In Parliament – Session 2022 - 2023

HS2

High Speed Rail (Crewe – Manchester)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

Volume 2: Community Area reports

MA01: Hough to Walley's Green

S11

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S11

Department for Transport

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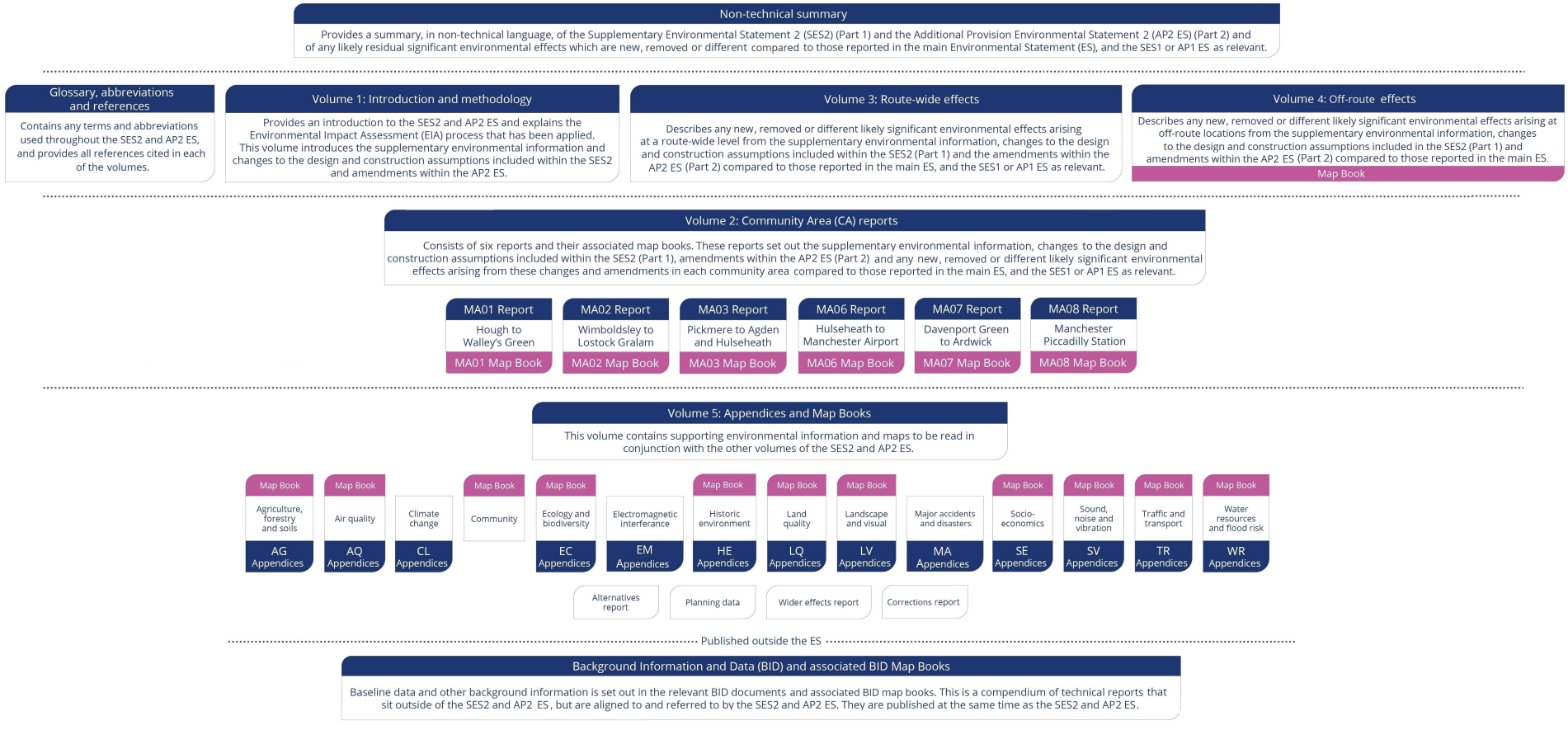
Structure of the HS2 Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

This report is part of the suite of documents that make up the SES2 and AP2 ES for the High Speed Rail (Crewe – Manchester) Bill. The SES2 and the AP2 ES are separate documents; however, they are bound together and presented in a number of volumes shown in Figure 1 and described below:

- **Non-technical summary (NTS)**. This provides a summary in non-technical language of the SES2 (Part 1) and the AP2 ES (Part 2). It presents a summary of any likely residual significant environmental effects (i.e. effects which are likely to remain after mitigation measures are put in place), both beneficial and adverse, which are new, different or have been removed compared to those reported in the main ES or the SES1 and AP1 ES, where relevant;
- **Glossary of terms, list of abbreviations and references**. This contains any terms and abbreviations used throughout the SES2 and the AP2 ES, and provides all references cited in each of the volumes listed below;
- **Volume 1: Introduction to the SES2 and the AP2 ES**. This introduces the supplementary environmental information and changes to the design and to the construction assumptions included within the SES2 and amendments within the AP2 ES. The report explains the environmental impact assessment (EIA) process which has been applied;
- **Volume 2: Community area reports and map books**. These report the supplementary environmental information and changes to the design and to the construction assumptions included within the SES2 (Part 1), amendments within the AP2 ES (Part 2) and any new, different or removed likely significant environmental effects arising from these changes and amendments in the following community areas:
  - MA01: Hough to Walley's Green;
  - MA02: Wimboldsley to Lostock Gralam;
  - MA03: Pickmere to Agden and Hulseheath;
  - MA06: Hulseheath to Manchester Airport;
  - MA07: Davenport Green to Ardwick; and
  - MA08: Manchester Piccadilly Station.
- Note, through the SES1, the removal of the HS2 West Coast Main Line (WCML) connection, included in the original scheme, has removed the community areas of Broomedge to Glazebrook (MA04) and Risley to Bamfurlong (MA05) from the HS2 Phase 2b Western Leg. Where changes in the combined traffic assessment result in effects that would have been reported in these two community areas, they are instead reported in the Hulseheath to Manchester Airport (MA06) community area report;

- The environmental effects in the Volume 2 reports are compared to those reported in the main ES, the SES1 or AP1 ES as relevant. The maps relevant to each community area are provided in separate Volume 2 map books and should be read in conjunction with the relevant community area report;
- **Volume 3: Route-wide effects**. This describes any new, different or removed likely significant environmental effects arising at a route-wide level from the supplementary environmental information and changes to the design and to the construction assumptions included within the SES2 (Part 1) and the amendments within the AP2 ES (Part 2) compared to those reported in the main ES, the SES1 or AP1 ES as relevant;
- **Volume 4: Off-route effects**. Describes any new, different or removed likely significant environmental effects arising at locations beyond the route corridor between Crewe and Manchester from the supplementary environmental information, changes to the design and construction assumptions included in the SES2 (Part 1) and amendments within the AP2 (Part 2) compared to those reported in the main ES; and
- **Volume 5: Appendices and map books**. These contain supporting environmental information and associated maps.
- Certain reports and maps containing background information and data (BID) have been produced, which do not form part of the SES2 and AP2 ES. These documents are available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-2-and-additional-provision-2-environmental-statement. The BID documents and maps present background survey information and other relevant background material.

Figure 1: Structure of the SES2 and AP2 ES



Structure of this report

This volume of the SES2 and AP2 ES is divided into Community Area (CA) reports. Each of these reports is in turn divided into two parts.

Part 1 (SES2) provides supplementary environmental information, where relevant, relating to:

- new baseline information with respect to environmental surveys completed and additional information received since the production of the main ES and the SES1 and AP1 ES;
- changes to the design and construction assumptions that do not require changes to the Bill; and
- corrections to the main ES and the SES1 and AP1 ES.

Part 2 (AP2 ES) provides environmental assessment information relating to proposed amendments to the design that have resulted in the need to alter the powers conferred by the Bill and the Additional Provisions to the Bill.

Parts 1 and 2 also include the following, where relevant:

- a description of the SES2 changes (Part 1) or the proposed AP2 amendments (Part 2) within the community area that have triggered the need for reassessment;
- an assessment of the environmental effects of the SES2 changes (Part 1) or the proposed AP2 amendments (Part 2) for relevant environmental topics, considering the:
  - scope, assumptions and limitations of the assessment;
  - environmental baseline;
  - effects arising during construction;
  - effects arising from operation; and
  - mitigation and residual effects;
- a summary of any new, removed or different likely residual significant effects as a result of the SES2 changes (Part 1) and the proposed AP2 amendments (Part 2) compared to those reported in the main ES and the SES1 and AP1 ES (as relevant).

1 Introduction

1.1.1 The High Speed Rail (Crewe – Manchester) Bill was submitted to Parliament together with an Environmental Statement ('the main ES') in January 2022. The SES1 and AP1 ES, which was submitted in July 2022, updated the main ES and contained changes and amendments to the design of the original scheme (i.e. the scheme submitted in January 2022) for the following community areas:

- MA01: Hough to Walley's Green;
- MA02: Wimboldsley to Lostock Gralam;
- MA03: Pickmere to Agden and Hulseheath;
- MA04: Broomedge to Glazebrook; and
- MA05: Risley to Bamfurlong.

1.1.2 The Bill and the Additional Provisions to the Bill, if enacted by Parliament, will provide the powers to construct, operate and maintain the HS2 Phase 2b Western Leg.

1.1.3 Since submission of the main ES and SES1 and AP1 ES, a number of further updates or changes to environmental baseline information, to the design and to construction assumptions have occurred, which may lead to new, removed or different significant effects. These effects, depending on the type of change, are reported in the SES2 or the AP2 ES, which form Part 1 and Part 2 of this report respectively.

1.1.4 The SES2 (Part 1) contains updated environmental baseline information and scheme information relating to changes within the current limits and powers of the Bill, which therefore do not require an Additional Provision to the Bill. The SES2 changes within the Hough to Walley's Green area include:

- additional environmental baseline information (which may be relevant to the SES2 scheme and/or AP2 revised scheme) for: air quality; ecology and biodiversity; land quality; socio-economics; sound, noise and vibration; traffic and transport; and, water resources and flood risk;
- changes to the design and to construction assumptions that do not require changes to the Bill; and
- corrections to the main ES and the SES1 and AP1 ES.

1.1.5 These changes are described in Part 1 and are assessed on a topic by topic basis, where relevant.

1.1.6 The purpose of the SES2 is to describe the assessment and identify any new, removed or different likely significant environmental effects arising from the changes. These will be compared to the main ES or SES1 as relevant for each topic assessment.

1.1.7 The AP2 ES (Part 2) describes the likely significant effects of amendments to the design of the scheme which require the use of land outside the original limits of the Bill, additional

access rights or other extensions to the powers conferred by the Bill, making it necessary to submit an Additional Provision to the Bill.

1.1.8 The AP2 ES reports the assessment of each amendment separately for all relevant topics. The purpose of the AP2 ES is to provide an assessment of any new, removed or different likely significant environmental effects arising from the amendments, as compared to the main ES, the SES1 or the SES2 as relevant. Consideration is also given to the interaction between AP1 amendments and AP2 amendments, where relevant.

1.1.9 A combined assessment of new, removed or different significant construction and operation traffic and traffic related effects, as a result of changes in traffic flows, is reported in Section 7. This is because alterations in traffic flows cannot generally be directly attributed to particular SES2 changes or AP2 amendments. Traffic and transport effects are reported first, since the effects arise from changes in traffic flows. Other topics affected by traffic and transport changes are then reported, as necessary.

1.1.10 All other new, removed or different significant traffic and transport effects are reported with the relevant SES2 change or AP2 amendment section of this report.

1.1.11 The standard measures that will be used to mitigate likely significant adverse environmental effects during construction and operation of the scheme are described in Section 9 of Volume 1 of the main ES and in the draft Code of Construction Practice (CoCP)[1] submitted in support of the Bill. Implementation of these measures has been assumed in this SES2 and AP2 ES.

1.1.12 In order to differentiate between the original proposals assessed as part of the main ES and subsequent changes, the following terms are used throughout the SES2 and the AP2 ES to define the scheme:

- 'the SES1 scheme' – the original scheme with any changes described in SES1 that are within the existing powers of the Bill;
- 'the AP1 revised scheme' – the original scheme as amended by SES1 changes and AP1 amendments;
- 'the SES2 scheme' – the original scheme with any changes described in SES1 (submitted in July 2022) and SES2; and
- 'the AP2 revised scheme' – the original scheme as amended by SES1 changes, SES2 changes and AP2 amendments.

[1] High Speed Two Ltd (2022), High Speed Rail (Crewe - Manchester), *Environmental Statement, draft Code of Construction Practice,* Volume 5, Appendix: CT-002-00000. Available online at: https://www.gov.uk/government/collections/cross-topic-technical-appendices-for-high-speed-rail-crewe-manchester-environmental-statement#draft-code-of-construction-practice.

1.1.13 The following terms are used to differentiate between changes included in the SES2 and those included in the AP2 ES:

- 'SES2 design changes' – changes to the scheme design reported in the SES2 that do not require additional powers;
- 'SES2 changes' – all changes reported in the SES2 that do not require additional powers. This may include new baseline information, changes to the design and to construction assumptions, and corrections; and
- 'AP2 amendments' – amendments to the scheme reported in the AP2 ES that include requirements for additional powers in the Bill.

1.1.14 In addition, the following terms are used in the SES2 and AP2 ES, where relevant:

- 'SES1 design changes' – changes to the scheme design reported in the SES1 that do not require additional powers;
- 'SES1 changes' – all changes reported in the SES1 that do not require additional powers. These may include new baseline information, changes to the design and construction assumptions, and corrections; and
- 'AP1 amendments' – amendments to the scheme reported in the AP1 ES that include requirements for additional powers in the Bill.

Part 1: Supplementary Environmental Statement 2

2 Summary of changes in the Hough to Walley's Green area

2.1 New environmental baseline information

2.1.1 Since the main ES and SES1 and AP1 ES, updates to the environmental baseline information have occurred which may lead to new or different significant effects for the following environmental topics.

2.1.2 An update to the baseline information for traffic and transport effects is reported first, since this has implications for other topics. The other topics where updated baseline information may lead to new or different significant effects are then reported, in the following sequence:

- air quality;
- ecology and biodiversity;
- land quality;
- socio-economics;
- sound, noise and vibration; and
- water resources and flood risk.

Traffic and transport

2.1.3 Since the main ES and the SES1 and AP1 ES, additional traffic information has been used in the development of updated baseline and future baseline models for the SES2 scheme and AP2 revised scheme in the Hough to Walley's Green area. This includes Trafficmaster journey time data from the Department for Transport (DfT), as set out in the Background Information and Data (BID)[2] report BID TR-004-00001 SES2 and AP2 ES. This data has been combined with the information collected for local junction modelling set out in the BID[3] report BID TR-004-00001 which accompanied the main ES.

[2] High Speed Two Ltd (2023), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement, Transport Assessment policy and data*, BID TR-004-00001. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-2-and-additional-provision-2-environmental-statement.

[3] High Speed Two Ltd (2022), High Speed Rail (Crewe - Manchester), *Background Information and Data, Transport Assessment policy and data report,* BID TR-004-00001. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement.

2.1.4 The baseline and future baseline models have been updated for the assessment of the SES2 scheme and AP2 revised scheme to reflect:

- additional traffic information outlined above;
- refinement of network coding to improve model performance in key areas of interest;
- inclusion of recently committed or completed transport schemes and development proposals that have come forward since the models used in the assessment reported in the main ES and the SES1 and AP1 ES were developed; and
- the change in the future baseline forecast years from 2030 to 2031 and 2038 to 2039 (as described in Section 7 of this report).

2.1.5 The assessment of the changes to traffic flows associated with the updated baseline and future baseline models in combination with all SES1 changes, AP1 amendments, SES2 changes and AP2 amendments is reported in Section 7 of this report.

Air quality

2.1.6 Road traffic data, as discussed in Section 7, and air quality assessment years have been updated for both construction (2026 as a worst case earliest construction year) and operation (2039) for the Hough to Walley's Green area. Details of the additional traffic data and associated background air pollution concentrations in this area are provided in the BID[4] document BID AQ-002-0MA01 SES2 and AP2 ES, SES2 and AP2 ES Volume 5, Appendix: AQ-001-0MA01 and SES2 and AP2 ES Volume 5, Air Quality Map Book: Map Series AQ-01 Monitoring Locations and Receptors.

Ecology and biodiversity

2.1.7 Since the main ES and the SES1 and AP1 ES, additional Phase 1 habitat, hedgerow, National Vegetation Classification (NVC), pond and canal, river habitat, bat and great crested newt surveys have been completed in the Hough to Walley's Green area.

2.1.8 Details of these additional ecological surveys are provided in BID documents[5] (BID EC-017-00000, BID EC-007-00000 and BID EC-011-00000), and BID Ecology and biodiversity Map

[4] High Speed Two Ltd (2023), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement, Additional data used in the air quality assessment*, BID AQ-002-0MA01. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-2-and-additional-provision-2-environmental-statement.

[5] High Speed Two Ltd (2023), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement, Ecology and biodiversity baseline data*. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-2-and-additional-provision-2-environmental-statement.

Book[6]: Map Series EC-02, EC-04, EC-05, EC-06, EC-08, EC-10, EC-11 and EC-12, which accompany the SES2 and AP2 ES.

2.1.9 Additional effects that are significant at the local/parish level that are likely to occur as a consequence of changes to the SES2 baseline and AP2 amendments are identified in SES2 and AP2 ES Volume 5, Appendix: EC-015-00000.

2.1.10 Details of supplementary ecological information that is relevant to the SES2 assessment is provided in Section 3.

Land quality

2.1.11 Following comment from Cheshire East Council, land quality baseline data was reviewed and an additional site has been added to the baseline assessment for land quality in the Hough to Walley's Green area.

2.1.12 Details of the additional site are provided in SES2 and AP2 ES Volume 5, Appendix: LQ-002-00000. This information has been used in the land quality assessment undertaken for the SES2 changes and AP2 amendments, which are reported in ES Volume 5, Appendix: LQ-002-00000. No new, different or removed significant effects have been identified.

Socio-economics

2.1.13 Since the main ES, the following baseline information has been updated:

- datasets reflecting changes to the business and labour market from the Office for National Statistics (ONS), namely:
  - UK Business Counts (UKBC) (January – December 2021);
  - Business Register and Employment Survey (BRES) (January – December 2021); and
  - Annual Population Survey (APS) (January – December 2021);
- vacancy rates for industrial and warehousing property and for office space, with information supplied by Estates Gazette.

2.1.14 This baseline information has been considered, where relevant, in the assessment and is presented in the SES2 and AP2 ES Volume 5, Appendix: SE-001-00000, Updated socio-economic baseline information.

[6] High Speed Two Ltd (2023), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement, Ecology and biodiversity Map Book:* Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-2-and-additional-provision-2-environmental-statement.

Sound, noise and vibration

2.1.15 Road traffic information, such as flows and speeds, is used to determine the baseline sound levels. Additional road traffic information has been obtained for the SES2 scheme and AP2 revised scheme. Where relevant, this road traffic information has been used to update the existing and future baseline sound modelling. Details of the updated baseline information that is relevant to the assessment are provided in SES2 and AP2 ES Volume 5, Appendix: SV-002-00000.

2.1.16 The main ES identified several non-residential properties in Crewe which, on the basis of a precautionary assessment, were identified to be significantly affected by operational ground borne noise. Since the main ES and the SES1 and AP1 ES, additional surveys and site visits have been undertaken at the following four properties:

- Best Western Crewe Arms Hotel, Nantwich Road, Crewe;
- Bentley Manor Care Home, Sherborne Rd, Crewe;
- Sherborne Court Neurological Centre, Sherborne Road, Crewe; and
- the Eurocard Centre and the Eurosales Centre in Herald Park, Herald Drive, Crewe.

2.1.17 The purpose of the surveys and site visits was to collect further information on the use, sensitivity and the design of the receptors affected. Details of the updated baseline information that is relevant to the assessment are provided in Section 3.

Water resources and flood risk

2.1.18 In July 2021, the Environment Agency published revised guidance and climate change allowances for peak river flows to reflect the UK Climate Projections 2018 (UKCP18)[7]. In May 2022 updated peak rainfall intensity allowances were published by the Environment Agency using UKCP local projections of extreme rainfall. Further details are provided in the SES2 and AP2 ES Volume 5, Appendix: CT-001-00005: Water resources and flood risk technical note: Updated guidance on flood risk assessment. The main changes to the guidance of relevance to the SES2 and AP2 ES are:

- peak river flow and rainfall intensity allowances are given for 'management catchments' instead of river basin districts. The smaller geographical units better reflect variability of the catchment response to climate change impact;
- the 'Higher Central' peak river flow allowance should be used for catchments which contain 'essential infrastructure, elsewhere the 'Central' allowance should be used; and
- the 'Upper end' peak rainfall intensity allowance should be used for all development with a lifespan beyond 2100.

[7] Environment Agency (2022). *Flood risk assessments: climate change allowances*. Available online at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.

2.1.19 This information has been used in the water resources and flood risk assessment, where relevant.

2.1.20 Since the main ES and SES1 and AP1 ES, additional surface water surveys have been completed around Hoggins Brook and Tributary of Fowle Brook 1. Downstream from the HS2 route, Tributary of Fowle Brook 1 is connected to two surface water bodies which form a part of the Sandbach Flashes Site of Special Scientific Interest (SSSI).

2.1.21 A review of Ordnance Survey (OS) mapping suggested that a drain, shown terminating on the western side of the West Coast Main Line (WCML) close to Spring Plantation, might be connected by culvert to Tributary of Fowle Brook 1 on the eastern side of the WCML. The SES1 and AP1 ES therefore reported that the drainage area to the west of the WCML would be severed from Tributary of Fowle Brook 1 and, hence, from the Sandbach Flashes SSSI. Therefore, on a precautionary basis, the SES1 and AP1 ES reported a potential hydrological impact on Sandbach Flashes SSSI. However, during the additional surface water surveys, no evidence was found of a culvert which could link the drain with Tributary of Fowle Brook 1. Instead, the drain looked to extend to the north to connect to Hoggins Brook. It is, therefore, concluded that the drainage on the western side of the WCML is not connected to Tributary of Fowle Brook 1 on the eastern side of the WCML.

2.2 Changes to the design or to construction assumptions not requiring a change to the Bill

Introduction

2.2.1 The following have been identified for the Hough to Walley's Green area:

- changes to construction assumptions; and
- changes to the construction programme.

2.2.2 These changes, which are described below, do not require a change to the Bill.

Changes to construction assumptions

2.2.3 The main ES provided indicative details of the construction works to be managed from the construction compounds in the area (see Section 2 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES). This was updated to reflect changes to construction works associated with the AP1 revised scheme in the SES1 and AP1 ES. The information included the duration of works, number of workers and a summary of the works to be undertaken. A construction programme was also provided, which included indicative periods for each of the core construction activities.

2.2.4 A route-wide review of earthworks and the movement of materials has been undertaken since the main ES. Changes to assumed construction methods have also been made. The review and the changes have resulted in the need to alter the indicative construction

programme. The revised programme is provided in Section 6 and described in Section 3.2 of the SES2 and Section 5 of the AP2 ES.

2.2.5 There will be no changes to the construction workforce at compounds as a result of the AP2 revised scheme. An assessment of socio-economic effects on employment at a route-wide level is reported in Volume 3 of the SES2 and AP2 ES.

SES2 engineering changes

2.2.6 There are no SES2 design changes which result in new or different significant effects in the Hough to Walley's Green area.

2.3 Corrections to the main ES and the SES1 and AP1 ES

2.3.1 The need for a number of corrections to the contents of the main ES and the SES1 and AP1 ES has been identified since submission of the Bill. Table 1 provides the following:

- corrections to the Volume 2, Community Area report: Hough to Walley's Green (MA01) that have the potential to alter the significant environmental effects previously reported;
- corrections to any factual inaccuracies relating to significant effects previously reported;
- clarifications to elements of the scheme description previously reported;
- the location of the text that is subject to the correction in the relevant report;
- the reason for the correction;
- the original text from the relevant report and, where applicable, revised text; and
- whether the correction changes a significant effect previously reported.

2.3.2 These corrections were considered, where relevant, in the technical assessments reported in Section 3 of this SES2.

Table 1: Summary of corrections to the main ES, and SES1 and AP1 ES in Hough to Walley's Green area

Reference in the main ES or SES1 and AP1 ES	Reason for correction	Text in the relevant report	Revised text	Change to significant effects and mitigation
Community Combined effects of changes and amendments in the Hough to Walley's Green area due to changes in construction traffic flows, Paragraphs 7.5.9, 7.5.10, 7.5.11, 7.5.13 and 7.5.14, Volume 2, MA01 of the SES1 and AP1 ES	The SES1 and AP1 ES should have reported the removal of significant community effects on approximately five residential properties along the B5076 North Street in Crewe, approximately 20 residential properties along the B5076 Bradfield Road in Crewe, approximately 250 residential properties in the vicinity of Broughton Road, Coppenhall, approximately 25 residential properties on Sydney Road, Crewe, and approximately 30 residential properties on the A530 Middlewich Road, Bradfield Green.	None included.	Paragraph 7.5.9: The main ES reported a moderate adverse in-combination effect on approximately five residential properties along the B5076 North Street in Crewe. Significant HGV traffic effects were expected to combine with significant air quality effects. New construction traffic data will remove the significant HGV traffic and air quality effects. This will result in the removal of the significant in-combination effect on amenity for residents of approximately five properties along the B5076 North Street. Paragraph 7.5.10: The main ES reported a moderate adverse in-combination effect on approximately 20 residential properties along the B5076 Bradfield Road in Crewe. Significant HGV traffic effects were expected to combine with significant air quality effects. New construction traffic data will remove the significant HGV traffic and air quality effects. This will result in the removal of the significant in-combination effect on amenity for residents of approximately 20 properties along the B5076 Bradfield Road.	Yes. This correction will lead to the removal of all significant community amenity effects.

Reference in the main ES or SES1 and AP1 ES	Reason for correction	Text in the relevant report	Revised text	Change to significant effects and mitigation
			Paragraph 7.5.11: The main ES reported a major adverse in-combination effect on approximately 250 residential properties in the vicinity of Broughton Road, Coppenhall. Significant airborne noise effects were expected to combine with significant visual and significant air quality effects for approximately five years and six months during the daytime, two years and four months during the evening, and two years and six months during the night-time. Properties were also expected to experience significant road traffic noise effects. Broughton Road is a designated route for construction traffic. Significant air quality effects and significant road traffic noise effects were expected to combine with the significant noise and visual effects reported in the main ES, as amended by AP-001-004. New construction traffic data and changes to the sound, noise and vibration assessment as a result of this new data, will remove the significant air quality and traffic noise effects. This will result in the removal of the significant in-combination effect on amenity for residents of approximately 250 properties in the vicinity of Broughton Road, Coppenhall.	

Reference in the main ES or SES1 and AP1 ES	Reason for correction	Text in the relevant report	Revised text	Change to significant effects and mitigation
			Paragraph 17.5.12: The main ES reported a moderate adverse in-combination effect on approximately 25 residential properties on Sydney Road, Crewe. Sydney Road, Crewe, is a designated route for construction traffic and is expected to experience a significant increase in HGV traffic movements. These significant HGV traffic effects were expected to combine with significant traffic noise effects during the peak months of construction. Changes to the sound, noise and vibration assessment as a result of new construction traffic data will result in the removal of the significant traffic noise effect. This change will result in the removal of the significant in-combination effect on amenity for residents of 25 residential properties on Sydney Road, Crewe. Paragraph 7.5.13: The main ES reported a moderate adverse in-combination effect on approximately 30 residential properties on the A530 Middlewich Road, Bradfield Green. The A530 Middlewich Road, Bradfield Green is a designated route for construction traffic and is expected to experience a significant increase in HGV traffic movements. These significant HGV traffic effects were expected to combine	

Reference in the main ES or SES1 and AP1 ES	Reason for correction	Text in the relevant report	Revised text	Change to significant effects and mitigation
			with significant traffic noise effects during the peak months of construction. Changes to the sound, noise and vibration assessment as a result of new construction traffic data will result in the removal of the significant traffic noise effect. This change will result in the removal of the significant in-combination effect on amenity for residents of 30 residential properties on the A530 Middlewich Road, Bradfield Green.	
Land Quality Paragraph 10.3.14, Volume 2, MA01 of the main ES.	The main ES incorrectly omitted a land quality site (Ambulance Station).	Paragraph 10.3.14: Current potentially contaminative land uses within the study area include one landfill site, one waste disposal facility and 158 industrial and commercial sites.	Paragraph 10.3.14: Current potentially contaminative land uses within the study area include one landfill site, one waste disposal facility and 159 industrial and commercial sites.	No change. This correction will not lead to a new or different significant effect.
Land Quality Paragraph 10.4.8, Volume 2, MA01 of the main ES.	The main ES incorrectly omitted a land quality industrial site (Ambulance Station).	Paragraph 10.4.8: In the Hough to Walley's Green area, 18 sites remain following initial screening to go through to detailed risk assessment and require CSM.	Paragraph 10.4.8: In the Hough to Walley's Green area, 19 sites remain following initial screening to go through to detailed risk assessment and require CSM.	No change. This correction will not lead to a new or different significant effect.
Land Quality Paragraph 10.4.12, Table 32: Summary of baseline CSM for sites which may pose a contaminative risk in relation to the Proposed Scheme, Volume 2, MA01 of the main ES.	The main ES incorrectly omitted a land quality industrial site (Ambulance Station).	None included.	Paragraph 10.4.12, Table 32, new entry beneath final row: **Category:** Off-site **Site group/ID** Ambulance station MA01-388 **Human health risk** Moderate/low to low **Groundwater risk** Low to moderate **Surface water risk**	No change. This correction will not lead to a new or different significant effect.

Reference in the main ES or SES1 and AP1 ES	Reason for correction	Text in the relevant report	Revised text	Change to significant effects and mitigation
			N/A **Ecosystem risk** N/A **Buildings risk** Very low to low	
Sound, Noise and Vibration Paragraph 7.8.11, Volume 2, MA01 of the SES1 and AP1 ES	The SES1 and AP1 ES incorrectly reported the significant effect code and the Volume 5 reference for dwellings located along Waldron's Lane and Stoneley Road.	Paragraph 7.8.11: …The main ES did not identify an indirect noise effect along this road; therefore, this is considered to be a new likely significant effect on a community basis at the dwellings on these roads, denoted as MA02-C-C12 in Volume 5, Appendix: SV-002-0MA02.	Paragraph 7.8.11: …The main ES did not identify an indirect noise effect along this road; therefore, this is considered to be a new likely significant effect on a community basis at the dwellings on these roads, denoted as MA01-C-C12 in Volume 5, Appendix: SV-002-0MA01.	No change. This correction does not lead to a new or changed significant effect.
Traffic and transport Paragraph 7.3.16, Volume 2, MA01 of the SES1 and AP1 ES Paragraph 7.3.18, Table 21, Volume 2, MA01 of the SES1 and AP1 ES	The SES1 and AP1 ES incorrectly reported the scenario when shuttle working on the A532 West Street/Coppenhall Lane would take place during construction.	Paragraph 7.3.16, first and second bullet: utilities scenario, 2025 Q1 – 2026 Q3. This scenario corresponds with utility and advance works and includes shuttle working on the A532 West Street/Coppenhall Lane. There are negligible construction traffic movements in this scenario; scenario 1, 2026 Q4 - 2030 Q1. This corresponds with the construction peak during the period when Clive Green Lane (Wimboldsley to Lostock Gralam area (MA02)) will not be available to HS2 construction traffic and includes commencement of works on Cowley Way vent shaft and Middlewich Street vent shaft. This scenario equates to the overall peak in construction traffic across the whole construction period; and	Paragraph 7.3.16, first and second bullet: utilities scenario, 2025 Q1 – 2026 Q3. This scenario corresponds with utility and advance works. There are negligible construction traffic movements in this scenario; scenario 1, 2026 Q4 - 2030 Q1. This corresponds with the construction peak during the period when Clive Green Lane (Wimboldsley to Lostock Gralam area (MA02)) will not be available to HS2 construction traffic and includes shuttle working on the A532 West Street/Coppenhall Lane and commencement of works on Cowley Way vent shaft and Middlewich Street vent shaft. This scenario equates to the overall peak in construction traffic across the whole construction period; and	The assessment of the changes to traffic flows as a result of this correction, in combination with all AP2 amendments and SES2 changes is reported in Section 7.

Reference in the main ES or SES1 and AP1 ES	Reason for correction	Text in the relevant report	Revised text	Change to significant effects and mitigation
		Paragraph 10.2.14 – Table 21, first entry: Type: Utilities Intervention: Shuttle working on A532 West Street/Coppenhall Lane Utilities scenario – 2025 Q1 – 2026 Q3: Included Scenario 1 – 2026 Q4 – 2030 Q1: Not included Scenario 2 – 2030 Q2 – 2033 Q4: Not included	Paragraph 7.3.18 – Table 21, first entry: Type: Utilities Intervention: Shuttle working on A532 West Street/Coppenhall Lane Utilities scenario – 2025 Q1 – 2026 Q3: Not included Scenario 1 – 2026 Q4 – 2030 Q1: Included Scenario 2 – 2030 Q2 – 2033 Q4: Not included	
Traffic and transport Volume 2, MA01 of the SES1 and AP1 ES	Traffic assessment in the SES1 and AP1 ES did not include the closure of Casey Lane or the provision of the Casey Lane diversion associated with HS2 Phase 2a.	None included.	None included.	The assessment of the changes to traffic flows as a result of this correction, in combination with all AP2 amendments and SES2 changes, is reported in Section 7.
Traffic and transport Paragraph 7.3.24, Table 22, Volume 2, MA01 of the SES1 and AP1 ES	The SES1 and AP1 ES incorrectly reported the performance of the A530 Middlewich Road/B5076 Flowers Lane/Eardswick Lane junction as a single junction in the future baseline and construction assessment. Junction performance should have been reported for two junctions (the A530 Middlewich Road/Eardswick Lane junction and the A530	Paragraph 7.3.24 – Table 22, 31st entry: Road Name: A530 Middlewich Road/B5076 Flowers Lane/Eardswick Lane Significant effect: Major adverse (increased) (Previously major adverse) AP1 construction scenario: Scenarios 1 and 2	Paragraph 7.3.24 – Table 22, 31st entry: Road Name: A530 Middlewich Road/Eardswick Lane Significant effect: No change from main ES (Previously major adverse) AP1 construction scenario: Scenarios 1 and 2	Yes. The effect at the A530 Middlewich Road/Eardswick Lane junction changes from major adverse (increased) to major adverse. There is no significant effect at the A530 Middlewich Road/B5076 Flowers Lane junction.

Reference in the main ES or SES1 and AP1 ES	Reason for correction	Text in the relevant report	Revised text	Change to significant effects and mitigation
	Middlewich Road/B5076 Flowers Lane junction) following a change to the highway network in the future baseline.			
Traffic and transport Paragraph 7.3.24, Table 22, Volume 2, MA01 of the SES1 and AP1 ES	The SES1 and AP1 ES incorrectly reported the effect on delays to vehicle occupants and congestion on the B5076 Flowers Lane/B5076 Bradfield Road/Minshull New Road/Smithy Lane junction during construction as major adverse. The correct effect was moderate adverse.	Paragraph 7.3.24 – Table 22, 27th entry: Road Name: B5076 Flowers Lane/B5076 Bradfield Road/Minshull New Road/Smithy Lane Significant effect: No change from main ES (previously major adverse) AP1 construction scenario: Utilities scenario	Paragraph 7.3.24 – Table 22, 27th entry: Road Name: B5076 Flowers Lane/B5076 Bradfield Road/Minshull New Road/Smithy Lane Significant effect: Moderate adverse (previously major adverse) AP1 construction scenario: Utilities scenario	Yes. The effect changes from major adverse to moderate adverse.

3 Assessment of changes in the Hough to Walley's Green area

3.1 Introduction

3.1.1 This section describes the effects of the SES2 changes in the Hough to Walley's Green area on:

- ecology and biodiversity;
- sound, noise and vibration; and
- water resources and flood risk.

3.1.2 Any new or different likely significant environmental effects as a result of the baseline and changes summarised in Section 2 are identified, compared to the original scheme or the SES1 scheme as relevant.

3.1.3 The assessment of the changes to traffic flows and traffic related effects as a result of all changes and amendments to the original scheme is reported in Section 7.

3.2 Ecology and biodiversity

Introduction

3.2.1 The environmental baseline relevant to the ecology and biodiversity assessment is described below. Any new or different likely significant environmental effects as a result of the baseline and changes introduced in Section 2 are then identified, compared to those reported in the main ES or SES1 as relevant.

Scope, assumptions and limitations

3.2.2 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1 and the Scope and Methodology Report (SMR)[8] of the main ES.

3.2.3 The SES2 changes of relevance to this assessment have the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for ecology and biodiversity.

3.2.4 Ecology and biodiversity effects that result from the changes to traffic flows as a result of all amendments in combination with all changes are reported in Section 7.

[8] High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Environmental Impact Assessment Scope and Methodology Repo*rt, Volume 5, Appendix: CT-001-00001. Available online at: https://www.gov.uk/government/collections/cross-topic-technical-appendices-for-high-speed-rail-crewe-manchester-environmental-statement#environmental-impact-assessment-scope-and-methodology-report.

SES2 changes relevant to the assessment

3.2.5 New environmental baseline information resulting from additional ecological surveys in the Hough to Walley's Green area is relevant to the assessment.

Environmental baseline

Existing baseline

3.2.6 The baseline ecology and biodiversity information is as described in Section 7 of Volume 2, Community Area report: Hough to Walley's Green area of the main ES and Section 3 of Volume 2, Community Area report: Hough to Walley's Green area of SES1. A summary of the baseline information relevant to the assessment of the SES2 scheme is provided below.

Designated sites

3.2.7 The AP1 ES reported a precautionary adverse effect on Sandbach Flashes SSSI arising from a potential reduction in flow from the Tributary of Fowle Brook 1 to the SSSI. Since SES1, additional hydrological surveys have developed the understanding of the drainage network within the land required for the construction of the scheme that is relevant to the assessment of Sandbach flashes SSSI.

Habitats

3.2.8 The main ES reported a total of 28km of hedgerow within the land required for the construction of the original scheme. This comprised 10.9km of native species-poor hedgerow and 17.1km of native species-rich hedgerow (including 12.4km of hedgerow not subject to survey and assumed to be species-rich on a precautionary basis). The network as a whole is of county/metropolitan value.

3.2.9 Additional surveys of hedgerows that were previously not subject to survey have identified that 1.6km of hedgerow previously assumed on a precautionary basis to be species-rich are species-poor.

3.2.10 As a result of updated baseline information and adjusting for improved data, the total length of hedgerows within the land required for the SES2 scheme has reduced to 26.6km, comprising 12.2km of native species-poor hedgerow and 14.4km of native species-rich hedgerow (including 10.8km of un-surveyed hedgerow assumed to species-rich on a precautionary basis). The change in length and composition of hedgerows reported does not change the value of the hedgerow network as a whole from that reported in the main ES.

3.2.11 The main ES reported 21 ponds located within, or partly within, the land required for the construction of the original scheme in the Hough to Walley's Green's area. On a precautionary basis it was assumed that all ponds could qualify as habitats of principal importance or local Biodiversity Action Plan (BAP) habitats and are of district/borough value.

The SES2 baseline, accounting for OS mapping changes and further survey data, shows there are 26 ponds located within or partially within the land required for the SES2 scheme.

Species

Amphibians

3.2.12 The outcomes of additional ecological surveys undertaken for great crested newt have formed the basis of a review of the composition of metapopulations across the Hough to Walley's Green area. This review has considered the quality and connectivity of terrestrial habitat between ponds in order to determine the locations of distinct clusters of ponds that are likely to support metapopulations of great crested newt. Changes to the baseline to inform the SES2 scheme have resulted in one new metapopulation and changes to the composition of three metapopulations, in comparison with those reported in the main ES and SES1. Great crested newt metapopulations that are reported in the Amphibians BID EC-007-00000 SES2 and AP2 ES include metapopulations associated with AP2 amendments which are not relevant to the SES2 assessment.

3.2.13 The main ES reported a great crested newt metapopulation in a network of eight ponds to the west of Woolstanwood (GCNMP1.1.12). This included ponds in which the presence of great crested newt was confirmed through desk study. On a precautionary basis, the presence of a medium sized population was assumed. This metapopulation was valued at county/metropolitan level in the main ES. Additional surveys since the main ES reported the absence of great crested newts within two ponds which have been removed from the metapopulation. The decrease in the number of ponds with confirmed or assumed populations of great crested newt as a result of this SES2 baseline update does not change the value of GCNMP1.1.12, reported in the main ES.

3.2.14 The SES1 reported 127 ponds to the north of Crewe and south-east of Middlewich (GCNMP1.1.19) with confirmed or assumed populations of great crested newt. On a precautionary basis, the presence of a large sized population was assumed as it is associated with a network of over 100 ponds. This metapopulation was valued at county/metropolitan level in the SES1. Additional surveys at SES2 recorded two new ponds with assumed populations of great crested newt and absence of great crested newts within 11 ponds, which have been removed from the metapopulation. Negative field survey results have created a spatially separate metapopulation of four ponds, which are now removed and form a new metapopulation referred to as GCNMP1.1.33. The revised metapopulation for GCNMP1.1.19 is 114 ponds and does not change the assumed population size or value as reported in the SES1.

3.2.15 The SES1 reported a great crested newt metapopulation in 56 ponds in the area to the north of Crewe extending to Walley's Green (GCNMP1.1.20) which includes ponds where the presence of great crested newt was confirmed by field survey data. On a precautionary basis, the presence of a medium population was assumed in the remaining un-surveyed ponds. This metapopulation is valued at county/metropolitan value in the SES1. Additional surveys have confirmed the population is medium and identified the presence of one

additional pond with a population of great crested newt and the removal of two ponds previously assumed to support populations of great crested newt. The net decrease in the number of ponds with populations of great crested newt does not change the value of GCNMP1.1.20 reported in the SES1.

3.2.16 Additional surveys and reclassification of metapopulations have identified a new great crested newt metapopulation in four ponds north of Crewe (GCNMP1.1.33) previously within GCNMP1.1.19. Negative field survey results have determined these to be spatially separate the ponds from GCNMP1.1.19. All four ponds are located within land required for the construction of the SES2 scheme. On a precautionary basis the population size class of this metapopulation is assumed medium, due to the presence of un-surveyed water bodies. This metapopulation is valued at up to county/metropolitan level.

Bats

3.2.17 The SES1 reported an assemblage of at least eight species of bats between Coppenhall Moss and Walley's Green. Occasional roosts of at least seven bat species, a feeding perch of an unidentified species and a possible maternity roost of common pipistrelle were recorded. This assemblage is of county/metropolitan value on the basis of the moderate numbers of foraging and commuting *Myotis* species and low to moderate numbers of noctule recorded. These species are considered 'rarer' bats in England although noctule are more common in Cheshire. Additional surveys at SES2 have recorded a further occasional roost of brown long eared bat and common pipistrelle 60m south-west of the land required for construction of the SES2 scheme. Surveys also identified an increase in the number of individuals using two occasional roosts of previously recorded species (common pipistrelle and soprano pipistrelle) 15m and 65m south-west of the SES2 scheme. The recording of these additional roosts and changes in bat activity does not change the value of the bat assemblage, as reported in the SES1.

Future baseline

3.2.18 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000) and the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

3.2.19 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

3.2.20 None of the identified developments affect the assessment of the SES2 scheme's likely impacts on ecology and biodiversity.

Effects arising during construction

Avoidance and mitigation measures

3.2.21 No avoidance or mitigation measures additional to those reported in the main ES and SES1 and AP1 ES and draft Code of Construction Practice (CoCP)[9] are proposed.

Assessment of impacts and effects

Designated sites

3.2.22 A precautionary adverse effect on Sandbach Flashes SSSI was reported in the SES1 and AP1 ES which was associated with the potential for a reduction in water flow from the Tributary of Fowle Brook 1 to the SSSI, that was significant at the national level. Since SES1, additional hydrological surveys have confirmed that there is no connectivity of the Tributary of Fowle Brook 1 beneath the WCML with Sandbach Flashes SSSI. Therefore, the adverse effect on the SSSI reported in the SES1 and AP1 ES is removed.

Habitats

Hedgerows

3.2.23 The main ES assumed, on a precautionary basis, all hedgerows (28km) within the land required for the construction of the scheme in the Hough to Walley's Green area would be permanently lost, and the remaining hedgerow network would be fragmented. This would have a permanent adverse effect that was significant at county/metropolitan level. Following the SES2 changes, the total extent of hedgerows within the Hough to Walley's Green area that are assumed to be permanently lost has, on a precautionary basis, decreased to 26.6km. This will result in a different significant effect to that reported in the main ES. However, there will be no change to the level of significance reported in the main ES.

Water bodies

3.2.24 The main ES reported the loss of 21 ponds which was significant at the district/borough level in each case. The SES2 baseline, accounting for OS mapping changes and further survey, show the number of ponds within land required for the SES2 scheme is 26. The increase in the number of ponds that will be lost will result in a different significant effect to that reported in the main ES. However, there will be no change in the level of significance reported in the main ES.

[9] High Speed Two Ltd (2022), High Speed Rail (Crewe - Manchester), E*nvironmental Statement, draft Code of Construction Practice,* Volume 5, Appendix: CT-002-00000. Available online at: https://www.gov.uk/government/collections/cross-topic-technical-appendices-for-high-speed-rail-crewe-manchester-environmental-statement#draft-code-of-construction-practice.

Species

Amphibians

3.2.25 The main ES reported that the loss of habitat resulting from the construction of the original scheme would result in an adverse effect on the metapopulation of great crested newt in a network of eight ponds to the west of Woolstanwood (GCNMP1.1.12). This would result in a permanent adverse effect on the metapopulation that is significant at the county/metropolitan level. Following additional surveys, the number of ponds associated with this metapopulation has decreased to six. The change in composition of this metapopulation will result in a different significant effect to that reported in the main ES. However, there will be no change in the level of significance of the effect as reported in the main ES.

3.2.26 The SES1 reported the loss of habitat resulting from the construction of the SES1 scheme would result in an adverse effect on the metapopulation of great crested newt in a network of 127 ponds to the north of Crewe and the south-east of Middlewich (GCNMP1.1.19). This would result in a permanent adverse effect on the metapopulation that is significant at the county/metropolitan level. Following additional surveys, the number of ponds associated with this metapopulation has reduced to 114. The change in composition of this metapopulation will result in a different significant effect to that reported in the SES1. However, there will be no change in the level of significance of the effect as reported in the SES1.

3.2.27 The SES1 reported that the loss of habitat resulting from the construction of the SES1 scheme would result in an adverse effect on the metapopulation of great crested newt in a network of 56 ponds in the area north of Crewe extending to Walley's Green (GCNMP1.1.20). This would result in a permanent adverse effect on the metapopulation that is significant at the county/metropolitan level. Following additional surveys, the number of ponds associated with this metapopulation has decreased to 55. The change in number of ponds will result in a different significant effect to that reported in the SES1. However, this will not change the level of significance of the effect as reported in the SES1.

3.2.28 Following additional surveys, GCNMP1.1.33 was identified as a new metapopulation owing to the four ponds that were previously associated with GCNMP1.1.19 being spatially separated. The change in composition of the metapopulation, will result in a different significant effect to that reported in the SES1. However, as the ponds that form this metapopulation were previously assessed as part of GCNMP1.1.19, there will be no change in the level of significance of the effect as reported in the SES1.

Bats

3.2.29 The SES1 reported a bat assemblage of at least eight species between Coppenhall Moss and Walley's Green. Although no roosts were recorded within the land required for the construction of the scheme, it was assumed on a precautionary basis that roosts would be lost due to the loss of woodland and foraging habitat as well as disturbance of roost sites as

a result of the SES1 scheme. It was also assumed on a precautionary basis that occasional roosts of common pipistrelle and brown long-eared bat would be lost as they are located immediately adjacent to the land required for the construction scheme. The loss and disturbance of these roosts and partial loss of woodland foraging and commuting habitats would result in a permanent adverse effect on the bat assemblage which is significant at the county/metropolitan level. Following further surveys at SES2, which identified newly found roosts and an increase in the number of individuals in existing roosts, disturbance of occasional roosts for common pipistrelle, brown long-eared and soprano pipistrelle will result in an additional impact on the bat assemblage. This will result in a different significant effect to that reported in SES1; however, this will not change the level of significance of the effect to that reported in SES1.

Other mitigation measures

3.2.30 This section describes other mitigation measures designed to reduce or compensate for significant ecological effects. These include habitat creation and habitat enhancement.

Habitats

Hedgerows

3.2.31 The SES2 reports the loss of 26.6km of hedgerow which represents a small reduction in the loss of 28km at main ES. The main ES reported a total of 10.1km of new hedgerows would be planted as mitigation for those lost as a result of the scheme in the Hough to Walley's Green area. This represented a net reduction in hedgerow of 17.9km after mitigation and a residual adverse effect that was significant at county/metropolitan level, as reported in the main ES. As a result of the reduced loss in hedgerow from the SES2 scheme, the overall net loss of hedgerow will decrease to 16.5km. This will result in a different residual effect to that reported in the main ES. However, there will be no change the level of significance of the effect reported in the main ES.

Water bodies

3.2.32 At least one pond will be created for every pond lost within the land required for the construction of the Proposed Scheme. New ponds will be established in accordance with the Ecological Principles of Mitigation in the SMR. Once established, it is anticipated that any adverse effect on pond habitats will be reduced to a level that is not significant.

Species

Amphibians

3.2.33 The SES1 reported that significant adverse effects on the great crested newt populations within the Hough to Walley's Green area would be addressed by the provision of measures within the ecological habitat creation areas north of Parkers Road, east of Moss Lane, west of Warmingham Road, south of Larch Wood and west of Park House Farm. These measures

would comprise provision of ponds, grassland and woodland that would be designed to compensate for the loss of breeding sites, foraging habitat and places of shelter used by great crested newt. The mitigation measures will take account of the different significant effects identified above. Therefore, implementation of the measures reported in the main ES and the SES1 and AP1 ES, once established, will reduce adverse effects on the amphibian populations in the Hough to Walley's Green area to a level that is not significant.

Bats

3.2.34 The SES1 reported that significant effects to the bat assemblage between Coppenhall Moss and Walley's Green would be addressed by mitigation which would be provided in accordance with the Ecological Principles of Mitigation within the SMR. This includes the provision of artificial roosts, as well as woodland planting and creation of hedgerows, grassland, wetland habitat and ponds throughout this area. These measures will also address the additional impacts on this bat assemblage caused by the loss/disturbance of an additional brown long eared occasional roost, a soprano pipistrelle occasional roost and two further common pipistrelle occasional roosts associated with the SES2 scheme. The mitigation measures will take account of the different significant effects identified above. Therefore, following implementation of these measures, the effects on the bat assemblage between Coppenhall Moss and Walley's Green will be reduced to a level that is not significant.

Summary of likely residual significant effects

3.2.35 The precautionary significant adverse effect on Sandbach Flashes SSSI reported in SES1 and AP1 ES will be removed.

3.2.36 On a precautionary basis, it is assumed that there will be a net loss in hedgerows of 16.5km, which is 1.4km less than the loss reported in the main ES. This will remain a permanent adverse residual effect that is significant at the county/metropolitan level, as reported in the main ES.

Cumulative effects

3.2.37 No new, removed or different significant cumulative effects have been identified.

3.3 Sound, noise and vibration

Introduction

3.3.1 The environmental baseline relevant to the sound, noise and vibration assessment is described below. Any new or different likely significant environmental effects as a result of the baseline and changes introduced in Section 2 are then identified, compared to those reported in the main ES and the SES1 and AP1 ES.

3.3.2 Sound, noise and vibration effects that result from the assessment of the changes to traffic flows as a result of all changes and amendments to the original scheme are reported in Section 7.

Scope, assumptions and limitations

3.3.3 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES.

3.3.4 The SES2 changes have the potential to result in new or different likely significant operational effects only. Therefore, there is no assessment of construction effects for sound, noise and vibration.

SES2 changes relevant to the assessment

3.3.5 The additional environmental baseline information is considered in the operational phase assessment.

Environmental baseline

Existing baseline

3.3.6 In the Hough to Walley's Green area, the updated sound modelling described in Section 2 has resulted in updates to the existing baseline sound levels at receptors adjacent to roads. Further information on the updated baseline sound levels relevant to the assessment is provided in the SES2 and AP2 ES Volume 5, Appendix: SV-002-00000. Where no updates to baseline sound levels are required, the baseline sound, noise and vibration information is as described in Section 13 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES and Section 3 of SES1 and AP1 ES Volume 2, Community Area report: Hough to Walley's Green (MA01).

3.3.7 As described in Section 2, there has been a survey and site visit to the Eurocard Centre and Eurosales Centre, Herald Park, Herald Drive, Crewe since the main ES and the SES1 and AP1 ES to collect further information on the use and sensitivity and the design of the receptor.

Future baseline

3.3.8 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2038.

3.3.9 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

3.3.10 None of the identified developments affect the assessment of the AP2 revised scheme's likely impacts on sound, noise and vibration. No updates have been made to future baseline sound levels compared to the main ES and the SES1 and AP1 ES.

Effects arising from operation

Avoidance and mitigation measures

3.3.11 No additional avoidance or mitigation measures, compared to those reported in the main ES and the SES1 and AP1 ES, are proposed.

Assessment of impacts and effects

Non-residential receptors: direct effects

3.3.12 The main ES identified a likely significant adverse operational ground-borne noise effect on the basis of a precautionary assessment at Eurosales Centre and Eurocard Centre (assessment location ref.: 610664), which are commercial office facilities. This was denoted as MA01-O-N2 in the Volume 2, Community Area report: Hough to Walley's Green (MA01), in Volume 5, Appendix: SV-003-0MA01 and in the Volume 5, Sound, noise and vibration Map Book: Map Series SV-02 of the main ES. In the main ES, ground-borne noise was predicted to exceed the impact screening criterion at this receptor location, as defined in the SMR, of 40dB LpASmax for offices by 3dB. Following a visit to the Eurosales Centre and Eurocard Centre, it is apparent that due to the use of the offices and activity as a call centre, the office use is not likely to be disturbed by ground-borne noise at the predicted noise level to the extent that it would be significant. As a result, the likely significant adverse effect identified at Eurosales Centre and Eurocard Centre reported in the main ES is removed.

Other mitigation measures

3.3.13 No other mitigation measures, compared to those reported in the main ES and the SES1 and AP1 ES, are proposed.

Summary of likely residual significant effects

3.3.14 The SES2 changes will not result in any new or different residual significant effects from operational noise or vibration.

3.3.15 The SES2 changes will result in the removal of the likely residual significant ground-borne noise effect at Eurosales Centre and Eurocard Centre (offices), Herald Park, Herald Drive, Crewe.

Cumulative effects

3.3.16 No new, removed or different significant cumulative effects have been identified.

3.4 Water resources and flood risk

Introduction

3.4.1 The environmental baseline relevant to the water resources and flood risk assessment is summarised below. Any new or different likely significant environmental effects as a result of the baseline and changes introduced in Section 2 are identified, compared to the main ES and the SES1 and AP1 ES as relevant.

Scope, assumptions and limitations

3.4.2 The assessment scope, key assumptions and limitations for water resources and flood risk are as set out in Volume 1 and the SMR of the main ES. The scope and methodology for the updated flood risk assessment is set out in the SES2 and AP2 ES Volume 5, Appendix: CT-001-00005: Water resources and flood risk technical note: Updated guidance on flood risk assessment.

3.4.3 The baseline changes set out in Section 2 have the potential to result in new or different significant construction effects for flood risk only. Therefore, there is no construction assessment for water resources and no operational assessment for water resources and flood risk.

Environmental baseline

Existing baseline

3.4.4 The baseline water resources and flood risk information is as described in Section 15 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES.

3.4.5 In the main ES, culvert design details were provided along with the estimated peak flow during the 1 in 100 year plus climate change event. These assessments were based on the guidance published by the Environment Agency in February 2016 which established a peak rainfall intensity allowance of 40% in line with UK Climate Projections 2009 (UKCP09). For the SES2 assessment, the baseline environmental information has been updated to include the new climate change guidance for rainfall which was published by the Environment Agency in May 2022 and results in an increase in peak rainfall intensity allowance from 40% to 45%.

3.4.6 As discussed in Section 2, additional surface water surveys have been completed around Hoggins Brook and Tributary of Fowle Brook 1. The surveys indicated that a drain, shown terminating on OS mapping on the opposite side of the WCML to Tributary of Fowle Brook 1, appears to continue to the north alongside the WCML and connect to Hoggins Brook. The surveys gave no indication of the presence of a culvert which could link the drain with Tributary of Fowle Brook 1.

Future baseline

3.4.7 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

3.4.8 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 ES Volume 5, Appendix: CT-004-00000). The developments have been considered to determine whether they would result in a material change to the future baseline or have the potential to give rise to cumulative effects.

3.4.9 None of the identified developments affect the assessment of the SES2 scheme's likely impacts on water resources and flood risk.

Effects arising during construction

Avoidance and mitigation measures

3.4.10 The avoidance and mitigation measures specific to water resources and flood risk are set out in the Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. No further avoidance and mitigation measures, additional to those reported in the main ES and draft CoCP, are proposed.

Assessment of impacts and effects

3.4.11 In the main ES, culvert design details were provided along with the estimated peak flow during the 1 in 100 year plus climate change event (the 1.0 Annual Exceedance Probability (AEP) + 40% CC peak flow). Taking into account the change to climate change allowances for increase in peak rainfall intensity, the estimated peak flows during the 1 in 100 year plus climate change event have been recalculated (the 1.0 AEP + 45% CC peak flow). These values have been used to ensure that the culverts in the original scheme have sufficient conveyance capacity to accommodate the estimated change in peak flow calculated using the new climate change allowances. The original scheme culverts are set out in Table 2 and the size and location remains unchanged since the main ES. These values show that the culverts are of sufficient size to convey the estimated increase in peak flow.

Table 2: Details of original scheme culvert design and estimated increase in peak flow

Watercourse/ location	Structure name	Estimated 1.0% AEP peak flow (m^3/s)	Estimated 1.0% AEP + 40% CC peak flow (m3/s) as reported in main ES	Estimated 1.0% AEP + 45% CC peak flow (m^3/s) for SES2[10]	Culvert location[11]	Culvert capacity (m^3/s)[12]
Hoggins Brook	Coppenhall Moss culvert	2.61	3.89	4.70	CT-06-306 G6, G7	8.04
Hoggins Brook – offline	Footpath Crewe 29/1 offline culvert	2.02	2.83	2.93	CT-06-306 D5	3.57
Hoggins Brook – offline	Warmingham Moss offline culvert	2.52	3.56	3.79	CT-06-306 E5	7.47
Hoggins Brook – offline	Offline culvert	2.52	3.56	3.79	CT-06-306 E5	7.47

3.4.12 The SES1 and AP1 ES reported a precautionary permanent moderate hydrological impact on Sandbach Flashes SSSI. This precautionary impact was reported due to the potential existence of a culvert beneath the WCML between Parkers Road and Spring Plantation, providing a pathway for surface water to flow from the west of the WCML into Tributary of Fowle Brook 1 to the east of the WCML. If this were the case, then the AP1 revised scheme would sever this connection and give rise to a potential reduction in catchment area and discharge to Tributary of Fowle Brook 1. This could, in turn, result in a reduction in flood flows to Sandbach Flashes SSSI.

3.4.13 Additional surface water surveys have, however, indicated that the drainage on the western side of the WCML is hydraulically connected to a ditch which runs north along the WCML and enters the catchment of Hoggins Brook. There was no indication of the presence of a culvert which could link the drain with Tributary of Fowle Brook 1. It was concluded, therefore, that the drainage on the west side of the WCML cannot be contributing directly to flow in

[10] The climate change allowance is applied to the rainfall intensity and the Revitalised Flood Hydrograph rainfall-runoff model version 2.2 (ReFH2) is used to determine the peak flow generated. Therefore, a 5% increase in peak rainfall intensity allowance can lead to a greater than 5% increase in peak river flow.
[11] The feature locations are indicated by the grid coordinates on the relevant Volume 2, MA01 Map Book, Map series CT-06 of the main ES.

[12] The capacity of culvert quoted is the free flowing capacity of the culvert excluding the allowances for 300mm of substrate at the culvert invert, to allow for natural bed reinstatement, and 300mm freeboard to the culvert soffit above the design flood level. In some cases, the design capacity of the culverts is substantially greater than required to convey the estimated peak design flow. During design development, the culverts will be designed, where reasonably practicable, to achieve sediment equilibrium. Consideration will be given, where necessary, to culvert size and/or the installation of benching to create a low flow channel to minimise sediment accumulation and increased risk of blockage. Designs will be in accordance with HS2 Technical Standards alongside consideration of guidance such as CIRIA C786 Culvert, screen and outfall manual.

Tributary of Fowle Brook 1, and indirectly to seasonal flows and water levels in the Sandbach Flashes SSSI. This change in baseline information will therefore lead to the removal of the precautionary permanent moderate hydrological impact on Sandbach Flashes SSSI. The assessment of any significant ecological effects arising from the removal of this hydrological impact is provided in Section 3.2, Ecology and biodiversity.

Other mitigation measures

3.4.14 No mitigation measures additional to those reported in the main ES, the SES1 and AP1 ES and the draft CoCP are proposed.

Summary of likely residual significant effects

3.4.15 No new or different significant effects are anticipated for water resources and flood risk, due to the SES2 changes. The assessment of any significant ecological effects arising from the removal of this hydrological impact is provided in Section 3.2, Ecology and biodiversity.

Cumulative effects

3.4.16 No new, removed or different significant cumulative effects have been identified.

3.5 Summary of new or different likely residual significant effects as a result of the SES2 changes

Construction

Ecology and biodiversity

3.5.1 On a precautionary basis, it is assumed that there will be a net loss in hedgerows of 16.5km, which is 1.4km less than the loss reported in the main ES. This will remain a permanent adverse residual effect that is significant at the county/metropolitan level, as reported in the main ES.

3.6 Summary of likely residual significant effects that will be removed

Construction

Ecology and biodiversity

3.6.1 As a result of the SES2 changes the precautionary significant effect on Sandbach Flashes SSSI that was reported in the SES1 and AP1 ES will be removed.

Operation

Sound, noise and vibration

3.6.2 The SES2 changes will result in the removal of the likely residual significant ground-borne noise effect at Eurosales Centre and Eurocard Centre (offices), Herald Park, Herald Drive, Crewe.

Part 2: Additional Provision 2 Environmental Statement

4 Summary of AP2 amendments in the Hough to Walley's Green area

4.1 Engineering amendments

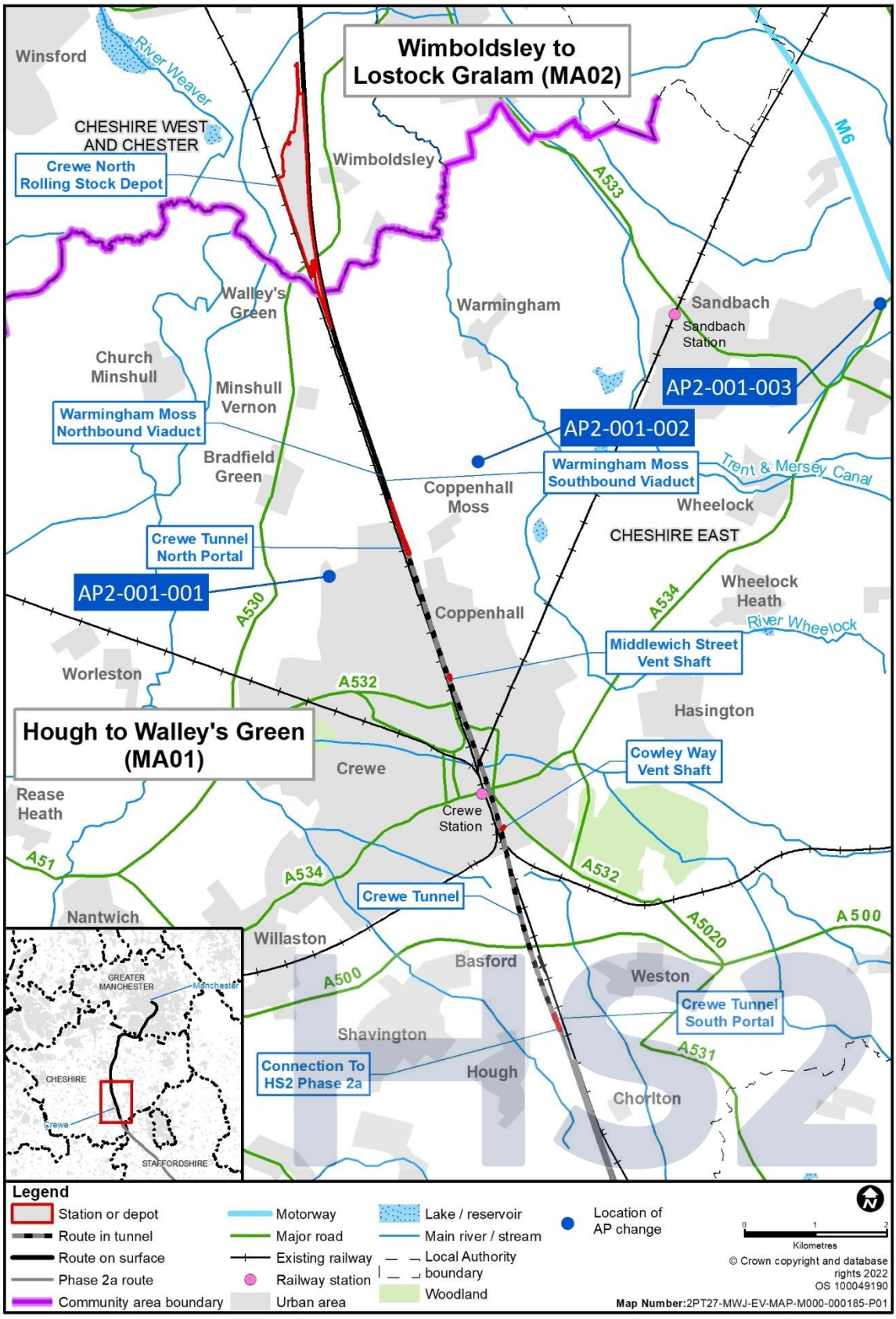
4.1.1 Amendments will be required in the Hough to Walley's Green area that will result in changes to the land or Bill powers required for the SES2 scheme. Table 3 provides a summary of the engineering amendments and Figure 2 shows their locations.

4.1.2 Please note that all dimensions in the following sections are approximate.

Table 3: Summary of AP2 engineering amendments in the Hough to Walley's Green area

Name of AP2 amendment	Description of the original scheme or AP1 revised scheme	Description of the AP2 revised scheme
Additional land temporarily required for modifications to the B5076 Bradfield Road and Parkers Road junction AP2-001-001 Map CT-05-306-L1, A5 to B6, in the SES2 and AP2 ES Volume 2, MA01 Map Book	The main ES did not propose any mitigation works in this location for road users.	The junction of Bradfield Road and Parkers Road will be temporarily modified to include carriageway widening and alterations to traffic signals.
Additional land permanently required for modifications to the Warmingham Road and Hall Lane junction. AP2-001-002 Map CT-05-306-R1, E9 to G10, in the SES2 and AP2 ES Volume 2, MA01 Map Book	The main ES did not propose any mitigation works in this location for road users.	The junction of Warmingham Road and Hall Lane will be temporarily modified to include carriageway widening to enable the formation of a right-turn lane at the junction of Warmingham Road and Hall Lane.
Additional land temporarily required for modifications to the A534 Old Mill Road and Congleton Road junction AP2-001-003 Map CT-05-306-R2, G5 to G7, in the SES2 and AP2 ES Volume 2, MA01 Map Book	The main ES did not propose any mitigation works in this location for road users.	The junction of the A534 Old Mill Road and Congleton Road will be temporarily modified to include carriageway widening to enable the formation of a right-turn lane on Old Mill Road, to the east of the junction of Congleton Road and the A534 Old Mill Road.

Figure 2: Locations of AP2 amendments in the Hough to Walley's Green area



5 Assessment of engineering amendments in the Hough to Walley's Green area

5.1 Additional land temporarily required for modifications to the B5076 Bradfield Road and Parkers Road junction (AP2-001-001)

5.1.1 The Bill provides for construction traffic routes and construction compounds in the Hough to Walley's Green area. The main ES reported that movement of excavated or fill material and construction vehicles accessing construction compounds during the construction of the original scheme together with temporary road closures and diversions would result in changes in daily traffic flows. These activities would result in a significant adverse effect due to increased traffic congestion at the junction of the B5076 Bradford Road and Parkers Road. The main ES did not propose any mitigation works in this location for road users.

5.1.2 Since the main ES, further work has identified mitigation for the impacts of HS2 construction work on existing users of the junction of the B5076 Bradfield Road junction with Parkers Road.

5.1.3 The junction will be temporarily modified to include:

- changes to the traffic signals, introducing a new turn signal for users turning left from the B5076 Bradfield Road into Parkers Road;
- widening of the junction to the south of Parkers Road by up to 4m;
- installing dropped kerbs to enable a small alteration to a dedicated cycle route; and
- realignment of a 30m section of footway, adjacent to and to the south of Parkers Road. The footway will be moved 3m to the south.

5.1.4 In addition, modifications to the existing kerb lines and road markings will be required. Highway drainage will need to be relocated along these new kerb lines.

5.1.5 Minor temporary utility diversions will be required to enable works to the carriageway.

5.1.6 The modification and widening of the B5076 Bradfield Road and Parkers Road junction will be constructed over a period of up to one year, commencing in 2024 and remain in place during the construction works. The original configuration of the junction will be reinstated within the indicative construction programme provided in Section 6.

5.1.7 The land required for the amendment is outside the limits of the Bill. The amendment will result in the temporary requirement for an additional 0.6ha of land (see SES2 and AP2 ES Volume 2, MA01 Map Book: maps CT-05-306-L1, A5 to B5).

Topics included in the AP2 assessment

5.1.8 The assessment of this amendment has identified new, different or removed likely significant effects for the following topics: community; health; landscape and visual; socio-economics; and sound, noise and vibration.

5.1.9 The assessment of changes to traffic flows and traffic related effects as a result of all changes and amendments to the original scheme is reported in Section 7. Topics where a significant effect has been identified due to changes to traffic flows are reported in Section 7 and include: air quality; ecology and biodiversity; socio-economics; and sound, noise and vibration.

Community

Scope, assumptions and limitations

5.1.10 The assessment scope, key assumptions and limitations for community are as set out in Volume 1 and the SMR of the main ES.

5.1.11 This amendment has the potential to result in new significant construction effects only. Therefore, there is no operational assessment for community.

Environmental baseline

Existing baseline

5.1.12 The baseline community information is as described in Section 6 of the main ES Volume 2, Community Area report: Hough to Walley's Green (MA01). A summary of the baseline information relevant to the assessment of the amendment is provided below.

5.1.13 Crewe comprises approximately 30,000 residential properties. The HS2 route passes underneath Crewe in a tunnel. Crewe has several suburbs including Leighton, Maw Green, Sydney and Coppenhall Moss.

Future baseline

5.1.14 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.1.15 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.1.16 None of the identified developments affect the assessment of the AP2 revised scheme's likely impacts for community.

Effects arising during construction

Avoidance and mitigation measures

5.1.17 No avoidance or mitigation measures additional to those reported in the main ES and draft Code of Construction Practice (CoCP)[13] are proposed.

Assessment of impacts and effects

5.1.18 This amendment will result in a new major adverse in-combination effect on approximately 35 residential properties at the junction of Parkers Road and the B5076 Bradfield Road, Crewe. As reported in the main ES, Parkers Road is a construction traffic route and is expected to experience a significant increase in HGV traffic. New significant noise effects are expected to combine with new significant visual effects and existing HGV traffic effects for approximately one year and four months. Together, these noise, visual and HGV traffic effects will result in a new major adverse in-combination effect on amenity for residents at these properties, which is significant. The locations of significantly affected resources are shown in the SES2 and AP2 ES Volume 5, Community Map Book: Map Series CM-01.

Other mitigation measures

5.1.19 No further mitigation measures have been identified.

Summary of likely residual significant effects

5.1.20 The amendment will result in a new temporary residual major adverse in-combination effect on approximately 35 residential properties at the junction of Parkers Road and the B5076 Bradfield Road, Crewe due to new noise and visual effects and existing HGV traffic effects.

Cumulative effects

5.1.21 No new, removed or different significant cumulative effects have been identified.

[13] High Speed Two Ltd (2022), High Speed Rail (Crewe - Manchester), *Environmental Statement, draft Code of Construction Practice,* Volume 5, Appendix: CT-002-00000. Available online at: https://www.gov.uk/government/collections/cross-topic-technical-appendices-for-high-speed-rail-crewe-manchester-environmental-statement#draft-code-of-construction-practice.

Health

Scope, assumptions and limitations

5.1.22 The assessment scope, key assumptions and limitations for health are as set out in Volume 1 and the SMR of the main ES.

5.1.23 This amendment has the potential to result in new construction effects only. Therefore, there is no operational assessment for health.

Environmental baseline

Existing baseline

5.1.24 The baseline health information is as described in Section 8 of the main ES Volume 2, Community Area report: Hough to Walley's Green (MA01). A summary of the baseline information relevant to the assessment of the amendment is provided below.

5.1.25 Crewe comprises approximately 30,000 residential properties. The HS2 route passes underneath Crewe in tunnel. Crewe has several suburbs including Leighton, Maw Green, Sydney and Coppenhall Moss.

5.1.26 There are no health facilities in proximity to land required for this amendment.

Future baseline

5.1.27 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.1.28 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.1.29 None of the identified developments affect the assessment of the AP2 revised scheme's likely impacts on health.

Effects arising during construction

Avoidance and mitigation measures

5.1.30 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are proposed.

Assessment of impacts and effects

5.1.31 This amendment will result in a new adverse neighbourhood quality effect for residents in the vicinity of the junction of Parkers Road and the B5076 Bradfield Road, Barrow Green in Crewe. As reported in the main ES, Parkers Road is a construction traffic route and is expected to experience a significant increase in HGV traffic. Construction noise is expected to be noticeable for approximately one year and four months. Construction activities will be visible from street level in the vicinity of the junction. People in this community are likely to experience these effects as changing the quality of their neighbourhood and to regard that change as adverse, in diminishing the amenity of the settlement.

Other mitigation measures

5.1.32 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Cumulative effects

5.1.33 No new, removed or different cumulative effects have been identified.

Landscape and visual

Scope, assumptions and limitations

5.1.34 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1 and the SMR of the main ES.

5.1.35 This amendment has the potential to result in new construction effects for the visual assessment only. Therefore, there is no operational phase visual assessment and no construction or operational phase landscape assessment.

5.1.36 All visual effects arising from this amendment are reported in SES2 and AP2 ES Volume 5, Appendix: LV-001-0MA01. The locations of significantly affected viewpoints during the construction phase are shown in the SES2 and AP2 ES Volume 2, MA01 Map Book: Map Series LV-03.

Environmental baseline

Existing baseline

5.1.37 The baseline visual information is as described in SES2 and AP2 ES Volume 5, Appendix: LV-001-0MA01. A summary of the visual baseline information relevant to the assessment of the amendment is provided below.

Visual baseline

5.1.38 The amendment has the potential to significantly affect one new viewpoint. This viewpoint is described in SES2 and AP2 ES Volume 5, Appendix: LV-001-0MA01 and summarised below.

View north from Parkers Road (high sensitivity receptors) (304-02-016)

5.1.39 This new viewpoint is in an area where there will be changes from the original scheme. It represents the views experienced by residents of Parkers Road, Bradfield Road, Marshall Close, Elmstead Crescent and Lawford Close and road users. Located close to a signalled road junction, the view comprises the existing junction, garden boundary fencing and mature boundary hedges which border residential properties to the north and south of the junction. A wide grass verge extends from the junction area along Parkers Road to the east. A locally prominent line of isolated, mature trees and shrub planting occupies the grassed verge area on the north side of the junction. In the middle to far distance, a pylon and overhead power lines are visible beyond residential properties and against the skyline.

Future baseline

5.1.40 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.1.41 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.1.42 None of the identified committed developments affect the assessment of the AP2 revised scheme's likely impacts for landscape and visual.

Effects arising during construction

Avoidance and mitigation measures

5.1.43 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

Visual assessment

View north from Parkers Road (high sensitivity receptors) (304-02-016)

5.1.44 This new viewpoint is located in an area where there will be changes from the original scheme. Residents of **high** susceptibility and road users of lower susceptibility, all with **medium** value views, will experience a noticeable change to filtered views of the

construction of the amendment and the presence of traffic along the temporarily modified section of the road during the construction period. Views for residents of Elmstead Crescent and Lawson Close will be heavily filtered by an existing roadside hedge. Views for residents of Marshall Close and Barrow Close will be partially screened by a combination of existing garden boundary fences and trees. The loss of existing mature trees removed during construction will be noticeable beyond intervening vegetation and fence lines. The construction activity and presence of traffic along the modified section of road will be visible in near-distance views for road users of Parkers Road and Bradfield Road. There will be a **medium** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.

Other mitigation measures

5.1.45 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

5.1.46 The amendment will give rise to a new likely residual significant construction effect at view north from Parkers Road (304-02-016), after implementation of construction phase mitigation. The effect will be **moderate** adverse (significant).

Cumulative effects

5.1.47 No new, removed or different significant cumulative effects have been identified.

Socio-economics

Scope, assumptions and limitations

5.1.48 The assessment scope, key assumptions and limitations for socio-economics are as set out in Volume 1 and the SMR of the main ES.

5.1.49 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for socio-economics.

Environmental baseline

Existing baseline

5.1.50 The baseline socio-economics information is as described in the SES2 and AP2 ES Volume 5, Appendix: SE-001-00000, Updated socio-economic baseline information.

Future baseline

5.1.51 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.1.52 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.1.53 None of the identified developments affect the assessment of the AP2 revised scheme's likely impacts on socio-economics.

Effects arising during construction

Avoidance and mitigation measures

5.1.54 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

5.1.55 The amendment will result in a new adverse significant in-combination effect on Cygnet Nield House, a mental health hospital located south-east of Bradfield Green, as a result of a new significant noise effect for one year and three months. This effect is in addition to the significant effects from HGV construction traffic congestion and delays for road users reported in the main ES. The sensitivity of Cygnet Nield House is assessed to be medium as clients may be sensitive to impacts on the local environment and setting. The construction works may discourage them from using this facility. Given the duration of effects and the medium level of sensitivity, the amendment will result in a new adverse in-combination effect on Cygnet Nield House, which is significant. The locations of significantly affected resources are shown in the SES2 and AP2 ES Volume 5, Socio-economics Map Book: Map Series SE-01.

Other mitigation measures

5.1.56 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

5.1.57 The amendment will result in a new temporary adverse significant in-combination effect on Cygnet Nield House, a mental health hospital.

Cumulative effects

5.1.58 No new, removed or different significant cumulative effects have been identified.

Sound, noise and vibration

Scope, assumptions and limitations

5.1.59 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES. This amendment has the potential to result in new or different likely significant construction effects only. Therefore, there is no assessment of operational effects for sound, noise and vibration.

5.1.60 Baseline surveys have not been undertaken in the vicinity of this amendment and as such, a precautionary approach to the identification of likely significant effects has been taken due to the increased uncertainty of the baseline in this area.

Environmental baseline

Existing baseline

5.1.61 The baseline sound, noise and vibration information is as described in Section 13 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. Baseline sound levels representative of the assessment locations affected by this amendment have been used in the construction assessment.

5.1.62 This amendment involves works close to properties which were not included within the main ES. The additional baseline sound levels are presented in SES2 and AP2 ES Volume 5, Appendix: SV-002-00000.

Future baseline

5.1.63 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.1.64 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.1.65 None of the identified committed developments affect the assessment of the AP2 revised scheme's likely impacts for sound, noise and vibration.

Effects arising during construction

Avoidance and mitigation measures

5.1.66 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

Residential receptors: direct effects – communities

5.1.67 The amendment has the potential to give rise to new temporary direct adverse noise effects, which may be considered to be significant on a community basis. The potential new or different likely significant effects are discussed in the following paragraphs and summarised in Table 4. In the table, the duration of impact is the period where the relevant assessment category is exceeded. The predicted monthly construction noise level will vary throughout this period and as a guide the typical and highest monthly noise levels at the closest properties in the community identified are presented in the 'cause' column of this table.

5.1.68 The amendment has the potential to introduce a new adverse noise effect at approximately 35 dwellings in the vicinity of the junction of Bradfield Road and Parkers Road at Barrows Green (MA01-C-C16). The predicted duration of the construction noise impact is up to one year and four months during the daytime. This may be considered by the local community as an effect on the acoustic character of the area and hence be perceived as a change in the quality of life for that community. This is considered to be a likely significant effect when assessed on a community basis.

Table 4: Direct adverse construction effects on residential communities and shared open areas that are considered to be significant on a community basis and are new or different to those reported in the main ES

Significant effect number (and Map reference)[14]	Type of significant effect	Time of day	Location	Cause (construction activities)[15]	Assumed approximate duration of impact
MA01-C-C16 (SV-03-303)	Construction noise (New)	Daytime	Barrows Green: approximately 35 dwellings in the vicinity of the junction of Bradfield Road and Parkers Road.	During the daytime, highway works in the vicinity of the junction of Bradfield Road and Parkers Road. The typical and highest monthly noise levels will be approximately 70dB and 75dB[16].	Up to one year and four months.

[14] See SES2 and AP2 Volume 5, Appendix: SV-002-00000 and SES2 and AP2 ES, Volume 5, Sound, noise and vibration Map Book: Map Series SV-03.

[15] The construction activity giving rise to the highest predicted noise or vibration level is reported. Multiple construction activities may contribute to the typical noise levels and the approximate duration of impact.

[16] Equivalent continuous sound level at the facade, $L_{pAeq, 0700-1900}$.

5.1.69 For further information see SES2 and AP2 ES Volume 5, Appendix: SV-002-00000 and SES2 and AP2 ES Volume 5, Sound, noise and vibration Map Book.

Non-residential receptors: direct effects

5.1.70 The amendment will give rise to predicted construction noise levels which exceed both the relevant screening criteria and the noise change criterion (typically a change of greater than 3dB[17] compared with the existing baseline sound level) at Cygnet Nield House (Hospital) (assessment location ref.: 611229).

5.1.71 This location is identified in the Hough to Walley's Green area, as shown in Volume 5, Sound, noise and vibration Map Book: Map Series SV-03 in the SES2 and AP2 ES. At the non-residential receptor identified above an assessment has been undertaken to determine if this impact would result in a significant effect, using the significance criteria set out in Annex A of Volume 5, Appendix: SV-001-00000 of the main ES.

5.1.72 Cygnet Nield House is a two-storey, 29 bed mental health hospital for women. The receptor is located adjacent to Bradfield Road, approximately 45m north of the land required for construction of the amendment. Cygnet Nield House has been assessed against the hospital criteria. The predicted daytime monthly construction noise level is above the screening criterion defined in the SMR for hospital use[18] for a period of one year and three months. The highest predicted daytime monthly construction noise level is 9dB above the screening criterion defined in the SMR. The typical predicted monthly daytime construction noise level is 8dB above the screening criterion defined in the SMR. Cygnet Nield House is identified, on the basis of a precautionary assessment, as being subject to a likely significant adverse effect (denoted by MA01-C-N11 in Table 6 of Volume 5, Appendix: SV-002-0MA01). This temporary adverse effect may take the form of activity disturbance to residents of the hospital.

Other mitigation measures

5.1.73 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

5.1.74 The amendment will give rise to a new likely temporary residual adverse significant construction noise effect on the residential community of Barrows Green.

5.1.75 The amendment will give rise to a new likely temporary residual adverse significant construction noise effect on Cygnet Nield House (Hospital).

[17] The exception is where the use and sensitivity of the receptor or land use is very sensitive to noise and have been included in the detailed assessment where there is a change less than 3dB. Further information can be found in the SES2 and AP2 ES, Volume 5, Appendix: SV-002-0MA01.

[18] 50dB $L_{pAeq,0700-2300}$ (façade) during the day, which is equivalent to 53dB $L_{pAeq,0700-2300}$ (façade).

Cumulative effects

5.1.76 No new, removed or different significant cumulative effects have been identified.

Summary of new or different likely residual significant effects as a result of the amendment

Construction

Community

5.1.77 The amendment will result in a new temporary residual significant in-combination community effect on approximately 35 residential properties at the junction of Parkers Road and the B5076 Bradfield Road, Crewe due to new noise and visual effects and existing HGV traffic effects.

Landscape and visual

5.1.78 The amendment will give rise to a new likely residual significant landscape and visual construction effect at view north from Parkers Road (304-02-016), after the implementation of construction phase mitigation. The effect will be moderate adverse (significant).

Socio-economics

5.1.79 The amendment will result in a new adverse significant in-combination socio-economic effect on Cygnet Nield House.

Sound, noise and vibration

5.1.80 The amendment will result in a new temporary residual adverse significant noise effect from construction activities on the residential community of Barrows Green.

5.1.81 The amendment will result in a new temporary residual adverse significant noise effects from construction activities on Cygnet Nield House (Hospital).

5.2 Additional land permanently required for modifications to the Warmingham Road and Hall Lane junction (AP2-001-002)

5.2.1 The Bill provides for construction traffic routes and construction compounds in the Hough to Walley's Green area. The main ES reported that movement of excavated or fill material and construction vehicles accessing construction compounds during the construction of the original scheme together with temporary road closures and diversions would result in changes in daily traffic flows. These activities would result in a significant adverse effect due

to increased traffic congestion at the junction of Warmingham Road and Hall Lane. The main ES did not propose any mitigation works in this location for road users.

5.2.2 Since the main ES, further work has identified mitigation for the impacts of HS2 construction work on existing users of the junction of Warmingham Road and Hall Lane.

5.2.3 The junction will be temporarily modified to include carriageway widening by up to 5m to enable the formation of a right-turn lane on Warmingham Road, to the west of the junction with Hall Lane.

5.2.4 Temporary modifications to the existing kerb lines and road markings will be required. Highway drainage will need to be relocated along these new kerb lines.

5.2.5 Minor temporary utility diversions will be required to enable works to the carriageway.

5.2.6 The modification and widening of the Warmingham Road and Hall Lane junction will be constructed over a period of up to one year, commencing in 2024 and remain in place during the construction works. The original configuration of the junction will be reinstated within the indicative construction programme provided in Section 6.

5.2.7 The land required for the amendment is outside the limits of the Bill. The amendment will result in the permanent requirement for an additional 0.8ha of land (see SES2 and AP2 ES Volume 2, MA01 Map Book: maps CT-06-306-R1, E9 to G10).

Topics included in the AP2 assessment

5.2.8 The assessment of this amendment has identified new, different or removed likely significant effects for the following topics: ecology and biodiversity; and landscape and visual.

5.2.9 The assessment of changes to traffic flows and traffic related effects as a result of all changes and amendments to the original scheme is reported in Section 7. Topics where a significant effect has been identified due to changes to traffic flows are reported in Section 7 and include: air quality; ecology and biodiversity; socio-economics; and sound, noise and vibration.

Ecology and biodiversity

Scope, assumptions and limitations

5.2.10 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1 and the SMR of the main ES.

5.2.11 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for ecology and biodiversity.

5.2.12 Where there are limitations in data, a precautionary baseline has been taken following the approach set out in the SMR which constitutes a 'reasonable worst-case' basis for the subsequent assessment.

Environmental baseline

Existing baseline

5.2.13 The baseline ecology and biodiversity information is as described in Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES, SES1 and SES2. A summary of the baseline information relevant to the assessment of the AP2 amendment is provided below.

Designated sites

5.2.14 The land required for the amendment is located within the Natural England Impact Risk Zone (IRZ) for Sandbach Flashes SSSI (which is of national value), located west of Sandbach, approximately 1km east of the land required for the construction of the amendment.

Habitats

5.2.15 Habitats within the land required for construction of the amendment include hedgerow, improved grassland, amenity grassland and hardstanding.

5.2.16 Within the land required for the amendment, there are small sections of hedgerow that (based on aerial photography) are intact and are assumed to be species-rich. These hedgerows may qualify as a habitat of principal importance and a conservation priority of the Cheshire BAP. These hedgerows contribute to a wider hedgerow network across the Hough to Walley's Green area that is of county/metropolitan value.

Species

5.2.17 Protected and notable species that are known or assumed to occur within the land required for construction of the amendment include great crested newts and bats. The species of relevance to the assessment of the amendment are described in further detail below.

5.2.18 The SES2 baseline reports a great crested newt metapopulation in a network of 114 ponds to the north of Crewe and south-east of Middlewich (GCNMP1.1.19). The land required for construction of the amendment to the south of the junction with Hall Lane includes terrestrial habitat associated with this meta-population, which is valued at county/metropolitan level.

5.2.19 The main ES reported a great crested newt metapopulation in a network of ponds to the north of Crewe and south-east of Middlewich (GCNMP1.1.15). The land required for construction of the amendment to the south of the junction with Hall Lane includes terrestrial habitat associated with this metapopulation, which is valued at county/metropolitan level.

5.2.20 The land required for the amendment contains trees which, on a precautionary basis, are assumed to support common and widespread species of roosting bats. Several species of bat are species of principal importance and a conservation priority of the Cheshire Biodiversity Action Plan (BAP). In the absence of survey information, on a precautionary basis, assumed roosts present are of up to county/metropolitan value.

Future baseline

5.2.21 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.2.22 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.2.23 None of the identified committed developments affect the assessment of the AP2 revised scheme's likely impacts for ecology and biodiversity.

Effects arising during construction

Avoidance and mitigation measures

5.2.24 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

Designated sites

5.2.25 The amendment is within the IRZ for Sandbach Flashes SSSI. However, there will be no significant adverse effects on the integrity of the site due to the limited nature of the amendment and the distance of the land required.

Habitats

5.2.26 On a precautionary basis, the SES2 reports a net loss of 16.5km of hedgerow habitat taking account of mitigation, within the land required for the construction of the SES2 scheme within the Hough to Walley's Green area, resulting in a permanent adverse effect significant at the county/metropolitan level. As a result of the amendment, approximately 569m of assumed species-rich hedgerow located to the south of Hall Lane falls within the land required for the construction of the AP2 revised scheme. The amendment will therefore result in an increase in hedgerow loss, which will give rise to a different significant effect to that reported in the SES2. However, this will not change the level of significance of the effect reported in the SES2.

Species

5.2.27 The SES2 reports that the loss of habitat resulting from the construction of the original scheme would result in an adverse effect on the metapopulation of great crested newt in a network of 114 ponds to the north of Crewe and south-east of Middlewich (GCNMP1.1.19), which will be significant at county/metropolitan level. As a result of the amendment, there will be a 1.2ha increase in the suitable terrestrial habitat associated with this metapopulation which will be lost to the AP2 revised scheme. The amendment will result in a different significant adverse effect, but there will be no change in the level of significance of the effect reported in the SES2.

5.2.28 The main ES reported that the loss of habitat resulting from the construction of the original scheme would result in an adverse effect on the metapopulation of great crested newt in a network of 31 ponds to the north-east of Crewe (GCNMP1.1.15), which would be significant at county/metropolitan level. As a result of the amendment, there will be a 462m² increase in the suitable terrestrial habitat associated with this metapopulation which will be lost to the AP2 revised scheme. The amendment will result in a different significant adverse effect, but there will be no change in the level of significance of the effect reported in the main ES.

5.2.29 The amendment will result in the loss of trees which, on a precautionary basis, are assumed to support common and widespread species of roosting bats. This would result in a new permanent adverse effect on the species of bats present, which would be significant at up to county/metropolitan level.

Other mitigation measures

5.2.30 The SES2 reports a total of 10.1km of new hedgerows will be planted as replacement for those lost as a result of the SES2 scheme, resulting in an overall net loss of 16.5km of hedgerow after mitigation. This will result in a permanent adverse effect that is significant at the county/metropolitan level. The amendment will result in the loss of an additional 569m of assumed species-rich hedgerow. This will result in a different effect on hedgerow to that reported in the main ES. However, this will not change the significance of the effect reported in the main ES on hedgerows within the Hough to Walley's Green area.

5.2.31 The adverse effects on great crested newt through construction will be addressed by the provision of measures within the ecological habitat creation areas, in accordance with the Ecological Principles of Mitigation within the SMR. The mitigation measures will take account of the different significant effects on great crested newt identified above. Following implementation, the adverse effects on the amphibian populations in the Hough to Walley's Green area would be reduced to a level that is not significant.

5.2.32 To replace roosts that will be lost to construction, artificial roosts will be provided in retained areas as close to the roost being lost as possible, in accordance with the Ecological Principles of Mitigation within the SMR. The mitigation measures will take account of the different significant effects on bats identified above. Following the implementation of these measures, the effects of the potential loss of roosts on the bat assemblage will be reduced to a level that is not significant.

Summary of likely residual significant effects

5.2.33 On a precautionary basis, it is assumed in the SES2 that there will be a net loss in hedgerows of 16.5km at SES2 taking account of mitigation, and the amendment will result in a further loss of 569m. This will remain a permanent adverse residual effect that is significant at the county/metropolitan level. In addition to the mitigation described, opportunities will be sought for additional retention and replacement of hedgerow within the land required for the temporary works.

Cumulative effects

5.2.34 No new or different significant cumulative effects have been identified.

Landscape and visual

Scope, assumptions and limitations

5.2.35 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1 and the SMR of the main ES.

5.2.36 This amendment has the potential to result in new significant construction effects for the visual assessment only. Therefore, there is no operational phase visual assessment and no construction or operational phase landscape assessment.

5.2.37 All landscape and visual effects arising from this amendment are reported in SES2 and AP2 ES Volume 5, Appendix: LV-001-0MA01. The locations of significantly affected viewpoints during construction are shown in the SES2 and AP2 ES Volume 2, MA01 Map Book: Map Series LV-03.

Environmental baseline

Existing baseline

5.2.38 The baseline landscape and visual information is as described in Volume 5, Appendix: LV-001-0MA01 of the main ES and in SES2 and AP2 ES Volume 5, Appendix: LV-001-0MA01. A summary of the visual baseline information relevant to the assessment of the amendment is provided below.

Visual baseline

5.2.39 The amendment has the potential to significantly affect one new viewpoint. This viewpoint is described in SES2 and AP2 ES Volume 5, Appendix: LV-001-0MA01 and summarised below.

View west from Hall Lane Cottage, Hall Lane (high sensitivity receptors) (304-02-017)

5.2.40 This new viewpoint is located in an area where there will be changes from the original scheme. It represents the views experienced by residents of Hall Lane Cottage and Fields Farm and road users along Warmingham Road and Hall Lane. Located on Hall Lane and orientated west, the view comprises an agricultural landscape of medium-sized pastoral fields, bordered in the near distance by managed field boundary hedgerows with frequent mature hedgerow trees, and blocks of woodland. The far-distance comprises open pastoral fields set against a continuous background canopy of mature field boundary trees. Pylons and overhead power lines are visible against the skyline and a low voltage power line with timber telegraph poles runs alongside Hall Lane.

Future baseline

5.2.41 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.2.42 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.2.43 None of the identified committed developments affect the assessment of the AP2 revised scheme's likely impacts for landscape and visual.

Effects arising during construction

Avoidance and mitigation measures

5.2.44 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

Visual assessment

View west from Hall Lane Cottage, Hall Lane (high sensitivity receptors) (304-02-017)

5.2.45 This new viewpoint is located in an area where there will be changes from the original scheme. Residents of high susceptibility and road users of lower susceptibility, all with medium value views, will experience a change to near and middle-distance views during construction of the amendment. Residents of Hall Lane Cottage and Fields Farm will experience noticeable changes to near and middle-distance views due to the proximity of

construction activity and the removal of existing vegetation including roadside hedges and mature trees, notably along Warmingham Road, which will open up views west over adjacent fields. Construction activity will be visible in near-distance views for road users of Warmingham Road and Hall Lane. There will be a **medium** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.

Other mitigation measures

5.2.46 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

5.2.47 The amendment will give rise to a new likely residual significant construction effect at view west from Hall Lane Cottage, Hall Lane (304-02-017), after implementation of construction phase mitigation. The effect will be **moderate** adverse (significant).

Cumulative effects

5.2.48 No new or different significant cumulative effects have been identified.

Summary of new or different likely residual significant effects as a result of the amendment

Construction

Ecology and biodiversity

5.2.49 On a precautionary basis, it is assumed that there will be a net loss in hedgerows of 16.5km at SES2 taking account of mitigation, and the amendment will result in a further loss of 569m. This will remain a permanent adverse residual effect that is significant at the county/metropolitan level. In addition to the mitigation described, opportunities will be sought for additional retention and replacement of hedgerow within the land required for the temporary works.

Landscape and visual

5.2.50 The amendment will give rise to a new likely residual significant construction effect at view west from Hall Lane Cottage, Hall Lane (304-02-017), after implementation of construction phase mitigation. The effect will be moderate adverse (significant).

5.3 Additional land temporarily required for modifications to the A534 Old Mill Road and Congleton Road junction (AP2-001-003)

5.3.1 The Bill provides for construction traffic routes and construction compounds in the Hough to Walley's Green area. The main ES reported that movement of excavated or fill material and construction vehicles accessing construction compounds during the construction of the original scheme together with temporary road closures and diversions would result in changes in daily traffic flows. These activities would result in a significant adverse effect due to increased traffic congestion at the junction of the A534 Old Mill Road and Congleton Road. The main ES did not propose any mitigation works in this location for road users.

5.3.2 Since the main ES, further work has identified mitigation for the impacts of HS2 construction work on existing users of the junction of A534 Old Mill Road junction with Congleton Road.

5.3.3 The junction will be temporarily modified to include carriageway widening by up to 5m. This will enable modification of the right-turn lane on the A534 Old Mill Road, to the east of the junction of Congleton Road and the A534 Old Mill Road.

5.3.4 In addition, modifications to the existing kerb lines and road markings will be required. Highway drainage will need to be relocated along these new kerb lines.

5.3.5 The modification and widening of the A534 Old Mill Road and Congleton Road junction will be constructed over a period of up to one year, commencing in 2024 and remain in place during the construction works. The original configuration of the junction will be reinstated within the indicative construction programme provided in Section 6.

5.3.6 The land required for the amendment is outside the limits of the Bill. The amendment will result in the temporary requirement for an additional 0.7ha of land (see SES2 and AP2 ES Volume 2, MA01 Map Book: map CT-05-306-R2, G5 to G7).

Topics included in the AP2 assessment

5.3.7 The assessment of this amendment has identified new, different or removed likely significant effects for: community; ecology and biodiversity; health; landscape and visual; socio-economics; and sound, noise and vibration.

5.3.8 The assessment of changes to traffic flows and traffic related effects as a result of all changes and amendments to the original scheme is reported in Section 7. Topics where a significant effect has been identified due to changes to traffic flows are reported in Section 7 and include: air quality; ecology and biodiversity; socio-economics; and sound, noise and vibration.

Community

Scope, assumptions and limitations

5.3.9 The assessment scope, key assumptions and limitations for community are as set out in Volume 1 and the SMR of the main ES.

5.3.10 This amendment has the potential to result in new significant construction effects only. Therefore, there is no operational assessment for community.

Environmental baseline

Existing baseline

5.3.11 A summary of the baseline information relevant to the assessment of the amendment is provided below.

5.3.12 Sandbach is a settlement comprising approximately 8,000 residential properties. The nearest residential properties to the amendment are located on Gatekeeper Close and Henshall Drive, adjacent to land required for the construction of the AP2 revised scheme.

5.3.13 Nearby community facilities include Park House Care Home on Congleton Road. Other community facilities are located in the centre of Sandbach and include a number of schools, GP surgeries, a library, a leisure centre and a number of parks.

Future baseline

5.3.14 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.3.15 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.3.16 None of the identified developments affect the assessment of the AP2 revised scheme's likely impacts for community.

Effects arising during construction

Avoidance and mitigation measures

5.3.17 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are proposed.

Assessment of impacts and effects

5.3.18 This amendment will result in a new major adverse in-combination effect on approximately 20 residential properties at the junction of the A534 Old Mill Road and Congleton Road in Sandbach. New significant noise effects are expected to combine with new significant visual effects for approximately one year and five months. Together, these noise and visual effects will result in a new temporary major adverse in-combination effect on amenity for residents at these properties, which is significant.

5.3.19 This amendment will result in a new temporary major adverse in-combination effect on Park House Care Home on Congleton Road, Sandbach. New significant noise effects are expected to combine with new significant visual effects for approximately one year and one month. Together these noise and visual effects will result in a new major adverse in-combination effect on amenity for residents at Park House Care Home, which is significant.

5.3.20 The locations of significantly affected resources are shown in the SES2 and AP2 ES Volume 5, Community Map Book: Map Series CM-01.

Other mitigation measures

5.3.21 No further mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

5.3.22 The amendment will result in new temporary residual significant effects on:

- approximately 20 residential properties at the junction of Old Mill Road and Congleton Road, Sandbach due to new noise and visual effects; and
- Park House Care Home, Congleton Road, due to new noise and visual effects.

Cumulative effects

5.3.23 No new, removed or different significant cumulative effects have been identified.

Ecology and biodiversity

Scope, assumptions and limitations

5.3.24 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1 and the SMR of the main ES.

5.3.25 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for ecology.

5.3.26 Where there are limitations in data, a precautionary baseline has been taken following the approach set out in the SMR which constitutes a 'reasonable worst-case' basis for the subsequent assessment.

Environmental baseline

Existing baseline

5.3.27 The baseline ecology and biodiversity information is as described in Section 7 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES and SES1. A summary of the baseline information relevant to the assessment of the amendment is provided below.

Designated sites

5.3.28 The land required for the amendment is located within the Natural England Impact Risk Zone (IRZ) for Sandbach Flashes SSSI which is of national value. The SSSI is located west of Sandbach and is approximately 3.55km west of the land required for the construction of the amendment.

Habitats

5.3.29 Habitats within the land required for construction of the amendment include scattered trees, semi-improved grassland, amenity grassland and hardstanding.

Species

5.3.30 The land required for the amendment contains trees which, on a precautionary basis, are assumed to support common and widespread species of roosting bats. Several species of bat are species of principal importance and a conservation priority of the Cheshire BAP. In the absence of survey information, on a precautionary basis, assumed roosts present are of up to county/metropolitan value.

Future baseline

5.3.31 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.3.32 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.3.33 None of the identified committed developments affect the assessment of the AP2 revised scheme's likely impacts for ecology and biodiversity.

Effects arising during construction

Avoidance and mitigation measures

5.3.34 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

Designated sites

5.3.35 The amendment is within the IRZ for Sandbach Flashes SSSI. However, there will be no significant adverse effects on the integrity of the site due to the limited nature of the changes and the distance of the land required for the amendment.

Species

5.3.36 The amendment will result in the loss of trees which, on a precautionary basis, are assumed to support common and widespread species of roosting bats. This will result in a new permanent adverse effect on the species of bats present, which would be significant at up to county/metropolitan level.

Other mitigation measures

5.3.37 To replace roosts that will be lost to construction, artificial roosts will be provided in retained areas as close to the roost being lost as possible, in accordance with the Ecological Principles of Mitigation within the SMR. Following the implementation of these measures, the effects of the potential loss of roosts on the bat assemblage will be reduced to a level that is not significant.

Summary of likely residual significant effects

5.3.38 There are no changes to the likely residual significant effects identified in the main ES as a result of the amendment.

Cumulative effects

5.3.39 No new or different significant cumulative effects have been identified.

Health

Scope, assumptions and limitations

5.3.40 The assessment scope, key assumptions and limitations for health are as set out in Volume 1 and the SMR of the main ES.

5.3.41 This amendment has the potential to result in new significant construction effects only. Therefore, there is no operational assessment for health.

Environmental baseline

Existing baseline

5.3.42 A summary of the baseline information relevant to the assessment of the amendment is provided below.

5.3.43 Sandbach is a settlement comprising approximately 8,000 residential properties. The nearest residential properties are located on Gatekeeper Close and Henshall Drive, adjacent to land required for the construction of the AP2 revised scheme.

5.3.44 There is one healthcare facility within the study area: Park House Care Home on Congleton Road. Other community facilities are located in the centre of Sandbach and include a number of schools, GP surgeries, a library, a leisure centre and a number of parks.

Future baseline

5.3.45 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.3.46 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.3.47 None of the identified developments affect the assessment of the AP2 revised scheme's likely impacts for health.

Effects arising during construction

Avoidance and mitigation measures

5.3.48 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are proposed.

Assessment of impacts and effects

5.3.49 This amendment will result in a new adverse neighbourhood quality effect for residents in the vicinity of the junction of the A534 Old Mill Road and Congleton Road in Sandbach. Construction noise is expected to be noticeable for approximately one year and five months. Construction activities will be visible from street level. People in this community are likely to

experience these effects as changing the quality of their neighbourhood and to regard that change as adverse, in diminishing the amenity of the settlement.

5.3.50 This amendment will result in an adverse health effect on Park House Care Home on Congleton Road, Sandbach. Construction noise is expected to be noticeable for approximately one year and one month and construction activities are expected to be visible from the care home. These effects will result in a temporary adverse effect on the beneficial health outcomes of accessing services, health and social care.

Other mitigation measures

5.3.51 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Cumulative effects

5.3.52 No new or different cumulative effects have been identified.

Landscape and visual

Scope, assumptions and limitations

5.3.53 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1 and the SMR of the main ES.

5.3.54 This amendment has the potential to result in new construction effects for the visual assessment only. Therefore, there is no operational phase visual assessment and no construction or operational phase landscape assessment.

5.3.55 All visual effects arising from this amendment are reported in SES2 and AP2 ES Volume 5, Appendix: LV-001-0MA01. The locations of significantly affected viewpoints during the construction phase are shown in the SES2 and AP2 ES Volume 2, MA01 Map Book: Map Series LV-03.

Environmental baseline

Existing baseline

5.3.56 The baseline visual information is as described in SES2 and AP2 ES Volume 5, Appendix: LV-001-0MA01. A summary of the visual baseline information relevant to the assessment of the amendment is provided below.

Visual baseline

5.3.57 The amendment has the potential to significantly affect one new viewpoint. This viewpoint is described in the SES2 and AP2 ES Volume 5, Appendix: LV-001-0MA01 and summarised below.

View north from Gatekeeper Close (high sensitivity receptors) (304-02-021)

5.3.58 This new viewpoint is in an area where there will be changes from the original scheme, and represents the views experienced by residents of Filter Bed Way and Gatekeeper Close, Congleton Road, Park House Care Home and Mews, users of Footpath Sandbach 11/2 and road users along Congleton Road and A534 Old Mill Road. It is situated on Gatekeeper Close and overlooks the grass verge, surfaced footpath, a low-level timber boundary fence line and adjoining managed hedge. Established trees, where present, along the A534 Old Mill Road and Gatekeeper Close partially filter views north towards the traffic island, directional signs, street lighting and small parking area immediately beyond. Wide grass verges adjoin the road junction on both sides of Congleton Road, with scattered roadside trees located on the south-west verge. In the middle to far-distance mature tree canopies partially obscure wider views of adjacent residential development, including Park House Care Home and Mews.

Future baseline

5.3.59 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.3.60 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.3.61 None of the identified committed developments affect the assessment of the AP2 revised scheme's likely impacts for landscape and visual.

Effects arising during construction

Avoidance and mitigation measures

5.3.62 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

Visual assessment

View north from Gatekeeper Close (high sensitivity receptors) (304-02-021)

5.3.63 This new viewpoint is located in an area where there will be changes from the original scheme. Residents and footpath users of **high** susceptibility and road users of lower susceptibility, all with **medium** value views, will experience a noticeable change to near-distance views during the construction period as a result of the amendment. The loss of scattered roadside trees will open up near-distance views of the temporarily modified

junction and the presence of traffic using the junction for residents of Filter Bed Way and Gatekeeper Close, users of Footpath Sandbach 11/2 and road users along Congleton Road and Old Mill Road. Near-distance views for residents of Congleton Road and Park House Care Home and Mews will be partially obscured by vegetation along property boundaries, although there will be some awareness of the loss of roadside trees beyond. There will be a **low** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.

Other mitigation measures

5.3.64 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

5.3.65 The amendment will give rise to a new likely residual significant construction effect at view north from Gatekeeper Close (304-02-021), after implementation of construction phase mitigation. The effect will be **moderate** adverse (significant).

Cumulative effects

5.3.66 No new or different significant cumulative effects have been identified.

Socio-economics

Scope, assumptions and limitations

5.3.67 The assessment scope, key assumptions and limitations for socio-economics are as set out in Volume 1 and the SMR of the main ES. This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for socio-economics.

Environmental baseline

Existing baseline

5.3.68 The baseline socio-economics information is as described in the SES2 and AP2 ES Volume 5, Appendix: SE-001-00000, Updated socio-economic baseline information.

Future baseline

5.3.69 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.3.70 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume

5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.3.71 None of the identified developments affect the assessment of the AP2 revised scheme's likely impacts on socio-economics.

Effects arising during construction

Avoidance and mitigation measures

5.3.72 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

5.3.73 The amendment will result in a new adverse significant in-combination effect on Park House, a residential care home located north-east of Sandbach, as a result of new significant noise effects for one year and one month and visual effects. These effects are in addition to the significant effects from HGV construction traffic congestion reported in the main ES and the SES1 and AP1 ES. The sensitivity of Park House is assessed to be high as users may be sensitive to impacts on the local environment and setting and this is likely to discourage customers of the residential care home. The construction works may discourage them from using this business. Given the duration of effects and the high level of sensitivity, the amendment will result in a new adverse in-combination effect on Park House, which is significant. The locations of significantly affected resources are shown in the SES2 and AP2 ES Volume 5, Socio-economics Map Book: Map Series SE-01.

Other mitigation measures

5.3.74 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

5.3.75 The amendment will result in a new temporary adverse significant in-combination effect on Park House care home.

Cumulative effects

5.3.76 No new or different significant cumulative effects have been identified.

Sound, noise and vibration

Scope, assumptions and limitations

5.3.77 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES. This amendment has the potential to result in new or different likely significant construction effects only. Therefore, there is no assessment of operational effects for sound, noise and vibration.

5.3.78 Baseline surveys have not been undertaken in the vicinity of this amendment and as such, a precautionary approach to the identification of likely significant effects has been taken due to the increased uncertainty of the baseline in this area.

Environmental baseline

Existing baseline

5.3.79 The baseline sound, noise and vibration information is as described in Section 13 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. Baseline sound levels representative of the assessment locations affected by this amendment have been used in the construction assessment.

5.3.80 This amendment involves works close to properties which were not included within the main ES. The additional baseline sound levels are presented in SES2 and AP2 ES Volume 5, Appendix: SV-002-00000.

Future baseline

5.3.81 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) and SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

5.3.82 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

5.3.83 None of the identified committed developments affect the assessment of the AP2 revised scheme's likely impacts for sound, noise and vibration. No updates have been made to future baseline sound levels compared to the main ES and the SES1 and AP1 ES.

Effects arising during construction

Avoidance and mitigation measures

5.3.84 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

Residential receptors: direct effects – communities

5.3.85 The amendment has the potential to give rise to new temporary direct adverse noise effects, which may be considered to be significant on a community basis. The potential new or different likely significant effects are discussed in the following paragraphs and summarised in Table 5. In the table, the duration of impact is the period where the relevant assessment category is exceeded. The predicted monthly construction noise level will vary throughout this period and as a guide the typical and highest monthly noise levels at the closest properties in the community identified are presented in the 'cause' column of this table.

5.3.86 The amendment has the potential to introduce a new adverse noise effect at approximately 20 dwellings in the vicinity of the junction of the A534 Old Mill Road and Congleton Road in Sandbach (MA01-C-C17). The predicted duration of the construction noise impact is up to one year and five months during the daytime. This may be considered by the local community as an effect on the acoustic character of the area and hence be perceived as a change in the quality of life for that community. This is considered to be a likely significant effect when assessed on a community basis.

Table 5: Direct adverse construction effects on residential communities and shared open areas that are considered to be significant on a community basis and are new or different to those reported in the main ES

Significant effect number (and Map reference)[19]	Type of significant effect	Time of day	Location	Cause (construction activities)[20]	Assumed approximate duration of impact
MA01-C-C17 (SV-03-303-R2)	Construction noise (New)	Daytime	Sandbach: approximately 20 dwellings in the vicinity of the junction of the A534 Old Mill Road and Congleton Road	During the daytime, highway works in the vicinity of the junction of the A534 Old Mill Road and Congleton Road. The typical and highest monthly noise levels will be	Up to one year and five months.

[19] See SES2 and AP2 Volume 5, Appendix: SV-002-00000 and SES2 and AP2 ES, Volume 5, Sound, noise and vibration Map Book: Map Series SV-03.

[20] The construction activity giving rise to the highest predicted noise or vibration level is reported. Multiple construction activities may contribute to the typical noise levels and the approximate duration of impact.

Significant effect number (and Map reference)[19]	Type of significant effect	Time of day	Location	Cause (construction activities)[20]	Assumed approximate duration of impact
				approximately 70dB and 75dB[21].	

5.3.87 For further information see SES2 and AP2 ES Volume 5, Appendix: SV-002-00000 and SES2 and AP2 ES Volume 5, Sound, noise and vibration Map Book.

Non-residential receptors: direct effects

5.3.88 The amendment will give rise to predicted construction noise levels which exceed both the relevant screening criteria and the noise change criterion (typically a change of greater than 3dB[22] compared with the existing baseline sound level) at Park House Care Home, Congleton Road, Sandbach (assessment location ref.: 611220).

5.3.89 This location is identified in the Hough to Walley's Green area, as shown in Volume 5, Sound, noise and vibration Map Book, Map Series SV-03 in the SES2 and AP2 ES. At the non-residential receptor identified above an assessment has been undertaken to determine if this impact would result in a significant effect, using the significance criteria set out in Annex A of Volume 5, Appendix: SV-001-00000 of the main ES.

5.3.90 Park House Care Home is a two-storey building providing residential or respite care for up to 29 residents. The receptor is located in the vicinity of Congleton Road, approximately 25m north of the land required for construction of the amendment. Park House Care Home has been assessed against the residential criteria. The predicted daytime monthly construction noise level is above the screening criterion defined in the SMR for residential use[23] for a period of one year and one month. The highest predicted daytime monthly construction noise level is 3dB above the screening criterion defined in the SMR. The typical predicted monthly daytime construction noise level is 2dB above the screening criterion defined in the SMR. Park House Care Home is identified, on the basis of a precautionary assessment, as being subject to a likely significant adverse effect (denoted by MA01-C-N12 in Table 5 of Volume 5, Appendix: SV-002-0MA01). This temporary adverse effect may take the form of activity disturbance to residents of the care home.

[21] Equivalent continuous sound level at the facade, $L_{pAeq,\ 0700\text{-}1900}$.

[22] The exception is where the use and sensitivity of the receptor or land use is very sensitive to noise and have been included in the detailed assessment where there is a change less than 3dB. Further information can be found in the SES1 and AP1 ES, Volume 5, Appendix: SV-002-0MA01.

[23] 65dB $L_{pAeq,0700\text{-}2300}$ (façade) during the day, based on Category A of the BS5228 ABC method.

Other mitigation measures

5.3.91 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

5.3.92 A new temporary residual adverse significant noise effect from construction activities on the residential community of Sandbach is likely as a result of the amendment.

5.3.93 New temporary residual adverse significant noise effects from construction activities on the non-residential buildings at Park House Care Home are likely as a result of the amendment.

Cumulative effects

5.3.94 No new or different significant cumulative effects have been identified.

Summary of new or different likely residual significant effects as a result of the amendment

Construction

Community

5.3.95 The amendment will result in new residual community significant effects on:

- approximately 20 residential properties at the junction of the A534 Old Mill Road and Congleton Road, Sandbach due to new noise and visual effects; and
- Park House Care Home, Congleton Road, due to new noise and visual effects.

Landscape and visual

5.3.96 The amendment will give rise to a new likely residual significant construction effect at view north from Gatekeeper Close (304-02-021), after implementation of construction phase mitigation. The effect will be moderate adverse (significant).

Socio-economics

5.3.97 The amendment will result in a new adverse significant in-combination effect on Park House Care Home.

Sound, noise and vibration

5.3.98 The amendment will result in a new temporary residual adverse significant noise effect from construction activities on the residential community of Sandbach.

5.3.99 The amendment will result in a new temporary residual adverse significant noise effect from construction activities on the non-residential buildings at Park House Care Home.

6 Construction programme

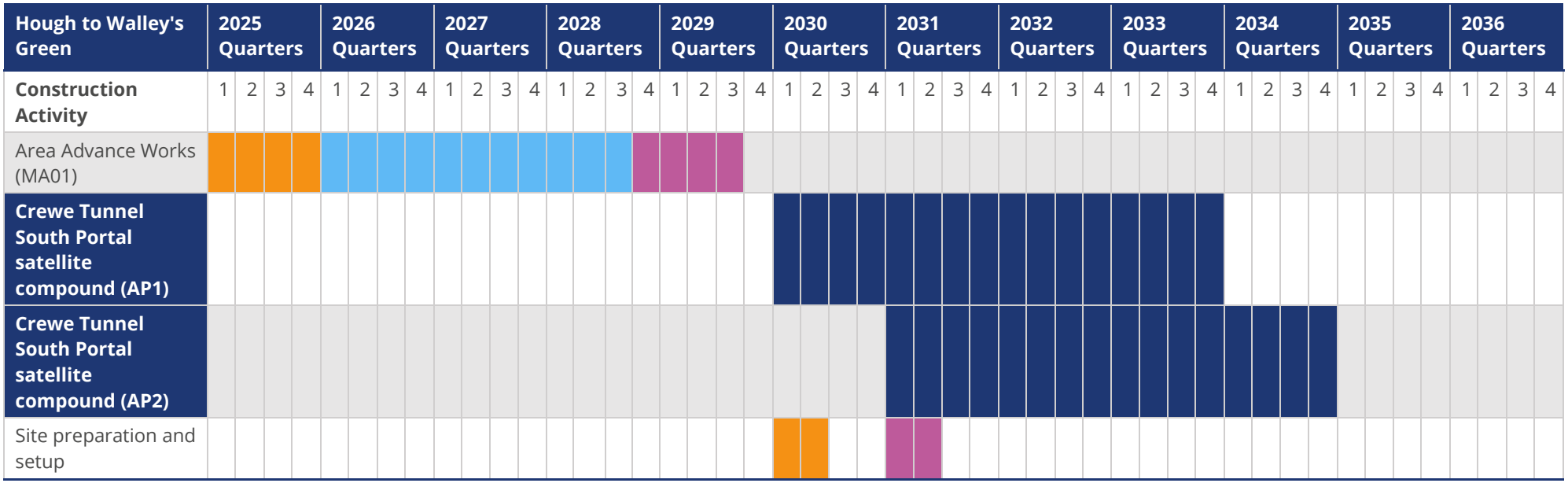
6.1 Introduction

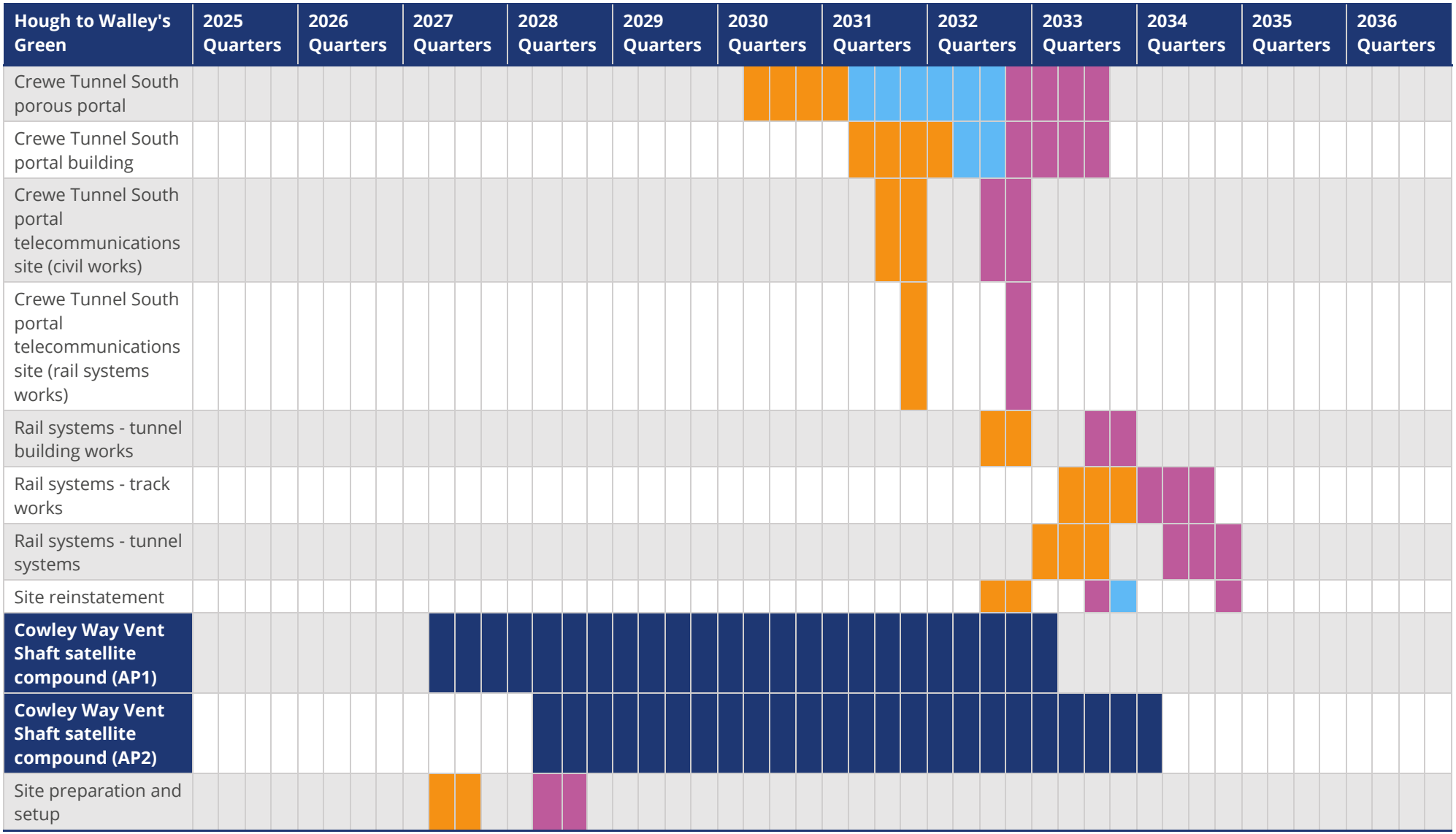
6.1.1 The AP2 revised scheme has resulted in the need to alter the indicative construction programme set out in the SES1 and AP1 ES.

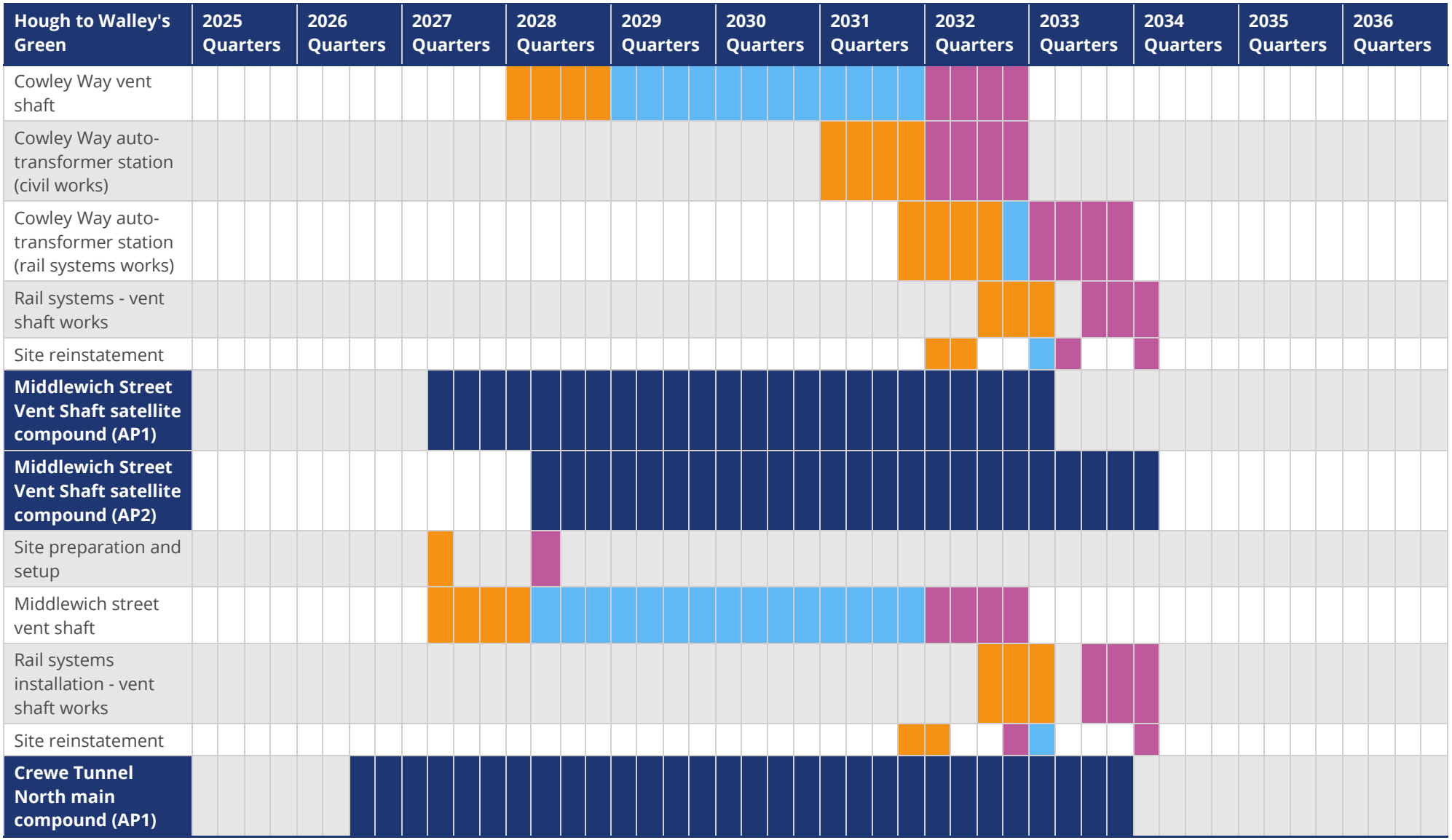
6.1.2 The revised indicative programme compared to the programme included in the SES1 and AP1 ES is shown in Figure 3.

Figure 3: Indicative construction programme for the SES2 and AP2 ES compared to the SES1 and AP1 ES

Key	
	Compound duration showing start and end of mobilisation. Activities below will be managed from the above compound. Second phase site reinstatement can occur post the compound demobilisation.
	Activity duration (indicates where there is no change from the SES1 and AP1 ES taking into consideration SES2 changes and AP2 amendments).
	Increase in duration or activity moved as a result of a SES2 change or AP2 amendment. (A purple box indicates that works are now taking place in the quarter indicated.)
	Decrease in duration or activity moved as a result of a SES change or AP amendment. (An orange box indicates that works are no longer taking place in the quarter indicated.)
	Removed as a result of SES2 change or AP2 amendment.
	New elements of the programme (compound or associated) works as a result of a SES2 change or an AP2 amendment.




Hough to Walley's Green
2025 Quarters
2026 Quarters
2027 Quarters
2028 Quarters
2029 Quarters
2030 Quarters
2031 Quarters
2032 Quarters
2033 Quarters
2034 Quarters
2035 Quarters
2036 Quarters
Crewe Tunnel South porous portal
Crewe Tunnel South portal building
Crewe Tunnel South portal telecommunications site (civil works)
Crewe Tunnel South portal telecommunications site (rail systems works)
Rail systems - tunnel building works
Rail systems - track works
Rail systems - tunnel systems
Site reinstatement
Cowley Way Vent Shaft satellite compound (AP1)
Cowley Way Vent Shaft satellite compound (AP2)
Site preparation and setup


Hough to Walley's Green
2025 Quarters
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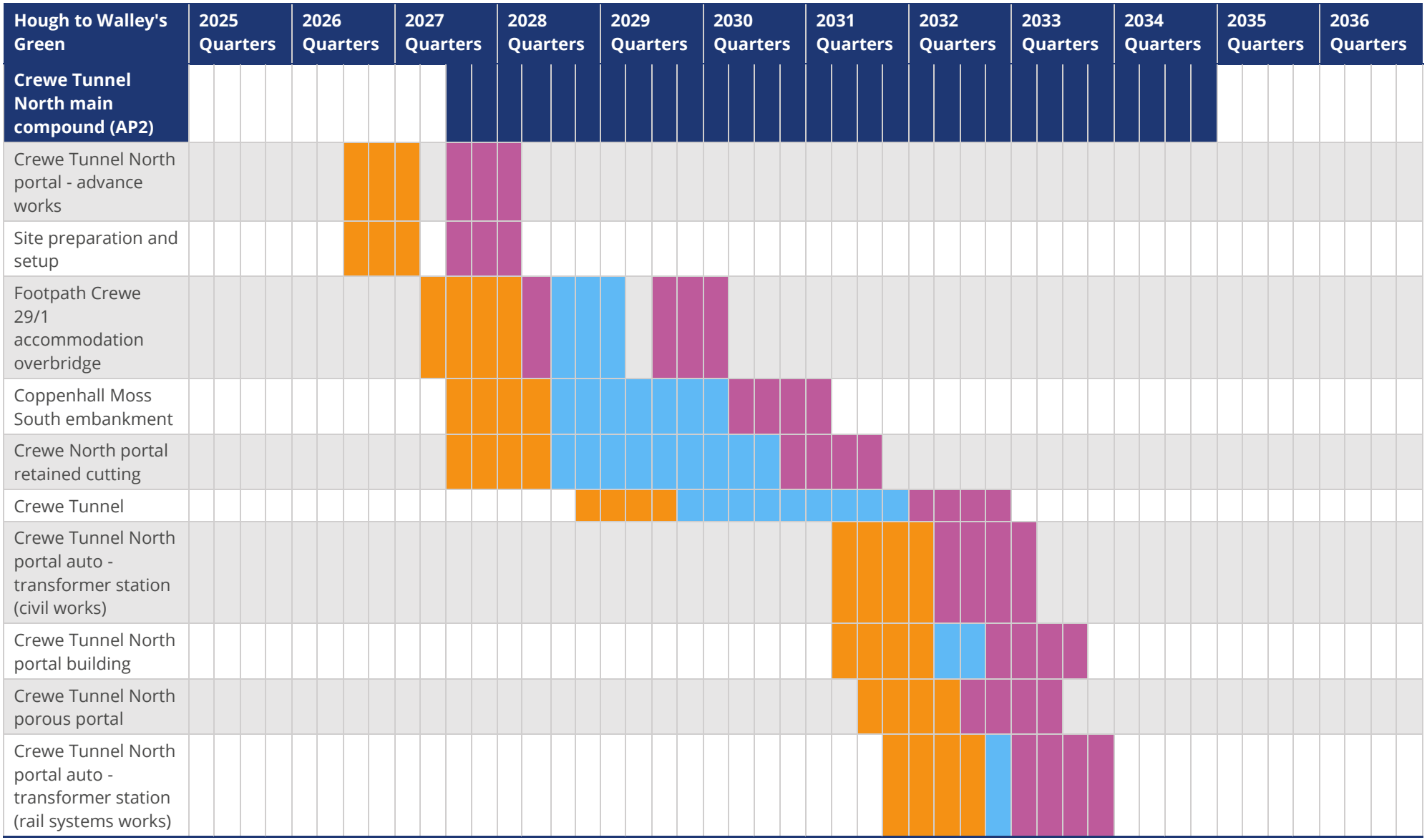
2030 Quarters
2031 Quarters
2032 Quarters
2033 Quarters
2034 Quarters
2035 Quarters
2036 Quarters
Cowley Way vent shaft
Cowley Way auto-transformer station (civil works)
Cowley Way auto-transformer station (rail systems works)
Rail systems - vent shaft works
Site reinstatement
Middlewich Street Vent Shaft satellite compound (AP1)
Middlewich Street Vent Shaft satellite compound (AP2)
Site preparation and setup
Middlewich street vent shaft
Rail systems installation - vent shaft works
Site reinstatement
Crewe Tunnel North main compound (AP1)


Hough to Walley's Green
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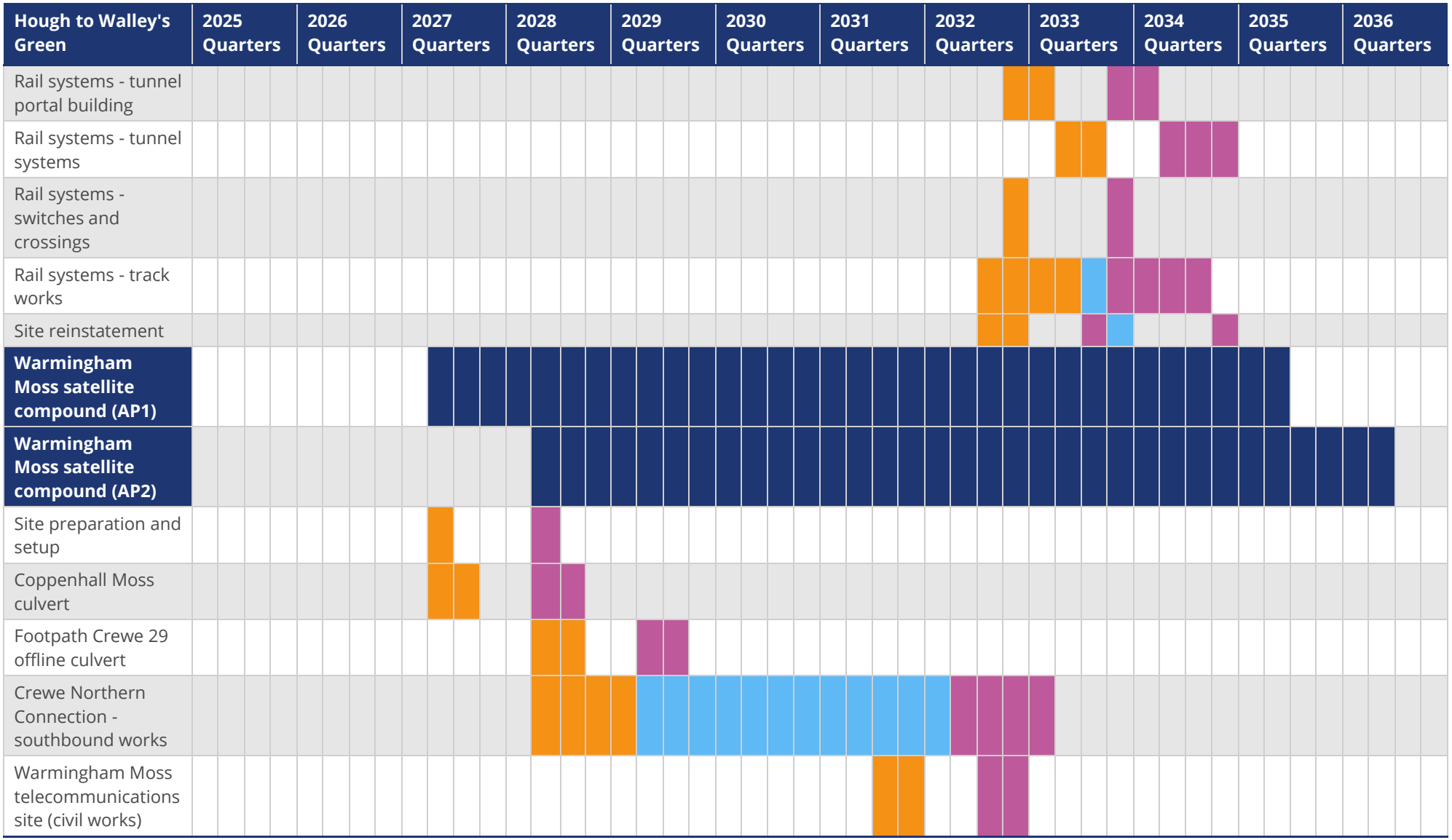
2028 Quarters
2029 Quarters
2030 Quarters
2031 Quarters
2032 Quarters
2033 Quarters
2034 Quarters
2035 Quarters
2036 Quarters
Crewe Tunnel North main compound (AP2)
Crewe Tunnel North portal - advance works
Site preparation and setup
Footpath Crewe 29/1 accommodation overbridge
Coppenhall Moss South embankment
Crewe North portal retained cutting
Crewe Tunnel
Crewe Tunnel North portal auto - transformer station (civil works)
Crewe Tunnel North portal building
Crewe Tunnel North porous portal
Crewe Tunnel North portal auto - transformer station (rail systems works)


Hough to Walley's Green
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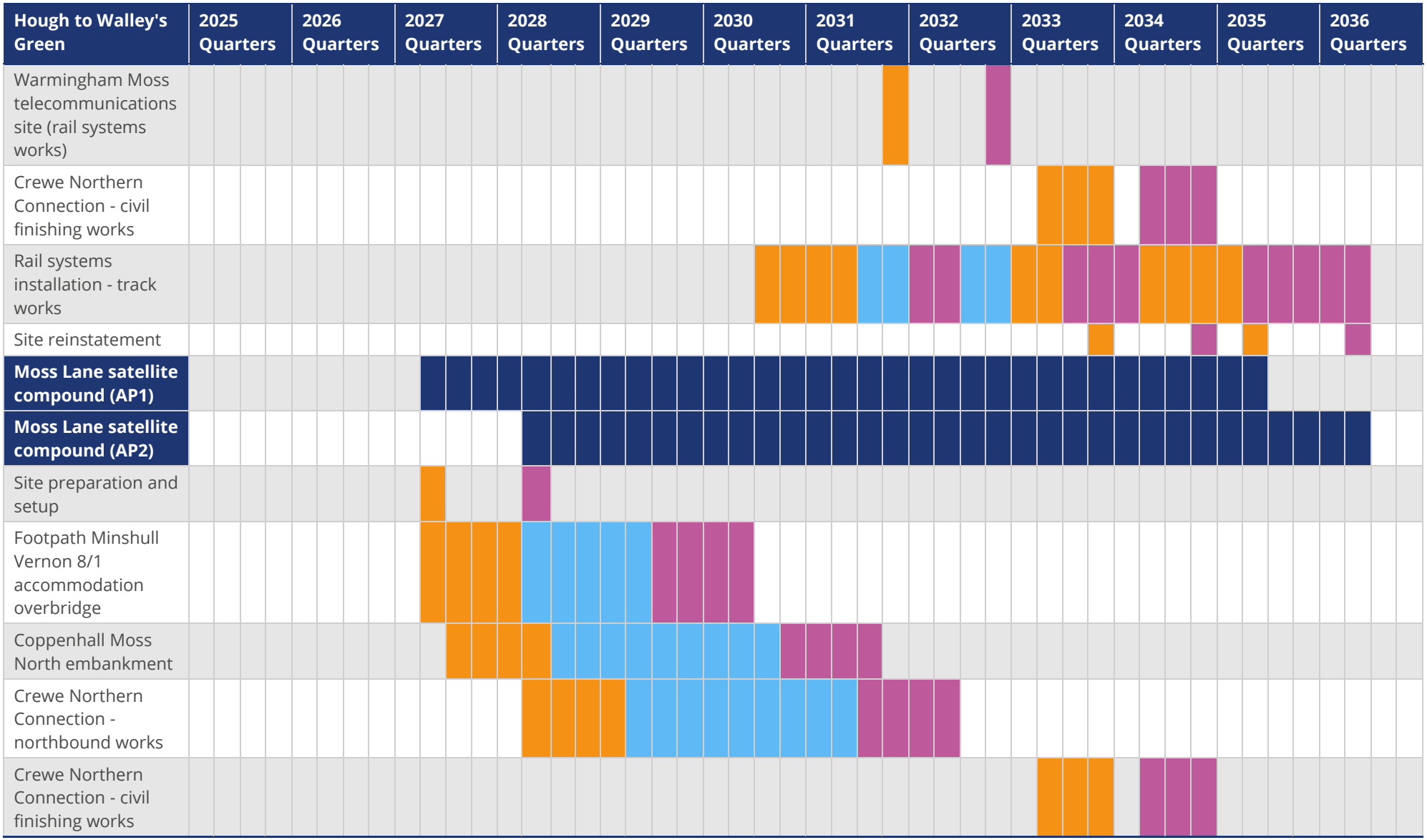
2026 Quarters
2027 Quarters
2028 Quarters
2029 Quarters
2030 Quarters
2031 Quarters
2032 Quarters
2033 Quarters
2034 Quarters
2035 Quarters
2036 Quarters
Rail systems - tunnel portal building
Rail systems - tunnel systems
Rail systems - switches and crossings
Rail systems - track works
Site reinstatement
Warmingham Moss satellite compound (AP1)
Warmingham Moss satellite compound (AP2)
Site preparation and setup
Coppenhall Moss culvert
Footpath Crewe 29 offline culvert
Crewe Northern Connection - southbound works
Warmingham Moss telecommunications site (civil works)


Hough to Walley's Green
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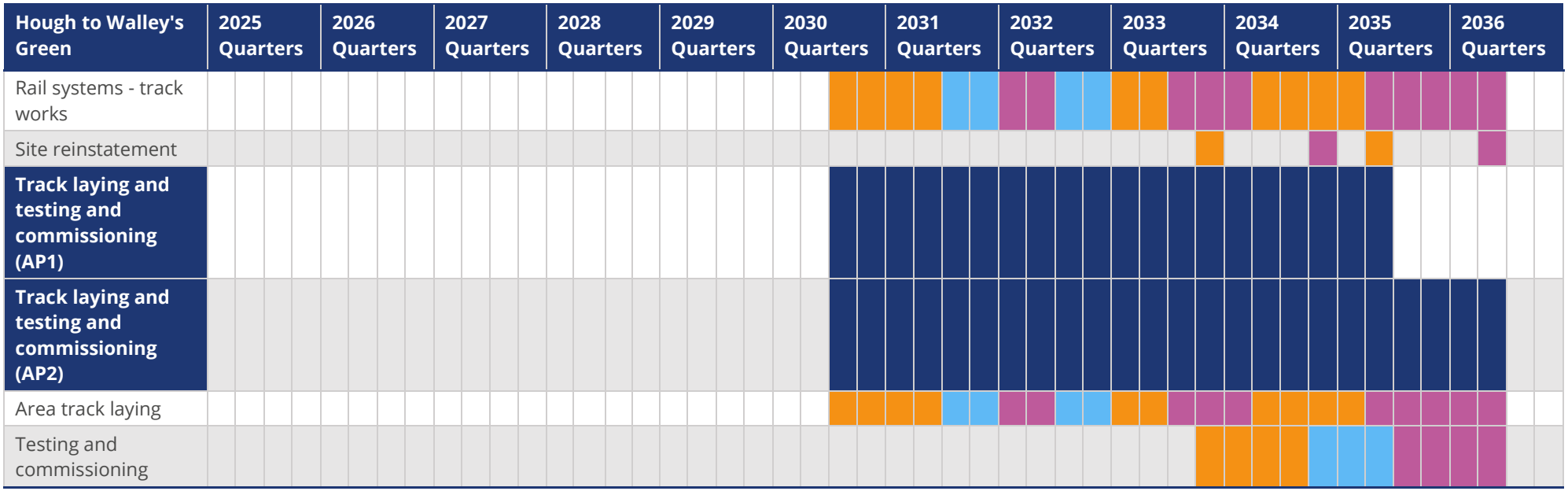
2027 Quarters
2028 Quarters
2029 Quarters
2030 Quarters
2031 Quarters
2032 Quarters
2033 Quarters
2034 Quarters
2035 Quarters
2036 Quarters
Warmingham Moss telecommunications site (rail systems works)
Crewe Northern Connection - civil finishing works
Rail systems installation - track works
Site reinstatement
Moss Lane satellite compound (AP1)
Moss Lane satellite compound (AP2)
Site preparation and setup
Footpath Minshull Vernon 8/1 accommodation overbridge
Coppenhall Moss North embankment
Crewe Northern Connection - northbound works
Crewe Northern Connection - civil finishing works


Hough to Walley's Green
2025 Quarters
2026 Quarters
2027 Quarters
2028 Quarters
2029 Quarters
2030 Quarters
2031 Quarters
2032 Quarters
2033 Quarters
2034 Quarters
2035 Quarters
2036 Quarters
Rail systems - track works
Site reinstatement
Track laying and testing and commissioning (AP1)
Track laying and testing and commissioning (AP2)
Area track laying
Testing and commissioning

7 Combined effects of changes and amendments in the Hough to Walley's Green area due to changes in traffic flows

7.1 Introduction

7.1.1 This section reports the combined assessment of new or different significant traffic and traffic related effects, as a result of changes in traffic flows. These relate to changes associated with SES1 changes, AP1 amendments, SES2 changes and AP2 amendments, where the change in traffic flows cannot be directly attributed to a specific SES2 change or AP2 amendment.

7.1.2 The assessment has also considered any impacts in the Hough to Walley's Green area associated with SES2 changes and AP2 amendments in other community areas.

7.1.3 Traffic and transport effects are reported first, since the effects arise from changes in traffic flows. Other topics where a significant effect has been identified, are then reported in the following sequence:

- air quality;
- ecology and biodiversity;
- socio-economics; and
- sound, noise and vibration.

7.2 SES2 changes and AP2 amendments of relevance to this assessment

7.2.1 The assessment includes all changes to traffic. The primary contributors to the changes in construction traffic are the changes to the movement of excavated material, construction programme and construction assumptions. The assessment takes into account measures to reduce the need to move material by the road network and use of site haul routes to limit construction traffic on the road network.

7.2.2 In addition to the changes in construction traffic, the following AP2 amendments make a particular contribution to the changes in traffic flows in the Hough to Walley's Green area:

- additional land temporarily required for modifications to the B5076 Bradfield Road and Parkers Road junction (AP2-001-001);
- additional land permanently required for modifications to the Warmingham Road and Hall Lane junction (AP2-001-002); and
- additional land temporarily required for modifications to the A534 Old Mill Road and Congleton Road junction (AP2-001-003).

7.2.3 In addition, updates to the transport model existing and future baselines described in Section 2 will lead to changes to the future baseline traffic forecasts reported in the main ES and the SES1 and AP1 ES. These baseline changes could give rise to new or different effects compared with the main ES and the SES1 and AP1 ES as a result of, for example, different underlying levels of traffic and congestion against which the impacts of HS2 are assessed. The combined assessment of changes to traffic flows presented in this section of the report takes into account the revised future baseline traffic forecasts alongside the changes in traffic flows associated with the AP2 revised scheme.

7.3 Traffic and transport

Scope, assumptions and limitations

7.3.1 The assessment scope, key assumptions and limitations for the traffic and transport assessment are as set out in Volume 1 (Section 8) and the SMR of the main ES.

7.3.2 In the main ES, the future baseline traffic volumes were calculated for 2030, 2038 and 2046. In the SES1 and AP1 ES, the 2046 future baseline was updated to 2051 in order to give the assessment greater resilience to long term growth in travel demand. For the SES2 and AP2 ES, the 2030 and 2038 future baselines have been updated to 2031 and 2039 to reflect the revised programme presented in Section 6. Consequently, the construction assessment of the AP2 revised scheme has been undertaken for 2031. As a result, effects reported in 2031 due to construction of the AP2 revised scheme are compared against effects reported for 2030 in the SES1 and AP1 ES. In the MA01 area there are no junctions affected by operation of the AP2 revised scheme.

7.3.3 The extent and nature of changes to travel behaviour following the changes seen during COVID-19 are not yet clear and consequently are not reflected in the assessment. However, the impact of COVID-19 on economic growth is reflected in the HS2 travel forecasts. The February 2023 release of the Department for Transport's (DfT's) national travel forecasts (NTEM8) indicate that local travel forecasts used in the assessment generally reflect the impact of COVID-19 on economic growth. The impact of COVID-19 on travel behaviour is not yet known, although it is considered likely to result in lower travel demand in the medium term than the forecasts used in the assessment. Consequently, the assessment is considered to overstate travel demand for both construction and operation scenarios and therefore to present a robust case for traffic and transport.

7.3.4 Changes to traffic and transport impacts within the Hough to Walley's Green area as a result of the AP2 revised scheme are contained in the SES2 and AP2 ES Volume 5, Appendix: TR-003-00001 Transport Assessment Part 3 Addendum.

7.3.5 There were SES1 changes and AP1 amendments in the Hough to Walley's Green area. The assessment reports the new or different likely significant effects, compared to those reported in the SES1 and AP1 ES, arising due to changes in traffic flows as a result of the SES1 changes, AP1 amendments, SES2 changes and AP2 amendments combined.

7.3.6 Maps relating to these new or different likely significant effects are set out in the Volume 5, Traffic and transport Map Book:

- Map Series TR-01 – Station Impacts (Operational);
- Map Series TR-03 – Significant Residual Transport Effects Arising during Construction and Construction Traffic Routes; and
- Map Series TR-04 – Significant Residual Transport Effects Arising from Operation.

7.3.7 In addition, construction traffic routes are set out in Map Series TR-08 – Construction Routes to the Strategic Network.

Environmental baseline

Existing baseline

7.3.8 The baseline traffic and transport information is described in Section 14 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES and Section 7.3 of the SES1 and AP1 ES Volume 2, Community Area report: Hough to Walley's Green (MA01), as amended in Section 2 of this report and below.

7.3.9 Since the main ES and the SES1 and AP1 ES additional traffic information has been used in the development of updated baseline and future baseline models for the SES2 scheme and AP2 revised scheme in the Hough to Walley's Green area. This includes Trafficmaster journey time data from the DfT, as set out as set out in the BID[24] report BID TR-004-00001 SES2 and AP2 ES. This data has been combined with the information collected for local junction modelling as set out in the BID[25] report BID TR-004-00001 which accompanied the main ES.

Future baseline

Construction (2031)

7.3.10 The future baseline traffic and transport information is described in Section 14 of Volume 2, Community Area report: Hough to Walley's Green, (MA01) of the main ES and Section 7.3 of the SES1 and AP1 ES Volume 2, Community Area report: Hough to Walley's Green (MA01) and is updated for the AP2 revised scheme below.

7.3.11 The assumptions regarding underlying committed developments and transport schemes for each assessment year have been reviewed and updated taking into account information

[24] High Speed Two Ltd (2023), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement, Transport Assessment policy and data*, BID TR-004-00001. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-2-and-additional-provision-2-environmental-statement.

[25] High Speed Two Ltd (2022), High Speed Rail (Crewe - Manchester), *Background Information and Data, Transport Assessment policy and data report,* BID TR-004-00001. Available online at: https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement.

from National Highways and Cheshire East Council (CEC) and are considered to be appropriately reflected in the traffic forecasts.

7.3.12 Since the main ES and the SES1 and AP1 ES there have been two committed or recently completed substantial highway schemes in the study area that have been taken into account in the future baseline for the AP2 revised scheme. These schemes have now been incorporated into the A500 Crewe Area Wide Transport model for the AP2 revised scheme in the 2031, 2039 and 2051 future baseline scenarios. These are:

- M6 junction 17 Sandbach improvement scheme associated with the nearby Capricorn Business Park development. This scheme involves replacing the existing roundabout to the western side of the M6 junction 17 to provide access to the development; and
- A530/Wistaston Green Road improvement scheme was completed in 2021and involved signalising the three-arm priority controlled junction.

Effects arising during construction

Avoidance and mitigation measures

7.3.13 No avoidance or mitigation measures additional to those reported in the main ES and draft Code of Construction Practice (CoCP)[26] are proposed.

Assessment of impacts and effects

Temporary effects

Key construction transport issues

7.3.14 Table 19 in the SES1 and AP1 ES Volume 2, Community Area report: Hough to Walley's Green (MA01) provides details of construction compounds in the Hough to Walley's Green area. This information has been updated to reflect changes resulting from the AP2 revised scheme and is provided in Table 6.

[26] High Speed Two Ltd (2022), High Speed Rail (Crewe - Manchester), *Environmental Statement, draft Code of Construction Practice*, Volume 5, Appendix: CT-002-00000. Available online at: https://www.gov.uk/government/collections/cross-topic-technical-appendices-for-high-speed-rail-crewe-manchester-environmental-statement#draft-code-of-construction-practice.

Table 6: Typical vehicle trip generation for construction compounds in the Hough to Walley's Green area

Compound type	Compound name	Indicative start/set up date (years/ quarter)	Estimated duration of active use (years/ months)	Average daily combined two–way car/LGV trips during busy period and within peak month of activity	Average daily combined two–way HGV trips during busy period and within peak month of activity	Estimated duration of busy period (months)
Satellite	Crewe tunnel south portal satellite compound	2031 Q1	4 years	94-248	188-190	7
Satellite	Cowley Way vent shaft satellite compound	2028 Q2	5 years and 9 months	110-190	112-114	2
Satellite	Middlewich Street vent shaft satellite compound	2028 Q2	5 years and 9 months	106-128	64-86	12
Main	Crewe tunnel north main compound	2027 Q3	7 years and 6 months	374-576	222-338	33
Satellite	Warmingham Moss satellite compound	2028 Q2	7 years and 3 months	196-502	166-226	7
Satellite	Moss Lane satellite compound	2028 Q2	7 years and 6 months	196-468	154-210	11

7.3.15 Details of the construction traffic routes for construction compounds in the Hough to Walley's Green area are reported in Table 20 of the SES1 and AP1 ES Volume 2, Community Area report: Hough to Walley's Green (MA01). This information has been updated to reflect changes resulting from the AP2 revised scheme and is provided in Table 7.

Table 7: Construction HGV routes for construction compounds in the Hough to Walley's Green area

Compound name(s)	Access routes to/from compound(s) to main road network
Crewe tunnel south portal satellite compound	Casey Lane, Newcastle Road and A531 Newcastle Road
Cowley Way vent shaft satellite compound	Route to/from the south: Cowley Way, A532 Weston Road, A5020 David Whitby Way and A500 Shavington Bypass Route to/from the north: Cowley Way, A532 Weston Road and A534 Crewe Road
Middlewich Street vent shaft satellite compound	Route to/from the south: B5076 Middlewich Street, Remer Street, Sydney Road and A5020 University Way B5076 Middlewich Street, Remer Street, B5076 North Street, B5076 Bradfield Road, B5076 Flowers Lane and A530 Middlewich Road Route to/from the north:

Compound name(s)	Access routes to/from compound(s) to main road network
	B5076 Middlewich Street, Remer Street, Sydney Road and A534 Haslington Bypass
Crewe tunnel north main compound	Route to/from the south: Warmingham Road, Groby Road, Sydney Road and A5020 University Way Parkers Road, B5076 Bradfield Road, B5076 Flowers Lane and A530 Middlewich Road Route to/from the north: Warmingham Road, Groby Road, Sydney Road and A534 Haslington Bypass
Warmingham Moss satellite compound	Route to/from the south: Site haul route, Warmingham Road, Groby Road, Sydney Road and A5020 University Way Site haul route, Warmingham Road, Groby Road, Sydney Road and A534 Haslington Bypass Site haul route, Parkers Road, B5076 Bradfield Road, B5076 Flowers Lane and A530 Middlewich Road Route to/from the north: Site haul route and A530 Nantwich Road
Moss Lane satellite compound	Site haul route and A530 Middlewich Road

7.3.16 Information on the indicative construction programme is provided in Section 6 of this report, and the construction methodology is summarised in Volume 1 (Section 6) of the main ES. These illustrate how the phasing of activities at different compounds will generally be staggered and that construction activities at individual compounds may not occur over the whole duration presented in Table 6.

7.3.17 Utility works have been included in the assessment where they are major and where the traffic or transport impacts from the works separately, or in combination with other works, will be greater than other construction activities arising within the area. Most utility works are expected to result in only localised traffic and pedestrian diversions, which will be of short-term duration and are not expected to result in significant effects.

7.3.18 The effects of construction of the AP2 revised scheme on the highway network in the Hough to Walley's Green area have been assessed by undertaking strategic model runs for a number of 'with AP2 revised scheme' construction scenarios and comparing the traffic flows and delays against the 2031 future baseline scenario. The assessment is based on the highest volume of construction traffic on each construction route in each construction scenario. Where construction routes will serve more than one construction compound, the assessment is based on the highest combined volume of construction traffic on each section of each route in each construction scenario.

7.3.19 In using the strategic model, the impacts and effects have been considered in a utilities scenario and two scenarios covering the main construction phases. These scenarios ensure that the assessment addresses the different combinations and interactions of advance works, utility works, temporary highway closures and diversions and construction HGV movements through the construction period. Due to changes in the construction

programme of the AP2 revised scheme, these scenarios differ slightly from those reported in the SES1 and AP1 ES:

- utilities scenario, 2026 Q1 – 2027 Q2. This scenario corresponds with utility and advance works and includes the A532 Weston Road and Weston Service Road one way system, shuttle working on the A530 Nantwich Road and temporary traffic management associated with implementation of the temporary junction modifications. There are negligible construction traffic movements in this scenario;
- scenario 1, 2027 Q3 – 2031 Q1. This corresponds with the construction peak during the closure of Clive Green Lane (in the Wimboldsley to Lostock Gralam area (MA02)) and includes shuttle working on the A532 West Street/Coppenhall Lane and commencement of works on Cowley Way vent shaft and Middlewich Street vent shaft. This scenario equates to 94% of the overall peak in construction traffic across the whole construction period; and
- scenario 2, 2031 Q2 – 2036 Q4. This corresponds with the construction peak following the realignment of Clive Green Lane (in the Wimboldsley to Lostock Gralam area (MA02)) and includes works associated with Crewe tunnel north main compound. This scenario equates to the overall peak in construction traffic across the whole construction period.

7.3.20 The HS2 construction works and the associated construction traffic movements differ for each of these scenarios. The assessment considers the impacts in all temporal phases and reports the highest magnitude of significant effects, regardless of which scenario they arise in.

7.3.21 Table 21 of the SES1 and AP1 ES Volume 2, Community Area report: Hough to Walley's Green (MA01) gives details of the most relevant highway interventions and works for each scenario in the Hough to Walley's Green area. This information has been updated to reflect changes resulting from the AP2 revised scheme and is provided in Table 8.

Table 8: Construction highway interventions by scenario

Type	Intervention	Utilities scenario – 2026 Q1 – 2027 Q2	Scenario 1 – 2027 Q3 – 2031 Q1	Scenario 2 – 2031 Q2 – 2036 Q4
Utilities	Shuttle working on A532 West Street/Coppenhall Lane	Not Included	Included	Not included
Utilities	A532 Weston Road and Weston Service Road one way system and shuttle working on A530 Nantwich Road between bridge over WCML and junction with Clive Green Lane	Included	Not Included	Not Included
Main works	Temporary traffic management associated with implementation of temporary junction modifications	Included	Not included	Not included

Type	Intervention	Utilities scenario – 2026 Q1 – 2027 Q2	Scenario 1 – 2027 Q3 – 2031 Q1	Scenario 2 – 2031 Q2 – 2036 Q4
Main works	Clive Green Lane (Wimboldsley to Lostock Gralam area (MA02)) available to construction traffic	Not included	Not included	Included
Main works	Groby Road/Remer Street/Maw Green Road Junction Improvement Scheme	Included*	Included*	Included*
	Construction HGV traffic assessed as a percentage of peak construction HGV traffic (Crewe model)	Negligible	94%	100%

**While it is considered likely that this improvement scheme will have been completed prior to the commencement of the construction of the AP2 revised scheme, due to the uncertainty over the timing of its delivery, the Sydney Road/Maw Green Road, Remer Street/Sydney Road/Elm Drive and Remer Street/Groby Drive junctions have been assessed both with and without the junction improvement scheme in place.*

7.3.22 The strategic models have been used to assess these construction scenarios taking account of the HS2 construction traffic movements and any road closures, diversions and realignments, traffic management or changes to junction operations in each scenario. The strategic model outputs for each of these scenarios are only relevant to the assessment of the effects on traffic delays to vehicle occupants and traffic related severance.

Highway network

7.3.23 The AP2 revised scheme includes a number of changes to the highway network compared to the AP1 revised scheme. This includes temporary changes to the highway network to mitigate impacts identified at the following locations during construction. These amendments are temporary and will be in place during construction of the AP2 revised scheme only. The proposed layouts will be constructed during the utilities scenario. During this period, temporary traffic management will be in place. The following proposed layouts will be complete from scenario 1 onwards:

- B5076 Bradfield Road/Parkers Road junction (AP2-001-001);
- Warmingham Road/Hall Lane junction (AP2-001-002); and
- A534 Old Mill Road/Congleton Road junction (AP2-001-003).

7.3.24 The indicative construction programme in Section 6 of this report illustrates how the phasing of activities will generally be staggered and that construction activities associated with the AP2 revised scheme may not occur at the same time.

7.3.25 The combined impact of all SES1 changes, AP1 amendments, SES2 changes and AP2 amendments will lead to flow changes on the highway network in all construction scenarios. This will result in changes to the traffic congestion and delay effects for vehicle occupants reported in the SES1 and AP1 ES. Changes to traffic congestion and delay effects are set out in Table 9. Where changes to effects are reported, these changes are compared to the

effects reported in the SES1 and AP1 ES. Locations not listed in Table 9 remain unchanged to those reported in the SES1 and AP1 ES. The significance of the effect reported in the SES1 and AP1 ES is indicated in brackets.

Table 9: Junctions with changes resulting in new or different significant effects on delays and congestion to vehicle occupants, 2031

Junction Name	Significant Effect	AP2 Construction Scenario
A500 Newcastle Road/A500 Shavington Bypass/A531 Newcastle Road/B5472 Weston Road (Meremoor Moss roundabout)	Minor adverse (Previously major adverse)	Utilities scenario and scenario 2
A51 Nantwich Bypass/A534 Crewe Road/B5338 Crewe Road/Park Road	Moderate adverse (Previously minor adverse)	Scenarios 1 and 2
B5071/Crewe Road	Minor adverse (Previously no effect)	Utilities scenario
A500 Shavington Bypass/B5071 Jack Mills Way	Moderate adverse (Previously minor adverse)	Scenarios 1 and 2
A530 Middlewich Road/A51 Nantwich Bypass/B5334 Middlewich Road (Alvaston Roundabout)	Moderate adverse (Previously major adverse**)	Scenarios 1 and 2
A542 Weston Road/Weston Service Road south	Minor adverse (Previously no effect)	Scenarios 1 and 2
A534 Nantwich Road/A5078 Edleston Road/Edward Street	No effect (Previously minor adverse)	-
A534 Nantwich Road/A5019 Mill Street/B5071 South Street	Moderate adverse (Previously major adverse)	Scenario 1
Wistaston Green Road/Capesthorne Road	No effect (Previously minor adverse)	-
A530 Middlewich Road/Wistaston Green Road	Major adverse (Previously no effect)	Scenario 2
A534/A534 Crewe Green Road/A5020 University Way (Crewe Green roundabout)	Major adverse (Previously moderate adverse)	Scenarios 1 and 2
A532 West Street/Victoria Avenue	Moderate beneficial (Previously major adverse)	Scenario 1
A532 West Street/Minshull New Road	Minor adverse (Previously no effect)	Utilities scenario and scenario 2
A532 West Street/A5078 Dunwoody Way/Bessemer Way	Moderate adverse (Previously no effect)	Utilities scenario
Badger Avenue/Broad Street	No effect (Previously moderate adverse)	-
Badger Avenue/Underwood Lane	Moderate adverse (Previously minor adverse)	Utilities scenario and scenario 2
B5076 Bradfield Road/Parkers Road*	Major adverse (Previously moderate adverse)	Utilities scenario
B5076 Flowers Lane/B5076 Bradfield Road/Minshull New Road/Smithy Lane	Minor adverse (Previously moderate adverse**)	Scenario 1
A534/Crewe Road	Minor adverse (Previously moderate adverse)	Scenarios 1 and 2

Junction Name	Significant Effect	AP2 Construction Scenario
Warmingham Road/Groby Road*	Major adverse (Previously moderate beneficial)	Utilities scenario and scenario 2
B5079 Hind Heath Road/Crewe Road	Minor adverse (Previously no effect)	Utilities scenario
Warmingham Road/Hall Lane*	Major adverse (Previously no effect)	Utilities scenario
A533 The Hill/A534 Old Mill Road/High Street	Minor adverse (Previously no effect)	Utilities scenario
A533 Middlewich Road/A533 Old Mill Road/Crewe Road/Hightown	Minor adverse (Previously no effect)	Utilities scenario
A533 Middlewich Road/Platt Avenue	No effect (Previously moderate adverse)	-
A533 London Road/B5079 Station Road	Minor adverse (Previously major adverse)	Utilities scenario
A534 Congleton Road/A534 Old Mill Road/Congleton Road*	Major adverse (increased) (Previously major adverse)	Utilities scenario
M6 Junction 17/A534 Congleton Road	Minor adverse (Previously no effect)	Scenarios 1 and 2
Forge Mill Lane/Dragons Lane/Tetton Lane/White Hall Lane	No effect (Previously minor adverse)	-

** Temporary traffic management in utilities scenario and proposed layout from scenario 1 onwards*

*** As corrected in Section 2 of this report*

7.3.26 A change in traffic levels can result in changes to traffic-related severance for non-motorised road users, particularly pedestrians using or seeking to cross a road. Changes to traffic-related severance for non-motorised users are set out in Table 10 for all-traffic effects and Table 11 for HGV traffic effects. Where changes to effects are reported, these changes are compared to the effects reported in the SES1 and AP1 ES. Locations not listed in Table 10 and Table 11 remain unchanged to those reported in the SES1 and AP1 ES. The significance of the effect reported in the SES1 and AP1 ES is indicated in brackets.

Table 10: Roads with changes in daily all vehicle movements (more than 30%) resulting in new or different significant effects on traffic-related severance for non-motorised users, 2031

Road Name	Significant Effect	AP2 Construction Scenario
Annions Lane (between A51 London Road and B5071 Main Road)	No effect (Previously minor adverse)	-
Main Road east (between Newcastle Road and Main Road west)	No effect (Previously minor adverse)	-
Casey Lane realignment (between Newcastle Road and Weston Lane)	No effect (Previously minor adverse)	-
Cemetery Road (between Cemetery Road north and Main Road)	No effect (Previously minor adverse)	-

Road Name	Significant Effect	AP2 Construction Scenario
Cemetery Road (between Whites Lane and Mere Road)	No effect (Previously minor adverse)	-
Eastern Road (between Rope Hall Lane and Rope Lane)	Minor adverse (Previously no effect)	Scenario 1
Barthomley Road (between Radway Green Road and B5077 Butterton Lane)	No effect (Previously minor adverse)	-
Ernest Street (between Manor Way and Neville Street)	Minor adverse (Previously no effect)	Scenario 1
Chambers Street (between Catherine Street and A534 Nantwich Road)	Moderate adverse (Previously no effect)	Scenarios 1 and 2
Cotterill Street (between A534 Nantwich Road and Hope Street)	Moderate adverse (Previously no effect)	Utilities scenario and scenarios 1 and 2
Hope Street (between A5078 Edleston Road and Cotterill Street)	Moderate adverse (Previously no effect)	Scenarios 1 and 2
Hope Street (between Lord Street and A5019 Mill Street)	Minor adverse (Previously no effect)	Utilities scenario and scenarios 1 and 2
Forge Street/Prince Albert Street (between Chester Street and Lyon Street)	Minor adverse (Previously no effect)	Scenario 1
Elm Drive (between B5076 Middlewich Street and Coronation Street)	Moderate adverse (Previously no effect)	Scenarios 1 and 2
Elm Drive (between Coronation Street and Sycamore Avenue)	Moderate adverse (Previously no effect)	Scenarios 1 and 2
Elm Drive (between Sycamore Avenue and Lime Tree Avenue)	Moderate adverse (Previously no effect)	Scenarios 1 and 2
Lime Tree Avenue (between B5076 Middlewich Street and Sycamore Avenue)	No effect (Previously minor adverse)	-
Lime Tree Avenue (between Sycamore Avenue and Acer Avenue)	No effect (Previously minor adverse)	-
Lime Tree Avenue (between Prunus Road and Elm Drive)	No effect (Previously minor adverse)	-
Maw Green Road (between Sydney Road and Maw Lane)	Moderate adverse (Previously no effect)	Scenario 2
Lime Tree Avenue (between Acer Avenue and Prunus Road)	No effect (Previously minor adverse)	-
Clay Lane (between Newtons Lane and Maw Lane)	Moderate adverse (Previously no effect)	Scenarios 1 and 2
Newtons Lane (between Clay Lane and Nesfield Drive)	Moderate adverse (Previously no effect)	Scenarios 1 and 2
Groby Road (between Remer Street and Stoneley Road)	Moderate beneficial (Previously no effect)	Utilities scenario
Stoneley Road (between Waldron's Lane and Groby Road)	Major adverse (Previously moderate adverse)	Scenario 1
Waldrons Lane (between Stoneley Road and Warmingham Road)	Major adverse (increased) (Previously major adverse)	Scenario 1

Road Name	Significant Effect	AP2 Construction Scenario
Groby Road (between Stoneley Road and Warmingham Road)	Moderate beneficial (Previously no effect)	Utilities scenario and scenario 1
Warmingham Road (between Waldron's Lane and Groby Road)	Moderate beneficial (Previously no effect)	Utilities scenario
A533 The Hill (between Hassall Road and Heath Road)	Major adverse (Previously no effect)	Utilities scenario
Manor Road (between Dubthorn Lane and School Lane)	Moderate adverse (Previously no effect)	Utilities scenario
Heath Road (between A533 The Hill and Manor Road)	Major adverse (Previously no effect)	Utilities scenario
Heath Road (between Manor Road and School Lane)	Major adverse (Previously no effect)	Utilities scenario
A533 The Hill (between A534 Old Mill Road and Hassall Road)	Moderate adverse (Previously no effect)	Utilities scenario
School Lane (between Manor Road and Heath Road)	Moderate adverse (Previously no effect)	Utilities scenario
High Street (between Hightown and A534 Old Mill Road)	Moderate adverse (Previously no effect)	Utilities scenario
Bradwall Road (between Hightown and Chapel Street)	Moderate adverse (Previously no effect)	Utilities scenario
Chapel Street (between A533 Middlewich Road and Bradwall Road)	Minor adverse (Previously no effect)	Utilities scenario
Church Lane (between Heath Road and Reynolds Lane)	Major adverse (Previously no effect)	Utilities scenario
Bradwall Road (between Chapel Street and Elworth Street)	Moderate adverse (Previously no effect)	Utilities scenario
Moss Lane (between B5079 Salt Line Way and Plant Lane)	Minor adverse (Previously no effect)	Utilities scenario

Table 11: Roads with changes in daily HGV movements (more than 30%) resulting in new or different significant effects on traffic-related severance for non-motorised users, 2031

Road Name	Significant Effect	AP2 Construction Scenario
Back Lane (between Casey Lane and Newcastle Road)	Moderate adverse (Previously major adverse)	Scenarios 1 and 2
Casey Lane realignment (between Newcastle Road and Weston Lane)	No effect (Previously moderate adverse)	-
A500 Newcastle Road (between A500 Shavington Bypass and M6 junction 16)	No effect (Previously moderate adverse)	-
A51 Nantwich Bypass (between A534 Crewe Road and A530 Middlewich Road)	Major adverse (Previously moderate adverse)	Scenarios 1 and 2
Weston Road Service Road (between Weston Road south access and Weston Road north access)	Major adverse (Previously no effect)	Utilities scenario
Union Street (between A5078 Edleston Road and Lord Street)	No effect (Previously moderate adverse)	-

Road Name	Significant Effect	AP2 Construction Scenario
Union Street (between Lord Street and A5019 Mill Street)	No effect (Previously moderate adverse)	-
Sydney Road (between Herbert Street and Maw Green Road)	Moderate adverse (Previously major adverse)	Scenarios 1 and 2
B5076 Middlewich Street (between Stamp Avenue and Lime Tree Avenue)	No effect (Previously moderate adverse)	-
B5076 Middlewich Street (between Lime Tree Avenue and Remer Street)	No effect (Previously moderate adverse)	-
A533 The Hill (between Hassall Road and Heath Road)	Major adverse (Previously no effect)	Utilities scenario
Heath Road (between A533 The Hill and Manor Road)	Major adverse (Previously no effect)	Utilities scenario
Heath Road (between Manor Road and School Lane)	Major adverse (Previously no effect)	Utilities scenario
A533 The Hill (between A534 Old Mill Road and Hassall Road)	Major adverse (Previously no effect)	Utilities scenario
Church Lane (between Heath Road and Reynolds Lane)	Major adverse (Previously no effect)	Utilities scenario

Other mitigation measures

7.3.27 No further appropriate traffic and transport mitigation measures are proposed. HS2 Ltd will, however, continue to work with the relevant highway authorities to consider whether any further mitigation measures would be required.

Summary of likely residual significant effects

7.3.28 The temporary residual significant effects during construction remain as described above. These effects will be temporary and reversible in nature lasting only for the duration of the construction works.

7.3.29 The AP2 revised scheme will result in the following changes to the congestion and delay effects for vehicle occupants to the effects reported in the SES1 and AP1 ES:

- significant adverse effects removed at five junctions (two moderate, three minor);
- change (decrease) from major adverse effect to moderate adverse effect at two junctions;
- change (increase) from moderate adverse effect to major adverse effect at two junctions;
- change (increase) from minor adverse effect to moderate adverse effect at three junctions;
- change (decrease) from major adverse effect to minor adverse effect at two junctions;
- change (decrease) from moderate adverse effect to minor adverse effect at two junctions;

- change (decrease) from major adverse effect to moderate beneficial effect at one junction;
- change (increase) from moderate beneficial effect to major adverse effect at one junction
- new major adverse effect at two junctions;
- new moderate adverse effect at one junction;
- new minor adverse effect at seven junctions; and
- different (increased) major adverse significant effect at one junction.

7.3.30 The AP2 revised scheme will result in the following changes to the traffic-related severance effects for non-motorised users to the effects reported in the SES1 and AP1 ES:

- significant adverse effects removed on 15 roads (six moderate and nine minor);
- change (decrease) from major adverse effect to moderate adverse effect on two roads;
- change (increase) from moderate adverse effect to major adverse effect on two roads;
- new major adverse effect on five roads;
- new moderate adverse effect on 14 roads;
- new minor adverse effect on six roads; and
- different (increased) major adverse significant effect on one road.

Cumulative effects

7.3.31 This combined assessment has taken into account cumulative effects from background traffic growth, committed developments and traffic and transport impacts of the construction works arising from the SES2 changes and AP2 amendments in this area and other community areas.

7.4 Air quality

Scope, assumptions and limitations

7.4.1 The assessment scope, key assumptions and limitations for air quality are as set out in Volume 1 and the SMR of the main ES and Volume 1 of the SES2 and AP2 ES. Since the SES1 and AP1 ES, there have been changes to the methodology, including the consideration of ammonia (NH_3) at sensitive ecological sites. The scope and methodology for the updated air quality assessment is set out in SES2 and AP2 ES Volume 5, Appendix: CT-001-00005.

Environmental baseline

Existing baseline

7.4.2 The baseline air quality information is as described in Section 4 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the AP2 revised scheme is provided below. An

update of the model verification has been undertaken and is presented within Volume 5, Appendix: AQ-001-0MA01.

Future baseline

7.4.3 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000) and the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

7.4.4 This information has been supplemented by the committed developments listed in the equivalent Volume 5 planning report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline receptors where relevant.

Effects arising during construction

Avoidance and mitigation measures

7.4.5 No further avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

7.4.6 Construction activity could affect local air quality through the additional traffic generated on the highway network and site haul routes as a result of construction vehicles and through changes to traffic patterns arising from temporary road diversions and realignments.

7.4.7 The assessment of construction traffic emissions has been undertaken for a 'without the AP2 revised scheme' scenario and a 'with the AP2 revised scheme' scenario. The traffic data for each scenario includes the additional traffic from future committed developments.

7.4.8 Construction traffic data in the study area have been screened to identify roads that required further assessment and to confirm the likely effect of the change in emissions from vehicles using those roads during construction of the AP2 revised scheme. There were two construction traffic scenarios assessed for air quality in the Hough to Walley's Green (MA01).

7.4.9 There is the potential for new significant effects from the construction of the AP2 revised scheme compared to the SES1 and AP1 ES for Oakhanger Moss SSSI/Midland Meres and Mosses Phase 2 Ramsar site due to NOx concentrations, ammonia concentrations, nitrogen deposition and acid deposition. This is discussed further in Section 7.5 Ecology and biodiversity.

Other mitigation measures

7.4.10 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

7.4.11 The methods outlined within the draft CoCP are considered effective at reducing traffic emissions, and therefore, no significant residual effects are anticipated.

Cumulative effects

7.4.12 This combined assessment has taken into account cumulative effects from background traffic growth, committed developments and impacts related to traffic emissions arising from the SES2 changes and AP2 amendments in this area and other community areas.

7.5 Ecology and biodiversity

Scope, assumptions and limitations

7.5.1 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1 and the SMR of the main ES.

7.5.2 The changes of relevance to this assessment have the potential to result in new or different significant permanent construction and operational effects.

7.5.3 The assessment of combined traffic effects on designated sites in this section draws its conclusions from the designated site assessment for the Midland Meres and Mosses Phase 2 Ramsar site (Oakhanger Moss) and the designated site assessment for the Midland Meres and Mosses Phase 1 Ramsar site and the West Midland Mosses Special Area of Conservation (Wybunbury Moss) (see SES2 and AP2 ES Volume 5, Appendices: EC-016-00006 and EC-016-00009).

7.5.4 The assessment in this section identifies effects on designated sites that would be significant at the national or international level, and on any protected and/or notable species that are not covered by the national and international designations. These effects are compared to those reported in the SES1 and AP1 ES to identify any new, different or removed significant effects.

7.5.5 As described in Section 7.4 (Air quality) there have been changes to the methodology for air quality assessment that reflect Natural England's consultation response to the main ES. The assessment of the original scheme considered nitrogen deposition only; oxides of nitrogen (NOx) and acidification were also assessed for the SES1 and AP1 ES. The assessment of the AP2 revised scheme also considers the impacts of ammonia (NH3). Additionally, the AP2 revised scheme includes updated information on traffic flows that has also prompted a new assessment of the associated changes in air quality. Changes in air quality is the only new or different impact of the AP2 revised scheme that requires consideration for the sites described below.

Environmental baseline

Existing baseline

7.5.6 The baseline ecology and biodiversity information is as described in Section 7 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the SES1 and AP1 ES. A summary of the baseline information relevant to this assessment is provided below.

Designated sites

7.5.7 There are three statutory sites of international importance of relevance to the assessment of the AP2 revised scheme, all three sites were considered in the main ES and SES1 and AP1 ES:

- Midland Meres and Mosses Phase 1 Ramsar site, comprising 16 wetland SSSI distributed across the Cheshire/Shropshire Plain, of which Wybunbury Moss SSSI is of relevance to the Hough to Walley's Green area (MA01). The Mere, Mere SSSI in the Pickmere to Agden and Hulseheath area (MA03) and Tatton Meres SSSI in the Hulseheath to Manchester Airport area (MA06) are also of relevance;
- Midland Meres and Mosses Phase 2 Ramsar site, comprising 18 wetland SSSI distributed across the Cheshire/Shropshire Plain, of which the closest component unit of relevance to the assessment is Oakhanger Moss SSSI. One further component of this Ramsar site, Oak Mere SSSI, located in the Wimboldsley to Lostock Gralam area (MA02), is also relevant; and
- West Midlands Mosses Special Area of Conservation (SAC), comprising four constituent wetland SSSI, of which the closest is Wybunbury Moss SSSI which is also a constituent of the Midland Meres and Mosses Phase 1 Ramsar site.

7.5.8 There are three statutory sites of national importance of relevance to the assessment of the AP2 revised scheme, as follows:

- Wybunbury Moss SSSI, part of the Midland Meres and Mosses Phase 1 Ramsar site and West Midlands Mosses SAC, is designated as one of the finest examples in the country of a schwingmoor and supports an outstanding assemblage of invertebrates. It is located 1.8km south-west of the land required for the construction of the AP2 revised scheme and at its closest point, is approximately 150m east of the B5071 Stock Lane and Main Road on which traffic will be redistributed as a result of the AP2 revised scheme; and
- Oakhanger Moss SSSI, part of Midland Meres and Mosses Phase 2 Ramsar site, is designated for the range of mire vegetation communities present, from open water to raised bog. It is located 4.4km east of the land required for the construction of the AP2 revised scheme, and 120m west of the M6, which will be used by construction vehicles for the AP2 revised scheme.

Future baseline

7.5.9 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000) and the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

7.5.10 This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

7.5.11 None of the identified developments affect the assessment of the AP2 revised scheme's likely impacts for ecology and biodiversity.

Effects arising during construction

Avoidance and mitigation measures

7.5.12 No further avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, have been identified at this stage.

Assessment of impacts and effects

Designated sites

Midlands Meres and Mosses Phase 1 Ramsar site

7.5.13 The SES1 and AP1 ES reported that, with mitigation provided as part of the original scheme to address impacts on the hydrological regime at The Mere, Mere SSSI, there would be no adverse effects on the Midland Meres and Mosses Phase 1 Ramsar site. While there were no adverse effects from air pollution, an updated assessment of changes in air quality at the constituent SSSI of the Midland Meres and Mosses Phase 1 Ramsar site of relevance to the AP2 revised scheme has been undertaken. These sites are Wybunbury Moss SSSI (located in the Hough to Walley's Green area (MA01)), The Mere, Mere SSSI (located in the Pickmere to Agden and Hulseheath area (MA03)) and Tatton Meres SSSI (located in the Hulseheath to Manchester Airport area (MA06)). The main ES reported that there would be no adverse effects from air pollution at Tatton Meres SSSI. This remains the same for the AP2 revised scheme, despite the changes in the basis for the assessment of air quality, as changes in traffic movements are below the threshold at which assessment is required. The main ES reported that there would be no adverse effects at Wybunbury Moss SSSI. This remains the same for the AP2 revised scheme as the changes in traffic movements are below the threshold at which assessment is required. For The Mere, Mere SSSI, an assessment of effects demonstrates that the changes in air quality brought about by the AP2 revised scheme will result in exceedance of the relevant thresholds for NH3 and acid deposition.

Therefore, on a precautionary basis, there will be an adverse effect on the Midland Meres and Mosses Phase 1 Ramsar site that is significant at the international level. This represents a new significant effect to that reported in the SES1 and AP1 ES. Information on the findings of the assessment of effects for the SSSI noted above is provided in Section 3 of the designated site assessment reports for Wybunbury Moss SSSI (SES2 and AP2 ES Volume 5, Appendix: EC-016-00009), The Mere, Mere SSSI (SES2 and AP2 ES Volume 5, Appendix: EC-016-00003), and Tatton Meres SSSI (SES2 and AP2 ES Volume 5, Appendix: EC-016-00007).

West Midlands Mosses SAC

7.5.14 The SES1 and AP1 ES reported that there would be no adverse impacts on the West Midlands Mosses SAC. The only site relevant to the updated assessment reflecting changes in air quality for the AP2 revised scheme is Wybunbury Moss SSSI. As stated above in relation to the Midland Meres and Mosses Phase 1 Ramsar site, there will be no adverse effects at Wybunbury Moss SSSI, as the changes in traffic movements are below the threshold at which assessment is required. As such, there will be no adverse effects on the SAC, and there are no changes to the assessment of effects reported in the SES1 and AP1 ES.

Midlands Meres and Mosses Phase 2 Ramsar site

7.5.15 The SES1 and AP1 ES reported that there would be no adverse impacts on Midland Meres and Mosses Phase 2 Ramsar site. While there were no adverse effects from air pollution, an updated assessment of changes in air quality at the constituent SSSI of the Midland Meres and Mosses Phase 2 Ramsar site of relevance to the AP2 revised scheme has been undertaken. These sites are Oakhanger Moss SSSI (located in the Hough to Walley's Green area (MA01)) and Oak Mere SSSI (located in the Wimboldsley to Lostock Gralam area (MA02)). The assessment of effects demonstrates that there will be no adverse effects at Oak Mere SSSI, as the increase in construction traffic associated with the AP2 revised scheme will not exceed the thresholds required for air quality assessment. For Oakhanger Moss SSSI, an assessment of effects demonstrates that the changes in air quality brought about by the AP2 revised scheme will result in exceedance of the relevant thresholds for NH3 concentrations and nitrogen deposition. Therefore, on a precautionary basis, there will be an adverse effect on the Ramsar site that is significant at the international level. This represents a new significant effect to that reported in the SES1 and AP1 ES. Information on the findings of the assessment of effects for the SSSI noted above is provided in Section 3 of the designated site assessment reports for Oakhanger Moss SSSI (SES2 and AP2 ES Volume 5, Appendix: EC-016-00006) and Oak Mere SSSI (SES2 and AP2 ES Volume 5, Appendix: EC-016-00001).

Wybunbury Moss SSSI

7.5.16 Wybunbury Moss SSSI, a component part of the Midland Meres and Mosses Phase 1 Ramsar site and West Midlands Mosses SAC, is designated for wetland habitats that also form the reason for designation of the SAC and Ramsar site. As stated above in relation to the Midland Meres and Mosses Phase 1 Ramsar site and West Midland Mosses SAC, there will be no adverse effects at Wybunbury Moss SSSI, as the changes in traffic movements are below

the threshold at which assessment is required. As such, there will be no change to the assessment of effects provided in the SES1 and AP1 ES.

Oakhanger Moss SSSI

7.5.17 Oakhanger Moss SSSI, a component part of Midland Meres and Mosses Phase 2 Ramsar site, is designated for wetland habitats that also form the reason for designation of the Ramsar site. Consequently, the exceedance of thresholds for NH3 and nitrogen deposition will, on precautionary basis, have an adverse effect on qualifying features of the SSSI. Therefore, on a precautionary basis, there will be an adverse effect on Oakhanger Moss SSSI that is significant at the national level. This represents a new significant effect to that reported in the SES1 and AP1 ES.

Other mitigation measures

7.5.18 No mitigation measures, additional to those reported in the main ES and draft CoCP, have been identified at this stage.

7.5.19 HS2 Ltd is continuing to seek to identify suitable measures to mitigate or compensate for potential significant effects identified on designated sites. In doing so HS2 Ltd will continue to engage with stakeholders to fully understand the receptors and the suitability of the measures.

Summary of likely residual significant effects

7.5.20 In the absence of mitigation, at this stage, the significant adverse effects from the construction of the AP2 revised scheme reported above at The Mere, Mere SSSI component of the Midland Meres and Mosses Phase 1 Ramsar Site and the Oakhanger Moss SSSI component of the Midland Meres and Mosses Phase 2 Ramsar Site will remain.

Cumulative effects

7.5.21 No new, removed or different significant cumulative effects with committed developments have been identified.

Effects arising during operation

Avoidance and mitigation measures

7.5.22 No further avoidance or mitigation measures, additional to those reported in the main ES, are proposed.

Assessment of impacts and effects

Designated sites

Midlands Meres and Mosses Phase 1 Ramsar site

7.5.23 The SES1 and AP1 ES did not report adverse effects from changes in air quality arising from operation of the AP1 revised scheme for the Midland Meres and Mosses Phase 1 Ramsar site. Change in traffic flows during operation of the AP2 revised scheme will not exceed the thresholds for assessment of changes in air quality at Tatton Mere SSSI and Wybunbury Moss SSSI, therefore, no air quality assessment is required. The assessment of effects of changes in air quality for the AP2 revised scheme at the Mere, Mere SSSI demonstrates that the thresholds for NOx, NH3, and nitrogen and acid deposition will not be exceeded. As such, there will be no adverse effects upon the Ramsar site, and there are no changes to the assessment of operational effects reported in the SES1 and AP1 ES.

West Midlands Mosses SAC

7.5.24 The SES1 and AP1 ES did not report adverse effects from changes in air quality arising from operation of the AP1 revised scheme for the West Midland Mosses SAC, of which Wybunbury Moss is the only SSSI relevant to the AP2 revised scheme. Changes in traffic flows on roads affected by AP2 revised scheme in the vicinity Wybunbury Moss SSSI, do not meet the threshold for air quality assessment. As such, there will be no adverse effects on the West Midlands Mosses SAC, and there are no changes to the assessment of operational effects reported in the SES1 and AP1 ES.

Midlands Meres and Mosses Phase 2 Ramsar site

7.5.25 The SES1 and AP1 ES did not report adverse effects from changes in air quality arising from operation of the AP1 revised scheme for the Midland Meres and Mosses Phase 2 Ramsar site. The changes in traffic flows on roads affected by the AP2 revised scheme in the vicinity of the relevant constituent sites (Oak Mere SSSI and Oakhanger Moss SSSI) do not meet the threshold for air quality assessment. As such, there will be no adverse effects on the Ramsar site, and there are no changes to the assessment of operational effects reported in the SES1 and AP1 ES.

Other mitigation measures

7.5.26 No mitigation measures, additional to those reported in the main ES, are proposed.

Summary of likely residual significant effects

7.5.27 At this stage, no residual significant effects arising from operation of the AP2 revised scheme are anticipated.

Cumulative effects

7.5.28 No new, removed or different significant cumulative effects have been identified.

Ongoing work

7.5.29 Section 4 of the relevant designated site assessment reports (SES2 and AP2 ES Volume 5 Appendices) for the sites reported in this section includes the emerging results of an assessment of air quality impacts during construction and operation of the AP2 revised scheme in-combination with other schemes. Further assessment of these potential effects will continue in accordance with the requirements of Regulation 63 of the Conservation of Habitats and Species Regulations 2017. At this stage, it is identified that there are potentially significant effects at the following sites.

Midland Meres and Mosses Phase 1 Ramsar site

7.5.30 The Midland Meres and Mosses Phase 1 Ramsar site, when considering the construction of the AP2 revised scheme in-combination with other schemes, results in exceedance of the relevant thresholds for NH3, nitrogen deposition and acid deposition at The Mere, Mere SSSI and Wybunbury Moss SSSI. In-combination assessment also demonstrates that there is a greater than 1% exceedance for the critical level for NH3 at The Mere, Mere SSSI during the operational phase of the AP2 revised scheme. Therefore, at this stage and on a precautionary basis, an adverse effect on the Ramsar site that is significant at the international level has been identified. There are no exceedances of thresholds for any pollutants at Tatton Meres SSSI and traffic volumes at Wybunbury Moss SSSI during the operational phase remain below the threshold required for further consideration.

7.5.31 Information on the findings of the in-combination assessment for each SSSI noted above is provided in Section 4 of the relevant designated site assessment report The Mere, Mere SSSI (SES2 and AP2 ES Volume 5, Appendix: EC-016-00003), Tatton Meres SSSI (SES2 and AP2 ES Volume 5, Appendix: EC-016-00007), and Wybunbury Moss SSSI (SES2 and AP2 ES Volume 5, Appendix: EC-016-00009).

West Midlands Mosses SAC

7.5.32 Section 4 of SES2 and AP2 ES Volume 5, Appendix: EC-016-00009 includes the emerging results of an assessment of air quality impacts during construction and operation of the AP2 revised scheme in-combination with other schemes at Wybunbury Moss SSSI, the only relevant component of the West Midlands Mosses SAC.

7.5.33 At this stage, when considering the construction of the AP2 revised scheme in-combination with other schemes, there is exceedance of relevant thresholds for NH3, nitrogen deposition and acid deposition at Wybunbury Moss SSSI. During operation, changes in traffic flows on roads affected by AP2 revised scheme in the vicinity of Wybunbury Moss SSSI, do not meet the threshold for air quality assessment.

Midlands Meres and Mosses Phase 2 Ramsar site and Oak Mere SAC

7.5.34 At this stage, it is identified that there are potentially significant effects at the Oakhanger Moss SSSI component of the Midland Meres and Mosses Phase 2 Ramsar site during construction when considering the AP2 revised scheme in combination with other schemes. In-combination assessment demonstrates that the thresholds for NOx, NH3, nitrogen deposition and acid deposition are all predicted to be exceeded at this SSSI. Therefore, at this stage and on a precautionary basis, an adverse effect on the Ramsar site that is significant at the international level has been identified. The thresholds for these pollutants are also exceeded at Oak Mere SSSI (SES2 and AP2 ES Volume 5, Appendix: EC-016-00001), which is a further component of the Midland Meres and Mosses Phase 2 Ramsar site and forms Oak Mere SAC but affected parts of the site are considered to be site fabric only and therefore will not result in an adverse effect.

7.5.35 The changes in traffic flows on roads affected by AP2 revised scheme during operation, in combination with other schemes, in the vicinity of the relevant constituent sites (Oak Mere SSSI and Oakhanger Moss SSSI) of the Midland Meres and Mosses Phase 2 Ramsar site and Oak Mere SAC do not meet the threshold for air quality assessment. Therefore, this assessment identifies that there are no potentially significant effects when considering the AP2 revised scheme in combination with other schemes at the Ramsar site and SAC, and no requirement for further assessment of effects at Oak Mere SAC in accordance with the requirements of Regulation 63 of the Conservation of Habitats and Species Regulations 2017.

7.6 Socio-economics

Scope, assumptions and limitations

7.6.1 The assessment scope, key assumptions and limitations for socio-economics are as set out in Volume 1 and the SMR of the main ES.

Environmental baseline

Existing baseline

7.6.2 The baseline socio-economics information is as described in the SES2 and AP2 ES Volume 5, Appendix: SE-001-00000, Updated socio-economic baseline information.

Future baseline

7.6.3 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000) and the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2025.

7.6.4 This information has been supplemented by the committed developments listed in the equivalent Volume 5 planning report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

7.6.5 None of the identified developments affect the assessment of the AP2 revised scheme's likely impacts on socio-economics.

Effects arising during construction

Avoidance and mitigation measures

7.6.6 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

7.6.7 Construction works will impact pedestrian and vehicular traffic along the A530 Middlewich Road which provides access to two receptors: Rising Sun Nurseries (a garden centre) and the Rising Sun Inn (a public house). The A530 Middlewich Road is an important through road from Crewe to Middlewich, with substantial passing trade and the two receptors are expected to be used by both vehicle occupants using the road and by pedestrians arriving from Wistaston Green.

7.6.8 Due to the significant congestion and severance effects and the sensitivity of the Rising Sun Nurseries and Rising Sun Inn to changes in accessibility, the changes in traffic flows is assessed to have a new temporary moderate adverse significant isolation effect on these two receptors. The locations of significantly affected resources are shown in the SES2 and AP2 ES Volume 5, Socio-economics Map Book: Map Series SE-01.

Other mitigation measures

7.6.9 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

7.6.10 The changes in traffic flows will result in new temporary adverse significant isolation effects on Rising Sun Nurseries and Rising Sun Inn.

Cumulative effects

7.6.11 No new, removed or different significant cumulative effects have been identified.

7.7 Sound, noise and vibration

Scope, assumptions and limitations

7.7.1 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES.

Environmental baseline

Existing baseline

7.7.2 In the Hough to Walley's Green area, the updated sound modelling described in Section 2 has resulted in updates to the existing baseline sound levels at receptors adjacent to roads. Further information on the updated baseline sound levels relevant to the assessment is provided in the SES2 and AP2 ES Volume 5, Appendix: SV-002-00000. Where no updates to baseline sound levels are required, the baseline sound, noise and vibration information is as described in Section 13 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES and Section 3.8 of SES1 and AP1 ES Volume 2, Community Area report: Hough to Walley's Green (MA01).

Future baseline

7.7.3 The Planning data reports of the main ES (see Volume 5, Appendix: CT-004-00000) and the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000) provide details of committed developments assumed to have been implemented by 2038.

7.7.4 This information has been supplemented by the committed developments listed in the equivalent Volume 5 planning report of the SES2 and AP2 ES (see SES2 and AP2 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

7.7.5 None of the identified developments affect the assessment of the AP2 revised scheme's likely impacts on sound, noise and vibration.

7.7.6 Updates have been made to future baseline sound levels at the locations identified in the existing baseline section above where updates to the existing baseline sound levels have been made for the SES2 and AP2 ES.

Effects arising during construction

Avoidance and mitigation measures

7.7.7 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

Residential receptors: indirect effects

7.7.8 As a result of the AP2 revised scheme, construction traffic is likely to cause adverse noise effects on residential receptors along Chambers Street between the A534 Nantwich Road and Catherine Street. Approximately 50 dwellings located along the road are forecast to experience a change in road traffic noise levels of around 5dB $L_{pAeq,0700-2300}$ during the peak months, due to local traffic diverting away from other roads where signal optimisation has been implemented. This is considered to be a new likely significant indirect effect on a community basis at the dwellings on this road denoted as MA01-C-C18 in SES2 and AP2 ES Volume 5, Appendix: SV-002-00000. This temporary adverse effect from construction traffic noise represents a change in the acoustic character of the area, which may be perceived as a change in the quality of life for that community.

7.7.9 The SES1 and AP1 ES identified an indirect likely construction significant effect on a community basis at approximately 25 dwellings located along Waldron's Lane between Warmingham Road and Stoneley Road, and Stoneley Road between Groby Road and Waldron's Lane. This was denoted as MA01-C-C12 in Table 8 in the SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. As a result of the AP2 revised scheme both the average and peak monthly construction road traffic movements on these roads have increased, and thus the associated construction traffic noise levels have also increased. Dwellings located along the road are forecast to experience a change in road traffic noise levels of around 7dB $L_{pAeq,0700-2300}$ during the peak months, due to workforce traffic avoiding mitigation measures (temporary traffic lights) on nearby roads. This will result in a change in the likely significant effect from minor adverse to moderate adverse. This is considered to be a different likely significant indirect effect on a community basis at the dwellings on this road denoted as MA01-C-C12 in SES2 and AP2 ES Volume 5, Appendix: SV-002-00000. This temporary adverse effect from construction traffic noise represents a change in the acoustic character of the area, which may be perceived as a change in the quality of life for that community.

Other mitigation measures

7.7.10 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

7.7.11 As a result of the AP2 revised scheme, construction traffic in this area will give rise to a new likely temporary residual adverse significant noise effect on dwellings adjacent to Chambers Street between the A534 Nantwich Road and Catherine Street.

7.7.12 As a result of the AP2 revised scheme, construction traffic in this area will give rise to a different likely temporary residual adverse significant noise effect on dwellings adjacent to

Waldron's Lane between Warmingham Road and Stoneley Road, and Stoneley Road between Groby Road and Waldron's Lane.

Cumulative effects

7.7.13 This combined assessment has taken into account cumulative effects as described in Section 7.2 arising from the SES2 changes and AP2 amendments in this area and other community areas.

7.8 Summary of new or different likely residual significant effects as a result of combined effects due to changes in traffic flows

Traffic and transport

7.8.1 The construction of the AP2 revised scheme will result in the following changes to the congestion and delay effects for vehicle occupants to the effects reported in the SES1 and AP1 ES:

- change (decrease) from major adverse effect to moderate adverse effect at two junctions;
- change (increase) from moderate adverse effect to major adverse effect at two junctions;
- change (increase) from minor adverse effect to moderate adverse effect at three junctions;
- change (decrease) from major adverse effect to minor adverse effect at two junctions;
- change (decrease) from moderate adverse effect to minor adverse effect at two junctions;
- change (decrease) from major adverse effect to moderate beneficial effect at one junction;
- change (increase) from moderate beneficial effect to major adverse effect at one junction;
- new major adverse effect at two junctions;
- new moderate adverse effect at one junction;
- new minor adverse effect at seven junctions; and
- different (increased) major adverse significant effect at one junction.

7.8.2 The construction of the AP2 revised scheme will result in the following changes to the traffic-related severance effects for non-motorised users to the effects reported in the SES1 and AP1 ES:

- change (decrease) from major adverse effect to moderate adverse effect on two roads;
- change (increase) from moderate adverse effect to major adverse effect on two roads;

- new major adverse effect on five roads;
- new moderate adverse effect on 14 roads;
- new minor adverse effect on six roads; and
- different (increased) major adverse significant effect on one road.

Ecology and biodiversity

7.8.3 At this stage, without any mitigation taken into account, the construction of the AP2 revised scheme will result in significant adverse effects on:

- The Mere, Mere SSSI component of the Midland Meres and Mosses Phase 1 Ramsar Site. On a precautionary basis this will result in an adverse effect on the Midland Meres and Mosses Phase 1 Ramsar site that is significant at the international level. This is a new significant effect compared to that reported in the SES1 and AP1 ES; and
- Oakhanger Moss SSSI component of the Midland Meres and Mosses Phase 2 Ramsar Site. On a precautionary basis, this will result in an adverse effect on the Midland Meres and Mosses Phase 2 Ramsar site that is significant at the international level. It will also result in an adverse effect on the SSSI that is significant at the national level. These are new significant effects compared to those reported in the SES1 and AP1 ES.

7.8.4 HS2 Ltd is continuing to seek to identify suitable measures to mitigate or compensate for potential significant effects identified on designated sites. In doing so HS2 Ltd will continue to engage with stakeholders to fully understand the receptors and the suitability of the measures.

Socio-economics

7.8.5 The changes in construction traffic flows will result in new temporary adverse significant isolation effects on Rising Sun Nurseries and Rising Sun Inn.

Sound, noise and vibration

7.8.6 As a result of the AP2 revised scheme, construction traffic in this will give rise to a new likely temporary residual adverse significant noise effect on dwellings adjacent to Chambers Street between the A534 Nantwich Road and Catherine Street.

7.8.7 As a result of the AP2 revised scheme, construction traffic in this will give rise to a different likely temporary residual adverse significant noise effect on dwellings adjacent to Waldron's Lane between Warmingham Road and Stoneley Road, and Stoneley Road between Groby Road and Waldron's Lane.

7.9 Summary of likely residual significant effects that will be removed

Traffic and transport

7.9.1 The construction of the AP2 revised scheme will result in the removal of significant adverse effects at five junctions (two moderate, three minor) following changes to the congestion and delay effects for vehicle occupants reported in the SES1 and AP1 ES.

7.9.2 The construction of the AP2 revised scheme will result in the removal of significant adverse effects on 15 roads (six moderate and nine minor) following changes to the traffic-related severance effects for non-motorised users reported in the SES1 and AP1 ES.

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