HyNet North West

ENVIRONMENTAL STATEMENT (VOLUME II)

Chapter 17 – Traffic and Transport (Tracked Change)

HyNet Carbon Dioxide Pipeline

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulations 5(2)(a)

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17.1. INTRODUCTION

17.1.1. This Chapter considers the likely significant effects of the DCO Proposed Development on the environment in respect of Traffic and Transport.

17.1.1. This Chapter reports the assessment of the likely significant effects of the DCO Proposed Development on Traffic and Transport and describes:

- Relevant, legislation, policy and guidance;
- Consultation undertaken;
- Scope of the assessment;
- Assessment methodology;
- Baseline conditions;
- Sensitive receptors;
- Design development and embedded mitigation;
- Assessment of likely impacts and effects;
- Mitigation and enhancement measures;
- Residual effects;
- Monitoring; and
- Next steps.

17.1.2. This Chapter (and its associated figures and appendices) is intended to be read as part of the wider Environmental Statement (ES) with particular reference to **Chapter 3 - Description of the DCO Proposed Development**, **Chapter 6 - Air Quality**, **Chapter 15 - Noise and Vibration**, and **Chapter 19 – Combined and Cumulative Effects (Volume II).** This Chapter is also accompanied by a number of figures, listed in **Table 17.1** and contained in **Volume IV.**

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17.1.3. A **Transport Assessment (Appendix 17.13, Volume III)**, **Interim Worker Travel Plan (Appendix 17.14, Volume III)**, and **Outline Construction Traffic Management Plan (OCTMP) (Document Reference: D.6.5.3)** also accompany the DCO Application.

17.1.4. This Chapter has been prepared by competent experts with relevant and appropriate experience. Expertise and competency are detailed in **Appendix 5.1 - Relevant Expertise and Competency (Volume III)**.

17.2. LEGISLATION, POLICY AND GUIDANCE

17.2.1. A summary of the international, national, and local legislation, planning policy and guidance relevant to this Chapter is set out below.

LEGISLATIVE FRAMEWORK

17.2.2. Relevant legislation includes:

The Highways Act 1980

17.2.3. The Highways Act sets out the management and maintenance of highways, and defines the various authorities responsible for such.

The Road Traffic Act 1988

17.2.4. This covers the correct and appropriate use of vehicles on the road in the UK, concerning licencing of vehicles, insurance and road regulation.

The New Roads and Street Works Act 1991

17.2.5. This Act outlines a code of Practice for the Co-ordination of Street Works and Works for Road Purposes and Related Matters.

The Traffic Management Act 2004

17.2.6. This places a duty on local authorities to make sure traffic moves freely and quickly on their roads and the roads of nearby authorities and outlines the measures for doing this when works are being undertaken.

The Road Vehicles (Construction & Use) Regulations 1986

17.2.7. These regulations ensure that vehicles are made to high standards, to ensure that such standards are maintained while in use and that they are roadworthy.

The Road Vehicles (Authorised Weight) Regulations 1998

17.2.8. These regulations concern the licensing of vehicles, insurance and road regulation for vehicles associated with transporting goods, setting out maximum authorised axle weights.

POLICY

17.2.9. Relevant policy includes:

- ~~Ministry~~ Ministry of Housing, Communities, and Local Government 'The National Planning Policy Framework' (NPPF) (2021);
- Welsh Government 'Planning Policy Wales' Edition 11 (2021);
- The National Development Framework: Future Wales – The National Plan 2040;
- Flintshire County Council Flintshire Local Development Plan (2015-2030);
- Cheshire West and Chester Council Local Plan Part 1 (Strategic Policies), Adopted 2015;
- The Department for Energy and Climate Change 'Overarching National Policy Statement for Energy (EN-1) 2011'; and
- North Wales Joint Local Transport Plan (2015).~~of Housing, Communities, and Local Government 'The National Planning Policy Framework' (NPPF) (2021);~~
- ~~Welsh Government 'Planning Policy Wales' Edition 11 (2021);~~
- ~~The National Development Framework: Future Wales – The National Plan 2040;~~
- ~~Flintshire County Council Emerging Flintshire Local Development Plan (2015-2030);~~
- ~~Cheshire West and Chester Council Local Plan Part 1 (Strategic Policies), Adopted 2015;~~
- ~~The Department for Energy and Climate Change 'Overarching National Policy Statement for Energy (EN-1) 2011'; and~~
- ~~North Wales Joint Local Transport Plan (2015).~~

GUIDANCE

17.2.10. Relevant guidance includes:

- Institute for Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic (1993) **(Ref. 17.1)**;
- Ministry of Housing, Communities, and Local Government (MHCLG) (2015). Transport Evidence Bases in Plan Making and Decision Making **(Ref. 17.2)**;
- Highways England (2020) 'DMRB LA 112' – Population and Human Health'(**Ref. 17.3);**
- Department for Transport (2021) 'TAG Unit A3' – Environmental Impact Appraisal (**Ref. 17.4);**
- Department for Transport (2018) 'Transport Analysis Guidance' – The Transport Appraisal Process (Ref. **17.5**);

- Highways Agency (2008) 'DMRB Volume 11 Section 2 Part 5' – Environmental Assessment. Environmental Impact Assessment and management of environmental effects **(Ref. 17.6);**
- Department for Transport (2020) 'TAG Unit M1.2' – Data Sources and Surveys **(Ref. 17.7);**
- DfT Transport Appraisal Guidance (TAG) UNIT A4.1 Social Impact Appraisal **(Ref. 17.8);**
- DMRB LA104: Environmental assessment and Monitoring Rev 1 (**Ref. 17.9);**
- DMRB guidance (Volume 11, Section 3, Part 8)[1] **(Ref. 17.10);**
- Trip End Model Presentation Programme (TEMPro) v7.2 (8 August 2022) https://www.gov.uk/government/publications/tempro-downloads (**Ref. 17.11**);
- Department for Transport (DfT) Guide to Lorry Types and Weights (July 2013) https://www.gov.uk/government/publications/guide-to-lorry-types-and-weights (**Ref 17.12**);
- Welsh Government A55 A494 A548: Flintshire Corridor (September 2021) https://gov.wales/a55-a494-a548-flintshire-corridor-overview (**Ref. 17.13**);
- Welsh Government Roads Review Oral Statement (June 2021) https://record.assembly.wales/Plenary/12317#A66072; (**Ref. 17.14**) and
- National Highways Chief Analysts Division Guidance on traffic data collection (September 2021) (**Ref 17.15**)

17.3. SCOPING OPINION AND CONSULTATION

RESPONSE TO THE SCOPING OPINION

17.3.1. An EIA Scoping Opinion (**Appendix 1.2** – **EIA Scoping Opinion, Volume III**) was received by the Applicant from the Planning Inspectorate (The Inspectorate) on 14 July 2021, including formal responses from Statutory Consultees. A full list of the responses from The Inspectorate and how these requirements have been addressed by the Applicant are set out in **Appendix 1.3 – EIA Scoping Opinion Responses (Volume III).**

17.3.2. The responses from the Local Planning Authorities (LPAs), Local Highways Authorities (LHAs), North and Mid Wales Trunk Road Agent (NMWTRA), and National Highways to the EIA Scoping Opinion in relation to Traffic and

[1] Whilst this has been formally withdrawn, it has not been superseded by equivalent relevant guidance, and, as such, is still considered to be appropriate for use as the foundation of assessment.

Transport and how these requirements have been addressed by the Applicant are set out in **Appendix 1.3 - EIA Scoping Opinion Response (Volume III)**.

CONSULTATION UNDERTAKEN TO DATE

17.3.3. **Table 17.2** provides a summary of the consultation and engagement undertaken to inform the Traffic and Transport assessment.

17.3.4. The purpose of these meetings was to:

- Introduce the Project and DCO Proposed Development to key stakeholders;
- Discuss and agree the approach to assessment;
- Scope supporting technical documentation including the Transport Assessment, OCTMP, and Interim Worker Travel Plan;
- Discuss topic specific issues such as methods of construction, working locations, and construction traffic routes; and
- Confirm approach to data collections and surveys.

17.3.5. All parties confirmed a willingness to work collaboratively to ensure robust assessment work and to maintain an ongoing dialogue as the DCO Proposed Development develops.

Table 17.2 - Summary of Consultation Undertaken

Body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
Flintshire County council (FCC)	Teleconference 12 May 2021	**FCC** The traffic and transport team confirmed that a Transport Assessment will be appended to the ES Chapter. The traffic and transport team stated an intention to commence surveys in June 2021 and that they will cross compare with historic data. FCC confirmed that they would be happy with this approach in principle and could provide data for this comparison. FCC confirmed that they could provide traffic data although this might not have been kept up to date. If so, CrashMap would be an acceptable alternative. FCC agreed to provide a list of relevant colleagues for road safety and Public Rights of Way (PRoW). The traffic and transport team agreed to report back with any proposed changes to the survey methodology.
Cheshire West and Chester Council (CWCC)	Teleconference 14 May 2021	The project team introduced the DCO Proposed Development, the traffic and transport project team, discussed survey methodology, and contacts for specific enquiries, for example, road closure/diversions, and accident/ traffic flow data. **CWCC** In regard to traffic surveys, CWCC acknowledged the sensitivities around post-pandemic traffic flows and advised that depending on the timing of surveys, cross-comparison with pre-2020 traffic flows may be required. CWCC advised that accident data could be purchased from their road safety team. CWCC requested further information regarding the construction programme and likely start dates for the work. It was agreed that additional counts and cross comparison would be carried out, or a postponement of surveys would be required. At the close of the meeting future meetings and likely timings of those was agreed.
North and Mid Wales Trunk Road Agent (NMWTRA)	Teleconference 5 August 2021	The DCO Proposed Development traffic and transport team provided an introduction to the DCO Proposed Development, and led a discussion around the scope of assessment, and moratorium on new road schemes in Wales. NMWTRA advised the DCO Proposed Development traffic and transport team to consider status of road schemes at time of completing the assessment, following the Roads Review in Wales (**Ref.**

Body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
		17.14). The traffic and transport team agreed that the assessment would reflect the current status of the review at that time.
Cheshire West and Chester Council	Teleconference 11 November 2021	This was a short update meeting held to discuss surveys undertaken for preparation of the Preliminary Environmental Information Report (PEIR). The Traffic and Transport team discussed the presence of works along the A5117 associated with new cycling facilities including traffic management, and the likely impact on Traffic and Transport surveys. CWCC advised that this was not in place at the time of survey for the PEIR and therefore would not affect the outputs.
Cheshire West and Chester Council	Teleconference 24 March 2022	This meeting was held to provide an update on the status of the DCO Proposed Development following the PEIR and to discuss planned next steps with CWCC officers. The traffic and transport team confirmed that the latest tranche of survey information which would underpin the assessment work would be completed by the end of March. Agreed that the next steps would be to confirm the scope of assessment, via a Scoping Note, and share road crossing locations and diversion routes. Traffic and transport team agreed that they would do so and share this information via email to CWCC.
Flintshire County Council - Highways	Teleconference 4 April 2022	This meeting covered the DCO and TCPA Applications. The DCO Proposed Development traffic and transport team provided an update on the progress of the DCO Proposed Development and likely timescales associated with the finalisation of the Preliminary Design. Confirmed timescales of statutory consultation period for the DCO, following submission of the ES. Traffic and transport team confirmed that 50 surveys had been completed and that this data was now informing the selection of construction traffic routes. FCC confirmed that they were keen to understand what the impacts are (if any) during the Construction Stage. Agreed that the next steps would be to confirm the scope of assessment, via a Scoping Note, and share road crossing locations and diversion routes. Traffic and transport team agreed that they would do so and share this information via email to FCC.
Cheshire West and	Teleconference 19 May 2022	The DCO Proposed Development traffic and transport team provided an update on timescales for the DCO submission and construction programme and provided an overview of the latest design including

Body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
Chester Council		construction activities at working locations and estimates of construction traffic volumes. The approach to traffic assessment and PRoW was also discussed. CWCC made the request to understand more detail on daily and hourly movements in order to understand the likely traffic impacts. CWCC expressed concern with proposed access to the Centralised Compound off Old Cryers Lane, Picton Lane, and Chorlton Lane. The Applicant was requested to consider relocation to the section of Cryers Lane south of the signal junction with the A5117 on this basis. CWCC confirmed that before and after dilapidation surveys would be required. Where road closures are proposed, CWCC wanted the opportunity to review and comment in advance of the DCO submission. CWCC accepted that whilst numbers would need to be confirmed it would appear that the DCO Proposed Development is unlikely to have an impact on highway capacity. CWCC also requested that swept paths are provided to demonstrate the suitability of construction traffic routes to Construction Compounds. Traffic and Transport team committed to produce and issue a TA Scoping Note for CWCC comment w/e 3rd June. In addition to the TA also confirmed that an Outline CTMP and Interim Worker Travel Plan would be prepared.
Flintshire County Council – Highways	Teleconference 30 May 2022	The scope of the supporting transport documents for the ES Chapter was discussed. An overview of construction programme and activities at working locations and estimates of construction traffic volumes was discussed. The approach to traffic assessment and PRoW was also discussed. FCC confirmed that they would need to see the detail in terms of construction traffic volumes across the programme on construction traffic routes to understand likely impacts. Traffic and transport team committed to producing and issuing a TA Scoping Note for FCC comment w/e 3rd June. In addition to the TA also confirmed that an Outline CTMP and Interim Worker Travel Plan would be prepared.
Flintshire County Council – Public Rights of Way	Teleconference 28 June 2022	Proposed PRoW diversions and the approach to temporary management at each location were discussed, confirming that all diversions would be temporary. FCC confirmed that they were broadly happy with the proposed approach but temporary closures may be appropriate in some locations.

Body / organisation	Meeting dates and other forms of consultation	Summary of outcome of discussions
North and Mid Wales Trunk Road Agent	Teleconference 29 July 2022	A summary of the Traffic and Transport assessment approach was discussed. Given the scale of traffic expected to be generated by the DCO Proposed Development, the assessment does not include strategic modelling or an assessment of the impact of the completed Flintshire Corridor scheme its Construction Stage. NMWTRA requested a list of Strategic Road Network (SRN) junctions and indicative Annual Average Daily Traffic (AADT) flows on the A494. The project team explained that the preferred route would clash with the DCO Proposed Development. However, the scheme is still at options stage and is on hold. The traffic and transport team explained that the publicly available, and now outdated, programme for the Flintshire Corridor scheme indicated that the DCO Proposed Development was likely to be operational prior to the commencement of construction of the Flintshire Corridor scheme. The Applicant requested an update on the status of the Flintshire Corridor scheme. NMWTRA clarified that the scheme is still on hold (per all road schemes in Wales) pending climate review by Welsh Ministers.

17.4. SCOPE OF THE ASSESSMENT

17.4.1. The scope of this assessment was set out in the **EIA Scoping Report (Appendix 1.1, Volume III)** and revised on the basis of the **Scoping Opinion (Appendix 1.2, Volume III).** Further modifications have been necessitated following the receipt of Preliminary Design information, including traffic volumes associated with the DCO Proposed Development. Further information can be found in **Chapter 5 - EIA Methodology (Volume II)** of this ES and **Appendix 17.2 - Methodology (Volume III)**.

17.4.2. This section provides an update to the Scoping Report and re-iterates the evidence base for scoping out elements following the assessment carried out within the **PEIR (D.0.9.17)**.

ELEMENTS SCOPED OUT OF THE ASSESSMENT

17.4.3. The elements shown in **Table 17.3** are not considered to give rise to likely significant effects as a result of the DCO Proposed Development and have therefore not been considered within this assessment

Table 17.3 – Elements Scoped Out of the Assessment

Element Scoped Out	Justification
Operational Stage	The operation of the DCO Proposed Development will not result in significantly increased traffic flow or changes to traffic composition.
Decommissioning Stage	Decommissioning activities are not anticipated to occur for a significant length of time and it is not possible for Traffic and Transport baseline conditions to be robustly understood.
Existing Flint Connection to PoA Terminal Pipeline	There are no construction activities associated with this pipeline, as an existing pipeline, therefore an assessment for this has been scoped out.

17.4.4. It is anticipated that the operation of the DCO Proposed Development, including maintenance, will not result in any significant traffic and transport effects. Traffic generated by the DCO Proposed Development during the Operational Stage will typically relate to staff travel and infrequent maintenance activities that will have an imperceptible impact upon the operation of the Traffic and Transport network. Therefore, the Operational Stage of the DCO Proposed Development has been scoped out of the assessment.

17.4.5. Similarly, decommissioning of the DCO Proposed Development at its end of life has been excluded from the assessment. At that time the Newbuild Carbon Dioxide Pipeline and the Flint Connection to PoA Terminal Pipeline will be safely decommissioned and left in situ; meaning that less construction traffic will be associated with this process when compared to the Construction Stage.

Block Valve Stations (BVSs) and Above Ground Installations (AGIs) will be dismantled, cleared and the ground conditions restored to their previous conditions however these would not be expected to occur until a significant number of years into the future, at such a time when future baseline conditions would be very different, and difficult to predict accurately at this time.

17.4.6. The effects of additional traffic on diversion routes have not been assessed. The assessment also does not consider the impact of construction traffic serving secondary access locations. The justification for scoping out these elements is presented in **Appendix 17.2 Methodology (Volume III)**.

17.4.7. The delivery of Abnormal Indivisible Loads (AILs) may be required at working locations. When 'D6' bulldozers (or similar) are being transported between working locations they will have the front blades attached. In this configuration they will exceed the defined wide load category and would fall in the abnormal load category (having a width of more than 2.90 m). The 'Water Preferred Policy' (**Ref. 17.25**) would not apply to loads of this size. The transportation of D6 bulldozers are the only AILs that will be required for the DCO Proposed Development.

17.4.8. Abnormal loads are not considered within this assessment and will be assessed under separate cover by a specialist AIL contractor prior to construction.

ELEMENTS SCOPED INTO THE ASSESSMENT

17.4.9. There are a range of potential traffic impacts that could be caused by the DCO Proposed Development during construction without, or prior to, the implementation of mitigation measures.

17.4.10. The scoping process identified the potential for temporary effects due to increases in traffic flow (i.e. increases in Light Goods Vehicle (LGV) and Heavy Goods Vehicle (HGV) Traffic) and changes to traffic composition (i.e. increased proportion of HGVs) through construction.

17.4.11. The assessment considers the effects of the DCO Proposed Development during the Construction Stage on the following environmental effects: Severance, Driver Delay, Pedestrian Delay, Pedestrian Amenity, Fear and Intimidation, and Highway Safety.

17.4.12. The full methodology which has been used to assess the effects are presented in **Appendix 17.2 - Methodology (Volume III).**

Overview of Construction Stage Impacts

17.4.13. Construction activities will generate movements of HGVs and LGVs, and private vehicles for construction staff working at each working location. Access from the local road network (LRN) to working locations will require provision of temporary access tracks. In some locations, these temporary access tracks will be

upgraded and made permanent such as at BVSs and AGIs. In other locations, a permanent right of access might be required to enable occasional and periodic inspections and maintenance during the operation of the DCO Proposed Development. Traffic volumes associated with such activity will be negligible.

17.4.14. This assessment has used a reasonable worst-case scenario in terms of the quantity of construction traffic to the highway network in the Zone of Influence (described further in **Section 17.5**); considering 'Peak Month' construction activity, forecast to be during August 2024.

17.4.15. A wide variety of vehicle types will be used for the construction of the DCO Proposed Development. Vehicles will be required to transport people, equipment and materials.

17.4.16. Volumes of LGVs and HGVs associated with the Construction Stage of the DCO Proposed Development are detailed and assessed in **Appendix 17.7 - Construction Traffic Flows (Volume III)**.

17.4.17. For the purposes of the EIA and Transport Assessment (TA), the construction vehicles have been classified as follows, in accordance with the Driver and Vehicle Standards Agency Lorry types and weights guide (**Ref. 17.12**)

- LGV: Vehicle 3.5 tonnes or below in gross weight; and
- HGV: defined as any vehicle exceeding 3.5 tonne gross weight.

17.4.18. **Table 17.4** outlines the vehicle classification and typical vehicle types that will be required for the construction of the DCO Proposed Development.

Table 17.4 - Typical Construction Vehicle Classifications

LGVs	HGVS
Car, Van, 4x4 pick up, welfare van, Minibus	Excavator, soil compactor, HIAB/winch tractor, tractor and trailer,10 m and 12 m rigid vehicles, 20 tonne tippers, concrete mixer trucks 14 m and 16.5 m articulated vehicles, low loaders, cranes

17.4.19. Construction traffic volumes have been estimated based upon the Preliminary Design and based on working experience of similar projects.

Access

17.4.20. ~~There~~ There are 95 existing and 18 new access locations which have been proposed to facilitate the construction of the DCO Proposed Development. Access locations are presented in **Figure 17.5 - Access Locations (Volume IV).** ~~are 95 existing and eight new access locations which have been proposed to facilitate the construction of the DCO Proposed Development. Access locations are presented in **Figure 17.5 - Access Locations (Volume IV)**.~~

17.4.21. All the proposed access locations are located on the LRN and have been identified to maximise use of existing access locations and meet the construction requirements. The proposed access locations will provide a temporary link from the existing LRN to the Newbuild Infrastructure Boundary.

17.4.22. Access locations will be designed and constructed to accommodate the largest vehicles that will require access to each construction working location.

17.4.23. In addition to whether access locations are temporary or permanent, access locations are also categorised as ‘Primary’ or ‘Secondary’, defined below.

17.4.24. The approach to the assessment of access locations, including definitions, is set out in the **Access Principles Note**, **Annex D** of the **OCTMP (Document Reference: D.6.5.3)**. Both LHAs have subsequently confirmed in writing their acceptance of the principles contained within this document.

17.4.25. Primary Access Locations are those which will serve the following:

- Centralised Compounds;
- AGIs; or
- BVSs.

17.4.26. These locations are considered to represent key construction works locations where access for construction traffic will be sustained over a period of months.

17.4.27. All other access locations are designated as Secondary Access Locations. These represent locations where access for construction traffic will take place over a number of days or weeks, and outside of these activities the associated traffic volumes will be negligible.

17.4.28. Primary Access Locations include both temporary and permanent access locations. Secondary Access Locations are comprised of temporary access locations only.

17.4.29. This assessment considers prescribed construction traffic routes to Primary Access Locations that are both temporary and permanent – in the latter case where temporary access tracks will be upgraded and made permanent as at BVS and AGI, for example.

17.4.30. Further information on the methodology and matters scoped into the Traffic and Transport assessment is presented in **Appendix 17.2 - Methodology (Volume III)**.

Construction Compounds

17.4.31. A series of Construction Compounds will be established along the DCO Proposed Development Working Width:

- ‘Centralised’;

- ‘Localised’; and
- ‘Trenchless Crossing’.

17.4.32. A description of the Construction Compounds and their role in the construction of the DCO Proposed Development is presented in **Chapter 3 - Description of the Proposed Development (Volume II)**.

17.4.33. The summaries presented in the following sub-sections describe how these working locations will be used in construction of the Newbuild Carbon Dioxide Pipeline, AGIs and BVSs and present any relevant information regarding construction traffic.

Construction Traffic Summary by DCO Proposed Development Element

17.4.34. A summary of the vehicle movements associated with construction activities is set out below.

- Newbuild Carbon Dioxide Pipeline;
- AGIs; and
- BVSs

Newbuild Carbon Dioxide Pipeline

17.4.35. The majority of the Newbuild Carbon Dioxide Pipeline will be constructed via open trench method with trenchless installation techniques used at complex crossings, such as at major roads, watercourses, and rail Infrastructure.

17.4.36. For each of the pipelines which collectively form the Newbuild Carbon Dioxide Pipeline, following the survey of the route, the Working Width will be established. This will be undertaken in sections and requires construction of laydown areas, establishment of site offices including any security huts, removal and localised storage of topsoil, and erection of temporary fencing for both safety and security.

17.4.37. Construction traffic will be generated by the transportation of materials required for construction of the Newbuild Carbon Dioxide Pipeline. All pipe material will be delivered to the respective Centralised Compounds and stockpiled there. It will then be distributed to each of the local work-fronts by HGV/ tractor and trailer and strung out within the Working Width.

17.4.38. Construction traffic will also include that associated with the specialist trenchless installation plant and equipment, worker travel, and the transportation of bulk civils material.

17.4.39. Pipe sections will be distributed along the length of the route from a Centralised Compound. Where reasonably practical, all pipeline sections, materials, plant, and equipment will be transported along the Working Width. Where this is not feasible due to physical constraints (e.g. major waterways, roads, and rail lines), these items will be transported via the LRN.

17.4.40. As described earlier within this section and **Appendix 17.2 - Methodology (Volume III)**, it is anticipated that Trenchless Crossing Compounds and access to the Working Width from the LRN, using secondary access points, will only generate a material volume of construction traffic for a matter of days or weeks. Access to Trenchless Crossing Compounds and secondary access points outside of these periods of activities will be negligible.

17.4.41. However, construction traffic at Centralised Compounds, associated with the transportation and storage of bulk deliveries, worker traffic, pipeline sections, as well as plant and equipment, will be sustained throughout the construction programme. This is demonstrated in **Appendix 17.8 - Construction Traffic Profiles (Volume III)**.

Block Valve Stations and Above Ground Installations

17.4.42. Installation of BVSs and AGIs includes the provision of new permanent vehicular access for ongoing maintenance once the DCO Proposed Development is operational.

17.4.43. During construction, the construction of BVSs and AGIs will generate vehicular movements by HGVs and LGVs, delivering plant and materials, and for construction staff. In these locations, the temporary access location and temporary access track will be upgraded during the Construction Stage to provide permanent access for operation and maintenance activities.

17.4.44. Construction activities will take place over a shorter duration than at Centralised Compounds. Construction traffic volumes are also forecast to be less than at Centralised Compounds. This is demonstrated in **Appendix 17.7 - Construction Traffic Flows (Volume III)** and **Appendix 17.8 - Construction Traffic Profiles (Volume III)**

17.5. ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

ZONE OF INFLUENCE (ZOI)

17.5.1. Traffic and Transport effects are considered within the Zone of Influence (ZoI). This is a Study Area that includes areas of the Traffic and Transport network that could be impacted by the DCO Proposed Development. The ZoI for the Traffic and Transport EIA is presented in **Figure 17.1 - Traffic and Transport Zone of Influence (Volume IV)**.

17.5.2. Construction traffic will need to access working areas and Construction Compounds through temporary access points. All roads and junctions within the ZoI fall under the control of FCC, CWCC, NMWTRA, and National Highways.

17.5.3. The ZoI was identified during the scoping stage and is based on the professional judgement as to the extent to which Traffic and Transport effects may materialise and the IEMA Guidelines for the Environmental Assessment of

Road Traffic (1993) (**Ref. 17.1**) which state that ZoIs should include road links on the basis of two rules of thumb, described as follows:

- Rule 1: Include highway links where total traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
- Rule 2: Include any specifically sensitive areas where traffic flows are predicted to increase as a consequence of a development by 10% or more. Sensitive areas may be defined as locations near to more vulnerable user groups, such as school children, people with disabilities or the elderly, or accident black spot areas, roads at or near capacity, or links with high pedestrian flow.

17.5.4. In determining the ZoI, consideration has been given to the principle that impacts will be direct or indirect. Direct impacts will occur where the DCO Proposed Development crosses, or is located along, a key transport feature, such as a road or rail line. Indirect impacts will occur where construction traffic uses the existing highway network and thereby increases traffic volumes and potentially the proportion of HGVs. The ZoI primarily reflects where indirect effects may be experienced on road links.

METHOD OF BASELINE DATA COLLECTION

Desk Study

17.5.5. A desktop study has been undertaken to inform the understanding of baseline Traffic and Transport conditions. This included the use of the following online resources:

- Google Maps Service (**Ref. 17.16**);
- Google Earth Pro (**Ref. 17.17**);
- CWCC Interactive Mapping Service (**Ref. 17.18**);
- FCC 'Spectrum Spatial' Mapping Service (**Ref. 17.19**);
- DfT 'Countpoint' Road Traffic Statistics Mapping Service (**Ref. 17.20**);
- Sustrans' National Cycle Network Map (**Ref. 17.21**);
- Welsh Government (NMWTRA) Network Map. (**Ref.17.22**);
- National Highways (Highway's England) website. (**Ref. 17.23**); and
- 'CrashMap' Personal Injury Accident Online Service (**Ref. 17.24**).

17.5.6. The desktop exercise involved the identification of relevant Traffic and Transport related infrastructure and receptors. It considered the suitability of roads to cater for HGV and LGV traffic, the location of PRoW and Cycle Routes, the location of personal injury accidents, and network constraints including weight and height limits at bridge crossings. Using the above, and professional judgement, a number of locations were identified as being appropriate to collect baseline traffic count data. This is discussed further below.

DfT Countpoint Data

17.5.7. Additional traffic flows data have been sourced from the DfT Countpoint Road Traffic Statistics for the following locations:

- A5117 West of J10 M53 (DfT Countpoint Site 37813);
- A5104 (DfT Countpoint Site 30671);
- A5117 4 Bypass Road (DfT Countpoint Site 27768); and
- A5119 Flint Mountain (DfT Countpoint Site 10669).

CrashMap Data

17.5.8. Personal Injury Accident (PIA) data has been sourced from the Crashmap database (**Ref. 17.24**) for the most recently available five-year period for which data is available (2017-2021) along all of the identified construction traffic routes.

17.5.9. All PIA locations for this time period are presented in **Figure 17.3 - Personal Injury Accident Locations (Volume IV)**. The assessment of PIA on construction traffic routes for the DCO Proposed Development is presented within **Appendix 17.3 - Personal Injury Accident Summary (Volume III)**.

Site Visit

17.5.10. Site visits were carried out at various road links within the ZoI, considering the Newbuild Infrastructure Boundary for the DCO Proposed Development.

17.5.11. Site visits were carried out on the following dates:

- 25 October 2021;
- 28 October 2021;
- 12 November 2021;
- 26 May 2022; and
- 10 June 2022.

17.5.12. The purpose of the site visits was to take photographs of relevant DCO Proposed Development locations, understand any local constraints, and to establish baseline traffic conditions.

Automatic Traffic Count Surveys

17.5.13. ~~Automatic~~ Automatic Traffic Count (ATC) surveys have been undertaken across 99 locations to provide 24-hour, seven day per week flows, as well as traffic speed information. Data was collected in the form of classified counts inclusive of LGVs and HGVs.

17.5.14. ATC surveys were carried out on the following dates:

- 4 – 18 October 2021;

- 18 – 24 March 2022;
- 12 - 19 July 2022; and
- 6 – 12 December 2022.

~~17.5.13.~~ The ATC data is classified so that the proportions of LGVs and HGVs may be derived. In accordance with DfT WebTAG Modelling Guidance (Ref. 17.7), which recommends that traffic flows are derived using a 'neutral' month (for example, a month that is unlikely to feature school holidays), the majority of the data (82 sites) were collected in October 2021 and March 2022. Surveys were undertaken at the remaining locations (17 sites) in July and December 2022 outside of the school holidays in FCC and CWCC~~Traffic Count (ATC) surveys have been undertaken across 98 locations to provide 24-hour, seven day per week flows, as well as traffic speed information. Data was collected in the form of classified counts inclusive of LGVs and HGVs~~.

~~17.5.14. ATC surveys were carried out on the following dates:~~

- ~~4 – 18 October 2021;~~
- ~~18 – 24 March 2022; and~~
- ~~12 - 19 July 2022.~~

17.5.15. ~~The ATC data is classified so that the proportions of LGVs and HGVs may be derived. In accordance with DfT WebTAG Modelling Guidance (**Ref. 17.7**), which recommends that traffic flows are derived using a 'neutral' month (for example, a month that is unlikely to feature school holidays), the majority of the data (82 sites) were collected in October and March. July 2022 surveys were undertaken outside of the school holidays in FCC and CWCC.~~

17.5.16. During the meeting on 14 May 2021 CWCC discussed the timings of traffic surveys in light of Covid-19 travel restrictions and their potential influence on travel patterns. Since then, National Highways has issued an advice note (30 July 2021) **(Ref. 17.15**) confirming that traffic surveys were now being permitted on the Strategic Road Network (SRN) subject to certain requirements. Consequently, the ATC surveys presented in this report were commissioned over a two-week period to ensure greater confidence in the data, and compliance with the National Highways advice note. The Applicant's traffic and transport team has subsequently discussed this with FCC and CWCC who confirmed that they were permitting traffic surveys to be carried out across their network on the basis of the National Highways advice.

17.5.17. The first phase of ATC surveys were commissioned for a two-week period (October 2021) whilst this advice was in place. Following the removal of all Covid-19 restrictions, subsequent phases (in March and July 2022) were carried out over a period of one week.

17.5.18. All ATC locations which captured traffic data within the DCO Traffic and Transport Zone of Influence are presented in **Figure 17.2 - ATC Locations (Volume IV)**.

IMPACT ASSESSMENT METHODOLOGY

17.5.19. The following are considered to be the key parameters for the Traffic and Transport assessment:

- Baseline and Future Baseline HGV and LGV traffic flows for construction traffic routes;
- Forecast LGV and HGV DCO Proposed Development peak year traffic flows;
- Construction traffic routes and access locations (embedded mitigation); and
- Sensitivity of highway links along construction traffic routes.

17.5.20. Further information on the above is presented in **Section 17.6**.

17.5.21. The full methodology which has been used to calculate the significance of effects of the DCO Proposed Development for Traffic and Transport is presented in **Appendix 17.2 - Methodology (Volume III).**

ASSUMPTIONS AND LIMITATIONS

17.5.22. To ensure transparency within the EIA process, the following limitations and assumptions have been identified. Some of these assumptions have been adopted to ensure that the assessment is robust and represents a reasonable worst-case scenario:

- Construction traffic volumes have been estimated based upon the Preliminary Design and based on working experience of similar projects.
- All HGV and LGV construction traffic is assumed to originate from the SRN and will route along prescribed construction traffic routes; and
- All vehicle movements quoted are assumed to be two-way; i.e. 40 movements will consist of 20 inbound and 20 outbound trips.

17.6. BASELINE CONDITIONS

EXISTING BASELINE

Highway Network

17.6.1. The highway network within the ZoI comprises a range of roads of varying classification, from the trunk road network A55, A494, M53, and M56 to unclassified single-track rural lanes.

17.6.2. Broadly speaking, roads may be categorised as being within the SRN or LRN. The SRN comprises the trunk road network. These routes are not managed at the local authority level and are instead the responsibility of National Highways

(in England) and the North and Mid Wales Trunk Road Agency (NMWTRA) on behalf of the Welsh Government. These routes will form the entry and exit points for construction traffic within the ZoI; construction routes have been identified to find the most appropriate routes along the LRN to the SRN from Construction Compounds and other working areas.

17.6.3. All other non-SRN routes are categorised as being within the LRN. These routes are managed and maintained by either CWCC or FCC.

17.6.4. The ZoI **Figure 17.1 - Traffic and Transport Zone of Influence (Volume IV)** and baseline conditions presented below, are informed by prescribed construction traffic routes.

Construction Traffic Routes

17.6.5. Construction routes have been identified based upon their suitability to accommodate HGV and LGV traffic. This process is set out in the **OCTMP (Document Reference D.6.5.3).**

17.6.6. As far as reasonably practicable, HGV routes will maximise use of the SRN. Proposed construction traffic routes for LGVs and HGVs are presented in **Figure 17.4 - Construction Traffic Routes (Volume IV)** and are summarised in **Table 17.5**. Where a road is divided into multiple links, definitions are provided in **Table 17.6**.

Sensitivity of Highway Links

17.6.7. The sensitivity of highway links along construction routes is also a key parameter for this assessment. This is detailed further in **Section 17.7**.

Table 17.5 - Proposed Construction Traffic Routes

Reference	Type	SRN Junction	Location	Highway Links
CC CTR 1	Two-Way	J14 M56	Stanlow	A5117 1, B5132 Cryers Lane
CC CTR 2	Two-Way	J10 M53	Picton Lane	A5117 2, Little Stanney Lane, Picton Lane
CC CTR 3	Two-Way	J10 M53	Chorlton Lane	A5117 2, Rake Lane, Little Rake Lane, Chorlton Lane
CC CTR 4	Two-Way	A494/ A548	Sealand Central	A548 Sealand Road
CC CTR 5	Two-Way	A494/ A548	Wood Farm	A548 Sealand Road, Deeside Lane
CC CTR 6	Two-Way	J36 A55	Sandycroft	A5104, Manor Lane, B5129
CC CTR 7	Two-Way	A494/ B5125/ B5127 Roundabout	Shotton Lane	B5125 3
CC CTR 8a	Inbound	J33A A55	Northop Hall	Brookside, B5125 1
CC CTR 8b	Outbound	J33 A55	Northop Hall	B5125 2, B5126, A5119
AGI CTR 1	Two-way	J14 M56	Ince AGI	A5117 1, Ince Lane, Ash Road, Pool Lane, Pool Lane North
AGI CTR 2	Two-Way	J14 M56	Stanlow AGI	A5117 1, Pool Lane
AGI CTR 3a	Inbound	J33A A55	Northop Hall AGI	Brookside, B5125 1
AGI CTR 3b	Outbound	J33 A55	Northop Hall AGI	B5125 2, B5126, A5119
AGI CTR 4	Two-Way	J33 A55	Flint AGI	A5119, Starkey Lane, Alt Goch Lane
BVS CTR 1	Two-Way	J10 M53	Rock Bank	A5117 2, Rake Lane Little Rake Lane, Chorlton Lane
BVS CTR 2	Two-Way	A494 Deeside Park	Mollington	A5117 4, A540, Overwood Lane
BVS CTR 3	Two-Way	A494/ B5125/ B5127 Roundabout	Aston Hall	B5125 4, Upper Aston Hall Lane, Lower Aston Hall Lane
BVS CTR 4	Two-Way	J32a A55	Cornist Lane	B5123, Bryntyrion Road, Lleprog Lane
BVS CTR 5	Two-Way	J32a A55	Pentre Halkyn	B5123, Bryn Emlyn, Ffordd Groes, B5121
BVS CTR 6	Two-Way	J31 A55	Babell	B5122, Racecourse Lane

Reference	Type	SRN Junction	Location	Highway Links
CC CTR 1	Two-Way	J14 M56	Stanlow	A5117 1, B5132 Cryers Lane
CC CTR 2	Two-Way	J10 M53	Picton Lane	A5117 2, Little Stanney Lane, Picton Lane
CC CTR 3	Two-Way	J10 M53	Chorlton Lane	A5117 2, Rake Lane, Little Rake Lane, Chorlton Lane
CC CTR 4	Two-Way	A494/ A548	Sealand Central	A548 Sealand Road
CC CTR 5	Two-Way	A494/ A548	Wood Farm	A548 Sealand Road, Deeside Lane
CC CTR 6	Two-Way	J36 A55	Sandycroft	A5104, Manor Lane, B5129
CC CTR 7	Two-Way	A494/ B5125/ B5127 Roundabout	Shotton Lane	B5125 3
CC CTR 8a	Inbound	J33A A55	Northop Hall	Brookside, B5125 1
CC CTR 8b	Outbound	J33 A55	Northop Hall	B5125 2, B5126, A5119
AGI CTR 1	Two-Way	J14 M56	Grinsome Road AGI	A5117 1, Ince Lane, Ash Road
AGI CTR 2	Two-Way	J14 M56	Stanlow AGI	A5117 1, Pool Lane
AGI CTR 3a	Inbound	J33A A55	Northop Hall AGI	Brookside, B5125 1
AGI CTR 3b	Outbound	J33 A55	Northop Hall AGI	B5125 2, B5126, A5119

~~Reference~~	~~Type~~	~~SRN Junction~~	~~Location~~	~~Highway Links~~
~~AGI CTR 4~~	~~Two-Way~~	~~J33 A55~~	~~Flint AGI~~	~~A5119, Starkey Lane, Alt Goch Lane~~
~~BVS CTR 1~~	~~Two-Way~~	~~J10 M53~~	~~Rock Bank~~	~~A5117 2, Rake Lane Little Rake Lane, Chorlton Lane~~
~~BVS CTR 2~~	~~Two-Way~~	~~A494 Deeside Park~~	~~Mollington~~	~~A5117 4, A540, Overwood Lane~~
~~BVS CTR 3~~	~~Two-Way~~	~~A494/ B5125/ B5127 Roundabout~~	~~Aston Hall~~	~~B5125 4, Upper Aston Hall Lane, Lower Aston Hall Lane~~
~~BVS CTR 4~~	~~Two-Way~~	~~J32a A55~~	~~Cornist Lane~~	~~B5123, Bryntyrion Road, Lleprog Lane~~
~~BVS CTR 5~~	~~Two-Way~~	~~J32a A55~~	~~Pentre Halkyn~~	~~B5123, Bryn Emlyn, Ffordd Groes, B5121~~
~~BVS CTR 6~~	~~Two-Way~~	~~J31 A55~~	~~Babell~~	~~B5122, Racecourse Lane~~

Table 17.6 – Link Descriptions

Link	Description
A5117 1	West of J14 M56
A5117 2	West of J10 M53
A5117 3	Dunkirk West of A41 Roundabout
A5117 4	Bypass Road East of A540 Parkgate Road Roundabout

Link	Description
B5125 1	East of Northop Hall Compound to Northop Hall
B5125 2	West of Northop Hall Compound to B5126
B5125 3	East of Northop Hall Compound to B5127
B5125 4	East of A494/ B5127 Roundabout Hawarden

Baseline Traffic Flows

17.6.8. Baseline traffic flows have been established through ATC surveys and DfT Countpoint data. Baseline traffic flows are presented in **Appendix 17.4 - Baseline Traffic Data (Volume III)**.

17.6.9. These flows have been uplifted using TEMPro (**Ref. 17.11**) growth factors to establish baseline flows during the anticipated peak construction year of 2024. 2024 baseline traffic is presented in **Appendix 17.9 - Future Year Traffic Flows (Volume III)**.

17.6.10. **Appendix 17.4 - Baseline Traffic Data (Volume III)** summarises 2022 baseline traffic flows for all links proposed to comprise construction traffic routes.

Highway Safety

17.6.11. All PIA locations are presented in **Figure 17.3 - Personal Injury Accident Locations (Volume IV)**. The assessment of PIA on construction traffic routes for the DCO Proposed Development is presented within **Appendix 17.3 - Personal Injury Accident Summary (Volume III).**

Walking and Cycling

Public Rights of Way

17.6.12. There are a number of PRoW within the ZoI comprising footpaths, bridleways, restricted byways and byways open to all traffic that are expected to interact with the DCO Proposed Development. An overview description of each section considering the SRN, LRN, Rail, PRoW and geographic landmarks is provided in **Appendix 17.6 - Section by Section Descriptions (Volume III)**.

17.6.13. There are also instances where PRoW are impacted by the proposed construction traffic routes. This is reflected in the link sensitivities summarised in **Appendix 17.10 - Assigned Link Sensitivities (Volume III)** and subsequent assessment of environmental effects in these locations.

17.6.14. Where PRoW are crossed by the DCO Proposed Development, diversions, closures, or proposed sequencing of works are illustrated in **Figure 17.6 - PRoW Diversions** (**Volume IV**).

17.6.15. The impact on PRoW within a 500 m radius of the DCO Proposed Development has been considered within **Chapter 16 - Population and Human Health (Volume II),** the outcomes of which are presented in **Appendix 16.2 - Public Rights of Way (Volume II).**

17.6.16. Further consideration of the mitigation of impacts at PRoW is provided in the **OCTMP (Document reference: D.6.5.3)**.

Sustrans National Cycle Network

17.6.17. The ZoI includes a number of routes comprising the National Cycle Network (NCN). The key routes within the ZoI include NCR5, NCR568 and NCR 563 **(Appendix 17.6 - Section by Section Descriptions, Volume III).** These are a mix of traffic-free and on-road routes. The ZoI also includes regional routes not on the National Cycle Network linking NCR routes. These routes will also be considered regarding exposure to construction traffic, link sensitivities, impacts and mitigation.

17.6.18. Interaction with the DCO Proposed Development and associated construction traffic is not limited to crossing locations and will consider effects along the links themselves. This is reflected in the link sensitivities summarised in **Appendix 17.10 - Assigned Link (Volume III)** and subsequent assessment of environmental effects in these locations.

Wales Coast Path

17.6.19. The Wales Coast Path is an 870-mile-long designated footpath following the Welsh coast. The DCO Proposed Development will cross the route north of the River Dee in Flintshire. From this point running in a north westerly direction the path continues north of the A548 along the north Wales coast to Talacre. Where it is crossed by the DCO Proposed Development, the path runs along approximately 3m shared footway/cycleway on a traffic free route between Saltney and Queensferry. This section is also part of the National Cycle Route 586 referred to above.

Summary by Section

17.6.20. The route has been subdivided into seven geographic sections running from east to west which are described in **Chapter 3 - Description of the Proposed Developmen**t (**Volume II**). These sections are listed below. An overview of each section considering the SRN, LRN, Rail, PRoW and geographic landmarks is provided in **Appendix 17.6 - Section by Section Descriptions (Volume III)**.

FUTURE BASELINE

17.6.21. To establish the future baseline conditions on the highways, traffic growth factors have been extracted from the TEMPro database (**Ref. 17.11**) to estimate the traffic growth within the ZoI between 2021 or 2022 (when the ATCs surveys took place), and 2024, which is anticipated to be the year where peak construction activities will commence. The assessment is based on a peak year of construction traffic activity which is assumed to commence in June 2024 and end in May 2025.

17.6.22. Growth factors have been extracted using the following parameters:

- **Geographical Area(s):** Flintshire / Cheshire West and Chester; and

- **Time Period:** Average weekday (as aligned to the ATC data and proposed working hours).

17.6.23. **Table 17.7** presents the extracted growth factors for each road type.

Table 17.7 - TEMPro Growth Factors

Period	Area	Category	Authority	
			CWCC	FCC
2021-2022	Rural	Principal	1.0093	1.0090
		Minor	1.0091	1.0049
	Urban	Principal	1.0094	1.0078
		Minor	1.0101	1.0080
2022-2024	Rural	Principal	1.0185	1.0178
		Minor	1.0182	1.0097
	Urban	Principal	1.0187	1.0154
		Minor	1.0201	1.0159

17.6.24. As **Table 17.7** shows a variety of factors have been obtained from TEMPro (**Ref. 17.11**) to reflect the location and category of link comprising each construction traffic route. This includes roads categorised as 'Principal' (i.e. A Roads) and Minor (i.e. B Roads and below) for both Urban and Rural environments.

17.6.25. The 2024 future baseline flows for the construction routes are presented in **Appendix 17.9 - Future Year Traffic Flows (Volume III)**.

Assessment of HGVs and LGVs

17.6.26. Forecast traffic flows for HGVs and LGVs have been taken from information provided by The Applicant. Forecast construction traffic is presented in **Appendix 17.9 - Future Year Traffic Flows (Volume III)**.

Highways Schemes

17.6.27. The Welsh Government announced a freeze on new road building schemes in the country in June 2021 (**Ref 17.14)** this includes the proposed A55/A494/A548 Flintshire Corridor (Red Route) scheme (**Ref 17.13)**. At the time of writing this ES there have been no further updates to this announcement from the Welsh Government (see **Table 17.2**). The original, now delayed, programme indicated that the DCO Proposed Development would be operational prior to commencement of construction of the Flintshire Corridor (Red Route) Scheme. The proposed scheme would therefore not coincide with the Construction Stage of the DCO Proposed Development. This scheme has therefore not been accounted for in this assessment contained within this

Chapter. This approach was discussed and confirmed with NMTRA on 29 July 2022.

17.6.28. Engagement has also been undertaken with other stakeholders, including CWCC highways. No other highways schemes have been identified for consideration within the Traffic and Transport assessment of the DCO Proposed Development.

Committed Development

17.6.29. No committed developments have been identified that are anticipated to significantly impact the future baseline beyond background traffic growth.

17.7. SENSITIVE RECEPTORS

17.7.1. A full description of sensitive receptors within the Traffic and Transport is presented in **Appendix 17.2 - Methodology (Volume III)** and summarised below.

17.7.2. For the purposes of the Traffic and Transport assessment, a receptor is defined not as the affected person or group of people, but by the link they are using at the time.

17.7.3. To expand on this, an individual cyclist might use multiple routes, some of which experience varying degrees of change to traffic flows as a consequence of the DCO Proposed Development. It is considered inappropriate to take the highest degree of traffic flow change experienced by the cyclist and conclude that this is the impact of the Proposed Development, when there may be multiple routes used by the cyclist that have a considerably lower degree of change in traffic flows.

17.7.4. A review has been undertaken of all construction traffic routes and each link, or section of link, has been given an overall level of sensitivity based on the character and the presence of certain receptors along the link.

17.7.5. Each link (or, in the case of longer links with changing characteristics, each section of link), has been given an overall level of sensitivity based on the character and the presence of certain receptors ('Built Environment Indicators') along the link. Based on the criteria outlined in **Appendix 17.2 - Methodology (Volume III)** each of the highway links allocated as construction routes for the DCO Proposed Development have been assigned an overall link sensitivity.

17.7.6. The assigned sensitivity for each link, including a description of the reasons for its sensitivity, is presented in **Appendix 17.8 - Assigned Link Sensitivities (Volume III)**.

17.8. DESIGN DEVELOPMENT, IMPACT AVOIDANCE, AND EMBEDDED MITIGATION

17.8.1. Mitigation measures have been identified and incorporated into the Preliminary Design of the DCO Proposed Development to minimise environmental impacts ('Embedded Mitigation'). In relation to Traffic and Transport mitigation by design has included the selection and specification of access points off the public highway. Construction traffic routes have been selected to reduce, where possible, traffic effects on links that will be more sensitive to changes in traffic volumes, due to the presence of built environment indicators used by sensitive affected parties. Further description of the selection of construction traffic routes is presented in the **OCTMP** (**Document Reference: D.6.5.3**).

17.9. ASSESSMENT OF LIKELY IMPACTS AND EFFECTS

17.9.1. This section details the preliminary assessment of predicted impacts and effects for the DCO Proposed Development during the Construction Stage. The assessment is structured across two stages, the first being a calculation of effects based on the methodology outlined in **Appendix 17.2 - Methodology** (**Volume III**). The second stage, (**Section 17.11**) considers the residual effects based on the calculated effects (**Section 17.9**), consideration of proposed mitigation measures (**Section 17.10**), and professional judgement in reaching a conclusion.

SIGNIFICANT EFFECTS

Construction Traffic

17.9.2. This section describes the potential Traffic and Transport effects that could occur as a result of the DCO Proposed Development in the absence of mitigation. There is the potential for environmental effects where affected parties are exposed to increase in LGV and HGV traffic through their proximity to a construction traffic route. As described in **Appendix 17.2 - Methodology (Volume III)** the presence of affected parties is determined by the presence of Built Environment Indicators (BEI). The presence of BEI has, in turn, determined the link sensitivities presented in **Appendix 17.10 - Assigned Link Sensitivities (Volume III).**

17.9.3. Having assigned construction traffic along proposed construction traffic routes and considered the magnitude of impacts against the sensitivity of each link, there are a range of potential traffic effects that could be caused by the DCO Proposed Development prior to mitigation. These are described in **Table 17.8**.

17.9.4. Profiles of estimated construction traffic volumes across the construction programme are presented in **Appendix 17.7 - Construction Traffic Flows (Volume III)** and **Appendix 17.8 - Construction Traffic Profiles (Volume III)**.

17.9.5. Given the rural location of much of the DCO Proposed Development, a number of very lightly trafficked highway links are proposed to be used as temporary construction traffic routes **(Appendix 17.4 - Baseline Traffic Data, Volume III)**. Given that the ES is based on percentage increases in traffic, even small increases – in absolute numbers of vehicles and HGVs can result in high magnitudes of impacts. Where a low baseline of traffic exists on a link this is discussed in determining residual effects in **Section 17.10**.

17.9.6. Furthermore, it is important to note that the IEMA guidelines (**Ref. 17.1**) do not distinguish between temporary and permanent changes in traffic flows, whereas, in reality, short duration increases are likely to be more tolerable than permanent increases, and therefore less significant.

17.9.7. Therefore, although the level of effect is initially reported for peak month traffic, the methodology set out in the IEMA Guidelines assumes this is a permanent increase. As such professional judgement has been applied in considering the influence shorter durations may have on the overall significance of effects.

Summary of Pre-mitigation (Calculated) Effects

17.9.8. A summary of pre mitigation calculated effects is presented in **Appendix 17.11 - Summary of Pre-mitigation Calculated Effects (Volume III)**.

Table 17.8 - Magnitude of Environmental Effects

		Magnitude					
Ref	Link	Link Sensitivity	Severance	Fear and Intimidation	Pedestrian Amenity	Driver Delay	Pedestrian Delay
1	A5117 1	Low	Negligible	Negligible	Negligible	Negligible	Medium
2	A5117 2	Medium	Negligible	Negligible	Negligible	Negligible	Medium
3	B5132 Cryers Lane	Medium	High	High	Negligible	High	Medium
4	Little Stanney Lane	Medium	High	High	Negligible	High	Medium
5	Picton Lane	Medium	High	High	Negligible	High	Negligible
6	Rake Lane	Low	High	High	Negligible	High	Medium
7	A548 Sealand Road	Medium	Negligible	Negligible	Negligible	Negligible	Medium
8	B5129	Low	High	High	Negligible	High	Medium
9	B5125 1	Medium	Medium	Medium	Negligible	Medium	Medium
10	B5125 2	Medium	High	High	Negligible	High	Medium
11	B5126	Medium	Negligible	Negligible	Negligible	Negligible	Medium
12	A5119 1	Medium	Negligible	Negligible	Negligible	Negligible	Medium
13	Ince Lane	Medium	Negligible	Negligible	Negligible	Negligible	Medium
14	Ash Road	Medium	Negligible	Negligible	Negligible	Negligible	Medium
15	Pool Lane	Low	Negligible	Negligible	Negligible	Negligible	Medium
16	Starkey Lane	Low	High	High	Negligible	High	Negligible
17	Alt Goch Lane	Low	High	High	Negligible	High	Negligible
18	Chorlton Lane	Low	High	High	Negligible	High	Negligible
19	A540	Medium	Negligible	Negligible	Negligible	Negligible	Medium
20	Upper Aston Hall Lane	Low	High	High	Negligible	High	Medium

		Magnitude					
Ref	Link	Link Sensitivity	Severance	Fear and Intimidation	Pedestrian Amenity	Driver Delay	Pedestrian Delay
21	Lower Aston Hall Lane	Medium	High	High	Negligible	High	Medium
22	B5123	Medium	Negligible	Negligible	Negligible	Negligible	Medium
23	Bryntyrion Road	Low	High	High	Negligible	High	Medium
24	Lleprog Lane	Medium	High	High	High	High	Negligible
25	Bryn Emlyn	Medium	Negligible	Negligible	Negligible	Negligible	Medium
26	Ffordd Groes	Medium	Negligible	Negligible	Negligible	Negligible	Medium
27	B5121	Medium	Medium	Medium	Negligible	Medium	Medium
28	B5122	Medium	Negligible	Negligible	Negligible	Negligible	Medium
29	A5104	Medium	Negligible	Negligible	Negligible	Negligible	Medium
30	Manor Lane	Medium	High	High	Negligible	High	Medium
31	Little Rake Lane	Medium	High	High	Low	High	Negligible
32	Brookside	Medium	High	High	Negligible	High	Medium
33	A5117 4	Medium	Negligible	Negligible	Negligible	Negligible	Medium
34	Overwood Lane	Low	High	High	Negligible	High	Negligible
35	Racecourse Lane	Medium	High	High	High	High	Negligible
36	B5125 4	Medium	Medium	Medium	Negligible	Medium	Medium
37	A5119 2	Low	Negligible	Negligible	Negligible	Negligible	Medium
38	Pool Lane North	Low	Negligible	Negligible	Negligible	Negligible	Medium

		Magnitude					
Ref	Link	Link Sensitivity	Severance	Fear and Intimidation	Pedestrian Amenity	Driver Delay	Pedestrian Delay
1	A5117 1	Low	Negligible	Medium	Negligible	Negligible	Negligible
2	A5117 2	Medium	Negligible	Medium	Negligible	Negligible	Negligible
3	B5132 Cryers Lane	Medium	Medium	Medium	Negligible	Medium	Medium
4	Little Stanney Lane	Medium	High	Medium	Negligible	High	High
5	Picton Lane	Medium	High	Negligible	Negligible	High	High
6	Rake Lane	Low	High	Medium	Negligible	High	High
7	A548 Sealand Road	Medium	Negligible	Medium	Negligible	Negligible	Negligible
8	B5129	Low	High	Medium	Negligible	High	High
9	B5125 1	Medium	Low	Medium	Negligible	Low	Low
10	B5125 2	Medium	High	Medium	Negligible	High	High
11	B5126	Medium	Negligible	Medium	Negligible	Negligible	Negligible
12	A5119 1	Medium	Negligible	Medium	Negligible	Negligible	Negligible
13	Ince Lane	Medium	Negligible	Medium	Negligible	Negligible	Negligible
14	Ash Road	Medium	Negligible	Medium	Negligible	Negligible	Negligible
15	Pool Lane	Low	Negligible	Medium	Negligible	Negligible	Negligible
16	Starkey Lane	Low	High	Negligible	Negligible	High	High
17	Alt Goch Lane	Low	High	Negligible	Negligible	High	High
18	Chorlton Lane	Low	High	Negligible	Negligible	High	High
19	A540	Medium	Negligible	Medium	Negligible	Negligible	Negligible
20	Upper Aston Hall Lane	Low	High	Medium	Negligible	High	High
21	Lower Aston Hall Lane	Medium	High	Medium	Negligible	High	High

		Magnitude					
Ref	Link	Link Sensitivity	Severance	Fear and Intimidation	Pedestrian Amenity	Driver Delay	Pedestrian Delay
22	B5123	Medium	Negligible	Medium	Negligible	Negligible	Negligible
23	Bryntyrion Road	Low	High	Medium	Negligible	High	High
24	Lleprog Lane	Medium	High	Negligible	High	High	High
25	Bryn Emlyn	Medium	Negligible	Medium	Negligible	Negligible	Negligible
26	Ffordd Groes	Medium	Negligible	Medium	Negligible	Negligible	Negligible
27	B5121	Medium	Medium	Medium	Negligible	Medium	Medium
28	B5122	Medium	Negligible	Medium	Negligible	Negligible	Negligible
29	A5104	Medium	Negligible	Medium	Negligible	Negligible	Negligible
30	Manor Lane	Medium	Negligible	Medium	Negligible	Negligible	Negligible
31	Little Rake Lane	Medium	High	Negligible	Low	High	High
32	Brookside	Medium	High	Medium	Negligible	High	High
33	A5117-4	Medium	Negligible	Medium	Negligible	Negligible	Negligible
34	Overwood Lane	Low	High	Negligible	Negligible	High	High
35	Racecourse Lane	Medium	High	Negligible	High	High	High
36	B5125-4	Medium	Medium	Medium	Negligible	Medium	Medium
37	A5119-2	Low	Negligible	Medium	Negligible	Negligible	Negligible

17.10. MITIGATION AND ENHANCEMENT MEASURES

17.10.1. This section sets out the proposed avoidance and mitigation which will be implemented to address the predicted significant effects as assessed in the previous section.

17.10.2. Careful consideration of the siting of temporary access points during construction is a key feature of the embedded mitigation within the DCO Proposed Development in terms of risk reduction of adverse effects. Furthermore, access points will require the incorporation of site-specific and appropriate visibility splays, turning radii and, where deemed necessary or appropriate, speed limit reductions. These measures will be secured as part of a full Construction Traffic Management Plan (CTMP) to be submitted to FCC and CWCC prior to construction of the DCO Proposed Development (**D-TT-001** of the **Register of Environmental Actions and Commitments, Document Reference: D.6.5.1**). The production of the full CTMP is included as a Requirement of the **Draft DCO** (**Document Reference: D.3.1**)

17.10.3. Having established proposed construction routes and the predicted volume of construction traffic serving working locations, further mitigation includes the form of traffic management. Traffic management will be used to mitigate any residual constraints identified along construction traffic routes, as set out in the **OCTMP (Document reference D.6.5.3)**. This includes the use of restrictions such as speed limit reductions, one-way systems, and traffic signals. The need for these measures has been determined on a case by case basis to address identified local risks.

17.10.4. The **OCTMP (Document reference D.6.5.3)** refers to mitigation measures, informed by the assessment, and stakeholder engagement, where deemed appropriate or necessary.

17.10.5. The OCTMP details actions required by the Construction Contractor(s) during the construction process, following these objectives:

- Ensure that movements of people, plant and materials are achieved in a safe, efficient, timely and sustainable manner;
- Ensure that any impact to local communities and the local economy is reduced as far as reasonably practical;
- Ensure that construction traffic levels do not exceed an acceptable level during network peak periods;
- Reduce and control construction vehicle trips where practical;
- Ensure that strategies and mitigation measures are implemented and adhered to through continued monitoring, review, and improvement; and
- Limit the effects of construction traffic on the LRN.

17.11. RESIDUAL EFFECTS

17.11.1. A range of potential effects exist that may be caused by the DCO Proposed Development prior to identified mitigation measures. As described in **Appendix 17.2 - Methodology (Volume III)** these potential effects are identified to be limited exclusively to the construction period of the DCO Proposed Development, and would therefore, by definition, be exclusively temporary in nature, with no permanent effects likely.

17.11.2. Duration is considered when assessing the overall significance of residual effects, noting that the DMRB (**Ref. 17.10**) indicates:

"Recognition should be made that permanent impacts will be more significant than those of a temporary nature. For example, the impact may only occur during a single phase of the project construction and may be temporary. Alternatively, the impact may be long-term or irreversible and hence permanent. It is, therefore, important that the assessment distinguishes between permanent and temporary impacts'.

17.11.3. All of the Traffic and Transport effects associated with the DCO Proposed Development will be temporary effects during construction. Some temporary effects will likely last longer than others and it is considered appropriate to reflect the predicted duration of effects when determining the likelihood of significant effects.

17.11.4. **Table 17.9** summarises the residual effects associated with the DCO Proposed Development during construction, after considering durations of effects, mitigation measures, and the application of professional judgement.

Table 17.9 - Summary of Residual Effects

Description of the effect	Pre-mitigation Calculated Effect (Where Significant)	Commentary	Mitigation Measures	Residual effect
Severance	***Major (Significant)*** • B5132 Cryers Lane; • Little Stanney Lane; • Picton Lane; • B5125 (west of Northop Hall Centralised Compound); • Lower Aston Hall Lane; • Lleprog Lane; • Racecourse Lane; • Manor Lane; • Little Rake Lane; and • Brookside.	Average month traffic is notably lower than for the DCO Proposed Development Peak Month **Appendix 17.8 - Construction Traffic Profiles (Volume III).** Baseline HGV flows in all of these locations is <30 AADT and represent very low baseline levels of HGV traffic. Absolute increases in HGVs - when considered across each day - are modest; a maximum of 28 AADT on Little Rake Lane. Total HGV %s remain less than 2% on all links with construction traffic in the future baseline year with construction traffic (2024). LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases is anticipated to lower.	Mitigation measures on these routes are outlined in the **OCTMP (Document Reference: D.6.5.3 Ref. D-TT-002** of the **REAC, Document Reference D.6.5.1**). In particular B5132 Cryers Lane, Little Stanney Lane, Picton Lane, Lleprog Lane, Racecourse Lane, Manor Lane, Little Rake Lane, and Brookside. Traffic management measures will be implemented to manage construction traffic movements and reduce the potential effect of severance on communities adjacent to these links These measures, as outlined within the OCTMP (**Document Reference: D.6.5.3),** include hazard warning signage (**Ref. D-TT-012** of the **REAC, Document Reference: D.6.5.1**), temporary speed limits (Ref. D-TT-010 of the **REAC, Document Reference: D.6.5.1**), and community engagement to minimise inconvenience and disruption to road users (**Ref. D-TT-009** of the **REAC, Document Reference: D.6.5.1**). A restriction on HGV deliveries will be imposed on Brookside between the hours of 0800-0900 and 1700-1800 respectively (**D-TT-007** of the **REAC, Document Reference: D.6.5.1**). A restriction on HGV deliveries will be imposed on the B5125 in Hawarden during the drop off and collections times associated with Hawarden High School to minimise exposure to increases in HGV traffic by vulnerable road users and minimise the potential for Fear and Intimidation (**D-TT-007** of the **REAC, Document Reference: D.6.5.1**). These measures will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC (**D-TT-002** of the **REAC, Document Reference: D.6.5.1**).	*Minor (not Significant)*
	Moderate (Significant) • Rake Lane; • B5129; • B5125 1 (east of Northop Hall Centralised Compound); • Starkey Lane; • Alt-Goch Lane; • Chorlton Lane; • Upper Aston Hall Lane; • Bryntyrion Road; • The B5125 in Hawarden; and • Overwood Lane.	Peak Month construction traffic has been assessed. Average month traffic is notably lower than for the DCO Proposed Development Peak Month. HGV flows in all of these locations is <50 AADT and represent very low baseline levels of HGV traffic. Absolute increases in HGVs - when considered across each day - are modest; a maximum of 30 AADT on the B5129. LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases is anticipated to lower.	Rake Lane, B5125 1, and Chorlton Lane all form routes to Centralised Compounds. Traffic management measures will be implemented to manage construction traffic movements and reduce the potential effect of severance on communities adjacent to these links (**D-TT-010, D-TT-011, DD-TT-012** of the **REAC, Document Reference: D.6.5.1**), as outlined within the **OCTMP (Document Reference: D.6.5.3).** Mitigation measures on these routes are outlined in the **OCTMP (Document Reference: D.6.5.3**). This will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC (**D-TT-002** of the **REAC, Document Reference: D.6.5.1**). These measures include hazard warning signage, temporary speed limits, and community engagement to minimise inconvenience and disruption to road users (**D-TT-009, D-TT-010, D-TT-012** of the **REAC, Document Reference: D.6.5.1**).	*Minor (not significant)*

Description of the effect	Pre-mitigation Calculated Effect (Where Significant)	Commentary	Mitigation Measures	Residual effect
Pedestrian Delay	***Major (Significant)*** N/A			
	Moderate (Significant) • A5117 2; • B5132 Cryers Lane; • Little Stanney Lane; • A548 Sealand Road; • B5125 1; • B5125 2; • B5126 Connahs Quay Road; • A5119 Northop Road 1; • Ince Lane; • Ash Road; • A540; • Lower Aston Hall Lane; • Upper Aston Hall Lane; • Bryn Emlyn; • Ffordd Groes; • B5121; • B5122; • A5104; • Brookside; • A5117 4; and • B5125 4	Average month traffic is notably lower than for this peak period **Appendix 17.8 - Construction Traffic Profiles (Volume III).** Medium and High magnitudes of effects can occur for Pedestrian Delay where total AADT > 1400 vehicles. It should be noted that all of these links have flows that exceed a total AADT of 1400 in the future baseline year (2024) and that the impact of the DCO Proposed Development does not cause any links to exceed this threshold. Where possible, use of the SRN and higher classification (i.e., A and B roads) has been used. Many links comprising construction traffic routes therefore have AADT > 1400 vehicles. LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases at key pedestrian demand times is expected to be lower in reality.	No specific mitigation is proposed to address the effect of construction traffic on Pedestrian Delay.	*Negligible (not significant)*
Pedestrian Amenity	***Major (Significant)*** • Racecourse Lane; and • Lleprog Lane	Average month traffic is notably lower than for the DCO Proposed Development Peak Month **Appendix 17.8 - Construction Traffic Profiles (Volume III).**	Traffic movements will be managed by Traffic Marshals and radio-communications between inbound HGV deliveries and working locations. Pedestrian Amenity will therefore be protected as far as reasonably practicable during the Construction Stage of the DCO Proposed Development (**D-TT-012** of the **REAC, Document Reference: D.6.5.1**). This will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC (**D-TT-002** of the **REAC, Document Reference: D.6.5.1**).	*Minor (not significant)*

Description of the effect	Pre-mitigation Calculated Effect (Where Significant)	Commentary	Mitigation Measures	Residual effect
		Baseline traffic flows on Racecourse Lane and Lleprog Lane are less than 100 AADT and therefore the calculated percentage increases are unrepresentative of a significant effect on Pedestrian Amenity. Pedestrian amenity will not be compromised by the additional traffic arising from DCO Proposed Development in these locations, where baseline levels of traffic are negligible.		
	Moderate (Significant) N/A			
Fear and Intimidation	***Major (Significant)*** • B5132 Cryers Lane; • Little Stanney Lane; • Picton Lane; • B5125 2 (west of Northop Hall Centralised Compound); • Lower Aston Hall Lane; • Lleprog Lane; • Manor Lane; • Little Rake Lane; and • Brookside; and • Racecourse Lane.	Average month traffic is notably lower than for the DCO Proposed Development Peak Month **Appendix 17.8 - Construction Traffic Profiles (Volume III).** All effects arising from additional construction traffic are temporary (16 month duration). Baseline HGV flows in all of these locations is <30 AADT and represent very low baseline levels of HGV traffic. Absolute increases in HGVs - when considered across each day - are modest; a maximum of 30 AADT on the B5129. Total HGV%s remain less than 2% on all links with construction traffic in the future baseline year with construction traffic (2024). LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases is anticipated to lower.	Mitigation measures on these routes are outlined in the **OCTMP (Document reference: D.6.5.3**) In particular B5132 Cryers Lane, Little Stanney Lane, Picton Lane, Lleprog Lane, Racecourse Lane, Manor Lane, Little Rake Lane, and Brookside (**D-TT-012** of the **REAC, Document Reference: D.6.5.1**). Traffic management measures will be implemented to manage construction traffic movements and reduce the potential effect of Fear and Intimidation experienced by local communities and road users on these links (**D-TT-010, D-TT-011,** and **DD-TT-012** of the **REAC, Document Reference: D.6.5.1**). These measures include temporary speed limits and traffic calming to minimise inconvenience and disruption to road users (**D-TT-010** of the **REAC, Document Reference: D.6.5.1**). A restriction on HGV deliveries will be imposed on Brookside between the hours of 0800-0900 and 1700-1800 respectively (**D-TT-007** of the **REAC, Document Reference: D.6.5.1**). Specific locations where restrictions on HGV timings are proposed are set out in full within the **OCTMP (Document reference: D.6.5.3**). These measures will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC (**D-TT-002** of the **REAC, Document Reference: D.6.5.1**).	*Minor (not significant)*
	Moderate (Significant) • Rake Lane; • B5125 1; • B5129; • Starkey Lane; • Alt-Goch Lane; • Chorlton Lane;	Average month traffic is notably lower than for the DCO Proposed Development Peak Month. HGV flows in all of these locations is <50 AADT and represent very low baseline levels of HGV traffic. Absolute Increases in HGVs - when considered across each day - are modest; a maximum of 30 AADT on the B5129.	Rake Lane, B5125 1 and Chorlton Lane all form routes to Centralised Compounds. Traffic management measures will be implemented to manage construction traffic movements and reduce the potential effect of Fear and Intimidation experienced by local communities and road users on these links (**D-TT-012** of the **REAC, Document Reference: D.6.5.1**). Mitigation measures on all routes are outlined in the **OCTMP (Document reference: D.6.5.3)**.	*Minor (not significant)*

Description of the effect	Pre-mitigation Calculated Effect (Where Significant)	Commentary	Mitigation Measures	Residual effect
	• Upper Aston Hall Lane; • Bryntyrion Road; • The B5125 in Hawarden; and • Overwood Lane;	LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases is anticipated to lower.	These measures include hazard warning signage, temporary speed limits, and community engagement to minimise inconvenience and disruption to road users (**D-TT-010, D-TT-012** of the **REAC, Document Reference: D.6.5.1**). A restriction on HGV deliveries will be imposed on the B5125 in Hawarden during the drop off and collections times associated with Hawarden High School to minimise exposure to increases in HGV traffic by vulnerable road users and minimise the potential for Fear and Intimidation (**D-TT-007** of the **REAC, Document Reference: D.6.5.1**). These measures will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC (**D-TT-002** of the **REAC, Document Reference: D.6.5.1**).	
Driver Delay	***Major (Significant)*** • B5132 Cryers Lane; • Little Stanney Lane; • Picton Lane; • B5125 2 (west of Northop Hall Centralised Compound; • Lower Aston Hall Lane; • Lleprog Lane; • Manor Lane; • Little Rake Lane; • Brookside; and • Racecourse Lane;	Average month traffic is notably lower than for the DCO Proposed Development Peak Month **Appendix 17.8 - Construction Traffic Profiles (Volume III).** Baseline HGV flows in all of these locations is ≤30 AADT and represent very low baseline levels of HGV traffic. Absolute Increases in HGVs - when considered across each day - are modest; a maximum of 30 AADT on the B5129. Total HGV%s remain less than 2% on all links with construction traffic in the future baseline year with construction traffic (2024). LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases is anticipated to lower.	Mitigation measures on these routes are outlined in the **OCTMP (Document reference: D.6.5.3)** In particular B5132 Cryers Lane, Little Stanney Lane, Picton Lane, Lleprog Lane, Manor Lane, Racecourse Lane, Little Rake Lane, and Brookside (**D-TT-012** of the **REAC, Document Reference: D.6.5.1**). Traffic management measures will be implemented to ensure that construction traffic can safely access working locations (**D-TT-010, D-TT-011**, and **DD-TT-012** of the **REAC, Document Reference: D.6.5.1**). For rural routes where there are geometric constraints (i.e. carriageway widths) that may result in delays arising from increases in HGVs traffic, HGV movements will be restricted during peak periods to reduce the effect of Driver Delay (**D-TT-007** of the **REAC, Document Reference: D.6.5.1**). Specific locations where restrictions on HGV timings are proposed are set out in the **OCTMP (Document reference: D.6.5.3).** These measures will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC (**D-TT-002** of the **REAC, Document Reference: D.6.5.1**).	*Minor (not significant)*
	Moderate (Significant) • Rake Lane; • B5125 1; • B5129; • Starkey Lane; • Alt-Goch Lane; • Chorlton Lane; • Upper Aston Hall Lane; • Bryntyrion Road;	Average month traffic is notably lower than for the DCO Proposed Development Peak Month **Appendix 17.8 - Construction Traffic Profiles (Volume III).** HGV flows in all of these locations is <50 AADT and represent very low baseline levels of HGV traffic. Absolute Increases in HGVs - when considered across each day - are modest; a maximum of 30 AADT on the B5129. LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800)	Mitigation measures on these routes are outlined in the **OCTMP (Document reference: D.6.5.3).** B5125 1, Rake Lane, and Chorlton Lane all form routes to Centralised Compounds. Traffic management measures are proposed to manage construction traffic movements and reduce the potential effect of Fear and Intimidation experienced by local communities and road users on these links (**D-TT-012** of the **REAC, Document Reference: D.6.5.1**). Traffic management measures will be implemented to ensure that construction traffic can safely access working locations (**D-TT-010, D-TT-011**, and **DD-TT-012** of the **REAC, Document Reference: D.6.5.1**). For rural routes where there are geometric constraints (i.e. carriageway widths) that may result in delays arising from increases in HGVs traffic, it is proposed to restrict HGV	*Minor (not significant)*

Description of the effect	Pre-mitigation Calculated Effect (Where Significant)	Commentary	Mitigation Measures	Residual effect
	• Overwood Lane; and • B5125 4 (Hawarden)	therefore exposure to increases is anticipated to lower.	movements during peak periods to reduce the effect of Driver Delay (**D-TT-007** of the of the **REAC, Document Reference: D.6.5.1**). Specific locations where restrictions on HGV timings are proposed are set out in the **OCTMP (Document reference: D.6.5.3).** These measures will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC (**D-TT-002** of the of the **REAC, Document Reference: D.6.5.1).**	
Highway Safety	Pre-mitigation significant effects were forecast at four locations located along prescribed construction traffic routes: • Cluster Reference 1 – A5117 1/ Rake Lane junction. • Construction Traffic Route(s): CTR BVS 1, CTR CC 3. • Cluster Reference 2 – Rake Lane/Little Rake Lane Junction. • Construction Traffic Route(s): CTR BVS 1, CTR CC 3. • Cluster Reference 3 – A540 Parkgate Road. • Construction Traffic Route(s): CTR BVS 2. • Cluster Reference 4 – A540 Parkgate Road Roundabout. • Construction Traffic Route(s): CTR BVS 2. The assessment of Highway Safety effects, and mitigation proposed is presented in **Appendix 17.3 - PIA Summary (Volume III)** and the **OCTMP (Document Reference D.6.5.3).**			*Minor (not significant)*

~~Description of the effect~~	~~Pre-mitigation Calculated Effect (Where Significant)~~	~~Commentary~~	~~Mitigation Measures~~	~~Residual effect~~
~~**Severance**~~	~~***Major (Significant)***~~ ~~• Little Stanney Lane;~~ ~~• Picton Lane;~~ ~~• B5125 (west of Northop Hall Centralised Compound);~~ ~~• Lower Aston Hall Lane;~~ ~~• Lleprog Lane;~~ ~~• Racecourse Lane~~ ~~• Little Rake Lane; and~~ ~~• Brookside.~~	~~Average month traffic is notably lower than for the DCO Proposed Development Peak Month **Appendix 17.8 - Construction Traffic Profiles (Volume III).**~~ ~~Baseline HGV flows in all of these locations is >30 AADT and represent very low baseline levels of HGV traffic. Absolute Increases in HGVs - when considered across each day - are modest; a maximum of 28 AADT on Little Rake Lane.~~ ~~Total HGV %s remain less than 2% on all links with construction traffic in the future baseline year with construction traffic (2024).~~ ~~LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800)~~	~~Mitigation measures on these routes are outlined in the **OCTMP (Document Reference: D.6.5.3 Ref. D-TT-002** of the **REAC, Document Reference D.6.5.1).** In particular Little Stanney Lane, Picton Lane, Lleprog Lane, Racecourse Lane, Little Rake Lane, and Brookside. Traffic management measures will be implemented to manage construction traffic movements and reduce the potential effect of severance on communities adjacent to these links~~ ~~These measures include hazard warning signage (**Ref. D-TT-012** of the **REAC, Document Reference: D.6.5.1)**, temporary speed limits (**Ref. D-TT-010** of the **REAC, Document Reference: D.6.5.1**), and community engagement to minimise inconvenience and disruption to road users (**Ref. D-TT-009** of the **REAC, Document Reference: D.6.5.1**).~~ ~~A restriction on HGV deliveries will be imposed on Brookside between the hours of 0800-0900 and 1700-1800 respectively (**D-TT-007** of the **REAC, Document Reference: D.6.5.1**).~~ ~~A restriction on HGV deliveries will be imposed on the B5125 in Hawarden during the drop off and collections times associated with Hawarden High School to minimise~~	~~*Minor (not Significant)*~~

Description of the effect	Pre-mitigation Calculated Effect (Where Significant)	Commentary	Mitigation Measures	Residual effect
		therefore exposure to increases is anticipated to lower.	exposure to increases in HGV traffic by vulnerable road users and minimise the potential for Fear and Intimidation (**D-TT-007** of the **REAC, Document Reference: D.6.5.1**). These measures will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC (**D-TT-002** of the **REAC, Document Reference: D.6.5.1**).	
	Moderate (Significant) • B5132 Cryers Lane; • Rake Lane; • B5129; • Starkey Lane; • Alt-Goch Lane; • Chorlton Lane; • Upper Aston Hall Lane; • Bryntyrion Road; • The B5125 in Hawarden; and • Overwood Lane.	Peak Month construction traffic has been assessed. Average month traffic is notably lower than for the DCO Proposed Development Peak Month. HGV flows in all of these locations is >50 AADT and represent very low baseline levels of HGV traffic. Absolute Increases in HGVs - when considered across each day - are modest; a maximum of 30 AADT on the B5129. LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases is anticipated to lower.	B5132 Cryers Lane, Rake Lane, and Chorlton Lane all form routes to Centralised Compounds. Traffic management measures will be implemented to manage construction traffic movements and reduce the potential effect of severance on communities adjacent to these links (**D-TT-010, D-TT-011, DD-TT-012** of the **REAC, Document Reference: D.6.5.1**). Mitigation measures on these routes are outlined in the **OCTMP (Document Reference: D.6.5.3).** This will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC **(D-TT-002** of the **REAC, Document Reference: D.6.5.1**). These measures include hazard warning signage, temporary speed limits, and community engagement to minimise inconvenience and disruption to road users (**D-TT-009, D-TT-010, D-TT-012** of the **REAC, Document Reference: D.6.5.1**).	*Minor (not significant)*
Pedestrian Delay	***Major (Significant)*** N/A			
	Moderate (Significant) • A5117 2; • B5132 Cryers Lane; • Little Stanney Lane; • A548 Sealand Road; • B5125 1; • B5125 2; • B5126 Connahs Quay Road; • A5119 Northop Road 1; • Ince Lane;	Average month traffic is notably lower than for this peak period **Appendix 17.8 - Construction Traffic Profiles (Volume III).** Medium and High magnitudes of effects can occur for Pedestrian Delay where total AADT > 1400 vehicles. It should be noted that all of these links have flows that exceed a total AADT of 1400 in the future baseline year (2024) and that the impact of the DCO Proposed Development does not cause any links to exceed this threshold. Where possible, use of the SRN and higher classification (i.e., A and B roads) has been	No specific mitigation is proposed to address the effect of construction traffic on Pedestrian Delay.	*Negligible (not significant)*

Description of the effect	Pre-mitigation Calculated Effect (Where Significant)	Commentary	Mitigation Measures	Residual effect
	• Ash Road; • A540; • Lower Aston Hall Lane; • Upper Aston Hall Lane; • Bryn Emlyn; • Ffordd Groes; • B5121; • B5122; • A5104; • Manor Lane; • Brookside; • A5117 4; and • B5125 4	used. Many links comprising construction traffic routes therefore have AADT > 1400 vehicles. LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases at key pedestrian demand times is expected to be lower in reality.		
Pedestrian Amenity	***Major (Significant)*** • Racecourse Lane; and • Lleprog Lane	Average month traffic is notably lower than for the DCO Proposed Development Peak Month **Appendix 17.8 - Construction Traffic Profiles (Volume III).** Baseline traffic flows on Racecourse Lane and Lleprog Lane are less than 100 AADT and therefore the calculated percentage increases are unrepresentative of a significant effect on Pedestrian Amenity. Pedestrian amenity will not be compromised by the additional traffic arising from DCO Proposed Development in these locations, where baseline levels of traffic are negligible.	Traffic movements will be managed by Traffic Marshals and radio-communications between inbound HGV deliveries and working locations. Pedestrian Amenity will therefore be protected as far as reasonably practicable during the Construction Stage of the DCO Proposed Development (**D-TT-012** of the **REAC, Document Reference: D.6.5.1**). This will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC (**D-TT-002** of the **REAC, Document Reference: D.6.5.1**).	*Minor (not significant)*
	Moderate (Significant) N/A			

Description of the effect	Pre-mitigation Calculated Effect (Where Significant)	Commentary	Mitigation Measures	Residual effect
Fear and Intimidation	**Major *(Significant)*** • Little Stanney Lane; • Picton Lane; • B5125 2 (west of Northop Hall Centralised Compound); • Lower Aston Hall Lane; • Lleprog Lane; • Little Rake Lane; and • Brookside; and • Racecourse Lane.	Average month traffic is notably lower than for the DCO Proposed Development Peak Month **Appendix 17.8 - Construction Traffic Profiles (Volume III).** All effects arising from additional construction traffic are temporary (16 month duration). Baseline HGV flows in all of these locations is >30 AADT and represent very low baseline levels of HGV traffic. Absolute Increases in HGVs - when considered across each day - are modest; a maximum of 30 AADT on the B5129. Total HGV%s remain less than 2% on all links with construction traffic in the future baseline year with construction traffic (2024). LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases is anticipated to lower.	Mitigation measures on these routes are outlined in the **OCTMP (Document reference: D.6.5.3)** In particular Little Stanney Lane, Picton Lane, Lleprog Lane, Racecourse Lane, Little Rake Lane, and Brookside (**D-TT-012** of the **REAC, Document Reference: D.6.5.1**). Traffic management measures will be implemented to manage construction traffic movements and reduce the potential effect of Fear and Intimidation experienced by local communities and road users on these links (**D-TT-010, D-TT-011,** and **DD-TT-012** of the **REAC, Document Reference: D.6.5.1**). These measures include temporary speed limits and traffic calming to minimise inconvenience and disruption to road users (**D-TT-010** of the **REAC, Document Reference: D.6.5.1**). A restriction on HGV deliveries will be imposed on Brookside between the hours of 0800-0900 and 1700-1800 respectively (**D-TT-007** of the **REAC, Document Reference: D.6.5.1**). Specific locations where restrictions on HGV timings are proposed are set out in full within the **OCTMP (Document reference: D.6.5.3).** These measures will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC (**D-TT-002** of the **REAC, Document Reference: D.6.5.1**).	*Minor (not significant)*
	Moderate (Significant) • B5132 Cryers Lane; • Rake Lane; • B5129; • Starkey Lane; • Alt-Goch Lane; • Chorlton Lane; • Upper Aston Hall Lane; • Bryntyrion Road; • The B5125 in Hawarden; and • Overwood Lane;	Average month traffic is notably lower than for the DCO Proposed Development Peak Month. HGV flows in all of these locations is >50 AADT and represent very low baseline levels of HGV traffic. Absolute Increases in HGVs - when considered across each day - are modest; a maximum of 30 AADT on the B5129. LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases is anticipated to lower.	B5132 Cryers Lane, Rake Lane, and Chorlton Lane all form routes to Centralised Compounds. Traffic management measures will be implemented to manage construction traffic movements and reduce the potential effect of Fear and Intimidation experienced by local communities and road users on these links (**D-TT-012** of the **REAC, Document Reference: D.6.5.1**). Mitigation measures on all routes are outlined in the **OCTMP (Document reference: D.6.5.3).** These measures include hazard warning signage, temporary speed limits, and community engagement to minimise inconvenience and disruption to road users (**D-TT-010, D-TT-012** of the **REAC, Document Reference: D.6.5.1**). A restriction on HGV deliveries will be imposed on the B5125 in Hawarden during the drop-off and collections times associated with Hawarden High School to minimise exposure to increases in HGV traffic by vulnerable road users and minimise the potential for Fear and Intimidation (**D-TT-007** of the **REAC, Document Reference: D.6.5.1**). These measures will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC (**D-TT-002** of the **REAC, Document Reference: D.6.5.1**).	*Minor (not significant)*
Driver Delay	***Major (Significant)*** • Little Stanney Lane;	Average month traffic is notably lower than for the DCO Proposed Development Peak Month	Mitigation measures on these routes are outlined in the **OCTMP (Document reference: D.6.5.3)** In particular Little Stanney Lane, Picton Lane, Lleprog Lane, Racecourse Lane,	Minor *(not significant)*

Description of the effect	Pre-mitigation Calculated Effect (Where Significant)	Commentary	Mitigation Measures	Residual effect
	• Picton Lane; • B5125 2 (west of Northop Hall Centralised Compound; • Lower Aston Hall Lane; • Lleprog Lane; • Little Rake Lane; • Brookside; and • Racecourse Lane;	**Appendix 17.8 - Construction Traffic Profiles (Volume III).** Baseline HGV flows in all of these locations is >30 AADT and represent very low baseline levels of HGV traffic. Absolute Increases in HGVs - when considered across each day - are modest; a maximum of 30 AADT on the B5129. Total HGV%s remain less than 2% on all links with construction traffic in the future baseline year with construction traffic (2024). LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases is anticipated to lower.	Little Rake Lane, and Brookside (**D-TT-012** of the **REAC, Document Reference: D.6.5.1**). Traffic management measures will be implemented to ensure that construction traffic can safely access working locations (**D-TT-010, D-TT-011,** and **DD-TT-012** of the **REAC, Document Reference: D.6.5.1**). For rural routes where there are geometric constraints (i.e. carriageway widths) that may result in delays arising from increases in HGVs traffic, HGV movements will be restricted during peak periods to reduce the effect of Driver Delay (**D-TT-007** of the **REAC, Document Reference: D.6.5.1**). Specific locations where restrictions on HGV timings are proposed are set out in the **OCTMP (Document reference: D.6.5.3).** These measures will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC (**D-TT-002** of the **REAC, Document Reference: D.6.5.1**).	
	Moderate (Significant) • B5132 Cryers Lane; • Rake Lane; • B5129; • Starkey Lane; • Alt-Goch Lane; • Chorlton Lane; • Upper Aston Hall Lane; • Bryntyrion Road; • Overwood Lane; and • B5125 4 (Hawarden)	Average month traffic is notably lower than for the DCO Proposed Development Peak Month **Appendix 17.8 - Construction Traffic Profiles (Volume III).** HGV flows in all of these locations is >50 AADT and represent very low baseline levels of HGV traffic. Absolute Increases in HGVs - when considered across each day - are modest; a maximum of 30 AADT on the B5129. LGV movements are primarily associated with worker travel which will take place outside of the typical peak hours (0800-0900 and 1700-1800) therefore exposure to increases is anticipated to lower.	Mitigation measures on these routes are outlined in the **OCTMP (Document reference: D.6.5.3).** B5132 Cryers Lane, Rake Lane, and Chorlton Lane all form routes to Centralised Compounds. Traffic management measures are proposed to manage construction traffic movements and reduce the potential effect of Fear and Intimidation experienced by local communities and road users on these links (**D-TT-012** of the **REAC, Document Reference: D.6.5.1**). Traffic management measures will be implemented to ensure that construction traffic can safely access working locations (**D-TT-010, D-TT-011,** and **DD-TT-012** of the **REAC, Document Reference: D.6.5.1**). For rural routes where there are geometric constraints (i.e. carriageway widths) that may result in delays arising from increases in HGVs traffic, it is proposed to restrict HGV movements during peak periods to reduce the effect of Driver Delay (**D-TT-007** of the of the **REAC, Document Reference: D.6.5.1**). Specific locations where restrictions on HGV timings are proposed are set out in the **OCTMP (Document reference: D.6.5.3).** These measures will be set out in the full CTMP prepared by the Construction Contractor for approval by FCC and CWCC (**D-TT-002** of the of the **REAC, Document Reference: D.6.5.1**).	*Minor (not significant)*
Highway Safety	Pre-mitigation significant effects were forecast at four locations located along prescribed construction traffic routes: • Cluster Reference 1 – A5117 1/ Rake lane junction. • Construction Traffic Route(s): CTR BVS 1, CTR CC 3.			*Minor (not significant)*

Description of the effect	Pre-mitigation Calculated Effect (Where Significant)	Commentary	Mitigation Measures	Residual effect
	• Cluster Reference 2 – Rake Lane/Little Rake Lane Junction. • Construction Traffic Route(s): CTR BVS 1, CTR CC 3. • Cluster Reference 3 – A540 Parkgate Road. • Construction Traffic Route(s): CTR BVS 2. • Cluster Reference 4 – A540 Parkgate Road Roundabout. • Construction Traffic Route(s): CTR BVS 2. The assessment of Highway Safety effects, and mitigation proposed is presented in **Appendix 17.3 - PIA Summary (Volume III)** and the **OCTMP (Document Reference D.6.5.3).**			

17.11.5. As can be seen in **Table 17.9**, there are not anticipated to be any residual significant Traffic and Transport effects associated with the DCO Proposed Development.

17.12. IN-COMBINATION CLIMATE CHANGE IMPACTS

17.12.1. It is not anticipated that there would be any in-combination climate change impacts that would affect the conclusions of the Traffic and Transport assessment.

17.13. MONITORING

17.13.1. The Construction Contractor may be required to demonstrate compliance with the measures included in the Outline CTMP during the construction of the DCO Proposed Development. Further information on monitoring and review is presented in the **OCTMP (Document Reference: D.6.5.3)**. The CTMP will be based on the OCTMP and prepared by the Construction Contractor (for approval by FCC and CWCC) prior to construction (**D-TT-002 of the REAC, Document Reference: D.6.5.1**).

17.14. REFERENCES

- **Ref. 17.1** – IEMA (1993) 'Guidelines for the Environmental Assessment of Road Traffic';
- **Ref. 17.2** – Ministry of Housing, Communities, and Local Government (MHCLG) (2015). Transport Evidence Bases in Plan Making and Decision Making**;**
- **Ref. 17.3** – Highways England (2020) 'DMRB LA 112' – Population and Human Health';
- **Ref. 17.4** – Department for Transport (2021) 'TAG Unit A3' – Environmental Impact Appraisal;
- **Ref. 17.5** – Department for Transport (2018) 'Transport Analysis Guidance' – The Transport Appraisal Process;
- **Ref. 17.6** – Highways Agency (2008) 'DMRB Volume 11 Section 2 Part 5' – Environmental Assessment. Environmental Impact Assessment. Assessment and management of environmental effects;
- **Ref. 17.7** – Department for Transport (2020) 'TAG Unit M1.2' – Data Sources and Surveys;
- **Ref. 17.8** - DfT Transport Appraisal Guidance (TAG) UNIT A4.1 Social Impact Appraisal;
- **Ref. 17.9** - DMRB LA104: Environmental assessment and Monitoring Rev 1;
- **Ref. 17.10** - Highways Agency (1993) 'DMRB Volume 11 Section 3 Part 8' - Environmental Assessment Techniques. Pedestrians, Cyclists, Equestrians and Community Effects (Amended August 1994 – Withdrawn);

- **Ref. 17.11** Trip End Model Presentation Programme (TEMPro) v7.2 (8th August 2022) https://www.gov.uk/government/publications/tempro-downloads;
- **Ref 17.12** Department for Transport (DfT) Guide to Lorry Types and Weights (July 2013) https://www.gov.uk/government/publications/guide-to-lorry-types-and-weights;
- **Ref. 17.13** Welsh Government A55 A494 A548: Flintshire Corridor (September 2021) https://gov.wales/a55-a494-a548-flintshire-corridor-overview;
- **Ref 17.14** Welsh Government Roads Review Oral Statement (June 2021) https://record.assembly.wales/Plenary/12317#A66072;
- **Ref 17.15 National Highways** Chief Analysts Division Guidance on traffic data collection (September 2021);
- **Ref 17.16** Google Maps Service (August 2022) [redacted]ps;
- **Ref 17.17** Google Earth Pro (August 2022) [redacted];
- **Ref 17.18** CWCC Council Interactive Mapping Service (August 2022) https://maps.cheshirewestandchester.gov.uk/cwac/webmapping;
- **Ref 17.19** FCC Council 'Spectrum Spatial' Mapping Service (August 2022) https://fccmapping.flintshire.gov.uk/connect/analyst/mobile/ ;
- **Ref 17.20** DfT 'Countpoint' Road Traffic Statistics Mapping Service (July 2022) https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints;
- **Ref 17.21** Sustrans' National Cycle Network Map (July 2022) [redacted]
- **Ref 17.22** Welsh Government (NMWTRA) Network Map (August 2022) https://traffic.wales/welsh-government-strategic-road-network-map;
- **Ref 17.23** National Highways (Highway's England) website August 2022) [redacted] and
- **Ref 17.24** 'CrashMap' Personal Injury Accident Online Service (August 2022)[redacted]
- **Ref. 17.25** Highways England *Water Preferred Policy* (2019) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/799833/WPP_guidelines_2019_DfT_consultation_revision.pdf