

HS2

Woore Village Permanent Bypass

Security classification: OFFICIAL

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1 Executive Summary

- 1.1.1 This report summarises the findings of a study to investigate the design of a permanent bypass to Woore village. The study is in response to a request from Owen Patterson MP that arose at a stakeholder meeting between Woore Parish Council (WPC), Owen Patterson MP and HS2 that took place on 18th January 2019.
- 1.1.2 It is noted that there is no reference in any planning document in relation to any bypass of Woore village or a need thereof.¹ Furthermore, this scheme is not actively being promoted or supported by the local highway authority, Shropshire County Council.
- 1.1.3 The proposed alignment examined for the permanent bypass is similar to the proposed alignment of the 'Short Route - Option 1' temporary alternative construction route investigated previously as part of a separate study at this location². The proposed bypass would commence to the south of Woore village with a roundabout junction on the A51 London Road located just south of the existing A51 London Road 30mph speed threshold. The bypass would be connected to the A525 Newcastle Road, to the east of Woore village, with a roundabout junction located at approximately the same location as the existing A525 Newcastle Road 30mph speed threshold.
- 1.1.4 The bypass wouldn't deliver the intended benefits of diverting HS2 construction traffic away from Woore village. The earliest estimate for opening of the bypass is Q3 2025. As a result, the vast majority of HS2 construction traffic would still pass through Woore village as well as on roads south of Woore, including throughout the busy period in Q4 2024 and Q1 2025. In addition, construction of the two roundabouts on the A51 London Road and A525 Newcastle Road would likely lead to a temporary increase in traffic congestion and delays at these locations. The bypass, once opened to public traffic, would result in only minor journey time improvements and a relatively small reduction in existing traffic travelling through Woore village. Any bypass, once operational, would provide no benefit south of Woore. The assumed programme for the permanent bypass represents a best-case scenario. The programme is subject to numerous risks, in particular in relation to the planning application process, and extensions would likely be required. This could lead to an increased duration of the temporary impacts of construction activities on Woore village.
- 1.1.5 A high-level assessment shows that the Benefit to Cost Ratio (BCR) falls for a bypass into the poor value for money category implied by a BCR between 0-1.

¹ Including the 'Woore Neighbourhood Plan 2016-2036' report, Regulation 15 Submission Version (May 2018), Covering the Parish of Woore which includes Woore, Pipe Gate, Gravenhunger, Dorrington, Ireland's Cross, Bearstone and part of Onneley"

² Woore Parish Council Proposal - Alternative Construction Routes Appraisal (CA4) [Document No. C861-ARP-PT-REP-000-100222, Revision P03]

2 Introduction

2.1 Background

2.1.1 This report is a supplement to the following report:

- Woore Parish Council Proposal – Alternative Construction Routes Appraisal (CA4) [Document No. C861-ARP-PT-REP-000-100222, Revision P03]

2.1.2 Refer to the report listed above for full background information on this study.

2.2 Study scope

2.2.1 A meeting between Woore Parish Council (WPC), Owen Patterson MP and HS2 took place on 18th January 2019 to discuss the findings of the report listed above. This report examines a number of actions that arose from this meeting as follows:

Permanent bypass

- Design a permanent bypass proposal, along a similar alignment to the alternative haul route options;
- Provide an outline development, design and construction programme to include: feasibility design stage, Environmental Impact Assessment, Planning approval / public enquiry, surveys, detailed design, construction and commissioning. The programme should indicate how the permanent bypass would relate to HS2 construction programme;
- Provide a high-level set of benefits and dis-benefits of the provision of the permanent bypass for engineering and environmental based on professional judgement;
- Produce an outline cost estimate for the permanent bypass.

Drawings

- Produce a local draft CT-05 and CT-06 plan centred on Woore village and the AP2 revised scheme. (Refer to Appendix A)

Traffic calming and footway provision

- A further action to undertake additional assessment of traffic calming measures and footway provision through Woore village was also agreed. For further details of this assessment refer to the report 'Woore Village Traffic Calming and Footway Provision' [Document No. C861-ARP-PT-REP-000-100276, Revision P01].

2.3 Limitations of this report

2.3.1 The following points should be considered when reading this report:

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- The assessment of the permanent bypass is based on a high-level preliminary design, only partially developed in 3D.
- More detailed site surveys and ground investigation, in particular related to the localised peat deposit, is critical to attain more design certainty.
- Optioneering to identify the best overall route for a permanent bypass solution has not been carried out.
- An assessment of the need for a bypass has not been carried out.
- No environmental data has been obtained for this area nor have surveys or engagement with potentially effected landowners been undertaken. Reporting is based on assessed likely outcomes in turn based on the information available which at this stage should be treated as precautionary.
- The Benefit Cost Ratio calculation, is based on a very high-level desk top analysis based on a comparison of journey time savings compared to costs which does not involve the use of traffic modelling to calculate journey time benefits / dis-benefits.

2.3.2 Accordingly, the design and comments on the environmental considerations, land take, cost and programme may be subject to considerable change following further design development.

2.3.3 However, it is our professional judgement that the overall conclusions of the report will remain broadly unchanged despite these limitations.

3 Study Assumptions / Design Constraints

3.1 Permanent Bypass Assumptions

3.1.1 The following assumptions formed the basis of the study:

- The study assumes that there is a need for a permanent bypass at this location. (Note: An assessment of the need for a bypass has not been carried out. It should be noted that there is no reference in any planning document for any bypass of Woore village.)
- The design assumes the permanent bypass would have a speed limit of 40mph.
- The design assumes the permanent bypass would have a floating road design solution³ would be utilised for the section of the alignment that passes through a peat deposit. This was based on the assumption that the depth of the underlying peat deposit would be too great to excavate and replace in a cost-effective manner. An average settlement depth of 800mm was assumed for this section of the alignment.
- The design of the permanent bypass assumes a single footway 1.2m wide assumed on one side of the carriageway within the verge. No further Non-Motorised Users provision would be made along the bypass.
- The programme assumes all site surveys (Ecology, species, ground investigation etc.) would take one year and would commence 14 weeks after royal assent is obtained.
- The programme assumes that obtaining planning permission and the discharge of conditions would be completed in 54 weeks. This represents a best-case scenario based on the assumption that all decisions are made in statutory time periods and that no unexpected comments are received from consultees that the planning authority require to be taken into account.
- The programme assumes that any public consultation could be completed in parallel to the Environmental Impact Assessment, without delaying the programme. No time was allowed for any unexpected comments that would lead to significant re-design.
- The programme assumes that all of the conditions that might be included in the planning application would be reasonably straightforward to discharge and that the associated workload could be accommodated within the timeline allowed for the Compulsory Purchase Order (CPO) process. It was assumed that the CPO process could be completed within 78 weeks.

³ A floating road on peat is a road that is constructed directly on top of the peat relying on the strength of the in-situ peat for its support. A geosynthetic layer is placed on the surface of the peat before the road is constructed to give a working platform for the road and provide a separation layer between the road and the peat below.

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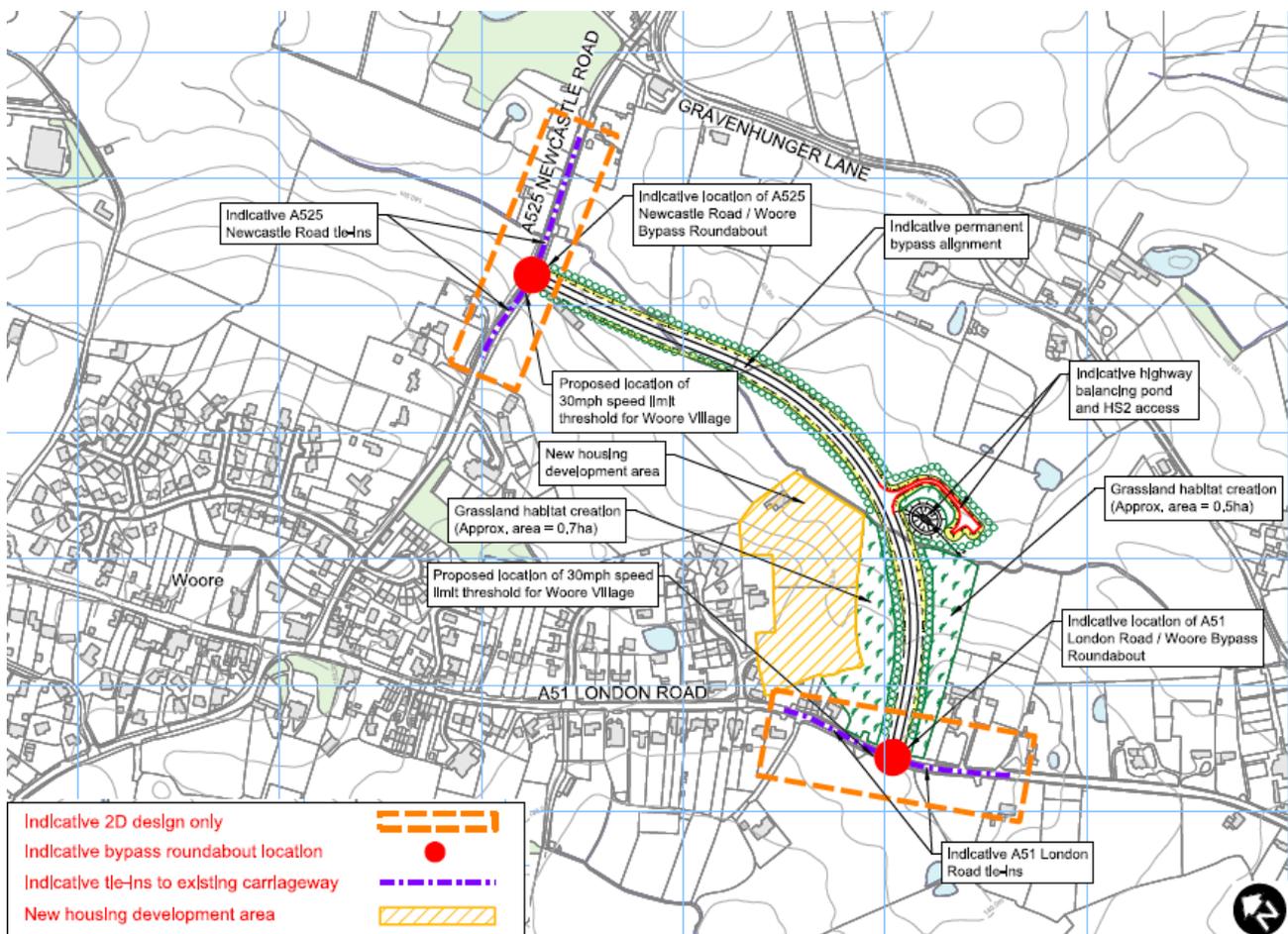
- The programme assumes that detailed design of the bypass could be completed within an accelerated 9-month programme and that this would partially overlap with the CPO timeline.
- The programme assumes that the procurement of a contractor and the attainment of any further permissions, such as species licences or permits would take place during the CPO process.
- The roundabout design and tie-ins to the existing carriageway on the A525 Newcastle Road and A51 London Road are indicative two-dimensional designs only. Additional design development and options assessment would be required to confirm the engineering design details and exact land take requirements at these locations.

4 Woore Village Permanent Bypass

4.1 Overview

4.1.1 An overview of the indicative Woore village permanent bypass alignment and key design features can be found in Figure 1. The bypass commences to the south of Woore village with a roundabout junction on the A51 London Road located approximately 20m to the south of the existing A51 London Road 30mph speed threshold. The bypass is connected to the A525 Newcastle Road, to the east of Woore village, with a roundabout junction located at approximately the same location as the existing A525 Newcastle Road 30mph speed threshold.

Figure 1: Indicative Woore village permanent bypass alignment and design features



4.1.2 The permanent bypass alignment would have a similar alignment to the temporary alternative construction route 'Short Route – Option 1'. The key reasons for selecting this alignment include:

- The alignment minimises the clashes with residential properties.

- The alignment doesn't clash with any other local roads, removing the potential need for additional diversions or realignments beyond minor realignments at the tie-ins to the A51 and A525.
- The length of the bypass is minimised, minimising the land take impact on local property owners and reducing the scheme cost.

4.2 Highways and Civils Considerations

4.2.1 The key features of the permanent bypass design can be summarised as follows:

- The single two-lane carriageway bypass alignment is approximately 680m long. The assumed carriageway width is 7.3m with two 2.5m wide verges. (Includes spatial provision for road safety barriers) The design assumes that a single 1.2m wide footway would be provided on one side of the carriageway within the spatial provision for the verge.
- A 70kph design speed was used for the bypass and it is assumed that the bypass would have a speed limit of 40mph.
- The speed limit on the A51 London Road to the north of the proposed roundabout would be 30mph. The speed limit on the A525 Newcastle Road to the west of the roundabout would be 30mph. It should be noted that both roundabouts are located in close proximity to the existing Woore village 30mph speed thresholds.
- The indicative horizontal alignment includes a radius of 255m. This is a one-step relaxation from the desirable minimum value of 360m.
- The embankment height is a minimum of 1.5m through the section of carriageway that passes through the peat deposit in order to ensure that a 'floating road' design can be accommodated.
- Spatial provision has been made in the verge to accommodate a road safety barrier along the full length of the bypass.

A51 London Road and A525 Newcastle Road Roundabouts

4.2.2 The roundabouts on the A51 London Road and A525 Newcastle Road are assumed to be compact type roundabouts in accordance with the criteria set out in Table 6/1 in DMRB TD16/07⁴. In accordance with Figure 7/4 in DMRB TD16/07, the assumed Inscribed Circle Diameter (ICD) for both roundabouts is 36.0m and the assumed central island diameter is 18m in order to accommodate the turning movements of large HGVs.

⁴ Full document details are as follows: Design Manual for Roads and Bridges Volume 6 Section 2 Part 3 TD 16/07 Geometric Design of Roundabouts.

- 4.2.3 The A51 London Road roundabout has been positioned with the aim of minimising vertical alignment changes to the existing A51 London Road in the vicinity of the existing residential properties. There is limited spatial provision within the existing highway boundary to enable vertical alignment or cross section changes, particularly to the north of the proposed roundabout.
- 4.2.4 The gradient of the A525 Newcastle Road at the proposed location of the A525 Newcastle Road roundabout is approximately 6%. In order to accommodate the geometric design requirements for the roundabout and the A525 Newcastle Road, extended tie-ins to the existing carriageway will be required. The surface level of the existing road would need to be raised and the increased earthworks footprint may clash with residential properties adjacent to the existing carriageway. Accordingly retaining walls may be required to minimise the impact to residential properties.

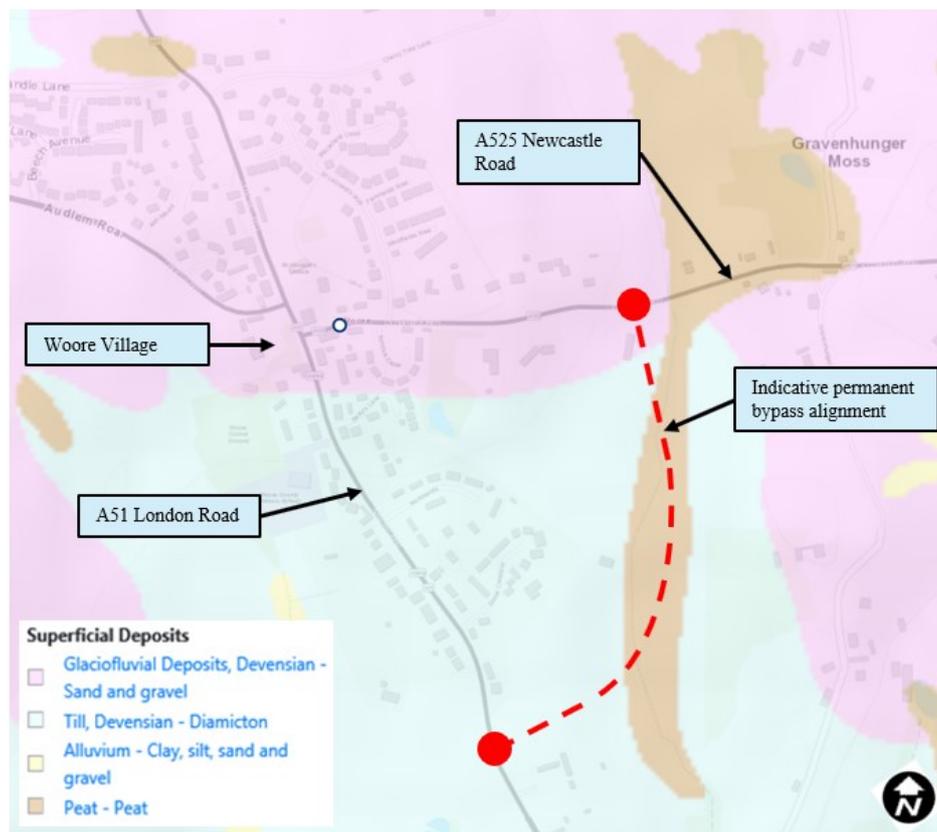
Field Accesses

- 4.2.5 The permanent bypass would necessitate the relocation of a number of existing field accesses as well as the provision of a number of new field accesses along the bypass alignment, in particular where individual land parcels would be severed by the proposed alignment. The location of these field accesses would need to be determined at a later design stage.
- 4.2.6 There is an existing field access on the northern side of the A525 Newcastle Road in close proximity to the proposed roundabout location. For road safety reasons, it may need to be relocated and have a dedicated provision from the proposed roundabout. This would need to be investigated further at a later design stage.

Ground conditions

- 4.2.7 The permanent bypass alignment crosses the Woore Moraine. Publicly available geology information indicates glacial superficial deposits comprising a mixture of sands, gravel and clay. These deposits overly a mudstone bedrock. An area of peat is identified running along the existing field drain. Figure 2 shows an extract of the British Geological Survey (BGS) map for the area including the approximate permanent bypass alignment.
- 4.2.8 The permanent bypass design would need to take account of poor ground conditions, in particular the peat deposit. A 'floating road' design has been assumed for permanent bypass across the sections where the alignment crosses peat on the geological map. Further details are provided in the construction section below.

Figure 2: Extract from BGS geological map with indicative permanent bypass alignment



4.3 Drainage provision

4.3.1 The preliminary drainage design for the permanent bypass carriageway assumes a ditch on both sides of the carriageway outside the verge. These channels will convey surface water runoff to the highway balancing pond illustrated in Figure 1. At this preliminary design stage, the assumed pond volume is 250m³.

4.4 Utilities

4.4.1 There are no major utilities constraints on the permanent bypass alignment. However, a number of existing minor utility services exist on the A51 London Road and A525 Newcastle Road which will need to be diverted and/or protected as part of the works in the vicinity of the proposed roundabouts and tie-ins on the A51 London Road and A525 Newcastle Road.

4.5 Construction and logistics

Construction methodology

4.5.1 Figure 3 illustrates indicative construction phase information for the permanent bypass including land take boundaries and construction compound and temporary material stockpile locations. The preferred location for the construction compound

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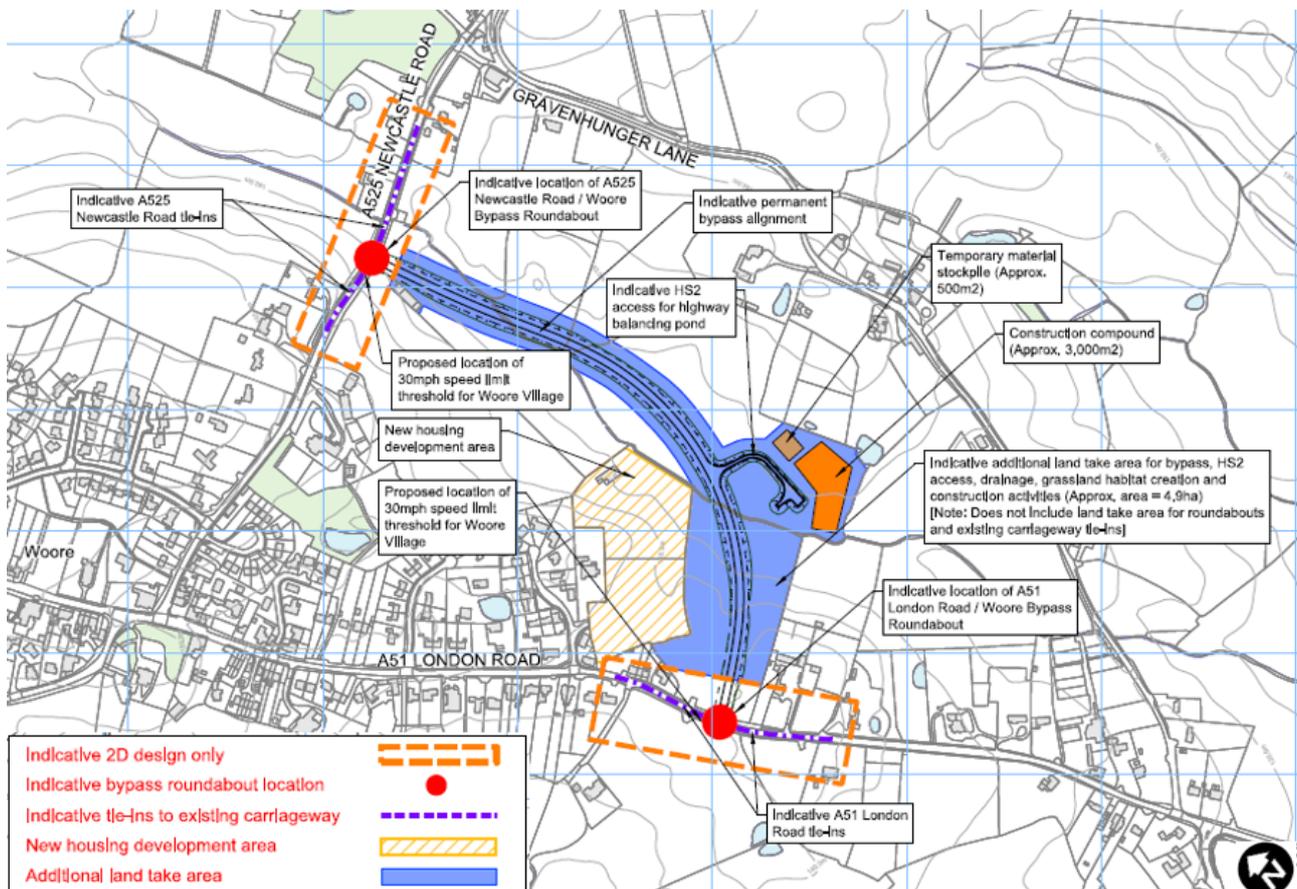
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and temporary material stockpile would be directly adjacent to the A51 London Road. However, as this area has been designated for grassland habitat enhancement and species translocations, the compound and stockpile have been located to the east of the existing watercourse to minimise the environmental impacts. Access to the compound and stockpiles would be accommodated within the working area for the bypass. Locating the compound and stockpiles adjacent to the proposed A525 Newcastle Road roundabout would not be desirable for a number of reasons, including increased construction traffic volumes through Woore village, localised topography issues and the proximity to expected temporary highway diversions.

4.5.2 It should be noted that further design development and options consideration would be required to determine exact land take requirement in the vicinity of the roundabouts and tie-ins to the existing carriageway at the A51 London Road and A525 Newcastle Road junctions.

Figure 3: Indicative construction phase plan for Woore permanent bypass



4.5.3 The route would be constructed using standard construction plant and techniques, such as excavators, vibratory rollers and possibly dozers for grading the haul road fill materials.

- 4.5.4 The ground conditions introduce further challenges due to the mixture of clay type materials and peat bog, a solution to this is introducing reinforcement to the road formation to avoid excess differential settlement and form a 'floating road'.
- 4.5.5 Utility services are present at the junction tie-ins. Without a full 3D design, it is not feasible to comment on any methods likely to be used.
- 4.5.6 A simple construction sequence is detailed below, some activities will occur simultaneously as the work front progresses.
- Ecology surveys, topographical surveys and ground investigation to support detailed design.
 - Advanced ecology works to translocate or relocate species at risk from construction activities.
 - Advanced archaeological excavations ahead main construction.
 - Site mobilisation including compound, fencing, site clearance.
 - Formation of the junctions off the main highways may commence. Access's will be surfaced as soon as practical and wheel wash stations setup.
 - Service diversions and protection works.
 - Topsoil/Subsoil strip for stockpiling, setup site waste water management, treatment areas and outfalls to water courses.
 - Excavation, import and placement of fill in other locations where required. Watercourse crossings and drainage features are formed as the work front(s) progress.
 - Placement of geotextiles or reinforcements.
 - Import, placement and compaction of granular fill to finished levels.
 - Seeding of excavated slopes to reduce erosion during operation.
 - Setup access controls to stop public vehicles from using the bypass.
 - Demobilise site welfare or compounds.
 - Operation
- 4.5.7 Bulk materials during construction and removal will be delivered to site via the site access on the A51 London Road. No traffic has been proposed to use the A525 Newcastle Road except limited numbers for utility diversions.

Construction and logistics approach

- 4.5.8 The unbound formation material and trafficking will give rise to silt to manage from surface water run-off, areas in addition to the balancing pond will be setup on site to attenuate and treat the run off before discharge in line with any consents and permits.

- 4.5.9 The presence of aquifers/groundwater is not envisaged to be a major construction constraint as the proposed route is mainly on shallow embankments.
- 4.5.10 Detailed surveys would be needed to define the hydrology of the area and the peat type and in-situ peat strength. The design of the permanent bypass road would be based on this data and the expected traffic loadings. For the purposes of costing in support of this study, some assumptions have been made with respect to floating road provision across peat sections.
- 4.5.11 The preliminary earthworks design requires mainly imported fill materials, a small provision has been made to accommodate site-won topsoil for later landscaping use.
- 4.5.12 Due to the nature of the underlying peat, a 6-month settlement period has been allowed for prior to any further construction which would be susceptible to settlement, the exception to this would be edge of carriageway drainage ditches which provide a benefit to manage run-off during this period. Due to the embankment heights and falls of the channels they should still function with limited differential settlement and avoid constructing additional toe of embankment drains within the ecologically sensitive peat bog.
- 4.5.13 From a review of the available information, no major utility services are known to cross the route, with the exception of at the A51 London Road and A525 Newcastle Road junctions. The A525 Newcastle Road junction may contain a rising main sewer and pumping station which could both be affected by the works and require significant work to divert or assure.
- 4.5.14 Construction of the junctions with the A51 London Road and A525 Newcastle Road would be undertaken under traffic management and signal control, it is likely traffic will be diverted within the site during these works, possibly more than once to give access to all areas of the roundabouts and maintain safety. The junction with the A525 Newcastle Road will be the most complex element of the scheme due to the existing gradients and location of residents, retaining structures may be required in front of properties and the presence of what is suspected to be a sewer pumping station. Maintaining a through route for traffic would be extremely challenging.

4.6 Programme

- 4.6.1 Figure 4 below provides an indicative high-level programme from commencement of planning to operation. It is estimated that in a best-case scenario, the planning approval, consents, EIA and Compulsory Purchase Order (CPO) process for the permanent bypass could be completed over a period of approximately three years from royal assent. Following 12 months of ecological works, the estimated duration for construction would be 24 months. On the basis of the above, the earliest date for operation would be during Q3 2025.

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4.6.2 There are numerous risks associated with this assumed programme (Refer to Section 4.9 for a high-level summary of these risks) and the programme may be subject to considerable delay. The programme assumptions are listed in Section 3.1. A more detailed programme can be found in Appendix B.

Figure 4: High-level programme for permanent bypass from planning to construction

Woore Permanent Bypass	2020 Quarters				2021 Quarters				2022 Quarters				2023 Quarters				2024 Quarters				2025 Quarters			
Activity	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Preliminary design, planning, EIA, consents and CPO	■				■				■															
Detailed design									■				■											
Ecological works									■				■											
Site preparation and set-up													■											
A51 junction roundabout and tie-ins construction													■				■							
Main permanent bypass link road construction													■				■							
A525 junction roundabout and tie-ins construction																	■							
Site reinstatement																	■							

4.6.3 The programme has been estimated (at a high level) to account for reduced construction outputs of working within a narrow site corridor, challenging ground conditions and sensitive ecological receptors. With increased land take the programme durations could possibly be reduced, however local HGV movements would increase and a portion of these may travel through Woore and onto the A525 Newcastle Road causing further disruption to Woore.

4.7 Environmental considerations

4.7.1 A high-level environmental sift of benefits and dis-benefits was undertaken to compare the indicative permanent bypass design to the AP2 revised scheme. The sift used professional judgement, based on the early stage concept design and with limited site information available. A copy of the sift is included in Appendix D and commentary is provided for each topic in this section.

4.7.2 For the remainder of this section, ‘construction’ and ‘operation’ refer to construction and operation of the bypass itself. Once operational, the bypass would initially be open to HS2 Phase 2a construction traffic only. Following the end of the HS2 Phase 2a construction period it would be open to the public.

Traffic and transport

4.7.3 The permanent bypass represents a moderate worsening on the AP2 revised scheme in terms of impacts on traffic and transport. The provision of a bypass would not remove the significant construction effects on non-motorised users as reported in the AP2 ES. The length of the programme for constructing the bypass would mean that the vast majority of HS2 construction traffic would still pass through Woore village as well as on roads south of Woore. In addition, construction of the two roundabouts on the A51 London Road and A525 Newcastle Road would likely give rise to new temporary adverse significant effects due to an increase in traffic congestion and delays. The bypass, once opened to public traffic, would

result in only minor journey time improvements and a relatively small reduction in existing traffic travelling through Woore village. Any bypass, once operational, would provide no benefit south of Woore.

Impact during construction of the permanent bypass

- 4.7.4 The AP2 ES reports temporary moderate adverse traffic severance effects for non-motorised users, which are significant, on the A51 London Road and the A525 Newcastle Road in Woore village. During the period of constructing the bypass (approximately 24 months) HS2 Phase 2a traffic would continue to pass through Woore village, resulting in the same effects reported for the AP2 revised scheme.
- 4.7.5 It is expected that traffic associated with the construction of the bypass itself would not increase construction traffic flows within Woore village, over and above the traffic associated with the construction of the AP2 revised scheme. Additional construction traffic associated with bypass construction would mainly increase through other settlements to the south and east of Woore village including, but not limited to, Whitmore, Baldwins Gate, Pipe Gate, and Ireland's Cross. There would however be a risk that some of the additional construction traffic associated with the bypass itself could pass through the Woore village.
- 4.7.6 It is estimated that construction of the bypass would take 24 months and would generate 4,577 HGV movements in each direction or 9,154 combined two-way movements in total with a peak of 60 combined movements two way per day during the busy periods.
- 4.7.7 The two new roundabouts, where the bypass would connect with the existing road network, on the A51 London Road and the A525 Newcastle Road, would be located on land utilised by the existing road network. Therefore, there would be temporary disruption to existing road users, with additional congestion and delays, during construction of the roundabouts. Figure 4 shows that the programme to construct the roundabouts on the A51 London Road and A525 Newcastle Road would be approximately six months and nine months respectively. This would likely give rise to new temporary adverse significant effects on both highways due to an increase in congestion and delays to vehicle occupants.

Impact during operation of the permanent bypass

HS2 construction traffic only

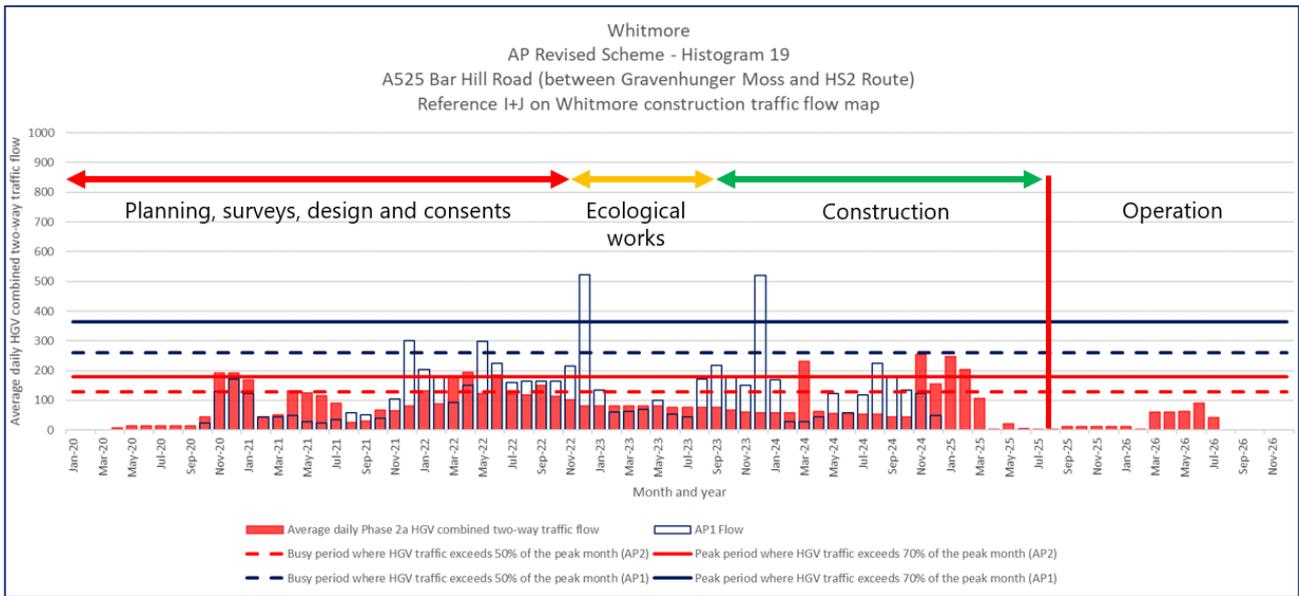
- 4.7.8 The histogram in Figure 5, below, has been annotated to show the construction programme in relation to HS2 HGV traffic using the A525 Newcastle Road. As the figure indicates, the earliest estimate for opening of the bypass is Q3 2025, which would provide little benefit for reduction of HS2 traffic through Woore village and as such, HS2 construction traffic would continue to pass through Woore village during the busy period in Q4 2024 and Q1 2025.

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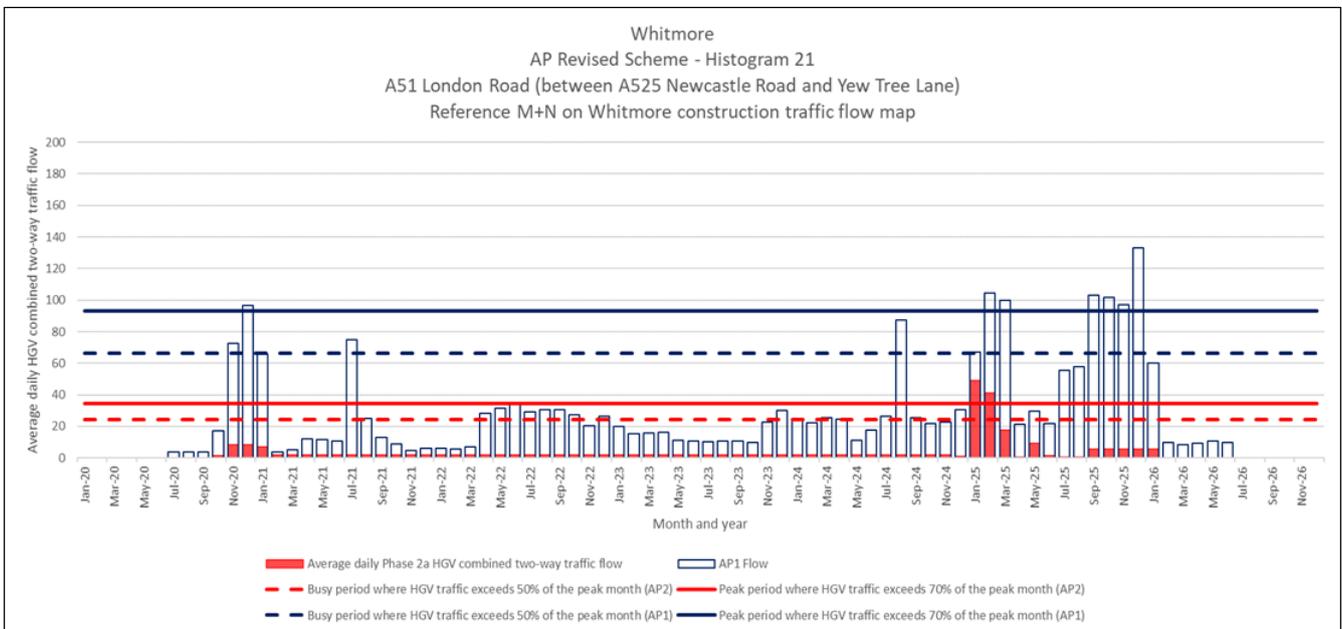
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Figure 5: Indicative earliest operation date of the permanent bypass in relation to HS2 HGV traffic using the A525 Newcastle Road (AP1 and AP2 revised scheme)



4.7.9 All HS2 construction traffic travelling along the A51 London Road, north of the A525 Newcastle Road, would continue to pass through Woore village regardless of any bypass. In the AP2 revised scheme this traffic has fallen substantially, as Figure 6 shows, but there will still be some construction traffic, particularly in Q1 2025.

Figure 6: HS2 construction traffic travelling along the A51 London Road, north of the A525 Newcastle Road (AP1 and AP2 revised scheme)



4.7.10 The bypass would not result in a substantial reduction in HS2 construction traffic travelling through Woore village. As a result, the moderate adverse traffic severance effects for non-motorised users, which are significant, on the A51 London Road, south of the A525 Newcastle Road and the A525 Newcastle Road in Woore village would remain.

4.7.11 The bypass would have no impact on HS2 construction traffic south of Woore village compared to the AP2 revised scheme since HS2 construction traffic would continue to use the roads south of Woore before routing on to the new bypass.

Public use following completion of HS2 construction

4.7.12 The estimated traffic flows for the permanent bypass for the post construction year 2027 are summarised in Table 1. The estimated traffic volumes would be approximately half the volume of the estimated future baseline traffic on the A525 Newcastle Road in Woore village in the same year, 2027. The high-level assessment indicates that 1,564 vehicles per day, on weekdays, would use the bypass and therefore there would be a reduction of the same volume of traffic on the A51 London Road in Woore village, between the bypass and the A525 Newcastle Road, and on the A525 Newcastle Road in Woore village, between the A51 London Road and the bypass. The traffic volumes using the bypass have been calculated using observed turning volumes at the A51 London Road / A525 Newcastle Road junction in particular the right turn into the A525 Newcastle Road and the left turn out of the A525 Newcastle Road.

Table 1: Estimated traffic flows for the permanent bypass for 2027

Direction	Observed AM peak vehicles	Observed PM peak vehicles	Estimated AADT ⁵ vehicles	Estimated AADT HGV vehicles
A51 London Road – A525 Newcastle Road	76	69	758	86
A525 Newcastle Road – A51 London Road	76	79	806	55
Two way	152	148	1564	141

4.7.13 A high-level Benefit to Cost Ratio (BCR) assessment of the bypass was undertaken, designed to test economic feasibility of the bypass as a standalone project. This is based on a simple assessment of journey time savings, compared to construction costs. Detailed traffic modelling has not been undertaken to capture journey time delays, in particular at the existing A51 London Road /A525 Newcastle Road junction and new junctions on the A51 London Road and A525 Newcastle Road with the latter generating additional delays. Furthermore, the main ES Volume 5: Transport Assessment⁶ reported that the existing A51 London Road / A525 Newcastle Road junction operates well with capacity in the 2023 future baseline. The scheme costs include land costs, civils costs and mitigation.

⁵ Annual average daily traffic

⁶ HS2 Ltd (2017) High Speed Rail (West Midlands - Crewe) Environmental Statement, Volume 5: Technical appendices, Transport Assessment part 2. Available online at <https://www.gov.uk/government/publications/hs2-phase-2a-environmental-statement-volume-5-traffic-and-transport>

4.7.14 The Department for Transport (DfT) has produced a Value for Money Framework⁷ published in 2015. Paragraph 5.6, page 25 states: '*In standard cases, where Broad Transport Budget cost outlays exceed revenue costs or savings, the Department uses six value for money categories*' which are shown in Table 2 below.

Table 2 Transport Scheme Value for Money Standard Categories

Value for Money Category	Implied by
Very High	BCR greater than or equal to 4
High	BCR between 2 and 4
Medium	BCR between 1.5 and 2
Low	BCR between 1 and 1.5
Poor	BCR between 0 and 1
Very Poor	BCR less than or equals to 0

4.7.15 The estimated BCR of the permanent bypass scheme is 0.46 and therefore is considered to offer poor value for money.

Agriculture, forestry and soils

Impact during construction and operation of the permanent bypass

4.7.16 The permanent bypass represents a minor worsening on the AP2 revised scheme in terms of impacts on agricultural land holdings and soils. However, it is considered unlikely, based on available data, that the bypass would introduce new or different significant construction or operational effects on agricultural land or farm holdings.

Construction

4.7.17 For construction of the permanent bypass, five land parcels, which appear to form parts of two farm holdings, would be affected. The affected land appears to be low grade grassland used for grazing. The permanent bypass would sever the northern holding into two but access would be available to the severed land either side of

⁷ Department for Transport (2015) *Value for Money Framework*. Available online at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/630704/value-for-money-framework.pdf

the bypass from the A525 Newcastle Road. The southern land parcel would be required in its entirety, with no residual severance.

4.7.18 No detailed Agricultural Land Classification (ALC) data are available at the time of writing. The land is shown on the Provisional ALC as Grade 3 land. This land is unlikely to be best and most versatile (BMV) land.

4.7.19 Some provision could be required for crossing the construction route when land ownership and usage is established.

Operation

4.7.20 All impacts on agricultural land and soils (including permanent impacts) would occur during the construction of the bypass; there would be no impacts arising from the operation of the bypass.

Air quality

Impact during construction and operation of the permanent bypass

4.7.21 The permanent bypass represents a minor worsening in air quality impacts compared to the AP2 revised scheme but would not give rise to any new or different significant effects.

Construction

4.7.22 The main ES and SES2 and AP2 ES report negligible impacts and no significant effects on Woore village for air quality.

4.7.23 It is expected that the construction of the bypass would increase traffic flows in Woore Parish to the south of Woore village and through Whitmore, Baldwin's Gate, Pipe Gate and Ireland's Cross. This increase would be likely to have a minor worsening in air quality impacts compared to the AP2 revised scheme but would not give rise to any new or different significant effects.

Operation

HS2 construction traffic only

4.7.24 Due to the programme for constructing the bypass, the earliest estimate for opening of the bypass would be Q3 2025, which means HS2 construction traffic would continue to pass through Woore village during the busy construction period in Q4 2024 and Q1 2025. The volume of HS2 HGVs that would use the bypass during this short period when it would be open only to HS2 construction traffic

would be low and would have a negligible impact on air quality. Therefore, there would be no change in air quality impacts compared to the AP2 revised scheme.

Public use following completion of HS2 construction

- 4.7.25 The permanent bypass would result in a reduction in traffic flows through Woore village by 1,564 vehicles per day. This reduction would have a negligible impact on air quality. The use of the permanent bypass would not introduce any new air quality impacts. Overall, there would be no change in air quality effects compared to the AP2 revised scheme.

Community

Impact during construction and operation of the permanent bypass

- 4.7.26 The permanent bypass represents a moderate worsening on the AP2 revised scheme in terms of impacts to sensitive community receptors, which could give rise to a new significant effect during construction.

Construction

- 4.7.27 The construction of a permanent Woore bypass would not directly impact any community resources. There is potential, however, that the construction of the bypass would introduce new impacts on the amenity of residential properties on A51 London Road and Gravenhunger Lane, and the proposed residential development east of St Leonards Way (12/04496/OUT), due to a combination of noise and visual impacts. These impacts would have the potential to be of a scale that could result in new significant effects on the community.

Operation

HS2 construction traffic only

- 4.7.28 As the bypass would not be available during the peak construction period, the levels of construction traffic using the bypass would be relatively low. This traffic using the bypass would not result in air quality, noise or HGV impacts that could result in an in-combination effect on the community.

Public use following completion of HS2 construction

- 4.7.29 During operation, the use of the bypass could introduce new impacts on the amenity of residential properties on the A51 London Road and Gravenhunger Lane, and the proposed residential development east of St Leonards Way (12/04496/OUT), due to a combination of noise and visual impacts. However, this would be unlikely to be of a scale that would result in significant effects on the

community. The reduction in traffic on the existing road is unlikely to result in any noticeable beneficial community impacts.

Cultural heritage

Impact during construction and operation of the permanent bypass

- 4.7.30 The permanent bypass represents a minor worsening on the AP2 revised scheme in terms of impacts on heritage assets and would likely give rise to a new significant construction effect compared to the AP2 revised scheme.

Construction

- 4.7.31 There would be direct physical impacts during construction on an area of ridge and furrow (Shropshire Historic Environment Record (HER) reference MSA30736) and a linear stone structure (Shropshire HER reference MSA30559). There would also be an impact on the heritage significance of an agricultural brick building (Shropshire HER reference MSA30737) as the result of the change in its setting. It is possible that the bypass would result in a permanent impact on the significance of Gravenhunger Hall, a Grade II listed country residence (Shropshire HER reference MSA 8233), as the result of changes to its setting.
- 4.7.32 Overall, these construction impacts represent a minor worsening compared to the AP2 revised scheme, and the removal of the linear stone structure (Shropshire HER reference MSA30559), would give rise to a new moderate adverse significant effect.

Operation

- 4.7.33 Noise and visual intrusion from moving vehicles on the proposed bypass would result in changes to the setting of the agricultural brick building (HER reference MSA30737) and Gravenhunger Hall leading to impacts on their heritage significance. It is not considered that these relatively low impacts would give rise to any additional significant operational effects compared to the AP2 revised scheme.

Ecology and biodiversity

Impact during construction and operation of the permanent bypass

- 4.7.34 The permanent bypass represents a moderate worsening on the AP2 revised scheme in terms impacts to ecological receptors. It has the potential to give rise to new significant effects to ecology if key habitats (e.g. habitats of principal importance) and/or species (e.g. protected or notable species) are present.

Construction

- 4.7.35 The route of the permanent bypass would cross a number of field boundaries and a minor watercourse. It is likely that construction would result in the loss of the existing hedgerow and trees at the locations where the alignment would cross these field boundaries.
- 4.7.36 The permanent bypass would result in the loss of small areas of grassland and arable habitats (at this stage of unknown ecological value) and this would likely be a permanent impact. Based upon a review of aerial photography of the area, the grass field within which the bypass would join the A51 London Road appears to be of some ecological interest.
- 4.7.37 Adequate mitigation for ecological losses would be required. This would be likely to primarily focus on reinstating or enhancing existing grassland habitats (as well as potential enhancements to the adjacent watercourse). An additional area of land take would be required, as identified in Figure 1. Approximately 1.2ha has been proposed on a precautionary basis for grassland habitat creation to mitigate for this loss of habitat as a result of the scheme.
- 4.7.38 It is not known at this stage whether any protected or notable species are likely to be present within the proposed bypass corridor. No information reviewed to date has indicated this to be the case.
- 4.7.39 The proposed junction works and verge widening at the proposed A525 Newcastle Road roundabout location would involve the removal of a section of (likely species-poor) hedgerow. Mitigation would comprise reinstated hedgerow that would tie in with vegetation to either side of the widening area.
- 4.7.40 The proposed junction works and verge widening at the proposed A51 London Road roundabout location would involve the removal of a section of ruderal vegetation⁸. No mitigation would be required beyond reinstatement. The works would also involve the removal of a section of hedgerow on the southern side of the A51 London Road. Mitigation would comprise reinstated hedgerow that would tie in with vegetation to either side of the roundabout works area.

Operation

- 4.7.41 The permanent bypass would give rise to longer-term disturbance to species and potential permanent displacement from the area around the proposed road corridor as a result of the presence of road traffic (noise, vibration, night-time lighting, pollutant effects on adjacent habitats).

⁸ Plant species that typically colonise disturbed land.

Land quality

Impact during construction and operation of the permanent bypass

- 4.7.42 The permanent bypass represents no change to the AP2 revised scheme in terms of land quality impacts and would not give rise to any new or different significant effects.

Construction

- 4.7.43 Construction of the AP2 revised scheme would not give rise to any land quality impacts. The permanent bypass represents no change to the AP2 revised scheme on the basis of no significant current or historic potential sources of contamination identified within the immediate area of the proposed bypass. Additionally, the area of construction would not be within a Mineral Safeguarding area.

Operation

- 4.7.44 There would be no operational impacts on land quality associated with the AP2 revised scheme. The permanent bypass represents no change to the AP2 revised scheme in terms of land quality effects.

Landscape and visual

Impact during construction and operation of the permanent bypass

- 4.7.45 The permanent bypass represents a moderate worsening on the AP2 revised scheme in terms of impacts on landscape and visual amenity, which could introduce new or different significant construction and operational effects.

Construction

- 4.7.46 The proposed location for the permanent bypass is in a location characterised by pastoral and arable farmland with dispersed farmsteads and properties. Small to medium-scale irregular fields are bounded by mostly robust hedgerows with mature hedgerow trees that connect to shelterbelts and coppices in the wider area.
- 4.7.47 Construction of the permanent bypass and the associated construction elements including compounds and earthworks would have an effect on the rural skyline character as well as a visual impact on a number of local receptors along the route of the bypass that were not previously impacted by the AP2 revised scheme. Newly affected receptors include residential properties directly facing the bypass on A51 London Road, Grove Crescent and Gravenhunger Lane. The presence of

construction equipment, stockpiles, earthmoving, levelling and re-grading would degrade the scenic quality and perception of tranquillity.

Operation

- 4.7.48 The bypass alignment, with a large radius and otherwise relatively straight sections would not be in keeping with the surrounding context, where similar roads have a more sinuous alignment. Passing traffic using the proposed bypass would affect a number of local receptors along the route that were not previously impacted by the AP2 revised scheme, including residential properties directly facing the bypass on A51 London Road, Grove Crescent and Gravenhunger Lane.

Socio-economics

Impact during construction and operation of the permanent bypass

- 4.7.49 The permanent bypass represents no change to the AP2 revised scheme in terms of socio-economic impacts on sensitive businesses within Woore and would not give rise to any new or different significant effects.

Construction

- 4.7.50 The bypass would not require any new land take from socio-economic resources and there would not likely be any residual environmental effects (i.e. noise, air quality, HGV) associated with construction due to the distance of the works from the sensitive businesses within Woore village.

Operation

HS2 construction traffic only

- 4.7.51 Due to the programme for constructing the bypass, the earliest estimate for opening of the bypass would be Q3 2025, which means HS2 construction traffic would continue to pass through Woore village during the busy construction period in Q4 2024 and Q1 2025. The volume of HS2 HGVs that would use the bypass during the short period from Q3 2025 when it would be open only to HS2 construction traffic would be low and would not result in air quality, noise or HGV impacts that could result in an in-combination effect on sensitive businesses within Woore village.

Public use following completion of HS2 construction

- 4.7.52 Once open to the public, the bypass would enable choice as to whether vehicles go through Woore village or use the bypass.

- 4.7.53 In terms of in-combination effects, traffic (including HGVs) could be diverted away from sensitive businesses within Woore village, reducing environmental effects (i.e. noise, air quality, HGV). However, there is no definitive proof of this and therefore no change is assumed compared to the AP2 revised scheme.
- 4.7.54 The assessment of isolation effects at the operational phase was outside the scope of the original ES. From an isolation perspective the bypass would offer a choice to vehicular traffic users between continuing to use the A51 London Road/ Nantwich Road (which would remain open) through Woore village or use the bypass. Tourist visitors and resident users of local services could well continue to use the A51 London Road/ Nantwich Road leaving other users to prefer the bypass option. There could therefore be some level of change in passing trade because of the bypass, however, the precise nature and volume of such a change remains unknown. Due to the absence of supporting evidence, no change is assumed compared to the AP2 revised scheme.

Sound, noise and vibration

Impact during construction and operation of the permanent bypass

- 4.7.55 The permanent bypass represents a moderate worsening on the AP2 revised scheme in terms of sound, noise and vibration impacts and would potentially give rise to new significant construction effects on receptors within proximity to the proposed bypass.

Construction

Construction traffic

- 4.7.56 Due to the estimated earliest completion of the bypass being towards the end of the HS2 construction period (Q3 2025), the majority of HS2 construction traffic would continue to use the existing A51 London Road and A525 Newcastle Road, as proposed in the AP2 revised scheme.
- 4.7.57 Additionally, construction traffic associated with construction of the bypass is estimated to be 60 HGVs per day during a peak month. This increase is considered small compared to the existing traffic flows on the A51 London Road and A525 Newcastle Road and would not introduce a new or different significant effect on properties on the A51 London Road, A525 Newcastle Road and Grove Crescent compared to the AP2 revised scheme.

Construction activities

- 4.7.58 There is potential for additional moderate impacts on residential properties directly facing the bypass on the A51 London Road, Grove Crescent and Gravenhunger

Lane because of construction activities associated with the bypass. This has the potential to give rise to a new significant construction effect compared to the AP2 revised scheme.

Operation

HS2 construction traffic only

- 4.7.59 As the earliest estimated date for opening of the bypass would be Q3 2025, this would provide little benefit for reduction of HS2 construction traffic through the Woore village, and so associated noise impacts would remain as in the AP2 revised scheme. The HS2 construction traffic using the bypass during this period would result in a small increase in traffic noise levels for residential properties directly facing the bypass on the A51 London Road, Grove Crescent and Gravenhunger Lane, but would not introduce a new or different significant effect compared to the AP2 revised scheme.

Public use following completion of HS2 construction

- 4.7.60 Once open to the public, the total diverted traffic onto the bypass is estimated to be 1,564 (AADT⁹ vehicles), with 141 daily HGV movements. Residential properties located immediately adjacent to the bypass on the A51 London Road, A525 Newcastle Road, Grove Crescent and Gravenhunger Lane would be forecast to experience an increase in road traffic noise levels. However, the total projected traffic flows on the bypass would not give rise to a new or different significant effect compared to the AP2 revised scheme.
- 4.7.61 The corresponding projected reduction in traffic on the A51 London Road and A525 Newcastle Road, once operational to the public, would be estimated to reduce traffic noise levels by 1dB compared to the existing noise levels. This reduction is not considered to provide a new beneficial significant effect on the properties on the A51 London Road and A525 Newcastle Road within Woore village.

Water resources and flood risk

Impact during construction and operation of the permanent bypass

- 4.7.62 The permanent bypass represents a moderate worsening on the AP2 revised scheme in terms of impacts on surface water as well as potential non-significant impacts on Water Framework Directive (WFD) compliance that would require confirmation with the Environment Agency. These impacts have the potential to give rise to new significant effects on flood risk during construction and on surface

⁹ Annual average daily traffic

water quality during operation. Further baseline information and impact assessment would be required to verify these potential significant effects.

Construction

Surface water

- 4.7.63 The permanent bypass would cross a minor, unnamed watercourse in two locations, requiring the construction of two new permanent culverts. The culverts could have an adverse impact on fluvial flood risk immediately upstream of the culverts during high flow events. The proposed bypass alignment is also located within a surface water flood zone of 30 years and greater. This could impact the access to the working area during moderate storm events, which could affect the construction programme, and could have an adverse impact on surface water flooding at the site and downstream.
- 4.7.64 The proposed bypass therefore introduces a potential new significant effect on flood risk, both to the bypass and surrounding existing roads and properties, which represents a moderate worsening on the AP2 revised scheme. An assessment of the watercourse and surface water runoff hydrology at the site would need to be undertaken at the next design stage as part of the Flood Risk Assessment to inform appropriate design/sizing of the culverts and drainage infrastructure to reduce the risk of flooding and associated potential effects on the bypass and surrounding existing roads and residential properties.
- 4.7.65 The embedded mitigation measures outlined in the draft Code of Construction Practice (CoCP) would ensure negligible pollution risks to the watercourses from construction of the bypass.

Groundwater

- 4.7.66 The permanent bypass would overlie superficial deposits and bedrock which are classified by the Environment Agency as Unproductive, Secondary (undifferentiated) and Secondary A, and Secondary B aquifers, respectively.
- 4.7.67 There are no mapped springs or water dependent ecological sites in this area. There are also no licensed groundwater abstractions or registered unlicensed private groundwater abstractions in proximity to the proposed bypass. However, there are two water wells shown on the British Geological Survey (BGS) borehole records that are located approximately 300m and 360m west of the construction route within the underlying Sherwood Sandstone Group. The status of these wells is unknown.
- 4.7.68 Based on the available information, it is anticipated that embedded mitigation measures outlined in the draft CoCP would ensure negligible pollution risks to the aquifers or nearby wells. The permanent bypass would therefore not give rise to

any new or different significant effects on groundwater receptors. This represents a minor worsening on the AP2 revised scheme.

Water Framework Directive

- 4.7.69 The permanent bypass would cross an unnamed watercourse that is a tributary of the River Tern, a designated river water body under the WFD. The two culverts required at the bypass crossing locations would have localised shading and footprint impacts on the unnamed watercourse.
- 4.7.70 The crossing locations are near the upstream extent of the catchment and the affected watercourse is suspected to comprise a small drainage channel of low value for WFD quality elements (subject to further baseline assessment). As such, the embedded mitigation measures outlined in the draft CoCP would be deemed sufficient to ensure no WFD compliance risks. This represents a minor worsening on the AP2 revised scheme.
- 4.7.71 If, following further baseline assessment, the watercourse at the crossing locations is confirmed to be of higher value for WFD quality elements, the shading and footprint impacts of the two culverts would result in minor, localised effects on biological, physicochemical and hydromorphological WFD quality elements. The magnitude of these effects would not be anticipated to cause a risk of deterioration in WFD status at the water body scale. However, consultation with the Environment Agency would be required to ensure no additional mitigation measures would be required.

Operation

Surface water

- 4.7.72 Once operational, the permanent bypass would create the potential for a pollution impact to the adjacent watercourse associated with highway runoff / spillages. This would introduce a potential new significant effect on surface water quality, which represents a minor worsening on the AP2 revised scheme.
- 4.7.73 A Highways Agency Water Risk Assessment Tool (HAWRAT) assessment would need to be undertaken to verify this effect and identify how the proposed design would compare to the existing road network and drainage.

Groundwater

- 4.7.74 No impacts would be anticipated on groundwater receptors from operation of the permanent bypass, representing no change to the AP2 revised scheme.

Water Framework Directive (WFD)

4.7.75 No impacts would be anticipated on WFD quality elements from operation of the permanent bypass, representing no change to the AP2 revised scheme.

4.8 Cost

4.8.1 Cost evaluation for the engineering cost of permanent bypass is included in Appendix C. This evaluation includes provisional environmental mitigation but excludes land and property costs.

4.9 Risks

4.9.1 The following key risks in relation to the preliminary permanent bypass design should be noted:

- There are numerous significant risks in relation to the site ground conditions, in particular the in-situ peat deposit:
 - The settlement period and settlement depth assumed for the floating road design may vary significantly depending on the actual site ground conditions. This may lead to programme, design and cost changes. Ground investigation would be required to develop more certainty on the existing ground conditions.
 - There is a risk that a floating road design is deemed unsuitable and that significant excavation works would be required to accommodate the permanent bypass. This would have cost, land take and programme implications.
- There is a risk that a number of residential properties in the vicinity of the bypass tie-ins to the A525 Newcastle Road and A51 London Road would need to be purchased (partially or in full) in order to accommodate the alterations to the existing highways. Further design development would be required to determine full details on the impact to these properties.

4.9.2 The key risks to the programme include the following:

- Potential delays during planning applications and CPOs.
 - Planning decisions may not be made within statutory time periods and that unexpected comments are received from consultees that the planning authority require to be taken into account.
 - Public consultation may lead to programme delays (E.g. Due to unexpected comments that require significant re-design).
 - Onerous planning conditions may require extended time to discharge.
 - There may be delays in the procurement of a contractor and the attainment of any further permissions, such as species licences or permits.

- Uncertainty regarding scope of potential advanced ecological and heritage surveys/works.
- Uncertain ground conditions (till and peat) leading to significant design and constructability risks. (e.g. unexpected settlement issues leading to construction programme delays).
- Design uncertainty at the junctions, especially the A525 Newcastle Road roundabout and tie-ins.
- Lack of detailed utilities information.

4.10 Opportunities

4.10.1 The following opportunities could be examined at the next design stage:

- The drainage design could be optimised following further design development. If highway run-off could be attenuated in the ditches, the need for the 250m³ highway balancing pond could be removed. Alternatively, the drainage ditches could be reduced in size or replaced by an alternative drainage solution to reduce the cross-section width of the embankment and minimise earthworks volumes. If an alternative piped drainage system was utilised the impacts of the significant settlement expected at this location would need to be assessed.
- If the peat depth through the site is sufficiently shallow, the peat could be excavated and the floating road design could be replaced with a standard cut and fill design. This would remove the risks inherent in a floating road design.

5 Summary

- 5.1.1 In requesting a permanent bypass, Woore Parish Council's aim was to allow HS2 construction traffic to avoid Woore village as a construction route. The permanent bypass would not achieve this aim since it would not be built in sufficient time to avoid the need for HS2 construction traffic to use the A51 London Road and pass through Woore village.
- 5.1.2 It is unlikely that the permanent bypass would lead to any improvement in adverse impacts associated with construction traffic in Woore village and it would also lead to some increase in construction traffic along the road network south of Woore village, resulting from the construction of the permanent bypass. There would also be the potential for new adverse significant effects with respect to traffic and transport, community, cultural heritage, ecology and biodiversity, landscape and visual, sound, noise and vibration, and surface water and flood risk.
- 5.1.3 The land take requirements for the permanent bypass would affect a number of land owners within Woore Parish, that are currently unaffected by the AP2 revised scheme. The introduction of the permanent bypass option would not remove the significant environmental effects reported as result of the AP2 revised scheme.
- 5.1.4 HS2 are not proposing any further Additional Provisions to the Phase 2a Bill, and therefore it has been assumed that the permanent bypass would require separate planning consent. Due to the additional significant environmental effects expected as a result of the proposed bypass and the need for temporary and permanent works on third party land, the likelihood of objection by local residents, landowners and the planning authority is high. The risks that would occur as a result of the planning process include the application of restrictive conditions by the local authority, programme risk from any delay in the decision making, increase in cost to options as a result of the planning process, and risk of refusal. Objections may also be raised by the affected property owners and requests may be made to move the bypass to the west of the A51 London Road.

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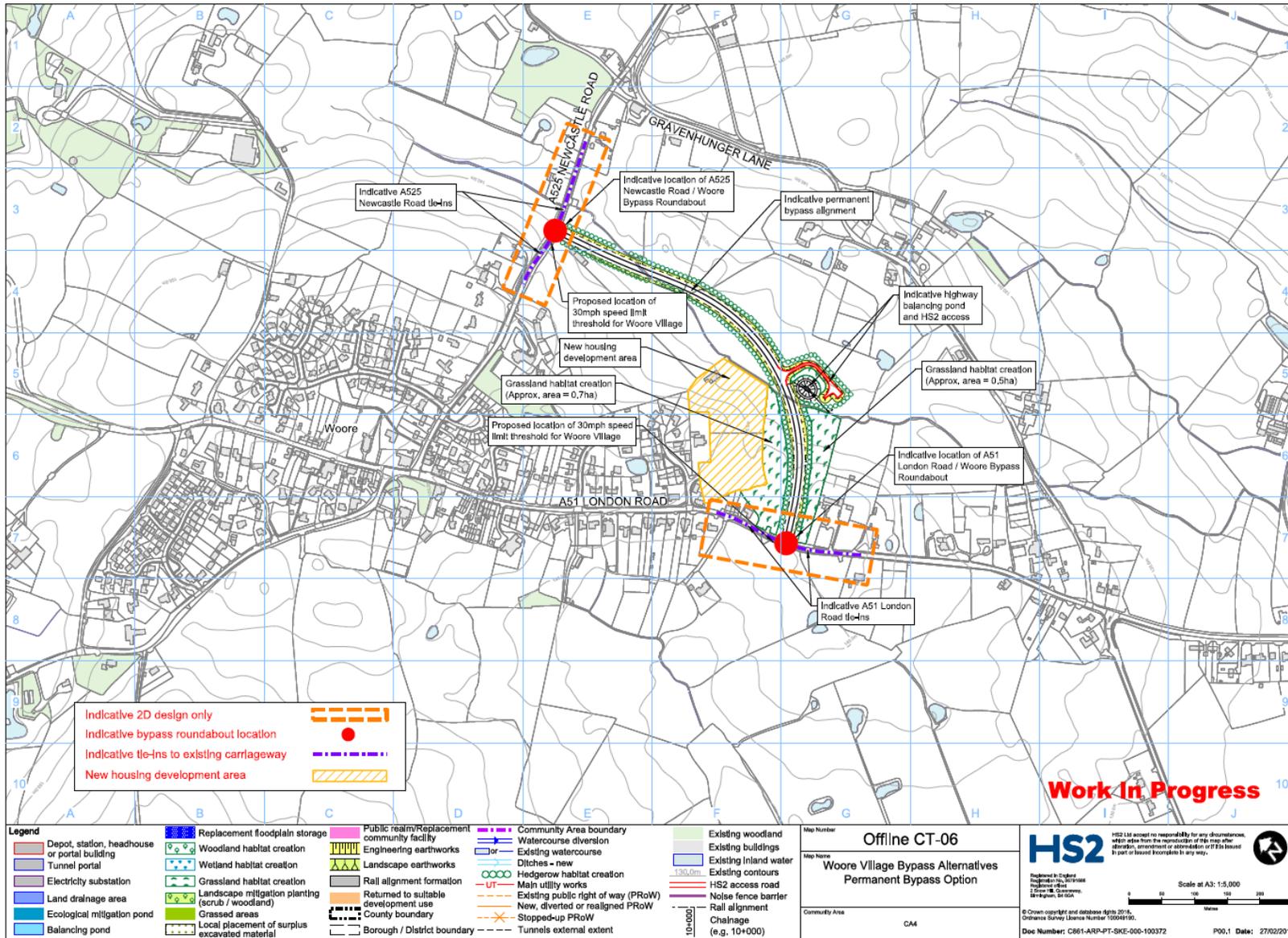
Appendix A - Drawings

Woore Village Permanent Bypass

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Figure 7: Draft indicative operation phase map of permanent bypass

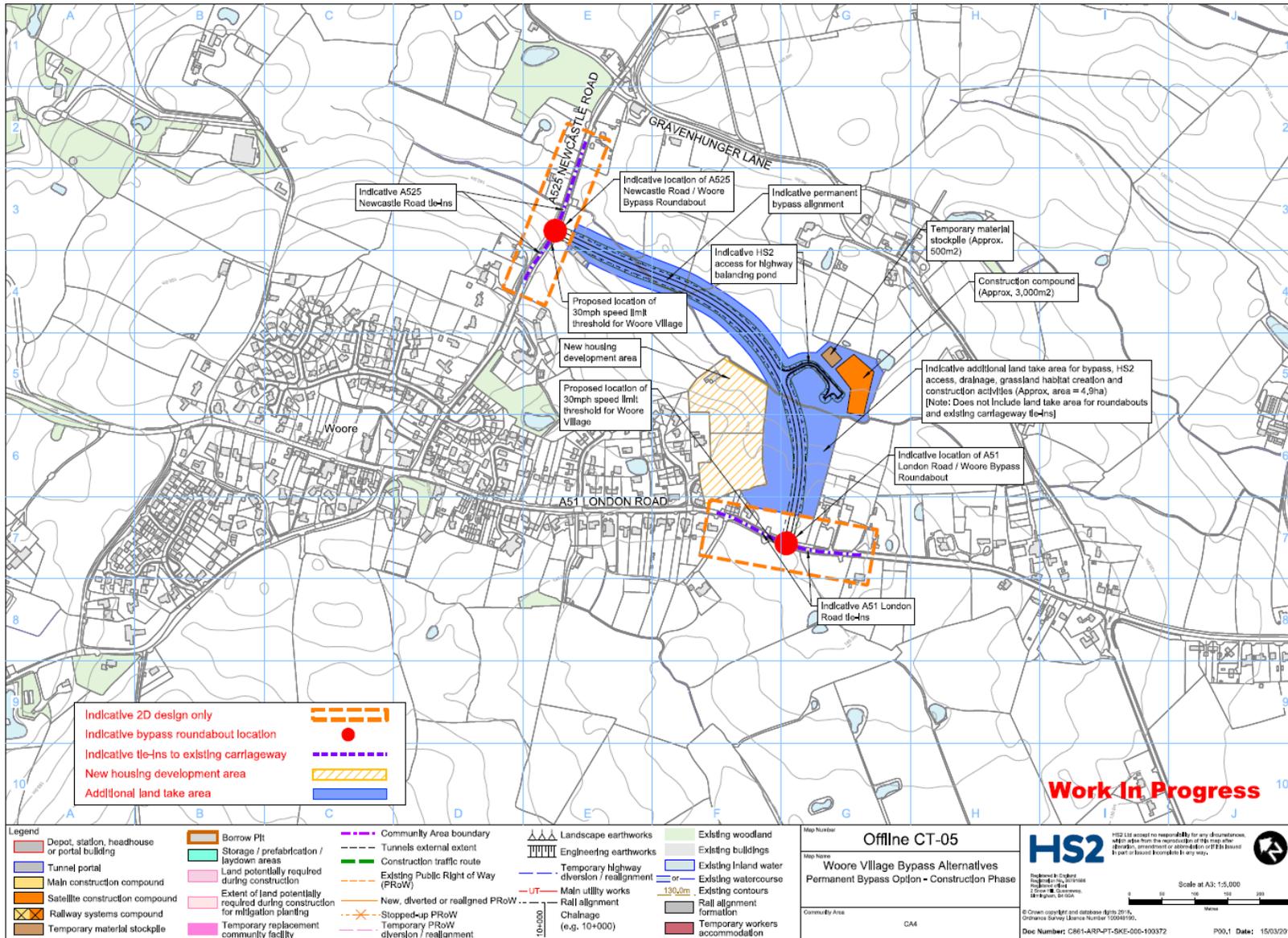


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Figure 8: Draft indicative construction phase map of permanent bypass

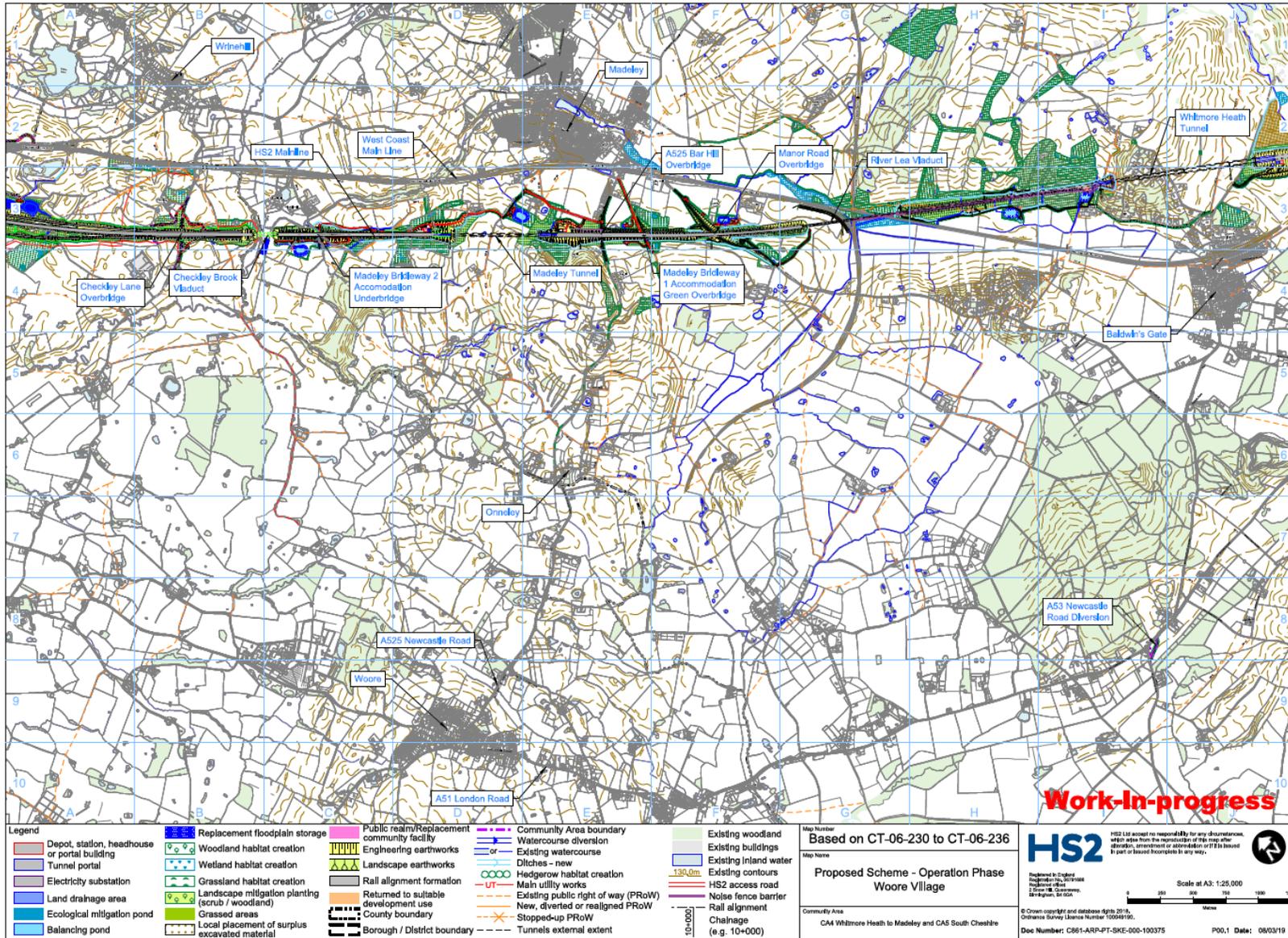


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Figure 9: AP2 CT-06 operation phase map of Woore and surrounding HS2 works

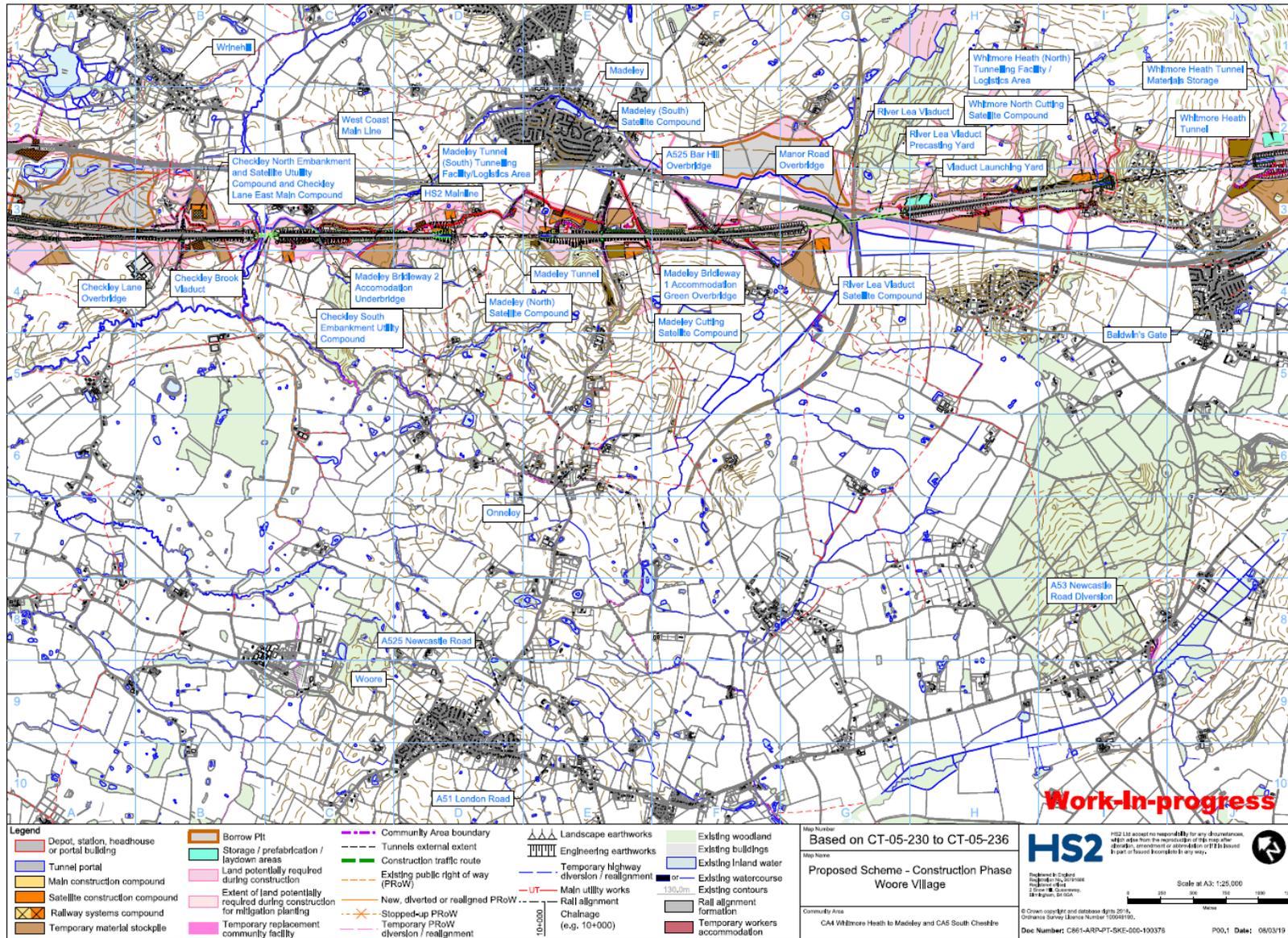


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Figure 10: AP2 CT-05 construction phase map of Woore and surrounding HS2 works



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Appendix B- Detailed programme

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Appendix C - Permanent Bypass Cost Estimate

Appendix D - Comparison Table

5.1.5 The table below summarises the evaluation of engineering and environment with respect to the permanent bypass option for Woore village compared to the AP2 revised scheme. In addition, a summary of key considerations with respect to construction logistics are presented together with the outcome of the cost assessment.

5.1.6 The option appraisal assessment criteria are as follows:

---	Major worsening on the Comparator Scheme
--	Moderate worsening on Comparator Scheme
-	Minor worsening to Comparator Scheme
0	No Change to the Comparator Scheme
+	Minor improvement on Comparator Scheme
++	Moderate improvement on Comparator Scheme
+++	Major improvement on Comparator Scheme

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Topic	AP2 revised scheme ¹⁰	Permanent bypass option ¹¹	
		Appraisal outcome: During construction and operation of the permanent bypass	Rating
Engineering (route civils, geotechnics and drainage)	Simple solution comprising temporary removal of traffic furniture and passing bay installation	Significant additional works with increased complexity particularly in relation to the localised peat deposits. Site surveys would be required to attain greater certainty on the existing ground conditions and to enable further development of an appropriate design solution.	--
Construction logistics	Uses existing road network with very little associated improvement works.	Would increase the scale and scope of construction works. Maintaining a through route for traffic would be challenging at the tie-ins to the A51 and A525. Influences programme.	---
Cost (excluding land and property)	-	Increased engineering cost	---
Traffic and transport (Woore village)	<p>Construction The AP2 ES reports temporary moderate adverse traffic severance effects for non-motorised users, which are significant, on the A51 London Road and A525 Newcastle Road (through Woore village).</p> <p>Operation No impacts or effects from the AP2 revised scheme (no operational HS2 traffic through Woore village).</p>	<p>Construction Due to the completion of the bypass in Q3 2025 (late on in the HS2 construction period) the majority of HS2 construction traffic would continue to travel through Woore village, which represents virtually no change to the AP2 revised scheme and would not give rise to any new or different significant effects. The temporary moderate adverse significant effects on non-motorised users in the AP2 revised scheme (through Woore village) would remain.</p> <p>The construction of the bypass would result in an estimated 9,154 combined HGV two way movements. Most would be expected to access south of Woore, however some could pass through Woore village. These would be in</p>	--

¹⁰ HS2 construction traffic would pass through Woore village on the A51 London Road/Nantwich Road and A525 Newcastle Road. Street furniture would be temporarily removed at the A51 London Road/A525 Newcastle Road junction to allow easier turning of HS2 HGVs). In relation to the AP2 revised scheme, 'construction' and 'operation' refer to construction and operation of the AP2 revised scheme

¹¹ A permanent bypass route approximately 0.7km long would be provided between the A51 London Road and the A525 Newcastle Road (see Section 4 of this report for full details). In relation to the permanent bypass option, 'construction' and 'operation' refer to construction (24 months) and operation of the bypass itself. Once operational, the bypass would initially be open to HS2 phase 2a construction traffic only. Following the end of the HS2 Phase 2a construction period it would be open to the public.

Topic	AP2 revised scheme ¹⁰	Permanent bypass option ¹¹	
		Appraisal outcome: During construction and operation of the permanent bypass	Rating
		<p>addition to HS2 construction traffic already passing through Woore village, representing a minor worsening compared to the AP2 revised scheme but would not give rise to any new or different significant effects.</p> <p>Some temporary traffic disruption would be expected associated with construction of roundabouts at either end of the bypass on the A51 London Road and A525 Newcastle Road. This would be likely to result in new temporary adverse significant effects due to an increase in congestion and delays to vehicle occupants, representing a moderate worsening compared to the AP2 revised scheme.</p> <p>Operation (HS2 construction traffic only) There would be a small overall reduction in HS2 construction traffic passing through Woore village as a result of using the bypass. Given the earliest estimated operational date for the bypass being Q3 2025 this reduction would be after the busy periods (in Q4 2024 and Q1 2025). This represents a negligible benefit when compared to the AP2 revised scheme and would not give rise to any new or different significant effects.</p> <p>Operation (public use following completion of HS2 construction) The assessment indicates approximately 1,564 vehicles a day could bypass Woore, which would result in some minor journey time savings. Most traffic passing through Woore on the A51 London Road would continue to pass through Woore. Decongestion benefits in the centre of Woore would likely be offset by additional delays generated by the new roundabouts. This represents a minor benefit when compared to the AP2 revised scheme but would not give rise to any new or different significant effects.</p>	
Traffic and transport (South of Woore)	Construction The AP2 ES reports a temporary moderate adverse traffic severance effect for non-motorised users,	Construction The construction of the bypass would result in an estimated 9,154 combined HGV two-way movements, with the vast majority accessing from the south	--

Topic	AP2 revised scheme ¹⁰	Permanent bypass option ¹¹	
		Appraisal outcome: During construction and operation of the permanent bypass	Rating
	<p>which is significant, on the A51 south of Woore village as far as the A53 Newcastle Road.</p> <p>The AP2 ES reports a temporary minor adverse traffic severance effect for non-motorised users, which is significant, on the A53 Newcastle Road between the A51 London Road and the A5182 Trentham Road.</p> <p>Operation No impacts or effects from the AP2 revised scheme (no operational HS2 traffic south of Woore).</p>	<p>of Woore. This increased construction traffic on roads south of Woore represents a moderate worsening compared to the AP2 revised scheme. The temporary adverse significant effects on non-motorised users in the AP2 revised scheme (South of Woore) would remain.</p> <p>Some temporary traffic disruption would be expected associated with construction of the roundabout on the A51 London Road. This would be likely to result in a new temporary adverse significant effect due to an increase in congestion and delays to vehicle occupants, representing a moderate worsening compared to the AP2 revised scheme.</p> <p>Operation (HS2 construction traffic only) No change compared to the AP2 revised scheme. HS2 construction traffic would continue to use the roads south of Woore before routing on to the new bypass.</p> <p>Operation (public use following completion of HS2 construction) No change compared to the AP2 revised scheme. Existing traffic would continue to use the roads south of Woore whether or not they route on to the new bypass since the roads south of Woore would continue to take all traffic, including those using the bypass and those not using the bypass.</p>	
Agriculture, forestry and soils	<p>Construction: No impacts or significant effects (no agricultural land affected).</p> <p>Operation: No impacts or significant effects (no agricultural land affected).</p>	<p>Construction: Five additional land parcels, likely to form parts of two farm holdings, would be affected. Unlikely to be any best and most versatile agricultural land affected. Based on available data, there would not likely be any new or different significant construction effects. This represents a minor worsening compared to the AP2 revised scheme.</p>	-

Topic	AP2 revised scheme ¹⁰	Permanent bypass option ¹¹	
		Appraisal outcome: During construction and operation of the permanent bypass	Rating
		<p>Operation: All impacts on agricultural land and soils (including permanent impacts) would occur during the construction of the bypass. There would be no impacts arising from the operation of the bypass.</p>	
Air quality	<p>Construction: Construction traffic passing through Woore village will have an adverse impact on air quality, however this is below significant effect threshold.</p> <p>Operation: No impacts or significant effects.</p>	<p>Construction: It is expected that the construction of the bypass would increase traffic flows in Woore Parish to the south of Woore village and through Whitmore, Baldwin's Gate, Pipe Gate and Ireland's Cross. This increase would be likely to have a minor worsening in air quality impacts compared to the AP2 revised scheme but would not give rise to any new or different significant effects.</p> <p>Operation (HS2 construction traffic only): Due to the programme for constructing the bypass (with earliest estimated operational date being Q3 2025), HS2 construction traffic would still pass through Woore village during the busy construction period (Q4 2024 and Q1 2025). The volume of HS2 HGVs that would use the bypass during this short period when it would be open only to HS2 construction traffic would be low and would have a negligible impact on air quality. Therefore, there would be no change in air quality impacts compared to the AP2 revised scheme.</p> <p>Operation (public use following completion of HS2 construction): There would be a projected reduction in traffic flows through Woore village by 1,564 vehicles per day. This reduction would have a negligible impact on air quality. The use of the permanent bypass would not introduce any new air quality impacts. Overall, there would be no change in air quality effects compared to the AP2 revised scheme.</p>	-
Community	<p>Construction: No impacts or significant effects.</p> <p>Operation: No impacts or significant effects.</p>	<p>Construction: No land would be required from community resources to construct this option.</p> <p>Construction of the bypass would have potential to result in impacts on the amenity of residential properties on the A51 London Road, Gravenhunger</p>	--

Topic	AP2 revised scheme ¹⁰	Permanent bypass option ¹¹	
		Appraisal outcome: During construction and operation of the permanent bypass	Rating
		<p>Lane and proposed residential properties east of St Leonards Way (permission 12/04496/OUT) due to noise and visual impacts. These impacts would have the potential to be of a scale that could result in new significant effects on the community, representing a moderate worsening compared to the AP2 revised scheme.</p> <p>Operation (HS2 construction traffic only): As the bypass would not be available during the peak construction period, the levels of HS2 construction traffic using the bypass would be relatively low. This traffic using the bypass would not result in air quality, noise or HGV impacts that could result in an in-combination effect on the community. This represents no change to the AP2 revised scheme.</p> <p>Operation (public use following completion of HS2 construction): There is potential for permanent impacts on the amenity of residential properties on the A51 London Road, Gravenhunger Lane and proposed residential properties east of St Leonards Way, due to noise and visual impacts of traffic using the new road. However, this would not likely be significant. The reduction in traffic on the existing road would be unlikely to result in any noticeable beneficial community impacts. This represents a minor worsening compared to the AP2 revised scheme.</p>	
Cultural heritage	<p>Construction: No impacts or significant effects.</p> <p>Operation: No impacts or significant effects.</p>	<p>Construction: Construction of the bypass would result in direct physical impacts on area of ridge and furrow (Shropshire Historic Environment Record (HER) reference MSA30736) and linear stone structure (Shropshire HER reference MSA30559). There would also be an impact on the heritage significance of an agricultural brick building (Shropshire HER reference MSA30737) and Gravenhunger Hall, a Grade II listed country residence (Shropshire HER reference MSA 8233), as the result of the change in its setting.</p>	-

Topic	AP2 revised scheme ¹⁰	Permanent bypass option ¹¹	
		Appraisal outcome: During construction and operation of the permanent bypass	Rating
		<p>Overall, these construction impacts represent a minor worsening compared to the AP2 revised scheme, and the removal of the linear stone structure (Shropshire HER reference MSA30559), would give rise to a new moderate adverse significant effect.</p> <p>Operation: Noise and visual intrusion from moving vehicles on the proposed bypass would result in changes to the setting of the agricultural brick building (HER reference MSA30737) and Gravehunger Hall leading to impacts on their heritage significance. This represents a minor worsening compared to the AP2 revised scheme but would not give rise to any additional significant operational effects.</p>	
Ecology and biodiversity	<p>Construction: No impacts or significant effects.</p> <p>Operation: No impacts or significant effects.</p>	<p>Construction: The bypass would result in a permanent loss of ecological features (hedgerow, trees, grassland, sections of watercourse) and temporary disturbance to species, as well as risk to peat resource from construction. This could result in new significant effects to ecology (from construction) if those habitats and species present are of greater than local/parish value, which represents a moderate worsening compared to the AP2 revised scheme.</p> <p>Operation: Longer-term disturbance to species and potential permanent displacement from area around road corridor as a result of the presence of road traffic (noise, vibration, night-time lighting, pollutant effects on adjacent habitats). This could result in new significant effects to ecology (from operation) if those species present are of greater than local/parish value, which represents a moderate worsening compared to the AP2 revised scheme.</p>	--
Land quality	<p>Construction: No impacts or significant effects.</p> <p>Operation: No impacts or significant effects.</p>	<p>Construction: The permanent bypass represents no change to the AP2 revised scheme in terms of land quality effects on the basis of no significant current or historic potential sources of contamination identified within the</p>	O

Topic	AP2 revised scheme ¹⁰	Permanent bypass option ¹¹	
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		<p>immediate area. The area of construction would not be within a Mineral Safeguarding area.</p> <p>Operation: The permanent bypass represents no change to the AP2 revised scheme in terms of land quality effects.</p>	
Landscape and visual	<p>Construction: No impacts or significant effects.</p> <p>Operation: No impacts or significant effects.</p>	<p>Construction: moderate worsening on the rural skyline character as well as a visual impact on a number of newly affected local receptors (residential properties directly facing the bypass on A51 London Road, Grove Crescent and Gravenhunger Lane) resulting from construction of the route, which could introduce new or different significant construction effects. This represents a moderate worsening on the AP2 revised scheme.</p> <p>Operation: moderate worsening on a number of newly affected local receptors (residential properties directly facing the bypass on A51 London Road, Grove Crescent and Gravenhunger Lane) resulting from the operation of the route (passing traffic), which could introduce new or different significant operational effects. This represents a moderate worsening on the AP2 revised scheme.</p>	--
Socio-economics	<p>Construction: No impacts or significant effects.</p> <p>Operation: No impacts or significant effects.</p>	<p>Construction: The bypass would not require any new land take from socio-economic resources and would be unlikely to give rise to any residual environmental effects (i.e. noise, air quality, HGV) associated with construction due to the distance of the works from the sensitive businesses within Woore village. This represents no change to the AP2 revised scheme.</p> <p>Operation (HS2 construction traffic only): Due to the programme for constructing the bypass, the earliest estimate for opening of the bypass would be Q3 2025, which means HS2 construction traffic would continue to pass through Woore village during the busy construction period in Q4 2024 and Q1 2025. The volume of HS2 HGVs that would use the bypass during the</p>	O

Topic	AP2 revised scheme ¹⁰	Permanent bypass option ¹¹	
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		<p>short period from Q3 2025 when it would be open only to HS2 construction traffic would be low and would not result in air quality, noise or HGV impacts that could result in an in-combination effect on sensitive businesses within Woore village. This represents no change to the AP2 revised scheme.</p> <p>Operation (public use following completion of HS2 construction): In terms of in-combination effects, traffic (including HGVs) could be diverted away from sensitive businesses within Woore village, reducing environmental effects (i.e. noise, air quality, HGV) associated with traffic. However, there is no definitive proof of this and therefore no change is assumed compared to the AP2 revised scheme.</p> <p>The assessment of isolation effects at the operational phase was outside the scope of the original ES. From an isolation perspective the bypass would offer a choice to vehicular traffic users between continuing to use the A51 London Road/ Nantwich Road (which would remain open) through Woore village or use the bypass. Tourist visitors and resident users of local services could well continue to use the A51 London Road/ Nantwich Road leaving other users to prefer the bypass option. There could therefore be some level of change in passing trade because of the bypass, however, the precise nature and volume of such a change remains unknown. Due to the absence of supporting evidence, no change is assumed compared to the AP2 revised scheme.</p>	
Sound, noise and Vibration	Construction: Construction traffic passing through Woore village will have an adverse impact on noise-sensitive receptors, however this is below the significant effect threshold	<p>Construction:</p> <p><u>Construction traffic</u> The construction traffic associated with construction of the bypass is estimated to be 60 HGV per day during a peak month. This represents a</p>	--

Topic	AP2 revised scheme ¹⁰	Permanent bypass option ¹¹	
		Appraisal outcome: During construction and operation of the permanent bypass	Rating
	<p>Operation: No impacts or significant effects.</p>	<p>minor worsening compared to the AP2 revised scheme, however it is unlikely that the estimated additional construction traffic would introduce a new or different significant effect on those properties on the A51 London Road and A525 Newcastle Road.</p> <p><u>Construction activities</u> Construction activities associated with construction of the bypass would potentially give rise to a temporary significant effect on those properties directly facing the bypass on the A51 London Road, Grove Crescent and Gravenhunger Lane. Overall, it is likely that this option would potentially give rise to a new significant construction effect on receptors within proximity to the proposed bypass, representing a moderate worsening compared to the AP2 revised scheme.</p> <p>Operation (HS2 construction traffic only): As the bypass would not be available during the peak HS2 construction period, the levels of HS2 construction traffic using the bypass would be relatively low. This would provide little benefit for reduction of HS2 construction traffic through Woore village and noise impacts would remain, representing no change compared to the AP2 revised scheme. The HS2 construction traffic using the bypass during this period would not introduce a new or different significant effect and represents no change compared to the AP2 revised scheme.</p> <p>Operation (public use following completion of HS2 construction): The total diverted traffic onto the bypass would be estimated to be approximately 1,564 (AADT¹²), with 141 HGV movements (daily).</p>	

¹² Annual average daily traffic

Topic	AP2 revised scheme ¹⁰	Permanent bypass option ¹¹	
		Appraisal outcome: During construction and operation of the permanent bypass	Rating
		The corresponding projected reduction in traffic on the A51 London Road and A525 Newcastle Road would be estimated to reduce traffic noise levels by approximately 1dB compared to the existing noise levels (within Woore village). This reduction in noise levels represents a minor improvement on the AP2 revised scheme, however is not considered to provide a new beneficial significant effect.	
Water resources and flood risk	<p>Construction: No impacts or significant effects.</p> <p>Operation: No impacts or significant effects.</p>	<p>Construction: <u>Surface water</u> The permanent bypass would cross a watercourse in two locations, requiring the construction of two separate culverts. The alignment would also be within the 30 year surface water flood zone. There is potential for a new significant effect on flood risk which represents a moderate worsening on the AP2 revised scheme.</p> <p><u>Groundwater</u> There would be potential for some consolidation and dewatering of the unproductive peat aquifer. No significant effects to groundwater receptors would be expected. This represents a minor worsening on the AP2 revised scheme.</p> <p><u>WFD</u> The permanent bypass would require two culverts on an Unnamed tributary of the River Tern located within the River Tern WFD surface water body. The culverts would have shading and footprint impacts, which could have a minor localised effect on biological, physicochemical and hydromorphological WFD quality elements if the watercourse is confirmed to be of higher value. However, this is not anticipated to cause a risk to WFD status at the water body scale. Therefore, no new significant WFD effects would be expected. This represents a minor worsening on the AP2 revised scheme.</p> <p>Operation:</p>	--

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		Appraisal outcome: During construction and operation of the permanent bypass	Rating
		<p><u>Surface water</u> The permanent bypass would create a new potential pollution risk to the adjacent watercourse during the operational phase associated with highway runoff / spillages. This represents the potential for a new significant effect on surface water which represents a minor worsening on the AP2 revised scheme.</p> <p><u>Groundwater</u> No operational impacts to groundwater receptors would be expected. No new significant effects (no change to the AP2 revised scheme).</p> <p><u>WFD</u> No operational impacts to WFD quality elements would be expected. No new significant effects (no change to the AP2 revised scheme).</p>	
Overall environmental rating		<p>Overall, from an environmental perspective the permanent bypass option represents a moderate worsening on the AP2 revised scheme. It wouldn't deliver the intended benefits of diverting HS2 construction traffic away from Woore village and the significant effects related to this (traffic severance for non-motorised users) would remain.</p> <p>Construction of the permanent bypass would have the potential to give rise to the following new significant adverse effects:</p> <ul style="list-style-type: none"> • new temporary adverse significant effects due to an increase in congestion and delays to vehicle occupants; • a potential new significant in-combination community effect on nearby residential receptors; • a potential moderate adverse significant effect due to the removal of a linear stone structure (cultural heritage); • potential new significant effects to ecological receptors if habitats and species present are of greater than local/parish value; • potential new significant construction landscape and visual effects on newly affected receptors; 	--

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		<ul style="list-style-type: none"> • new significant noise impacts from construction activities; and • potential for a new significant effect on flood risk due to culverting a watercourse and construction within a 30 year surface water flood zone. <p>Operation of the permanent bypass would have the potential to give rise to the following new significant effects:</p> <ul style="list-style-type: none"> • potential new significant operational effects to ecological receptors if habitats and species present are of greater than local/parish value; • Potential new significant operational landscape and visual effects on newly affected receptors; and • Potential for a new significant effect on surface water due to highway runoff / spillages. 	