HORIZON NUCLEAR POWER

WYLFA NEWYDD

ENERGY WORKING FOR BRITAIN

Wylfa Newydd Project

Request for Non-Material Change no.5
HGV Movements

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Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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1 Introduction

1.1 Purpose of this report

1.1.1 Horizon Nuclear Power Wylfa Limited ("Horizon") is proposing a non-material change to the delivery window for Heavy Goods Vehicles (HGVs) during the construction phase of the Wylfa Newydd Project ("the Project").

1.1.2 Horizon is seeking to extend the weekday delivery window into the evening (between 19:00 and 23:00) and to add a delivery window on Saturday mornings (between 08:00 and 13:00). This change does not propose to amend the profile of HGV deliveries as presented in the Development Consent Order application ("DCO application") but proposes to extend the period available each day to accommodate HGV deliveries thereby supporting a more flexible logistics management arrangement.

1.1.3 Further details of the proposed change are provided in section 2.2 of this document and have been assessed against relevant parts of the DCO application to determine whether it would result in any new or different likely significant environmental effects. The details of the proposed change have been carefully considered to ensure that the change can be undertaken with minimal environmental effects. Where there is considered potential for new or different effects to occur as a consequence of the proposed change, new and/or enhanced mitigation has been proposed to enable a conclusion of 'no new or different likely significant environmental effects' to be reached.

1.1.4 This report sets out the proposal for this non-material change to the Project's DCO application that was submitted by Horizon and accepted for Examination by the Secretary of State for Business, Energy and Industrial Strategy on 28 June 2018. The DCO application is currently in the Examination phase.

1.1.5 Recipients of this report are invited to provide representations on the proposed non-material change to Horizon by Thursday 6 December 2018. Feedback will be via Horizon's freepost address (FREEPOST WYLFA NEWYDD, no stamp required) or by emailing wylfaenquiries@horizonnuclearpower.com. If you have any questions about the consultation, please call 0800 954 9516.

1.1.6 Following completion of consultation, Horizon will have regard to the responses received and update this document as appropriate. The updated report will then be submitted to the Examining Authority as a request for the non-material change to be considered for acceptance into Examination by the Examining Authority (with the opportunity for Interested Parties to make further representations in Examination accordingly).

1.1.7 This document uses terms and definitions that are taken from and can be seen in the DCO General Glossary (APP-006).

1.2 Scope of this report

1.2.1 This report describes the proposed change, the justifications for it being sought and the environmental appraisal of this proposed change. It includes a table (Table 2-6) clearly setting out the implications of the proposed change for the assessments detailed in the DCO application, and a statement on any

new or different likely significant environmental effects (if any) of the proposed change.

1.2.2 This report also includes a 'schedule of engagement' (Table 2.7) identifying the parties expected to have an interest in this proposed change and how Horizon is engaging with them.

1.2.3 Finally, a 'schedule of consequential amendments' (Table 2-8) is provided, listing the original application documents (or parts thereof) which may be amended by Horizon should the Examining Authority accept the proposed change into Examination.

1.2.4 Horizon's objective in compiling this report is to ensure that stakeholders are provided with sufficient information to comment on the proposed change and, after consultation, for the Examining Authority to be able to make a decision on whether or not the proposed change may be accepted and therefore included in the Examination of the DCO application.

1.2.5 However, should the Examining Authority require any further relevant additional information in support of this report, Horizon will endeavour to provide it as soon as possible in response to any request for such information.

1.3 Non-materiality of the proposed change

1.3.1 In assessing the proposed change Horizon has had regard to the advice contained in the Planning Inspectorate's Advice Note 16: *How to request a change which may be material* (Version 2, March 2018) [RD1].

1.3.2 In determining the materiality of the change, Horizon reviewed the Environmental Statement including the following topics and their associated appendices to determine whether or not there were any new or different likely significant effects resulting from the proposed change in relation to:

- traffic and transport (chapter C2, APP-089);
- public access and recreation effects of traffic (chapter C3, APP-090);
- air quality effects of traffic (including those on ecological receptors which are beyond the discrete study areas assessed in volumes D to H of the Environmental Statement) (chapter C4, APP-091);
- noise and vibration effects of traffic (chapter C5, APP-092);
- combined topic effects (chapter C7, APPAPP-094);
- intra-project cumulative effects (chapter I4, APP-387); and
- inter-project cumulative effects (chapter I5, APP-388).

1.3.3 The details of the proposed change have been carefully considered to ensure that the change can be undertaken with minimal environmental effects. Where there is considered potential for new or different effects to occur as a consequence of the proposed change, new and/or enhanced mitigation has been proposed to enable a conclusion of 'no new or different likely significant environmental effects' to be reached.

1.3.4 Further consideration has also been given to the potential effect on the Health Impact Assessment Report (APP-429) as well as the Equality Impact

Assessment (APP-434) with respect to air quality, noise and transport effects. The conclusions remain unchanged and there are no new or different likely significant effects identified.

1.3.5 All other assessments submitted as part of the DCO application (e.g. Welsh Language Impact Assessment, APP-432; and Water Framework Directive Compliance Assessment, APP-444) would remain unaffected by the proposed change and have therefore not been considered further.

1.3.6 The Shadow Habitats Regulations Assessment Report (APP-050/051) has also been considered in light of the proposed change, and Horizon has concluded that the change would not result in a change to the conclusions on effects in that report.

1.3.7 On the basis of the information presented here and in subsequent sections, it is not anticipated that the proposed change alters the Project to such a degree that it is a materially different project.

Cumulative effects

1.3.8 Horizon intends to make a request for a total of five non-material changes to the Project DCO application. Horizon has already consulted and submitted the following two non-material change requests:

- Request for Non-Material Change no.1 – Blasting Strategy (AS-012); and
- Request for Non-Material Change no.2 – Marine Vessel Movements (AS-013).

1.3.9 In addition to the non-material change (no.5) described in this document, Horizon has gone out to consultation with respect to two further non-material change requests:

- Request for Non-Material Change no.3 – Worker Shift Patterns; and,
- Request for Non-Material Change no.4 – Working Hours

1.3.10 The implications of each proposed change to the cumulative assessment reported in the DCO application is considered and assessed within each individual document.

1.3.11 The cumulative assessment is summarised in section 2.6 below with further information provided in appendix 1-1. Based on the information presented, it is not anticipated that the proposed change outlined in this report will interact with any of the non-material changes being sought to produce any new or different likely significant environmental effects resulting from the interaction of these changes either in combination or cumulatively with any other projects.

1.3.12 Taking the above factors into account, and subject to the representations received in response to this consultation, Horizon therefore considers that the proposed change to the delivery window for HGVs should be regarded as a non-material.

1.4 Engagement and consultation on the proposed change

1.4.1 Following notification of its intention to submit a written request for non-material change on Wednesday 17 October (AS-011) Horizon is undertaking consultation on the proposed change to ensure that all persons that are potentially affected have sufficient opportunity to provide their views.

1.4.2 Consultation on the proposed change is running for a period of **28** days, commencing Thursday 8 November 2018 and ending on Thursday 6 December 2018. In order to facilitate this engagement in the consultation, Horizon has:

- notified prescribed persons under section 42(a)-(d) of the Planning Act 2008, and any other person identified by Horizon as potentially affected, of the consultation process and invited their views;
- publicly notified the consultation in the London Gazette and over two successive weeks in The Daily Post; and
- carried out targeted mail drops at residential addresses and erected site notices near the affected area.

1.4.3 Section 2.7 identifies the parties expected to have an interest in this proposed change and how Horizon proposes to engage with them.

1.4.4 As the proposed change does not require any 'additional land', Horizon does not consider that the consent of persons with an interest in the relevant land is required under the Infrastructure Planning (Compulsory Acquisition) Regulations 2010.

1.4.5 Copies of the consultation documents are available for public viewing at:

- The Anglesey Business Centre, Isle of Anglesey County Council, Bryn Cefni Business Park, Llangefni, Anglesey, LL77 7XA, Monday to Friday 9am to 5pm, and
- Wylfa Newydd Site Office, Cemaes Bay, Anglesey, LL67 0AA, Monday to Friday 9am to 5pm by appointment only, or
- on Horizon's consultation website, www.horizonnuclearpower.com/consultation.

1.5 Proposed procedure after consultation

1.5.1 Following consultation, Horizon will have regard to the responses received and will review and update this document as appropriate. It will then submit the revised version to the Examining Authority as a formal written request for a non-material change to the DCO application. Horizon expects that it will be able to submit this formal written request to the Examining Authority by Examination Deadline 3 (18 December 2018) or Examination Deadline 4 (17 January 2019). Responses received during consultation would be summarised in, and appended, to the written request for non-material change submitted to the Examining Authority to demonstrate how Horizon has had regard to these responses.

1.5.2 Horizon acknowledges that the acceptance and procedure for consideration and examination of the proposed changes is entirely at the discretion of the Examining Authority. However, if the Examining Authority is minded to accept the proposed changes into the Examination, Horizon considers that the remainder of the Examination would provide sufficient time for Interested Parties to consider and make representations on the published proposed changes to the Examining Authority and for any other procedural requirements to be met. Such representations could be required to be submitted by Deadline 5 (Tuesday 12 February 2019).

1.5.3 Horizon also considers that, with the proposed change, the DCO application, would still be of a sufficient standard for Examination and any other procedural requirements can still be met.

2 Non-Material Change: HGV Delivery Window Changes

2.1 Background to the proposed change

2.1.1 During construction of the proposed Wylfa Newydd Power Station, HGVs will be required for the transport of materials and equipment to site. The assessed HGV delivery windows and HGV numbers per month as submitted in the Wylfa Newydd DCO application are presented in table 1-1 of the DCO Transport Assessment (APP-101) and provided in Table 2-1 below. HGV deliveries are assessed to be undertaken Monday to Friday between 07:00 and 19:00.

Table 2-1 HGV delivery windows and HGV numbers assessed in the DCO Transport Assessment (APP-101) submitted as part of the DCO application

Parameter	Assumption value
Construction delivery – days of week	Model assumes Monday to Friday
Construction delivery – hours	Model assumes 07:00 to 19:00 Exception being initial stages of construction when no deliveries would occur at school start/end times.
Number of HGV deliveries during construction period	Peak: maximum of 3,500 HGVs per month at site (35-40 per hour based on 25% of daily flow in peak hour)

2.1.2 The information presented in Table 2-1 forms the basis of the traffic and transport assessment for the road traffic related effects (project-wide) (chapter C2, APP-089) which states that "*the majority of deliveries to the Power Station by HGVs are expected between 07:00 and 19:00 during weekdays only*" (paragraph 2.4.30).

2.1.3 Since the preparation and submission of the DCO application, Horizon has undertaken additional work to further analyse and understand the practical implications of the proposed delivery programme within the DCO application. This review was necessitated by a number of factors including:

- rationalisation of the preferred delivery model for the Project (shift from a joint venture to project management contract structure which resulted in Horizon becoming responsible for logistical arrangements); and,
- the appointment of, and engagement with, the project management contractor.

2.1.4 This review has highlighted the need for Horizon to seek additional flexibility within the delivery programme in order to ensure that HGV deliveries can be maintained (to the extent possible) in the event of unforeseen delivery delays or traffic incidents.

2.1.5 As a result of these discussions, Horizon has identified that a change to the HGV delivery windows (i.e. an extended window for evening deliveries and an

additional window for Saturday deliveries) during the construction phase of the Project.

2.2 Description of the proposed change

2.2.1 Horizon is proposing to extend the weekday (Monday to Friday inclusive) delivery window into the evening, to include deliveries between the hours of 19:00 and 23:00. Furthermore, an additional delivery window is proposed on Saturday mornings, between 08:00 and 13:00.

2.2.2 The proposed changes are summarised in Table 2-2 alongside the HGV delivery parameters submitted in the DCO application.

2.2.3 The proposed change to HGV delivery windows would result in a total of 85 hours per week being available for HGV deliveries instead of the currently proposed total of 60 hours per week as per the DCO application.

2.2.4 The total number of HGVs would not change as a result of the proposed changes to HGV delivery windows. Therefore, the daily and monthly peaks and quarterly and annual average HGV delivery numbers presented in the DCO application remain unaltered. As a result, there is also no change to the annual average daily traffic flow (AADT) or proportion of Light Duty Vehicles or Heavy Duty Vehicles, which are key parameters for the air quality modelling of traffic emissions and which have been assessed as part of the DCO application

2.2.5 As a result of increasing the HGV delivery window, Horizon will impose the following additional limits:

- during the weekday evening period 19:00 to 23:00 there will be a maximum of 20 HGV movements in each direction; and
- on Saturday between 08:00 and 13:00 there will be a maximum of 50 HGV movements in each direction.

Table 2-2 HGVs numbers and delivery windows as submitted in the DCO application and the proposed change

Parameter	DCO application	Proposed change
Weekday delivery periods (daytime)	5 days per week (07:00 – 19:00)	No change
Weekday delivery period (evening)	n/a	5 days per week (19:00 – 23:00) with a limit of 20 HGV movements in each direction
Saturday delivery period	n/a	Saturday deliveries (08:00 – 13:00) with a limit of 50 HGV movements in each direction

2.3 Justification for the proposed change

Improving the efficiency and resilience of the delivery programme

2.3.1 Following appointment of the project management contractor, it was identified that the delivery programme would benefit from further flexibility to accommodate delays or unforeseen disruptions (i.e. bad weather or traffic incidents).

2.3.2 For example, if the Marine Offloading Facility became temporarily unavailable due to adverse weather conditions, Horizon may need to redirect some of the Marine Offloading Facility deliveries via the road network. To enable this, longer delivery periods will be required; although Horizon would still need to operate within the HGV profiles provided in the DCO application. Similarly, if there was a traffic incident which affected movement along key routes, Horizon would be unable to release HGVs up to the Site until it had been cleared. The consequence of both these events would be that both the delivery and construction programme would be impacted.

2.3.3 The proposed extension to the delivery window provides two key benefits:

- it will ensure that an appropriate level of flexibility and resilience can be built into the delivery programme so Horizon can better accommodate unforeseen events or accidents, as deliveries can be rescheduled within these extended hours; and
- it enables Horizon to overcome logistical restrictions on-site (i.e. security, processing and unloading) and provides opportunities for Horizon to better manage and secure the current delivery programme and volumes at key points of construction.

Urgent need for new nuclear

2.3.4 By improving the resilience and frequency of HGV deliveries and opportunities to accelerate the construction programme, the proposed changes will enable Horizon to assist the UK Government in meeting its energy security and carbon reduction objectives through the delivery of this nationally significant infrastructure project. The urgent need for new nuclear has been firmly established in National Policy Statements EN-1 [RD2] and EN-6 [RD3] and the recent Ministerial Statement on Energy Infrastructure (December 2017) [RD4] which confirms the Government's continued support for new nuclear power generation post-2025.

Reduces the frequency and length of effects on the local community

2.3.5 The extension of the delivery window for HGV deliveries will enable Horizon to spread HGV movements into weekday evenings and Saturday mornings, thereby reducing the hourly frequency of HGVs travelling through local communities as well as congestion on the road network. Although the proposed change does not seek to increase the maximum HGV movements,

it provides opportunities for Horizon to accelerate the current delivery programme and potentially deliver the Project ahead of schedule, thereby potentially reducing the length of time that the local community is exposed to construction-related effects.

2.4 Summary of environmental appraisal

2.4.1 The proposed change has been reviewed and assessed in order to identify any potential likely significant effects that would be new or materially different to those assessed in the DCO application. This information is summarised in Table 2-6; where relevant, and further discussion is provided below.

Environmental Statement

2.4.2 This review identified that the proposed change could potentially have implications for the following assessments outlined in the Environmental Statement:

- traffic and transport (chapter C2, APP-089);
- public access and recreation effects of traffic (chapter C3, APP-090);
- air quality effects of traffic (including those on ecological receptors which are beyond the discrete study areas assessed in volumes D to H of the Environmental Statement) (chapter C4, APP-091);
- noise and vibration effects of traffic (chapter C5, APP-092);
- combined topic effects (chapter C7, APP-094);
- intra-project cumulative effects (chapter I4, APP-387); and
- inter-project cumulative effects (chapter I5, APP-388).

2.4.3 The proposed change to the HGVs delivery windows only relates to expanding the timeframe of deliveries and therefore has implications specifically to assessments outlined in volume C (project-wide effects) of the Environmental Statement. The change does not affect the HGV delivery profile presented in the DCO application and therefore does not change the maximum daily or monthly peak HGV number, or the quarterly or annual average HGV numbers and therefore there are no effects predicted on any receptors assessed in volumes D to H of the Environmental Statement and the conclusions remain as reported in the DCO application for those volumes.

2.4.4 The proposed change does not affect the socio-economics or tourism assessment completed in volume C (APP-088) of the Environmental Statement and has also been scoped out of further consideration.

Other Assessments

2.4.5 Further consideration has also been given to the potential effect on the Health Impact Assessment Report (APP-429) and the Equality Impact Assessment (APP-434) via air quality, noise and transport effects. The conclusions remain unchanged and there are no new or different likely significant effects identified.

2.4.6 Consideration has also been given to the potential effect of the proposed change to the appropriate assessment for habitats and species detailed in the

Shadow Habitats Regulations Assessment Report (APP-050 and APP-051) via effects to air quality and noise. As the peak noise and air quality effects are not predicted to change significantly as a result of the proposed change compared to those presented in the DCO application, the assessments reported in the Shadow Habitats Regulations Assessment Report (APP-050 and APP-051) would remain unchanged.

2.4.7 All other assessments submitted as part of the DCO application (e.g. Welsh Language Impact Assessment, APP-432; and Water Framework Directive Compliance Assessment, APP-444) would also remain unaffected by the proposed change and have therefore not been considered further.

2.5 Topic assessments

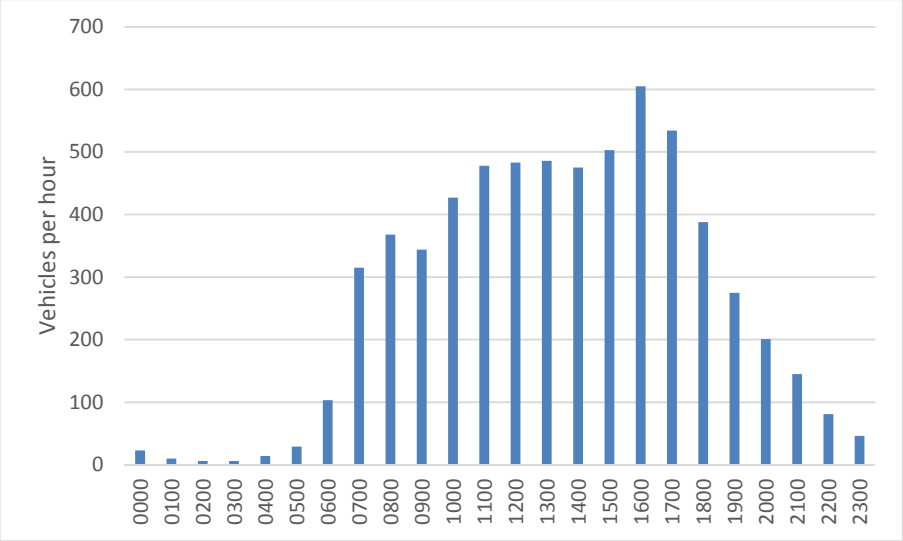
2.5.1 The effects of the proposed change to the assessments listed in paragraphs 2.4.2 and 2.4.5 above are summarised in Table 2-6, with further discussion provided below where relevant.

Traffic and transport

Weekday evening (19:00 – 23:00)

2.5.2 Additional traffic will be generated in the weekday evening period (19:00-23:00) as a result of the proposed change to HGV delivery windows. Figure 2-1 shows the current traffic volumes on the A5025 in Llanfachraeth (without the Wylfa Newydd Development), represented by an Automatic Traffic Counter count on the A5025, and shows the low levels of traffic between 19:00-23:00. These hours are therefore considered off-peak and no modelling was included in the DCO Transport Assessment (APP-101) which assesses this time period. The DCO Transport Assessment (APP-101) provides a wide range of traffic data and the survey data presented in Figure 2-1 has been used as it is based on a survey which covers all hours of the day and is on the construction route to the Wylfa Newydd Development Area. This site has a reference number 95 and details of this and other traffic surveys are provided in Appendix D of the DCO Transport Assessment (APP-105).

Figure 2-1 Weekday average two-way hourly traffic flow – A5025, Llanfachraeth (Junction reference 95)



2.5.3 Therefore, given the relatively low numbers of vehicles expected on the road network during this off-peak time, the change associated with the introduction of an HGV delivery window in the evening is small (20 HGV movements in each direction per evening which is equivalent on average to an additional five HGV movements in each direction per hour). For example, Figure 2-1 shows that the two-way traffic flow from 20:00 to 21:00 is approximately 200 vehicles per hour and hence an increase by an average of five HGV movements in each direction (and hence an average two-way increase of 10 HGVs per hour) is a 5% increase in traffic flows. This means that the proposed change would not affect the outcome of the assessment currently presented in chapter C2 (APP-089) and the DCO Transport Assessment (APP-101) of the Environmental Statement.

2.5.4 Allowing for the movement of HGVs during the evening period (19:00-23:00) will mean that fewer HGV movements are required during the day (07:00-19:00) as the total number of daily HGV movements is not changing. This means that traffic impacts during the day will be lower than that stated in the submitted DCO Transport Assessment (APP-101).

Saturday (08:00 – 13:00)

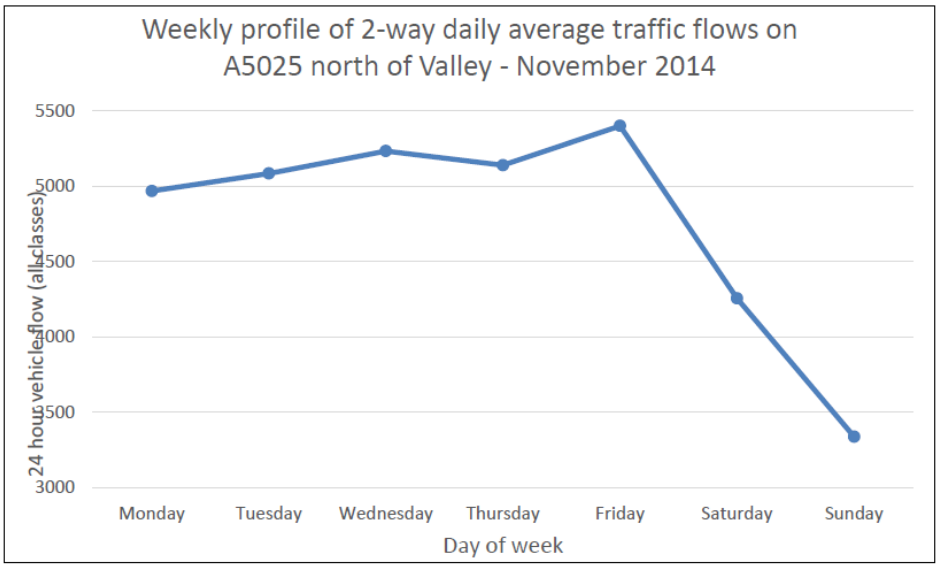
2.5.5 As a result of the proposed change to the HGV delivery windows, additional traffic will be generated in the weekend period on Saturdays in the hours between 08:00 and 13:00.

2.5.6 The variation of traffic flows across a week on the A5025 north of Valley was presented in figure 5-2 of Appendix L of the DCO Transport Assessment (APP-113). This figure is repeated as Figure 2-2 below.

2.5.7 Figure 2-2 shows that flows on a Saturday are approximately 4,250 vehicles per day compared to between 5,000 and 5,500 vehicles per day on a weekday

i.e. flows on a Saturday are approximately 20% lower than traffic flows on a typical weekday.

Figure 2-2 Traffic flow profile over a week on the A5025 – November 2014



2.5.8 This difference meant that Saturdays were considered off-peak and no modelling was included in the DCO Transport Assessment (APP-101) to assess Saturdays, except for the Junctions 9 ARCADY modelling undertaken for Junction 2 of the A55. This modelling was undertaken for the period 12:00 and 13:00 as the area around Junction 2 is predominantly retail and leisure, thus Saturday lunchtimes are considered to be a peak time for this particular junction. Full details of the modelling undertaken at Junction 2 for the DCO application are contained in Appendix H of the DCO Transport Assessment (APP-109).

2.5.9 The ARCADY models for Junction 2 of the A55 were updated to include on average an additional 10 HGV movements per hour travelling from the A55 westbound to the Logistics Centre and to the A55 eastbound from the Logistics Centre as a result of the proposed change described in section 2.2 above. The value of 10 HGVs per hour on average is based on the daily worst case movement on a Saturday of 50 HGV movements in each direction being divided evenly across each of the five hours of operation. Full details of this updated ARCADY models and assessment are provided in [RD5].

2.5.10 No capacity issues were identified as a result of the additional HGV movements on Saturdays at Junction 2.

2.5.11 The lower traffic flows on a Saturday compared to a weekday mean that the change associated with an HGV delivery window on a Saturday is small and would not affect the outcome of the assessment currently presented in chapter C2 (APP-089) and the DCO Transport Assessment (APP-101) of the Environmental Statement.

Conclusion

2.5.12 The change in traffic flows associated with the proposed HGV delivery windows on weekday evenings plus Saturday mornings is small and would not affect the outcome of the assessment currently presented in chapter C2 (APP-089) and the DCO Transport Assessment (APP-101). Therefore, there would be no new or different likely significant environmental effects than those reported in the DCO application.

Public access and recreation

2.5.13 The proposed change to HGV delivery windows would result in an increased duration of HGV movements within two of the public access and recreation study areas:

- Junction 2 of the A55 to the Logistics Centre; and
- Junction 3 of the A55 to the Off-Site Power Station Facilities and the Wylfa Newydd Development Area using the A5 and A5025.

2.5.14 The embedded and good practice mitigation measures presented in chapter C3 (APP-090) of the Environmental Statement remain unchanged and have been taken into account for the assessment of effects as a result of the proposed change. Apart from the proposed change to HGV delivery windows described in section 2.2, all other assumptions set out in section 3.4 of chapter C3 (APP-090) of the Environmental Statement would remain the same.

2.5.15 Two scenarios were initially considered in the assessment of effects as a result of the proposed change:

- traffic flows in the opening year of the A5025 Off-line Highway Improvements; and
- traffic flows in the year of peak construction.

2.5.16 However, the potential changes to effects as a result of the proposed change would be the same in both scenarios and therefore these have not been split in the sections below. This is because there would be no change in the total number of HGV movements in either scenario, with only the delivery window changing. Therefore, the peak flows considered in each scenario in chapter C3 (APP-090) of the Environmental Statement would remain the same.

Public Access

2.5.17 There would be no effect on users of Public Rights of Way (PRoW) within the Junction 2 of the A55 to the Logistics Centre study area as a result of the proposed change as a result of no PRoWs that link to the road in this section.

2.5.18 There would also be no change in effect from that assessed in the Chapter C3 of the Environmental Statement on users of PRoWs within Junction 3 of the A55 to the Off-Site Power Station Facilities and the Wylfa Newydd Development Area using the A5 and A5025 study area. Taking into account HGV deliveries extending into weekday evenings and on Saturday mornings there would only be a negligible effect predicted on users of the PRoW and therefore no new or different likely significant effects have been identified.

Onshore Recreation

2.5.19 In chapter C3 (APP-090) of the Environmental Statement a residual minor adverse effect on the Lôn Trefignath cycle route was identified between 07:00 and 19:00 as a result of the HGV movements in and out of the Logistics Centre. The duration of this effect would increase into weekday evenings and on Saturday mornings, as a result of the proposed change which has the potential to affect a small number of recreational users. However, despite the duration of effect, extending it is not considered sufficient to dissuade use of the cycle route and with the current embedded mitigation, including a zebra crossing, no new or different likely significant effects are predicted, and the assessment made in chapter C3 (APP-090) remains the same.

2.5.20 The assessment of effects on walkers and cyclists on the A5 and A5025 between Junction 3 of the A55 and Wylfa Newydd Development Area set out in chapter C3 (APP-090) of the Environmental Statement identified that there would be a moderate adverse effect on these recreational users during weekdays, a minor adverse effect on weekends at shift change times and a negligible effect during the evenings and during the weekend outside of shift changes. The proposed change would result in a potential increase in HGV traffic both in weekday evenings and on Saturday mornings although the maximum daily peak or monthly and annual average HGV numbers will remain unchanged, potentially resulting in a spreading out of HGVs in a greater window and reducing the effects during 07:00 to 19:00 weekdays. However, the period of time where there could be a reduction in recreational amenity would be extended into the weekday evening and Saturdays. Typically, recreational journeys are more likely to be undertaken in the evening and at weekends, and therefore extending traffic from HGV movements into these time periods could change assessments. However, Horizon would limit the number of HGV movements in each direction between 19:00 and 23:00 on weekdays to 20, and a maximum of 50 between 08:00 and 13:00 on Saturdays. As a result, the assessment would change from negligible to minor adverse effects on weekday evenings and Saturdays (outside of shift pattern changes) but still remain not significant. An assessment of moderate adverse effect remains during weekdays 07:00 to 19:00 due to the number of HGV movements predicted during this timeframe. A minor adverse effect on recreational users of the other sections of the A5025 is also predicted and therefore no new or different likely significant effects are predicted for onshore recreation.

2.5.21 The effect on walkers and cyclists crossing the A5025 assessed in chapter C3 (APP-090) of the Environmental Statement and would not change as a result of the extension of HGV delivery windows as the number of HGVs is not changing.

Active Travel

2.5.22 In chapter C3 (APP-090) of the Environmental Statement a residual minor adverse effect on users of the Lôn Trefignath cycle route undertaking active travel journeys was identified between 07:00 and 19:00 as a result of the HGV movements in and out of the Logistics Centre. The duration of this effect

would extend into weekday evenings and on Saturday mornings, as a result of the proposed change.

2.5.23 The assessment of effects on walkers and cyclists on the A5 and A5025 between Junction 3 of the A55 and Wylfa Newydd Development Area set out in chapter C3 (APP-090) of the Environmental Statement identified that there would be a moderate or minor adverse effect on active travel during weekdays, but that in the evenings and on weekends there would be a negligible effect on active travel outside the shift change times when buses would be using the route. As a result of the proposed change of additional HGVs movements on late weekday evenings and Saturday mornings there would be an additional adverse effect on people undertaking active travel journeys during these time periods. However, the majority of active travel journeys that take place along the A5025 are unlikely to be in order to access recreational facilities (such as leisure centres and playgrounds) due to the distance that needs to be travelled or the location of facilities within communities, where journeys would not include a section of the A5025. The community of Caergeiliog would continue to use the A5 as part of active travel journeys to Holyhead and these are more likely to take place in the evenings and at weekends, they are also more likely to access Valley for local services than the communities along the A5025. Extending traffic movements associated with operation of the Logistics Centre, or the routing of HGVs directly to the WNDA into weekday evenings and Saturday mornings would result in a minor adverse effect on active travel walkers and cyclists on the A5 and sections of the A5025 which have been assigned a medium value during these time periods also, and a negligible effect on active travel walkers and cyclists on the other sections of the A5025 including NCN Route 5. Therefore, no new or different likely significant effects are predicted for active travel.

Conclusion

2.5.24 The proposed changes to HGVs delivery windows would extend the periods during which there would be adverse effects on onshore recreation and active travel. When weekday evenings and/or Saturday deliveries occur, there would be an expected decrease of HGV numbers during weekdays 07:00 to 19:00 as a result of the HGV profiles not changing. Combined with existing embedded mitigation measures already secured in the DCO application, and the limits imposed for weekday evenings and Saturday as part of the proposed change, there would be no new or different likely significant environmental effects predicted and presented in chapter C3 (APP-090) of the Environmental Statement.

Air quality

2.5.25 The proposed change to HGV delivery windows is not anticipated to change the main input parameters to the air quality modelling of road traffic emissions used in the DCO application, for example the AADT or proportion of Light Duty Vehicles or Heavy Duty Vehicles. However, it would lead to modifications to the time of day or night, or day of the week upon which vehicles would arrive and depart from the Wylfa Newydd Development Area during construction.

2.5.26 The air quality modelling undertaken for chapter C4 (APP-091) of the Environmental Statement was based on a modelling method which distributed the AADT for each road link equally across each hour of the day and for each day of the week (i.e. the AADT was divided by 24 and the average hourly flow used to represent the traffic flows). Consequently, this approach did not take account of any diurnal variation in flows by hour of the day or day of the week.

2.5.27 In order to assess the effects of the proposed change (i.e. the re-distribution of daily vehicle movements due to the proposed changes to HGV delivery windows), diurnal variations in traffic flows need to be considered. Recognising that this approach would deviate from that which was used within the DCO application, a sensitivity analysis has been carried out to understand the following:

- how the model which considers the diurnal variation in vehicle flows, compares to the original modelling method used in the DCO application; and
- how the proposed change and resulting variations to the diurnal profile of vehicle flows would affect the assessment conclusions presented in chapter C4 (APP-091) of the Environmental Statement.

Comparison of modelling approaches

2.5.28 A description of the method used to model the vehicle flows using a diurnal approach for the sensitivity analysis is set out in Appendix 1.2. This appendix also contains details of the revised verification process and comparison of the modelled results for the two modelling approaches. In summary, the model verification process was repeated using a diurnal profile for one of the verification zones used in the original assessment (RAF Valley verification area). This zone was used as it contained the human receptor for which the greatest changes in nitrogen dioxide (NO_2) concentrations were predicted as a result of the Wylfa Newydd Project (receptor R20, receptor model ID Hum_1964). This verification zone also contained five receptor locations used as the verification points (referred to as receptors B, C, D, E and F in Appendix 1-2).

2.5.29 The model verification process showed that using a diurnal profile for modelling road traffic emissions, leads to higher differences between the raw modelled (i.e. before any adjustment) and monitored oxides of nitrogen (NOx) concentrations at the roadside monitoring locations compared to the non-diurnal verification modelling reported in appendix C4-1 (APP-114) of the Environmental Statement. This essentially means that although a more realistic representation of the traffic flows, the model does not perform as well when using a diurnal profile compared to when traffic flows were averaged across a 24-hour period. Consequently, this leads to the application of a higher model adjustment factor to the predicted raw NOx concentrations at receptor locations within 200m of the modelled road links before conversion of the NOx to NO_2.

2.5.30 As shown in Appendix 1-2, the final adjusted total modelled NO_2 concentrations at the verification points vary in comparison to those presented

in appendix C4-1 (APP-114) of the Environmental Statement. As noted in Appendix 1-2, using the diurnal profile leads to some instances where the modelled total NO_2 concentrations are lower and one instance where the total concentrations are higher.

2.5.31 At receptor R20, the modelling using a diurnal profile was undertaken for the future baseline and future with Wylfa Newydd Project scenarios for the 2020 (representative of early years construction) and 2023 (representative of peak construction) assessment years to allow direct comparison to the results presented in chapter C4 (APP-091) of the Environmental Statement. This showed that at receptor R20, the predicted NO_2 concentrations using a diurnal profile were slightly higher for both the future baseline and future with Wylfa Newydd Project scenarios for both assessment years, compared to those presented in chapter C4 (APP-091) of the Environmental Statement.

2.5.32 Initial observations could conclude that for higher concentrations, the diurnal profile method leads to higher total concentrations; however, for some of the verification points, the total concentrations for no diurnal profile are very similar to those for receptor Hum_1964 for the future 2020 and 2023 baseline and yet the diurnal profile method concentration is lower for these receptors and higher for receptor Hum_1964. From the comparison of the modelled concentrations in Appendix 1-2, it is concluded that for receptors which are very close to the edge of the modelled road source (i.e. less than 1m from the kerb), the diurnal profile method leads to higher total NOx and NO_2 concentrations (the verification point at A5025 Valley (diffusion tube D) and receptor Hum_1964 are both approximately 0.5m from the edge of the road), and for the other receptors further from the road source the method without diurnal profile leads to higher concentrations (all other verification points, diffusion tubes B, C, E and F range from 1.2m to 1.7m from the kerbside).

2.5.33 On this basis, it is unlikely that use of a diurnal method would change the outcome and conclusions of the air quality assessment presented in chapter C4 (APP-091) of the Environmental Statement.

Assessment of effects of proposed change on air quality

2.5.34 Although the change at the worst-case long-term receptor for annual mean concentrations (i.e. Hum_1964, the human receptor closest to the road source, at 0.5m from the edge of the road, which experiences the highest predicted change in concentrations) is slightly higher for the diurnal method, this would potentially only change the effect descriptor for the 2023 scenario from small adverse to medium adverse for this one receptor. As the vast majority of receptors are more than 1m from the edge of the roads, the total concentrations and change in concentrations due to the proposed change to HGV delivery windows are unlikely to be any higher than those presented in chapter C4 (APP-091) of the Environmental Statement.

2.5.35 The balance of effects at human receptors would remain predominantly negligible with some beneficial effects due to the A5025 Offline Highway Improvements.

2.5.36 As the distances from the modelled road sources to ecological receptors are generally further than the very close locations (less than 1m) discussed above,

using a diurnal profile would not alter the assessment of effects at ecological receptors presented in chapter C4 (APP-091) of the Environmental Statement. The total concentrations and deposition rates and change in concentrations or deposition rates due to the proposed change to HGV delivery windows are unlikely to be any higher than presented in chapter C4 (APP-091) of the Environmental Statement.

2.5.37 Given that there is unlikely to be any significant difference between using a diurnal method and the average hourly flow method used for the DCO application, the proposed change in HGV delivery windows would not alter the conclusions of the air quality assessment presented in chapter C4 (APP-091) of the Environmental Statement, with the balance of effects at human receptors remaining predominantly negligible and no change to the assessment of effect at ecological receptors also assessed in chapter C4 (APP-091) of the Environmental Statement. Therefore, there would be no new or different likely significant environmental effects than those reported in the Environmental Statement.

Noise and vibration

2.5.38 The traffic modelling described in chapter C2 (APP-089) of the Environmental Statement is based upon annual average weekly total construction HGV traffic operating on the local and wider road network between 07:00 and 19:00 on weekdays. Some of the outputs from this traffic modelling are used as inputs to the noise and vibration assessment as reported in chapter C5 (APP-092) of the Environmental Statement.

2.5.39 To investigate the potential effects from a change in HGV delivery windows, further noise modelling was conducted (using traffic flow data presented in appendix 1-3), and additional noise and vibration assessments undertaken.

2.5.40 For weekdays, the noise modelling was based on the same annual average number of HGVs during weekdays as used in the DCO assessments, but with the additional constraint that 20 HGV movements in each direction would occur in the evening period between 19:00 and 23:00. For Saturday mornings, noise modelling was based on a maximum of 50 HGV movements in each direction between the hours of 08:00 and 13:00; this results in a conservative assessment as a result of using a maximum rather than an annual average value.

2.5.41 The proposed changes relate to the construction phase only. As the proposed A5025 Off-line Highways Improvements will not be completed when HGV deliveries first start, two scenarios have been reassessed; these are the existing A5025 route in 2020 (the early years without bypass and with On-Line Highway Improvements which include sections of pavement reconstruction and widening, and sections of new surface dressing) and the A5025 in 2023 with the completed Off-line Highways Improvements. The 2023 scenario also represents the peak construction traffic year.

2.5.42 For each situation the following four periods are considered; this allows the effects of the delivery periods to be assessed both individually and cumulatively. The DCO application scenario is included and form the benchmark against which changes to effects are established:

- DCO application - Weekday (07:00 to 19:00), assessed using the daytime road traffic noise assessment criteria set out in the Environmental Statement chapter C5 (APP-092). These criteria include the change in the daytime noise level in the short-term using the $L_{A10,18h}$ noise metric, and whether the free-field noise level exceeds a value of 50 dB $L_{Aeq,16h}$ which is the threshold below which the World Health Organization Guidelines for Community Noise [RD6] consider that the majority of the adult population will be protected from becoming moderately annoyed.
- Period 1 – Weekday + Weekday Evening (19:00 to 23:00), using DCO average annual HGV numbers with the additional constraint of 20 HGV movements in each direction in the weekday evening period. The effects of this period are determined by considering the change in noise levels over the 19:00 to 23:00 period using the $L_{A10,4h}$ noise metric and whether a value of 50 dB $L_{Aeq,16h}$ is exceeded over the period 07:00-23:00
- Period 2 – Weekday + Saturday (08:00 to 13:00), using a maximum of 50 HGV movements in each direction to ensure that the worst-case effects during the Saturday (08:00 to 13:00) period are identified. The effects of this period are determined by considering the change in noise levels over the 08:00 to 13:00 period using the $L_{A10,5h}$ noise metric and whether a value of 50 dB $L_{Aeq,16h}$ is exceeded over the period 07:00-23:00.
- Period 3 – Weekday + Weekday Evening (19:00 to 23:00) + Saturday (08:00 to 13:00), which represents the worst case cumulative situation arising from Period 1 (evenings) and Period 2 (Saturday mornings) in combination at each receptor.

The paragraphs below provide a summary of the effects from the proposed changes.

Residential receptors

2.5.43 Table 2-3 and Table 2-4 provide a comparative summary of the overall balance of significant adverse effects at residential receptors as detailed in chapter C5 (APP-092) of the Environmental Statement, and for each Period for the proposed change to HGV delivery windows. The results are presented for the day effects at each receptor since this is where the variation in effects arises due to the additional HGV scenarios in relation to the DCO application. Tables 2-3 and 2-4 present the balance of worst case effects (by offsetting adverse effects with beneficial effects) and shows the total number of significant adverse effects at residential receptors with the given scenario and in the absence of any mitigation (see paragraphs 2.5.59 to 2.5.65).

Table 2-3 Summary of significant effects pre-mitigation at residential receptors for the 2020 without bypass assessment year.

	Adverse	Beneficial	Balance	Change in balance	Percentage change
DCO ES	273	0	273	-	-
Period 1 (DCO + Weekday evening)	285	0	285	+12	+4%
Period 2 (DCO + Saturday)	277	0	277	+4	+1%
Period 3 (DCO + Weekday evening + Saturday)	289	0	289	+16	+6%

2.5.44 In 2020 prior to the bypass completion there would be significant adverse effects at 12 additional residential receptors during the day with the HGV movements extending into the weekday evening (Period 1) compared to the DCO application. The overall balance would increase by four significant adverse effects when considering the DCO application plus HGV movements on Saturday mornings only (Period 2). This indicates that conducting 20 HGV movements in each direction on the weekday evening would have greater effects compared with 50 HGV movements in each direction during Saturday mornings. This is due to one of the assessment criteria which is a test against the 50 dB $L_{Aeq,16h}$ threshold which is calculated over the whole daytime period (07:00 to 23:00) and which is exceeded at a greater number of properties on weekdays than on Saturdays as average traffic flows (including all vehicles, not just HGVs) are higher on weekdays than Saturdays.

2.5.45 Examining the combined effects, if deliveries occur on weekday evenings and on Saturday mornings (Period 3), there would be, pre-mitigation, significant adverse effects at 289 properties compared to 273 properties in the DCO application, an increase of 16 properties.

Table 2-4 Summary of significant effects pre-mitigation at residential receptors for the 2023 with bypass assessment year.

	Adverse	Beneficial	Balance	Change in balance	Percentage change
DCO ES	152	26	126	-	-
Period 1 (DCO + Weekday evening)	166	26	140	+14	+11%

	Adverse	Beneficial	Balance	Change in balance	Percentage change
Period 2 (DCO + Saturday)	154	26	128	+2	+2%
Period 3 (DCO + Weekday evening + Saturday)	167	26	141	+15	+12%

2.5.46 In the peak construction year there would be significant adverse effects at 14 additional residential receptors during the day with the HGV movements extending into the weekday evening (Period 1) compared to the DCO application. The overall balance would increase by two significant adverse effects when considering the DCO application plus HGV movements on Saturday mornings only (Period 2). This demonstrates that the introduction of 20 HGV movements in each direction on the weekday evenings would have greater effects compared with the introduction of 50 HGV movements in each direction during Saturday mornings. This is due to one of the assessment criteria which is stated as an absolute noise level over the whole daytime period (07:00 to 23:00) being met at a greater number of properties during weekdays than on Saturdays.

2.5.47 Examining the combined effects, if HGVs are operated on weekday evenings and on Saturday mornings (Period 3), there would be, pre-mitigation, a significant adverse balance of effects at 141 properties compared to 126 properties in the DCO application, an increase of 15 properties.

2.5.48 When considering the cumulative effects for both 2020 and 2023 it has been derived that for the DCO application there would be 307 significant adverse effects. Broken down by delivery period with the proposed change this would be:

- 321 for Period 1;
- 312 for Period 2; and,
- 325 for Period 3.

2.5.49 This demonstrates that there would be an increase in significant adverse effects of 18 properties when compared to the DCO application.

2.5.50 The additional mitigation applied in the DCO application for the cumulative effects for both 2020 and 2023 resulted in 103 properties being eligible for noise insulation. Using the same DCO criteria for the proposed change results in the following eligibility:

- 104 for Period 1;
- 108 for Period 2; and,
- 109 for Period 3.

2.5.51 This demonstrates that there would only be a maximum increase in properties qualifying for noise insulation of six properties when compared to the DCO application.

Non-residential receptors

2.5.52 Chapter C5 (APP-092) of the Environmental Statement identified two potential significant adverse effects. These were investigated further and were deemed to be not significant (see APP-092). A similar two stage process has been undertaken here, with potential significant adverse effects identified and reported in Table 2-5, and then examined further in paragraphs 2.5.56.

2.5.53 In chapter C5 (APP-092) of the Environmental Statement the assessment criteria were exceeded at a number of PRoWs, but these were not assessed to be significant due to the relatively short duration that users of the PRoWs would be subject to road traffic noise effects while traversing the walking routes towards and away from the roads. In addition, a single significant beneficial effect was identified at the Llanfachraeth Play Area.

2.5.54 Table 2-5 presents a summary of the numbers of non-residential receptors expected to experience potential significant effects for each assessment period in the absence of any mitigation. This table includes all PRoWs presented in the DCO application where the threshold for the onset of a significant effect was expected to be exceeded (but later excluded due to the short duration of exposure for users).

Table 2-5 Potentially significant adverse effects for each period for the proposed change to HGV delivery windows for non-residential receptors

Period	Number of potentially significant adverse effects, with potentially significant beneficial effects shown in parentheses				
	Educational	Places of Worship	Commercial	Industrial	Other
DCO ES	0 (0)	0 (0)	0 (0)	0 (0)	2 (2)
Period 1 (DCO + Weekday evening)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0)
Period 2 (DCO + Saturday)	1* (0)	0 (0)	0 (0)	0 (0)	16 (2)
Period 3 (DCO + Weekday evening + Saturday)	1* (0)	0 (0)	0 (0)	0 (0)	16 (2)

* Noise levels at Rhyd Y Llan school in Llanfaethlu exceed the potential onset of significant effects on Saturday mornings, but the school is typically not open at this time.

2.5.55 Table 2-5 shows for the weekday evenings (Period 1), there would potentially be significant adverse effects at two 'other' receptors. Both of these are PRoWs and, as set out in the DCO application, the noise effects at these are not assessed to be significant. It is noted that in the 2023 assessment there would be significant beneficial effects at two 'other' receptors (Llanfachraeth Play Area and a PRoW adjacent to Section 7 (Cefn Coch)) but these benefits would not occur until after the A5025 Off-Line Highway Improvements have

been completed; as they are not present in both the 2020 and 2023 assessments they have been omitted from the table.

2.5.56 With Saturday morning deliveries (Period 2) there would potentially be a significant adverse effect at one school, significant adverse effects at 'other' receptors, and significant beneficial effects at two 'other' receptors. Considering the potential adverse effects in detail:

Schools are typically not open on Saturday mornings, and any potential effects would only be until the A5025 Off-Line Highway Improvements are completed; therefore, no adverse effect is concluded for this receptor.

Fifteen (15) of the 'other' receptors are PRoWs, and as set out in the DCO application the noise effects at these are not assessed to be significant; this is due to the relatively short duration that users would be subject to road traffic noise effects while traversing the PRoWs. It is also noted that these would only be affected after the A5025 Off-Line Highway Improvements are completed.

- The remaining 'other' receptor is Dronwy Caravan Park, which operates from 1 March to 31 January each year. The Saturday day-time free-field noise level at this receptor is expected to increase by 3dB from 38dB $L_{Aeq,16h}$ to 41dB $L_{Aeq,16h}$. The DCO application does not set out minimum thresholds for significance at caravan parks, but in relation to new buildings, BS 8233: 2014 [RD7] suggests that for steady external noise sources, during the day, an internal noise level of 35 dB $L_{Aeq,16h}$ is appropriate for resting conditions within living rooms and bedrooms. While it is not possible to be precise regarding the sound insulation offered by different caravan constructions, research by Napier University [RD8] suggests that a partially open window will provide 12-18 dB(A) reduction in road traffic noise from the outside to inside. It is reasonable to assume that the sound insulation performance of a caravan would not be worse than that of a partially open window, and therefore internal daytime noise levels within caravans will remain below 35 dB $L_{Aeq,16h}$. In relation to the outdoors space within the caravan park, the noise levels will remain within the range at which the World Health Organization Guidelines for Community noise [RD6] consider the majority of the adult population will be protected from becoming moderately annoyed. In summary, no adverse effects are expected within or outside caravans as a result of the proposed change in HGV delivery times, and therefore it is concluded that no significant adverse effects will occur at this receptor.

2.5.57 In Period 3, which is the worst-case combination of weekday evening and Saturday morning deliveries, the number of potential significant adverse effects at non-residential receptors would increase from two to 17 when compared with the DCO application, while the number of significant beneficial effects would decrease to zero as no benefits would exist in both the 2020 and 2023 assessments. The potentially significant effects are as detailed above

for Period 1 and 2 and, after detailed consideration of the situation at each receptor, there will be no new or different likely significant effects expected to occur as a result of the combined changes to HGV delivery times on non-residential receptors.

Groundborne and airborne vibration

2.5.58 The proposed change does not introduce new types of vehicles or effect the delivery profile stated in the DCO application and therefore instantaneous peak particle velocity vibration and airborne vibration would not be expected to change with an extension of the HGV delivery window. As such the assessments made in chapter C5 (APP-092) of the DCO application on vibration remain the same.

Mitigation arising from the proposed change

Additional mitigation secured in the DCO application

2.5.59 The use of low noise road surface secured in the Design and Access Statement – volume 3 (part 2 of 2; APP-410) of the DCO application would reduce some of the effects arising from the proposed change.

2.5.60 In consideration of the benefits of this it should also be noted that the guidance within the Design Manual for Roads and Bridges [RD9] states that below the speed of 75km/h a low noise surface only delivers a reduction of 1dB(A)1 (compared with a reduction of 3.5dB(A) for speed above 75km/h). Recent work which has been presented at a 2018 Institute of Acoustics (IOA) conference suggests that the noise reduction from a low noise surface does not suddenly reduce from 3.5dB(A) to 1dB(A), and it is in fact a gradual drop-off. The paper presented provides a method to quantify this reduction for speeds less than 75km/h. With several locations along the A5025 having speeds between 60km/h and 65km/h, the paper suggests the potential benefit in terms of noise reduction at such locations could be greater than the 1dB(A) which has been assumed within the Environmental Statement calculations. It is therefore possible that this assessment underestimates the beneficial effects of Low Noise Surfaces, and this should be borne in mind when considering the value of this mitigation.

2.5.61 The implementation of a Local Noise Mitigation Scheme (LNMS) for the Wylfa Newydd Project, which is secured in the Wylfa Newydd Code of Construction Practice (APP-414), will also provide reduced effects arising from the proposed change. Eligibility for noise insulation under the Local Noise Mitigation Scheme as set out in section 8.3 of the Wylfa Newydd Code of Construction Practice (APP-414) is based on multiple criteria, including whether the predicted noise level at properties exceeds 68 dB $L_{A10,18\ hours}$.

[1] "A-weighting" refers to the noise level that represents the human ear's response to sound. The dB(A) unit is internationally accepted and has been found to correspond well with people's subjective reaction to noise.

2.5.62 When considering the cumulative effects of both 2020 and 2023, there would be six properties additional qualifying for noise insulation when compared to the DCO application as presented in paragraph 2.5.51.

Enhanced mitigation for the proposed change

2.5.63 With the potential for a small increase in significant adverse effects during the construction period, a number of options for enhanced mitigation have been considered:

- a reduction in speed limit on part or all of the A5025;
- lowering the daytime threshold of eligibility for the LNMS contained within the Wylfa Newydd Code of Construction Practice (APP-414) from 68 dB $L_{A10,18h}$ to 63 dB $L_{A10,18h}$; and,
- direct deliveries to site rather than the current position which requires all deliveries to be routed through the Logistics Centre.

2.5.64 A reduction in speed will cause a reduction in noise, and so there is the possibility to use this measure as noise mitigation. Potential benefits could be up to a 1dB reduction in noise for every 10km/h reduction in speed. However, it is considered that such a mitigation measure is likely to be unpopular and could potentially cause delays to those using the A5025, which would include the project construction traffic. This measure for enhanced noise mitigation is therefore not proposed for further consideration.

2.5.65 Given the increase in significant adverse noise effects at up to 18 properties as a result of this proposed change, and as a result of the number of significant effects identified in the DCO application, feedback through Relevant Representations and ongoing Statement of Common Ground discussions, Horizon will extend the commitments made in the LNMS set out in section 8.1 of the Wylfa Newydd Code of Construction Practice (APP-414) irrespective of this proposed change. This would involve reducing the noise threshold at which properties would be eligible for noise insulation (secondary glazing and acoustic ventilation) from road traffic noise by 5 dB from 68 dB $L_{A10,18h}$ to 63 dB $L_{A10,18h}$. Doing this will result in an additional 50 properties being potentially eligible for noise insulation in the cumulative situation when the Period 3 extended operating hours for HGVs in the cumulative 2020 and 2023 situation is considered (159 properties potentially eligible compared to 109 in the DCO application).

Conclusion

2.5.66 The findings of the revised noise assessment show that the proposed change would slightly increase the overall number of significant adverse effects pre-mitigation compared to those reported in chapter C5 (APP-092) of the Environmental Statement for residential and non-residual receptors. As a result of this and the number of significant effect in the DCO application, enhanced mitigation is being proposed to mitigate all effects further which will be secured through an update to the Wylfa Newydd Code of Construction Practice (APP-414). These measures will reduce the significant adverse effects from weekday evening and Saturday morning deliveries below the significant effects reported in the DCO application. It is therefore concluded

that the proposed change would not introduce any new or different likely significant environmental effects other than those reported in the Environmental Statement and a greater number of residential receptors will benefit from being eligible for noise insulation.

Health impacts

2.5.67 This section discusses the implications for the Health Impact Assessment Report (APP-429) arising from the proposed change to HGVs delivery windows.

Scope of health analysis

2.5.68 The proposed revisions to HGV delivery windows discussed here relate only to issues associated with vehicles transporting materials on the local road network. The relevant geographical population is predominantly the population near the local road network.

2.5.69 It is assumed that the HGV delivery windows describe all movements of HGVs, including those travelling to or from the Wylfa Newydd Development Area (laden or unladen).

2.5.70 The proposed changes to HGV delivery windows are relevant to the following topics discussed in the Health Impact Assessment Report (APP-429):

- air quality (section C.2 Air quality, emissions from vehicles transporting materials and people on the local road network during construction);
- noise (section C.3 Noise, noise from vehicles transporting materials and people on the local road network during construction); and
- traffic (section C.5 Transport, road safety during construction and health trip journey times (e.g. to a hospital) during construction).

2.5.71 Physical activity effects discussed in section D.5 of the Health Impact Assessment Report (APP-429) relate to changes to the network of footpaths and cycleways near the Wylfa Newydd Development Area. As discussed in paragraphs 2.5.19 to 2.5.23 above (Public access and recreation), the proposed changes to HGV delivery windows would have a limited effect on locations where this network crosses the A5025, with no new or different likely significant environmental effects predicted. Health effects relating to changes in HGV movements where pedestrian and cycle routes use or cross the A5025 are discussed in under 'traffic: road safety' (road safety being one factor relevant to decisions around active travel and physical activity).

2.5.72 The proposed change to HGV delivery windows would not affect how the Logistics Centre at Parc Cybi would be used or its operating practices. On this basis it is not expected that the proposed change would affect the rapid Health Impact Assessment conclusions set out in volume H of the Health Impact Assessment Report (APP-429). Similarly, it is not expected that the Logistics Centre's contribution as an embedded mitigation of the Project would be reduced.

2.5.73 With regard to physical activity, paragraph 2.5.19 above notes that no new or different likely significant effects are predicted in relation to recreational users on footpaths or cycleways around the Logistics Centre.

Summary of the proposed change

2.5.74 The changes to the HGV delivery windows broadly result in two types of potential effect:

- Firstly, as the HGV profile is not changing, the extended HGV delivery times could result in a spreading out of HGVs across a longer time period. This would generally reduce the magnitude of effects at particular locations as the frequency of exposure would decrease.
- Secondly, there would be more vehicle movements at sensitive times. Generally, compared to the DCO application HGV delivery windows, a greater number of activities may be taking place that can be considered to be sensitive to traffic movement, e.g. a higher frequency of walking or cycling for leisure on Saturday mornings and greater potential to disturb sleep or rest during evenings and Saturday mornings.

Air quality related health effects

2.5.75 Sensitivity testing of air quality models presented in the DCO application is discussed above in paragraphs 2.5.27 to 2.5.37. The results indicate that the effect of the proposed HGV delivery window changes on average concentrations of air pollutants associated with the Project's vehicle movements along the road network would not alter the conclusions presented in chapter C4 (APP-091) of the Environmental Statement. This includes the Environmental Statement concluding that effect of changes to long and short-term concentrations of PM_{10} and $PM_{2.5}$ at human receptors would be negligible and concentrations would be well within the relevant UK Air Quality Objectives.

2.5.76 On the basis of the air quality sensitivity testing it is considered that the conclusions reached in the Health Impact Assessment Report (APP-429) in relation to potential air quality effects on population health from the Project's HGVs on the local road network during construction would also remain unchanged. As described in paragraphs C.2.22 and C.2.23 of the Health Impact Assessment Report (APP-429) this would be a negligible effect on the health of the general population and up to a minor adverse effect on the health of particularly sensitive groups. These conclusions continue to take account of the potential for non-threshold effects of some pollutants. It is therefore concluded that there would be no new or different likely significant air quality related health effects from the proposed change.

Noise related health effects

2.5.77 Relevant health outcomes for road traffic noise relate to cardiovascular health, mental health (e.g. relating to annoyance) and for the evening period, sleep disturbance (with the potential to affect day-time functioning, physical health and mental health). Cognitive performance in children is unlikely to be reduced

by this change (the changes being outside of school hours), though the consequent reduction in HGV movements at other times, including school hours, could be a slight benefit.

2.5.78 Two noise scenario years have been modelled and assessed in relation to an extension of the HGV delivery windows; the 2020 and 2023 scenarios. Both scenarios are discussed as the population exposed to road transport noise differs to some extent between the two. This is relevant to ensuring mitigation would be appropriately targeted. As presented in paragraphs 2.5.38 to 2.5.66, an extension to the HGV delivery window does slightly increase the number of significant effects pre-mitigation however the introduction of additional and enhanced mitigation reduces the effects when compared to the DCO application.

2.5.79 The weekday evening delivery window, with HGV movements occurring up to 23:00, is most relevant to sleep disturbance as an outcome (though cardiovascular and annoyance effects are also relevant). It would be expected that most people, across all ages, would be turning in for the night between this 19:00 to 23:00 period. Although the 19:00 to 23:00 period is relevant to sleep, importantly the changes to HGV movements do not extend into the night-time period of 23:00 to 07:00 that is often used by health-related noise criteria such as the World Health Organisation's Night Noise Guidelines for Europe [RD10]. For this reason, the modelling described above is based on daytime criteria of 50dB $L_{Aeq\ T}$.

2.5.80 In both noise assessment scenario years, the change associated with the introduction of an HGV delivery window in weekday evenings (with a limit of 20 HGV movements in each direction per evening) is equivalent to on average an additional five HGV movements in each direction per hour. Whilst a small increase to overall road traffic, the noise from vehicles of this size is likely to be more noticeable than noise from most lighter vehicles. Intermittent disturbance at this time, particularly if it is from a source about which strong views are held, could potentially inhibit sleep or cause annoyance. The effects are likely to be limited to those people living close to the local road network along the HGV route.

2.5.81 HGV deliveries during Saturdays (08:00 to 13:00) may affect periods of rest and amenity, including in dwellings, gardens and along PRoW. A reduction in amenity may affect day-time relaxation and may discourage physical activity, e.g. in gardens. The introduction of an HGV delivery window on Saturdays between 08:00 and 13:00 (with a maximum limit of 50 HGV movements in each direction) is equivalent to on average an additional 10 HGV movements in each direction per hour. As noted in paragraph D.3.15 of the Health Impact Assessment Report (APP-429), generally there is a higher tolerance of day-time, compared to night-time, noise. The population most likely to be affected regularly are those people living close to the local road network along the HGV route.

2.5.82 To mitigate changes in the magnitude and extent of significant adverse effects (for weekday evenings, Saturday mornings and their combined effects) the noise section (paragraphs 2.5.38 to 2.5.66) describes the expansion of the LNMS as set out in the Wylfa Newydd Code of Construction Practice (APP-

414). As shown by the increase in the number of dwellings eligible for noise insulation (increasing in the 2020 and 2023 assessment years), such enhanced mitigation would be commensurate with the level of change in extent and magnitude of effects. Although day-time metrics have been used in the modelling, the mitigation offered would include measures appropriate to reducing the potential for sleep disturbance (e.g. acoustic ventilation and either double or secondary glazing depending on the property for bedrooms of eligible properties).

2.5.83 In population health terms the change in size of the affected population (for weekday evenings, Saturday mornings and their combined effects) is very similar to that which informed the Health Impact Assessment Report (APP-429) submitted as part of the DCO application.

2.5.84 On this basis, it is considered that potential noise disturbance effects on population health from the Project's HGVs on the local road network during construction as a result of the proposed change would be within the bounds of the existing assessment conclusions of the Health Impact Assessment Report (APP-429). As described in paragraphs C.3.20 and C.3.12 of the Health Impact Assessment Report (APP-429) this would be a negligible residual effect on the health of the general population and up to a minor adverse residual effect on the health of particularly sensitive groups. It is therefore concluded that there would be no new or different likely significant noise related health effects from the proposed change.

Transport related health effects

2.5.85 The transport assessment undertaken as a result of the proposed change is discussed above (paragraphs 2.5.2 to 2.5.12). The results describe how the weekday evenings (19:00 to 23:00) and Saturday day-time (08:00 to 13:00) would be off-peak times for the highway network. During these off-peak times, the change to traffic volumes is assessed to be small and would not alter the conclusions presented in chapter C2 (APP-089) of the Environmental Statement. That conclusion incudes that there is sufficient capacity at Junction 2 of the A55 (near the Logistics Centre) which has a high retail and leisure related use at the weekends.

2.5.86 The Health Impact Assessment Report (APP-429) considers transport effects in relation to both potential delays to health trip journey times and road safety.

Health trip journey times

2.5.87 Peak times for the highway network are also the period where health trip journey times may be most affected. The proposed changes do not increase vehicle movements during these peak times. During the off-peak times of weekday evenings (19:00 to 23:00) and Saturday day-time (08:00 to 13:00) the potential for significant delays for heath trip journey times is considered unlikely. The conclusions reached in the Health Impact Assessment Report (APP-429) on this issue would therefore remain unchanged and therefore no new or different likely significant effects have been identified. As described in paragraphs C.5.35 and C.5.36 of the Health Impact Assessment Report (APP-429) this would be a negligible effect on the health of the general population and up to a minor adverse effect on the health of particularly sensitive groups.

2.5.88 Although not included within the transport assessment (in order to reflect a worst-case scenario), the general reduction in the frequency of HGV movements at peak times (as a consequence of spreading some vehicle movements into the off-peak evening and Saturday period) could represent a slight improvement compared to the DCO application. Although beneficial, any change would likely be within the bounds of the existing conclusions in paragraphs C.5.35 and C.5.36 of the Health Impact Assessment Report (APP-429) as described above.

Road Safety

2.5.89 Whilst the proposed change in Project HGVs during the evening period (19:00 to 23:00) would represent a relatively small increase to overall road traffic, the change may still affect road safety. Factors that contribute to accident risk are likely to vary during the evening period, some increasing risks, others reducing risks. This includes a likely reduction in visibility during the evenings (particularly in winter months), which may increase risks. However, most evening periods are also a time when there tend to be lower numbers of other vehicles using the road network, potentially reducing accident risk.

2.5.90 In contrast, the Friday evening (19:00 to 23:00) and Saturday day-time (08:00 to 13:00) are times when a greater number of people who are walking or cycling for leisure may be expected (particularly in summer months). Compared to the HGV delivery window times in the DCO application there may therefore be more vulnerable road users (particularly Non-Motorised Users (NMUs)) on, or crossing, the route used by the Project's HGVs.

2.5.91 Chapter C2 (APP-089) of the Environmental Statement includes assessment of accidents and safety; this chapter describes the A5025 as in proximity to residential communities and as showing a dispersed but frequent accident history. That assessment of accident risk presented in chapter C2 (APP-089) of the Environmental Statement was based on accident history data and modelling (see Transport Assessment Appendix E; APP-106). Estimates of the increases in accidents along each route were based upon the percentage change in total AADT flows with and without the Wylfa Newydd Project in place. The assessment also included consideration of the change in percentage of HGVs on the routes. Accident cluster sites were identified, and common causes considered.

2.5.92 Compared to the DCO application, the proposed changes do not affect the AADT flows or the overall percentage of HGVs on the routes. This reflects that whilst the timings of HGVs would change (increasing in the weekday evenings 19:00 to 23:00 and Saturday 08:00 to 13:00), the overall numbers of HGVs (or other traffic) would not change. The results of the accident analysis presented in chapter C2 (APP-089) of the Environmental Statement are therefore not expected to change. This is due to that analysis already spanning all times of day and night and all days of the week, including periods when NMUs may be more likely to be present, such as Friday evenings 19:00 to 23:00 and Saturdays between 08:00 and 13:00. The most relevant sections of the accident analysis presented in chapter C2 (APP-089) of the Environmental Statement are reproduced below:

- paragraph 2.5.37: The predicted increase in traffic flows along the A5025 between Valley and Tregele in the Wylfa Newydd 'without bypasses' scenario could result in NMUs experiencing an increase in accident risk, especially in villages. Therefore, this represents a small magnitude of change and an adverse effect of minor significance.
- paragraph 2.5.38: During the Wylfa Newydd Project 'with bypasses' scenario, NMUs in Valley (section 9), Llanfachraeth (section 12), Llanfaethlu (section 15) and Cefn Coch (section 18) would experience a decrease in accident risk as the majority of traffic would transfer from the existing A5025 onto the A5025 Offline Highway Improvements (sections 10, 13, 16 and 19). Therefore, this represents a small magnitude of change and a beneficial effect of minor significance.
- paragraph 2.5.39: NMUs travelling along other sections in the study area where additional Wylfa Newydd Project traffic is present are unlikely to experience an increase in accident risk during either Wylfa Newydd Project scenario. Therefore, this represents a negligible magnitude of change, which is not considered to be a significant effect.

2.5.93 These conclusions of the accident analysis presented in chapter C2 (APP-089) of the Environmental Statement were taken into account by the Health Impact Assessment Report (APP-429) in relation to road safety associated with the Project's HGVs on the local road network during construction. As described in paragraphs C.5.13 and C.5.14 of the Health Impact Assessment Report (APP-429) this would be a negligible effect on the health of the general population and up to a minor adverse effect on the health of particularly sensitive groups. The Health Impact Assessment Report (APP-429) noted the expected benefits to road safety from the A5025 Highway Improvements.

2.5.94 Whilst the Friday evening periods (19:00 to 23:00), and Saturday period (08:00 to 13:00) are acknowledged as potentially being times when a greater number of people who are walking or cycling for leisure would be expected, these are also times when there are typically lower numbers of other vehicles on the roads (off-peak times).

2.5.95 The quantitative accident analysis undertaken for the DCO application is unlikely to have the resolution to detect changes in risk due to the proposed HGV delivery window changes, as the accident analysis considers annual vehicle movements. However, based on a qualitative professional judgement, compared to the DCO application, the proposed changes may be associated with a slight increase in accident risk prior to the completion of the A5025 Highway Improvements. Therefore, the following enhanced mitigation is proposed which will be secured through the Section 106:

- Horizon will fund a road safety campaign with the Isle of Anglesey County Council, as Highways Authority, and the North Wales Police. The campaign would commence from Project implementation through to the completion of the A5025 Highway Improvements (on-line and off-line). The target audience would be all road users on the A5025 between Valley and the Site Entrance. This would include the Project's

HGV drivers, the public (including those walking or cycling) and construction workers. The road safety campaign would use a mix of methods (e.g. information, Logistics Centre briefings, school presentations and speed checks). The detail planning of the multi-agency road safety campaign would be an activity of the Health and Well-being monitoring sub-group. The timing of checks would include weekday evenings 19:00 to 23:00 and Saturday 08:00 to 13:00. Key locations would include:

- the areas of the future bypasses in Valley, Llanfachraeth, Llanfaethlu and Cefn Coch; and
- junctions or crossings of the A5025 used by footpaths, NCN Route 5; the Copper Trail, or between Llanfaethlu and the Black Lion Inn.

2.5.96 With the inclusion of this enhanced mitigation, it is considered that the HGV delivery window changes (weekday evenings 19:00 to 23:00 and Saturday 08:00 to 13:00) before the completion of the A5025 Highway Improvements, would be within the bounds of the existing assessment conclusions of the Health Impact Assessment Report (APP-429) and therefore no new or different likely significant effects have been identified.

2.5.97 Once the A5025 Highway Improvements (on-line and off-line) are fully completed the slight increase in the road accident risk compared to the DCO application would reduce to negligible. This reflects the road safety benefits of:

- the bypasses in Valley, Llanfachraeth, Llanfaethlu and Cefn Coch;
- the construction of a segregated cycle path for NCN Route 5 at Llanynghenedl and a new segregated cycle path between Nanner Road and the Wylfa Newydd Development Area, which incorporates a crossing for the Copper Trail heading east to Llanfechell at Bwlch; and
- the new shared use footway/cycle way between Llanfaethlu and the Black Lion Inn.

2.5.98 Noting the proposed additional mitigation measures, as well as those existing measures described in the Health Impact Assessment Report (APP-429) and committed to in the DCO application in relation to monitoring accident hotspots and road safety promotion work, the conclusions reached in the Health Impact Assessment Report (APP-429) in relation to road safety associated with the Project's HGVs on the local road network during construction would remain unchanged and therefore no new or different likely significant effects have been identified. As described in paragraphs C.5.13 and C.5.14 of the Health Impact Assessment Report (APP-429) this would be a negligible effect on the health of the general population and up to a minor adverse effect on the health of particularly sensitive groups.

2.5.99 As with journey times, although not included within the transport assessment (in order to reflect a worst-case scenario), the general reduction in the frequency of HGV movements at peak times (as a consequence of spreading some vehicle movements into the off-peak evening and Saturday period) could represent a slight improvement compared to the DCO submission.

Although beneficial, any change would likely be within the bounds of the existing conclusions in paragraphs C.5.13 and C.5.14 of the Health Impact Assessment Report (APP-429) as described above.

Equality impacts

2.5.100 The potential effects of the Wylfa Newydd DCO Project on people with 'protected characteristics' (as set out in the Equality Act 2010) as well as socioeconomically deprived communities have been assessed in the Equality Impact Assessment (APP-434).

2.5.101 The traffic assessment presented above in paragraphs 2.5.2 to 2.5.12 concluded that the change in traffic flows associated with the proposed HGV delivery windows on weekday evenings plus Saturday mornings is small and would not affect the outcome of the assessment currently presented in chapter C2 (APP-089) and the DCO Transport Assessment (APP-101). The public access and recreation assessment presented above in paragraphs 2.5.13 to 2.5.24 concluded that the proposed changes to HGV delivery windows would extend the periods during which there would be adverse effects on onshore recreation and active travel. However, with existing embedded and additional mitigation measures already secured in the DCO application there would be no new or different likely significant environmental effects to the assessment presented in chapter C3 (APP-090) of the Environmental Statement and the conclusions of the assessment remain as reported. On this basis it is considered that the overall equality effects reported in the Equality Impact Assessment (APP-434) with regards to road traffic and public access and recreation would remain unchanged and therefore no new or different likely significant effects have been identified.

2.5.102 Sensitivity testing of air quality models presented in the DCO application is discussed above in paragraphs 2.5.25 to 2.5.37. The results indicate that the effect of the proposed HGV delivery window changes on average concentrations of air pollutants associated with the Project's vehicle movements along the road network would not alter the conclusions presented in chapter C4 (APP-091) of the Environmental Statement. On this basis it is considered that the conclusions reached in the Equality Impact Assessment (APP-434) in relation to potential air quality effects on equality from the Project's HGVs on the local road network during construction would remain unchanged. Therefore, no significant health and no disproportionate or differential equality effects are expected as a result of the proposed change.

2.5.103 The results of noise modelling and assessment discussed above in paragraphs 2.5.38 and 2.5.66 show a small increase in the number of residential and non- residential properties effected by the proposed change pre-mitigation. With additional and enhanced mitigation proposed these effects are reduced further than those presented in the DCO application. Therefore, the conclusions of the Equality Impact Assessment (APP-434) with regards to noise effects from road traffic on these receptors remain unchanged and therefore no new or different likely significant effects have been identified.

Table 2-6 Likely new or different environmental effects

Document name	Examination Reference Number	Chapter name / section name	New or different likely significant effects	Material change / non-material change / no change
Environmental Statement chapter C2 and the DCO Transport Assessment	APP-089 and APP-101	Traffic and Transport and DCO Transport Assessment	As outlined in paragraphs 2.5.2 to 2.5.12, the change in traffic flows associated with the proposed HGV delivery windows on weekday evenings and Saturday mornings is small and would not affect the outcome of the assessment currently presented in chapter C2 (APP-089) and the DCO Transport Assessment (APP-101).	Non-material change
Environmental Statement chapter C3	APP-090	Public Access and Recreation	As outlined in paragraphs 2.5.13 to 2.5.24, the proposed changes would extend the periods during which there would be adverse effects for onshore recreation and active travel. However, with existing mitigation measures and the constraints placed on the number of HGVs during weekday evenings and on Saturdays there would be no new or different likely significant environmental effects.	Non-material change
Environmental Statement chapter C4	APP-091	Air quality	As outlined in paragraphs 2.5.25 to 2.5.37, the proposed change would not significantly alter the air quality assessment, in particular effects to human and ecological receptors, due	Non-material change

Document name	Examination Reference Number	Chapter name / section name	New or different likely significant effects	Material change / non-material change / no change
			to the proposed change in HGV delivery windows. Thus, there is considered to be no new or different likely significant environmental effects to the assessment of air quality and the conclusions presented in chapter C4 (APP-091) of the Environmental Statement remain as reported.	
Environmental Statement chapter C5	APP-092	Noise and Vibration	As outlined in the Noise and Vibration assessment outlined in paragraphs 2.5.38 to 2.5.66 the findings of the revised noise assessment show that the proposed change in HGV delivery windows would increase the overall number of significant adverse effects on residential receptors pre-mitigation compared to those reported in chapter C5 (APP-092) of the Environmental Statement. As a result, enhanced mitigation measures are presented in paragraph 2.5.65 which will be secured through an update to the Wylfa Newydd Code of Construction Practice (APP-414). These measures will reduce the significant adverse effects for the Wylfa Newydd Project and as a result of this change. It is therefore concluded that the proposed change	Non-material change

Document name	Examination Reference Number	Chapter name / section name	New or different likely significant effects	Material change / non-material change / no change
			would not introduce any new or different likely significant environmental effects other than those reported in the Environmental Statement. The proposed change will result in an increase in noise at some non-residential receptors however upon detailed analysis presented in paragraphs 2.5.56 to 2.5.58 these would still be considered not significant and therefore no new or different likely significant environmental effects are predicted.	
Environmental Statement chapter C7	APP-094	Combined topic effects	Based on the assessments outlined in section 2.4.7 and summarised in this table, there are no new or different likely significant combined effects as a result of the proposed change. Consequently, the combined topic effects assessment remains as reported in chapter C7 (APP-094) of the Environmental Statement.	No change
Environmental Statement, chapter I4	APP-387	Intra-project cumulative effects	Based on the assessments outlined in section 2.4.7 and summarised in this table and the additional mitigation proposed with respect to noise effects, there are no new or different likely significant intra-project	Non-material change

Document name	Examination Reference Number	Chapter name / section name	New or different likely significant effects	Material change / non-material change / no change
			cumulative effects that would arise as a result of the proposed change. Consequently, the intra-project cumulative effects assessment remains as reported in chapter I4 (APP-387) of the Environmental Statement.	
Environmental Statement chapter I5	APP-388	Inter-project cumulative effects	Based on the assessments outlined in section 2.4.7 and summarised in this table and the additional mitigation proposed with respect to noise effects, there is considered to be no new or different likely significant interproject cumulative effects that would arise as a result of the proposed change. Consequently, the inter-project cumulative effects assessment remains as reported in chapter I5 (APP-388) of the Environmental Statement.	Non-material change
Health Impact Assessment Report	APP-429	Air quality (HIA section C.2) Noise (HIA section C.3 Noise) Traffic (HIA section C.5)	As outlined in paragraphs 2.5.67 to 2.5.99, the proposed change to HGV delivery windows is unlikely to change the conclusions reached in the Health Impact Assessment Report (APP-429) provided further road safety restrictions and noise mitigation commitments are adopted by the Project.	Non-material change

Document name	Examination Reference Number	Chapter name / section name	New or different likely significant effects	Material change / non-material change / no change
			For the general population, the redistribution of the same number of Project HGVs over a longer time period is expected to have slight benefits for emissions, disturbance, journey times, road safety. For vulnerable groups there is the potential for more significant adverse effects compared to the scenario submitted in the DCO. However, this is mitigated by a commensurate expansion of the Local Noise Mitigation Strategy. Any reduction in road safety is expected to be greatest prior to the opening of the A5025 Highway Improvements, so would be mitigated by a targeted road safety campaign during this time. On the basis of adoption of such mitigation, the conclusions of the Health Impact Assessment Report (APP-429) remain as reported and therefore no new or different likely significant effects have been identified.	
Equality Impact Assessment	APP-434	7 What are the potential equality effects of the Wylfa	As outlined in paragraphs 2.5.100 to 2.5.103 there are no new or different likely significant effects to the traffic and transport or public access and	Non-material change

Document name	Examination Reference Number	Chapter name / section name	New or different likely significant effects	Material change / non-material change / no change
		Newydd DCO Project?	recreation assessments presented in chapter C2 (APP-089), the DCO Transport Assessment (APP-101) and chapter C3 (APP-090) of the Environmental Statement. On this basis it is considered that the overall equality effects reported in the Equality Impact Assessment (APP-434) with regards to road traffic and public access and recreation would remain unchanged. Sensitivity testing of air quality models presented in the DCO application indicate that the effect of the proposed HGV delivery window changes on average concentrations of air pollutants associated with the Project's vehicle movements along the road network would not alter the conclusions presented in chapter C4 (APP-091 of the Environmental Statement. On this basis it is considered that the conclusions reached in the Equality Impact Assessment (APP-434) in relation to potential air quality effects on equality from the Project's HGVs on the local road network during construction would remain unchanged. Therefore, no significant health and no	

Document name	Examination Reference Number	Chapter name / section name	New or different likely significant effects	Material change / non-material change / no change
			disproportionate or differential equality effects are expected as a result of the proposed change. The increase in the properties that would experience significant adverse effects due to road traffic noise as a result of the proposed changes is considered to be small and with enhanced mitigation would be reduced below that assessed in the DCO application and therefore would not change the overall equality effects reported in the Equality Impact Assessment (APP-434) with regards to noise effects from road traffic.	

2.6 Cumulative assessment for the proposed changes

2.6.1 To assess whether all the proposed non-material changes could interact to result in the Wylfa Newydd Project having a greater cumulative effect to that reported in the DCO application, a cumulative assessment has been carried out, the results of which can be found in appendix 1-1.

2.6.2 Cumulative effects include both intra-project (resulting from the various developments that comprise the Wylfa Newydd Project) and inter-project (resulting from the Wylfa Newydd Project together with external projects) effects; these assessments are reported in volume I (cumulative effects) (APP-384 to APP-388) of the Environmental Statement.

2.6.3 Combined topic effects, also known as intra-development effects, occur when a single receptor is affected in more than one way by the same development. The relevant combined topic assessment (i.e. project wide effects) is reported in chapter C7 (APP-094) of the Environmental Statement.

2.6.4 As demonstrated in the cumulative assessment report (appendix 1-1), there are considered to be no new or different intra- and inter-cumulative effects to environmental receptors as a consequence of the proposed changes. Furthermore, there are considered to be no new or different combined topic effects as a consequence of the proposed changes.

2.6.5 Consequently, the overall cumulative assessment of the Wylfa Newydd Project remains as reported in the DCO application.

2.7 Schedule of engagements

Table 2-7 Schedule of engagements

Date	Event
17 October 2018	Horizon wrote to PINS, submitting Batch 1 Requests for Non-Material Change (Blasting Strategy and Marine Vessel Movements) and advising of an emerging Batch 2 (Working Hours, Shift Patterns and HGV Deliveries)
23 October 2018	Preliminary Meeting
31 October 2018	Horizon's letter of 17 October 2018 accepted at the discretion of the Examining Authority
31 October 2018	First notice advertising consultation on Batch 2 (8 November to 6 December 2018) published in The Daily Post
7 November 2018	Second notice advertising consultation on Batch 2 (8 November to 6 December 2018) published in The Daily Post, and also in the London Gazette
8 November 2018	28-day consultation on Batch 2 begins
19 November 2018, 1-7pm	Horizon Open Surgery at Cemaes Village Hall, attended by Batch 2 consultation team

6 December 2018	28-day consultation on Batch 2 ends
7-17 December 2018	Expected dates during which Horizon will have regard to representations received and update consultation documents as required
18 December 2018 (Exam Deadline 3)	Earliest expected date for submission into Examination of second batch of formal requests for non-material change
17 January 2019 (Exam Deadline 4)	Latest expected date for submission into Examination of second batch of formal requests for non-material change
23 April 2019	End of Examination

2.7.2 As noted in paragraph 1.4.5, copies of the consultation documents are available for public viewing at:

The Anglesey Business Centre, Isle of Anglesey County Council, Bryn Cefni Business Park, Llangefni, Anglesey, LL77 7XA, Monday to Friday 9am to 5pm, and

Wylfa Newydd Site Office, Cemaes Bay, Anglesey, LL67 0AA, Monday to Friday 9am to 5pm by appointment only, or

on Horizon's consultation website, www.horizonnuclearpower.com/consultation.

2.7.3 List of specified consultees (prescribed persons under section 42(a)-(d) of the Planning Act 2008):

Welsh Government

Natural Resources Wales

Isle of Anglesey Council

Gwynedd Council

Conwy County Borough Council

North Wales Economic Ambition Board

North Wales Wildlife Trust

RSPB Cymru

National Trust

The Crown Estate

Betsi Cadwaladr University Health Board

Public Health Wales

Welsh Ambulance Service Trust

North Wales Police

RAF Valley

North Wales Fire and Rescue Service

National Grid
Welsh Water
North & Mid Wales Trunk Road Agency
The Marine Management Organisation
North West & North Wales Sea Fisheries Committee x
The Maritime & Coastguard Agency
Marine Conservation Trust
Royal National Lifeboat Institution
The Maritime & Coastguard Agency
SP Manweb plc
Magnox
Nuclear Decommissioning Authority
North Anglesey Partnership
Destination Anglesey Partnership
North Wales Economic Ambition Board
Trinity House
Joint Nature Conservation Committee
Cyngor Tref Amlwch (Town Council)
Cyngor Cymuned Cylch-Y-Garn (Community Council)
Cyngor Cymuned Llanbadrig
Cyngor Cymuned Mechell
Cyngor Cymuned Llaneilian
Cyngor Cymuned Rhosybol
Bodedern Community Council
Bryngwran Community Council
Llanfachraeth Community Council
Llanfaethlu Community Council
Trearddur Community Council
Valley Community Council
Llanfair yn Neubwll Community Council
Talybolion Local Members
Twrcelyn Local Members

2.7.4 Targeted mail drops:

Main Site – regular list of near neighbours, comprising 909 addresses in Cemaes and Tregele

A5025 corridor – list of addresses (within 1km wide corridor along the A5025 from Main Site to and including Valley) used for on-line road consultations for applications under the Town & Country Planning Act 1990 – 1,679 addresses

Logistics Centre, Parc Cybi – a new zone of 750m radius from the Centre, comprising 67 residential and business addresses

Park and Ride, Dalar Hir – a new zone based on a 1,250m radius, with the addition of some further properties close to the zone, comprising a total of 363 addresses

TOTAL: 3,018 addresses.

2.7.5 Site notices:

22 locations around Anglesey

2.7.6 The proposed changes do not require any 'additional land', so Horizon does not consider that the consent of persons with an interest in the relevant land is required under the Infrastructure Planning (Compulsory Acquisition) Regulations 2010. However, letters providing information about the consultation have been sent to persons with an interest in land relating to the Main Site, A5025, Parc Cybi and Dalar Hir, comprising approximately 850 addresses.

2.7.7 Horizon's letter to the Planning Inspectorate of 17 October 2018 (notifying of the emerging second batch of non-material changes) advised that Horizon did not propose to undertake 'roadshow' type events as part of the consultation, but instead to undertake consultation on a written basis only (due to the scheduled hearings and other demands of the examination process on stakeholders). However, Horizon has identified an opportunity to send a Batch 2 consultation team to one of the regular 'Open Surgeries' hosted at Cemaes Village Hall, thereby giving stakeholders an opportunity to discuss the Batch 2 changes in person, as noted in the schedule of engagements above.

2.8 Schedule of consequential amendments to application documents

Table 2-8 Schedule of consequential amendments to application documents

Application document name	Examination Reference Number	Section	Version to be amended	Description of amendment
DCO Transport Assessment	APP-101	1.13, 7.5 and 7.6	1.0	Update to key assumptions of assessment (table 1-1) and the associated figures and text.
DCO TA appendix F – Integrated Travel and Transport Strategy	APP-107	7.5	1.0	Update to figures and associated text describing delivery windows
Environmental Statement chapter C3: Public access and recreation effects of traffic	APP-090	3.5	1.0	Update to basis of assessment and duration of effects.

Application document name	Examination Reference Number	Section	Version to be amended	Description of amendment
Environmental Statement chapter C5: Noise and vibration effects of traffic	APP-092	5.5	1.0	Changes to the number of receptors predicted to experience significant adverse effects from construction traffic and details about the enhanced mitigation to reduce effects.
Environmental Statement chapter D1: Proposed development	APP-120	1.6	1.0	Update to HGV delivery windows.
Environmental Statement Road traffic-related effects (project-wide) Figure Booklet – Volume C	APP-119	Figures	1.0	Updates to noise levels/receptors in figures.
Design and Access Statement - Volume 1 – Project-Wide	APP-407	4.4	1.0	Update to HGV delivery windows.
Wylfa Newydd Code of Construction Practice	APP-414	8.3	1.0	Updates to outline the extended commitments of the LNMS.
Draft Heads of Terms for Planning Obligations (Planning Statement Chapter 7 (APP-406)	APP-406		1.0	Addition of road safety campaign mitigation.
Health Impact Assessment Report	APP-429	C.3	1.0	Summary of additional detail within the LNMS and how it would mitigate the HGV delivery window changes, including for properties affected before and after the opening of the A5025 Highway Improvements.
Health Impact Assessment Report	APP-429	C.5 and J	1.0	Inclusion of Road Safety Campaign and summary of the reasons for its inclusion prior to the opening of the A5025

Application document name	Examination Reference Number	Section	Version to be amended	Description of amendment
				Highway Improvements.
Equality Impact Assessment	APP-434	7.2	1.0	Updates to numbers of properties affected by traffic noise.

3 References

Table 3-1 Schedule of references

ID	Reference
RD1	The Planning Inspectorate. 2018. Advice Note 16: How to request a change which may be material. [Online]. [Accessed: June 2018]. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/07/Advice-note-16.pdf
RD2	Department of Energy and Climate Change. 2011. Overarching National Policy Statement for Energy (EN-1). [Online]. [Accessed: 02 July 2018]. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf
RD3	Department of Energy and Climate Change. 2011. National Policy Statement for Nuclear Power Generation (EN-6). [Online]. [Accessed: 02 July 2018]. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47859/2009-nps-for-nuclear-volumeI.pdf
RD4	Department for Business, Energy and Industrial Strategy. 2017. Statement on Energy Infrastructure. [Online] [Accessed: 22 October 2018]. Available from: https://www.parliament.uk/business/publications/written-questions-answers-statements/written-statement/Lords/2017-12-07/HLWS316/
RD5	Steer. 2018. Wylfa Newydd Project – RFC Heavy Goods Vehicles Delivery Window Changes. Technical Memo. 40 pp.
RD6	World Health Organization. (WHO) Guidelines for Community Noise 1999. [Online] Available from: http://whqlibdoc.who.int/hq/1999/a68672.pdf
RD7	British Standards Institute. 2014. British Standard BS 8233: 2014: Guidance on Sound Insulation and Noise Reduction for Buildings. Available from: https://shop.bsigroup.com/ProductDetail/?pid=000000000030241579
RD8	Tim Waters-Fuller and Daniel Lurcock, NANR116: 'Open/closed window research' sound insulation through ventilated domestic windows. Edinburgh, UK: The Building Performance Centre, Napier University, 2007. Available from: https://www.napier.ac.uk/~/media/worktribe/output-246785/twfrepnanr116pdf.pdf
RD9	Highways Agency. 2006. Design Manual for Roads and Bridges Vol 7 Pavement Design and Maintenance Section 2 Part 1 Traffic Assessment (HD24/06) [Online] Available from: http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol7/section2/hd2406.pdf
RD10	World Health Organization Regional Office for Europe. (2009) Night noise guidelines for Europe. (Copenhagen, Denmark). http://www.euro.who.int/data/assets/pdf_file/0017/43316/E92845.pdf

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Appendix 1-1 Cumulative Assessment Report

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1 Introduction

1.1.1 Horizon intends to make a request for a total of five non-material changes to the Project DCO application. Horizon has already consulted and submitted the following two non-material change requests:

- Request for Non-Material Change no.1 – Blasting Strategy (AS-012); and
- Request for Non-Material Change no.2 – Marine Vessel Movements (AS-013).

1.1.2 Horizon has also gone out to consultation with respect to the following three non-material change requests:

- Request for Non-Material Change no.3 – Worker Shift Patterns;
- Request for Non-Material Change no.4 – Working Hours; and
- Request for Non-Material Change no.5 – HGV delivery window.

1.1.3 Further information related to each non-material change is provided in section 1.2 below; detailed assessments can be found in the standalone candidate for change documents.

1.2 Scope

1.2.1 This appendix (which is attached – in duplicate form – to documents 3, 4 and 5 listed above) sets out an assessment of the effects of all five proposed non-material changes to the cumulative assessment reported in the DCO application. The purpose is to assess whether the proposed changes could interact to result in the Project having a greater cumulative effect to that reported in the DCO application. The effect of each separate request for non-material change on the cumulative assessment reported in the DCO application has been assessed and reported within the standalone candidate for change documents.

1.2.2 The approach to the cumulative assessment of the proposed changes is consistent with the Project Environmental Impact Assessment (EIA); see chapter B1 (introduction to the assessment process, APP-066) of the Environmental Statement for an overview of this process. There are three components to the assessment of cumulative EIA effects: combined topic effects; intra-project effects; and inter-project effects, and all are described further below.

1.2.3 Combined topic effects (also known as intra-development effects) occur when a single receptor is affected in more than one way by the same development. Combined topic effects for each development comprising the Project are reported in chapters C7 (Project-wide effects, APP-094), D16 (WNDA Development, APP-135), E12 (Off-Site Power Station Facilities: AECC ESL and MEEG, APP-250), F12 (Park and Ride, APP-227), G12 (A5025 Off-line Highway Improvements, APP-315) and H12 (Logistics Centre, APP-366) of the Environmental Statement.

1.2.4 Intra-project effects result from the various developments that comprise the Project, whilst inter-project effects result from the Wylfa Newydd Project

together with external projects. These assessments are reported in volume I (cumulative effects) (APP-384 to APP388) of the Environmental Statement.

1.2.5 Consideration has also been given to the cumulative effects of the proposed changes to the Health Impact Assessment Report (APP-429) and the Shadow Habitats Regulations Assessment Report (APP-050/051) and a conclusion of no new cumulative or in-combination effects has been reached, respectively.

1.2.6 All other assessments submitted as part of the DCO application (e.g. Welsh Language Impact Assessment, APP-432; Equality Impact Assessment, APP-434; and Water Framework Directive Compliance Assessment, APP-444) would remain unaffected by the proposed changes and have therefore not been considered further.

1.3 Assessment approach

1.3.1 For the purpose of the assessment and in order to assess a worst case, it is assumed that the proposed changes and the associated construction activities and environmental effects would occur concurrently. This is considered worst case as in reality the proposed changes are unlikely to fully overlap with one another (e.g. blasting activities will occur earlier in the programme than marine vessel movements but are estimated to overlap for approximately 8 months).

Assessment of noise effects

1.3.2 The noise assessments for each of the following requests for non-material change identified the potential for new or different likely significant environmental effects:

- Request for Non-Material Change no.4 – Working Hours; and
- Request for Non-Material Change no.5 – HGV delivery window.

1.3.3 However, implementation of a Local Noise Mitigation Strategy (LNMS) for the Project, as well as other mitigation measures secured in the Wylfa Newydd Code of Construction Practice (CoCP) (APP-414), will reduce the assessment of effects arising from the proposed changes. With the potential for some small increases in the number of adverse effects, including cumulatively, a number of options for new and enhanced mitigation have been proposed. Included in these options is an extension to the commitment made in the LNMS set out in section 8.3 of the Wylfa Newydd CoCP (APP-414) irrespective of the proposed changes to working hours and the HGV delivery window (Requests for Non-Material Change no. 4 and 5). This extension will on balance mitigate the worse affected properties and reduce major significant effects identified in the DCO application and as of the proposed change.

1.3.4 On the basis of this mitigation, the noise and vibration topic assessment for the proposed change to working hours and the HGV delivery window (Requests for Non-Material Change no. 4 and 5) concluded that on balance, there would be no new or different likely significant environmental effects. However, the potential cumulative effect of changes to noise disturbance as a result of the five requests for non-material change to the DCO application has been considered within this appendix (see sections 2 to 4).

Assessment of air quality effects

1.3.5 The air quality dispersion modelling which was undertaken to assess the air quality effects of the proposed change to working hours (Request for Non-Material Change no. 4) took into consideration Horizons' pre-existing commitment within the DCO application to use lower emitting plant, machinery and marine vessels proposed as additional mitigation. It also took account of the proposed change to the marine vessel movements (Request for Non-Material Change no. 2) which has been submitted to the Examining Authority.

1.3.6 Although air quality modelling work was undertaken to assess the proposed change to worker shift patterns and the HGV delivery window (Requests for Non-Material Change no. 3 and 5), there was no requirement to take account of any pre-existing mitigation commitments within the DCO application. The proposed change to the blasting strategy (Request for Non-Material Change no. 1) relates to the timings for carrying out blasting and has no effect on the amount or magnitude of blasting required. Therefore, this proposed change does not affect the assessment of air quality effects reported in the DCO application.

1.3.7 As expected, the lower emitting construction plant, machinery and vessels delivered significant reductions in air quality effects. The effect of the proposed changes to working hours (Request for Non-Material Change no. 4) have therefore been assessed against the quantified residual effects of the two modelling scenarios (for year 2 and year 5) which take account of this mitigation as this is considered to be a more appropriate baseline scenario than the DCO application which does not quantify this mitigation within the modelling assessments (see paragraphs 2.5.2 to 2.5.4 of the request for non-material change to working hours). This forms the basis of the cumulative assessment.

Assessment of human health impacts

1.3.8 The Health Impact Assessment has adopted the same assessment approach to mitigation as the noise and air quality assessments described above. This forms the basis of the cumulative assessment.

1.4 Description of the proposed non-material changes

1.4.1 A detailed description of the five proposed non-material changes being sought by Horizon, including a justification for their requirement and non-materiality can be found in the standalone candidate for change documents.

1.4.2 For reference, a brief description of each proposed non-material change is provided in Table 1-1 below.

Table 1-1 Proposed non-material changes to the DCO application being sought by Horizon

Proposed non-material change	Description
Request for Non-Material Change no.1 – Blasting Strategy (AS-012)	Horizon is seeking an extension to the daily time frame within which blasting for the Main Construction works is permitted, from: Monday to Friday between 10:00 and 16:00, and Saturday between 10:00 and 13:00 (as submitted in the DCO application); to Monday to Friday between 09:00 and 19:00, and Saturday between 08:00 and 13:00 (with no blasting after dusk between March and September). In practice, because of the change in length of day and the change to BST, dusk falls after 19:00 from April until September.
Non-Material Change no.2 – Marine Vessel Movements (AS-013)	Horizon is seeking to increase the upper daily limit from four movements per day (two vessels) to 16 movements per day (eight vessels). These changes fall within the total vessel movements described and assessed in the DCO application.
Request for Non-Material Change no.3 – Worker Shift Patterns	Horizon is also seeking the following changes to shift times and durations: • increase the day shift windows by half hour at the end of each shift; • amend the start of the night shift window by three hours; and • decrease the night shift window by half hour during peak construction (e.g. 2023).
Request for Non-Material Change no.4 – Working Hours	Horizon is seeking to extend the following working hours to include 19:00-07:00 hours (i.e. 24-hours) for: • marine piling (percussion piling to 19:00 only); • MOLF construction • preparation for blasting including rock drilling and packing for blasting; • moving/repositioning won rock in the excavations; and • support operations which covers a range of activities required to support the early works and Main Construction As a consequence of the proposed change to working hours and to reduce overall environmental effects from those reported in the DCO application, Horizon is also

Proposed non-material change	Description
	seeking an extension to the working hours for site grading in construction zones 6, 7, 8 and 9 and the transportation of resultant material on haul routes HR-013, HR-B1 and HR-B2 for the construction of Mound E and Mound B from 19:00 to 23:00.
Request for Non-Material Change no.5 – HGV delivery window	Horizon is seeking to extend the weekday (Monday to Friday inclusive) delivery window into the evening, to include deliveries between the hours of 19:00 and 23:00 (up to a maximum of 20 HGV movements in each direction). Furthermore, an additional delivery window is proposed on Saturday mornings, between 08:00 and 13:00 (up to a maximum of 50 HGV movements in each direction).

2 Combined topic effects (i.e. intra-development cumulative effects)

2.1.1 The proposed changes to worker shift patterns and the HGV delivery window (Requests for Non-Material Change no. 3 and 5) have potential implications to the assessment of project-wide effects outlined in volume C of the Environmental Statement. The remaining proposed changes to the blasting strategy, marine vessel movements, and working hours (Request for Non-Material Change no. 1, 2 and 4) relate specifically to the WNDA Development which is assessed in volume D of the Environmental Statement (Table 2-1).

2.1.2 Thus, this section examines the potential effect of the proposed changes to the combined topic effects assessments presented within chapter C7 (APP-094) (project-wide effects) and D16 (APP-135) (WNDA Development) of the Environmental Statement.

Table 2-1 Summary matrix of the non-material change requests and the developments effected

Proposed non-material change	Project-wide effect (volume C)	WNDA Development (volume D)
Request for Non-Material Change no.1 – Blasting Strategy (AS-012)		X
Non-Material Change no.2 – Marine Vessel Movements (AS-013)		X
Request for Non-Material Change no.3 – Worker Shift Patterns	X	
Request for Non-Material Change no.4 – Working Hours		X
Request for Non-Material Change no.5 – HGV delivery window	X	

The proposed changes do not affect assessments of combined topic effects relating to the Off-Site Power Station Facilities: AECC ESL and MEEG (volume E), Park and Ride (volume F), A5025 Off-line Highway Improvements (volume G) and the Logistics Centre (volume H) as there is no pathway of effect to receptors considered within these assessments. Therefore, the assessment of combined topic effects for these developments remain as reported in chapters E12 (APP-250), F12 (APP-277), G12 (APP-315) and H12 (APP-366) of the Environmental Statement.

2.2 Project-wide combined topic effects

2.2.1 The project-wide combined topic effects assessment of each of the proposed changes to worker shift patterns and the HGV delivery window (Requests for Non-Material Change no. 3 and 5), concluded no change to the assessment and conclusions presented in chapter C7 (APP-094) of the Environmental Statement.

2.2.2 Considering these proposed changes together, it was identified that there could be effects to the following receptors via the traffic and transport, and public access and recreation project-wide topic assessments (see Table 2-2):

- Motorised and public transport users (traffic and transport);
- Recreational cyclists and walkers (public access and recreation); and
- Active travel cyclists and walkers (public access and recreation).

Table 2-2 Topic assessments and receptors potentially affected by the proposed changes to worker shift patterns and the HGV delivery window (adapted from appendix C7-1 (APP-118))

Proposed non-material change	Socio-economics	Traffic and transport	Public access and recreation	Air quality	Noise and vibration	Waster and materials management
Motorised and public transport users		Y				
Recreational cyclists and walkers			Y			
Active travel cyclists and walkers			Y			

2.2.3 As a consequence of the proposed changes to worker shift patterns and HGV delivery windows, no new receptors would be scoped into the project-wide combined topic effects assessment.

Traffic and transport

2.2.4 The proposed changes to worker shift patterns and the HGV delivery window (Requests for Non-Material Change no. 3 and 5) both have the potential to alter traffic flows, and in the case of Saturday morning HGV deliveries, introduce new construction-related traffic from that assessed within the DCO application.

2.2.5 The traffic and transport assessment for the proposed changes to shift patterns (Request for Non-Material Change no. 3) and the HGV delivery window (Request for Non-Material Change no. 5) each concluded that there would be no new or different likely significant combined effects than those reported in chapter C7 (APP-094) of the Environmental Statement.

2.2.6 When considering these two proposed changes in combination, the only potential for a cumulative effect to occur is during the weekday evenings around the commencement of the evening night shift (i.e. 19:00) as HGV deliveries would continue past 19:00. There would be no overlap in the timing of worker shift patterns (which means workers arrive at the Wylfa Newydd Development Area before 08:00) and the HGV delivery window on Saturdays (which ensures there are no HGV movements before 08:00) and so any impacts of these proposed changes are considered independent of one another.

2.2.7 If HGV movements were to be introduced in the evenings, the number of HGV movements in the hour that overlaps with worker traffic movements associated with the proposed change to shift patterns would be small (an average of five HGVs per direction). Lower background traffic flows in the evening period mean that impacts should be less than those assessed during peak hours of traffic on the road network. Furthermore, in practice the proposed change would reduce peak hourly flows during the day as the same number of HGV deliveries would occur over a greater time period. Given the limited temporal overlap of the two proposed changes and the small vehicle numbers involved, there would be no new or different likely cumulative transport impacts.

2.2.8 Consequently, there is considered to be no change to the assessment of combined topic effects to motorised and public transport users presented within chapter C7 (APP-094) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

Public access and recreation

2.2.9 The proposed changes to shift patterns and the HGV delivery window both have the potential to affect recreational amenity value as well as active travel for walkers and cyclists as a result of changes to, or increased traffic flows.

2.2.10 The public access and recreation assessment for the proposed changes to worker shift patterns (Request for Non-Material Change no. 3) and the HGV delivery window (Request for Non-Material Change no. 5) each concluded that with consideration of existing embedded and additional mitigation measures already secured in the DCO application, there would be no new or different likely significant combined effects than those reported in chapter C7 (APP-094) of the Environmental Statement.

2.2.11 The proposed change to the HGV delivery window (Request for Non-Material Change no. 5) was found to alter the assessment of recreational amenity for walkers and cyclists from negligible to minor adverse effects due to the addition of HGV deliveries during weekday evenings and Saturdays. Minor changes to peak traffic flows associated with the proposed change to worker shift patterns (Request for Non-Material Change no. 3) are not considered to combine to worsen the effect to this receptor.

2.2.12 Both proposed changes would not result in a net change in the number of vehicles or HGVs using the road network as a result of the Project. Considering the smaller number of HGV deliveries that would be permitted weekday evenings and on a Saturday morning and the timing of shift changes,

there are considered to be no new or different likely cumulative impacts to public access and recreation.

2.2.13 Consequently, there is considered to be no change to the assessment of combined topic effects to walkers and cyclists undertaking recreation or active travel presented within chapter C7 (APP-094) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

2.3 WNDA Development combined topic effects

2.3.1 The WNDA Development combined topic effects assessment for each of the proposed changes to the blasting strategy, marine vessel movements and working hours (Request for Non-Material Change no. 1, 2 and 4), concluded no change to the assessment and conclusions presented in chapter D16 (APP-135) of the Environmental Statement.

2.3.2 Considering these proposed changes together, it was identified that there could be a change to the WNDA Development combined topic assessment for the following receptors (which are already considered in chapter D16 (APP-135) of the Environmental Statement) via the air quality and noise and vibration topic assessments (Table 2-3):

- Human receptors:
  - i) residential receptors within 350m of the Wylfa Newydd Development Area.
- other receptors:
  - ii) bats; and
  - iii) marine mammals (pinnipeds and cetaceans).

2.3.3 As a consequence of the proposed changes to the blasting strategy, marine vessel movements and working hours, no new receptors would be scoped into the WNDA Development combined topic effects assessment.

Table 2-3 Topic assessments and receptors potentially affected by the proposed changes to the blasting strategy, marine vessel movements and working hours (denoted by 'Y'), as well as any other topics which affect the same (or similar) receptors but are not affected by the proposed changes (denoted by 'X') (adapted from appendix D16-1 (APP-236))

Proposed non-material change	Socio-economics	Public access and recreation	Air quality	Noise and vibration	Soils and geology	Surface water and groundwater	Terrestrial and freshwater ecology	Landscape and visual	Cultural heritage	Coastal processes and coastal geomorphology	Marine environment	Radiological effects	Shipping and navigation
Human receptors													
Residential receptors within 350m of the Wylfa Newydd Development Area			Y										
Other receptors													
Bats							Y						
Marine mammals (pinnipeds and cetaceans)											Y		

Human residential receptors

2.3.4 The proposed change to the blasting strategy, marine vessel movements, and working hours (Requests for Non-Material Change no. 1, 2 and 4) each have the potential to affect human residential receptors due to changes in noise and vibration effects. The proposed change to marine vessel movements and working hours also each have the potential to impact air quality. Those receptors potentially affected are likely to be located within 350m of the Wylfa Newydd Development Area which includes the majority of Tregele, the western half of Cemaes (i.e. those properties or locations to the west of the High Street) and several other properties located around the Wylfa Newydd Development Area.

2.3.5 The combined topic assessment for each of the proposed changes to the blasting strategy, marine vessel movements and working hours (Requests for Non-Material Change no. 1, 2 and 4) each concluded no change to the assessment and conclusions presented in chapter D16 (App-135) of the Environmental Statement. However, it is acknowledged that the proposed changes combined could result in an additive or combined effect which could lead to a change in the overall combined topic assessment for the WNDA Development.

2.3.6 The proposed change to marine vessel movements (Request for Non-Material Change no. 2) would result in a small increase in noise levels at 120 properties closest to the Wylda Newydd Development Area which would be undetectable to a person. As the proposed change to the blasting strategy (Request for Non-Material Change no. 1) would be subject to the noise and vibration control measures (including monitoring) set out in section 8 of the Main Power Station Site sub-CoCP and would include strict adherence to BS6472-2 [RD1], there would be no additive effect from these two proposed changes. This conclusion remains valid when the proposed change to working hours is also considered on the basis that new and enhanced mitigation has been offered to address any new or different likely significant noise disturbance effects associated with this proposed change.

2.3.7 The proposed changes to marine vessel movements and working hours (Requests for Non-Material Change no. 2 and 4) are both predicted to result in small changes in predicted concentrations of pollutants at human receptor locations, with some properties experiencing an additive effect. This change however, would be small and is not considered to alter the conclusions of the combined topic effects assessment presented in D16 (APP-135) of the Environmental Statement.

2.3.8 Overall, any changes to noise and air quality effects arising from the proposed changes to the blasting strategy (Request for Non-Material Change no. 1) would not combine to result in a change to the assessment of combined topic effects presented within chapter D16 (Application Number 6.4.16) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application

Other receptors

Bats

2.3.9 The proposed changes to the blasting strategy and working hours (Requests for Non-Material Change no. 1 and 4) both have the potential to affect bats via visual, noise and air quality disturbance effects as this crepuscular receptor is most active around dusk.

2.3.10 The terrestrial and freshwater ecology assessment for each of the proposed changes to the blasting strategy and working hours (Request for Non-Material Change no. 1 and 4) concluded that there would be no new or different likely significant combined effects than those reported in chapter D16 (APP-135) of the Environmental Statement.

2.3.11 Given the positive effects the lower emitting plant, machinery and marine vessels would have to air quality, the neutral effect of environmental lighting and the very minor changes to peak noise levels predicted as a result of the proposed changes, it is not considered that these effects would combine to alter the assessment of combined topic effects to bats presented within chapter D16 (APP-135) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

Marine mammals (pinnipeds and cetaceans)

2.3.12 The proposed changes to the marine vessel movements and working hours (Requests for Non-Material Change no. 2 and 4) both have the potential to affect marine mammals (pinnipeds and cetaceans) due to increases in underwater noise disturbance and the increased risk of vessel strikes associated with marine vessel movements.

2.3.13 The marine environment assessment for each of the proposed changes to the blasting strategy and working hours (Request for Non-Material Change no. 1 and 4) concluded that there would be no new or different likely significant combined effects than those reported in chapter D16 (APP-135) of the Environmental Statement.

2.3.14 Given that the assessment of underwater noise effects presented in chapter D13 (APP-132) of the Environmental Statement already takes into consideration 24-hr operations for marine dredging and that the overall number of vessel movements associated with the Project would be small, it is not considered that these effects would combine to alter the assessment of combined topic effects to marine mammals presented within chapter D16 (APP-135) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

3 Intra-project cumulative effects

3.1.1 An intra-project cumulative assessment has been undertaken for those topic assessments outlined in the Environmental Statement which are potentially affected by at least two of the non-material changes being sought in relation to the DCO application. The methodology used for the cumulative effects assessment has considered all residual effects that are minor adverse or greater.

Traffic and transport

3.1.2 Of the five requests for non-material change, the proposed change to worker shift patterns and the HGV delivery window (Request for Non-Material Change no. 3 and 5) have implications to the traffic and transport assessment reported in the DCO application. The potential effect of these proposed changes has already been assessed on a project-wide basis and is considered in section 2.2. Thus, there is no requirement to carry out an intra-project cumulative effects assessment for this topic.

Public access and recreation

3.1.3 Of the five requests for non-material change, the proposed changes to worker shift patterns and HGV delivery window (Request for Non-Material Change no. 3 and 5) have implications to the public access and recreation assessment reported in the DCO application. The potential effect of these proposed changes has already been assessed on a project-wide basis and is considered in section 2.2. Thus, there is no requirement to carry out an intra-project cumulative effects assessment for this topic.

Air quality

3.1.4 Of the five requests for non-material change, the proposed changes to worker marine vessels movements, shift patterns, working hours and the HGV delivery window (Request for Non-Material Change no. 2, 3, 4 and 5) have implications to both the project-wide and WNDA Development assessments of air quality. As such, there is potential for intra-project additive cumulative effects due to emissions to air from sources within the Wylfa Newydd Development Area and emissions from road traffic associated with the Wylfa Newydd Project.

3.1.5 The air quality assessment for the proposed changes associated with the WNDA Development demonstrated that, with the use of newer lower emitting plant, machinery and marine vessels, the majority of effects at human receptors would be negligible, and air quality effects as a consequence of the proposed change would be not significant.

3.1.6 The project-wide air quality assessment stated that there would be no net increase or decrease in the total vehicle flows on the road network. The changes would result in some modifications to the time of day or night upon which vehicles would arrive and depart from the Wylfa Newydd Development Area during construction. The assessments for the proposed changes to worker shift patterns and HGV movements (Request for Non-Material Change

no. 3 and 5) indicated that predicted concentrations or deposition rates are unlikely to be any higher than those presented in chapter C4 (APP-091) of the Environmental Statement. The assessments concluded that the balance of air quality effects at human receptors would remain predominantly negligible with some beneficial effects due to the A5025 Offline Highway Improvements.

3.1.7 Further consideration of the potential additive effects to air quality as a consequence of the proposed changes to worker shift patterns and HGV movements (Request for Non-Material Change no. 3 and 5) concluded no change to the intra-project cumulative assessment reported in the DCO application.

3.1.8 Air quality effects are local in scale; most air quality assessment methodologies in the UK only consider receptors within 200m of the road network when assessing emissions from road traffic and the largest effects are within very close proximity to the affected roads. Therefore, at most air quality sensitive receptors, the physical distance of the proposed changes listed associated with project-wide activities and those occurring at the WNDA Development would prevent intra-project cumulative air quality effects occurring.

3.1.9 However, there will be some receptors, particularly those close to the A5025 in the vicinity of the Wylfa Newydd Development Area, where there may be the potential for additive effects. However, given the negligible effect of the emissions from road traffic and minimal change in effects from the proposed changes to shift patterns and HGV deliveries (Requests for Non-Material Change no. 3 and 5), the intra-project cumulative effect of all the proposed changes is considered to be negligible.

3.1.10 The proposed changes are not considered to alter the intra-project cumulative effects reported in chapter I4 (APP-387) of the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

Noise and vibration

3.1.11 The proposed changes to the blasting strategy, marine vessel movements and shift patterns (Request for Non-Material Change no. 1, 2 and 3) has been shown not to result in any changes to noise effects and are therefore not considered further.

3.1.12 The proposed changes to working hours and the HGV delivery window (Request for Non-Material Change no. 4 and 5) have implications to both the project wide and WNDA Development assessments of noise effects. As such, there is potential for intra-project additive cumulative effects due to increased evening and night-time noise levels from sources within the Wylfa Newydd Development Area and from road traffic associated with the Project.

3.1.13 Considering both 2020 (representative of early construction) and 2023 (representative of peak construction), the proposed change to the HGV delivery window (Request for Non-Material Change no. 5) was found to potentially result in adverse effects at an additional 18 residential properties compared to the DCO application and in the absence of mitigation. These effects are predicted to occur at Cefn Coch, Kingsland, Llanfaethlu,

Llangynghenedl as well as outlying receptors at Llanfaethlu and Llanfachraeth.

3.1.14 The proposed change to working hours was also found to potentially result in a small number of additional significant effects at residential receptors located predominately over 1km from the Wylfa Newydd Development Area. A large number of residential receptors assessed as major significance in the DCO application would benefit from the proposed change to working hours; these are located in Cemaes.

3.1.15 There is very little overlap in the residential properties affected by the proposed change to the HGV delivery window and working hours. This is principally because these two non-material change requests relate to aspects of the project that are spatially segregated. Noise effects are local in scale; most noise assessment methodologies in the UK only consider receptors within 600m of the development scheme. Therefore, at most noise sensitive receptors, the physical distance of the proposed changes will prevent cumulative noise effects from one group at the other group. However, there is potential for some properties which are both adjacent to the Main Site and also adjacent to the A5025, and at which cumulative adverse effects could occur.

3.1.16 With consideration of the enhanced mitigation outlined in paragraph 1.3.3, the proposed changes to working hours and the HGV delivery window are not considered to result in any new intra-project effects with respect to increased noise levels from the effects of traffic and elevated noise levels during construction. Thus, the intra-project cumulative effects for this topic remain as reported in chapter I4 (APP-387) of the Environmental Statement.

Terrestrial and freshwater ecology

3.1.17 The only potential effects considered of minor or greater significance relate to the WNDA Development. As shown in section 2.3, the proposed changes to the blasting strategy, marine vessel movements and working hours (Request for Non-Material Change no. 1, 2 and 4) have no effect on this assessment and therefore there are no changes to the intra-project cumulative effects reported in chapter I4 (APP-387) of the Environmental Statement.

The marine environment

3.1.18 The only potential effects to the marine environment as a result of the proposed change to marine vessel movements and working hours (Request for Non-Material Change no. 2 and 4) relate to the WNDA Development (see section 2.3); hence, there are no intra-project cumulative effects to report for this topic.

4 Inter-project cumulative effects

4.1.1 An inter-project cumulative assessment has been undertaken for those topic assessments outlined in the Environmental Statement which are potentially affected by at least two of the non-material changes being sought in relation to the DCO application. These include:

- public access and recreation which is potentially affected by the proposed change to worker shift patterns and the HGV delivery window (Request for Non-Material Change no. 3 and 5);
- air quality which is potentially affected by the proposed change to marine vessel movements and working hours (Request for Non-Material Change no. 2 and 4); and
- noise and vibration which is potentially affected by the proposed change to working hours and the HGV delivery window (Request for Non-Material Change no. 4 and 5).

4.1.2 For these topics, all other requests for non-material change have been scoped out as requiring further consideration within the inter-project cumulative assessment as they have either no pathway for effect or their effect is negligible.

4.1.3 For the traffic and transport assessment, projects considered to have cumulative effects have been included in the traffic model for the Project and therefore form part of the assessment of effects that is represented in volume C of the Environmental Statement and considered in section 2.2 of this appendix.

4.1.4 The methodology used for the cumulative effects assessment has considered all residual effects that are minor adverse or greater.

4.1.5 The list of Reasonably Foreseeable Future Projects (RFFPs) which have been considered within the inter-project cumulative assessment is shown in appendix I2-2 (Matrix of receptors affected by the Wylfa Newydd Project and which short-listed projects could affect them) (APP-390). There is no requirement to scope in any additional RFFPs as a consequence of the proposed changes.

4.1.6 Considering the physical distance of the proposed changes; both the beneficial and adverse effects associated with these; and the new and enhanced mitigation proposed to address adverse effects associated with the Project, all five non-material changes requests even when combined are not considered to alter the inter-project cumulative assessment presented in chapter I5 (APP-388) and associated appendices in the Environmental Statement. Thus, the conclusions remain as reported in the DCO application.

5 Health impacts

5.1.1 The Health Impact Assessment (HIA) Report (APP-429) could potentially be affected by the proposed changes to the blasting strategy, worker shift patterns, working hours and HGV delivery (Request for Non-Material Change no. 1, 3, 4 and 5). The proposed change to the marine vessel movements (Request for Non-Material Change no. 2) will have no impact on human health.

5.1.2 The general influences relevant to population health that arise from the proposed changes are summarised in Table 5-1. The table shows the potential effects against the relevant geographical population groups as used in the Health Impact Assessment Report (APP-429).

5.1.3 The effects are summarised as follows:

- For the population near the Wylfa Newydd Development Area the proposed change to the blasting strategy and workings hours (Request for Non-Material Change no. 1 and 4) are the relevant sources of potential cumulative effects.
- For the population near the local road network (A5025, A55, A5 and A487) the proposed change to the HGV delivery window and worker shift patterns are the relevant sources of potential cumulative effects.

5.1.4 The proposed change to marine vessel movements (Request for Non-Material Change no. 2) is not considered to impact the assessment of effects to human health reported in the Health Impact assessment (HIA) Report (APP-429).

5.1.5 In both cases similar potentially vulnerable groups are relevant (children and young people; older people; and people with existing poor health). Where groups overlap, there may be increased vulnerability.

5.1.6 For the population near the Wylfa Newydd Development Area, the proposed changes that affect the same determinant of health relate to noise disturbance in the evening period from both blasting and construction related activities (including general earthworks close to communities). Other changes from the effects discussed in the DCO application HIA table I-2 that combine to influence the health of this population include: increased night-time noise and reduced nitrogen dioxide concentrations.

5.1.7 As appropriate new and enhanced mitigation is proposed (see paragraph 1.3.3), the overall effect for population health, taking account of the range of small residual beneficial and adverse changes across vulnerable groups, is not expected to alter the HIA conclusion that near the Wylfa Newydd Development Area the overall residual population health effect is considered to be up to minor adverse for the general population and up to moderate adverse for relevant vulnerable groups. The largest change relates to the air quality commitments to improved emission standards. Whilst beneficial, the change in this one determinant of health is unlikely to change the overall cumulative score, which takes account of a range of other health determinants.

5.1.8 For the population near the local road network (A5025, A55, A5 and A487), the proposed changes that affect the same determinants of health relate to

more noise disturbance in the evening period from both HGVs and from vehicles associated with worker shift changes. The combination of morning noise due to shift changes (06:00 or 05:30) and evening noise due to HGV movements (19:00 to 23:00) would also reduce the period when Project related transport would not contribute to potential sleep disturbance. Changes to the times at which these two categories of Project vehicle would be using the local road network may also contribute to both beneficial and adverse influences on road safety. Other changes from the effects discussed in the DCO application HIA (table I-2) that combine to influence the health of this population include: reduced night-time noise (there being no night-shifts ending between 03:00 and 04:00); reduced potential for health-trip journey time delays (e.g. to a hospital); and the potential for weekend HGV movements to reduce amenity and discourage physical activity.

5.1.9 As appropriate new and enhanced mitigation is proposed, the overall effect for population health, taking account of the range of small residual beneficial and adverse changes across vulnerable groups, is not expected to alter the HIA conclusion that near the local road network the overall residual population health effect is considered to be negligible for the general population and up to minor adverse for relevant vulnerable groups. Thus, the conclusions remain as reported in the DCO application.

Table 5-1 Health analysis cumulative assessment

	Relevant geographical population groups	
	Population near the Wylfa Newydd Development Area	**Population near the local road network**
Changes to working hours		
Air quality	Less potential for adverse effects from air pollution due to commitment to higher emission standards.	N/A
Lighting	No changes to community identity or sleep disturbance expected.	N/A
Changes to the HGV delivery window		
Air quality	N/A	No change to air quality from redistribution of vehicle times.
Traffic	N/A	More potential for accident risk during the weekend, as more pedestrians and cyclists. Less potential for journey delays as more use of off-peak times.
Changes to worker shift patterns		
Air quality	N/A	No change to air quality from redistribution of vehicle times.
Traffic	N/A	Less potential for accident risk as less overlap with school travel. Less potential for journey delays.
Construction workers	N/A	No change to community interaction with workforce.

6 Shadow Habitats Regulations Assessment

6.1.1 It was identified that the Shadow Habitats Regulations Assessment (APP-050/051) could potentially be affected by the proposed changes to the blasting strategy, marine vessel movements and working hours (Request for Non-Material Change no. 1, 2 and 4).

6.1.2 Assessments of each of these proposed changes concluded no new or different likely significant (alone or in-combination) effects to that reported in the Shadow Habitats Regulations Assessment (APP-050/051). Consequently, there is not considered to be any new or likely significant (alone or in-combination) effects from the three changes being sought in relation to the Project (i.e. blasting strategy, marine vessel movements and working hours, Request for Non-Material Change no. 1, 2 and 4). Thus, the conclusions remain as reported in the DCO application.

7 Schedule of consequential amendments to application documents

Table 7-1 Schedule of consequential amendments to application documents

Application document name	Examination Reference Number	Section of document	Version to be amended	Description of amendment
Environmental Statement chapter I4: Intra-project cumulative effects	APP-387	4.2	1.0	Update to air quality and noise modelling results
Environmental Statement appendix I4-2: Project-wide and WNDA development intra-project air quality assessment	APP-393	5	1.0	Update to air quality modelling results
Environmental statement appendix I4-3: Intra-project cumulative noise effects	APP-394	1.2	1.0	Update to noise modelling results

8 References

Table 8-1 Schedule of references

ID	Reference
RD1	British Standards Institution. 2008. BS 6472-2 Guide to Evaluation of human exposure to vibration in buildings. Blast-induced vibration. London: British Standards Institution.

Appendix 1-2 Modelling of road traffic emissions with diurnal profile

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1 Introduction

1.1 Purpose of this report

1.1.1 As a part of the Non-Material Change assessment of the effects upon air quality, an evaluation has been carried out of the effect of using an hourly diurnal profile of vehicle flows for modelling of dispersion of air pollutants from vehicles on the A55, A5 and A5025, connected with the Wylfa Newydd Project. For the DCO submission, a single, annual average hourly traffic (AAHT) flow was input to the model for each hour of the day, derived from annual average daily traffic (AADT) flows.

1.1.2 The Non-Material Change would re-distribute construction-related traffic on an hourly basis to and from the site within the 24-hour periods of days but would not result in any net increase in daily traffic flows of light duty vehicles (LDV) or heavy duty vehicles (HDV) over and above the DCO submission case.

1.1.3 Initially, further modelling was undertaken for one receptor, Hum_1964, which was identified as the receptor experiencing the largest change in concentrations as a result of project traffic on the A5025. It was then recognised that the use of a diurnal profile would have an effect on the adjustment factors applied to the emissions from road traffic results; therefore, the diurnal profile modelling was expanded to include the diffusion tube locations around the Valley area and an updated adjustment factor was calculated.

1.1.4 This report contains a summary of the modelling methodology adopted in the assessment, the results of the revised modelling and the effect upon the model verification and adjustment procedures. A section of road links comprising the A55, A5 around Valley and the A5025 immediately to the north of Valley has been used as a test case.

2 Methodology

2.1 Background to the proposed methodology

2.1.1 This modelling uses the previous verification model (from Autumn 2017) as a base.

2.1.2 Jacobs was requested to provide Wood with the hourly traffic flows for the relevant road links in the model. This traffic flow profile is consistent with the Strategic Traffic Model (STM) used in the DCO submission. Relevant road links consist of those within 200 m – 250 m of the diffusion tube locations and Hum_1964.

2.1.3 Hourly traffic flows were converted into hourly emission factors for each link, using different profiles for LDV flows and HDV flows.

2.1.4 A fac file was created to incorporate these emission factors into the model. The fac file uses a 3-day diurnal profile, for weekdays, Saturdays and Sundays.

2.1.5 There are two profiles for each road link, as we need an HDV profile and a LDV profile, consistent with the road traffic flow data split.

2.1.6 Since two profiles cannot be applied to one road source, roads sources with profiles applied need to be duplicated. In this case, the following statements are true:

- the locations of duplicated sources remain the same,
- for links where the LDV profile is applied, the HDV flows are set to zero,
- for links where the HDV profile is applied, the LDV flows are set to zero; and
- therefore, the total traffic flows along the links remain the same.

2.1.7 The model included 5 of the diffusion tube locations as receptors and Hum_1964, using RAF Valley meteorological data. This aligns with the previous verification modelling undertaken at the diffusion tube locations. For more details, see Appendix C4.1 in the DCO Environmental Statement. The receptor locations are presented in Table 2.1.

Table 2-1 Receptors included in the modelling

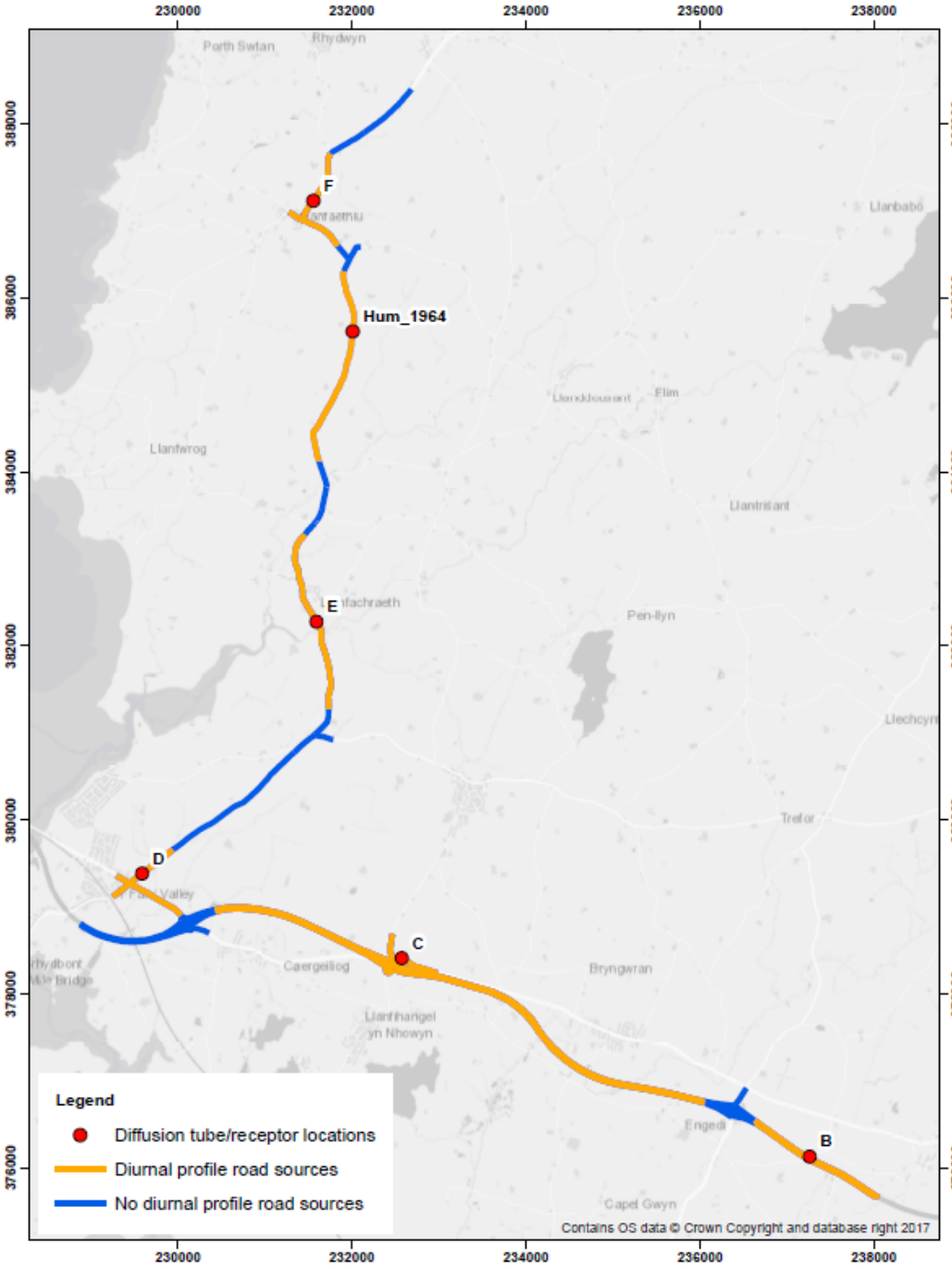
Diffusion tube/receptor ID	Location	X (m)	Y (m)
B	Minor road A55	237267	376129
C	A5 at Dalar Hir	232573	378407
D	A5025 Valley	229588	379382
E	A5025 Llanfacraeth	231593	382274
F	A5025 Llanfaethlu	231555	387112
Hum_1964	A5025 between Llanfacraeth and Llanfaethlu	232008	385608

2.1.8 Figure 2-1 provides a visualisation of the receptor locations and the road sources included in the modelling. The road links included in the modelling which had a diurnal profile applied are also listed below.

- A55_J5_J6_EB,
- A55_J5_J6_WB,
- A5_30,
- A55_J4_ON-SLIP_EB,
- A55_J4_ON-SLIP_WB,
- A55_J4_OFF-SLIP_EB,
- A55_J4_OFF-SLIP_WB,
- A44_J4_THR_JCT_EB,
- A44_J4_THR_JCT_WB,
- A55_J4_J5_EB,
- A55_J4_J5_WB,
- A55_J3_J4_EB,
- A55_J3_J4_WB,
- A55_J4_BRIDGE_NB,
- A55_J4_BRIDGE_SB,
- LOCAL_10; and
- A5025_71 (applied to all relevant A5025 links i.e. the profile was assumed to be the same along the entirety of the A5025).

2.1.9 Note that there are road links included in the model that did not have a profile applied. Where this occurred, it was because the road link is more than 250 m from the relevant receptor location and was left in the model for completion.

Figure 2-1 Road sources and receptor locations included in the modelling



2.1.10 Note: Figure 2.1 shows the road sources without bypasses (i.e. without the A5025 off-line highway improvements) and without the Logistics Centre and Park and Ride. As such, this represents an early project year.

3 Results and Discussion

3.1 Summary

3.1.1 The re-run of the verification with the diurnal profile in place results in lower modelled raw NOx (i.e. unadjusted) concentrations at the diffusion tube locations. This is consistent with the initial modelling completed for receptor Hum_1964.

3.1.2 Overall, this results in a higher model adjustment factor, because the difference between the modelled results and the monitoring data has increased, when compared with the original verification. Using the diurnal profile, therefore, indicates that the model performs less well than without the profile in place:

- The previous Valley adjustment factor, without the diurnal profile applied, was 3.62,
- The Valley adjustment factor, with the diurnal profile applied, is now 4.89; and
- This may bring about increases in modelled NO2 concentrations at receptors where the adjustment factor is applied. However, where the reduction with the profile is large enough to offset the effect of a larger adjustment factor, the overall concentration will decrease.

3.2 Verification calculations

3.2.1 Table 3.1 shows the comparison of the monitored and unadjusted modelled NO2 results at the diffusion tube locations. The comparison indicates that it is appropriate to undertake model verification, as the differences between the modelled and monitored NO2 are greater than 25%.

Table 3-1 Comparison of unadjusted and monitored NO_2 concentrations

Diffusion tube location	Background NO2 (µg m-3)	Monitored total NO2 (µg m-3)	Modelled total NO2 (µg m-3)	% difference (modelled vs. monitored)
B	3.8	9.6	4.98	-48.1%
C	3.9	11.1	5.20	-53.2%
D	4.5	15.1	6.92	-54.2%
E	3.9	9.8	4.97	-49.3%
F	3.8	9.3	4.87	-47.6%

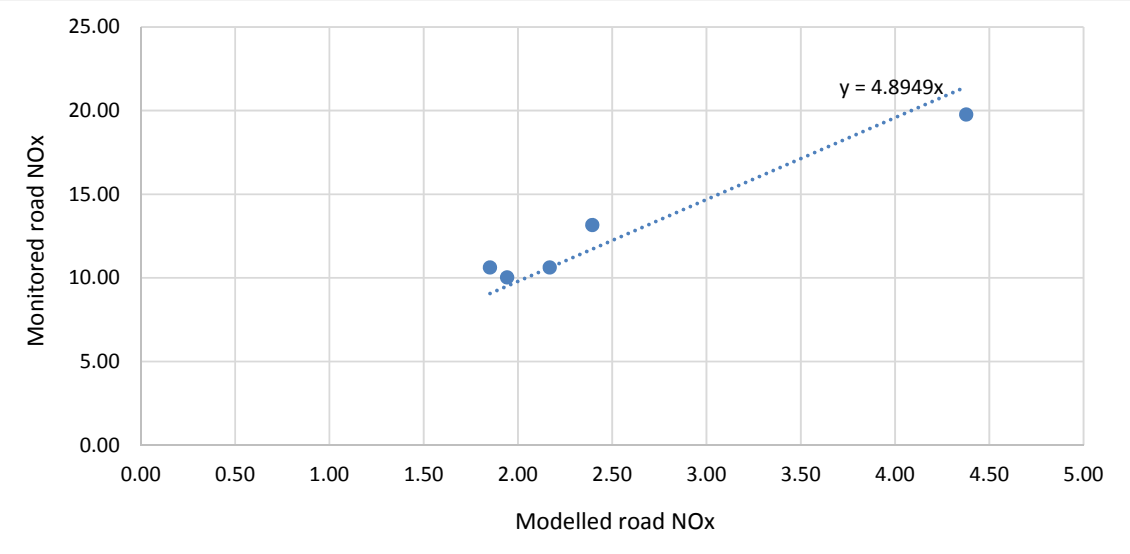
3.2.2 The data required for model adjustment is presented in Table 3.2.

Table 3-2 Model adjustment data

Diffusion tube location	Monitored road contribution NOx (µg m-3)	Modelled road contribution NOx (µg m-3)
B	10.62	2.17
C	13.16	2.40
D	19.76	4.38
E	10.62	1.85
F	10.02	1.94

3.2.3 Figure 3-1 provides a comparison of the modelled road contribution NOx versus modelled road contribution NOx and the equation of the trend line based on linear regression through zero for each of the verification areas. The equation of the trend line gives the adjustment factor which should be applied to the modelled results.

Figure 3-1 Adjustment factor line of regression



3.2.4 The raw results and the verified (adjusted) results for each of the diffusion tube locations are shown in Table 3.3.

Table 3-3 Model results after verification

Diffusion tube location	Monitored total NO2 (µg m-3)	Adjusted modelled total NO2 (µg m-3)	% difference (modelled vs. monitored)	Adjustment factor
B	9.6	9.6	<0.1%	4.89
C	11.1	10.3	-7.4%	4.89
D	15.1	16.0	5.7%	4.89
E	9.8	8.9	-9.0%	4.89
F	9.3	9.0	-2.9%	4.89

3.3 Results at Hum_1964

3.3.1 Using the updated adjustment factor calculated in section 3.2, the results at Hum_1964 with the diurnal profile in place are presented in Table 3.4. 'Baseline' and 'with project' scenarios for 2020 and 2023 have been evaluated.

Table 3-4 Annual mean NO_2 results at Hum_1964 with diurnal profile

Scenario	Raw road NOx concentration (µg m-3)	Adjusted modelled road NO2 (µg m-3)	Adjusted modelled total NO2 (µg m-3)	% PEC of AQS*
2020 base	3.60	9.55	13.68	34.2%
2020 project	4.81	12.59	16.73	41.8%
2023 base	3.36	8.93	13.07	32.7%
2023 project	5.11	13.34	17.47	43.7%

*AQS for annual mean NO2 is 40 µg m-3

3.3.2 The results in Table 3.4 show that, with a diurnal profile and an adjustment factor of 4.89, the results at Hum_1964 are significantly below the air quality standard (AQS) in both the 2020/2023 base and 2020/2023 with project scenarios.

3.4 Results comparison – with and without diurnal profile

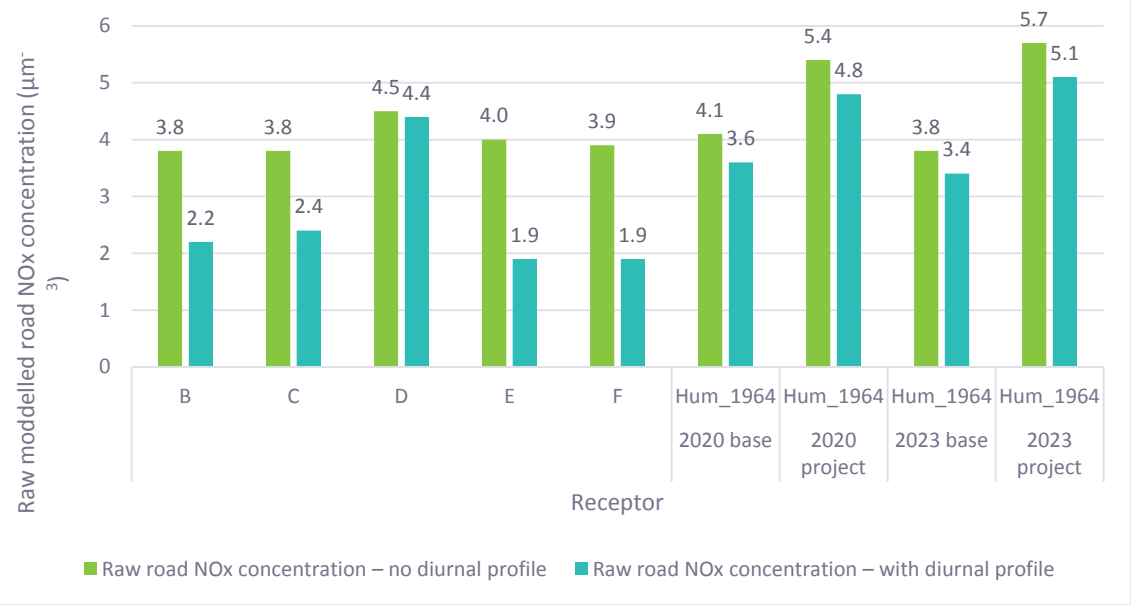
3.4.1 A comparison of the raw road contribution NOx concentrations (unadjusted) and the adjusted total NO2 concentrations at the receptor locations with and without the diurnal profile are presented in Table 3.5 and Figures 3.2 and 3.3. The adjustment factor for the No Profile scenario is 3.62 and the adjustment factor for the With Profile scenario is 4.89.

Table 3-5 Comparison of results with and without diurnal profile (µg m-3)

Scenario	Receptor location	Raw road NOx concentration – no diurnal profile	Raw road NOx concentration – with diurnal profile	Adjusted modelled total NO2 – no diurnal profile	Adjusted modelled total NO2 – with diurnal profile
2016 verification	B	3.8	2.2	11.3	9.6
2016 verification	C	3.8	2.4	11.4	10.3
2016 verification	D	4.5	4.4	13.2	16.0
2016 verification	E	4.0	1.9	11.9	8.9
2016 verification	F	3.9	1.9	11.4	9.0
2020 base	Hum_1964	4.1	3.6	12.3	13.7
2020 project	Hum_1964	5.4	4.8	14.7	16.7
2023 base	Hum_1964	3.8	3.4	11.5	13.1
2023 project	Hum_1964	5.7	5.1	15.0	17.5

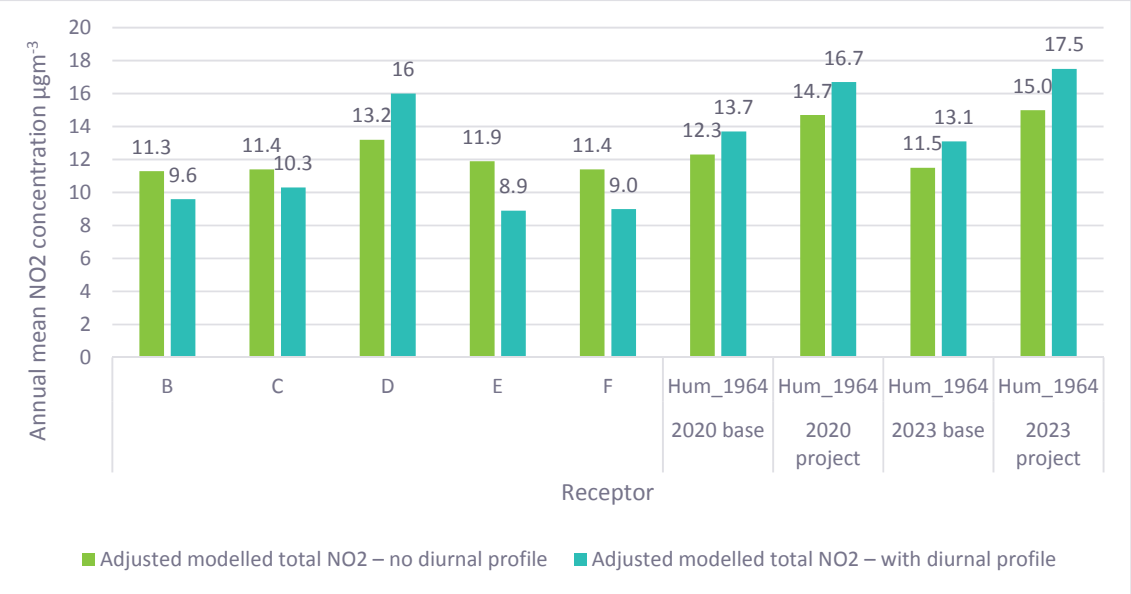
Note: the adjusted results for the No Profile scenario were derived using the same procedure as presented in section 3.2.

Figure 3-2 Comparison of results – raw modelled road NO_x



3.4.2 The data in Figure 3.2 show the comparison between the raw modelled road NOx (i.e. unadjusted) for the No Profile and With Profile scenarios. At all the receptors, the raw modelled road NOx is higher for the No Profile scenario.

Figure 3-3 Comparison of results – adjusted total modelled NO_2

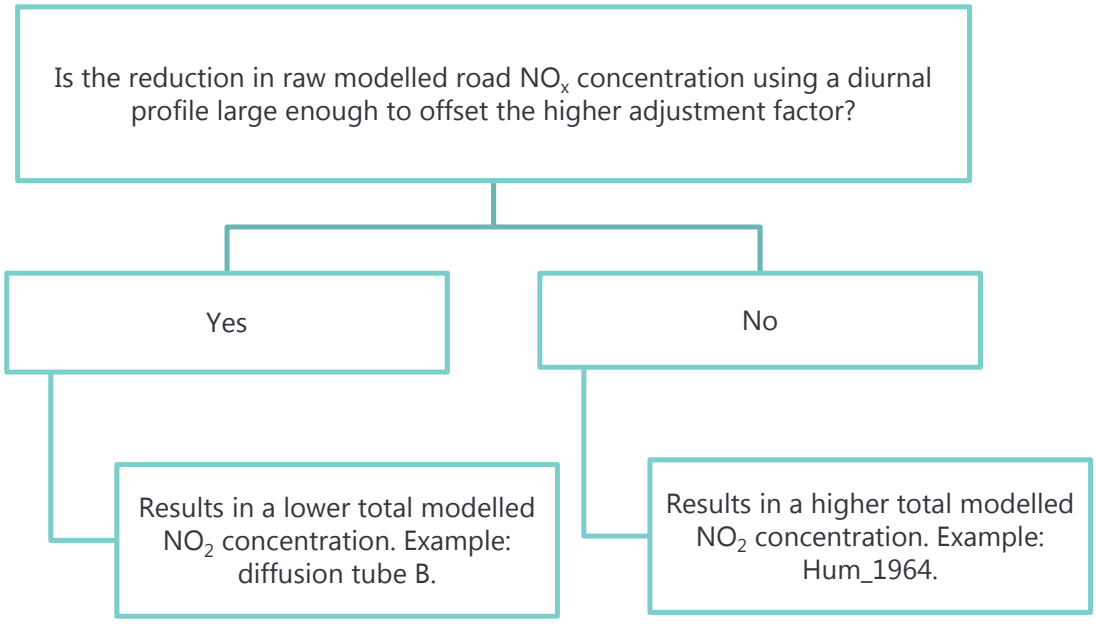


3.4.3 The data in Figure 3.3 compares the adjusted total modelled NO2 results for the No Profile and With Profile scenarios. For diffusion tubes B, C, E and F, using the diurnal profile results in lower total modelled NO2 concentrations. For diffusion tube D and Hum_1964 2020/2023 base/project, using the diurnal profile results in higher total modelled NO2 concentrations.

3.5 Discussion

3.5.1 The data in Table 3.5 and Figures 3.2 and 3.3 show that, for 4 of the receptors in this assessment, raw modelled roads NOx concentrations for the No Profile scenario are higher and therefore adjusted NO2 results at most receptors for the No Profile scenario are also higher, compared with those for the With Profile scenario. This is in spite of the higher adjustment factor derived for the With Profile scenario. At the other 2 receptors, diffusion tube D and Hum_1964, the reduction in raw NOx concentration as a result of using the diurnal profile is not significant enough to counteract the higher adjustment factor. Examples are shown in Figure 3.4 below.

Figure 3-4 Flow chart



3.5.2 The modelling demonstrates, therefore, that the use of a diurnal profile tends to reduce raw modelled road NOx concentrations, when compared with the No Profile scenario. However, the final, adjusted, total modelled NO2 results may increase or decrease, when compared with the No Profile scenario, due to the use of an adjustment factor.

The adjustment factor in the With Profile scenario has increased, because the ratio between the monitored road contribution NOx data and the modelled contribution NOx data has increased. This means that, where the use of a diurnal profile results in a decrease in raw modelled road NOx concentration that is significant enough to offset the increase in the adjustment factor, the overall total modelled NO2 result will be lower. However, the opposite is true if the diurnal profile results in a raw NOx concentration reduction that does not differ by a significant amount.

Appendix 1-1

Issued by	Approved by
.....	.....
Emma Dunabin	**Martin Peirce**

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Appendix 1-3 Updated traffic flows used in the noise assessment

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2020 reference case weekday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	3,427	158	5%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	3,598	278	8%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	8,221	272	3%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	6,672	1,181	18%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	7,093	1,473	21%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	3,337	162	5%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	861	18	2%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	6,355	1,461	23%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	9,176	1,394	15%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	9,294	1,680	18%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	7,977	1,550	19%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	8,185	1,646	20%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	9,275	1,600	17%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	9,390	1,754	19%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	6,111	304	5%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	6,111	304	5%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	5,974	336	6%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	5,974	336	6%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	5,974	336	6%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	4,773	219	5%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	4,796	221	5%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	4,796	221	5%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	4,556	275	6%	63

2020 reference case weekday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	4,157	284	7%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	4,157	284	7%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	3,848	246	6%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	3,848	246	6%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	3,457	254	7%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	3,249	230	7%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	3,267	233	7%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	3,220	217	7%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	1,903	366	19%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	6,121	441	7%	33

2020 reference case weekday 19:00-23:00 (4 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	285	10	3%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	304	10	3%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	802	20	2%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	556	101	18%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	709	190	27%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	299	14	5%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	68	1	2%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	640	189	29%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	784	120	15%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	940	203	22%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	553	120	22%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	819	201	25%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	667	123	18%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	929	208	22%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	592	20	3%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	592	20	3%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	572	21	4%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	572	21	4%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	572	21	4%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	327	8	2%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	328	8	2%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	328	8	2%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	413	18	4%	63

2020 reference case weekday 19:00-23:00 (4 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	370	17	5%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	370	17	5%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	293	14	5%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	293	14	5%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	304	15	5%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	276	14	5%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	283	13	5%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	247	13	5%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	3	0	0%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	477	5	1%	33

2020 reference case Saturday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	2,437	62	3%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	2,699	165	6%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	7,361	112	2%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	4,854	712	15%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	5,270	790	15%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	2,779	36	1%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	485	9	2%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	4,828	784	16%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	7,240	918	13%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	7,337	963	13%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	6,127	915	15%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	6,091	947	16%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	6,917	923	13%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	7,001	977	14%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	5,209	65	1%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	5,209	65	1%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	4,785	82	2%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	4,785	82	2%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	4,785	82	2%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	3,123	37	1%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	3,105	43	1%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	3,105	43	1%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	3,395	47	1%	63

2020 reference case Saturday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	2,998	51	2%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	2,998	51	2%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	3,391	59	2%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	3,391	59	2%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	2,368	49	2%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	2,198	41	2%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	2,228	53	2%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	2,782	48	2%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	307	264	86%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	4,454	301	7%	33

2020 reference case Saturday 08:00-13:00 (5 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	911	33	4%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	1,069	118	11%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	2,806	57	2%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	1,913	345	18%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	2,022	323	16%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	1,188	21	2%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	160	5	3%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	1,832	320	17%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	2,970	440	15%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	2,674	398	15%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	2,630	445	17%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	2,176	388	18%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	2,981	449	15%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	2,477	401	16%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	1,995	32	2%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	1,995	32	2%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	1,800	43	2%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	1,800	43	2%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	1,800	43	2%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	1,088	16	1%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	1,077	18	2%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	1,077	18	2%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	1,264	20	2%	63

2020 reference case Saturday 08:00-13:00 (5 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	1,146	24	2%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	1,146	24	2%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	1,556	30	2%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	1,556	30	2%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	869	18	2%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	823	17	2%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	834	16	2%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	1,243	18	1%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	165	147	89%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	1,848	169	9%	33

2020 DS no bypass weekday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	3,642	230	6%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	3,792	349	9%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	8,546	343	4%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	7,090	1,276	18%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	7,509	1,544	21%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	3,930	289	7%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	976	55	6%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	6,698	1,524	23%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	10,061	1,615	16%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	10,191	1,868	18%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	8,732	1,723	20%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	8,957	1,813	20%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	10,287	1,820	18%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	10,496	1,968	19%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	7,384	584	8%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	7,384	584	8%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	7,250	616	8%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	7,250	616	8%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	7,250	616	8%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	5,859	452	8%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	5,883	455	8%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	5,883	455	8%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	5,642	519	9%	63

2020 DS no bypass weekday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	5,218	537	10%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	5,218	537	10%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	4,957	484	10%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	4,957	484	10%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	4,437	443	10%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	4,239	420	10%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	4,254	431	10%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	4,192	398	10%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	2,173	509	23%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	6,603	586	9%	33

2020 DS no bypass weekday 19:00-23:00 (4 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	305	30	10%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	324	30	9%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	822	40	5%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	578	121	21%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	732	211	29%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	342	35	10%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	88	21	24%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	661	210	32%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	829	142	17%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	829	224	23%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	597	142	24%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	840	222	26%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	714	145	20%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	950	229	24%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	656	62	9%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	656	62	9%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	623	61	10%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	623	61	10%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	623	61	10%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	376	48	13%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	378	48	13%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	378	48	13%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	463	58	13%	63

2020 DS no bypass weekday 19:00-23:00 (4 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	420	58	14%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	420	58	14%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	342	54	16%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	342	54	16%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	353	55	16%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	326	54	17%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	332	54	16%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	296	53	18%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	43	40	94%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	517	45	9%	33

2020 DS no bypass Saturday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	2,539	112	4%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	2,782	215	8%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	7,466	162	2%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	5,020	767	15%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	5,404	845	16%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	3,093	97	3%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	618	65	10%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	4,917	834	17%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	7,584	979	13%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	7,699	1,024	13%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	6,420	972	15%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	6,416	1,004	16%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	7,313	980	13%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	7,467	1,034	14%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	5,974	232	4%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	5,974	232	4%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	5,553	249	4%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	5,553	249	4%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	5,553	249	4%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	3,808	170	4%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	3,790	176	5%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	3,790	176	5%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	4,089	215	5%	63

2020 DS no bypass Saturday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	3,694	221	6%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	3,694	221	6%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	4,087	229	6%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	4,087	229	6%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	3,008	186	6%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	2,836	178	6%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	2,866	190	7%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	3,420	185	5%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	497	364	73%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	4,644	401	9%	33

2020 DS no bypass Saturday 08:00-13:00 (5 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	974	83	8%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	1,131	168	15%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	2,869	107	4%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	1,976	395	20%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	2,084	374	18%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	1,277	74	6%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	221	55	25%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	1,894	370	20%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	3,060	494	16%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	2,791	449	16%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	2,719	498	18%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	2,294	439	19%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	3,072	501	16%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	2,596	453	17%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	2,228	166	7%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	2,228	166	7%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	2,034	177	9%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	2,034	177	9%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	2,034	177	9%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	1,281	120	9%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	1,270	122	10%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	1,270	122	10%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	1,486	154	10%	63

2020 DS no bypass Saturday 08:00-13:00 (5 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	1,369	158	12%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	1,369	158	12%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	1,779	164	9%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	1,779	164	9%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	1,062	122	12%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	1,016	121	12%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	1,027	120	12%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	1,436	123	9%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	289	247	85%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	1,973	269	14%	33

2023 reference case weekday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	3,496	160	5%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	3,669	280	8%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	8,400	275	3%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	6,819	1,196	18%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	7,256	1,493	21%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	3,403	164	5%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	879	18	2%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	6,505	1,481	23%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	9,380	1,411	15%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	9,498	1,702	18%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	8,145	1,570	19%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	8,362	1,668	20%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	9,479	1,620	17%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	9,597	1,778	19%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	6,229	306	5%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	6,229	306	5%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	6,089	339	6%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	6,089	339	6%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	6,089	339	6%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	4,855	221	5%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	4,881	224	5%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	4,881	224	5%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	4,635	277	6%	63

2023 reference case weekday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	4,224	286	7%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	4,224	286	7%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	3,903	248	6%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	3,903	248	6%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	3,504	256	7%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	3,293	231	7%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	3,311	234	7%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	3,260	218	7%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	1,903	366	19%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	6,225	441	7%	33

2023 reference case weekday 19:00-23:00 (4 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	292	10	3%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	311	10	3%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	820	20	2%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	569	102	18%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	726	193	27%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	305	14	4%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	69	1	2%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	656	192	29%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	802	121	15%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	962	206	21%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	565	121	21%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	839	204	24%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	682	125	18%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	951	211	22%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	607	20	3%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	607	20	3%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	586	21	4%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	586	21	4%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	586	21	4%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	334	8	2%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	336	8	2%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	336	8	2%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	423	18	4%	63

2023 reference case weekday 19:00-23:00 (4 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	379	18	5%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	379	18	5%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	299	14	5%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	299	14	5%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	310	15	5%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	283	14	5%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	289	13	5%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	252	13	5%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	3	0	0%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	487	5	1%	33

2023 reference case Saturday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	2,495	63	3%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	2,762	166	6%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	7,532	113	2%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	4,983	718	14%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	5,410	797	15%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	2,838	36	1%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	497	10	2%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	4,957	791	16%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	7,422	924	12%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	7,521	970	13%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	6,280	922	15%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	6,243	954	15%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	7,090	930	13%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	7,176	985	14%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	5,344	65	1%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	5,344	65	1%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	4,907	83	2%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	4,907	83	2%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	4,907	83	2%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	3,204	37	1%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	3,184	43	1%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	3,184	43	1%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	3,485	48	1%	63

2023 reference case Saturday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	3,078	52	2%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	3,078	52	2%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	3,477	60	2%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	3,477	60	2%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	2,428	49	2%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	2,253	41	2%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	2,283	53	2%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	2,850	48	2%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	307	264	86%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	4,553	301	7%	33

2023 reference case Saturday 08:00 - 13:00 (5 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	933	33	4%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	1,093	118	11%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	2,872	58	2%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	1,964	350	18%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	2,075	326	16%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	1,213	21	2%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	164	5	3%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	1,881	323	17%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	3,043	445	15%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	2,741	402	15%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	2,695	450	17%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	2,231	392	18%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	3,054	453	15%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	2,539	406	16%	97
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	2,048	32	2%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	2,048	32	2%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	1,848	44	2%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	1,848	44	2%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	1,848	44	2%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	1,119	16	1%	63
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	1,106	18	2%	63
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	1,106	18	2%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	1,299	20	2%	63

2023 reference case Saturday 08:00 - 13:00 (5 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total Vehicles	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	1,178	24	2%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	1,178	24	2%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	1,598	30	2%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	1,598	30	2%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	892	18	2%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	845	17	2%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	856	16	2%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	1,276	18	1%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	165	147	89%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	1,889	169	9%	33

2023 DS with bypass weekday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	3,717	267	7%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	3,881	386	10%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	8,732	382	4%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	7,320	1,331	18%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	7,776	1,616	21%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	4,360	317	7%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	1,116	138	12%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	6,887	1,582	23%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	10,590	1,616	15%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	10,659	1,879	18%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	9,188	1,717	19%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	9,359	1,815	19%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	10,816	1,767	16%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	10,945	1,924	18%	97
A5025_BY1_10	A5025	Valley Bypass (Roundabout - Eastern Arm)	10,972	755	7%	63
A5025_BY1_13	A5025	Valley Bypass (Roundabout - Northern Arm)	8,302	638	8%	63
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	8,302	638	8%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	8,302	638	8%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	8,160	670	8%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	8,160	670	8%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	8,160	670	8%	97
A5025_BY2_20	A5025	Llanfachraeth (S) to Llanfachraeth (N) (Via Bypass)	6,258	576	9%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	6,861	596	9%	97

2023 DS with bypass weekday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	6,915	570	8%	97
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	6,915	570	8%	97
A5025_BY3_30	A5025	Llanfaethlu Bypass (Roundabout - Southern Arm)	6,609	616	9%	97
A5025_BY3_31	A5025	Llanfaethlu Bypass (Roundabout - Northern Arm)	6,678	613	9%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	6,678	613	9%	97
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	6,243	631	10%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	6,176	631	10%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	5,903	578	10%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	5,903	578	10%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	5,448	561	10%	97
A5025_BY4_40	A5025	Cefn Coch Bypass (S) to Llanfairynghornwy turn-off (Via Bypass)	5,188	578	11%	97
A5025_BY4_41	A5025	Llanfairynghornwy turn-off to Cefn Coch Bypass (N) (Via Bypass)	5,157	572	11%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	5,256	573	11%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	5,283	585	11%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	5,215	551	11%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	2,193	581	26%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	6,732	658	10%	33

2023 DS with bypass weekday 19:00-23:00 (4 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	312	30	10%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	331	30	9%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	840	40	5%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	594	122	21%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	758	215	28%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	384	34	9%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	89	21	24%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	681	213	31%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	885	141	16%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	987	228	23%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	648	142	22%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	861	226	26%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	781	145	19%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	973	233	24%	97
A5025_BY1_10	A5025	Valley Bypass (Roundabout - Eastern Arm)	939	71	8%	63
A5025_BY1_13	A5025	Valley Bypass (Roundabout - Northern Arm)	712	61	9%	63
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	712	61	9%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	712	61	9%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	669	62	9%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	669	62	9%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	669	62	9%	97
A5025_BY2_20	A5025	Llanfachraeth (S) to Llanfachraeth (N) (Via Bypass)	414	53	13%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	467	54	12%	97

2023 DS with bypass weekday 19:00-23:00 (4 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	418	49	12%	97
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	418	49	12%	97
A5025_BY3_30	A5025	Llanfaethlu Bypass (Roundabout - Southern Arm)	502	58	12%	97
A5025_BY3_31	A5025	Llanfaethlu Bypass (Roundabout - Northern Arm)	505	58	12%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	505	58	12%	97
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	461	58	13%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	461	58	13%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	381	54	14%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	381	54	14%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	345	53	15%	97
A5025_BY4_40	A5025	Cefn Coch Bypass (S) to Llanfairynghornwy turn-off (Via Bypass)	354	55	15%	97
A5025_BY4_41	A5025	Llanfairynghornwy turn-off to Cefn Coch Bypass (N) (Via Bypass)	355	54	15%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	364	54	15%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	371	54	15%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	334	53	16%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	43	40	94%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	527	45	9%	33

2023 DS with bypass Saturday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	2,640	163	6%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	2,896	267	9%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	7,681	214	3%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	5,234	824	16%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	5,638	903	16%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	3,420	159	5%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	708	116	16%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	5,099	892	17%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	8,043	1,047	13%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	8,043	1,093	13%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	6,840	1,039	15%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	6,831	1,071	16%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	7,779	1,048	13%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	7,944	1,103	14%	97
A5025_BY1_10	A5025	Valley Bypass (Roundabout - Eastern Arm)	8,256	386	5%	63
A5025_BY1_13	A5025	Valley Bypass (Roundabout - Northern Arm)	6,727	322	5%	63
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	6,727	322	5%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	6,727	322	5%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	6,289	340	5%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	6,289	340	5%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	6,289	340	5%	97
A5025_BY2_20	A5025	Llanfachraeth (S) to Llanfachraeth (N) (Via Bypass)	4,447	294	7%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	4,890	309	6%	97

2023 DS with bypass Saturday 06:00-00:00 (18 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	4,591	300	7%	97
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	4,591	300	7%	97
A5025_BY3_30	A5025	Llanfaethlu Bypass (Roundabout - Southern Arm)	4,852	308	6%	97
A5025_BY3_31	A5025	Llanfaethlu Bypass (Roundabout - Northern Arm)	4,889	305	6%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	4,889	305	6%	97
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	4,488	311	7%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	4,472	302	7%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	4,871	311	6%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	4,871	311	6%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	4,455	305	7%	97
A5025_BY4_40	A5025	Cefn Coch Bypass (S) to Llanfairynghornwy turn-off (Via Bypass)	3,559	291	8%	97
A5025_BY4_41	A5025	Llanfairynghornwy turn-off to Cefn Coch Bypass (N) (Via Bypass)	3,577	293	8%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	3,642	293	8%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	3,677	306	8%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	4,244	300	7%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	593	465	78%	20
NEW_SITE_&_VISITOR_CENTRE_AC	Access Roads	New Site Access & Visitor Centre Access Junction	1,183	263	22%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	4,839	502	10%	33

2023 DS with bypass Saturday 08:00-13:00 (5 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total	HGV + PSV	HGV + PSV%	Speed (kph)
A55_J2_ON-SLIP_EB	A55	A55 J2 on-slip EB - EB	1,041	134	13%	63
A55_J2_OFF-SLIP_WB	A55	A55 J2 off-slip WB - WB	1,201	219	18%	63
A55_J2_OVER_BRIDGE	A55	A55 J2 bridge SB	2,980	159	5%	33
A55_J2_J3_EB	A55	A55 J2 (Parc Cybi - A5153) to A55 J3 (Valley) - EB	2,072	450	22%	97
A55_J2_J3_WB	A55	A55 J3 (Valley) to A55 J2 (Parc Cybi - A5153) - WB	2,184	427	20%	97
A55_J3_ON-SLIP_EB	A55	A55 J3 on-slip EB - EB	1,413	132	9%	97
A55_J3_OFF-SLIP_EB	A55	A55 J3 off-slip EB - EB	270	106	39%	97
A55_J3_THR_JCT_WB	A55	A55 J3 through WB - WB	1,989	424	21%	97
A55_J3_J4_EB	A55	A55 J3 (Valley) to A55 J4 (Dalar Hir) - EB	3,245	556	17%	97
A55_J3_J4_WB	A55	A55 J4 (Dalar Hir) to A55 J3 (Valley) - WB	3,245	511	17%	97
A55_J4_THR_JCT_EB	A55	A55 J4 through EB - EB	2,896	560	19%	97
A55_J4_THR_JCT_WB	A55	A55 J4 through WB - WB	2,452	501	20%	97
A55_J4_J5_EB	A55	A55 J4 (Dalar Hir) to A55 J5 (A4080) - EB	3,258	564	17%	97
A55_J4_J5_WB	A55	A55 J5 (A4080) to A55 J4 (Dalar Hir) - WB	2,763	515	19%	97
A5025_BY1_10	A5025	Valley Bypass (Roundabout - Eastern Arm)	3,038	279	9%	63
A5025_BY1_13	A5025	Valley Bypass (Roundabout - Northern Arm)	2,469	253	10%	63
A5025_12	A5025	Valley to Llanghenedl (Valley Bypass to Speed Limit Change 2)	2,469	253	10%	97
A5025_13	A5025	Valley to Llanghenedl (Speed Limit Change 2 to Llanghenedl)	2,469	253	10%	63
A5025_20	A5025	Llanghenedl to Llanfachraeth (S) (Llanghenedl to Speed Limit Change 1)	2,272	264	12%	63
A5025_21	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 1 to Speed Limit Change 2)	2,272	264	12%	63
A5025_22	A5025	Llanghenedl to Llanfachraeth (S) (Speed Limit Change 2 to Llanfachraeth Bypass)	2,272	264	12%	97
A5025_BY2_20	A5025	Llanfachraeth (S) to Llanfachraeth (N) (Via Bypass)	1,516	238	16%	97
A5025_61	A5025	Llanfwrog turn-off to Llanfigael turn-off (Llanfachraeth Bypass (N) to Llanfigael turn-off)	1,674	245	15%	97

2023 DS with bypass Saturday 08:00-13:00 (5 hour) traffic flows for noise predictions (links with project HGVs only)

Link ID	Road Network	Link Description	Total	HGV + PSV	HGV + PSV%	Speed (kph)
A5025_70	A5025	Llanfigael turn-off to Black Lion (Llanfigael turn-off to Speed Limit Change 1)	1,524	239	16%	97
A5025_71	A5025	Llanfigael turn-off to Black Lion (Speed Limit Change 1 to Llanfaethlu Bypass)	1,524	239	16%	97
A5025_BY3_30	A5025	Llanfaethlu Bypass (Roundabout - Southern Arm)	1,706	243	14%	97
A5025_BY3_31	A5025	Llanfaethlu Bypass (Roundabout - Northern Arm)	1,717	241	14%	97
A5025_82	A5025	Black Lion to Llanfaethlu (Speed Limit Change 2 to Llanfaethlu)	1,717	241	14%	97
A5025_90	A5025	Llanfaethlu to Chapel St (Llanfaethlu to Speed Limit Change 1)	1,596	245	15%	63
A5025_91	A5025	Llanfaethlu to Chapel St (Speed Limit Change 1 to Chapel St)	1,586	236	15%	63
A5025_100	A5025	Chapel St to Llanrhyddlad (Chapel St to Speed Limit Change 1)	2,006	242	12%	63
A5025_101	A5025	Chapel St to Llanrhyddlad (Speed Limit Change 1 to Llanrhyddlad)	2,006	242	12%	97
A5025_110	A5025	Llanrhyddlad to Cylch-y-Garn (Llanrhyddlad to Cefn Coch Bypass (S))	1,815	238	13%	97
A5025_BY4_40	A5025	Cefn Coch Bypass (S) to Llanfairynghornwy turn-off (Via Bypass)	1,215	226	19%	97
A5025_BY4_41	A5025	Llanfairynghornwy turn-off to Cefn Coch Bypass (N) (Via Bypass)	1,226	227	19%	97
A5025_131	A5025	Llyn Llygeirian turn-off to Nanner Road (Cefn Coch Bypass (N) to Nanner Road)	1,249	227	18%	97
A5025_140	A5025	Nanner Road to Llanfechell turn-off	1,264	228	18%	97
A5025_150	A5025	Llanfechell turn-off to Tregele (Lanfechell turn-off to Visitor Centre Access)	1,684	230	14%	97
PARC_CYBI_ACCESS_10	Access Roads	Parc Cybi & Cae Glas (Land & Lakes) Access Junction	380	348	92%	20
A5153_20	Other Roads	A55 J2 to Kingsland & Parc Cybi/Cae Glas Accesses	2,104	370	18%	33