

12 Traffic and Transport

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12 Traffic and Transport

12.1 Executive Summary

- 12.1.1 The Proposed Development will be accessed from the A965 between Kirkwall and Finstown via a priority access junction constructed at the location of an existing agricultural access. In order to construct the Proposed Development, bulk materials such as concrete and rock will be imported to the site from local sources, whilst specialist loads such as the turbine components will arrive on Orkney by ship and will be transported to site using specialist vehicles from Hatston Pier.
- 12.1.2 The construction activities will lead to increased traffic volumes on the A965 during the construction phase only. Following commissioning of the Proposed Development, traffic flows will fall to two vehicles every fortnight.
- 12.1.3 An assessment of likely potential effects using IEMA guidelines has been undertaken. This determined that prior to the implementation of mitigation, only a minor, non-significant effect could be expected in Finstown, relating to the increase in HGV traffic operating on the route. All other receptors indicated a negligible effect caused by the Proposed Development within the study area.

12.2 Introduction

- 12.2.1 This Chapter considers the likely significant effects on receptors along the transport routes resulting from vehicle movements associated with the construction and operation of the Proposed Development. The specific objectives of the chapter are to:
- review the relevant policy and legislative framework;
 - describe the baseline transport conditions;
 - describe the assessment methodology and significance criteria used in undertaking the assessment;
 - describe the likely potential effects, including direct, indirect and cumulative effects;
 - describe the mitigation measures proposed to address likely significant effects; and
 - assess the residual effects remaining following the implementation of mitigation.
- 12.2.2 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 as the IEMA Guidelines in this chapter.
- 12.2.3 The chapter should be read in conjunction with Appendix 12.1 Transport Assessment. This chapter and Appendix 12.1 have been authored by Gordon Buchan (BEng (Hons), MSc, CMILT, MCIHT of Pell Frishmann, a transport lead with over 23 years experience.

12.3 Legislation, Policy and Guidelines

- 12.3.1 A review of relevant transport planning policies has been undertaken and is summarised below for national and local government policies.

Legislation

- 12.3.2 There is no legislation applicable to this chapter.

Policy & Guidance

- 12.3.3 Chapter 5 of the EIA Report provides an overview of all the relevant planning policy. Of particular relevance to this chapter are:

Planning Advice Note (PAN) 75

- 12.3.4 Planning Advice Note (PAN) 75: Planning for Transport provides advice on the requirements for Transport Assessments. The document notes that:

“... 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.”

Transport Assessment Guidance (2012)

- 12.3.5 Transport Scotland’s (TS) Transport Assessment Guidance was published in 2012. It aims to assist in the preparation of Transport Assessments (TA) for development proposals in Scotland such that the likely transport effects can be identified and dealt with as early as possible in the planning process. The document sets out requirements according to the scale of development being proposed.
- 12.3.6 The document notes that a TA will be required where a development is likely to have significant transport effects but that the specific scope and contents of a TA will vary for developments, depending on location, scale and type of development.

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

- 12.3.7 The most recent Scottish Government advice note regarding onshore wind turbines was published in 2014. The advice note identifies the typical planning considerations in determining applications for onshore wind turbines including landscape impact, impacts on wildlife and ecology, shadow flicker, noise, ice throw, aviation, road traffic impacts, cumulative impacts and decommissioning.
- 12.3.8 In terms of road traffic impacts, the guidance notes that in siting wind turbines close to major roads, pre-application discussions are advisable as this is important for the movement of abnormal indivisible loads during the construction period, ongoing planned maintenance and for decommissioning (if applicable).

Orkney Local Development Plan

- 12.3.9 The Orkney Local Development Plan (LDP) was adopted by the Council in April 2017 and is the established planning policy for Orkney. It sets out a settlement strategy and spatial framework for how the Council foresees development occurring in the forthcoming twenty-year period.
- 12.3.10 Within the plan, relevant transport elements include:

“Developments that have the potential to generate significant levels of freight will be directed to industrial allocations beside key ports and harbour facilities (Hatston, Copland’s Dock and Lyness).”

“Development will only be permitted where due regard has been paid to Designing Streets and the proposal demonstrates that:

i. It is well connected to the existing network of roads, paths and cycleways and will not create a barrier to future development;

ii. It can be safely and conveniently accessed by service, delivery and other goods vehicles, as appropriate to the development;

iii. Any new access, or upgrades to an existing access, linking to the adopted road network has been designed to an adoptable standard as defined by the National Roads Development Guide (new accesses should be resource efficient, safe for all road users, and convenient for sustainable travel modes);

- iv. It is designed to cause minimal impact on the character of the site and the surrounding area; and
- v. There are satisfactory arrangements to ensure that there is provision for the long-term maintenance.”

12.3.11 A Supplementary Energy Guidance noted is included within the LDP. With regards to transport and access, the supplementary note advises that:

“The developer must liaise with the Council as Roads Authority in relation to access and egress from the proposed development site. This must include for all works associated with alterations to the existing roads infrastructure required to transport materials to and from the development site and to all works associated with construction, maintenance and decommissioning.

Depending on the scale of the turbine(s) and the sensitivity of the site, all scales of wind energy developments could be required to submit a method statement for the construction of their proposal in support of the application. This statement would cover the phasing of construction, associated timescales and methods for transporting equipment to and from the site. This is to ensure minimal impacts on the surrounding environment and users.”

12.4 Consultation

12.4.1 Consultation has been undertaken with Orkney Islands Council Roads Department as detailed below in Table 12.1.

Table 12.1 – Consultation Summary

Organisation	Summary / Concerns Raised	Action Required
Orkney Islands Council – Scoping Opinion	A Transport Assessment (TA) for the Proposed Development should be prepared.	A TA has been prepared and is provided in Appendix 12.1.
	The TA should cover the construction, operation and decommissioning phases of the Proposed Development.	The TA and the assessment in this chapter cover the construction and operation of the Proposed Development. The application is for the development to exist in perpetuity, however should decommissioning occur the effects are not anticipated to be greater than the construction phase. It should however be noted that as elements of the Proposed Development would be retained should the site ever be decommissioned (i.e. the access junction and other elements such as sections of track that may assist with agricultural access, etc.) and as such, the assessment of the construction phase is the worst case scenario. Should the site be decommissioned a Traffic Management Plan could be produced at that time to review access and transport issues.
	The scale of the development may have a detrimental impact upon road infrastructure.	Details of the abnormal loads have been provided in the Route Survey Report within Appendix 12.1.

Organisation	Summary / Concerns Raised	Action Required
	Details of the weights and sizes of vehicles used in the construction process should be provided.	All other vehicles will comply with the Construction & Use Regulations and as such, no further weight details are necessary. This Chapter and Appendix 12.1 detail the numbers of additional vehicles associated with the construction phase at the peak of activity.
	A Section 96 Agreement to cover abnormal wear and tear on the road network may be required.	A Section 96 Agreement is noted and included as potential mitigation for the Proposed Development. The scope of this agreement should extend to 300m of either side of the site access junction on the A965.
	There are no Core Paths or rights of way within the site.	Noted.
Orkney Islands Council – Harbours Team	Access for abnormal loads would be best achieved via the Hatston Pier and there are no physical constraints to its use.	The Route Survey Report assumes access from Hatston Pier and notes that there are no physical infrastructure constraints at the pier.
	A swept path assessment of the route from the pier to the public road will be required.	The Route Survey Report contains the required drawings and assessment.
	A Port Management Plan will be required to manage abnormal load deliveries and other marine traffic at Hatston Pier.	A commitment to a Port Management Plan is contained in the mitigation proposals.
Orkney Islands Council – Roads Team	The study area will need to include the A965 and Grainshore Road. The use of Low National Road Traffic Forecasts (NRTF) is acceptable in accounting for traffic growth and committed development traffic.	The study area contains traffic flow data for the A965 and Grainshore Road. Low NRTF has been applied.

Organisation	Summary / Concerns Raised	Action Required
	The site access junction should be of an appropriate design and incorporate suitable visibility splays.	The junction design is appropriate for its intended use and appropriate visibility provision has been made. Appropriate traffic management measures will also be in place during the construction phase to advise the public of construction traffic activity and this may include a temporary speed reduction.

12.5 Assessment Methodology and Significance Criteria

12.5.1 The methodology adopted in this assessment involved the following key stages:

- determine the baseline;
- review the Proposed Development for impacts;
- evaluate significance of effects on receptors;
- identify mitigation; and
- assess residual effects.

Consultation

12.5.2 Consultation was undertaken with the following:

- Orkney Islands Council – Roads Team; and
- Orkney Islands Council – Harbours Team.

12.5.3 The results of these consultations have been included in the evolution of the design and access strategy for the Proposed Development and are detailed in Section 12.4 above.

Desk Study & Site Visit

The desk study included reviews and identification of the following:

- relevant transport planning policy;
- accident data;
- any other traffic sensitive receptors in the area (core paths, routes, communities, etc);
- Ordnance Survey (OS) plans;
- potential origin locations of construction staff and supply locations for construction materials to inform extent of local area roads network to be included in the assessment; and
- constraints to the movement of Abnormal Indivisible Loads (AILs) through a Route Survey including swept path assessments.

12.5.4 The desk review was later confirmed by a site visit and walk over of the Proposed Development site. This included a detailed review of Hatston Pier and the routes leading to and from the Proposed Development site.

Study Area

- 12.5.5 The study area for this assessment is as follows and has been discussed and agreed with Orkney Islands Council to include:
- The A965 from Finstown through to Kirkwall; and
 - Grainshore Road between the Hatston Pier and the junction with the A965.
- 12.5.6 The study area network is illustrated in Figure 12.1 and has been based upon scoping discussion with Orkney Islands Council and previous wind farm developments on the islands.
- 12.5.7 The A965 covers the location of the site access junction and principal route for HGV access and site staff. The A965 also provides connections from the proposed bulk material origin points through to the site access junction (the access roads for both proposed quarries converge onto the A965 - these are excluded from the study area as quarry traffic has been assessed as part of the quarry planning applications).
- 12.5.8 Grainshore Road provides connections between Hatston Pier and the site access and will be the primary route for abnormal loads associated with the wind turbines.

Assessment of Likely Potential Effect Significance

- 12.5.9 The Institution of Environmental Management and Assessment (IEMA) ‘Guidelines for Environmental Impact Assessment’ (2005) notes that the separate ‘Guidelines for the Environmental Assessment of Road Traffic’ (1993) document should be used to characterise the environmental traffic and transport effects (off-site effects) and the assessment of significance of the effects of major new developments. The guidelines intend to complement professional judgement and the experience of trained assessors.

Receptor Sensitivity

- 12.5.10 In terms of traffic and transport impacts, the receptors are the users of the roads within the study area and the locations through which those roads pass.
- 12.5.11 The IEMA Guidelines 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 is summarised in Table 12.2.

Table 12.2 – Classification of Receptor Sensitivity

Receptor	Sensitivity			
	High	Medium	Low	Negligible
Users of Roads	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs. Includes roads with traffic control	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	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition. Includes roads with little or no traffic calming or traffic	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

Receptor	Sensitivity			
	High	Medium	Low	Negligible
	signals, waiting and loading restrictions, traffic calming measures.	management measures.	management measures.	junctions capable of accommodating Abnormal Loads.
Users / Residents of Locations	Where a location is a large rural settlement containing a high number of community and public services and facilities.	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.	Where a location is a small rural settlement, few community or public facilities or services.	Where a location includes individual dwellings or scattered settlements with no facilities.

12.5.12 The classifications are based upon the activities that can be expected in different areas and different types of streetscape. Professional judgement is used to reflect these generalised descriptions to study areas, especially those in remote areas where settlement size, function and facilities are more important than the category descriptors suggest.

12.5.13 Where a road passes through a location, users are considered subject to the highest level of sensitivity defined by either the road or location characteristics.

Magnitude of Impact

12.5.14 The following rules, also taken from the IEMA Guidelines are used to determine which links within the study area should be considered for detailed assessment:

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

12.5.15 The IEMA Guidelines identify the key impacts that are most important when assessing the magnitude of traffic impacts from an individual development: the impacts 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’ [or minor, moderate, and major] 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 major] 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 major 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 major.
- Pedestrian amenity – the IEMA Guidelines suggests 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 major 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 minor, moderate and major changes 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.

12.5.16 While not specifically identified, as more vulnerable road user, cyclists are considered in similar terms to pedestrians.

Significance of Effects

12.5.17 To determine the overall significance of effects, the results from the receptor sensitivity and magnitude of change assessments are correlated and classified using 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 12.3.

Table 12.3 – Significance of Effects

Receptor Sensitivity	Magnitude of Impacts			
	Major	Moderate	Minor	Negligible
High	Major	Major / Moderate	Moderate / Minor	Minor
Medium	Major / Moderate	Moderate	Minor	Minor / Negligible
Low	Moderate / Minor	Minor	Minor	Minor / Negligible
Negligible	Minor	Minor	Minor / Negligible	Negligible

12.5.18 In terms of the EIA Regulations, effects would be considered of significance where they are assessed to be major or moderate. Where an effect is Moderate/Minor, professional judgement will be used to determine whether the effect is significant on a case by case basis.

Requirements for Mitigation

12.5.19 If significant likely potential effects are identified appropriate mitigation will be implemented to remove and reduce the significance of the effects where possible.

Residual Effects

- 12.5.20 Residual effects will be assessed following a similar methodology as the potential effects but taking into consideration the identified mitigation.

Cumulative Effects

- 12.5.21 Cumulative effects will take into consideration other developments in planning, under construction or in operation which, with the addition of the Proposed Development could cumulatively impact upon receptors.

Limitations to Assessment

- 12.5.22 The assessment is based upon an assumed construction programme for the Proposed Development. Alterations in this programme, may increase or decrease traffic flows per month.
- 12.5.23 This assessment is based upon average traffic flows. There may be localised peaks with construction days where flows can be higher for a specific hour, such as a shift change on site.
- 12.5.24 Assumptions on the original points for materials have been made to provide a worst-case assessment scenario. Should these origin points change, the effects on surrounding areas may alter to those presented in the assessment.

12.6 Baseline Conditions

Pedestrian and Cyclist Networks

- 12.6.1 There are no Core Paths recorded by Orkney Islands Council near the proposed site access. The A965 does not have any pedestrian or cyclist infrastructure near the site access junction and as such, active travel activity is considered to be low at this location.
- 12.6.2 The closest Core Paths that interact with the study area are located towards Finstown and are:
- WM7: Path to Keelylang Hill (from A956 to of the hill – does not cross the A965);
 - WM8: Cuween Paths (local paths near Old Finstown Road - does not cross the A965); and
 - St Magnus Way: Within Finstown (running along and crossing the A965).
- 12.6.3 A review of the Sustrans cycle network plan of the United Kingdom indicates that there are no recommended National Cycle Routes (NCR) within the study area.
- 12.6.4 There is a segregated cycle / pedestrian path on Grainshore Road in the industrial unit section of the road. This provides links from this point, through to Kirkwall town centre via the A965.

Road Access

- 12.6.5 Access to the site would be taken directly from the A965 via a new priority junction. The junction would be surfaced and constructed so that the junction bellmouth would be to adoptable standards (within the current limits of adoption). The remaining tracks within the site would be private.
- 12.6.6 The access junction would have the first 2 metres surfaced in a bituminous macadam and appropriate junction markings and reflective junction markers would be provided at the access bellmouth. The throat of the junction would be widened to a minimum of 5.5m to ensure that opposing vehicles can pass in safety.
- 12.6.7 Visibility splays of 160m in both directions with a set-back distance of 4.5 m from the centre of the junction would be provided, in line with standards set out in the Design Manual for Roads and Bridges (DMRB).
- 12.6.8 The A965 is a district distributor road connecting Kirkwall to Stromness. The road is of a modern design standard within the study area and is approximately between 6m and 7.2m in width and is

subject to a 60mph speed limit at the site access junction location. This reduces as the road passes through Finstown.

- 12.6.9 The A965 passes into Kirkwall and changes to a 30mph urban distributor road.
- 12.6.10 Grainshore Road is a loop to the A965, providing access to industrial units and the Hatston Pier to the north of the A road. The road is subject to a 40mph speed limit between the A965 junction and the start of the industrial developments to the west of Kirkwall.

Existing Traffic Conditions

- 12.6.11 In order to assess the impact of development traffic on the study area, data from a series of Automatic Traffic Count (ATC) sites were obtained. The locations and sources for the data are indicated below:
 - A965 Finstown (obtained from the Department for Transport traffic counts);
 - Grainshore Road (obtained from published data associated with Costa Head Wind Farm);
 - A965 Kirkwall (obtained from the Department for Transport traffic counts); and
 - A965 West of Finstown (obtained from the Department for Transport traffic counts).
- 12.6.12 The count site at Finstown has been used to determine traffic flow past the site access junction as there are no significant areas for traffic to depart the road network between the village and the site access.
- 12.6.13 The locations of the ATC sites are illustrated in Figure 12.2. These sites were identified as being areas where sensitive receptors on the access route could be located.
- 12.6.14 The traffic data collected at the count sites detailed in Figure 12.2 allowed the traffic flows to be split into vehicle classes and the data have been summarised into cars / light goods vehicles (Lights) and heavy goods vehicles (HGVs) (all goods vehicles >3.5 tonnes gross maximum weight).
- 12.6.15 Construction of the Proposed Development could commence during 2024 if consent is granted and is anticipated to take up to 12 months depending on weather conditions and ecological considerations.
- 12.6.16 To assess the likely effects during the construction and typical operational phase, base year traffic flows were determined by applying a National Road Traffic Forecast (NRTF) low growth factor to the surveyed traffic flows.
- 12.6.17 The traffic flows were brought to a common year of 2024 using National Road Traffic Forecasts (Low Growth estimates. The 2024 baseline flows are presented in Table 12.2 and these flows will be used in the Construction Traffic Impact Assessment.

Table 12.4 – 2024 24 Hour Average Traffic Flows

Location	Cars & Lights	HGV	Total
A965 Site Access	4360	254	4614
A965 Finstown	4360	254	4614
Grainshore Road	3417	280	3697
A965 Kirkwall	7702	310	8012
A965 West of Finstown	3956	240	4196

Accident Review

12.6.18 Road traffic accident data for the five year period commencing 1st January 2014 through to the 31st December 2018 was obtained from the online resource crashmap.co.uk which uses data collected by the police about road traffic crashes occurring on British roads.

12.6.19 The statistics are categorised into three categories, namely “Slight” for damage only incidents, “Serious” for injury accidents and “Fatal” for accidents that result in a death. Tables 12.5, 12.6 and 12.7 summarise the accidents noted in the study area.

Table 12.5 – Accident History Summary

Accident Severity	Number of Recorded Incidents
Slight	8
Serious	1
Fatal	2

12.6.20 There are eleven recorded incidents, all occurring on the A965, of which two involved fatalities, one located to the west of Finstown and one at Rennibister (approximately 2 km to the west of the site access junction).

Table 12.6 – Accident Casualty Summary

Accident Severity	Cyclist	Child	Motorcyclist	Pedestrian
Slight	1	0	1	1
Serious	0	0	0	0
Fatal	0	0	0	0

Table 12.7 – Vehicles Involved in Accidents Summary

Accident Severity	Cyclist	Motorcycle	Car	HGV	Bus	Young Driver
Slight	1	1	7	2	0	2
Serious	0	0	1	0	0	0
Fatal	0	0	2	1	0	1

12.6.21 The statistics indicate that the majority of accidents are “Slight” in nature and that there are a limited number of HGV incidents occurring in the five year review period.

12.6.22 One “Fatal” accident involved a young driver and a car (near Rennibister), whilst the “Fatal” accident other involved an HGV and a car (to the west of Finstown).

12.6.23 Within a three year window, five accidents were recorded with three being “Slight”, one “Serious” and one “Fatal”.

Construction Phase

- 12.6.24 During the 12 month construction period, the following traffic will require access to the to the site:
- staff transport, either cars or staff minibuses;
 - construction equipment and materials, deliveries of machinery and supplies such as crushed rock and concrete; and
 - abnormal loads consisting of the wind turbine sections and also a heavy lift crane, transported to site in sectional loads.
- 12.6.25 Average monthly traffic flow data were used to establish the construction trips associated with the site based on the assumptions detailed in Appendix 12.1.
- 12.6.26 The distribution of development trips on the network will vary depending on the types of loads being transported. All traffic will enter and exit the site by way of the site access junction on the A965.
- 12.6.27 Staff trips are assumed to originate from the directions of Kirkwall and Stromness / Finstown in equal numbers to be close to the site. General site deliveries are also assumed to all originate from Kirkwall.
- 12.6.28 All bulk materials (concrete, road stone, cabling sand, etc) will originate from either Cursiter or Heddle Quarries.
- 12.6.29 General construction and building supply deliveries will be made via the A965 from Kirkwall, whilst geotextile, cable and reinforcement deliveries will be made from the UK Mainland to Orkney via the freight ferry that docks at Hatston Pier.
- 12.6.30 Access from Cursiter Quarry has been assumed to be via Finstown to provide a robust assessment of potential traffic impact. An alternative route onto the A965 via the single carriageway Zion’s Loan is also available, avoiding access through Finstown.
- 12.6.31 All abnormal loads would be unloaded at Hatston Pier and would access the site via Grainshore Road and the A965. Full details of these loads are provided in Appendix 12.1.
- 12.6.32 Using the assumptions above and details measured from the site layout plan (refer to Figure 1.2), a construction programme has been developed for the Proposed Development. This has been used to determine timescales for the various deliveries and trips and is detailed in Table 12.8.
- 12.6.33 The trip generation programme indicates that Month 6 is the peak period for construction activities. This corresponds with the delivery of ready mix concrete for the turbine foundations, completion of the access track network, start of cable trenching and general site deliveries and staff. The activities are anticipated to generate an average of 88 movements per day (44 trips in and 44 trips out), of which 32 would be made by light vehicles (site staff, etc.) and 56 by HGV.
- 12.6.34 Using the distribution of traffic described Appendix 12.1, the proposed traffic flows on the study area network at the peak of construction are illustrated in Table 12.9.

Table 12.8 – Construction Traffic Generation Profile

Activity	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Site Establishment	50	20										
Access Tracks & Hardstand Stone		743	743	743	743	743						

Activity	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Access Track Geotextiles		6		6								
Turbine Foundations				375	375	375	375					
Turbine Reinforcement				9	9	9	9					
Cabling Sand						58	58	58	58			
Cabling Materials						6	4		6			
Turbine Delivery								77	77			
Turbine Escorts								83	83			
Control Building & Ancillary Works								36	34	34		
Site Reinstatement & Commissioning										50	50	20
Staff	281.6	422.4	704	704	704	704	704	704	704	563.2	422.4	281.6
General Site Deliveries	40	40	40	40	40	40	40	40	40	40	40	40
Total HGV	90	809	783	1172	1166	1230	486	211	215	124	90	60
Total Cars / LGV	282	422	704	704	704	704	704	787	787	563	422	282
Total Movements	372	1231	1487	1876	1870	1934	1190	998	1002	687	512	342
Total HGV per Day	4	37	36	53	53	56	22	10	10	6	4	3
Total Cars / LGV per Day	13	19	32	32	32	32	32	36	36	26	19	13
Total per Day	17	56	68	85	85	88	54	45	46	31	23	16

Table 12.9 – Peak Construction Month Daily Traffic Data

Location	Cars & Lights	HGV	Total
A965 Site Access	32	56	88
A965 Finstown	16	53	69
Grainshore Road	0	1	1

Location	Cars & Lights	HGV	Total
A965 Kirkwall	16	2	18
A965 West of Finstown	16	0	16

12.6.35 The peak month traffic data was combined with the future year (2024) traffic data to allow a comparison between the baseline results to be made. The increase in traffic volumes is presented in percentage increases for each class of vehicle and is illustrated in Table 12.10.

Table 12.10 – 2024 Peak Month Daily Traffic Data

Location	Cars & Lights	HGV	Total	Cars & Lights % Increase	HGV % Increase	Total Traffic % Increase
A965 Site Access	4392	310	4702	0.73%	22.05%	1.91%
A965 Finstown	4376	307	4683	0.37%	21.08%	1.51%
Grainshore Road	3417	281	3698	0.00%	0.24%	0.02%
A965 Kirkwall	7717	312	8029	0.21%	0.59%	0.22%
A965 West of Finstown	3972	240	4212	0.40%	0.00%	0.38%

12.6.36 A review of existing road capacity has been undertaken using the Design Manual for Roads and Bridges, Volume 15, Part 5 “The NESAs Manual”. The theoretical road capacity has been estimated for each of the road links that makes up the study area and the assessment is presented in Appendix 12.1. The assessment clearly indicates that there are no road capacity issues associated with the Proposed Development.

Operational Phase

12.6.37 It is predicted that during the operation of the site there would be up to two vehicle movements per week for maintenance purposes. There may be occasional abnormal load movements to deliver replacement components in the unlikely event of a major failure.

12.6.38 Given the low level of traffic generation associated with the operational phase, no further assessment has been undertaken.

12.7 Receptors Brought Forward for Assessment

12.7.1 The impact assessment indicates that traffic levels will not exceed the 30% threshold for total traffic or HGV flows at any point within the study area. As such, Rule 1 of the IEMA guidance is not exceeded.

12.7.2 Rule 2 notes that an assessment should be undertaken if traffic flows exceed 10% in particularly sensitive areas.

12.7.3 A review of receptors has been undertaken to allow assessment against the criteria laid out in the IEMA guidance and the supporting thresholds. The receptor sensitivities within the study area are noted below in Table 12.11 are based upon the descriptions contained in Table 12.2.

Table 12.11 – Receptor Sensitivity Summary

Receptor	Sensitivity
Road Users of the A965	Low Sensitivity
Road Users of Grainshore Road	Low Sensitivity
Residents of the A965 in Finstown	Medium Sensitivity
Employees on the A965 on Grainshore Road	Negligible Sensitivity
Residents of the A965 in Kirkwall	High Sensitivity

12.7.4 Based upon the results noted in the impact assessment, the only two receptors that exceed a 10% threshold are the A965 at the site access and the A965 at Finstown.

12.7.5 The A965 in Finstown is an A Class distributor road and features regular HGV traffic due to its regional distributor function. To the east of Heddle Road, the street is fronted by residential properties on both sides of the road, with limited retail uses. Finstown is the fourth largest settlement within Orkney and there are a small number of community and public facilities accessed from the A965 in Finstown (including a garage, public conveniences and a post office). Other community facilities are not directly accessed from the A965, including the primary school, which is accessed directly from the A966, to the north of the town.

12.7.6 As the site access cannot be described as a highly sensitive, the only receptor that could be classed as being sensitive are residents of Finstown on the A965, therefore the residents of Finstown on the A965 are taken forwards for further assessment.

12.8 Standard Mitigation

A number of the mitigation measures set out in the following section are considered good practice for wind farm construction sites and can be considered to be part of normal construction mitigation for a site of this nature.

Construction Phase

12.8.1 Subject to consent the Applicant will prepare a Construction Traffic Management Plan (CTMP) for agreement with Orkney Islands Council prior to construction works commencing. The following measures would be implemented through the CTMP during the construction phase:

- All materials delivery lorries (dry materials) will be sheeted to reduce dust and stop spillage on public roads.
- Specific training and disciplinary measures will be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway.
- Wheel cleaning facilities will be established on the site.
- Appropriate traffic management measures will also be put in place at the site access junction to advise drivers to slow down and be aware of turning traffic.
- Provision of construction updates on the project website and distribution of a newsletter to residents within an agreed distance of the site.
- Requirement for all delivery drivers to attend an induction to include a safety briefing, the need for appropriate care and speed control, particularly in sensitive areas, identification of specific

sensitive areas, identification of the specified route, and the requirement not to deviate from the specified route.

- The production and implementation of a Staff Travel Plan which will include pick up times and car sharing information for those travelling to and from site.
- 12.8.2 The Applicant will cover the cost of abnormal wear and tear on roads not designed for that purpose and propose that this imposed by a planning condition.
- 12.8.3 Video footage of the pre-construction phase condition of the abnormal loads access route and the construction vehicles route will be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline will inform any change in the road condition during the construction stage of the Proposed Development. Any necessary repairs will be coordinated with Orkney Islands Council. Any damage caused by traffic associated with the Proposed Development, during the construction period that would be hazardous to road users, will be repaired immediately.
- 12.8.4 Any damage to road infrastructure caused directly by construction traffic will be made good, and street furniture that is removed on a temporary basis would be fully reinstated.
- 12.8.5 There will be a daily road edge review and any debris and mud removed from the public carriageway using an onsite road sweeper to keep the road clean and safe during the initial months of construction activity, until the construction junction and immediate access track works were complete.

Specific Abnormal Load Mitigation

- 12.8.6 All abnormal load deliveries will be undertaken at appropriate times (to be discussed and agreed with the relevant roads authorities and police) with the aim to minimise the effect on the local road network. It is likely that the abnormal load convoys will travel in the early morning periods, before peak times while general construction traffic would generally avoid the morning and evening peak periods.
- 12.8.7 The majority of potential conflicts between construction traffic and other road users will occur with abnormal load traffic. General construction traffic is not likely to come into conflict with other road users as the vehicles are narrower and road users are generally more accustomed to them.
- 12.8.8 Potential conflicts between the abnormal loads and other road users can occur at a variety of locations and circumstances. The main potential conflicts are likely to occur:
- On the A965 where the loads may straddle the centre line, where fast moving oncoming traffic may be encountered, etc.;
 - On the section of contraflow movement at the junction of the A965 and Grainshore Road;
 - Where traffic turns at a road junction, requiring other traffic to be restrained on other approach arms; and
 - In locations where high speeds of general traffic are predicted.
- 12.8.9 Advance warning signs will be installed on the approaches to the affected road network. Information signage could be installed to help improve driver information and allow other road users to consider alternative routes or times for their journey (where such options exist).
- 12.8.10 The location and numbers of signs will be agreed post consent and would form part of the wider traffic management proposals for the Proposed Development.
- 12.8.11 Information on the turbine convoys will be provided to local media outlets such as local papers and local radio to help assist the public.
- 12.8.12 Information would relate to expected vehicle movements from Hatston Pier through to the site access junction. This will assist residents becoming aware of the convoy movements and may help reduce any potential conflicts.

- 12.8.13 The Applicant will also ensure information was distributed through its communication team via the project website, local newsletters and social media.
- 12.8.14 A police escort will be required to facilitate the delivery of the predicted loads. The police escort would be further supplemented by a civilian pilot car to assist with the escort duty. It is proposed that an advance escort would warn oncoming vehicles ahead of the convoy, with one escort staying with the convoy at all times. The escorts and convoy would remain in radio contact at all times where possible.
- 12.8.15 The abnormal loads convoys will be no more than three AILs long, or as advised by the police, to permit safe transit along the delivery route and to allow limited overtaking opportunities for following traffic where it is safe to do so.
- 12.8.16 The times in which the convoys would travel will need to be agreed with Police Scotland who have sole discretion on when loads can be moved.

Abnormal Load Transport Management Plan

- 12.8.17 An Abnormal Load Transport Management Plan will be prepared to cater for all movements to and from the Proposed Development site. This would include:
- Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking.
 - A diary of proposed delivery movements to liaise with the communities to avoid key dates such as popular local events etc.
 - A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic.
 - Proposals to establish a construction liaison committee to ensure the smooth management of the project / public interface with the applicant, the construction contractors, the local community, and if appropriate, the police forming the committee. This committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.

Operational Phase Mitigation

- 12.8.18 Site entrance roads will be well maintained and monitored during the operational life of the development. Regular maintenance will be undertaken to keep the site access track drainage systems fully operational and the road surface in good condition and to ensure there are no adverse issues affecting the public road network.

12.9 Likely Potential Effects

Construction

An assessment of the likely effects has been undertaken using the previously described thresholds. The results of this are summarised below in Table 12.12. The likely effects have assumed that the proposed mitigation measures are in place.

Table 12.12 – Construction Phase Effects Assessment

<i>Receptor</i>	<i>Severance</i>	<i>Driver Delay</i>	<i>Pedestrian Delay</i>	<i>Amenity</i>	<i>Fear</i>	<i>Accidents & Safety</i>
Residents of Finstown on the A965	Minor	Minor	Minor	Minor	Minor	Minor

- 12.9.1 The effects on the A965 within Finstown have been reviewed and have been classified as being **minor** and non-significant.

Operation

- 12.9.2 As per paragraphs 12.6.37-38 no operational effects are anticipated.

Decommissioning

- 12.9.3 The Applicant is seeking in-perpetuity consent for the Proposed Development. In the event of decommissioning, or replacement of turbines, it is anticipated that the levels of effect would be similar but of a lesser level than those during construction. Decommissioning would be undertaken in line with best practice processes and methods at that time and will be managed through an agreed Decommissioning Environmental Management Plan

12.10 Additional Mitigation and Enhancement

Port Management Plan

- 12.10.1 Following discussions with Orkney Islands Council’s Ports team, it is apparent that Hatston Pier is currently highly utilised with freight, oil support and cruise liner traffic. Many vessels, especially the cruise liners book quay space many months in advance and it will not be possible to relocate them to allow access for turbine deliveries.
- 12.10.2 Following consent, the Applicant will need to undertake a procurement exercise with the turbine suppliers to agree timescales for the import of components through Hatston Pier. As part of this process, the turbine suppliers will be required to formulate a Port Management Plan with the harbour authorities. The management plan will:
- agree timescales for deliveries to be made;
 - agree quay space and temporary storage areas;
 - agree crane and stevedore access arrangements;
 - book quay space;
 - detail the vessels that will undertake the deliveries; and
 - agree access rights along the access road from the pier and the convoy management with Orkney Islands Council, ports team and Police.
- 12.10.3 To ensure that there are no detrimental issues at Hatston Pier, the Applicant would produce a Port Management Plan secured by planning condition that will be agreed prior to the delivery of the first turbine component.
- 12.10.4 Traffic originating from Cursiter Quarry could be fully or part routed via Zion’s Loan to avoid integration with other road users in Finstown. This option will be further considered by the Balance of Plant (BoP) contractor in liaison with OIC prior to commencement of construction activities on site.

12.11 Residual Effects

Construction

- 12.11.1 The assessment confirms that the effects will be **minor** and non-significant. The traffic effects associated with the construction phase are temporary in nature and are confined to the construction period only. No long lasting detrimental transport or access issues are associated with the Proposed Development.

Operation

- 12.11.2 There are no residual effects associated with the operational phase of the Proposed Development.

12.12 Cumulative Assessment

- 12.12.1 The use of Low NRTF growth assumptions has provided a basis for general local development growth within the study area. The use of NRTF covers other committed development traffic flows within the study area.
- 12.12.2 The only consented wind farm application that is located near to the proposed site and that would share portions of the assessed study area is Costa Head Wind Farm.
- 12.12.3 Costa Head Wind Farm is being developed by Hoolan Energy to the north-west of the Proposed Development. A statement by the Development Director of Hoolan Energy, states that the wind farm will have a grid connection date of 2023. This implies that the Costa Head site will be constructed in 2022 – 2023 ready for the connection and that as such, its construction activities will not coincide with those for the Proposed Development. As such, no further cumulative assessment is required.
- 12.12.4 Should the Costa Head Wind Farm construction be delayed, then construction activities could potentially coincide with works at the Proposed Development. In this scenario, traffic levels will be greater than those described in this chapter. Should this occur, then this will be mitigated by using an overarching Traffic Management and Monitoring Plan for both sites and by introducing a phased abnormal loads delivery plan which will be agreed with OIC. The implementation of the mitigation will reduce any effects to non-significant.

12.13 Summary

- 12.13.1 The Proposed Development will lead to increased traffic volumes on the A965 during the construction phase. This increase will be temporary.
- 12.13.2 An assessment of likely effect using IEMA guidelines has been undertaken. This determined that **minor**, non-significant effects could be expected in Finstown on the A965, relating to the increase in HGV traffic operating on the route. All other receptors within the study area have been scoped out of the assessment.

Table 12.13 – Summary of Effects

Description of Effect	Significance of Likely Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial/ Adverse		Significance	Beneficial/ Adverse
Construction					
Traffic impacts within Finstown	Minor	Adverse	No additional mitigation than the standard mitigation.	Minor, non-significant	Adverse
Operation					
No operational effects anticipated.					

Table 12.14 – Summary of Cumulative Effects

Receptor	Effect	Cumulative Developments	Significance of Cumulative Effect	
			Significance	Beneficial/ Adverse
Traffic impacts within Finstown	Minor	Costa Head Wind Farm (assuming construction date of 2023)	No cumulative effects	
Traffic impacts within Finstown	Minor	Costa Head Wind Farm (assuming construction date of 2024)	Minor	Adverse

12.14 References

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