west coast.

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

15.7 CUMULATIVE EFFECTS

15.7.1 Construction Phase

Chapter 2: Project Description as well as **Table 2.1** set out the existing and proposed wind farms within 20 km of the Wind Farm Site and Hydrogen Plant Site.

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

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

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

Outlined below are the wind farms within 20 km of the Wind Farm Site. The nearest operational wind farms are the Carrowleagh Wind Farm adjacent to the east of the Wind Farm Site and Carrowleagh Wind Farm Extension which is adjacent to the northeast.

- **Black Lough Wind Farm– Six turbines, 1.3 km to northeast**
- **Carrowleagh Wind Farm – Thirteen turbines, Adjacent wind farm**
- **Carrowleagh Extension Wind Farm – Four turbines, Adjacent wind farm**
- **Bunnyconnellan Wind Farm – Twelve turbines, 5 km to south**
- **Kingsmountain Wind Farm – Ten turbines, 12 km to northeast**
- **The Dunneill Wind Farm – Thirteen turbines, 12 km to northeast**
- **Lacken Wind Farm – Three turbines, 12 km to northwest**
- **Stokane Wind Farm – One turbine, 1.09 km to north**
- **Bunnyconnellan East Turbine – One turbine, 5 km to south**

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 in an operational wind farm during the construction phase. However, in the unlikely event of such a scenario the replacement blades would have a 3-4 month lead time and deliveries can be co-ordinated. It would not lead to significant effects. Wind farms do not generate a significant amount of traffic during operation as outlined in **Section 15.5.13**.

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

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

15.7.2 Operational Phase

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

The Hydrogen Plant will be in operation 24 hours a day, seven days a week and will be manned with a dedicated team providing maintenance.

The Hydrogen Plant will have a total of 26 HGV and 10 light vehicles entering and leaving the Hydrogen Plant Site on a daily basis. This means that the N59 at the L-6612-1 Junction is predicted to be running at 618 AADT at this junction, which is approximately 5.3% of its capacity and therefore has the capacity to accommodate the Hydrogen Plant, neighbouring sites and any additional traffic in the future the cumulative effect is rated as being negligible.

15.7.3 Decommissioning

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

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

It is the intention that the Hydrogen Plant will continue operations indefinitely. The source of electricity for the Hydrogen Plant would change upon the decommissioning of the Wind Farm and be changed to one of the following options:

- Subject to planning consents, the repowering of the Wind Farm.
- Reinforced electricity network with a corporate Power Purchase Agreement with a green electricity producer.
- Connection to an offshore wind power generator off the west coast

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

15.8 RESIDUAL EFFECTS OF THE PROPOSED DEVELOPMENT

15.8.1 HGV Deliveries

On the Killybegs Turbine Delivery Route and Galway Turbine Delivery Route, there is likely to be a slight, negative, short-term residual effect on the national road network with an increase in traffic volumes on the roads and works at a number of locations as outlined in **Table 15.19** and **Table 15.20**. During times when specific widening works are being undertaken on local roads the impacts will be high, negative, short-term. However, with the mitigation outlined, these will be minimised and the resurfaced roads will produce a positive residual benefit.

In terms of the Construction Haul Routes, the 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 Grid Connection and Interconnector, the Proposed Development is likely to have a high negative, short- term impact on local roads which will accommodate the Grid Connection and Interconnector. However, with the mitigation measures as outlined, these will be minimised and the resurfaced roads will produce a positive residual benefit.

15.8.2 Operational Phase Residual Effects

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

The production of green hydrogen creates zero carbon emissions and enhances the output potential of the Wind Farm and its contribution to renewable energy and climate targets for Ireland. This hydrogen can be utilised as a fuel which can benefit Ireland's economy and energy security and can be used to displace fossil fuels in hard to abate sectors giving further climate benefits.

The Hydrogen Plant will be in operation after the Wind Farm is operational. This will mean that the collection of green hydrogen by HGV will operate at an ongoing basis and will have a residual effect.

15.8.3 Decommissioning Phase Residual effects

On the Killybegs Turbine Delivery Route or Galway Turbine Delivery Route, there is likely to be a slight, negative, short-term residual effect on the road network with an increase in traffic volumes on the roads and works at a number of locations as outlined in **Table 15.19** and **Table 15.20** assuming the turbine components are transported back to Killybegs Port or Galway 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 15.4.2**.

Effects during the decommissioning phase have been assessed to be small compared to the construction phase if Turbine Hardstand areas are left in place and revegetated and potentially turned into wet heath habitat rather than removed from 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.

15.9 MONITORING

The local road network near the site used to transport construction materials will be monitored during construction so that any damage caused by construction traffic associated with the 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 on-site. The monitoring will be undertaken by the Owner's Engineer to be appointed by the Developer for the construction

stage in conjunction with the Local Authority Roads Area Engineer on the L-6612, L-1102, L-5136-0, L-2604-0, L-5137-0, L-5137-9 and L-6612-1.

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

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

The operational stage impacts are considered as being imperceptible for the Wind Farm. However, the residual effects for the Hydrogen Plant in the operation phase have been assessed as moderate, negative and long-term. The addition of the Hydrogen Plant Site will increase the indirect positive impacts that reducing emissions and displacing fossil fuels have on wider biodiversity, ecosystem resilience and climate change mitigation.

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

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

15.11 STATEMENT OF SIGNIFICANCE

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