FEHILY TIMONEY

DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED SHANCLOON WIND FARM, CO. GALWAY

VOLUME 2 – MAIN EIAR

CHAPTER 14 – TRAFFIC AND TRANSPORTATION

Prepared for:
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RWE

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14. TRAFFIC AND TRANSPORTATION

14.1 Introduction

This chapter of the EIAR evaluates the potential impacts of the proposed Shancloon Wind Farm, associated grid connection and turbine delivery route on the existing traffic conditions and transportation network, including changes to peak annual average daily traffic and the carrying capacity of the surrounding road network. The assessment examines potential effects on traffic and transportation for the construction, operation and decommissioning phases of the Project and identifies measures to mitigate impacts if required. Potential cumulative impacts with other developments are also assessed.

This Chapter of the EIAR is supported by Figures in Volume IV, Planning Drawings accompanying the planning application and the following Appendix documents provided in Volume III:

- Appendix 2.1: Construction Environmental Management Plan (CEMP)
- Appendix 2.3: Grid Connection Construction Methodology
- Appendix 2.5: Bridge inspection report
- Appendix 11.3: Review of Stabilising techniques for floating road on peat
- Appendix 11.4: Peat and spoil Management plan
- Appendix 14.1: Turbine Delivery Route Assessment
- Appendix 14.2: Traffic Management plan

A full description of the Project assessed in this EIAR is provided in Chapter 2 Development Description. The Proposed Development assessed in this EIAR comprises the following elements:

- The wind farm site (referred to in this EIAR as the 'Site') which includes the on-site 110 kV substation and loop-in connection to the existing Cashla-Dalton overhead line;
- The turbine delivery route (referred to in this EIAR as the 'TDR');
- The grid connection route from the on-site 110kV substation to the loop-in connection to the existing Cashla-Dalton overhead line (referred to in this EIAR as the 'GCR').

14.1.1 Study Area

The proposed project is located within the jurisdiction of Galway County Council, approximately 30km north of Galway City. The study area includes the assessment of roads associated with the Site, substation and loop-in connection to the overhead line, and the transportation routes.

The details of the proposed project are considered in relation to the construction, operation and decommissioning phases of the project.

The likely traffic that will be generated by each phase of the project is estimated to identify potential disruptions to existing road users within the study area. Based on the project construction methodologies described in Chapter 2 and the CEMP, an estimate of the number of vehicles generated as a result of the project is calculated. These estimates are used to assess the impact on the road network in numerical terms.

Site access points are assessed for suitability in the context of both TII and Local Authority requirements for both geometric design and visibility. Potential disruption as a result of road or lane closures as a result of works along public roads are also assessed.

The potential for soiling or damage to public road infrastructure through poor construction practices as well as potential health and safety hazards through poor traffic management are also identified where applicable.

The effects of the project on the existing transport network are then considered and described in terms of quality, duration and significance. Mitigation measures are then proposed followed by identification of residual impacts. The potential for cumulative impacts from other developments are assessed.

The transport network comprising the study area is identified in Figure 14.1.

14.2 Statement of Authority

The Traffic and Transportation chapter, Traffic Management Plan and site assessments were completed by Fehily Timoney and Company engineers. The chapter was prepared by Leigh Doyle, reviewed by Trevor Byrne.

Leigh is a Senior Project Engineer at Fehily Timoney and Company working in the Energy and Planning department. He has over 4 years' experience and holds a Master's degree in Civil, Structural and Environmental Engineering in UCC. Leigh is a member of the engineering team within the Planning and Energy division at FT and provides technical and engineering support to the EIAR teams for a variety of commercial scale renewable energy projects as well as other developments.

Leigh has experience in the preparation of Traffic and Transportation assessments, Air and Climate Assessments, as well as other technical chapters associated with EIAR's and environmental reports for renewable energy projects ranging from wind farms, solar farms, grid connections, battery energy storage systems and ancillary grid infrastructure projects. He also has experience in the design of renewable energy developments.

Leigh has site experience in the form of environmental walkover surveys and engineering surveys to inform Traffic and Transportation and Hydrology assessments for large scale energy projects. In addition, Leigh also has experience in carrying out fieldwork to support air quality monitoring campaigns and noise and vibration assessments in support of the Infrastructure and Noise teams at FT. Leigh also has experience relating to stakeholder and landowner liaison as part of his day-to-day project work and site work within the Planning and Energy Division.

Trevor works as a Principal Engineer for Fehily Timoney and Company. Trevor has over 19 years' experience in engineering consultancy and construction roles. He holds a Master's degree in Sustainable Energy Systems from the University of Edinburgh and an Honours degree in Civil Engineering following his studies at Edinburgh Napier University and Cork Institute of Technology. Trevor is a senior project manager within the Planning and Energy division at FT and is a chartered engineer with Engineers Ireland. His primary area of expertise is in the design and construction of renewable energy projects and urban developments.

Trevor has considerable environmental engineering and environmental impact assessment experience and is a proven project manager with a track record in successfully guiding large scale projects through the consenting process as well as construction stage. He also has significant on-site experience relating to managing the construction of renewable energy developments and environmental coordination roles.

Throughout his career to date, Trevor has provided technical advisory services through all stages of project delivery from feasibility assessment, impact assessment, design, expert witness, contract administration and construction. He has extensive experience in public / landowner consultation, liaison with private and public-sector clients, and with statutory and non-statutory bodies.

Trevor is also experienced in the management of teams delivering Appropriate Assessment (Natura Impact Statements), Environmental Impact Assessment, Ecological Impact Assessment, environmental licensing, environmental management, environmental pollution control and mitigation design.

The TDR route was identified and surveyed by Pell Frischmann Consulting Engineers. Pell Frischmann is a multi-disciplinary and international consultant engineering company working across infrastructure, buildings, and regeneration. The commission was led by Gordon Buchan BEng (Hons), MSc, FCIHT, CMCILT, Divisional Director for Pell Frischmann and Timothy Lockett BSc, MCILT. Gordon has over 15 years' experience in undertaking abnormal load assessments across the UK, Republic of Ireland and northern Europe and has worked on over 500 wind farm sites. Timothy has over 10 years' experience and has worked on over 300 wind farm sites in the UK and Ireland.

14.3 Assessment Methodology

14.3.1 Construction Programming

As described in Chapter 2, the construction of the project in its entirety is expected to take 24 months. A 24 month construction programme was assumed for construction traffic generation movement calculations as part of this assessment.

The assessment uses a combination of field surveys, automatic traffic counter (ATC) data, desktop studies of potential haulage routes and local roads department consultation conducted by FT Engineers.

14.3.2 Relevant Guidance and Legislation

The following guidance was adhered to during the assessment of traffic and transport in this EIAR:

- TII Publication PE-PDV-02045: Traffic and Transport Assessment Guidelines, TII, 2014;
- TII Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections, TII, 2021;
- EPA Guidelines on The Information to Be Contained In Environmental Impact Assessment Reports, EPA, 2022;
- Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017;
- TII Project Appraisal Guidelines for National Roads: Estimating AADT on National Roads, TII, 2016;
- TII Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections, TII, 2021;
- TII Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions) DN-GEO-03060, TII, April 2017;
- Galway Development Plan 2022-2028;
- Road Traffic Act 2024;
- Guidelines for Managing Openings in Public Roads, Department of Transport, April 2017.

14.3.3 Sources of Information

- Traffic count data was obtained from 7-day traffic count surveys conducted on the 16th of September 2023;
- Open-source TII traffic counter information and private traffic count data carried out for historical impact assessments, accessed in September 2024.
- Ordinance survey and aerial mapping, accessed in June-September, 2024;
- Project construction methodologies detailed in the CEMP, accessed in September 2024;
- Site Layout Plans, reviewed in August 2024;
- Route Survey Report for the Turbine Delivery Route carried out by Pell Frischmann in January 2021 and revised in June 2024;

The above sources of information have been used to identify the study area and transport routes to be assessed.

14.3.4 Consultation

Transport Infrastructure Ireland (TII) were consulted as part of the EIAR scoping process. A copy of the correspondence from TII is included in Appendix 5.22 and discussed further in Chapter 5 – Scoping and Consultation.

Galway County Council (GCC) Roads Department were consulted during the EIAR scoping phase and through subsequent virtual and site meetings on the 28th of November 2023 and 17th of January 2024 respectively. The purpose of the consultation meetings were to present proposed haul routes, the turbine delivery route, road upgrades, and construction entrances to the Area Engineer for comment and feedback. Any recommendations received by the roads department would then be implemented into the design and application in advance of the submission to the local authority.

Mayo County Council (MCC) Roads Department were consulted via a virtual meeting on the 7th of March 2024 to discuss potential haul routes from McGraths Quarry in Cong. MCC recommended a haul route from the quarry which avoids the town of Cong to prevent traffic disruption utilising the R345, L1613, N84 and R332.

Gas Networks Ireland (GNI) were consulted via email in June 2024 to assess potential impacts to the Mayo - Galway natural gas high pressure transmission pipeline. The proposed internal access track crosses the existing High Pressure Gas Transmission Main at the point at which the track parallels the L-22204 local road (see 100-Series planning application drawings). This is the Gas Networks Ireland (GNI) Mayo - Galway natural gas distribution main which is connected to the nearby Beaghmore Transmission Above Ground Installation (AGI). Consultation with GNI has confirmed that the gas main comprises a heavy walled pipe at this location (up to ITM X: 532528.770 ITM: Y 753639.059 Meters) and as such GNI has confirmed that no additional protection measures e.g. slabbing, are required for this crossing. GNI has confirmed the turbine array is sufficiently set back from their infrastructure noting that they require a distance of 2 times hub height of wind turbine set back.

GNI also advised that wind farm underground cables need to have at least 600mm separation from the red high pressure transmission pipeline. Open cut trenching is preferred with all works supervised.

An Garda Síochána were also consulted during the EIAR scoping phase. A copy of the correspondence is included in Chapter 5 – Scoping and Consultation.

Uisce Éireann was consulted in relation to (Diversion Enquiry Reference DIV24312) in relation to a build-over of Uisce Éireann's water main as part of the proposed Development, and have confirmed that the proposed build over can be facilitated – ref Appendix 5.2, Volume III.

14.4 Existing Environment

14.4.1 Existing Road Network

Roads in the Republic of Ireland are classified as motorways, national (primary and secondary), regional and local roads. Transport Infrastructure Ireland (TII) has overall responsibility for the planning and supervision of the construction and maintenance of motorways, national primary and secondary roads. The local authorities have responsibility for all non-national roads. The hierarchy of roads throughout Ireland is outlined in Table 14.1.

Table 14-1: Road Categories

Road Category	Description
Motorways	These are high quality multiple lane roads with limited grade separated junctions. They are high speed (120kmph) road predominantly provided to facilitate strategic traffic with reduced journey times.
National Primary Roads	These are predominantly single carriageway, with some that are dual carriageway. Generally high speed (100kmph) roads that facilitate strategic traffic, with reduced journey times.
National Secondary Roads	These are medium distance through-routes connecting towns, serving medium to large geographical areas and link to primary routes to form a homogeneous arterial network.
Regional Roads	Predominantly single carriageway roads of regional and local importance. These roads generally receive more frequent maintenance criteria than Local Roads and therefore tend to be structurally sound.
Local Roads (Primary, Secondary and Tertiary)	The local road system is operated in three tiers defining local importance, usage and maintenance priorities. They form a network of single carriageway roads of varying quality.

Motorways

The nearest motorway to the site is the **M17** which connects Tuam to the M18 between Galway City and Athenry. The M17 is located approximately 7.5km to the southeast (straight line distance) of the Site. The AADT for the M17 in 2023 according to the TII automatic traffic counter (TMU M17 016.0 N) data was 10,373 with approximately 6% of this comprised of HGV traffic. For all traffic count positions considered in the assessment, full yearly data available for 2019, 2022 and 2023 was applied.

There are no other motorways located within 20km of the site.

The Turbine Delivery Route (TDR) will utilise the M6 and M17 motorway network. The Grid Connection Route (GCR) does not utilise the motorway network.

National Primary Routes

The nearest national primary road is the **N17**, which is located approximately 6.8km to the southeast (straight line distance) of the site. The N17 forms the route from Tuam to Collooney. The AADT for the N17 in 2023 according to TII automatic traffic counter (TMU N17 028.0S) data was 10,638 with approximately 5.4% comprised of HGV traffic.

The N17 will connect the M17 to the R332 along the proposed TDR.

The GCR does not utilise the national primary road network.

National Secondary Routes

The closest national secondary route to the site is the **N84**, located approximately 5km southwest of the Site. The N84 connects Galway city with Castlebar. The AADT for the N84 in 2023 according to the procured Automatic Traffic Count data was 13,167 with approximately 4% comprised of HGV traffic.

The N84 forms part of the northern construction haul route.

The TDR does not utilise the N84 national road.

The GCR does not utilise the national secondary road network.

Regional Roads

The nearest regional road is the **R332** which is located approximately 2.45km northeast (straight line distance) of the Site. The R332 connects the N17 near Tuam to the N84 in Kilmaine. The AADT for the R332 in 2023 according to the procured Automatic Traffic Count data was 4,136 with approximately 4% comprised of HGV traffic. The R332 is a dual carriageway and has centreline and edge markings in places. The road surface is in generally good condition with minor rutting and localised depressions. There are sections where repairs for rutting and upheaval of the road are evident.

The R332 forms up to 6.7km of the southern haul route as well as TDR, it also makes up 14km of the northern construction haul route.

The GCR does not utilise the regional road network.

Local Roads

There are several local roads in the vicinity of the Site. The main site entrance is located on the **L2234**. This is a single carriageway road in fair condition. The speed limit on the road is 80km/h, however, it is difficult for vehicles to reach this speed due to road surface condition and the narrow road width. Rutting and potholing is also present with repairs and patch work evident throughout the road section. This road is lightly trafficked and is mainly used for local access to private dwellings and agricultural fields. Drainage ditches along the grass verges are present in places on both sides of the road.

The **L6483** is a local secondary road to the east of the site which connects the L2234 at the crossroads located north of the proposed site entrance to the R332.

The substation entrance is located on the **L6100** local secondary road.

The Horizontal Directional Drill (HDD) is located near the existing bridge along the **L6225** local secondary road.

TDR proposes the use of the L2234, L6483, L22202, L2220 and the L22204.

The GCR proposes the use of the L6100, L6225, L22204, L2220, and the L22202.

14.4.2 Other Transport Network Infrastructure Within the Study Area

There are no active railway lines, greenways or waterways within 20km of the Proposed Development.

The site location and existing road network is shown in Figure 14.1, Volume IV.

14.4.3 Existing Environment Traffic Volumes

Existing traffic volumes on roads in the study area are shown in Table 14-2 below:

Table 14-2: Baseline Traffic Volumes

Road	Baseline AADT		
	HGV	LGV	AADT
N17 - Tuam Bypass Co. Galway	781	10,341	11,122
N84 Between Ballinrobe and Partry Co. Mayo	853	10,315	11,168
N83	199	3,914	4,112
R332	62	1,231	1,294
L6483	3	54	57
L6225	3	53	56

AADT figures are projected to a proposed construction commencement year of 2027 in section 14.6 from 2022 and 2023 source data in accordance with NRA Project Appraisal Guidelines for National Roads: Unit 5.5 Link-Based Traffic Growth Forecasting, 2011 and TII Project Appraisal Guidelines for National Roads: Unit 5.3 – Travel Demand Projections, 2021.

14.5 Proposed Project

A large infrastructural project of this nature will generate additional traffic on the existing road network as a result of the construction, operation and decommissioning. A detailed description of the project assessed in this EIAR is provided in Chapter 2.

The following sections describe the Project in the context of the existing traffic conditions and transportation network.

14.5.1 Construction Programme

The construction of the project in its entirety is expected to take 24 months. Given the topographical condition of the site, it is anticipated that the earthworks and the construction of both access tracks and turbine hard standings would extend the development programme by up to 6 months longer than a typical 11 turbine wind farm development. A 24 month construction programme was assumed for the purposes of assessing conservative traffic volumes in the traffic impact assessment.

An indicative construction programme upon which vehicle trip distribution calculations are based is shown in Table 14-3.

Table 14-3: Proposed Construction Programme

Activity	Month																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mobilisation and site setup	X	X																						
Site clearance and felling	X	X																						
Internal access tracks	X	X	X	X	X	X	X	X	X	X	X	X												
Turbine hard standings			X	X	X	X	X	X	X	X	X	X	X	X										
Turbine foundations								X	X	X	X	X	X	X	X									
TDR accommodation works											X													
Turbine Installation														X	X	X	X	X	X	X	X			
Met Mast																			X	X				
Onsite substation													X	X	X	X	X	X						
Cable Works (On-Site)															X	X	X	X	X	X	X			
Cable Works (In Public Road)															X	X	X	X	X	X	X			
Testing and Commissioning																					X	X	X	X
Landscaping, reinstatement, demobilisation																							X	X

There are a number of items which will be conducted in parallel, but the basis of the construction programme will involve site establishment, site access road and drainage construction, hardstanding construction and substation works. The grid connection works are likely to be done in parallel with the site works and the turbine installation works will be completed before commissioning, reinstatement and landscaping. However it is also possible that the grid route could commence prior to the on-site infrastructure or subsequent to the construction of the on-site infrastructure. Carrying out the grid connection works in parallel with the site works represents the worst-case scenario as it would generate peak volumes of construction traffic on the local road network.

14.5.2 Main Site

As described in Chapter 2, the Site includes the wind turbines, internal access tracks, hard standings, the permanent meteorological mast, onsite substation compound, internal electrical and communications cabling, temporary construction compounds including a wheel wash facility, lay down areas, drainage infrastructure and all associated works related to the construction of the wind farm.

14.5.3 Electrical Infrastructure / Grid Connection

14.5.3.1 On-Site Electrical Cabling

Electricity generated from wind turbines will be collected at medium voltage (33kV) by internal circuits of buried cables and joint bays. These circuits will be directed to the proposed 110 kV on-site substation.

The internal collector circuit cable routes are shown on the planning application drawings and will follow the alignment of the internal access tracks. A short section, c. 150m, of the cable alignment is along the L-6225-13. Additionally, the route will cross the L-2220-21. Otherwise, the remaining sections of the are off road within agricultural land or forestry.

1. Crossing of Gas Transmission Mains: The cable route parallelling the L-22204 local road will require an overcrossing of the Gas Networks Ireland Mayo - Galway natural high pressure gas distribution main which is connected to the nearby Beaghmore Transmission Above Ground Installation (AGI). At this location the crossing will comprise two cable circuits and will require a flattened crossing with a trench width of 2390 mm (see Planning Drawing 051021-DR-113). GNI has instructed that the cables need to have at least 600mm separation from the red indicator tape for all transmission pipelines (whether high pressure or low pressure) and that open cut trenching is preferred with all works supervised.
2. Crossing of Uisce Éireann services: The cable route crossing of the L-2220-21 local road will cross an existing 250 mm diameter uPVC potable water trunk main (which is under gravity flow). At this location the crossing will comprise two cable circuits and will require a flattened crossing with a trench width of 2390 mm. In this regard, Uisce Éireann Diversions Team has provided a Confirmation of Feasibility to building over or near Uisce Éireann assets (Diversion Enquiry Reference DIV24312).

As part of the scoping and consultation process for the Proposed Development, searches of existing utility services were carried out to identify whether there were any other where major assets exist such as high voltage electricity cables or utility and telecommunications services. There are no known services within any other areas of the Site. However, in advance of the construction phase cable detection tools, ground penetrating radar and slit trenches will be used, as appropriate, to verify existing services and their exact location. It is expected that partial road closures and stop/go system will be put in place to facilitate this work. This will enable the works to be completed as quickly and as safely as possible, with minimal disruption time for residents of the area.

14.5.4 Site Access

14.5.4.1 Main Site Entrance

The proposed development will have one main site entrance which will be used for both construction and operation as an access point from the L-2234 public road. The meteorological mast (met mast) will be accessed from the main site entrance via the internal access track leading to turbine 3 to construct, service and maintain the met mast. The location of the access point is shown on the haul route Figure 14.3 and on the 100 series planning drawings. An assessment of the existing geometry and sightlines from these entrances was carried out in with existing visibility presented in Table 14-4.

The access point has been selected with consideration for safety of public road users, construction staff and to ensure they can be constructed to comply with the requirements of both Galway County Council and TII design requirements for direct accesses.

The main site entrance requires construction of a new access on the L2234 local road. This entrance will be constructed to facilitate the delivery of turbine components. All turbine components accessing the site will use this entrance. The general local road speed limit applies of 60kph. The minimum sight distance for an 60kph road is 120m in line with Transport Infrastructure Ireland (TII) standards (TII Publication DN-GEO-03060). Note that a planning application for a residential dwelling along this road submitted 70 metre sightlines and was granted by Galway County Council.

Line of sight was first established at the center point of the proposed entrance bell-mouth at a 3-metre setback from the road edge. The 3-metre setback was not achievable at this location due to hedgerow vegetation obstructing the assessment. The maximum setback distance available from the road was 1-metre. Visibility at this point allows for 135m north (LHS) and 140m south (RHS). Visibility distances further than 135m are constrained by vegetation which hinders visibility. Existing visibility at this access point is currently non-compliant with TII visibility distance requirements in both directions. It is proposed to construct a sweeping bell mouth and clear vegetation within the 120m visibility splays in both directions to facilitate the over-sized turbine delivery vehicles entering the site at this point and achieve minimum sight line distances. The detail is shown drawing P20-306-0101-0001 included with the planning application. Visual obstructions 1.05m above ground level will be removed to achieve target ‘Y’ visibility distances in both directions of 120m in accordance with TII design specifications.

Plate 14-1: Proposed Site Entrance Location

Plate 14-2: Existing Visibility to Left from Proposed Site Entrance at X=0m

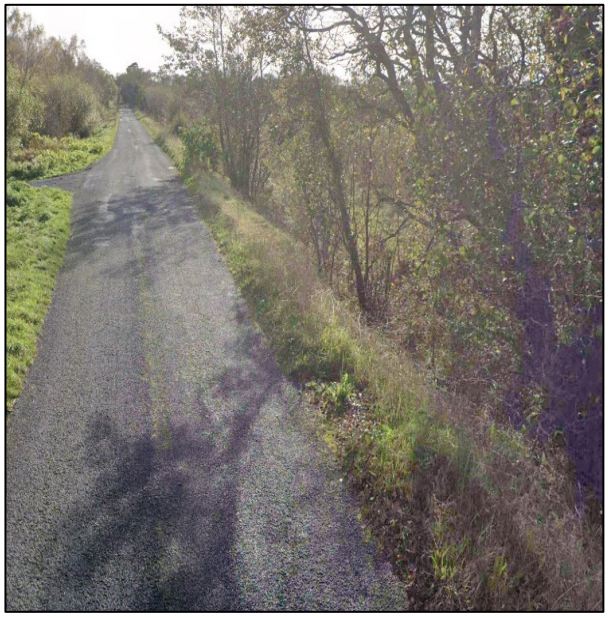

Plate 14-3: Existing Visibility to Right from Proposed Site Entrance at X=0m

14.5.4.1 Substation Site Entrance

The proposed grid connection export cable will exit the site through the new substation entrance located on the L6100 local road. This access point will also be used for construction and operation and will be used by both HGV's and LGV's for substation construction.

At the existing location of the entrance to the substation, line of sight was first established at the center point of the proposed entrance bell-mouth at a 3-metre setback from the road edge. The maximum setback distance available from the road was 3-metres. Visibility at this point allows for 70m southeast (LHS) and 120m northwest (RHS). Existing visibility at the proposed substation access point is currently compliant with local authority visibility distance requirements in both directions set by residential developments on the L6100 local road where the substation entrance is located. Other developments were granted planning permission with 70-metre sight line distances setback 2.4 metres from the road edge at the vehicular entrance. It should also be noted that the traffic to and from the substation during the operational phase is anticipated to be c. 2-3 trips per month on average which is significantly less vehicular movements than that of a residential dwelling.

It is proposed to construct a bell mouth to facilitate vehicles entering the substation site at this point and achieve minimum sight line distances. The detail is shown on 0101-Series planning application drawings included with the planning application. No visual obstructions currently exist above 1.05 metres and the target 'Y' visibility distance in both directions of 70 metres in accordance with local council design standards and granted planning applications in the area is achieved.

Plate 14-4: Proposed Substation Entrance Location

Plate 14-5: Existing Visibility to Left from Substation Entrance at X=0m

Plate 14-6: Existing Visibility to Right from Substation Entrance at X=0m

Table 14-4: Site Entrance Visibility Results

Entrance	Coordinates (LAT)	Coordinates (LON)	Y (m) at x=0m[1]		Y (m) at x=3m[2]		Major Road Average Width (m)	Major Road Speed Limit (kph)[3]
			R	L	R	L		
Main Site	53.547000	-8.971000	120	120	NA	NA	4	60
Substation	53.516508	-9.060939	160	135	160	70	3.5	60

14.5.4.2 Felling

Felling of 0.54 ha of coniferous forestry will be carried out at the main entrance to the wind farm and along the internal access tracks where necessary to accommodate the delivery and construction of turbines, hardstands, crane pads, temporary compounds, along the proposed GCR from the site to the substation and to provide for mitigation for Bat species, as detailed in Chapter 9: Biodiversity.

[1] The distance back along the minor road or direct access from which the full visibility is measured is known as the 'x' distance. It is measured back along the centreline of the minor road or direct access from the continuation of the line of the nearside edge of the paved surface (including hard strip or hard shoulder) of the major road. (TII Standard DN-GEO-03060: Geometric Design of Junctions, May 2023).

[2] From the point "x" metres back from the major road a driver approaching the junction along the minor road will be able to see clearly points to the left and right on the nearer edge of the major road running carriageway at a distance measured from its intersection with the centreline of the minor road. This is called the 'y' distance. (TII Standard DN-GEO-03060: Geometric Design of Junctions, May 2023).

[3] Where no posted speed limit is available for public road in question, a speed limit of 60kph is assumed in accordance with the Road Traffic Act 2024.

14.5.4.3 Permanent Met Mast

1 no. permanent meteorological (Met) mast will be erected approximately 0.4km south of Turbine 03 within the site. The permanent met mast will be of the following configuration:

- 110m high free standing lattice steel mast with a shallow concrete foundation fixed to ground anchors by 3no. guy-wires to measure local meteorological conditions. The mast will include a concrete base measuring 10m by 10m and will be up to 1.5m in depth.

The met mast will be accessed from the proposed wind farm internal access road network and existing agricultural track which will be upgraded as shown on layout plans. A section of new track will lead from the existing agricultural track to the met mast location. The met mast access track will be 3.5m in width and will include drainage.

14.5.4.4 Temporary Crossing Points

There are three main crossing points across the site which traverse the public road. These crossing points are necessary to reach different parts of the site.

- Crossing Point 1 traverses the L-2220 local road and provides a linkage between the east of the site where T1-T4 are located and the centre of the site where T5, T8, T9 and T10 are located.

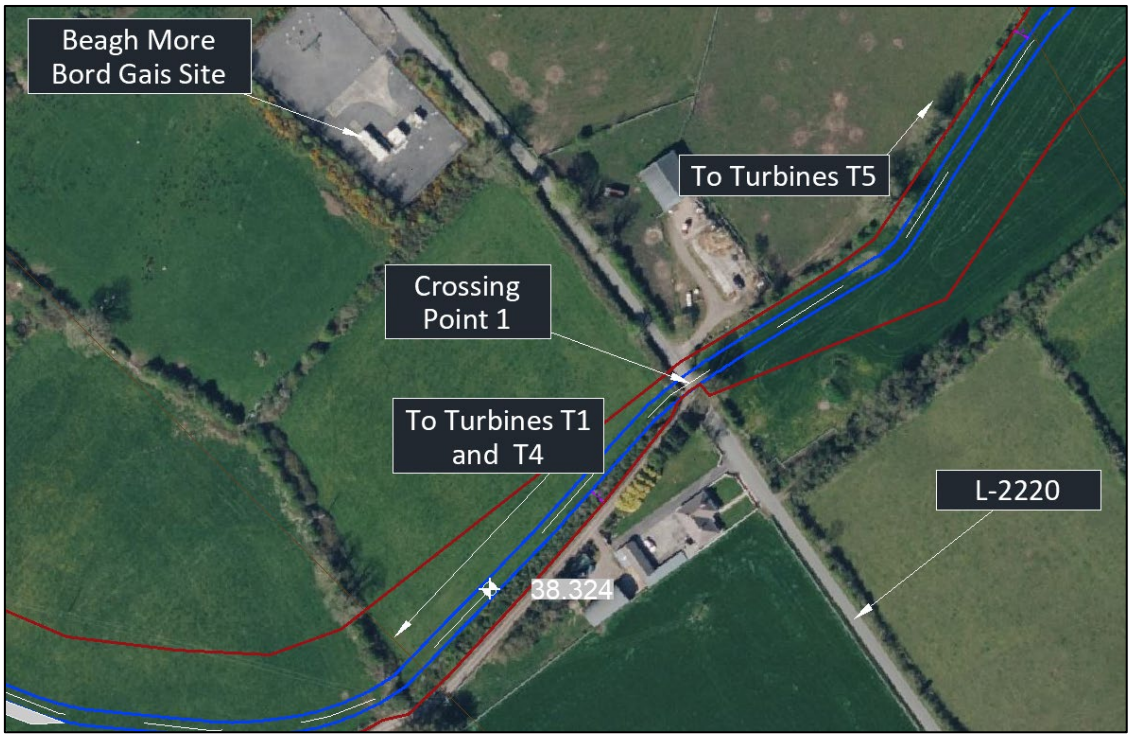

Figure 14-1: Crossing Point 1

- Crossing Point 2 traverses the L-22202 local road and provides a linkage between T5 and T8 - T10 located centrally within the site.

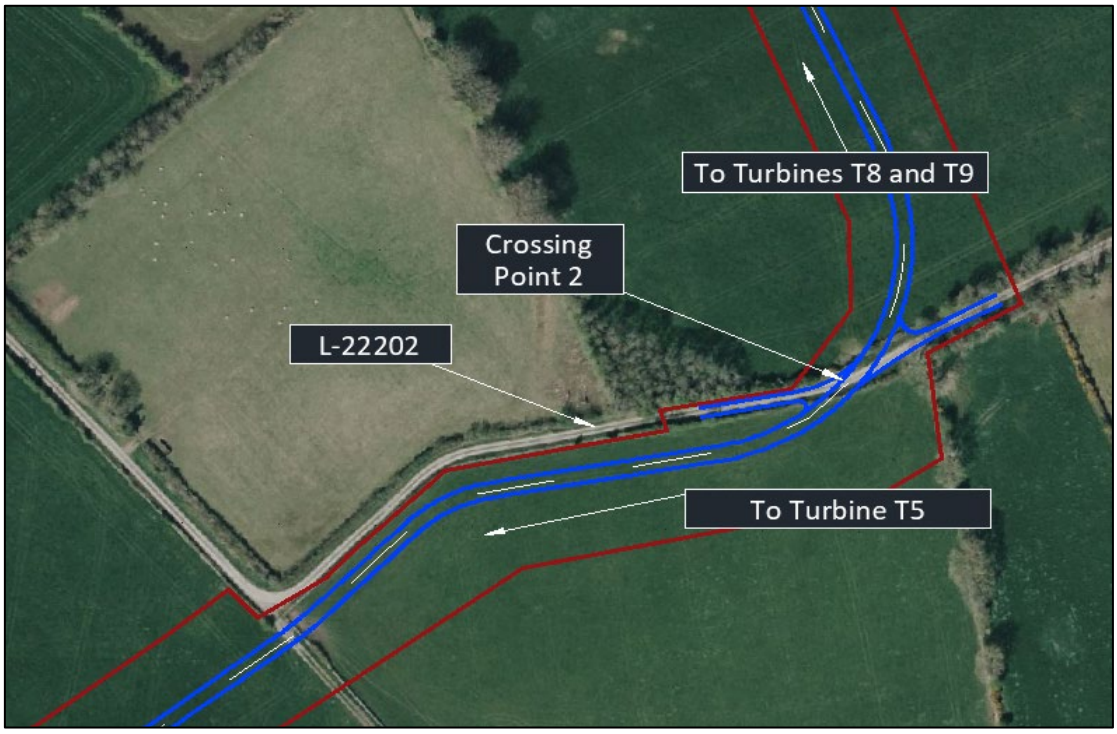

Figure 14-2: Crossing Point 2

- Crossing Point 3 also traverses the L-22202 local road and provides a linkage between T6 and T7 with T8 - T10 located centrally within the site.

Figure 14-3: Crossing Point 3

For further information about how these crossing points will be managed from a traffic management perspective please refer to the traffic management plan within Appendix 14.2 for further details.

14.5.4.5 Construction Haul Routes

In constructing the wind farm, materials and plant will be delivered to the site. The material haul routes will include some of the surrounding road network which will need to cater for the additional traffic associated with the project. The Haul Route Map is shown in Figure 14.3.

The traffic impact assessment assumes all structural fill for access tracks, turbine hardstands, turbine foundations and on-site substation will be sourced from local quarries and transported to the site along the road network. This assumes all series 600 material for bases and Clause 804 material for surface courses of roads, foundations, hardstands etc. will be transported from externally licensed quarries. The surrounding quarries currently in operation and indicative haul routes to the site have been identified. The closest external quarry to the site is Mortimer's Quarry in Belclare, Co. Galway located approximately 7.5km (S) of the site.

The location of licensed waste facilities are identified in Table 14-5. All materials required for the construction of the proposed wind farm will approach the site along the R332, L-6483 and L-2234 local roads. This will act as the main haul route for the construction phase of the project.

Traffic associated with the construction phase include:

- HGVs carrying aggregates, pipes and other materials associated with construction of the internal access tracks, hard standings and drainage infrastructure;
- HGVs (Concrete wagons) carrying concrete for turbine foundations and substation foundations;
- HGVs carrying building materials for the substations as well as electrical equipment and cabling;
- HGVs carrying plant and fuel;
- HGVs exporting site waste;
- Cranes and associated elements for the main crane for erecting the turbines;
- Private cars and vans for the commuting workforce.

The surrounding quarries currently in operation and indicative haul routes to the site have been identified. The nearest suppliers of quarry stone (TII Class 6 products) and concrete:

1. Mortimer's Quarry, Belclare Co. Galway located c. 7.5km from Shancloon and supplying crushed aggregates.
2. McGrath's Limestone Quarry, Cong Co. Mayo located c. 21.5km from Shancloon, supplying crushed aggregates and concrete products.
3. Harrington's Quarry, Kilkelly Co. Mayo located c. 35km from Shancloon, supplying crushed aggregates and concrete products.

Indicative haul routes for the proposed development are shown in Figure 14.3.

Waste Management Facilities

Authorised waste management facilities have been identified in the greater County Galway area as listed on the Local Authority Waste Facility Register by the National Waste Collection Permit Office. The authorised waste facilities utilised during the construction and decommissioning of the proposed project will depend on the contractors appointed and will depend on the capacity of the various facilities at the time of construction and decommissioning. A list of existing licensed waste facilities in proximity to the wind farm site is presented in Table 14-5 below. These facilities were identified at the time of the preparation of this EIAR.

Table 14-5: Licensed Waste Facilities in the Vicinity of Shancloon Wind Farm

Licensed Waste Facility Location	Type of Waste
T/A Walsh Complete Waste Management, Deerpark Industrial Estate, Oranmore, Co. Galway	Paper and cardboard packaging, mixed packaging, wooden packaging, concrete, bricks, wood, plastic, mixed construction and demolition wastes, plastics, mixed metals, soil and stones, bituminous mixtures, cables, glass, textiles, rubber, combustible waste, bulky waste, mixed municipal waste, solid wastes from soil remediation.
Frank Mortimer Ltd. Cartron, Belclare, Tuam, Co. Galway.	Soil and stone, concrete, glass, bituminous mixtures, mixed construction and demolition waste.
Tuam Recycling Centre, Athenry Road, Tuam, Co. Galway	Mixed recyclables.

14.5.5 On-Site Electrical Substation and Loop in Connection

Electricity generated from wind turbines will be collected at medium voltage (33kV) by internal circuits of buried cables and joint bays. These circuits will be routed to the proposed 110 kV on-site substation. The internal collector circuit cable routes are shown on the planning application drawings and will follow the alignment of the internal access tracks. A short section, c. 150m, of the cable alignment is along the L-6225-13. Additionally, the route will cross the L-2220-21. Otherwise, the remaining sections of the are off road within agricultural land or forestry.

The onsite 110 kV electricity substation will be constructed within the Site as shown in Figure 2.2a. This will provide a connection point between the wind farm and the proposed loop-in grid connection point to the existing Cashla-Dalton 110 kV overhead line.

The proposed substation compound dimensions and building dimensions are presented in accompanying planning application drawings and described in section 2.4.2.3 of Chapter 2 Description of the Proposed Development.

A wastewater holding tank will be provided outside the substation compound fence line so that it can be maintained where required without requiring access to the substation compound. The wastewater holding tank will be a sealed storage tank with all wastewater tankered off site as required by an authorised waste collector to a wastewater treatment plant. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007, will be employed to transport wastewater away from the site. The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. Potable water will be delivered to site and stored in a holding tank in the substation control building.

It is proposed to connect the development via underground 110 kV cable to the existing Cashla-Dalton 110 kV overhead line. Two new loop-in masts will be required to allow for the connection to the overhead line. The proposed loop-in connection is presented in accompanying planning application drawings.

The overall length of the grid connection between the on-site substation and the existing overhead line is 650 m and will require a crossing of the L-6100 road, otherwise the cable is to be constructed within agricultural lands.

As part of the scoping and consultation process for the Proposed Development, searches of existing utility services were carried out to identify areas where major assets exist such as high voltage electricity cables or gas mains. Private utility and telecommunications companies were also consulted. There are no known services within this road. However, in advance of the construction phase cable detection tools, ground penetrating radar and slit trenches will be used, as appropriate, to verify existing services and their exact location.

It is expected that full road closures will be put in place to facilitate cabling works using stop/go systems. This will enable the works to be completed as quickly and as safely as possible, with minimal disruption time for residents of the area. The appointed contractor and will outline local diversions whilst always maintaining local access for residents, farms and businesses.

These works will be progressive with short sections (less than 200 metres in length) of trench excavated and left open within the enclosed works area for short periods before moving the works area to the next section. This will require delivery of plant and construction materials to the sections along the route, followed by excavation, laying of cables and subsequent reinstatement of trenches and road surfaces. A careful approach will be taken to planning the works to ensure minimal impacts on road users and the general public.

The ducts will be installed, and the trench reinstated in accordance with landowner, EirGrid and Galway County Council specifications. The electrical cabling/fibre cable will be pulled through the installed ducts. Construction methodologies implemented and materials used will ensure that the GCR is installed in accordance with the requirements and specifications of EirGrid.

The loop-in and loop-out masts will generally be constructed by installing the foundations and lower section of the mast first. The upper sections of the masts will only be constructed when the rest of the grid connection infrastructure is ready to become live. This approach will minimise the amount of time the main 110kV line must be switched off.

The appointed contractor will agree traffic management measures with Galway County Council and implement suitable traffic management in the form of a stop-go system. Enforcement of traffic management procedures will include temporary traffic lights/ flag men in place during proposed ducting works. Should the need for weekend or night works be required this will be adhered to by the build contractor and agreed with in writing prior to such works taking place. Road works will be subject to the applicable statutory road opening licensing processes as implemented by the roads authority.

14.5.5.1 Trench Details

The Project's trenching requirements within public roads is less than 495m in total to facilitate cabling works and uses private lands for cable trenches and joint bays where possible. This trenching is predominantly on local tertiary roads with very low traffic volumes (L22202, L6225 and L22204) and is minimal compared to other wind developments of similar scale. Details for trench reinstatement are contained in the CEMP Appendix 2-1 and will be designed and constructed in accordance with Eirgrid specifications[4].

The proposed trench and ducting will be installed at a minimum depth of 1500mm so as not to conflict with the drainage for the public roadway. No existing safety barriers reside along the route in which the ducting is proposed. The ducting will be installed inline with EirGrid / ESBN specification and design reviewed with all relevant stakeholders prior to obtaining a road opening license. Any improvements required to facilitate development will be identified prior to works. The ducting will be placed and designed in such a position to ensure that future routine network improvements such as pavement overlay and strengthening, installation of new verge-side signs and other road furniture are not impacted by the cable trench.

The pavement will be reinstated to a condition equal or better than the existing pavement, pre-construction.

All materials used in the reinstatement of trenches will comply with the requirements of the Department of Transport guidelines for the Opening, Backfilling and Reinstatement of Trenches in Public Roads and the TII Specifications for Road Works.

It is proposed that all roads will be reinstated expeditiously on completion of the construction works. Roads will be reinstated to their pre-works condition or better and to the satisfaction of the roads authority.

Trench excavation, backfilling and road surface reinstatement methodologies are described in Chapter 2 and the CEMP.

14.5.6 Horizontal Directional Drilling (HDD)

Horizontal Direction Drilling (HDD) will be employed to pass the 33 kV cable circuits under the riverbed of the Togher River (see Figure 2.2 for HDD location and Planning Drawing 051021-DR-308 for HDD crossing detail). The HDD entry and exit pits are fully contained within private lands and are not proposed within the public road. Access to the HDD crossing location will be by temporary access track which will be 3m in width and formed with aggregate. This track will be removed and the land re-graded with peat or soil to a natural profile and reinstated as appropriate to previous landuse following the works.

Impacts to the public road network for the HDD are limited to delivery of machinery by HGVs, export of spoil by HGV to the nearest temporary construction compound, and the HDD construction crew travelling to and from the site in LGVs.

A competent specialist HDD contractor will be appointed for the proposed works. The HDD Contractor will conduct the drilling works in a safe and controlled manner with due regard for site constraints including environmental issues. The Contractor will be required to ensure that their proposed works do not adversely affect, existing services / utilities, groundwater / aquifers.

A description of construction methodologies for HDDs is presented in the CEMP and Chapter 2.

[4] https://www.eirgridgroup.com/customer-and-industry/general-customer-information/transmission-policies-and/

14.5.7 Turbine Delivery Route

The proposed turbine delivery route is presented in Figure 2.3, Volume IV. A Delivery Route Selection and Assessment was carried out to identify the optimum delivery route to site and is presented as Appendix 14.1, Volume III of this EIAR.

Large components associated with the wind farm construction will be transported to site via the identified turbine delivery route (TDR). A substation transformer unit will be transported to site which will be categorised as an abnormal load. As a result, an abnormal load permit will be sought for this movement. Multiple transformers have already been delivered to ESBN substations in the area without any impact on the structures along the road network. The only suitable Port of Entry (PoE) for this site is Galway. It is not feasible to approach the site from the north due to a constraints through a number of towns. As such turbine delivery is proposed to be via the following route:

- Loads will exit the Galway docks and head northeast on Lough Atalia Road;
- Loads will take a slight right onto College Road / R339. They will then continue to follow R339;
- Loads will turn left at Connolly Avenue;
- Loads will then turn right onto Tuam Road / R336;
- Loads will turn right at the R386 / N6 junction and will proceed eastbound on the N6;
- Loads will continue on the N6 and the M6 eastbound;
- At Junction 18 loads would turn left onto the M17 northbound;
- Loads would follow the Tuam bypass onto the N17;
- Loads will turn left onto the R332;
- Loads will turn left onto the L6483 and continue west to the L-2234-24 and on to the proposed site entrance.

The objective will be to maintain the strategic capacity and safety of the N17 carriageway at all times, cognisant of the National Development Plan, 2021 – 2030, with key sectoral priorities for maintaining the national road network to a robust and safe standard for users.

In some cases, accommodation works are required along the turbine delivery route such as hedge or tree cutting, relocation of powerlines/poles, lampposts, signage and local road widening. Any accommodation works within the public road corridor will be carried out in advance of the turbine deliveries in agreement with the local authority and subject to a road opening license. Some temporary hardcore surfacing will be required at roundabouts and areas of overrun. All temporary accommodation works associated with the TDR will be fully reinstated following the construction stage.

Temporary accommodation works will only be required during the operational phase in the unlikely event of a major turbine component replacement. The temporary accommodation works will not be required for the decommissioning phase as turbine components can be broken up on site and removed using standard HGVs.

Key elements of the temporary accommodation works for the delivery of turbines are summarised below. Works within private lands are included within the planning application red line boundary. All other works are within the public road. A full list of proposed temporary accommodation works are presented in Chapter 2.

Table 14-6: Temporary Accommodation Works on Delivery Route

POI Ref.	Location	Description of Works	Third Party Lands Required?	Included in this Planning Application
1	Exit from Galway Harbour	Loads will need to travel through the car park where parking should be suspended and the fences removed. All street furniture should be removed. Loads will over-sail the right-hand verge of Lough Atalia Road where one lighting column should be removed.	no	No – this element is assessed in the EIAR but is part of the wider project and will be subject to a separate consents as applicable
3	Lough Atalia Road / College Road Junction	Loads will merge onto the R339 northbound by undertaking a contraflow manoeuvre. Loads will over-sail both verges through the section. One traffic signal head should be removed from the right-hand verge and one traffic signal head, one road sign, and two bollards should be removed from the left-hand verge.	no	No – this element is assessed in the EIAR but is part of the wider project and will be subject to a separate consents as applicable
4	R339 / R338 Junction	Blade tip will over-sail the left-hand verge on entry where one traffic signal should be removed. Loads will over-sail the exit splitter island where one traffic signal, one crossing signal and pedestrian guardrails should be removed.	no	No – this element is assessed in the EIAR but is part of the wider project and will be subject to a separate consents as applicable
5	R339 / Connolly Avenue Junction	Loads will turn left to join Connolly Avenue northbound. Blade tip will oversail the south eastern verge. Loads will overrun and oversail the footway on the inside of the left bend where a load bearing surface will be laid and one traffic signal and two lighting columns will be removed. Loads will overrun and oversail the eastern footway of the exit road where a load bearing surface should be laid and one traffic signal will be removed.	no	No – this element is assessed in the EIAR but is part of the wider project and will be subject to a separate consents as applicable
7	R336 / N6 Junction	Loads will turn right at the junction to join the N6 eastbound, undertaking a contraflow manoeuvre. The blade will over-sail the left-hand verge on entry where one road sign	no	No – this element is assessed in the EIAR but is part of the wider project and will be subject to a separate consents as applicable

POI Ref.	Location	Description of Works	Third Party Lands Required?	Included in this Planning Application
		will be removed and vegetation trimmed. Loads will oversail the inside verge of the right turn where one traffic signal, one lighting column and the pedestrian guardrail will be removed.		
10	N6 Coolagh Roundabout	Loads will take the first exit at the roundabout via the slip road to remain on the N6 eastbound. Blade will oversail the outside verge of the bend where four road signs should be removed. Loads will oversail the inside verge where four lighting columns and two road signs should be removed.	no	No – this element is assessed in the EIAR but is part of the wider project and will be subject to a separate consents as applicable
11	M6 Junction 18 Slip Road	Loads would leave the M6 and join the slip road for the M17. Escorts to ensure that the convoy can safely complete the manoeuvre.	no	No – this element is assessed in the EIAR but is part of the wider project and will be subject to a separate consents as applicable
12	M17 / N83 Roundabout	Loads will continue straight over the M17 roundabout. Loads will overrun and oversail through the centre of the roundabout island where a load bearing surface should be laid. Loads will oversail the western verge on approach to the roundabout.	no	No – this element is assessed in the EIAR but is part of the wider project and will be subject to a separate consents as applicable
13	N17 / R332 Junction	Loads will turn left from the N17 onto the R332. Loads will oversail the junction entry splitter island where one chevron sign and one road sign should be removed. Bollards will be oversailed. Two lighting columns and three road signs should be removed from the western verge on entry. Loads will overrun the entry splitter island at the roundabout and the central island where load bearing surfaces should be laid. Five road signs should be removed. Loads will oversail the exit splitter island at the roundabout where one bollard and one road sign should be removed.	no	No – this element is assessed in the EIAR but is part of the wider project and will be subject to a separate consents as applicable

POI Ref.	Location	Description of Works	Third Party Lands Required?	Included in this Planning Application
16	R332 / L6483 Junction	Loads will turn left onto the L6483 at the junction. Loads will oversail and overrun into third party land on the inside of the left bend where a load bearing surface should be laid and the drainage ditch culverted. Trees and vegetation will be cleared and one utility pole removed.	Yes – see Declaration of Identity submitted as part of planning application.	Yes
17	L6483	Loads will continue west on the L6483. The road along this section will need to be widened to provide a minimum 4.5m running width and a 5.5m clearance width. Widening will be within local authority lands.	No	Yes
18		Loads will turn left onto the L6483 towards the proposed site entrance. Loads will oversail and overrun into third party land on the inside of the left bend where a load bearing surface should be laid. Two road signs should be removed. Trees and vegetation should be cleared.	Yes – see Declaration of Identity submitted as part of planning application.	Yes

Pell Frischmann (PF) were commissioned by Fehily Timoney (FT) to undertake a study of the delivery route for wind turbine Abnormal Indivisible Loads (AIL) associated with the construction and development of Shancloon Wind Farm. The Route Survey Review (RSR) has been prepared to help inform the EIAR on the issues associated with the development of the site with regard to off-site transport and access for AIL traffic and includes a detailed swept path analysis (SPA). The report identifies the key issues associated with AIL deliveries and identifies remedial works, either in the form of physical works or as traffic management interventions that will be required to accommodate the predicted loads. A copy of this report is contained in Appendix 14.1. The use of the Siemens SG155 turbine at the site was assessed. Following a review of the components, it is considered that the SG155 blade and combination of the mid tower with the width of the base tower represents the largest components for further assessment based on the possible combinations available. Their details are contained in Appendix 14.1.

Turbine blades will be carried on a hybrid trailer to reduce the need for mitigation in constrained sections of the route. Towers will be carried in a 4+7 clamp adaptor style trailer, whereas loads such as the hub, nacelle housing and drive train will be carried on a six axle step frame trailer.

The locations of the above accommodation works are indicated in Figure 2.3. Specific details of the proposed temporary works are presented in the accompanying route assessment report in Appendix 14.1.

14.5.7.1 Existing Utilities and Overhead Lines

All overhead utilities and obstructions will be removed at any locations that the swept path analysis indicated possible conflict locations. The removal of overhead utilities will be either temporary disconnections or permanent re-routing. Such works will be carried out by the utility providers in advance of turbine delivery to site.

The permanent re-routing of overhead utilities will result in a temporary disruption to power and telecommunications services for existing residents and business and will also involve temporary road works to 'underground' these services. The location of the rerouting will be agreed with the utility provider.

A traffic management plan will be agreed with Galway County Council in advance of any such works. Any trenching and road reinstatement works associated with utility diversions will be subject to a road opening license and is expected to be carried out in such a way as to ensure one lane of traffic will be open to traffic at all times. Such works will be carried out over a number of days (estimated 1 day per service).

However, if the permanent re-routing of overhead utilities is not possible, temporary disconnections of overhead lines will be required on several occasions to facilitate the delivery of turbine blades and will be carried out during the delivery of the components. Advance disconnection works will be carried out before the first turbine deliveries.

The schedule of turbine component deliveries will be determined by the turbine supplier however it is reasonable and conservative to assume that five convoys will be required to deliver all of the turbine components to site over the course of the turbine installation works which is expected to take place over the course of 6 months. This is based on a total of 7 no. loads per turbine to deliver blades, tower sections and nacelles, with each convoy consisting of components for two turbines at a time. Over the course of the 6-month installation period, it has been assumed convoys will be scheduled to deliver components to site every 4 weeks. It is reasonable to assume a conservative scenario where temporary disconnections will be required during off peak times, on six different occasions over the course of six months (approximately once every month) to facilitate convoys, with a duration of several hours between disconnection and re-connection of services on each occasion. The impact on residents and businesses is assessed in Chapter 6, Population, Human Health and Chapter 17 Material Assets.

Temporary disconnections of overhead utilities will result in a significantly greater impact on local residents and businesses in terms of disruption to services than permanent diversions. It will also result in greater disruptions to traffic flows as the delivery of components through the town on each occasion will take slightly longer due to additional temporary works each time.

At TDR nodes where it has been identified that relocation of existing utilities is required to facilitate the temporary accommodation requirements, all such works will be carried out in advance of the formation of groundworks associated with the creation of new load bearing surfaces and all such activities will take place within the immediate vicinity of the proposed TDR node areas assessed in this EIAR.

14.5.7.2 Existing Structures Along TDR

There are a number of existing watercourse crossing structures along the turbine delivery route that will be crossed by the proposed oversized loads associated with the delivery of turbine components.

The Route Survey Report (RSR) identifies the key issues associated with AIL deliveries and identifies remedial works, either in the form of physical works, vehicle modifications or traffic management interventions that will be required to accommodate the predicted loads. Vehicle modifications including lowering the suspension and increased vertical clearance at overbridge constraint locations are identified at Lough Atalia Road Railway Overbridge (POI 2). No structural reinforcement of existing structures is predicted to be required to facilitate the delivery of the proposed loads along the TDR.

The Preliminary Traffic Management Plan which can be found in Appendix 14.2 and contains a report detailing locations of proposed passing bays along the TDR and haul routes carried out from the L-6483 and L-2234 local roads en-route to wind farm site entrance.

14.6 Assessment of Likely Significant Effects

Potential impacts of the proposed project are outlined below, these are categorised in relation to the construction phase, operational phase and decommissioning of the project. The Do-nothing Scenario is also detailed.

14.6.1 Do-Nothing Scenario

If the proposed project is not constructed, there will be no change to the current road network and existing traffic patterns within the study area.

14.6.2 Construction

14.6.2.1 Main Wind Farm Site

The construction activities associated with the project will lead to additional construction related traffic on the existing public road network over the duration of the construction works. These impacts will include:

- Heavy Goods Vehicles (HGVs) transporting materials to and from the site, including road making materials, concrete, building materials, drainage/ducting materials, cabling, electrical components and excavated material.
- HGVs transporting conventional earthworks machinery such as excavators, dumper trucks and rollers.
- Fuel trucks transporting fuel for plant to each site compound during the construction phase
- Light Goods Vehicles (LGVs) such as cars, 4x4s and vans used by the workers and supervisory staff involved in the construction works.
- Oversized loads including turbine components (more details below).

Without appropriate mitigation measures, the proposed works have the potential to lead to a negative impact on the existing road network including:

- Delay and slight disruption to road users;
- Road safety issues should the works not be carried out in line with good traffic management practices;
- Inappropriate parking of construction related vehicles along the route of the works;
- Soiling of the public road leading to a general lack of cleanliness and poor skid resistance on roads;
- Damage to existing road surface.

Tree felling will be required as part of the project. Haul routes used for felling activities will generally be the same as those identified for the project construction. Felling of 0.54 ha of coniferous forestry is required within and around the wind farm infrastructure to accommodate the construction of turbines, hardstands, crane pads, temporary compounds, access tracks and the proposed onsite substation.

For a conservative assessment, it has been assumed that clearance felling for the project will take place at the start of the construction programme in advance of the commencement of the main balance of plant construction works. HGV's associated with the felling works will approach and leave the site via the route identified in Figure 14.3.

The following sawmills are located in the vicinity of the proposed development:

- Connolly Sawmills, Roscommon Road, Barnaboy, Co. Galway;
- Gabriel Curran & Sons Sawmills Limited, Corrandulla, Co. Galway;
- Murray Timber Group Limited, Hermitage, Co. Galway;
- Coole Timber Products, Gort, Co. Galway.

All of the above sawmills are located close to motorways and national routes and area easily accessible from the project transport routes.

The construction of the permanent met mast will be carried out by a small crew and the following mobile plant:

- Low-loader
- Flatbed trucks
- Works Van
- Telescopic Handler
- Mobile Crane

Access to the mast location will be via internal and access tracks through the wind farm site and road network as shown in the layout plans.

Construction of the met mast will take place over a number of days. Construction traffic will consist of a small number of truck movements for delivery of mast sections and construction plant and crew.

14.6.2.2 110kV Infrastructure (Substation and Loop-In Connection to Overhead Line)

Cable Works

The traffic impact associated with the grid connection cable works will fall into two main categories, the construction traffic related impacts and the temporary lane closure related impacts.

The proposed grid connection is shown on Figure 2.4.

Construction Traffic Related Impacts

The cable route construction works will involve constantly moving the working area as the cable installation works progress. Traffic related impacts associated with the cable works are expected to be short term in duration as the majority of the 33kV internal cabling works are within grass or peatlands off of the public road. However, there are 6 no. locations where the cable route must cross the public road to connect specific turbines onto the circuit. The trenching and cabling works at the crossing points will be managed by a Stop/Go system without the need to close the road. Cable trenches can be excavated and covered using trench covers to maintain traffic flow. These works can be completed in less than 1-day across the L-6225, L-22202, L-2220, L-22204 and a private road near T01 and T02 used for turbary activity.

Cabling and trenching works within the public road corridor are described in detail in section 5.4.2 of the Traffic Management Plan. These works will lead to additional traffic associated with the cable route construction.

Temporary Lane Closure Related Impacts

The grid connection construction works will require a combination of temporary road works with traffic diversions and temporary traffic management measures such as Stop/Go systems along the proposed route. For further information on the temporary road works required for the grid connection and 33kV internal collector cable please refer to sections 4.3 and 5.4.2 of the Traffic Management Plan.

All road works will be subject to a road opening licence, but it is anticipated that the cable installation along local roads will be advanced using a combination of rolling lane closures where the existing road width is insufficient to accommodate an open lane for traffic to pass the works area. Public traffic movements will be maintained during these works through the use of trench covers and traffic management measures.

The grid connection cable works by its nature will be isolated to a relatively small works area which will move on a daily basis. Impacts associated with the works will be experienced on the road network in the immediate vicinity to the works area.

Off-line sections of the proposed grid connection through private lands will not generate an impact to existing traffic flows.

Temporary lane closures and Stop/Go systems will be required at specific locations for the installation of joint bays and cable pulling and jointing operations at later dates. These activities are isolated and carried out in under a day at each location. Without appropriate mitigation measures, the proposed works have the potential to lead to a negative impact on the existing road network including:

- Delay and disruption to road users.
- Road safety issues should the works not be carried out in line with good traffic management practices;
- Inappropriate parking of construction related vehicles along the route of the works;
- Soiling of the public road leading to a general lack of cleanliness and poor skid resistance on roads;
- Damage to existing road surface.

14.6.2.3 Turbine Delivery Route

The delivery of turbine components including blades, tower sections and nacelles is a specialist transport operation owing to the oversized loads involved. The blades are the longest component and have been considered for the purpose of this assessment.

Turbine component deliveries will be carried out during off-peak times and will be done using a convoy and a specialist heavy haulage company. Turbine deliveries will also be escorted by An Garda Siochána. This will ensure the impacts of the turbine deliveries on the existing road network are minimised. As described in Section 14.4, accommodation works are required along the turbine delivery route such as hedge or tree cutting, removal of wall sections, street furniture, vegetation, fences, temporary culverting of ditches and stream crossings, relocation of powerlines/poles, lampposts, signage and temporary local road widening through the laying of compacted load bearing aggregate to verges and roundabouts.

Without appropriate mitigation measures, the construction of the proposed temporary accommodation works have the potential to lead to a negative impact on the existing road network including:

- Delay and disruption to road users;
- Road safety issues should the works not be carried out in line with good traffic management practices;
- Inappropriate parking of construction related vehicles in the public road in the vicinity of the works areas;
- Soiling of the public road leading to a general lack of cleanliness and poor skid resistance on roads;
- Damage to existing public road infrastructure.

14.6.3 Operation

Traffic associated with the operational phase of the project will be associated with the wind farm owner/operator and grid network operator personnel visiting the substation, and maintenance staff. There will also be a limited infrequent attendance by routine environmental monitoring/compliance staff.

Routine turbine maintenance is generally conducted by personnel climbing inside the tower. However, there may be circumstances where a crane may need to be mobilised to site to conduct non-routine maintenance.

The proposed substation and control buildings have been designed in accordance with network operator requirements with welfare facilities. However, they will not require full time operational staff and will be largely automated with occasional visits from maintenance teams.

Unforeseen or unplanned events such as emergency turbine repair works could potentially require the mobilisation of construction plant and personnel to site. The replacement of a large turbine component such as a blade will require a crane and the re-installation of some TDR temporary accommodation requirements.

A cable fault along the grid connection could potentially require temporary road works for intrusive investigations and repair. The above unplanned events are extremely unlikely to occur.

14.6.4 Decommissioning

On decommissioning, cranes will disassemble the above ground turbine components which will be removed off site for recycling. All the major component parts are bolted together, so this is a relatively straightforward process.

The foundation pedestals will be covered over and allowed to re-vegetate naturally. Leaving the turbine foundations in situ is considered a more environmentally sensible option as to remove the reinforced concrete associated with each turbine would result in environmental nuisances such as noise and vibration and dust.

It is proposed that all the internal site access tracks and turbine hard standings will be left in place. These will continue to be used for recreation, forestry and agriculture. Turbine hardstandings will be covered over with topsoil previously stripped and used for landscaping purposes during the construction stage and left to revegetate naturally. The recreational trails and associated signage will be left in situ.

The temporary accommodation requirements along the TDR will not be required for the decommissioning phase as turbine components can be dismantled on site and removed using standard HGVs.

Grid connection infrastructure including the on-site substation and ancillary electrical equipment will form part of the national grid and will be left in situ.

It is expected that the decommissioning phase will take no longer than 6 months to complete.

The traffic impact associated with the decommissioning phase will be significantly less than the construction phase due to the considerably lower number of vehicle movements.

The decommissioning phase of the project is described in Chapter 2 of this EIAR.

14.7 Impact Assessment

14.7.1 Construction

The construction phase traffic generated by the project on the surrounding road network has been calculated by estimating the number of vehicles required for each phase of the project (construction, operation and decommissioning). The number of vehicles is then converted to the equivalent two-way trips, whereby every vehicle will generate two trips, one to and one from the site.

In order to assess the impact of the additional construction related traffic on the existing road network it is first required to estimate the amount of construction traffic that will be generated (trip generation) as a result of the proposed project.

This assessment was done by estimating the amount of traffic, in the form of heavy goods vehicles (HGV) and light goods vehicles (LGV) that will be generated during the construction phase and then distributing it over the duration of the construction programme. In determining the number of 'trips' the estimated number of HGV vehicles was multiplied by a factor of 2 to account for a single trip 'in' and a corresponding single trip 'out'.

In the case of LGVs, the estimated number of vehicles was multiplied by 2.5 to account for some additional LGV movements e.g. some workers taking lunch breaks in the local area. The analysis allowed for a total number of trips per month to be calculated. This could be translated to annual average trips per day (AADT).

Some key assumptions taken when preparing the trip generation estimates include:

- An average ready mix concrete truck carries a load of approximately $8m^3$ of concrete;
- An average tipper truck carries approximately $10m^3$ of soil/rock/aggregate;
- A construction period of 24 months is expected based on the nature and scale of the proposed works.
- It has been assumed that cable trenching works associated with the construction of the grid connection and internal cabling works is expected to take 6 months to complete and will be carried out in parallel with the wind farm construction where practical;
- An average of 1.5m of engineering fill will be imported for the formation of wind turbine foundations per turbine;
- An average of 1.5m of engineering fill will be imported for the formation of wind turbine hardstanding areas per turbine;
- An average of 0.6m of engineering fill will be imported for the formation of floated access track;
- An average of 0.45m of engineering fill will be imported for the formation of new access track;

Project related traffic will vary over the course of the construction programme. Activities can be broken up into the following main categories:

- Mobilisation and site setup
- Site clearance and felling
- Internal access tracks
- Turbine hard standings
- Turbine foundations
- TDR Accommodation Works
- Turbine Installation
- Met Mast
- Onsite substation
- Private electrical network
- Grid connection cable works
- Testing and Commissioning
- Landscaping, reinstatement, demobilisation.

Table 14-8 and Image 14-1 show construction stage vehicle trips and their distribution across the 24-month construction programme for the entire project.

Table 14-7: Vehicle Trip Distribution – Project Including Grid Connection Cable Works

Activity	One-Way Movements	Month																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Total Trips per month	59223	2107	2107	3270	3270	3270	3270	3270	3788	3878	3945	3945	3945	3167	3167	1599	1720	1720	1720	1277	1277	1016	859	879	758
Total HGV Trips per month (x2)	46096	1644	1644	2807	2807	2807	2807	2807	3324	3414	3481	3481	3481	2703	2703	1135	1135	1135	1135	693	693	173	16	36	36
Total LGV Trips per month (x2.5)	13126	464	464	464	464	464	464	464	464	464	464	464	464	464	464	464	585	585	585	585	585	843	843	843	722
Total Trips Per Week	13773	490	490	761	761	761	761	761	881	902	917	917	917	737	737	372	400	400	400	297	297	236	200	204	176
Total HGV Trips Per Week	10720	382	382	653	653	653	653	653	773	794	810	810	810	629	629	264	264	264	264	161	161	40	4	8	8
Total LGV Trips Per Week	3053	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	136	136	136	136	136	196	196	196	168
Total Trips Per Day	2295.5	82	82	127	127	127	127	127	147	150	153	153	153	123	123	62	67	67	67	50	50	39	33	34	29
HGV Trips Per Day	1786.7	64	64	109	109	109	109	109	129	132	135	135	135	105	105	44	44	44	44	27	27	7	1	1	1
LGV Trips Per Day	508.8	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	23	23	23	23	23	33	33	33	28

Activity	One-Way Movements	Month																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Total Trips Per Hour	230	8	8	13	13	13	13	13	15	15	15	15	15	12	12	6	7	7	7	5	5	4	3	3	3
Total HGV Trips Per Hour	179	6	6	11	11	11	11	11	13	13	13	13	13	10	10	4	4	4	4	3	3	1	0	0	0
Total LGV Trips Per Hour	51	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3

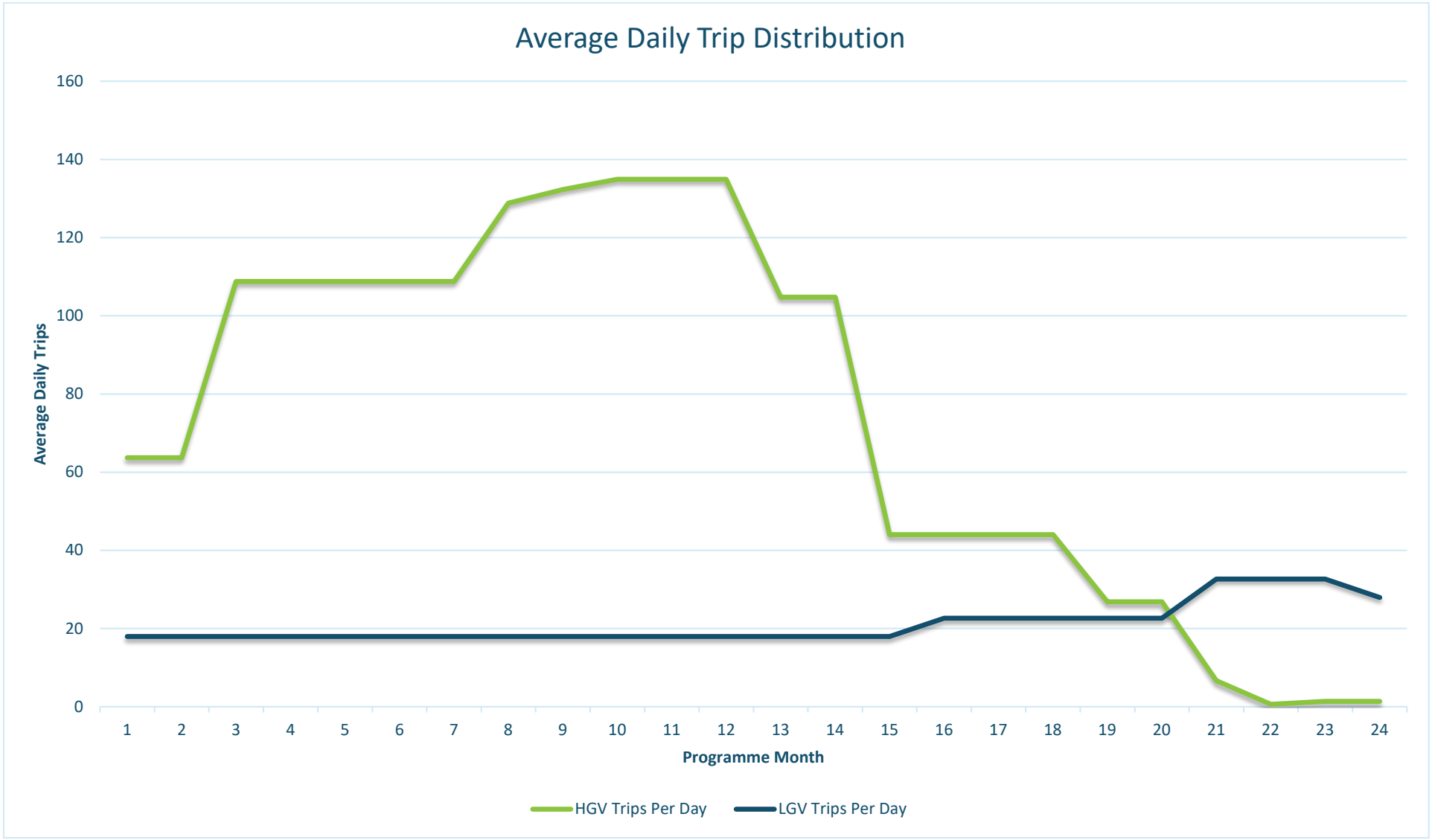

Figure 14-4: Average Daily Trip Distribution – Project Including Grid Connection Cable Work

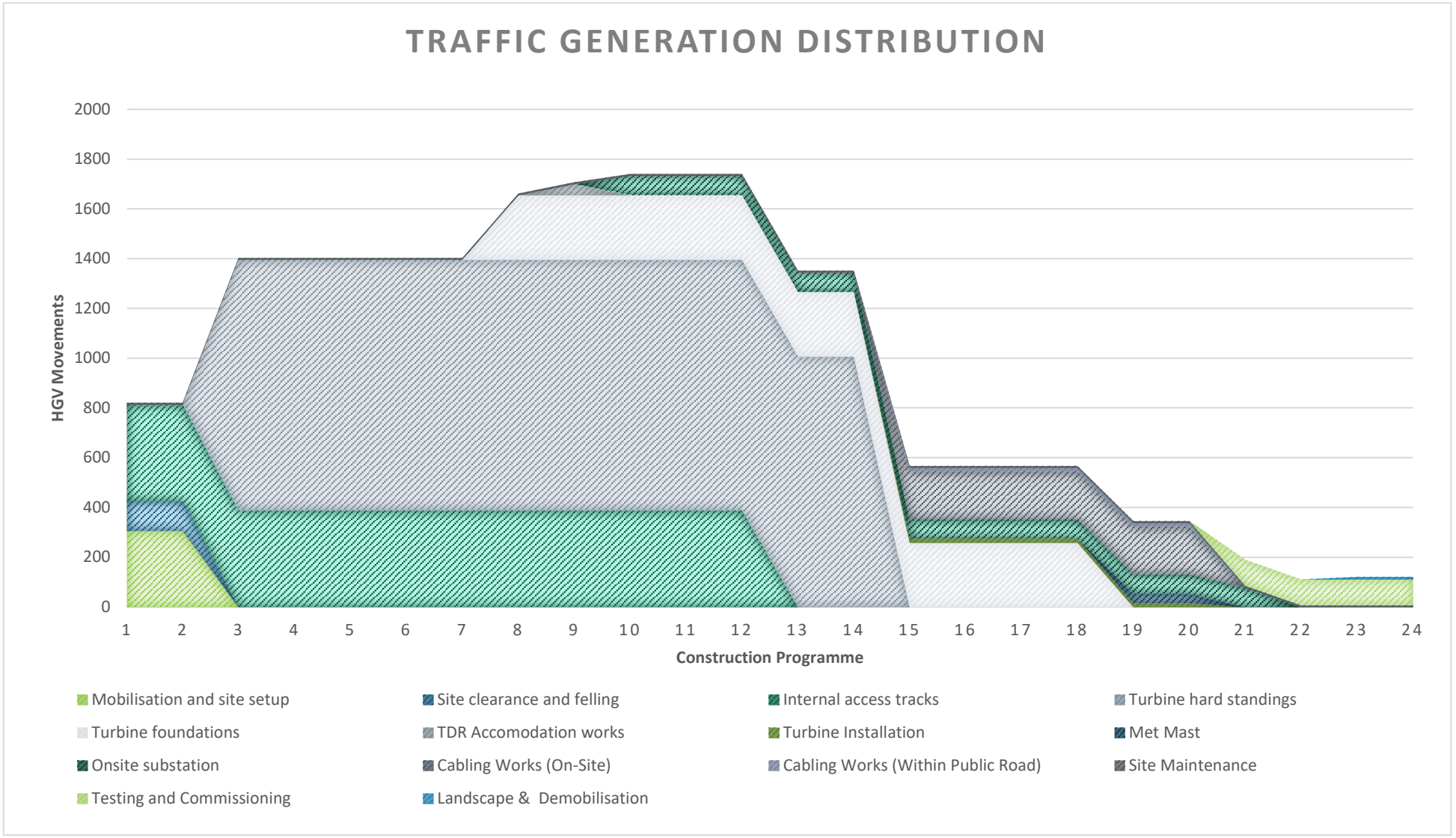

Figure 14-5: Cumulative HGV Trip Distribution - Including Grid Connection Works

The construction phase for the Proposed Development will lead to 46,096 additional HGV trips (two-way) over the duration of the construction works.

Calculations of HGV movements associated with the construction of the project indicate an average daily increase of 74 HGV trips per day over a construction period of 24 months. This increases to 135 HGV trips per day during peak months which occur in months 10 - 12 inclusive for HGV traffic.

An average workforce of 30 persons is anticipated, increasing to 40 persons during peak periods. This is estimated to give rise to an increase of LGV traffic of 42 trips per day on average rising to 54 trips during peak construction periods which occur for LGV traffic during months 21 – 23 inclusive.

The combined HGV and LGV average daily increase is 117 trips per day throughout the construction programme.

The predicted AADT during the construction phase of the proposed project is presented in Table 14-9. The impact on predicted future traffic on the surrounding road network is also presented in this table.

Table 14-8: Predicted AADT with Average Daily Construction Phase Traffic

Location	Predicted AADT During Construction (Estimated Site Start 2028)	HGV AADT Pre Development	Average Daily HGV Trips Generated by Development	Predicted HGV AADT During Construction	% Increase	LGV AADT Pre-Development	Average Daily LGV Trips Generated by Development	Predicted LGV AADT During Construction	% Increase	Average Daily Trips Generated by Development (Combined)	Predicted Combined AADT During Construction	% Increase
N17: Tuam Bypass, Co. Galway	11,122	781	74	856	10%	10,341	42	10,383	0.41%	117	11,239	1.05%
N84: Between Ballinrobe and Partry Co. Mayo	11,168	853	74	928	9%	10,315	42	10,357	0.41%	117	11,285	1.05%
N83	4,112	199	74	273	37%	3,914	42	3,956	1.08%	117	4,229	2.84%
R332	1,294	62	74	137	119%	1,231	42	1,274	3.43%	117	1,411	9.02%
L6483	57	3	74	78	2482%	54	42	96	78.13%	117	174	204.80%
L6225	56	3	74	78	2482%	53	42	95	79.69%	117	173	208.46%

The busiest period during the construction programme is expected to occur in months 10 - 12 when multiple construction activities take place concurrently. These activities include access tracks, turbine hard standing and foundation construction, and on-site substation construction works.

It should be noted that the traffic increases presented in the assessment are conservative and include all construction stage traffic associated with the project including the cabling works. In reality, traffic impact on roads associated with the cable route will be considerably less than what is presented due to the nature of cabling works. The cabling works impact approximately 0.5km of public roadway, of which the longest section on a single road is c. 225 metres. Other sections of the cabling works within the public road relate to crossing points, where the cable only needs to cross the width of the carriageway to continue into private lands. These crossing sections should take less than 1 day to complete before being reopened to traffic. For further details on the grid connection and internal collector cable please refer to the Traffic Management Plan sections 4.3 and 5.2.4.

Additionally, although the percentage increases on the local road network are quite high as shown in Table 14-9 above, the actual number of HGVs currently using these roads are very low which gives the impression of a significant impact when in reality there is not. The local road network will continue to operate well within its carrying capacity with the additional construction traffic.

The predicted AADT for the project during peak months of the construction phase of the proposed project is presented Table 14-9.

Table 14-9: Predicted AADT with Peak Construction Phase Traffic

Location	Predicted AADT During Construction (Estimated Site Start 2028)	HGV AADT Pre-Development	Average Daily HGV Trips Generated by Development during Peak Construction Month	Predicted HGV Daily Trips During Peak Construction Month	% Increase	LGV AADT Pre-Development	Average Daily LGV Trips Generated by Development during Peak Construction Month	Predicted LGV AADT During Construction	% Increase	Average Daily Trips Generated by Development (Combined) During Peak Construction Month	Predicted Combined AADT During Peak Construction Month	% Increase
N17: Tuam Bypass, Co. Galway	11,122	781	135	916	17.3%	10,341	54	10,395	0.52%	174	11,296	1.56%
N84: Between Ballinrobe and Partry Co. Mayo	11,168	853	135	988	15.8%	10,315	54	10,368	0.52%	174	11,342	1.56%
N83	4,112	199	135	334	67.9%	3,914	54	3,967	1.37%	174	4,286	4.23%
R332	1,294	62	135	197	215.9%	1,231	54	1,285	4.37%	174	1,468	13.45%
L6483	57	3	135	138	4497.4%	54	54	108	99.30%	174	231	305.24%
L6225	56	3	135	138	4497.4%	53	54	107	101.28%	174	230	310.69%

The following sub-sections assess the impacts associated with the various elements of the project. The construction of the proposed cabling works within the public road and the private electrical network has been separated from the rest of the project as these works will be isolated from the main wind farm site works (i.e. cabling works will take place on the opposite side of the site during hardstand construction and foundation pours to facilitate trenching works in or adjacent to the access track) and carried out by a largely independent construction team.

14.7.1.1 Main Wind Farm Site

The volume and distribution of vehicle trips generated by the construction of the main wind farm site are presented in Table 14-11and Image 14-2.

Table 14-10: Vehicle Trip Distribution – Main Wind Farm Site Excluding Cabling Works

Activity	One-Way Movements	Month																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mobilisation and site setup	610	305	305																						
Site clearance and felling	240	120	120																						
Internal access tracks	4666	389	389	389	389	389	389	389	389	389	389	389	389												
Turbine hard standings	12078			1007	1007	1007	1007	1007	1007	1007	1007	1007	1007	1007	1007										
Turbine foundations	2846								259	259	259	259	259	259	259	259	259	259							
TDR Accomodation works	45									45															
Turbine Installation	96															16	16	16	16	16	16				
Met Mast	75																			38	38				
Onsite substation	942										78	78	78	78	78	78	78	78	78	78	78	78			
Site Maintenance	192	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Landscape & Demobilisation	20																							10	10
Site staff	9675	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403
Total Trips per month	70729	2651	2651	3814	3814	3814	3814	3814	4332	4422	4489	4489	4489	3711	3711	2114	2114	2114	2114	1672	1672	1336	1179	1199	1199
Total HGV Trips per month (x2)	45922	1644	1644	2807	2807	2807	2807	2807	3324	3414	3481	3481	3481	2703	2703	1106	1106	1106	1106	664	664	173	16	36	36
Total LGV Trips per month (x2.5)	24807	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	1008	1163	1163	1163	1163
Total Trips Per Week	16449	617	617	887	887	887	887	887	1007	1028	1044	1044	1044	863	863	492	492	492	492	389	389	311	274	279	279
Total HGV Trips Per Week	10680	382	382	653	653	653	653	653	773	794	810	810	810	629	629	257	257	257	257	154	154	40	4	8	8
Total LGV Trips Per Week	5769	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	270	270	270	270
Total Trips Per Day	2741	103	103	148	148	148	148	148	168	171	174	174	174	144	144	82	82	82	82	65	65	52	46	46	46
HGV Trips Per Day	1780	64	64	109	109	109	109	109	129	132	135	135	135	105	105	43	43	43	43	26	26	7	1	1	1
LGV Trips Per Day	962	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	45	45	45	45
Total Trips Per Hour	274	10	10	15	15	15	15	15	17	17	17	17	17	14	14	8	8	8	8	6	6	5	5	5	5
Total HGV Trips Per Hour	178	6	6	11	11	11	11	11	13	13	13	13	13	10	10	4	4	4	4	3	3	1	0	0	0
Total LGV Trips Per Hour	96	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5

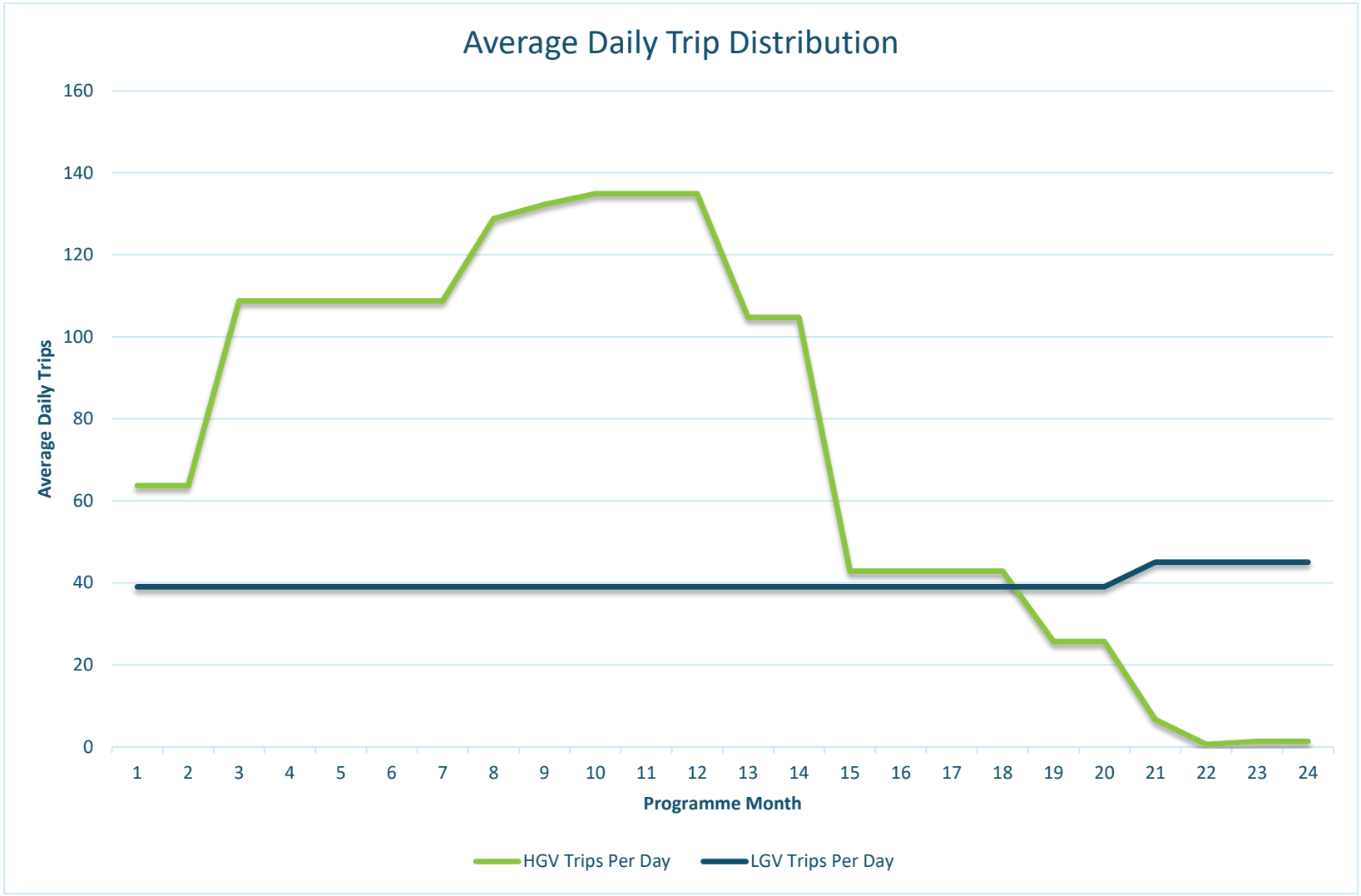

Image 14-1: Average Daily Trip Distribution - Project Excluding Cabling Works

It is estimated that the construction phase for the main wind farm site will lead to 45,922 additional HGV trips (two-way) over the duration of the construction works.

Calculations of HGV movements associated with the construction works indicate an average daily increase of 74 HGV trips over the course of the construction programme. The peak months for HGV trips occur in months 10 to 12 inclusive where average daily HGV trips rise to 135.

An average workforce of 30 persons is anticipated, increasing to 40 persons during peak periods. This is calculated to give rise to an average daily increase of 40 LGV trips per day over a construction period of 24 months. The peak months for LGV trips occurs in months 21 to 24 inclusive where average daily LGV trips rise to 45.

The combined HGV and LGV average daily increase for the wind farm site excluding grid connection works is 114 trips per day throughout the construction programme.

The predicted AADT during the construction phase of the main wind farm site is presented in Table 14-12. The impact on predicted future traffic on the surrounding road network is also presented in this table.

Table 14-11: Predicted AADT with Construction Phase Traffic - Main Wind Farm Site Only

Location	Predicted AADT During Construction (Estimated Site Start 2026)	HGV AADT Pre-Development	Average Daily HGV Trips Generated by Development	Predicted HGV AADT During Construction	% Increase	LGV AADT Pre-Development	Average Daily LGV Trips Generated by Development	Predicted LGV AADT During Construction	% Increase	Average Daily Trips Generated by Development (Combined)	Predicted Combined AADT During Construction	% Increase
N17 - Tuam Bypass Co. Galway	11,122	781	74	855	9.5%	10,341	40	10,381	0.39%	114	11,236	1.03%
N84 Between Ballinrobe and Partry Co. Mayo	11,168	853	74	927	8.7%	10,315	40	10,355	0.39%	114	11,282	1.02%
N83	4,112	199	74	273	37.3%	3,914	40	3,954	1.02%	114	4,226	2.78%
R332	4,112	199	74	273	37.3%	3,914	40	3,954	1.02%	114	4,226	2.78%
L6483	1,294	62	74	137	118.7%	1,231	40	1,271	3.25%	114	1,408	8.83%
L6225	57	3	74	77	2472.1%	54	40	94	74.01%	114	171	200.40%

The works will result in approximately 1% temporary increase in traffic volumes on the N17 and N84. A temporary increase of approximately 2.8% of traffic volumes on the N83 and R332. These roads form part of the TDR and haul routes for the construction of the project but do not form part of the grid connection cable route.

The local roads near Shancloon, Cloonbar, Emone, and Ralusk will see a more significant temporary increase in traffic volumes over the course of the construction phase of ca. 8.8% - 200% according to the table. These local roads from part of the TDR, GCR and construction haul routes. The percentage increases on the local road network are quite high as shown, however, the actual number of HGVs currently using these roads are very low which gives the impression of a significant short term impact when in reality there is not. The local road network will continue to operate well within its carrying capacity with the additional construction traffic from the development.

Based on the above, negative or adverse effects on the receiving environment associated with the construction works at the main wind farm site are considered to be short-term in duration and moderate in significance without appropriate mitigation.

14.7.1.2 Grid Connection

The volume and distribution of vehicle trips generated by the construction of the grid connection cable works are presented in Table 14-13 and Image 14-3.

Table 14-12: Vehicle Trip Distribution - Grid Connection Cable Work

Activity	One-Way Movements	Month																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Grid connection cable works	87															15	15	15	15	15	15				
Testing and Commissioning	413																					103	103	103	103
GCR staff	387															65	65	65	65	65	65				
Total Trips per month	1555															190	190	190	190	190	190	103	103	103	103
Total HGV Trips per month	175															29	29	29	29	29	29				
Total LGV Trips per month	1381															161	161	161	161	161	161	103	103	103	103
Total Trips Per Week	362															44	44	44	44	44	44	24	24	24	24
Total HGV Trips Per Week	41															7	7	7	7	7	7				
Total LGV Trips Per Week	321															38	38	38	38	38	38	24	24	24	24
Total Trips Per Day	60															7	7	7	7	7	7	4	4	4	4
HGV Trips Per Day	7															1	1	1	1	1	1				
LGV Trips Per Day	54															6	6	6	6	6	6	4	4	4	4
Total Trips Per Hour	6															1	1	1	1	1	1				
Total HGV Trips Per Hour	1															0	0	0	0	0	0				
Total LGV Trips Per Hour	5															1	1	1	1	1	1				

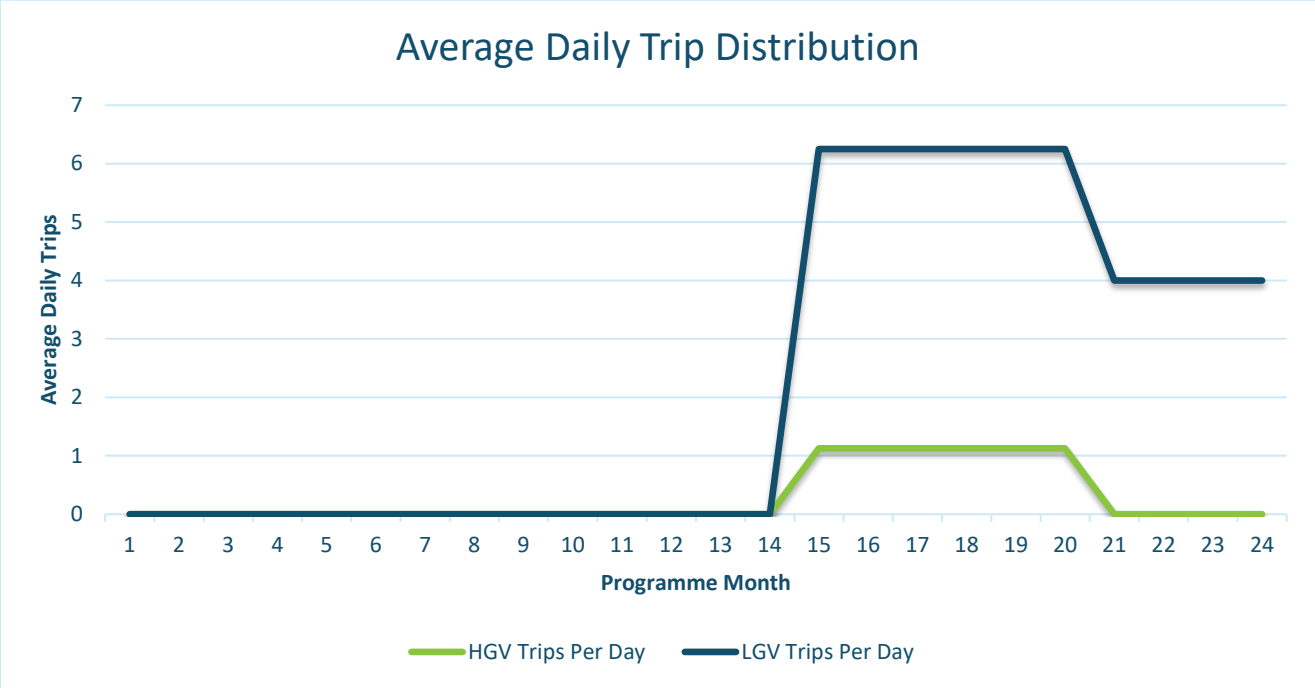

Image 14-2: Average Daily Trip Distribution - Cabling Works

It is estimated that the construction phase for the grid connection cable works will lead to 175 additional HGV trips (two-way) over the duration of the construction works.

Calculations of HGV movements associated with the construction works indicate an average daily increase of less than 1 HGV trip per day over the course of the construction programme. The pattern of HGV trips will remain relatively steady throughout the 6 month cabling works program and does not exceed 1 HGV trips per day on average over an 24-month duration.

The workforce associated with this activity is expected to give rise to an average daily increase of 2 LGV trips per day over the course of the construction programme. The pattern of LGV trips will remain relatively steady throughout the construction works and does not exceed 6 LGV trips per day on average over a 24-month duration.

The combined HGV and LGV average daily increase is 3 trips per day and does not exceed 7 trips per day throughout the construction programme.

As described in Section 14.5.2.2, the cabling works by its nature will be isolated to a small works area which will move on a daily basis as the construction progresses along the route. Adverse impacts associated with the works will therefore be experienced on the road network in the immediate vicinity to the works area. Should the construction of the grid connection works be split over two or more works areas, this would result in a significant reduction in overall construction time. This approach would also have the effect of increasing the overall average number of construction vehicle trips per day associated with the construction of the grid connection, albeit over a shorter timeframe. In such a scenario, as each of the works areas would be isolated from each other, the impacts associated with the works at each location would be as described above for that locality and would not act cumulatively with each other.

The predicted AADT during the construction phase of the cabling works is presented in Table 14-14. The impact on predicted future traffic on the L6225 is presented in this table. Although the GCR crosses other local roads, namely the L2220, L6100 and the L22202, traffic data was not available for these roads but it is likely that the annual average daily traffic using these roads is similar to that of the AADT shown on the L6225 local road.

Table 14-13: Predicted AADT with Construction Phase Traffic – Grid Connection Cable Works

Location	Predicted AADT During Construction (Estimated Site Start 2028)	HGV AADT Pre-Development	Average Daily HGV Trips Generated by Development	Predicted HGV AADT During Construction	%	LGV AADT Pre-Development	Average Daily LGV Trips Generated by Development	Predicted LGV AADT During Construction	% increase	Average Daily Trips Generated by Development (Combined)	Predicted Combined AADT During Construction	%
L6225	56	3	4	7	121.2%	53	33	86	62.81%	37	93	66.02%

The works will result in approximately 66% temporary increase in total traffic volumes on the L6225 and it is likely similar increases will be experienced on the L2220, L6100 and the L22202. Sections of these roads form part of the TDR, GCR and haul routes for the construction of the project.

These local roads along cabling route, turbine delivery and haul routes will see a higher temporary increase in traffic volumes over the course of the construction phase for reasons previously stated in the analysis of the wind farm traffic impact. While the overall temporary increase in traffic volumes can be considered low, there will be a noticeable temporary uplift in traffic as a result of the cabling works along these local roads throughout the duration of the works. Construction traffic associated with the cabling works will average less than 1 no. trip per hour and is not expected to exceed 1 no. trip per hour throughout the duration of the works.

Based on the above negative or adverse effects on the receiving environment associated with the construction of the grid cabling works are considered to be short-term in duration and slight to moderate in significance without appropriate mitigation.

14.7.1.3 Turbine Delivery Route

Impacts along the TDR will be limited to specific locations where temporary accommodation works are required and on occasions where large turbine component deliveries are brought to the site. Temporary accommodation works are at isolated locations and will not generate significant construction traffic.

It has been assumed that all turbine blades will be carried on a hybrid trailer to reduce the need for mitigation in constrained sections of the route. Where constraints are significant, it is possible to raise the scissor lift to a maximum of 10m in height. This allows loads to be either lifted over height constraints and to reduce the overall swept path of the delivery vehicle. The turbine blades will be transported in the flat position for the majority of the delivery route.

Overhead utilities and obstructions will need to be removed at any locations that the blade is raised on the scissor lift. The removal of overhead utilities will be either temporary disconnections or permanent re-routing. Such works will be carried out by the utility providers in advance of turbine delivery to site.

The permanent re-routing of overhead utilities will result in a temporary disruption to power and telecommunications services for existing residents and business and will also involve temporary road works to 'underground' these services. In addition, a traffic management plan will be agreed with Galway County Council in advance of any such works. Any trenching and road reinstatement works associated with utility diversions will be subject to a road opening license and can be carried out in such a way as to ensure one lane of traffic will be open to vehicles on the road at all times. Such works will be carried out over a number of days.

However if the permanent re-routing of overhead utilities is not possible, temporary disconnections of overhead lines will be required on several occasions to facilitate the delivery of turbine blades and will be carried out during the delivery of the components. Advance disconnection works will be carried out before the first turbine deliveries. The schedule of turbine component deliveries will be determined by the turbine supplier however it is reasonable to assume that several convoys will be required to deliver all of the turbine components to site over the course of the turbine installation works which is expected to take place over the course of 5 months.

It is reasonable to assume a conservative scenario where temporary disconnections will be required during off peak times, on up to six different occasions over the course of six months to facilitate convoys, with a duration of several hours between disconnection and re-connection of services on each occasion.

Temporary disconnections of overhead utilities will result in a significantly greater impact on local residents and businesses in terms of disruption to services than permanent diversions. It will also result in greater disruptions to traffic flows as the delivery of components through the town on each occasion will take slightly longer due to additional temporary works each time.

Negative or adverse effects on the receiving environment associated with the turbine delivery route are considered to be temporary in duration and slight to moderate in significance without appropriate mitigation.

14.7.2 Operation

The trip generation for the project once operational is anticipated to be minimal as both the wind farm and substations will be operated remotely as described in Section 14.5.3.

Effects on the receiving environment associated with the operation phase of the project are considered to be neutral in terms of quality, long-term in duration and imperceptible in significance.

For unforeseen or unplanned works, it is predicted that negative or adverse effects on the receiving environment will be temporary in duration and slight in significance without appropriate mitigation.

14.7.3 Decommissioning

Impacts associated with the decommissioning of the project will be similar in nature to the construction stage but of a much lower magnitude primarily due to the following key reasons:

- Wind farm access tracks will be left in-situ;
- The grid connection will form part of the grid network and will be left in place;
- Wind turbine components will be dismantled on site and can be removed on standard HGV's eliminating the requirement for temporary accommodation requirements needed at construction stage.

Negative or adverse effects on the receiving environment associated with decommissioning works at the main wind farm site are considered to be temporary in duration and slight in significance without appropriate mitigation.

Infrastructure associated with the grid connection will form part of the national transmission and distribution system and will be left in-situ. Therefore, no impacts are envisaged upon decommissioning of the grid connection and no mitigation is required.

Negative or adverse effects on the receiving environment associated with the turbine delivery route are considered to be temporary in duration and slight in significance without appropriate mitigation.

14.8 Mitigation Measures

14.8.1 Construction

14.8.1.1 Main Wind Farm Site

This section outlines the mitigation measures that will reduce, minimise or eliminate the potential impacts created by the project and outlined above.

The following mitigation measures are proposed to reduce the impact of the construction activity in relation to the construction phase of the project:

Traffic Management Plan

A Preliminary Traffic Management Plan has been completed and is found in Appendix 14.2. The traffic management plan (TMP) will be agreed with the road's authority and An Garda Siochána prior to commencing construction.

14.8.1.2 Grid Connection Works

Mitigation measures that will be implemented in full for the grid connection works include:

Road Opening : The road works associated with cable trenching works will be completed in line with the requirements of a road opening license as agreed with the local authority.

Route Proofing: In advance of the cabling works an assessment will be carried out to define the precise alignment of the cable route within the corridor which has been assessed. This will include slit trenching with the aim of minimising the construction impacts and avoiding existing services in the road.

Road Cleanliness: Appropriate steps will be taken to prevent soil/dirt generated during the works from being transported on the public road. Road sweeping vehicles will be used when necessary, to ensure that the public road network remains clean.

Temporary Trench Reinstatement: Trenches on public roads, once backfilled, will be temporarily reinstated to the satisfaction of the roads authority.

Surface Overlay after Trench Reinstatement: following temporary reinstatement of trenches on public roads, sections of the public roads will receive a full surface overlay. Details will be agreed with the roads authority. At a minimum they will be reinstated to their pre-works condition or better and to the satisfaction of the roads authority.

14.8.1.3 Turbine Component Delivery Mitigation

The turbine delivery route has been assessed using a detailed appraisal of potential routes and the identification of the most appropriate route including the accommodation requirements along the route to mitigate the impact of the turbine delivery. The impact of the deliveries on traffic is mitigated by delivering components during off-peak or night-time deliveries.

Mitigation measures proposed for the turbine delivery route also include:

Programme of Deliveries: a programme of deliveries will be submitted to the roads authority in advance of deliveries of turbine components to the site. The programme will include details of the dates and times of each component delivery along with the route to be taken. Turbine component deliveries will be carried out during off-peak times and will be done using a convoy and a specialist heavy haulage company.

Unloaded Trial Run: vehicles with similar dimensions of the abnormal load vehicles will complete an unloaded run of the route to ensure all temporary accommodation works are suitable for the loaded convoy.

Garda Escort: Turbine deliveries will be escorted by An Garda Siochána. This will ensure the impacts of the turbine deliveries on the existing road network are minimised.

Reinstatement: Any area affected by the works to facilitate turbine delivery will be fully reinstated to its original condition.

Consultation: Consultation with the local residents and Galway County Council will be carried out in advance to manage turbine component deliveries.

14.8.2 Operation

Site entrances to the site will be maintained continually to ensure visibility conditions at these entrances has not deteriorated. Hedgerow maintenance will be required periodically to ensure continued visibility at site entrances.

14.8.3 Decommissioning

The traffic impact associated with the decommissioning phase will be significantly less than the construction phase.

Infrastructure associated with the grid connection will form part of the national transmission network and will be left in-situ. Therefore, no impacts are envisaged upon decommissioning of the wind farm project and no mitigation is required.

Mitigation measures adopted for project decommissioning will be in line with those identified for the construction phase of the project.

All decommissioning works will be carried out in accordance with a decommissioning plan to be agreed with the planning authority in advance of the decommissioning works. Traffic management measures identified will be included in the decommissioning plan for the wind farm.

14.9 Residual Impacts

The implementation of mitigation measures outlined in Section 14.7 will ensure that residual impacts are minimised throughout the duration of the proposed activities.

14.9.1 Construction

Negative or adverse effects on the receiving environment associated with the construction works on the main wind farm site are considered to be short-term in duration and slight in significance following mitigation.

Negative or adverse effects on the receiving environment associated with the turbine delivery route are considered to be temporary in duration and slight following mitigation.

Negative or adverse effects on the receiving environment associated with the construction of the grid connection are considered to be short-term in duration and slight in significance following mitigation.

14.9.2 Operation

The trip generation for the project once operational is anticipated to be minimal.

Effects on the receiving environment associated with the operation phase of the project are considered to be neutral in terms of quality, long-term in duration and imperceptible in significance.

For unforeseen or unplanned works such as emergency turbine repair works described in Section 14.5.3, it is considered that negative or adverse effects on the receiving environment will be temporary in duration and not significant to slight following appropriate mitigation.

14.9.3 Decommissioning

Negative or adverse effects on the receiving environment associated with decommissioning works at the wind farm site are considered to be temporary in duration and not significant following mitigation.

Negative or adverse effects on the receiving environment associated with the turbine delivery route are considered to be temporary in duration and not significant following mitigation.

Infrastructure associated with the grid connection will form part of the national transmission network and will be left in-situ. Therefore, no impacts are envisaged upon decommissioning of the project and no mitigation is required.

Table 14-14: Summary of Residual Impacts

Phase	Project Element	Main Receiving Environment	Description of Potential Effect		
			Duration	Quality	Significance
Construction	Main Wind Farm Site	N17, N84, R332 and surrounding local road network	Short-term	Negative/Adverse	Slight
	Turbine Delivery Route	M17, N17, R332 and surrounding local road network	Temporary	Negative/Adverse	Slight
	Grid Connection	L2220, L22202, L6100, Local road network along Grid Connection Route.	Short-term	Negative/Adverse	Slight
Operation	Main Wind Farm Site	N17, N84, R332 and surrounding local road network	Long-term	Neutral	Imperceptible
	Turbine Delivery Route	M17, N17, R332 and surrounding local road network	Long-term	Neutral	Imperceptible
	Grid Connection	L2220, L22202, L6100, Local road network along Grid Connection Route.	Long-term	Neutral	Imperceptible
Decommissioning	Main Wind Farm Site	N17, N84, R332 and surrounding local road network	Temporary	Negative/Adverse	Not significant
	Turbine Delivery Route	M17, N17, R332 and surrounding local road network	Temporary	Negative/Adverse	Not significant
	Grid Connection	L2220, L22202, L6100, Local road network along Grid Connection Route.	N/A	N/A	N/A
Unplanned Events (i.e. Accidents)	Main Wind Farm Site	N17, N84, R332 and surrounding local road network	Temporary	Negative/Adverse	Not significant - Slight
	Turbine Delivery Route	M17, N17, R332 and surrounding local road network	Temporary	Negative/Adverse	Not significant - Slight
	Grid Connection	L2220, L22202, L6100, Local road network along Grid Connection Route.	Temporary	Negative/Adverse	Not significant - Slight

14.10 Cumulative Impacts

All known existing and proposed projects within the cumulative study area of 20km that could potentially generate a cumulative impact with Shancloon Wind Farm in relation to traffic and transportation during construction, operation and decommissioning were identified and examined as part of this assessment. Table 14-16 provides details of the projects within the study area that were considered for cumulative impacts.

Table 14-15: Existing and Proposed Projects Assessed for Cumulative Impacts

Development (Application No.)	Number of turbines	Distance from the Site (km)	Status
Clonberne Wind Farm (ABP ref. 320089)	11	18.0	Lodged in July 2024
Laurclavagh Wind Farm (ABP ref. 319307)	8	14.0	Lodged in March 2024
R332 Kilmaine to Foxhall realignment and resurfacing maintenance programme	NA	2.4	Works ongoing
Western Hygiene Supplies Ltd. (GCC ref. 212138)	NA	12.5	Granted
Omaum River Restoration (GCC ref. 2435)	NA	17.0	Granted
Nanny River Restoration (GCC ref. 2460226)	NA	14.0	Granted
Lislaughera, Cong, County Mayo. (MCC ref. 2460297)		16.5	Further information
Restoration of a gravel pit at Brackloon (GCC ref. 221204)	NA	17.5	Granted
Development of a warehouse and infrastructure at Farrannamartin (GCC ref. 2360887)	NA	10.0	Granted
Development of a factory extension and substation (GCC ref. 19302)	NA	11.5	Granted
Quarry development at Cloonascragh (GCC ref. 2260819)	NA	13	Granted
Development of a care centre at Glebe (GCC ref. 19920)	NA	11	Granted
Development of a concrete batching plant at Cartron (GCC ref. 20419)	NA	7	Granted

Development (Application No.)	Number of turbines	Distance from the Site (km)	Status
Development of a quarry at Tuam (GCC ref. 2460013)	NA	19	New Application
Commercial and residential development at Oughterard (GCC ref. 2460466)	NA	20	Further information

The existing energy developments and planning applications listed in Table 14-16 below were obtained from a planning search on the Galway County Council Planning Website, accessed in October 2024 and through consultation with the local roads department engineer. The search included developments lodged within the last 10 years within 20km of the Site.

14.10.1 Clonberne Wind Farm, Co. Galway

Clonberne Wind Farm (ABP. Ref. 320089) consisting of 11 turbines of approximately 7.2MW with a combined output of approximately 79.2MW and associated site development works. This development is located approximately 20km east (straight line distance) of the Shancloon Wind Farm. The case is currently being reviewed by An Bord Pleanála and is due to be decided on the 8th of January 2025.

The proposed Clonberne Wind Farm shares a common turbine delivery route with the Shancloon Wind Farm from Galway Port up to the N17 Tuam Bypass. The route is shared for approximately 20km and any temporary accommodation works for abnormal load deliveries along the route could be kept in place for both projects should the construction programs align. The assumed construction year for the Clonberne Wind Farm is between 2028 and 2030 which is similar to that of the Shancloon Wind Farm. The applicant is committed to phasing turbine deliveries appropriately with the Local Authority to avoid major traffic disruption on the road network.

The Clonberne Wind Farm project does not appear to identify a specific quarry that they intend on sourcing materials from but have stated in the EIAR that quarries are located to the Southwest of the site. The Clonberne Wind Farm may share a portion of the haul route with the Shancloon project, should they source material from Mortimer's Quarry in Carragh, Co. Galway. The EIAR also states that the project will utilise a borrow pit to source stone and gravel which would reduce the need for importing external aggregate and reduce the cumulative impact on the surrounding road network.

The Clonberne Wind Farm does not share a common GCR with the Shancloon Wind Farm, therefore, cumulative effects are not expected from the GCR.

It is estimated that during civil construction, approximately 4,595 HGV loads will be delivered to the Clonberne Site. This breaks down to approximately 255 loads per month excluding Sundays and bank holidays assuming an 18-month construction programme as stated in the EIAR.

Potential negative cumulative effects on the road network are anticipated to have a temporary impact and slight to moderate in significance during the construction phase.

The wind farm does not generate any perceptible levels of traffic during operation as it is remotely operated. In the highly unlikely event of a significant turbine component replacement during the Shancloon Wind Farm operational phase, this will involve a small number of HGV trips and potential abnormal load deliveries along the TDR route over a short period of time.

It is considered that no cumulative impact will be created as a result of this development during the operation or decommissioning phases of the Shancloon Wind Farm.

14.10.2 Laurclavagh Wind Farm

Laurclavagh Wind Farm (ABP. Ref. 319307) consisting of 8 turbines of approximately 7MW with a combined output of approximately 56MW and associated site development works. This development is located approximately 12km south (straight line distance) of the Shancloon Wind Farm. The case is currently being reviewed by An Bord Pleanála and was due to be decided on the 12th of September 2024.

The Laurclavagh Wind Farm shares a common turbine delivery route with the Shancloon Wind Farm from Galway Port up to the N6/R336 junction. The route is shared for approximately 4km. As stated previously, any temporary accommodation works for abnormal load deliveries along the route could be kept in place for both projects should the construction programs align. The assumed construction year for the Laurclavagh Wind Farm is in 2028 which is similar to that of the Shancloon Wind Farm. The applicant is committed to phasing turbine deliveries appropriately with the Local Authority to avoid major traffic disruption on the road network.

The Laurclavagh Wind Farm project does not appear to identify a specific quarry that they intend on sourcing materials from but have stated in the EIAR that quarries are located to the North and South of the site. The Laurclavagh Wind Farm may share a portion of the haul route with the Shancloon project, should they source material from Mortimer's Quarry in Carragh, Co. Galway.

The underground cabling route for the Laurclavagh project has a section of the grid connection route within the N83 national secondary road which is utilised by the Shancloon project for hauling aggregates. The GCR travels north on the N83 for approximately 7.5km where it meets the L-6141 which connects into the N83 from the east. This section of the carriageway has sufficient width for the construction of the underground cabling to take place while operating a "stop-go" arrangement. This section of the grid connection will take approximately 50 days to construct as stated in the EIAR. The applicant is committed to phasing import deliveries appropriately with the other developments to avoid major traffic disruption on the road network. The applicant will also stop sourcing aggregate from quarries which require the use of the N83 during the GCR works should the construction programs coincide.

It is estimated that during civil construction, approximately 9,803 HGV loads will be delivered to the Laurclavagh Site. This breaks down to approximately 545 loads per month or an average of 21 loads per day excluding Sundays and bank holidays assuming an 18-month construction programme as stated in the EIAR.

Potential negative cumulative effects on the road network are anticipated to have a temporary impact and slight to moderate in significance during the construction phase.

The wind farm does not generate any perceptible levels of traffic during operation as it is remotely operated. In the highly unlikely event of a significant turbine component replacement during the Shancloon Wind Farm operational phase, this will involve a small number of HGV trips and potential abnormal load deliveries along the TDR route over a short period of time.

It is considered that no cumulative impact will be created as a result of this development during the operation or decommissioning phases of the Shancloon Wind Farm.

14.10.3 R332 Kilmaine to Foxhall Road Realignment, Widening and Resurfacing

The proposed road upgrade scheme consists approximately 3km in length (7 sections) of both online and offline carriageway construction involving vertical and horizontal realignment, road widening and road pavement overlay.

The proposed cross section typically consists of a 6m wide carriageway, a 3m wide two-way cycleway/ pedestrian shared facility with 2m wide segregation area, 0.5m minimum lateral clearance for cycleway, and 3m wide verge.

The proposed upgrade scheme shares sections of the route with one of the proposed haul routes for the Shancloon Wind Farm from McGrath's Quarry in Cong but does not share the main haul and TDR section of the R332 (between N17/R332 junction and Castlegrove West) which the Shancloon Wind Farm project proposes to use. The Shancloon Wind Farm project contractor will stop importing stone from McGrath's Quarry and utilise one of the other two haul routes identified from Harrington's Quarry or Mortimer's Quarry during the road realignment and resurfacing works if the two construction programs coincide.

Potential negative cumulative effects on the road network are anticipated to have a temporary impact and slight in significance during the construction phase.

It is considered that no cumulative impact will be created as a result of this development during the operation or decommissioning phases of the Shancloon Wind Farm.

14.11 Conclusion

There are no significant impacts expected on the receiving environment as a result of the construction, operation and decommissioning of the proposed project.

The proposed project is likely to result in a slight to moderate short-term negative impact on the existing road network during the construction phase if adequate mitigation measures are not implemented.

Following implementation of mitigation measures outlined herein, residual impacts during the construction phase will be reduced and are not expected to exceed 'slight to moderate' in significance.

Impacts during operation and decommissioning are considered imperceptible to not significant.

There are no significant cumulative impacts expected on the receiving environment as a result of other existing or proposed projects.

The mitigation measures identified in this Chapter will be adopted and implemented by the Contractor and incorporated into the construction stage CEMP and TMP for the project .

A TMP is contained in Appendix 14.2 of Volume III of this EIAR. In the event planning permission is granted for the proposed development, the final TMP will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned.

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