

Glenvernoch Wind Farm

Environmental Impact Assessment Report Volume I Chapter 11: Traffic and Transportation

October 2024

CONTENTS

11 TRAFFIC AND TRANSPORTATION.....	11-1
Introduction.....	11-1
Legislation and Policy Context	11-1
Scope of Assessment.....	11-4
Potential Effects Scoped Out	11-5
Assessment Methodology & Significance Criteria Assessment of	11-6
Effects	11-6
Assessment of Significance.....	11-8
Baseline Conditions.....	11-10
Baseline Traffic Flows.....	11-11
Road Safety	11-12
The 'Do Nothing' Scenario.....	11-13
Identification and Evaluation of Key Effects	11-13
Cumulative Impacts and Interaction of Effects	11-24
Residual Effects.....	11-28
Summary.....	11-29
References	11-30
Non-Technical Summary	11-31

TABLES

Table 11-1 - Summary of Consultee Responses.....	11-2
Table 11-2 – Receptor Sensitivity	11-9
Table 11-3 – Thresholds for Determining Magnitude of Effects	11-9
Table 11-4 – Significance Matrix.....	11-10
Table 11-5 - ATC Locations	11-11
Table 11-6 - Summary of Traffic Data	11-12
Table 11-7 - Accident Statistics	11-12
Table 11-8 - Estimated No. of HGV Trips During Construction.....	11-15
Table 11-9 - Estimated No. of HGV Trips per Month.....	11-17
Table 11-10 - Construction Traffic Distribution	11-19
Table 11-11 - Assessment of Construction Traffic Impact (Month 6)	11-19
Table 11-12 - Potential Cumulative Impact Wind Farm Schemes	11-24
Table 11-13 - Residual Effects.....	11-28

FIGURES

Figure 11-1 – Study Area
Figure 11-2 – Traffic Counter Locations
Figure 11-3 – Abnormal Loads Route
Figure 11-4 – Offsite Access Route – A75 – Barnkirk Road
Figure 11-5 – Offsite Access Route – Barnkirk Road – A714

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11 TRAFFIC AND TRANSPORTATION

Introduction

- 11.1 This chapter assesses the likely 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 the development. The key objectives of the chapter are to:
- Describe the assessment methodology and significance criteria used in completing the assessment;
 - Describe the current traffic and transport conditions;
 - Identify and assess the likely effects;
 - Identify and describe the mitigation measures proposed to address any significant effects; and
 - Assess any residual effects post mitigation implementation.
- 11.2 This chapter has been prepared by SYSTRA Ltd and is supported by the following figures as contained within Volume 2: Figures:
- Figure 11.1: Study Area;
 - Figure 11.2: Traffic Counter Locations; and
 - Figure 11.3: Abnormal Loads Route.
- 11.3 The chapter is supported by two Technical Appendices (as set out within Volume 4: Technical Appendices) comprising:
- Appendix 11.1: Abnormal Loads Assessment
 - Appendix 11.2: Site Access Design
- 11.4 SYSTRA has extensive experience in the preparation of Traffic and Transport EIA Report Chapters (formerly Environmental Statements). SYSTRA's EIA team have produced Traffic and Transport EIA Report Chapters and Abnormal Loads Assessment reports for numerous wind farm developments across Scotland and for several developments within The Dumfries and Galloway Council administrative area.

Legislation and Policy Context

- 11.5 This Chapter has been prepared taking cognisance of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations) and relevant documents set out in Chapter 5 (Renewable Energy and Planning Policy) of this EIA Report.

11.6 This assessment is informed by the following policy documents, data sources and guidelines:

- National Planning Framework 4 (NPF4, Scottish Government 2023);
- Institute of Environmental Management and Assessment (IEMA) publication - "Environmental Assessment of Traffic and Movement", 2023 ("the IEMA Guidelines");
- Transport Assessment Guidance (Scottish Government, 2012);
- Institute of Environmental Management and Assessment (IEMA) publication - "Environmental Assessment of Traffic and Movement", 2023 ("the IEMA Guidelines");
- Department for Transport (DfT) publication "Design Manual for Roads and Bridges" (DMRB, DfT 2013);
- Planning Advice Notice (PAN) 75 – "Planning for Transport" (Scottish Government 2005).

Consultation

11.7 The assessment process has been informed by a consultation exercise coordinated through the ECU leading to the issue of a formal Scoping Opinion (February 2024). A summary of the key consultation responses is described in Table 11-1.

Table 11-1 - Summary of Consultee Responses

Consultee	Summary	Addressed
Dumfries and Galloway Council	It would be appropriate that any future application confirm the access route(s) and identify the full extent of proposed off-site road accommodation and mitigation works. It should be noted that the A714 through Newton Stewart would not be suitable as a route for HGVs and AIL's and as such alternatives should be sought. Proposals for access routes, site access and all accommodation works must be supported by swept path tracks. It should be noted that both route options to the proposed access(es) will cross a number of bridges/structures, many of which may be unsuitable for heavy HGVs and larger AILs, the applicant will require to get approvals and safe axle loadings (in respect of those structures) from the Council's Engineering Services (Bridges	Noted. The study area identifies the key access routes and is illustrated in Figure 11.1 Study Area. The abnormal load route is indicated in Figure 11.3 Abnormal Loads Route. No construction traffic will route through Newton Stewart. The designated route will be via the U52W Barnkirk Road. Swept paths are included as part of the abnormal loads assessment contained within Technical Appendix 11.1. Consultation will be undertaken with DGC Structures team prior to any abnormal load deliveries being made which is in line with the AL permitting process.

	and Structures) unit. It would be appropriate that any future submission/Environmental Statement include reference to a Construction phase Traffic Management Plan (CTMP) The CTMP should include a programme of delivery types/numbers by month, details of all proposed mitigation measures to minimise the impact on local communities and businesses, agreed and excluded access routes and details of measures that will be implemented. It would be appropriate that the TMP (CTMP) acknowledge that co-ordination phasing may be required to mitigate against the cumulative traffic impact. In the event that suitable and sufficient aggregate is not available from on-site Borrow Pits, any future submission/ES/TMP should also identify worst case scenario that 100% of the aggregate required for construction shall be imported to site and identify the potential number of movements in that event so that the potential impact of importing aggregate from elsewhere via the public road network be assessed. The A714 is a well trafficked timber haulage route and therefore it would be appropriate that there should be consultation with nearby forest managers and timber hauliers through the office of the South of Scotland Timber. Transport Officer to co-ordinate timber haulage operations that may use the access route during the construction period, to minimise the cumulative impact on communities and road users. There is the possibility of other unrelated windfarm projects being constructed in the near vicinity concurrently with this project. Therefore, it would be appropriate that the CTMP acknowledge that co-ordination phasing may be required to mitigate against the cumulative traffic impact. The developer will be held responsible for the immediate execution of any repairs and will be required to meet the cost of above average maintenance to the public road network arising from the concentration of heavy traffic associated with this development. This to be	CTMP is discussed under 'Mitigation Measures' in Paragraph 11.126 A programme of delivery numbers and types by month is provided in Table 11-9. Details of routes and measures will be included in the CTMP. Noted. The assessment contained within this chapter considers a worst case scenario of 100% stone imported. Consultation will be undertaken with appropriate transport officers as part of the CTMP. Noted. Noted.
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Transport Scotland	secured by legal agreement (Section 96). The methods adopted to assess the likely traffic and transportation impacts on traffic flows and transportation infrastructure should comprise: • Determination of the baseline traffic and transportation conditions, and the sensitivity of the site and existence of any receptors likely to be affected in proximity of the trunk road network; • Review of the development proposals to determine the predicted construction requirements; and • Assessment of the significance of predicted impacts from these transport requirements, taking into account impact magnitude (before and after mitigation) and baseline environmental sensitivity. Base traffic data for the trunk road network will require to be factored to the peak construction year, using National Road Traffic Forecasts (NRTF) Low Growth. A full Abnormal Loads Assessment report should be provided with the Environmental Impact Assessment Report (EIAR) that identifies key pinch points on the trunk road network. Swept path analysis should be undertaken and details provided with regard to any required changes to street furniture or structures along the route.	Baseline traffic conditions are described from Paragraph 11.47. Predicted construction requirements are set out in Table 11-8. Assessment of effects of road links in the study area which exceed the IEMA threshold is provided from Paragraph 11.82. NRTF low growth from 2024 to 2030 has been applied. A full abnormal loads assessment is contained within Technical Appendix 11.1.
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Scope of Assessment

- 11.8 The assessment is made with reference to the Proposed Development, as described in Chapter 3: Project Description and Construction Methods.
- 11.9 The most identifiable traffic and transport characteristic associated with wind farm developments is the need to transport the wind turbine components to the Site. Turbine components would be delivered to an appropriate Port of Entry (PoE) and then transported as abnormal loads to the Site via the public road network.

- 11.10 It is anticipated that the route via the trunk road network from the port of delivery will generally be of a suitable standard to accommodate the abnormal loads associated with the Proposed Development as it is a tried and tested route used by other wind farms in the Dumfries and Galloway area. The likely PoE for the turbines would be King George V Dock in Glasgow from where the abnormal loads vehicles would navigate east onto the M8 then south on the M74 before merging into the A74 and continuing onto the M6 to Carlisle. At junction 43 of the M6, vehicles would turn at the interchange to head back north on the M6 and A74 to Dumfries. Vehicles would leave the A74(M) at Junction 22 and would route west onto the A75 to just past Newton Stewart, turning north onto the U52W Barnkirk Road and then turning left to head north on the A714 before arriving at the site access. The proposed route is indicated by Figure 11.3.
- 11.11 There is also a need to bring to the Site general construction materials (concrete, aggregates, pipes, cabling, etc.) in standard heavy goods vehicles (HGVs). The characteristic of this form of traffic is 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. A small amount of traffic would also be generated by construction workers commuting to/from the Site during the construction and operational stages.
- 11.12 The potential for a cumulative assessment in respect of the traffic and transport effects has been considered for other wind farm developments within the surrounding area that would potentially utilise the same road network as the proposed development during the construction period.
- 11.13 It is recognised that the construction period represents the greatest intensification in traffic although it is important to note that this intensification is temporary in nature. The parameters and assumptions used to inform this chapter have been designed to represent a robust and worst-case scenario.

Potential Effects Scoped Out

- 11.14 On the basis of a detailed desktop study, the professional judgement of the Environmental Impact Assessment (EIA) team and experience from other relevant projects and policy guidance, the following characteristics have been scoped out of this Traffic and Transport Chapter.

Operational Stage

- 11.15 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 4x4's accessing the Proposed Development Site from time to time.
- 11.16 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.

Decommissioning Stage

- 11.17 Planning permission for the Proposed Development is sought for a 35 year period, after which

time the Proposed Development will be decommissioned unless a further application is submitted for an operational extension. Traffic associated with the decommissioning stage is anticipated to be significantly less than that generated during construction.

- 11.18 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

- 11.19 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.

Access Tracks and Beyond the Study Area

- 11.20 The effect of increased traffic associated with the Proposed Development on existing access tracks is not anticipated to have a discernible environmental effect and is therefore not appraised in this report. The effects of the Proposed Development on the local public road network are included.
- 11.21 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 as the effects of traffic are diluted with increasing distance from the point of origin.

Assessment Methodology & Significance Criteria Assessment of Effects

- 11.22 The assessment of effects is based on the project description as outlined in Chapter 3: Project Description and Construction Methods.
- 11.23 This assessment is structured around the consideration of potential environmental effects relating to traffic and transport, as identified by the IEMA Guidelines and including the following:
- Severance of communities
 - Road vehicle driver and passenger delay
 - Non-motorised user delay and amenity
 - Fear and intimidation on and by road users
 - Road user and pedestrian safety
 - Hazardous and large loads
- 11.24 There are no hazardous loads associated with the Proposed Development.
- 11.25 Guidance for the assessment of the environmental effects of generated traffic is provided in the IEMA document, "Environmental Assessment of Traffic and Movement". The document is the only guidance document currently available that sets out a methodology for assessing

potentially significant environmental impacts where a Proposed Development is likely to give rise to changes in traffic flows.

11.26 The guidance suggests that in order to determine the scale and extent of the assessment and the level of impact the development will have on the surrounding road network, the following two 'rules' should be followed.

- Rule 1 – Include road links where traffic flows are 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.

11.27 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. It is noted that further consideration should be given to road user and pedestrian safety as well as driver delay effects even if the above thresholds are not exceeded.

Study Area

11.28 The Study Area for the assessment of traffic and transport has been identified using the assessment thresholds within the IEMA Guidelines as an aide and is indicated by Figure 11.1: Study Area. The study area has been predicated on the access location to the Site and the proposed routes to the access point from the external road network.

11.29 To determine appropriate access routes to the Site, detailed consideration and assessment of the surrounding road network has been undertaken in the form of a comprehensive desk-based study. This has established that the most likely route for general construction HGV traffic is via the A75 from the east (from Dumfries) or from the west (from Stranraer), then via the minor road to the west of Newton Stewart (to avoid construction traffic routing through Newton Stewart) and the A714, from which the Site is accessed. Some construction traffic may also route to the site via the A714 from the north. A Construction Traffic Management Plan (CTMP) will be used to ensure that construction vehicles are kept on the preferred haul routes.

11.30 It is expected that the turbine components would be transferred by abnormal load vehicles to the Site via the M8, M74, A74M / M6, A75, U52W and A714 to the site access point.

11.31 The identified Study Area is as follows:

- A75 east from Newton Stewart to Twynholm;
- A75 west from Newton Stewart to Dunragit;
- U52W Barnkirk Road; and
- A714 from U52W Barnkirk Road to Barrhill.

11.32 It is highly unlikely that there will be any significant effects on the road network outside of the Study Area identified above. IEMA Rule 1 will be applied to all road links with regard to the increase in HGV levels.

Desk Based Research and Data Sources

11.33 The traffic and transport Study Area characteristics have been determined by a desk-based assessment, using traffic data from a range of sources including 24-hour ATC survey data obtained from the Transport Scotland National Traffic Data System (NTDS), and commissioned traffic surveys. Described below is the source of the traffic count information at locations identified in the Study Area. These are also indicated by Figure 11-2.

- 1. A75 east of Newton Stewart: NTDS counter ATC09023;
- 2. A75 west of Newton Stewart: NTDS counter JTC00377;
- 3. U52W Barnkirk Road: 2024 ATC Survey; and
- 4. A714 from A75 to Barrhill: 2024 ATC Survey.

Assessment of Significance

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

Evaluation of Sensitivity

11.35 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.

11.36 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.

11.37 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.

11.38 The criteria that has been used to make judgements on the sensitivity of the receptor(s) and the magnitude of change are presented in Table 11-2.

Table 11-2 – Receptor Sensitivity

Sensitivity	Criteria
High	Receptors of high importance and value on international or national scales. Designated or heritage areas of unique value. Large settlements with a large number of public services and facilities, traffic control measures and regular use by pedestrians and cyclists. Minor and historic roads not generally suitable for HGV traffic.
Moderate	Receptors of some regional importance. Medium-sized settlements with some public services facilities and infrastructure and some traffic control measures, including some accommodation for pedestrians and cyclists. Capable of supporting regular HGV traffic.
Low	Receptors with low regional importance. Typically small settlements with few facilities and no traffic control measures and with nearby trunk or A-class roads that are able to accommodate HGV traffic.
Negligible	Users not sensitive to transport effects. Includes very small settlements and roads with no significant settlements including new strategic trunk roads or motorways.

Evaluation of Magnitude

- 11.39 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).
- 11.40 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.
- 11.41 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.
- 11.42 The criteria that has been used to make judgement on the magnitude of the effect on the receptor(s) is provided in Table 11-3.

Table 11-3 – Thresholds for Determining Magnitude of Effects

Magnitude	Criteria
Major	>90% increase in traffic
Moderate	60%-90% increase in traffic
Minor	30%-60% increase in traffic
Negligible	0%-30% increase in traffic

11.43 In line with Rules 1 and 2, as set out in paragraph 11.13, an increase in traffic on a particular route of less than 30% is generally not considered significant and does not warrant an assessment, except in areas of particular sensitivity. In this instance, an increase of more than 10% will be assessed. An increase of less than 10% does not warrant assessment even in sensitive areas given that daily variations in background traffic flow may vary by this amount.

Evaluation of Significance

11.44 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 11-4. This is based on combining the magnitude of the effect with the receptor sensitivity.

Table 11-4 – Significance Matrix

Sensitivity	Magnitude of change				
		Major	Moderate	Minor	Negligible
	High	Major	Major/ Moderate	Moderate	Moderate/ Minor
	Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor
	Low	Moderate	Moderate/ Minor	Minor	Minor/ Negligible
	Negligible	Minor	Negligible	Negligible	Negligible

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

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

Baseline Conditions

11.47 The following paragraphs detail the baseline conditions of the road links identified as being within the Study Area in addition to the Site access tracks.

A75

11.48 The A75 is a trunk road in Scotland, linking Stranraer on the west coast with the A74(M) at Gretna, close to the border with England and the M6 motorway. This strategic route connects southern Scotland / northern England with Northern Ireland via the ferry port at Cairnryan.

11.49 The A75 is typically a two-way single carriageway of approximately 7.3m in width, with a few dual carriageway sections and sections with a third overtaking lane. The road is subject to the national speed limit, with the exception of a few sections outwith the study area where the road passes through settlements.

- 11.50 Within the study area, the A75 routes in a primarily east / west direction from Twynholm in the east to Dunragit in the west, bypassing both of those settlements and also bypassing the settlements of Cardoness, Creetown, Newton Stewart and Glenluce.

A714

- 11.51 The A714 routes in a north / south direction from Girvan on the west coast of Scotland, through the centre of Newton Stewart and ends just north of the village of Braehead, a total distance of 61.2km.
- 11.52 In the context of the study area, the A714 routes south from the village of Barrhill, through the centre of Newton Stewart to the south of the town where it connects with the A75 by means of a roundabout.
- 11.53 The A714 is a two-way single carriageway of approximately 6.5m in width and is subject to the national speed limit, with the exception of through Newton Stewart where the speed limit reduces to 30mph.
- 11.54 It is proposed that all construction traffic be routed via the U52W Barnkirk Road to avoid travel through the centre of Newton Stewart.

U52W Barnkirk Road

- 11.55 Barnkirk Road is a minor road which bypasses Newton Stewart to the west of the town by connecting the A75 in the south with the A714 in the north. The 2.4km route is proposed to be used by construction traffic to avoid routing heavy goods vehicles through the centre of Newton Stewart, as has been done for previous windfarms in the area.
- 11.56 Barnkirk Road is a two-way single carriageway road of approximately 5.5m in width and is subject to the national speed limit.

Baseline Traffic Flows

- 11.57 Table 11-5 describes the source and location of the traffic counters used to establish baseline traffic flows, also illustrated in Figure 11-2.

Table 11-5 - ATC Locations

Location	ATC ID	Data Source
1. A75 west of A714	JCT00377	Transport Scotland NTDS
2. A75 east of A714	ATC09023	Transport Scotland NTDS
3. U52W Barnkirk Road	ATC site 2	2024 Survey
4. A714	ATC site 1	2024 Survey

- 11.58 Table 11-6 indicates the two-way Average Daily Traffic Flow (ADT) in the Study Area and the percentage of traffic which is classified as HGVs. Future year traffic forecasting from 2024 to 2030 (assumed as the year construction would begin) using the National Roads Traffic

Forecast 'low growth' rate (1.031) has been applied to the data to represent a robust assessment of the baseline conditions.

Table 11-6 - Summary of Baseline Traffic Data

Location	Base ADT 2024	Base ADT HGV 2024	2028 ADT	ADT HGV 2028	Percentage HGV
1. A75 west	3,994	1,282	4,116	1,321	32.1%
2. A75 east	4,386	1,544	4,520	1,591	35.2%
3. U52W Barnkirk Road	1,033	234	1,065	241	22.7%
4. A714	1,166	281	1,202	290	24.1%

Road Safety

11.59 Five-year accident data (Jan 2019 – Jan 2024) for the trunk road within the study area (A75) has been obtained from Transport Scotland. The Crashmap website has been utilised to determine the number of accidents that have occurred in the five year period 2018-2022 (the most recent available data) along the remaining road links within the identified study area. The results of this investigation are indicated by Table 11-7 with additional commentary provided on serious and fatal accidents, if applicable.

Table 11-7 – Accident Statistics

Counter Location	Slight	Serious	Fatal	Comment
1. A75 west	12	8	1	One fatal accident in 2023 approximately 220m east of the junction with the B735, involving two vehicles and one casualty.
2. A75 east	8	6	1	One fatal accident in 2019 near Palmuir involving two vehicles and two casualties.
3. U52W Barnkirk Road	2	-	-	-
4. A714	3	5	1	One fatal accident in 2018 involving one vehicle and one casualty approximately 2km south of Knockville access.

11.60 Table 11-7 indicates that a total of 20 slight, 14 serious, and 2 fatal accidents have occurred on the A75 within the study area over the previous five years. This level of accidents is typical of trunk roads of this rural nature carrying high volumes of traffic and the accidents are generally spread out across the road network.

11.61 Accident records for the U52W Barnkirk Road show 2 slight accidents in the last five years, while the A714 recorded 3 slight, 5 serious and one fatal accident. Accidents on these two routes were distributed across the road network with no identifiable accident 'hot spots' or clusters.

The 'Do Nothing' Scenario

- 11.62 If the Proposed Development was not implemented then it is likely that there would be no significant changes to the traffic and transport situation in the vicinity of the Proposed Development, other than changes to background traffic as a result of general traffic growth and any nearby committed developments.

Identification and Evaluation of Key Effects

Construction Programme

- 11.63 The construction traffic associated with the Proposed Development would comprise of construction workers, HGVs / LGVs carrying construction materials & plant, and abnormal load vehicles carrying the main wind turbine components.
- 11.64 There is expected to be up to 30 personnel working on-site at any one time. It is important to note that the number of personnel on-site would vary during the construction process. In general, work hours are expected to be between 07:00 to 18:00 on weekdays and 08:00 to 14:00 on Saturdays which means that staff would generally arrive and depart outside the peak hours associated with the surrounding road network (typically 8:00 to 9:00 and 17:00 to 18:00). Turbine delivery, erection and commissioning activities may take place outwith these hours depending on weather conditions.
- 11.65 Estimates of traffic generation associated with the construction phase of the Proposed Development have been calculated from first principles and consider the following activities:
- Highway modifications to enable vehicles to access the Site from the strategic and local highway network;
 - Installation of construction compound/storage area for Site office facilities and storage of materials and components;
 - The excavation of the borrow pit and extraction of aggregate for new tracks, upgrades existing tracks and hardstandings
 - Construction of up to 9.5km of permanent Site tracks;
 - Installation of hardstandings and outrigger pads for the support of the cranes that would be used for the erection of the turbines;
 - Construction of foundations for the support of the turbine structures;
 - Wind turbine delivery and erection;
 - Installation (if necessary) of transformers in separate housings alongside each wind turbine;
 - Installation of on-Site High Voltage (HV) cabling, communication cabling and earthing;
 - Installation of Supervisory Control and Data Acquisition (SCADA) system;
 - Construction of substation;
 - Commissioning of Site mechanical and electrical equipment; and

- Reinstatement, landscaping, removal of temporary Site offices, reseeding verges, borrow pit and areas around turbine bases.

11.66 In order to calculate a robust scenario, information was gathered regarding the materials required and the size of average loads associated with the construction vehicles. Table 11-8 includes an estimate of construction vehicle numbers required for each task during the construction period.

Table 11-8 – Estimated No. of HGV Trips during Construction

Construction Task	Vehicle Type	Approximate No. of Loads
Site Establishment / Demobilisation	Low Loader and Dump Truck	120
General site deliveries	Low Loader and Dump Truck	180
Imported stone (access roads, crane hardstanding areas, other hardstanding areas)*	Dump Truck	3018
Reinforcement	Low Loader	32
Foundations (off-site batched concrete)	Concrete Wagon	3991
Cabling deliveries and sand	Low Loader	420
Geotextile separators	Low Loader	176
Delivery of HV electrical items	Dump Truck	33
Construction of Sub-station	Various	164
Battery Storage	Various	80
Cranes and related lifting equipment	Crane Vehicle	55
Erection of turbines	Abnormal Loads	130
Site reinstatement and restoration	Various	70
Total Inbound Trips		8,469
Total Trips (Inbound plus Outbound)		16,938

**assumes 100% stone requirements are imported to the Site*

11.67 Potential on-site borrow pits have been identified and it is likely that a high proportion of the required stone can be sourced from them. It is the Applicant's intention to win stone in this manner in order to construct access tracks and hardstanding areas. The use of borrow pits will help to reduce HGV levels considerably. However, at the request of DGC (as stated in the scoping opinion, February 2024) and for the purpose of providing a worst case assessment, it is assumed that 100% of the stone estimated to be required to construct the site would be sourced from an off-site location thus the assessment undertaken represents a very conservative and robust approach.

11.68 In addition to the construction vehicles identified in Table 11-8, it is anticipated that there would be approximately 60 two-way daily private car/LGV trips to the Site associated with construction staff/welfare. This equates to a maximum of 30 arrivals and 30 departures at the start and end of the working day. In these circumstances, the effects of car/LGV traffic are considered to be negligible, therefore not significant, however, to represent a robust assessment this number of non-HGV trips has been included in the assessment.

- 11.69 It is anticipated that the abnormal loads will require car or LGV escort vehicles whilst transporting the turbines. This would equate to approximately seven vehicles per week when transporting the abnormal loads. This impact is considered to be negligible and not significant and has therefore not been assessed further.
- 11.70 The construction of the Proposed Development would take approximately 18 months. Using the indicative construction programme, the number of construction trips that are anticipated to visit the Site for each month of the construction period has been calculated and is presented within Table 11-9.

Table 11-9: Estimated No. of HGV Trips per Month

Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
Site Establishment / Demobilisation	20	20	20													20	20	20	120
General site deliveries	12	12	12	12	12	10	10	10	10	10	10	10	10	10	10	10	5	5	180
Imported stone (access roads, crane hardstanding areas, other hardstanding areas)*	503	503	503	503	503	503													3018
Reinforcement						6	6	5	5	5	5								32
Foundations (off-site batched concrete)						665	665	665	665	665	665								3,991
Cabling deliveries and sand							84	84	84	84	84								420
Geotextile separators					44	44	44	44											176
Delivery of HV electrical items									8	8	8	8							33
Construction of Sub-station									55	55	54								164
Battery Storage													20	20	20	20			80
Cranes and related lifting equipment								28	14	13									55
Erection of turbines (abnormal loads)												26	26	26	26	26			130
Site reinstatement and restoration																10	30	30	70
Total Inbound Trips	535	535	535	515	559	1228	809	836	841	840	826	44	56	56	56	86	55	55	8,469
Total Trips (Inbound plus Outbound)	1,070	1,070	1,070	1,030	1,118	2,456	1,618	1,672	1,683	1,681	1,653	89	112	112	112	172	110	110	16,938

- 11.71 The construction Site may be operational 11 hours every weekday (07:00 – 18:00) and 6 hours on a Saturday (07:00 – 13:00), with no construction works on Sundays or Bank Holidays, therefore vehicles could be arriving or leaving at any time during this working week of 5.5 days. Construction vehicles would be arriving and departing the Site at regular intervals during expected Site working hours.
- 11.72 Table 11-9 indicates that the HGV trips are relatively well spread out over the duration of the construction period. Months 6-11 have the highest number of trips associated with the importation of stone for the construction and upgrading of the Site access track network. The final seven months are very light in terms of HGV trips when compared with the months with stone importation/access track construction. The peak is in Month 6 where there is an overlap between stone importation and concrete pours for foundations.

Abnormal Load Movements

- 11.73 With regard to the movement of abnormal load vehicles, Table 11-9 indicates that abnormal loads will only be transported over five months of the 18-month construction period. Assuming 26 inbound abnormal load vehicle trips per month, this equates to approximately 7 inbound trips per week. Abnormal load vehicles are restricted in the hours that they can operate and a maximum of four abnormal loads would be transported on any given day. It is also noted that abnormal load vehicles will retract to the size of an HGV for their return journey once the loads have been delivered to the destination, equating to 7 inbound abnormal load trips plus 7 outbound HGV trips per week.
- 11.74 The movement of abnormal loads may be spread out evenly across the day of the week or concentrated over 2 – 3 days within each week, therefore meaning that there would be no movements on the remaining days of the week. The schedule of movements of abnormal loads will be agreed upon following discussions with the hauliers and Police Scotland to ensure the least impact on the road network as possible.
- 11.75 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. As a result, no further assessment of the effect of abnormal load vehicles has been undertaken.

Worst Case Assessment

- 11.76 The worst-case month for general construction traffic (HGVs) is Month 6 with 2,456 total (inbound plus outbound) HGV trips estimated. Assuming four weeks per month, this equates to approximately 614 HGVs trips per week (307 inbound and outbound respectively). Month 6 is therefore used to assess the impact and effects of the Proposed Development on the transport network. This estimate of HGV movements assumes that 100% of stone requirements are imported; however, there is a high possibility that a significantly high proportion of stone could be sourced on-site which would significantly reduce the number of HGV movements. It is therefore considered that the traffic levels assessed are maximum case, therefore providing a robust assessment.

11.77 The daily HGV trip generation for Month 6 is therefore estimated to be approximately 112 total trips (assuming 5.5 days per week). This equates to approximately 9 HGV trips per hour (4.5 inbound and 4.5 outbound), assuming an 11-hour working day. It is important to note that this number of trips applies to the worst-case month only which is Month 6; all other months have a significantly lower construction traffic generation.

Construction Effects

Traffic Distribution

11.78 The majority of construction related traffic is anticipated to originate from the A75 to the south of the site, from either Stranraer to the west or Dumfries to the east, approaching the site via the Newton Stewart Bypass (Barnkirk Road) and the A714. Additional construction traffic may travel to the site from the northeast, routing south on the A714.

11.79 All construction traffic will be required to use the A714 as access to the proposed development is taken directly from this road.

11.80 Based on these routing assumptions, the traffic distribution which has been applied is detailed in Table 11-10.

Table 11-10: Construction Traffic Distribution

		% of Development Traffic Applied
1	A75 west of A714	100%
2	A75 east of A714	100%
3	Barnkirk Road	100%
4	A714	100%

11.81 It is important to note that this represents a worst-case scenario for each road link and this impact could not occur simultaneously.

Construction Traffic Impact

11.82 Table 11-11 details the daily percentage increases in traffic flows associated with the construction of the Proposed Development at the traffic counters within the Study Area during the worst-case month. The location of the traffic counters is illustrated in Figure 11.2

Table 11-11 - Assessment of Construction Traffic Impact (Month 6)

	1. A75 west	2. A75 east	3. U52W	4. A714
2030 ADT	4116	4520	1065	1202
2030 HGV	1321	1591	241	290
2030 % HGV	32.1%	35.2%	22.7%	24.1%
Month 6 daily HGV	112	112	112	112
Month 6 daily staff trips	60	60	60	60

2030 ADT + Month 6 total traffic	4288	4692	1236	1373
2030 HGV + Month 6 HGV traffic	1433	1703	353	401
Percentage increase in total traffic due to the proposed development	4%	4%	16%	14%
Percentage increase in HGVs due to the proposed development	8%	7%	46%	39%

Please note minor variances due to rounding may occur.

11.83 Table 11-11 indicates that the temporary increase in daily total traffic levels during the worst-case month is considered to be negligible for the A75 both east and west with a total traffic increase of 4% and an HGV traffic increase of 8% (west) and 7% (east), both of which fall below the 'Rule 2' increase of 10% or more at sensitive locations and therefore no further assessment of these links is required.

11.84 The total traffic levels along the U52W Barnkirk Road and the A714 could increase by 16% and 14% respectively with the addition of Proposed Development traffic, which is considered to be an increase of negligible magnitude in accordance with Table 11-3. The increase in HGVs on the U52W Barnkirk Road and the A714 during the worst-case month 6 is predicted as 46% and 39% respectively. It should be noted that the high percentage increase in HGV levels is attributable to the low baseline HGV traffic levels on these routes. Notwithstanding this, this level of increase exceeds the IEMA Rule 1 threshold (30%) and requires a full assessment of effects to be undertaken for the affected road links which is detailed below.

Severance of Communities

11.85 The IEMA Guidelines advise that "Severance is the perceived division that can occur within a community when it becomes separated by major transport infrastructure".

11.86 The potential for traffic associated with the Proposed Development to cause severance is assessed on a case by case basis using professional judgement where non-negligible traffic increases are predicted on roads through residential settlements.

11.87 Increased severance can result in the isolation of areas of a settlement or individual properties. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure. Severance effects could equally be applied to residents, motorists or pedestrians.

11.88 With reference to Table 11-3, the magnitude of the change in HGV levels along the U52W Barnkirk Road and the A714 is considered to be minor (30-60%). As discussed, this is undoubtedly due to the fact that baseline HGV levels are very low rather than there being high traffic volumes associated with the construction of the proposed development. To put the increase in traffic levels into perspective, 112 total (inbound plus outbound) HGV movements per day equates to only nine additional HGVs per hour over the course of a day.

11.89 The sensitivity of link 3, the U52W, to an increased severance effect is considered to be low in

accordance with Table 11-2. The southern extent of the U52W routes through an industrial area, while the northern section is predominantly rural. There are few properties accessed from the route, and no facilities which would generate pedestrian movements. Combining the minor magnitude of change with the low sensitivity of the receptor in accordance with Table 11-4 equates to a likely significance of effect which is classed as minor and **Not Significant** as per the EIA Regulations.

- 11.90 The sensitivity of link 4 (the A714) to an increased severance effect is considered to be medium in accordance with Table 11-2. Assessment of the A714 does not include the section through the centre of Newton Stewart as construction traffic will be routed via the U52W. The A714 (outwith Newton Stewart) is a predominantly rural route however, it passes through small settlements such as Challoch, Penninghame and Bargrennan and bus stops are located on the A714 at these locations. Combining the minor magnitude of change with the medium sensitivity of the receptor in accordance with Table 11-4 equates to a likely significance of effect which is classed as moderate/minor and **Not Significant** as per the EIA Regulations.

Road Vehicle Driver and Passenger Delay

- 11.91 Some driver delay may be experienced when construction traffic is accessing the Site. The IEMA Guidelines advise “delays are only likely to be significant when the traffic on the network surrounding the Site is already at, or close to, the capacity of the system”.
- 11.92 Traffic delay to non-development traffic may occur at several points on the network surrounding the Site including:
- At the Site entrance where there will be additional turning movements;
 - At intersections along the local road network which might be affected by increased traffic; and
 - At side roads where the ability to find gaps in traffic may be reduced, thereby lengthening delays.
- 11.93 It is noted that there are no significant areas of congestion within the Study Area at this point in time. With reference to Table 11-3, the magnitude of the change in HGV levels along the U52W Barnkirk Road and the A714 is considered to be minor (30-60%).
- 11.94 The sensitivity of these road links to an increased road vehicle driver and passenger delay effect is considered to be low in accordance with Table 11-2 as there are very few junctions and therefore potential areas for the delay of other road users by turning HGVs. Furthermore, the ADT on these road links is low, hence, there is sufficient available capacity to accommodate additional vehicle movements without causing delay to other road users.
- 11.95 Combining the minor magnitude of change with the low sensitivity of the receptor in accordance with Table 11-4 equates to a likely significance of effect which is classed as minor and **Not Significant** as per the EIA Regulations.

Non-Motorised User Delay and Amenity

- 11.96 The IEMA Guidelines advise that "The assessment of pedestrian delay serves as a proxy for the delay that other modes of non-motorised users may experience when crossing roads".
- 11.97 Traffic volumes, traffic composition, traffic speed, the existence of pedestrian footways and the existence of pedestrian crossings all contribute to the level of general pleasantness experienced by pedestrians and other vulnerable road users.
- 11.98 With reference to Table 11-3, the magnitude of the change in HGV levels along the U52W Barnkirk Road and the A714 is considered to be minor (30-60%).
- 11.99 The sensitivity of the U52W road link to an increased pedestrian delay and reduced pedestrian amenity effect is considered to be negligible in accordance with Table 11-2 as there are no pedestrian footways on this road and access to the industrial area at the southern extent of the road would be by vehicle.
- 11.100 Combining the minor magnitude of the change with the negligible sensitivity of the receptor in accordance with Table 11-2 equates to an effect which is classed as negligible and **Not Significant** as per the EIA Regulations.
- 11.101 The sensitivity of the A714 road link to an increased pedestrian delay and reduced pedestrian amenity effect is considered to be medium in accordance with Table 11-2 due to location of the settlements of Challoch, Penninghame and Bargrennan along the route. Combining the minor magnitude of the change with the sensitivity of the receptor in accordance with Table 11.3 equates to a likely significance of effect which is classed as moderate/minor and **Not Significant** as per the EIA Regulations.

Fear and Intimidation by Road Users

- 11.102 IEMA guidelines state that "a further environmental impact that affects people is the fear and intimidation created by all moving objects", with the extent of fear and intimidation dependent upon:
- The total volume of traffic;
 - The heavy vehicle composition;
 - The speed these vehicles are passing; and
 - The proximity of traffic to people.
- 11.103 The 2023 IEMA guidelines provide a weighting system to help quantify the likelihood and level of pedestrian fear and intimidation. Following this process, which is based on average traffic flows and vehicle speeds, the potentially sensitive areas on the A714 such as Challoch, Penninghame and Bargrennan are assessed to have a level of fear and intimidation classed as 'small', which is the lowest level. The magnitude of change due to the increase in construction traffic during the worst-case month of construction is deemed to be minor. When the small sensitivity is combined with the minor magnitude, the effect is assessed as minor and **Not Significant**.
- 11.104 The sensitivity of the U52W Barnkirk Road to an increased fear and intimidation effect is considered to be negligible as there is unlikely to be any pedestrian activity along this road link

due to the lack of footways present and no amenities which would generate pedestrian movement. The magnitude of change due to the increase in construction traffic during the worst-case month of construction is deemed to be minor. When the negligible sensitivity is combined with the minor magnitude, the effect is assessed as negligible and **Not Significant**.

Road User and Pedestrian Safety

- 11.105 The most recently available accident data for the road links within the Study Area has been summarised in Table 11-7. The data from 2018 to 2022 (the most recent available data) indicates that 2 slight accidents have occurred on the U52W Barnkirk Road, while the A714 recorded 3 slight, 5 serious and one fatal accident.
- 11.106 An approximate calculation has been undertaken to quantify the level of accident risk that could be expected due to an increase in traffic associated with the Proposed Development. The likelihood of an accident occurring is commonly expressed in accidents per million vehicle-km. Accidents that are appraised in relation to transport are predominantly those in which personal injury is sustained by those involved (personal injury accidents (PIAs)).
- 11.107 For the purpose of this calculation, it has been assumed that the length of road is 2.4km for the U52W Barnkirk Road and 25km for the A714 making a total of approximately 27.4km, which can be generally classified as 'rural typical single carriageway' in accordance with the criteria set out within DMRB.
- 11.108 Accident rates from the DMRB for this standard of road are:
- Rural typical single carriageway: 0.190 Personal Injury Accidents (PIA) per million vehicle-km.
- 11.109 Assuming a two-way trip on the 27.4km route for each of the 8,469 vehicles during the construction period (as set out in Table 11-9), a total distance of 464,091km is obtained. Based on the rate above; this suggests 0.0882 accidents during the construction period associated with the additional traffic.
- 11.110 It is considered that the magnitude of this effect is negligible but receptor sensitivity to this effect is always considered as high. When combined, the effect can be classified as moderate/minor and **Not Significant**.

Hazardous and Large Loads

- 11.111 There are no hazardous loads associated with the Proposed Development.
- 11.112 IEMA guidelines state that "The movement of large (abnormal) loads is regulated by National Highways and will be subject to separate agreement with the relevant highway authorities and police". The number and schedule of abnormal load trips associated with the Proposed Development is detailed in Table 11-9 and equates to seven abnormal loads per week over weeks 12 to 16 of the construction programme. This impact is considered to be negligible and **Not Significant**.

Cumulative Impacts and Interaction of Effects

Cumulative Impacts

- 11.113 Cumulative effects have been considered for other wind farm developments in the vicinity of the Proposed Development, excluding operational Wind farms as the traffic impacts relate primarily to the construction phase. These developments either have planning consent but are yet to be constructed or are currently in planning and could utilise a common access route for general construction traffic. The potential for cumulative effects has been assessed by reviewing data available from the Traffic and Transport Chapters within the respective EIARs for the relevant developments.
- 11.114 Whilst the developments identified in Table 11-12 may share a similar route for abnormal load vehicles, the restrictions in place and requirement for Police approval and escort means that abnormal load deliveries would not be permitted to occur at the same time. Therefore, there is no scope for a cumulative effect of abnormal load movements.

Table 11-12 – Potential Cumulative Impact Wind Farm Schemes

Site Name	Status	Turbine Count
Stranoch 2	Consented	20
Arcleloch Wind Farm Extension	Consented	13
Kilgallioch Extension	Consented	9
Chirmorie Wind Farm	Consented	21
Garvilland Wind Farm	Consented	5
Artfield Forest Wind farm	Consented	12
Blair Hill Wind Farm	Scoping	22

Consented Wind Farms

Stranoch 2

- 11.115 Stranoch 2 gained consent in November 2021 and is a 20 turbine wind farm between New Luce and Barrhill. The original Stranoch Wind Farm application for 24 turbines was consented in 2016 but not constructed. Stranoch 2 is accessed primarily via minor roads from the A77 although construction traffic is also expected to route from the A75. Construction is expected to commence in 2024 therefore the peak construction months of this development and the Proposed Development are highly unlikely to overlap.

Arcleloch Wind Farm Extension

- 11.116 Arcleloch Wind Farm extension gained consent in November 2021 following a public inquiry. The extension lies to the east of the operational 60 turbine Arcleloch Wind Farm and is comprised of 13 turbines of 200m tip height. The site is located approximately 3km south west of Barrhill with access taken from the A714, and as such the Arcleloch Extension and the Proposed Development share similar characteristics in terms of abnormal loads route and construction HGV routes, however the Arcleloch Extension is expected to be constructed and operational

by 2025 and therefore the peak construction periods are highly unlikely to coincide.

Kilgallioch Extension

- 11.117 Consent was granted for the 9 turbine Kilgallioch Extension in December 2021. The development is an extension to the operational 96 turbine Kilgallioch Wind Farm which lies approximately 7km west of the Proposed Development. Access to the Kilgallioch Extension will be via the existing Kilgallioch Wind Farm from the A714 at Wheeb Bridge therefore sharing the construction traffic route with the Proposed Development, however due to the two developments being at different stages of planning it is highly unlikely that the peak construction periods will coincide.

Chirmorie Wind Farm

- 11.118 Consent was originally granted in 2018 for the 21 turbine Chirmorie Wind farm, approximately 7km southwest of Barrhill. In 2020 consent was granted for a variation which included a new access from the A714. In 2021 a further variation was granted consent which included an increase to tip height of all 21 turbines from 146.5m to 149.9m, and an increase in blade length from 57m to 68m. The second variation also included a temporary construction access route from Barrhill and an alternative access route from the A77 near Innermessan via the consented Stranoch Wind Farm. Due to the access via the A714, there is an overlap in construction traffic route with the Proposed Development, however due to the two developments being at different stages of planning it is highly unlikely that the peak construction periods will coincide.

Garvilland Wind Farm

- 11.119 Garvilland Wind Farm gained consent in December 2023 from Dumfries and Galloway Council for a five turbine development located approximately 4.5km north of Glenluce. Due to the location of the development to the southwest of the proposed development and its proximity to the A75, the only potential overlap in construction traffic route would be the A75. The A75 is a trunk road with relatively low traffic volumes and sufficient capacity to accommodate the construction traffic generated by a five turbine development in addition to the Proposed Development without reaching IEMA assessment thresholds.

Artfield Forest Wind Farm

- 11.120 Artfield Forest Wind Farm gained consent in February 2023 and comprises 12 turbines located approximately 8km northwest of Kirkcowan and 15km west of Newton Stewart. Similar to Garvilland, the only potential overlap in construction traffic route would be the A75 which has sufficient capacity to accommodate additional traffic including HGV's. It is unlikely that there would be an overlap in the peak months of construction as both developments are at different stages of the planning process, nevertheless, both wind farm developments will implement a Construction Traffic Management Plan which ensure that deliveries are scheduled appropriately to minimise the impact to the public road network and ensure that discernible cumulative effects are avoided.

Wind Farms at Scoping Stage

Blair Hill Wind Farm

- 11.121 The proposed Blair Hill Wind Farm is currently at scoping stage and comprises 22 turbines of 250m ground to tip height, located approximately 6km north of Newton Stewart. Access to the site

would be via the A75 and A712 therefore a potential overlap of construction traffic routes would be on the A75. It is unlikely that there would be an overlap in the peak months of construction as both developments are at different stages of the planning process, nevertheless, both wind farm developments will implement a Construction Traffic Management Plan which ensure that deliveries are scheduled appropriately to minimise the impact to the public road network and ensure that discernible cumulative effects are avoided.

Summary

- 11.122 In summary, it is highly 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 periods. 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.
- 11.123 Furthermore, implementation of a CTMP (further details contained within the Mitigation Measures section below) for each development would ensure that there are open lines of communication with DGC, Police Scotland, Transport Scotland, 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.

Interaction of Effects

- 11.124 In addition to the effects assessed in full within this chapter (i.e. severance, driver delay etc.), there are also visual and noise effects which are inter-related to the traffic and transport impacts associated with the construction phase of the Proposed Development. These effects are assessed respectively within Chapter 6: Landscape and Visual Amenity and Chapter 10: Noise.
- 11.125 The assessment predicts that, prior to mitigation measures, the effect of severance, driver delay and pedestrian delay and amenity would be **Not Significant** along the road links within the Study Area and amenity as a result of increased levels of HGVs associated with the Proposed Development. Therefore, in accordance with the EIA Regulations mitigation is not required. However, as a measure of good practice, and as requested by DGC in the scoping opinion it is proposed to prepare and implement a comprehensive Construction Traffic Management (CTMP) which is intended to minimise the effects of construction traffic within the Study Area as far as possible.

Mitigation Measures

Outline Construction Traffic Management Plan

11.126 The final CTMP will identify measures to reduce the number of construction vehicles, as well as considering reducing or avoiding the impact of vehicles through construction programming / routing and identification of an individual with responsibilities for managing traffic and transport effects. The CTMP will also identify measures to reduce and manage construction staff travel by private car, particularly single occupancy trips. Potential measures could include (but are not limited to):

- Immediately upon commencement, all deliveries, operatives and visitors to the Site would report to the security gate. This would be communicated to all early works contractors at their pre-start meeting.
- The main contractor would develop a logistics plan highlighting the access point for the project, loading bay(s), pedestrian / vehicular segregation, welfare, storage, security and material handling that would be enforced following full Site establishment.
- Approved haul routes would be identified to the Site and protocols put in place to ensure that HGVs adhere to these routes.
- All contractors would be provided with a site induction pack containing information on delivery routes, any restrictions on routes and maximum load capacity for the internal access tracks.
- Temporary construction site signage would be erected along the identified construction traffic routes to warn other road users of construction activities and associated construction vehicles.
- A construction traffic speed limit (for example, 20mph in 30mph zones) would be imposed through the sensitive areas along the route and on approach to the main Site access point.
- The construction material 'lay down' areas would allow for a staggered delivery schedule throughout the day, avoiding peak periods and unsociable hours (i.e., before 06:00 and after 22:00).
- An integral part of the progress meetings held with all trade contractors is the delivery schedule pro-forma. All contractors would be required to give details of proposed timing of material deliveries to the Site. At this stage, they would 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 would HGVs be allowed to lay-up in surrounding roads. All personnel in the team would be in contact with each other and with Site management, who in turn would have mobile and telephone contact with the subcontractors.

- A wheel washing / wheel cleaning facility would be installed on-site during the construction period in order to reduce mud and debris being deposited onto the local road network.

11.127 The CTMP will ensure that there is signage along the construction routes to make residents aware of the additional HGV traffic and to provide the opportunity to plan ahead. The CTMP will ensure that construction HGVs do not travel during peak periods or at the start/end of the school day and that they adhere to a lowered speed limit. Each of these measures will contribute to minimising the level of effect experienced by residents and road users within the Study Area.

Residual Effects

11.128 The assessment has been carried out considering the peak in construction traffic and any high percentage increase in HGV traffic is reflective of the low baseline HGV volumes on the roads within the Study Area. Furthermore, it is important to recognise that all effects associated with increased construction traffic will be temporary and local in nature, and that this assessment has considered the worst-case possible impact at each location.

11.129 Results of the assessment indicate that all temporary traffic and associated environmental effects are deemed '**Not Significant**' before implementation of the CTMP, as summarized in Table 11-14. Following implementation of the CTMP all residual effects will be minimised further where possible.

Table 11-13 - Residual Effects

Potential Effect	Significance	Mitigation	Residual Effects
Severance of Communities	U52W: Minor – Not Significant A714: Moderate/Minor – Not Significant	Not required	Not Significant
Road Vehicle Driver and Passenger Delay	U52W: Minor – Not Significant A714: Minor – Not Significant	Not required	Not Significant
Non-Motorised (Pedestrian) Delay and Amenity	U52W: Negligible – Not Significant A714: Moderate/Minor – Not Significant	Not required	Not Significant
Fear and Intimidation	U52W: Negligible – Not Significant A714: Minor – Not Significant	Not required	Not Significant
Road User and Pedestrian Safety	U52W: Moderate/Minor – Not Significant A714: Moderate/Minor – Not Significant	Not required	Not Significant
Hazardous and Large Loads	U52W: Negligible – Not Significant A714: Negligible – Not Significant	Not required	Not Significant

Summary

- 11.130 This assessment has considered the effects on the local road network of HGV traffic associated with the construction phase of the Proposed Development.
- 11.131 The construction programme associated with the Proposed Development is anticipated to cover an 18 month period, during which 8,469 HGVs would access the Site equating to 112 daily total HGV trips (56 inbound plus 56 outbound) during the busiest construction month (Month 6). The movement of abnormal loads is not anticipated to exceed 7 trips per week over the course of four months (with no overlap during the busiest construction months).
- 11.132 A robust assessment was undertaken based on a conservative approach for the total construction traffic movements and the worst-case scenario for each link. The impact of construction traffic could increase total traffic flows along the road links within the Study Area by the following:
- 4% at both assessed locations on the A75;
 - 16% on the U52W Barnkirk Road; and
 - 14% on the A714.
- 11.133 The percentage increase in HGVs associated with the worst-case month of the construction programme for the Proposed Development could increase HGV levels by the following:
- 8% on the A75 west of Newton Stewart;
 - 7% on the A75 east of Newton Stewart;
 - 46% on the U52W Barnkirk Road; and
 - 39% on the A714.
- 11.134 The impacts and effects of the Proposed Development represent a conservative approach assuming that 100% stone requirements are imported to the Site, while it is anticipated that a proportion of stone will be won from on-site borrow pits. Furthermore, these increased traffic levels are temporary in nature and are likely to be lower during the other 12 months of construction.
- 11.135 With reference to Table 11-14, this chapter concludes that the environmental effects associated with increased traffic as a result of the Proposed Development are deemed to be Not Significant and therefore mitigation is not required as per EIA regulations. As a measure of good practice and in order to minimise as far as possible any effects associated with a temporary increase in traffic levels during the construction phase, a Construction Traffic Management Plan will be implemented.

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Non-Technical Summary

- 11.136 This chapter assesses the effects of the Proposed Development on the surrounding road network during construction, operation and decommissioning.
- 11.137 The assessment has been conducted with reference to relevant legislative and planning policy.
- 11.138 The methodology and significance criteria used to assess the Effects of the Proposed Development are industry standards as published by the IEMA.
- 11.139 An assessment of traffic volumes and vehicle types associated with the construction phase of the Proposed Development has been set in the context of existing traffic flows and movements.
- 11.140 A baseline of existing traffic was established using a combination of historical and commissioned survey data.
- 11.141 A review of the proposed route for ALLs, which includes turbine component delivery, was completed to minimise potential Effects on the surrounding road network and establish that potential pinch points can be resolved.
- 11.142 Due to the nature of the operation of a wind farm the majority of vehicular activity is during the construction phase with minimal traffic during the operational phase.
- 11.143 The traffic generated by construction of the Proposed Development (over an 18 month period) will result in a temporary increase in baseline traffic levels, with the peak traffic generation occurring in month 6.
- 11.144 The potential environmental effects associated with this increase in traffic have been assessed and are anticipated to give rise to effects that are classed as not significant and which do not require mitigation, in accordance with IEMA guidelines.
- 11.145 Good practice mitigation measures are included in an outline CTMP which sets out proposed details for staff travel, HGV routing and guidelines for deliveries to further reduce potential Effects on the surrounding network.