

14 TRAFFIC AND TRANSPORT

14.1 INTRODUCTION

14.1.1 Background and Objectives

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the potential traffic and transport effects of the Development, describes the existing transport network within the vicinity of the Site, identifies whether there is any potential for significant effects to arise (both in isolation and in combination with other developments) and outlines any mitigation measures as required. This assessment was undertaken by Jennings O'Donovan & Partners Limited (JOD). The assessment will consider the potential effects during the following phases of the Development:

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

This chapter outlines potential effects of traffic associated with the proposed Development on the public road network and associated junctions during the life of the wind farm. During the construction phase of the wind farm, traffic will include HGV's delivering construction materials to and from site, abnormal load vehicles transporting turbine components from Waterford Port to site, HGV's removing unsuitable material from site, HGV's and plant involved with grid connection works on the public road and construction operatives visiting the site in cars and light goods vehicles. During the operations phase of the wind farm, traffic will include cars and light goods vehicles involved with site maintenance, servicing and repair. Traffic during the decommissioning of the wind farm will be similar to the construction phase and will consist of HGV's and abnormal load vehicles removing turbine components and electrical installations from site and HGV's importing materials for landscaping.

Common acronyms used throughout this EIAR can be found in **Appendix 1.4**. This chapter of the EIAR is supported by Figures provided in Volume III and by the following Appendix document provided in Volume IV of this EIAR:

- **Appendix 14.1: Pell Frishmann Survey Reports of December 2021 and October 2022**
- **Appendix 14.2: Swept Path Analysis Drawings**

14.1.2 Statement of Authority

This chapter of the EIAR has been prepared by Jennings O'Donovan & Partners Limited, Finisklin Business Park, Sligo. Established in Sligo in 1950, Jennings O'Donovan & Partners Limited is a Clean Tech Company providing consulting engineering services in the areas of renewable energy, civil and structural engineering, road design, water supply, wastewater collection and treatment, environmental resource management and impact assessment and in the area of housing and commercial development.

The chapter has been reviewed by Mr. David Kiely of Jennings O'Donovan & Partners Ltd. Mr. Kiely has 35 years' experience in the civil engineering and environmental sector. He has obtained a Bachelor's Degree in Civil Engineering and a Masters' in Environmental Protection, has overseen the construction of over 40 wind farms and has carried out numerous soils and geology assessments for EISs. He has been responsible in the overall preparation of in excess of 20 EIA Reports (EIARs).

14.2 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

14.2.1 Assessment Methodology

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

- Legislation and guidance review
- Desk study, including review of available maps and published information
- Swept path analysis (SPA) of the Haul Route
- Establishment of Baseline Scenario
- Evaluation of potential effects
- Evaluation of the significance of these effects
- Identification of measures to avoid and mitigate potential effects
- Evaluation of residual effects following implementation of mitigation measures

14.2.2 Planning Policy and Guidelines / Guidance

This assessment has been prepared and carried out in accordance with guidance contained in the documents shown in **Table 14.1**.

Table 14.1: Policy and Guidance

Policy / Author	Title	Policy
Environmental Protection Agency (September 2022)	Guidelines on the information to be contained in Environmental Impact Assessment Reports	This is a general advice note on the preparation of EIARs. It outlines how various participants in the EIA process can contribute to the process, how to describe a proposed development, the

Policy / Author	Title	Policy
		environmental topics to be covered and topics covered in EISs for different project types.
Government of Ireland	The Design Manual for Urban Roads and Streets (DMURS) ¹	This document outlines guidelines on the design of urban roads and streets in terms of signage, pedestrians and cyclists, carriageways (widths, surfaces, junctions etc.), policies and plans, design process and audits (safety and quality).
Transport Infrastructure Ireland (TII)	The Design Manual for Roads and Bridges (DMRB)	The DMRB provides requirements which shall be applied to the appraisal, design, maintenance, operation and disposal of motorway and all-purpose trunk roads. DMRB requirements can be applied to other roads with the approval of the County Council
Transport Infrastructure Ireland (TII)	Traffic and Transport Assessment Guidelines ²	The guidelines provide guidance for developers, planning authorities and the National Roads Authority (NRA) for: <ul style="list-style-type: none"> • Scoping for traffic and transport assessment for future development and development areas, particularly areas in proximity to national roads, • Defining thresholds where studies are recommended to minimise the impact of future proposals on the national road network, Contributing to the provision of sustainable forms of development and better-informed planning decisions.
Government of Ireland	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.
Waterford City & County Council	Waterford City & County Development Plan (CDP).	The Waterford County Development Plan 2022-2028 sets out an overall strategy for the

1 <http://www.housing.gov.ie/sites/default/files/migrated-files/en/Publications/DevelopmentandHousing/Planning/FileDownload%2C32669%2Cen.pdf>

2 <http://www.tii.ie/tii-library/land-use-planning/Transport-Assessment-GuidelinesMay2014.pdf>

Policy / Author	Title	Policy
		<p>proper planning and sustainable development of the functional area of Waterford City & County Council.5.10 Priority Transportation Infrastructure Objectives 2022-2028:</p> <p>Lists priority transport infrastructure to be provided and or for improvement that has been identified within the Development Plan period;</p> <ul style="list-style-type: none"> • R710 Waterford city Outer Orbital Route. • R671/R672 Regional Road from Dungarvan to Clonmel. • Dunmore Link Road. • R685 Glen Road from Waterford Road to Quarry Road. • Enhanced link from Cumann na mBan Road at SETU Arena to Industrial Zoned Lands east of the Roundabout. • Quarry Road (L15011), Waterford City – Improvement • R666 Ballyduff Road Junction with the N72 at Ballyrafter.

14.2.3 Study Area

The study area for this Traffic and Transport assessment is focused on the public road network which will be used for the following construction operations:

- 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 from Belview Port (Waterford Port) to site.
- Works at junctions and pinch points on the turbine delivery route between Belview Port (Waterford Port) to the site entrance on the R671 to facilitate the swept path of abnormal load vehicles delivering turbine components to site.
- Works associated with the connection of the wind farm to the national electricity grid, which will be via 110kV underground cable connection approximately 16.013km in length to the existing ESB Dungarvan 110kV GIS Substation.

14.2.4 Desk Study

A desk study of the area was completed in advance of undertaking the route survey. This involved using Google Maps and Streetview to assess the road network from Bellview Port to the Site for the transportation of turbine components and to review the road network in the vicinity of the site for the Civil Construction Haul Route. Waterford City and County Council were consulted by the Applicant regarding the use of the public road network for haul routes to the proposed wind farm development. Traffic count data from the TII traffic counter on the N72 near the R671 junction was used to inform the location and duration of classified traffic counts carried out on the road network.

14.2.5 Field Work

A survey of the turbine delivery route between Belview Port and the Wind Farm site was undertaken in October 2022 by Pell Frishmann Ltd. The haul route survey outlines works which are required to facilitate the swept path of abnormal load vehicles transporting turbine components to the site. The Abnormal Indivisible Load Route Review is included in **Appendix 14.1**.

Classified traffic counts were carried out by Jennings O'Donovan on 18th October 2022 at three locations in the vicinity of the wind farm site to determine baseline traffic volumes for junction capacity analysis. The traffic counts were carried out at the following locations and are shown on **Figure 14.1**:

- R671 Regional Road Junction / R672 Regional Road Junction (Junction 1)
- N72 National Secondary Road / R671 Regional Road Junction (Junction 2)
- N72 National Secondary Road / R672 Regional Road Junction (Junction 3)

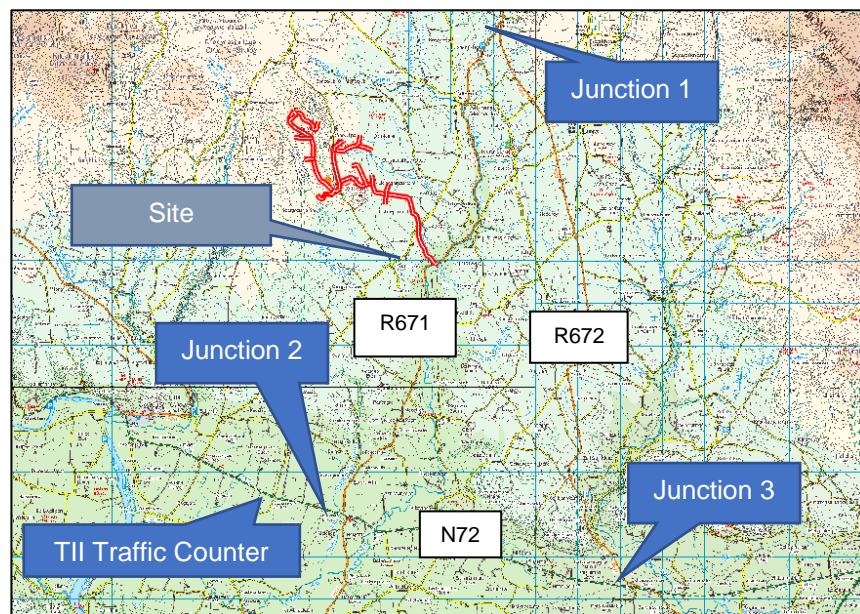


Figure 14.1: Traffic Count Locations

14.2.6 Evaluation of Potential Effects

Following on from the identification of the baseline environment, the available data was utilised to identify and categorise potential effects likely to affect the local road network used for the Haul Route and Civil Construction Haul Route as a result of the Development.

The statutory criteria (EPA, 2002; EPA, 2003) for the assessment of effects require that likely effects are described with respect to their extent, magnitude, type (i.e. negative, positive or neutral) probability, duration, frequency, reversibility, and transboundary nature (if applicable). The descriptors used in this Environmental Impact Assessment Report (EIAR) are those set out in EPA (2002) 'Glossary of Impacts'.

Effects may be categorised as follows:

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

14.2.7 Sensitivity

The sensitivity of the local transport infrastructure has been identified utilising the criteria outlined within the TII Guidance. These criteria are outlined within **Table 14.2** below.

Table 14.2: Receptor Sensitivity

Importance	Description
High	Receptors of greatest sensitivity to changes in traffic flow including: People whose livelihood depends upon unrestricted movement within their environment including commercial drivers and companies who employ them, local residents, schools and colleges.
Medium	Traffic flow sensitive receptors including: People who habitually pass through the area, but whose livelihoods are not dependent on free access. Would also generally include: congested junctions, community services, parks, businesses with roadside frontage and recreation facilities.
Low	Receptors with some sensitivity to changes in traffic flow: People who occasionally use the road network. Would also include: public open spaces, nature conservation areas, listed buildings, tourist attractions, residential roads with adequate footway provision and churches.
Negligible	Receptors with very low sensitivity to traffic flows: People not sensitive to transport effects. Would also refer to receptors that are sufficiently distant from the affected roads and junctions.

14.2.8 Magnitude

The magnitude of potential impacts has been defined in accordance with the criteria provided in the 2002 EPA publication 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' as outlined within **Table 14.3**.

The Institute for Environmental Management and Assessment (IEMA) Guidelines³ contains two broad principles to determine the scale and extent of an assessment, which are:

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

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

These guidelines were developed to assess the potential effects of major developments on the road network during their operation and not for short-term construction or decommissioning. In the absence of guidance, these guidelines have been used to assess the short-term construction and Decommissioning phases the Development. On roads where existing traffic levels are generally low, any increase would be higher than the Guidelines and in such cases, it is necessary to consider the overall increase in traffic flows and the capacity of the road before making a conclusion on effects.

Table 14.3: Magnitude of Change

Magnitude of Effect	Description
Significant	The Development could result in a change of length or duration to the current traffic routes or schedules which could result in hardship.
Moderate	The Development could result in delays or the need to reschedule which may cause inconvenience.
Slight	The Development could occasionally cause minor modifications to routes, or slight delays in current schedules, or on activities in the short-term.

³ The Institute of Environmental Management and Assessment (1993), Guidelines for the Environmental Assessment of Road Traffic

Magnitude of Effect	Description
Imperceptible	The Development does not cause an effect on movement of road traffic above normal levels.

14.2.9 Significance of Effects

The magnitude of the effect on the road network will determine the significance of any effects associated with the increase. An increase in traffic flows on existing roads with a low level of service which are experiencing capacity issues will result in significant effects on the road network. An assessment has been made of the significance of effects taking into account the sensitivity of the receptor, effect magnitude, duration, and the likelihood of the effect. In the absence of traffic data for all road links and junctions on the Haul Route, professional judgement, knowledge of the area from previous projects and experience on similar projects have been used to assess the significance of effects.

14.3 BASELINE DESCRIPTION

14.3.1 Site Location, Context and the Development

The proposed Wind Farm site is located in the townlands Ballynaguilkee Upper, Broemountain, Corradoon, Dyrick, Lickoran, Lickoranmountain, Lisleagh, Lisleaghmountain, Lyrattin and Scartmountain in County Waterford. The Site is located 43km west of Waterford City, and 55km northeast of Cork City. The Wind Farm will consist of 12 No. wind turbines with a rotor diameter of 162m and 110kV electrical substation. Each turbine will be erected on an insitu concrete foundation with steel reinforcement and will have a crane hardstand constructed from granular material, the crane hardstand will be used to store turbine components and to support a crane during the erection of the turbine. Each turbine hardstand will be linked to the site entrance on the R671 by a network of access roads constructed from granular materials with associated drainage and fencing. The turbines will be linked to the onsite substation by electrical cabling laid in buried ducts alongside the access road. The substation will be linked to the national grid via a 110kV underground cable connection approximately 16.013km in length to the existing ESB Dungarvan 110kV GIS Substation. Due to the limited environmental constraints on the windfarm all surplus material will be stored on site at specified spoil deposition areas and used to backfill the onsite borrow pit. The Location and layout of the wind farm site is shown on **Figure 14.2**. The location of the 110kV grid connection is shown on **Figure 14.3**.

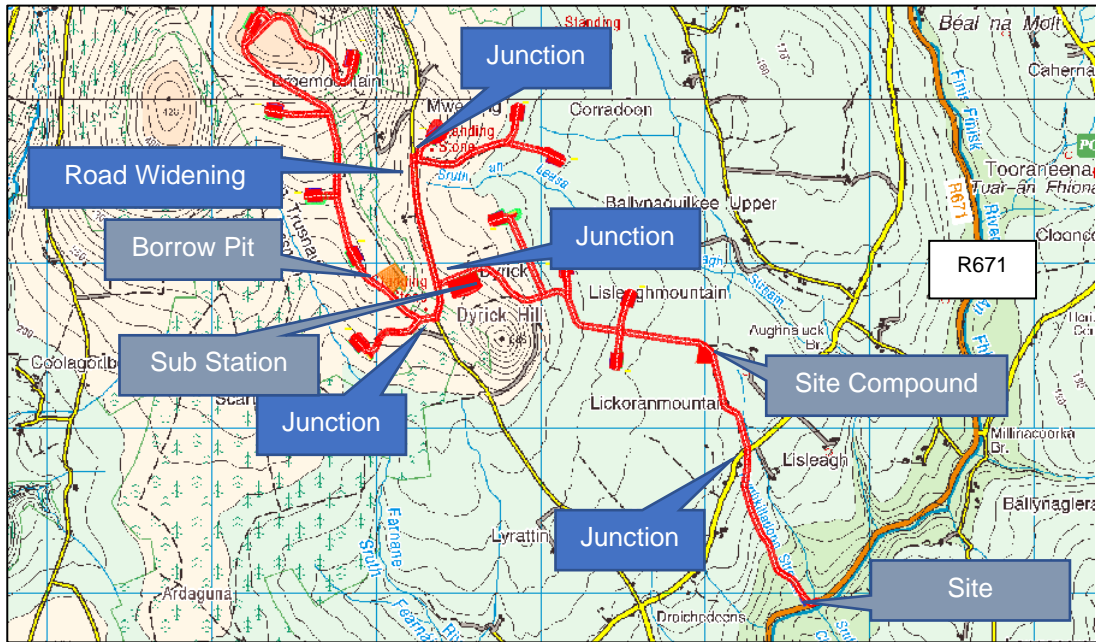


Figure 14.2: Wind Farm Site Location

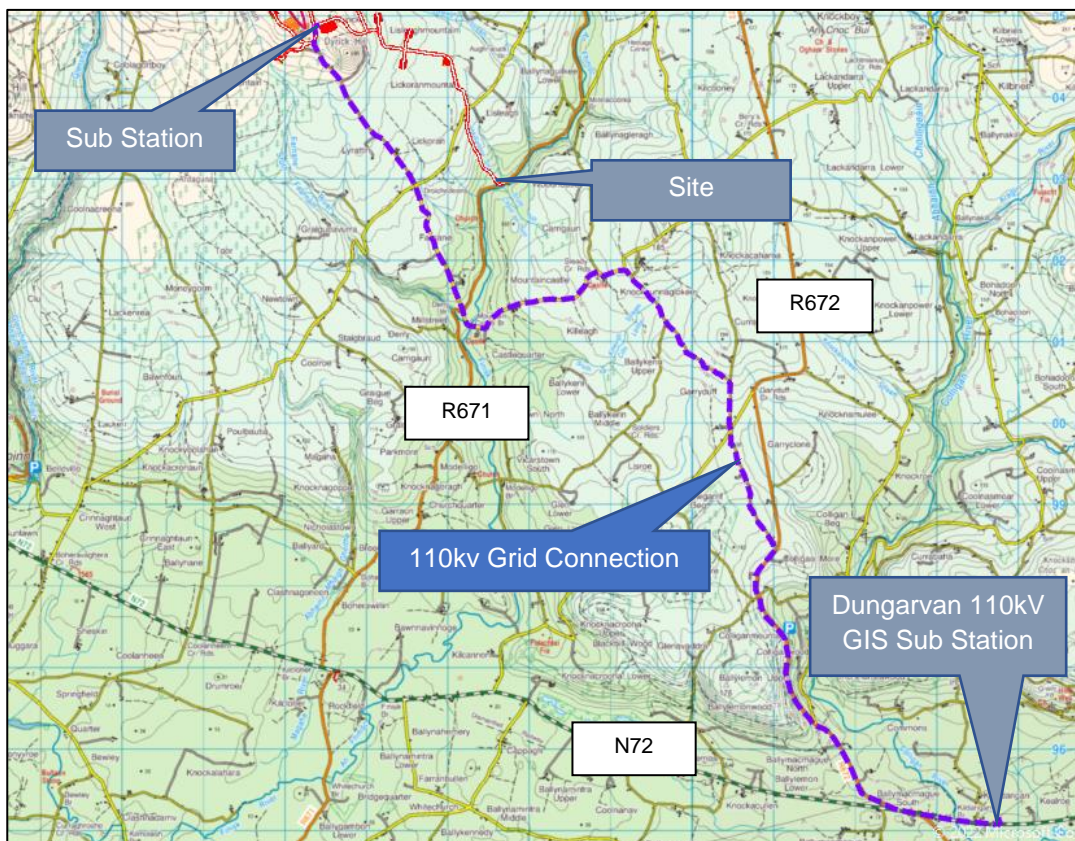


Figure 14.3: 110kV Grid Connection

It is proposed that the turbine components including rotor blades, towers, nacelles, hubs and drivetrains will be landed by ship and stored for transportation at Belview Port (Waterford Port). From there, they will be transported to the Site using specialised abnormal

load vehicles. Turbine delivery vehicles will travel to site using the N29 national primary road travelling northwest, will join the N25 national primary road and then the N72 national secondary road. Delivery vehicles will join the R672 regional road at the N72 / R672 junction and the L5071 local road at its junction with the R672. Turbine delivery vehicles will join the R671 at its junction with the L5071 and continue to the wind farm site entrance on the R671. The proposed haul route for turbine delivery traffic is shown on Figure 14.4, the turbine delivery haul route in the vicinity of the site is shown on Figure 14.5. Detailed analysis of the proposed turbine haul route between Belview port and the R761 have been carried out by Pell Frishmann Ltd and are included in the Abnormal Indivisible Load Route Review in **Appendix 14.1**. Detailed analysis of the proposed turbine haul route between the R761 and the site entrance have been carried out by Jennings O'Donovan and are included in **Appendix 14.2**.

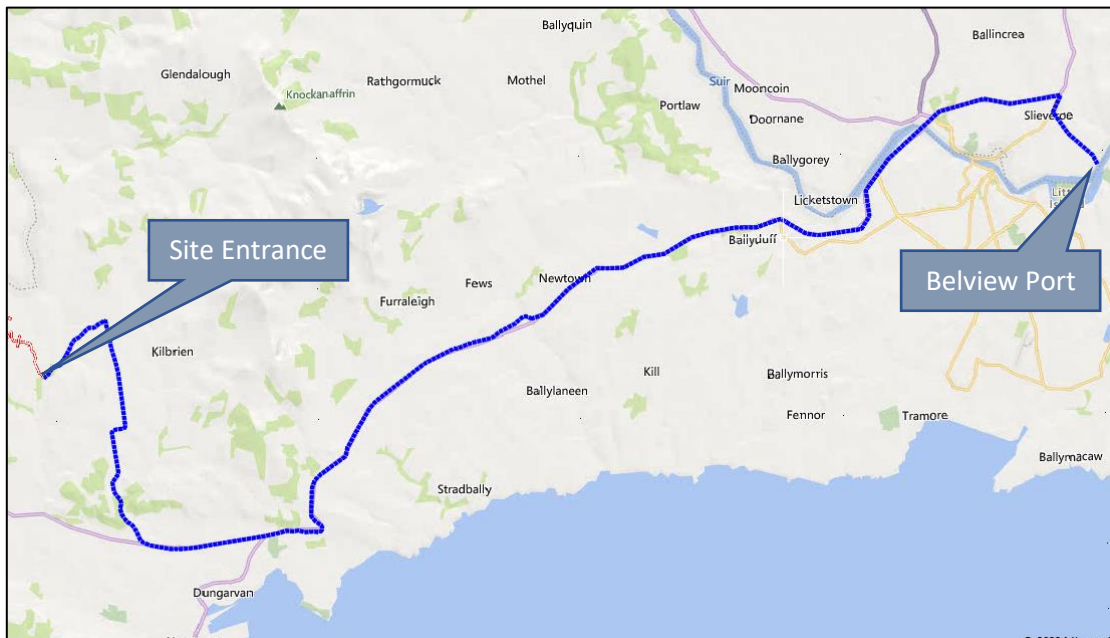


Figure 14.4: Turbine Delivery Haul Route

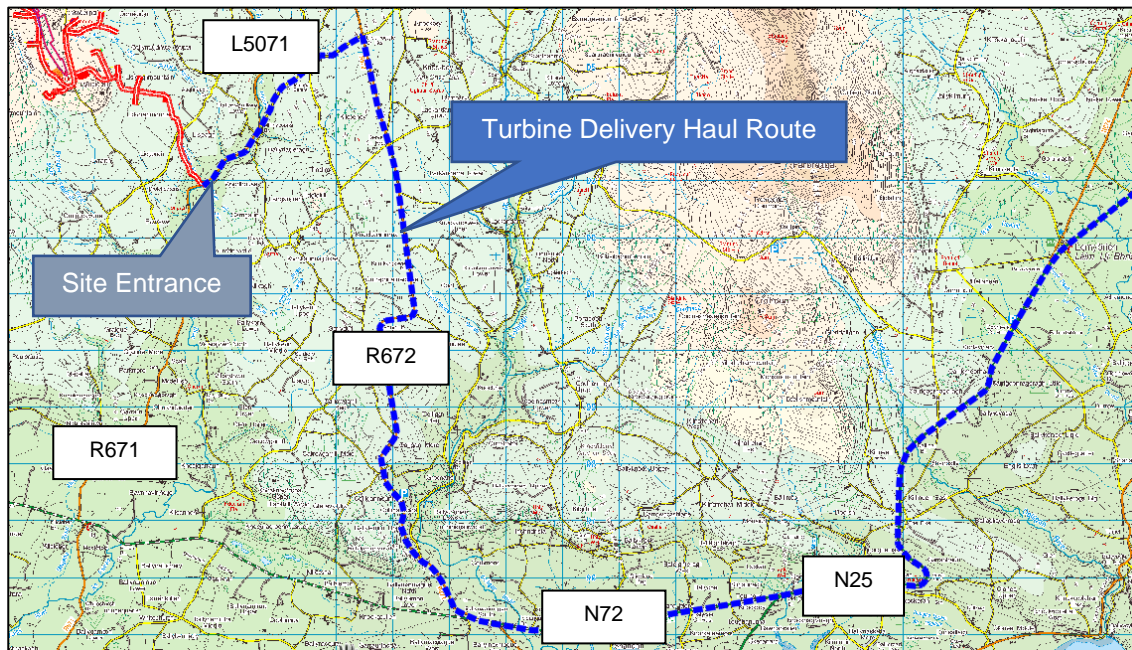


Figure 14.5: Turbine Delivery Haul Route from N25 to Site

The haul route for wind farm construction traffic will use the national and regional road network to access the site. The use of local roads for construction traffic will be prohibited unless the local road is part of an agreed haul route or provides access to a licenced suppliers facility. Haul roads for general construction traffic is shown in **Figure 14.6**. Earthworks calculations carried out for the wind farm site have shown that the majority of granular materials for Site Access Track and Turbine Hardstand construction will be sourced from excavations and from the borrow pit within the Site. It is also envisaged that ready-mix concrete for Turbine Foundation construction and Substation foundations will be sourced from a local authorised quarry located along the N72 road corridor. The location of aggregate suppliers, concrete suppliers and waste disposal facilities in the vicinity of the proposed wind farm are shown in **Figure 14.7**. Distances to concrete and aggregate suppliers from the wind farm site are shown in **Table 14.4**. Construction workers will use the Site entrance on the R671 to access the site but will need to have flexibility in the roads they use to reach the Site.

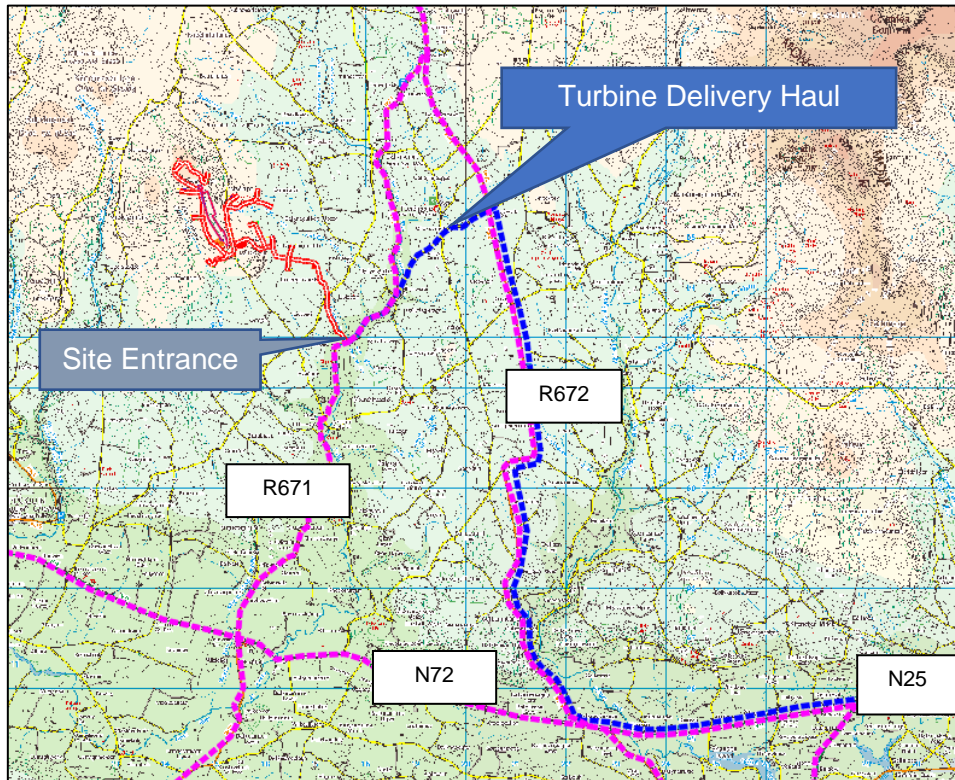


Figure 14.6: Construction Haul Route



Figure 14.7: Concrete and Aggregate Suppliers

Table 14.4: Distances to local quarry sites.

Quarry	Distance
Roadstone Cappagh	10.5km
Kereen Quarry	11.6km
Gleeson Quarries	56.6km
Corbett Concrete	31.0km
Lagan Products	58.7km

14.3.2 Sensitive Receptors

The Site is generally served by the N72 national secondary road and the R671, R672 regional roads. The N72 runs in an east-west direction from its junction with the N25 near Dungarvan to the N70 in Killorglin in County Kerry. The R671 runs in a north-south direction from the N25 to its junction with the R672 and will be used by all construction traffic to access the site. The R672 runs in a north-south direction from Dungarvan to Cappaquin. The construction of the wind farm will require works to be carried out on the public road network which may impact on sensitive receptors listed in **Table 14.5**. The works on the public road network and their potential impact on sensitive receptors are listed in **Table 14.6**. Mitigation measures to reduce the impact of construction works at isolated locations on the public road network are discussed in detail in **Section 14.6** of this chapter and summarised in **Table 14.7**.

Table 14.5: Works Location and Potential Impact on Sensitive Receptors

Construction Activity	Potential impact on Sensitive Receptors	Impact of works on Sensitive Receptors and Public Road Users
Construction of R671 Site Entrance	Low Impact / Short Term	Increased journey times due to traffic management. Increased Noise and vibration due to construction works
Construction of Local Road Junctions at intersections with wind farm access roads, 4 No. Locations	Low Impact / Short Term	Increased journey times due to traffic management and traffic diversions. Increased Noise and vibration due to construction works
Local Road Widening for turbine delivery within the site.	Low Impact / Short Term	Increased journey times due to traffic management and traffic diversions. Increased Noise and vibration due to construction works
HGV and Abnormal Load Vehicle Deliveries to Site	Low Impact / Medium term	Increased journey times due to slow-moving traffic.
Construction of 38kV Grid Connection between Site and	Medium Impact / Medium Term	Increased journey times due to traffic management and traffic diversions.

Construction Activity	Potential impact on Sensitive Receptors	Impact of works on Sensitive Receptors and Public Road Users
Dungarvan 110kV Substation.		Increased Noise and vibration due to construction works involving saw cutting, excavation, trench reinstatement and surfacing.
Haul Route Enabling Works at Exit from Belview Port	Medium Impact / Short Term	Parking Restrictions at Port. Increased noise and vibration from construction activities during surfacing works, alterations to traffic islands and fencing.
Haul Route Enabling Works at N29 Slieverue Roundabout	Medium Impact / Short Term	Increased journey times due to traffic management required to modify the roundabout central island. Increased noise and vibration due to construction activities during surfacing works, removal of signs and street furniture.
Haul Route Enabling Works at N25 Luffany Roundabout	Medium Impact / Short Term	Increased journey times due to traffic management required to modify the roundabout central island and approach islands. Increased noise and vibration due to construction activities during surfacing works, removal of signs and street furniture.
Haul Route Enabling Works at N25 Carrick Road Roundabout	Medium Impact / Short Term	Increased journey times due to traffic management required to modify the roundabout central island and approach islands. Increased noise and vibration due to construction activities during surfacing works, removal of signs and street furniture.
Haul Route Enabling Works at N25 / N72 Junction	Medium Impact / Short Term	Increased journey times due to traffic management required to modify the junction. Increased noise and vibration due to construction activities during surfacing works and modifications to street furniture.
Haul Route Enabling Works at N72 / R672 Junction	Medium Impact / Short Term	Increased journey times due to traffic management required to modify junction and to remove traffic bollards at the junction. Increased noise and vibration due to construction activities during surfacing works and modifications to street furniture.
Haul Route Enabling Works on the R672 regional Road – Various Locations	Medium Impact / Short Term	Increased journey times due to traffic management required for road widening, strengthening works, hedge trimming, boundary realignment and modifications to signs and street furniture. Increased noise and vibration due to construction activities during surfacing works and modifications to boundaries and street furniture.
Haul Route Enabling Works at R672 / L5071 Junction	Medium Impact / Short Term	Increased journey times due to traffic management required to modify junction, realign fencing and tree removal. Increased noise and vibration due to construction activities during surfacing works and modifications to boundaries, trees and vegetation.
Haul Route Enabling Works on the L5071 Various Locations	Medium Impact / Short Term	Increased journey times due to traffic management required for road widening, strengthening works, hedge trimming, boundary realignment and modifications to signs and street furniture.

Construction Activity	Potential impact on Sensitive Receptors	Impact of works on Sensitive Receptors and Public Road Users
		Increased noise and vibration due to construction activities during surfacing works and modifications to boundaries and street furniture.
Haul Route Enabling Works at L5071/ R671 Junction Finsk Bridge	Medium Impact / Short Term	Increased journey times due to traffic management required for bridge parapet alterations, road widening, strengthening works, hedge trimming, boundary realignment and modifications to signs and street furniture. Increased noise and vibration due to construction activities during surfacing works, modifications to bridge parapets and modifications to boundaries and street furniture.
Haul Route Enabling Works at on the R671	Low Impact / Short Term	Increased journey times due to traffic management required for hedge and tree trimming.

Table 14.6: Sensitive Receptors

Receptor	Sensitivity	Reason for Inclusion
Hospitals, Medical Centres	High	Medical centres are likely to be highly sensitive to changes in traffic density, noise and vibration from HGVs and construction activities. Access will be required at all times for general and emergency access
Private dwellings located along the haul routes	High	There are numerous residential properties which front directly on to the proposed Haul Route (for Turbine Components) and proposed Civil Construction Haul Route. Residents of these properties are likely to require unrestricted access to the roads in order to access their place of employment and/or local services. These properties are also likely to be highly sensitive to changes in traffic density, noise and vibration from HGVs etc.
Care Homes	High	Care Homes are likely to be highly sensitive to changes in traffic density, noise and vibration from HGVs and construction activities. Access will be required at all times for general and emergency access
Schools	High	Schools are likely to be highly sensitive to changes in traffic density, noise and vibration from HGVs and construction activities during school hours. Access will be required at all times
Churches	Moderate	Churches are likely to be sensitive to noise and vibration from HGVs and construction activities during church services. Access will be required at all times.
Hotels and B&B's	Moderate	Hotels and B&Bs are likely to be sensitive to noise and vibration from HGVs and construction activities. Access will be required at all times.
Businesses and Shops	Moderate	Businesses and Shops are likely to be sensitive to noise and vibration from HGVs and disruption from construction activities during business hours. Access will be required at all times.
Farms	Low	Farm operations may be sensitive to noise and disruption from construction activities

Receptor	Sensitivity	Reason for Inclusion
Public Amenities	Low	Entrance to public amenities may be sensitive to disruption from construction activities

Table 14.7: Mitigation Measures for Isolated Works Carried out on the Public Road Network

Item	Mitigation Measure
Public Safety	All works on the public road network shall be carried out under a road opening licence and an approved traffic management plan. The location of works shall be signposted in accordance with the Traffic Signs Manual. Works shall be carried out within a dedicated work zone and fenced to prevent unauthorised access.
Public and Emergency Access	Access for the public and emergency services shall be provided at all times through the works.
Public liaison	The contractor shall appoint a liaison officer who will inform the public of the location and expected duration of works on the public road network.
Vehicle noise, emissions, and loading	All vehicles used during the construction, operation and decommissioning phases of the wind will be road legal vehicles subject to HCV, LCV, ADR and NCT requirements for noise, axle loading and emissions.
Haul routes for construction traffic	Construction vehicles will be prohibited from using the local road network and will use the national and regional road network to access the wind farm site.
Parking for construction Vehicles	Construction vehicles shall be parked in dedicated parking areas within the work zone when working on the public road.
Noise, vibration and dust	Works on the public road will be carried out during normal working hours in order to minimise disruption from noise and vibration. Dust and debris resulting from construction activities shall be controlled by wetting down and street sweeping.
Traffic delay	Turbine deliveries will be carried out during off peak hours at times agreed with An Garda Siochana and Waterford City and County Council to minimise disruption. The movement of abnormal loads to site will be subject to abnormal load permits and vehicles will be escorted by support teams and An Garda Siochana who provide routine and emergency traffic management for the convoy vehicles in sensitive areas.

14.3.3 Road Access to the Site

Access to the wind farm site will be from a new priority T-junction constructed on the R671. The junction will be constructed to accommodate the swept path of abnormal load vehicles accessing the site during the delivery of turbine components. The junction will be a stop-controlled junction with priority for N59 traffic. Visibility splays of 160m will be available in both directions from a 3.0m setback in accordance with TII specifications. The location of the junction will be signposted in accordance with Chapter 8 of the Traffic Signs Manual during the construction of the wind farm. The location of the wind farm site entrance junction is shown on **Figure 14.2**, the layout of the site entrance junction is shown in **Figure 14.8**.



Figure 14.8: Site Entrance Junction

14.3.4 Scoping Responses and Consultation

Consultation responses are shown in **Table 14.8**.

Table 14.8: Consultation Responses

Consultee	Type & Date	Summary of Response	Response to Consultee
Transport Infrastructure Ireland (TII)	Email 22/04/2022	<p>With respect to grid connection routing proposals crossing the N72, TII provides the following observations:</p> <ul style="list-style-type: none"> TII notes with concern the grid connection proposals which seek to utilise the existing N72, national road, as a cable route. <p>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.</p> <p>There is around 99,000km of roads in Ireland, the national road network which caters for strategic inter-urban travel consists of only approximately 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.</p> <p>The provision of cabling along the national road network represents a number of significant</p>	

Consultee	Type & Date	Summary of Response	Response to Consultee
		<p>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. Therefore, TII advises that grid connection cable routing should seek to utilise available alternatives, as opposed to the strategic national road network contrary to the provisions of official policy.</p> <p>In addition,</p> <p>TII advises:</p> <ul style="list-style-type: none"> • 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. • Grid connection and cable routing proposals should also 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 national road scheme. In that regard, consideration should be given to routing options, use of existing crossings, depth of cable laying, etc. Consultations should be had with the relevant Local Authority/National Roads Design Office with regard to locations of existing and future national road schemes; N72. <p>In relation to the general project scoping/pre-planning, the recommendations indicated below provide general guidance:</p> <ul style="list-style-type: none"> • 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 	

Consultee	Type & Date	Summary of Response	Response to Consultee
		<p>impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of the NRA/TII TTA Guidelines which addresses requirements for sub-threshold TTA. Any improvements required to facilitate development should be identified. It will be the responsibility of the developer to pay for the costs of any improvements to national roads to facilitate the private development proposed as TII will not be responsible for such costs,</p> <ul style="list-style-type: none"> • In the interests of maintaining the safety and standard of the national road network, methods/techniques proposed for any works traversing/in proximity to the national road network should be identified, • TII recommends that the applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed. Where abnormal 'weight' loads are proposed, separate structure approvals/permits and other licences may be required in connection with the proposed haul route and all structures on the haul route through all the relevant County Council administrative areas should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal 'weight' load proposed. <p>The national road network is managed by a combination of PPP Concessions, Motorway Maintenance and Renewal Contracts (MMaRC) and local road authorities in association with TII.</p> <p>The applicant/developer should also consult with all PPP Companies, MMaRC Contractors and road authorities over which the haul route traverses to ascertain any operational requirements such as delivery timetabling, etc. and to ensure that the strategic function of the national road network is safeguarded.</p> <p>Additionally, any damage caused to the pavement on the existing national road arising from any temporary works due to the turning movement of abnormal 'length' loads (eg. 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.</p>	
<p>Waterford City & County Council Roads Department</p>	<p>Email 11/04/2022</p>	<ul style="list-style-type: none"> • The TIA, RSA etc. should address concerns in relation to construction traffic, oversized loads, passing bays and road damage particularly on the local roads. • Haul routes- The EIAR shall record the roadside/field boundary types and ecological 	

Consultee	Type & Date	Summary of Response	Response to Consultee
		corridors along proposed haul routes and assess how they will be impacted by transport of proposed wind energy infrastructure i.e. sections of realignment, loss of hedgerows, mitigatory planting etc .	

14.3.5 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 measuring 79m in length will be delivered on an extendable semi-trailer, one per trailer. Approximately 15.0m of the blade will over- hang the rear of the trailer. Following delivery to the site, the trailer will be retracted for the return trip. An indicative blade delivery vehicle schematic is shown in **Plate 14.1** below.

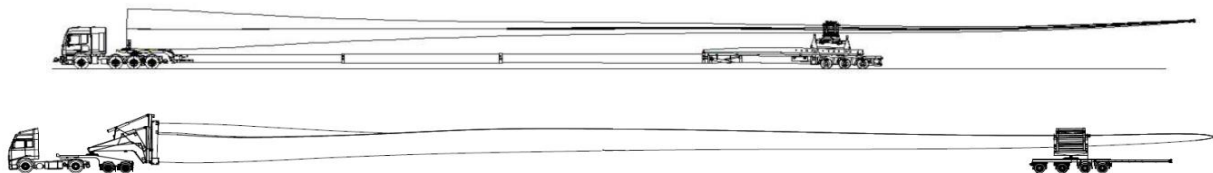


Plate 14.1: Indicative Turbine Delivery Vehicle for Turbine Rotor Blades

Wind turbine blades may be delivered to site using a blade lifter vehicle. The use of a blade lifter vehicle will reduce the extent of widening and strengthening works required at junctions and acute bends on the haul route due to its reduced wheelbase and ability to adjust the blade in the vertical plane. Each turbine tower will be delivered to site in four sections on extendable semi-trailers, the tower sections range in length from 20.0m to 35.00m with a maximum width of 4.5m. An indicative tower transporter vehicle is shown in **Plate 14.2**.

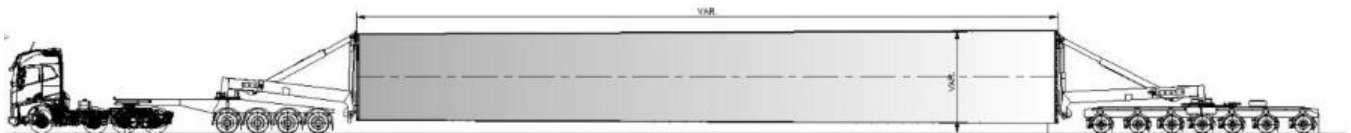


Plate 14.2: Indicative Turbine Tower Section Delivery Vehicle

All material deliveries will have a maximum axle load of up to 12 tonnes per axle, and a maximum total truck weight 65 tonnes approx. The main crane for turbine erection will have a maximum axle loading of 12 tonnes per axle and a maximum total weight of 100 tonnes approx. Vehicles delivering counter-weights for the crane will have a maximum axle loading

of up to 12 tonnes per axle. The transport vehicles used for transportation of components may differ from those shown above depending on the haulage contractor's preferences.

14.3.6 Existing and Forecast Traffic Volumes

Jennings O'Donovan & Partners carried out classified traffic counts at three locations in the vicinity of the proposed wind farm to determine baseline traffic volumes and junction capacity on the public road network at locations which will be directly affected by construction traffic during the wind farm construction period. The traffic count periods were selected using information from the TII automatic traffic counter at Drumroe which is located on the N72 between Dungarvan and Cappoquin to the west of R671 / N72 junction. Data from the TII traffic counter taken during an average workday in May 2022 is shown in **Table 14.9**. The traffic data shows that peak traffic occurs at 08.30 in the morning and at 17.30 in the evening. HGV traffic accounts for approximately 5.0% of the total traffic volume on the N72 near the R671 junction.

The locations of the classified traffic counts are shown in **Figure 14.1**. The classified traffic counts were carried out during the morning and evening peak hour traffic periods obtained from the TII traffic counter to record maximum traffic levels on the road network. The classified traffic counts were carried out at the following locations:

- R672 / R671 Junction 1
- N72 / R671 Junction 2
- N72 / R672 Junction 3

Existing traffic volumes on the R671, R672 and N72 were obtained from the classified traffic counts carried out by JOD in October 2022. 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 N72, R671 and R672 are calculated as follows:

The R671 regional road has an AADT of 360 vehicles near its junction with the R672 which equates to a two-way traffic flow of 31 vehicles during peak hour traffic periods. The R671 has an AADT of 965 vehicles near its junction with the N72 which equates to a two-way traffic flow of 83 vehicles during peak hour traffic periods. HGV traffic accounts for approximately 15% of the total traffic on the R671 between the N72 and the R672. The R672 regional road has an AADT of 2,965 vehicles at its junction with the R671 corresponding to a two-way traffic flow of 255 vehicles during peak hour periods. The R672 regional road has an AADT of 3,800 vehicles to the north of the N72 junction. which equates to a two-way traffic flow of 350 vehicles during peak traffic periods. HGV traffic accounts for approximately 12% of the total traffic on the R672 between the N72 and the R671. The N72

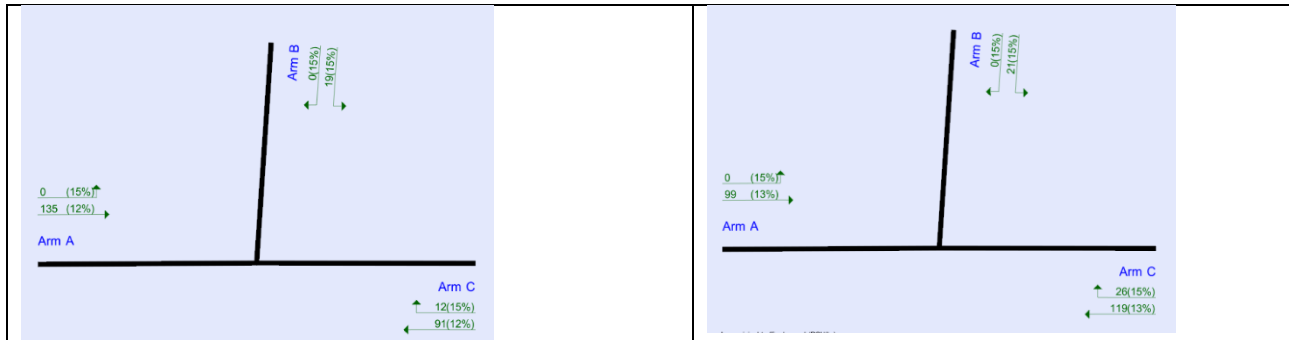
national secondary road has an AADT of 7,070 to the east of the R672 junction, 9,380 between the R672 and R671 junctions and 5,970 to the west of the R671 junction. HGV traffic accounts for approximately 5% of the total traffic on the N72.

Traffic analysis carried out at the R671 / R672 junction, R671 /N72 and the R672 / N72 junction show that the junctions are operating within capacity and can accommodate additional traffic growth in the future. A summary of the analysis is shown in **Table 14.9**.

Table 14.9: N59 Traffic Volumes 2022

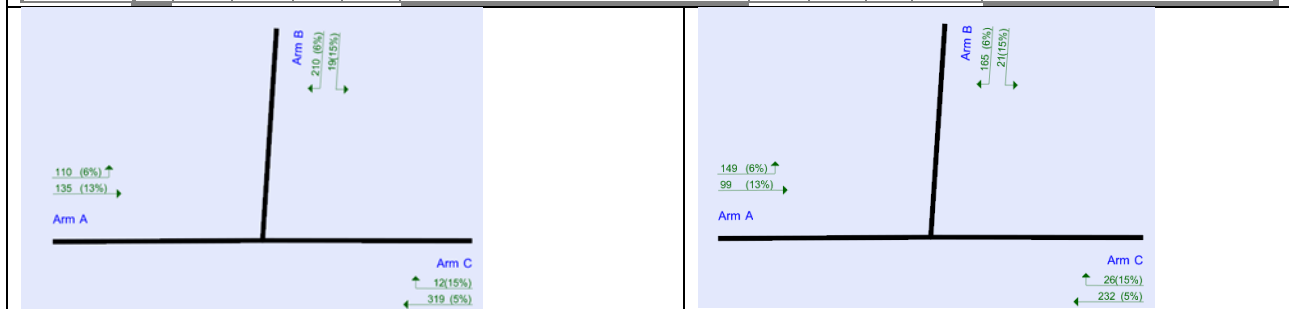
Time	Eastbound	Westbound	Total Traffic	HGV Traffic
07.00 – 08.00	184	140	324	19
08.00 – 09.00	275	189	464	25
09.00 – 10.00	189	142	331	26
10.00 – 11.00	169	138	307	24
11.00 – 12.00	166	151	317	19
12.00 – 13.00	173	167	340	18
13.00 – 14.00	175	177	352	17
14.00 – 15.00	191	196	387	20
15.00 – 16.00	209	212	421	20
16.00 – 17.00	209	247	456	18
17.00 – 18.00	218	280	498	16
18.00 – 19.00	166	224	390	12
19.00 – 20.00	114	144	258	7

R671 / R672 Junction – 2022 Analysis and Turning Movements																
	AM								PM							
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
R671 / R672 Junction - 2022 - Baseline Traffic																
Stream B-AC	D1	0.0	7.72	0.04	A	0.91	A	768 % [Stream B-AC]	D2	0.0	7.62	0.04	A	1.34	A	584 % [Stream C-AB]
Stream C-AB		0.0	6.32	0.02	A					0.1	6.25	0.05	A			



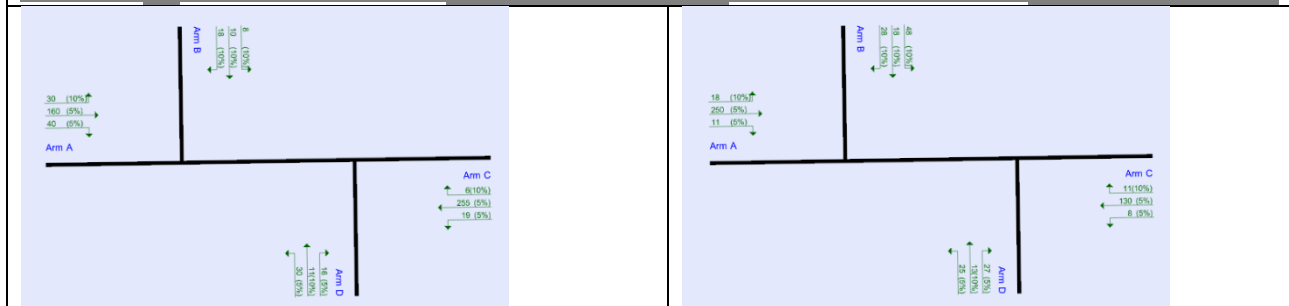
N72 / R672 Junction – 2022 Analysis and Turning Movements

		AM							PM							
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
N72 / R672 Junction - 2022 - Baseline Traffic																
Stream B-AC	D1	2.0	29.95	0.66	D	8.65	A	6 %	D2	1.1	20.14	0.52	C	5.73	A	30 %
Stream C-AB		0.0	5.40	0.03	A					0.1	5.88	0.06	A			



N71 / R672 Junction – 2022 Analysis and Turning Movements

		AM							PM									
	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
N72 / R671 - 2022 - Baseline Traffic																		
Stream B-ACD	D1	0.1	0.5	9.49	0.09	A	1.28	A	180 %	D2	0.3	1.4	10.40	0.23	B	1.89	A	129 %
Stream AB-CD		0.2	~1	6.01	0.11	A					0.1	~1	5.11	0.07	A			
Stream D-ABC		0.2	0.5	8.94	0.13	A					0.2	0.5	9.16	0.15	A			
Stream CD-AB		0.1	~1	5.81	0.05	A					0.1	~1	6.68	0.06	A			



14.3.7 Predicted Future Traffic Volumes

TII publication PE-PAG-20217 forecasts traffic growth for regions in Ireland by applying growth factors to baseline traffic volumes to predict future traffic flows. TII forecast annual

traffic demand in the Waterford region to increase by 1.7% for light good vehicles and 3.6% for HGV's using the "Central Growth" scenario. Forecast traffic demand on the N72 national secondary road and the R671, R672 regional roads are shown in **Table 14.10**. Traffic projections on the public roads are used for analysis in conjunction with traffic generated by wind farm construction to determine if junctions will continue to operate within capacity in 2024/25 when wind farm construction is likely to occur.

Table 14.10: Future Traffic Growth on The Public Road Network

Year	N72 Without Development			R671 Without Development			R672 Without Development		
	AADT	HGV's Per Hour	%HGV	AADT	HGV's Per Hour	%HGV	AADT	HGV's Per Hour	%HGV
2022	9,380	40	5.0%	965	12	15.0%	3,800	42	12.0%
2023	9,540	41	5.00%	980	13	15.00%	3,865	43	12.00%
2024	9,700	42	5.00%	998	14	15.00%	3,930	44	12.00%
2025	9,865	43	5.00%	1,015	15	15.00%	3,997	45	12.00%

14.4 PROPOSED WORKS

14.4.1 Construction Phase

The construction period of the Development is anticipated to take approximately 20 months. The majority of HGV deliveries to Site will take place during the first 14 months of the project and will be associated with site road and turbine hardstand construction, construction of turbine foundation bases and substation building.

It is expected that construction hours will be between 07:00 and 19:00 Monday to Friday and 07:00 – 13:00 on Saturdays with no working on Sundays or on Bank or Public Holidays unless agreed otherwise with Waterford City and County Council. Some special deliveries such as turbine components and concrete for Turbine Foundations may be required to be delivered outside of these times in consultation with Waterford City and County Council.

14.4.2 Turbine Component Haul Route

Modifications to the public road network for the transportation of abnormal loads, between Waterford Port and the Site, will be required to facilitate turbine component deliveries. Works will include verge widening / strengthening, alterations to roundabouts, bridges and junctions, temporary removal of street furniture and signage. The works are described in detail in the Abnormal Indivisible Load Route Review report prepared by Pell Frischmann included in **Appendix 14.1**.

14.4.3 110kV Grid Connection Works

The construction of the 110kV grid connection will be carried out in the public road network. Grid connection works will be carried out under a number of phased operations which will involve traffic management. The first phase of the works will involve the excavation of a 0.6m wide cable trench, construction of 2m wide x 6m long joint bays, installation of cable ducting, backfilling of trench and temporary reinstatement of road surfacing.

The second phase of the works will involve installing the 38kV cable in the ducting. During the cable installation, traffic management will be required at the joint bays to allow cable pulling and jointing. The final phase of the works will involve permanent reinstatement of the road surfacing and surface dressing.

14.5 ASSESSMENT OF POTENTIAL EFFECTS

14.5.1 HGV Deliveries

The estimated timescale for the completion of the construction phase is 20 months, inclusive of all works to site access tracks, turbine hardstands, drainage, Substation building, grid connection works and erection and commissioning of turbines. **Table 14.11** contains details of the estimated HGV deliveries to the Site during the construction period. The expected HGV volumes are based on trips generated during the construction of similar sized wind farms and will be subject to amendment based on local conditions and contractors working practices.

Table 14.11: HGV and Abnormal Load Deliveries

Materials	Quantity	No. Of Deliveries	Timeframe (Week)	Maximum Loads / Day	Vehicle Type
Mobilise on Site		15	1	5	OGV1
Construction of Site Compound	200m ³	20	1-2	10	OGV2
Rock for Site Access Tracks and Turbine Hardstands	20,000m ³	2,000	2-56	10	OGV2
Site Drainage and Fencing		40	4-56	2	OGV2
Ready Mix Concrete for turbine Foundations	9,768m ³	1,221	8-56	102	OGV2
Steel Reinforcement for Turbine Foundations	1,080T	54	8-56	5	OGV2
Foundation Bolts	12 Turbines	12	8-56	1	OGV2

Materials	Quantity	No. Of Deliveries	Timeframe (Week)	Maximum Loads / Day	Vehicle Type
Substation Building Materials		15	8-28	1	OGV2
Electrical Switchgear		2	26-36	1	OGV2
Electrical Cables		10	6-56	1	OGV2
Grid Connection Works	18.6km	2400	10-60	12	OGV2
Wind Turbine Components	12 Turbines	120	50-64	3	OGV2
Crane		10	50	5	OGV2
Reinstatement and Demobilisation		25	70-80	5	OGV2
Total		5,944			

It is estimated that, during the wind farm construction, an approximate total of 5,944 loads of material and building supplies will be delivered and removed from the Site. The majority of granular materials for access road and turbine hardstand construction will be sourced from the onsite borrow pit, site excavations and processed on site. The majority of HGV movements to and from site will occur during the first fourteen months of the construction period and will be associated with the construction of site roads, turbine hardstands and turbine foundations.

Table 14.12 shows a schedule of maximum predicted daily traffic movements to site over a 20-month period. This is a worst-case scenario assuming construction will be completed in 20 months.

Table 14.12: Schedule of Maximum Predicted Daily Traffic Movements to Site Over 20 Month Construction Period

Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17 to 20
Mobilise on Site	5																
Construction of Site Compound	10																
Rock for Site Access Tracks and Turbine Hardstands	10	10	10	10	10	10	10	10	10	10	10	10	10	10			
Site Drainage and Fencing		2	2	2	2	2	2	2	2	2	2	2	2	2			
Ready Mix Concrete for			102	102	102	102	102	102	102	102	102	102	102	102			

Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17 to 20
turbine Foundations																	
Steel Reinforcement for Turbine Foundations			5	5	5	5	5	5	5	5	5	5	5	5			
Foundation Bolts			1	1	1	1	1	1	1	1	1	1	1	1			
Substation Building Materials			1	1	1	1	1										
Electrical Switchgear							1	1	1								
Electrical Cables			1	1	1	1	1	1	1	1	1	1	1	1			
Grid Connection Works			12	12	12	12	12	12	12	12	12	12	12	12	12		
Wind Turbine Components												3	3	3	3	3	
Crane												5					
Reinstatement and Demobilisation																	5
Total	25	12	134	134	134	134	135	134	134	133	133	141	136	136	15	3	5

Weeks 1 to 8 will involve deliveries of materials for site access works, site access tracks, site compound, site offices, site security, and drainage. This period will include deliveries of fencing materials for site boundaries and compounds, temporary fencing to protect trees, hedges and ecological buffer zones where necessary, road construction materials for access tracks and site entrance, 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 period of weeks 1 to 8.

Weeks 8 to 56 will involve deliveries of materials for site access works, turbine hardstand, turbine foundations, site access tracks, substation building and cable / ducting works, turbine component delivery and 110kV grid connection works. This period will include deliveries of fencing materials for site boundaries, road construction materials for access tracks, site entrances and turbine hardstands, ready mix concrete and steel reinforcement for turbine foundations. It is anticipated that a maximum of 39 HGV vehicles (78 HGV movements) will visit the site on a daily basis during the period of weeks 8 to 56 with an additional 102 HGV vehicles (204 HGV movements) delivering concrete for turbine

foundations on twelve separate days during the forty eight week period between weeks 8 to 56.

Weeks 56 to 80 will involve HGV movements for works associated with turbine delivery, turbine erection, turbine commissioning, electrical works, site landscaping and the removal of temporary works materials such as offices and fencing from site. It is anticipated that a maximum of 15 HGV vehicles (30 HGV movements) will visit the site on a daily basis during the period of weeks 56 to 80.

The expected HGV volumes are based on earthworks calculations and traffic profiles generated by similar sized wind farms and will be subject to amendment based on local conditions and contractor working practices.

Based on the indicative timetable outlined above the peak times for HGV deliveries per day will be months 3 to 14 when site access roads, Turbine Hardstands and Turbine Foundations will be constructed.

Increased volumes of traffic will be generated by the proposed development during the construction period. Peak traffic generated by the development will correspond to the construction of turbine foundations and will occur during twelve days within the 20 month construction period when the development will generate a maximum of 141 HGV trips (282 HGV movements) and 60 LGV (120 traffic movements) at the R671 site entrance. Outside these times, construction traffic will typically consist of 39 HGV trips (78 HGV movements) and 60 LGV (120 traffic movements) at the R671 site entrance. Development traffic will be distributed throughout the day with morning, afternoon and evening peaks. The distribution of daily development traffic is shown in **Table 14.13** during the construction of turbine foundations.

Table 14.13: Development Traffic Profile

Time	Arrivals		Departures	
	HGV	LGV	HGV	LGV
06.00 – 07.00		30		
07.00 – 08.00	15	25	15	
08.00 – 09.00	12	5	12	2
09.00 – 10.00	11		11	

Time	Arrivals		Departures	
	HGV	LGV	HGV	LGV
10.00 – 11.00	11		11	
11.00 – 12.00	11		11	
12.00 – 13.00	11		11	
13.00 – 14.00	11	5	11	5
14.00 – 15.00	14		14	
15.00 – 16.00	12		12	
16.00 – 17.00	11		11	
17.00 – 18.00	11	2	11	5
18.00 – 19.00	11		11	25
19.00 – 20.00				30

14.5.2 Works on the 110kV Grid Connection

The construction of the 110kV grid connection will be carried out under a number of phased operations which will involve traffic management. The first phase of the works will involve the excavation of a 0.6m wide cable trench, construction of 2m wide x 6m long joint bays, installation of cable ducting, backfilling of trench and temporary reinstatement of road surfacing. The second phase of the works will involve installing the 110kV cable in the ducting. During the cable installation traffic management will be required at the joint bays to allow cable pulling and jointing. The final phase of the works will involve permanent reinstatement of the road surfacing and surface dressing. The phased works will require traffic management to be removed and reinstalled a number of times over the course of the project. The works will be carried out under a road opening licence and traffic management plan approved by Waterford City and County Council. These works may have a slight, negative, temporary effect on residents, businesses and road users due to increased noise and vibration resulting from construction activities and increased journey times and delays due to temporary traffic management. However, these effects will be confined to a very short period during the construction phase, prior to the delivery of turbine components, and hence are not predicted to have a significant effect. Once works have been completed, the works will be reinstated to their pre-existing condition in accordance with the "Guidelines for Managing Openings in Public Roads" and the requirements of Waterford City and County Council .

14.5.3 Works on the Turbine Components Haul Route

Works on the turbine supply route are described in detail in the haul route report included in **Appendix 14.1**, works will be required at a number of locations along the Haul Route from Belview Port to the Site. The works will be carried out under a road opening licence and traffic management plan approved by Waterford City and County Council. These works may have a slight, negative, temporary effect on residents, businesses and road users due to increased noise and vibration resulting from construction activities and increased journey times and delays due to temporary traffic management. However, these effects will be confined to a very short period during the construction phase, prior to the delivery of turbine components, and hence are not predicted to have a significant effect. Once works have been completed, the works will be reinstated to their pre-existing condition in accordance with the requirements of Waterford City and County Council.

14.5.4 Light Vehicles/Vans and Construction Personnel

The number of staff on the Site will vary according to the phase of the construction works being undertaken on site. Staff numbers on site are expected to reach approximately 60 during Turbine Foundation construction. It is expected that the majority of workers will arrive onsite in mini-buses and crew vehicles which are used to transport teams of workers from the various contractors. Vehicle sharing will be actively encouraged to reduce vehicular movements. A number of additional unscheduled visits may be required throughout the construction period for Site inspections, Site meetings, and unforeseen circumstances.

It is expected that a maximum of 55-60 vehicles will visit the Site on a daily basis during the peak construction period (Turbine Foundation construction). Parking for staff will be provided at the Temporary Construction Compound on the wind farm site and at designated locations within the work zone during turbine haul route works on the public road network. No parking will be allowed for construction workers on the public road network in any other circumstance.

14.5.5 Air Quality

Good air quality is essential for the health and quality of life of residents in the vicinity of the wind farm site and along the Haul Route. Transport accounts for a significant proportion of pollutants in the atmosphere namely, CO₂ emissions, nitrogen dioxide (NO₂) and particulate matter (PM₁₀). NO₂ emissions can also be harmful to vegetation and ecosystems in the vicinity of the wind farm site and Haul Route. The increase in traffic movements on the regional and national road network will average approximately 160 (two way) trips per day

over a short-term period and therefore the effect of the Development on air quality will be imperceptible. Construction HGV's, LGV's and private vehicles are subject to government HCV, LCV, ADR and NCT emissions tests.

14.5.6 Noise and Vibration

There is likely to be some noise and vibration due to the predicted 5% increase in HGV movements along the Haul Route to the wind farm site which may cause disturbance to residents living along this road. Due to the relatively low number of trips generated per day in relation to existing traffic volumes on the national and regional road network, the restrictions on working hours and the short-term nature of the construction phase, the effects are not predicted to be significant. Construction HGV's, LGV's and private vehicles are subject to government HCV, LCV and NCT noise and suspension tests.

14.5.7 Pedestrians and Vulnerable Road Users

Pedestrian and other vulnerable road users may be affected by the works at the wind farm site entrance, haul route modifications and vehicle movements during delivery of turbine components. The construction of the wind farm site entrance and modifications to the public road network at various locations along the turbine haul route will be carried out under a road opening licence and traffic management plan which will accommodate pedestrians at the works locations. 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. The effect on pedestrian safety is therefore considered not to be significant and short term.

14.5.8 Driver Delay

Projected traffic volumes for future years on the N72, R671 and R672 are shown in **Table 14.14** and compared against the impact of peak construction traffic associated with the wind farm development.

Table 14.14: N59 Future Traffic Flows – Average Workday May 2022

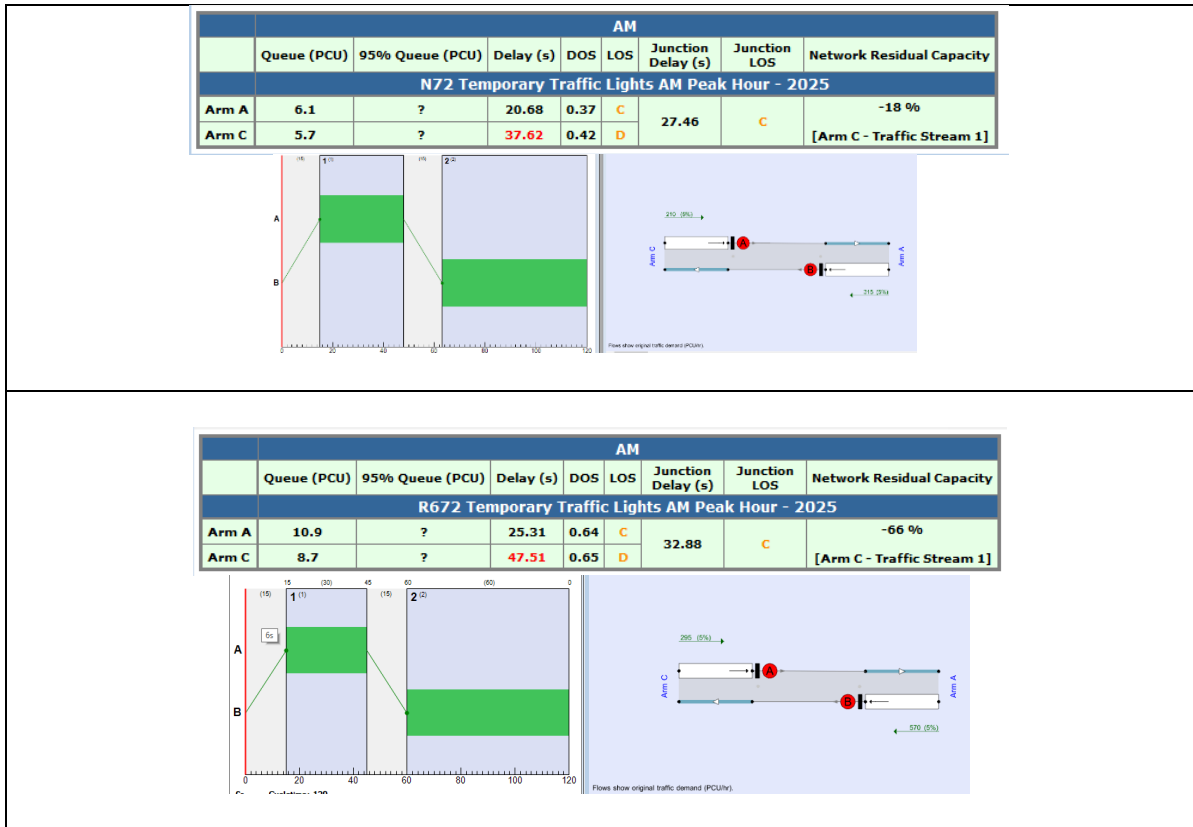
Year	N72			R671			R672		
	AADT	HGV's Per Hour	%HGV	AADT	HGV's Per Hour	%HGV	AADT	HGV's Per Hour	%HGV
2022 – Baseline Traffic	5,400	23	5.0%	3,800	21	6.0%	9,850	45	5.0%

Year	N72			R671			R672		
	AADT	HGV's Per Hour	%HGV	AADT	HGV's Per Hour	%HGV	AADT	HGV's Per Hour	%HGV
2023–No Development Traffic	5,492	24	5.00%	3,865	22	6.00%	10,017	47	5.00%
2023–With Development Traffic	5,837	54	9.0%	4,215	52	12.0%	10,366	77	8.00%
2024–No Development Traffic	5,585	25	5.00%	3,930	22	6.00%	10,188	48	5.00%
2024–With Development Traffic	5,930	55	9.0%	4,280	52	12.0%	10,540	78	8.00%
2025–No Development Traffic	5,680	26	5.00%	3,997	23	6.00%	10,361	50	5.00%
2025–With Development Traffic	6,025	56	9.0%	4,346	53	12.0%	10,710	80	8.00%

There is potential for driver delay on the public road network due to HGV turning movements and traffic management associated with site access construction, haul route enabling works and 110kV grid connection. Traffic analysis carried out for the development shows that delays of approximately 40 to 50 seconds can be expected at temporary traffic lights on the N72 and the R672 during 110kV grid connection works. Traffic analysis for the R671 / R672 junction near the wind farm site entrance shows that the junctions will operate within capacity and will not cause significant delays for motorists during the construction period. Traffic analysis for the N72, R671 and R672 is shown in **Table 14.15**.

Table 14.15: Traffic Analysis

	AM							PM								
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Network Residual Capacity
R671 / R672 Junction - 2025 - No Construction Traffic																
Stream B-AC	D1	0.0	7.77	0.04	A	0.91	A	714 % [Stream B-AC]	D2	0.1	7.66	0.04	A	1.30	A	540 % [Stream C-AB]
Stream C-AB		0.0	6.32	0.03	A				D2	0.1	6.22	0.05	A			
R671 / R672 Junction - 2025 - Wind Farm Construction Traffic																
Stream B-AC	D3	0.1	8.09	0.06	A	1.32	A	467 % [Stream B-AC]	D4	0.1	8.42	0.09	A	1.81	A	402 % [Stream B-AC]
Stream C-AB		0.1	6.11	0.04	A				D4	0.1	5.97	0.06	A			



Delays are expected on the turbine delivery haul Route during the delivery of turbine components due to the abnormal load vehicles. Abnormal load deliveries will be carried out with an abnormal load permit and timed to take place outside of peak times, possibly at night, and therefore the potential effects are not considered to be significant. The abnormal load convoys will be accompanied by escorts who will provide routine and emergency traffic management in the event of unforeseen circumstances for abnormal load convoys.

14.5.9 Severance

Severance is caused when a community is perceived to be physically divided by traffic. The turbine delivery and construction haul route to the wind farm site will use the existing national and regional road network to access the site, therefore, potential effects are not predicted to be significant.

14.5.10 Mud and Debris on the Local Road Network

HGVs leaving the Site have the potential to transport mud, stones or other debris from the Site to the public road network on wheels of the vehicles. This could cause nuisance to local road users or damage to vehicles from loose debris. Mitigation measures to prevent the spread of mud and debris from the site to the public road network are summarised in **Section 14.3.2** and detailed in **Section 14.6** of this report. This effect can be predicted to

be direct, negative, minor and short-term in nature confined to the construction and Initial Decommissioning phases only.

14.5.11 Operational Phase – Traffic

During the operational phase of the Development, the windfarm will normally be unmanned. Operational and remote monitoring activities will be carried out on an ongoing basis via telephone and computer links. However, regular visits to the Site will be necessary for maintenance and routine inspections. A car or van will normally be required for these routine inspections. Under normal circumstances, the operation of the windfarm would require 1-2 visits to the Site per week by trained personnel and/or accompanied visitors. Parking will be provided outside the existing substation and at turbine entrances. In the case of a major fault e.g. breakdown of a turbine component, larger machinery, including possibly mobile cranes, will require access to the Site.

There will be a low volume of traffic generated during the operational phase of the Development. The effect of traffic associated with the operation of the Development on the existing public road network will be imperceptible due to the type of traffic and the low volume of traffic generated during operation.

14.5.12 Traffic Impact During Wind Farm Decommissioning Phase

During decommissioning, it is envisaged that the total volume of HGV traffic will be relatively small compared to the construction period assuming Turbine Bases, Site Access Tracks and Turbine Hardstands will remain insitu, landscaped and allowed to revegetate with only the turbines, sub station building materials and electrical equipment being removed from site for recycling/reconditioning. This phase could be expected to last approximately 16 weeks. If Site Access Tracks and Turbine Hardstands are left in place and revegetated, the effect is predicted to be an imperceptible effect on traffic.

If Site Access Tracks and Turbine Hardstands are to be dug up then the decommissioning phase could last up to 4 months in this case. Material will need to be transported off-site for reuse/recycling elsewhere, in which case HGV numbers could be expected to be similar to those of the construction phase. If Site Access Tracks and Turbine Hardstands are removed from Site, then the effect can be predicted to be slight and negative of short-term duration and high probability.

14.6 MITIGATION MEASURES

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

- Prior to delivery of abnormal loads i.e. turbine components, the Applicant or their representatives, will consult with An Garda Síochána and Waterford City and County Council to 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.
- Wheel cleaning equipment will be used on the Site Access Track near the public road junction to prevent any mud and/or stones being transferred from Site to the public road network. All drivers will be required to see that their vehicle is free from dirt and stones prior to departure from the construction site.
- In addition, any dust generating activities will be minimised where practical during windy conditions, and drivers will adopt driving practices to minimise the creation of dust. Where conditions exist for dust to become friable, techniques such as damping down of the potentially affected areas may be employed.
- To reduce dust emissions, vehicle containers/loads will be covered during both entrance and egress to the Site where required.
- A survey of the Haul Route will be undertaken to identify if any overhead lines will need to be lifted along the route to allow abnormal loads such as tower sections and nacelles to be delivered.
- Turbine component deliveries will be timed to avoid peak times and in particular, times when pupils will be dropped off and picked up from the various schools on the turbine component Haul Route.
- During the wind farm construction and decommissioning phases, road works signs in accordance with the requirements of Chapter 8 of the Traffic Signs Manual will be erected at the wind farm site entrance on the N59 and at all locations on the haul route which are being modified to facilitate turbine delivery.

- 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.

14.7 CUMULATIVE EFFECTS

Cumulative effects from the Development and other developments in the area will only occur during the construction and Initial Decommissioning phase of the wind farm. Windfarms do not generate a significant amount of traffic during operation as outlined in **Section 14.5.11**. There are no other consented developments located within 10km of the Development.

14.8 RESIDUAL EFFECTS OF THE DEVELOPMENT

14.8.1 HGV Deliveries

On the Turbine Supply Haul Route, there is likely to be a slight, negative, short-term residual effect on the road network with an increase in abnormal load traffic volumes on the roads and enabling works at a number of locations along the haul route as outlined in the Abnormal Indivisible Load Route Review report prepared by Pell Frischmann included in **Appendix 14.1**. In terms of the Civil Construction Haul Route, the Development is likely to have a minor residual effect on the local road network given increased traffic volumes on the road network are unavoidable. However, with the mitigation outlined, these effects will be minimised and will not be significant.

14.8.2 Operational Phase Residual Effects

There will be no residual effects during the operational phase as only occasional light vehicles are envisaged to visit the Site during operation for routine checking and maintenance as outlined in **Section 14.5.11**. In the event of a major malfunction during the life of the wind farm which may require turbine components to be transported using abnormal load vehicles and erected on site. The works will be carried out in consultation with Waterford City and County Council and the effects can be classed as being a moderate negative, direct short-term.

14.8.3 Decommissioning Phase Residual effects

On the Haul Route, there is likely to be a slight, negative, short-term residual effect on the road network with an increase in traffic volumes on the roads assuming the turbine components are reduced in size and transported back to Belview Port. Effects during the

decommissioning phase have been assessed to be small compared to the construction phase if hardstand areas are left in place and revegetated rather than removed from Site. In this case, the effect can be assessed as being imperceptible. If the hardstanding areas are removed, then effects can be assessed as similar those experienced during the construction phase as imported rock will be removed from Site. The effects can be classed as being a moderate negative, direct short-term and high probability effect.

14.9 MONITORING

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

The appointed contractor will be responsible for seeing that HGV drivers travelling to and from the Site obey the designated speed limits, rules of the road and that they only use the designated Civil Construction Haul Route. This will be done through regular tool-box talks for drivers.

14.10 SUMMARY OF SIGNIFICANT EFFECTS

This Section has assessed the significance of potential effects of the Development on traffic and transport. The Development has generally been assessed as having the potential to result in effects of a negative, slight/moderate, direct, short-term, high probability effect or lower during the construction and Decommissioning phase only. After mitigation, the residual effects have been assessed as imperceptible/slight, negative and short-term in nature. There will be a slight positive residual effect from verges having been widened at locations along the Haul Route. This effect could be temporary or permanent depending on the preference of Waterford City and County Council.

Potential cumulative effects were assessed as being slight, negative, short-term and low probability in nature. There was also a slight positive residual effect identified in terms of the works on the Haul Route resulting from road and junction improvements at works locations along the route with improved surfacing and increased visibility resulting from removal of vegetation for abnormal loads.

Given that only effects of significant effect or greater are considered “significant” in terms of national legislation as detailed in **Chapter 1: Introduction**, the potential effects of the Development on traffic and transport are considered to be **not significant**.

14.11 STATEMENT OF SIGNIFICANCE

This assessment has identified no potentially significant effects, given the design and the mitigation measures recommended for the implementation of the Development.