

Environmental Impact Assessment Report

Cummeennabuddoge Wind Farm

Chapter 7: Traffic and Transport

Cummeennabuddoge Wind (DAC)

September 2024



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Glossary of Terms

Term	Definition		
The Applicant	Cummeennabuddoge Wind Designated Activity Company (DAC)		
The Agent	Atmos Consulting Limited		
Environmental Advisors and Planning Consultants	Atmos Consulting Limited		
Environmental Impact Assessment	A means of carrying out, in a systematic way, an assessment of the likely significant environmental effects from a development		
Environmental Impact Assessment Regulations	Schedule 6 of the Planning and Development Regulations 2001 (as amended)		
Environmental Impact Assessment Report	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations		
The Proposed Development	Cummeennabuddoge Wind Farm		
The Proposed Development Site	The land enclosed by the red line shown on Figure 1-1a		
The Planning Act	Directive 2011/92/EU (as amended by Directive 2014/52/EU, the EIA Directive).		

List of Abbreviations

Abbreviation	Description
ATC	Automatic Traffic Count
AADT	Average Annual Daily Traffic
CTMP	Construction Traffic Management Plan
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
HGV	Heavy Goods Vehicles
IEMA	Institute of Environmental Management and Assessment
LGV	Light Goods Vehicles
PoE	Port of Entry
PPE	Personal Protective Equipment
TII	Transport Infrastructure Ireland



7 Transport and Access

7.1 Introduction

This chapter of the EIAR assesses the potential effects of the Proposed Development on the existing transport network and on sensitive receptors as a result of the construction, operation and decommissioning phases of 17 wind turbines and associated infrastructure (the Proposed Development). The Proposed Development is described in full in Chapter 4 of this EIAR.

The key objectives of this chapter are to:

- Describe the assessment methodology and significance criteria used in completing the assessment;
- Describe the traffic and transport conditions on the network around the Proposed Development;
- Describe the access arrangements for the Proposed Development;
- Identify and assess the likely environmental effects associated with increased traffic generated by the Proposed Development;
- Identify and describe the mitigation measures proposed to address potential significant environmental effects;
- Identify any cumulative effects; and

Assess residual effects post mitigation implementation.

7.1.1 Statement of Authority

The Access, Traffic and Transport assessment has been undertaken by SYSTRA Ltd with SYSTRA's EIA input led by Alan DeVenny. Alan has a BEng in Civil and Transportation Engineering as well as a PhD in Civil Engineering. Alan is a Chartered Member of the Institution of Civil Engineers (CEng, MICE) and has over 23 years of consultancy experience delivering development planning services and infrastructure design services for new developments.

SYSTRA's EIA team has produced Traffic and Transport EIA Report (EIAR) Chapters for approximately 50 wind farm developments and have considerable windfarm experience from feasibility stage through to the construction stage.

7.2 Methodology and Approach

7.2.1 Legislation, Planning Policy and Guidance

A full list of the overarching policy documents which inform this EIAR can be found in the Planning Statement.

This assessment is informed by, and adheres to, the following additional policy documents, data sources and guidelines:

 PE-PDV-02045, Traffic and Transport Assessment Guidelines, Transport Infrastructure Ireland, May 2014



- PE-PAG-02017, Project Appraisal Guidelines, Unit 5.3, Travel Demand Projections, Transport Infrastructure Ireland, October 2021
- Institute of Environmental Management and Assessment (IEMA) publication -"Guidelines for the Environmental Assessment of Road Traffic", 1993 ("the IEMA Guidelines").

7.2.2 Consultation

The assessment process has been informed by consultation and responses collated in the Environmental Impact Assessment Scoping Synopsis (November 2021). A summary of the key consultation responses that relate to traffic and transport is described in Table 7-1.

Consultee Sur		Summary of Response	Where addressed within this Report	
	Transport Infrastructure Ireland (TII)	• TII notes that the subject site adjoins the local road network. Access to the road network shall be developed in accordance with official policy and road safety considerations. Consultations should be had with the relevant Local Authority/ National Roads Design Office with regard to locations of existing and future national road schemes.	Noted	
		• Specific concern as to potential significant impacts the development would have on the national road network (and junctions with national roads) in the proximity of the Proposed Development; N22, national primary road.	Section 8.5 considers the Assessment of Effects of construction traffic on the local road network.	
		• The developer should assess visual impacts from existing national roads.	Consideration of Visual Impacts is found in Chapter	
		• The developer should have regard to any EIAR/EIS and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should in particular have regard to any potential cumulative impacts.	7. Noted. Cumulative Impacts are addressed in Section 8.6.	
		 The developer, in preparing EIAR, should have regard to TII Publications and the Authority's Traffic and Transport Assessment Guidelines (2014). 	Noted	
		 The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required. 	Noted	
		 TII recommends that the applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed, specifically where abnormal 'weight' loads are proposed. 	Abnormal Route assessment is discussed in Section 8.2.3 and 8.2.5.	
		• The developer should consult with all PPP Companies, MMaRC Contractors and road authorities over which the haul route traverses to ascertain any operational requirements such as delivery timetabling, etc. and to ensure that the strategic function of the national road network is	Noted	

Table 7-1: Consultation Responses



Consultee	Summary of Response	Where addressed within this Report
	 safeguarded. Grid connection and cable routing proposals should be developed to safeguard proposed road schemes. 	Noted

7.2.3 Scope of Assessment

Abnormal Loads

The most identifiable transport and access characteristic associated with wind farm developments is the need to transport the wind turbine components to the site. Turbine components will be delivered to an appropriate Port of Entry (PoE) and then transported as abnormal loads, given their size, from the selected PoE via the public road network.

Ringaskiddy Port has been chosen as the most suitable PoE for shipping of the turbine components. The proposed route as follows:

- From harbour at Ringaskiddy onto the N28 heading in a north-west direction;
- Continue on N28 for approximately 12km, then take the slip road onto N40;
- Head west on N40 which becomes N22;
- Merge onto the Macroom bypass south of Macroom;
- Re-join the N22, leaving the Macroom bypass at Baile Bhuirne junction north of Ballynourney;
- Continue 3.7 miles on N22, then turn right onto Layby Road; and
- Turn right and enter proposed site entrance at OSI W 14106 81485.

General HGVs

There is also a need to bring general construction materials (concrete, aggregates, pipes, cabling, etc.) to the Proposed Development Site in standard heavy goods vehicles (HGVs). During the construction stage there will be a temporary intensification of HGV traffic on the road network. This intensification varies depending on the scale of the development, the construction stage and operational requirements.

Staff Vehicles

A small amount of traffic will be generated by construction workers commuting to/from the site during the construction stage in private car, pick-up or works minibus.

7.2.4 Potential Effects Scoped Out

On the basis of the scale of the Proposed Development, the professional judgement of the team and experience from other relevant projects and policy guidance, the following effects have been scoped out of the assessment.



Operational Stage

Once the Proposed Development is operational, the amount of traffic associated with a wind farm is minimal, relating to maintenance of the turbines only. It is estimated that on average there will be just single 4x4s accessing the Proposed Development Site from time to time.

Therefore, the effect of vehicle movements during the operational phase will be negligible. In respect of transport, the operational phase of the Proposed Development is therefore not assessed further.

Irrespective of the operation of the Proposed Development, ongoing forestry operations will continue from the current land-use on the Proposed Site.

Decommissioning Stage

Planning permission for the Proposed Development is sought for a 35-year period, after which time the Proposed Development will be decommissioned. Traffic associated with the decommissioning stage is anticipated to be significantly less than that generated during construction because some elements of the development are likely to remain insitu, such as the substation, turbine foundations, cable trenches, access tracks, etc (see Decommissioning Plan, Annex C of Appendix 4-1 Construction Environmental Management Plan).

In addition, turbine tower, blades and any other oversized components will be cut up and transported out of the site during the decommissioning phase. The turbine nacelle will be disassembled and transported out of the site on HGVs.

Given the timescales involved and the likelihood for changes to the baseline situation during this period, the transport and access effects of wind farm decommissioning are not assessed further.

Peak Hour Congestion

The effect of construction related vehicles on the road network is considered unlikely to be significant in terms of peak hour congestion as deliveries will be spread out across the day. Therefore, detailed junction capacity assessments have not been undertaken as part of this assessment.

Access Tracks & Impact Beyond the Study Area

The effect of increased traffic associated with the Proposed Development on existing access tracks within the site is not anticipated to have a discernible environmental effect and is, therefore not assessed. The effects of the Proposed Development on the local public road network are included.

It is anticipated that the volume of traffic associated with the construction of the Proposed Development will not have a discernible effect on roads and sensitive receptors outwith the study area (see below for definition of the study area) as the effects of traffic are diluted with increasing distance from the point of origin.

Potential Environmental Effects

This assessment is structured around the consideration of potential environmental effects relating to transport and access, as identified by the IEMA Guidelines and including the following:

• Noise;



- Severance;
- Driver delay;
- Pedestrian delay;
- Pedestrian amenity;
- Accidents and safety;
- Hazardous loads; and
- Dust and dirt.

The environmental effects associated with noise are addressed in Chapter 14: Noise within this EIAR. There are no hazardous loads (transport of hazardous material) associated with the Proposed Development.

Guidance for the assessment of the environmental effects of traffic is provided in the IEMA Guidelines. The document sets out a methodology for assessing potentially significant environmental effects where a proposed development is likely to give rise to changes in traffic flows.

The guidance suggests that in order to determine the scale and extent of the assessment and the level of effect the Proposed Development will have on the surrounding road network, the following two 'rules' should be followed:

- Rule 1 Include highway links¹ where flows are predicted to increase by more than 30% (10% if affecting a sensitive area) or where the number of heavy goods vehicles (HGVs) is predicted to increase by more than 30%; and
- Rule 2 Include any other specifically sensitive area where traffic flows are predicted to increase by 10% or more.

Paragraph 2.5 of the IEMA Guidelines identifies groups, locations and special interests which may be sensitive to changes in traffic conditions as follows:

- People at home;
- People in workplaces;
- Sensitive groups including children, elderly and disabled;
- Sensitive locations, e.g. hospitals, churches, schools, historic buildings;
- People walking or cycling;
- Open spaces, recreational sites, shopping areas; and
- Sites of ecological / nature conservation value tourist attractions.

The significance of each effect is considered against the criteria within the IEMA Guidelines, where possible, however the guidelines state that:

"For many effects there are no simple rules or formulae which define the thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed-up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing a change in environmental impact as well as the assessment of the damage to various natural resources."

¹ 'Highway links' in the IEMA Guidelines refers to road links



It is considered that both rules from the IEMA Guidelines are appropriate to apply when assessing the potential effects of the Proposed Development on the road network. These rules are used to identify the road links within the Study Area where a full assessment of environmental effects associated with an intensification in road traffic may be required.

7.2.5 Study Area

The study area for the assessment of transport and access has been identified using the thresholds within the IEMA Guidelines as an aid and is indicated by Figure 7-1.

The study area has been based on the location of the Proposed Development Site access point and the public road routes that will be used to reach the access point. A comprehensive desk-based study has been undertaken to understand the surrounding road network. Consultants GDG also walked parts of the turbine delivery route and Collett and Sons Ltd drove the route as part of the abnormal loads assessment.

The turbine components will be brought into the Ringaskiddy Port, County Cork. The operational windfarms in the area around the Proposed Development (including the Grousemount Wind Farm southwest of Ballyvourney) have used Ringaskiddy Port and have brought abnormal loads in via the N28, N40, and N22.

The full Proposed Turbine Range was assessed for the Abnormal Loads Primary Route Assessment. The 81.5m blade length (or 163m rotor diameter) has been identified to have the greatest potential for effect and has therefore been assessed in the assessment. This included a visual inspection which identified pinch points along the route from Ringaskiddy to the Site access point. The Abnormal Loads route is indicated by Figure 7-2 and the Abnormal Loads Assessment report can be found in Technical Appendix 7-1.

All general construction traffic (HGVs, abnormal loads, cars, and Light Goods Vehicles (LGVs)) will access the site via the existing Coillte CGA site entrance (old N22 road alignment layby) taken directly from the N22 at Cummeenavrick, approximately 7.4km north of Ballyvourney. The Abnormal Loads Assessment has considered a route to site via the south layby junction of the old N22 section, as opposed to the north layby junction. Access to the south layby junction will require to be opened up as it is currently blocked by a soil banking.

It is expected that the delivery of various materials and machinery to the site during the construction phase will originate from either south or north of the site entrance off the N22. The specific routes will be determined following confirmation of the Principal Contractor for the site and will be based on a number of factors including supply locations and depot locations.

One of the main considerations is the location of quarries in the area that would be able to supply stone, sand and concrete to the site. It is not possible to identify the exact quarry that will be used at this application stage but the following quarries have been identified (the list is not exhaustive) which could potentially supply the Proposed Development:

- McGroup Keim Quarry;
- Coppeen Concrete, Enniskeane;
- Mid-Cork Quarries, Gortnadiha;



- McSweeney Bros, Kilmichael;
- Keohane Readymix, Ballygurteen; and
- Murray Bros Tarmacadam Ltd, Ardcahan.

Having reviewed the likely haul routes from these quarries, and the road network in the area around the Proposed Development, the study area has been defined as follows:

- N22 south of Killarney to its junction with the N40;
- N40 Jct 1 to Jct 9; and
- N28 to the Ringaskiddy Port.

All road links within the study area are subject to Rule 1, whereby a 30% increase in HGV levels or total traffic will trigger the requirement for a detailed assessment of the potential environmental effects associated with traffic from the Proposed Development.

In reference to the indicators outlined in the IEMA Guidelines, the settlements of Shanbally and Ringaskiddy will be considered as sensitive receptors and will also be subject to IEMA Rule 2; whereby a 10% increase in total traffic will trigger the requirement for a full assessment of environmental effects associated with increased traffic.

7.2.6 Desk Based Research and Data Sources

The Study Area for the assessment of traffic and transport has been predicated on the potential access location to the Site and the proposed routes to the access point from the external road network. To determine appropriate access routes to Site, detailed consideration and assessment of the surrounding road network has been undertaken.

Traffic count information along the N22, N40, and N28 has been obtained to represent the baseline traffic flows for the road links within the study area from 24-hour ATC surveys obtained from the Transport Infrastructure Ireland (TII) survey database for 2019.

The traffic flows have been factored up to represent the anticipated year of construction (2028) flows using the 'Project Appraisal Guidelines for National Roads'.

Described below is the source of the traffic count information at each of the road links identified in the Study Area. These locations are also indicated by Figure 7-3.

- 1) Site TMU N22 070.0 E, represents traffic flows for the N22 between Killarney and N22/R569 Jn, Islandmore, Co. Kerry, north of the Site access;
- 2) Site TMU N22 060.0 E, represents traffic flows for the N22 between Killarney and Macroom, Ballyvourney Co. Cork, south of the Site access;
- 3) Site TMU N40 000.0 W, represents traffic flows for the N40 between Ballinora and Curraheen, South Ring Road, Bishopstown, Co. Cork, between J1 and J2; and
- 4) Site TMU N28 008.0 W, represents traffic flows for the N28 between Ringaskiddy and Shannonpark Roundabout, Raffeen Co Cork.

All areas within the Study Area are subject to 'Rule 1' and are assessed in full if total traffic levels or the level of HGV traffic exceeds 30% of the existing AADT. It is noted that construction traffic using the N28 from Ringaskiddy (passing through Traffic Counter 4) would travel through Shanbally.



Shanbally and Ringaskiddy are considered to be sensitive receptors in this assessment given that they are villages with local amenities and schools. Therefore, this area (represented by Traffic Counter 4) is also subject to 'Rule 2' of the IEMA guidelines whereby a 10% increase in total traffic will require a full assessment of environmental effects.

7.3 Assessment of Significance

The following section sets out the methodology used to assess the significance of effects at locations along the proposed routes within the study area where total traffic levels or the level of HGV traffic exceed the screening thresholds for further assessment set out by the IEMA guidelines.

Sensitivity

The sensitivity to change in traffic levels of any given road segment and the receptors located along that road segment are generally assessed by considering the residual capacity of the network under existing conditions.

Where there is a high degree of residual capacity, the network may readily accept and absorb an increase in traffic and therefore the sensitivity may be said to be low. Conversely, where the existing traffic levels are high compared to the road capacity, there is little spare capacity, and the sensitivity to change in traffic levels will be considered to be high.

Consideration has been given to the composition of the traffic on the road network, under both existing and proposed conditions. For example, LGVs have less effect on traffic and the road system than HGVs. Similarly, HGVs can have less effect than abnormal load vehicles, depending on the frequency of the abnormal loads.

The criteria used to make judgements on the sensitivity of the receptor(s) are presented in Table 7-2.

Sensitivity	Description
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance. Local residents whose daily activities depend upon unrestricted movement within their environment. Receptors such as schools, colleges, hospitals and accident hotspots.
Medium	The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character; is of low/local importance. Areas such as trunk road or A class roads constructed to accommodate significant HGV volumes.
Negligible	Users not sensitive to transport effects. Includes very small settlements and roads with no significant settlements including new strategic trunk roads or motorways.

Table 7-2: Framework for Determining Sensitivity of Receptors

Magnitude

The magnitude of traffic effects is a function of the existing traffic volumes, the percentage increase and change due to the Proposed Development, changes in the type of traffic and the temporal distribution of traffic (day of week, time of day).



The determination of magnitude has been undertaken by reviewing the Proposed Development, establishing the parameters of the receptors that may be affected and quantifying these effects utilising IEMA Guidelines and professional judgement.

Consideration is given to the composition of the traffic on the road network, under both existing and proposed conditions. For example, LGVs have less effect on traffic and the road system than HGVs. Similarly, HGVs can have less effect than abnormal load vehicles, depending on the frequency of the abnormal loads.

The criteria used to make judgement on the magnitude of the effect on the receptor(s) is presented in Table 7-3.

Magnitude	Description
Major	Total loss of, or major/substantial alteration to, key elements/features of the baseline (pre-development) conditions such that the post development character/composition/attributes will be fundamentally changed. Generally a rule of >90% (or >70% at sensitive receptors) change in traffic is considered to be a major magnitude.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed. Generally, a rule of 60% - 90% (or 40% - 70% at sensitive receptors) change in traffic is considered to be a moderate magnitude.
Minor	A minor shift away from baseline conditions. Change arising from the loss / alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-development circumstances/situation. Generally, a rule of 30 – 60% (or 10% - 40% at sensitive receptors) change in traffic is considered to be a minor magnitude.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation. Generally, a rule of <30% (or <10% at sensitive receptors) change in traffic is considered to be a negligible magnitude.

Table 7-3: Framework for Determining Magnitude of Effects

Significance

As a guide to inform the assessment, but not as a substitute for professional judgement, criteria for determining the significance of traffic related effects are set out in Table 7-4. This is based on combining the magnitude of the effect with the receptor sensitivity.

Table 7-4: Significance Criteria Matrix

Sensitivity of	Magnitude of Change							
Receptor	Major	Moderate	Minor	Negligible				
High	Major	Major / Moderate	Moderate	Minor				
Medium	Major / Moderate	Moderate	Moderate / Minor	Minor				
Low	Moderate	Moderate / Minor Minor		Negligible				
The effects recorded	The effects recorded in grey highlighted cells are considered to be 'Significant'							

The effects recorded in grey highlighted cells are considered to be 'Significant'

Significance is categorised as major, moderate, minor or negligible. Effects judged to be of minor or negligible significance are considered Not Significant.



7.4 Baseline Conditions

The following paragraphs detail the baseline conditions of the road links identified as being within the study area.

7.4.1 N22

The N22 is a national primary road connecting Tralee to Cork. There are multiple settlements along the route including Killarney, Farranfore, Macroom, and Ballincollig. The access point for the Proposed Development is approximately 7.4km north of Ballyvourney and shown on Figure 1-4.

The road is a mixture of single carriageway, dual carriageway, and 2+1 overtaking/climbing sections. The speed limit is 80-100kph except through major junctions or villages where the speed reduces to 50-60kph.

The road is generally rural in nature with a narrow hard shoulder and grass verges either side of the road and a width of approximately 12m. The most easterly 11km section of road is full dual carriageway as it bypasses Billincollig.

The Macroom to Baile Bhuirne Bypass became operational in August 2023, allowing general construction and abnormal load vehicles to bypass the villages of Ballymakeery and Ballyvourney, the urban area of Macroom and multiple individual residential accesses.

All construction traffic will use the N22 as the access point to the Proposed Development is taken from the road. All abnormal loads will use the N22 between the N40 and the Site access. Other deliveries of materials may also come from the north or south along the N22.

7.4.2 N40

The N40, or South Cork Ring Road, is a national primary road linking the N22 at Ballincollig to the N25 at the Dunkettle Interchange. There are several major junctions along the route including junctions with the N71, N27, and N28.

The road is dual carriageway with grade separated junctions and the speed limit is 100kph. The road is generally urban in nature with merge and diverge sections and a narrow hard shoulder.

All abnormal loads will use the N40 between Junction 9 for the N28 and where it joins the N22. Other deliveries of materials may also come from the east and use the N40.

7.4.3 N28

The N28 is a national primary road connecting the Port at Ringaskiddy to the N40 South Cork Ring Road. Two settlements lie at the southern end of the route, Ringaskiddy and Shanbally.

For the majority of its length, the road is single carriageway and 100kph speed limit except for sections through settlements where the speed limit reduces to 50kph. There is a southbound overtaking lane from the exit from the N40 to the slips with the R609 and a short northbound overtaking lane at the L6477.

The road is generally rural in nature with grass verges either side of the road and a width of approximately 12m, except where it passes through settlements.



All abnormal loads will use the N28 between the Port and the N40. It is unlikely any other construction traffic would utilise the N28.

7.4.4 Baseline and Construction Year Traffic Flows

Table 7-5indicates the two-way Average Annual Daily Traffic (AADT) in the study area and the percentage of traffic which is classified as HGVs. Automatic Traffic Count (ATC) sites for the study area were sourced from the TII Traffic Count Data Website.

The AADT capacity of each road link is as per the guidance contained within the TII Standards document DN-GEO-03031 Rural Road Link Design, Table 6/1.

Counter Location	TII Road Llink Design Category	Source	TII Capacity (AADT)	Base AADT	Base HGV	Percentage HGV
1. N22 Islandmore (north of Site entrance)	Type 1 Single (7.3m) Carriageway	TII (2019)	11,600	8,831	415	4.7%
2. N22 Ballyvourney (south of Site entrance)	Type 3 Dual (7.0m + 3.5m) Divided 2+1 lanes	TII (2019)	14,000	7,258	385	5.3%
3. N40 Cork South Ring Road (between Jct 1 & Jct 2)	Wide Motorway Divided 2+2 Lane (2X7.5m)	TII (2019)	55,500	43,036	1,463	3.4%
4. N28 Ringaskiddy (at Raffeen Bridge)	Type 1 Single (7.3m) Carriageway	TII (2019)	11,600	9,451	567	6.0%

Table 7-5: Study Area Baseline 2019 Traffic Flows

The 'Project Appraisal Guidelines for National Roads (Unit 5.3)' set out link based annual growth rates by metropolitan area and by county in Tables 6.1 and Table 6.2 of the guidance note. The annual growth rates for light (car & LGV) and heavy vehicles are shown in Table 7-6 for the relevant years.

The cumulative annual growth rates are presented in Table 7-7. The Central Growth Rate has been applied to derive the forecast traffic flows.

Table 7-8 presents the construction year (2028) baseline traffic flows by vehicle type.

	Cork Metropolitan Area		County Cork		County Kerry	
Year	Light Vehicle	Heavy Vehicle	Light Vehicle	Heavy Vehicle	Light Vehicle	Heavy Vehicle
2019	1.0169	1.0294	1.0189	1.0377	1.0111	1.0285
2020	1.0169	1.0294	1.0189	1.0377	1.0111	1.0285
2021	1.0169	1.0294	1.0189	1.0377	1.0111	1.0285
2022	1.0169	1.0294	1.0189	1.0377	1.0111	1.0285

Table 7-6: Study Area Annual Central Growth Rates



	Cork Metropolitan Area		County Cork		County Kerry	
2023	1.0169	1.0294	1.0189	1.0377	1.0111	1.0285
2024	1.0169	1.0294	1.0189	1.0377	1.0111	1.0285
2025	1.0169	1.0294	1.0189	1.0377	1.0111	1.0285
2026	1.0169	1.0294	1.0189	1.0377	1.0111	1.0285
2027	1.0169	1.0294	1.0189	1.0377	1.0111	1.0285
2028	1.0169	1.0294	1.0189	1.0377	1.0111	1.0285

Table 7-7: Study Area Cumulative Annual Central Growth Rates

	Cork Metropolitan Area		County Cork		County Kerry			
Year	Light Vehicle	Heavy Vehicle	Light Vehicle	Heavy Vehicle	Light Vehicle	Heavy Vehicle		
2019	1	1	1	1	1	1		
2020	1.017	1.029	1.019	1.038	1.011	1.029		
2021	1.034	1.060	1.038	1.077	1.022	1.058		
2022	1.052	1.091	1.058	1.117	1.034	1.088		
2023	1.069	1.123	1.078	1.160	1.045	1.119		
2024	1.087	1.156	1.098	1.203	1.057	1.151		
2025	1.106	1.190	1.119	1.249	1.068	1.184		
2026	1.124	1.225	1.140	1.296	1.080	1.217		
2027	1.143	1.26	1.162	1.345	1.092	1.252		
2028	1.163	1.298	1.184	1.395	1.104	1.288		
2019-2028 growth rate	1.163	1.298	1.184	1.395	1.104	1.288		

Table 7-8: Study Area Construction Year Baseline Traffic Flows

Counter Location	TII Road Llink Design Category	TII Capacity (AADT)	Base 2019 Lights	Base 2019 HGV	2028 Lights	2028 HGV	% HGV
1. N22 Islandmore (north of Site entrance)	Type 1 Single (7.3m) Carriageway	11,600	8,416	415	9,295	534	5.3%
2. N22 Ballyvourney (south of Site entrance)	Type 3 Dual (7.0m + 3.5m) Divided 2+1 lanes	14,000	6,873	385	8,135	537	6.0%
3. N40 Cork South Ring Road (between Jct 1 & Jct 2)	Wide Motorway Divided 2+2 Lane (2X7.5m)	55,500	41,573	1,463	48,341	1,899	3.7%
4. N28 Ringaskiddy (at Raffeen Bridge)	Type 1 Single (7.3m) Carriageway	11,600	8,884	567	10,330	736	6.5%



7.4.5 Road Safety

The Road Safety Authority publish tables on "Road Casualties and Collisions in Ireland" each year. The last published table is for 2016. Accident records are categorised as occurring "Inside Built-Up Areas" or "Outside Built-up Areas". Table 7-9 summarises the accidents occurring on the N22 from 2013 – 2016.

	Inside	Built-Up Ar	eas		Outside	Built-Up A	reas		Overall	Collision	
Year	Fatal	Serious Injury	Minor Injury	Total	Fatal	Serious Injury	Minor Injury	Total	Total	Rate per km	
2016	0	4	19	23	2	5	21	28	51	0.44	
2015	0	2	23	25	1	7	22	30	55	0.47	
2014	0	0	12	12	4	8	21	33	45	0.38	
2013	0	1	8	9	4	3	13	20	29	0.25	

Table 7-9: Accident Statistics for the N22, 2013 – 2016

Table 7-6 indicates outside built-up areas tend to experience more accidents than inside built-up areas. The table indicates that there are a number of recorded accidents over the record period for the N22. The results are fairly typical for a national primary road and it is considered that there are no particular accident issues that would warrant special consideration as part of this application.

7.5 Assessment of Effects

The construction traffic associated with the Proposed Development will comprise construction workers, HGVs / LGVs carrying construction materials & plant and abnormal loads carrying the main wind turbine components.

Construction of the Proposed Development is estimated to take 24 months. General working hours are expected to be between 07:00 and 19:00 on weekdays and 07:00 and 12:00 on Saturdays which means that staff will predominantly arrive and depart outside the peak hours associated with the surrounding road network.

Turbine delivery, erection and commissioning activities may also take place out-with these hours depending on weather conditions and the agreed timing of abnormal load deliveries, which may occur during the day or night.

The potential number of traffic movements that will result from the construction of the Proposed Development are set out in Table 7-10 whilst Table 7-11 and Table 7-12 indicate the distribution of traffic flows across the construction programme.

The estimated number of traffic movements associated with importing stone are based on 20% of stone being imported to site for a robust assessment, although it is anticipated that almost all stone will be sourced from on-site borrow pits as indicated by the borrow pit assessment which confirms the quantity of available stone along with confirmation that the stone is of sufficient quality. Chapter 4 (section 4.3.9) sets out the locations of the borrow pits and the estimated rock volume from each borrow pit which totals 396,900m³ of material which is well in excess of the estimated total project requirements. Concrete will be imported rather than on-site batching.

Estimated movements are based on a conservative scenario in terms of turbine size and construction site material requirements and include HGV and abnormal loads. The movements are noted in line with an approximate 24 month construction programme



and general assumptions around the composition and dimensions of associated infrastructure.

Table 7	7-10:	Construction	HGV	Movements
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Construction Task	Vehicle Type	Approximate No. of Loads
Site Establishment	Low Loader and Dump Truck	120
General site deliveries (Includes transportation of waste off-site)	Low Loader and Dump Truck	260
Forestry removal	Articulated Low Loader	907
Imported stone (access roads, crane hardstanding areas, other hardstanding areas)	Dump Truck	5,500*
Reinforcement	Low Loader	128
Foundations (off-site batched concrete)	Concrete Wagon	2,375
Cabling deliveries and sand	Low Loader	724
Geotextile separators	Low Loader	20
Construction of Sub-station	Various	684
Cranes and related lifting equipment	Crane Vehicle	50
Erection of turbines	Abnormal Loads	146
Site reinstatement and restoration	Various	120
	Total (one-way trips)	11,034
	Total (two-way trips)	2,068

*Based on a conservative estimate that 20% of stone will be imported to site with remaining stone won on site.



	Month												
Task	1	2	3	4	5	6	7	8	9	10	11	12	Total
Site Establishment	40	40	40										-
General site deliveries	11	11	11	11	11	11	11	11	11	11	11	11	-
Forestry Removal	302	302	302										-
Imported stone*	700	700	700	700	700	600	600	500	300				-
Reinforcement								19	19	18	18	18	-
Foundations									264	264	264	264	-
Cabling deliveries and sand									72	72	72	72	-
Geotextile separators				5	5	5	5						-
Construction of Sub- station													-
Cranes and related lifting equipment													-
Erection of turbines													-
Site reinstatement and restoration													-
Total (one-way trips)	1,053	1,053	1,053	716	716	616	616	530	666	365	365	365	-
Total (two-way trips)	2,107	2,107	2,107	1,432	1, 432	1,232	1,232	1,060	1,332	730	730	730	-

Table 7-11: Construction HGV Movements per Month (Months 1-12)

* Based on 20% of stone imported



	Month												
Task	13	14	15	16	17	18	19	20	21	22	23	24	Total
Site Establishment													120
General site deliveries	11	11	11	11	11	11	11	11	11	11	11	7	260
Forestry Removal													907
Imported stone*													5,500
Reinforcement	18	18											128
Foundations	264	264	264	264	263								2,375
Cabling deliveries and sand	72	72	72	72	72	76							724
Geotextile separators													20
Construction of Sub- station				136	136	136	138	138					684
Cranes and related lifting equipment			10	10	10	10	10						50
Erection of turbines						30	30	30	28	28			146
Site reinstatement and restoration										40	40	40	120
Total (one-way trips)	365	365	357	493	492	263	189	179	39	79	51	47	11,034
Total (two-way trips)	730	730	714	986	984	526	378	358	78	158	102	94	22,068

Table 7-12: Construction HGV Movements per Month (Months 13-24)

* Based on 20% of stone imported



As Table 7-11 and Table 7-12 illustrate, the predicted peak of HGV movements to and from the Proposed Development Site would be during months one, two, and three of the delivery programme, as each has the equivalent total volume of 2,107 two-way HGV movements each month. The predicted HGV movements are set to remain over 1,000 two-way trips per month for months 1 to 9 of the delivery programme.

If an average four-week month is considered, this would equate to 527 two-way weekly HGV movements. If a 5.5 working day week is considered, this would equate to a total of 96 two-way daily HGV movements during months one, two and three of the delivery programme.

With regards to staff movements, it is estimated that there would be approximately 30 staff members on site on an average day. This will result in an average daily movement of 60 cars/LGVs (30 trips in, and 30 trips out daily) in addition to the daily average HGV movements derived from Table 7-8.

With regard to the movement of abnormal load vehicles, Table 7-12 indicates that abnormal loads will only be transported over five months of the 24 month construction period (months 18-22). The movement of abnormal loads is outwith the peak period of construction (months 1-3). Assuming 30 inbound abnormal load vehicle trips per month (as indicated in Table 7-12), this equates to approximately 7.5 inbound abnormal load vehicle trips per week. Abnormal load vehicles will retract to the size of an HGV for their return journey once the loads have been delivered to the destination, therefore this equates to 7.5 inbound abnormal load trips plus 7.5 outbound HGV trips per week.

Given this low number of vehicles and the short duration for which abnormal load vehicles will be on the local road network, it is not anticipated that the number of abnormal load vehicles will give rise to any significant environmental effects within the Study Area. Any required mitigation measures or interventions to facilitate the movement of abnormal loads are identified within the Abnormal Loads Assessment report contained within Appendix 7-1.

Table 7-13 indicates the daily percentage increases on the road links within the study area for the busiest months of the construction period (months one, two and three) in the assumed year of construction (2028).

A worst-case scenario of 100% construction traffic (HGV and staff movements) has been applied to links 1-3 and 50% to Link 4 within the study area to determine whether any further detailed assessment of environmental effects associated with increased traffic is required.

For Link 4, the level of traffic has been reduced as it will consist of the abnormal loads and some select materials only that have been landed at the Port of Ringaskiddy.



Scenario	1. N22 Islandmore (north of Site)	2. N22 Ballyvourney (south of Site)	3. N40 Cork South Ring Road (between Jct 1 & Jct 2)	4. N28 Ringaskiddy (at Raffeen Bridge)
2028 Light Vehicle Count	9,295	8,135	48,341	10,330
2028 HGV Count	534	537	1,899	736
2028 HGV %	5.3%	6.0%	3.7%	6.5%
Month 1/2/3 worst-case daily total traffic (HGVs + staff vehicle movements)	156	156	156	78
Month 1/2/3 worst-case daily HGV traffic	96	96	96	48
Percentage increase in total traffic levels due to the Proposed Development	1.6%	1.8%	0.3%	0.7%
Percentage increase in HGVs due to the Proposed Development	17.9%	17.8%	5.0%	6.5%

Table 7-13: Construction Traffic Effect on Routes within Study Area

As stated previously, IEMA Guidelines Rules 1 and 2 are used as thresholds to determine the requirement for a full assessment of effects in relation to an increase in traffic flows associated with the construction of the Proposed Development.

Table 7-13 indicates that for Count Locations 1 to 4, the temporary increase in total traffic levels associated with the Proposed Development would increase the total traffic flow by a negligible amount (<5%), and that the level of HGV traffic would increase by 5% to 18%.

Given that the increase in total traffic and HGV levels are both below the IEMA Guideline thresholds for Rules 1 and 2, a full assessment of effects is not required for these road links.

It is noted that two sensitive receptors had been identified on the N28 corridor, but total and HGV percentage impacts were both identified as being within the Rule 2 thresholds meaning no further detailed assessment is required. The environmental effects of the temporary increase in traffic associated with the construction of the Proposed Development are therefore deemed Not Significant.

7.6 Assessment of Cumulative Effects

Technical Appendix 2-3: List of Cumulative Sites was consulted to determine which windfarm sites and other projects to consider for cumulative effects.

Cumulative effects have been assessed for other developments which may utilise sections of the road network required for accessing the Proposed Development. Operational wind farms have been discounted as they have negligible operational traffic and therefore have no cumulative traffic effect.



The potential for cumulative effects has been assessed by reviewing traffic flow data available from the Traffic and Transport Chapters within the respective EIARs for the relevant developments.

Whilst the wind farm developments identified may share a similar route for abnormal load vehicles, these deliveries would not be permitted to occur at the same time and as such there is no scope for a cumulative effect of abnormal load movements.

Knocknamork Wind Farm - Approved

Knocknamork received approval in January 2020 for a wind farm comprising 7 wind turbines and a 70,000m² solar array to a site directly south of the Proposed Development.

A further application was lodged in July 2022 to An Bord Pleanála for works consisting of a 110kV electricity substation, borrow pits, underground cabling and access roads, and associated works (key electrical infrastructure which will facilitate the operation of the permitted development Knocknamork).

A further application was submitted in March 2023 for an increase in overall ground to blade tip height of the 7 proposed wind turbines to 175m, an increase of 25m from the previous application.

The Traffic and Transport EIA chapter states an on-site 12–18 month construction programme for both developments, which would ideally run concurrently.

The preferred site entrance will be the same as the Proposed Development, via the layby of the old N22, but access would be via the north layby junction as opposed to the south layby junction. The access route from the port of entry is undecided, but the preferred route option for the turbines is from Foynes Port. The anticipated year of construction is 2024.

Knocknamork and the Proposed Development are to share the same site access and are likely to use the same grid connection to Ballyvouskill Substation (7.5km south of Millstreet). The Applicant is in control of both the site access and the forest track to be used for the grid connection. If the two developments were to overlap in the same construction timeframe, programming through the CTMPs for both developments will ensure that the peak traffic generating months do not coincide. The CTMPs will maintain free access for vehicles along the forest track and ensure no queues develop on the N22.

Gortyrahilly – In planning

An application for a wind farm of up to 14 turbines was submitted to An Bord Pleanála in September 2022. The site is located approximately 11km south-west of the Proposed Development Site, and south of the N22.

The turbine components are to be delivered through Ringaskiddy and take the same route to the N22 proposed in this chapter, making a 180 degree turn at the layby of the N22 before ultimately heading southbound on the N22 to the site.

The anticipated year of construction is stated to be 2025, with months 6 to 11 seeing the highest volume of predicted HGV traffic (approximately 790 – 970 vehicle movements per month, or 44 daily HGV trips).



It is not anticipated that the peak construction months of Gortyrahilly and the Proposed Development would coincide, moreso the construction periods for both developments are likely to occur entirely separately. Gortyrahilly is estimated to start in 2025 and the Proposed Development estimated to start in 2028. This indicates there will be no significant cumulative impact along the N22. The CTMPs associated with the two developments would also be used to ensure that peak traffic-generating activities do not coincide.

Gortyrahilly and the Proposed Development are likely to use a similar grid connection route to Ballyvouskill Substation. The Applicant is in control of the forest track to be used for the grid connection so if the two developments were to overlap in the same construction timeframe, programming through the CTMPs for both developments will ensure that the peak traffic generating months do not coincide. The CTMPs will maintain free access for vehicles along the forest track and ensure no queues develop on the N22.

Inchamore – In planning

Inchamore, Coolea is a site 7km to the southwest of the Proposed Development Site, with a planning application submitted in May 2023 for a wind farm of five turbines. The turbine components are to be delivered through Ringaskiddy and take the same route to the N22 proposed in this chapter.

The anticipated year of construction is stated to be 2025, with months 5 to 10 seeing the highest volume of predicted HGV traffic (approximately 359 vehicle movements per month, or 16 daily HGV trips).

Inchamore and the Proposed Development are likely to use the same grid connection route to Ballyvouskill Substation. The Applicant seeking planning permission for Gortyrahilly, Inchamore and the Proposed Development are joint ventures between FuturEnergy Ireland and SSE Renewables. There is therefore the opportunity to ensure programming is aligned and avoid overlap of peak construction periods.

Summary

In summary, it is unlikely that the peak construction period associated with another wind farm development in the area would overlap with the peak construction period of the Proposed Development as the applications are at different stages in the planning process and each development has varying lengths of construction.

The high traffic generating activities, such as the importation of stone and concrete, only occur over a few months of the whole construction period for each development. It is unlikely that the local capacity for concrete and stone production could supply several developments at once, therefore, high traffic generating activities would naturally be staggered.

Furthermore, implementation of a Construction Traffic Management Plan (CTMP) for each development would ensure that there are open lines of communication with Cork County Council, Kerry County Council, An Garda Síochána, the roads authorities, other stakeholders and wind farm developers to monitor the progress of the construction stages.

This process would flag whether construction HGV traffic is reaching unacceptable levels and would ensure that action is taken accordingly to minimise effects.



7.7 Mitigation Measures

While not strictly necessary to address the environmental effects associated with the increase in traffic within the study area, a CTMP is proposed as a "good practice" measure to support the Proposed Development. A TMP has been prepared as part of the CEMP and is included as Technical Appendix 4-1. This CTMP document will be developed further in accordance with the conditions of any permission granted.

The CTMP identifies measures to reduce the number of construction vehicles as well as considering ways to reduce or avoid the impact of vehicles through construction programming / routeing and identification of an individual with responsibilities for managing transport and access effects.

The CTMP also includes measures to reduce and manage construction staff travel by private car, particularly single occupancy trips.

Prior to construction and once the Contractors have confirmed their suppliers, the CTMP will be updated in consultation with Cork and Kerry County Councils and An Garda Síochána as necessary. Proposed measures include (but are not limited to):

- Immediately upon commencement, all deliveries, operatives and visitors to the Proposed Development Site will report to the security gate and be required to sign in and out. All Site visitors will undergo a Site induction covering Health and Safety issues at the Contractor's temporary compound and will be required to wear appropriate Personal Protective Equipment (PPE) while onsite. This would be communicated to all early works contractors at their pre-start meeting;
- The main contractor will develop a logistics plan highlighting the access point for the project, loading bay, pedestrian / vehicular segregation, welfare, storage, security and material handling that would be enforced following full site establishment;
- Approved haul routes have been identified to the Proposed Development Site and protocols put in place to ensure that HGVs adhere to these routes;
 - The new N22 Macroom By-Pass will be used to transport all materials to the wind farm site, so as to minimise traffic through built-up areas such as Macroom, Ballymakeery and Ballyvourney;
 - Prior to delivery of abnormal loads i.e. turbine components, the Applicant or their representatives, will consult with An Garda Síochána and Cork and Kerry County Council Roads Departments to discuss the requirement for a Garda escort;
 - Abnormal loads are likely to travel at night and outside the normal construction times as may be required by An Garda Síochána. Due to the relatively modest distance between Ringaskiddy Port and the Site of approximately 80km, the journey is achievable within a 2-3 hour timeframe. Accordingly, locations for resting will not be required. Local residents along the affected route will be notified of the timescale for abnormal load deliveries; and
 - Works on public roads on the turbine delivery road and grid connection will be strictly in accordance with "Guidance for the Control and Management of Traffic at Road Works – 2nd Edition 2010" as well as "Traffic Signs Manual 2010-Chapter 8- Temporary Traffic Measures and Signs at Roadworks".
- All contractors will be provided with a site induction pack containing information on delivery routes and any restrictions on routes;



- Temporary construction site signage will be erected along the identified construction traffic routes to warn people of construction activities and associated construction vehicles;
- A construction traffic speed limit (for example, 25 kph) will be imposed through sensitive areas and on the wind farm site;
- An integral part of the progress meetings held with all trade contractors is the delivery schedule pro-forma. All contractors will be required to give details of proposed timing of material deliveries to the Site. At this stage, they will be given a specific area for delivery;
- The CTMP and the control measures therein would be included within all trade contractor tender enquiries to ensure early understanding and acceptance / compliance with the rules that would be enforced on this project;
- Under no circumstances will HGVs be allowed to lay-up in surrounding roads. All
 personnel in the team will be in contact with each other and with Site
 management, who in turn will have mobile and telephone contact with the
 subcontractors;
- All vehicles accessing the wind farm site will either have roof mounted flashing beacons or will use their hazard lights;
- Roads will be maintained in a clean and safe condition;
- A wheel cleaning facility will be installed on-site during the construction period in order to reduce mud and debris being deposited onto the local road network;
- In addition, any dust generating activities will be minimised where practical during windy conditions, and drivers will adopt driving practices to minimise the creation of dust. Where conditions exist for dust to become friable, techniques such as damping down of the potentially affected areas will be employed; and
- To reduce dust emissions, vehicle containers/loads of crushed stone will be covered during both entrance and egress to the Site.

7.8 Residual effects

The potential effects of the increase in construction traffic on the study area roads was evaluated. The summary of this assessment is provided in Table 7-13. The percentage increase in total traffic levels due to the Proposed Development were low and no road capacity issues are predicted within the study area during the construction phase.

The assessment has been carried out considering the peak in construction traffic levels for the Proposed Development. Considering that the temporary traffic and associated environmental effects are deemed to be not significant before implementation of any mitigating measures, all residual effects will also be negligible and not significant.

7.9 Summary and Statement of Significance

This chapter considers the potential traffic and transport effects associated with the construction of the Proposed Development on the surrounding public road network and sensitive receptors.

The construction programme associated with the Proposed Development is anticipated to cover a 24 month period. During this time, 11,034 HGVs would access the Proposed



Development Site, which equates to 96 daily two-way HGV trips during the peak construction months (Month 1, 2 and 3).

A robust assessment has been undertaken using a conservative scenario for two-way traffic movements, including the assumption that 20% of stone would be imported to the Proposed Development Site.

The impact of total construction traffic could increase traffic flows along the road links within the Study Area by the following percentages:

- N22 north of the Proposed Development Site 1.6%;
- N22 south of the Proposed Development Site 1.8%;
- N40 Cork South Ring Road 0.3%; and
- N28 at Ringaskiddy 0.7%.

The percentage increase in HGVs associated with the highest movement month of the construction programme for the Proposed Development could increase HGV traffic flows by the following percentages;

- N22 north of the Proposed Development Site 17.9%;
- N22 south of the Proposed Development Site 17.8%;
- N40 Cork South Ring Road 5.0%; and
- N28 at Ringaskiddy 6.5%.

The percentage increase in total traffic and HGV traffic levels does not exceed the IEMA Guidelines and as such, no further detailed assessment of effects has been undertaken.

It is important to note that these increased traffic levels are temporary in nature and represent the expected traffic generation during the busiest month of construction. Generated traffic by the Proposed Development during other months of the construction programme will be considerably lower than those assessed in this chapter.

This chapter concludes that environmental effects of increased traffic as a result of the Proposed Development are Not Significant prior to any mitigation measures. This chapter also concludes that the traffic levels anticipated during the busiest month of construction can be accommodated by the existing road network within the Study Area, and further managed / minimised by the implementation of a CTMP.

7.10 References

PE-PDV-02045, Traffic and Transport Assessment Guidelines, Transport Infrastructure Ireland, May 2014

PE-PAG-02017, Project Appraisal Guidelines, Unit 5.3, Travel Demand Projections, Transport Infrastructure Ireland, October 2021

Institute of Environmental Management and Assessment (IEMA). (1993). Guidelines for the Environmental Assessment of Road Traffic ("the IEMA Guidelines")

TII Standards document DN-GEO-03031 Rural Road Link Design, Table 6/1, April 2017

Road Casualties and Collisions in Ireland, The Road Safety Authority, 2013-2016