

16 TRAFFIC AND TRANSPORT

16.1 INTRODUCTION

16.1.1 Background and Objectives

This chapter assesses the likely significant direct and indirect effects of traffic associated with the Project on the public road network and on sensitive receptors in the vicinity of the Project, describes the existing public road and junction network, identifies whether there is any potential for significant effects to arise (both in isolation and in combination with other developments) and outlines the mitigation measures that will be implemented to avoid, reduce, or offset any potential significant effects that might arise. The assessment will consider the potential effects of traffic generated by the Project during the following phases:

- Construction of the proposed Development,
- Construction of proposed Development Grid Connection in the public road network between the Onsite Substation and the existing 110kV substation at Tullabrack.
- Transportation of turbine components on the public road network between Shannon Foynes Port and the proposed Development.
- Enabling works for the transportation of turbine components on the public road network between Shannon Foynes Port and the proposed Development.
- Operation and maintenance of the proposed Development.
- Decommissioning of the proposed Development.

This chapter of the EIAR is supported by supporting Figures in **Volume III** and the following Appendix documents provided in **Volume IV**:

- **Appendix 16.1 Traffic and Transport Assessment**
- **Appendix 16.2 Traffic Management Plan**
- **Appendix 16.3: Swept Path Analysis**
- **Appendix 16.4 Temporary Works on the Turbine Delivery Route**

Common acronyms used throughout this EIAR can be found in **Appendix 1.4**.

16.1.2 Statement of Authority

This chapter of the EIAR has been prepared by John Doogan, Senior Designer at Jennings O'Donovan & Partners Limited who holds a Higher national diploma (Level 7) in Civil engineering from Bolton Street College of Technology. John has over 34 years of road design and traffic experience in Ireland and the UK and has worked on the design, planning and construction of over 30 wind farms projects in Ireland, UK, Europe and Mexico.

This report has been reviewed 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 41 years' experience. He has extensive experience in the preparation of Traffic and Transport Assessments, Traffic Management Plans, EIARs and EISs for environmental projects including Wind Farms, Solar Farms, Waste Water Projects and various Commercial Developments. David has also been involved in the construction of over 60 wind farms since 1997.

16.1.3 Site Location, Context and Proposed Development

The Project site is located in south-west county Clare, 3km northwest of the town of Kilrush and 6.8km southwest of Cooraclare village in the townland Moanmore Lower. It is located within an area comprised of agricultural livestock grazing farmland, bog, and shrub land. The townlands through which the proposed Grid Connection will transect include the townlands of Moanmore Lower, Moanmore South, and Tullabrack. Vertical realignment works will be undertaken on a crest curve of the L6132 in the townland Gower South. Construction of a temporary blade transfer area on the L6132 local road in the townland of Tullabrack East. Temporary works will be required in the verges of the L6132, L2036 and the L2034 in the townlands of Derreen, Tullagower, Gowerhass, Tullabrack east, Tullabrack West, Tullabrack, Moanmore South and Moanmore Lower.

The Project is detailed in **Section 2.2** of **Chapter 2 Project Description**.

The Location and layout of proposed Development is shown on **Figure 16.1**. The Grid Connection is shown on **Figure 16.2**. The turbine components for proposed Development will be shipped to Shannon Foynes Port. The turbine components will be transported on the public road network using abnormal load vehicles between Shannon Foynes Port and the proposed Development. The proposed turbine delivery route between Shannon Foynes Port and the proposed Development is shown in **Figure 16.3**.

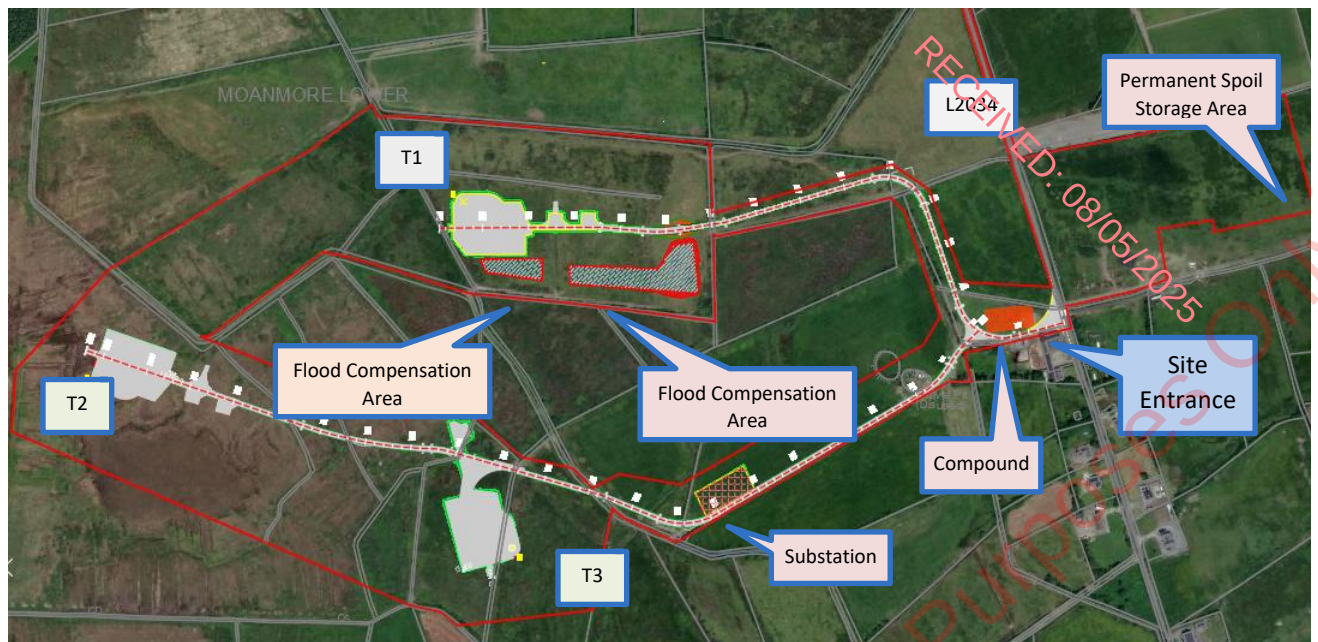


Figure 16.1: Moanmore Lower Windfarm Site Layout

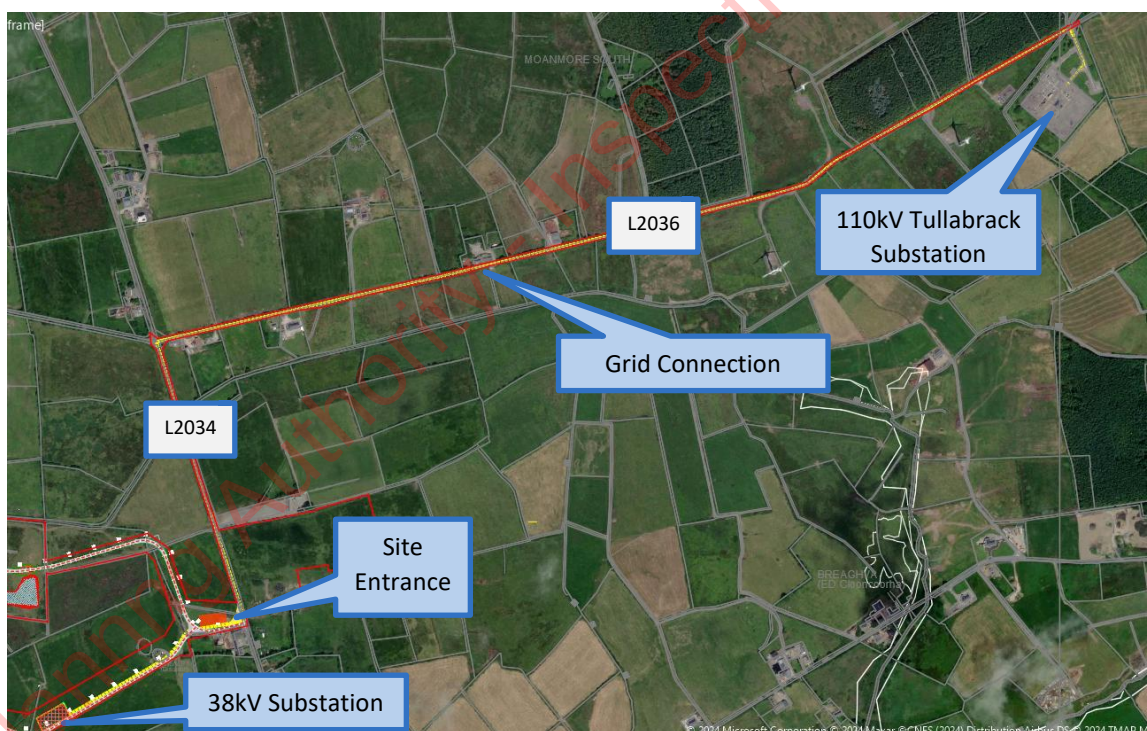


Figure 16.2: Grid Connection Route



Figure 16.3: Turbine Delivery Route

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 is to be read in conjunction with the following Appendix documents provided in Volume IV of this EIAR:

- **Appendix 16.1 Traffic and Transport Assessment:**
- **Appendix 16.2 Traffic Management Plan:**
- **Appendix 16.3: Swept Path Analysis**

16.1.4 Scoping Responses and Consultation

The proposed Development management team contacted relevant stakeholders as part of the scoping process for the wind farm design. The consultation responses are shown in **Table 16.1**.

Table 16.1: Consultation Responses

Consultee	Type & Date	Summary of Response	Response to Consultee
Transport Infrastructure Ireland (TII)	09/08/24	Dear Ms Gallagher, Thank you for your correspondence of 6 August 2024 regarding the above. Transport Infrastructure Ireland's (TII's) position in relation to your enquiry is as follows. TII wishes to advise that it is not in a position to engage directly with planning applicants with respect to proposed developments. TII will endeavour to consider and respond to planning applications referred to it, given its status and duties as a statutory consultee under the Planning Acts. The approach to be adopted by TII in making such submissions or comments will seek to uphold official policy and guidelines, as outlined in the Section 28 Ministerial Guidelines 'Spatial Planning and National Roads Guidelines for Planning Authorities' (DoECLG, 2012) and TII publications. Regard should also be had to other relevant guidance available at www.TII.ie. The issuing of this correspondence is provided as best practice guidance only and does not prejudice TII's statutory right to make any observations, requests for further information, objections or appeals, following the examination of any valid planning application referred. TII notes that the proposed development is in the vicinity of the N67. It is unclear where the proposed grid connection is to be directed. With respect to EIAR Scoping issues, the recommendations indicated below provide only general guidance for the preparation of an EIAR, which may affect national road and / or light rail networks. The project promoter should have regard, inter alia, to the following: Having regard to the EPA's 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022), it is recommended as appropriate that the national road and light rail networks are recognised as strategic transport assets under "material assets". EIAR assessment and mitigation should have regard to the following: • National Roads: Official policy for development at or near national roads is set out in the DoECLG's 'Spatial Planning and National Roads Guidelines for Planning Authorities' (2012), available at https://www.gov.ie/en/collection/85b83-planning-guidelines-standards/ • TII Publications: In addition, as part of TII's responsibilities for managing and improving the Country's national road and light rail networks, the Authority	Traffic Addressed in this Chapter and in the Traffic and Transport Assessment (Appendix 16.1) and the Traffic Management Plan in Appendix 16.2

Consultee	Type & Date	Summary of Response	Response to Consultee
		sets development guidance and standards for traffic and road assessments and construction, which may be necessary by reason of proposed development location, scale or typology, to be prepared to accompany applications for developments or works. Technical guidance and standards are contained in TII Publications, available at https://www.tiipublications.ie/. In addition, the EIAR should have regard to, <i>inter alia</i>, to the following: National Road Network: - TII would be specifically concerned as to potential significant impacts the development would have on the national road network (and junctions with national roads), in the proximity of the proposed development. - Consultations should be had with the relevant Local Authority/National Roads Design Office, with regard to the locations of existing and future national road schemes. - The EIAR should have regard to any prior Environmental Impact Statement or Assessment Report and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should, in particular, have regard to any potential cumulative impacts. - The EIAR should have regard to the provisions of Chapter 3 of the DoECLG 'Spatial Planning and National Roads Guidelines for Planning Authorities', in the assessment. TII Publications: - It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site, with reference to impacts on the national road network and junctions of lower category roads with national roads. In relation to national roads, TII's 'Traffic and Transport Assessment Guidelines' (2014) should be referred to in relation to proposed development, with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of TII's TTA Guidelines, which addresses requirements for sub-threshold TTA. - The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required.	

Consultee	Type & Date	Summary of Response	Response to Consultee
		Haul routes utilising the national road network: - Elements of the national road network are operated and managed by a combination of (Public Private Partnerships) PPP Concessions, Motorway Maintenance and Renewal Contracts (MMaRC) and local road authorities, in association with TII. In relation to haul route identification, the applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed to ascertain any operational requirements, including delivery timetabling, etc., to ensure that the strategic function of the national road network is safeguarded. - Separate structure approvals/permits and other licences and works specific deeds of indemnity may be required in connection with the proposed haul route, including where temporary modification to the road network may be required. Consultation with all relevant local authorities, 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. Additionally, any damage caused to the pavement on the existing national road arising from any temporary works due to the turning movement of abnormal loads (e.g. tearing of the surface course, etc.) shall be rectified in accordance with TII Pavement Standards and details in this regard shall be agreed with the Road Authority prior to the commencement of any development on site. National Road Crossings: - 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. - The preferred method of necessary national road network crossings is by horizontal directional drilling (HDD). It is appropriate for the designers to contact thirdpartyworks@tii.ie in order to co-ordinate and process approvals for this type of crossing, which may include requirements for Section 53 consent and specific indemnities for the works. Potential cable routing: Any grid connection and cable routing proposals should be developed to safeguard proposed road schemes, as TII will not be responsible for costs associated with future relocation of cable routing where proposals are catered for in an area of a proposed	

Consultee	Type & Date	Summary of Response	Response to Consultee
		national road scheme. In that regard, consideration should be given to routing options, use of existing crossings, depth of cable laying, etc. In the context of the existing national road network, in accordance with the National Planning Framework National Strategic Outcome no. 2 'Enhanced Regional Accessibility', there is a requirement to maintain the strategic capacity and safety of the network. This requirement is further reflected in the National Development Plan, the National Investment Framework for Transport in Ireland and also the existing Statutory Section 28 'Spatial Planning and National Roads Guidelines for Planning Authorities'. There is around 99,000km of roads in Ireland. The national road network, which caters for strategic inter-urban travel, consists of only approx. 5.4% of this. There is a critical requirement to ensure the strategic capacity and safety of this national road network is maintained and significant Government investment already made in the national road network is safeguarded. The provision of cabling along the national road network represents a number of significant implications for TII and road authorities in the management and maintenance of the strategic national road network and TII is of the opinion that grid connection cable routing should reflect the foregoing provisions of official policy. TII has identified a number of significant implications for TII and road authorities in the management and maintenance of the strategic national road network, resulting from the laying of high voltage electricity cabling in the national road reservation, including: • Impacts on embankments, bridges, drainage and road furniture infrastructure leading to future maintenance liabilities. • Impediments to future maintenance and operations activities, such as safety barrier repair and French drain renewal. • Impediments to future routine network improvements such as pavement overlay and strengthening, installation of new verge-side signs and other road furniture. • Impacts on network traffic flows during installation. • Impediment to future on-line upgrades of national roads because of the implications to road authority/ TII in having to incur the additional costs of moving underground cables in order to accommodate the road improvements. Proposals to lay cable in the national road reservation, including the construction of associated joint bays, have the potential to impact road authorities and TII in undertaking future maintenance and improvement requirements. There may also be additional cost implications to national road improvements and maintenance resulting from the presence of high voltage cabling within the national road reservation.	

Consultee	Type & Date	Summary of Response	Response to Consultee
		Section 12.4.1.1 'Accelerate Renewable Electricity Generation' of the Climate Action Plan 2024 (CAP24) outlines the objective of reaching 80% of electricity demand from renewable sources by 2030 through a range of measures, including; 'All relevant public bodies will carry out their functions in a manner which supports the achievement of the renewable electricity targets, including, but not limited to, the use of road and rail infrastructure to provide a route for grid infrastructure where this is the optimal solution'. Consistent with CAP24, for all renewable energy developments requiring grid connection to the national grid, TII recommends that a full assessment of all route alternatives for grid connection takes place, including alternatives to public road, where appropriate to demonstrate clearly that the 'optimal solution' in accordance with CAP 24 requirements is proposed in the subject application. In TII's experience, grid connection accommodated on national roads has the potential, inter alia, to result in technical road safety issues such as differential settlement due to backfilling trenches and can impact on ability and cost of general maintenance, upgrades and safety works to existing national roads. Other consents or licences may be required from the road authority for any trenching or cabling proposals crossing the national road. TII requests referral of all proposals agreed and licensed between the road authority and the applicant which affect the national road network. Cable routing should avoid all impacts to existing TII infrastructure such as traffic counters, weather stations, etc. and works required to such infrastructure shall only be undertaken in consultation with and subject to the agreement of TII, any costs attributable shall be borne by the applicant/developer. The developer should also be aware that separate approvals may be required for works traversing the national road network. TII environmental assessment guidance: - The EIAR should have regard to TII's Environmental Assessment and Construction Guidelines, including the 'Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes' (National Road Authority (NRA), 2014). - The EIAR should consider the European Communities '(Environmental Noise) Regulations 2018' (S.I. No. 549 of 2018)) and, in particular, how the development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see 'Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes' (NRA, 2014)).	

Consultee	Type & Date	Summary of Response	Response to Consultee
		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. I hope that this information is of assistance to you. Yours sincerely, _____ Suzanne Cahill Regulatory & Administration Executive	
Department of Transport	15/08/24	Jennings O'Donovan and Partners Limited Finisklin Business Park Sligo F91 RHH9 15th August 2024 Re: Request for Scoping Opinion on information to be included in the preparation of an Environmental Impact Assessment (EIA) for Moanmore Lower Wind Farm, Moanmore Lower, Co. Clare The Department of Transport makes the following comments on a consultation request relating to the Scoping Report for the proposed Moanmore Lower Wind Farm in County Clare. It should be noted that the Department considers the construction involved in providing this development and especially, the connection cables to the national grid may have effects on both the environment and the Regional and Local Road network. Where the developer proposes the placement of any cables (or additional cables) in one or more trenches within the extents of the (regional and local) public road network, it is necessary to consider the following: • Their presence within the public road will likely significantly restrict the Road Authority in carrying out its function to construct and maintain the public road and will likely add to the costs of those works post construction. • Their installation within the lands associated with the public road may affect the stability of the road. In particular where the road is a "legacy road" (where there is no designed road structure and the subgrade may be poor or poorly drained) the design needs to take account of all the variable ground conditions and not be based on a sample of the general soil conditions.	Traffic Addressed in this Chapter and in the Traffic and Transport Assessment (Appendix 16.1) and the Traffic Management Plan in Appendix 16.2

Consultee	Type & Date	Summary of Response	Response to Consultee
		- The possible effect on the remaining available road space (noting that there may be need to accommodate other utilities within the road cross-section in the future). - The necessity to have the power in the cables switched off where the Road Authority considers this necessary in order to carry out its function to construct and maintain the public road. The Department consider it important that the examination of the proposal should include consideration of the following: - Examination of all available technologies and route options other than the routing of cables along the public road, - Examination of options for connection to the national grid network at a point closer to the wind farm in order to reduce the adverse impact on public roads, - Details of where within the road cross section cables are to be placed so as to minimise the effect on the Roads Authority in its role of construction and maintenance, - Examination of details of any chambers proposed within the public road cross section so as to minimise the effect on the Roads Authority in its role of construction and maintenance, - Elimination of permanent jointing bays from beneath the road pavement to protect the integrity of the road structure for the safety of those driving on the public road by eliminating hard spots and also preserve the road width for other utilities, - Prevention of the attachment of cables to all bridge structures and culverts by diverting them beneath or away from these structures and, - Rationalisation of the number of cables involved (including existing electric or possible future cables) and their diversion into one trench, in order to minimise the impacts on the road network and the environment along the road boundary (hedgerows). The Department considers the following should be considered when applying conditions to any approval: - A condition requiring the specific approval of the local authority to the detail of the final route of cables through the public road space. If during construction there is a need to deviate from the detailed design then the approval of the local authority would again be sought. This would assist in minimising the impact on the public road. - A condition requiring the developer to comply with all appropriate standards and, inter alia the Guidelines for Managing Openings in Public Roads, 2017 in order to ensure orderly development. - A condition requiring that the location of the cables would be recorded as exactly as possible (maybe using BIM type technology) so as to facilitate the further use of road space for utilities and the maintenance/construction of the	

Consultee	Type & Date	Summary of Response	Response to Consultee
		public road by the Roads authority. This record should include as constructed surveys of all infrastructure altered, added, removed, or relocated and exact detail of the road construction including any drains or other features encountered. The record should be lodged with the local authority and with the ESB Networks for retention on their records. 4. A condition to require the elimination of permanent jointing bays from under the road pavement to protect the integrity of the road structure, thereby improving safety for those driving on the public road by eliminating hard spots and preserving the road width for other utilities. 5. A condition requiring the developer to route cables away from bridge structures and specifically preventing the developer from attaching cables to road bridges. This would allow for the future maintenance of bridges without interruption of the electricity supply along the cables. 6. A condition requiring the replacement of culverts that have been excavated during the cable duct placement operation. The replacement culverts should be designed appropriately and include an allowance for the effects of climate change. 7. A condition requiring the developer to notify the Roads Authority of the owner of the cables (Owner) and the controller (Power Controller) of the power transmitted along the cables. In addition, the condition should require Owner and Power Controller to notify the Roads Authority of any change in ownership of the cables or change of Power Controller transmitting power along the cables. In all instances the Owner and Power Controller should be required to maintain an agreed contacts list with the Roads Authority. <i>Central Policy, Coordination and Reform</i> An Roinn Iompair <i>Department of Transport</i> Lána Líosain, Baile Átha Cliath, D02 TR60 Leeson Lane, Dublin, D02 TR60 T +353 (0)1 604 1177 gcu@transport.gov.ie www.gov.ie/transport	
Clare County Council – Transportation Department	06/08/20	Acknowledgement of Scoping letter	

16.2 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

16.2.1 Assessment Methodology

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

- Policy and guidance review.
- Desk study, including review of available maps and published information.
- Site visit (driving the route) including review of road network to be used.
- Classified traffic count data.
- Topographical Survey of potential 'constraints'.
- Swept Path Analysis of the Haul Route. (Included in **Appendix 16.3** of this report.)
- Establishment of Baseline Scenario and existing traffic flows / junction capacity.
- Traffic and transport assessment of junctions in the vicinity of the Site. (Included in **Appendix 16.1** of this report).
- Evaluation of potential effects.
- Evaluation of the significance of these effects.
- Identification of measures to avoid and mitigate potential effects.
- Assessment of number of dwellings served by the route adjacent to the Project site.

The methodology for the assessment has been based primarily on guidance from TII publication PE-PDV-02045, Traffic and Transport Assessment Guidelines and Guidelines on the Information to be Contained in Environmental Impact Assessment Reports published by the Environmental Protection Agency (EPA). A full list of policy and guidance documents relating to this assessment is given in **Table 16.2**.

Traffic generated by existing developments, permitted developments and in combination with known proposed plans and projects are cumulatively assessed in this chapter of the EIAR and in the Traffic and Transport Assessment (TTA) in **Appendix 16.1**. This includes plans and projects that are pending a decision from the planning authority, An Bord Pleanála and other known projects which are in the advanced stages of being prepared to be submitted for planning and have the potential for in combination effects and including the evaluation of residual effects following implementation of mitigation measures. Further details of the assessment are provided in the following sections.

A limitation relating to road safety data at the local road junctions surrounding the site was encountered due to collision data being unavailable on the RSA website.

16.2.2 Planning Policy and Guidelines / Guidance

In addition to the EIAR standards outlined in **Chapter 1: Introduction**, this assessment has been prepared and carried out in accordance with guidance contained in the documents shown in **Table 16.2**.

Table 16.2: Policy and Guidance

Policy / Author	Title	Policy
Clare County Council	County Clare Development Plan 2023 - 2029	Chapter 11 - Physical Infrastructure Appendix 1 – Development Management Guidelines
Department of Transport, Tourism and Sport and Department of Environment, Community and Local Government	The Design Manual for Urban Roads and Streets (DMURS)	This document outlines guidelines on the design of urban roads and streets in terms of street networks, street signage, pedestrians and cyclists, carriageways (widths, surfaces, junctions etc.), policies and plans, design process and audits (safety and quality).
Transport Infrastructure Ireland (TII)	Standards and Technical Documents	A full list of the TII standards and specifications are found on the TII website at the following link, www.tiipublications.ie/current-documents/2024-/Current-Documents-(May-2024).pdf a summary of the TII specifications and standards used during the design of the proposed Development are listed below.
Transport Infrastructure Ireland (TII)	Introduction (INT)	GE-1INT-01029 Introduction to the TII publications system
Transport Infrastructure Ireland (TII)	Drainage (DNG)	Road drainage
Transport Infrastructure Ireland (TII)	Environment (ENV)	Management of waste / landscape treatment / invasive species / Air quality / noise
Transport Infrastructure Ireland (TII)	Geometry (GEO)	Road link design / junction design / cross sections & headroom
Transport Infrastructure Ireland (TII)	Pavement (PAV)	Pavement and foundation design / materials / skid resistance

Policy / Author	Title	Policy
Transport Infrastructure Ireland (TII)	Planning & Development (PDV)	Traffic & transport assessment guidelines
Transport Infrastructure Ireland (TII)	Policy (POL)	TII policy guidelines
Transport Infrastructure Ireland (TII)	Project Appraisal Guidelines (PAG)	Travel demand projections and calculations
Transport Infrastructure Ireland (TII)	Road equipment (REQ)	Design and assessment of road restraint systems
Transport Infrastructure Ireland (TII)	Safety (STY)	Guidance for road safety audits
Transport Infrastructure Ireland (TII)	Specification For Works (SPW)	Specification for materials and workmanship
Transport Infrastructure Ireland (TII)	Standard Construction Details (SCD)	Details for road construction
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.

Policy / Author	Title	Policy
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.
Department of Transport	Traffic Signs Manual www.trafficsigns.ie	Temporary traffic measures and signs for roadworks. Regulatory / directional / information / warning signs and road markings for the public road network
Transport Infrastructure Ireland (TII)	Spatial Planning and National Roads Guidelines (2012)	It is in the public interest, in so far as is reasonably practicable, that the national road network continues to serve its intended strategic purpose. The EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network, in order to demonstrate that the development can proceed complementary to safeguarding the capacity, safety and operational efficiency of that network.
Environmental Protection Agency (EPA)	Guidelines on the Information to be Contained in Environmental Impact Assessment Reports	Guidelines for the preparation of all Environmental Impact Assessment Reports.

16.2.3 Study Area

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

- Transportation of building materials and electrical components.
- Transportation of granular materials for wind farm access road and turbine hardstand construction.

- Transportation of concrete and steel reinforcement for the construction of turbine foundations.
- Transportation of turbine components using abnormal load vehicles along the Turbine Delivery Route from Shannon Foynes Port to the proposed Development site entrances on the L2034.
- Enabling works at junctions and pinch points on the public road network to facilitate the swept path of abnormal load vehicles delivering turbine components along the Turbine Delivery Route between Shannon Foynes Port and the proposed Development site entrances on the L2034
- Works associated with the Grid Connection to the national electricity grid, which will be via an underground cable connection to the existing ESB 110kV Substation at Tullabrack.
- Removal of forestry from the blade transfer area located off the L6132.
- Removal of spoil from the Site to the permanent spoil storage area.
- Traffic associated with the operation and maintenance of the proposed Development during the 40-year operational life, subject to planning permission being granted.
- Traffic associated with the decommissioning of the proposed Development.

16.2.4 Desk Study

A desk study of the existing road network in the vicinity of the proposed Development was carried out to determine potential locations for the Site entrances and to determine potential haul routes for the delivery of turbine components using abnormal load vehicles. The desk study involved using AutoCAD and AutoTRACK software combined with Lidar survey, OSI / Bing / Google Maps and Streetview to assess the suitability of public road network for junction visibility and vehicle turning movements. The Swept Path Analysis in **Appendix 16.3** has been carried out using a 66.6m long blade for a turbine with 136m rotor diameter, the blade represents the largest components to be transported. The blade will be transported using a Superwing blade delivery vehicle loaded with a horizontal blade between Shannon Foynes Port and the blade transfer area on the L6132 and a blade transporter carrying a blade elevated at 60 degrees between the transshipment area and the site entrance. The blade delivery vehicle will have the greatest impact on the public road network due to the length of the loaded vehicle.

A desk study was also carried out to determine potential grid connection routes between the Onsite Substation and the existing ESB 110kV substation at Tullabrack.

16.2.5 Field Work

The preliminary wind farm design, haul route assessment and turbine delivery route assessment was supplemented using detailed topographical survey information carried out at the proposed site entrances and at pinch points on the turbine delivery route. The topographical survey was carried out by GHE Surveying, topographical surveyor at various stages of the design process.

A site visit to assess potential turbine delivery routes from the N68 national secondary road in County Clare to the wind farm site entrance was carried out in January 2023 and October 2023. Details of the assessment are included in **Chapter 3: Alternatives Considered**.

Traffic counts were undertaken by Jennings O' Donovan during a site visit on 12th January 2023 to record traffic volumes and turning movements of vehicles at the N68/L6132 junction, L6132/R483/L2036 junction and at the L2036/L2034 junction. The traffic counts were carried out to determine baseline traffic volumes in the area and formed the basis of the traffic and transport Assessment in **Appendix 16.1**. The locations of the traffic counts were chosen as the selected junctions will be used by the majority of wind farm traffic to access the Site. The duration and recording time of the classified traffic counts was chosen with reference to the TII automatic traffic counter TMU N68 030.0 E - N68 Between Ennis and Kilrush, Ballyduneen, Co. Clare. Data from the traffic counter shows that the recorded traffic on Thursday January 12th is representative of peak traffic flows in the area. The classified traffic counts have been adjusted using the methodology from TII publication PE-PAG-02039 to account for hourly, daily and monthly variations in traffic flows. The automatic count data is freely available on the TII website and provides data 24 hour traffic counts on the national road and motorway network. The automatic counts were used to determine peak hour traffic flows on the public road network.

Primary Route Assessments and detailed swept path analysis for the turbine component haul route between the N68 and the proposed Development site entrance were undertaken by Jennings O'Donovan Ltd for a turbine with a 136m rotor to represent the largest turbine components to be transported. The analysis is included in **Appendix 16.3** and summarised in **Section 16.2.9** of this chapter.

Clare County Council, TII and The Department of Transport were consulted as part of the proposed Development design scoping process. Scoping responses are listed in **Table 16.1**.

16.2.6 Receiving Environment

The location of the Site entrance to the proposed Development is shown on **Figure 16.1**. the site entrance is located on the L2034 local road (Reference Plate 1). The L2034 is a 5.0m wide single carriageway with grass verges. The L2034 runs between the N67 in Kilrush and the L2030 junction to the north of the proposed development. The L2034 local road has an 80km/h speed limit classification. The L2034 is in good condition and will be the primary access road to the site during the construction, operation and decommissioning of the proposed Development. Existing traffic volumes on the L2034 were obtained from the classified traffic counts carried out by JOD on Wednesday 12th January 2023 at the L2034 / L2036 junction. Using the methodology from TII publication PE-PAG-02039 to calculate annual average daily traffic (AADT) from short period traffic counts, the resulting AADT on the L2034 is calculated from the recorded traffic counts as follows: The L2034 local road has an AADT of 811 vehicles at its junction with the L2036 which equates to a two-way traffic flow of approximately 90 vehicles during peak hour traffic periods with less than 1% HGV traffic.



Plate 1: L2034 Local Road

The existing N68 national secondary road (Reference Plate 2) is typically a 6.0m wide two-lane single carriageway road in the vicinity of its junction with the L6132. The road is delineated with road markings and signposted with regulatory and directional signs. Existing traffic volumes on the N68 were obtained from the classified traffic counts carried out by JOD on Wednesday 12th January 2023 at the N68 / L6132 junction. Using the methodology from TII publication PE-PAG-02039 to calculate annual average daily traffic (AADT) from short period traffic counts, the resulting AADT on the N68 is calculated from the recorded traffic counts as follows. The N68 local road has an AADT of 2,870 vehicles at its junction with the L6132 which equates to a two-way traffic flow of approximately 300 vehicles during peak hour traffic periods with 5% HGV traffic.



Plate 2: N68 National Road

The existing N67 national secondary road (Reference Plate 3) is typically a 6.0m wide two-lane single carriageway road in the vicinity of the Site. The road is delineated with road markings and signposted with regulatory and directional signs.



Plate 3: N67 National Road

The existing L6132 (Reference Plate 4) is a 2.8m / 3.0m wide two-lane local road with regulatory signs and road markings at junctions. The L6132 will be used during delivery of turbine components. Existing traffic volumes on the L6132 were obtained from the classified traffic counts carried out by JOD on Wednesday 12th January 2023 at the N68 / L6132 junction. Using the methodology from TII publication PE-PAG-02039 to calculate annual average daily traffic (AADT) from short period traffic counts, the resulting AADT on the L6132 is calculated from the recorded traffic counts as follows: The L6132 local road has an AADT of 170 vehicles at its junction with the N68 which equates to a two-way traffic flow of approximately 20 vehicles during peak hour traffic periods with less than 1% HGV traffic.



Plate 4: L6132 Local Road

The existing L2036 (Reference Plate 5) is a 2.8m / 3.0m wide two-lane local road with regulatory signs and road markings at junctions. The L2036 will be used during delivery of turbine components and during grid connection works. Existing traffic volumes on the L2036 were obtained from the classified traffic counts carried out by JOD on Wednesday 12th January 2023 at the L2036 / L2034 junction. Using the methodology from TII publication PE-PAG-02039 to calculate annual average daily traffic (AADT) from short period traffic counts, the resulting AADT on the L2036 is calculated from the recorded traffic counts as follows. The L2036 local road has an AADT of 432 vehicles at its junction with the L2034 which equates to a two-way traffic flow of approximately 30 vehicles during peak hour traffic periods with less than 1% HGV traffic.



Plate 5: L2036 Local Road

The existing junction between the N67 and the L2034 (Reference plate 6) is a ghost island T-junction with priority for N67 traffic. The junction is located in a 60km/h speed limit zone. The junction is a stop-controlled junction with regulatory road markings and signage. The junction is lit by public lighting. Observations during the traffic counts show that there are no capacity problems at the junction under current traffic conditions.



Plate 6: N67 / L2034 Junction

The existing junction between the N68 and the L6132 (Reference plate 7) is a staggered crossroads junction with priority for N68 traffic. The junction is located in a 80km/h speed limit zone. The junction is a stop-controlled junction with regulatory road markings and signage. The junction is not lit by public lighting. Observations during the traffic counts and traffic analysis carried out at the junction using the recorded traffic volumes show that there are no capacity problems at the junction under current traffic conditions. The junction is currently operating at free flow conditions with a level of service = A. Road network and junction capacity is measured in terms of level of service (LOS) thresholds which are based on the queuing delay on each arm of the junction. The transportation LOS system uses the letters A through F as described in **Section 16.2.19** of this report. The results of the analysis are included in the TTA, **Appendix 16.1**.



Plate 7: N68 / L6132 Junction

The existing junction between the R483 / L6132 / L2036 at Tullabrack Cross (Reference plate 8) is crossroads junction with priority for R483 traffic. The junction is located in a 80km/h speed limit zone. The junction is a stop-controlled junction with regulatory road markings and signage. The junction is not lit by public lighting. Observations during the

traffic counts and traffic analysis carried out at the junction using the recorded traffic volumes show that there are no capacity problems at the junction under current traffic conditions. The junction is currently operating at free flow conditions with a level of service = A. The results of the analysis are included in the TTA, **Appendix 16.1**.



Plate 8: R483 / L6132 Tullabrack Cross Junction

The existing junction between the L2034 and the L2036 (Reference plate 9) is crossroads junction with priority for L2034 traffic. The junction is located in a 800km/h speed limit zone. The junction is a stop-controlled junction with regulatory road markings and signage. The junction is not lit by public lighting. Observations during the traffic counts and traffic analysis carried out at the junction using the recorded traffic volumes show that there are no capacity problems at the junction under current traffic conditions. The junction is currently operating at free flow conditions with a level of service = A. The results of the analysis are included in the TTA, **Appendix 16.1**.



Plate 9: L2034 / L2036 Junction

16.2.7 Proposed Development Entrance Works

The location of the proposed Development entrance is shown on **Figure 16.1**. A detailed description of the proposed Development entrance and Site entrance works on the public road network is given in **Section 3** of the Traffic Management Plan in **Appendix 16.2** of this report. The works will include;

- Construction of site entrance on the L2034

- Trimming of vegetation for visibility at existing entrance for permanent spoil storage.

16.2.8 Grid connection Works

The location of the proposed Development is shown on **Figure 16.2**. A detailed description of the grid connection works on the public road network is given in **Section 4** and Appendix A of the Traffic Management Plan included in **Appendix 16.2** of this report. the works will include;

- L2034 - Cable Trench in Public Road.
- L2036 - Cable Trench in Public Road.

16.2.9 Turbine Delivery Route and Enabling Works

The turbine components for the proposed Development will be shipped to Shannon Foynes Port. The turbine components will be transported on the public road network using abnormal load vehicles between Shannon Foynes Port and the Site. The proposed Development Turbine Haul Route is shown on **Figure 16.3**. Delivery vehicles will use the following road network to access the Site;

- Exit from Shannon Foynes Port on L6188 – Limerick County Council
- N69 – Limerick County Council / Transport Infrastructure Ireland
- N18 – Limerick County Council / Transport Infrastructure Ireland / Direct Route (Limerick) Ltd
- N18 – Clare County Council / Transport Infrastructure Ireland
- M18 – Clare County Council / Transport Infrastructure Ireland
- N85 – Clare County Council / Transport Infrastructure Ireland
- N68 – Clare County Council / Transport Infrastructure Ireland
- L6132 – Clare County Council
- L2036 – Clare County Council
- L2034 – Clare County Council

Alternative route for high loads to avoid N18 Limerick Tunnel

- R510 (Junction 2 on the N18)– Limerick County Council
- R527 – Limerick County Council
- R445 (Rejoin N18 at junction 4)– Limerick County Council / Clare County Council

A detailed description of the turbine delivery route and enabling works on the public road network is given in Section 4 and Appendix B of the Traffic Management Plan included in

Appendix 16.2 of this report and are detailed in **Drawings 6778-JOD-MNWF-XX-DR-C-HR-0250-0272** attached as **Appendix 16.4**. the works will include;

- N68 / L6132 Junction – Road widening and strengthening at junction to withstand wheel loading from abnormal load vehicles. relocation of telegraph poles, traffic signs and street furniture.
- L6132 - Temporary road widening in road verge to increase the carriageway width to 4.5m for the transportation of turbine components.
- L6132 - Vertical realignment of an existing crest curve to prevent abnormal vehicles grounding.
- L6132 - Construction of a blade transfer area with access onto the L6132.
- L2036 - Temporary road widening in road verge to increase the carriageway width to 5.5m for the transportation of turbine components.
- L2034 / L2036 Junction - Construction of overrun area in third party lands to withstand wheel loading from abnormal load vehicles delivering turbine components.
- There are three existing watercourse crossings along the L6132. At these three locations steel plates will be placed on the verge for 10m each side of watercourse crossings to avoid excavation and disturbance of the existing ground. Upon completion of the wind farm construction the L6132 verge will be reinstated by removing approximately 150mm of granular material from widened sections and replaced with topsoil, steel plates will also be removed from the verge at this stage. See Appendix 16.4 Drawings 6778-JOD-MNWF-XX-DR-C-HR-0271 and 6777-JOD-XX-DR-C-HR-272 for details of watercourse crossings along the L6132.

16.2.10 Construction Haul Route for General HGV and LGV Traffic

All HGV traffic associated with the construction of the wind farm infrastructure will use the site entrance junction on the L2034. Access to the proposed Development will be from the N67 national secondary road and the N67 / L2034 junction. Haul routes for wind farm construction traffic are shown in **Figure 16.4**. Workers employed on the Site will follow the construction haul route shown in **Figure 16.4** to access the works.

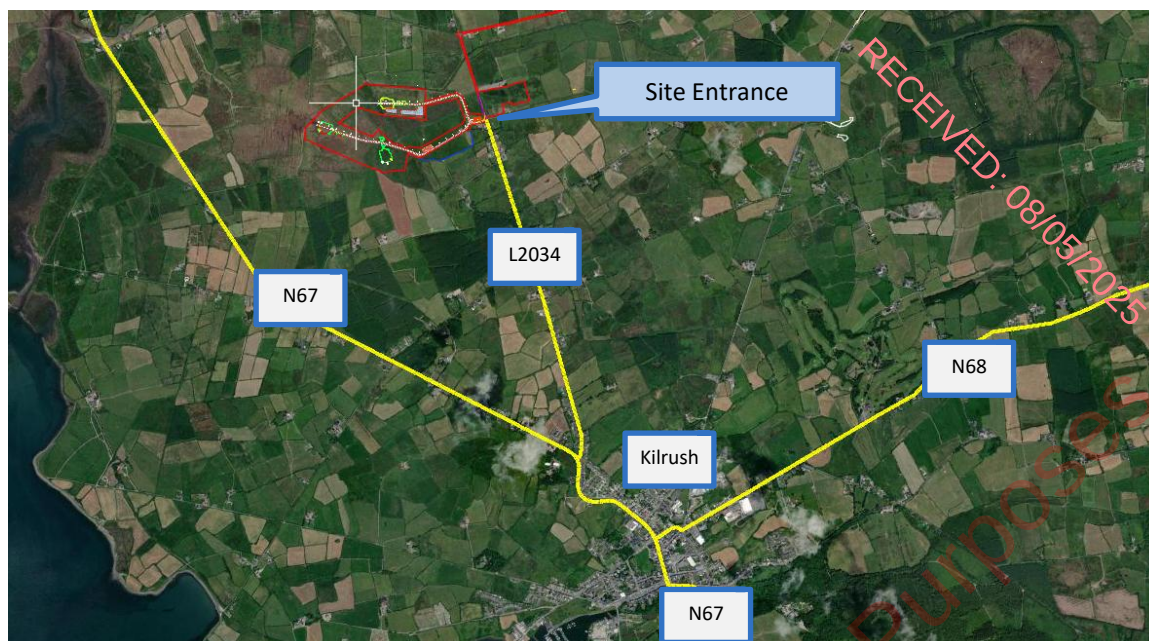


Figure 16.4: Construction Haul Route

16.2.11 Haul Routes for Grid Connection HGV Traffic

All HGV traffic associated with the construction of Grid Connection between the Onsite Substation and the 110kV substation at Tullabrack will follow the grid connection route and associated diversions to access the works. Construction vehicles will be prohibited from using local roads which are not part of the grid connection works or local diversions. The grid connection route is shown in **Figure 16.2**. Workers employed on the grid connection works will follow the grid connection route shown in **Figure 16.2** to access the works. Details of traffic diversions during the construction of the Grid Route are shown in Appendix B of the Traffic Management Plan in **Appendix 16.2**.

16.2.12 Haul Routes for Material Suppliers

The construction of the proposed Development will require specific grades of granular material to be delivered to the Site for the structural layers of wind farm access roads, fill under turbine foundations and turbine hardstands / crane platforms. The construction of turbine foundations and onsite structures will require imported ready mix concrete and reinforcing steel. The construction of the Onsite Substation will require delivery of general building materials such as concrete blocks. Precast concrete products will be required for onsite grid connections. The construction of the grid connection will require selected granular materials to backfill trenches and asphalt surfacing materials. The materials will be sourced from local quarries in the area such as the following which are show on **Figure 16.5**:

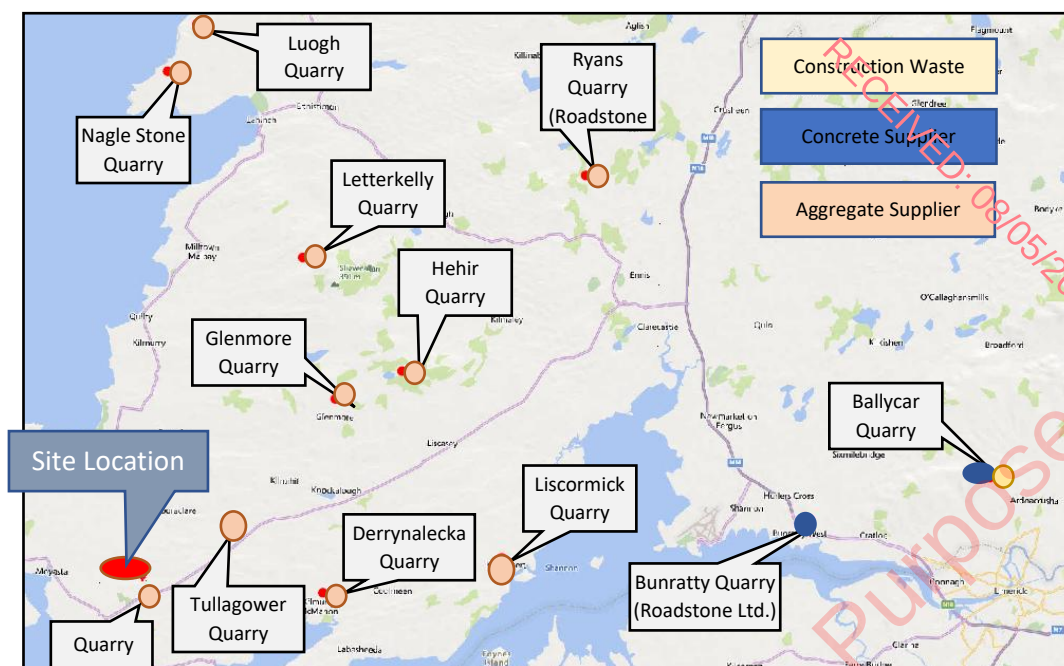


Figure 16.5: Ready Mix Concrete and Granular Material Supplier

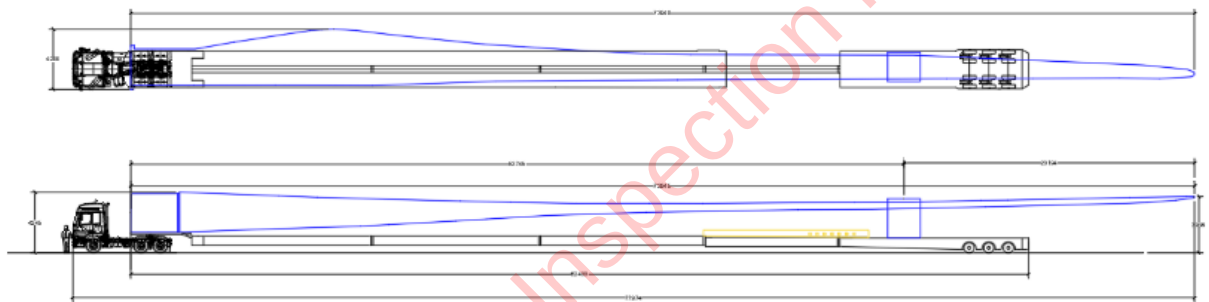
16.2.13 Haul Routes for the Removal of Material from Site

Topsoil and unsuitable subsoil material resulting from Site clearance will be processed / graded on site and incorporated into non-structural elements of the design and used for site landscaping, suitable subsoil material resulting from site excavations will be incorporated into structural elements of the works. Surplus topsoil and subsoil will be deposited in the permanent spoil disposal area shown in **Figure 16.1**. Volumes of excavated material are detailed in the proposed Development spoil management plan. Trees felled during site clearance at the Blade Transfer Area on the L6132 will be transported from Site using the Construction Haul Route shown in **Figure 16.4**. The construction of the grid connection on the public road network will result in waste granular and asphalt material which will be transported from site for recycling / disposal at a licenced waste facility. Surplus topsoil and subsoil will be notified under Article 27 of the European Communities (Waste Directive) Regulations, 2011 or treated to comply with Article 28 if practicable. Any materials containing invasive species will be appropriately managed and sent to authorised facilities.

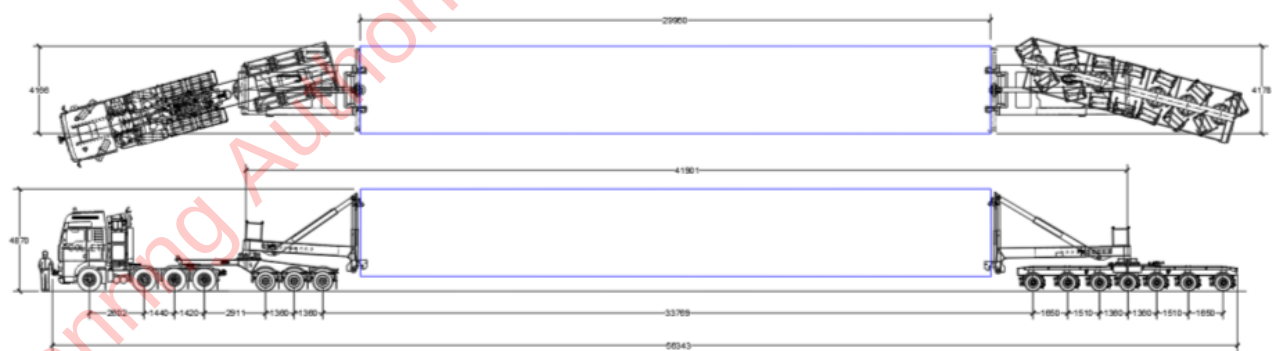
16.2.14 Delivery Vehicle Specification

Delivery of road construction materials, concrete for Turbine Foundations, building materials, drainage, ducting and cables will be carried out using standard heavy goods vehicles (HGV). Delivery of turbine components will be carried out using specialist abnormal load vehicles. Turbine blades will be delivered on an extendable semi-trailer, one per trailer. The turbine blades will be 66.6m long, approximately 10m of the blade will overhang the rear of the trailer. Following delivery to the Site, the trailer will be retracted for the return trip.

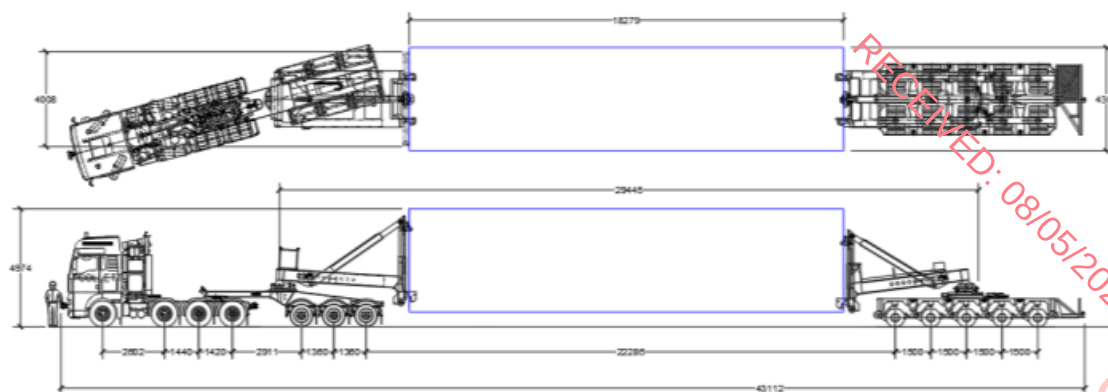
Each turbine tower will be delivered to site in three sections on extendable semi-trailers, the tower sections range in length from 30.0m to 23.0m with a maximum width of 4.3m. All material deliveries will have a maximum axle load of 12 tonnes per axle, and a maximum total truck weight 63 tonnes. The main crane for turbine erection will have a maximum axle loading of 12 tonnes per axle and a maximum total weight of 100 tonnes. Vehicles delivering counterweights for the crane will have a maximum axle loading of up to 12 tonnes per axle. Vehicle weights do not exceed 180 tonnes and structures on the haul route with spans not exceeding 50m are not subject to a Category 3 structural assessment as defined in Section 1.3 of DN-STR-03001 published by TII for exceptional abnormal loads. Abnormal load vehicles used for the transportation of turbine components are shown below. The transport vehicles used for transportation of components may differ from those shown below depending on the haulage contractor's preferences.



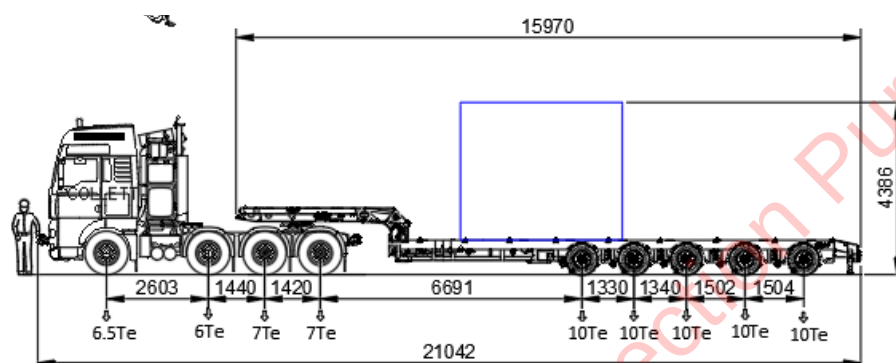
Typical Turbine Blade Transport Vehicle



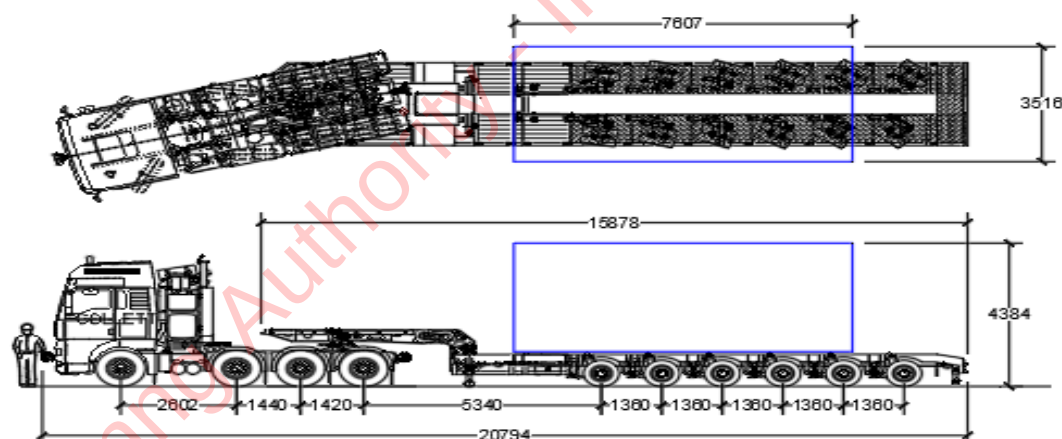
Typical Turbine Tower Transport Vehicle



Typical Nacelle Transport Vehicle



Typical Hub Transport Vehicle



Typical Generator Transport Vehicle

16.2.15 Evaluation of Likely Significant Effects

The baseline environment is described in **Section 16.2.6** of this report and in the Traffic and Transport assessment in **Appendix 16.1**. Baseline traffic volumes have been recorded during a site visit on Thursday 12th January 2023 to record traffic volumes and turning movements of vehicles at the N68 / L6132 junction, L6132 / R483 junction and at the L2034 / L2036 junction. The traffic counts were carried out between 7.00am and 11.00am in the morning to capture peak traffic flows during the morning period and between 3.30am and

6.00am in the evening to capture peak traffic flows during the evening period. The traffic volumes have been adjusted to account for seasonal variations using the methodology in TII publication PE-PAG-02039.

A traffic analysis was carried out using TRL Junctions 9 modelling software at the N68 / L6132 junction, L6132 / R483 junction and at the L2034 / L2036 junction using the recorded 2023 traffic flows and turning movements to determine if capacity problems exist at the primary junctions in the vicinity of the proposed Development.

Future year traffic assessments with TII factors for forecast traffic growth on the public road network were then carried out at the L2034 / L2036 junction using the following scenarios to determine if capacity problems would arise at the junctions with and without the development in place.

Do Nothing scenarios, Likely Evolution of the Baseline

- 2025 Projected traffic flows without the proposed Development (Planning Approval). Forecast increases in traffic flows between 2023 and 2025 are shown in **Table 16.3**.
- 2035 Projected traffic flows without the proposed Development (Planning Period / Windfarm Construction). Forecast increases in traffic flows between 2023 and 2035 are shown in **Table 16.3**.
- 2075 Projected traffic flows without the proposed Development (Operations Period). Forecast increases in traffic flows between 2023 and 2070 are shown in **Table 16.3**.

Do something scenario's

- 2035 Projected traffic flows with the proposed Development (Wind Farm Construction Traffic)
- 2075 Projected traffic flows with the proposed Development (Wind Farm Operations Traffic)
- 2075 Projected traffic flows with the proposed Development (Wind Farm Decommissioning Traffic)

Traffic Infrastructure Ireland (TII) forecasts for future traffic growth on the public road network are published in PE-PAG-02017 "Travel Demand Projections". The growth factors are applied to the 2023 baseline traffic flows to approximate the traffic flows on the public road network in the future assuming the proposed Development is granted planning permission in 2025, 10-year planning grant and construction in 2035 and a 40-year operational period and decommissioning in 2075. The growth factors for the relevant

assessment years using the central-growth scenario for County Clare are shown in **Table 16.3**.

Table 16.3: Traffic Growth Factors for Public Roads

Year	LGV Growth Factor	HGV Growth Factor
2023	1.00	1.00
2025	1.03	1.08
2035	1.13	1.47
2075	1.28	3.14

A traffic assessment was carried out with the proposed Development under construction in 2035 with additional traffic from unrelated planned and consented developments to determine if capacity problems would arise at the junctions due to combined traffic volumes in the vicinity of the proposed Development.

Temporary traffic lights will be required for short periods on the L2034 and on the N68 for traffic management during the construction of the proposed Development. A traffic analysis has been carried out to assess the impact of the temporary traffic lights on the L2034 and the N68.

The data from the Traffic and Transport assessment in **Appendix 16.1** was then used to identify and categorise potential effects likely to affect the road network resulting from the construction, operation and decommissioning of the proposed Development.

16.2.16 Accident Statistics

Mapped statistics for accident data in the area were not available from the RSA website in November 2024.

16.2.17 Description of Effects

The description of effects arising from traffic associated with the proposed Development are given in Table 3.4 of the EPA Guidelines 2022 and are categorised as follows in **Table 16.4**;

Table 16.4: Description of Effects

Table 3.4 Descriptions of Effects	
Quality of Effects	Positive Effects
It is important to inform the nonspecialist reader whether an	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the

Table 3.4 Descriptions of Effects	
effect is positive, negative or neutral.	reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/Adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).
Describing the Significance of Effects 'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see Determining Significance).	Imperceptible An effect capable of measurement but without significant consequences.
	Not Significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	Extent Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Table 3.4 Descriptions of Effects	
Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur so that the CA can take a view of the balance of risk over advantage when making a decision.	Likely Effects The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	Momentary Effects Effects lasting from seconds to minutes.
	Brief Effects Effects lasting less than a day.
	Temporary Effects Effects lasting less than a year.
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years.
	Reversible Effects Effects that can be undone, for example through remediation or restoration.
	Frequency of Effects Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Describing the Types of Effects	Indirect Effects (a.k.a. Secondary or Off-site Effects) Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
	'Do-nothing Effects'

Table 3.4 Descriptions of Effects	
	The environment as it would be in the future should the subject project not be carried out.
	'Worst-case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SO _x and NO _x to produce smog).

16.2.18 Assessing Receptor Sensitivity

The sensitivity of the transport infrastructure has been identified utilising the criteria outlined in the Traffic Management Guidelines published by the Department of Transport and TII publication DN-GEO-03031, Rural Road Link Design. These criteria are outlined in **Table 16.5** below.

Table 16.5: Receptor Sensitivity

Importance/Sensitivity of Receptor	Resource	Receptor
High	Local Tertiary and Local Secondary rural roads	Where a location is a large rural settlement containing a high number of community and public services and facilities.
	Local urban Collector and Access roads	
	Where the road is a minor rural road, not constructed to accommodate frequent use by heavy goods vehicle (HGVs).	Urban roads for local journeys and provide links to major routes. Many such roads will have residential and commercial access/frontage and

Importance/Sensitivity of Receptor	Resource	Receptor
	Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.	there will be significant movements of pedestrians and cyclists
Medium	Local Primary rural, Regional roads and National Secondary Roads District Primary urban roads Roads capable of regular use by HGV traffic. Includes roads where there is some traffic calming or traffic management measures.	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services. These roads provide links between local districts within urban areas. They can have significant movements of buses and cyclists along them (segregated or on-road) and pedestrians crossing them where there are schools, shops, offices and businesses.
Low	National Primary Roads Where the road is constructed to accommodate general and HGV traffic moving between primary destinations. Includes roads with little or no traffic calming or traffic management measures.	Where a location is a small rural settlement, few community or public facilities or services.
Very Low	Motorways and Dual carriageways Where roads have no adjacent settlements.	Where a location includes individual dwellings or scattered settlements with no facilities or residents/workers travelling by foot or by vehicle.

16.2.19 Assessing Magnitude of Change

The magnitude of potential impacts has been defined in accordance with the criteria provided in TII Publication PE-PDV-02045, Traffic and Transport Assessment Guidelines and traffic management guidelines published by the Department of Transport. PE-PDV-02045 requires a traffic and transport assessment to be carried out for developments which will generate the following vehicle movements:

- 100 trips in / out combined in the peak hours for the proposed development.
- Development traffic exceeds 10% of turning movements at junctions with and on National Roads.

- Development traffic exceeds 5% of turning movements at junctions with National Roads if location has potential to become congested or sensitive.

The traffic management guidelines require a traffic assessment for the following criteria

- Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road
- Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive

The assessment of priority road junction and road network capacity is carried out using industry standard TRL traffic modelling software PICADY to model isolated priority junctions as recommended in PE-PDV-02045 section 2.5.2.

Road network and junction capacity is measured in terms of level of service (LOS) thresholds which are based on the queuing delay on each arm of the junction. The transportation LOS system uses the letters A through F, with the following definitions:

- A = Free flow
- B = Reasonably free flow
- C = Stable flow
- D = Approaching unstable flow
- E = Unstable flow
- F = Forced or breakdown flow

The magnitude of change based on increased traffic volumes on the public road network is measured in terms of LOS on the network arm as follows.

- High – considerable deterioration – Network arm has exceeded LOS = D (Approaching Unstable Flow) due to increased traffic volumes.
- Medium – readily apparent change in conditions - Network arm has entered LOS = D (Approaching unstable flow) due to increased traffic volumes.
- Low – perceptible change in conditions - Network arm has entered LOS = C (Stable Flow) due to increased traffic volumes.
- Negligible — no discernible change in conditions - Network arm has a LOS = A (Free Flow) / B (Reasonably free flow)

16.2.20 Assessing Significance of Effects

To determine the overall significance of the effects, the results from the receptor sensitivity and impacts magnitude assessment are correlated and classified using Figure 3.4 of the EPA Guidelines, May 2022 as shown in **Figure 16.6** below.

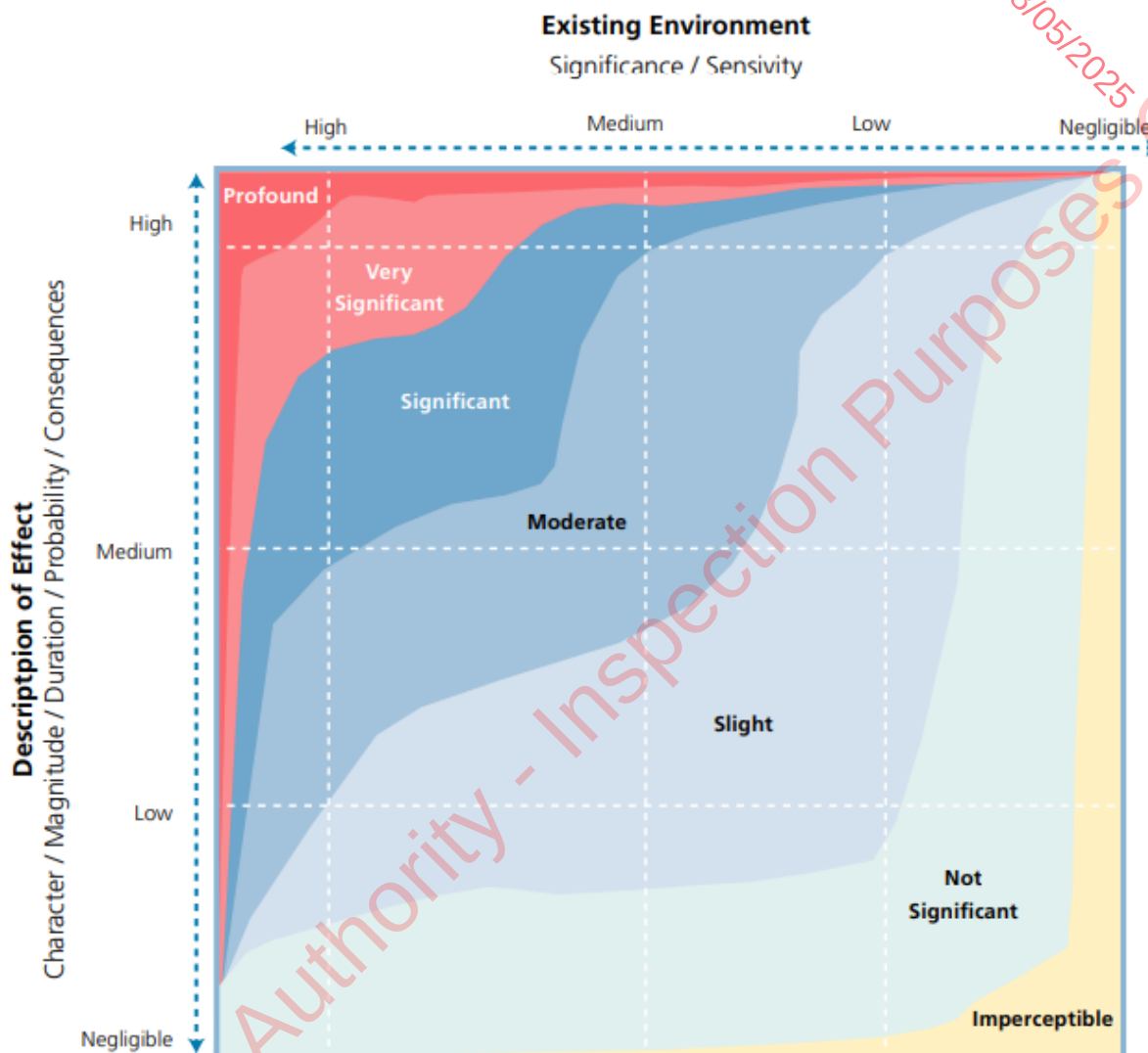


Figure 16.6: EPA Guidelines 2022, Significance of Effects

16.2.21 Sensitive Receptors – Construction Period

The following sensitive receptors will be impacted by the additional traffic generated by the construction of the proposed Development and by works carried on and adjacent to the public road network as part of the proposed Development. Detailed descriptions of the works locations and traffic management measures are included in the Traffic Management Plan in **Appendix 16.2**.

Table 16.6: Sensitive Receptors - Construction

Receptor	Sensitivity	Reason for inclusion
Kilrush	High	Increased traffic Volumes due to construction traffic
Moyasta National School (Requested in HSE Scoping response)	High	Increased traffic Volumes due to construction traffic
L2034	Medium	Increased traffic Volumes due to construction and turbine delivery traffic. Construction of wind farm site entrance Construction of grid connection
L2036	Medium	Increased traffic Volumes due to turbine delivery traffic. Road widening for turbine delivery Grid connection works
L6132	Medium	Increased traffic Volumes due to turbine delivery traffic. Road widening and vertical realignment works for turbine delivery Construction of blade transfer area with access onto L6132.
N68	Low	Increased traffic Volumes due to construction and turbine delivery traffic.
N67	Low	Increased traffic Volumes due to construction traffic.
R483	Medium	Increased traffic Volumes due to diversion for road widening works on the L6132. Increased traffic Volumes due to grid Connection and road widening works on the L2306.
L6094	Medium	Increased traffic Volumes due to diversion for grid Connection works on the L2306.
L61321	High	Increased traffic Volumes due to diversion for vertical realignment works on the L6132.

16.2.22 Sensitive Receptors – Operations Period

The following sensitive receptors will be impacted by the additional traffic generated by the operation of the proposed Development.

Table 16.7: Sensitive Receptors - Operation

Receptor	Sensitivity	Reason for inclusion
L2034	Medium	Increased traffic Volumes due to operations traffic.
N67	Low	Increased traffic Volumes due to operations traffic.
N68	Low	Increased traffic Volumes due to operations traffic.

16.2.23 Sensitive Receptors – Decommissioning Period

The following sensitive receptors will be impacted by the additional traffic generated by the decommissioning of proposed Development and by works carried on and adjacent to the public road network as part of the proposed Development.

Table 16.8: Sensitive Receptors - Decommissioning

Receptor	Sensitivity	Reason for inclusion
L2034	Medium	Increased traffic Volumes due to decommissioning and turbine removal traffic. Removal of wind farm site entrances Removal of grid connection cable
L2036	Medium	Removal of grid connection cable.
N67	Low	Increased traffic Volumes due to decommissioning and turbine removal traffic.
N68	Low	Increased traffic Volumes due to decommissioning and turbine removal traffic.

16.3 ASSESSMENT OF POTENTIAL EFFECTS

16.3.1 Wind Farm Traffic Generation

The estimated timescale for the completion of the construction phase is 10 months, inclusive of all works to Site Access Tracks, access routes, substation building and erection and commissioning of turbines and grid connection works.

The estimated HGV and abnormal load deliveries of materials and turbine components required to construct the proposed Development, and the Grid connection are given in **Table 16.9**. The estimated trips generated by the construction of the proposed Development are based on AutoCAD Civil 3D site layout design drawings, site investigation results and turbine suppliers specifications. It is estimated that during the wind farm construction, an

approximate total of 4,227 loads of material and building supplies will be delivered and removed from the Site. The majority of HGV movements to and from Site will occur during the first five months of the construction period and will be associated with access track construction, turbine hardstand construction and turbine foundation construction. The schedule of deliveries is used to determine new trips on the public road network which will be generated by the Development and is used in the traffic analysis in **Appendix 16.1** to assess the impact of the development on the public road and junction network.

The number of staff on site will vary according to the phase of the construction, peaking at approximately 50 at the height of the construction period. 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 different construction disciplines. Labour vehicle sharing will be actively encouraged to reduce vehicular movements.

Based on similar sized projects it is estimated that 35-40 staff light goods vehicles (LGV) will visit the site daily during the peak construction period. Parking for staff will be provided within the Temporary Construction Compound and within the works area during grid connection and TDR enabling works. No parking will be allowed for construction workers on the public road network in the vicinity of the Site. A small number of additional unscheduled visits may be required throughout the construction period for site inspections and unforeseen circumstances.

Table 16.9: HGV and Abnormal Load Deliveries

Materials	Quantity	No. Of Deliveries	Timeframe (Week)	Maximum Loads / Day	Vehicle Type
Site Establishment & Fencing		10	1	5	OGV1
Construction of L2034 Site Entrance	530m ³	53	1-2	10	OGV1
Construction of Temporary Construction Compound	1,000m ³	100	1-2	10	OGV1
Construction of Site Access Roads and Internal Junctions	3,390m ³	339	4-16	10	OGV1
Construction of Turbine Hardstands and Turning Heads	8,340m ³	834	8-20	10	OGV1
Site drainage		20	4-20	2	OGV2
Ready-mix concrete for Turbine Foundations	1,950m ³	245	12-20	81	OGV2

Materials	Quantity	No. Of Deliveries	Timeframe (Week)	Maximum Loads / Day	Vehicle Type
Steel reinforcement for Turbine Foundations	150T	10	8-16	3	OGV2
Foundation bolts	3 Turbines	3	8-16	1	OGV2
Verge widening at N68 / L6132 Junction Spoil Removal (95m ³) + Granular Material (95m ³)	190m ³	20	8	10	OGV1
Construction of L6132 verge strengthening on Turbine Delivery Route 5.56km (Tullabrack cross to N68) Spoil Removal (4,450m ³) + Granular Material (4,450m ³)	8,900m ³	890	8-20	20	OGV1
Vertical realignment of L6132 crest curve on Turbine Delivery Route Spoil Removal (18m ³) + Asphalt Surfacing (12m ³)	30m ³	5	8	1	OGV1
Removal of Forestry for Blade Transfer Area (7,450m ²)		8	8	5	OGV1
Construction of Blade Transfer Area (5,050m ²)	2,275m ³	227	8-20	10	OGV1
Construction of L2036 verge strengthening on Turbine Delivery Route (Tullabrack Cross to (20334)) Spoil Removal (1,760m ³) + Granular Material (1,760m ³)	3,520m ³	352	8-20	10	OGV1
Construction of L2034 verge strengthening on Turbine Delivery Route Spoil Removal (10m ³) + Granular Material (10m ³)	20m ³	2	16-20	2	OGV1
Substation building materials		15	8-20	1	OGV2
Electrical switchgear		2	20-34	1	OGV2
Electrical cables		5	20-32	1	OGV2

Materials	Quantity	No. Of Deliveries	Timeframe (Week)	Maximum Loads / Day	Vehicle Type
Grid Connection works (2.45km) Excavation (1470m ³) Reinstatement (1470m ³)	2940m ³	294	8-20	12	OGV2
Wind turbine components	3 Turbines	30	20-28	3	OGV2
Crane		10	20	5	OGV2
Reinstatement of L6132 verges, Material Removal (1,480m ³) + Imported Topsoil (1,480m ³)	2,960m ³	296	28-38	10	OGV1
Reinstatement of L2036 & L2034 verges, Material Removal (585m ³) + Imported Topsoil (585m ³)	1,170m ³	117	28-38	10	OGV1
Construction of Flood Compensation Area	3,200m ³	320	28-38	10	OGV1
General reinstatement and demobilisation		20	36-40	5	OGV2
Total		4,227			

A schedule of maximum predicted daily traffic movements to site over the 10-month construction period is shown in **Table 16.10**.

Table 16.10: HGV and Abnormal Load Deliveries to Site During Construction

Activity	1	2	3	4	5	6	7	8	9	10	11	12
Site Establishment & Fencing	5											
Construction of L2034 Site Entrance	10											
Construction of Temporary Construction Compound	10											
Construction of Site Access Roads and Internal Junctions		10	10	10								
Construction of Turbine Hardstands and Turning Heads			10	10	10							
Site drainage		2	2	2	2							
Ready-mix concrete for Turbine Foundations				81	81							

Activity	1	2	3	4	5	6	7	8	9	10	11	12
Steel reinforcement for Turbine Foundations			1	1								
Foundation bolts			1	1								
Verge widening at N68 / L6132 Junction Spoil Removal (95m ³) + Granular Material (95m ³)			10									
Construction of L6132 verge strengthening on Turbine Delivery Route 5.56km (Tullabrack cross to N68) Spoil Removal (4,450m ³) + Granular Material (4,450m ³)			20	20	20							
Vertical realignment of L6132 crest curve on Turbine Delivery Route Spoil Removal (18m ³) + Asphalt Surfacing (12m ³)			1									
Removal of Forestry for Blade Transshipment Area (7,450m ²)			5									
Construction of Blade Transfer Area (5,050m ²)			10	10	10							
Construction of L2036 verge strengthening on Turbine Delivery Route (Tullabrack Cross to (20334) Spoil Removal (1,760m ³) + Granular Material (1,760m ³)			10	10	10							
Construction of L2034 verge strengthening on Turbine Delivery Route Spoil Removal (10m ³) + Granular Material (10m ³)					2							
Substation building materials			2	2	2							
Electrical switchgear						1	1	1				
Electrical cables						1	1	1				
Grid Connection works (2.45km) Excavation (1470m ³) Reinstatement (1470m ³)			12	12	12							
Wind turbine components						3	3					
Crane						5						

Activity	1	2	3	4	5	6	7	8	9	10	11	12
Reinstatement of L6132 verges, Material Removal (1,480m ³) + Imported Topsoil (1,480m ³)							10	10	10			
Reinstatement of L2036 & L2034 verges, Material Removal (585m ³) + Imported Topsoil (585m ³)							10	10	10			
Construction of Flood Compensation Area							10	10	10			
General reinstatement and demobilisation										5		
Total	25	12	94	159	149	10	35	32	30	5	0	0

The first month of the construction period will involve deliveries of materials for site access works, site compound, site offices and site security. This period will include deliveries of fencing materials for site boundaries and compounds, temporary fencing to protect trees, hedges and ecological buffer zones, road construction materials for site compounds and site entrances, and delivery of temporary site office units. It is anticipated that a maximum of 25 HGV vehicles (50 HGV movements) will visit the Site on a daily basis during the first month of the contract.

Months 2 to 6 will involve deliveries of materials for turbine hardstands, turbine foundations, site access tracks, electrical substation building and cable / ducting works. This period will include deliveries of road construction materials for access tracks and turbine hardstands, ready mix concrete and steel reinforcement for turbine foundations. It is anticipated that a maximum of 159 HGV vehicles (318 HGV movements) will visit the Site on a daily basis during the period of weeks 8 to 24. The peak traffic of 159 HGV vehicles will occur on 3 days during this 3-month period when turbine foundations are poured. Concrete pours for individual turbine foundations will generate 81 HGV arrivals (162 HGV movements).

Months 6 to 10 will involve HGV movements for works associated with turbine delivery, turbine erection, turbine commissioning, electrical works, grid connection works, road reinstatement, road surfacing, site landscaping and the removal of temporary works materials such as offices and fencing from site. It is anticipated that a maximum of 35 HGV vehicles (70 HGV movements) will visit the Site on a daily basis during this period.

Based on the indicative timetable outlined above the peak times for HGV deliveries to Site will be during months 4 and 5 (78 daily HGV deliveries + 81 additional deliveries during concrete pours which will take place on three separate days during this period). Development traffic will be distributed throughout the day with morning, afternoon and evening peaks. The distribution of Development traffic is shown in **Table 16.11** during the construction of Turbine Foundations.

Table 16.11: Development Traffic Profile

Time	Arrivals		Departures	
	HGV	LGV	HGV	LGV
06.00 – 07.00		20		
07.00 – 08.00	18	15	18	
08.00 – 09.00	14	5	14	2
09.00 – 10.00	14		14	
10.00 – 11.00	14		14	
11.00 – 12.00	17		17	
12.00 – 13.00	14		14	
13.00 – 14.00	14	5	14	5
14.00 – 15.00	17		17	
15.00 – 16.00	14		14	
16.00 – 17.00	10		10	
17.00 – 18.00	8	2	8	5
18.00 – 19.00	5		5	15
19.00 – 20.00				20

16.3.2 Wind Farm Operations Traffic

The vehicle movements associated with the operational period of the Development will be very low. Trips during the operational period would normally be made by vans associated with site monitoring, servicing, cleaning and maintenance operations. During the operational period, parking will be provided within the site and security gates will be set back from the public road to allow operatives to access the site without obstructing the public road network. The frequency of vehicle trips associated with servicing, monitoring and upkeep of the site are expected to be in the region of 230 trips per year.

16.3.3 Wind Farm Decommissioning Traffic

The vehicle movements associated with the decommissioning period of the Development are estimated to be similar to the construction period. The decommissioning period will take approximately 4 to 6 Months, during which time the entire infrastructure will be removed from Site. Decommissioning will not require deliveries of concrete and will not include traffic spikes which occur during the construction of turbine foundations.

16.3.4 Magnitude and Significance of Effects

The magnitude and significance of effects and their impact on public road users at works locations on the public road network is analysed in **Table 16.12**. The impact of the effects is based on the Traffic and Transport Assessment in **Appendix 16.1** which gives details of traffic analysis at junctions in the vicinity of the Site and the Traffic Management Plan in **Appendix 16.2** which gives details of works duration, traffic management, road closures and diversions. A summary of the traffic analysis from **Appendix 16.1** is shown in **Figure 16.7** for the N68 / L6132 / L6162 Junction, **Figure 16.8** for the R483 / L6132 / L2036 Junction and **Figure 16.9** for the R483 / L6132 / L2036 Junction. The results of the analysis show that the junctions will not exceed the 0.85 ratio of flow to capacity (RFC) and will continue to operate with reserve capacity beyond 2075. The ratio of flow to capacity (RFC) is calculated from Junctions 9 PICADY software. An RFC value of 1.0 indicates that the junction is operating at full capacity with a value of 0.85 considered to be the maximum RFC value after which the junction will begin to experience some capacity issues.

	AM						PM					
	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS
2023 Existing Traffic - N68 / L6132 / L6162 Junction												
Stream B-ACD	0.0	7.07	0.03	A	0.36	A	0.0	7.02	0.01	A	0.39	A
Stream A-BCD	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
Stream C-ABD	0.0	0.00	0.00	A			0.0	5.29	0.02	A		
2025 Forecast Traffic Flows (Grant of Planning - No Development)												
Stream B-ACD	0.0	7.90	0.03	A	0.41	A	0.0	8.94	0.02	A	0.46	A
Stream A-BCD	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
Stream C-ABD	0.0	0.00	0.00	A			0.0	5.28	0.02	A		
2035 Forecast Traffic Flows (Planning Period - No Development)												
Stream B-ACD	0.0	7.90	0.04	A	0.49	A	0.0	8.74	0.02	A	0.50	A
Stream A-BCD	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
Stream C-ABD	0.0	0.00	0.00	A			0.0	5.25	0.03	A		
2075 Forecast Traffic Flows (Operational Lifespan - No Development)												
Stream B-ACD	0.1	8.04	0.09	A	0.79	A	0.1	8.50	0.05	A	0.41	A
Stream A-BCD	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.0	0.00	0.00	A			0.0	0.00	0.00	A		

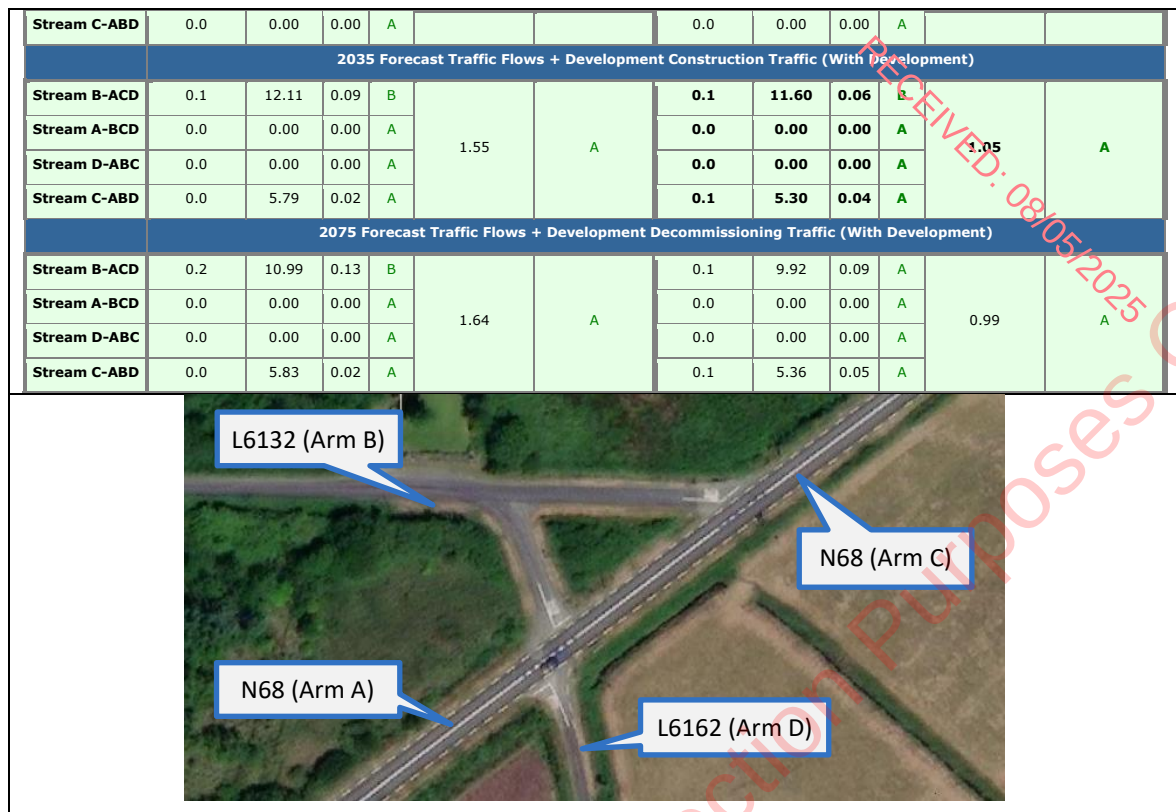


Figure 16.7: Traffic Analysis Summary for the N68 / L6132 / L6162 Junction



Stream C-ABD	0.0	0.00	0.00	A			0.0	6.68	0.01	A		
2075 Forecast Traffic Flows (Operational Lifespan - No Development)												
Stream B-ACD	0.1	10.49	0.07	B	1.88	A	0.1	8.22	0.06	A	1.97	A
Stream A-BCD	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.1	10.39	0.05	B			0.1	10.30	0.09	B		
Stream C-ABD	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
2035 Forecast Traffic Flows + Development Construction Traffic (With Development)												
Stream B-ACD	0.2	14.78	0.09	B	4.41	A	0.1	11.69	0.06	B	3.34	A
Stream A-BCD	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.1	14.99	0.08	B			0.2	12.67	0.11	B		
Stream C-ABD	0.0	0.00	0.00	A			0.0	6.67	0.01	A		
2075 Forecast Traffic Flows + Development Decommissioning Traffic (With Development)												
Stream B-ACD	0.2	14.30	0.13	B	4.23	A	0.1	10.59	0.09	B	3.90	A
Stream A-BCD	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.2	14.03	0.10	B			0.3	12.91	0.18	B		
Stream C-ABD	0.0	0.00	0.00	A			0.0	7.14	0.01	A		

Figure 16.8: Traffic Analysis Summary for the R483 / L6132 / L2036 Junction

	AM						PM					
	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS
	2023 Existing Traffic - L2034 / L2036 Junction											
Stream B-ACD	0.0	8.49	0.03	A	2.30	A	0.0	7.17	0.03	A	1.37	A
Stream A-BCD	0.0	5.46	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.0	9.38	0.01	A			0.0	0.00	0.00	A		
Stream C-ABD	0.0	5.66	0.01	A			0.0	5.49	0.00	A		
	2025 Forecast Traffic Flows (Grant of Planning - No Development)											
Stream B-ACD	0.0	8.52	0.03	A	2.37	A	0.0	7.20	0.04	A	1.43	A
Stream A-BCD	0.0	5.46	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.0	9.38	0.01	A			0.0	0.00	0.00	A		
Stream C-ABD	0.0	5.67	0.01	A			0.0	5.49	0.00	A		
	2035 Forecast Traffic Flows (Planning Period - No Development)											
Stream B-ACD	0.0	8.57	0.04	A	2.65	A	0.1	7.31	0.05	A	2.10	A
Stream A-BCD	0.0	5.45	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.0	9.20	0.02	A			0.0	10.15	0.01	B		
Stream C-ABD	0.0	5.67	0.01	A			0.0	5.47	0.00	A		
	2075 Forecast Traffic Flows (Operational Lifespan - No Development)											
Stream B-ACD	0.1	8.92	0.09	A	3.56	A	0.1	7.81	0.11	A	3.10	A
Stream A-BCD	0.0	5.41	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.0	8.87	0.03	A			0.0	9.73	0.03	A		
Stream C-ABD	0.0	0.00	0.00	A			0.0	0.00	0.00	A		
	2035 Forecast Traffic Flows + Development Construction Traffic (With Development)											
Stream B-ACD	0.2	12.72	0.10	B	6.66	A	0.1	9.11	0.08	A	3.87	A
Stream A-BCD	0.0	5.45	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.1	14.51	0.07	B			0.0	10.26	0.01	B		
Stream C-ABD	0.0	5.67	0.01	A			0.1	8.44	0.03	A		
	2075 Forecast Traffic Flows + Development Decommissioning Traffic (With Development)											
Stream B-ACD	0.2	12.16	0.15	B	6.80	A	0.2	9.11	0.13	A	4.42	A
Stream A-BCD	0.0	5.42	0.00	A			0.0	0.00	0.00	A		
Stream D-ABC	0.1	13.41	0.08	B			0.0	9.86	0.03	A		
Stream C-ABD	0.0	5.69	0.01	A			0.1	8.24	0.03	A		
	2035 Forecast Traffic Flows + Development Construction Traffic + Local Development Traffic											
Stream B-ACD	0.2	12.98	0.12	B	6.78	A	0.1	9.24	0.09	A	3.94	A

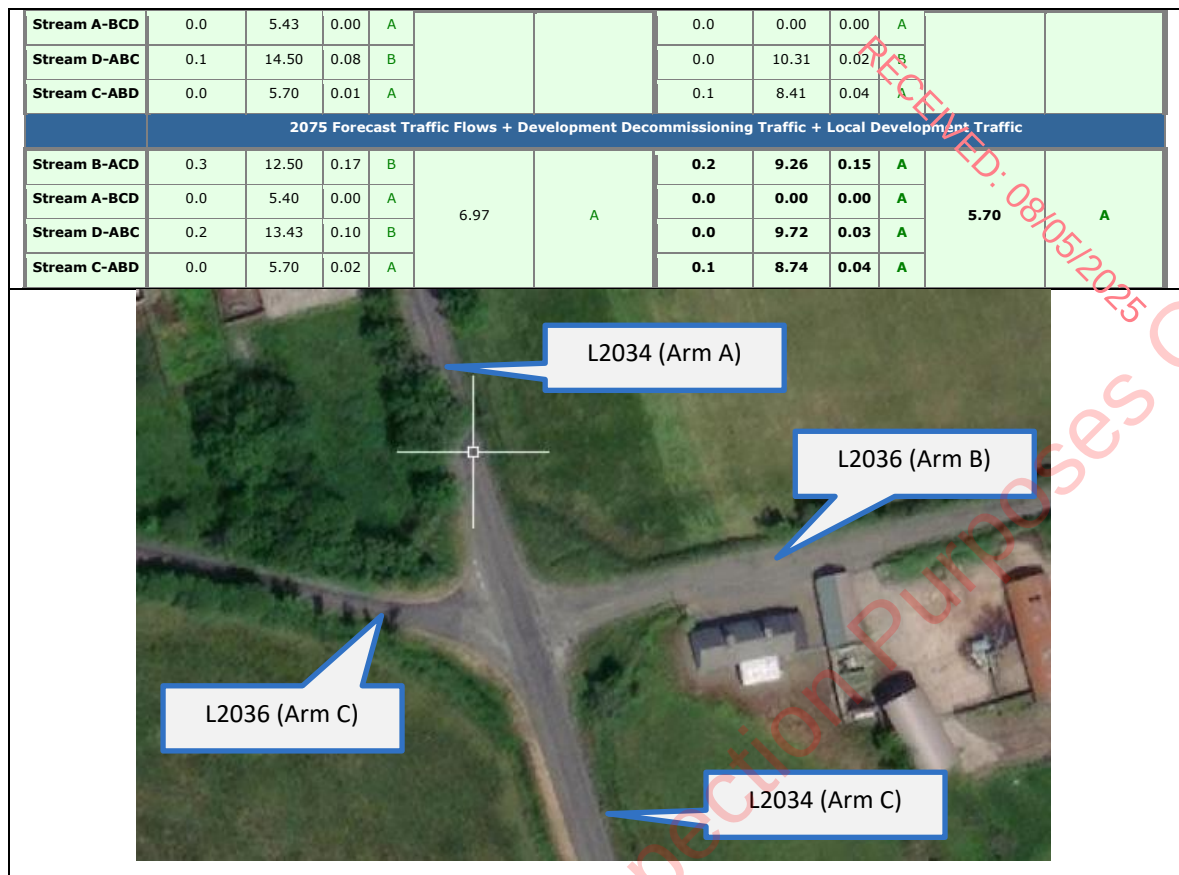


Figure 16.8: Traffic Analysis Summary for the L2034 / L2036 Junction

Table 16.12: Magnitude and Significance of Impacts

Construction Period					
Receptor	Sensitivity	Magnitude	Significance of Effect	Duration of Effect	Conclusion
Kilrush	High	Low	Slight / Moderate	Temporary / Short Term	Not Significant
Moyasta School	High	Low	Slight / Moderate	Temporary / Short Term	Not Significant
L2034	Medium	Medium	Moderate	Temporary / Short Term	Not Significant
L2036	Medium	Medium	Moderate	Temporary / Short Term	Not Significant
L6132	Medium	Medium	Moderate	Temporary / Short Term	Not Significant
N68	Low	Low	Not Significant	Temporary / Short Term	Not Significant
N67	Low	Low	Not Significant	Temporary / Short Term	Not Significant
R483	Medium	Low	Slight	Short Term	Not Significant
L6094	Medium	Low	Slight	Short Term	Not Significant
L61321	High	Low	Slight	Short Term	Not Significant
Operations Period					
Receptor	Sensitivity	Magnitude	Significance of Effect	Duration of Effect	Conclusion
L2034	Medium	Negligible	Not Significant	Long Term	Not Significant
N67	Low	Negligible	Not Significant	Long Term	Not Significant

N68	Low	Negligible	Not Significant	Long Term	Not Significant
Decommissioning Period					
Receptor	Sensitivity	Magnitude	Significance of Effect	Duration of Effect	Conclusion
L2034	Medium	Medium	Moderate	Temporary / Short Term	Not Significant
L2036	Medium	Medium	Moderate	Temporary / Short Term	Not Significant
N67	Low	Low	Not Significant	Short Term	Not Significant
N68	Low	Low	Not Significant	Short Term	Not Significant

16.3.5 Air Quality

Construction HGV's, LGV's and private vehicles are subject to government HCV, LCV, ADR and NCT emissions tests. A full air quality assessment is included in **Chapter 12: Air Quality and Climate of the EIA**.

16.3.6 Noise and Vibration

There is likely to be some noise and vibration due to the predicted short-term increase in HGV movements along the Haul Routes to the proposed development. The increased traffic volumes may cause disturbance to residents living along the local road network of the proposed Development Construction Haul Route, Turbine Delivery Route and Grid Connection Route. Construction HGV's, LGV's and private vehicles are subject to government HCV, LCV and NCT noise and suspension tests. A full noise and vibration assessment is included in **Chapter 10: Noise of the EIA** and the predicted noise levels are well within NRA guidelines given as acceptable and are considered not significant. Construction noise is a temporary activity.

16.3.7 Pedestrians and Vulnerable Road Users

Pedestrian and other vulnerable road users may be affected by the works at the proposed Development entrances, Construction Haul Routes, Turbine Delivery Route enabling works, grid connection works and increased vehicle movements during construction and delivery of turbine components. The construction of the proposed Development entrances and modifications to the public road network at various locations along the Turbine Delivery Route will be carried out under a road opening licence and traffic management plan which will accommodate pedestrians at the works locations. The effect of the works on pedestrian safety is therefore assessed to be medium sensitivity for a short-term duration and is not significant. Pedestrian facilities may be altered for short periods during the transportation of turbine components. During these periods alternative arrangements will be put in place for pedestrians.

16.3.8 Driver Delay

The traffic analysis carried out in the Traffic and Transport Assessment in **Appendix 16.1** at the L2034 / L2036 junction shows that drivers will experience short delays due to increased traffic volumes during the wind farm construction and decommissioning periods. In 2035 vehicles joining the L2034 from the L2036 will experience a delay of 10 seconds without development construction traffic and a delay of 14 seconds with the additional traffic generated by wind farm construction. In 2075 vehicles joining the L2034 from the L2036 will experience a delay of 9 seconds without development decommissioning traffic and a delay of 14 seconds with the additional traffic generated by wind farm decommissioning. The effects of the additional traffic volumes are assessed as slight and temporary with a duration of 10 months. The effect is assessed as non-significant. The results from the traffic analysis are summarised in **Figure 16.8**.

Enabling works on the public road network will be carried out using traffic management and temporary traffic signals at locations where it is not possible to maintain two way traffic. Analysis carried out in the Traffic and Transport Assessment in **Appendix 16.1** shows that vehicles will experience delays of approximately 75 seconds when the lights are in place on the L2034 and the N68. The effects of the additional traffic volumes are assessed as slight and short term. The effect is assessed as non-significant. The location and duration of works requiring temporary traffic lights is detailed in the traffic management Plan in **Appendix 16.2**.

The delivery of turbine components will take place outside peak traffic periods to avoid disruption on the public road network. The haul route for the transportation of turbine components consisting of dual carriageway and motorway will have unrestricted passing opportunities and no delays to public road users are expected. There is potential for momentary delay to public road users in the urban areas surrounding Shannon Foynes Port, at the N69 Ferrybridge, N69 Clarina roundabout, N18 / N69 junction 2, M18 / N55 junction 12, N85 Clareabbey roundabout, N85 Rocky Road Roundabout, N68 Kilrush road roundabout, N68 / L6132 junction, L6132 / R483 Junction, L2036 / L2034 junction and in the urban areas of Limerick City. Following assessment in the TTA in **Appendix 16.1**, it is concluded that delays to traffic due to turbine delivery will be imperceptible and momentary in duration. The effect is assessed as non-significant.

The construction of grid connection works on public roads will require road closures on local roads where the road width is too narrow to support traffic flows. The road closures will result in delays to public road users and increased journey times. Following assessment in

the TTA in **Appendix 16.1**, it is concluded that these effects will be slight and short term. The effect is assessed as non-significant.

16.4 MITIGATION MEASURES

16.4.1 Construction Phase

Although no significant effects have been predicted, the proposed mitigation measures have been incorporated into the design to maintain the highest standard of road safety, minimise delay and disruption to all public road users, and to comply with statutory regulations.

- The appointed Contractor shall inform local residents, businesses and emergency services of proposed works and road closures in advance of any works taking place on Site. Access shall be maintained to properties at all times during the course of the works. The Contractor will appoint a project coordinator who will be the main point of contact for matters relating to traffic which will affect the general public, local businesses and emergency services. An out of hours contact number shall also be provided.
- Prior to delivery of abnormal loads i.e. turbine components, the Applicant or their representatives, will consult with An Garda Síochána, TII, PPP operators and all relevant Local Authorities to obtain all necessary abnormal load permits and discuss the requirement for a Garda escort. The Applicant will also outline the intended timescale for deliveries and efforts can be made to avoid peak times such as school drop off times, church services, peak traffic times where it is considered this may lead to unnecessary disruption, and abnormal loads may travel at night and outside the normal construction times as may be required by An Garda Síochána. Local residents at sensitive locations along the affected route will be notified of the timescale for abnormal load deliveries.
- Prior to delivery of abnormal loads, the Applicant or their representatives, will consult with TII, PPP operators and all Local Authorities through which the abnormal loads will pass and agree the specification for any enabling works to be carried out on the Turbine Delivery Route.
- Prior to the transportation of turbine components on the national road network. the Developer will submit details of the turbine components to TII bridge management section and determine the requirement for an abnormal load assessment to ensure that structures on the national road network are not adversely affected.
- Prior to the delivery of turbine components, a survey of the Turbine Delivery Route will be undertaken to identify if any overhead lines or height restrictions at toll booths will need to be lifted along the route to allow abnormal loads such as tower sections and nacelles to be delivered.

- Prior to the delivery of turbine components, a trial run shall be carried out between Shannon Foynes Port and the proposed Development entrance using an abnormal load vehicle with a retractable load gauge to determine that abnormal load vehicles can transverse the route without undue delay and disruption to public road users.
- During the construction and decommissioning phases, road works signs in accordance with the requirements of Chapter 8 of the Traffic Signs Manual will be erected at all the proposed Development entrances and at all locations on the Grid Connection route and Turbine Delivery Route which are being modified to facilitate turbine delivery. Details of signage are given in the Traffic management plan in **Appendix 16.2**.
- Wheel cleaning equipment will be used at all site entrances with the public road 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 Site.
- To reduce dust emissions, vehicle containers/loads will be covered during both entrance and egress to the Site where required.
- All 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 may be employed.
- Access to the construction 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 Contractor's temporary compound and will be required to wear appropriate Personal Protective Equipment (PPE) while onsite.
- A condition survey of the road network in the vicinity of the site entrances will be carried out and agreed with Clare County Council prior to any works being carried out on site.
- All works on the public road network will be carried out using an approved road opening licence and traffic management plan.
- All wind farm vehicles shall have roof mounted flashing beacons when working on the public road network or will use their hazard lights within the Site.
- A speed limit of 25 km/h shall apply to all vehicles within the Site.

16.5 CUMULATIVE EFFECTS

16.5.1 Unrelated Proposed and Consented Developments

The Clare County Council planning portal provides details of planned developments in County Clare. A search of the portal in October 2024 shows that there are no planned

developments in the vicinity of the proposed Development which will generate a significant number of new trips and turning movements on the public road network at the site entrance on the L2034 which would require a TTA under the TII guidelines described in **Section 16.2.19**. Developments which are currently at construction stage have also been included in the recorded traffic volumes. A list of adjacent developments and their impact on Development traffic are given in **Table 16.13**.

The proposed Development is located close to high quality public roads such as the N68 and N67 national secondary roads. The results of the traffic analysis in **Appendix 16.1** show that the road and junction network will continue to operate with reserve capacity during construction, operation and decommissioning of the proposed Development and the traffic impacts are assessed as non-significant. A schedule of consented and proposed developments within 20km of the Development is given in **Appendix 1.2**.

Table 16.13: Adjacent Developments

Other Developments	Status	Planning Reference	Approximate Distance to the Site Boundary	Direction from the Development	Traffic Impact
Ballykett (4 turbine windfarm)	Proposed		c. 0.96km	Northeast	Significant
Shronowen (12 turbine windfarm)	Proposed		c. 16.46km	South	Not Significant
Construction of Ballroom/Function Room building	Permission	18930	10/10/2019	8.7km	Not Significant
Development of a livestock slatted unit, manure pit, horse stables with fenced sand arena, and associated site works	Permission	19775	20/06/2020	3.4km	Not Significant
Development of a Sewerage scheme at Skagh Point, Kilrush, Co Clare.	Permission	21203	02/05/2021	3.1km	Not Significant
Extend existing graveyard and associated works	Permission	17157	11/05/2017	2.7km	Not Significant
New wastewater treatment plant and associated works	Permission	19643	02/10/2019	3.1km	Not Significant
Development of two water storage tanks above ground level and an	Permission	17809	14/12/2017	8.2m	Not Significant

Other Developments	Status	Planning Reference	Approximate Distance to the Site Boundary	Direction from the Development	Traffic Impact
underground pump chamber located within the Moneypoint generating station complex					
Develop a 9-hole pitch and putt course, reception hut and car parking facilities along with all associated works	Permission	19380	15/09/2019	2.9km	Not Significant
Construct a new external refrigeration plant area enclosure	Permission	20506	17/09/2020	2.8km	Not Significant
To convert and extend existing Convent structures, to include 30 No apartments, to demolish part of existing outbuilding, to construct 20 No semi-detached dwellings, service road, new entrance and to upgrade/ extend existing ancillary services. The Convent is a protected structure (RPS 861) and associated works	Permission	21239	11/11/2021	2.7km	Not Significant
Moanmore Solar PV Energy development	Permission	18679	18/10/2018	1.0km	Significant
Development coastal erosion management	Permission	161012	21/12/2017	10.1km	Not Significant
Construct a cubicle house for cows, extend the existing shed by one bay, construct 2 underground slurry tanks, construct a new milking complex with adjoining drafting system and calf facility. And demolish old store and section of existing parlour to facilitate construction of new milking complex	Permission	20120	12/10/2022	9.8km	Not Significant
Construct a new 120m long covered 4 lane sprint track and a	Permission	17107	12/10/2022	9.8km	Not Significant

Other Developments	Status	Planning Reference	Approximate Distance to the Site Boundary	Direction from the Development	Traffic Impact
new storage shed along with all associated site works					
Construct agricultural slatted unit, plus machinery/storage shed, silage slab, concrete yard plus all ancillary site works	Permission	2030	24/03/2020	10.6km	Not Significant

An analysis has been carried out at the to test the capacity of the N68 / L6132 / L6162 junction during construction in 2035 and decommissioning in 2070 with construction traffic from significant adjacent developments Ballykett Wind Farm and Moanmore Solar Farm included in the analysis. The analysis shows that the junction will continue to operate within capacity in 2035 and 2070 with traffic from Moanmore Wind Farm, Ballykett Wind Farm and Moanmore Solar Farm if the developments are constructed and decommissioned at the same time. The results of the analysis are shown in **Figure 16.9**.

	AM							PM						
	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
2035 Forecast Traffic Flows + Moanmore Wind Farm Construction Traffic														
Stream B-ACD	0.1	12.11	0.09	B	1.55	A	301 %	0.1	11.60	0.06	B	1.05	A	320 %
Stream A-BCD	0.0	0.00	0.00	A			[Stream B-ACD]	0.0	0.00	0.00	A			[Stream B-ACD]
Stream D-ABC	0.0	0.00	0.00	A			0.0	0.00	0.00	A	[Stream B-ACD]			
Stream C-ABD	0.0	5.79	0.02	A			0.1	5.30	0.04	A	[Stream B-ACD]			
2035 Forecast Traffic Flows + Moanmore Wind Farm Construction Traffic + Significant Adjacent Developments														
Stream B-ACD	0.4	14.53	0.19	B	3.15	A	152 %	0.1	11.94	0.09	B	1.59	A	257 %
Stream A-BCD	0.0	0.00	0.00	A			[Stream B-ACD]	0.0	0.00	0.00	A			[Stream B-ACD]
Stream D-ABC	0.0	0.00	0.00	A			0.0	0.00	0.00	A	[Stream B-ACD]			
Stream C-ABD	0.1	5.98	0.06	A			0.1	5.38	0.06	A	[Stream B-ACD]			
2075 Forecast Traffic Flows + Moanmore Wind Farm Decommissioning Traffic														
Stream B-ACD	0.2	10.99	0.13	B	1.64	A	232 %	0.1	9.92	0.09	A	0.99	A	244 %
Stream A-BCD	0.0	0.00	0.00	A			[Stream B-ACD]	0.0	0.00	0.00	A			[Stream B-ACD]
Stream D-ABC	0.0	0.00	0.00	A			0.0	0.00	0.00	A	[Stream B-ACD]			
Stream C-ABD	0.0	5.83	0.02	A			0.1	5.36	0.05	A	[Stream B-ACD]			
2075 Forecast Traffic Flows + Moanmore Wind Farm Decommissioning Traffic + Significant Adjacent Developments														
Stream B-ACD	0.4	13.54	0.23	B	3.00	A	124 %	0.2	10.73	0.14	B	1.48	A	181 %
Stream A-BCD	0.0	0.00	0.00	A			[Stream B-ACD]	0.0	0.00	0.00	A			[Stream B-ACD]
Stream D-ABC	0.0	0.00	0.00	A			0.0	0.00	0.00	A	[Stream B-ACD]			
Stream C-ABD	0.1	6.02	0.07	A			0.1	5.45	0.07	A	[Stream B-ACD]			

Figure 16.9: Traffic Analysis Summary for the N68 / L6132 / L6162 Junction with Significant Adjacent Developments

An additional analysis was carried out to test the capacity of the L2034 / L2036 junction with the forecast growth on the public road network increased by an additional 10% to test the capacity of the junction with additional development traffic which may arise in the future. The results of the analysis show that the road network will continue to operate with reserve capacity with additional development traffic during construction in 2035 and decommissioning in 2075. The results of the traffic analysis are included in **Appendix 16.1** and summarised in **Figure 16.8**.

16.6 RESIDUAL EFFECTS OF THE DEVELOPMENT

16.6.1 Construction Phase Residual Effects

The results of the traffic analysis in **Appendix 16.1** have shown that the existing public road network can accommodate the increased traffic volumes generated by the proposed Development. Works on the public road network will be carried out using an approved traffic management plan and site entrances will be signposted in accordance with chapter 8 of the Traffic Signs Manual. Visibility at site entrance will be maintained in accordance with the Clare County Council Development Plan. There is likely to be a slight residual effect on the condition of road surfaces at the site entrances due to vehicles turning and on the grid connection route prior to final road reinstatement. Following final road reinstatement, there will be positive residual effects associated with the road resurfacing works.

16.6.2 Operational Phase Residual Effects

There will be no residual effects on the public road network during the operational phase of the proposed Development. The results of the traffic analysis in **Appendix 16.1** have shown that the existing public road network can accommodate the operational traffic generated by the proposed Development when combined with predicted public traffic growth beyond 2075. The interface between the proposed Development and the public road network has been designed to eliminate residual risk with visibility splays, signs and road markings and dwell areas to allow vehicles to pull off the road when entering the Site.

16.6.3 Final Decommissioning Phase Residual effects

The results of the traffic analysis in **Appendix 16.1** have shown that the existing public road network can accommodate the increased traffic volumes generated by the proposed Development during decommissioning. There is likely to be a slight residual effect on the condition of road surfaces at the site entrances due to vehicles turning. The decommissioning will be subject to a separate traffic management plan as the destination for recycled turbine parts may differ from the port of origin.

16.7 SUMMARY OF SIGNIFICANT EFFECTS

This section has assessed the significance of potential effects of the Project on traffic and transport.

Following assessment of the Quality of effects on the public road network, it has been concluded that the Quality of effects will be neutral with increased traffic flows during the construction and decommissioning of the proposed Development with no permanent changes to the geometry of the public road network and its associated junctions. Grid connection works on the local road network requiring road closures have been assessed as negative due to the short-term disruption to public road users resulting from road closures and driver delay resulting from temporary traffic lights and traffic diversions.

Following assessment, it has been concluded that the significance of the effects on the public road network where traffic management / two-way traffic flows can be maintained during works has been assessed as slight. The significance of the effects has been assessed as moderate on local roads where road closures will be required to carry out the grid connection works.

Following assessment, it has been concluded that the duration of effects relating to increased HGV traffic flows in the vicinity of the Site have been assessed as Temporary and may last up to 10 months during the construction and decommissioning of the proposed Development, the maximum effects from increased HGV traffic flows will occur on 3 days during the 10 month construction period during the construction of turbine foundations.

Following assessment, it has been concluded that the duration of effects relating to grid connection works, enabling works on the Turbine Haul Route and delivery of turbine components have been assessed as short-term lasting less than one year.

16.8 STATEMENT OF SIGNIFICANCE

This assessment has identified no likelihood of significant effects of the Project on traffic and transport during the construction, operation and decommissioning periods. Effect are assessed as **Non-Significant** on the national and regional road network and **Non-Significant** on the local road network and within populated centres. The potential effects will occur for a **temporary / short term** duration during the construction and decommissioning periods of the Development. During the operations phase of the proposed Development the effects are assessed as **Non-Significant**. Following final road reinstatement, there will be positive residual effects associated with the road resurfacing works.