HORIZON NUCLEAR POWER

WYLFA NEWYDD

ENERGY WORKING FOR BRITAIN

Wylfa Newydd Project

6.3.14 ES Volume C - Road traffic-related effects (project-wide) App C2-4 - DCO Transport Assessment

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1.1 Introduction

1.1.1 Horizon Nuclear Power Wylfa Limited (Horizon) is applying to the Secretary of State for a Development Consent Order (DCO) to construct, operate and maintain a new nuclear power station on the north-west coast of Anglesey in North Wales.

1.1.2 The Wylfa Newydd Project comprises the Wylfa Newydd DCO Project, the Licensable Marine Activities and the Enabling Works. The Wylfa Newydd DCO Project comprises: the Power Station (adjacent to the Existing Power Station which is currently being decommissioned); other on-site development; marine works and the Off-Site Power Station Facilities (comprising the Alternative Emergency Control Centre (AECC), Environmental Survey Laboratory (ESL) and a Mobile Emergency Equipment Garage (MEEG)).

1.1.3 During the construction phase, several specifically designed measures are embedded within the proposals to reduce the transport impacts of the Project. These include, but are not limited to, the Marine Off-Loading Facility (MOLF), a Logistics Centre at Parc Cybi and a Park and Ride facility at Dalar Hir.

1.2 Policy Context

1.2.1 The site at Wylfa Newydd is identified in *National Policy Statement (NPS) EN-1 (Overarching National Policy Statement for Energy)* Reference Document 1 [RD1] as being potentially suitable for a new nuclear power station. The Wylfa Newydd Project has been developed in accordance with *NPS EN-1* and associated *NPS EN-6 (National Policy Statement for Nuclear Power Generation)* [RD2].

1.2.2 Given the level and urgency for new energy infrastructure, *NPS EN-1* states that the starting position should be a presumption in favour of granting consent to applications for energy-related Nationally Significant Infrastructure Projects (NSIPs), such as Wylfa Newydd.

1.2.3 The NPSs also recognise that the development of new energy infrastructure, at the scale and speed required to meet current and future needs, is likely to result in a variety of impacts that will need to be considered and, where appropriate, mitigated. In considering these impacts, however, the NPS suggests that the development does not need to meet a 'nil detriment' or no impact standard.

1.3 Pre-Application Consultation

1.3.1 In developing the transport proposals for the Wylfa Newydd Project, the policy objectives of local, regional and national authorities have also been considered. Many of these policies are associated with transport and encourage travel by public transport, walking and cycling while discouraging travel by private car. There have also been extensive pre-application consultations and discussions with the Isle of Anglesey County Council, Gwynedd County Council, the Welsh Government and other local

stakeholders. The scope of this Transport Assessment has been discussed and developed with local stakeholders as part of these consultations.

1.4 Existing Situation

1.4.1 The proposed site for the Wylfa Newydd Power Station is accessed via the A5025. This is a single carriageway road with one lane in each direction which passes through several villages. The A5025 joins the strategic road network via the A5 at Valley where Junction 3 provides a grade-separated interchange with the A55. The A55 is a trunk road linking Holyhead with the North Wales coast via the Britannia Bridge. The A55 has two lanes in each direction except at the Britannia Bridge which has a single lane in each direction.

1.4.2 Traffic delays can occur in the morning and evening peak periods across the bridge due to the reduction from two lanes to one lane. These delays are generally tidal in nature: towards the mainland in the morning; and towards Anglesey in the afternoon. Delays increase during summer holiday periods and when ferries from Ireland dock at Holyhead and large numbers of vehicles disembark and travel eastwards towards the mainland. The rest of the highway network across Anglesey is generally uncongested.

1.4.3 A large programme of traffic surveys has been undertaken in consultation with local stakeholders to measure traffic flows, traffic composition and journey times across Anglesey, near the Britannia Bridge and around Bangor. These data have been used to prepare traffic models of the existing situation on Anglesey and around the Britannia Bridge.

1.4.4 Accident data have been examined at locations where there are clusters of accidents which would affect the transport strategy for the Project but no significant clusters have been found.

1.4.5 Bus services operate across Anglesey with relatively low frequencies reflecting the rural nature of much of the island. Holyhead Port provides ferry services to and from Ireland and there are national rail and coach stations at Holyhead and Bangor providing cross-country services towards Chester and beyond. A small airport at Valley provides a daily service to and from Cardiff.

1.5 Proposed Development

1.5.1 The Wylfa Newydd Project includes two new nuclear power reactors (referred to as Units) and a range of other facilities within the Wylfa Newydd Development Area. Construction of the Project is expected to take approximately nine years and at the peak there will be up to 9,000 construction workers. This peak lasts for approximately one year and for half of the nine-year construction period there will be fewer than 3,000 construction workers.

1.5.2 Once operational, the Power Station will require 850 workers. Each reactor will undergo routine maintenance on an 18-month cycle and this will require approximately 1,000 additional workers for one month. This is known as a Scheduled Outage period. When construction of the Power Station is complete, the Park and Ride site will be returned to its current use as agricultural land and the Logistics Centre will be able available for redevelopment as warehousing or an alternative employment use.

1.5.3 Other committed and proposed developments near the Wylfa Newydd Development Area (including the National Grid "North Wales Connection" scheme) and indeed schemes further afield have been considered as part of the assessment.

1.6 Integrated Traffic and Transport Strategy

1.6.1 An Integrated Traffic and Transport Strategy (ITTS) (Application Reference Number: 6.3.20) has been developed to inform the management of travel during the construction and operation of the Wylfa Newydd Project and describes measures to be adopted through the Wylfa Newydd Code of Construction Practice (CoCP) (Application Reference Number: 8.6) and the Wylfa Newydd Code of Operational Practice (CoOP) (Application Reference Number: 8.13) to keep transport impacts to a minimum.

1.6.2 During construction, up to 9,000 workers will be required. Travel impacts will be reduced by:

- enabling up to 4,000 workers to live at the Site Campus in the Wylfa Newydd Development Area meaning they would be able to walk to and from work each day;
- providing shuttle bus services for workers living on Anglesey and to/ from the mainland towns of Bangor and Caernarfon;
- providing a Park and Ride facility at Dalar Hir and a shuttle bus service between Dalar Hir and the Wylfa Newydd Development Area to reduce car travel by workers on the A5025; and
- requiring car sharing through a programme of incentivisation and management.

1.6.3 Up to 7,000 workers are expected to move to the area temporarily. This means that they will not have established travel patterns and hence will be open to the travel management proposals described in the ITTS (Application Reference Number: 6.3.20).

1.6.4 The strategy considers both daily travel and the travel undertaken by workers at the end of an 11-day shift cycle when some workers are likely to travel long distances to return to their permanent home.

1.6.5 The strategy also covers construction traffic and the following measures are proposed to reduce construction traffic impacts:

- Construction of a Marine Off-Loading Facility (MOLF) adjacent to the Wylfa Newydd Site. This will take between 60% and 80% of all construction materials required for the Power Station.
- Construction of A5025 Off-line Highway Improvements on the A5025 including three village bypasses.
- Construction of a Logistics Centre adjacent to Junction 2 of the A55. This will enable construction vehicle movements on the A5025 to be controlled, helping to ensure a smooth flow of construction vehicles to the site and avoiding sensitive times along the corridor.

- Implementation of mitigation and management measures to control the flow of construction traffic whilst the early elements of the Project are being constructed e.g. MOLF.

1.6.6 In addition, the construction of A5025 On-line Highway Improvements is proposed as part of a separate Town and Country Planning Act Application.

1.6.7 This Transport Assessment has been prepared by Jacobs, RSK and Steer Davies Gleave and it examines the transport effects of the Wylfa Newydd Project and its Integrated Traffic and Transport Strategy. The Transport Assessment forms a part of the Environmental Statement.

1.7 Trip Generation and Trip Distribution – Construction Workers

1.7.1 The number of daily trips generated by the Power Station depends on the number of workers and their working patterns. The Power Station will be constructed with 70% of workers on the day shift and 30% of workers on the night shift during peak construction. The start (and end) of each shift will be staggered to spread the arrival and departure of workers. In the morning, start times will be 07:00, 07:30 and 08:00. In the evening start times are 16:30, 17:00 and 17:30. Each day shift is assumed to last 10 hours. Each evening shift is assumed to last 10.5 hours

1.7.2 At the peak, up to 4,000 workers will live in the Site Campus at the Wylfa Newydd Development Area and they will be able to walk to and from work each day. The remaining 5,000 workers will need to travel in from Anglesey and beyond. Of these 4,600 workers will work at the Wylfa Newydd Development with 400 working at off-site facilities (e.g. at the Logistics Centre).

1.7.3 The workers travelling to the Wylfa Newydd Development Area on a daily basis will be able to use the proposed network of shuttle buses and approximately 1,600 workers are expected to use this mode of transport. Other workers will car share and travel to the car park at the Wylfa Newydd Development Area or travel to the Park and Ride facility. Overall, during peak construction it is expected that workers will car share with two workers per car on average. A small number of workers could walk or cycle to the Wylfa Newydd Development Area from nearby villages.

1.7.4 A review of population densities, accommodation availability and likely worker availability suggests that approximately 87% of workers will live on Anglesey. Only approximately 13% of workers are expected to live on the mainland and hence will need to travel across the Britannia Bridge or Menai Bridge each day.

1.7.5 As well as travelling to the Wylfa Newydd Development Area each day, at the end of each 11-day shift cycle some workers are expected to travel back to their permanent place of residence. The number of these trips will be based on how attractive it is to make return home trips, with workers living nearby in Wales or north-west England expected to make more trips than workers who live in continental Europe. These workers will travel by road, rail, coach or air to reach their destination and workers will be incentivised to car share where

possible or use shuttle buses to travel to the rail and coach stations in Holyhead and Bangor.

1.8 Trip Generation and Trip Distribution – Construction Materials

1.8.1 The number of construction vehicles required to access the Wylfa Newydd Development Area each day has been calculated assuming that the MOLF receives 60% of construction materials. This is a conservative estimate and the target is for the MOLF to receive 80% of bulk materials. Based on these assumptions, during the peak of construction activity, up to 40 heavy goods vehicles per hour per direction are expected to travel between the Logistics Centre and the Wylfa Newydd Development Area.

1.9 Trip Generation and Trip Distribution – Operational Phase

1.9.1 During the operational phase, the number of trips to the Wylfa Newydd Development Area will be based on the number of workers (850 typically rising to 1,850 during maintenance of each reactor) together with a small number of servicing/ delivery trips.

1.10 Assessment Methods and Scenarios

1.10.1 The transport impacts of the Wylfa Newydd Project have been assessed using industry-standard tools, techniques and software in accordance with the principles of *WelTAG* [RD3]. A summary of the Transport Assessment methodology is shown in figure 1-1.

1.10.2 The traffic flows on the network near the Project have been forecast for future years using standard Department for Transport growth factors applied to surveyed traffic flows.

1.10.3 Traffic flows on the road network near the Project have been modelled using a spreadsheet-based Strategic Traffic Model. This incorporates information on existing traffic flows, traffic growth, committed development and trip generation and distribution forecasts for trips related to the project to calculate the expected hourly traffic flows on the main routes across Anglesey and on the mainland around Bangor.

1.10.4 Using the model, changes in traffic flows were examined at 38 junctions. Where a potential congestion issue was identified, the junction was then examined in more detail using standard junction modelling tools to estimate delays and queues.

1.10.5 In addition, a detailed VISSIM model was prepared of the road network around the Britannia Bridge to provide a more in-depth analysis of potential traffic delays in this area (Note: VISSIM models the movement of each vehicle individually and is a standard way of assessing specific sections of a traffic network in detail).

1.10.6 A further assessment was made of merging and diverging traffic along the A55 to determine whether the additional traffic generated by the Wylfa Newydd Project would cause delays at each junction.

1.10.7 Finally, an assessment was also made of the potential for the additional worker and construction traffic to affect the potential for accidents.

1.10.8 The traffic assessments were undertaken for the 2016 baseline and then for three years with and without the Project:

- 2020 (Year 2 of the construction programme) Opening year of the A5025 Off-line Highway Improvements
- 2023 (Year 5 of the construction programme) Peak year for construction traffic assuming 60% of construction materials arrive via MOLF and 9,000 construction workers
- 2033 (Year 15 of the construction programme) Peak year for operational traffic including construction of radiological waste buildings and two scheduled outages

1.10.9 This approach means that the impacts of the Project on traffic flows and delays have been determined during peak years of activity. The transport impacts of the Project on accidents and other modes (e.g. rail) is also assessed.

1.11 Assessment Results

1.11.1 Of the 38 assessed junctions, 11 were identified as being potentially affected by the scheme in one or more of the three assessment years i.e. they have a ratio of demand to capacity greater than 0.7. Detailed modelling of each junction showed that no significant increases in delays or queues are expected due to the Wylfa Newydd Project.

1.11.2 The majority of additional traffic flows on the Britannia Bridge are forecast to avoid the most congested times of day due to the scheduling of shift start and end times. Some additional delays are forecast but these are relatively small (e.g. 23 seconds or less per vehicle on average over the peak hour during the peak construction year) and they are considered to be acceptable given the requirements of the National Policy Statements *EN-1* [RD1] and *EN-6* [RD2].

1.11.3 Traffic flows are forecast to increase substantially on the A5025 (e.g. up to 100% increase in southbound traffic flows in the PM peak during periods of peak construction activity) and four bypasses (i.e. A5025 Off-line Highway Improvements) are proposed to reduce traffic impacts on local villages.

1.11.4 No significant impacts are predicted on public transport during the construction and operational phases of the Project.

1.11.5 No significant transport impacts owing to the Project are forecast during the operational phase of the Project. Some parts of the highway network exceed capacity in 2033 but this is due to background traffic growth and traffic associated with other committed developments.

1.12 Mitigation

1.12.1 The transport assessment process has not identified the need for further mitigation beyond those measures identified as part of the ITTS (Application Reference Number: 6.3.20) i.e. the MOLF, Logistics Centre, Park and Ride, car sharing etc. As set out in the Wylfa Newydd CoCP (Application Reference Number: 8.6) and the Wylfa Newydd CoOP (Application Reference Number: 8.13) certain travel management measures would be monitored and reviewed and updated as part of the construction process and during operation.

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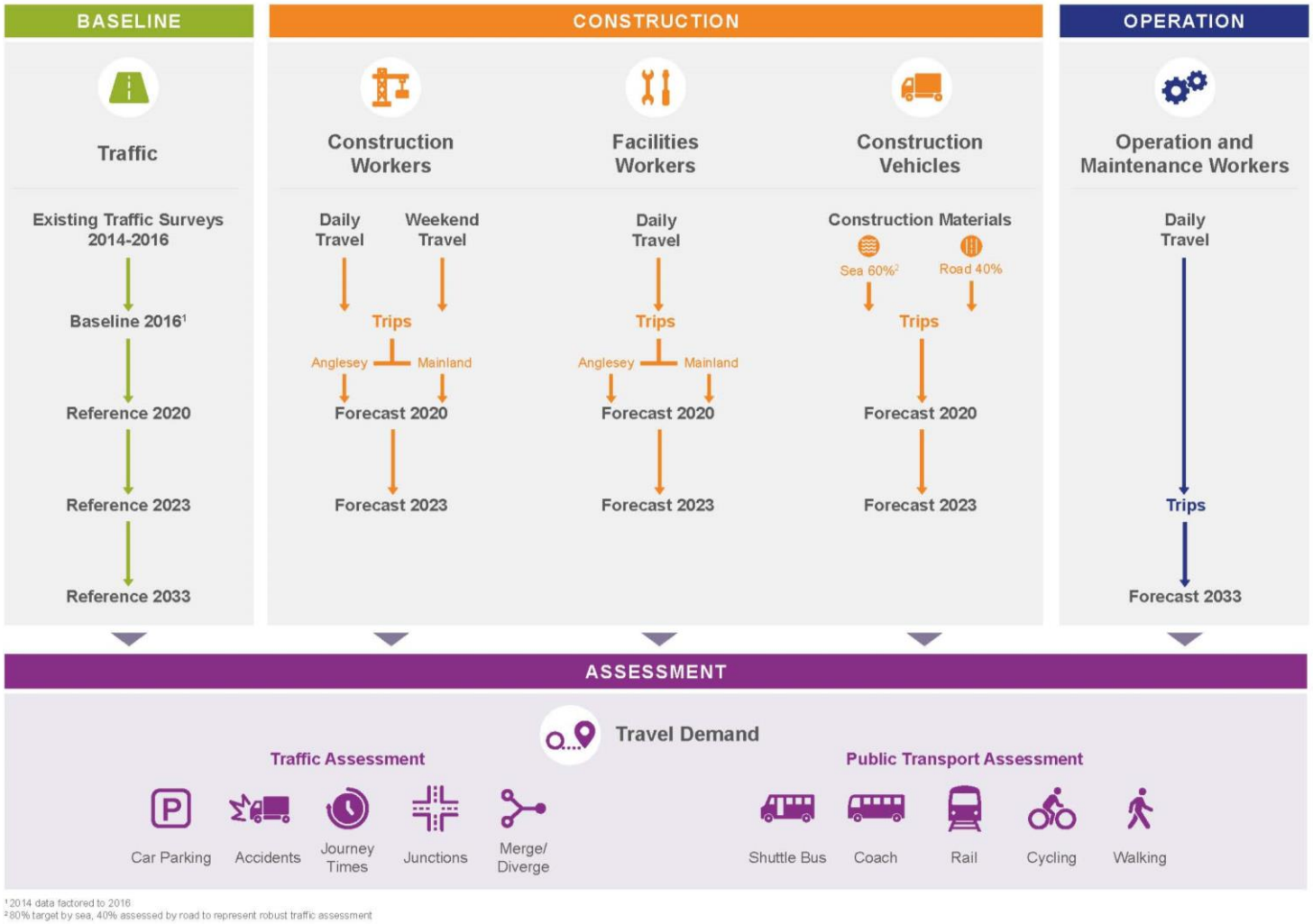
Figure 1-1 Summary of Transport Assessment methodology



[1] 2014 data factored to 2016
[2] 80% target by sea, 40% assessed by road to represent robust traffic assessment

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1.13 Key Assumptions

1.13.1 The key assumptions made in this TA and used in the ITTS and transport analysis provided in the Environmental Statement are detailed in table 1-1.

Table 1-1 Key Assumptions

Assumption	Value
Workers	
No. of workers during construction	Up to 9,000 at peak year
No. of workers residing in the Site Campus	Up to 4,000 at peak year
No. of workers residing off-site	Up to 5,000 at peak year
No. of workers during operational phase	850 rising to 1,850 during maintenance
Construction day/night shift split	70%/ 30% in assessed years
Construction day shift	07:00-17:00 07:30-17:30 08:00-18:00 (i.e. 10 hour shifts)
Construction night shift	16:30 – 03:00 17:00 – 03:30 17:30 – 04:00 (i.e.10.5 hour shifts)
Construction Shift cycle	14-day shift cycle with workers working 11 days and having 3 days leave – leave to occur over a weekend hence 50% of workers have leave each weekend.
Duration of construction	Approximately nine years
Operational phase office/ shift workers split (including ESL staff)	100/ 750
Staff at Logistics Centre	14
Staff at Park & Ride	36
Level of attendance	100% (i.e. no allowance for sickness).
Timing of Delivery of transport facilities and Site Campus	
Shuttle buses	Operational from start of construction

Assumption	Value
Park and Ride facility	Construction to commence in year 1 and last for approximately 18 months (i.e. assumed to open in 2020)
Logistics Centre	Construction to commence in year 1 and last for approximately 15 months (i.e. assumed to open in 2020)
Marine Off-Loading Facility	Fully open end of 2021
A5025 Off-line Highway Improvements	Open late 2020
On-site car park at Wylfa Newydd Development Area	Open from beginning of construction
Site campus	Phase 1 opens late 2020
Daily Commute Car Occupancy during assessment years (2020, 2023, 2033)	
Project average car occupancy	2.0
Park and Ride site average car occupancy	1.5
Wylfa Newydd Development Area average car occupancy	3.0
Construction Materials	
Use of MOLF for construction materials	60% of all material assessed (target 80%)
Construction material delivery split	76% bulk goods, 19% common/ palletised goods, 5% containerised.
Construction delivery – days of week	Model assumes Monday to Friday (Saturdays also likely to be used and hence traffic model is conservative as the same number of deliveries would be spread over a longer period)
Construction delivery – hours	Model assumes 07:00 to 19:00 (Period from 19:00 to 23:00 could also be used and hence traffic model is conservative) Exception being initial stages of construction when no deliveries would occur at school start/end times
Number of HGV deliveries during construction period	Peak: 3,500 per month at site (35-40 per hour based on 25% of daily flow in peak hour).
Abnormal Indivisible Loads	1,150 by road over duration of construction programme (12 per week in early years)

Assumption	Value
Payment for worker travel time	Distribution of residential locations for workers assumes workers are not paid for travel time. Some workers could be paid a travel allowance which would incentivise living close to the work site.
Travel to Site	
Peak facilities workers typical max. commute distance	60 minutes
Peak construction workers typical max. commute distance	90 minutes
Shuttle buses potential catchment	Buses travel within 600m of 55% of all residents on Anglesey, Bangor and Caernarfon
Shuttle bus capacity	50 passengers per bus for Park and Ride and town shuttles, 32 passengers per bus for other services
Shuttle bus occupancy	80% on average
Park and Ride bus journey time from Dalar Hir to site	Approximately 25 minutes
Anglesey/ mainland residence split of workers	87%/ 13%
Mode split for daily travel for peak construction workers	Walk 47% Shuttle bus 19% Car 18% (passenger and driver) Park and Ride 14% Car share en route 3%
Distribution of weekend trips	Ireland 11% Rest of Wales 11% England 50% Scotland 7% Europe 21%
Mode split of weekend trips (not all to site)	Car 78% Rail (or coach) 14% Sea 4%; Air + rail 3%
Mode split of site campus workers	58% by car at 1.5 per car on average
Car Parking Arrangements	
Park and Ride Site	Up to 1,900 car spaces

Assumption	Value
	(939 for daily trips; 936 for residents of Site Campus; 25 for visitors)
Wylfa Newydd Development Area (Site Campus Car Park and Car Park for Daily Workers)	Up to 1,900 spaces Site Campus (up to 769 car spaces) Car Park for Daily Workers (up to 807 car spaces - 782 for daily trips; 25 for visitors) Further 311 spaces for short-term use during peak construction to provide flexibility and resilience
Logistics Centre	100 HGVs + 13 car spaces
Overall spaces during construction	Up to 3,800 car spaces
Operational phase	Up to 500 car spaces + further 1,000 during outages
Disabled parking provision	5% of total parking across sites

1.14 Code of Construction Practice and Code of Operational Practice

1.14.1 The construction works will be delivered by a main contractor appointed by Horizon and there will be further sub-contractors for specialist works. Horizon through its Main Contractor will manage and monitor all the workers and sub-contractors in accordance with the terms and conditions of the main contract which will be based on the parameters identified as part of the DCO.

1.14.2 A Code of Construction Practice (CoCP) will be prepared and agreed as part of the DCO process. The Wylfa Newydd CoCP (Application Reference Number: 8.6) will include guidelines to manage travel to and from the Wylfa Newydd Development Area and outline proposals are included as part of this DCO application. Areas covered include management of traffic incidents and construction traffic management.

1.14.3 Similarly, during the operation of the Power Station there will be a Wylfa Newydd Code of Operational Practice (Application Reference Number: 8.13). This is expected to include a travel plan strategy and operational delivery and servicing strategy which will require a regular review and refinement of travel arrangements to meet stated objectives and targets.

Conclusion

1.14.4 The construction of the Wylfa Newydd Project is a significant undertaking which will take approximately nine years to complete and require up to 9,000 construction workers. The Project has been developed and designed to reduce impacts on local transport networks through the incorporation of a Marine Off-loading Facility, Logistics Centre, highway improvements, on-site accommodation for up to 4,000 workers, shuttle buses, a Park and Ride facility and incentivised car sharing.

1.14.5 The Project has been developed in accordance with national, regional and local planning policy and an Integrated Traffic and Transport Strategy (ITTS) (Application Reference Number: 6.3.20) which describes the proposals developed to manage the travel of workers and construction vehicles to and from the Wylfa Newydd Development.

1.14.6 The number of trips by workers and construction vehicles has been calculated and their impact assessed using detailed traffic models. The analysis shows no significant impact on the local transport networks.

1.14.7 The assessment is based on peak construction activity at the Wylfa Newydd Development (i.e. 9,000 workers) and 60% of construction materials arriving via the MOLF (40% by road). For more than 50% of the construction programme there will be 3,000 workers or fewer and the aim is to use the MOLF to transport 80% of construction materials. This means that the forecast transport impacts will likely be much lower than those presented in this assessment for a substantial proportion of the nine-year construction programme.

1.14.8 The Wylfa Newydd CoCP (Application Reference Number: 8.6) and Wylfa Newydd CoOP (Application Reference Number: 8.13) are proposed to

implement and monitor the transport strategy during the construction and operation of the Project. The initial slow build-up in the number of construction workers over several years provides time to ensure that the transport strategy reflects actual requirements by construction workers and the movement of construction vehicles.

1.14.9 In summary, this Transport Assessment has examined the potential transport impacts of the Wylfa Newydd Project and the results show that all the impacts are relatively small after mitigation, and will have no significant effects on the local road and public transport networks. The impacts are within the limits considered appropriate by National Planning Statements.

This Transport Assessment has been jointly produced by Jacobs, RSK and Steer Davies Gleave on behalf of Horizon Nuclear Power Wylfa Limited. The role of each organisation is as follows:

- *Jacobs has undertaken all traffic data collection, traffic modelling and assessments including all junction modelling, VISSIM modelling, and accident analysis.*

- *RSK has prepared the Integrated Traffic and Transport* Strategy (ITTS) (Application Reference Number: 6.3.20) which includes the forecast wor*ker trip generation, mode shares and HGV forecasts.*

- *Steer Davies Gleave has prepared the written elements of the Transport Assessment and is reliant upon the inputs listed above for the preparation of these written elements.*

- *The appendices are authored as follows:*
  - *Appendix A (Application Reference Number: 6.3.15) – Steer Davies Gleave*
  - *Appendix B (Application Reference Number: 6.3.16)– Jacobs*
  - *Appendix C (Application Reference Number: 6.3.17) – Steer Davies Gleave*
  - *Appendix D (Application Reference Number: 6.3.18) – Steer Davies Gleave using Jacobs owned data*
  - *Appendix E (Application Reference Number: 6.3.19) – Jacobs*
  - *Appendix F (Application Reference Number: 6.3.20) – RSK*
  - *Appendix G (Application Reference Number: 6.3.21) – Jacobs*
  - *Appendix H (Application Reference Number: 6.3.22) – Steer Davies Gleave using Jacobs owned data*
  - *Appendix I (Application Reference Number: 6.3.23) – Jacobs*
  - *Appendix J (Application Reference Number: 6.3.24) – Jacobs*
  - *Appendix K (Application Reference Number: 6.3.15) – Jacobs and AECOM*
  - *Appendix L (Application Reference Number: 6.3.26) – Steer Davies Gleave*

2 Introduction

2.1 Overview and Purpose of this Transport Assessment

2.1.1 This Transport Assessment has been prepared to support an application by Horizon Nuclear Power Wylfa Limited (Horizon) for a Development Consent Order (DCO) to construct, operate and maintain a new nuclear power station on the Isle of Anglesey, Wales.

2.1.2 The location of the Project and local context is shown in figure 2-1.

2.1.3 The proposals are known collectively as the Wylfa Newydd Project.

2.1.4 This Transport Assessment is based on the transport proposals described in the Integrated Traffic and Transport Strategy (ITTS) (Application Reference Number: 6.3.20) developed for the construction, operation and maintenance of the Power Station and it assesses the transport elements of the Wylfa Newydd Project in the construction and operational phases based on the measures proposed in the strategy.

2.1.5 The Transport Assessment has been prepared to meet the requirements of *National Planning Statement EN-1* [RD1] which states that such an assessment should be prepared following the Department for Transport's *WebTAG* (or *WelTAG* in Wales) [RD3] methodology.

2.1.6 The analysis presented in this Transport Assessment also provides information that supports the traffic and transport chapters in the Environmental Statement.

2.1.7 The Transport Assessment has been prepared in consultation with relevant stakeholders including:

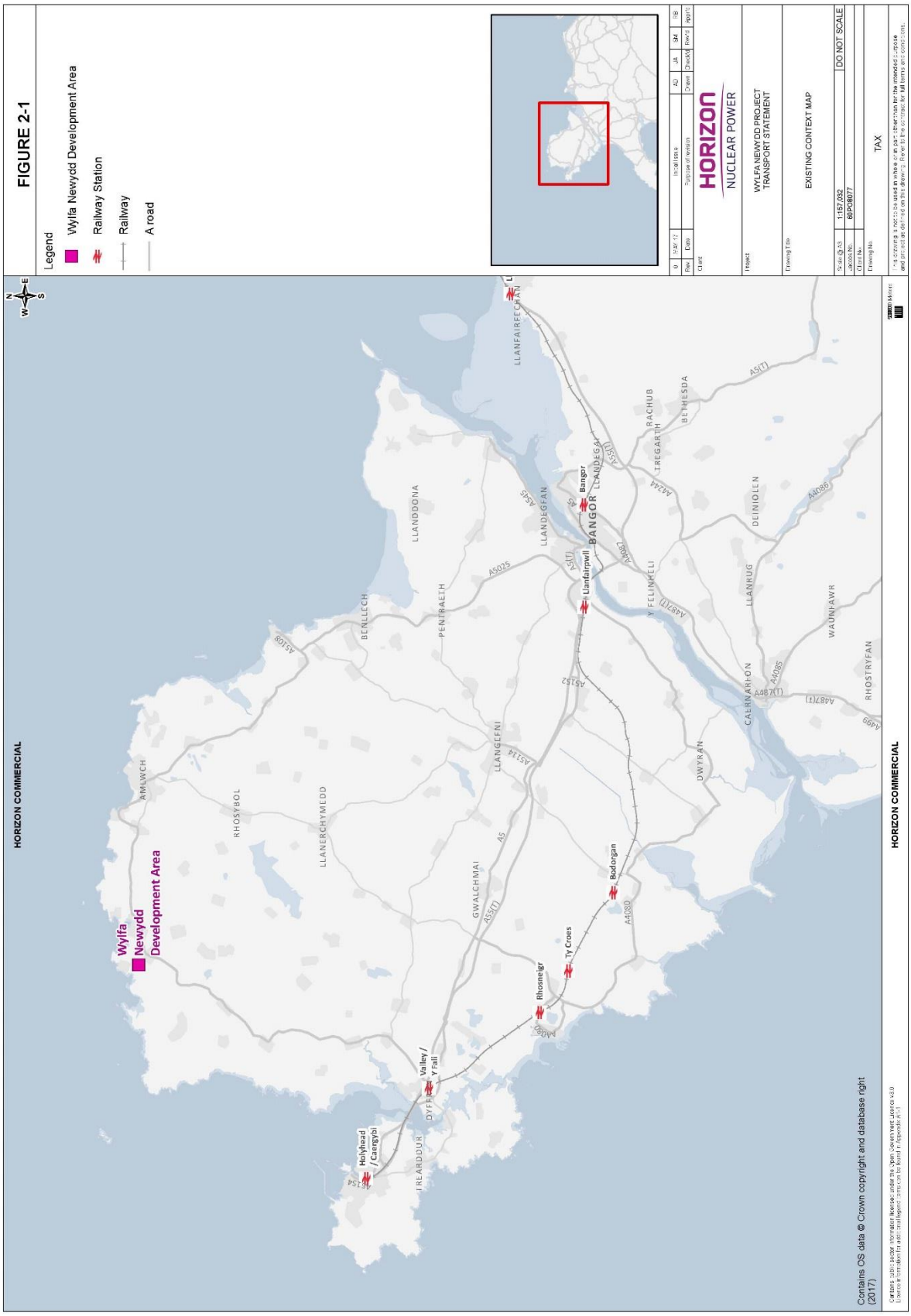
- Welsh Government;
- Isle of Anglesey County Council (IACC) (who are the local highway authority); and
- Gwynedd Council.

2.1.8 These consultations have been undertaken to meet the requirements of the *Overarching National Policy Statement for Energy* [RD1]. Further details of these consultations are provided in appendix A (Application Reference Number: 6.3.15).

2.1.9 As part of these consultations, the scope of this Transport Assessment was discussed and developed and further details are provided in appendix B (Application Reference Number: 6.3.16).

2.1.10 A glossary of abbreviations, acronyms and key terms is provided for reference in appendix C (Application Reference Number: 6.3.17).

Figure 2-1 Existing situation and local context



2.2 Background

2.2.1 Horizon is a UK energy company developing a new generation of nuclear power stations to help meet the UK's need for stable and sustainable low carbon energy. Building on core values of safety, courage, integrity, collaboration and inspiration, Horizon's vision is as follows:

- "We believe there is a compelling requirement for new nuclear power in the UK to help tackle the vital and complex challenge of delivering a sustainable energy future. As part of this vision Horizon will deliver secure affordable, low carbon energy for present and future generations" [RD4].

2.2.2 There is an existing nuclear power station (known as the Existing Power Station) operated by Magnox located west of Cemaes, on the north coast of Anglesey. Land adjacent to the Existing Power Station is considered by the UK Government to be potentially suitable for the construction of a new nuclear power station. Horizon proposes to construct and operate a new nuclear power station, known as the Wylfa Newydd Power Station, on this land. The expected nominal gross electrical output of the Power Station would be approximately 3,000 MWe, enough to power 5.5 million homes.

2.2.3 The Wylfa Newydd Project is defined as those parts of the project which are to be consented by the DCO, comprising the following parts:

- The proposed new nuclear Power Station, including:
  - two UK Advanced Boiling Water Reactors (UK ABWRs) to be supplied by Hitachi-GE Nuclear Energy Ltd;
  - supporting facilities, buildings, plant and structures; and
  - radioactive waste and spent fuel storage buildings.
- Other on-site development, including:
  - including landscape works and planting;
  - drainage - surface water management systems;
  - public access works including temporary and permanent closures and diversions of public rights of way;
  - new Power Station access road and internal site roads;
  - car parking;
  - construction compounds and temporary parking areas;
  - laydown areas;
  - working areas and temporary works and structures;
  - temporary construction viewing area;
  - diversion of utilities; and
  - perimeter and construction fencing.
- Marine Works comprising a Cooling Water System (CWS), Marine Off Loading Facility (MOLF) and breakwater structures.

- Off-site Power Station Facilities comprising the Alternative Emergency Control Centre (AECC), Environmental Survey Laboratory (ESL) and a Mobile Emergency Equipment Garage (MEEG).
- Associated Developments comprising works included in the DCO which facilitate the delivery of the nationally significant infrastructure project, and which principally include: a Site Campus providing accommodation for construction workers; a Park and Ride facility at Dalar Hir for construction workers; a Logistics Centre at Parc Cybi and A5025 Off-line Highway Improvements. Other than the A5205 Off-line Highway Improvements these works are all temporary, relating to the construction of the Power Station.

2.2.4 Nuclear Power Stations are classified as Nationally Significant Infrastructure Projects under the Planning Act 2008 and require a DCO under this Act.

2.2.5 In addition to the DCO, a number of planning applications are to be submitted under the Town and Country Planning Act to enable the advanced delivery of certain elements, for example the A5025 On-line Highway Improvements and Site Preparation and Clearance.

2.2.6 The Wylfa Newydd Project requires the development of complex infrastructure to connect the Wylfa Newydd Power Station to the National Grid electricity transmission network (known as the North Wales Connection Project). The North Wales Connection Project and the associated DCO application is being progressed separately by National Grid. The potential transport effects of the National Grid proposals have been incorporated into this Transport Assessment.

2.3 Structure of this Transport Assessment

2.3.1 The delivery of the Wylfa Newydd Project requires the preparation, assessment, implementation, monitoring and review of the proposed traffic and transport strategy for the DCO Project.

2.3.2 To meet this requirement, a suite of transport-related documents (including this Transport Assessment) have been provided as part of the DCO Application. They are listed in table 2-1 together with comments on the purpose of each document.

Table 2-1 Transport-related DCO Documents

Document	Description and Comment	DCO Application Reference
Integrated Traffic and Transport Strategy (ITTS)	This document describes the traffic and transport strategy to be delivered as part of the DCO Project. It has been developed in consultation with stakeholders and a summary is provided in chapter 6 of the Transport Assessment. The full strategy is	Appendix F (Application Reference Number: 6.3.20) of the Transport Assessment (Application

Document	Description and Comment	DCO Application Reference
	provided as a stand-alone document in appendix F of the Transport Assessment.	Reference Number: 6.3.14)
ES Volume B – Introduction to the topics – Traffic and Transport	This document defines the approach and methodology taken to assess the transport-related environmental impacts associated with the delivery of the Wylfa Newydd Project, including the implementation of the traffic and transport proposals described in the ITTS.	Application Reference Number: 6.2.3
ES Volume C – Project-wide effects C2 – Traffic and Transport	This document presents the results of the assessment of the transport-related impacts of the Wylfa Newydd Project including the implementation of the traffic and transport proposals described in the ITTS. Environmentally-focused traffic impacts (such as journey times and driver stress) are provided in the main body of the document with operational impacts on the nearby road and public transport networks considered in depth in the Transport Assessment (Appendix C2.04).	Application Reference Number: 6.3.2
DCO Transport Assessment (ES Volume C – Road-traffic related effects (project-wide) App C2-4)	This document provides a comprehensive analysis of the trips generated by the DCO project, their distribution and timing, and their impact on nearby road and public transport networks. The document includes the results of junction modelling of locations which could be potentially affected by the implementation of the DCO Project. The Transport Assessment is accompanied by a suite of appendices which presents details of modelling assumptions and modelling results.	Application Reference Number: 6.3.14
Code of Construction Practice and Code of Operational Practice	These documents set out the approach taken to the construction and operation of the DCO Project and they identify the method of delivering different aspects of the ITTS (for example defining the times when construction vehicles can make deliveries).	Application Reference Number: 8.6 and 8.13

2.3.3 Given the large volume of material provided on transport issues, it is recommended that the Executive Summaries of the ITTS (Application Reference Number: 6.3.20) and Transport Assessment (Application Reference Number: 6.3.14) are read first to gain a good understanding and overview of the approach taken to managing and assessing transport issues for the Wylfa Newydd Project.

2.3.4 Further details of the assessment can then be considered in chapters B3 (Application Reference Number: 6.2.3) and C2 (Application Reference Number: 6.3.2) of the Environmental Statement, with the approach to implementation and management considered in the CoCP (Application Reference Number: 8.6) and CoOP (Application Reference Number: 8.13).

2.3.5 In this Transport assessment, following this introduction the structure is as follows:

- Chapter 3: Policy Context
- Chapter 4: Existing Situation
- Chapter 5: Proposed Development
- Chapter 6: Integrated Traffic and Transport Strategy
- Chapter 7: Trip Generation
- Chapter 8: Trip Distribution
- Chapter 9: Assessment Methods
- Chapter 10: Assessment Scenarios
- Chapter 11: Assessment Results
- Chapter 12: Mitigation
- Chapter 13: Code of Construction Practice and Code of Operational Practice
- Chapter 14: Conclusions
- Chapter 15: References

2.3.6 A series of further documents and assessments is provided as appendices to this Transport Assessment as follows:

- Appendix A:Details of Consultations (Application Reference Number: 6.3.15)
- Appendix B:Transport Assessment Scope (Application Reference Number: 6.3.16)
- Appendix C: Abbreviations, Acronyms and Key Terms (Application Reference Number: (6.3.17)
- Appendix D: Traffic Data Report (Application Reference Number: 6.3.18)
- Appendix E: Accident Analysis (Application Reference Number: 6.3.19)
- Appendix F:Integrated Traffic and Transport Strategy (Application Reference Number: (Application Reference Number: 6.3.20)

- Appendix G: Strategic Traffic Model – Overview (Application Reference Number: (Application Reference Number: 6.3.21)
- Appendix H: Junction Assessments (Application Reference Number: 6.3.22)
- Appendix I:VISSIM Model Results (Application Reference Number: 6.3.23)
- Appendix J: Merge / Diverge Assessment Results (Application Reference Number: 6.3.24)
- Appendix K: Road Safety Audits (Application Reference Number: 6.3.25)
- Appendix L: Supplementary Information (Application Reference Number: 6.3.26)

3 Policy Context

3.1 Overview

3.1.1 This chapter provides a summary of the national, regional and local transport policies relevant to the Wylfa Newydd Project.

3.1.2 As the Power Station is anticipated to be operational after 2025, the Government considers that the DCO application should be considered under section 105 of the Planning Act 2008. The decision of the Secretary of State (SoS) under Section 105 of the Planning Act 2008 needs to be made having regard to any Local Impact Report and matters that the SoS thinks are both important and relevant. These would include the policies contained in EN-1 and EN-6, which is confirmed in the recent Ministerial Statement on Energy Infrastructure [RD26]. This further clarifies continued Government support for nuclear power, and specifically at Wylfa. NPS EN-1 and EN-6 therefore remain the primary basis for decision making.

3.1.3 Section 104(2) of the Planning Act 2008 lists the matters the Secretary of State (on the Planning Inspectorate's recommendation and hereafter referred to as the decision maker) must consider in deciding an application for a DCO affected by a National Policy Statement (NPS). These matters are:

- any NPS which affects the proposed development;
- the appropriate marine policy documents (if any) determined in accordance with section 59 of the Marine and Coastal Access Act 2009 (MCA Act);
- any local impact report submitted to the Secretary of State;
- any relevant matters prescribed in regulations; and
- any other matters which the Secretary of State thinks are both important and relevant to his or her decision.

3.1.4 The Planning Statement submitted as part of the DCO application sets out the planning policy requirements for the Wylfa Newydd Project in detail and the following sections present relevant information on transport policies.

3.2 National (UK) Policy

National Policy Statements

3.2.1 The National Policy Statements (NPSs) applicable to the Project are:

- NPS for Energy (EN-1) [RD1]; and
- NPS for Nuclear Power Generation (EN-6) [RD2].

3.2.2 The following extracts from these NPSs are relevant to the development of the Integrated Traffic and Transport Strategy and Transport Assessment for the Wylfa Newydd Project.

3.2.3 Section 5.13 of *NPS EN-1* sets out the traffic and transport policies that should be considered when developing a DCO application:

3.2.4 Paragraph 5.13.3 states that "If a project is likely to have significant transport implications, the applicant's ES should include a transport assessment, using the *New Approaches to Appraisal (NATA)/WebTAG* [RD3] methodology stipulated in Department for Transport guidance, or any successor to such methodology. Applicants should consult the Highways Agency and Highways Authorities as appropriate on the assessment and mitigation".

3.2.5 Paragraph 5.13.7 states that: "Provided that the applicant is willing to enter into planning obligations or [that] requirements can be imposed to mitigate transport impacts identified in the *NATA/WebTAG* [RD3] transport assessment, with attribution of costs calculated in accordance with the Department for Transport's guidance, then development consent should not be withheld, and appropriately limited weight should be applied to residual effects on the surrounding transport infrastructure".

3.2.6 Paragraph 5.13.8 states that: "Where mitigation is needed, possible demand management measures must be considered and if feasible and operationally reasonable, required, before considering requirements for the provision of new inland transport infrastructure to deal with remaining transport impacts".

3.2.7 Paragraph 5.13.9 states that: "The IPC [Infrastructure Planning Commission] should have regard to the cost-effectiveness of demand management measures compared to new transport infrastructure, as well as the aim to secure more sustainable patterns of transport development when considering mitigation measures".

3.2.8 Note that the IPC is now defunct and the role is undertaken by the Infrastructure Planning Unit within the Planning Inspectorate.

3.2.9 Paragraph 5.13.10 states that: "Water-borne or rail transport is preferred over road transport at all stages of the project, where cost-effective".

3.2.10 The following extracts are from Section 3.15 of *NPS EN-6* [RD2] which sets out the policies relating to impacts on significant infrastructure that should be considered when developing a DCO application.

3.2.11 Paragraph 3.15.2 states that: "Applications should demonstrate that the proposed development would not have an unacceptable adverse impact on significant infrastructure. The IPC should take into account any local authority impact report, advice from the relevant Nuclear Regulators and relevant policy in NPSs in assessing impacts on significant infrastructure and resources".

3.2.12 Paragraph 3.15.3 states that: "In particular, the Nuclear AoS [Appraisal of Sustainability] identified that there may be adverse effects during the construction and decommissioning phases on regional transport networks that may already be under stress, particularly where there are clusters of potentially suitable sites for new nuclear power stations. In considering this issue the policy set out in Section 5.13 of *EN-1* (Transport and Traffic impacts) [RD1] applies".

3.2.13 Therefore, the interpretation of these policies is that developers should seek to address transport impacts arising from the development of new nuclear powers stations during the construction and operational phases of development, but not to a nil-detriment level. In addition demand management

measures should be considered before proposing new-build inland based infrastructure, and that water or rail based transport is favoured over road based transport at all stages of the Project, where cost-effective and feasible.

3.2.14 While *NPS EN-1* [RD1] and *NPS EN-6* [RD2] together form the primary basis for deciding DCO applications for nuclear NSIPs, paragraph 4.1.5 of *NPS EN-1* states that other matters which the decision maker may consider both important and relevant to its decision making include Development Plan Documents or other documents in the Local Development Framework. These are considered in the following sections. The same paragraph also states that in the event of a conflict between these or any other documents and an NPS, the NPS prevails for the purposes of decision making given the national significance of the infrastructure.

3.3 National (Wales) Policy and Guidance

Introduction

3.3.2 *NPS EN-1* [RD1] states at paragraph 4.1.5 that the relevant NPSs have taken account of relevant Planning Policy Statements (PPSs) and Technical Advice Notes (TANs) where appropriate. As such, these policies are of limited relevance where they pre-date the NPSs. This includes the *Wales Spatial Plan* [RD5] and *TAN 18 – Transport* [RD6]. Newer Welsh national policies will be more relevant but still not determinative in decision-making and *NPS EN-1* [RD1] and *EN-6* [RD2] will always take precedence over them and are intended to provide self-contained policy for NSIPs.

3.3.3 Taking account of the above, it can be concluded that Welsh national and local planning policies have a role to play in informing the decision-making on the DCO application, but they are not determinative.

3.3.4 For development in Wales, the principal strategic policy documents are *Planning Policy Wales Edition 9* [RD7], TANs and the *Wales Spatial Plan* [RD5]. Together these comprise the national planning policy framework informing the preparation of local development plans.

Planning Policy Wales

3.3.5 *Planning Policy Wales (PPW) Edition 9* [RD7] provides the main policy objectives and principles of planning in Wales, and chapter 8 is relevant to transport.

3.3.6 Paragraph 8.1.5 of *PPW* states that land-use planning can help to achieve the Welsh Government's objectives for transport through, for example:

- "supporting traffic management measures";
- "promoting sustainable transport options for freight";
- "supporting sustainable transport options in rural areas"; and
- "supporting necessary infrastructure improvements".

3.3.7 Paragraph 8.3.3 of *PPW* states that park and ride should normally be considered as one element of a comprehensive planning and transport

strategy designed to improve the relative attractiveness of public transport and reduce the overall dependence on cars.

3.3.8 Paragraph 8.5.3 of *PPW* goes on to state that the strategic significance of freight access to industry and commerce should be taken into consideration by planning authorities. Wherever possible these authorities should promote the carriage of freight by rail, water or pipeline rather than by road.

3.3.9 Paragraph 8.7.1 of *PPW* also states that local planning authorities should take into account the following when considering a planning application:

- "the willingness of a developer to promote travel by walking, cycling or public transport, or to provide infrastructure or measures to manage traffic, to overcome transport objections to the proposed development";
- "…the environmental impact of both transport infrastructure and the traffic generated (with a particular emphasis on minimising the causes of climate change associated with transport)"; and
- "the effects on the safety and convenience of other users of the transport network".

Wales Transport Strategy

3.3.10 *The Wales Transport Strategy (WTS)* [RD8] promotes sustainable transport networks that safeguard the environment while strengthening economic and social life. Key identified priorities include:

- reducing greenhouse gas emissions and other impacts;
- integrating public transport;
- improving access between key settlements and sites;
- enhancing international connectivity; and
- increasing safety and security.

National Transport Finance Plan for Wales

3.3.11 The *National Transport Finance Plan for Wales (NTFP)* [RD9] will help deliver the Welsh Government's objectives for transport, as set out in the *WTS*. It reflects the Government's ongoing programme of investment in transport improvements. It also sets out how future schemes will be identified and developed. The emerging *NTFP* identifies national and regional transport improvements to be taken forward, whilst Local Planning Authorities (LPAs) are expected to identify priorities at the local level within the Local Transport Plans (which is still currently under development for North Wales). The Welsh Government is expected to engage with LPAs throughout this planning process to ensure an integrated approach between national, regional and local priorities. The following priorities have been set:

- support economic growth and safeguard jobs with a particular focus on the City Regions, Enterprise Zones and local growth zones;

- reduce economic inactivity by delivering safe and affordable access to employment;
- maximise the contribution that effective transport services can make to tackling poverty and target investment to support accessibility improvements for the most disadvantaged;
- encourage safer, healthier, safer and sustainable travel; and
- connect communities and enable access to key services.

Building a more Prosperous Wales: Infrastructure for a Modern Economy

3.3.12 *Building a more Prosperous Wales: Infrastructure for a Modern Economy* [RD10] identifies the following key challenges in relation to transport:

- ensuring that provision is made for future public transport capacity needs to ensure that growth does not stagnate as demand increases;
- ensuring that devolution does not affect citizens' ability to travel or affect the quality of their experience; and
- ensuring that transport infrastructure along strategic routes is enhanced to drive economic growth.

3.3.13 Future needs are also identified for transport which are:

- improving local connectivity;
- linking transport improvements in England to improve connections from Wales to the rest of the UK; and
- improving Wales's key transport corridors and infrastructure (e.g. creating a regional airport, developing seaports) for access to global markets.

Technical Advice Note 18

3.3.14 *Technical Advice Note 18 Transport (TAN18)* [RD6] sets out how the Welsh Government aims to integrate land-use and transport planning to provide an efficient and sustainable transport system to facilitate ongoing economic development.

3.3.15 Paragraph 7.4 of *TAN18* states that more sustainable travel is to be promoted as part of a combined journey. It clarifies that *"*the development of safe and efficient public transport facilities where different modes of transport intersect, including cycling, is essential for the integration of transport provision*."*

3.3.16 Paragraph 7.5 of *TAN18* states that the use of park and ride facilities is promoted to reduce the number of longer commuting journeys in a single occupancy vehicle.

3.3.17 Paragraph 8.11 of *TAN18* states that the movement of freight by rail or water rather than by road is encouraged.

3.4 Regional and Local Policy

3.4.1 Regional and local transport policy also directly relates to the delivery of the Wylfa Newydd Project.

North Wales Regional Transport Plan

3.4.2 *The North Wales Regional Transport Plan* [RD11] outlines the regional transport priorities for North Wales, including:

- providing a transport network for North Wales that makes the best use of available resources to give efficient movement of both people and freight;
- enhancing performance of public transport through the integration of different public transport services including: trains; fast inter-urban bus and coach services; improving the local bus network; and an appropriate mix of services involving smaller vehicles for rural areas;
- resolving congestion and highway access issues;
- maintaining safe, efficient and more sustainable transport networks;
- implementing road, rail and terminal improvements in conjunction with national and regional agencies and companies; and
- increasing current levels of cycling and walking by residents and visitors.

North Wales Joint Local Transport Plan

3.4.3 The *North Wales Joint Local Transport Plan (LTP)* [RD12] has been jointly produced by the six north Wales local authorities of Conwy, Denbighshire, Flintshire, Gwynedd (partially), Isle of Anglesey and Wrexham. The key outcomes that the Local Transport Plan aims to achieve include:

- providing affordable and accessible transport to jobs and services with a focus on the most deprived communities;
- improved safety and security benefits of both actual and perceived safety of travel by all modes; and
- minimising impacts on the natural environment, with infrastructure to support public and community transport.

Anglesey and Gwynedd Joint Local Development Plan

3.4.4 The *Anglesey and Gwynedd Joint Local Development Plan* (JLDP) [RD13] was formally adopted on 31 July 2017. This now supersedes all of the policies and interim policies contained within the Gwynedd Structure Plan (1993), Anglesey Local Plan (1996), Anglesey Unitary Development Plan (stropped) (2005), Interim Planning Policy: Large Sites (2011), Interim Planning Policy: Rural Clusters (2011) and the Gwynedd Unitary Development Plan (2009).

3.4.5 The key relevant adopted polices for transport are provided below:

Strategic Policy PS9: Wylfa Newydd and Related Development

3.4.6 *Strategic Policy PS9* provides overarching policies relating to development at Wylfa. In relation to transport the following criteria are relevant:

"…In responding to proposals forming part of a Development Consent Order application to the Secretary of State the Councils will take the same considerations into account in the preparation of a Local Impact Report..."

"3. Highways and transport proposals for the Wylfa Newydd DCO Project form part of the integrated traffic and transport strategy that has regard to Strategic Policy PS4 [Sustainable Transport, Developments and Accessibility] and any relevant detailed Policies in the Plan and minimises adverse transport impacts to an acceptable level, including those arising during the construction, operation and decommissioning stages, and any restoration stages. Proposals should where feasible make a positive contribution to transportation policy objectives in the locality, and should include multi-modal solutions and investment that encourages travel by public transport, walking and cycling and other sustainable forms of transport."

"7. Proposals for campus style temporary workers accommodation, logistics centres and park and ride facilities will also be assessed against the criteria set out in Policies PS 10- 12 [See following section for further details]."

"12. All proposals shall be appropriately serviced by transport infrastructure including public transport and shall not have adverse impacts on local communities and tourism and this shall be demonstrated in a transport assessment. Where there is insufficient transport linkage or, the road network does not have sufficient capacity to accommodate the level of traffic which will result from any development or an adverse impact is predicted appropriate improvements to the transport network and the provision of sustainable transport options shall be provided to mitigate the impacts."

Strategic Policy PS10: Wylfa Newydd - Campus Style Temporary Accommodation for Construction Workers

3.4.7 Strategic Policy PS10 relates to campus style temporary accommodation for construction workers, and relevant policy related to transport states that:

"4. Where there is insufficient capacity within existing off-site leisure, recreational, retail and healthcare facilities to meet the needs of occupiers of the site or such facilities are not available within an acceptable distance which facilitates pedestrian or cycle access to them, the proposal must include appropriate mechanisms to mitigate negative impacts which may include onsite provision of ancillary facilities for the use of the occupiers…"

Strategic Policy PS11: Wylfa Newydd Logistics Centres

3.4.8 Strategic Policy PS11: Wylfa Newydd - Logistics Centres, refers to where logistics centres should be located and relevant policy states that:

"1. The site is located:

i) on a safeguarded or allocated employment site; or

ii) within development boundaries of Centres identified within the Plan's Settlement Hierarchy; or

iii) in other locations adjacent to development boundaries of Centres that are located along or close to the A5/A55 where the applicant has demonstrated that sites identified in criteria i and ii have been first considered and discounted based on landscape and environmental considerations and that the impacts of development in the countryside can be acceptably minimised and mitigated."

"2. Proposals include sustainable transport proposals for staff including links to public transport, as appropriate."

"3. The siting of buildings and activities, means of access and egress and appropriate mechanisms are used to mitigate negative impacts of the proposed development on the amenity of local communities."

Strategic Policy PS12: Wylfa Newydd - Park and Ride and Park and Share Facilities

3.4.9 Strategic Policy PS12 relates to where park and ride and park and share facilities should be located and relevant policy states that:

"1. In order to minimise the need for construction workers and workers that service the facility to travel by private car, the site is located:

- i. within or adjacent to development boundaries of Centres located along or close to the A5/ A55; or
- ii. in other locations along the A5/A55 where the site is part of a comprehensive approach to mitigating the transport effects of the Project, takes account of the Councils' preference to consider sites closer to Centres, has due regard to landscaping and environmental considerations, and where provision for travel to the site by sustainable means, including public transport and cycling, can be provided."

"2. Proposals should make provision for new and enhancement of existing pedestrian and cycle paths and improvement to public transport services."

"3. The siting of buildings and activities, means of access and egress and appropriate mechanisms are used to mitigate negative impacts of the proposed development on the amenity of local communities."

Policy TRA1: Transport Network Improvements

3.4.10 Policy TRA1 identifies specific highway improvements, including potential off-line highway improvements along the A5025, and states:

"1. Improvements to Existing Infrastructure

Improvements to the existing transport network will be granted provided they conform to the following criteria:

i. The choice of route and/or site minimises the impact on the built and natural environment, landscapes and property; and

ii. Permanent land-take is kept to the minimum that is consistent with good design and high quality landscaping; and

iii. In the case of cycle ways, park and ride schemes, roads and roadside service areas, the scheme will help to improve road safety; and

iv. In the case of new roads a full range of practicable solutions to the transport problem has been considered and road enhancement provides the optimum solution..."

" 2. Transfer Between Transport Modes

In order to facilitate the transfer between transport modes and help to minimise travel demand and reduce car dependency, provided they conform to relevant policies in the Plan the following proposals will be granted:

- i. Improvements to existing rail and bus interchanges, including measures to facilitate access by active travel modes and disabled people with particular access needs;
- ii. Strategically located permanent park and ride facilities within or adjacent to Centres or in other locations close to the main highway network when it can be demonstrated that no alternative sites closer to the Centres are suitable, where customers are supported by frequent bus services between the facility and the destination;
- iii. Strategically located facilities within or adjacent to Centres for overnight lorry parking and freight transfer;
- iv. High quality driver and passenger facilities including but not limited to, seating, information, toilet facilities;
- v. Facilities for park and share in appropriate locations within or adjacent settlements on the strategic highway network;
- vi. Facilities within settlements for coach parking, taxis and passenger drop off; and
- vii. Facilities for interchange with water-based transport."

"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."

"4. Transport Schemes

Improvements to the strategic transportation network in the plan area shown on the Proposals Maps will be secured through safeguarding and provision of land. Schemes include:

i. A487 Caernarfon to Bontnewydd

ii. Llangefni Link-Road

iii. A5025 Valley to Wylfa and other transport infrastructure improvements associated with the new nuclear development at Wylfa

Newydd, including improvements from Amlwch to Wylfa Newydd where need for improvement on that section is demonstrated following a highway impact assessment of the Wylfa Newydd DCO Project on the A5025".

3.4.11 Paragraphs 6.1.45 to 6.1.48 provide the supporting text to Policy TRA1, and specifically, the A5025 Valley to Wylfa Newydd and other transport infrastructure improvements associated with the new nuclear development at Wylfa Newydd including improvements from Amlwch to Wylfa Newydd where need for improvement on that section is demonstrated following a highway impact assessment of the Wylfa Newydd on the A5025. Paragraph 6.1.45 to 6.1.48 state:

"6.1.45 The A5025 from Valley to Wylfa Newydd will experience a significant increase in traffic, including an increase in the number of large vehicles using the road. This route has a number of pinch points, and environmental and safety issues. Additionally, the A5/Valley junction requires consideration.

6.1.46 The four main locations on the route which require significant improvements, and shown on the Proposals Maps, are:

- A5/A5205 (Valley);
- A5025 (Llanfachraeth);
- A5025 (Llanfaethlu);
- A5025 (Cefn Coch)".

6.1.47 Improvements along the route from Amlwch to Wylfa Newydd may also need to be considered.

6.1.48 Councils will work with the promoter of the Wylfa Newydd DCO Project to develop an appropriate scheme of transport solutions to mitigate the effects of the construction and operation of the new power station. In addition to the road upgrades referred to above such solutions are likely to include development of park and ride schemes and construction logistics centres to control the numbers and timing of traffic movements to the power station site. Policies PS 11 and PS 12 will apply to the proposed park and ride and park and share facilities and logistics centres, respectively. The promoter and the Councils will work together in partnership to develop an appropriate Integrated Traffic and Transport Strategy (ITTS) in respect of the Wylfa Newydd DCO Project."

Policy TRA2: Parking Standards

3.4.12 Policy TRA2 sets out parking standards, and states:

"Policy TRA2: Parking Standards

Parking provision for all modes of transport should be in accordance with the Councils' Parking Standards.

In exceptional circumstances, proposals may be granted if it can be demonstrated that parking requirement can be satisfactorily met off-site, either by direct provision or, exceptionally, through payment of commuted sums.

The provision of appropriate coach parking facilities to encourage bus and coach visitation the plan area's Service Centres is encouraged."

3.4.13 Paragraphs 6.1.49 to 6.1.51 provide the supporting text and explanation to Policy TRA2. Of particular relevance, paragraph 6.1.49 and 6.1.50 state as follows:

"6.1.49 In line with Planning Policy Wales and Technical Advice Note (TAN) 18 Transport, the demand for parking spaces for cars should be managed and the parking provision for other modes of transport, such as cycling should be encouraged. The Councils' Parking Standards Supplementary Planning Guidance, are informed by Planning Policy Wales , TAN 18 and the County Surveyors Society Parking Standards (2014). All in all, the maximum parking standards seek to attain a balance between parking needs for different modes of transport, capacity of the road system, accessibility of public transport, and avoidance of congestion, displacement, danger and visual intrusion. Where opportunities arise, for example, shared parking for commercial and industrial uses will be encouraged, in order to reduce the provision."

6.1.50 There may be instances where adequate parking cannot be incorporated within a development site, but could be provided in an equally accessible location nearby. In such instances, consideration will also be given to permitting development where a commuted sum is paid to enable upgrading of existing off-site parking provision, improvements to public transport provision, and additional bus shelters on along existing public transport routes…"

TRA4: Managing Transport Impacts

3.4.14 Policy TRA4 describes ways in which developers should manage transport impacts, and states:

"Policy TRA 4: Managing Transport Impacts

Where appropriate, proposals should be planned and designed in a manner that promotes the most sustainable modes of transport having regard to a hierarchy of users

1. Pedestrians, including people with prams and/or young children;
2. Disabled people with mobility impairments and particular access needs;
3. Cyclists;
4. Powered two-wheelers;
5. Public transport;
6. Vehicular access and traffic management within the site and its vicinity;
7. Car parking and servicing;
8. Coach parking; and
9. Horse-riders.

Proposals that would cause unacceptable harm to the safe and efficient operation of the highway, public transport and other movement networks including pedestrian and cycle routes, public rights of way and bridle routes,

will be refused. The degree of unacceptable harm will be determined by the local authority on a case by case basis."

The New Nuclear Build (NNB) at Wylfa Supplementary Planning Guidance

3.4.15 Whilst the Wylfa Newydd SPG remains adopted guidance it is now out of date, as it pre-dates the adopted JLDP. A draft Wylfa Newydd Supplementary Planning Guidance 2018 Consultation Draft was published for consultation in January 2018. The draft SPG is, at the time of submission, subject to consultation, including representations submitted by Horizon. It can therefore be given very limited weight.

3.4.16 Details of the SPG are presented in following paragraphs to provide further policy background for the development of the transport proposals for the Wylfa Newydd Project.

3.4.17 *The New Nuclear Build at Wylfa: Supplementary Planning Guidance* [RD14] sets out the guidance IACC wishes developers to consider when developing proposals at Wylfa. Section 4.6 of the document deals specifically with transport and the following extracts in particular are relevant for this Transport Assessment:

3.4.18 Paragraph 4.6.6 states that the "The principal road routes which are likely to be used to access the main NNB site are the A5, A55 and A5025. The main existing road congestion issues relate to the two bridges which provide access to the Island across the Menai Straits (A55 Britannia Bridge and A5 Menai Bridge) both of which are single carriageway, operate at close to existing capacity in the peak hours and experience the highest traffic volumes during the summer holiday season".

3.4.19 Paragraph 4.6.7 states that "Studies have identified the potential for constraints to exist local on the network. These constraints may require highway improvements to be implemented, most notably along the A5025 and at certain key junctions, for example at the A55 Junction 3 (A55/A5 junction) and Junction 1 of the A55 at Holyhead where enhancements to existing highway arrangements are required to deal with congestion associated with port traffic at peak periods"

3.4.20 Paragraph 4.6.8 states that "The use of transport modes other than road would be preferred on national, regional and local policy grounds."

3.4.21 Paragraph 4.6.9 states that "…The construction of a purpose built Marine Off-Loading Facility (MOLF) located at Wylfa and/or temporary MOLF could, however, be capable of handling both bulk construction materials and AILs".

3.4.22 Policy GP5 is concerned with seeking to ensure that the construction and operation of the NNB and any associated developments do not adversely affect the value and importance of tourism to Anglesey. It states that detailed assessments of potential effects associated with the NNB and, where appropriate, associated developments on tourism should be submitted with the DCO application. Policy GP5 states that, as a minimum, detailed

assessments should consider the impacts of the proposals on, amongst other things, transport, including traffic disruption, congestion and journey times.

3.4.23 Policy GP5 goes on to state that where there is the potential for adverse impacts, mitigation and/or compensation should be identified and implemented to protect and enhance the Island's visitor economy that could include (amongst others), the maintenance and enhancement of access to the coast allied with improvements to the Wales Coast Path, including the rights of way network, cycle routes and walking trail networks, is supported.

3.4.24 Policy GP14 deals with transport and states that proposals should maximise the use of rail and sea, align with existing transport strategy and make use of existing infrastructure provision. Any new major transport works associated with development should be assessed using *NATA/WelTAG* [RD3] methodology. Long distance travel to the Power Station Site should be reduced through the provision of Park and Ride, Park and Share, freight consolidation and a corporate hub. A Traffic Management Plan should be provided to assess any adverse impacts on key parts of the highway network and how they can be mitigated. The percentage of journeys made by more sustainable means should also be maximised through:

- the strategic location of worker accommodation to minimise worker travel by car;
- encouraging walking/cycling;
- enhancing pedestrian paths;
- improving public transport;
- a restriction on car parking numbers at the Power Station Site; and
- improvements to public transport services (particularly bus/rail).

3.4.25 The *Wylfa SPG* [RD14] also notes that Anglesey Airport could provide an appropriate long-distance travel option for a limited number of specialist workers.

3.4.26 Further transport related comments indicate that:

- Improvements to existing transport infrastructure should be considered including Holyhead Port, North Wales Coast railway main line and strategic highways.
- Existing rail facilities should be used for the movement of construction materials and workers. The potential use of the existing railhead at Anglesey Aluminium site should be assessed. Wider transport proposals including the Holyhead Port A55 New Access Link should be taken in to account.

Parking Standards Supplementary Planning Guidance

3.4.27 *The Parking Standards: Supplementary Planning Guidance* [RD15] sets out the guidance IACC wishes developers to consider when proposing car parking at developments. The following are relevant for this Transport Assessment:

3.4.28 Maximum car parking standards for the proposed construction worker accommodation could fall within 'sui-generis', with the ratio determined on an individual basis. As a guide, the standard for residential institutions as set out in paragraph 6.1 (Use Class C2) is 1 parking space per 3 bedrooms and 1 parking space for each staff member.

3.4.29 Paragraph 7.11 states that "5% of all spaces for employment uses shall be provided to 'mobility standard' (minimum width 3.6 metres)."

3.4.30 Paragraph 8.2 states that minimum cycle parking standards for industrial uses is based on 1 parking space/350m^2 GFA (Gross Floor Area) for administration offices and 1 space/500m^2 GFA for general industrial use.

3.4.31 Minimum cycle parking standards for residential uses (such as residential colleges or training centres, as a guide standard for the proposed construction worker accommodation), is based on 1 parking space/10 staff and 1 space/5 inhabitants as set out in Paragraph 8.2.

3.4.32 Paragraphs 9.1-9.2 states that Travel Plans are encouraged to reduce reliance on cars, integrate non-car uses (walking, cycling and public transport) and manage the volume of car parking.

3.4.33 Paragraphs 12.1-12.3 state that "The layout and design of proposed car parks should respect the character and distinctiveness of Anglesey's Area of Outstanding National Beauty (AONB), with consideration given to appropriate surfacing materials. Consideration should be given to the Council's AONB Management Strategy when submitting proposals for car parks in the AONB."

3.5 Policy Compliance

National Planning Policy

3.5.2 The Wylfa Newydd Project proposals align well with the transport aspects of national planning policy. In particular, the following points demonstrate the key areas of compliance:

- the Power Station Site is considered a suitable location for a new nuclear power station as set out in NPS EN-6 [RD2];
- the DCO application is supported by a Transport Assessment, ITTS (Application Reference Number: 6.3.20) and ES, covering construction and operational stages of the Wylfa Newydd Project as well as a Cumulative Impact Assessment, in line with policy set out in NPS EN-1 [RD1] and TAN 18 [RD6];
- the Wylfa Newydd Project aims to reduce the amount of vehicular traffic, particularly Heavy Goods Vehicles (HGVs) and single occupancy cars, associated with both the construction and operational phases through the use of a MOLF, Park and Ride facilities, a Logistics Centre, Site Campus and shuttle bus services. The need to travel will also be reduced by locating certain facilities in sustainable locations where practicable and where overall efficiency in transport movements can be achieved. This is consistent with policy set out in NPS EN-1 [RD1], The

Wales Transport Strategy [RD8], Planning Policy Wales [RD7] and TAN 18 [RD6];

- the Project will explore the potential for procuring buses that utilise 'low emission' technology for transferring workers from Park and Ride facilities and local accommodation across Anglesey and Gwynedd to the Power Station Site, which is in line with policies aimed at reducing greenhouse gases set out in the Wales Transport Strategy [RD8]; and
- the Project, during operation, will encourage journeys up to one and a half kilometres to be made on foot and up to eight kilometres to be made by bicycle rather than the private car. This is consistent with sustainable development policies set out in NPS EN-1 [RD1], The Wales Transport Strategy [RD8], Planning Policy Wales [RD7], TAN 18 [RD6] and the Active Travel (Wales) Act 2013.

Regional, Local and Site-Specific Planning Policy

3.5.3 The Wylfa Newydd Project proposals align well with the transport aspects of regional, local and site-specific planning policy. In particular, the following points demonstrate the key areas of compliance:

- The Wylfa Newydd Project aims to support existing transport services and provide new sustainable travel options and infrastructure. This is in line with the overarching sustainable travel ethos underlying all regional, local and site-specific policy and guidance.
- Informed by the Integrated Traffic and Transport Strategy, the Project will include proposals to reduce the volume of road-based traffic, particularly HGVs and private cars, associated with both construction and operation of the Power Station through the promotion of a MOLF, Park and Ride facility, Site Campus and shuttle bus services. This is consistent with policy set out in the LTP, the JLDP and Wylfa SPG.
- The Project includes a Logistics Centre which will enable the management of construction vehicles travelling along the A5025 and the potential consolidation of construction materials which will lead to fewer trips by construction vehicles.
- In line with guidance set out in the JLDP and Wylfa SPG, the Project will provide a Site Campus adjacent to the Power Station Site and preferential car parking for high occupancy vehicles will be provided at construction area car parks. This will combine with a robust worker travel strategy incentivising bus use and car sharing to ensure that trips by private car, particularly those at single occupancy, are kept as low as possible.
- The A5025 Off-line Highway Improvements proposed are in line with the policies set out in the JLDP. In addition, the highway improvement proposals and sustainable travel measures that will be implemented will

ensure that the development will not cause unacceptable harm to the safe and efficient operation of the highway.

- The Project will include proposals to improve walking and cycling routes in the immediate vicinity of the Power Station Site for existing users. This will be achieved via the provision of new and improved infrastructure, and during operation of the Power Station journeys up to eight kilometres will be encouraged to be made by bicycle rather than the private car. This is consistent with overarching sustainable development policy and more specifically with policies to encourage cycling, walking and route improvements in the adopted JDLP.

3.6 Guidance

3.6.1 This Transport Assessment has been prepared in accordance with current UK best practice. Relevant guidance is listed in table 3-1.

Table 3-1 Summary of key guidance

Document	Relevant guidance
WelTAG Welsh Transport Appraisal Guidance (Welsh Government) [RD3]	The methodology and assessment used in this Transport Assessment is consistent with the guidelines set out in WelTAG. We note the current version is 2008 and consultation is underway for the 2017 update.
Design Manual for Roads and Bridges (Highways England) [RD17]	Used to assist the identification of junctions that are potentially sensitive to increases in traffic related to the Project.
Guidance on Travel Plans, Transport Assessments and Statements (Department for Transport) [RD18]	Provides advice on when Transport Assessments and Transport Statements are required, and what they should contain.
Car Sharing – Factsheet 03 (Chartered Institution of Highways and Transportation) [RD19]	Provides advice on how to implement a successful car sharing scheme.

3.7 Summary

3.7.1 All of the above policy and guidance has been considered and taken into account when preparing this Transport Assessment. This Transport Assessment is therefore considered to be compliant with all relevant local, regional and national transport policies and guidance.

4 Existing Situation

4.1 Introduction

4.1.1 This chapter provides a summary of the existing transport situation in Anglesey and north-west Wales. This baseline highlights the main transport connections (see Figure 4-1figure 4-1), summarises traffic survey information and identifies where potential constraints exist that have influenced the development of the ITTS (Application Reference Number: 6.3.20) for the Wylfa Newydd Project.

4.2 Development Site Locations

4.2.1 The current transport arrangements and land-use characteristics at each development site location are as follows (see chapter 5 for more details):

- Wylfa Newydd Development Area– this area is currently accessed via a minor road which forms a priority junction with the A5025. The land is currently used by the Existing Power Station.
- Park and Ride facility at Dalar Hir – this is currently agricultural land with no road accesses.
- Logistics Centre at Parc Cybi – this area is currently undeveloped except for a road network which has been provided in advance of development occurring. This road network provides a link to the A55.
- Off-Site Power Station Facilities – this land is mostly comprised of an existing gorge site.

4.2.2 These existing site conditions have been considered as part of the assessment of the Wylfa Newydd Project.

4.3 Strategic Road Network

Anglesey

4.3.2 The A55 forms part of the E22 Euroroute which stretches between Holyhead Port on Anglesey and Ishim in Russia. The A55 crosses Anglesey and uses the Britannia Bridge to reach the mainland. The E22 forms part of the Trans European Road Network (TEN) route.

4.3.3 The Anglesey section of the A55 covers approximately 36km and was constructed as a Private Finance Initiative between Carillion plc, the John Laing Group plc and the Welsh Government. The two companies earn a shadow toll, paid by the Welsh Government, based on vehicle numbers and lane availability and are responsible for the maintenance of the Anglesey section for the duration of their 30-year toll agreement, which expires in 2028.

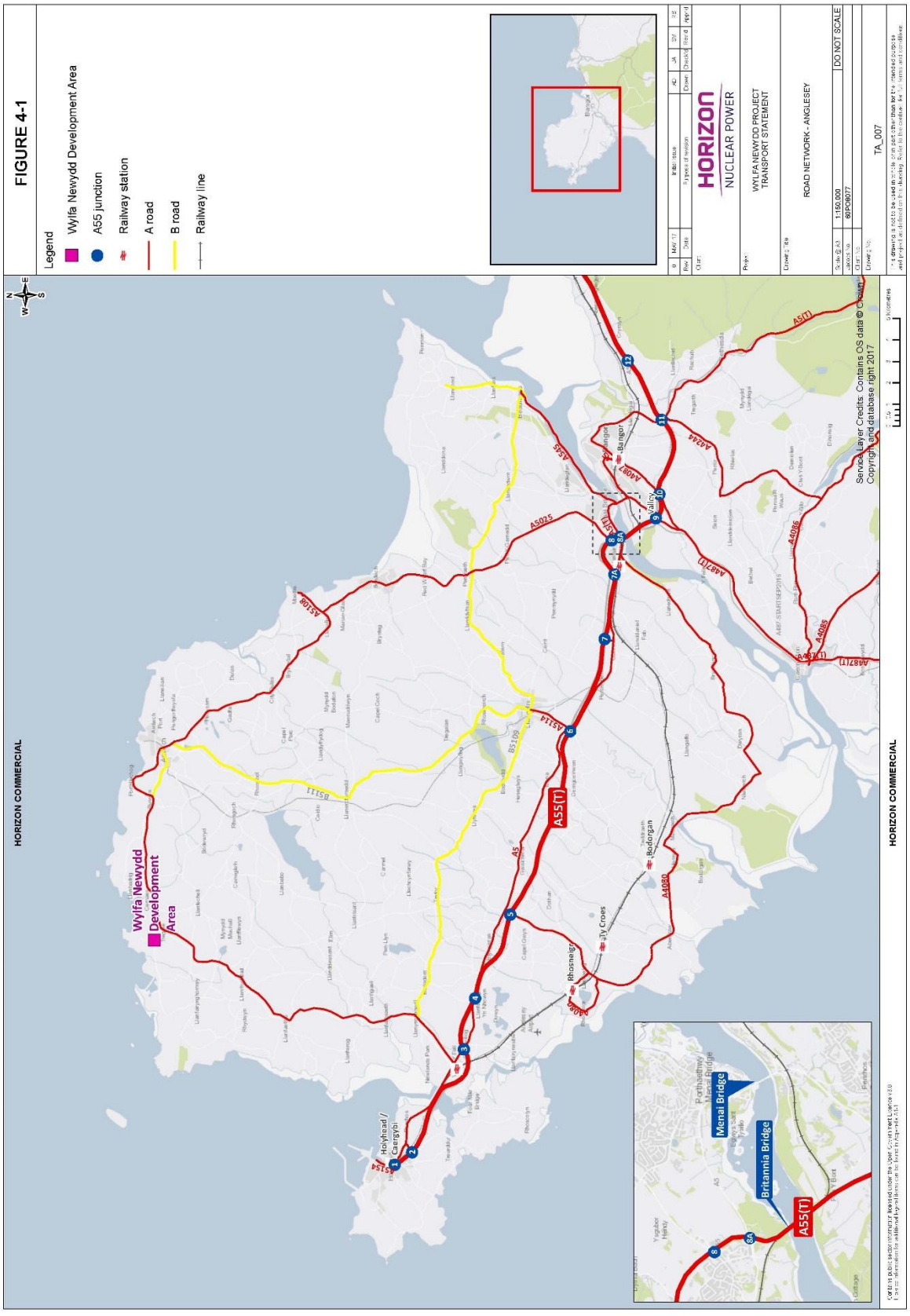
4.3.4 The A55 provides a dual carriageway standard road running south-east to north-west across the island. There are grade-separated junctions as far as Holyhead, and the road terminates at Holyhead Port. Connections to key routes and destinations on Anglesey are available as follows (see also figure 4-1 for junction locations):

- A55 terminus (Holyhead Port);
- Junction 1: B4545 (Holyhead);
- Junction 2: A5153 (Parc Cybi);
- Junction 3: A5 and A5025 (Valley / Wylfa);
- Junction 4: A5 (Bodedern);
- Junction 5: A4080 (Rhosneigr);
- Junction 6: A5114 (Llangefni);
- Junction 7: A5152 (Gaerwen);
- Junction 8: A5025 (Llanfairpwll); and
- Junction 8A: A5 (Llanfairpwll / Menai Bridge).

4.3.5 Traffic surveys in 2016 indicate that the A55 carries an annual average daily flow of around 17,500 vehicles in each direction on the mainland side of the Britannia Bridge. This reduces to just over 8,000 vehicles in each direction to the east of Valley and around 5,500 (westbound) to 6,500 (eastbound) vehicles in each direction at Holyhead. The dual carriageway standard of the road makes it suitable for construction vehicles. The TEN designation also ensures that this route is appropriate for carrying Abnormal Indivisible Loads (AILs). The A55 on Anglesey has a speed limit of 70mph and on the Britannia Bridge the speed limit is 50mph.

4.3.6 As well as the traditional weekday morning and evening peak traffic periods, there are additional peak periods as a result of ferries arriving and departing to/ from Holyhead Port. The arrival of a ferry will typically result in an intense but short-lived traffic peak, travelling south-east along the A55. This effect is less pronounced for departures as vehicles will arrive over a longer period in advance of a ferry leaving. Ferry arrivals are currently scheduled four times per day at 00:30-01:00, 05:30-06:00, 11:00-12:00, and 16:30-18:00. These peaks are an important consideration in managing the traffic flow associated with the Wylfa Newydd Project.

Figure 4-1 Existing road and rail networks on Anglesey

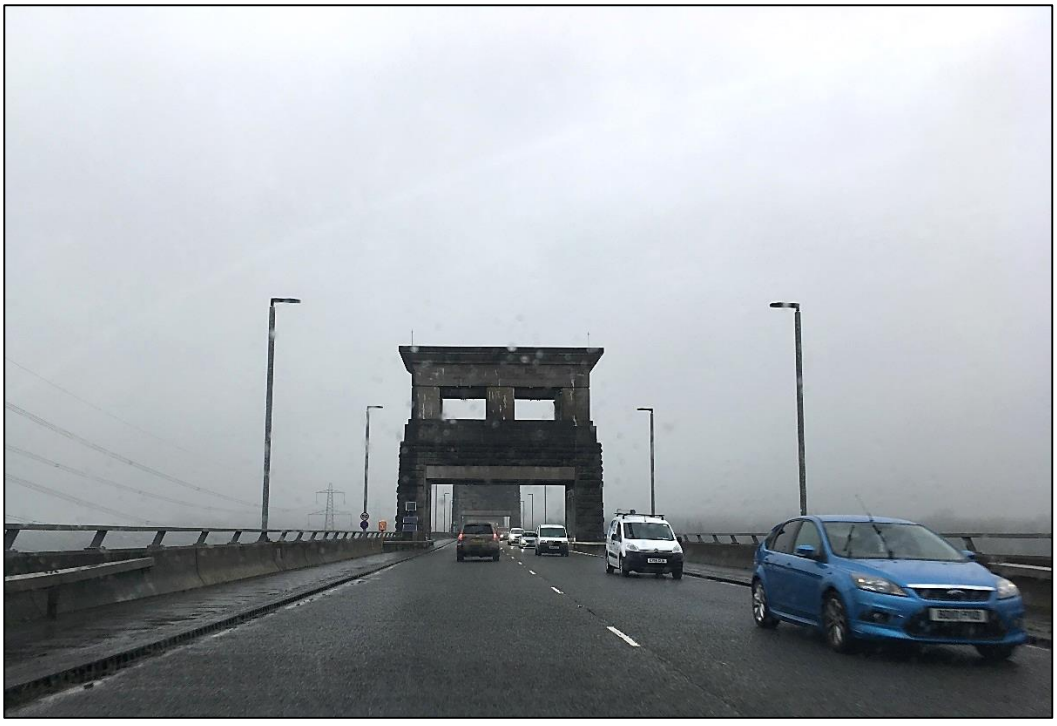


Links to Mainland Wales

4.3.7 There are two road bridges that link Anglesey to mainland Wales. The Britannia Bridge provides the strategic route onto the island carrying the A55. The Menai Bridge provides an alternative link to the island carrying the A487 and is located to the north-east of the Britannia Bridge. Both bridges can suffer from traffic delays during peak periods, which include the main holiday season as well as typical commuting peaks.

4.3.8 The Britannia Bridge is a double-deck structure, providing a single carriageway with one lane in each direction on the upper deck (see figure 4-2) and a single-track railway line on the lower deck. The dual carriageway approaches of the A55 on either side of the bridge have two lanes in each direction which reduce to a single lane in each direction for the crossing. This leads to reduced capacity over this short section of the A55. The capacity of the Britannia Bridge is up to approximately 2,000 vehicles per hour per direction for a road of this design according to the information provided in *Design Manual for Roads and Bridges Volume 5 Section 1 part 3 TA 79/99 Amendment No.1 - Traffic Capacity of Urban Roads* [RD17].

Figure 4-2 Britannia Bridge looking westbound



4.3.9 The A487 via the Menai Bridge provides an alternative route between the mainland and Anglesey. It is a single carriageway road with one lane in each direction and is not appropriate for use by HGVs given the limited overhead clearance between the carriageway and the bridge structure (see figure 4-3). Vehicles using the Menai Bridge can access the A55 at Junction 8 via the B5420 and the A5025.

Figure 4-3 Menai Bridge looking eastbound

4.3.10 To the east of the Britannia Bridge, the A55 provides access to Parc Menai, which is a large area of research and development facilities and other employment land uses south of Bangor as well as Bangor itself. The A55 extends eastwards along the North Wales coast into North West England and provides connections to the national motorway network.

4.3.11 The A55 connects to the A5 at Junction 11 some 8km to the east of the Britannia Bridge. The A5 continues south-east from this junction and provides a strategic route to Shrewsbury and Telford, connecting onwards to Wolverhampton and Birmingham via the M54.

4.3.12 To the east of the Menai Bridge the A487 continues some 2km north to Bangor. To the south, the A487 provides a north-south route through Wales that runs close to the coast between Anglesey and Fishguard.

4.4 Local Road Network – Anglesey

A5

4.4.2 The A5 is a single carriageway road with one lane in each direction across Anglesey that connects Holyhead with the Menai Bridge. The A5 was formerly the principal route crossing the island until the A55 opened. The A55 runs broadly parallel to the A5. The A5 is subject to varying speed limits and it is predominantly derestricted between villages, reducing to 30mph through village areas.

4.4.3 Observations show that the A5 carries local traffic and is lightly trafficked. While parts of the route are suitable for carrying construction traffic, including the section between Holyhead and Junction 3 of the A55 at Valley, the majority of the route runs parallel to the higher standard A55 which is considered most appropriate for use by HGVs.

A5025 – Overview

4.4.4 The A5025 represents the main circulatory road around the island, north of the A55, providing the primary connection between the Power Station Site and the strategic road network.

A5025 Valley to Tregele

4.4.5 The A5025 connects to the A5 at a crossroads in Valley which is a small village east of Holyhead. Between Valley and Tregele the A5025 is a single-carriageway road with one lane in each direction (see figure 4-4). It passes through several villages including Llanfachraeth and Llanfaethlu. The road is subject to varying speed limits and is predominantly derestricted between villages, reducing to between 50mph and 30mph within villages. Typically, footways are only provided when the road passes through villages.

Figure 4-4 A5025 looking north towards the Wylfa Newydd Development

4.4.6 This section of the A5025 has a daily average two-way flow of approximately 5,600 vehicles at the southern end, reducing to a daily two-way flow of approximately 3,200 vehicles at Tregele (source: Strategic Traffic Model). There are several minor width constraints that have the potential to restrict two-way HGV traffic. This section of the A5025 is designated by Highways England as a 'Heavy Load Route' (HR35) for transport between Holyhead Port and the Existing Power Station.

A5025 Tregele to Llanfairpwll

4.4.7 The A5025 between Tregele and Llanfairpwll is a single-carriageway road with one lane in each direction that runs parallel to the coast and provides links to the north Anglesey towns of Cemaes, Amlwch, and the east coast town of Benllech. The route is subject to varying speed limits and is predominantly derestricted between villages reducing to 30mph within villages. Typically, footways are only provided when the road passes through villages. This section of the A5025 has a daily two-way flow of approximately 4,800 vehicles per day between Tregele and Amlwch. There are several width constraints that have the potential to restrict two-way HGV traffic, broadly located in the villages. Therefore, the use of this section of the A5025 is not considered appropriate for construction vehicles.

4.4.8 The Existing Power Station access road connects to the A5025 at a priority junction to the south of Cemaes.

A4080

4.4.9 The A4080 provides a circulatory route around Anglesey to the south of the A55, and it is unlikely to be a route used to reach the Power Station Site other than by workers who reside along the A4080.

4.4.10 The A4080 runs close to the southern coast of Anglesey and provides links to a number of villages and small towns. The road is subject to varying speed limits and is predominantly derestricted between villages reducing to 30mph within villages. Typically, footways are only provided when the road passes through villages.

4.4.11 This road is not expected to carry significant volumes of traffic associated with the Wylfa Newydd Project as it only serves villages. This road is considered to be unsuitable for HGV construction traffic.

Other Roads

4.4.12 The majority of traffic travelling directly to the Power Station Site, including all HGVs, will travel across Anglesey on the A55 before transferring to the A5025. Some workers may utilise other local roads, especially workers residing in the north-eastern quarter of Anglesey and the following paragraphs describe the nature of these other rural link roads.

4.4.13 The B5109 is a narrow single carriageway with one lane in each direction which runs broadly parallel and to the north of the A5 and links to the A5025 at each end, at Pentraeth to the east and at Llanynghenedl to the west. The road runs through a number of villages including Llangefni, Llynfaes and Bodedern. The road is predominantly derestricted with speed limits of 30mph through villages. Typically, footways are only provided when the road passes through villages.

4.4.14 The B5111 links Llangefni in the south with Amlwch and the A5025 in the north and passes through a number of villages including Llannerch-y-Medd, Rhosmeirch and Rhosybol. The road is a narrow single carriageway with one lane in each direction and mainly derestricted with speed limits of 30mph within villages. Typically, footways are only provided when the road passes through villages.

4.4.15 The Wylfa Newydd Development Area includes an existing highway, Cemlyn Road, which connects to the A5025 at Tregele at its eastern end via a priority junction and to Nanner Road at Cemlyn at its western end. This road is a single track rural lane with passing places used for local access and by recreational users. Nanner Road is also a single track rural lane with passing places, serving a number of residential properties, farms and Cemlyn Bay (including public car parks).

4.5 Road Network – North Wales

A55

4.5.2 East of the Britannia Bridge, the A55 continues along the North Wales coast, passing to the south of Bangor and connecting several towns to the strategic road network, including Conwy, Llandudno Junction, Colwyn Bay and Abergele, as shown in figure 4-5 and outlined below:

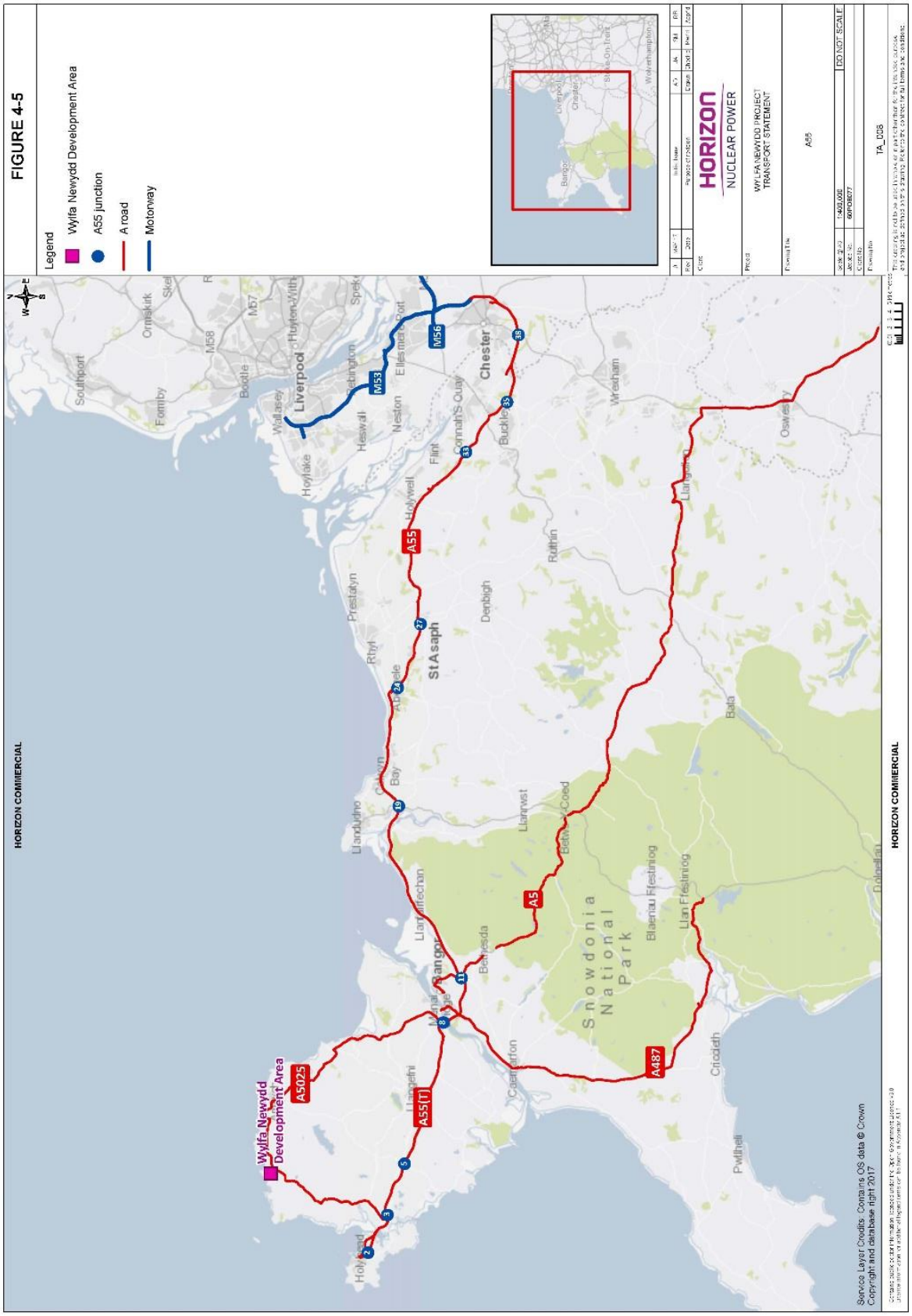
- Junction 9: A487 (Caernarfon/Parc Menai/Bangor);
- Junction 10: A4087 (Bangor);
- Junction 11: A5 (Llandygai/Bangor);
- Junction 12: Tal-y-bont/Crymlyn;
- Junction 13: Abergwyngregyn;
- Junction 14: Llanfairfechan (west);
- Junction 15: Llanfairfechan (east);
- Junction 15A: Penmaenmwar (west);
- Junction 16: Penmaenmwar (east);
- Junction 17: A547 (Conwy);
- Junction 18: A546 (Llandudno Junction - west);
- Junction 19: A470 (Llandudno Junction - east);
- Junction 20: Rhos on Sea;
- Junction 21: B5113 (Colwyn Bay);
- Junction 22: Old Colwyn;
- Junction 23: A547 (Llanddulas);
- Junction 23A: A548 (Pensarn); and
- Junction 24: A547 (Abergele).
- Junction 25: Bodelwyddan/ Ysbyty Glan Clwyd
- Junction 26: St Asaph Business Park
- Junction 27 A525 (Rhyl)
- Junction 28: B5429 (Rhuallt)
- Junction 29: Rhuallt
- Junction 30: Pen-y-Cefn
- Junction 31: A5151 (Holywell) and B5122 (Caerwys)
- Junction 32: A5026 (Holywell)
- Junction 33: A5119 (Mold)
- Junction 33A: Northop Hall
- Junction 34 A494 (Ewloe/ Queensferry) and M56 (Manchester)
- Junction 35: A550 (Hawarden, Wrexham)

- Junction 35A: A5104 (Broughton)

4.5.3 The majority of these junctions are grade separated with the exception of roundabouts at Llanfairfechan (east) (Junction 15) and Penmaenmawr (east) (Junction 16). The Welsh Government currently propose that the two junctions become grade separated junctions. The proposed construction programme is due to commence in 2019 and to be completed by 2021.

4.5.4 Beyond Abergele, the A55 turns inland and continues eastwards to Chester with connections to the M56 and M53 motorways, which serve north-west England. The junction of the A55 with the M56 is around a 60-minute journey by car from the Britannia Bridge. The speed limit along this section of the A55 is 70mph except through Colwyn Bay where it is 50mph.

Figure 4-5 Road network in North Wales



A487

4.5.5 The A487 is a single carriageway road that commences at the southern end of the Menai Bridge, intersects with the A55 at Junction 9 and continues in a south-westerly direction along the coast to Caernarfon. After passing through the centre of Caernarfon, it continues southwards across the Llyn Peninsula and then eastwards to Porthmadog, eventually meeting the A470 at Gellilydan.

4.5.6 The route through Caernarfon is often congested during the summer period and there are proposals to construct a bypass from the Plas Menai Roundabout, east of Caernarfon, to the Goat Roundabout, south of Llanwnda, intersecting the B4366, A4086 and A4085. Construction is due to start in 2017 and be completed by 2019 (subject to the result of the ongoing Planning Inquiry for the scheme).

A5

4.5.7 On the mainland, the A5 is a single carriageway road with one lane in each direction that leads from the Menai Bridge through Bangor, intersects the A55 at Junction 11, and continues southwards through Bethesda and then turns eastwards to Betws-y-Coed. Beyond Betws-y-Coed, the A5 continues south-eastwards across North Wales, intersects with the A483, and continues to Shrewsbury and the Midlands.

4.6 Road Traffic Surveys

4.6.1 Traffic surveys were undertaken on the main roads and junctions across Anglesey and around Bangor to understand existing traffic conditions and to prepare a baseline for future year traffic forecasts. These surveys included junction turning counts, automatic traffic counts and video surveys and they were undertaken between 2014 and 2017.

4.6.2 The locations where traffic surveys were undertaken are shown in figure 4-6. Full details of all traffic surveys are provided in appendix D (Application Reference Number: 6.3.18).

4.6.3 Several site visits have also been completed recording key observations, including:

- a review of general network performance;
- the length and timing of morning and evening peak queues on the approach to Britannia Bridge; and
- a qualitative review of merging behaviour on the A55.

4.6.4 For turning count surveys, various time periods were collected across the various surveys as listed in appendix D (Application Reference Number: 6.3.18). Most were collected over 16 hour periods (06:00-20:00 hours) and some focus on the peak periods, however all turning count surveys covered at least the following time periods:

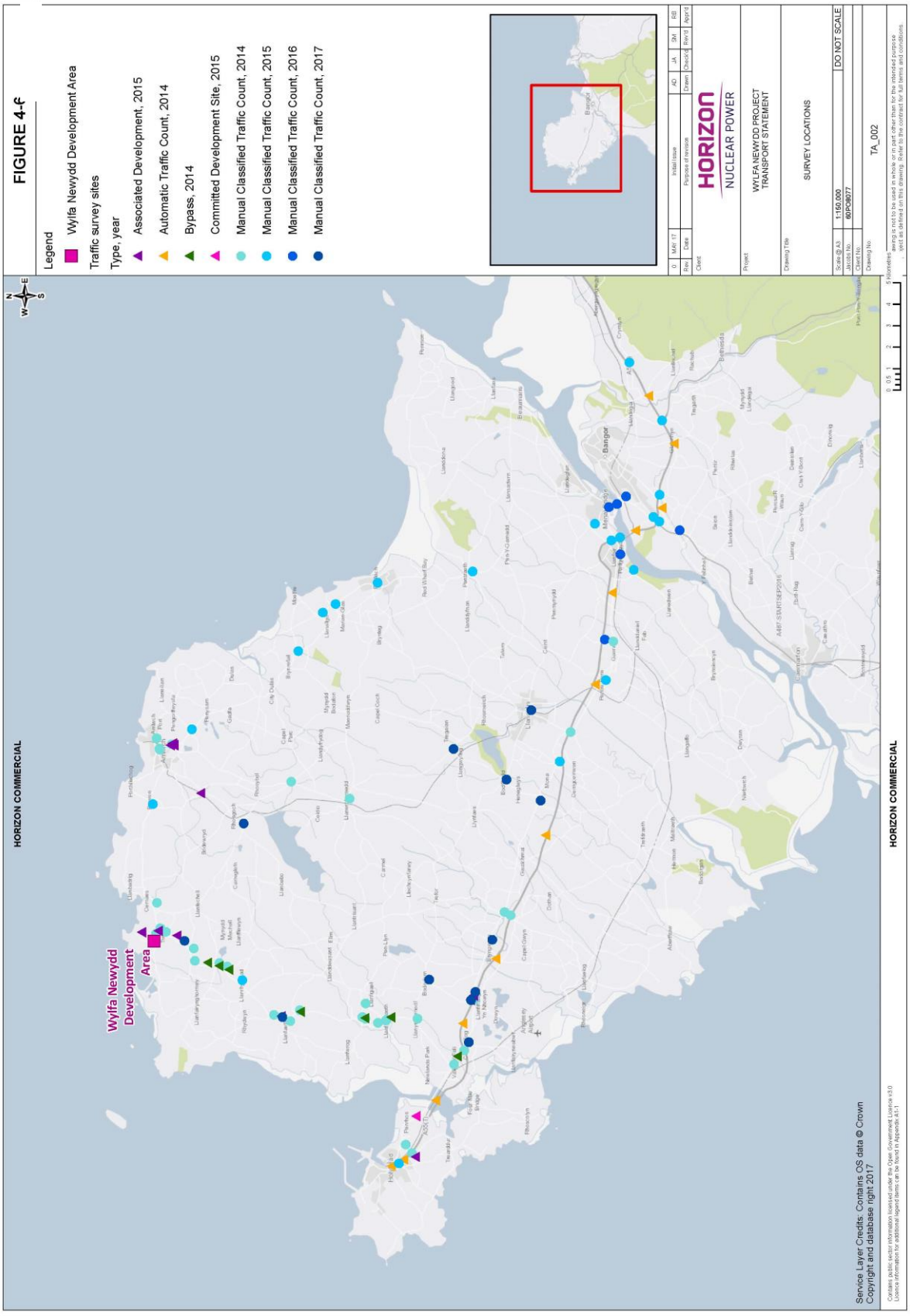
- AM peak 05:45 – 09:00; and
- PM peak 14:45 – 18:00.

4.6.5 Counts were classified into cars, light goods vehicles (LGVs), HGVs, Public Service Vehicles (buses and coaches), motorcycles and pedal cycles. All count data were reviewed to ensure consistency in traffic flows on adjacent links and across the network. Where there was an inconsistency the higher traffic volume was used in order to provide a conservative assessment of traffic flows.

4.6.6 Automatic Traffic Count (ATC) data were collected at various points in time as listed in appendix D (Application Reference Number: 6.3.18). For the VISSIM model, the ATC data were used to validate the turning count data described above.

4.6.7 Journey times across the VISSIM network were measured using Bluetooth data. This technique was considered appropriate as it was straightforward to implement and provided a high sample ratio. Bluetooth data were collected in two separate months. An initial survey was undertaken along the A55 corridor in March 2016. Data were collected between 17 March and 23 March 2016 throughout the day. An expanded survey was undertaken in June 2016 to capture journeys on both the A55 Britannia Bridge and the A5 Menai Bridge. This survey examined both journey times and route choice across the Menai Strait. As the number of vehicles recorded in the original survey was lower than expected, the duration of the second survey was increased to two weeks.

Figure 4-6 Locations of traffic counts



Video Surveys

4.6.8 A video survey was undertaken at all the locations of the following turning counts during the March 2016 surveys:

- Junction 8 A55;
- Junction 8a A55;
- Junction 9 North roundabout A55;
- Junction 9 South roundabout A55;
- Junction 10 A55;
- Junction 11 A55;
- A55 north of Britannia Bridge; and
- A55 south of Britannia Bridge.

4.6.9 These video surveys were used to record and observe merge and diverge movements at the junctions along the A55. This information helped determine where and when queuing was occurring at each junction.

4.6.10 Cameras were placed on each arm of the junctions to capture all turning movements. The two camera locations north and south of Britannia Bridge enabled queuing on the approaches to be reviewed.

4.6.11 The video surveys were consistent with conditions experienced during the site visits. Eastbound queuing commenced around 08:00 and continued through to 09:00. Westbound queuing commenced around 17:15.

4.6.12 The video footage showed that the short merge lengths at Junction 8a and Junction 9 can make it difficult for traffic to join the A55. For short periods, the resulting difference in speed between main line and merging traffic prevents safe entry, causing queues to form.

4.7 Traffic Surveys – Main Results

4.7.1 Existing traffic flows are summarised in table 4-1 for the main links being assessed. In the table HDV refers to heavy duty vehicle i.e. heavy goods vehicles, buses and coaches. Further survey results can be found in appendix D (Application Reference Number: 6.3.18).

Table 4-1 Summary of traffic flows - 2016

Link	Direction	Vehicle flow per hour – AM peak	Vehicle flow per hour – PM peak	% HDV AM/PM
A55 Britannia Bridge	Eastbound	1,720	1,360	15% / 8%
A55 Britannia Bridge	Westbound	1,330	1,640	22% / 9%
A55 east of Junction 3	Eastbound	670	790	14% / 6%
A55 east of Junction 3	Westbound	690	810	16% / 9%
A55 east of Junction 4	Eastbound	740	790	15% / 7%
A55 east of Junction 4	Westbound	720	810	16% / 9%
A5025 north of Valley	Northbound	140	330	6% / 1%
A5025 north of Valley	Southbound	290	220	3% / 0%
A5025 west of Amlwch	Eastbound	110	60	8% / 0%
A5025 west of Amlwch	Westbound	120	60	5% / 1%
B5111 north of Llangefni	Northbound	90	250	10% / 1%
B5111 north of Llangefni	Southbound	220	90	4% / 1%

4.7.2 Surveyed journey times across the Britannia Bridge are presented in table 4-2.

Table 4-2 Journey times across Britannia Bridge – 2016

Link	Direction	Journey Time – AM peak	Journey Time – PM peak
A55 Britannia Bridge	Eastbound	191 seconds (3 minutes 11 seconds)	125 seconds (2 minutes 5 seconds)
A55 Britannia Bridge	Westbound	172 seconds (2 minutes 52 seconds)	197 seconds (3 minutes 17 seconds)

4.7.3 The traffic flows across a day for the Britannia Bridge are shown in figure 4-7 for eastbound traffic and figure 4-8 for westbound traffic.

Figure 4-7 Eastbound traffic on Britannia Bridge 2016 (vehicles per hour)

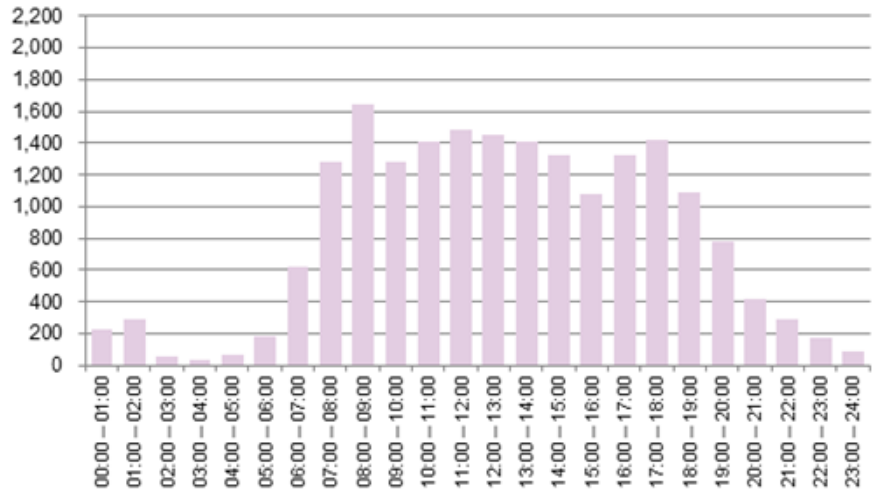
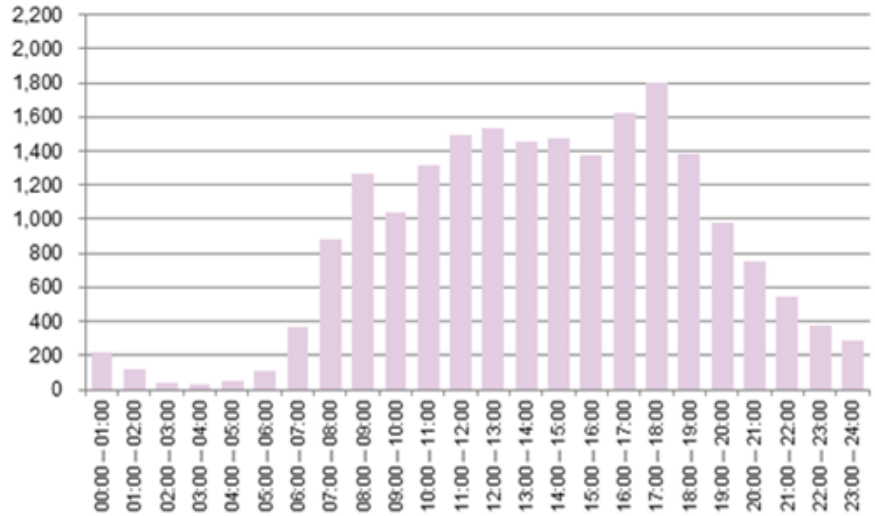


Figure 4-8 Westbound traffic on Britannia Bridge 2016 (vehicles per hour)



4.8 Summary of Traffic Surveys

4.8.1 The data show a strong level of consistency across each type of survey. Turning count data were consistent with supporting ATC data. Bluetooth journey times are consistent with on-site observations, with the expanded June 2016 sample providing greater accuracy across a wider number of movements. Video surveys are consistent with both journey time data and site visit conditions.

4.8.2 The survey data highlight an eastbound tidal flow from Anglesey to the mainland in the morning peak, with the reverse tidal flow in the evening peak. Morning peak queuing near the Britannia Bridge commences eastbound around 08:00 and continues until after 09:00. At its peak, eastbound queuing reaches midway between Junction 8a and Junction 8.

4.8.3 In the evening peak westbound queuing commences around 17:15 (with short period queuing after 16:30) and continues until 18:00. At their maximum, these queues extend approximately 1.25km to Junction 9 on the A55, with further queuing on the A487 on-slip back towards and occasionally onto the nearby roundabout.

4.9 Accident Analysis

4.9.1 An analysis of existing accident data has been undertaken based upon the average of the last five years of available STATS19 data (i.e. 1 January 2011 to 31 December 2015 inclusive).

4.9.2 Accident clusters were identified on the following assessed road sections

- A55 Junction 12 to Britannia Bridge;
- Britannia Bridge to A55 Junction 6;
- A5 Rhostrehwfa to A5 Menai Bridge; and
- A55 Junction 9 to A487 Y Felinheli Bypass (two clusters).

4.9.3 The analysis of clusters at these locations indicates that in the majority of cases the accidents are likely to have occurred because of poor observation, with vehicles pulling in front of or colliding with the side of other vehicles in spite of generally good light and road conditions. Based on this analysis the records for personal injury accidents included in clusters do not demonstrate strong correlation of causes that would be of relevance to the Wylfa Newydd Project.

Full details are provided in the chapter C2 of the Environmental Statement (Application Reference Number: 6.3.2). A detailed breakdown of each section assessed is provided at appendix E (Application Reference Number: 6.3.19).

4.10 Sea

4.10.1 The nearest port for the potential direct delivery of materials and passengers by sea is Holyhead Port, which is located some 25km south of the Power Station Site on the northern side of Holy Island. The port is operated by Stena Line Ports Ltd and it provides car and passenger services to Dublin in Ireland

and forms the principal surface transport link to Ireland from North Wales and the north-west of England. Historically Holyhead also provided passenger only services to Dun Laoghaire just to the south of Dublin. However, these services ceased in 2015.

4.10.2 In 2017, the total capacity per day of the Dublin-Holyhead route was circa 9,800 foot passengers and 5,000 vehicles per direction. The ferry services from Ireland result in increased traffic flows on the A55 in the eastbound direction after a ferry has docked as large numbers of vehicles disembark and travel towards North Wales and the UK motorway network. This effect is most pronounced in the summer holiday period. Ferry-bound vehicles travelling westwards towards Holyhead have a smoother arrival profile as vehicles tend to arrive over several hours in advance of each ferry departure.

4.10.3 Vehicle access to and from the port is via the A55, which runs to the south of the main port area. The port area is constrained by existing road infrastructure, residential and retail development and storage and parking ancillary to the land uses.

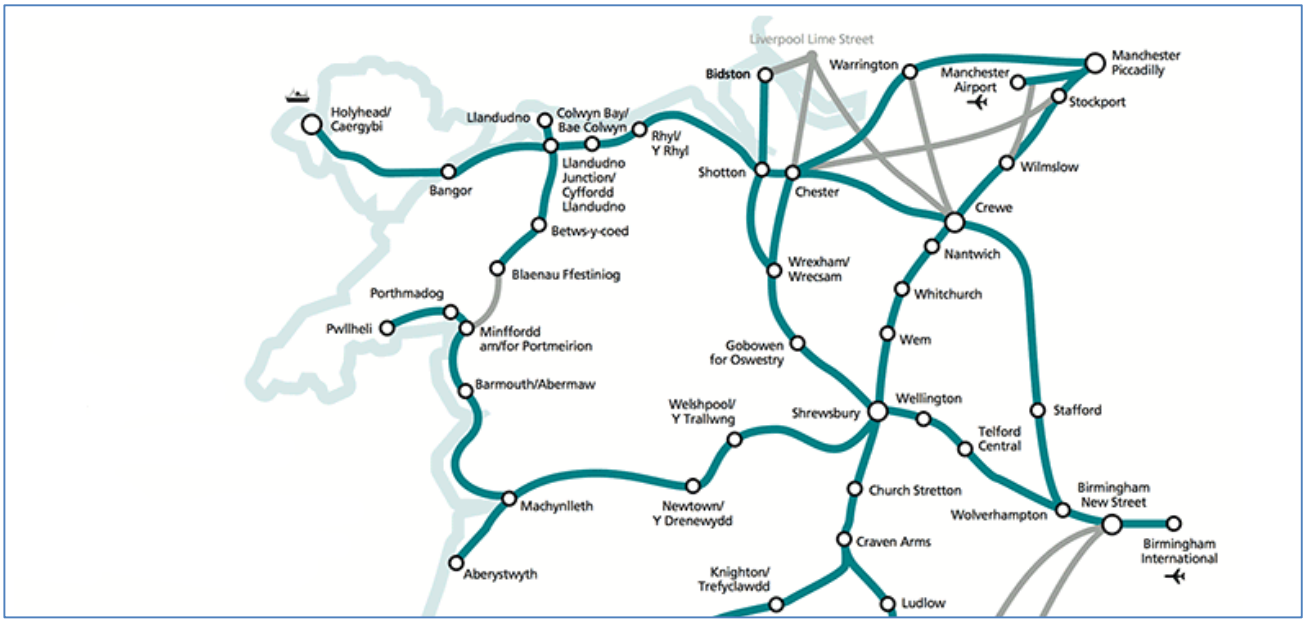
4.10.4 The *North Wales Joint Local Transport Plan* [RD12] sets out highway improvement works that are proposed to provide better links between the port and the A55. These works will improve access between the port and the strategic road network as well as to Holyhead town centre. The proposals include the provision of new dual carriageway link roads as well as landscaping to provide an efficient and attractive gateway to Anglesey. This scheme is in its early stages and is subject to funding.

4.10.5 Additional smaller port facilities are provided at Cemaes and Amlwch. These are primarily used for recreational sailing craft and are only suitable to accommodate small craft and vessels. In addition, vehicular accesses to these ports are also not suitable for accommodating significant numbers of construction vehicles.

4.11 Rail

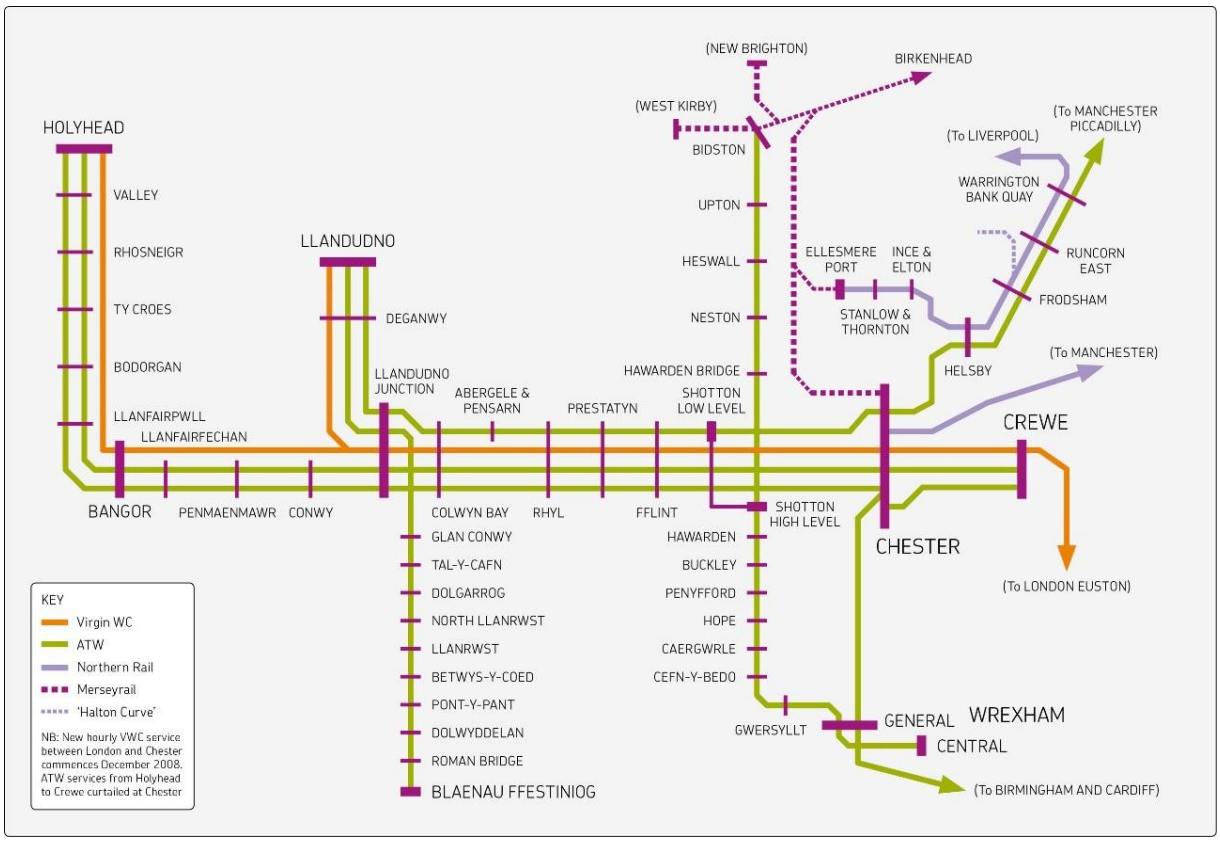
4.11.1 Anglesey is served by a railway that extends from Chester along the North Wales coast to Bangor, across the Britannia Bridge and on to Holyhead. The main stations are at Holyhead and Valley, and Bangor on the mainland. The rail services form part of the North Wales Coast Line which is operated by Arriva Trains Wales (ATW). Figure 4-9 illustrates the extent of the wider network and figure 4-10 shows the more local network. All rail services are currently operating within capacity.

Figure 4-9 North Wales rail network



Source: Arriva Trains Wales (2017)

Figure 4-10 Local rail network



Source: Network Rail

4.11.2 There are several stations along the North Wales coast, serving large and small towns. Several stations, particularly on Anglesey, are request stops only

due to their low patronage. Details of the stations relevant to the Wylfa Newydd Project are outlined below.

Holyhead

4.11.3 Holyhead railway station is some 25km south of the Power Station Site and immediately south of Holyhead Port. This station provides a range of service frequencies, passenger facilities and interchange options with local bus services and passenger ferries. Taxi pick-up points and bus stops are provided immediately outside Holyhead railway station for onward travel.

4.11.4 Holyhead railway station is served by hourly services along the North Wales Coast Line, connecting directly to Chester and Crewe in the east, with options to continue to Birmingham and Cardiff. In addition, five services per weekday are provided by Virgin trains in each direction to and from London Euston. At weekends, there are between six and nine daily services to Chester and Crewe, and four daily services to London Euston. The station was used by approximately 220,000 passengers in 2015-16.

Valley

4.11.5 The closest railway station to the Power Station Site is located at Valley. Valley railway station is currently only a request stop and is served by approximately half of the services that operate between Bangor and Holyhead. An increase in passengers using this station would be required to justify removal of the station's 'request stop' status and to increase the frequency of stopping trains. These potential changes would need to be balanced with journey times and the impact on overall patronage along the line. The station was used by approximately 16,000 passengers in 2015-16.

4.11.6 Passenger facilities at Valley railway station are limited to real-time arrival and departure boards. Toilets, shops and ticket machines are not provided. The nearest bus stops to the train station are located approximately 100m away.

4.11.7 The platform at Valley Station is 40-50m in length. This restricts the number of passenger carriages that the station can accommodate.

Bangor

4.11.8 Bangor railway station is approximately 35km south east of the Power Station Site, on the mainland, and it is on the North Wales Coast Line. This station provides a range of passenger facilities and interchange options, including local bus services and taxi pick-up points directly outside the station.

4.11.9 As a mainline station it provides the same level of service as Holyhead railway station for regional services, representing hourly weekday direct services to Holyhead, Wrexham and Shrewsbury, with opportunities for connections to other direct services. On weekdays, six services are provided in each direction by Virgin trains to/from London Euston, i.e. one additional service per day per direction compared to Holyhead.

4.11.10 At weekends, there are seven daily services to/ from Holyhead, Wrexham and Shrewsbury and four daily services in each direction to London Euston.

Bangor station was the busiest station in North Wales in 2015-16, attracting over 674,000 passengers.

Llandudno Junction

4.11.11 Llandudno Junction railway station is approximately 30km east of Bangor, alongside the River Conwy Estuary and within a short distance of Llandudno and Conwy. This station provides a range of passenger facilities and offers an interchange with a branch line to Llandudno.

4.11.12 As a mainline station, it provides the same level of service as Holyhead and Bangor railway stations for regional and national services. In May 2016, additional trains were introduced to provide a direct service to Manchester Airport on an hourly basis during daytime hours, Monday to Saturday. Llandudno Junction was used by 331,000 passengers in 2015-16.

Chester

4.11.13 Chester railway station is a major hub for connecting rail services. It is located in the city centre and provides a range of passenger facilities. The station serves all of the trains that pass through Holyhead and Bangor stations and provides connections to higher frequency services to Manchester and Liverpool as well as routes along the West Coast Main Line. It is therefore an important hub for workers travelling to or from Anglesey. The journey time from Holyhead to Chester is approximately 1 hour 45 minutes.

4.11.14 As a mainline station, it provides a high level of service with direct trains to locations across North West England and England. Chester was used by 4.62 million passengers in 2015-16.

Gaerwen – Amlwch Disused Railway

4.11.15 The Amlwch Line is a 28km long standard-gauge disused railway corridor that connected the port of Amlwch and the county town of Llangefni with the North Wales Coast Line at Gaerwen.

4.11.16 The line stopped carrying passengers in 1964 and all stations and goods yards, passing loops and sidings were removed, except the marshalling yard used to serve the now closed Octel industrial plant, located approximately 3km south-west of Amlwch. All services including freight operation ceased in 1993 although the track remains in place.

4.11.17 In 2012 Network Rail published a study (dated 2010) [RD20] that was prepared on behalf of the Welsh Government to assess the potential to re-open a 7.2km stretch of the line between Gaerwen and Llangefni in central Anglesey. The study concluded that it would be possible to return this section of track to operational use at a cost of up to £25.1million. The study did not assess the overall cost implications of re-opening the remaining 19km section of line between Llangefni and Amlwch.

Rail Freight

4.11.18 The North Wales Coast Line carries a limited volume of freight with occasional trains from Penmaenmawr quarry and the Valley railhead. Although there are available train paths for freight, the current gauge of this line prevents the most common containers, used by the majority of European and deep-sea shipping, being transported along this route to Holyhead. Furthermore, there are no intermodal facilities at Holyhead, which would allow the transfer of containers between rail and sea.

4.11.19 The railhead at Valley was previously used to transfer waste from the Existing Power Station to dedicated rail services when it was operational.

Strategic Rail Plans

4.11.20 The *North Wales Joint Local Transport Plan (LTP)* [RD12] sets out a range of aspirations for the short term (2015-2020) and medium and longer term (2020-2030), several of which relate to rail. The Network Rail report *Delivering a Better Railway for a Better Britain* [RD21] sets out the spending proposals for 2014-2019, which broadly aligns with the period covered by the LTP. The proposals associated with the North Wales Coast Line include the following:

Short Term (2015-2020)

- Abergele Park and Ride at Abergele railway station (noted to potentially serve the "Wylfa nuclear new build"), which is east of Colwyn Bay and near Junction 23a of the A55 approximately 80km east of Holyhead; and
- Modernisation of the North Wales Coast Line (Phase 1) – scheme includes new signalling and track infrastructure between Flint and Llandudno to improve line speeds.

Medium and Longer term (2020-2030)

- Modernisation of the North Wales Coast Line (Phase 2) – scheme includes new signalling and track infrastructure between Llandudno and Holyhead to improve line speeds.

4.11.21 The rail modernisation proposals already form part of Network Rail's plans for the North Wales Coast Line and are significantly advanced in planning with Phase 1 estimated to be implemented in 2017 and Phase 2 estimated in 2021 (subject to funding). The Park and Ride aspiration at Abergele is yet to be costed or confirmed as a committed scheme. Trains currently take just over an hour to reach Valley from Abergele.

4.11.22 Electrification of the North Wales Coast Line is currently being considered as a future possibility, and further work is required to establish the requirements, costs and timescales.

4.11.23 Proposals for Holyhead Port, including a masterplan for providing intermodal facilities, are at an early stage with limited information available. The timescales for such proposals are therefore unlikely to provide any significant benefit to the Wylfa Newydd Project.

4.12 Bus

4.12.1 Public bus services across Anglesey reflect rural levels of demand, with frequencies of less than one bus per hour. The services are heavily subsidised by the Isle of Anglesey County Council (IACC). A network of routes provides access to both local and island-wide facilities and services, as shown in figure 4-11.

4.12.2 Commercial services pass close to the Power Station and they operate Monday to Saturday with no Sunday services as follows:

- Service number 60 provides a circular local route to and from Amlwch via Cemaes, three times a day.
- Service number 61 connects Amlwch to Holyhead with a service every two hours.
- Service number 62 connects Cemaes to Bangor with four services per day.

4.12.3 The bus journey time between Amlwch and Tregele is approximately 10 to 15 minutes, from Holyhead to Tregele is approximately 35 minutes and from Bangor to Cemaes is approximately one hour and 10 minutes.

4.12.4 As well as commercial services, school buses operate across Anglesey together with volunteer bus-based community services.

4.13 Coach

Eurolines from Holyhead

4.13.1 Eurolines service 871 originates in Dublin and then goes from Holyhead to London. The journey from Holyhead to London runs seven days a week and takes seven hours and 25 minutes. It leaves Anglesey for London at 00:50, travels via Birmingham, Milton Keynes and Luton before arriving in London at 08:15.

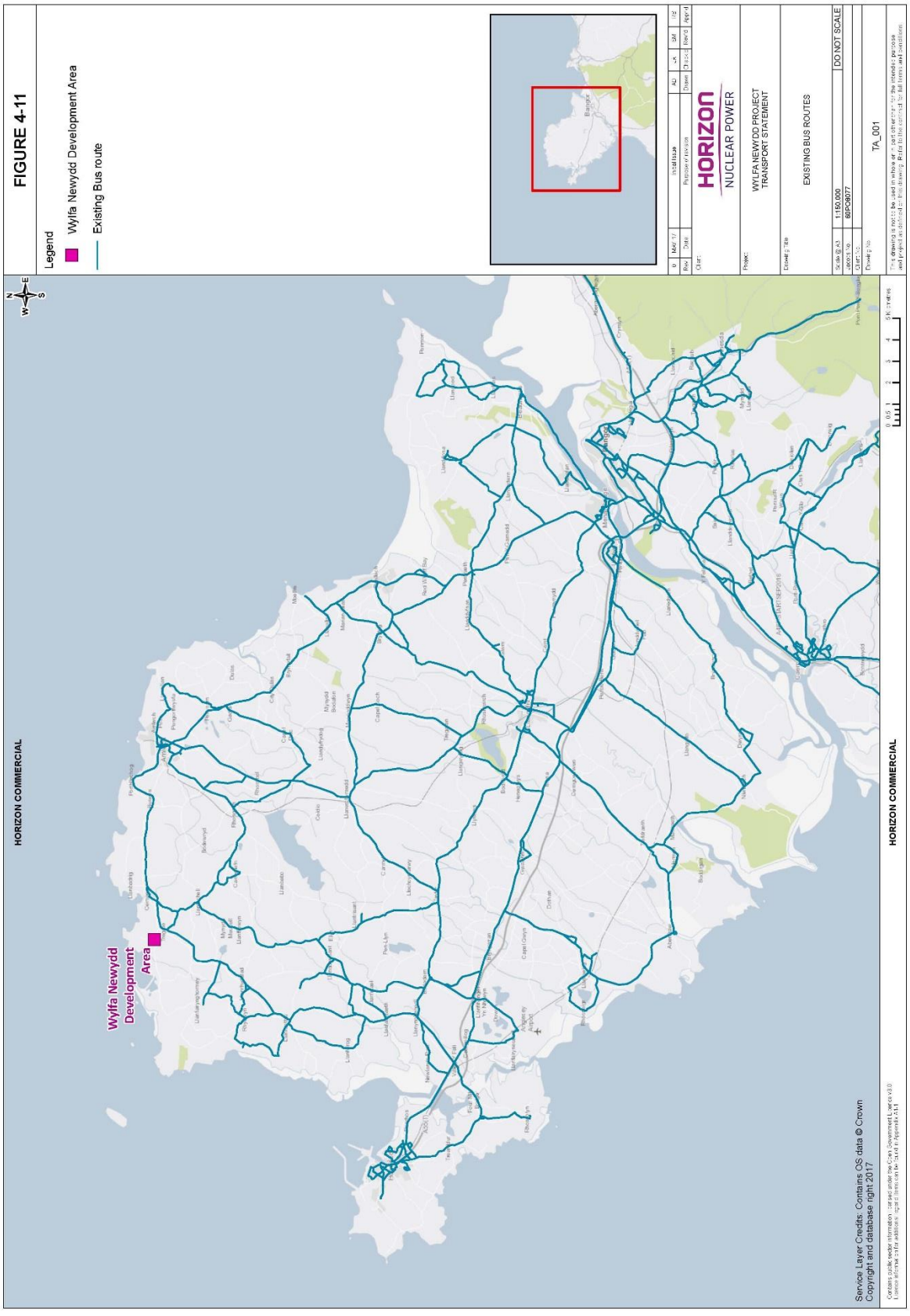
4.13.2 Eurolines service 880 originates in Dublin and then leaves Holyhead each day at 01:00 daily and travels via Bangor, Chester, Liverpool, Manchester and Bradford before arriving in Leeds at 07:00.

4.13.3 In the return direction coaches depart from London to travel to Anglesey at 18:00 and 18:30 daily.

Eurolines from Bangor

4.13.4 Eurolines service 555 goes from Bangor to London at 08:25 daily and takes nine hours and 50 minutes as it has more stops than service 871. The service stops at 17 locations in Wales before reaching Liverpool at 11:30. It then goes to Birmingham, Milton Keynes and London.

Figure 4-11 Bus routes on Anglesey



4.14 Walking and Cycling

4.14.1 The Power Station Site is located in a position relatively remote from significant population centres with only limited infrastructure to enable journeys to be safely made on foot or by cycle. The Walking and Cycling Strategy for Wales highlights that walking is a likely mode of travel for commuting journeys up to one mile (1.6 km), which encompasses the settlements of Cemaes and Tregele. Cycling is considered an appropriate mode for commuting journeys of up to five miles (8.0 km), which encompasses Cemaes and Amlwch to the east and Llanfechell to the south-east.

4.14.2 Cycle routes are shown in figure 4-12 and the walking and cycling catchment areas of the Wylfa Newydd Development Area are shown in figure 4-13 and figure 4-14. Figure 4-15 shows the walking catchment area of the Site Campus within the Wylfa Newydd Development Area.

4.14.3 On the A5025 there are continuous footways between Tregele to the south and Cemaes to the north. There are no segregated on-road cycle routes near the Power Station Site. However, there is an extensive rural network of roads that link to local population centres which are currently only lightly trafficked.

4.14.4 The Power Station Site is connected to and crossed by several recreational routes that will be affected by construction activities and the completed Power Station, including the Wales Coast Path and the Copper Trail.

4.14.5 National Route 566 of the National Cycle Network (NCN), locally known as ‘Lôn Las Copr’ or the ‘Copper Trail’, provides a predominantly on-road route around the northern coast of Anglesey. The route passes along Cemlyn Road to the south of the Existing Power Station, within the Power Station Site.

Figure 4-12 Existing signed cycling network on Anglesey

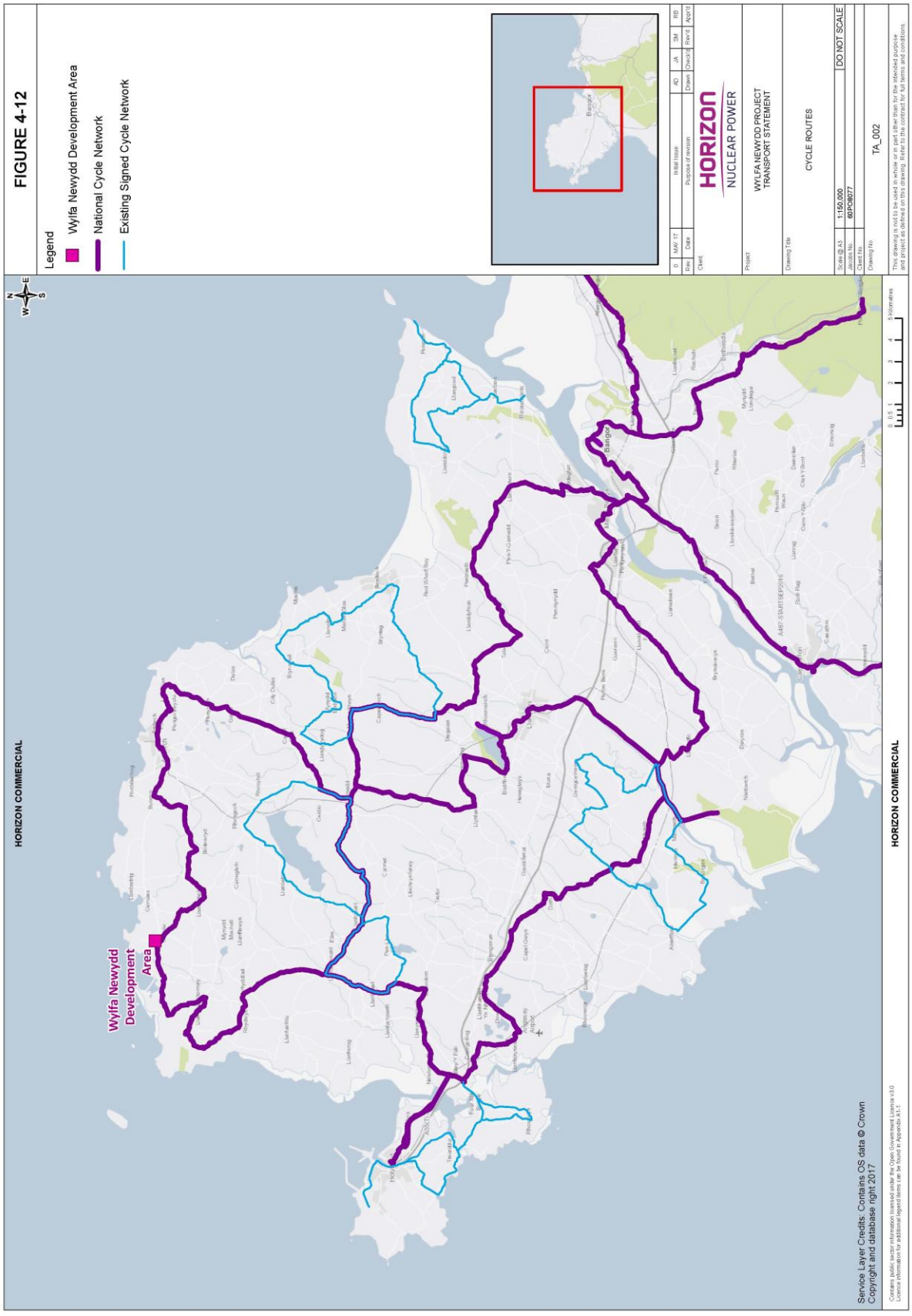


Figure 4-13 Cycle catchment area

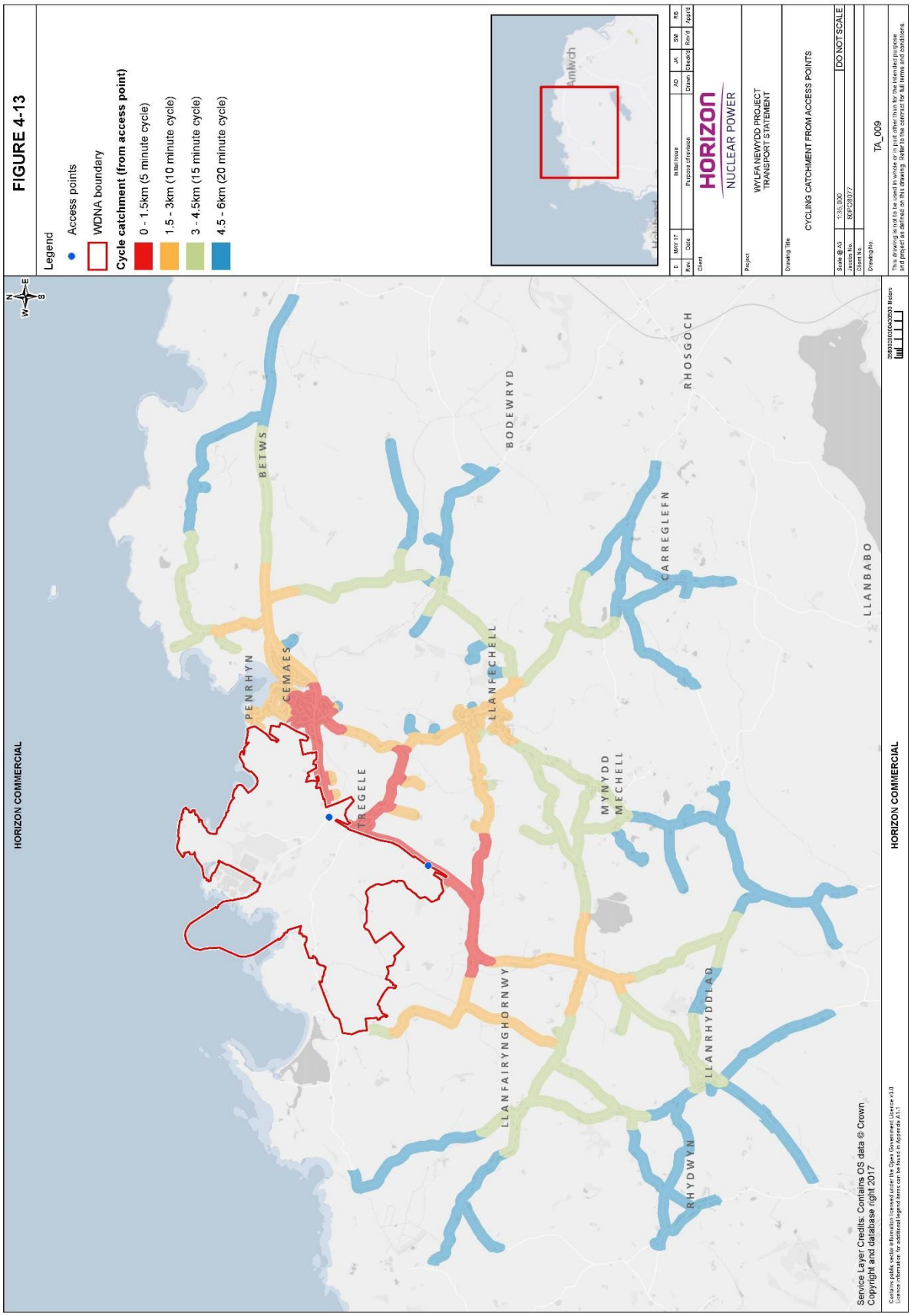
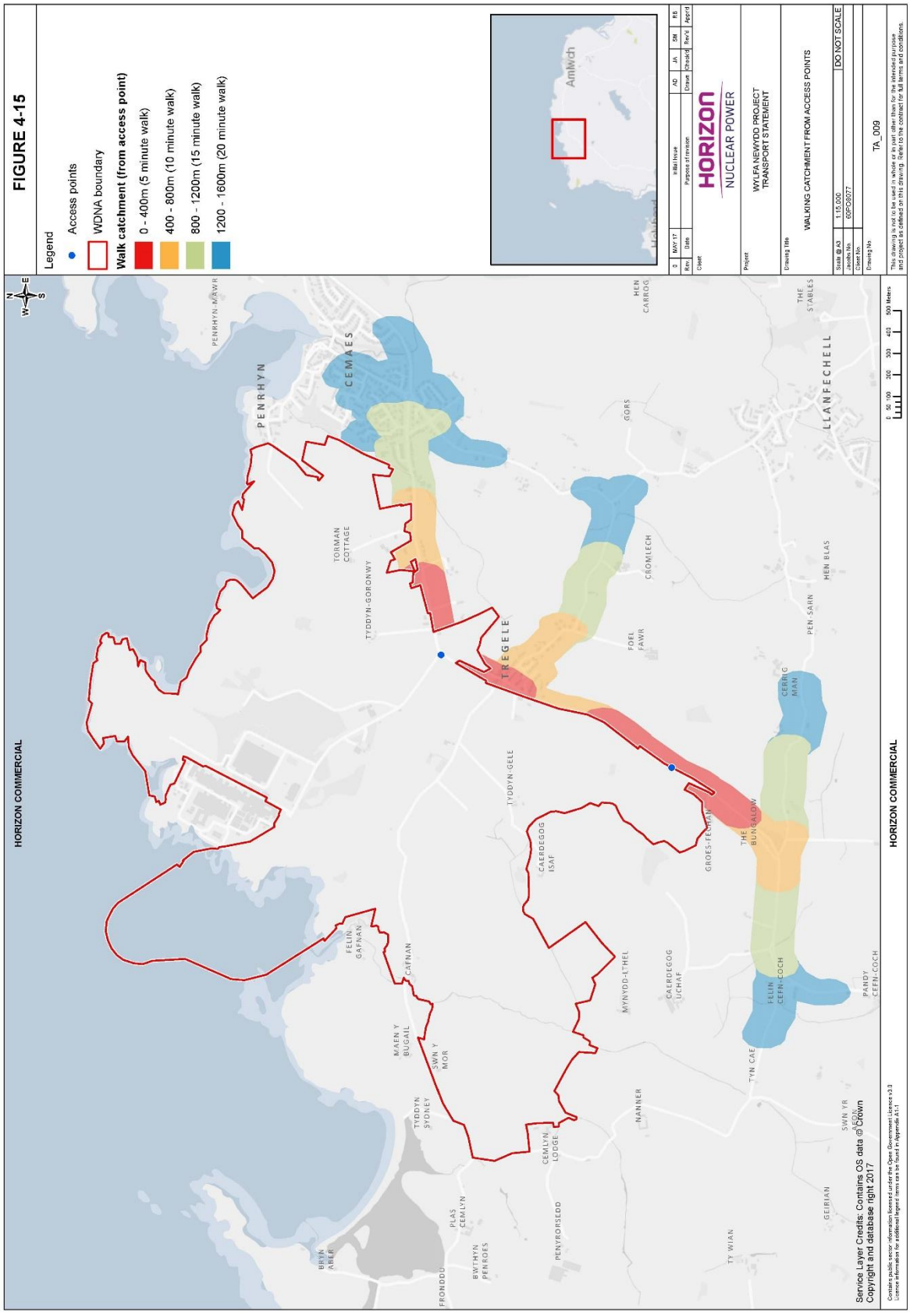


Figure 4-14 Walking catchment area



4.15 Air

4.15.1 Anglesey has an airport which currently offers year-round weekday return flights to Cardiff. For other domestic and international flights, the nearest airport facilities are located at Liverpool John Lennon Airport, Manchester Airport and Birmingham Airport.

Anglesey Airport

4.15.2 Anglesey Airport is located at Llanfair Yn Neubwll around 22km south of the Power Station Site. The public airport forms part of the RAF Valley teaching station and comprises a single storey building with a single check-in desk, departure lounge and baggage handling area. Access to the runways is shared with the RAF training centre. This results in restricted time periods for use of the runway for non-RAF activities and therefore limits the potential to significantly increase the number and frequency of flights in and out of the airport.

4.15.3 The airport provides direct access to Cardiff Airport. Flights to Cardiff are operated by Eastern Airways, operate twice daily (Monday – Friday), and are around one hour in duration. Typically, the route between Anglesey and Cardiff is operated by a small propeller driven plane. Cardiff Airport provides direct connecting flights to nine domestic and 36 Western Europe and Mediterranean destinations, as well as Qatar in the Middle East.

4.15.4 Anglesey airport connects to the A55 at Junction 3 to the west and Junction 4 to the east via a number of rural roads. These A55 junctions are around 2.5km to the north of the airport.

Other Airports

4.15.5 RAF Mona is a RAF station immediately north of the A5 and to the south of the village of Bodffordd on Anglesey. Access to the A55 is via Junction 5 and Junction 6 some 5km to the west and 4km to the east of the airstrip respectively. The airstrip is primarily used as a relief landing ground for RAF Valley and also accommodates a civilian flying club as well as the 2474 (Cefni) Air Training Corps. There are limited opportunities to introduce domestic flights at this airport without investment in facilities and no such flights currently take place.

4.15.6 Major airports at Liverpool, Manchester and Birmingham offer frequent domestic flights across the UK and international flights to a wide variety of destinations across Europe and the rest of the world. For long-haul destinations, Manchester Airport is likely to be the preferred choice.

4.15.7 A choice of transport connections to these airports is available. For access by car, the A55 and the wider strategic road network allow connections between the Power Station Site and Liverpool John Lennon Airport (two hours), Manchester Airport (two hours), Birmingham Airport (three hours) and Heathrow Airport (four to five hours).

4.15.8 Rail connections are also available from Holyhead to Liverpool South Parkway station (three hours, three trains required), Manchester Airport station (three

hours, two trains required), Birmingham International station (three to four hours, up to three trains required) and Heathrow Airport (five hours, three trains required)

5 Proposed Development

5.1 Introduction

5.1.1 Horizon is proposing to construct and operate the Wylfa Newydd Project which comprises the Power Station (including two Reactors, related plant and Ancillary Structures), other on-site development, the Marine Works, the Off-Site Power Station Facilities and the Associated Development.

5.1.2 The Off-Site Power Station Facilities comprising the Alternative Emergency Control Centre (AECC), the Environmental Survey Laboratory (ESL) and the Mobile Emergency Equipment Garage (MEEG).

5.1.3 Further details of the transport-related Associated Development and mitigation measures proposed as part of the Wylfa Newydd Project are listed below:

- Site campus at the Power Station including temporary accommodation for up to 4,000 construction workers;
- Shuttle buses;
- A Park and Ride facility with 1,900 car parking spaces for construction workers at Dalar Hir to reduce construction worker traffic flows along the A5025;
- Car parks at Wylfa Newydd Development Area with up to 1,900 car parking spaces;
- A 24-hour Logistics Centre at Parc Cybi with 100 HGV parking spaces to enable deliveries to be managed and prevent convoys (which is particularly useful during any traffic incidents);
- A5025 Off-line Highway Improvements including a new Power Station Access Road Junction; and
- Marine Off-Loading Facility.

5.1.4 In addition to the above measures, the proposed A5025 On-line Highway Improvements also offer benefits to assist the mitigation of impacts from Project related traffic. They are subject to a planning application outside of the DCO regime and as an application pursuant to the Town and Country Planning Act in order to provide the improvements in advance.

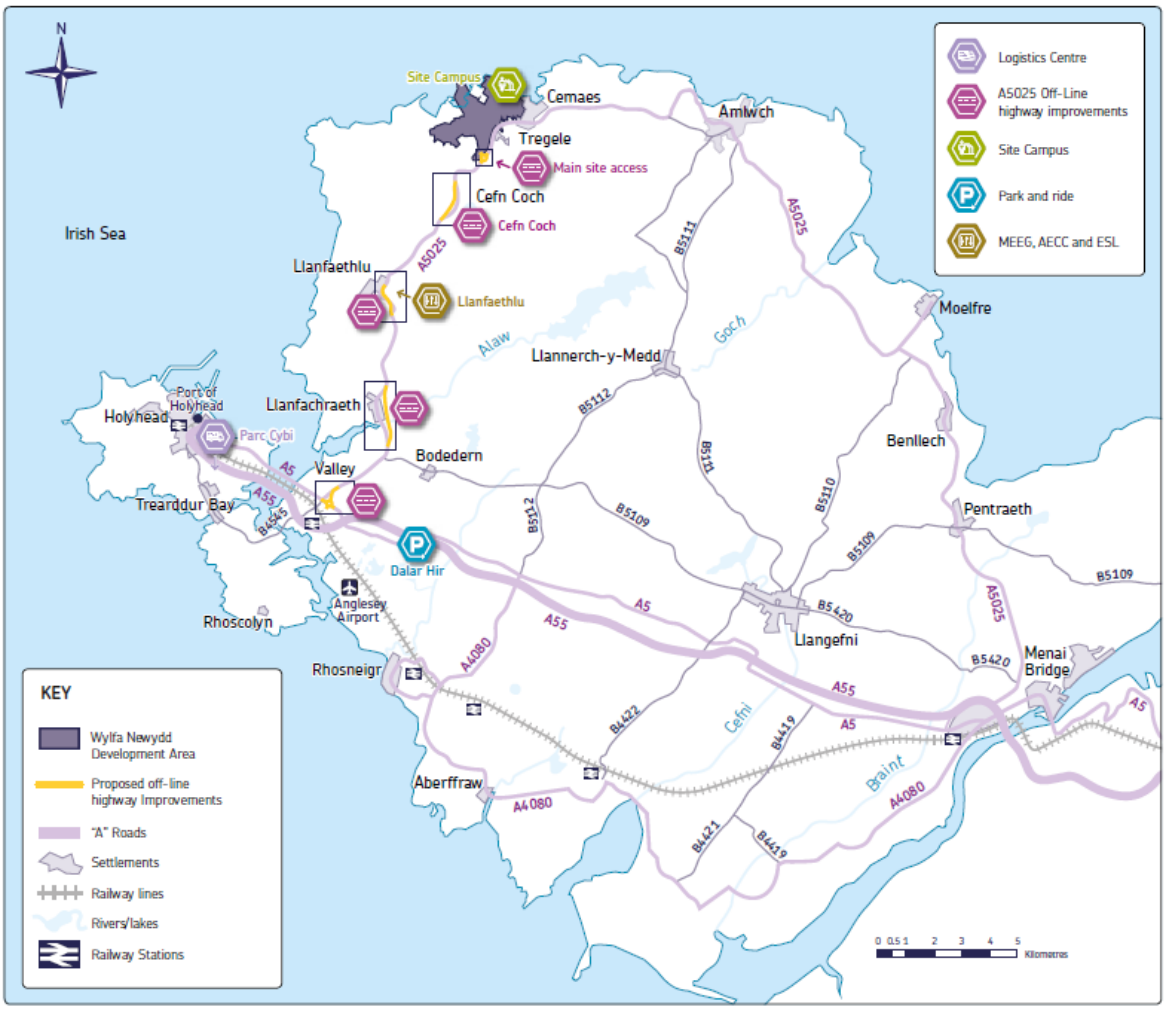
5.1.5 Up to 5% of car parking spaces will be designed for use by disabled workers or visitors. The location of these spaces will depend on the phase of construction and disabled spaces will be located as close as possible to the place of work for each worker or visitor. This means that more disabled spaces are likely to be provided at the Wylfa Newydd Development Area rather than the Park and Ride facility to reduce the need for disabled workers or visitors to use the shuttle bus facility.

5.1.6 The overall indicative nine-year programme for completing the Wylfa Newydd Project is presented in figure 5-1.

Figure 5-1 Indicative construction programme

5.1.7 The locations of the developments comprising the Wylfa Newydd Project are shown in figure 5-2, and they are described in more detail in following sections of this chapter.

Figure 5-2 Proposed development



Site Campus

5.1.8 The Site Campus includes temporary accommodation for up to 4,000 workers. It is within the Wylfa Newydd Development Area and is a key component of the ITTS (Application Reference Number: 6.3.20) for the Wylfa Newydd Project. Providing accommodation in this location means that workers can walk to and from their place of work each day. The Site Campus is expected to open in phases.

5.1.9 An illustrative layout of the Site Campus is shown in figure 5-3.

Figure 5-3 Illustrative layout of Site Campus

5.1.10 The Site Campus will also require up to 350 workers to operate and manage the facilities.

5.1.11 The site campus will include the following amenities for workers:

- cafeteria;
- café;
- reception area;
- outdoor recreational facilities including two multi-use games areas;
- gym;

- bar; and
- other social space.

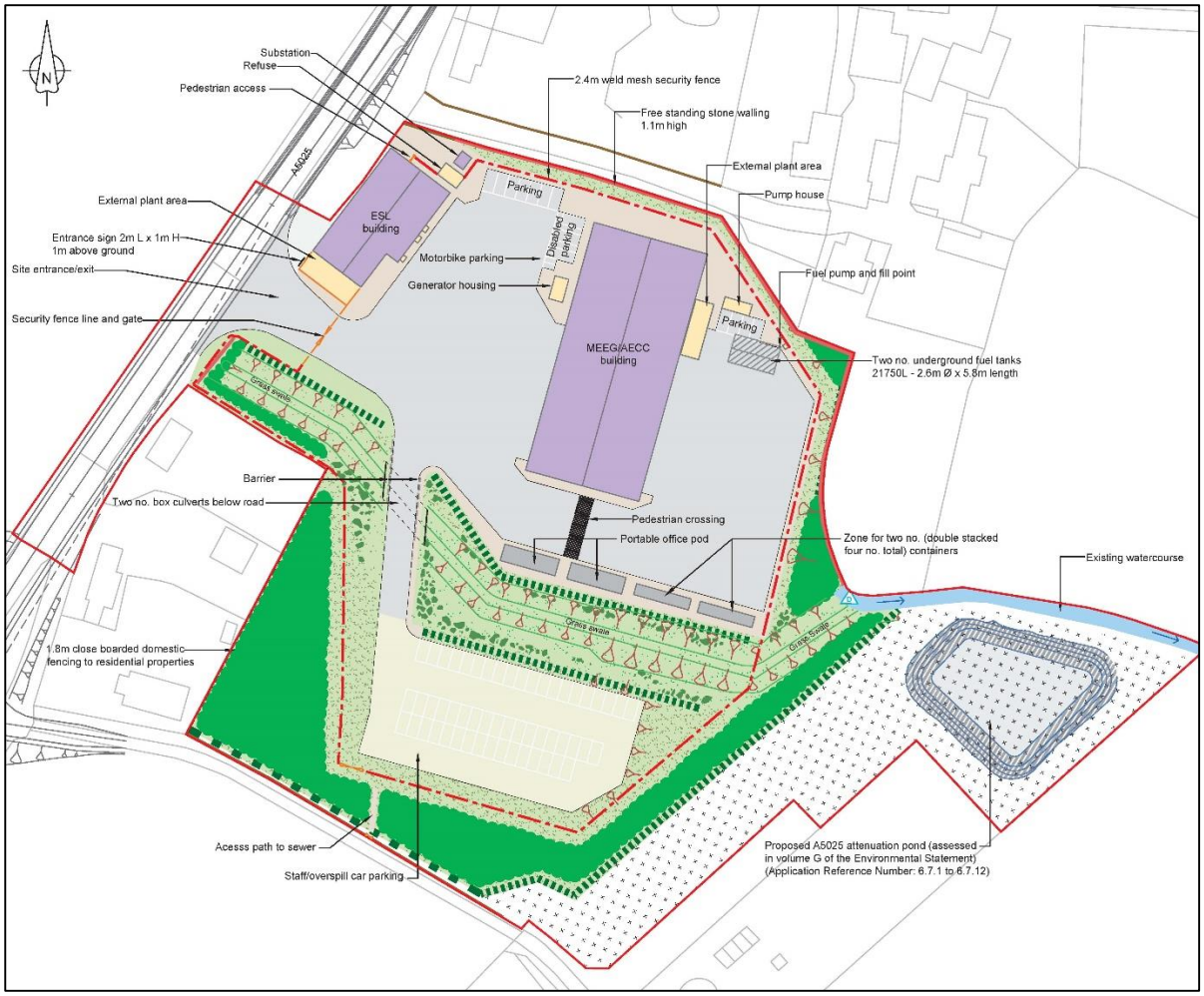
Off-Site Power Station Facilities

5.1.12 As part of the Wylfa Newydd Project the following facilities will be provided at Llanfaethlu:

- Alternative Emergency Control Centre (AECC);
- Environmental Survey Laboratory (ESL); and
- Mobile Emergency Equipment Garage (MEEG).

5.1.13 Vehicle access to these facilities will be from a new priority junction with the A5025. An illustrative layout of the site is shown in figure 5-4.

Figure 5-4 Illustrative layout of AECC, ESL and MEEG



5.1.14 These facilities are expected to have three workers who will typically work standard office hours. Car parking is provided for these workers together with an overflow car park for use in an emergency.

Shuttle Buses

5.1.15 A network of shuttle buses will be operated by Horizon serving the towns of Holyhead, Bangor and Caernarfon together with villages across Anglesey. These services will be flexible and routes will be refined to meet the actual demand from construction workers. Shuttle buses will also link the Park and Ride facility at Dalar Hir with the Wylfa Newydd Development Area and these shuttle buses will operate throughout the day. The shuttle bus service is expected to commence, subject to worker demand, from the start of construction activities.

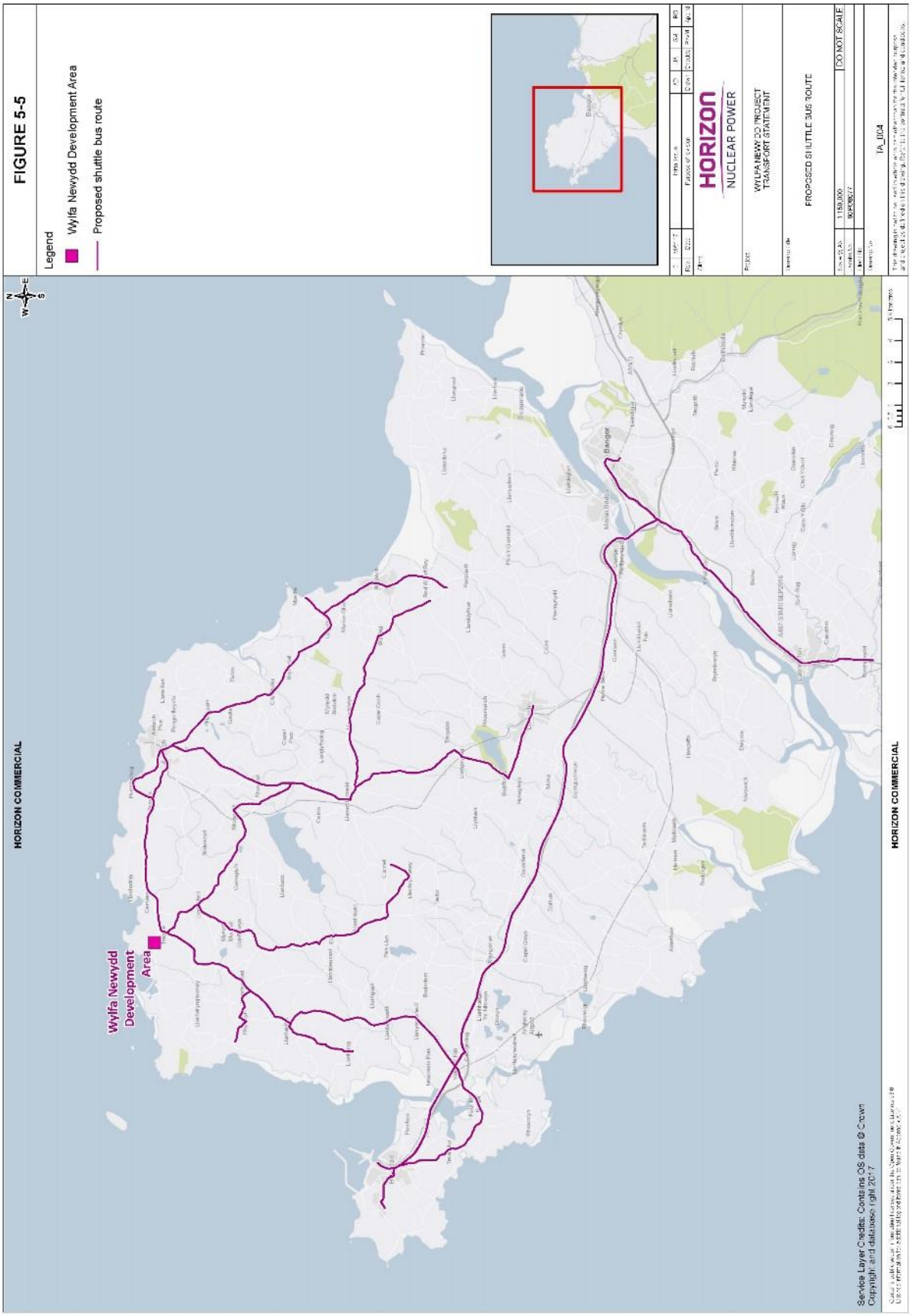
5.1.16 The initially proposed services are shown in figure 5-5. A catchment analysis shows that 55% of homes on Anglesey will be within 600m of a shuttle bus service. The shuttle buses will also serve the rail stations at Holyhead and Bangor.

5.1.17 The services will primarily operate to coincide with the morning and evening shift changeover times. However, a lower frequency service will also be provided during the inter-peak period to accommodate worker travel outside of the main shift peaks, such as facilities management staff and construction workers on a short shift.

5.1.18 All shuttle buses travelling to the Wylfa Newydd Development Area will be for the exclusive use of construction workers associated with the Wylfa Newydd Project. Workers using shuttle bus services will therefore be required to show appropriate accreditation upon boarding.

5.1.19 All buses procured for the Wylfa Newydd Project will meet the minimum standards for emissions in place at the time of construction. The procurement process has yet to be finalised, however local operators will be encouraged to tender for services to utilise their local knowledge and offer support in the form of depot and maintenance facilities.

Figure 5-5 Indicative shuttle bus network



Park and Ride

5.1.20 A Park and Ride facility of 1,900 car parking spaces will be provided on Anglesey at Dalar Hir, immediately to the north east of Junction 4 on the A55 as shown in an illustrative layout in figure 5-6. The proposals are based on the likely demand for the facility.

Figure 5-6 Illustrative layout of Park and Ride facility at Dalar Hir

5.1.21 This facility will reduce the number of vehicles travelling along the A5025, consolidating car-based worker movements into buses. Its location adjacent to the strategic road network of the A55 at Junction 4 will mitigate pressure on Junction 3, where traffic leaves the A55 to travel along the A5 and A5025 to the Wylfa Newydd Development Area, helping to ensure resilience on the road network.

5.1.22 The facility will be accessed directly from the northern roundabout at Junction 4 for all bus movements and incoming workers. Workers could exit the facility via a signal controlled junction towards the eastern end of the facility onto the A5. They would then be able to access the A5 at Junction 4.

5.1.23 The Park and Ride facility is expected to open in phases.. Once fully operational, it will provide up to 1,900 car parking spaces, welfare facilities and security personnel. It will be manned 24 hours a day by up to 36 workers and it will have lighting, secure fencing and CCTV. In addition, larger spaces for minibuses and electric vehicle charging points will be provided to encourage the use of sustainable transport.

5.1.24 The facility will be used for daily commuting purposes and for long stay parking for a proportion of those workers living at the Site Campus. Approximately half of the spaces will be allocated for long stay use with shuttle buses provided at weekly changeover times. The other half of the spaces will be allocated for daily travel and will accommodate fluctuations in demand and vehicle occupancy rates to ensure resilience and avoid overspill parking onto local roads. Workers who do not qualify for access to the Wylfa Newydd Development Area car park will be directed to Dalar Hir. At peak construction, it is expected that an average vehicle occupancy of 1.5 will be achieved at the Park and Ride facility.

5.1.25 Shuttle buses serving the Park and Ride facility at Dalar Hir will travel along the A55 between Junction 4 and Junction 3, before joining the A5025 at Valley and continuing north to the Wylfa Newydd Development Area. This journey will take around 25 minutes in free-flow conditions. Park and Ride buses will not be permitted to remain on the Power Station Site when not in use so will return to the Park and Ride facility after workers have disembarked.

5.1.26 A new bus stop will also be provided on the A5 to enable construction workers to travel to the Park and Ride facility using local bus services before using shuttle buses to reach the Wylfa Newydd Development Area.

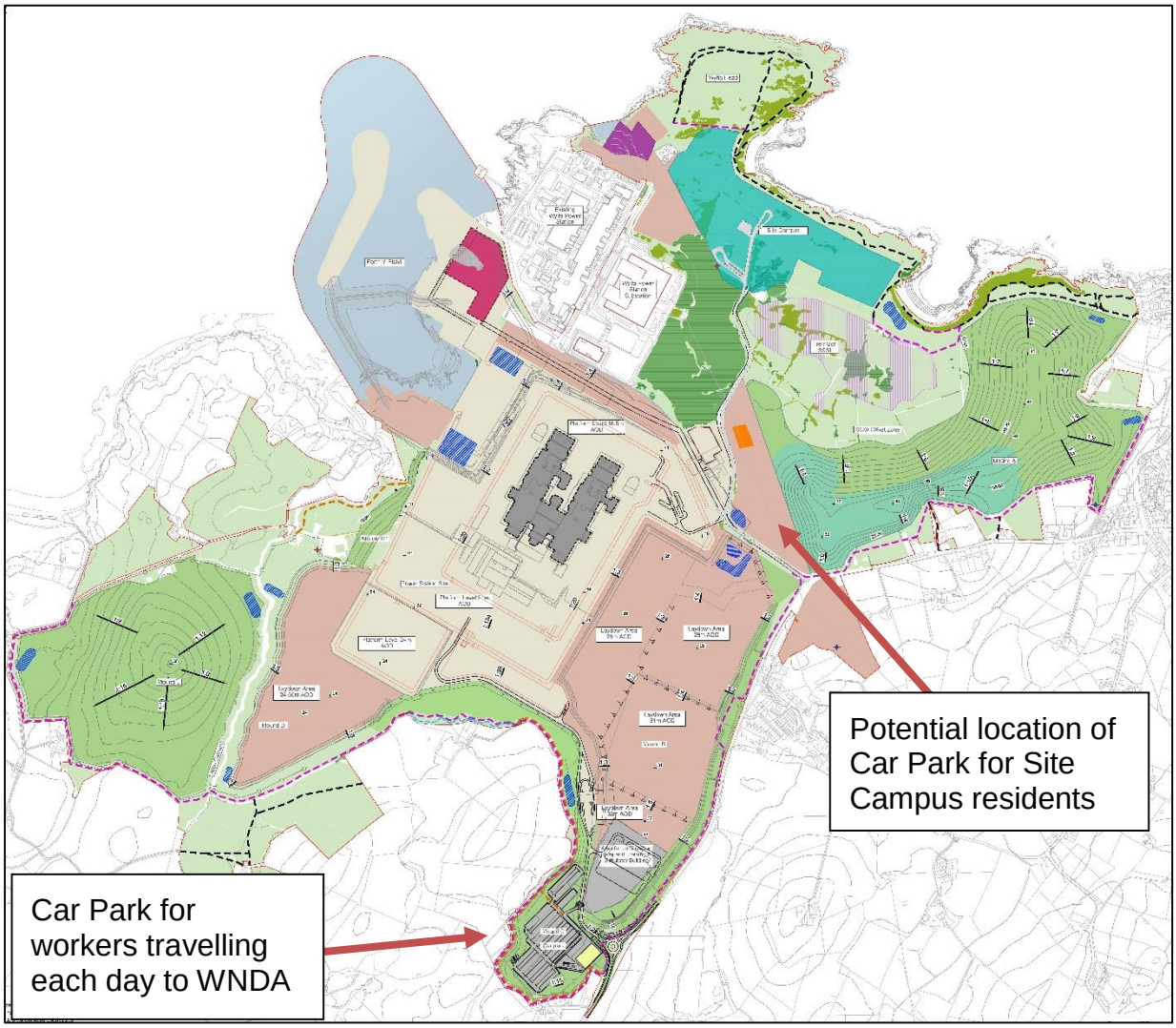
5.1.27 Following construction of the Power Station, the Park and Ride facility would be removed and the land restored to its existing use as agricultural land.

Car Parks at Wylfa Newydd Development Area

5.1.28 Two car parks with a total of up to 1,900 spaces will be provided at the Wylfa Newydd Development Area to accommodate a proportion of daily commuting workers who meet specific criteria, such as workers car sharing or requiring disabled access, and to provide spaces for workers staying at the Site Campus who have travelled there by car. See chapter 7 for more details of the proposed car parking arrangements.

5.1.29 The locations of the car parks are illustrated in figure 5-7.

Figure 5-7 Illustrative locations of car parks at Wylfa Newydd Development Area



5.1.30 Access to the Wylfa Newydd Development Area car parks will be controlled. As the number of workers increases, the criteria for accessing this car park will become more stringent. For the majority of workers this will be based upon vehicle occupancy with an expected threshold of three workers per vehicle in 2023 the peak construction year. The intention is to achieve as high a car share ratio as possible. See chapter 6 for further details on the worker travel

strategy, including how car sharing will be implemented and how parking will be controlled.

5.1.31 The car park for residents of the Site Campus will open in phases in tandem with the opening of the accommodation phases of the Site Campus.

5.1.32 The car park for daily workers travelling to the Wylfa Newydd Development Area will open at the start of construction activities and it will increase in size over the course of the construction programme to reflect the build-up in the number of construction workers. Further details of the proposed phasing arrangements are provided in chapter 7.

Logistics Centre

5.1.33 A Logistics Centre will be provided at Parc Cybi near Junction 2 of the A55. All construction vehicles travelling to the Wylfa Newydd Development Area will be required to travel to the Logistics Centre to be registered. Providing this facility means that the movement of construction vehicles along the A5025 can be managed to ensure there is a regular flow of construction vehicles and to hold vehicles in the event of a traffic incident. This will help reduce potential impacts on other road users.

5.1.34 The layout of the Logistics Centre is shown in figure 5-8. It will have space for up to 100 HGVs and be operated by approximately 14 employees. It is anticipated that construction of the Logistics Centre would begin in year 1 of the construction programme and last for approximately 15 months i.e. it would open in 2020. Thirteen car parking spaces are to be providing including one disabled space.

Figure 5-8 Illustrative Layout of Logistics Centre

5.1.35 Once construction vehicles have delivered material to the Wylfa Newydd Development Area they will return along the A5025 and re-join the A55 at Junction 3. The departure of these empty construction vehicles will be managed at the Wylfa Newydd Development Area so that there is a regular flow of southbound construction vehicles along the A5025, with vehicles released at regular intervals to avoid "convoys" of construction vehicles which could increase traffic impacts along the A5025 corridor. The outbound flow of construction vehicles is expected to match the inbound flow in terms of volume, i.e. up to 40 construction vehicles per hour per direction during the peak construction period.

5.1.36 The Logistics Centre has been designed to ensure that the site can be utilised for other business/employment uses as per the outline consent once no longer required to help support the construction of the Power Station.

A5025 Off-line Highway Improvements

5.1.37 The introduction of the Wylfa Newydd Project will increase traffic flows along the A5025 between Valley and the Wylfa Newydd Development Area. To help reduce the impact on local residents and facilities along the corridor, five off-line highway improvements are proposed as follows:

- A5 east of Valley Junction to north of Valley Junction – comprising a proposed four arm roundabout and a bypass connecting the A5 with the A5025 to the east of the existing A5/A5025 signalised junction in Valley. This is 1.06km in length.
- North of Llanynghenedl to north of Llanfachraeth – comprising a proposed bypass east of Llanfachraeth. This is 2.28km in length.
- South of Llanfaethlu to north of Llanfaethlu – comprising proposed improvements to two existing substandard bends on the A5025 in Llanfaethlu. This is 1.43km in length.
- North of Llanrhuddlad to north of Cefn Coch – comprising a proposed bypass to provide a straighter section of road and bypass two existing substandard bends in Llanrhwydrus. This is 1.3km in length.
- Power Station Access Road Junction – north of Cefn Coch – comprising a proposed three-arm roundabout junction linking the existing A5025 to the proposed Power Station Access Road.

5.1.38 The location of these proposed schemes is shown in figure 5-9 and further details (including details of any highway stopping up requirements) are provided in chapter G1 (Proposed Development) (Application Reference Number: 6.7.1).

5.1.39 These schemes are expected to begin construction in year 1 and last for 18 months i.e. for the purposes of the transport analysis they are assumed to open in 2020. They will remain following completion of the construction of the Power Station and hence provide a legacy benefit for residents and the wider economy along the A5025 corridor.

Figure 5-9 A5205 Off-line highway improvements

A5025 On-line Highway Improvements

5.1.40 Sections of the A5025 will be improved to support their use by construction traffic in advance of the DCO as follows:

- Some sections of the carriageway of the A5025 will be widened to improve road safety and reconstructed to ensure that the lifespan of the road is maintained.
- Sections of the existing A5025 which are bypassed by the A5025 Off-line Highway Improvements will be declassified and the surface dressed.
- Where Public Rights of Way intersect or terminate at the A5025, modifications will be made to ensure they are not affected and sufficient verge width will be provided to keep pedestrian routes away from the edge of the carriageway.
- New crossing points and surfaced cycleways will be provided where the National Cycle Network crosses the A5025.

5.1.41 These measures are to be implemented through a separate Town and Country Planning Act Planning Application so they can be undertaken in advance of the DCO works.

Construction Traffic Signage

5.1.42 A comprehensive signing strategy will be provided to ensure construction vehicles use designated routes and avoid wrong turns and re-routing. Appropriate symbols, colours, and/or abbreviations will be used to direct goods deliveries to the correct location, particularly as some sites may have more than one temporary construction compound. The signing strategy will be agreed with the local highway authority as part of the Wylfa Newydd CoCP (Application Reference Number: 8.6) in advance of construction and will be integrated into the web-based delivery booking system for suppliers.

Other Highway Changes

5.1.43 The Wylfa Newydd Project will require the closure and stopping-up of Cemlyn Road with access to Cemlyn limited to Nanner Road. Nanner Road is a single track rural lane with passing places, serving a number of residential properties, farms and Cemlyn Bay (including public car parks). It has recently been improved as part of the wider Wylfa Newydd Project to cater for the additional traffic diverted once Cemlyn Road closes.

Pedestrians and Cyclists

5.1.44 Covered and secure cycle parking will be provided at the Site Campus to encourage more sustainable travel options for leisure purposes. Usage will be monitored and provision increased where demand exists. The Site Campus will have good pedestrian facilities and connections to link with the existing wider footway network.

5.1.45 Covered and secure cycle parking will also be provided at the Logistics Centre and the Park and Ride facility at Dalar Hir to encourage those living within typical cycle travel-to-work distance (e.g. 8km) to cycle to these facilities for onward transfer by bus. Usage will be monitored and provision increased to meet demand.

5.1.46 National Route 5 of the National Cycle Network (NCN), crosses the A5025 to the south of the Wylfa Newydd Development Area near Llanynghenedl by way of a staggered junction. The current provision at this junction is signage with no cycle lane or path provided. Increased flows along the A5025 related to the Project will therefore affect this junction. It is therefore proposed that a formal staggered crossing for cyclists is provided at this location as part of the proposed A5025 On-line Highway Improvements. This involves installation of a designated cycle path that will run parallel to the A5025 before crossing the road, segregating cyclists form the main carriageway.

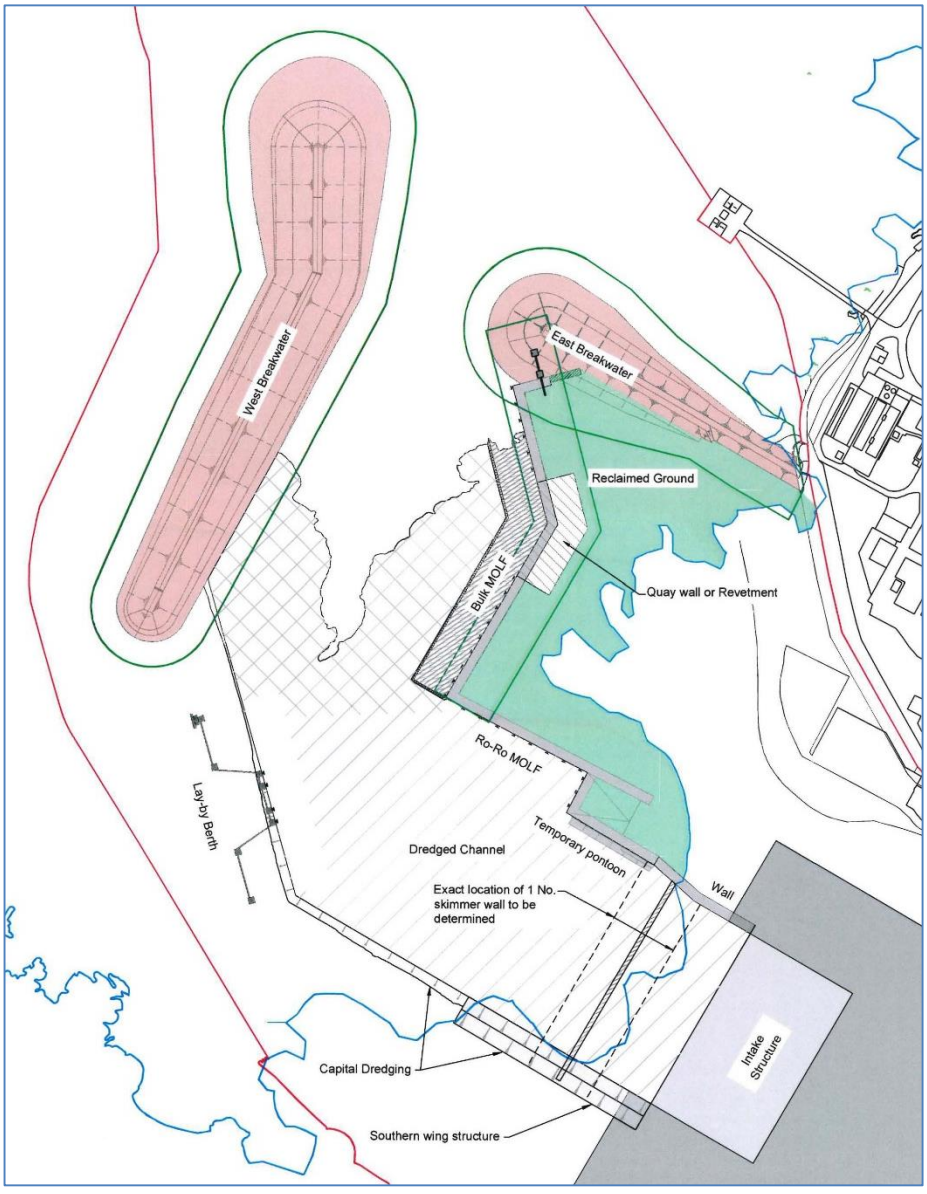
5.1.47 National Route 566 of the NCN, falls within the Power Station Site and requires a diversion from Cemyln Bay along Nanner Road and then direct to Llanfechell. A segregated cycle path is therefore proposed on one side of the A5025 carriageway for the short section over which the cycle route will run alongside the A5025. Cyclists will cross the A5025 at a designated location close to the Llanfechell junction.

Marine-Off Loading Facility

5.1.48 The MOLF will enable 60% to 80% of all construction materials to be delivered directly to the Wylfa Newydd Development Area thereby significantly reducing construction vehicle movements on the nearby road network. For the purposes of this transport assessment, only 60% of construction material is assumed to be processed by the MOLF, with the remaining construction material being transported by road. This provides a worst-case assessment of the impact of construction vehicles on the local road network.

5.1.49 An illustrative layout of the MOLF is shown in figure 5-11. The MOLF is expected to be able to be able to take deliveries from end of 2020 and be fully open in early 2021.

Figure 5-10 Illustrative layout of the proposed MOLF



Construction Vehicle Arrangements During Initial Stages of Construction Programme

5.1.50 During the initial stages of the construction programme, the A5025 Off-line Highway Improvements, MOLF and Logistics Centre will be under construction and they will therefore not form part of the transport strategy for the Project.

5.1.51 This initial stage is expected to last approximately 18-24 months.

5.1.52 During this period, other transport management measures will be implemented as follows:

- Construction vehicle arrivals and departures will be managed and each construction vehicle will have a scheduled arrival time at the Wylfa Newydd Development Area. This is a similar situation to other construction sites which do not have a Logistics Centre. Construction vehicle departures from the Wylfa Newydd Development Area will also be managed to provide a regular flow of vehicles along the A5025.
- Construction vehicle movements will not occur along the A5025 for a one-hour period around school opening and closing times. This is to reduce the potential impact of construction vehicle movements on children and parents travelling to and from the schools along the A5025 corridor.

5.1.53 Potential also exists to use the new link road near Valley as a temporary construction vehicle holding area once it is completed and before it is opened for use by general traffic.

5.1.54 In addition, each bypass will be opened as soon as it is completed to provide maximum benefits to local residents.

5.1.55 All these measures will be incorporated into the Code of Construction Practice described in chapter 13.

Worker Travel Arrangements during the Initial Stages of Construction

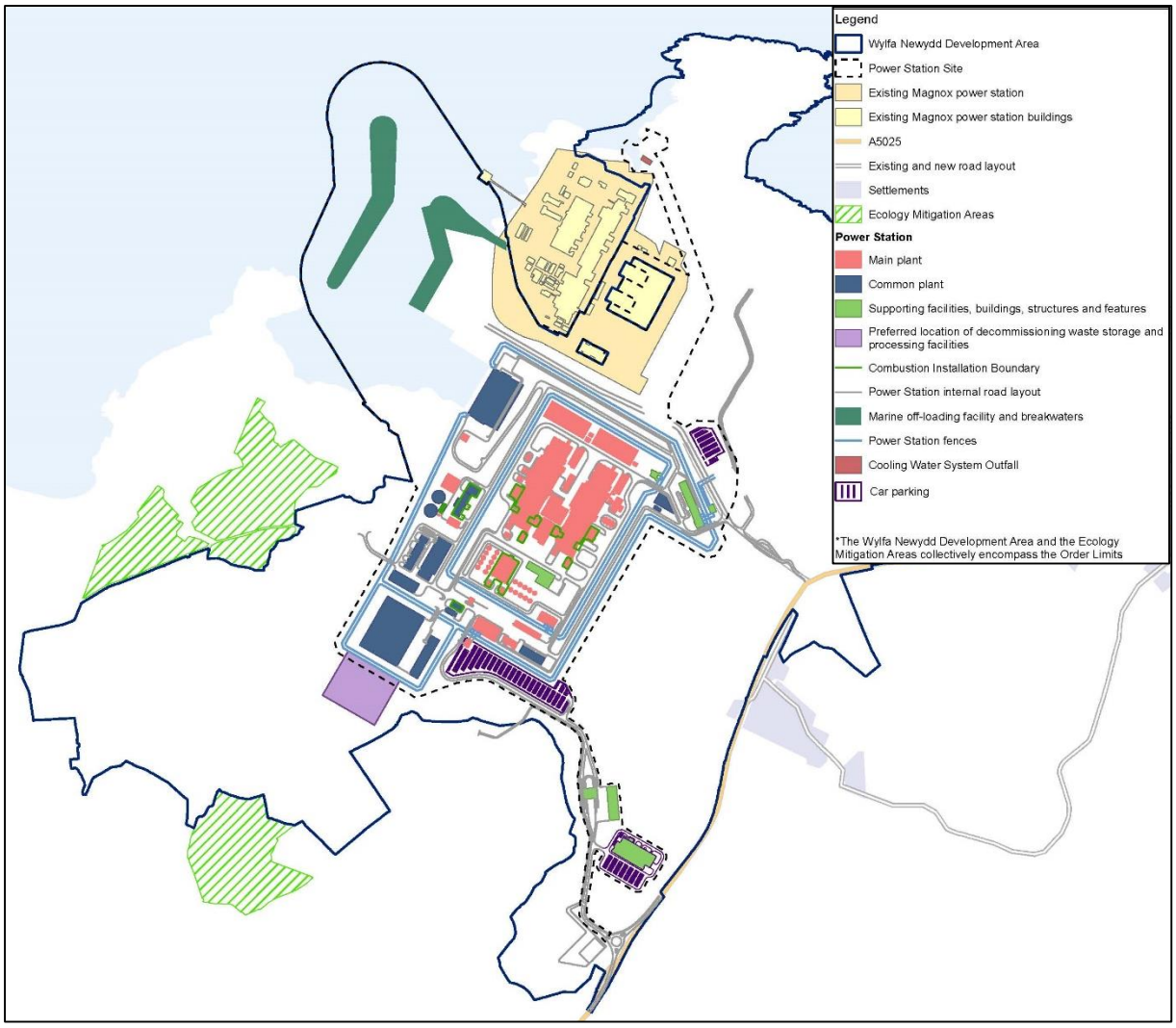
5.1.56 During the initial stages of the construction programme, the travel management arrangements for workers will be focused on shuttle buses and car sharing. This is because the Park and Ride facility and Site Campus will still be under construction.

5.1.57 Travel patterns will be monitored and car sharing will be encouraged through the use of a permit system to restrict car parking at the Wylfa Newydd Development Area. The shuttle bus network will be managed to ensure it provides a suitable service for a large proportion of construction workers and minibuses could be used to provide services to areas with lower numbers of construction workers.

Operational Phase

5.1.58 An illustrative layout of the Wylfa Newydd Development Area following completion of the construction of the Power Station is shown in figure 5-12. This shows a car park for workers during the operational phase of the Project of 500 spaces. This car park is provided for operational workers. A further temporary car park with up to 1,000 spaces will be made available during periods of Outage. During Outage the MOLF will continue to be available for the delivery of large items or bulk materials.

Figure 5-11 Illustrative layout during the operational phase



5.2 Committed Developments

5.2.1 Other committed developments on Anglesey and in North Wales and parts of England could have a potential impact on the transport networks considered as part of the Wylfa Newydd Project.

5.2.2 Other development schemes have therefore been reviewed to prepare a list of developments which is relevant to this assessment because they will occur during the period of assessment and are close to the Project. This list is provided in table 5-3 and includes details of the planning application reference, the development and developer, and a brief description.

Table 5-3 Committed developments

Planning application reference	Development and developer	Description
20C27D_2_CONS	Wylfa Decommissioning Magnox Limited	Decommissioning of the Existing Power Station including care and maintenance of the existing facilities followed by decommissioning and final site clearance.
19C1160/SCR	Anglesey Eco Park Orthios Group	299MWe biomass power station within the existing consented scheme. On-land prawn growing facility (aquaculture). A large soil-less indoor vegetable growing facility (hydroponics). Home compostable food packaging facility The Combined Food and Power Centre of Excellence. Research and development. A deep-water jetty for bulk import.
46C427K/TR/EIA/ECON	Penrhos Leisure Village Land and Lakes	A leisure village within Penrhos Coastal Park at Cae Glas, Parc Cybi.
Not available	Parc Cybi Stage 2	

Planning application reference	Development and developer	Description
	Conygar	Mixed-use employment developments; primarily distribution and warehousing space on the southern edge of Holyhead alongside the A55.
20C102L/EIA/RE	Rhyd-y-Groes Repower TPG Wind Limited	The current Rhyd-y-Groes Wind Farm, located near the northern shores of Anglesey east of Cemaes, has 22 turbines with a maximum total power output of 6.6MW. Proposals are to replace these with up to 13 modern turbines, which could produce up to 11.7MW of renewable energy.
29LPA1008	Llanfaethlu Primary School IACC	Plans for a new primary school to replace Ysgol Cylch y Garn, Ysgol Ffrwd Win and Ysgol Llanfachraeth. Note – this has been constructed and is now operational.
34LPA1013	Llangefni Link Road Scheme IACC	IACC propose a new 2.5km link road around the eastern side of Llangefni to enable traffic to more freely access the industrial estate in Coleg Menai and reduce traffic in Llangefni town centre. This scheme is currently under construction.

5.3 Dependent Developments

5.3.1 As well as these committed developments, which are in the planning system i.e. a planning application has been submitted, there are two other schemes which are expected to happen but which are still in the development phase. These are the National Grid North Wales Connection and the Welsh Water Wylfa Potable Water schemes.

National Grid – North Wales Connection

5.3.2 The National Grid North Wales Connection will provide a second connection between Wylfa Nuclear Power Station and the Welsh mainland.

5.3.3 A DCO application for the National Grid North Wales Connection is expected in 2018 and construction works are expected to begin in 2020 and last for four to five years.

5.3.4 The construction of the National Grid North Wales Connection will generate construction vehicle movements, including over the Britannia Bridge. Analysis of information provided by the National Grid and on the project website [RD22] suggests that up to 239 construction vehicles could be expected to cross the Britannia Bridge in each direction each day in the peak year of construction. This is equivalent to approximately 20 construction vehicles per hour per direction crossing the Britannia Bridge (based on a ten-hour construction day).

Welsh Water Connection to Wylfa Newydd Potable Water Scheme

5.3.5 Welsh Water has plans to connect the Wylfa Newydd Development Area to the potable water network. At this time however there is no information available on the timing and scale of this project, however it is likely that construction vehicles will be required to construct the connection.

5.3.6 How the above schemes have been taken into account in the assessment of Wylfa Newydd Project is described in chapter 9.

5.4 Other Transport Improvements

5.4.1 Other improvements to transport infrastructure on Anglesey and North Wales are proposed by other organisations. These are summarised below.

Road

5.4.2 The *North Wales Joint Local Transport Plan (LTP)* [RD12] sets out a range of aspirations for the short term (2015-2020) and medium and longer term (2020-2030), several of which relate to the road network.

5.4.3 The short-term proposals relevant to the Wylfa Newydd Project are summarised in Table 5-44.

Table 5-4 Local Authority road schemes

Scheme name	Local Authority	Description
A5025 Pentraeth Automotive Junction	Anglesey	Improve safety and capacity at a junction on the A5025 county road.
Improvements to link from Cemaes to B5111	Anglesey	Improvements to Class 3 road between Cemaes (Llanfechell/ Rhosgoch) to B5111 Llannerchymedd to Rhos-y-bol Road.
Holyhead A55 New Port Access Link	Anglesey	The Holyhead Port New Access Link is an extension to the A55.
Gaerwen Link Road	Anglesey	New link road to give improved access to Gaerwen Enterprise Zone site from the A55 and reduce amount of traffic on residential streets in Gaerwen.
A5025/B5420 Four Crosses Roundabout	Anglesey	Capacity enhancements to roundabout that links to national cycle route.
A487 Caernarfon – Bontnewydd bypass scheme	Gwynedd	The Caernarfon and Bontnewydd bypass scheme is due to commence construction in autumn 2017 (subject to the results of the current Planning Inquiry) and be completed by 2019. It will therefore provide benefits to the workers travelling to the Wylfa Newydd Project.
Llangefni Link Road	Anglesey	Currently under construction
A55 resilience proposals	Anglesey and North Wales Mainland	Scheme to develop the local highway network to accommodate any lack of capacity and resilience issues on A55.

5.4.4 These schemes are assumed to be delivered by the Local Authority over the period of the *Anglesey & Gwynedd Joint Local Development Plan (2011-2016)* [RD13] and they have been considered within the transport assessment of the Wylfa Newydd Project.

5.4.5 There are also several schemes planned for the medium and longer term:

- A55 New Menai Crossing: The Welsh Government is currently preparing a business case for a third crossing of the Menai Strait to secure funding.

However, route options and detailed engineering designs have yet to be progressed through any stakeholder consultation.

- A55 Junctions 15 and 16: grade separated junctions - construction of the proposed improvements to Junctions 15 and 16 of the A55 is estimated to start in 2019 and they are due to be completed by 2021.

5.4.6 As these schemes are not committed they have not been directly considered as part of the transport assessment of the Wylfa Newydd Project.

Bus

5.4.7 The IACC has an ongoing programme to upgrade every bus stop in the county. Improvements will range from the provision of shelters, easy access boarding kerbs and accessible access paths to new bus stops. Details of the plans are included in *Topic Paper 5: Transportation* [RD23].

5.4.8 This programme is assumed to be delivered by the IACC over the period of the *Anglesey & Gwynedd Joint Local Development Plan* (2011-2026) [RD13].

Rail

5.4.9 *Route Specifications 2017 Wales* [RD24] identifies that by 2019 there will be signal improvements between Chester and Holyhead which will increase line speeds and reduce journey times. By 2043 further improvements to signalling are expected which will lead to additional increases in line speeds and further reductions in journey time.

5.4.10 There are no current proposals to increase train frequencies by 2019 but *Route Specifications 2017 Wales* [RD24] indicates that there may be changes post-2019 in line with industry aspirations and franchise requirements.

5.4.11 The reinstatement of the section of rail track known as the Halton Curve will allow direct rail services from North Wales to access Liverpool Lime Street via Runcorn, avoiding a forced change of trains at Chester. Although current plans are for trains to run from Liverpool to Chester, the aspiration of local stakeholders is that the service be extended into North Wales. Given this is an aspiration rather than a commitment, this potential service enhancement has not been incorporated into this assessment.

5.4.12 Arriva Trains Wales is currently in discussions with Network Rail to secure a path into Manchester Airport for some North Wales to Manchester services. Again, as this is an aspiration rather than a commitment, this potential service enhancement has not been incorporated into the assessment.

Walking and Cycling

5.4.13 The IACC aims to deliver new cycle schemes to provide links to many parts of both the inland and coastal areas of Anglesey and full details are provided in the *Isle of Anglesey County Council Cycling Strategy* [RD25]. The IACC is responsible for the delivery of these new cycle schemes which include:

- Upgrading of the Menter Môn Bird Routes;
- Lôn Las Cefni improvements;

- New routes:
  - A5 Corridor as a way of linking communities across the island in a way that does not happen with National Cycle Routes 5 and 8 as they use minor roads that do not always go through the larger communities;
  - A5025 Corridor Improvements for cycling alongside, or close to, the A5025 between Valley and Wylfa, and Wylfa and Amlwch;
  - links to enterprise zones and major projects;
  - Future Tourism Cycling Network to enhance and connect with existing routes on the island;
  - circular route around Llyn Cefni to link with the existing route (Lôn Las Cefni) on the south-eastern side of the reservoir, and providing a path on the north-western side; and
  - Benllech to Llangefni using a disused railway route to create a shared use route between the two towns.

5.4.14 The *Isle of Anglesey County Council Cycling Strategy* acknowledges that many of these routes are speculative in nature, requiring either commitment from developers or a need to overcome land ownership constraints.

5.4.15 This uncertainty means that these cycle schemes are not assumed to be in place for the Wylfa Newydd Project.

5.4.16 There are no schemes proposed to improve walking in the local area in addition to those forming part of the Project.

Sea

5.4.17 In 2020, Irish Ferries plans to introduce a new vessel on the Holyhead-Dublin route which will provide a 50% increase in capacity compared to the existing vessel that serves this route.

6 Integrated Traffic and Transport Strategy

6.1 Introduction

6.1.1 The Integrated Traffic and Transport Strategy (ITTS) (Application Reference Number: 6.3.20) is a document that has been prepared to describe the transport proposals associated with the Wylfa Newydd Project. It describes how the proposals integrate with each other to provide a comprehensive strategy and forms a central evidence base to the Transport Assessment.

6.1.2 This chapter presents a summary of the ITTS (Application Reference Number: 6.3.20) for the Wylfa Newydd Project. Full details of the ITTS are provided in appendix F (Application Reference Number: 6.3.20).

6.1.3 Overall the strategy articulates the following goals and approach:

"Through our integrated approach to traffic and transport, we are committed to improving the transport system while reducing adverse effects on communities and the environment.

Our approach sets out how we intend to transport construction workers and materials to the Power Station Site by road, rail and sea. It shows our commitment to road safety; promoting sustainable travel by making fewer journeys; and leaving a lasting transport legacy after the construction phase of the Project."

6.1.4 The strategy has been based on this approach and it has been developed and discussed during the evolution of the Project and in discussions with stakeholders. The strategy contains a number of themes which align with policy objectives at a national, regional and local level and it provides a set of definitive outcomes against which the performance of the Wylfa Newydd Project can be measured.

6.2 Outcomes for ITTS

6.2.1 The Wylfa Newydd Project aims to meet the following two outcomes which align with current transport policy:

i) Improve the transport network to positively affect the local and global natural and built environment while minimising negative impacts.

ii) Provide an effective and efficient transport system with greater use of more sustainable forms of travel and which minimises the need to travel.

6.3 Objectives for ITTS

6.3.1 These outcomes are to be achieved by defining a set of objectives that help set the scope of the transport proposals for the Wylfa Newydd Project. These objectives help ensure that transport is considered as an integrated component of each aspect of the development, from the location of temporary worker accommodation to the method of transporting construction material.

Monitoring and reviewing travel patterns and making changes to arrangements where necessary is an important component of implementing the ITTS (Application Reference Number: 6.3.20).

6.3.2 The objectives of the strategy are as follows:

1. **Enhanced highway capacity and safety** – to include schemes to increase network capacity or remove pinch points/constraints and/or address particular road safety issues. This should ensure that the safety of roads for all types of users, including pedestrians and cyclists, is not adversely affected by the Wylfa Newydd Project. Schemes should be identified that manage disruption to existing communities from additional road traffic, introduce measures to enable the control of traffic to avoid exacerbating peak hour congestion on the existing highway network, and be designed to minimise land take.
2. **Integration with strategic public transport services** – to include schemes to improve access to railway stations, bus services and multi-modal interchange facilities, and provision of a Park and Ride facility at a strategic location. This should ensure that workers have the opportunity to travel via efficient, flexible, reliable and sustainable modes of transport.
3. **Improved transport links to the Wylfa Newydd Power Station** – to include schemes to provide improved access to the Power Station Site and Off-Site developments, such as a car share website, bus services and active travel measures.
4. **Encouraging sustainable travel** – to include infrastructure improvements and promotional initiatives to increase levels of public transport, walking and cycling. Schemes should offer efficient, flexible, reliable and sustainable modes of transport to the workforce. Permanent off-site facilities should also be located to maximise use of existing sustainable travel modes, while temporary facilities should be served by sustainable transport improvements that maximise their efficiency to the Project. These measures will help to minimise the carbon footprint of the Project.
5. **Reduced need to travel** – to include infrastructure and efficiency improvements in the supply chain to reduce and control the movement of freight by road, locate temporary workers' accommodation adjacent to the Power Station Site with integrated leisure facilities, and maximise the use of technology to improve the efficiency and reduce the carbon footprint of transport provision.

6.3.3 The delivery of these objectives through the Wylfa Newydd Project has led to a number of mitigation measures, which align with the objectives and key principles, as summarised in table 6-1.

Table 6-1 ITTS objectives, key principles and projects

Objectives	Key Principles	Key Projects
Enhanced highway capacity and safety	Ensure the safety of highways for all users Control private vehicle and freight movements along the A5025 corridor Reduce land take in delivery of transport infrastructure	A5025 On-line (subject to separate TCPA application) and Off-line Highway Improvements. Logistics Centre to control traffic movements along A5025.
Integration with strategic public transport services	Offer efficient, flexible, reliable and sustainable modes of transport to the workforce Reduce the number of trips by all modes through transport efficiency	Dalar Hir Park & Ride. Connect to key transport interchanges (rail, air and sea) with shuttle buses
Improved future transport links to the Wylfa Newydd Power Station	Reduce the number of trips by all modes through transport efficiency Provide, where possible, a legacy benefit for Anglesey	A5025 On-line (subject to separate TCPA application) and Off-line Highway Improvements. Potential to enhance future local bus services.
Encouraging sustainable travel	Promote the use of non-road modes for the movement of freight Offer efficient, flexible, reliable and sustainable modes of transport to the workforce	Marine Off-Loading Facility (MOLF) for transport of at least 60% of freight. Shuttle bus services to serve accommodation from main transport interchanges. Shuttle bus services from key centres to the Power Station Site. Travel Plan for operational workers. A construction worker accommodation booking system, car share website and travel information packs.

Objectives	Key Principles	Key Projects
Reduced need to travel	Reduce the need to travel, including through demand restraint to limit traffic growth Avoid where possible and mitigate against adverse environmental effects arising from transport	Delivery management system to ensure that suppliers consolidate deliveries at source, maximising use of vehicles to and from Anglesey. Logistics Centre to control journey times along the A5025. Car parking at the Power Station Site to be accessed by high occupancy vehicles only. Project wide car sharing target of 2.0 workers per car during peak construction to reduce worker traffic on road network.

6.3.4 Further details of the proposed mitigation measures which are embedded in the Project are summarised in table 6-2 for physical measures and table 6-3 for good practice management measures. These measures have been identified during the preparation and development of the scheme and following discussions with stakeholders.

Table 6-2 Embedded mitigation – physical

Mitigation	Description
Marine Off-Loading Facility	A facility comprising purpose-built quays and ramp to allow delivery of freight such as Abnormal Indivisible Loads and construction materials by sea.
Logistics Centre	An Off-Site facility at which deliveries can be consolidated into fewer loads and the timing of traffic movements to the Wylfa Newydd Development Area can be controlled during both the Enabling Works and Main Construction stages.
Site Campus	The Site Campus is a temporary facility that would house up to 4,000 construction workers in modular accommodation blocks, providing an independent living space for each worker, with shared campus-style amenities.
Park and Ride facility at Dalar Hir	Park and Ride facility at Dalar Hir to minimise travel in private vehicles, particularly on the A5025 by construction workers who would live in existing accommodation, including on the mainland.
A5025 Highway Improvements	Infrastructure improvements (including three bypasses) to the A5025 to improve safety and reduce traffic along particularly sensitive sections of the A5025.
Associated bus services for the Park and Ride facility at Dalar Hir	Shuttle bus service from the Park and Ride facility at Dalar Hir to the Power Station Site to minimise travel by private vehicles, particularly on the A5025.

Mitigation	Description
Shuttle bus services for construction workers living on Anglesey and the mainland.	Shuttle bus services for workers living in existing accommodation to reduce the need for the use of private cars to access the Power Station Site during construction. Shuttle buses will serve rail stations at Holyhead and Bangor if required.
Provision of a new bus stop on A5 at Dalar Hir	New bus stop to improve access to the Park and Ride facility from local towns and villages for construction workers and operational staff at the facility.
Improvements to Fisherman's Car Park access road to access On-Site TWA	Widening of the access road to the Fisherman's car park to provide access to the Site Campus and provide an improved road for existing users.
Wylfa Head Coastal Path	Circular loop of the Wales Coast Path around the National Trust Headland to be diverted during construction.

Table 6-3 Good practice mitigation – management

Mitigation	Description
Measures within the Code of Construction Practice	A Code of Construction Practice has been produced which contains proposed environmental management requirements and measures that will be adhered to throughout the construction of the Power Station to manage impacts.
Measures within the Code of Operational Practice	A Code of Operational Practice has been produced which contains proposed environmental management requirements and measures that will be adhered to throughout the operation of the Power Station to manage impacts.

6.3.5 All these mitigation measures have been considered as part of the transport assessment of the Wylfa Newydd Project.

Further Comments on Construction Worker Travel

6.3.6 During the development of the ITTS (Application Reference Number: 6.3.20) there have been ongoing discussions with stakeholders about the potential for car sharing and the need for enforcement and incentivisation as part of the Wylfa Newydd Project. The following sections provide some further commentary on these aspects of the proposals.

Car Sharing

6.3.7 Car sharing is an important component of the ITTS (Application Reference Number: 6.3.20) for the Wylfa Newydd Project and it is expected to provide the following benefits:

- minimising single occupancy car journeys;
- reducing the size of car parks, including Park & Ride facilities;

- reducing the volume of worker traffic travelling on the highway network, including the Britannia Bridge;
- providing increased travel options for workers living in rural or remote areas who may be able to share with people who live close to them; and
- allowing workers to share the cost and burden of driving.

6.3.8 An overall average level of car sharing of 2.0 workers per car has been assumed across the Wylfa Newydd Project. This is based on achieving an average of at least 1.5 workers per car at the Park and Ride facility at Dalar Hir and an average of at least 3.0 workers per car at the Wylfa Newydd Development Area.

6.3.9 In practice, some vehicles will be sole occupancy and some will contain three or more workers. An average of two is considered achievable, particularly as some contractors are expected to travel by minibus, thereby potentially achieving far higher vehicle occupancy rates.

6.3.10 There is evidence from other similar projects of this nature (such as the construction of Sizewell B nuclear power station) that this level of car sharing can be achieved with little incentive. Hinkley Power Station also provides a good example of current practice (see Case Study at the end of this section).

6.3.11 Car sharing provides several advantages for workers e.g. significant travel cost savings. In addition, Horizon proposes to implement a series of measures to incentivise and enforce the car sharing strategy.

6.3.12 The car sharing strategy has been based on guidance issued by The Chartered Institution of Highways and Transportation (CIHT) [RD19].

6.3.13 Car sharing for many businesses, such as those located on a business park, will often present several challenges:

- the relatively low number of staff spread over a large area typically results in low densities of employees in any given location;
- staff often have other activities associated with their daily routine, such as dropping off and picking up children, shopping, and leisure activities, which can affect their route and timing of their journey to and from work; and
- some staff will work part time, flexi-time or slightly different shifts to others, making a car-sharing match difficult to achieve for a reasonable proportion of the business.

6.3.14 For the Wylfa Newydd Project, these constraints are largely irrelevant because:

- the location of the Project on the north-western edge of Anglesey means that workers are travelling from a limited number of surrounding areas, with trips focused along a few routes (e.g. A55 and A5025);
- almost all construction workers are travelling to the same site every day on fixed shift times for an extended period; and

- construction workers who move to the area for this project are less likely to have their daily travel influenced by other factors e.g. the school run.

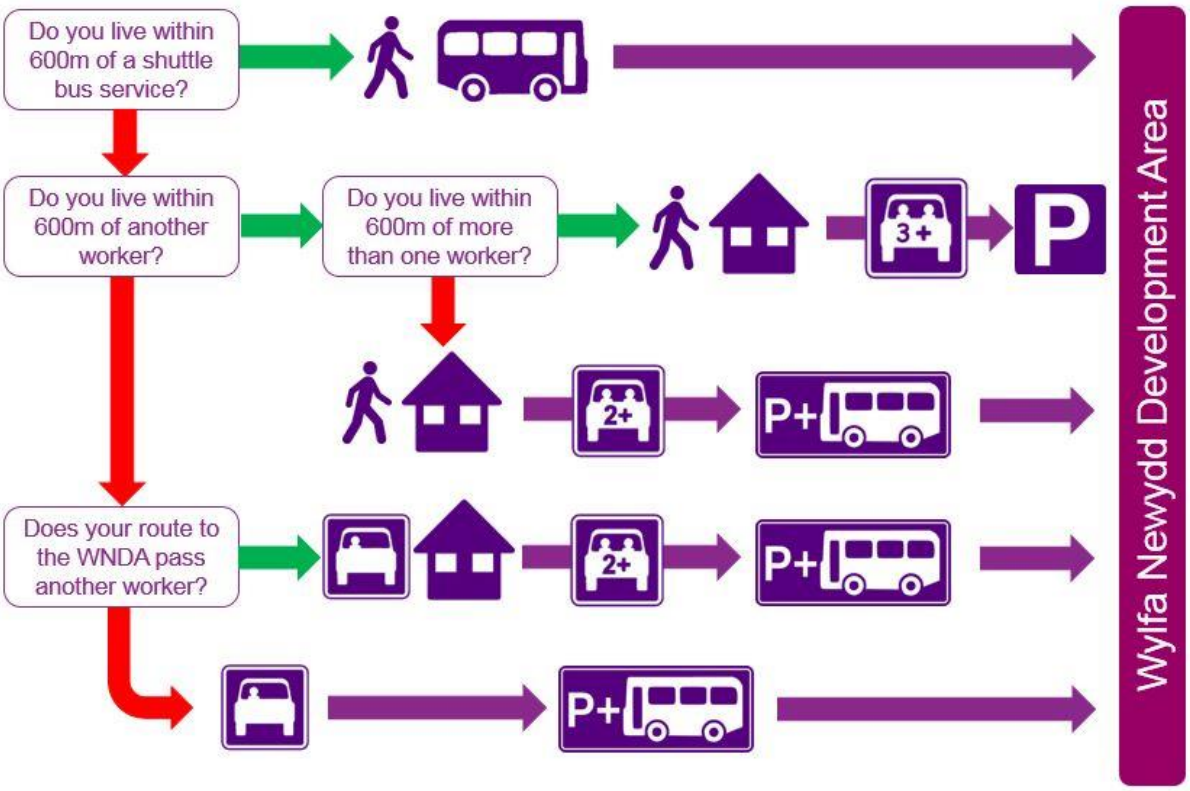
6.3.15 These travel patterns therefore strongly favour car sharing and greatly increase the opportunities for car sharing compared to a typical development.

Approach to Implementation

6.3.16 All workers will be registered on a database for site security purposes and this will provide a source of data to determine where workers will be living. Workers who live within a reasonable walking distance (e.g. 600m) of a shuttle bus route will be required to use this bus service. Other workers will be incentivised to car share.

6.3.17 The process for managing construction worker travel is shown in figure 6-1 and described in following sections.

Figure 6-1 Management of construction worker travel



6.3.18 The database will record the daily shift patterns for each worker and, together with information on home location, matches for workers who could car share will be identified i.e. workers on the same shift who live close to each other.

6.3.19 This database will be managed by Horizon and its supply chain, and it will be updated as worker numbers and locations change over the course of the construction period. Workers will be able to access the database system using a website or app.

6.3.20 Drivers and potential passengers who are matched will then confirm they can travel in this way and be issued with a permit. The driver and passengers are then committed to use this method of transport and provided with an appropriate permit. They would be able to change their mode of travel through the website or app if their circumstances change.

6.3.21 Vehicles with the highest level of car sharing (i.e. three or more workers per car) will be allocated a space at the Wylfa Newydd Development Area.

6.3.22 Vehicles with a lower level of car sharing (i.e. an average of 1.5 workers per car) will be allocated a space at the Dalar Hir Park and Ride facility.

6.3.23 This approach will incentivise higher levels of car sharing as travel direct to the Wylfa Newydd Development Area will be quicker than parking at Dalar Hir and taking the shuttle bus. Other benefits could be implemented by Horizon to incentivise car sharing including free or subsidised meals at the canteen, or points to spend on goods/services.

6.3.24 Allowances will be made for unforeseen changes to agreed car sharing arrangements, for example for sudden shift changes, sickness, or a worker

moving before another suitable replacement has been found. However, workers failing to adhere to their agreed and chosen car share arrangement on a regular basis will be refused entry to a given site through enforcement measures and potentially be given a formal warning.

6.3.25 As well as its use for daily trips to the Wylfa Newydd Development Area, the database will also be used to connect workers who will be travelling to their permanent home at the end of an 11-day shift cycle. These journeys will be more ad-hoc in nature so the database or other message board system will aim to share information about journeys taking place to reduce demands on the road network. This approach will also save workers money due to lower travel costs.

6.3.26 Evidence from other schemes shows that the uptake in car sharing increases significantly when there is trust in the identity of the potential car share partners, i.e. workers in a single organisation are more likely to share than the general public. The database would therefore need to offer verified identities to help maximise uptake from workers. The security clearance of all personnel on site offers the ideal mechanism to achieve this, with workers being able to see a photograph of their car share partner in advance and present their security pass to confirm identities when first meeting.

6.3.27 This car sharing strategy will be part of the Wylfa Newydd Code of Construction Practice (Application Reference Number: 8.6) for the Wylfa Newydd Project and it will be promoted, monitored, managed and enforced by Horizon through its supply chain.

Enforcement

6.3.28 All employees will have to sign up to a code of conduct which will include how they should travel.

6.3.29 Vehicles arriving at the Wylfa Newydd Development Area car park and Dalar Hir Park and Ride facility will be monitored to ensure that only permitted vehicles are allowed to enter.

6.3.30 Spot checks will also be carried out to check that each vehicle is carrying the agreed number of workers.

6.3.31 If a vehicle is identified with fewer than the agreed number of passengers the driver will be required to explain the difference. If the reason for the difference in passenger numbers does not relate to an unforeseen circumstance, for example sudden shift changes, sickness, leave, or a worker moving before another suitable replacement has been found, then enforcement action will be taken.

6.3.32 Workers arriving on foot at the security gate will only be allowed to enter if they have been granted ‘walk-in’ access, i.e. if they live within walking distance of the Wylfa Newydd Development Area. This will deter workers from parking on local roads and walking to the site.

6.3.33 A phone number and e-mail address will be made publicly available for members of the public to report suspected fly or illegal parking activity associated with the Wylfa Newydd Project. This will be investigated by

Horizon and its supply chain. Workers who are caught fly-parking or parking illegally in order to walk into the Wylfa Newydd Development Area or car share will face enforcement action.

6.3.34 Workers failing to adhere to this system and agreed travel arrangement will be disciplined accordingly. On each occasion, workers would also be reminded of their selected transport route and be given assistance if the worker is encountering difficulties with their daily travel arrangements.

6.3.35 All these enforcement measures will be included within the Code of Construction Practice for the Project and they will be managed by Horizon through its supply chain.

Case Study – Hinkley Point C Nuclear Power Station

6.3.36 In March 2013, a DCO was approved to provide a new nuclear power station at Hinkley Point C. The Hinkley scheme is a good comparator for the Wylfa Newydd Project as it requires the construction of a new nuclear power station in a rural area. The Hinkley scheme is currently under construction.

6.3.37 Relevant project facts about Hinkley Point C include:

- new dual reactor nuclear power station with supporting facilities;
- nine-year construction programme;
- estimated peak workforce of 5,600 workers; and
- predicted average daily maximum of 500 two-way construction vehicle movements.

6.3.38 The following mitigation measures have been approved for Hinkley Point C:

- three accommodation campuses for 1,510 workers (27% of peak workforce) – of these 510 workers to live on-site;
- four park and ride sites with a total of approximately 3,000 car parking spaces covering three different approach routes which reflect the local geography of the surrounding area;
- dedicated shuttle buses from park and ride sites, nearby railway station and accommodation campuses to and from the construction site;
- dedicated direct bus services from nearby towns with concentrations of workers;
- requirement that any worker living within 800m of a dedicated bus stop would be required to use the bus service;
- promotion of car sharing using a dedicated website and database;
- two logistics centres to manage flows of construction vehicles;
- provision of a MOLF and refurbished wharf to enable delivery of 80% of bulk materials by water; and
- monitoring, management and refinement of travel arrangements through surveys and discussions with local stakeholders.

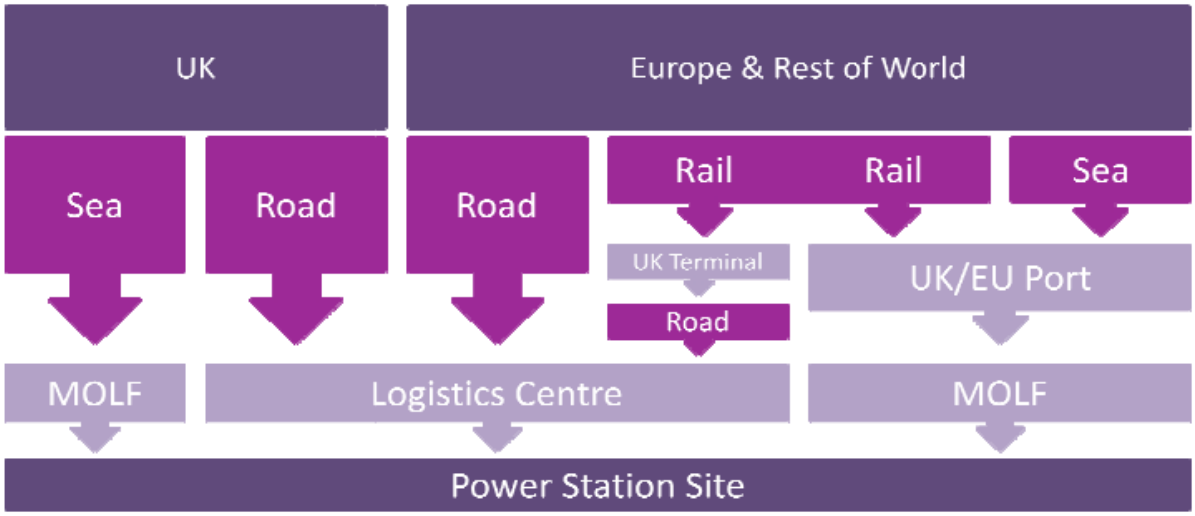
6.3.39 This comparison shows that many of the mitigation measures proposed as part of the Wylfa Newydd Project (e.g. car sharing) are already being implemented as part of the Hinkley Point C project. Where there are differences (for example in the number of proposed park and ride sites and logistics centres) this reflects the local geography with Hinkley having three approach routes and the Wylfa Newydd Project only having one approach route (via the A55 and A5025).

Further Comments on Development of Strategy for Construction Materials

6.3.40 There are several potential methods to transport construction materials to the Wylfa Newydd Development Area and these have been considered as part of the development of the ITTS (Application Reference Number: 6.3.20). Further details are provided in appendix F (Application Reference Number: 6.3.20) and a summary is provided in following sections.

6.3.41 The potential freight options are shown in figure 6-2.

Figure 6-2 Freight travel options for Wylfa Newydd Project



6.3.42 The freight option used will depend on the type of material being transport and its origin. Three main types of material are to be transported:

1. Bulk goods (e.g. stone aggregate, sand and cement) – approx. 76% of material.
2. Common / palletised goods (e.g. common building materials, food and consumables) – approximately 19% of material.
3. Containerised goods (typically goods sourced from overseas) – approximately 5% of material.

6.3.43 The potential to transport these goods to the Wylfa Newydd Development Area has been considered for movements by sea, road and rail. This review concluded that a Marine Off-loading Facility (MOLF) will be provided to process the delivery of bulk materials and other large items by sea. Other materials would be transported by road.

6.3.44 Between 60% and 80% of construction material is expected to be received by the MOLF with the remainder travelling by road. To provide a robust and conservative assessment of construction traffic impacts it has been assumed that 60% of construction material would be received by the MOLF and hence 40% of construction material would be transported by road i.e. double the target of 20%.

6.3.45 Further details of the MOLF are provided in chapter 5.

7 Trip Generation

7.1 Introduction

7.1.1 This chapter considers the number of people working at the Wylfa Newydd Project and how they will travel to and from the Wylfa Newydd Development Area and other facilities. The movement of construction materials to and from the Area is also examined.

7.2 Construction Workers

Number of Construction Workers

7.2.2 The construction activities for the Wylfa Newydd Project will require a total workforce of up to 9,000 workers at peak. This includes construction workers at the Power Station Site during different phases and workers to construct and operate the Associated Development and Off-Site Power Station Facilities. As the construction programme progresses there will be an increasing number of operational workers at the Power Station Site for training and for operational activities once Unit 1 becomes operational.

7.2.3 An estimated profile of construction worker numbers over the construction programme is illustrated in figure 7-1. This profile indicates a peak of workers in late 2023 with totals around this level for much of 2023.

7.2.4 Analysis of the profile also shows that for 50% of the construction period there will be fewer than 3,000 construction workers on the Project.

7.2.5 These construction workers will live in many different types of accommodation, from their own home to the Site Campus within the Wylfa Newydd Development Area. The forecast split of workers by type of accommodation is shown in figure 7-2.

7.2.6 At the peak of activity, up to 4,000 workers will live at the Site Campus with the remaining 5,000 workers travelling in from Anglesey and beyond.

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Figure 7-1 Construction worker profile – by location of work site

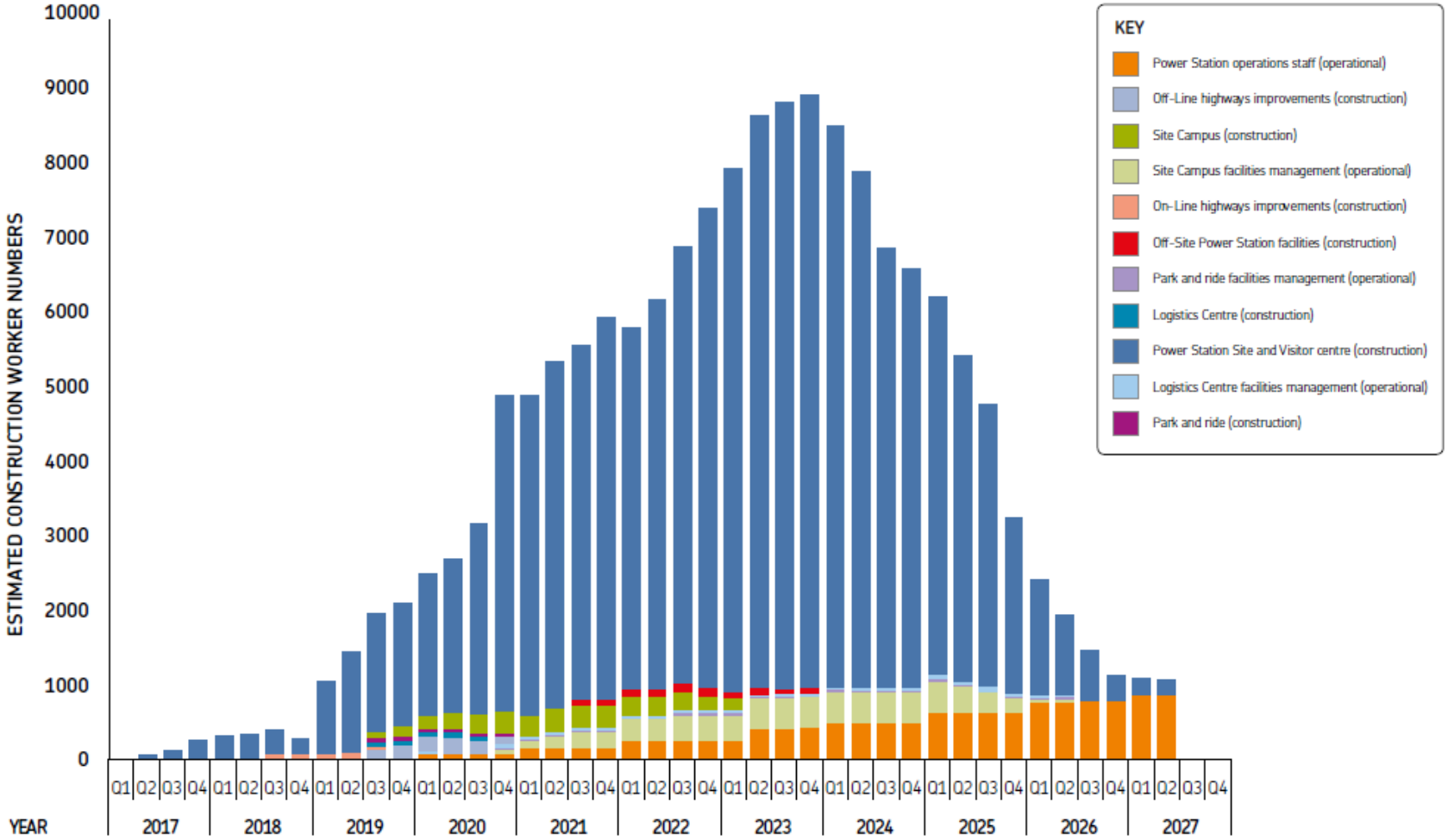
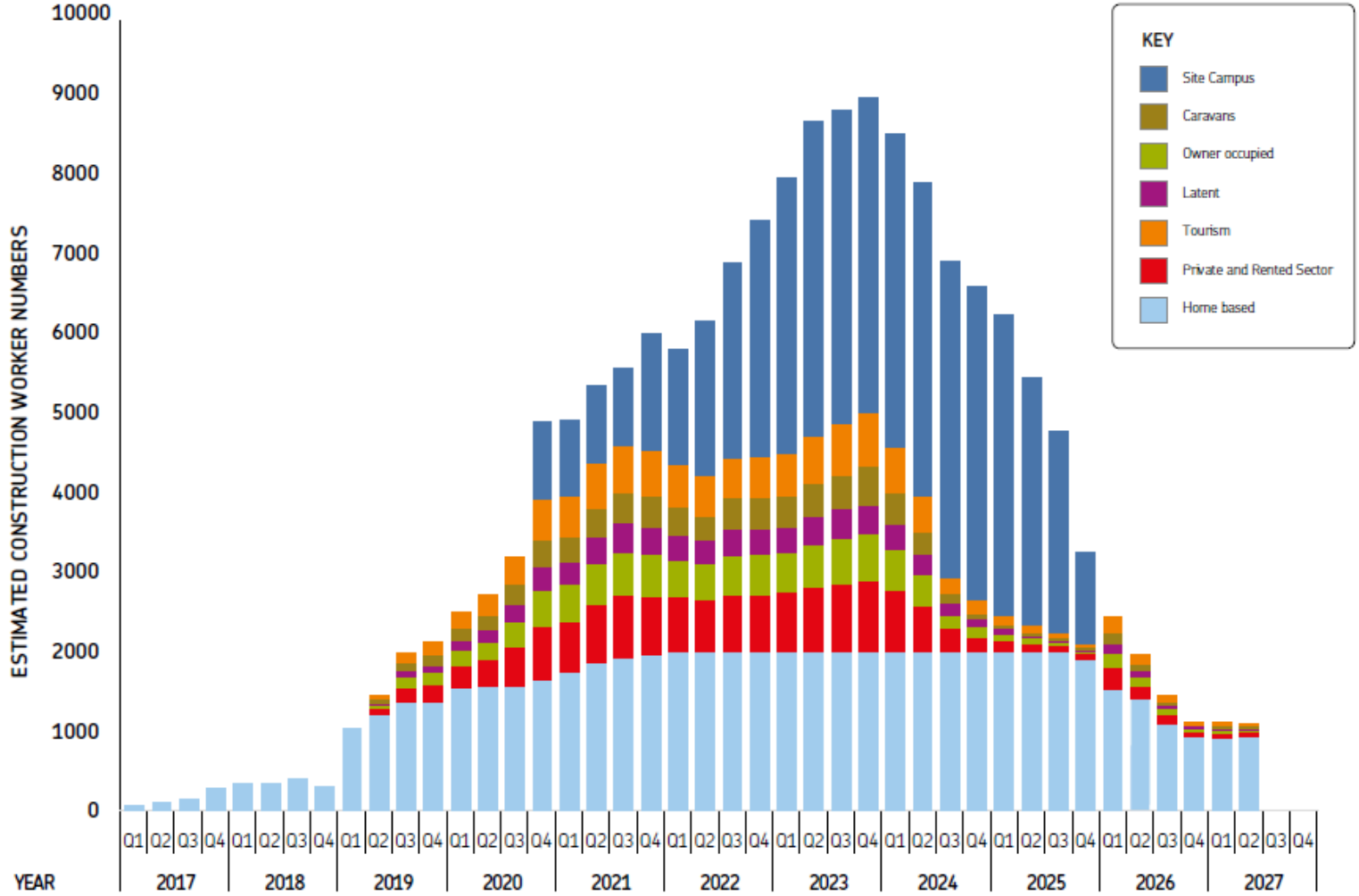


Figure 7-2 Construction worker profile – by type of accommodation



Facilities Management Staff

7.2.7 There are a number of facilities, both on and off the Wylfa Newydd Development Area, that will require operational staff on a daily basis. These will include catering, cleaning, security and administration staff, all of which are considered as 'facilities management' staff.

7.2.8 These workers will be required at the Site Campus, the Park and Ride facility at Dalar Hir, and the Logistics Centre. Those working at off-site locations will be encouraged to live within easy walking or cycling distance of the facility, where possible. Those living more remotely from the facilities, will be transported using the proposed dedicated minibus services or they will travel by car.

Visitors

7.2.9 There will be visitors to the Power Station Site on a daily basis, including representatives of Horizon, their consultants and others. Visitors will be directed to the Park and Ride facility at Dalar Hir where a regular shuttle bus service will operate throughout the day to transport them to the Power Station Site via the A5025. Some visitors may drive direct to the Wylfa Newydd Development Area.

7.3 Daily Travel

7.3.1 Construction shifts are proposed to start at 07:00, 07:30 and 08:00 for day shifts and 16:30, 17:00 and 17:30 for night shifts. At peak construction, the proportion of workers on the day shift is expected to be 70%, with 30% on the night shift.

7.3.2 In the stages of construction either side of the peak, the proportions of workers on the day and night shifts could change. However, the total number of workers in either the day or night shift will not exceed the totals generated at peak construction. This means that the assessment provides a robust analysis of worker travel.

7.3.3 Figure 7-3 provides a summary of workers by each mode at the start of each day, i.e. each 30-minute demand. The number of shuttle buses has also been calculated based on a capacity of 30 passengers and average 80% occupancy. Further details of the derivation of these numbers is provided in appendix F (Application Reference Number: 6.3.20).

7.3.4 The allocation of trips to different modes is based on the distribution of trips across Anglesey and the mainland and this is considered in more detail in the following chapter.

7.3.5 As can be seen from figure 7-3, it is assumed that workers will not use public bus or rail services for the purposes of daily commuting as the current service provision is not conducive to daily commuting patterns for shift workers associated with the Wylfa Newydd Project.

7.3.6 Note that of the 230 workers estimated to park and share during peak construction, 175 are assumed to travel direct to site with an average of at

least three workers per vehicle and 55 are assumed to travel to Dalir Hir with an average of at least 1.5 workers per vehicle.

Figure 7-3 Overall summary of daily worker trips to/ from the Wylfa Newydd Development Area during peak construction

Peak Daily Commute Car Parking Demand – Construction Workers

7.3.7 The trip analysis in figure 7-3 shows that approximately 1,725 workers will travel by car each day to the car park at the Wylfa Newydd Development Area (1,550 'Park at Site' + 175 of the 230 'Park and Share) during peak construction with an average of three workers per car. Given that three workers are assumed per vehicle this equates to 575 vehicles being driven to the Development Area during peak construction and a minimum requirement of 575 spaces. Although workers are split over day and night shifts, parking will be required to cover both due to shift start times over-lapping with shift end times.

7.3.8 Similarly, the trip analysis shows that 1,245 (1,190 'Park and Ride + 55 of the 'Park and Share') workers will travel by car to the car park at the Dalar Hir Park and Ride facility. Given that an average of 1.5 workers are assumed per vehicle this equates to 830 vehicles being driven to the Park and Ride facility

during peak construction and a minimum requirement of 830 spaces. Although workers are split over day and night shifts, parking will be required to cover both due to shift start times over-lapping with shift end times.

7.3.9 This analysis is summarised in table 7-1. 10% has been added to allow for fluctuations and circulation to ensure impacts on the public highway are minimised.

Table 7-1 Daily commute vehicle numbers – peak construction workers

Location	No. of workers	Average Car share ratio	Minimum parking requirement	Parking Requirement (inc. 10% for circulation)
Site Car Park	1,725	3.0	575	633
Park and Ride at Dalar Hir	1,245	1.5	830	913
Totals	2,970	2.0	1,405	1,546

7.3.10 There will also be additional car parking demand associated with workers who leave their cars parked for the duration of their 11-day shift. This is considered further on in this chapter.

Peak Daily Commute Car Parking Demand - Facilities Management Workers

7.3.11 Up to 400 facilities management workers will be required to support the construction of the Wylfa Newydd Project. They are expected to live in a mix of home-based and non-home-based accommodation within 60 minutes of the Wylfa Newydd Development Area and have been assessed in the same way as construction workers. This smaller catchment area is assumed because the less specialised nature of this type of work means that it is less likely that workers would be willing to travel up to 90 minutes each day to work in the same way as specialised construction workers (see also paragraph 8.1.13).

7.3.12 For the Park and Ride facility and the Logistics Centre it is assumed that all workers travel by car to travel to and from work. This is a conservative assumption and in practice some workers are likely to use the local bus services, the shuttle bus service, walk or cycle.

7.3.13 The 350 facilities management workers at the Site Campus will be able to use the proposed minibus service which will link the site with nearby towns and villages.

7.3.14 The transport mode for the facilities management workers has therefore been assumed to be:

- Anglesey – 50% of workers travel by car and 50% by minibus; and
- Mainland – 100% of workers travel by car.

7.3.15 Given the split of workers between Anglesey (87%) and the mainland (13%), the overall mode split by car is 58%.

7.3.16 This level of car use (58%) is higher than that assumed for the construction workers to reflect the working patterns of the facilities workers (i.e. non-shift based).

All facilities management workers will be expected to car share and 1.5 workers per car is assumed. These assumptions lead to the minimum car parking requirements as presented in table 7-2. It is assumed that 10% of spaces at these locations are designated for use by disabled drivers. Facilities management workers at the Site Campus are also assumed to be split between the day shift (70%) and night shift (30%), however parking will be required to cover both due to shift start times overlapping with shift end times. 10% is added to allow for fluctuations and circulation to minimise impacts on the public highway.

Table 7-2 Peak daily commute car parking demand – facilities management workers – peak construction

Location	No. of employees	Car mode share	Car share ratio	% of workers on day shift	Car parking spaces required (allowing +10%)
Site Car Park	350	58%	1.5	70%	149 (134 standard + 15 accessible)
Park and Ride at Dalar Hir	36	100%	1.5	100%	26 (23 standard + 3 accessible)
Logistics Centre	14	100%	1.5	100%	13 (12 standard + 1 accessible)

7.3.17 The remaining 42% of facilities management workers at the Site Campus will travel by minibus with an average vehicle occupancy of 12 i.e. the 350 facilities workers will generate approximately 150 daily minibus trips in 12 minibuses. These minibuses are expected to be provided along the main routes to the Wylfa Newydd Development Area i.e. towards the south along the A5025 to/ from Valley and Holyhead and towards the north/ east along the A5025 to/ from Amlwch. Some workers may also use the existing bus network to travel to and from the Development Area.

7.3.18 The resultant estimated car parking demand for daily commute construction workers and facilities management workers is presented in table 7-3.

Table 7-3 Daily commute car parking demand – construction and facilities management workers – peak construction

Location	Construction Parking	Facilities Management Parking	Total
Site Car park	633	149	782
Park and Ride at Dalar Hir	913	26	939
Logistics Centre	0	13	13

Location	Construction Parking	Facilities Management Parking	Total
Totals	1,546	188	1,734

7.3.19 The above table shows the total estimated parking demand for the Project for daily commuting workers. The total parking demand and total proposed parking provision for the Project is assessed later in this chapter.

Public Transport

7.3.20 It is not expected that any construction workers will utilise existing public transport services for daily commuting purposes because it would lead to indirect journeys with unattractive journey times, including some requirements for multiple interchange. Furthermore, the worker travel strategy included as part of the ITTS (Application Reference Number: 6.3.20) includes extensive shuttle bus services to/ from the Wylfa Newyyd Development Area and a robust car sharing strategy.

7.4 Weekend Travel

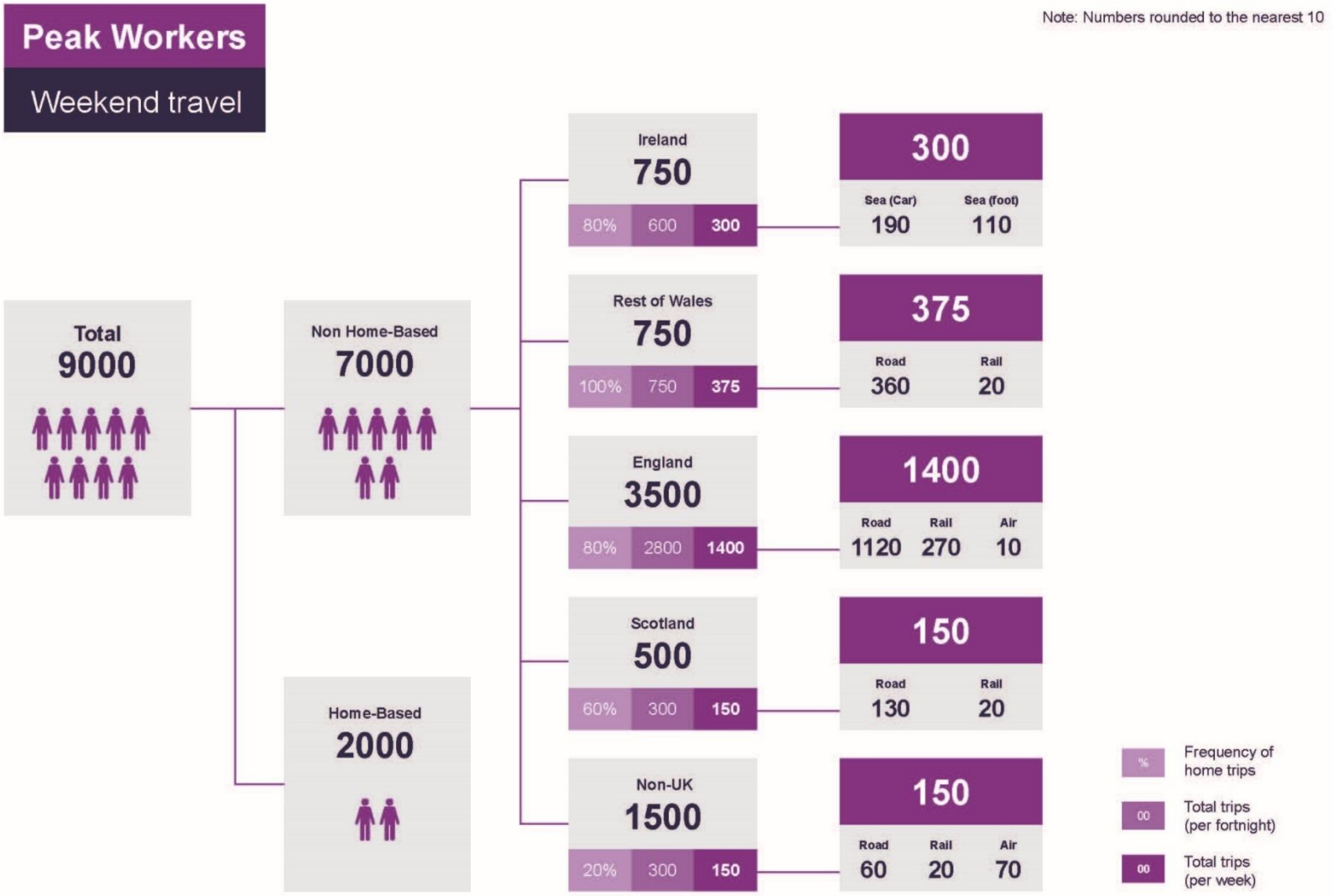
7.4.1 Most workers will have a minimum shift pattern of 11 days on then 3 days off, which will allow non-home-based workers to return to their permanent home.

7.4.2 The distance to home, and therefore the journey time, will influence how frequently workers return. For example, those workers travelling to continental Europe are less likely to return home each fortnight than those living in Wales. The proposed shift patterns are expected to result in weekend leave being scheduled from Thursday evening to Monday morning for the day shift workers, with 50% of the workforce on leave on any given weekend.

7.4.3 Those workers who stay instead of going home will continue to reside in their accommodation and may undertake leisure activities.

7.4.4 The majority of those workers travelling home are likely to travel on a Thursday evening and return on a Sunday evening, given the early start for the Monday day shift.

Figure 7-4 Non-home-based workers weekend travel to/ from Anglesey



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7.4.5 On this basis, factors relating to frequency of return trip and the weekly shift pattern have been applied to the 7,000 non-home-based workers to predict the volume of trips by each mode per weekend. The results of this process are summarised in figure 7-4 which shows that out of 7,000 non-home-based workers, around 2,375 are predicted to travel to their permanent home in any given week. The remaining 4,625 workers are expected to stay in their accommodation.

7.4.6 The distribution of these trips on local transport networks is considered in the following chapter.

Site Campus Car Parking Requirement

7.4.7 The overall mode share of workers who reside at the Site Campus and who travel by car to get to/ from the Site Campus is estimated at 58%. This equates to 2,320 construction workers who would travel by car. If it is then assumed that each car carries 1.5 workers (as this will save money for workers and follows the ITTS (Application Reference Number: 6.3.20) for the Project) then this equates to approximately 1,550 cars and a need for 1,550 parking spaces. 10% is added on to allow for circulation resulting in an overall parking requirement of 1,705 parking spaces for workers residing in the Site Campus.

7.4.8 These cars associated with workers who will live at the Site Campus would not be used during the week to travel to and from work as the workers will walk to and from work or use internal site transport. The cars can therefore be parked at the Wylfa Newydd Development Area or at the Dalar Hir Park and Ride facility. These cars will be used on some weekends for trips by workers to/ from their permanent homes, this is discussed in more detail in chapter 8.

Total Car Parking Requirement during Peak Construction

7.4.9 The overall estimated car parking requirement is based on the estimated daily car parking demand for construction workers and facilities management workers, and parking required for workers who will live at the Site Campus. In addition to this, an allowance of 25 parking spaces at both the site car park and Dalir Hir has been allowed for visitors. Visits by car will have to be pre-booked and hence will be managed to ensure demand matches supply and will be scheduled to occur outside AM and PM peak traffic hours whenever possible.

7.4.10 The total estimated car parking provision for construction workers, facilities management workers and visitors during peak construction is shown in table 7-4.

Table 7-4 Overall car parking requirement – peak construction

Car Park Area	Parking for daily trips	Parking for duration of 11-day shifts	Allowance for visitors	Total Provision
Site Car Park	782	0	25	807
Site Campus Car Park	0	769	0	769
Park and Ride facility at Dalar Hir	939	936	25	1,900
Logistics Centre	13	0	0	13
Total	1,734	1,705	50	3,489

7.4.11 A further allocation of 311 car parking spaces is proposed at the Wylfa Newydd Development Area for short-term to provide resilience and flexibility during the delivery of the Wylfa Newydd Project. The means that a total of 3,800 car parking spaces is proposed for the Wylfa Newydd Project.

7.4.12 The actual use of the car park (and other modes of travel) will be managed and monitored during the construction of the Wylfa Newydd Project and the relatively slow build-up of workers will enable management measures to be refined or put in place to ensure demand matches supply.

Public Transport

7.4.13 It is expected that some construction workers travelling to/ from Anglesey/ North Wales at the beginning/end of their 11-day shift cycles will utilise existing public transport services. This is likely to be via existing rail and ferry services.

Rail

7.4.14 As can be seen in figure 7-4, up to 340 rail trips are predicted per week during the construction peak owing to weekend travel by construction workers. If all trips by air are assumed to start with rail as well this could rise to 420 rail trips per week during the construction peak.

7.4.15 This figure is then split by the day and night shift by 70/ 30 resulting in approximately 300 rail passengers at the start/ end of a day shift, and 120 at the start/ end of a night shift. These figures will then be spread over several hours as the shift start/ end times are staggered, and some might choose to return to their accommodation before/after a shift start/ end time.

Sea

7.4.16 As can be seen in figure 7-4, up to 300 trips by ferry are predicted per week during the construction peak owing to weekend travel by construction workers which is broken down in to 190 workers in cars and 110 workers on foot.

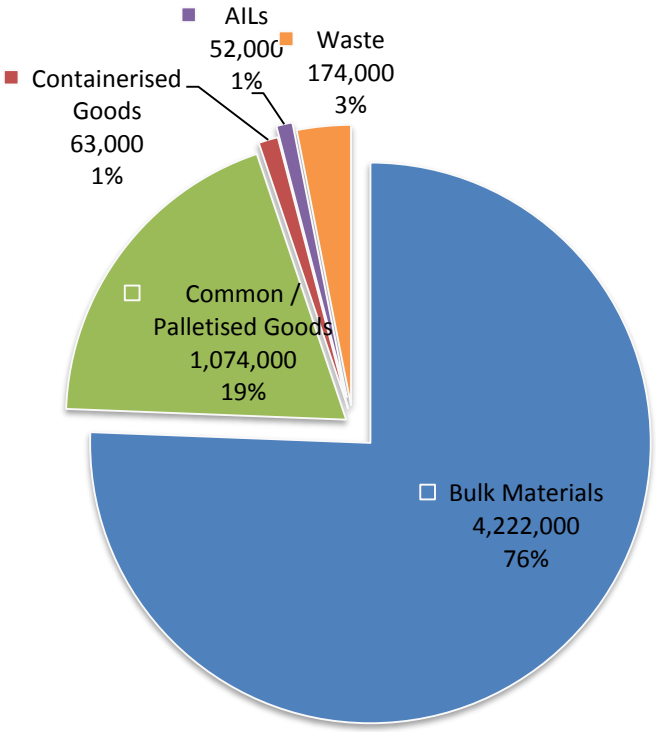
7.4.17 This figure is then split by the day and night shift by 70/ 30 resulting in approximately 133 ferry via car and 77 by foot at the start/ end of a day shift,

and 57 ferry by car and 33 by foot at the start/ end of a night shift. These figures will then be spread over several hours as the shift start/ end times are staggered, and some might choose to return to their accommodation before/ after a shift start/ end time.

7.5 Construction Vehicle Movements

7.5.1 The construction of the Wylfa Newydd Project is a significant undertaking and the type and volume of materials to be delivered to the Wylfa Newydd Development Area is shown in figure 7-5.

Figure 7-5 Type and volume of construction materials (tonnes)



7.5.2 As described previously, a Marine Off-Loading Facility is proposed to receive delivery of the bulk materials. The remaining materials are to be delivered by road via the Logistics Centre at Parc Cybi.

7.5.3 The number of construction vehicle movements for each construction activity has been calculated for the entire period of construction. The resulting profile of construction vehicle movements per month (and per hour) is shown in figure 7-6 (one-way movements). The coloured columns show monthly HGV movements (left-hand axis). The red line shows hourly movements (right-hand axis).

The graph shows that construction vehicle movements peak at just under 3,500 deliveries per month in mid-2023. (Note: each delivery means the movement of one construction vehicle to and then one movement from the Wylfa Newydd Development Area).

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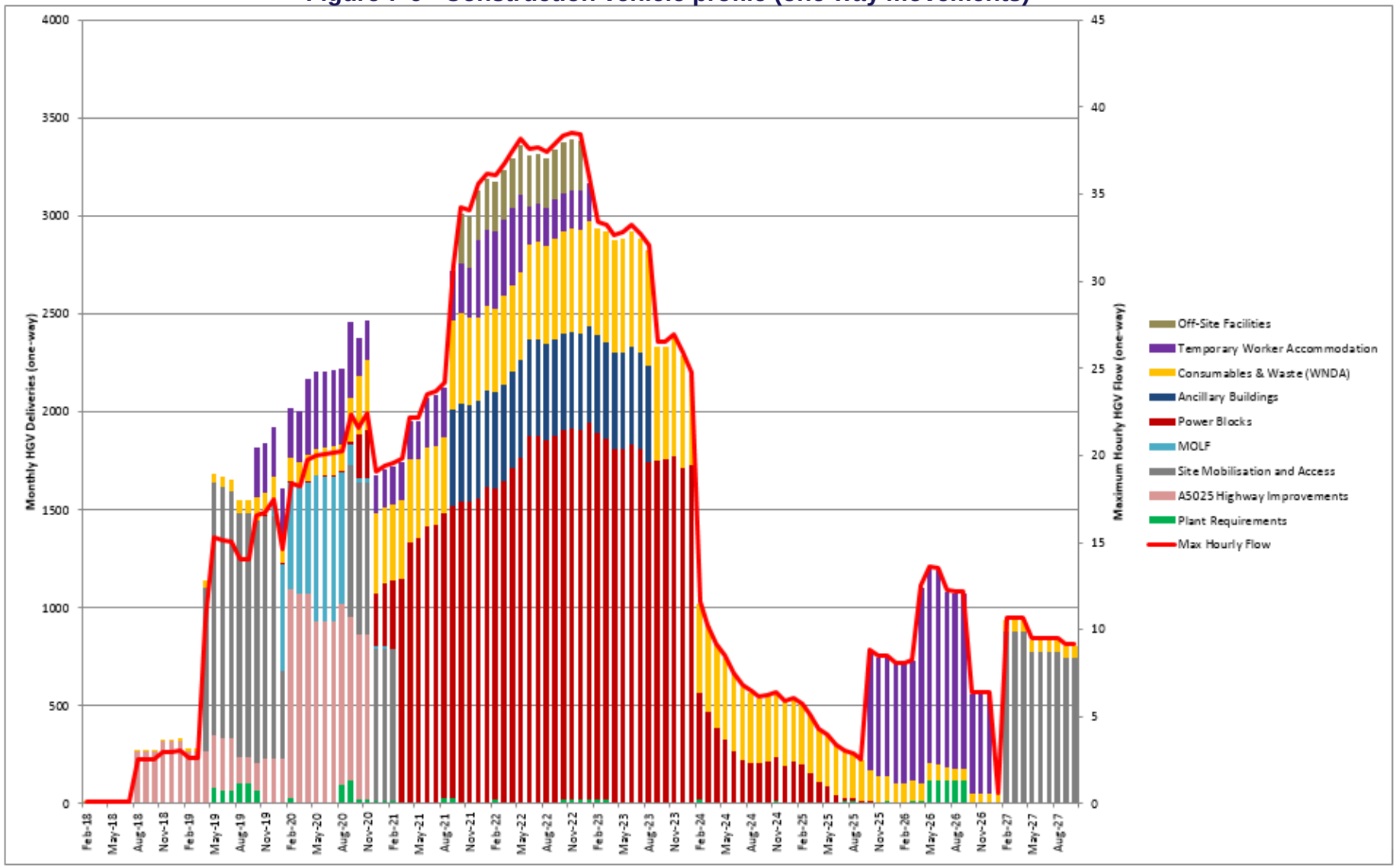
Figure 7-6 Construction vehicle profile (one-way movements)



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7.5.4 The estimate of construction vehicle movements assumes that 60% of all construction materials are transported by the MOLF. In practice, the target is for 80% of all material to be transported via the MOLF and hence the assessed estimate of construction vehicle movements (transporting 40% of materials by road) is double the target (20%). It should be noted that the target of 80% is based on all of the bulk materials being transported via the MOLF (76%) plus the AILs and a proportion of the common or palletised goods.

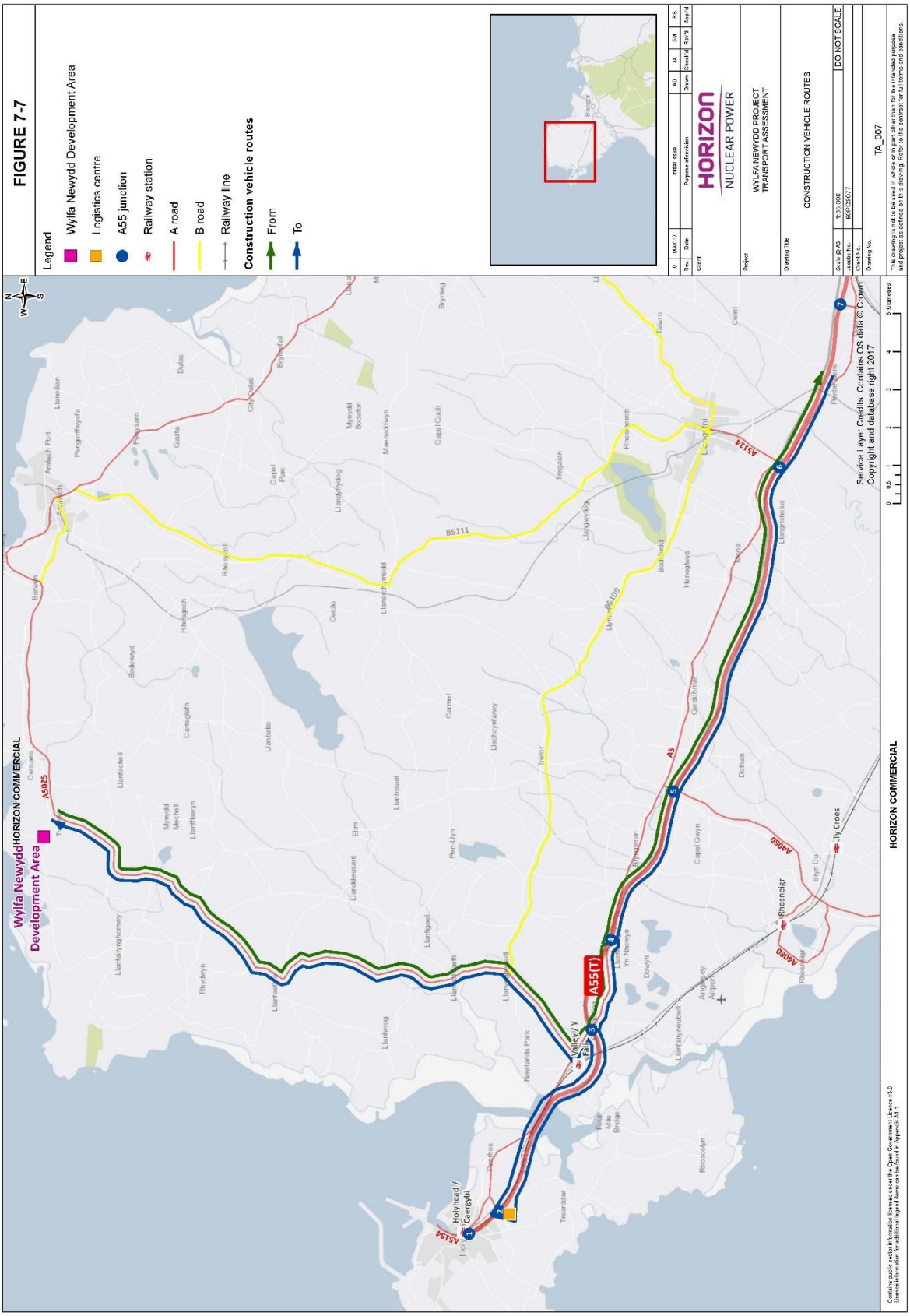
7.5.5 The right-hand scale of figure 7-6 shows that the 3,500 construction vehicle movements per month equates to approximately 39 peak construction vehicle movements per hour. This is based on the assumption that there are 22 working days per month and that 25% of the daily flow of construction vehicles occurs in a peak hour. Again, this is a conservative assumption construction vehicle movements will be spread across the working day and some deliveries will occur on Saturday mornings between 08:00 and 13:00. This estimate includes construction vehicle movements associated with the removal of waste, servicing associated with the Site Campus and the decommissioning of facilities such as the Logistics Centre and Park and Ride facility once they are no longer required. Further details of waste management arrangements are provided in chapter C6 – (Waste and materials management) (Application Reference 6.3.6).

7.5.6 Before the A5205 Off-line Highway Improvements are constructed, delivery vehicles will not travel along the A5025 around the times of school opening and closing (e.g. 08:15 to 09:15 and 15:00 to 16;00).

7.5.7 As described previously, all delivery vehicles must first travel to the Logistics Centre at Parc Cybi where they will be registered. All construction vehicles are expected to arrive via the Britannia Bridge and the A55. The departure of delivery vehicles from the Logistics Centre will be managed to ensure a regular flow of construction vehicles along the A5025. Similarly, the departure of construction vehicles from the Wylfa Newydd Development Area will be managed and controlled. Departing construction vehicles will not be required to return to the Logistics Centre and hence they will use the A55 and Britannia Bridge to leave the area. These measures will help reduce potential traffic impacts of the construction vehicles. The proposed construction vehicle routes are shown in figure 7-7.

7.5.8 These construction vehicle movements have been incorporated into the assessment of traffic flows generated by the construction of the Wylfa Newydd Project. Daily fluctuations in the number of construction vehicles will occur due to the changing needs of the construction programme.

Figure 7-7 Construction Vehicle Routes



Abnormal Indivisible Loads

7.5.9 The construction of the Wylfa Newydd Project will require the transportation and delivery of some very large pieces of equipment. These items are referred to as Abnormal Indivisible Loads (AILs) and their movement requires special consideration, particularly for movements using the road network.

7.5.10 The movement of each item will require bespoke transport arrangements depending on the size and weight of each AIL.

7.5.11 It is anticipated that the largest AILs, such as Power Station components, are to be delivered using the MOLF during the nine-year construction programme. A further 1,150 AILs are likely to be transported via the road network. Of this number, 650 are estimated to be of the type that would require an Abnormal Load order but not an escort, and the remaining 500 would require an Abnormal Load order and special arrangements including escort. These arrangements are considered in the Code of Construction Practice (see chapter 13).

7.5.12 It is expected that the peak in AIL by road activity would occur in the first two years of construction, where an average of approximately 12 AILs are expected per week.

7.5.13 The strategy for the movement of the AILs will seek to avoid peaks in the movement of other construction materials and peaks in general traffic flows on the local road network where practicable. The movement of AILs will also conform with current legal requirements.

7.6 Combined Vehicle Movements

7.6.1 Figure 7-8 shows the profile of all vehicle movements associated with the construction period (construction worker and construction traffic combined) across the Project.

7.6.2 The graph shows that total vehicle movements have a peak of just under 1,800 per day in mid-2023. (Note: each delivery means the movement of one vehicle to and then one movement from the Wylfa Newydd Development Area or Associated Development site).

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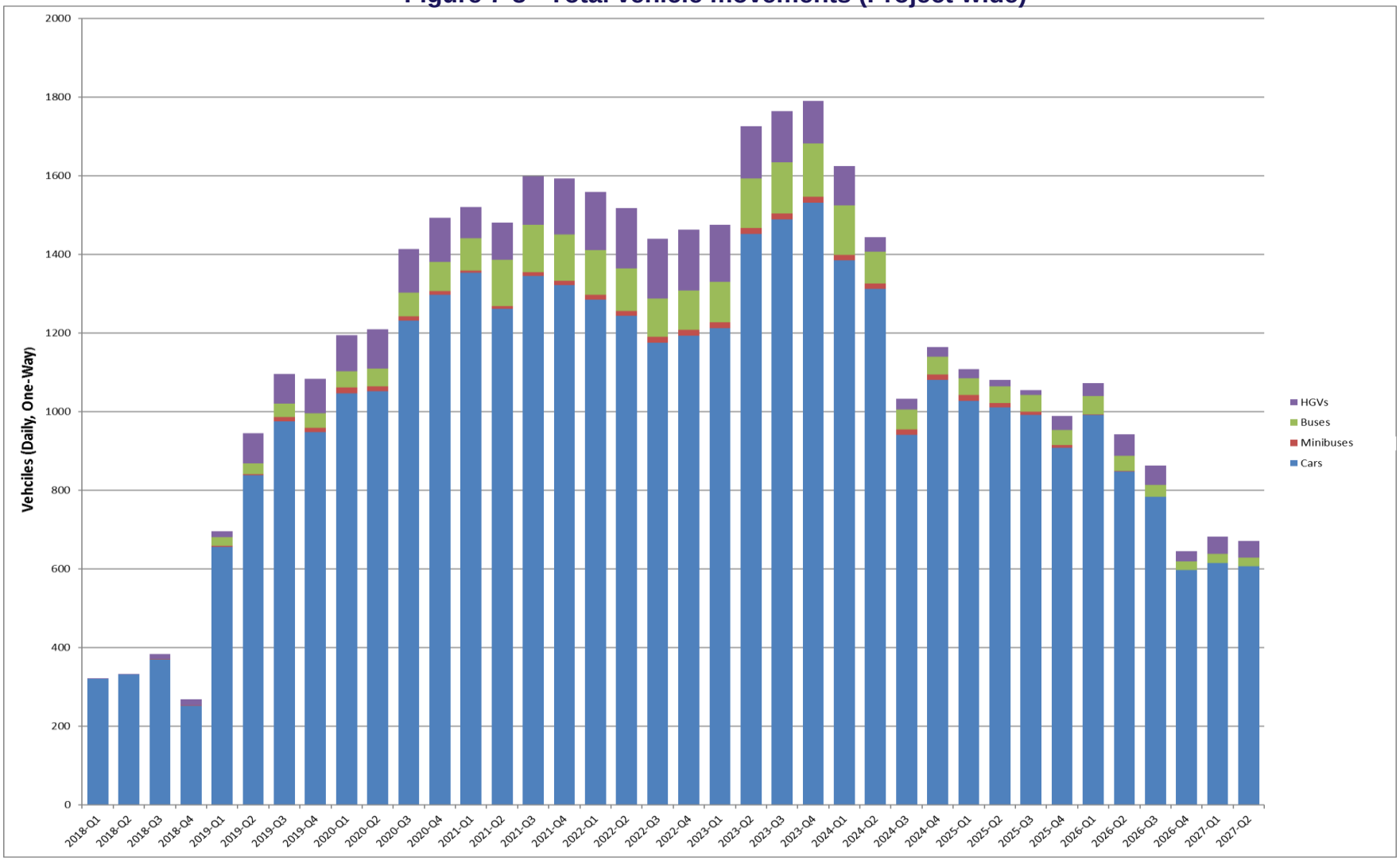
Figure 7-8 Total vehicle movements (Project-wide)



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7.7 Operation of Wylfa Newydd Power Station

Number of Operational Workers

7.7.2 During operation of the Wylfa Newydd Power Station, there will be up to 850 operational workers at the Wylfa Newydd Development Area on any one day, with 100 of these working on a shift basis and the remaining 750 working office hours. Based on the operation of the Existing Power Station a total of 34 HGVs/ LGVs are expected to access the Wylfa Newydd Development Area per day.

7.7.3 During periods of 'Outage' (i.e. scheduled routine maintenance which occurs every 18 months for each Generating Unit) there would be up to 1,000 additional workers per day (i.e. 1,850 workers on site in total), with each outage lasting for approximately one month.

7.7.4 Both units would not have outages at the same time. Typically, a Unit 1 outage would be followed six months later by a Unit 2 outage, subsequently followed by a Unit 1 outage one year later and so forth. The shift times for maintenance workers during outages are assumed to be two 12 hour shifts over a 24-hour period. An Operational Travel Plan will be in place to manage this travel demand.

7.7.5 90+% of people working in the W35000853 Census workplace zone commute currently commute to work by car with low levels of walking, cycling and public transport use. The future travel habits of staff travelling to/from Wylfa Newydd are expected to be similar, but with more emphasis on car sharing to reduce car journeys.

7.7.6 The Code of Operational Practice includes commitments to prepare a Travel Plan Strategy which would include annual surveys of staff mode shares to monitor against objectives and targets.

8 Trip Distribution

8.1.1 The construction worker trips generated by the Wylfa Newydd Project will use the local transport networks according to the location of the temporary or permanent home of each worker.

8.1.2 To understand where workers might live, an assessment has been made of the location of nearby towns and villages, the potential availability of suitable worker skills and the availability of space to accommodate workers (e.g. rented homes or rooms).

8.1.3 This analysis is presented as part of ES Volume C App C1-2 Socio-Economic Technical Appendix (Application Reference Number: 6.3.9) and this uses a gravity model which forecasts the likely home locations of workers based on the travel time to the Project. The gravity model has been developed in consultation with stakeholders.

8.1.4 The analysis is based on the assumption that construction workers will typically be prepared to travel up to 90 minutes from their home to the Wylfa Newydd Development Area. The area covered by this catchment is shown in figure 8-1.

8.1.5 The assessment of travel time assumes that there is no payment to workers for time spent on a shuttle bus or on the Park and Ride buses travelling between Dalar Hir and the Wylfa Newydd Development Area. This means that travel is assessed on normal considerations of time and cost (e.g. car running costs, public transport travel times and fares).

8.1.6 Any travel allowance arrangements would be defined to conform with the overall transport strategy which would include “promoting sustainable travel by making fewer journeys”.

8.1.7 A summary of this gravity model analysis for home-based and non-home-based workers during construction is provided in Table 8-1.

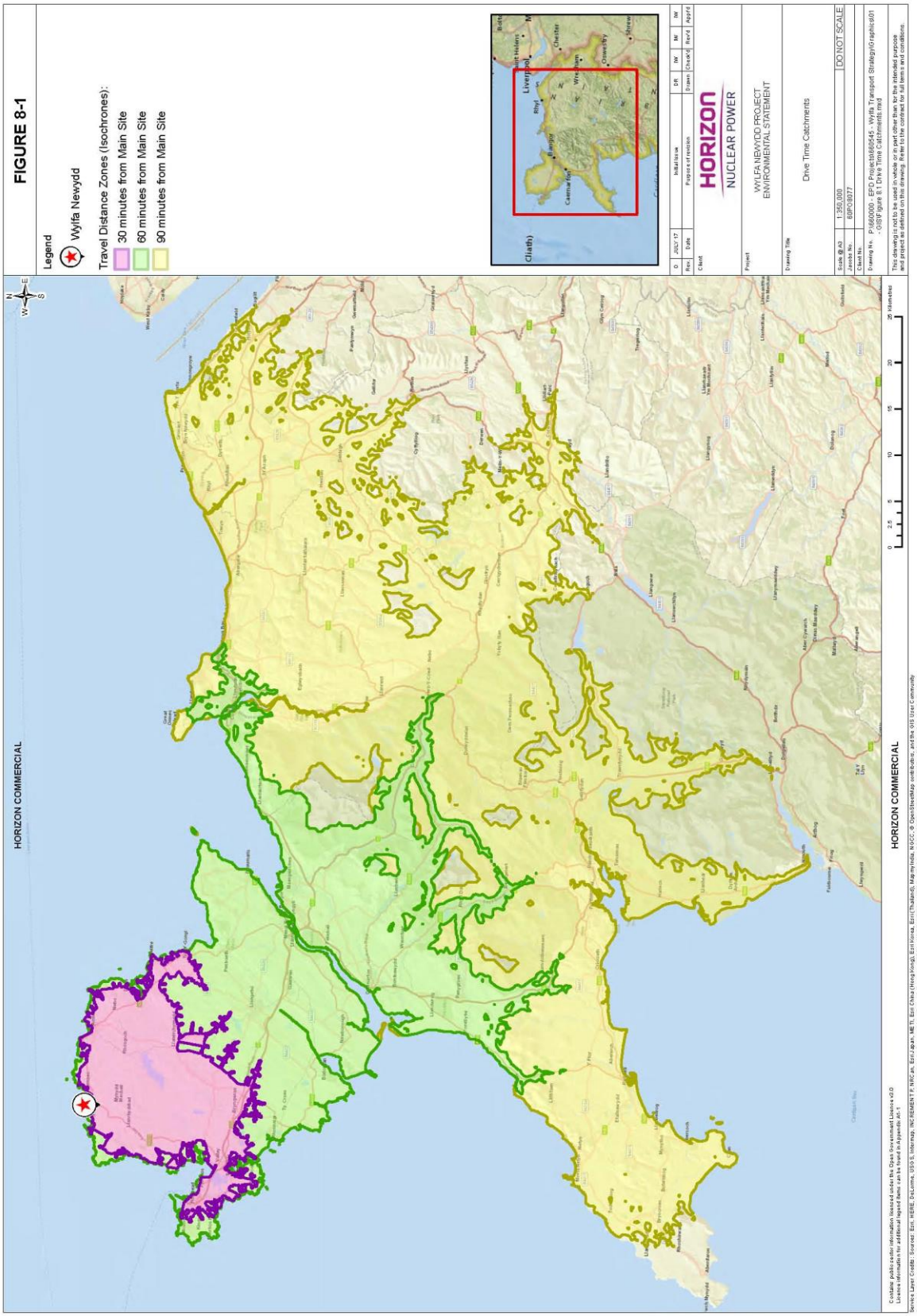
Table 8-1 Location of construction workers by type at peak

Location	Home based	Non-home based	Total	Total (%)
Anglesey	1,255	2,560	3,815	42%
Mainland	745	440	1,185	13%
Site Campus	0	4,000	4,000	45%
Total	**2,000**	**7,000**	**9,000**	**100%**

8.1.8 This analysis shows that during peak construction, 87% of workers will live on Anglesey, with 13% of workers living on the mainland. This indicates that at least 87% of workers will live with 60 minutes’ travel of the Wylfa Newydd Development Area.

8.1.9 Further analysis within the gravity model has been used to distribute trips around Anglesey.

Figure 8-1 Drive-time catchment



Distribution of Daily Trips – Construction Workers

8.1.10 This distribution of trips by their origin is shown in table 8-2 for the 4,600 construction shift workers who will travel to the Wylfa Newydd Development Area each day during peak construction. These are the 4,600 workers shown in figure 7-3 who are split by mode into 1,630 shuttle bus trips etc.

8.1.11 The allocation of trips from each area to different modes of transport is based on the availability of different options and the likely journey time of different modes. For example, a worker living in the 'North East Anglesey (i.e. the north-east of Anglesey) would not be expected to travel to the Park and Ride facility and then back to the Wylfa Newydd Development Area as this would mean the worker "doubling-back" as part of their trip.

Table 8-2 Origins of daily construction worker trips at peak

Region	No. of worker	%				No. of workers			
		Car to Park & Ride facility	Car to WNDA	Car Share en route	Shuttle Bus	Car to Park & Ride facility	Car to WNDA	Car Share en route	Shuttle Bus
Holyhead	626	10%	30%	0%	60%	63	188	0	375
South Anglesey	1,112	60%	40%	0%	0%	667	445	0	0
North West Anglesey	381	0%	40%	0%	60%	0	152	0	229
North East Anglesey	982	0%	40%	0%	60%	0	393	0	589
Amlwch	374	0%	40%	0%	60%	0	150	0	225
Caernarfon	100	20%	20%	0%	60%	20	20	0	60
Bangor	251	20%	20%	0%	60%	50	50	0	150
Other Gwynedd	313	50%	20%	30%	0%	156	63	94	0
Mainland beyond Gwynedd	462	50%	20%	30%	0%	231	92	139	0
Total	**4,601**					**1,187**	**1,552**	**233**	**1,628**
Total (round)	**4,600**		`			**1,190**	**1,550**	**230**	**1,630**

8.1.12 These results enable the overall mode split of the 8,600 construction worker trips to the Wylfa Newydd Development Area to be calculated (note – this

excludes the 400 facilities management staff who work on a non-shift basis) and this result is shown in table 8-3.

Table 8-3 Overall mode split - daily construction worker trips - peak construction

Mode	Daily trips (day and night shift)	%
Walk	4,000	47%
Park at Wylfa Newydd Development Area	1,550	18%
Park at Park and Ride	1,190	14%
Car share en route	230	3%
Shuttle bus	1,630	19%
TOTAL	**8,600**	**100%**

8.1.13 This analysis shows that 66% of daily construction worker trips to the Wylfa Newydd Development Area are forecast to be either on foot (47%) or by shuttle bus (19%) during peak construction.

Distribution of Daily Trips – Facilities Management Workers

8.1.14 The facilities management workers are likely to live within a 60-minute catchment of the Wylfa Newydd Development Area and the gravity model was used to forecast the distribution of facilities management workers as shown in table 8-4.

8.1.15 These workers will not be starting work at the same time as the construction shifts as their work will be related to catering, cleaning and security which has different requirements for start and end times. Some of the services will be delivered 24 hours per day. This means that the shuttle bus service from the mainland (e.g. Bangor) will not be available. The facilities management workers living on the mainland are therefore all assumed to travel by car. Half of the facilities management workers living on Anglesey are assumed to travel by car and half are assumed to use a minibus service. The resultant number of trips by mode is shown in table 8-4.

Table 8-4 Distribution of daily trips – facilities management workers

Region	% of workers	No. of workers	Mode split by car	Worker trips by car
Anglesey	87%	350	50%	170
Mainland	13%	50	100%	50
Total	**100%**	**400**	**-**	**220**

Distribution of Weekend Trips – Construction Workers

8.1.16 The distribution of weekend trips for each 11-day shift pattern is shown in table 8-5. The analysis is based on the 7,000 workers who are not expected to have a permanent home near the Wylfa Newydd Development Area (as shown in figure 7-4).

8.1.17 As with the distribution of daily trips, the allocation of workers from each region to different modes of transport is based on the availability of each mode and the journey time by each mode.

Table 8-5 Distribution of weekend trips – peak construction

Region	% of Workers	No. of workers	Frequency of home trips	No. of home trips per shift cycle	No. of home trips per week
Ireland (ferry)	11%	750	80%	600	300
Rest of Wales	11%	750	100%	750	375
England	50%	3,500	80%	2800	1,400
Scotland	7%	500	60%	300	150
Europe	21%	1,500	20%	300	150
Totals	**100%**	**7,000**		**4,750**	**2,375**

8.1.18 This analysis shows that there are forecast to be 2,375 trips home per week at the end of each 11-day shift cycle.

8.1.19 Table 8-6 shows the allocation of these 2,375 trips to different modes of transport. Rail services are assumed to reach nearby airports for air trips. In practice, some of these trips could be taken by coach or by car.

Table 8-6 Distribution of weekend trips – each week – peak construction

Region	No. of home trips per week	Road	Rail	Sea (foot)	Air + rail	Road	Rail	Sea (foot)	Air + rail
Ireland (ferry)	300	63%	0%	37%	0%	195	0	105	0
Rest of Wales	375	95%	5%	0%	0%	356	19	0	3
England	1,400	80%	19%	0%	1%	1,120	266	0	14
Scotland	150	84%	16%	0%	0%	126	24	0	0
Europe	150	41%	13%	0%	46%	62	20	0	69
Totals	**2,375**					**1,859**	**328**	**105**	**83**
Modal split						78%	14%	4%	3%

8.1.20 These trips will also be split by the 70/ 30 day shift/ night shift working pattern and the staggered start (and end) of shifts. For those 1,859 workers travelling by car, a car share ratio of 1.5 is assumed based on the strategy described in chapter 6.

8.1.21 The resultant number of weekly car trips is shown in table 8-7.

Table 8-7 Weekend car trips per week – peak construction

Weekend	Trips by car	Car share ratio	No. of vehicles	% on day shift	No. of vehicles at end of day shift	No. of vehicles at end of day shift per stagger
Ireland	195	1.5	130	70%	91	30
Wales	356	1.5	238	70%	166	55
England	1,120	1.5	747	70%	523	174
Scotland	126	1.5	84	70%	59	20
Europe	62	1.5	41	70%	29	10
Total	**1,859**		**1,239**		**867**	**289**

8.1.22 It is likely that most car trips will start from the location of the temporary home of the worker i.e. they will not all start from the Wylfa Newydd Development Area or the Park and Ride facility. This will spread the trips at the end of the day shift beyond that provided by the staggered shift-end arrangement.

8.1.23 A code of conduct will be signed by all workers which will stipulate that appropriate access routes will be via the A55 and A5025, followed by A roads and B roads, with construction workers only using minor roads where necessary to reach their accommodation. This will help to minimise impacts on local communities by avoiding the use of inappropriate roads, such as rural lanes.

8.1.24 The forecast 328 rail trips that are expected each week will likely start at the stations in Holyhead or Bangor. There are also forecast to be a further 83 rail trips by construction workers travelling to an airport. Construction workers will be able to use the shuttle buses to access the rail stations at Holyhead of Bangor. Some of these workers may also choose to travel by coach.

9 Assessment Method

9.1 Introduction

9.1.1 This chapter presents the methodology used to assess the transport impacts of the Wylfa Newydd Project. This methodology follows the requirements of the WelTAG guidance. The results of these methods are then described in chapter 10.

9.2 Traffic Growth

9.2.1 The traffic survey data described in chapter 4 have been used to develop a model of existing traffic patterns. This model has been used as a basis to prepare forecasts of traffic conditions in each year of assessment using traffic growth factors to convert the 2016 baseline data to baseline data for 2020, 2023 (the peak year of construction traffic) and for 2033 (when the Power Station is open).

9.2.2 Table 9-1 presents the increases that have been applied to convert 2016 weekday traffic data to traffic data for 2020, 2023 and 2033.

Table 9-1 Traffic growth factors

Vehicle type	Growth from 2016 to 2020	Growth from 2016 to 2023	Growth from 2016 to 2033
Car	5%	7%	13%
Light goods vehicles	11%	19%	45%
Heavy goods vehicles	3%	5%	15%

9.2.3 These growth forecasts are based on standard Department for Transport growth factors and the TEMPRO (version 7.2) database. Base calibrated car demand has been factored to 2023 using TEMPro growth factors. LGV and HGV traffic has been factored to the forecast year using values taken from Department for Transport Regional Traffic Forecasts. As part of this process potential future developments with planning permission (known as Committed Developments) on Anglesey were considered. Full details of the Committed Developments included are contained in appendix G (Application Reference Number: 6.3.21).

9.2.4 The additional construction traffic related to the North Wales Connection Project (see paragraph 5.2.5) is relatively small (approximately twenty construction vehicles per hour per direction). This traffic has not been included in the traffic forecasts for the Wylfa Newydd Project given the uncertainty surrounding the timing of the scheme. The traffic impact of the North Wales Connection Project has been considered as part of the assessment of Britannia Bridge. The Welsh Water Wylfa Newydd Potable Water scheme (see Paragraph 5.35) has not been considered either due to no information being available on the timing or traffic impact of this scheme. However it is likely this scheme will have a relatively small number of construction vehicles movements.

9.2.5 It is worth reiterating here that the Wylfa Newydd traffic forecasts are conservative as they are based on 40% of construction material coming by road where in reality it is likely to be nearer 20%.

9.2.6 These traffic growth factors were incorporated into the Strategic Traffic Model used to assess the Project and full details of the methodology is provided in appendix G (Application Reference Number: 6.3.21).

9.3 Strategic Traffic Model

9.3.1 A Strategic Traffic Model was developed to understand the effects that additional traffic associated with the proposed activities within the Wylfa Newydd Development Area would have on the surrounding road network.

9.3.2 The Strategic Traffic Model is an extensive and complex macro-based model developed in Microsoft Excel. The development of the Model to its current position has been an iterative process that included various updates to increase its functionality in line with the changing scope of the Wylfa Newydd Project and comments from stakeholders. Using the existing traffic flows for roads and junctions as the starting point, future traffic scenarios were assessed using the Model.

9.3.3 A previous version of the Model was used to inform preparatory documentation provided for stakeholders and public consultation. The Model has since been updated and it informs the technical analysis and supporting technical assessment for the DCO and the Environmental Impact Assessments.

9.3.4 In addition to providing turning movements by hour, the Model also calculates hourly link flows, Average Annual Daily Traffic flows (AADTs) and 18-hour Annual Average Weekday Traffic (AAWTs). Annualised inputs have been calculated by determining typical 'peak' and 'off peak' values across the course of a year using the activity profiles for each element of the Project.

9.3.5 The assessment presented in following chapters uses the results of the Strategic Traffic Model.

9.4 Junction Assessments

9.4.1 For the individual junction assessments, flows were obtained from the Strategic Traffic Model based on an average Quarter 3 weekday. Quarter 3 was chosen as this is the busiest Quarter of the year. See appendix G (Application Reference Number: 6.3.21) for further details.

9.4.2 A two-stage approach has been used to assess the impact of the Wylfa Newydd Project on junction performance.

- Stage 1: High-level assessment: This assesses a large number of junctions using the methodology defined in DMRB TD42/95 and TD16/07 [RD17]. The overall demand and capacity is assessed to select those junctions (if any) which are currently operating close to capacity, dependent on Ratio of Flow and Capacity (RFC).

- Stage 2: Detailed assessment: This examines the performance of junctions selected in Stage 1 in detail using industry standard software.

9.4.3 Further details are provided in the following paragraphs.

Stage 1

9.4.4 The observed traffic survey data at a junction was converted to passenger car units and used to determine the Ratio of Flow to Capacity (RFC) during the AM and PM peak hour at each assessed junction. Junctions with an RFC of more than 0.7 were taken forward to Stage 2 for detailed assessment. This threshold level of 0.7 is lower than the typical industry standard of 0.85 but was used following discussions with stakeholders to provide a robust assessment of potential junction impacts.

9.4.5 The list of junctions assessed in this way is presented in table 9-2 (see appendix H (Application Reference Number: 6.3.22) for the location of each junction).

Table 9-2 List of assessed junctions

Junction reference	Junction name
M-1	A55 Junction 2
M-3	Valley Crossroads
M-4	A55 Junction 3
M-5	A55 Junction 4
M-7	A5/ B5112/ A4080 Junction
M-8	A5025/ B5111 roundabout
M-11	A5025/ Queen Street
M-12	Magnox access road/ A5025 junction
M-13	A5025/ Cromlech Terrace/ Cemlyn Road
M-16	Roundabout at Llanerch-y-medd
M-17	B5111/ Minor Road south of Rhos-y-bol
M-18	A5025/ B5109 Llanynghenedl
M-20	A55 Junction 6
M-30	A5205/ Minor Road Tregele
M-34	A5025 Ffordd Caergybi/ High Street/ Ffordd Y Felin (Cemaes)
M-35	A5025/ Road to Rhosgoch
M-39	A5025/ B5420 Ffordd Penmynydd/ Pentraeth Road (Menai Bridge)
M-40	A5025 Pentraeth Road/ B5109 (Pentraeth)
M-41	A5025 Bangor Road/ Beach Road/ B5108 (Benllech)

Junction reference	Junction name
M-43	A5025/ A5108 (Moelfre)
M-45	A5025/ Minor Road Twrcelyn
M-46	A55 Junction 8
M-47	A55 Junction 8a
M-48 + M-49	A55 Junction 9
M-63	Proposed new Power Station access
M-64	Proposed MEEG access
M-65	Proposed exit onto A5 from Dalar Hir Park and Ride facility
M-66	Proposed access for Dalar Hir Park and Ride facility
M-71	A5/ Mona Road/ Pentraeth Road Roundabout
M-72	A5 Menai Road Roundabout
M-73	A5/ A487 Roundabout
M-74	A487/ B4547 Roundabout
M-75	A5114/ Bridge Street Junction
M-76	A5/ Llangefni Road
M-77	B5109/ Llangefni Road
M-78	B5111/ Minor Road south of Llangwyllog
M-79	Priority Junction west of Rhosgoch

Stage 2

9.4.6 The industry standard software modelling programmes ARCADY and PICADY (Junctions 9, version 9.0.1) were used to model traffic flows at roundabouts and priority junctions. LinSig v3.2.33.0 was used for signal-controlled junctions.

9.4.7 Junction geometry for each existing junction was based on Ordnance Survey master map information, supplemented by visual observations of the junctions (for example the full width of a road was not used where there is hatching). For new or upgraded junctions, design geometry was taken from AutoCAD drawings.

9.4.8 The assessment of each junction provides information on demand, capacity, RFC and queue lengths.

9.4.9 By comparing these values for the existing situation against the situation for each assessed scenario, the impact of the Wylfa Newydd Project was determined and where necessary mitigation measures were considered.

9.5 VISSIM Model

9.5.1 The junction assessment approach described in the previous chapter considered each junction individually. The area around the Britannia Bridge and Menai Bridge was also assessed as a network using the VISSIM traffic modelling software. VISSIM software produces a simulation that models the movement of each individual vehicle through the traffic network and provides information on traffic journey times and delays. The base VISSIM model represents spring 2016 traffic conditions and a sensitivity test has been undertaken to examine traffic conditions during the peak holiday period i.e. August. The extent of the VISSIM model was discussed in detail with local stakeholders. It should be noted that the number of construction vehicle movements assumed in the model to cross Britannia Bridge is based on the expected flow in this location (approx. 15 HGVs per hour per direction – see figure 7-2 of appendix F (Application Reference Number: 6.3.20)) and not the estimated maximum peak flow of 40 HGVs assumed along the A5025 (see figure 7-3 of appendix F (Application Reference Number: 6.3.20)).

9.5.2 The area assessed by the VISSIM model is provided in figure 9-1.

9.5.3 Important outputs of the model include the assessment of eastbound and westbound journey times across the Britannia Bridge and Menai Bridge.

9.5.4 These journey times have been calculated based on the locations described in table 9-3 and shown in figure 9-2.

Table 9-3 Measurement of journey times across the bridges

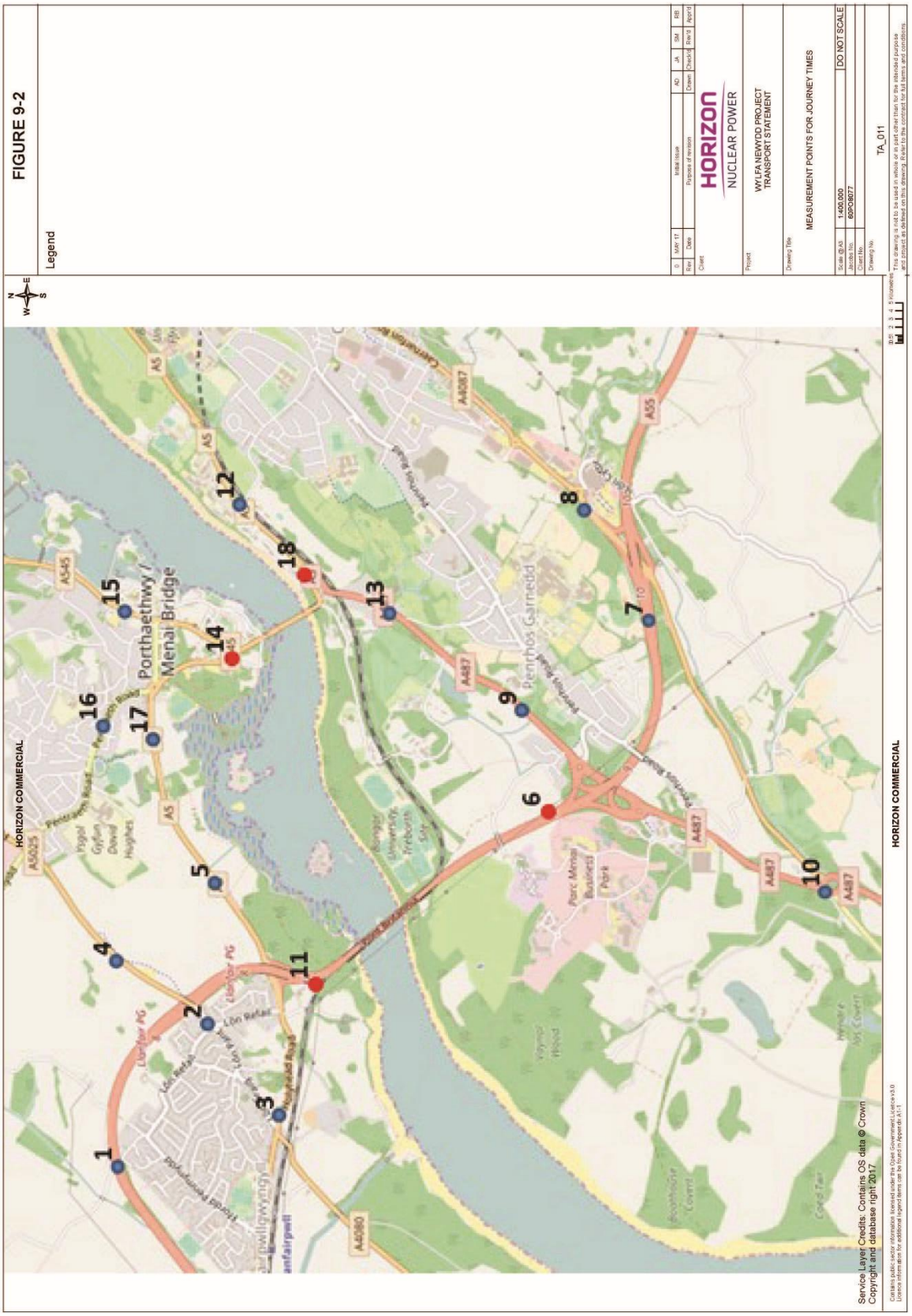
Location	From	To
A55 eastbound across Britannia Bridge	1,2,3,4,5	6
A55 westbound across Britannia Bridge	7,8,9,10	11
A5 eastbound across Menai Bridge	15,16,17	18
A5 westbound across Menai Bridge	12,13	14

9.5.5 Full details of the model and the methodology are provided in appendix I (Application Reference Number: 6.3.23).

9.5.6 A summary of the change in journey times resulting from the Project during the peak construction year (2023) is provided in chapter 11.

Figure 9-1 Area modelled using VISSIM

Figure 9-2 Measurement points for journey times



9.6 Merge / Diverge Assessment

9.6.1 The introduction of the Wylfa Newydd Project could lead to additional traffic using junctions on the A55.

9.6.2 The effects on merges/diverges on/off the A55 have been considered by examining the capacity and demand for merges using *Design Manual for Roads and Bridges Volume 13 Section 1 Chapter 7 Queuing Delay* [RD17] and *TD 22/06 Layout of Grade Separated Junctions* [RD17].

9.6.3 This approach was used to consider:

- the existing layout;
- the required layout with current traffic flows; and
- the required layout for each assessed scenario associated with the Wylfa Newydd Project.

9.6.4 The junctions listed below were examined as part of this process.

- Junction 2;
- Junction 3;
- Junction 4;
- Junction 5;
- Junction 6;
- Junction 7;
- Junction 8;
- Junction 8a;
- Junction 9; and
- Junction 10*.

  * Note: Junction 10 data were collected in order to assist the assessment of Junction 9 and Junction 10 itself has not been assessed.

9.6.5 The main aim of this process was to determine the ratio of flow to capacity for each junction. Junctions operating with a ratio of flow to capacity greater than 0.85 were selected for further assessment to determine any requirement for junction layout changes.

9.6.6 Overall, this process examined whether the introduction of the Wylfa Newydd Project would require any changes to the layout of the grade-separated junctions on the A55.

9.7 Accidents and Road Safety Audits

9.7.1 The increase in traffic flows associated with the Wylfa Newydd Project could change the risk of accidents occurring on the road network, and impact the safety road users. The results of this analysis are summarised in chapter 11.

9.7.2 Where new junctions or highway changes are proposed, the potential impacts on road safety and accidents have been assessed using Road Safety Audits. These audits apply a standard approach to provide an independent assessment of safety issues at the stages of feasibility design, detailed design, construction and implementation. See appendix K (Application Reference Number: 6.3.25) for copies of the Road Safety Audits undertaken.

9.8 Impact on Other Modes

9.8.1 The assessment of trips generated by the Wylfa Newydd Project estimates how many additional trips are expected by non-car modes or transport. This additional demand has been compared with the available capacity to determine whether existing services are able to accommodate additional demand. The results are shown in chapter 11.

10 Assessment Scenarios

10.1.1 The transport impact of the Wylfa Newydd Project has been assessed for the following three years:

- 2020 – Opening year of the A5025 Off-line Highway Improvements;
- 2023 –Year for peak construction traffic; and
- 2033 –Year for peak operational traffic.

10.1.2 The year 2020 (i.e. Year 2 of the construction programme) was chosen because, based upon the assumed programme, it represents the opening year of the A5025 Off-line Highway Improvements. To provide an assessment of peak project trip generation that assesses the effect of the A5025 Off-line Highway Improvements a 2020 assessment both with and without the A5025 Off-line Highway Improvements in place was completed. 2020 is also the year before opening of the MOLF.

10.1.3 The 2023 assessment year (i.e. Year 5 of the construction programme) was selected as it represents the peak year for project trip generation. This includes the maximum project vehicle trip generation incorporating the maximum of construction vehicles and construction worker traffic.

10.1.4 Assessment of 2033 (i.e. Year 15 from the start of construction) was included as it represents peak vehicle trip generation associated with the operation of the power station. This is because it includes normal operation, two outages (one for each unit) and, although they are not included in the Development Consent Order application, construction of radiological waste buildings.

10.1.5 The years assessed represent a snapshot in time for the purposes of assessment and use background traffic growth factors from the 2016 baseline to these future years. As with any assessment it is based on assumptions, consequently the resulting traffic flows are forecasts. The nature of the Project means that in practice there is the potential for activities to move forwards or backwards in time. However, the overall programme and phasing is likely to remain broadly similar and as a consequence the use of the years outlined above, and the relatively low year-on-year annual traffic growth (see appendix C2-4, Application Reference Number 6.3.21), is considered appropriate.

10.1.6 For each of these years, traffic impacts with the Project have been compared to a Reference Case without the Project.

10.1.7 These scenarios have therefore been chosen as they reflect the periods of peak activities during different phases of the Project. Potentially, the delivery of the DCO Project could be delayed and, depending on the duration of the delay, this could have an impact on the results presented in this document e.g. due to changes in background traffic growth. This potential issue is considered further in appendix L (Application Reference Number:6.3.26).

10.1.8 In 2020, two sub-scenarios were assessed: with the A5025 Off-line Highway Improvements under construction; and with the A5025 Off-line Highway Improvements open to traffic. Results in 2020 are presented for the scenarios with the improvements open. Other results are provided in the relevant appendix for each assessment.

10.1.9 In considering these schemes, it should be noted that the results are based on an assumption that 60% of construction materials use the MOLF i.e. 40% of construction materials travel by road.

10.1.10 In practice, the target is for 80% of construction materials to use the MOLF i.e. 20% of construction materials travel by road rather than 40%. This means that the traffic impacts are likely to be less than those presented in following chapters.

10.1.11 In addition, the peak forecast for 9,000 construction workers is considered to be an upper bound estimate and the number of peak workers could be lower.

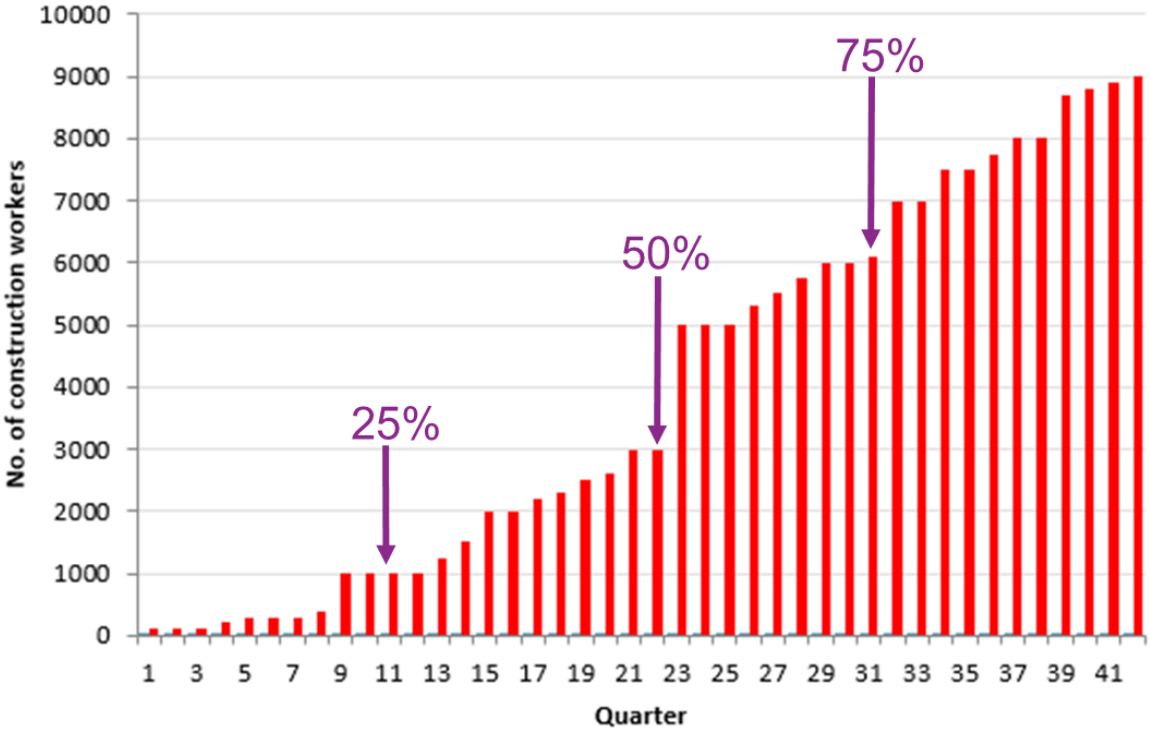
10.1.12 Finally, for more than 50% of the construction period, the number of construction workers will be 3,000 or fewer i.e. one-third of the assessed number of peak construction workers. This is illustrated in figure 10-1 which uses the overall worker profile in figure 7-1 ordered by the number of workers per quarter.

10.1.13 All these factors mean that the transport impacts presented in the following chapters and subsequent conclusions are conservative and robust.

10.1.14 The traffic modelling uses the shift times specified in paragraph 7.3.1. These shift times mean that construction worker traffic avoids the peak periods for other commuter traffic. If these shift times were to change, the traffic analysis and associated modelling assessments would need to be updated.

10.1.15 The impacts on public transport have also been assessed during the peak construction year.

Figure 10-1 Construction Worker Profile – Stacked by Workers per Quarter



11 Assessment Results

11.1 Introduction

11.1.1 This chapter presents the results of the transport assessment of the Wylfa Newydd Project. These results are based on the methodology described in the previous chapter.

11.2 Changes in Traffic Flows

11.2.1 The Strategic Traffic Model was used to forecast changes in traffic flows across the assessed network and the results for the main links in each year of assessment are presented in table 11-1, table 11-2 and table 11-3. In each table the relevant data for 2016 is also provided as a comparison. Flows represent vehicles on an average Quarter 3 weekday given this is the Quarter in the Strategic Traffic Model that represents the highest traffic flow of the year. The AM peak represents 08:00-09:00 and the PM peak represents 17:00-18:00.

Table 11-1 Summary of traffic flows (vehicles) – 2016 and 2020

		2016			2020 – Reference Case			2020 – With Scheme		
Link	**Direction**	**Vehicle flow per hour – AM peak**	**Vehicle flow per hour – PM peak**	**% HDV**	**Vehicle flow per hour – AM peak**	**Vehicle flow per hour – PM peak**	**% HDV**	**Vehicle flow per hour – AM peak**	**Vehicle flow per hour – PM peak**	**% HDV**
A55 Britannia Bridge	Eastbound	1,720	1,360	15% / 8%	1,830	1,500	15% / 12%	1,830	1,630	15% / 12%
A55 Britannia Bridge	Westbound	1,330	1,640	22% / 9%	1,400	1,820	21% / 12%	1,450	1,840	21% / 13%
A55 east of Junction 3	Eastbound	670	790	14% / 6%	720	850	13% / 9%	730	970	14% / 10%
A55 east of Junction 3	Westbound	690	810	16% / 9%	720	900	16% / 12%	760	940	17% / 13%
A55 east of Junction 4	Eastbound	740	790	15% / 7%	800	850	15% / 10%	800	1,030	15% / 10%
A55 east of Junction 4	Westbound	720	810	16% / 9%	750	910	16% / 12%	800	930	17% / 13%
A5025 north of Valley	Northbound	140	330	6% / 1%	130	350	9% / 3%	160	380	9% / 7%
A5025 north of Valley	Southbound	290	220	3% / 0%	300	240	4% / 3%	320	380	6% / 7%
A5025 west of Amlwch	Eastbound	110	60	8% / 0%	110	210	8% / 1%	120	250	9% / 3%
A5025 west of Amlwch	Westbound	120	60	5% / 1%	70	60	8% / 2%	70	70	8% / 8%
B5111 north of Llangefni	Northbound	90	250	10% / 1%	90	270	10% / 3%	90	270	10% / 3%
B5111 north of Llangefni	Southbound	220	90	4% / 1%	230	90	4% / 2%	230	90	4% / 2%

HDV=HGVs and Public Service Vehicles

Table 11-2 Summary of traffic flows (vehicles) – 2016 and 2023

		2016			2023 – Reference Case			2023 – With Scheme		
Link	**Direction**	**Vehicle flow per hour – AM peak**	**Vehicle flow per hour – PM peak**	**% HDV**	**Vehicle flow per hour – AM peak**	**Vehicle flow per hour – PM peak**	**% HDV**	**Vehicle flow per hour – AM peak**	**Vehicle flow per hour – PM peak**	**% HDV**
A55 Britannia Bridge	Eastbound	1,720	1,360	15% / 8%	1,880	1,530	14% / 11%	1,920	1,690	16% / 11%
A55 Britannia Bridge	Westbound	1,330	1,640	22% / 9%	1,440	1,860	21% / 12%	1,500	1,880	22% / 12%
A55 east of Junction 3	Eastbound	670	790	14% / 6%	730	870	13% / 9%	790	1,040	17% / 10%
A55 east of Junction 3	Westbound	690	810	16% / 9%	730	920	16% / 12%	800	980	18% / 13%
A55 east of Junction 4	Eastbound	740	790	15% / 7%	820	870	15% / 10%	860	1,110	17% / 9%
A55 east of Junction 4	Westbound	720	810	16% / 9%	770	930	16% / 12%	840	950	18% / 13%
A5025 north of Valley	Northbound	140	330	6% / 1%	140	360	9% / 3%	200	400	19% / 9%
A5025 north of Valley	Southbound	290	220	3% / 0%	310	240	4% / 3%	360	470	13% / 8%
A5025 west of Amlwch	Eastbound	110	60	8% / 0%	120	200	7% / 1%	120	280	9% / 2%
A5025 west of Amlwch	Westbound	120	60	5% / 1%	70	70	8% / 2%	70	80	8% / 7%
B5111 north of Llangefni	Northbound	90	250	10% / 1%	90	280	10% / 3%	90	280	10% / 3%
B5111 north of Llangefni	Southbound	220	90	4% / 1%	240	90	4% / 2%	240	90	4% / 2%

HDV=HGVs and Public Service Vehicles

Table 11-3 Summary of traffic flows (vehicles) – 2016 and 2033

		2016			2033 Reference Case			2033 – With Scheme		
Link	**Direction**	**Vehicle flow per hour – AM peak**	**Vehicle flow per hour – PM peak**	**% HDV**	**Vehicle flow per hour – AM peak**	**Vehicle flow per hour – PM peak**	**% HDV**	**Vehicle flow per hour – AM peak**	**Vehicle flow per hour – PM peak**	**% HDV**
A55 Britannia Bridge	Eastbound	1,720	1,360	15% / 8%	2,130	2,040	14% / 9%	2,130	2,070	14% / 9%
A55 Britannia Bridge	Westbound	1,330	1,640	22% / 9%	2,030	2,080	16% / 11%	2,060	2,090	16% / 11%
A55 east of Junction 3	Eastbound	670	790	14% / 6%	970	1,670	11% / 5%	980	1,700	11% / 5%
A55 east of Junction 3	Westbound	690	810	16% / 9%	1,670	1,130	8% / 10%	1,700	1,140	8% / 10%
A55 east of Junction 4	Eastbound	740	790	15% / 7%	1,060	1,680	12% / 5%	1,070	1,710	12% / 5%
A55 east of Junction 4	Westbound	720	810	16% / 9%	1,710	1,140	8% / 11%	1,740	1,150	8% / 11%
A5025 north of Valley	Northbound	140	330	6% / 1%	190	570	5% / 1%	220	580	5% / 2%
A5025 north of Valley	Southbound	290	220	3% / 0%	550	290	2% / 2%	560	320	2% / 2%
A5025 west of Amlwch	Eastbound	110	60	8% / 0%	120	100	7% / 1%	120	100	7% / 1%
A5025 west of Amlwch	Westbound	120	60	5% / 1%	80	70	7% / 2%	80	70	7% / 2%
B5111 north of Llangefni	Northbound	90	250	10% / 1%	100	300	9% / 3%	100	300	9% / 3%
B5111 north of Llangefni	Southbound	220	90	4% / 1%	250	100	4% / 2%	250	100	4% / 2%

HDV=HGVs and Public Service Vehicles

Table 11-4 Changes in traffic flows (vehicles) – 2020, 2023 and 2033- with and without project

		2020		2023		2033	
Link	**Direction**	**Change in vehicle flow per hour – AM peak**	**Change in vehicle flow per hour – PM peak**	**Change in vehicle flow per hour – AM peak**	**Change in vehicle flow per hour – PM peak**	**Change in vehicle flow per hour – AM peak**	**Change in vehicle flow per hour – PM peak**
A55 Britannia Bridge	Eastbound	0	130	40	160	0	30
A55 Britannia Bridge	Westbound	50	20	60	20	30	10
A55 east of Junction 3	Eastbound	10	120	60	170	10	30
A55 east of Junction 3	Westbound	40	40	70	60	30	10
A55 east of Junction 4	Eastbound	0	180	40	240	10	30
A55 east of Junction 4	Westbound	50	20	70	20	30	10
A5025 north of Valley	Northbound	30	30	60	40	30	10
A5025 north of Valley	Southbound	20	140	50	230	10	30
A5025 west of Amlwch	Eastbound	10	40	0	80	0	0
A5025 west of Amlwch	Westbound	0	10	0	10	0	0
B5111 north of Llangefni	Northbound	0	0	0	0	0	0
B5111 north of Llangefni	Southbound	0	0	0	0	0	0

Table 11-5 Percentage changes in traffic flows – 2020, 2023 and 2033

		2020		2023		2033	
Link	**Direction**	**Change in vehicle flow per hour – AM peak**	**Change in vehicle flow per hour – PM peak**	**Change in vehicle flow per hour – AM peak**	**Change in vehicle flow per hour – PM peak**	**Change in vehicle flow per hour – AM peak**	**Change in vehicle flow per hour – PM peak**
A55 Britannia Bridge	Eastbound	0%	9%	2%	10%	0%	1%
A55 Britannia Bridge	Westbound	4%	1%	4%	1%	1%	0%
A55 east of Junction 3	Eastbound	1%	14%	8%	20%	1%	2%
A55 east of Junction 3	Westbound	6%	4%	10%	7%	2%	1%
A55 east of Junction 4	Eastbound	0%	21%	5%	28%	1%	2%
A55 east of Junction 4	Westbound	7%	2%	9%	2%	2%	1%
A5025 north of Valley	Northbound	23%	9%	43%	11%	16%	2%
A5025 north of Valley	Southbound	7%	58%	16%	96%	2%	10%
A5025 west of Amlwch	Eastbound	9%	19%	0%	40%	0%	0%
A5025 west of Amlwch	Westbound	0%	17%	0%	14%	0%	0%
B5111 north of Llangefni	Northbound	0%	0%	0%	0%	0%	0%
B5111 north of Llangefni	Southbound	0%	0%	0%	0%	0%	0%

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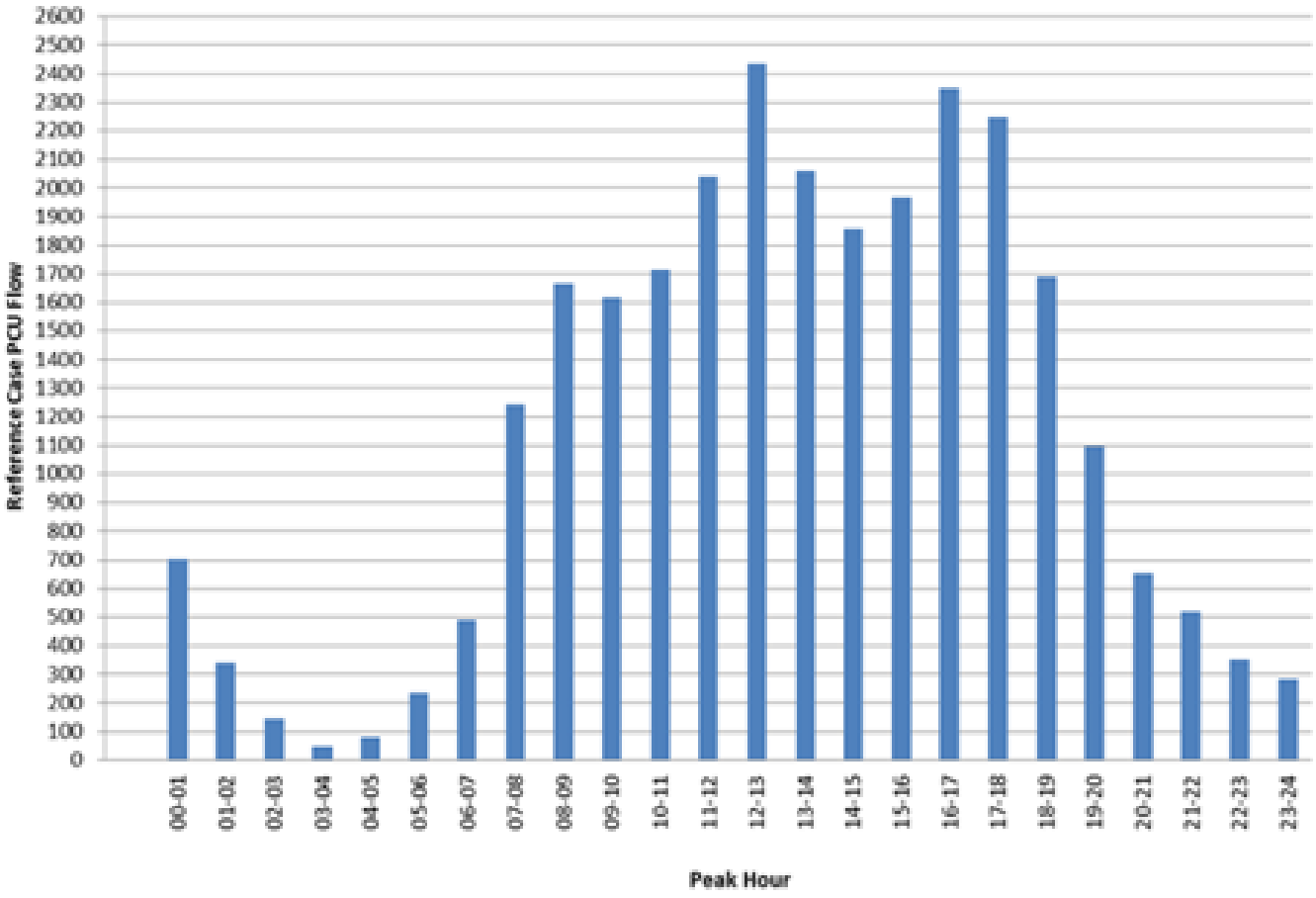
Peaks in Daily Flow

11.2.2 During consultations with local stakeholders (see chapter 2), there were discussions concerning the daily peaks of traffic flow on the local road network and how these should be assessed.

11.2.3 The variation in daily flow at Junction 2 of the A55 in 2023 (year of peak construction activity) has been examined in detail with and without the traffic generated by the Wylfa Newydd Project. This junction was chosen for this assessment because it was identified by stakeholders as a junction close to capacity.

11.2.4 The results of this process are shown in figure 11-1 for the baseline or 'without' scenario. In this diagram flows are presented in Passenger Car Units (PCUs) which means the effect of larger vehicles e.g. HGVs, is incorporated into the assessment of traffic demand.

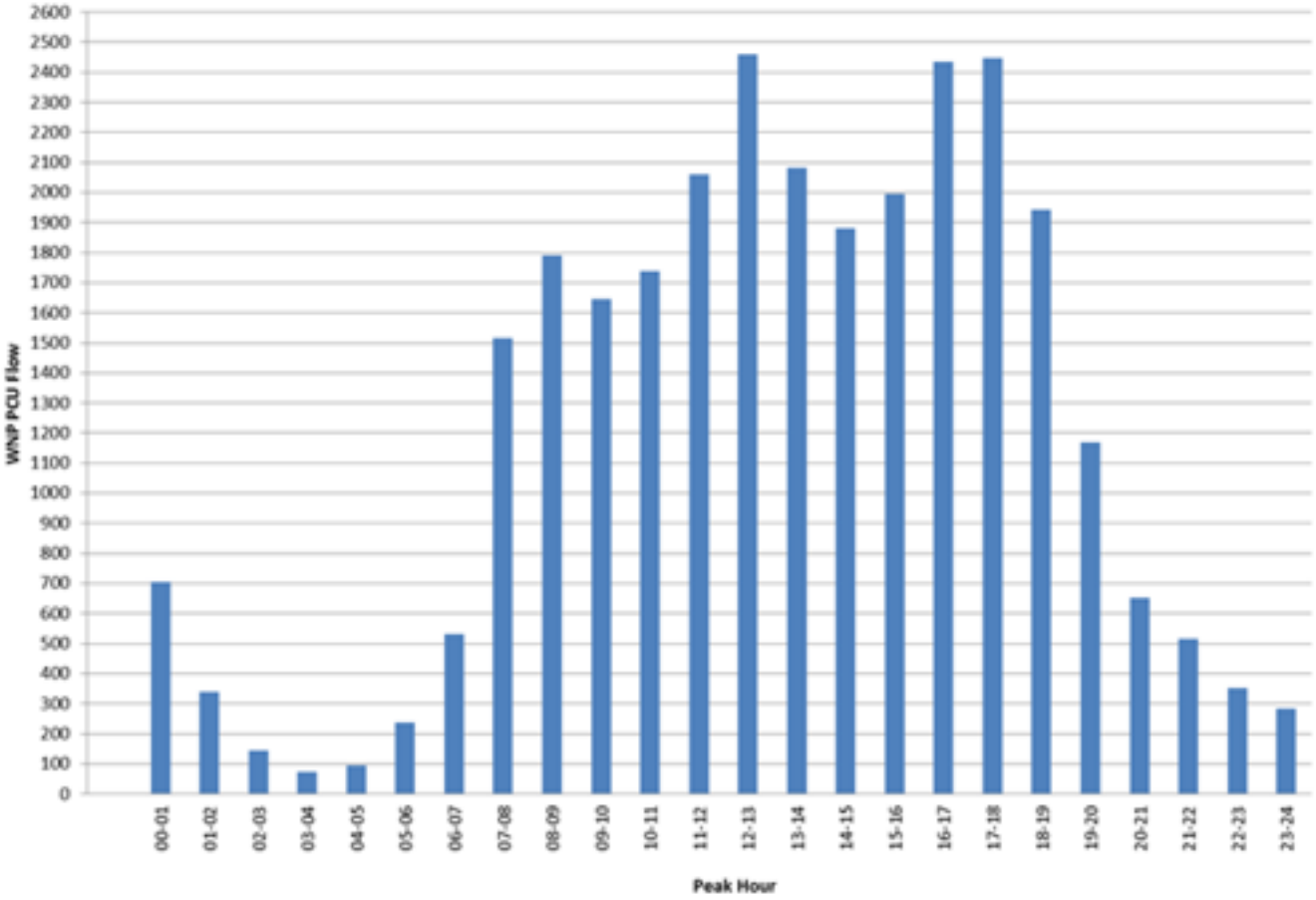
Figure 11-1 Daily flow profile – Junction 2 – 2023 (PCUs



11.2.5 This analysis shows that without the Wylfa Newydd Project, the peak flow during the morning occurs between 08:00 and 09:00 and the evening the peak which occurs between 16:00 and 17:00.

11.2.6 The traffic using Junction 2 of the A55 in 2023 with the addition of traffic related to the Wylfa Newydd Project is provided in figure 11-2.

Figure 11-2 Daily flow profile – Junction 2 – 2023 – with project (PCUs)



11.2.7 The data show that with the addition of the traffic related to the Wylfa Newydd Project, the busiest hour in the morning period is 08:00 to 09:00. In the evening period, the busiest hour is 17:00 to 18:00 (although with a very similar level of traffic to 16:00 to 17:00).

11.2.8 To provide a robust assessment, the performance of Junction 2 has been assessed for the busiest hours during the AM and PM peak periods on the road network in each scenario. This means that in 2023 the hours of 08:00-09:00 and 17:00-18:00 have been assessed.

11.2.9 This is a robust approach to assessing junction performance during morning and evening peak periods as the highest modelled traffic flows on the road network are considered. This approach has been adopted for the assessment of all junctions which means the hours of assessment may vary from junction to junction.

Britannia Bridge

11.2.10 The impact of the Wylfa Newydd Project on the operation of the Britannia Bridge is an important consideration. The forecast changes in traffic flows in 2023 are shown in figure 11-3 for eastbound traffic and figure 11-4 for westbound traffic.

Figure 11-3 Eastbound Britannia Bridge (vehicles per hour) 2016/2023

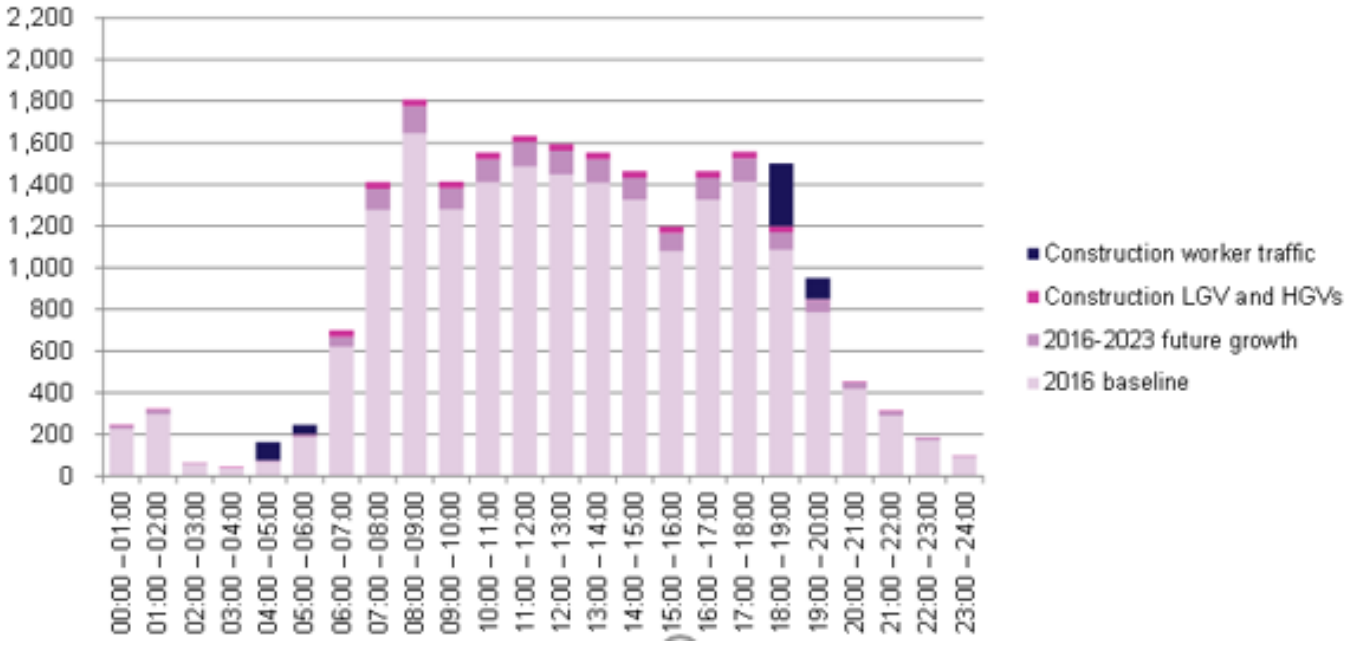
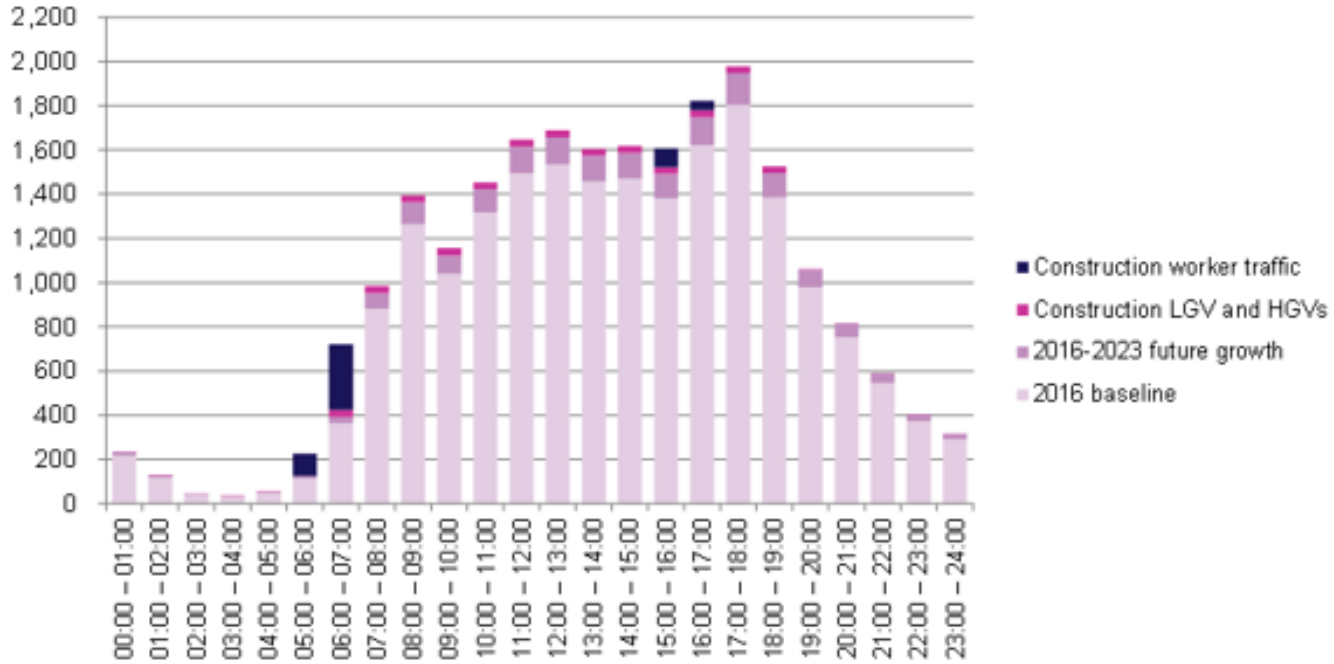


Figure 11-4 Westbound Britannia Bridge (vehicles per hour) 2016/2023



11.2.11 Figure 11-3 and figure 11-4 show that the timing of the shifts means that worker and construction traffic does not substantially affect the main peaks in traffic flow over the bridge.

11.2.12 The extra traffic in the AM peak is within the capacity of the bridge and there is a small impact on vehicle delay of around 1 second. The increase in traffic in the PM peak is shown to lead to a delay of 14 seconds or less per vehicle (see VISSIM results below).

A5025

11.2.13 The change in flows in 2023 from the Strategic Traffic Model along the A5025 is presented below:

AM Peak

- 43% increase northbound
- 16% increase southbound

PM Peak

- 11% increase northbound
- 92% increase southbound

11.2.14 Mitigation measures including the A5025 Off-line Highway Improvements (i.e. bypasses) are proposed as part of the Wylfa Newydd Project to manage this impact.

11.3 Junction Assessments

Stage 1 Assessment

11.3.2 The results from the Strategic Traffic Model have been used to identify junctions where there is the potential for traffic generated by the Wylfa Newydd Project to increase traffic delays.

11.3.3 38 junctions were identified and the Ratio of Flow to Capacity (RFC) was analysed for each time period for each scenario (with and without Project).

11.3.4 The full results are presented in appendix H (Application Reference Number: 6.3.22), however the list of the 38 junctions and their RFCs in 2023 (peak construction year) including Project traffic is provided in table 11-6.

Table 11-6 Junction RFCs assessed – 2023 With and Without Project

Survey Ref.	Junction	2023 Without Project		2023 With project	
		Max RFC AM peak	Max RFC PM Peak	Max RFC AM peak	Max RFC PM Peak
M-1	A55 Junction 2	20%	40%	25%	49%
M-3	Valley Crossroads	<70%*	<90%*	<70%*	<70%*
M-4	A55 Junction 3	25%	46%	29%	59%
M-5	A55 Junction 4	19%	22%	19%	23%
M-7	A5/ B5112/ A4080 Junction	16%	19%	16%	20%
M-8	A5025/ B5111 roundabout	14%	24%	14%	31%
M-11	A5025/ Queen Street	22%	24%	30%	24%
M-12	Magnox access road/ A5025 junction	55%	35%	74%	66%
M-13	A5025/ Cromlech Terrace/ Cemlyn Road	13%	6%	18%	8%
M-16	Roundabout at Llanerch-y-medd	37%	22%	37%	25%
M-17	B5111/ Minor Road south of Rhos-y-bol	15%	17%	15%	17%
M-18	A5025/ B5109 Llanynghenedl	8%	16%	10%	23%
M-20	A55 Junction 6	119%	143%	119%	147%
M-30	A5205/ Minor Road Tregele	1%	1%	1%	1%
M-34	A5025 Ffordd Caergybi/ High Street/ Ffordd Y Felin (Cemaes)	12%	13%	27%	23%
M-35	A5025/ Road to Rhosgoch	4%	1%	1%	1%
M-39	A5025/ B5420 Ffordd Penmynydd/ Pentraeth Road (Menai Bridge)	37%	106%	37%	109%

Survey Ref.	Junction	2023 Without Project		2023 With project	
		Max RFC AM peak	Max RFC PM Peak	Max RFC AM peak	Max RFC PM Peak
M-40	A5025 Pentraeth Road/ B5109 (Pentraeth)	18%	30%	18%	31%
M-41	A5025 Bangor Road/ Beach Road/ B5108 (Benllech)	9%	21%	9%	22%
M-43	A5025/ A5108 (Moelfre)	14%	15%	4%	10%
M-45	A5025/ Minor Road Twrcelyn	5%	6%	3%	6%
M-46	A55 Junction 8	106%	118%	106%	119%
M-47	A55 Junction 8a	46%	72%	46%	72%
M-48	A55 Junction 9	134%	114%	136%	114%
M-49		141%	107%	142%	115%
M-63	Proposed new Power Station access	17%	10%	28%	13%
M-64	Proposed MEEG access	0%	0%	4%	1%
M-65	Proposed exit onto A5 from Dalar Hir Park and Ride facility	<70%*	<70%*	<70%*	<70%*
M-66	Proposed access junction off London Road (Dalar Hir Park and Ride facility)	6%	4%	11%	6%
M-71	A5/ Mona Road/ Pentraeth Road Roundabout	88%	68%	88%	68%
M-72	A5 Menai Road Roundabout	63%	26%	63%	26%
M-73	A5/ A487 Roundabout	21%	45%	21%	45%
M-74	A487/ B4547 Roundabout	58%	55%	58%	57%
M-75	A5114/ Bridge Street Junction	80%	102%	80%	108%

Survey Ref.	Junction	2023 Without Project		2023 With project	
		Max RFC AM peak	Max RFC PM Peak	Max RFC AM peak	Max RFC PM Peak
M-76	A5/ Llangefni Road	47%	45%	47%	45%
M-77	B5109/ Llangefni Road	23%	21%	23%	21%
M-78	B5111/ Minor Road south of Llangwyllog	8%	10%	8%	10%
M-79	Priority Junction west of Rhosgoch	20%	11%	20%	14%

- * = These junctions are signalised and have been modelled using LinSig which gives a Practical Reserved Capacity (PRC) value instead of an RFC value. Full results are detailed in appendix H (Application Reference Number: 6.3.22).

11.3.5 As part of this analysis, any junction which has an arm with a ratio of flow to capacity greater than 0.70 in any assessed time period was selected for further detailed analysis.

Stage 2 Assessment

11.3.6 Eleven junctions have been chosen for further assessment using junction modelling software appropriate to the junction type. The junctions selected for more detailed analysis in Stage 2 are listed in Table 11-7.

11.3.7 Note that the new junctions for the Power Station Access Road, the Offsite Power Station Facilities, and Park & Ride, as well as Valley Crossroads, have also been modelled and no capacity or queuing issues are forecast.

Table 11-7 Junctions selected for detailed assessment

No.	Survey Ref.	Description	Type of junction
1	M-71	A5 Mona Road / B5420 Pentraeth Road / Dale Road	Roundabout
2	M-1	A55 Junction 2	Grade separated dumbbell junction
3	M-20	A55 Junction 6	Grade separated dumbbell junction
4	M-46	A55 Junction 8	Grade separated priority junction
5	M-47	A55 Junction 8a	Grade separated priority junction
6	M-48/49	A55 Junction 9	Grade separated dumbbell junction
7	M-73	A5 / A487 roundabout	Roundabout

No.	Survey Ref.	Description	Type of junction
8	M-12	Power Station Site access road / A5025 junction	Priority T-junction
9	M-39	A5025 / B5420 Ffordd Penmynydd / Pentraeth Road (Menai Bridge)	Roundabout
10	M-74	A487 / B4547 roundabout	Roundabout
11	M-75	A5114 / Bridge Street junction, Llangefni	Priority T-junction

11.3.8 The results of this process are presented in appendix H (Application Reference Number: 6.3.22) in full, and summarised in table 11-8 below:

Table 11-8 Junctions – results of detailed assessment

No.	Survey Ref.	Description	Summary Result of Assessment
1	M-71	A5 Mona Road / B5420 Pentraeth Road / Dale Road	Maximum RFC of 0.83 in 2033 but due to background traffic growth rather than WNP.
2	M-1	A55 Junction 2	Implementation of Parc Cybi distribution centre increases traffic flows above capacity of junction in 2033 only but this change is not related to WNP.
3	M-20	A55 Junction 6	No modelled capacity issues.
4	M-46	A55 Junction 8	Without the WNP, junction operates at or over capacity in 2016, 2020, 2023 and 2033 due to existing and background growth in traffic. Addition of WNP traffic slightly increases queuing and delays at the junction in 2033 only.
5	M-47	A55 Junction 8a	No modelled capacity issues
6	M-48/49	A55 Junction 9	Without the WNP, junction operates at or near capacity in 2023 and 2033 due to background growth in traffic. Addition of WNP traffic very slightly increases queuing and delays at the junction.
7	M-73	A5 / A487 roundabout	No modelled capacity issues
8	M-12	Power Station Site access road / A5025 junction	No modelled capacity issues

No.	Survey Ref.	Description	Summary Result of Assessment
9	M-39	A5025 / B5420 Ffordd Penmynydd / Pentraeth Road (Menai Bridge)	No modelled capacity issues
10	M-74	A487 / B4547 roundabout	No modelled capacity issues
11	M-75	A5114 / Bridge Street junction	Without the WNP, junction operates at or near capacity in 2023 and 2033 due to background growth in traffic. Addition of WNP traffic very slightly increases queuing and delays at the junction.

11.3.9 This analysis shows that although some junctions would have insufficient capacity to accommodate the total predicted traffic demand in 2020, 2023 and 2033, this is forecast to happen in any case, even without Wylfa Newydd Project traffic.

11.3.10 The implementation of the Wylfa Newydd Project will slightly increase queues and delays at some of these junctions, but the level of change is not considered sufficient to justify junction modifications.

11.3.11 In considering these junction assessment results, it should also be noted that the traffic forecasts used are conservative because 60% of construction materials are assumed to use MOLF when the target is 80%. This means that construction vehicle movements are likely to be over-estimated.

11.3.12 Overall, the detailed junction modelling process shows that no further junction modifications beyond those already incorporated are required to accommodate the additional traffic forecast to be generated by the Wylfa Newydd Project.

11.4 VISSIM Model Results

11.4.1 The traffic network near the Britannia Bridge has been modelling in detail in 2016 and 2023 using a VISSIM micro-simulation model. Full details of this model are provided in appendix I (Application Reference Number: 6.3.23) and the results for the Britannia Bridge are summarised in table 11-9.

Table 11-9 Change in journey times (in seconds) across the bridges in 2023

Location	AM Peak			PM Peak		
	06:00-07:00	07:00-08:00	08:00-09:00	15:00-16:00	16:00-17:00	17:00-18:00
Britannia Bridge Westbound						
Journey time (without Project)	109	115	192	120	128	327
Journey time (with Project)	108	114	191	120	131	351
Change	-1	0	-1	0	3	23
Britannia Bridge Eastbound						
Journey time (without Project)	123	137	327	124	125	126
Journey time (with Project)	124	139	339	124	125	127
Change	0	2	13	0	0	1
Menai Bridge Westbound						
Journey time (without Project)	82	80	86	87	92	100
Journey time (with Project)	83	81	88	87	94	98
Change	0	1	1	0	2	-2
Menai Bridge Eastbound						
Journey time (without Project)	113	120	276	116	129	135
Journey time (with Project)	113	121	290	116	131	135
Change	0	1	13	0	3	0

11.4.2 The above shows that the largest increase in journey times expected in the AM peak period is 13 seconds in the eastbound direction from 08:00-09:00 across both the Menai and Britannia Bridges.

11.4.3 The most significant increase in journey times expected in the PM peak period is 23 seconds in the westbound direction from 17:00-18:00 across the Britannia Bridge.

11.4.4 Note that the above reported maximum expected increases in journey times occur for only one hour per day, in one direction, in the peak construction year. The other time periods during the AM and PM peak periods assessed in the peak construction year are expected to have small increases in journey times of no more than three seconds.

11.4.5 Furthermore, the delays during the rest of the project programme (before and after 2023) are expected to be significantly less given the significantly lower construction worker and HGV numbers expected as shown in chapter 7.

11.4.6 As stated previously the traffic flow estimates for both construction workers and HGVs are conservative as they assume 9,000 workers at peak construction, whereas in reality the number of workers is likely to be significantly less for much of the construction programme, and that only 60% of materials will arrive via the MOLF, whereas in reality it is likely that up to 80% materials will arrive via the MOLF.

11.4.7 A sensitivity test was also undertaken to assess peak traffic conditions in the main holiday period i.e. August. Analysis of traffic flows shows that although total daily flows are higher in August than in March, AM and PM peak hour flows are lower. This reflects a lower number of commuter trips in the holiday period but a higher number of recreational trips which occur away from typical commuter peaks. This means that the VISSIM results for peak traffic conditions in March are applicable to peak traffic conditions in August. Further details are provided in appendix I (Application Reference Number: 6.3.23).

11.4.8 A further sensitivity test was undertaken to incorporate the additional traffic across the Britannia Bridge associated with the National Grid North Wales Connection Scheme. The results show that the additional traffic (20 vehicles per hour per direction) further increases queue lengths in peak period. However, the analysis is very conservative as the National Grid scheme is still evolving and arrangements for crossing the Menai Straight are not finalised. In addition, the VISSIM model makes no allowance for the potential diversion of a small number of vehicles from the Britannia Bridge to the Menai Bridge to avoid the potential increase in queues on the Britannia Bridge. The current route assumptions for the National Grid traffic could also be optimised. Further details are provided in appendix L (Application Reference Number: 6.3.26).

11.5 Merge / Diverge Results

11.5.1 The additional traffic flows have the potential to affect merge and diverge movements on the A55. This issue has been considered to determine which junctions would be expected to operate with a ratio of flow to capacity greater than 0.85. Further details of this analysis are provided in appendix J (Application Reference Number:6.3.24).

11.5.2 Only one junction met this selection criterion and is therefore potentially affected by the additional traffic associated with the Wylfa Newydd Project.

11.5.3 The affected junction is the A55 Junction 8a Southbound and the results from the assessment are presented in table 11-10.

Table 11-10 Merge results for A55 Junction 8a southbound

	2033 Reference Case			2033 With Wylfa Newydd Project		
	AM	PM	Weekend	AM	PM	Weekend
Ratio of flow to capacity	1.01	0.95	0.80	1.02	1.04	0.81

11.5.4 These results show that in the AM and PM peaks the junction is operating above or near capacity in the Reference Case i.e. without the Wylfa Newydd Project. The implementation of the project would increase traffic flows at the junction with a resulting worsening of the ratio of flow to capacity. The change is relatively small and does not suggest a need to redesign the layout of the merge arrangements.

11.5.5 The additional delay associated with the increase in traffic at this junction is examined in more detail as part of the VISSIM assessment of this part of the road network as described previously.

11.6 Accidents and Road Safety Audits

11.6.1 The potential change in risk of accidents occurring owing to increased traffic associated with the Project has been assessed in the Environmental Statement.

11.6.2 The findings of the assessment are that likely increases in accidents in 2023 (peak construction year) compared to the 2023 baseline conditions are less than +0.1 per section studied on average, and that this increase is not considered to be significant.

11.6.3 The Environmental Statement concludes that the predicted increase in traffic flows within the study area is unlikely to increase the accident risk on those sections where additional Wylfa Newydd Project traffic is present. appendix K (Application Reference Number: 6.3.25) provides copies of all the Road Safety Audits undertaken for the new proposed highway schemes and the Logistics Centre and Park and Ride facility.

11.7 Impact on Other Modes

Rail and Bus

Daily Trips

11.7.2 As described in chapter 7, the assessment of daily trips to the Wylfa Newydd Development Area assumes that no construction workers travel daily by rail or public bus. This assumption is supported by the proposed worker travel strategy as outlined in the ITTS (Application Reference Number: 6.3.20) which proposes comprehensive shuttle bus services and a car sharing strategy. In practice, there may be a small number of occasional trips using rail and public bus services, but the small numbers involved mean no impacts on the operation of the rail or public bus network are expected.

Weekend Trips

11.7.3 As described in chapter 7, approximately 330 additional rail trips are expected at the peak of construction (or 410 if all travel by air is assumed to start by rail) at the end of each 11-day shift cycle across the day and night shifts.

11.7.4 These trips will be further split (70/30) between day and night shifts. This means that at the start/ end of a day shift at the start/ end of an 11-day shift cycle, there will be approximately 287 additional rail trips. These trips will be spread over several hours due to the staggered shift start/end times, and the fact that some workers will need to return to temporary accommodation before travelling for the weekend.

11.7.5 These workers will be able to use the shuttle buses to access the railway stations at Holyhead and Bangor. In practice, some of those workers may use long-distance coach services reducing demand for rail services.

11.7.6 Analysis of existing spare capacity on Arriva trains Wales and Virgin Trains services shows that there are up to 249 available seats eastbound on a Thursday evening and up to 231 available seats westbound on a Sunday evening.

11.7.7 The need for additional transport services during the peak of construction will be monitored as part of the Wylfa Newydd Project. The relatively slow build-up of construction workers (i.e. it will take two years to reach 4,500 construction workers or 50% of the assessed construction peak) means that it will be possible to monitor actual travel patterns.

11.7.8 It is not expected that any weekend trips will be undertaken by public bus services to/from permanent home locations.

Sea

Daily Trips

11.7.9 As described in chapter 7, the assessment of daily trips to the Wylfa Newydd Development Area assumes that no construction workers travel daily by sea. This assumption is supported by the proposed worker travel strategy as outlined in the ITTS (Application Reference Number: 6.3.20).

Weekend Trips

11.7.10 As described in chapter 7, approximately 300 additional person trips by ferry are expected during the peak of construction and at the end of each 11-day shift cycle across the day and night shifts. This is formed of 190 workers travelling by car, at an average of 1.5 per vehicle, leading to 127 vehicles, and 110 as foot passengers.

11.7.11 These trips will be further spread between day and night shifts (70/30). This means that at the start/ end of a day shift at the start/ end of an 11-day shift cycle, there will be approximately 91 additional vehicles and 77 additional foot passenger trips. This figure will be spread further by the staggered shift start/end times, and the fact that some workers will need to return to temporary accommodation before travelling for the weekend.

11.7.12 The increase in vehicle and foot passengers represents 3% of the total daily vehicle capacity and 2% of the total available foot passenger capacity of the Holyhead-Dublin route which is unlikely to cause any noticeable impacts.

Walking & Cycling

Daily Trips

11.7.13 Similarly, there is expected to be a small number of additional daily walking and cycling trips and the proposed new pedestrian and cycling facilities described in chapter 5 will help accommodate these movements. Due to the small change in the number of pedestrian and cycling trips no impacts due to these trips are expected on surrounding pedestrian and cycling networks. The impact of changes in traffic flows on pedestrians and cyclists is presented in chapter 3 (public access and recreation effects of traffic) of the Environmental Statement (Application Reference Number: 6.3.3).

Weekend Trips

11.7.14 No weekend trips to permanent home locations are expected to take place are expected by walking or cycling modes.

11.8 Summary of Assessment Results

11.8.1 The transport impacts of the Wylfa Newydd Project have been assessed with the following main findings:

- Traffic flows will increase on the Britannia Bridge by up to 10% during the construction period.
- Increases of up to 96% are expected on the A5025 although from a low baseline level of traffic.
- The performance of 38 junctions has been assessed and 11 junctions were identified as potential locations where increased delays could be a potential problem.
- Detailed analysis of the performance of these 11 junctions shows that the increase in delay is predominantly associated with increases in background traffic.
- Detailed analysis of the road network near the Britannia Bridge shows that the increase in traffic flows will increase average delays by up to 23 seconds per vehicle in peak periods during the peak year of construction.
- Analysis of the grade-separated junctions along the A55 shows that no changes are required to junction layouts to accommodate the expected change in traffic flows.
- Analysis of accident data shows that the expected change in traffic flows will not significantly affect accident rates on construction routes.
- Demand for some rail, coach and bus services will increase, particularly at weekends when some workers will travel to their permanent home.

Sufficient capacity is available to accommodate this increase in the early years of construction and monitoring will be required to ensure there is sufficient capacity to accommodate the additional rail (or coach) passengers during periods of peak construction activity.

- No impacts are expected to walking or cycling facilities.

11.8.2 Mitigation measures and the process of reviewing, refining and updating the ITTS (Application Reference Number: 6.3.20) are described in the remaining chapters of this Transport Assessment.

12 Mitigation

12.1 Introduction

12.1.1 Mitigation measures are used to help alleviate the impact of a new development on the transport network. A transport assessment of the Wylfa Newydd Project has been undertaken and mitigation measures have been identified in the ITTS (Application Reference Number: 6.3.20) and they are summarised below.

12.1.2 These mitigation measures are already included as part of the Project. The results of this Transport Assessment show low levels of residual transport impacts which do not suggest a need for further transport-related mitigation measures beyond those already embedded in the Project.

12.1.3 The mitigation measures that are proposed can be found in chapter 6 and they are restated in table 12-1 and table 12-2.

Table 12-1 Embedded mitigation – physical

Mitigation	Description
Marine Off-Loading Facility	A facility comprising purpose-built quays and ramp to allow delivery of freight such as Abnormal Indivisible Loads and construction materials by sea.
Logistics Centre	An Off-Site facility at which deliveries can be consolidated into fewer loads and the timing of traffic movements to the Wylfa Newydd Development Area can be controlled during both the Enabling Works and Main Construction stages.
Site Campus	The Site Campus is a temporary facility that would house up to 4,000 construction workers in modular accommodation blocks, providing an independent living space for each worker, with shared campus-style amenities.
Park and Ride facility at Dalar Hir	Park and Ride facility at Dalar Hir to minimise travel in private vehicles, particularly on the A5025 by construction workers who would live in existing accommodation, including on the mainland.
A5025 Highway Improvements	Infrastructure improvements (including three bypasses) to the A5025 to improve safety and reduce traffic along particularly sensitive sections of the A5025.
Associated bus services for the Park and Ride facility at Dalar Hir	Shuttle bus service from the Park and Ride facility at Dalar Hir to the Power Station Site to minimise travel by private vehicles, particularly on the A5025.
Shuttle bus services for construction workers living on Anglesey and the mainland.	Shuttle bus services for workers living in existing accommodation to reduce the need for the use of private cars to access the Power Station Site during construction. Shuttle buses will serve rail stations at Holyhead and Bangor if required.

Mitigation	Description
Provision of a new bus stop on A5 at Dalar Hir	New bus stop to improve access to the Park and Ride facility from local towns and villages for construction workers and operational staff at the facility.
Improvements to Fisherman's Car Park access road to access Site Campus	Widening of the access road to the Fisherman's car park to provide access to the Site Campus and provide an improved road for existing users.
Wylfa Head Coastal Path	Circular loop of the Wales Coast Path around the National Trust Headland to be diverted during construction.

Table 12-2 Good practice mitigation – management

Mitigation	Description
Measures within the Code of Construction Practice	A Code of Construction Practice has been produced which contains proposed environmental management requirements and measures that will be adhered to throughout the construction of the Power Station to manage impacts.
Measures within the Code of Operational Practice	A Code of Operational Practice has been produced which contains proposed environmental management requirements and measures that will be adhered to throughout the operation of the Power Station to manage impacts.

12.2 Consideration of Further Mitigation

12.2.1 During the development of the ITTS (Application Reference Number: 6.3.20) and Transport Assessment, several other schemes and measures were suggested by stakeholders for inclusion in the strategy.

Third Crossing of Menai Strait

12.2.2 One suggestion from stakeholders was the potential need for a third crossing of the Menai Strait to help accommodate traffic flows to and from Anglesey. The analysis of the transport impact of the Wylfa Newydd Project on the existing Britannia Bridge and Menai Bridge has indicated no substantial impact on traffic flows and delays and consequently a third crossing is not considered necessary nor justified as part of the Wylfa Newydd Project.

Mainland Park and Ride

12.2.3 A further suggestion was the introduction of a Park and Ride facility on the mainland to help reduce traffic flows across the Britannia Bridge and along the A55. However, the traffic assessment of the operation of Britannia Bridge suggests that such a facility is not required to manage or mitigate traffic flows as part of the Wylfa Newydd Project.

Holyhead Port

12.2.4 The use of Holyhead Port to load and unload materials was considered as part of the development of the ITTS (Application Reference Number: 6.3.20) in discussion with the port and local authorities. At present the facilities at the port are not suitable for the needs of the Project and therefore the Transport Strategy does not include the use of Holyhead Port. If facilities at the port change in the future, and the need arises from the Project for the use of more port facilities, Horizon is willing to discuss the potential use of Holyhead port in the future.

Car Parking Management

12.2.5 If the specified car share ratios required are not achieved and/ or cars are regularly parked near the Wylfa Newydd Development Area, refinements to mitigation could be required such as increased parking patrols and removal of vehicles. Details of the proposals incorporated in the Project are provided in chapter 6.

12.3 Review Process

12.3.1 There will be regular meetings attended by Horizon and local stakeholders to review and discuss transport arrangements throughout the construction phase of the Project. These meetings and associated review processes will be specified as part of the Wylfa Newydd CoCP (Application Reference Number: 8.6).

13 Code of Construction Practice and Code of Operation Practice

13.1 Overview

13.1.1 This application for DCO is supported by a Code of Construction Practice (CoCP). The Wylfa Newydd CoCP (Application Reference Number: 8.6) identifies the standards and measures required to plan, manage and control construction activities during the development of the Wylfa Newydd Project.

13.1.2 Site specific sub-CoCPs will provide additional construction mitigation measures relating to specific locations, such as the Park and Ride facility at Dalar Hir.

13.1.3 Contractors will be required to provide their own Construction Environmental Management Plan to demonstrate how they would manage their works in accordance with Horizon's Wylfa Newydd CoCP (Application Reference Number: 8.6) and (where relevant to specific locations) the sub-CoCPs. The Contractor's Construction Traffic Management Plans (CTMPs) will form part of the Construction Environmental Management Plan. These would include both bespoke and industry standard measures.

13.1.4 A Wylfa Newydd Code of Operational Practice (CoOP) (Application Reference Number: 8.13) will also be produced, setting out the same principles but for the operational stage.

13.1.5 These documents will be kept under regular review by Horizon as part of their work to monitor, manage and refine travel arrangements for the Wylfa Newydd Project.

14 Conclusion

14.1 Conclusion of Transport Assessment

14.1.1 The development of the Wylfa Newydd Project is a significant undertaking which will take approximately nine years to complete and require up to 9,000 construction workers. The scheme would then operate with up to 850 operational workers.

14.1.2 This Transport Assessment has examined the transport impacts of the proposed scheme during construction and operation on surrounding road, public transport, walking and cycling networks. The assessment has included an analysis of the mitigation measures provided in the Integrated Traffic and Transport Strategy for the Project which includes a Marine Off-Loading Facility, Logistics Centre, highway improvements, on-site accommodation for up to 4,000 workers, shuttle buses, a park and ride facility and incentivised car sharing.

14.1.3 The Wylfa Newydd Project has been developed in accordance with national, regional and local planning and transport policies and the Transport Assessment has followed best practice guidance including WelTAG. During the development of the transport analysis regular meetings were held with local stakeholders, including the Welsh Government and the Isle of Anglesey County Council, to share results and help define the areas for assessment.

14.1.4 The proposed site for the Wylfa Newydd Power Station is accessed by the single carriageway A5025 which joins the A55 (which is part of the strategic road network) via the A5 at Valley. The A55 is a trunk road linking Holyhead with the North Wales coast via the Britannia Bridge. Delays can currently occur in the morning and evening peak periods at the Britannia Bridge. These delays increase in the summer holiday period. The rest of the highway network across Anglesey and North Wales is generally uncongested.

14.1.5 Bus services operate across Anglesey with low frequencies. Holyhead Port provides ferry services to Ireland. Stations at Holyhead and Bangor offer rail services to Chester and beyond.

14.1.6 The travel impacts of Wylfa Newydd Project have been considered taking account of the proposed working arrangements at the scheme. This includes a 70/ 30 split for workers between day and night shifts, and staggered start/ end times for each day or night shift. These arrangements help spread the travel demand of construction workers. Workers will work 11 days in 14 and some workers are expected to return to their permanent home each weekend when they are not working. The frequency of these return trips and the chosen mode of travel will depend on their home location i.e. workers from Wales could regularly drive home, those from continental Europe will travel less frequently by train or coach to an airport.

14.1.7 At the peak of construction, up to 4,000 workers will live at the Site Campus located in the Wylfa Newydd Development Area and they will be able to walk to and from work each day. The remaining 5,000 workers will need to travel in from Anglesey and beyond. Shuttle buses are expected to transport 1,600

of these workers with the rest using the Park and Ride facility or car sharing and travel to the Wylfa Newydd Development Area. Overall, during peak construction it is expected that workers will car share with an average of two workers per car. A small number of construction workers will walk or cycle to the Wylfa Newydd Development Area from nearby villages.

14.1.8 It is important to note that the peak of construction activity with 9,000 workers will last approximately one year and that for 50% of the nine-year construction programme there will be fewer than 3,000 construction workers i.e. one-third of the total number of workers assessed.

14.1.9 A further important aspect of the construction programme is that the number of construction workers will build up slowly during the initial years of construction (i.e. it will take two years to reach 4,500 construction workers or 50% of the assessed construction peak) and this means that there is scope to monitor travel behaviour and make adjustments, if required, to the transport strategy to help ensure targets and objectives are met.

14.1.10 An assessment of potential home locations and skills shows that workers will be split between 87% living on Anglesey and 13% living on the mainland. Those living on the mainland would be required to travel to Anglesey using the Britannia Bridge or Menai Bridge by car of bus.

14.1.11 The number of construction vehicles travelling to the Wylfa Newydd Development Area each day has been calculated assuming that the MOLF receives 60% of construction materials. At the peak, this is equivalent to approximately 40 heavy goods vehicles per hour travelling to the Wylfa Newydd Development Area. This is a conservative assessment and the target is for the MOLF to receive 80% of construction materials which would reduce the need for HGV movements further to approximately 20 per hour.

14.1.12 The traffic impact of the Wylfa Newydd Project has been assessed for three scenarios:

- 2020 Opening Year of the A5025 Off-line Highway Improvements
- 2023 Peak year for construction traffic assuming 60% of construction materials arrive via MOLF and 9,000 construction workers
- 2033 Peak year for operational traffic including construction of radiological waste buildings and two scheduled outages

14.1.13 The impact of the Wylfa Newydd Project on public transport services and walking and cycling networks has also been assessed in these three assessment years.

14.1.14 Traffic flows in each of the assessed years have been calculated using a Strategic Traffic Model which uses information on existing traffic flows, traffic growth, committed development and trip generation and distribution forecasts to calculate hourly and daily flows on main routes around Anglesey and on the mainland around Bangor.

14.1.15 Using this model, changes in traffic flows at 38 junctions on the main routes to and from the Wylfa Newydd Development Area were assessed. Potential congestion issues were identified at ten junctions which were then examined

using detailed models of the operation of each junction. These detailed assessments demonstrated that there would be no forecasted congestion problems at these junctions associated with the implementation of the Wylfa Newydd Project.

14.1.16 A detailed VISSIM model was prepared of the road network around the Britannia Bridge to provide a more in-depth analysis of potential traffic delays in this area. This model was prepared in consultation with stakeholders who consider the operation of the Britannia Bridge to be an important issue. This model shows that much of additional traffic flows on the Britannia Bridge related to the Wylfa Newydd Project is forecast to avoid the most congested times due to the scheduling of shift start and end times. Some additional traffic delays are forecast (i.e. an additional 23 seconds of delay per vehicle on average over the peak hour in the peak construction year). This increase is considered acceptable give national policy requirements for nuclear energy schemes and for the majority of the construction period, delays will be lower due to the lower level of generated traffic compared to the peak assessed.

14.1.17 The operation of junction merges and diverges on the A55 was assessed using DfT standards to determine whether changes to junction arrangements would be required. The analysis showed that no changes are required due to the additional traffic generated by the Wylfa Newydd Project.

14.1.18 Traffic flows are forecast to increase substantially on the A5025 (e.g. up to 100% increase in southbound traffic flows in the PM peak during periods of peak construction activity) and three bypasses are proposed to reduce the traffic impacts on local villages.

14.1.19 No significant traffic impacts are forecast during the operational phase of the Project.

14.1.20 Pedestrian and cycle networks near the Wylfa Newydd Development Area will see more activity and several measures are proposed to improve pedestrian and walking facilities e.g. new road crossings and segregated cycle lanes in some locations.

14.1.21 During the construction phase, the demand to use rail services is forecast to increase, especially at weekends when some construction workers will by travelling back to their permanent home. Analysis of rail capacity shows that some spare capacity is available and this will be kept under review as the number of workers on the Project increases.

14.1.22 All of the construction activities will be controlled through the Wylfa Newydd CoCP (Application Reference Number: 8.6). This will include guidelines on the management of travel to the Wylfa Newydd Project including management of traffic incidents and construction traffic management. The Wylfa Newydd CoCP (Application Reference Number: 8.6) is expected to include the provision of regular surveys to monitor travel patterns to allow for changes in travel management arrangements and incentives to meet the proposed targets (e.g. target of an average of two workers per car travelling to the Project).

14.1.23 Similarly, during the operation of the Power Station there will be a Wylfa Newydd CoOP (Application Reference Number: 8.13). This will include a

travel plan and operational service plan which will also require a regular review and refinement of travel arrangements to meet objectives and targets.

14.1.24 In summary, this Transport Assessment has examined the potential transport impacts of the Wylfa Newydd Project. The results show that the impacts are small and will have no significant impact on the local road and public transport networks during construction and operation.

15 References

Table 15-1 Schedule of references

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ID	Reference
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