

Technical Appendix 9.1: Traffic, Transport and Access Assessment Methodology

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1.1 Introduction

- 1.1.1 This Technical Appendix provides the detailed methodology applied in the assessment of likely environmental effects as a result of traffic generation associated with the construction of the Proposed Development (see **Chapter 9: Traffic, Transport and Access (Environmental Impact Assessment Report (EIAR) Volume 2)**).
- 1.1.2 The Proposed Development is a renewable energy development comprised of up to eight wind turbines, a Battery Energy Storage System (BESS) and associated infrastructure adjacent to Sullom Voe Oil Terminal (SVT) and the Shetland Gas Plant in Shetland, Scotland. The assessment is based on the Proposed Development as described in **Chapter 2: Proposed Development (EIAR Volume 2)**.
- 1.1.3 The assessment methodology includes criteria for assessing sensitivity of receptors, magnitude of change and cumulative effects, as well as overall significance criteria.
- 1.1.4 Guidance for the assessment of the environmental effects of generated traffic is provided by the Institute of Sustainability and Environmental Professionals (ISEP). The document 'Environmental Assessment of Traffic and Movement'¹ is the only guidance document currently available that sets out a methodology for assessing potentially significant environmental effects where a Proposed Development is likely to give rise to changes in traffic flows.

1.2 Study Area

- 1.2.1 The Study Area for the assessment of traffic, transport and access has been predicated on the access point to the Site and the proposed construction traffic routes to the access point from the external road network.
- 1.2.2 The Study Area for the assessment of traffic and associated environmental effects, as illustrated in **Figure 9.1: Study Area (EIAR Volume 3a)** is therefore identified as:
 - The A970 from Lerwick to Hillside, Voe;
 - The A968 from Hillside, Voe to the B9076 junction at Firth;
 - The B9076 from Brae to the A968 junction at Firth; and
 - The unadopted road to Shetland Gas Plant from the B9075 to the Site entrance.

1.3 Baseline Conditions

Desk Study

- 1.3.1 Baseline information for the Study Area has been obtained using Google Maps².
- 1.3.2 Road collision data for all road links within the Study Area has been obtained from the Crashmap website³, with data extracted for the most recent five-year period (2020-2024).
- 1.3.3 Existing traffic count data was obtained from several sources including the Department for Transport (DfT) website and publicly available 2015 survey data contained within the Traffic and Transport EIA Report chapter for the consented Beaw Field Wind Farm. The use of the identified traffic data sources has been agreed with Shetland Islands Council (SIC). The locations of the traffic counts are indicated on **Figure 9.2: Traffic Counter Locations (EIAR Volume 3a)**.

Field Surveys

- 1.3.4 No field surveys were undertaken for this assessment.

1.4 Assessment of Potential Significant Effects

Introduction

- 1.4.1 The assessment is structured around the consideration of potential environmental effects relating to traffic and transport, as identified by the ISEP guidelines, and including the following:
 - severance of communities;
 - road vehicle driver and passenger delay;
 - non-motorised user delay and amenity;
 - fear and intimidation on and by road users;
 - road user and pedestrian safety; and
 - hazardous and large loads.
- 1.4.2 The Guidelines suggest that in order to determine the scale and extent of the assessment and the level of impact the development will have on the surrounding road network, the following two 'rules' should be applied:
 - Rule 1 – Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
 - Rule 2 – Include highway links of high sensitivity where traffic flows have increased by 10% or more.
- 1.4.3 These rules are used to identify the road links within the Study Area where a full assessment of environmental effects associated with an intensification in road traffic may be required.

Sensitivity Criteria

- 1.4.4 The sensitivity to change in traffic levels of any given road segment and the receptors located along that road segment are generally assessed by considering the residual capacity of the network under existing conditions.
- 1.4.5 Where there is a high degree of residual capacity, the network may readily accept and absorb an increase in traffic and therefore the sensitivity may be said to be low. Conversely, where the existing traffic levels are high compared to the road capacity, there is little spare capacity, and the sensitivity to change in traffic levels is considered to be high.
- 1.4.6 Consideration has been given to the composition of the traffic on the road network, under both existing and proposed conditions. For example, Light Goods Vehicles (LGVs) have less effect on traffic and the road system than Heavy Goods Vehicles (HGVs). Similarly, HGVs can have less effect than abnormal load vehicles, depending on the frequency of the abnormal loads.
- 1.4.7 The following list is provided in the ISEP Guidelines and identifies special interests that should be considered when defining sensitive receptors and will inform the assessment of effect significance when the development traffic is assigned to the network:

¹ Institute of Sustainability and Environmental Professionals (2023). Environmental Assessment of Traffic and Movement. Available at: <https://www.iema.net/media/5mrmquib/iema-report-environmental-assessment-of-traffic-and-movement-rev07-july-2023.pdf> [accessed on 17/03/2026].

² Google (2026). Google Maps. Available at: <https://www.google.co.uk/maps> [Accessed 17/03/2026]

³ Crashmap (2022). CrashMap. Available at: <https://www.crashmap.co.uk/Search>. [Accessed 17/03/2026]

- People at home;
- People at work;
- Sensitive people including young age; older age; income; health status; social disadvantage; and access and geographic factors;
- Locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools);
- Recreational and shopping areas;
- Recreation areas including ecological/nature conservation sites;
- Tourist/visitor attractions;
- Collision clusters and routes with road safety concerns; and
- Junctions and road links at (or over) capacity.

1.4.8 The criteria that has been used to make judgements on the sensitivity of receptor(s) is presented in **Table 9.1.1**.

Table 9.1.1: Receptor Sensitivity	
Sensitivity	Criteria
High	Receptors of high importance and value on international or national scales. Designated or heritage areas of unique value. Large settlements with a large number of public services and facilities, traffic control measures and regular use by pedestrians and cyclists. Minor and historic roads are not generally suitable for HGV traffic.
Medium	Receptors of some regional importance. Medium-sized settlements with some public services facilities and infrastructure and some traffic control measures, including some accommodation for pedestrians and cyclists. Capable of supporting regular HGV traffic.
Low	Receptors with low regional importance. Typically, small settlements with few facilities and no traffic control measures and with nearby trunk or A-class roads that are able to accommodate HGV traffic.
Negligible	Users not sensitive to transport effects. Includes very small settlements and roads with no significant settlements including new strategic trunk roads or motorways.

Magnitude of Change Criteria

- 1.4.9 The magnitude of change is a function of the existing traffic volumes, the percentage increase and change due to the Proposed Development, changes in the type of traffic and the temporal distribution of traffic (day of week, time of day etc.).
- 1.4.10 The determination of magnitude has been undertaken by reviewing the Proposed Development, establishing the parameters of the receptors that may be affected, and quantifying these effects utilising ISEP guidelines and professional judgement.
- 1.4.11 Consideration is given to the composition of the traffic on the road network, under both existing and proposed conditions. For example, LGVs have less effect on traffic and the road system than HGVs.
- 1.4.12 The criteria that has been used to make judgement on the magnitude of change on the receptor(s) is provided in **Table 9.1.2**.

Table 9.1.2: Thresholds for Determining Magnitude of Change	
Magnitude	Criteria
Major	>90 % increase in traffic (or >70 % at sensitive receptors).
Moderate	60 %-90 % increase in traffic (or 40 % - 70 % at sensitive receptors).
Minor	30 %-60 % increase in traffic (or 10 % - 40 % at sensitive receptors).

Table 9.1.2: Thresholds for Determining Magnitude of Change	
Magnitude	Criteria
Negligible	0 %-30 % increase in traffic (or <10 % at sensitive receptors).

Significance of Effect

- 1.4.13 As a guide to inform the assessment, but not as a substitute for professional judgement, criteria for determining the significance of traffic related effects are set out in **Table 9.1.3**. This is based on combining the magnitude of change with the receptor sensitivity.

Table 9.1.3: Significance Matrix				
Sensitivity	Magnitude of Change			
	Major	Moderate	Minor	Negligible
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Minor	Minor	Minor/Negligible
Negligible	Minor	Negligible	Negligible	Negligible

- 1.4.14 The effects shown in grey highlighted cells, Moderate and Major, are considered Significant. The remaining effects are judged to be of minor or negligible significance and are considered Not Significant.

1.5 Potential Environmental Effects

- 1.5.1 The following potential environmental effects relating to traffic and transport are identified by the ISEP guidelines and described in more detail in this section.

Severance of Communities

- 1.5.2 The ISEP guidelines advise that "Severance is the perceived division that can occur within a community when it becomes separated by major transport infrastructure".
- 1.5.3 The potential for traffic generation associated with the Proposed Development to cause severance is assessed on a case-by-case basis using professional judgement where non-negligible traffic increases are predicted on roads through residential settlements.

Road Vehicle Driver and Passenger Delay

- 1.5.4 Some driver delay may be experienced when construction traffic is accessing the Site. The ISEP guidelines advise "delays are only likely to be significant when the traffic on the network surrounding the Site is already at, or close to, the capacity of the system".
- 1.5.5 Traffic delay to non-development traffic may occur at several points on the network surrounding the Site, including:
- at the Site access points where there will be additional turning movements;
 - at intersections along the local road network which might be affected by increased traffic; and

- at side roads where the ability to find gaps in traffic may be reduced, thereby lengthening delays

Non-Motorised User Delay and Amenity

- 1.5.6 The ISEP guidelines advise that “The assessment of pedestrian delay serves as a proxy for the delay that other modes of non-motorised users may experience when crossing roads”.
- 1.5.7 Traffic volumes, traffic composition, traffic speed, the existence of pedestrian footways and the existence of pedestrian crossings all contribute to the level of general pleasantness experienced by pedestrians and other vulnerable road users.

Fear and Intimidation on and by Road Users

- 1.5.8 ISEP guidelines state that “a further environmental impact that affects people is the fear and intimidation created by all moving objects”, with the extent of fear and intimidation dependent upon:
- the total volume of traffic;
 - the heavy vehicle composition;
 - the speed these vehicles are passing; and
 - the proximity of traffic to people.
- 1.5.9 The ISEP guidelines provide a weighting system to help quantify the likelihood and level of pedestrian fear and intimidation, which is based on average traffic flows and vehicle speeds.

Road User and Pedestrian Safety

- 1.5.10 Road collision data has been collated for the Study Area and interrogated to identify any ‘accident hotspots’ or areas of concern. The data was obtained from the Crashmap website³ for the road links in the Study Area.
- 1.5.11 An approximate calculation was then undertaken to quantify the level of accident risk that could be expected due to the increase in traffic associated with the Proposed Development. The likelihood of an accident occurring is commonly expressed in accidents per million vehicle-km. Accidents that are appraised in relation to transport are predominantly those in which personal injury is sustained by those involved (personal injury accidents (PIAs)).

Hazardous and Large Loads

- 1.5.12 There are no hazardous loads associated with the Proposed Development.
- 1.5.13 The ISEP Guidelines state that, “The movement of large (abnormal) loads is regulated by National Highways and will be subject to separate agreement with the relevant highway authorities and police”.

1.6 Cumulative Assessment

- 1.6.1 Cumulative effects have been considered for other developments in the vicinity of the Proposed Development that are consented or at planning application stage and may share construction traffic routes and timings with the Proposed Development. Developments that are currently under construction or operational have been excluded as it can be assumed that there would be a very minimal number of trips or no overlap in vehicle trip generation with the Proposed Development.
- 1.6.2 The potential for cumulative effects has been assessed by reviewing data available within the EIARs for the relevant developments where applicable.
- 1.6.3 The developments included in the cumulative assessment are those which may share potential access routes with the Proposed Development and may give rise to cumulative construction effects. Wind farm developments with three or less turbines have been excluded from the assessment as developments of

that size would be highly unlikely to result in significant cumulative construction effects with the Proposed Development.