

11 Traffic and Transport

Contents

11.1	Introduction	11-1
11.2	Legislation, Policy and Guidelines	11-1
11.3	Consultation	11-3
11.4	Assessment Methodology and Significance Criteria	11-4
11.5	Baseline Conditions	11-8
11.6	Potential Effects	11-11
11.7	Mitigation	11-18
11.8	Residual Effects	11-20
11.9	Cumulative Assessment	11-23
11.10	Summary	11-23
11.11	References	11-27

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11 Traffic and Transport

11.1 Introduction

11.1.1 This chapter considers the likely significant effects on receptors along the transport routes as a result of vehicle movements associated with the construction, operation and decommissioning of the Proposed Development. The specific objectives of the chapter are to:

- outline the relevant legislative framework;
- describe the transport baseline;
- describe the assessment methodology and significance criteria used in completing the impact assessment and any limitations of the assessment;
- describe the potential effects, including direct, indirect, secondary, cumulative and short, medium and long term effects;
- describe the mitigation measures proposed to address likely significant effects, and, where appropriate, any monitoring arrangements; and
- assess the residual effects remaining following the implementation of the mitigation measures.

11.1.2 A high-level overview of the effects of the traffic movements has been considered in accordance with Institute of Environmental Assessment (now Institute of Environmental Management and Assessment (IEMA)) Guidelines for the Environmental Assessment of Road Traffic. The document is referred to below as the IEMA Guidelines.

11.1.3 The assessment has been carried out by WYG Environment Planning Transport Limited, part of the WYG Group. All staff contributing to this chapter have undergraduate and/or postgraduate degrees in relevant subjects, have professional transport assessment experience, and hold professional membership of the Chartered Institute of Logistics and Transport. The report has been reviewed and approved by Liz Hunter of WYG. The chapter is supported by **Appendix 11.1** (Transport Assessment).

11.2 Legislation, Policy and Guidelines

Legislation

11.2.1 There is no relevant legislation to this assessment.

Policy

11.2.2 Relevant planning policy documents have been reviewed and taken into account as part of this traffic and transport assessment.

Scottish Planning Policy (SPP)

11.2.3 In relation to transport and access matters, SPP (Scottish Government, 2014b) notes:

“286. Where a new development or a change of use is likely to generate a significant increase in the number of trips, a transport assessment should be carried out. This should identify any potential cumulative effects which need to be addressed; and

290. Development proposals that have the potential to affect the performance or safety of the strategic transport network need to be fully assessed to determine their impact. Where existing infrastructure has the capacity to accommodate a development without adverse impacts on safety or unacceptable impacts on operational performance, further investment in the network is not likely to be required. Where such investment is required, the cost of the mitigation measures required to

ensure the continued safe and effective operation of the network will have to be met by the developer.”

Shetland Islands Local Development Plan 2014

- 11.2.4 The Shetland Islands Local Development Plan (LDP) 2014 was adopted by the Council on 26th September 2014 and is the established planning policy for the Shetland Islands. It sets out the Council's land use strategy which recognises existing developments, promotes sustainable economic growth and conserves Shetland's natural and built environment.
- 11.2.5 Policy TRANS3: Access and Parking Standards indicates that all developments should provide “*a safe and adequate access, visibility splay and turning area*”.
- 11.2.6 The LDP does not contain any transport specific requirements in relation to wind farm development.

Guidance

- 11.2.7 The following guidance has been taken into consideration in this assessment,

Planning Advice Note (PAN) 75

- 11.2.8 PAN75: Planning for Transport provides advice on the requirements for Transport Assessments as follows:

“Requires a transport assessment to be produced for significant travel generating developments. Transport Assessment is a tool that enables delivery of policy aiming to integrate transport and land use planning.”

“All planning applications that involve the generation of person trips should provide information which covers the transport implications of the development. The level of detail will be proportionate to the complexity and scale of the impact of the proposal...For smaller developments the information on transport implications will enable local authorities to monitor potential cumulative impact and for larger developments it will form part of a scoping exercise for a full transport assessment. Development applications will therefore be assessed by relevant parties at levels of detail corresponding to their potential impact.”

Onshore Wind Turbines; Online Renewables Planning Advice (May 2014)

- 11.2.9 The Scottish Government introduced online renewables advice in February 2011 which is regularly updated. The most recent specific advice note regarding onshore wind turbines was published in May 2014.
- 11.2.10 In terms of road traffic impacts, the guidance notes that in siting wind turbines close to major roads, pre-application discussions are advisable. This is particularly important for the movement of large components (abnormal load routing) during the construction period, periodic maintenance and for decommissioning.

Transport Assessment Guidance, Transport Scotland, 2012

- 11.2.11 The main objective of this guidance document is to assist in the preparation of Transport Assessments for development proposals in Scotland. The planning and transport policy context are set out in SPP which provides an outline of the framework for delivering integration of transport and land use planning, including the requirement for a Transport Assessment, for developments involving significant travel generating uses.
- 11.2.12 Transport Assessment Guidance sets out requirements according to the scale of development being proposed.

Guidelines for the Environmental Assessment of Road Traffic, IEMA, 1993

- 11.2.13 The document includes guidance on how the sensitivity of receptors should be assessed, contains rules to help determine which links in the study area should be considered for detailed assessment,

and how to identify the key impacts that are most important when assessing the magnitude of traffic effects from an individual development.

11.3 Consultation

11.3.1 **Table 11.1** provides a summary of consultation responses received from the scoping process and indicates where the item has been addressed in the assessment.

Table 11.1 – Summary of Consultation Responses

Consultee and Response Date	Consultation Response	Comment
Energy Consents Unit Scoping Opinion Section 8.8 April 2018	In the event that a new jetty is constructed on Yell for the delivery of abnormal roads to the island, full assessment of potential effects and mitigation proposed should be included in the EIA report.	The Applicant does not propose to construct a new jetty as part of the Proposed Development.
Shetland Islands Council ECU Scoping Opinion Appendix April 2018	A Construction Traffic Management Plan is required. This document submission should identify the main quantities/ volumes/ weights of plant and materials required for the construction of the project along with their sources and transport routes/ methods to get them on-site.	This information is provided in Section 11.7 of this Chapter
	Any haulage of surplus/waste materials off-site should be similarly identified along with authorised disposal sites.	It has been confirmed that no materials, such as peat, will be removed from the site.
	The applicant should note that the existing road between the A968 at Basta Voe and the B9082 at Cullivoe is a public road. This road is not currently suitable for the haulage of plant and materials for any significant construction project. The applicant will therefore need to consider in the EIA Report the requirement to bring the road in question up to a suitable standard as an early part of the development. This work will require to be done under a Road Construction Consent in agreement with the Roads Service of Shetland	Noted. Mitigation is discussed in Section 11.8 of this Chapter and Section 4 of Technical Appendix 11.1: Transport Assessment

Consultee and Response Date	Consultation Response	Comment
	Islands Council. This is a separate consent that will be required before any construction work on the project begins.	
Shetland Island Council Ferry Team November/December 2018	In developing an access solution [for turbine components], it is important that none of the existing infrastructure is damaged during deliveries and that no significant alterations to the link span are required. Any damage or alterations would be a significant inconvenience to the islanders and the ferry operator.	Noted A Working Proposal is discussed in Annex B of Technical Appendix 11.1: Transport Assessment
	The access solution must be safe and should allow fast and efficient discharge of the loads	Noted A Working Proposal is discussed in Annex B of Technical Appendix 11.1: Transport Assessment

11.4 Assessment Methodology and Significance Criteria

- 11.4.1 This chapter considers the potential for likely significant effects on receptors using transport routes resulting from vehicle movements associated with the construction, operational and decommissioning phases of the Proposed Development. Receptors include vehicle drivers, pedestrians, cyclists, horse riders and communities.
- 11.4.2 The methodology adopted in this assessment has involved the following key stages:
- determine baselines;
 - review the Proposed Development to identify potential effects;
 - evaluate significance;
 - identify mitigation; and
 - assess residual effects.
- 11.4.3 The chapter considers the potential for significant cumulative effects arising from the addition of the Proposed Development to other cumulative developments, which are the subject of a valid planning application. Operational, under construction and consented developments are considered as part of the baseline. Traffic flows associated with developments close to the end of their operational life are captured in surveys of existing traffic movements and therefore form part of the baseline to present 'worst case scenario'.
- 11.4.4 The assessment is based on the Proposed Development as described in **Chapter 3** (Proposed Development).

Consultation

- 11.4.5 Consultation was undertaken as part of the EIAR scoping, as summarised in **Table 11.1**. Separate consultation exercises were undertaken in February, November and December 2018 and February 2019 with The Shetland Islands Council Ferry Team regarding the movement of components to Yell.
- 11.4.6 The scope of the assessment has been informed by the consultation responses and the guidelines/policies described in Section 11.3.

Study Area

- 11.4.7 The study area on Yell for the traffic and transport assessment was identified through a review of the likely routes between suppliers of equipment and materials and the site, the boundary of which is indicated in **Figure 11.1**. The traffic and transport study area is defined as the public roads which would be used during the construction phase to access the Proposed Development, and is shown in **Figure 11.1**.

Desk Study

- 11.4.8 The baseline review focuses on the nature of the surrounding road infrastructure and the level of traffic that uses it. It has been informed by the following:
- review of responses to the scoping report;
 - collection of traffic flow data;
 - review of roads hierarchy;
 - identification of sensitive locations;
 - identification of constraints to the roads network, with or without height/width/weight restrictions;
 - identification of areas of road safety concern;
 - identification of traffic sensitive receptors in the area (routes, communities, buildings etc.);
 - review of Ordnance Survey (OS) plans to derive a local area roads network; and
 - consideration of potential supply locations for construction materials to inform extent of roads network to be considered in the assessment.

Site Visit

- 11.4.9 Automatic Traffic Count (ATC) surveys to determine existing baseline traffic flows and speeds in the study area were undertaken to further enhance the understanding of the operation of the road network (refer to **Figure 11.1**).
- 11.4.10 Site visits were undertaken as part of the Abnormal Indivisible Load (AIL) route assessment which considered potential constraints to the movement of AILs in terms of height, width and weight restrictions.
- 11.4.11 Consultation meetings and site visits were also held with the Ferries Department to assess options for transporting components by sea to Yell.

Criteria for the Assessment of Effects

- 11.4.12 In terms of traffic and transport effects, the receptors are the users of the roads within the traffic and transport study area and the locations through which those roads pass.

Criteria for Assessing the Sensitivity of Receptors

- 11.4.13 The IEMA Guidelines document includes guidance on how the sensitivity of receptors should be assessed. Using that as a base, professional judgement was used to develop a classification of

sensitivity for users based on the characteristics of roads and locations. This receptor sensitivity classification is summarised in **Table 11.2**.

Table 11.2 – Classification of Receptor Sensitivity

Receptor	Negligible	Low	Medium	High
Users of Roads	Where roads have no adjacent settlements. Includes new strategic trunk roads that would be little affected by additional traffic and suitable for Abnormal Loads and new strategic trunk road junctions capable of accommodating Abnormal Loads.	Where the road is Trunk or A-class, constructed to accommodate general and HGV traffic moving between primary destinations. Includes roads with little or no traffic calming or traffic management measures.	Where the road is a local A or B class road, capable of regular use by HGV traffic. Includes roads where there is some traffic calming or traffic management measures.	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs. Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.
Users of Locations	Where a location includes individual dwellings or scattered settlements with no facilities.	Where a location is a small rural settlement, few community or public facilities or services.	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.	Where a location is a large rural settlement containing a high number of community and public services and facilities.

Criteria for Assessing the Magnitude of Change

11.4.14 The following rules, also taken from the IEMA Guidelines were used to determine which links within the traffic and transport study area should be considered:

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

11.4.15 The IEMA Guidelines identify the key effects that are most important when assessing the magnitude of traffic impacts from an individual development: the effects and levels of magnitude are discussed below:

- Severance - the IEMA Guidance states that, "severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery." Further, "Changes in traffic of 30 %, 60 % and 90 % are regarded as producing 'slight', 'moderate' and 'substantial'

changes in severance respectively". However, the Guidelines acknowledge that "the measurement and prediction of severance is extremely difficult" (Para 4.28).

- Driver delay - the IEMA Guidelines note that these delays are only likely to be "significant [or substantial] when the traffic on the network surrounding the development is already at, or close to, the capacity of the system" (Para 4.32).
- Pedestrian delay - the delay to pedestrians, as with driver delay, is likely only to be substantial when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. An increase in total traffic of approximately 30 % can double the delay experienced by pedestrians attempting to cross the road and would be considered 'substantial'.
- Pedestrian amenity - the IEMA Guidelines suggest that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or its lorry component) is halved or doubled (Para 4.39). It is therefore considered that a change in the traffic flow of -50 % or +100 % would produce a 'substantial' change in pedestrian amenity.
- Fear and intimidation - there are no commonly agreed thresholds for estimating levels of fear and intimidation, from known traffic and physical conditions. However, as the impact is considered to be sensitive to traffic flow, changes in traffic flow of 30 %, 60 % and 90 % are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively.
- Accidents and safety - professional judgement would be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents.

Criteria for Assessing Cumulative Effects

- 11.4.16 Traffic associated with operational wind farms and other development is currently using the road network and therefore flows are captured in baseline traffic surveys undertaken across the traffic and transport study area in June 2018.
- 11.4.17 Traffic associated with wind farm developments that have received consent but have not yet been constructed (committed developments) and which is identified to impact on the traffic and transport study area at the same time as traffic associated with the Proposed Development, is considered as part of the future year baseline. Traffic flow information for relevant developments is extracted from documentation submitted with the planning applications.
- 11.4.18 Developments that are the subject of valid planning applications and where it is identified that construction traffic flows would impact on the traffic and transport study area over the period of construction of the Proposed Development are considered in a cumulative assessment.

Criteria for Assessing Significance

- 11.4.19 To determine the overall significance of the traffic and transport effects, the results from the receptor sensitivity and effects magnitude assessment described in paragraphs 11.4.12 – 11.4.16 are correlated and classified based on a scale set out in Table 2.4 of Volume 11, Section 2, Part 5 of the Design Manual for Roads and Bridges (DMRB) and summarised in **Table 11.3**.

Table 11.3 – Significance of Effects

Receptor Sensitivity	Magnitude of Change				
	Substantial	Moderate	Slight	Negligible	None
High	Major	Major/ Moderate	Moderate / Minor	Minor	None

Receptor Sensitivity	Magnitude of Change				
	Substantial	Moderate	Slight	Negligible	None
Medium	Major/ Moderate	Moderate	Minor	Minor / Negligible	None
Low	Moderate / Minor	Minor	Minor	Minor / Negligible	None
Negligible	Minor	Minor	Minor / Negligible	Negligible	None

11.4.20 In terms of the EIA Regulations, effects would be considered significant where they are assessed to be major or moderate.

Limitations to Assessment

11.4.21 In line with standard practice, daily baseline traffic flows have been developed from the average traffic flows collected over the course of a week long count survey. Although it is possible that the flows may over or under represent the baseline annual average daily flow, this is considered to be a robust approach because surveys were undertaken during an average period in terms of vehicle movements and no incidents likely to affect traffic flow were reported over the course of the surveys.

11.4.22 It was assumed that all aggregate required for the Proposed Development would be gained from on-site borrow pits and that concrete would be batched on-site.

11.4.23 For the purposes of this assessment, it is assumed that all staff and construction traffic would be generated from outside the traffic and transport study area, i.e. off Yell and their movements would impact on all roads under consideration. This is a robust assumption as it is likely that some staff would originate from settlements on Yell.

11.5 Baseline Conditions

Current Baseline

Study Area

11.5.1 It is assumed that all deliveries of materials to the Proposed Development will originate off Yell, transfer to Yell via the port at Ulsta and travel to the site, the boundary of which is indicated in **Figure 11.1**, via the A968 and the proposed access point off the Dalsetter Hill Road (known locally as the Old Cullivoe Road). The traffic and transport study area adopted for this assessment therefore focussed on the A968 between Ulsta and its junction with the B9082 at Gutcher and the Old Cullivoe Road between the A968 and the proposed site access junction.

11.5.2 The A968 is a local road managed by SIC. It is a two-way, rural, single carriageway road subject to the national speed limit. The Old Cullivoe Road is a local road managed by SIC. It is a narrow, rural, single carriageway road subject to the national speed limit with an unbound surface that is inappropriate for public access without using a 4x4 vehicle.

11.5.3 The relevant length of the road network within the study area is shown on **Figure 11.1**.

Existing Traffic Movements

11.5.4 To determine the existing road usage, week long Automatic Traffic Count (ATC) surveys were undertaken at two sites on the A968 during week commencing 19th November 2018 (considered a neutral period within the calendar year). Further to site observations it was assumed that traffic

flows on the Old Cullivoe Road are negligible. The locations of the traffic count sites are illustrated on **Figure 11.1** and are as follows:

- A968 north of Ulsta; and
- A968 east of junction with Old Cullivoe Road (providing a proxy for flows at the junction).

11.5.5 The existing weekday two way traffic flows at the two count sites are summarised into cars and Light Goods Vehicles (LGV) and HGVs in **Table 11.4**.

Table 11.4 – Existing Traffic Conditions (Weekday Average Two-way Flows)

Survey Location	Cars & LGV	HGV	Total
A968 Ulsta	378	125	503
A968 / Old Cullivoe Road	358	107	465

Vehicle Speeds

11.5.6 The ATC sites used to provide traffic volume data were also used to collect speed statistics. The two-way five-day average and 85th percentile speeds observed at the count locations are summarised in **Table 11.5**.

Table 11.5 – Speed Summary (Weekday Average Two-way Flows)

Survey Location	Average Speed (mph)	85 th Percentile Speed (mph)	Speed Limit (mph)
A698 Ulsta	43.6	51.0	60
A698 / Old Cullivoe Road	37.3	43.5	60

11.5.7 The speed survey data indicates that average and 85th percentile speeds at the two sites are lower than the speed limit.

Accident History

11.5.8 WYG obtained road traffic accident data from the online resource CrashMap.co.uk for the study area roads covering the five years to the end of 2017.

11.5.9 The data indicates that two slight personal injury accidents were reported over the five year period, one approximately 4 km north of Ulsta, the other approximately 2.5 km west of Gutcher. Both were single vehicle accidents involving cars travelling around a bend.

11.5.10 Neither of the accidents involved a HGV which is important to note as the majority of movements associated with the Proposed Development would be undertaken by goods traffic.

Path / Cycle Network

11.5.11 The SIC Core Paths Plan indicates that the Old Cullivoe Road is designated as Core Path CPPY04 between the A968 and the site access junction and on to Cullivoe. The core paths are open to use by law to pedestrians, equestrians and cyclists.

11.5.12 Core Paths CPPY03 and CPPY01 lie to the north of the site boundary around the Gloup Ness headland, outside the study area.

11.5.13 The A968 between Ulsta and Gutcher forms part of National Cycle Route 1, a long-distance cycle route connecting Dover and Shetland via the east coast of England and Scotland

11.5.14 The Core Paths and cycle route are indicated on **Figure 11.2**.

Future Baseline

Traffic Flows

11.5.15 Construction of the Proposed Development is due to commence during 2022/2023 if consent is granted and is likely to take 24 months.

11.5.16 Future year baseline traffic flows are determined by applying a National Road Traffic Forecast (NRTF) factor to the surveyed traffic flows and adding construction traffic associated with committed (consented) wind farm developments and schemes where a planning application has been submitted but not yet determined.

11.5.17 The NRTF low growth factor for 2018 to 2022 is 1.0299.

11.5.18 Construction traffic flows associated with committed wind farm developments, construction routes for which would impact on the study area at the same time as those of the Proposed Development are included within the baseline. Committed developments considered were Viking and Beaw Field wind farms. Viking is located on Mainland, Shetland and construction traffic would not therefore impact on the Yell road network. It is considered that materials and transport availability would preclude the Beaw Field Wind Farm being constructed simultaneously with the Proposed Development. No schemes where a planning application has been submitted but not yet determined and for which associated traffic would impact on the study area were identified. No committed development traffic was therefore included in the assessment.

11.5.19 The estimated future year baseline traffic movements are shown in **Table 11.6**.

Table 11.6 – Base Traffic Conditions (Weekday Average Two-way Flows)

Survey Location	Cars & LGV	HGV	Total
A968 Ulsta	389	129	518
A968 / Old Cullivoe Road	369	110	479

Summary of Sensitive Receptors

11.5.20 A summary of the receptors identified as being sensitive to traffic associated with the Proposed Development and which have been ‘scoped-in’ to the assessment are given in **Table 11.7**, together with the justification for inclusion. The receptors identified are indicated in **Figure 11.1** and **11.2**.

Table 11.7 – Summary of Receptor Sensitivity

Receptor	Sensitivity	Justification
Users of A968 Ulsta to Gutcher	Medium	Local A class road capable of regular use by HGV traffic
Users of Old Cullivoe Road / Core Path CPPY04	High	Local minor rural road, not constructed to accommodate frequent use by HGVs.
Cyclists using National Cycle Route 1 – follows A968	High	National Cycle Route 1 would be affected by construction traffic. Due to their

Receptor	Sensitivity	Justification
		vulnerability, cyclists are considered separately and as receptors of high sensitivity

11.6 Potential Effects

Construction

Development Traffic Generation

11.6.1 During the projected 24 month construction programme, it is anticipated the following vehicle types would require regular access to the site from the public road:

- staff transport, cars, vans and staff minibuses (cars and LGV);
- construction equipment and materials, deliveries of machinery and supplies such as concrete raw materials;
- ALLs consisting of the wind turbine components and heavy lift crane(s); and
- escort vehicles for ALL deliveries, cars and LGV.

11.6.2 Except for the turbine components, most traffic would be normal construction plant and would include grading tractors, excavators, high capacity cranes and dumper trucks. Most would arrive at the site on low loaders.

11.6.3 The turbines would be delivered to site in component sections and would be assembled on-site. The nacelle, hub, drive train, blade sections and tower sections are classified as AIL due to their weight and/or length, width and height when loaded.

11.6.4 The components can be delivered on a variety of transport platforms with typical examples illustrated in Section 4 **Appendix 11.1** (Transport Assessment).

11.6.5 In addition to the turbine deliveries, up to two high capacity erection cranes would be needed to offload some components and erect the turbines. The cranes are likely to be mobile cranes with a capacity up to 1,000 tonnes that would be accompanied by boom and ballast trucks to allow full mobilisation on-site. When broken down, the components that make up the crane fall within standard HGV parameters albeit some will need transport permits due to weight. Smaller erector cranes would also be present to allow the assembly of the main cranes and to ease overall erection of the turbines.

Construction Vehicle Movements

11.6.6 The assessment is based upon information provided by the Applicant and developed from experience of other wind farms of a similar scale which is detailed in Section 3 of Technical Appendix 11.1: Transport Assessment.

11.6.7 The candidate turbine used in the Route Assessment (discussed later in this chapter), represents the most onerous component dimensions likely to be transported to the site.

11.6.8 The greatest number of construction vehicle movements is associated with the movement of staff who will travel in cars, LGVs and minibuses. The greatest number of movements made by HGVs would be related to the import of concrete raw materials for turbine and other. It was assumed that concrete would be batched on-site which reduces the number of associated transport movements by around one third compared with delivery of ready-mix material.

11.6.9 Sufficient borrow pits have been identified on site to ensure that adequate material/aggregate will be available for site infrastructure including capping material for on-site tracks. If it is found that material is not suitable for the capping layer, this would be imported from off-site sources. To ensure

a robust assessment, it has been assumed that aggregate for a 0.2m deep capping layer will be imported.

- 11.6.10 To enable comparison of the estimated future year baseline traffic movements with total volumes including predicted construction traffic, average daily two-way movements for each month assuming a 22-day working month for deliveries were determined. Traffic movements were also split by vehicle type in line with the baseline data and the peak period for construction traffic determined. The final daily construction profile by activity is set out in Annex A of **Appendix 11.1** (Transport Assessment) and summarised in **Table 11.8**.

Table 11.8 – Average Daily Construction Traffic Movements

Vehicle Type	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Car / LGV	12	35	59	71	89	89	94	106	118	118	118	123
HGV	8	9	23	40	40	40	40	54	55	55	56	59
Total Daily Average	20		82	110	128	128	134	161	173	173	174	183
Month												
	13	14	15	16	17	18	19	20	21	22	23	24
Car / LGV	123	123	123	123	123	123	123	118	89	59	12	12
HGV	39	10	8	8	7	7	7	3	2	3	8	9
Total Daily Average	163	133	131	131	130	130	130	121	91	62	19	21

- 11.6.11 The maximum traffic movements associated with construction of the Proposed Development are predicted to occur in month 12 of the programme. During this month, an average of 59 two-way HGV movements are predicted per day and it is estimated that there would be a further 123 two-way car and LGV movements per day to transport construction workers to and from the site.

Development Traffic Routeing / Distribution

- 11.6.12 The origin of vehicle traffic would depend on the location of staff accommodation and the source of materials being imported. The highest volume of traffic would be generated by staff, the requirement for concrete materials.
- 11.6.13 It is intended that all staff will be accommodated on or close to the site. However, to ensure a robust assessment, it was assumed that all staff will travel daily on the A968 and the Old Cullivoe Road.
- 11.6.14 It was assumed that all concrete raw materials and aggregate will be sourced from Sullom Quarry and vehicles will either be transported on road going vehicles to Ulsta by barge from Sullom Voe or Greenhead Base or will travel by road to Toft, transferring to Ulsta outside peak traffic times by chartered ferry service.

11.6.15 ALL and crane trips would originate at either Sullom Voe or Greenhead Base and transfer to Ulsta by barge. A working proposal for the transfer of components is set out in Annex B of Appendix 11.1: Transport Assessment. From Ulsta, loads would travel to the site via A968, a new section of road between the A968 and Old Cullivoe Road, Old Cullivoe Road and new junctions into the site. The proposed route is indicated in **Figure 11.3** and the location and layout of the site access junctions are shown in Arcus Drawings 3219-DR-P-0001A and 0001B within the Drawings Annex of **Appendix 11.1** (Transport Assessment).

11.6.16 A detailed assessment, including swept path analysis, was undertaken of the road route. This identified a number of constraint points which are discussed in the mitigation measures section of this Chapter and in more detail in Section 4 of Technical Appendix 11.1: Transport Assessment.

Predicted Impact

11.6.17 To estimate the total trips on the study network during the construction phase, daily construction traffic flows were combined with the future year baseline traffic data. The resulting figures were compared with the weekday future year baseline traffic.

11.6.18 **Table 11.9** summarises the daily peak construction traffic at various locations within the traffic and transport study area and **Table 11.10** summarises the future year baseline plus peak construction traffic (total) flows.

Table 11.9 – Weekday Peak Construction Traffic Conditions (Weekday Average Two-way Flows)

Location	Cars & LGV	HGV	Total
A968 Ulsta	123	43	166
A968 / Old Cullivoe Road	123	52	175
Old Cullivoe Road	123	52	175

Table 11.10 – Total Traffic Conditions (Weekday Average Two-way Flows)

Survey Location	Cars & LGV	HGV	Total
A968 Ulsta	512	172	684
A968 / Old Cullivoe Road	492	162	654
Old Cullivoe Road	123	52	175

11.6.19 **Table 11.11** shows the percentage increase in total traffic over future year baseline traffic.

Table 11.11 – Percentage Increase in Total vs Baseline Traffic

Survey Location	Cars & LGV	HGV	Total
A968 Ulsta	31.59%	33.40%	32.04%
A968 / Old Cullivoe Road	33.36%	47.19%	36.54%
Old Cullivoe Road	100%	100%	100%

- 11.6.20 It is anticipated that should any weekend working take place, it would involve limited numbers of staff and associated vehicle movements and no deliveries by HGVs; no detailed analysis has therefore been undertaken.
- 11.6.21 No increases in traffic flow are predicted on the A968 west of its junction with Old Cullivoe Road.
- 11.6.22 The results indicate that total traffic movements are predicted to increase by between than 30% and 40% on the A968. HGV movements are anticipated to increase by just over 33% on the A968 close to Ulsta and 47% close to the site access junction. Both Light and HGV movements are anticipated to increase by 100% on Old Cullivoe Road although, due to the very light use of the road, this figure is predicated on an assumption that there are currently no daily vehicle movements along this route.
- 11.6.23 The uplifts appear to be relatively high in percentage terms. However, this is primarily due to the very low baseline levels of general and HGV traffic on the study area, including an assumption of zero daily vehicle movements along Old Cullivoe Road. In real terms, the additional number of HGV movements per hour averages less than five within this peak month of construction activity.
- 11.6.24 With reference to rule 1 of the IEMA guidelines, the results in **Table 11.11** indicate that during construction of the Proposed Development, car and LGV, HGV and total traffic flows are anticipated to increase by more than 30% on both sections of the A968 and on the Old Cullivoe Road. Therefore, the links have been taken forward to an assessment of effect significance.
- 11.6.25 **Table 11.12** summarises the potential effects (as identified in the IEMA Guidelines), the predicted magnitude of the impact from the increase in traffic movements with no mitigation in place and the significance of the effect.

Table 11.12 – Assessment of Construction Traffic and Transport Effects

Receptor and Sensitivity	Potential Effect	Magnitude of Impact	Significance of Effect	Comment
Users of / residents adjacent to A968 - medium sensitivity	Severance	Slight	Minor – Not Significant	Increase in traffic could result in difficulties for people crossing the road. Total traffic volumes are predicted to change by just over 30%. However, crossing demand is not observed to be high and there are only a very small number of dwellings along the route.
	Driver Delay	Slight	Minor – Not Significant	Some delay to drivers may occur during the movement of AILs. The road network is not considered to experience operational difficulties as traffic movements are low. The change in traffic volumes would not take the system close to capacity limits. Any impact is therefore considered to be minor.

Receptor and Sensitivity	Potential Effect	Magnitude of Impact	Significance of Effect	Comment
	Pedestrian Delay	Moderate	Moderate - Significant	Pedestrians could experience delay if their movements conflict with those of construction, and particularly AIL traffic. Pedestrian demand is not observed to be high but total traffic volumes are predicted to change by over 30% which is considered could potentially lead to delays.
	Pedestrian Amenity	Moderate	Moderate - Significant	<p>Pedestrian amenity could be affected where movements conflict with those of construction and particularly AIL traffic.</p> <p>Although pedestrian flows are observed to be very low, as the lorry component of traffic movements is anticipated to increase by 47% on the northern section of the A968, it is considered to produce a moderate change during the construction period.</p>
	Fear and Intimidation	Slight	Minor – Not Significant	As total traffic volumes are anticipated to change by just over the 30% threshold, the impact is considered minor.
	Accidents and Safety	Slight	Minor – Not Significant	There is potential for impact on safety due to driver frustration, particularly with regards to HGV movements and the transport of the AILs and due to potential conflict between HGVs and other traffic. It is not considered that construction traffic volumes are high enough to change the accident risk more than slightly compared with the baseline situation where HGVs do already use the road

Receptor and Sensitivity	Potential Effect	Magnitude of Impact	Significance of Effect	Comment
Users of Old Cullivoe Road / CPPY04 - high sensitivity	Severance	Substantial	Major - Significant	The Core Path may be temporarily severed during construction of the access road and junctions. While the impact would therefore only be temporary and pedestrian movements are not observed to be high, the change in traffic volumes indicates that the change must be considered substantial.
	Driver Delay	Slight	Minor – Not Significant	Some delay to drivers may occur during the movement of construction vehicles. However, while the road is a public road, traffic flows are minimal and an alternative route by A and B roads is available between Dalsetter and Cullivoe
	Pedestrian Delay	Moderate	Moderate - Significant	Pedestrians and other non-motorised users (NMU) could experience delay if their movements conflict with those of construction, and particularly AIL traffic. NMU movements are not observed to be high.
	Pedestrian Amenity	Substantial	Major - Significant	Pedestrian and other NMU amenity could be affected where their movements conflict with those of construction, and particularly AIL traffic. Although NMU flows are noted to be very low, as there are currently minimal numbers of vehicles using the route, it is considered that the impact magnitude should be considered substantial.

Receptor and Sensitivity	Potential Effect	Magnitude of Impact	Significance of Effect	Comment
	Fear and Intimidation	Substantial	Major - Significant	As total traffic volumes are anticipated to change by 100% threshold, the magnitude of the impact is considered substantial.
	Accidents and Safety	Moderate	Moderate - Significant	There is potential for impact on safety due to potential conflict between HGVs and other traffic and NMUs.
Cyclists using National Cycle Route 1 – follows A968	Severance	Slight	Minor – Not Significant	Severance relates to the desire to cross a road. It is not anticipated that cyclists using the NCN route would have a demand to cross the A968; they would rather be cycling with the flow of traffic. Total traffic volumes are predicted to change by only just over the 30% threshold likely to cause a change in severance.
	Driver Delay			Not Applicable
	Pedestrian (cyclist) Delay	Slight	Minor – Not Significant	Cyclists could experience delay if their movements conflict with those of construction traffic. Cycle demand is not observed to be high but the link does form part of a National Cycle Route route. Total traffic volumes are predicted to change by only just over the 30% threshold likely to cause a change in delay
	Pedestrian (cyclist) Amenity	Slight	Moderate - Significant	Cyclists amenity could be affected where their movements conflict with those of construction traffic Although cycle flows are not observed to be high, as the lorry component of traffic movements is anticipated to increase by over

Receptor and Sensitivity	Potential Effect	Magnitude of Impact	Significance of Effect	Comment
				30% on the A968 which forms part of a National Cycle Route, it is considered to produce a slight change during the construction period.
	Fear and Intimidation	Moderate	Moderate - Significant	As total traffic volumes on the A968 are anticipated to change by just over 30%, the magnitude of the change is considered moderate.
	Accidents and Safety	Moderate	Moderate - Significant	There is potential for impact on safety due to conflict between cyclists and HGV traffic.

Operation

- 11.6.26 It is predicted that during the operation of the site there would be up to two vehicle movements per week for maintenance purposes. Also, there could be occasional abnormal load movements to deliver replacement components in the event of a major component failure.
- 11.6.27 In terms of the IEMA Guidelines, such a small number of traffic movements and the associated percentage uplift over baseline traffic movements are not significant.

Decommissioning

- 11.6.28 Prior to decommissioning of the Proposed Development, likely to be 30 years from commissioning, a traffic assessment would be undertaken and appropriate traffic management procedures would be followed.
- 11.6.29 The decommissioning phase would result in fewer trips on the road network than the construction phase as it is likely that elements of infrastructure such as electrical connections would be left in place and components could be broken up on-site to allow transport by reduced numbers of standard HGVs.
- 11.6.30 As decommissioning would result in fewer vehicle trips on the road network than the construction phase, assuming the baseline has not substantially changed, the significance of any effects would not be greater. It can therefore be assumed that the assessment of the construction phase covers the worst-case scenario.

11.7 Mitigation

Construction

- 11.7.1 A letter/leaflet drop will be carried out at intervals during construction to inform the public/local residents of up-coming activities that may affect them. A notice board will also be erected at the site entrance to inform curious passers-by.

General Construction Traffic

- 11.7.2 A Construction Traffic Management Plan (CTMP) would be developed through which the mitigation measures detailed below would be implemented. A Traffic Management Plan (TMP) relating to the

movement of AILs would also be developed. This may form part of the CTMP. A Framework Traffic Management Plan for the movement of AILs is included within **Appendix 11.1** (Transport Assessment).

- 11.7.3 During the construction period, the project website would be regularly updated to provide the latest information relating to traffic movements associated with vehicles accessing the site. This would be agreed with SIC.
- 11.7.4 A new section of road will be provided between the A968 and the Old Cullivoe Road to the north west of the existing A968/ Old Cullivoe Road junction and the Old Cullivoe Road will be upgraded from this point to the northern site access junction to 5.0m width with passing places to be provided at locations to be agreed. The form of the works will be subject to detailed discussions with SIC, detailed design and the granting of technical approval through the appropriate road works licensing process.
- 11.7.5 Core Path CPPY04 would be affected by traffic during the construction phase only. Access to it will be maintained throughout. Conflict between construction traffic and NMUs will be minimised through appropriate traffic management and segregation if necessary. Should closures be required, their duration will be minimised. This will be managed through implementation of the CTMP and TMP.
- 11.7.6 National Cycle Route 1 which follows parts of the A968 would be affected by construction traffic. Access to it would be maintained during these phases. Conflict between construction traffic and cyclists would be prevented through appropriate traffic management and segregation (if necessary). This would be managed through implementation of the CTMP and TMP.
- 11.7.7 The following measures would be implemented during the construction phase through the CTMP:
- all materials delivery lorries (dry materials) should be sheeted to reduce dust and stop spillage on public roads;
 - specific training and disciplinary measures should be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
 - wheel wash facilities would be established at an appropriate location prior to vehicles exiting onto the A968;
 - normal site working hours would be limited to between 0700 and 1900 Monday to Friday and between 0800 and 1800 on Saturday to Sunday, though component delivery and turbine erection may take place outside these hours;
 - appropriate traffic management measures would be put in place on the A968 and the Old Cullivoe Road to avoid conflict with general traffic, subject to the agreement of the roads authority. Typical measures would include HGV turning and crossing signs and/ or banksmen at the A968/Old Cullivoe Road junction and site accesses and warning signs;
 - provision of construction updates on the project website and a newsletter to be distributed to residents within an agreed distance of the site on Yell;
 - adoption of a voluntary speed limit of 30 mph for all construction vehicles on the Old Cullivoe Road;
 - all drivers would be required to attend an induction to include:
 - a safety briefing;
 - the need for appropriate care and speed control;
 - a briefing on driver speed reduction agreements (to slow site traffic at sensitive locations);
 - identification of specific sensitive areas;

- identification of the specified route; and
 - the requirement not to deviate from the specified route.
- out of hours chartering of the ferry to reduce conflicts with other users.

11.7.8 The local authority may require an agreement to cover the cost of abnormal wear and tear on roads not designed for that purpose.

11.7.9 A pre-construction survey of the abnormal loads access route and the construction vehicles route would be undertaken to provide a baseline of the state of the road prior to any construction work commencing. This baseline would allow identification of any change in the road condition during the construction stage of the Proposed Development. Any necessary repairs would be coordinated with the Roads Authority. Any damage caused by traffic associated with the Proposed Development during the construction period that would be hazardous to public traffic would be repaired immediately.

11.7.10 Damage to road infrastructure caused directly by construction traffic would be made good and street furniture that is removed on a temporary basis would be fully reinstated.

11.7.11 There would be a daily road edge review and any debris and mud removed from the carriageway using an onsite road sweeper to keep the road clean and safe.

Abnormal Indivisible Loads (AIL)

11.7.12 An Access Route review was undertaken; this is discussed in Section 4 and Annex B of **Appendix 11.1** (Transport Assessment). This highlighted constraint points which were assessed using swept path assessment software. Remedial works to accommodate the predicted loads including the removal or relocation of street furniture and road widening at the Ulsta Ferry terminal exit and construction of a new section of road between between the A986 and Old Cullivoe Road were identified.

11.7.13 The required road improvements would be carried out in agreement with SIC to ensure that during delivery of turbine components minimal damage is caused to road surfaces, verges, street furniture and surrounding vegetation. These will be implemented subject to detailed discussions with SIC, detailed design and the granting of technical approval through the appropriate road works licensing process.

11.7.14 A TMP for the delivery of abnormal loads would be developed to reduce conflicts between abnormal load traffic and other road users. A framework for the TMP is set out in Section 5 of Technical **Appendix 11.1** (Transport Assessment).

Operation

11.7.15 With the exception of maintaining and monitoring site entrance roads, no mitigation measures are proposed during operation as it is predicted that there would only be a very small number of vehicle movements per week for maintenance purposes. Consideration may have to be given to the very occasional AIL movement to deliver replacement components, although any required mitigation to allow for this would be determined at the time.

Decommissioning

11.7.16 Given that similar operations are required to decommission the Proposed Development, the mitigation measures would likely be comparable with those indicated for the delivery and construction period. Contemporary best practice and prevailing guidance would be followed.

11.8 Residual Effects

Construction

11.8.1 An evaluation of the likely effects of the increase in traffic on the local roads to be used as the route for construction traffic was undertaken. This considered the traffic effects on different environmental receptors identified in the IEMA Guidelines with no mitigation in place (see **Table**

11.12). **Table 11.13** summarises an assessment of effects identified in the evaluation with mitigation in place for those effects that were found to be significant in **Table 11.12**. Professional judgment was used to determine the likely change in the magnitude of impact as a result of the mitigation with the significance of the effect determined from the matrix set out in **Table 11.3**.

Table 11.13 – Assessment of Residual Effects Post Mitigation

Receptor	Potential Effect	Mitigation	Magnitude of Impact	Significance of Residual Effect	Residual Significance
Users of / residents adjacent to A968 - medium sensitivity	Pedestrian Delay	Implementation of CTMP, traffic management on A968 and at junction with Old Cullivoe Road, restricted delivery hours	Slight	Minor	Not Significant
	Pedestrian Amenity	Implementation of CTMP, traffic management on A968 and at junction with Old Cullivoe Road, restricted delivery hours	Slight	Minor	Not Significant
Users of Old Cullivoe Road / CPPY04 - high sensitivity	Severance	Implementation of CTMP, application of speed limits, AIL movements controlled through TMP, traffic management on Old Cullivoe Road and at site access junctions, restricted delivery hours, segregation from construction traffic	Moderate	Moderate	Significant
	Pedestrian Delay	Implementation of CTMP, traffic management on Old Cullivoe Road, restricted delivery hours	Slight	Minor	Not Significant
	Pedestrian Amenity	Implementation of CTMP, application of speed limits, AIL	Moderate	Moderate	Significant

Receptor	Potential Effect	Mitigation	Magnitude of Impact	Significance of Residual Effect	Residual Significance
		movements controlled through TMP, traffic management on Old Cullivoe Road and at site access junctions, restricted delivery hours, segregation from construction traffic			
	Fear and Intimidation	Implementation of CTMP, application of speed limits, ALL movements controlled through TMP, traffic management on Old Cullivoe Road and at site access junctions, restricted delivery hours, segregation from construction traffic	Moderate	Moderate	Significant
	Accidents and Safety	Appropriate management of movement of ALLs, traffic management measures along access route. Implementation of CTMP and TMP, segregation from construction traffic	Slight	Minor	Not Significant
Cyclists using National Cycle Route 1 – follows A968	Pedestrian (cyclist) Amenity	Appropriate management of movement of ALLs, traffic management measures along access route. Implemented through TMP and CTMP	Slight	Minor	Not Significant

Receptor	Potential Effect	Mitigation	Magnitude of Impact	Significance of Residual Effect	Residual Significance
	Fear and Intimidation	Implementation of CTMP, traffic management	Slight	Minor	Not Significant
	Accidents and Safety	Appropriate management of movement of AILs, traffic management measures along access route. Implemented through TMP and CTMP	Slight	Minor	Not Significant

Operation

11.8.2 No significant operational effects were identified. As such, no residual effects are anticipated.

Decommissioning

11.8.3 No significant decommissioning effects were identified. As such, no residual effects are anticipated.

11.9 Cumulative Assessment

11.9.1 No cumulative impacts are anticipated as a result of this Proposed Development as no other significant developments that would impact on the Study Area are anticipated to be under construction (the main period of traffic generation) within the same timescale.

11.10 Summary

11.10.1 The Proposed Development would lead to increased traffic volumes on the local road network during the construction phase. Traffic volumes would reduce considerably outside the peak period of construction.

11.10.2 The maximum traffic impact associated with construction is predicted to occur in month 12 of the programme. Potential impacts have been identified on the A968 and Old Cullivoe Road between Ulsta and the proposed site access junctions. During this month; a maximum average of 59 two-way HGV movements (or fewer than 5 movements per hour) is predicted per day with a further 123 two-way car and LGV movements to transport construction workers to and from the site. It should be noted that as traffic volumes will reduce considerably outside the peak period of construction, these effects would be short/medium term and less severe during other parts of the construction programme.

11.10.3 No significant capacity issues are expected on any of the roads within the study area due to the additional construction traffic movements associated with the Proposed Development as background traffic movements are very low, the links are or will be of reasonable standard and appropriate mitigation is proposed.

11.10.4 A review of the local road network was undertaken to assess the feasibility of transporting turbines to the site.

11.10.5 Traffic levels during the operational phase of Proposed Development would be one or two vehicles per week for maintenance purposes. Traffic levels during the decommissioning of the Proposed

- Development are expected to be lower than during the construction phase as some elements may be left in situ and others broken up onsite.
- 11.10.6 The movement of AILs would require remedial works at a number of locations along delivery route and would require a police escort.
- 11.10.7 The assessment found that before the introduction of mitigation, significant impacts (moderate) could arise for users of:
- the A968 in relation to Pedestrian Delay and Pedestrian Amenity;
 - Old Cullivoe Road in relation to Severance, Pedestrian Delay, Pedestrian Amenity, Fear and Intimidation and Accidents and Safety; and
 - National Cycle Route 1 (cyclists) in relation to Cyclist Amenity, Fear and Intimidation and Accidents and Safety.
- 11.10.8 Effects for all other users of roads within the study area would be not significant.
- 11.10.9 **Tables 11.13** and **11.14** confirm that following the implementation of the identified mitigation, significant effects (moderate) could arise for users of Old Cullivoe Road in relation to Severance, Amenity and Fear and Intimidation. Effects for all other users of the other roads within the study area would be not significant. Effects would be minimised through development of the Construction Traffic Management Plan and Traffic Management Plan which would be agreed with SIC and secured through an appropriately worded planning condition.

Table 11.14 – Summary of Effects

Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial/ Adverse
Construction					
Severance to users of Old Cullivoe Road / CPPY04 resulting from HGV traffic movements	Major	Adverse	Implementation of CTMP, application of speed limits, AIL movements controlled through TMP, traffic management on Old Cullivoe Road and at site access junctions, restricted delivery hours, segregation from construction traffic	Moderate	Adverse
Amenity of pedestrians (cyclists and horse riders) using Old Cullivoe Road / CPPY04 resulting from HGV traffic movements	Major	Adverse	Implementation of CTMP, application of speed limits, AIL movements controlled through TMP, traffic management on Old Cullivoe Road and at site access junctions, restricted delivery hours, segregation from construction traffic	Moderate	Adverse
Fear and Intimidation affecting pedestrians (cyclists and horse riders) using Old Cullivoe Road / CPPY04	Major	Adverse	Implementation of CTMP, application of speed limits, AIL movements controlled through TMP, traffic management on Old Cullivoe Road and at site access junctions, restricted delivery hours, segregation from construction traffic	Moderate	Adverse
Operation					

Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial/ Adverse
No effects anticipated					
Decommissioning					
Effects will be similar to those identified during the construction period. However, as traffic flows are anticipated to be lower they are anticipated to be less significant					

Table 11.15 – Summary of Cumulative Effects

Receptor	Effect	Cumulative Developments	Significance of Cumulative Effect	
			Significance	Beneficial/ Adverse
No cumulative impacts are anticipated as a result of this Proposed Development as no other significant developments that would impact on the Study Area are anticipated to be under construction (the main period of traffic generation) within the same timescale				

11.11 References

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