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Morlais Project Environmental Statement

Chapter 23: Traffic and Transport

Volume I

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Author: Royal HaskoningDHV



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GLOSSARY OF ABBREVIATIONS

AADT	Annual Average Daily Traffic
AILs	Abnormal Indivisible Loads
ATC	Automated Traffic Counts
CIA	Cumulative Impact Assessment
CTMP	Construction Traffic Management Plan
DCO	Development Consent Order
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
EIA	Environment Impact Assessment
ES	Environmental Statement
GEART	Guidelines for the Environmental Assessment of Road Traffic
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
NPS	National Policy Statements
NSIP	Nationally Significant Infrastructure Project
PIC	Personal Injury Collision
PPG	Planning Practice Guidance
PPW	Planning Policy Wales
RSPB	Royal Society for the Protection of Birds
TAN	Technical Advice Note
TEMPro	Trip End Model Presentation Programme

GLOSSARY OF TERMINOLOGY

Two-way movement	A movement is the process of transporting goods from a source location to a predefined destination. A two-way movement represents the inbound (laden trip from source) and the outbound unladen trip (back to source).
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23. TRAFFIC AND TRANSPORT

23.1. INTRODUCTION

1. This chapter of the Environmental Statement (ES) considers the potential impacts of the Morlais Project (the Project) on traffic and transport. This Chapter provides an overview of the existing conditions and environment with regard to traffic and transport matters and assesses potential impacts and associated mitigation on sensitive receptors during the construction, operation and decommissioning phases of the Project. This chapter has been prepared by Royal HaskoningDHV.
2. The assessment considers the potential impacts of the onshore infrastructure and also considers cumulative impacts of other proposed projects. The proposed methodology adhered to for the Environmental Impact Assessment (EIA) and Cumulative Impact Assessment (CIA) is discussed in **Section 23.6.6**.
3. No announcement has yet been made regarding a preferred base port for the offshore construction and operation of the Project. Such facilities would be provided or brought into operation by means of one or more planning applications or as port operations enjoying permitted development rights. This Chapter therefore considers the impacts of constructing and operating the onshore infrastructure only.
4. It should be noted that the Project's traffic and transport effects have the potential to impact on environmental receptors discussed in other chapters within the ES. The relevant chapters to consider are:
 - Chapter 21, Noise and Vibration; and
 - Chapter 22, Air Quality.

23.2. POLICY, LEGISLATION AND GUIDANCE

5. There are a number of pieces of legislation, policy and guidance applicable to traffic and transport. The following sections provide detail on key pieces of UK legislation, policy and guidance. Further detail is provided in **Chapter 2, Policy and Legislation**.

23.2.1. Legislation and Policy

23.2.1.1. National Policy Statements

6. The Project is seeking consent for a Transport and Works Act Order from the Welsh Ministers and a Marine Licence from Natural Resources Wales (NRW). Although this Project is not seeking a Development Consent Order (DCO), its size (240 MW) means it is representative of a Nationally Significant Infrastructure Project (NSIP), therefore guidance relevant to NSIPs is considered appropriate to use for this Project. Guidance that is relevant to assessing impacts on traffic and transport for NSIPs are set out within National Policy Statements (NPSs) which are the principal decision-making documents for NSIPs. Those relevant to traffic and transport include:

- Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC) 2011a); and
 - NPS for Renewable Energy Infrastructure (EN-3), July 2011 (DECC, 2011b).
7. The NPS for Renewable Energy Infrastructure (EN-3) does not include specific reference to air quality.
 8. EN-1 outlines that if a project is likely to have significant transport implications, the Applicant's ES should include a transport assessment and where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts.
 9. This traffic and transport chapter provides the requisite level of information required by the current transport assessment guidance (referenced in **Section 23.2.2**) and this is evidenced throughout this document. With regards to travel planning, it is considered that the promotion of sustainable travel would be best managed through the development of a post consent Construction Traffic Management Plan (CTMP) once a contractor is appointed and greater certainty is available regarding workforce origins.
 10. Details of specific policies used to inform this assessment are provided in **Table 23-1** below. The specific assessment requirements for traffic and transport are detailed, together with an indication of the paragraph numbers of the chapter where each is addressed.

Table 23-1 NPS EN-1 and EN-3 Assessment Requirements Relevant to Traffic and Transport

NPS Requirement	NPS Reference	ES Reference
If a project is likely to have significant transport implications, the applicant's ES should include a Transport Assessment, using the NATA/ WebTAG methodology stipulated in Department for Transport (DfT) guidance, or any successor to such methodology.	EN-1 Section 5.13.3	The chapter has been produced in accordance with current transport guidance and this is evidenced throughout this document.
Where appropriate, the applicant should prepare a Travel Plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for car parking associated with the proposal and to mitigate transport impacts.	EN-1 Section 5.13.4	The impact assessment and proposed mitigation measures are set out in Section 23.6 and are summarised in Table 23-24 .

23.2.1.2. National Planning Policy

11. For development in Wales, a principle strategic policy document is the Planning Policy Wales (PPW) and the associated Technical Advice Note (TAN) suite of documents.
12. The PPW was published in November 2016 and sets out the land use planning policies of the Welsh Government. Chapter 8 of the PPW sets out the transport related planning policies.
13. The TAN is a series of documents that supplement the PPW by providing detailed planning advice. TAN 18: Transport (2007) gives a description of how to integrate land use, transport planning and details how transport impacts should be assessed and mitigated.

14. The salient requirements of the PPW and associated TAN are summarised in **Table 23-2**.

Table 23-2 National Planning Policies

Policy Description	Reference	ES Reference
<p>Land use and transport planning must be integrated. The planning system must ensure it enables integration:</p> <ul style="list-style-type: none"> • within and between different types of transport; • between transport measures and land use planning; • between transport measures and policies to protect and improve the environment; and • between transport measures and policies for education, health, social inclusion and wealth creation. 	4.1.4	Section 23.6 provides details of the traffic generation and worst-case assumptions that have informed the impact assessment
<p>Development proposals must seek to maximise accessibility by walking, cycling and public transport, by prioritising the provision of appropriate on-site infrastructure and, where necessary, mitigating transport impacts through the provision of off-site measures, such as the development of active travel routes, bus priority infrastructure and financial support for public transport services.</p>	4.1.10	A package of mitigation to reduce risks to the travelling public is included in Section 23.6.3.5.1 .
<p>It is Welsh Government policy to require the use of a sustainable transport hierarchy in relation to new development, which prioritises walking, cycling and public transport ahead of the private motor vehicles. The transport hierarchy recognises that Ultra Low Emission Vehicles also have an important role to play in the decarbonisation of transport, particularly in rural areas with limited public transport services.</p>	4.1.11	As above
<p>Development plans must identify and safeguard active travel routes and networks, including those identified in the Integrated Network Maps required by the Active Travel Act, and support their delivery. As part of the selection of future development sites, priority should be given to sites which can be readily connected to existing active travel routes or future networks. New development should be integrated with active travel networks and contribute to their expansion and improvement, through the inclusion of well-designed routes and facilities as part of the schemes and financial contributions to pay for off-site connections.</p>	4.1.32	As above
<p>Planning authorities must direct development to locations most accessible by public transport. They should ensure that development sites which are well served by public transport are used for travel intensive uses, such as housing, jobs, shopping, leisure and services, reallocating their use if necessary. In rural areas, planning authorities should designate local service centres, or clusters of settlements where a sustainable functional linkage can be demonstrated, as the preferred locations for new development.</p>	4.1.36	The Project is not considered to be one of the developments listed.
<p>Transport Assessments are an important mechanism for setting out the scale of anticipated impacts a proposed development, or redevelopment, is likely to have. They assist in helping to anticipate the impacts of development</p>	4.1.56	The Transport Assessment has been undertaken in line with DCLG Planning

Policy Description	Reference	ES Reference
so that they can be understood and catered for appropriately.		Practice Guidance. (Section 23.2.2.1)
When developing strategies, proposing or assessing development proposals it will be essential to understand the implications of the transport demand associated with the proposal and the effect this may have now and in the foreseeable future.	6.7.13	The Existing Environment with regard to traffic and transport is set out in Section 23.5.

15. The TAN18 in conjunction with the PPW is taken account by local planning authorities in the preparation of development plans. They may be material to decisions on individual planning applications and will be taken into account by the Assembly Government and Planning Inspectors where relevant to the determination of called-in planning applications and appeals.
16. The note provides guidance on:
- Integration between land use planning and transport;
 - Location of development;
 - Parking;
 - Design of development;
 - Walking and cycling;
 - Public transport;
 - Planning for transport infrastructure; and
 - Assessing impacts and managing implementation.

23.2.1.3. Regional Planning Policy

17. The traffic and transport study area (**Section 23.4.1**) falls under the jurisdiction of North Wales and the Isle of Anglesey County Council local planning authority.
18. A Local Transport Plan was jointly prepared by all six local authorities including the Isle of Anglesey in 2015. The Plan is aimed at improving connections to key destinations, enhancing access to employment and services, increasing levels of walking and cycling, bringing improved safety and security and at the same time bringing benefits and minimised impacts on the environment.
19. The Anglesey and Gwynedd have produced a Joint Local Development Plan which provides context on the majority of decisions on planning applications within the regions.
20. A summary of the requirements of the regional policies are summarised in **Table 23-3**, together with an indication of where each stipulation is addressed.

Table 23-3 National and Regional Policy Requirements Relevant to Traffic and Transport

Policy Description	Reference	ES Reference
North Wales Joint Local Transport Plan (2015)		
Improved safety and security benefits of both actual and perceived safety of travel by all modes.	N/A	Section 23.5.17 provides a review of existing road safety baseline
Anglesey and Gwynedd Joint Local Development Plan (JLDP)		
Development will be located so as to minimise the need to travel. The Councils will support improvements that maximise accessibility for all modes of transport, but particularly by foot, cycle and public transport. This will be achieved by securing convenient access via footways, cycle infrastructure and public transport where appropriate, thereby encouraging the use of these modes of travel for local journeys and reducing the need to travel by private car.	Strategic Policy PS 4: Sustainable Transport, Development and Accessibility	The Project will not impact on existing public transport infrastructure. (Section 23.6)
3. Transport Assessments Proposals for large-scale development or developments in sensitive areas that substantially increase the number of journeys made by private vehicles will be refused unless they include measures as part of a Transport Assessment and/or a Travel Plan. Where the Transport Assessment reveals the need for a Transport Implementation Strategy this will need to be secured through a planning obligation.	Policy TRA 1: Transport Network Developments	The impact assessment and proposed mitigation measures are set out in Section 23.6 and are summarised in Table 23-24 .
Parking provision for all modes of transport should be in accordance with the Councils' Parking Standards.	Policy TRA 2: Parking Standards	Providing parking is included within proposed mitigation measures (Section 23.6.3.7.1).
Development will be located so as to minimise the need to travel. The Councils will support improvements that maximise accessibility for all modes of transport, but particularly by foot, cycle and public transport. This will be achieved by securing convenient access via footways, cycle infrastructure and public transport where appropriate, thereby encouraging the use of these modes of travel for local journeys and reducing the need to travel by private car. The Council will endeavour to improve accessibility and seek to change travel behaviour. The Councils will also require appropriate transport infrastructure elements to be delivered as part of major infrastructure development schemes either in kind or through section 106 obligations.	Strategic Policy PS 4	It is recognised that due to the nature of the proposed development, the locations represent a compromise in terms of accessibility by sustainable modes of transport. It is considered that the promotion of sustainable travel would be best managed through the development of a post consent Construction Traffic Management Plan (CTMP) once a contractor is appointed and greater certainty is available regarding workforce origins.
Where appropriate, proposals should be planned and designed in a manner that promotes the most sustainable modes of transport	Policy TRA 4: Managing Transport Impacts	The impact assessment and proposed mitigation measures are set out in Section 23.6 and are summarised in Table 23-24 .
1. All impacts on landscape character, heritage assets and natural resources have been adequately mitigated, ensuring that the special qualities of all locally, nationally and internationally important landscape,	Policy ADN 3: Other Renewable Energy and Low	These assessments are considered in Chapter 18, Ground Conditions and Contamination, Chapter 19,

Policy Description	Reference	ES Reference
biodiversity and heritage designations, including, where appropriate, their settings are conserved or enhanced; 3. That the proposal is mitigated to ensure that there aren't any significant unacceptable effects on sensitive uses located nearby;	Carbon Technologies	Onshore Ecology, Chapter 20, Onshore Archaeology, Chapter 22, Air Quality and Chapter 24, SLVIA.
Wellbeing of Future Generations (Wales) Act 2015		
A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).	A resilient Wales	The impact assessment and proposed mitigation measures are set out in Section 23.6 and are summarised in Table 23-24.

23.2.2. Guidance

23.2.2.1. Guidelines for the Environmental Assessment of Road Traffic

21. The Guidelines for the Environmental Assessment of Road Traffic (GEART) (Institute of Environmental Assessment, 1993) relate to the assessment of the environmental impacts of road traffic associated with new developments, irrespective of whether the developments are to be subject to EIA.
22. The purpose of the guidelines is to provide the basis for systematic, consistent and comprehensive coverage for the appraisal of traffic impacts arising from development projects. Impacts that may arise include: pedestrian severance and amenity, driver delay, accidents and safety and noise, vibration and air quality. Further details on the assessment methodology undertaken for the Project in relation to traffic and transport can be found in **Section 23.4.3.**

23.2.2.2. DfT Transport Assessment Guidance

23. The DfT Transport Assessment guidance referred to in NPS EN-1, was withdrawn in October 2014 and was replaced with DCLG Planning Practice Guidance (PPG). For the purpose of assessing the impact of the Project, the relevant PPG is 'Travel Plans, Transport Assessment and Statements' (henceforth referred to as the Transport PPG).
24. The Transport PPG sets out the key principles to be adopted when developing a Transport Assessment as follows:
 - Proportionate to the size and scope of the proposed development to which they relate and build on existing information wherever possible;
 - Established at the earliest practicable possible stage of a development proposal;
 - Be tailored to particular local circumstances (other locally-determined factors and information beyond those which are set out in this guidance may need to be considered in these studies provided there is robust evidence for doing so locally); and
 - Be brought forward through collaborative ongoing working between the Local Planning Authority / transport authority, transport operators, rail network operators, Highways Agency (now Highways England) where there may be implications for the strategic road network and other relevant bodies.

25. The Transport PPG key principles have shaped the development of this ES and can be seen throughout this chapter.

23.3. CONSULTATION

26. Consultation undertaken throughout the pre-application phase has informed the approach taken and the information provided in this Chapter. A summary of the comments received from the Environmental Scoping Opinion (Planning Inspectorate, 2018) of particular relevance to traffic and transport is detailed in **Table 23-4** below.

Table 23-4 Consultation Responses

Consultee	Date/Document	Comment	Response
Planning Inspectorate	Scoping Opinion 2018	Potential Impacts: Table 9-12 of the Scoping Report refers to disruption to local traffic and driver delay. The assessment should also assess severance, pedestrian and cycle amenity and road safety."	The effects of severance, pedestrian and cycle amenity and road safety are considered within this ES.
	Scoping Opinion 2018	Potential Impacts: Table 9-12 of the Scoping Report states that the nature, duration and magnitude of effects will be dependent on transportation methods and crossing methods. It is therefore imperative for the ES to define the project as far as is possible, and to ensure that a worst-case scenario is assessed if flexibility is sought.	Section 23.6 provides details of the traffic generation and worst-case assumptions that have informed the impact assessment.
	Scoping Opinion 2018	Traffic movements: The ES should detail the anticipated vehicle movements during all phases of the Proposed Works. The assumptions made in deriving the traffic demand should be clearly explained within the ES and should represent a worst-case scenario.	
	Scoping Opinion 2018	Affected Road Network (ARN): The ARN should be identified and justified within the ES. This should include roads and transport links likely to be used to transport construction materials and should inform study areas for other aspects (e.g. air quality, noise and vibration).	Section 23.4.1 includes details of the proposed traffic and transport study area.
	Scoping Opinion 2018	Decommissioning: The ES should assess the potential impacts from decommissioning.	Section 23.6.5 presents a consideration of the potential decommissioning impacts.
	Scoping Opinion 2018	Traffic Surveys: It is recommended that effort is made to agree the baseline survey with the relevant consultees including the local highways authority and should take into account seasonal traffic fluctuations.	Section 23.5.15 sets out detail of the baseline traffic flows.

Consultee	Date/Document	Comment	Response
	Scoping Opinion 2018	Sensitive Receptors: The ES should identify any specific receptors which would be sensitive to traffic impacts e.g. schools, recreational facilities. Ecological receptors should also be identified, including any protected sites within 200m of the ARN.	Section 23.5.16 presents a consideration of the sensitive receptors within the traffic and transport study area. The assessment of ecological receptors is contained within Chapter 19, Onshore Ecology .
Isle of Anglesey County Council	4 July 2019 / Consultation	A meeting was held on Thursday 4th July, where Royal HaskoningDHV, on behalf of Menter Môn, presented an outline of the Traffic and Transport EIA to IoACC. IoACC made enquiries on the source of data and content of assessments however raised no concerns during the meeting.	Full details of the baseline data collection and impact assessment are provided in Section 23.5. and Section 23.6. , respectively

23.4. METHODOLOGY

27. This section describes the assessment methodology, including data collation, impacts and impact assessment criteria that were used in this traffic and transport assessment.

23.4.1. Study Area

28. The traffic and transport study area has been informed by determining the most probable routes for traffic, for both the movement of materials and employees, during construction, operational and decommissioning phases of the Project. In addition, the traffic and transport study area has been extended to include potential diversion routes whilst roads are closed to install the Project's cables in or adjacent to the highway.

29. Routes that extend outside of the traffic and transport study area are routes where construction traffic has dissipated and/ or include roads with negligible sensitive receptors. These parameters combine and do not represent significant impacts on the highway network.

30. The traffic and transport study area is illustrated in **Figure 23-1 (Volume II)** and covers the majority of western region of the Isle of Anglesey. The traffic and transport study area is divided into 13 separate highway sections known as links, which can be defined as sections of road with similar characteristics and traffic flows.

23.4.2. Data Sources

31. The data sources that have been used to inform the traffic and transport baseline are listed in **Table 23-5**.

Table 23-5 Data Sources

Data	Date	Coverage	Confidence	Notes
Classified Annual Average Daily Traffic (AADT) counts	2017	Links 1,2,3,4,12	High	Data sourced from the DfT which provides classified AADT traffic count data.
Classified Automatic Traffic Counts (ATC)	March 2019	Links 5,6,7,8,9,10,11,13	High	Traffic counts commissioned by Royal HaskoningDHV which provide classified hourly and daily traffic count data.
Personal Injury Collision (PIC) Data	2014 - 2019	All links	High	Open source data sourced from Crashmap.co.uk

32. In addition to the data sources listed in **Table 23-5**, a desk-based assessment was undertaken to provide information with regard to the existing baseline highway network.

23.4.3. Impact Assessment Methodology

33. The overarching methodologies used for EIA are outlined in **Chapter 5, EIA Methodology**. This section describes the assessment methodology, including data collation, impacts and impact assessment criteria that were used in the traffic and transport assessment.

23.4.4. Scale of Assessment

34. The following rules, taken from the GEART, have informed the screening process and thereby defined the extent and scale of this assessment:

- Rule 1: Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
- Rule 2: Include any other specifically sensitive areas where traffic flows (or HGV component) are predicted to increase by 10% or more.

35. In justifying these rules GEART examines the science of traffic forecasting and states:

“It is generally accepted that accuracies greater than 10% are not achievable. It should also be noted that the day to day variation of traffic on a road is frequently at least some + or -10%. At a basic level, it should therefore be assumed that projected changes in traffic of less than 10% create no discernible environmental impact.

...a 30% change in traffic flow represents a reasonable threshold for including a highway link within the assessment.”

36. Changes in traffic flows below the GEART rules (thresholds) are assumed to result in no discernible or negligible environmental effects and have therefore not been assessed further as part of this study.

37. The exception to the GEART Rule 1 and 2 is the consideration of the effects of driver delay and road safety. These effects can be potentially significant when high baseline traffic flows are evident, and a lower change in traffic flow can be potentially significant. Full details of the methodology adopted for these effects is set out in **Section 23.4**.
38. Following initial screening, GEART sets out consideration and, in some cases, thresholds in respect of changes in the volume and composition of traffic to facilitate a subjective judgement of traffic impact and significance.
39. The following environmental effects have been identified as being susceptible to changes in traffic flow and are appropriate to the local area.

23.4.5. Severance

40. Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. The term is used to describe a complex series of factors that separate people from both places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. It can also relate to relatively minor traffic flows if they impede pedestrian access to essential facilities. Severance effects could equally be applied to residents, motorists, cyclists or pedestrians.
41. GEART suggests that changes in total traffic flow of 30%, 60% and 90% are considered to be 'slight', 'moderate' and 'substantial' respectively.

23.4.6. Pedestrian / Cycle Amenity

42. Pedestrian amenity is broadly defined as the relative pleasantness of a journey and is considered to be affected by traffic flow, traffic composition and pavement width and separation from traffic. The definition of amenity also takes into consideration pedestrian fear and intimidation, consideration of the exposure to noise and air pollution, and the overall relationship between pedestrians and traffic.
43. GEART suggests that a threshold of a doubling of total traffic flow or the HGV component may lead to a negative impact upon pedestrian amenity.

23.4.7. Road Safety

44. The salient GEART guidance on road safety is as follows:

“Where a development is expected to produce a change in the character of traffic (e.g. HGV movements on rural roads), then data on existing accidents levels may not be sufficient. Professional judgement will be needed to assess the implications of local circumstances, or factors which may elevate or lessen the risk of accidents, e.g. junction conflicts.”
45. In this context, an examination of the existing collisions occurring within the traffic and transport study area will be undertaken to identify any areas of the highway with concentrations of collisions with similar patterns. These sites are considered to be sensitive to changes in traffic flows (sensitive receptors) and could therefore warrant more detailed analysis of significance in the context of the Project.

46. In addition to considering existing patterns of collisions that could be exacerbated by the development proposals, the road safety assessment also considers the potential for introduction of new risks associated with the formation of new junctions.

23.4.8. Driver Delay

47. GEART recommends the use of proprietary software packages to model junction delay and hence increased vehicle delays. However, it is noted that vehicle delays are only likely to be significant when the surrounding highway network is at, or close to, capacity.

48. The assessment therefore seeks to disaggregate the peak hour traffic movements across the traffic and transport study area to inform a judgement upon the potential significance of the driver delay effects.

49. In addition to considering the potential for delays associated with increases in traffic, the potential for delays associated with the temporary road closures will also be considered.

23.4.9. Abnormal Indivisible Loads

50. The importing of large Abnormal Indivisible Loads (AILs) may lead to delays on the highway network. The construction of the landfall substation is likely to require the delivery of three transformers. An AIL access study has been undertaken by abnormal load consultants Wynns to inform the management measures required to deliver AILs to the landfall substation.

51. The AIL study considered three trailer arrangements for transporting the transformer as at the time of drafting the final transformer configuration had not been selected. It has since been confirmed that the final transformer will be of such a size that it can be accommodated upon the smallest of the three trailer arrangements (overall 20m length) and as such the AIL study identifies no significant issues. The AIL study is provided within **Appendix 23-1 (Volume III)** and details the management measures to be employed to minimise the disruption to baseline traffic.

23.4.10. Other Impacts

52. Traffic-borne noise and vibration effects and air quality effects will be informed by the traffic data outlined in this chapter. These impacts are assessed in **Chapter 21, Noise and Vibration** and **Chapter 22, Air Quality**, respectively.

23.4.11. Sensitivity

53. The sensitivity of a road (link) can be defined by the type of user groups who may use it, e.g. elderly people or children. A sensitive area may be a village environment or where pedestrian or cyclist activity may be high, for example in the vicinity of a school. **Table 23-6** provides broad definitions of the different sensitivity levels which have been applied to the assessment.

Table 23-6 Example Definitions of the Different Sensitivity Levels for a Highway Link

Sensitivity	Definition
High	High concentrations of sensitive receptors (e.g. hospitals, schools, areas with high tourist footfall etc.) and limited separation provided by the highway environment.

Sensitivity	Definition
Medium	A low concentration of sensitive receptors (e.g. residential dwellings, pedestrian desire lines, etc.) and limited separation from traffic provided by the highway environment.
Low	Few sensitive receptors and / or highway environment can accommodate changes in volumes of traffic.
Negligible	Links that fall below GEART Rule 1 and 2 screening thresholds.
* High sensitivity links are considered to be 'specifically sensitive areas' for the purpose of GEART Rule 2	

23.4.12. Other receptors

54. In addition to the consideration of the sensitivity of highway links, areas with existing road safety issues and congested junctions have also been assigned a degree of sensitivity.
55. With regards to road safety areas with existing road safety concerns are considered to be highly sensitive to changes in traffic and are outlined further in **Section 23.5.17**.
56. With regards to driver delay, key junctions on the main 'A' roads within the traffic and transport study area have been identified as potentially highly sensitive to changes in traffic. These locations are discussed further in **Section 23.6.3.6**.

23.4.13. Magnitude

57. **Table 23-7** details the assessment framework for magnitude thresholds adapted from GEART. These thresholds are guidance only and provide a starting point by which transport data will inform a local analysis of the impact magnitude.

Table 23-7 Traffic and Transport Assessment Framework

Effect	Magnitude of Effect			
	Negligible	Low	Medium	High
Severance	Changes in total traffic flows of less than 30%	Changes in total traffic flows of 30 to 60%	Changes in total traffic flows of 60 to 90%	Changes in total traffic flows of over 90%
Pedestrian Amenity	Change in traffic flows (or HGV component) less than 100%	Greater than 100% increase in traffic (or HGV component) and a review based upon the quantum of vehicles, vehicle speed and pedestrian footfall		
Road Safety	Informed by a review of existing collisions patterns and trends based upon the existing personal injury collision records and the forecast increase in traffic			
Driver Delay (Capacity)	Informed by projected traffic increases through sensitive junctions within the traffic and transport study area			
Driver Delay (Road Closures)	Informed by a review of the likely delays associated with road closures			

23.4.14. Impact Significance

58. **Table 23-8** sets out the significance matrix which combines the initial impact assessment derived from the assessment framework presented in **Table 23-7** with the sensitive receptor value for the purpose of determining the 'magnitude of impact'.

Table 23-8 Impact Significance Matrix

		Negative Magnitude				Beneficial Magnitude			
		High	Medium	Low	Negligible	Negligible	Low	Medium	High
Sensitivity	High	Major	Major	Moderate	Minor	Minor	Moderate	Major	Major
	Medium	Major	Moderate	Minor	Minor	Minor	Minor	Moderate	Major
	Low	Moderate	Minor	Minor	Negligible	Negligible	Minor	Minor	Moderate
	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

*Beneficial magnitude matrix has been included for completeness, although it is not anticipated for traffic and transport impacts.

59. Note that for the purposes of this ES, major and moderate impacts are deemed to be ‘significant’. In addition, whilst minor impacts are not significant in their own right, it is important to distinguish these from other non-significant impacts as they may contribute to significant impacts cumulatively or through interactions.

23.5. EXISTING ENVIRONMENT

60. Characterisation of the existing environment has been informed through a number of sources, including:

- Desktop studies;
- Traffic count data from the DfT;
- Traffic surveys commissioned by Royal HaskoningDHV on behalf of Menter Môn (**Table 23-5**); and
- Personal injury collision data sourced utilising open source data.

23.5.1. Existing Highway Network

61. The highway network in the vicinity of the traffic and transport study area is illustrated on **Figure 23-1(Volume II)**. **Figure 23-2 (Volume II)** illustrates the traffic and transport study area and is divided up into 13 separate links which are described below.

23.5.2. Link 1 – A5 London Road

62. Link 1, the A5 London Road is a major road which runs for approximately 443km in England and Wales. The A5 provides one of the three crossings between Holyhead and the Isle of Anglesey and one of two crossings from the mainland to the Isle of Anglesey.

63. Within the traffic and transport study area, the A5 London Road is a two-lane single carriageway road. The eastern part of the link provides access to an out of town retail park and is subject to a 30mph speed limit with street lighting, to the east of the junction with the Holyhead Eco Park the speed limit increases to the national speed limit. A shared use footway/ cycleway is provided along the northern side of link 1.

23.5.3. Link 2 - A55 North Wales Expressway

64. Link 2, the A55 (North Wales Expressway) forms a direct link from Holyhead Port to Chester. The A55 is the second crossing between the mainland and the Isle of Anglesey. The A55 forms part of the European Route E22 which routes from the United Kingdom to Russia.

65. Within the traffic and transport study area, the A55 North Wales Expressway (link 2) is a two-lane dual carriageway road that runs from junction 2 with the A5153 east to junction 3 with the A5. The road is subject to a 70 mph speed limit, before reducing to 50mph on the approach to junction 2. This reduction in speed limit also corresponds with the provision of street lighting.

23.5.4. Link 3 - A55 North Wales Expressway / Victoria Road / A5154 Victoria Road

66. Link 3, the A55 (North Wales Expressway / Victoria Road) continues north east from junction 2 with A5153 to a signalised junction with the A5154. The link consists a of two-lane dual carriageway road subject to a 30 mph speed limit with street lighting present.

23.5.5. Link 4 - A5154 Victoria Road / Prince of Wales Road

67. Link 4, the A5154 Victoria Road provides a link from the A5 to the northern coastline and residential areas of Holyhead and consists of a two-lane single carriageway road.
68. The road is subject to a 30 mph speed limit with continuous footways and street lighting present along both sides of the road. A number of controlled and uncontrolled pedestrian crossing points are provided along its length. Upon turning west on to Prince of Wales Road / Beach Road traffic calming is provided along the road.

23.5.6. Link 5 – Walthew Avenue / New Park Road / South Stack Road

69. Link 5 comprises of Walthew Avenue, New Park Road and South Stack Road. The link runs south from the roundabout junction with Beach Road and intersects with South Stack Road.
70. Walthew Avenue and New Park Road are predominantly residential roads subject to a 30 mph speed limit with street lighting and footways along both sides of the road. Upon turning on to South Stack Road the link continues as a predominantly residential road subject to a 30 mph speed limit with street lighting and footways along both sides of the road until the junction with Hirfron. From this junction South Stack Road continues south as a rural single carriageway road subject to the national speed limit. Along this section of South Stack Road, there are no footways or street lighting.

23.5.7. Link 6 – Unnamed Road from South Stack Road to Plas Road

71. The unnamed road is a single-lane single carriageway road that runs from its junction with South Stack (link 5) to Plas Road (link 7). The width of the link varies along its length with some sections where vehicles are required to give-way to one another and wider sections where two vehicles can pass. Typically, where the road width prevents two vehicles from passing, informal passing places are provided at the bends in the road.
72. Typical of a rural road, the road is subject to the national speed limit with no footways or street lighting present.

23.5.8. Link 7 – Plas Road

73. Plas Road is a single-lane single carriageway road that runs southwest from Hollyhead. Within the built up areas of Hollyhead the Plas Road is subject to a 30 mph speed limit with a footway along the southern side of the road.
74. The road is also traffic calmed and street lighting present. To the south of the junction with Bryn Gwyn Road the road becomes more rural in character and is subject to the national speed limit with no footway or street lighting present. This section of road is only wide enough for a single vehicle and as such regular passing places are provided.

23.5.9. Link 8 – Unnamed Road from Plas Road to Porthdafarch Road

75. Link 8 is an unnamed road that runs south east from its junction with Plas Road (link 7) to its junction with Porthdafarch Road (link 11). The link is a single carriageway road subject to the national speed limit with no footpaths or street lighting present.

23.5.10. Link 9 - Lon Isallt

76. Link 9 (Lon Isallt) is a single-lane single carriageway road that runs east from its junction with Porthdafarch Road (link 9) to its junction with the B454 at Trearddur Bay.
77. Within the built-up area of Trearddur Bay, the link is subject to a 30 mph speed limit within the with footways and street lighting present. Upon leave the built-up area at Trearddur Bay (to the west of the junction with Isallt Back) the link is subject to the national speed limit with no footpaths or street lighting present.

23.5.11. Link 10 – Parc Cybi

78. Link 10 Parc Cybi runs east from its roundabout junction with the A5153 into Trearddur Bay. Parc Cybi is a modern single-lane single carriageway road subject to a 30 mph speed limit with segregated footway/cycleway to the north and is street lit.

23.5.12. Link 11 – Porthdafarch Road

79. Porthdafarch Road is a single-lane single carriageway road that runs southwest from its junction with the B4545 Kingsland Road to its junction with Lon Isallt. To the north, within the built up areas, the road is predominantly residential in character and subject to a 30 mph speed limit with a footway along at least one side of the road. This section of Porthdafarch Road is also traffic calmed and street lit.
80. To the south of the junction Cae Rhos the road becomes more rural in character and is subject to the national speed limit. A continue footway is however provide along the northern side of the road to the junction with link 8.

23.5.13. Link 12 – A5153

81. The A5153 is a modern a single-lane single carriageway road that runs west from its roundabout junction with the A5 through the A55 to its roundabout junction with the B4545.

82. The road is subject to a speed limit of 30 mph with footways and street lights provided on both sides of the road.

23.5.14. Link 13 – B4545 Kingsland Road / Lon St Ffraid

83. The B4545 is a single carriageway road to provide a link from A5153 (link 12) south to Trearddur Bay. To the south of the junction with the A5153 the link is subject to a speed limit of 30 mph and footways are provided along both sides of the road. The speed limit then increases to 40 mph and a footway is provided along the western side of the road until entering the built-up area of Trearddur Bay. At this point the speed limit reduces to 30 mph and there are generally footways along both sides of the road with street lighting.

23.5.15. Traffic Flow Data

84. Baseline traffic flow data including details of the data source for all the key links within the traffic and transport study area are summarised in **Table 23-9**.

85. **Table 23-9** provides details of the total Annual Average Daily Traffic Flows (AADT) and the HGV component. This assessment uses the term HGV as a proxy for HGVs and buses / coaches recognising the similar size and environmental characteristics of the respective vehicle types.

Table 23-9 Existing Annual Average Daily Traffic Flows

Link ID	Link Description	Total Vehicles (24hr AADT)	Total HGVs (24hr AADT)	Data Source, Type and Date
1	A5 London Road	6,527	145	2017 DfT data
2	A55 North Wales Expressway	11,666	1,012	2017 DfT data
3	A55 North Wales Expressway / Victoria Road / A5154 Victoria Road	12,949	1,123	2017 DfT data
4	A5154 Victoria Road / Prince of Wales Road	3,264	73	2017 DfT data
5	Walthew Avenue / New Park Road / South Stack Road	3,167	85	March 2019 commissioned ATC
6	Unnamed Road from South Stack Road to Plas Road	443	8	March 2019 commissioned ATC
7	Plas Road	470	7	March 2019 commissioned ATC
8	Unnamed Road from Plas Road to Porthdafarch Road	443	8	March 2019 commissioned ATC
9	Lon Isallt	1,015	15	March 2019 commissioned ATC
10	Parc Cybi	1,255	415	March 2019 commissioned ATC
11	Porthdafarch Road	1,665	100	March 2019 commissioned ATC
12	A5153	8,475	196	2017 DfT data
13	B4545 Kingsland Road / Lon St Ffraid	4,040	118	March 2019 commissioned ATC

23.5.16. Link Based Sensitive Receptors

86. A desktop exercise has been undertaken to identify the sensitive receptors in the traffic and transport study area utilising the definitions outlined in **Table 23-6**. All 13 links within the traffic and transport study area have been assessed and assigned a sensitivity.
87. Recognising that the characteristics of a link may change along its length, the 13 links have been sub-divided to reflect the varying concentration of receptors. For example, a road passing through a village providing access to a school could be considered highly sensitive, whilst the same road passing between the villages where there is no frontage development could be considered a low sensitive receptor.
88. **Table 23-10** details the routes and the rationale for the applied link sensitivity and **Figure 23-3 (Volume II)** illustrates these routes graphically.

Table 23-10 Link Based Sensitive Receptors

Link ID	Link Description	Link Sensitivity	Rationale
1	A5 London Road	Low	The links are main A roads that can accommodate a high volume of traffic and have limited sensitive receptors
2	A55 North Wales Expressway	Low	
3	A55 North Wales Expressway / Victoria Road / A5154 Victoria Road	Low	
4	A5154 Victoria Road / Prince of Wales Road	High	The link is an A-road that passes through built up areas. These built up areas have significant frontage developments including residential properties, shops, restaurants and public houses.
5a	Walthew Avenue / New Park Road / South Stack Road	High	The link passes through built up areas with significant frontage developments including residential properties, parks and schools.
5b	South Stack Road	Low	The link has no frontage developments present
6	Unnamed Road from South Stack Road to Plas Road	Low	The link has no frontage developments present
7a	Plas Road south to junction with Bryn Gwyn Road	High	The link passes through built up areas with significant frontage developments including a school, church, and doctor's surgery
7b	Plas Road south from with Bryn Gwyn Road	Low	The link has minimal frontage development present
8	Unnamed Road from Plas Road to Porthdafarch Road	Low	The link has minimal frontage development present
9a	Lon Isallt	Medium	The link has minimal frontage development present, however it does provide direct vehicular access to Porth Dafarch beach
9b	Lon Isallt within the built-up area of Trearddur Bay	High	The link passes through built up areas with residential frontage development and also provides direct access to Trearddur Bay Beach
10	Parc Cybi	Low	The link is predominantly a modern road with wide footways setback from the road, dropped kerb

Link ID	Link Description	Link Sensitivity	Rationale
			crossings and minimal frontage development present
11a	Porthdafarch Road	High	The link passes through built up areas with residential frontage development
11b	Porthdafarch Road	Medium	The link has minimal frontage development present, however, the does provide a pedestrian route to access attractions including such as Anglesey Outdoors and Porth Dafarch beach
12	A5153	Low	The link is a modern A-road with wide footways and signalised pedestrian crossings present. There is also minimal frontage development present in the form of retail shops which are setback from the road and served by the footways
13a	B4545 south to the built-up area of Trearddur Bay	Medium	The link has some residential frontage development and provides access to Holyhead Golf Club
13b	B4545 within Trearddur Bay	High	The road is a B-road that passes through built up areas with significant frontage developments including, residential properties and shops

23.5.17. Road Safety

89. To understand whether the Project would have a significant road safety impact, it is necessary to establish a baseline and identify any inherent road safety issues within the traffic and transport study area.
90. In order to establish whether there are any inherent safety issues a high-level search of the traffic and transport study area utilising open source data (Crashmap.co.uk) has been undertaken to identify any Personal Injury Collision (PIC) clusters.
91. Attempts were made by Royal HaskoningDHV to obtain more detail of the collisions (known as STATS19 data) from the Isle of Anglesey County Council, however, to date no response has been received.
92. Within the traffic and transport study area a total of 22 collisions occurred within the most recent five-year period available (January 2014 to December 2018), of these 15 were regarded as slight, six were serious, and one was fatal. **Table 23-11** provides a summary of the collisions and their locations in respect to the links.

Table 23-11 Summary of Collision Data

Link ID	Link Description	No. of Collisions			Summary
		Fatal	Serious	Slight	
1	A5 London Road	0	0	2	Two slight collision identified. None of two the collisions occurred within the proximity of each other.
2	A55 North Wales Expressway	0	1	1	One slight and one serious collision identified. None of two the collisions occurred within the proximity of each other.

Link ID	Link Description	No. of Collisions			Summary
		Fatal	Serious	Slight	
3	A55 North Wales Expressway / Victoria Road / A5154 Victoria Road	0	2	3	One collision occurred at the A55 junction 2, two collisions occurred at the A55 roundabout junction with Kingsland Road and two at the signalised junction with the A5154.
4	A5154 Victoria Road / Prince of Wales Road	0	1	4	One collision serious collision occurred close to the junction with Market Street. Three slight collisions occurred south of Station Street close to The Dublin Packet Public House and one slight collision occurred close to the H.M. Coastguard building.
5	Walthew Avenue / New Park Road / South Stack Road	0	0	0	No recorded collisions within assessment period
6	Unnamed Road from South Stack Road to Plas Road	0	0	1	One slight collision identified.
7	Plas Road	0	0	0	No recorded collisions within assessment period
8	Unnamed Road from Plas Road to Porthdafarch Road	0	0	0	No recorded collisions within assessment period
9	Lon Isallt	0	1	1	One serious and one slight collision identified. Neither of two the collisions occurred within the proximity of each other
10	Parc Cybi	0	0	0	No recorded collisions within assessment period
11	Porthdafarch Road	0	0	0	No recorded collisions within assessment period
12	A5153	0	1	2	Two slight and one serious collision identified at different roundabouts
13	B4545 Kingsland Road / Lon St Ffraid	1	0	1	One fatal and one slight collision identified. Neither of two the collisions occurred within the proximity of each other
Total		1	6	15	

93. **Table 23-11** identifies that no collision clusters were identified on any of the links within the traffic and transport study area. It is therefore considered that there are not any inherent safety issues in the traffic and transport study area.

94. Therefore, from a road safety perspective, the study area is considered to be of negligible sensitivity and the addition of development traffic is unlikely to result in significant impact. As such, no further assessment of road safety is presented.

23.5.18. Anticipated Trends in Baseline Condition

95. It is considered that the earliest date that construction could commence would be 2021; as such a baseline year for background traffic of 2021 has been derived for the purpose of this assessment.

96. To take account of sub-regional growth in housing and employment, the baseline flows have been factored to the future year baseline traffic using the Department for Transport Trip End Model Presentation Programme (TEMPro) Version 7.0, for the Isle of Anglesey and adjusted with National Trip End Model dataset AF15.

23.6. IMPACT ASSESSMENT

23.6.1. Mitigation

23.6.1.1. Embedded Mitigation

97. During the development of the detailed engineering design, a number of embedded mitigation measures have been included to reduce the potential impacts of the project. Full details of these are included in **Chapter 4, Project Description**. There are no embedded mitigation measures specific to Traffic and Transport impacts.

23.6.1.2. Additional Mitigation

98. Where significant adverse impacts have been identified as a result of the Project, additional site specific mitigation measures are proposed to seek to reduce residual impacts to acceptable (non-significant) levels. These are described where required within **Section 23.6.3**.

23.6.2. Worst Case Scenario

99. **Table 23-12** identifies the realistic worst-case parameters of the onshore infrastructure that are relevant to potential impacts on traffic and transport during construction, operation and decommissioning phases of the Project.

Table 23-12 Realistic Worst-Case Scenarios

Parameter	Notes
Construction	
Full overlap of the peak period for all onshore infrastructure, namely: <ul style="list-style-type: none"> ▪ Landfall substation; ▪ Landfall Horizontal Directional Drilling (HDD); ▪ Grid connection substation; ▪ A55 and North Wales Coast Railway HDD; and ▪ Cable installation. 	Represents maximum possible intensity of activities resulting in peak traffic generation.
Earliest start of construction 2021	2021 has been used as the realistic construction start date for the purpose of the assessment of environmental impacts.
No allowance for construction workers to car-share or be able to travel by non-car modes (bus, rail, walking and cycling) has been applied to the traffic demand	Represents a worst case, as the adoption of car-sharing, or use of non-car modes would reduce the assessed vehicle movements.
HGVs deliveries profiled over a 10-hour window.	A 7am to 7pm (12hr) 'delivery window' has been assumed with ten hours delivery time allocated. This results in higher hourly HGV flows (than 12hrs) but allows for breaks in deliveries (to allow deliveries to be suspended during particularly sensitive periods, e.g. school start and finish times).

Parameter	Notes
Workers departing for home are assumed to overlap with the evening network peak hour (17:00 – 18:00).	The nature of construction works typically requires that employees work longer hours in the summer and shorter hours in the winter to take advantage of the available daylight. Therefore, as a worst case, peak construction worker movements are assumed to overlap with peak background traffic.
Operation	
It anticipated that the landfall and grid connection substations would not normally be staffed. During the operational phase, vehicle movements would therefore be limited to occasional repair, maintenance and inspection visits at the substations.	
Decommissioning	
HGV and Light Commercial Vehicle (LCV) traffic demand as per construction, assuming minimal opportunities to leave components in-situ or recycle materials on site.	Represents peak decommissioning traffic impacts.

23.6.3. Potential Impacts During Construction

23.6.3.1. Trip Generation and Assignment

100. This section forecasts the traffic generated by the Project and distributes vehicle trips to the highway network to establish a basis for assessing the potential transport impacts.
101. The traffic generation that has informed this assessment has been derived by way of a ‘first principles’ approach. The first principles approach generates traffic volumes from an understanding of material quantities and personnel numbers required for the Project and converts these metrics into vehicle movements.
102. Construction consultants (Black and Veatch Ltd.) have been commissioned to provide industry expertise and to develop the methodologies and quantities that underpin the traffic demand assumptions for the Project.
103. The construction workforce would consist primarily of specialist workers who travel to work on similar projects throughout the UK. To supplement this, local workers would be used where possible, subject to required skills being available. The peak number of construction employees required has been estimated at up to 70 per day, further details regarding the likely split between the various construction activities is provided within **Table 23-13**.
104. The following **Table 23-13** also provides a summary of the forecast HGV movements for the respective construction activities. The numbers presented within **Table 23-13** represent the peak periods for each construction activity.

Table 23-13 Peak Two-Way Vehicle Movements

Construction Activities	Peak two-way * daily HGV movements	Peak two-way * LCV ** movements	Peak all vehicle movements (two-way *)
Onshore cable installation	6	24	30
Landfall substation and HDD	20	64	84

Construction Activities	Peak two-way * daily HGV movements	Peak two-way * LCV **	Peak all vehicle movements (two-way *)
Inland substation and HDD	20	52	72
Total	46	140	186

Notes	
*	<i>A two-way movement represents the inbound (laden trip from source/home) and the outbound trip (back to source/home). For example, 20 two-way HGV movements comprise 10 laden trips from source and 10 outbound unladen trips back to source.</i>
**	<i>LCV (Light Commercial Vehicles) includes a range of vehicles, such as cars, vans, pickups, etc.</i>

105. It is proposed that vehicles associated with the landfall substation, landfall HDD and cable installation activities would first travel to the proposed site compound at that landfall substation. From this point, vehicles associated with the cable installation would then travel onwards to their respective work fronts. Vehicles associated with the inland substation and inland HDD would however, travel direct to these sites.
106. In order to consider a worst case, it is assumed that work on the all construction activities would occur simultaneously. It can therefore be calculated that as a worst case there could be up to 140 employee movements and 46 two-way HGV movements per day.
107. At the time of submission, the supply chain for materials cannot be informed by early contractor involvement as the procurement process has not commenced. Therefore, for the purpose of the assessment, traffic distribution assumes that HGVs would all be distributed to the A55 to an origin/ destination outside the study area. Furthermore, the types of specialist skills required for projects such as the Project means that construction personnel often have to be drawn from across the country and not necessarily from local labour sources, as such it has also been assumed that as a worst case all employees would travel to the area from the A55.

23.6.3.2. Traffic Impact Screening

108. In accordance with the GEART (Rule 1 and Rule 2), a screening process has been undertaken for the onshore highway study area to identify routes that are likely to have sufficient changes in traffic flows and therefore require further impact assessment.
109. **Table 23-14** summarise the assigned daily peak two-way vehicle movements (i.e. arrivals and departures) of all materials, personnel and plant during the peak in-combination month when distributed across the highway network.
110. **Table 23-14** also provide a comparison of the peak daily construction flows with the forecast background daily traffic flows in 2021 and identifies the links exceeding the GEART screening thresholds.

Table 23-14 Existing Annual Average Daily Traffic Flows

Link ID	Link Description	Link sensitivity	Background 2021 flows		Forecast Construction Vehicle Movements (two-way)		Percentage Increase	
			All Vehicles	HGVs	All Vehicles	HGVs	All Vehicles	HGVs
1	A5 London Road	Low	6,790	151	98	40	1.4%	26.5%
2	A55 North Wales Expressway	Low	12,136	1,052	180	40	1.5%	3.8%
3	A55 North Wales Expressway / Victoria Road / A5154 Victoria Road	Low	13,471	1,168	108	20	0.8%	1.7%
4	A5154 Victoria Road / Prince of Wales Road	High	3,396	76	108	20	3.2%	26.3%
5	Walthew Avenue / New Park Road / South Stack Road	Low - High	3,228	86	108	20	3.3%	23.2%
6	Unnamed Road from South Stack Road to Plas Road	Low	452	8	32	8	7.1%	100%
7	Plas Road	Low - High	479	7	0	0	0.0%	0.0%
8	Unnamed Road from Plas Road to Porthdafarch Road	Low	452	8	32	8	7.1%	100%
9	Lon Isallt	Medium - High	1,035	15	0	0	0.0%	0.0%
10	Parc Cybi	Low	1,280	423	58	28	4.5%	6.6%
11	Porthdafarch Road	Medium - High	1,698	102	32	8	1.9%	7.8%
12	A5153	Low	8,817	204	130	48	1.5%	23.5%
13	B4545 Kingsland Road / Lon St Ffraid	Medium - High	4,118	120	0	0	0.0%	0.0%
Links above GEART screening thresholds								

111. In accordance with GEART only those links that are showing greater than 10% increase in total traffic flows (or HGV component) for sensitive links, or greater than 30% increase in total traffic or HGV component for all other links, are considered when assessing the traffic impact upon receptors.
112. It is noted from **Table 23-14** that links 1, 2, 3, 7 and 9 to 13 are below the GEART screening thresholds and are therefore not considered further in the impact assessment are negligible. The remaining links (highlighted within **Table 23-14**) are all above the GEART screening thresholds and are therefore considered further.
113. The following paragraphs summarise the assessment of construction traffic impacts on the effects identified as being susceptible to changes in flow.

23.6.3.3. Impact 1: Severance

114. The peak daily change in total traffic flow for all screened links is significantly less than a 30% change in total traffic, therefore, applying the GEART severance threshold (**Table 23-7**) the magnitude of effect is assessed as negligible on low to high sensitivity links giving a maximum impact of **negligible to minor adverse**.

23.6.3.4. Impact 2: Pedestrian Amenity

115. The peak daily change in total flows or HGV component for links 6 and 8 is greater than the 100 % GEART impact threshold, which suggests adverse amenity impacts may be experienced.
116. Link 6 and 8 comprises of an unnamed road from between South Stack Road and Porthdafarch Road, the links are assessed as low value sensitivity noting there is no frontage development, and no footways along the road, suggesting limited pedestrian demand. The links are subject to a 100 % increase in HGVs, however, it is noteworthy that there is a very low baseline of HGV traffic (8 HGVs a day), as such the addition of 8 two-way HGV movements per day associated with the Project results in a significant percentage increase.
117. The proposed HGV movements would be associated with HGVs departing from the site compound at the landfall substation and travelling to work on installing the Project's cables along the roads between South Stack Road and Mill Road. These HGVs would typically depart from the site compound at the start of the day within one hour and return at the end of the shift within an hour, as such for the majority of the day no additional HGV traffic would be observed.
118. The magnitude of effect is therefore assessed as medium on a low sensitivity link resulting in a **minor adverse** impact.

23.6.3.5. Impact 3: Road Safety

119. **Table 23-11** identifies that no collision clusters were identified on any of the links within the traffic and transport study area. It is therefore considered that there are no inherent safety issues within the traffic and transport study area. Therefore, from a road safety perspective, the study area is considered to be of negligible sensitivity and the addition of development traffic is likely to result in a negligible impact upon existing road safety issues.
120. It is considered however, that at new points of access to the highway network, the intensification of slow-moving construction traffic aligned to high speed rural roads could potentially lead to significant adverse road safety impacts. Therefore, a package of mitigation measures has been developed to reduce the risk to the travelling public and construction employees at these locations.

23.6.3.5.1. Mitigation

121. The following additional measures would be applied to reduce the road safety impacts associated with the intensification of slow-moving construction traffic at new and existing points of access.

122. A new access is proposed to the landfall substation off South Stack Road, an access concept design is detailed within **Appendix 23-2 (Volume III)**. The concept presented minimises the visual impact upon the existing landscape character, this has however resulted in a reduced carriageway width that would not accommodate two-way HGV movements.
123. To manage the potential for conflicting HGV movements at the access, it is proposed that measures would be agreed with the local highway authority post consent once a Contractor has been appointed through the development of a detailed CTMP, the measures could include:
- Advanced scheduling of deliveries and assigning of delivery slots to reduce the potential for two vehicles to meet at the access;
 - Requiring drivers to call ahead to confirm their expected arrival time; and
 - Controlling all departing HGV traffic through the use of a banksman.
124. In addition to the proposed CTMP measures, the access designs incorporate the following mitigation measures:
- The access would be provided with appropriate visibility splays to allow vehicles to safely access and exit, these would be maintained by the appointed Contractor;
 - The access would incorporate a bound (concrete or asphalt) surface to prevent dust and dirt being tracked on to the highway, reducing the potential for vehicles to lose control on loose material;
 - Temporary direction and warning signs to advise of turning vehicles would be provided for the construction phase. This signage would highlight the proposed access to drivers to avoid late breaking manoeuvres and highlight to the travelling public the potential for turning vehicles; and
 - A temporary reduction in the existing speed limit in the vicinity of the access would be implemented during the construction phase to reduce the speed of vehicles in the vicinity of the access.
125. Access to the grid connection substation and HDD under the A55 and North Wales Coast Railway line would be from the existing Orthios Eco Park access from the A5. The corresponding reception pit for the HDD on the southern side of the A5 and North Wales Coast Railway line would be provided from an existing access with Parc Cybi. Therefore, in order to make the public aware of the potential for constriction traffic to be using these accesses, temporary direction and warning signs to advise of turning vehicles would be provided. This signage would highlight the proposed accesses to drivers to avoid late breaking manoeuvres and highlight to the travelling public the potential for turning vehicles.

23.6.3.5.2. Residual Impact

126. Following the implementation of these additional mitigation measures, the potential for road safety impacts associated with the intensification of slow-moving construction traffic at new and existing points of access, the magnitude is assessed as negligible on high value receptors resulting in a **minor adverse** residual impact.

23.6.3.6. Impact 4: Driver Delay (Capacity)

127. The GEART screening thresholds do not apply to this effect as the potential impact is defined as significant when the highway network surrounding the development under consideration is at or close to capacity.
128. The most sensitive time for Driver Delay would be when the daytime construction shift finishes at the same time as the evening network peak. During this period, construction employees would be departing their place of work and HGVs would be returning from making deliveries.
129. To assess if this has the potential for significant impacts the traffic generation associated with all construction employees departing work and peak hourly HGV demand (daily HGV demand profiled across ten hours) has been considered.
130. This peak hour demand has been assigned to the main junctions within the traffic and transport study area. **Table 23-15** details the resultant traffic flows arriving at the junctions during the peak hour.

Table 23-15 Peak Hour Construction Traffic Flows Through Junctions

Junction	Entry arms	All vehicles	HGVs
Junction 1: A55 junction with the A5153	A55 westbound off-slip	1	1
	A55 eastbound off-slip	0	0
	A5153 north of A55	43	2
	A5153 south of A55	16	1
Junction 2: A55 junction with Kingsland Road	A55 North Wales Expressway	1	1
	Kingsland Road (south)	0	0
	Kingsland Road (north)	0	0
	A55 Victoria Road	45	1
Junction 3: A55 signalised junction with A5154	A55 Victoria Road	1	1
	A55 London Road	0	0
	A5154 Victoria Road	45	1

131. **Table 23-15** identifies that the peak construction traffic total flows through any arm is 45 vehicle per hour.
132. It is considered that the forecast increase in all vehicle movements through the junctions would not be significant in the context of the existing traffic levels. The magnitude of effect is therefore assessed as negligible on a potentially high value receptor resulting in a **minor adverse** impact.

23.6.3.7. Impact 5: Driver Delay (Road Closures)

133. **Chapter 4, Project Description** sets out that the Project cables would need to be installed in the highway between the proposed landfall substation and the grid connection substation, the cables would follow the route detailed below:

- South from the landfall substation via South Stack Road (link 5);

- East along link 6 and 8 from South Stack Road to Porthdafarch Road (link 11);
- North on Porthdafarch Road (link 11) to its junction with Mill Road;
- East on Mill Road for approximately 600 m before heading across fields to the Holyhead Leisure Centre;
- North through the Holyhead Leisure Centre car park and access road to link up with the A5153;
- North at the roundabout junction with the A5153 (link 12) to the junction with Parc Cybi (link 10); and
- East along Parc Cybi before passing under the A55 and North Wales Coast Railway line (by HDD) to reach the grid connection substation.

134. **Chapter 4, Project Description** sets out that the preferred option to bring the offshore cables onshore would be via HDD, with the cables installed under South Stack Road. However, an alternative option may be required where the cables would need to be installed by open trenching across South Stack Road. This open trenching option is therefore considered further as a worst case.
135. To ensure the safety of existing highway users and employees installing the cables, there would be a requirement to maintain a safe working distance between the cable installation works and live traffic.
136. The construction consultant for the Project (Black and Veatch Ltd.) have undertaken an initial review of the available highway width along each link and identified the preferred traffic management strategy. The final traffic management strategy and working practices may however need to be refined once a Contractor is appointed and final working practices are established. It is proposed that the final traffic management strategy would be agreed with the local highway authority post consent through the development of a detailed CTMP.
137. **Table 23-16** sets out details of the initial the traffic management strategy and details of the existing highway conditions via each link.

Table 23-16 Cable Installation Traffic Management Proposals

Link	Peak hour traffic flows	Footway/ Cycleway	Bus Route	Proposed traffic management
5	273	No	No	Single lane closure
6	54	No	No	Full road closure
8	54	No	No	Single lane closure
11	150	Yes	No	Full road closure
Mill Road	< 150	Yes	No	Full road closure
12	792 *	Yes	Yes	Single lane closure
10	115	Yes	Yes	Single lane closure
South Stack Road (west of link 6)	54	No	No	Single lane closure **
Notes				
* peak hour flow derived from annual average daily traffic flows				

Link	Peak hour traffic flows	Footway/ Cycleway	Bus Route	Proposed traffic management
** facilitated through temporary road widening				

138. It can be noted from **Table 23-16** that due to the narrowness of the existing highway, a full road closure would be required for three sections to allow the Contractor to safely install the Project's cables in the road whilst the five sections could be undertaken under single lane working, i.e. one lane of traffic remains operational.
139. With regards to managing the traffic through the single lane closure following measures would be applied to reduce the potentially adverse impacts. These measures would be agreed with the local highway authority post consent once a Contractor has been appointed through the development of a detailed CTMP, the measures would include:
- Controlling traffic through temporary traffic signals/ stop go boards;
 - Maintaining a safe route for pedestrians through the works area; and
 - Working with the local highway authority and local stakeholders to agree an appropriate time to undertake the works.
140. In addition to the measures outline above, to manage traffic through the single lane closure of South Stack Road (west of link 6) it would also be necessary to temporarily widen the highway into the adjoining verges. This temporary widening would maintain single lane traffic flow at all times, thus avoiding the need to close the road.
141. The Traffic Signs Manual (DfT, 2009) identifies that on roads with two-way flows of more than 1,300 vehicles per hour, overload of the controlled area is possible and exceptional delays may occur. It can be noted from **Table 23-16** that the flows on all roads are significantly less than 1,300 vehicles. It is therefore considered that the impact of a single lane closure upon links 5, 8, 10, 12 and South Stack Road (west of link 6) would be **negligible**.
142. With regards to links 6, 11 and Mill Road a full road closure would be required whilst the cables are installed. This could potentially lead to significant impacts as access to local businesses and properties along the routes as well as delays between people travelling along the link.
143. To reduce the impact upon local receptors along the links that require closing, further consideration has been given to the staging the cable route works to ensure that where possible local access is maintained. **Figure 23-4 (Volume II)** demonstrates that through staging of the works, local access can be maintained to all but three properties. The delivery contractor will schedule work to minimise the impact on these properties such that any closure is temporary in nature and limited to several days, with alternative access arrangements made.
144. The impact upon those local properties and businesses where access can be maintained is assessed as negligible on high sensitive receptors resulting in a **minor adverse** impact. The impact upon those three local properties where direct access cannot be maintained is assessed as high on high sensitive receptors resulting in a **major adverse** impact. Therefore, a package of mitigation measures has been developed to reduce the impact upon residents of these three properties.

145. A review of the destinations along links 6 and 11 that could be impacted by a closure of the road has been undertaken, this has identified the following particularly sensitive trip attractors:
- South Stack Cliffs Nature Reserve and South Stack Light House;
 - South Stack cliffs Nature Reserve and Royal Society for the Protection of Birds (RSPB) The Range;
 - Porth Dafarch Beach; and
 - Anglesey Outdoors.
146. The following tables (**Table 23-18** to **Table 23-20**) therefore set out a comparison of the time taken to reach each of these key trip attractors without a closure from within Anglesey and also approaching Anglesey on the A55. The tables also then provide details of the likely diversion routes and the additional time taken if link 6 or 11 were closed. The journey times presented have been taken from the google maps route planner for a weekday at midday.



Table 23-17 South Stack Cliffs Nature Reserve and South Stack Light House (LL65 1YH)

	North West of Holyhead (LL65 1AG)		South West of Holyhead (LL65 2AP)		South East of Holyhead (A55 Junction 2)		North East of Holyhead (LL65 2DU)		Trearddur (LL65 2LJ)	
Current route	Link 5		Link 5		Link 2, 3, 5		Link 4, 5		Link 9, 8, 6	
Journey time via current route	10 minutes		12 minutes		13 minutes		15 minutes		16 minutes	
Closure	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11
Proposed diversion	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Link 13, 3, 4, 5	n/a
Journey time via proposed diversion	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	16 minutes	n/a
Additional journey time	0 minutes	0 minutes	0 minutes	0 minutes	0 minutes	0 minutes	0 minutes	0 minutes	0 minutes	0 minutes

Table 23-18 South Stack cliffs Nature Reserve and RSPB The Range (LL65 2NA)

	North West of Holyhead (LL65 1AG)		South West of Holyhead (LL65 2AP)		South East of Holyhead (A55 Junction 2)		North East of Holyhead (LL65 2DU)		Trearddur (LL65 2LJ)	
Current route	Link 5, 6		Link 7, 6		Link 2, 3, 11, 8, 6		Link 3, 11, 8, 6		Link 9, 8, 6	
Journey time via current route	9 minutes		12 minutes		12 minutes		14 minutes		12 minutes	
Closure	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11
Proposed diversion	Link 7, 6	n/a	Link 11, 8, 6	n/a	Link 2, 3, 4, 5, 6	Link 2, 3, 4, 7, 6	Link 3, 4, 5, 6	Link 3, 4, 5, 6	Link 13, 3, 4, 5, 6	n/a
Journey time via proposed diversion	12 minutes	n/a	12 minutes	n/a	12 minutes	12 minutes	14 minutes	14 minutes	16 minutes	n/a
Additional journey time	3 minutes	0 minutes	0 minutes	0 minutes	0 minutes	0 minute	0 minute	0 minute	4 minutes	0 minutes



Table 23-19 Porth Dafarch (LL65 2LS)

	North West of Holyhead (LL65 1AG)		South West of Holyhead (LL65 2AP)		South East of Holyhead (A55 Junction 2)		North East of Holyhead (LL65 2DU)		Trearddur (LL65 2LJ)	
Current route	Link 5, 6, 8		Link 11		Link 2, 3, 11		Link 3, 11		Link 9	
Journey time via current route	12 minutes		9 minutes		8 minutes		10 minutes		7 minutes	
Closure	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11
Proposed diversion	Link 7, 8	n/a	n/a	Link 7, 8	n/a	Link 2, 12, 13, 9	n/a	Link 3, 7, 9	n/a	n/a
Journey time via proposed diversion	12 minutes	n/a	n/a	12 minutes	n/a	12 minutes	n/a	14 minutes	n/a	n/a
Additional journey time	0 minutes	0 minutes	0 minutes	3 minutes	0 minutes	4 minutes	0 minutes	4 minutes	0 minutes	0 minutes

Table 23-20 Anglesey Outdoors (LL65 2LP)

	North West of Holyhead (LL65 1AG)		South West of Holyhead (LL65 2AP)		South East of Holyhead (A55 Junction 2)		North East of Holyhead (LL65 2DU)		Trearddur (LL65 2LJ)	
Current route	Link 4, 3, 11		Link 11		Link 2, 3, 11		Link 3, 11		Link 9, 11	
Journey time via current route	12 minutes		7 minutes		5 minutes		8 minutes		8 minutes	
Closure	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11	Link 6	Link 11
Proposed diversion	n/a	Link 7, 8, 11	n/a	Link 7, 8, 11	n/a	Link 2, 12, 13, 9, 11	n/a	Link 3, 4, 7, 8, 11	n/a	Link 13, 11
Journey time via proposed diversion	n/a	14 minutes	n/a	14 minutes	n/a	12 minutes	n/a	14 minutes	n/a	9 minutes
Additional journey time	0 minutes	2 minutes	0 minutes	7 minutes	0 minutes	7 minutes	0 minutes	6 minutes	0 minutes	1 minute

147. It can be noted from **Table 23-18** to **Table 23-20** that where the road closure introduce delays, these delays would range between one and seven minutes. There are no commonly agreed thresholds for where delays from road works would be significant, however Chapter 8 of the Traffic Signs Manual (DfT, 2009) does advise that advanced signing of road works should be considered for shorter duration works where the temporary traffic management design indicates that there are likely to be moderate or severe delays of 10 minutes or more.
148. It is therefore reasoned that as delays are likely to less than 10 minutes and would be short term in duration, the delays would not be considered severe. It is therefore concluded that the magnitude of effect would be low on receptors of low sensitivity resulting in a **minor adverse** impact.
149. Prior to the commencement of construction, a CTMP would be submitted to the local highway authority, this CTMP would include details of:
- Proposed traffic management measures;
 - Staging of the construction activities;
 - The proposed diversion routes and advanced signing;
 - Details of the measure to manage impacts upon local residents; and
 - Details of measures to escort pedestrians and cyclists through the works.

23.6.3.7.1. Mitigation

150. With regards driver delay impacts upon the three properties that would be within the road closures, the following additional mitigation measures are proposed:
- Establishing a direct line of communication with residents to discuss the proposed timing of the works;
 - Providing temporary parking within the closed section of highway as close to the properties as possible;
 - Ensure that a banksman is available to guide residents safely through the works area; and
 - Provide assistance with carrying heavy items (shopping, bins, etc.) between the resident's vehicles and home.

23.6.3.7.2. Residual Impact

151. Following the implementation of these additional mitigation measures, the potential for driver delay impacts associated with the delay impacts upon the three properties that would be within the road closures, the magnitude is assessed as low on high value receptors resulting in a **moderate adverse** residual impact.

23.6.4. Potential Impacts During Operation

152. It is anticipated that the Project would not be permanently staffed. During the operational phase, vehicle movements would therefore be limited to periodic maintenance visits at the landfall and grid connection substations.
153. It is anticipated that maintenance visits could result in a peak of 10 employees (20 two-way movements) per day to either the landfall or grid connection substations.
154. During the operational phase access to the landfall substation would be via the new construction access from South Stack Road (detailed within **Appendix 23-2, Volume III**). This access would be constructed during the construction phase and remain in place for the life of the Project. Operational access to the grid connection substation would be from the existing Holyhead Eco Park access with the A5.
155. Considering the activities listed above, **no discernible impacts** are anticipated during the operational phase.

23.6.5. Potential Impacts During Decommissioning

156. No decision has been made regarding the final decommissioning policy for the Project as it is recognised that industry best practice, rules and legislation change over time. However, the substation equipment would likely be removed and reused or recycled and it is expected the onshore cables would be left in situ.
157. Intuitively, the decommissioning of the onshore cable would require less demand for HGV and personnel movements than that of the construction phase, whilst the decommissioning of the substation would potentially result in similar levels of HGV demand. Therefore, the overall magnitude of effects would be lower.
158. It is therefore expected that the traffic impacts are likely to be less than those presented for the construction phase and similar mitigation strategies would be valid for decommissioning.
159. The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with Isle of Anglesey County Council. A decommissioning plan would be provided.

23.6.6. Cumulative Impacts

160. The potential for cumulative impacts to occur as a result of the interaction between the Project and other plans, projects and activities was considered. Firstly, the potential for impacts identified in the traffic and transport assessment to act cumulatively with other projects was identified, as summarised in **Table 23-21**.

Table 23-21 Potential for Cumulative Impacts

Impact	Potential for Cumulative Impact	Data Confidence	Rationale
Construction			
Impact 1: Severance	Yes	High	Multiple projects could lead to increases in traffic flows which may lead to cumulative impacts upon receptors.
Impact 2: Pedestrian/ Cycle Amenity	Yes	High	
Impact 3: Road Safety	No	High	It has been demonstrated that there are no inherent safety issues within the traffic and transport study area.
Impact 4: Driver Delay (capacity)	Yes	High	Multiple projects could lead to increases in traffic flows which may lead to cumulative impacts upon receptors.
Impact 5: Driver Delay (road closures)	Yes	High	
Operation			
There are not anticipated to be any disenable traffic and transport impacts during the operational phase that would give rise to significant cumulative impacts.			
Decommissioning			
It is anticipated that the decommissioning impacts would be no worse than those of construction.			

161. The next stage of the CIA is to identify other plans or projects where the same road network will be used for multiple projects, plans or activities.
162. All offshore cumulative projects were scoped out of the traffic and transport CIA, as it was assumed that the potential for significant impacts to occur in combination with the onshore aspects considered in this assessment was minimal.
163. It can be noted from **Table 23-14** that the proposed traffic flows via the road links to Holy Island (the A5 and A55) are below GEART screening thresholds and are therefore, assessed to result in no discernible or negligible environmental impacts. Therefore, all projects elsewhere in North Wales offshore are scoped out of the traffic and transport CIA
164. The projects considered in the CIA therefore included those on Holy Island only. No projects were taken forward for CIA. A summary of the potential for cumulative impacts to occur is detailed in **Table 23-22**.

Table 23-22 Potential for Cumulative Impacts to Occur

Project	Status	Distance from the Project (km)	Included in CIA	Rationale
Extensions to dwelling	Consented 13/03/19, construction status unknown	0	No	Sub-regional growth in housing and employment has been captured within TEMPro future year growth factors for 2021. Therefore, the cumulative effect of these
Holyhead	Application validated: 03/01/2019	1.8	No	
Parc Cybi	Consented, construction status unknown	0	No	

Project	Status	Distance from the Project (km)	Included in CIA	Rationale
Conversion of outbuilding	Consented, construction status unknown	0.4	No	housing and employment projects is inherent in the traffic and transport impact assessments.
Penrhos Industrial Estate	Application validated: 06/03/2019	0.5	No	
Trearddur Bay Hotel	Consented, construction status unknown	1.3	No	
Tyn Towyn Caravan Park	Consented, construction status unknown Date valid: 26/03/2019	1.8	No	
Porth Diana Boat Yard	Application validated: 28/02/2019, awaiting decision	2.4	No	
Penrhos Coastal Park	Consented, construction status unknown	0.35	No	At the time of writing, the Isle of Anglesey Council note that they are transferring planning information to a new planning portal, as such no information is available enable a full CIA to be undertaken.
Roadking Parc Cybi	Consented, construction status unknown	0	No	
Holyhead Port	Application validated: 23/11/2018	1.3	No	
Breakwater Country Park	Application validated: 04/03/2019, awaiting decision	1.6	No	
Tyn Towyn Caravan Park	Consented, construction status unknown Date valid: 26/03/2019	1.8	No	
Holy Island Resort	Planning permission granted.	2.5	No	
Holyhead Deep Phase I	In April 2017, a Marine Licence was granted for the first 0.5MW installation.	2.0	No	The ES for the Holyhead Deep Project does not present any information regarding onshore traffic and transport impacts.
Reclamation adjacent to Terminal 4 of the Port of Holyhead	Scoping Report submitted 28/04/17	2.0	No	At the time of writing, the only information available is provided within a Scoping Report. The Scoping Report does not however provide details of likely traffic increases, as such it is considered that there is insufficient information to allow a full CIA to be undertaken.
Holyhead Waterfront Redevelopment	Pre-application	2.0	No	At the time of writing, the ES was not available online and as such there is insufficient information to allow a full CIA to be undertaken.

23.6.7. Inter-relationships

165. **Table 23-25** lists out the inter-relationships between this chapter and other chapters within the ES.

Table 23-23 Inter-topic relationships

Topic and description	Related Chapter	Where addressed in this Chapter	Rationale
Noise and Vibration	Chapter 21	Section 21.10.4 Construction Road Traffic Noise Emissions	The forecast construction traffic numbers contained within this chapter have been used to inform an assessment of traffic borne noise and vibration impacts. No significant residual noise and vibration effects have been identified.
Air Quality	Chapter 22	Section 22.6.4 Construction Phase road Traffic Emissions	The forecast construction traffic numbers contained within this chapter have been used to inform an assessment of traffic borne air quality impacts. No significant residual air quality effects have been identified.

23.6.8. Interactions

166. The impacts identified and assessed in this chapter have the potential to interact with each other, which could give rise to synergistic impacts as a result of that interaction. The worst case impacts assessed within the chapter take these interactions into account and for the impact assessments are considered conservative and robust. For clarity the areas of interaction between impacts are presented in **Table 23-24**, along with an indication as to whether the interaction may give rise to synergistic impacts.

Table 23-24 Potential Interaction Between Impacts

Potential interaction between impacts					
Construction	1 Severance	2 Pedestrian Amenity	3 Road Safety	4 Driver Delay (Capacity)	5 Drive Delay (Road Closures)
1 Severance	-	Yes	Yes	No	No
2 Pedestrian Amenity	Yes	-	Yes	Yes	No
3 Road Safety	Yes	Yes	-	No	No
4 Driver Delay (Capacity)	No	Yes	No	-	No
5 Drive Delay (Road Closures)	Yes	Yes	Yes	Yes	-
Operation					
No significant impacts					

23.7. SUMMARY

167. This chapter of the ES has assessed the potential impacts of the onshore elements of the Project on the surrounding traffic sensitive receptors.

168. This chapter has been developed with regard to the legislative and policy framework outlined in **Section 23.2**. In accordance with national guidance, a traffic and transport study area has been identified, baseline conditions established and sensitive receptors within the study identified. The traffic and transport study area was screened to identify routes that could be potentially adversely impacted by the Project's traffic generation.

169. A total of 13 links within the traffic and transport study area have been assessed for the effects of severance, pedestrian/ cycle amenity, road safety and driver delay. This detailed assessment concluded that there will therefore be no impacts resulting from the proposed Project that are considered to be significant in EIA terms (i.e. moderate or major adverse) as shown in **Table 23-25**.



Table 23-25 Potential Impacts Identified for Traffic and Transport

Potential Impact	Receptor	Sensitivity	Magnitude	Significance	Additional Mitigation Measures	Residual Impact
Construction						
Impact 1: Severance	Links 4, 5, 6, 8	Low – High	Negligible	Negligible to Minor	n/a	Negligible to Minor
Impact 2: Pedestrian/ Cycle Amenity	Links 4 and 5	Low – High	Negligible	Negligible to Minor	n/a	Negligible to Minor
	Link 6 and 8	Low	Medium	Minor	n/a	Minor
Impact 3: Road Safety	All links	Negligible	Negligible	Negligible	n/a	Negligible
Impact 4: Driver Delay (capacity)	Junction 1, 2, 3	High	Negligible	Minor	n/a	Minor
	Landfall substation access	High	Medium	Major	CTMP management measures to prevent two HGVs meeting at the new access Provision of a new access to include a bound surface, advanced warning signs and a temporary speed limit.	Minor
Impact 5: Driver delay (road closures)	Links 5, 8, 10 12 and South Stack Road (west of link 6)	Low	Low	Minor	CTMP measures including: temporary traffic signals/ stop go boards; safe pedestrian routes; agreeing timing of works; and temporary road widening.	Minor
	Links 6, 11 and Mill Road	High	Negligible where direct access can be maintained	Minor	n/a	Minor
			High where direct access cannot be maintained	Major	Direct communication between the Contractor and residents; Temporary parking facilities; and Banksman to guide and assist residents through the works.	Moderate



Potential Impact	Receptor	Sensitivity	Magnitude	Significance	Additional Mitigation Measures	Residual Impact
	Links 6, 11	Low	Low	Minor	CTMP measures including: Detail of traffic management measures including proposed diversion signing; Staging of construction activities; and Details of measures to escort pedestrians and cyclists through the works.	Minor
Operation						
No discernible impacts						
Decommissioning						
It is anticipated that the decommissioning impacts would be no worse than those of construction.						

23.8. REFERENCES

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