

Theo Clarke MP, Petition No. HS2-HOL- 037 – T&T Related Concerns and Requests

27 August 2020

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1 Executive Summary

1.1.1 This report primarily focuses on the traffic impacts of the construction of HS2 Phase 2a on the M6 motorway in Staffordshire, but also considers impacts on roads in Stafford and the freeing up of capacity on the West Coast Mainline (WCML) once HS2 Phase 2a is operational. The report has been prepared in response to the House of Lords Select Committee petition submitted by Theo Clarke, MP for the Stafford constituency. In her petition the MP for Stafford raises a number of traffic and transport related concerns, principally:

- disruption to the M6 motorway during construction of the Proposed Scheme, and in particular the proposed timing of the HS2 Phase 2a works, which is set to coincide with the existing Smart Motorway works between M6 junctions 13-15;
- the cumulative impact of constructing HS2 Phase 2a and other major infrastructure schemes, and developments impacting the M6 motorway, principally the proposed M54-M6 Link Road and the West Midlands Strategic Rail Freight Interchange (SRFI); and
- disruption on the local road network in Stafford caused by a combination of highway works associated with construction of the Proposed Scheme and major housing development, and the need to appropriately manage construction works so as to avoid major disruption on the highway network in Stafford.

1.1.2 The major HS2 Phase 2a impact on the M6 motorway will be a series of short term (overnight / weekend) temporary closures and lane restrictions associated with construction of the Proposed Scheme. We expect that construction of HS2 phase 2a will require three weekend closures of the M6 motorway plus some overnight carriageway restrictions. Section 5 of this note provides further details. Construction traffic, as opposed to HS2 Phase 2a highway works, generated by the HS2 Phase 2a scheme will not have a substantial impact on the M6 motorway mainline. HS2 phase 2a construction traffic impacts at motorway junctions, reported in the SES2 and AP2 ES, Volume 5 TA¹, show no substantial impacts at these junctions and no material impact on the M6 motorway mainline. The busy period for HS2 Phase 2a construction traffic is not expected to overlap with any major highway works disruption on the M6 motorway. Furthermore, the Smart Motorway upgrade which includes an increase in highway capacity on the M6 motorway between Junctions 13-15 is expected to be completed in advance of the HS2 Phase 2a construction traffic busy period.

1.1.3 Constructing the M6 slip roads near Yarnfield will result in some motorway restrictions and some disruption but it is expected that a minimum of three active

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/776242/J49_1_HS2_Phase_2a_AP2_ES_Volume_5_Transport_assessment_Part_1.pdf

lanes will be maintained in each direction during busy periods. Some weekend closures will be required which are associated with new M6 overbridges and the later demolition of the existing Yarnfield Lane M6 overbridge. After Royal Assent, detailed construction phasing plans and information will be developed to sequence the works and then shared with Highways England, and Staffordshire County Council as the relevant local highway authority. Appropriate consents from highway authorities and other stakeholders will be required. The timing of any highway closures or highway capacity reductions will be agreed with the relevant highway authorities with advance notice given of any closures and restrictions to affected road users in accordance with the framework set out in the HS2 phase 2a information paper E3: Management of traffic during construction².

- 1.1.4 Engagement is ongoing between HS2 Ltd and Highways England as part of the design development process to agree the work needed to assess traffic management and other measures that might be necessary to construct the HS2 Phase 2a scheme. In particular, any highway closures will require months of planning which includes engagement with multiple stakeholders. A recent example from the construction of HS2 Phase 1 is the temporary weekend closure of the M42 motorway in Solihull between Junctions 6 and 7A (northbound) and 7 and 6 (southbound) to install a new bridge. HS2 and their appointed contractor worked closely with Highways England and affected local authorities for over 12 months to plan the closures and minimise disruption for the local community and the travelling public. Work to install this 65m bridge spanning the motorway was completed in just two days and ahead of schedule as the motorway reopened to users 22 hours earlier than planned³.
- 1.1.5 The proposed M54-M6 Link Road was not within the approved temporal scope of the HS2 Phase 2a Bill traffic assessment as it had not been consented. However, as part of further traffic assessments, the potential cumulative traffic impact of this proposed scheme and the HS2 Phase 2a Bill project have been considered. It is concluded that traffic generated in constructing the proposed M54-M6 Link Road would have a minimal impact on the capacity of the M6 motorway even if it was using the M6 motorway in combination with HS2 Phase 2a construction traffic. Scenarios in which: the proposed M54 -M6 Link Road scheme has been brought into operation by the time that the HS2 Phase 2a project begins construction, and in which construction of the proposed M54 -M6 Link Road scheme does not coincide with the peak of HS2 Phase 2a construction, have also been considered. In both scenarios, it is considered that traffic reassignment impacts associated with the proposed new Link Road are likely to be local to that scheme, in particular on the A449 (T) Stafford Road and A5 (T) Watling Street, and will therefore not affect the M6 motorway north of junction 14. The proposed M54 -M6 Link Road scheme

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/828980/E3_Management_of_Traffic_During_Construction_v1.2.pdf

³ <https://mediacentre.hs2.org.uk/news/hs2-installs-new-modular-bridge-over-m42-in-just-two-days>

will increase the capacity of the Strategic Road Network. Traffic impacts will tend to be beneficial because the proposed M54 -M6 Link Road scheme, when it opens for traffic, would enable a reduction in traffic congestion.

- 1.1.6 It should be noted that the Secretary of State for Transport is expected to decide on the Development Consent Order (DCO) application for the M54-M6 Link Road in 2021, and therefore it is still not certain that the scheme will proceed.
- 1.1.7 There would be some temporary disruption to the M6 motorway at M6 Junction 11 during the construction of the proposed M54-M6 Link Road. Night time / weekend closures would be required for the installation of new and demolition of existing Junction 11 bridges. Some traffic management (reduced speed limits) would also be in place during daytime hours for the construction of the realigned M6 slip roads. These temporary restrictions could be in place when HS2 construction vehicles are on the M6 motorway in the vicinity of M6 Junction 11. However, even in the peak month of construction, the traffic volume over highway capacity ratio on the M6 motorway, in Staffordshire, is not anticipated to exceed the 85% at capacity threshold. Furthermore, any closures or substantial capacity reductions on the M6 motorway at Junction 11 would need to avoid busy weekday periods between 08:00 – 18:00, i.e. the hours of the working day during which HS2 construction vehicles are typically on the road network. Traffic diverted during any closures would likely lead to an increase in traffic on the A449 (T) Stafford Road and A5 (T) Watling Street. The timing of any closures will need to be co-ordinated to avoid overlapping with any other nearby major highway closures, thereby keeping disruption to a minimum.
- 1.1.8 The West Midlands Strategic Rail Freight Interchange (SRFI) was also not within the approved temporal scope of the HS2 Phase 2a Bill traffic assessment as it had not been consented.
- 1.1.9 The West Midlands SRFI is to be built in phases and is estimated to take approximately 15 years to achieve full completion. The Development Consent Order (DCO) was consented in 2020. Phase 1 of the West Midlands SRFI is not expected to be completed until 2026. The relevant documents⁴ have been reviewed and it is concluded that traffic generated in constructing the West Midlands SRFI would typically average 20 vehicles per hour on the M6 motorway during the construction working day, and therefore would have minimal impact on the capacity of M6 motorway if combined with the impact of HS2 Phase 2a construction traffic.
- 1.1.10 The operational traffic generated by the West Midlands SRFI, estimated to be no higher than 100 vehicles per hour during peak hours when combined with HS2 Phase 2a construction traffic, will have minimal impact on the operation of the M6 motorway. The coming into operation of HS2 Phase 2a will release capacity on the

⁴ <https://infrastructure.planninginspectorate.gov.uk/projects/west-midlands/west-midlands-interchange/?ipcsection=docs>

WCML and so enable more freight to shift from road to rail. In this way, both the West Midlands SRFI and HS2 Phase 2a will help to reduce traffic volumes and congestion on the highway network in Staffordshire.

- 1.1.11 Constructing the West Midlands SRFI will result in some temporary closures and traffic restrictions on the A449 and A5 in the vicinity of the West Midlands SRFI. Neither road is proposed as a HS2 Phase 2a construction traffic route. Both roads are a considerable distance from the designated HS2 Phase 2a construction traffic routes. Construction of the West Midlands SRFI is not predicted to require closures or other highway restrictions on the mainline of the M6 motorway. However, restrictions and possible closures (likely to be off peak, typically 22:00 – 05:00 hours) of the A449 (T) Stafford Road and A5 (T) Watling Street will require traffic to be diverted and likely lead to an increase in traffic on the A460 and the M6 motorway between Junctions 11 and 12. In this respect the timing of any closures will need to be co-ordinated to avoid overlapping with any other nearby major highway closures, thereby keeping disruption to a minimum.
- 1.1.12 The Promoter is aware that planned future housing growth in Stafford is likely to require associated junction improvements and other highway works. Following the anticipated grant of Royal Assent for the HS2 Phase 2a project and prior to construction, HS2 and its appointed contractors would work with the highway authority and other stakeholders to put in place detailed local traffic management plans. At this stage it would not be appropriate to produce these detailed plans given that Royal Assent has yet to be granted and other present uncertainties, including the timing of the highway improvements associated with housing development in Stafford. HS2 Ltd regularly engages with the Staffordshire County Council highway authority (and Highways England), and would need to agree appropriate traffic management plans to support delivery of the HS2 Phase 2a project whilst keeping traffic disruption to a reasonable minimum.

2 Introduction

- 2.1.1 This report responds to traffic and transport concerns and requests made by Theo Clarke, MP for the Stafford constituency. It also provides further details on HS2 Phase 2a construction impacts on the M6 motorway in Staffordshire.
- 2.1.2 The report summarises information relating to:
- The sequencing of HS2 works on the M6 motorway and how they affect capacity having regard to the M6 Smart Motorway works;
 - Cumulative impacts from other developments and from HS2 construction traffic;
 - The use of the future baseline obtained from Highways England (including the developments and schemes);

- Development such as the Rail Freight Interchange, the M54 works, and those development proposals listed in part D of the Petition (see section 2 for further details);
- Opportunities arising from HS2 to free up capacity on the West Coast Mainline (WCML); and
- HS2 traffic modelling and the calculation of congestion.

2.1.3 It is structured as follows:

- Section 3 – A summary of the relevant transport concerns and requests in the House of Lords (HoL) petition of Theo Clarke MP;
- Section 4 – Further details of HS2 construction traffic impacts on the M6 motorway in Staffordshire;
- Section 5 – Indicative sequencing of works on the M6 motorway;
- Section 6 – Consideration and assessment of cumulative impacts;
- Section 7 – Opportunities to free up / release capacity on the WCML;
- Section 8 – Transport modelling and traffic impacts; and
- Section 9 – Summary and conclusions.

3 Theo Clarke MP HoL petition transport concerns and requests

3.1.1 Theo Clarke (the elected member of Parliament for Stafford) makes a number of comments and requests in part D of her House of Lords (HoL) Petition relating to traffic and transport. These concerns and requests are set out below as follows:

Your petitioner is very concerned at the lack of a detailed transport plan for the construction of the HS2a line. Within the Stafford constituency alone, the M6, A34, A518, A51 as well as B and C roads will all be impacted and closed during some periods of construction. Although plans for these individual roads exist, your petitioner is yet to see or hear of an integrated traffic plan. The M6 and A34 provide a vital north to south national, regional and local link. Any problem with both these roads at the same time will not just provide a problem for the residents of Stafford, nor just North Staffordshire, but will cause major disruption to the national and regional economy.

Stafford is also earmarked as a place of significant development. There are several developments planned and outline permissions granted for thousands of homes near to the proposed HS2 routes with their construction planned for the same time period as the HS2 Phase 2a proposed construction. This development will involve traffic management and possibly road closures. There appear to be no joined up plans for

traffic management with HS2 Ltd. despite the fact that these traffic restrictions will be on the roads that would reasonably be expected to be the diversions for any HS2 work.

The M6 is also scheduled to undergo significant disruption over the next few years as the Highways Agency⁵ completes works to turn the stretch between Junctions 13 and 15 into Smart Motorway. This will involve significant lane closures and over-night full road closures, using the A34 as the route to divert traffic. I am very concerned that there is no traffic management plan to deal with any clash between the HS2 and M6 projects.

Your petitioner is also aware of plans to construct a major rail freight interchange on greenbelt at Gailey on the Birmingham-Stafford line south of Penkridge (currently subject to a Planning Inquiry). Your petitioner is opposing this development. However, if it were to go ahead, it would have significant impacts on both the Midlands railway network and the M6, A449 and A5 roads. All of these are major regional and national links. The proposed development would coincide with the construction of HS2 Phase 2a.

Your petitioner is also aware of the proposals for a new link road between the M54 and M6. It is likely that these very substantial roadworks (if the project goes ahead) would also coincide with the construction of HS2 Phase 2a. This would add further strain on the already congested regional and national network.

Request 1: That a detailed transport plan be developed as a matter of urgency for the region affected by HS2 Phase 2a. This should take into account all existing, permitted or proposed developments.

Request 2: That no construction work on HS2 Phase 2a, which will have any impact on the M6, should commence until all proposed major developments affecting the M6 (Smart Motorway J13 – J15), M54/M6 N Link Road and (possibly) J12 rail freight interchange are complete.

Request 3: That a new link road between the A34 South of Stafford and the M6 J13 be developed to provide additional connectivity for both regular traffic flows and the additional construction traffic during HS2 Phase 2a. This link was originally proposed as part of the Stafford Eastern Distributor Road.

Request 4: That the viaduct (not withstanding Request 2) carrying HS2 Phase 2a over the M6 be put in place during the work on the M6 J13-J15 Smart Motorway in order to minimise disruption. Precedent for this is the construction of the Lichfield Canal aqueduct over the M6 (Toll) during the motorway works in anticipation of the opening of a canal.

⁵ Now referred to as Highways England in England.

4 HS2 Phase 2a traffic impacts on the M6 motorway J10A-17

4.1 Introduction

- 4.1.1 This section provides further details relating to the HS2 Phase 2a construction traffic impact on the M6 motorway in Staffordshire (Junctions 10A -16) and part of Cheshire East (Junctions 16-17). This assessment has been provided in response to the petition of Theo Clarke, MP for the Stafford Constituency.
- 4.1.2 The Supplementary Environmental Statement (SES) 2 and Additional Provision 2 Environmental Statement (AP2 ES), Volume 5 Transport Assessment (TA)⁶ provided an assessment of traffic impacts on the M6 mainline between M6 Junctions 13 and 17 and Junctions 14 to 16. This technical note provides additional background and summarises the position for HS2 Phase 2a construction traffic impacts further to the south, to cover the entire M6 motorway in Staffordshire.
- 4.1.3 Part of the long-term solution to address traffic congestion and highway network resilience issues is to reduce the demand for car travel by providing alternative public transport solutions including HS2. The HS2 network will also free up capacity on the West Coast Mainline (WCML) and in doing so will free up train paths that could enable more freight to be moved by rail as opposed to by road. This opportunity is discussed in more detail in Section 7 of this report. In the shorter term, the construction of HS2 Phase 2a will result in additional construction traffic and some disruption from highway works on the M6 motorway. This section relates to HS2 Phase 2a construction traffic impacts only. The potential impact of HS2 Phase 2a highway works on the M6 motorway is discussed further in Section 5 of this report.
- 4.1.4 When constructing HS2 Phase 2a, wherever reasonably practicable the construction vehicles will use internal site haul roads. Haul roads will be developed early in the construction programme as part of the enabling works. These internal site haul roads would be used by construction vehicles to move materials, and thus limit the volume and impact of construction traffic on the public highway network.
- 4.1.5 Where HS2 construction vehicles do require access to the public highway network the approach is, wherever reasonably practicable, to use the motorway network first, then 'A' classified roads, followed by 'B' classified roads etc. The SRN includes many high capacity road corridors. Relative to the local road network, traffic on SRN corridors can generally move quicker, more safely and with less impact on

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/776242/J49_1_HS2_Phase_2a_AP2_ES_Volume_5_Transport_assessment_Part_1.pdf

other road users such as local residents. This is why the Promoter, subject to Highways England Consent, proposes to construct new slip roads near Yarnfield so that large construction vehicles can quickly access and egress the M6 motorway, and in doing so reduce the volume and impact of construction traffic on local roads.

- 4.1.6 One approach taken by Highways England to reduce existing congestion and delays on the SRN has been to upgrade many sections of the national motorway network to Smart Motorway. Over the last decade most of the M6 motorway between Junctions 8-19 has progressively been upgraded to a Smart Motorway. Smart Motorway improvements are designed to reduce delays and congestion by increasing capacity, in places by as much as one third. By varying the mandatory speed limits, Highways England can manage the flow of traffic more effectively. The speed limits displayed on the motorway will take account of prevailing traffic conditions with the aim of ensuring a smooth flow of traffic, maximising capacity, with driver compliance enforced by speed cameras. This means less speeding, less tailgating and fewer rapid changes of speed⁷.
- 4.1.7 In Staffordshire alone a substantial section of the M6 motorway, from Junctions 10A-13⁸, has already been upgraded. Works to upgrade the section between M6 Junctions 13-15 are on-going and scheduled for completion in Spring 2022⁹. In addition to relieving existing traffic congestion, this major investment in new highway infrastructure will increase the resilience of the motorway network so that it is better equipped to accommodate additional traffic growth from developments and schemes.
- 4.1.8 This technical note provides an overview of highway capacity and traffic operations along the M6 motorway between Junctions 8-19. Consideration has been given to elements of the M6 motorway beyond the core section in Staffordshire (Junctions 10A-16) in order to show explicitly that the Smart Motorway improvements continue beyond Staffordshire. The next sub-section provides further details of existing traffic volumes on the M6 motorway between Junctions 10A-17, followed by a more detailed assessment of predicted HS2 Phase 2a construction traffic impacts on the M6 motorway. The final sub-section considers possible alternatives to the use of the M6 motorway for HS2 Phase 2a construction traffic.

4.2 M6 motorway capacity and traffic operations

- 4.2.1 The M6 motorway in Staffordshire is the section between Junctions 10A (M54) and 16 (Crewe). To the south of Junction 10A, the M6 leaves Staffordshire and enters

⁷ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/873000/smart-motorway-safety-evidence-stocktake-and-action-plan.pdf (page 10)

⁸ <https://www.roads.org.uk/road-schemes/m6-j10a-13-smart-motorway>

⁹ <https://highwaysengland.co.uk/projects/m6-junction-13-to-junction-15-smart-motorway/>

the West Midlands metropolitan county, and to the north at Junction 16, the M6 leaves Staffordshire and enters the county of Cheshire. This sub-section considers M6 capacity and operations on the M6 motorway from Junctions 8 to 19. The majority of this section of the M6 motorway has some form of Smart Motorway provision and therefore this sub-section begins with a brief outline of the three different types of Smart Motorway provision followed by a summary of highway capacity and operations on discrete sections of the M6 motorway between Junctions 8-19.

4.2.2 As outlined on page 19 of the *Smart Motorway Safety Evidence Stocktake and Action Plan*¹⁰, Smart Motorways can operate in one of three ways:

- Controlled Motorway (CM) with three or more lanes, a hard shoulder and variable speed limits;
- Dynamic Hard Shoulder Running (DHS) with variable speed limits and the hard shoulder selectively opened as a running lane during periods when there is a lower speed limit in force, and emergency areas at regular intervals; and
- All Lane Running (ALR) with variable speed limits, the hard shoulder converted to a permanent running lane, and emergency areas at regular intervals.

M6 motorway, Junctions 8-10a

4.2.3 The M6 motorway between Junctions 8 (M5) to 10A (M54) was upgraded to Dynamic Hard Shoulder in April 2011¹¹. When the hard shoulder is active this section of the M6 motorway has a maximum of four active traffic lanes in each direction.

M6 motorway, Junctions 10A-11A

4.2.4 This section of the M6 motorway in Staffordshire has been upgraded to Controlled Motorway and was fully operational in February 2016¹². Between Junctions 10A (M54) and 11A (M6 Toll), variable speed limits have been installed whilst the motorway carriageway remains as a dual three lane carriageway with a hard shoulder.

M6 motorway, Junctions 11A-13

4.2.5 The section of motorway between Junctions 11A (M6 Toll) and 13 (Stafford south and central) has been upgraded to All Lane Running with the hard shoulder converted to a running lane. Therefore, this stretch of the M6 motorway (11A to 13)

¹⁰ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/873000/smart-motorway-safety-evidence-stocktake-and-action-plan.pdf

¹¹ <https://www.roads.org.uk/index.php/road-schemes/m6-m40-m42-birmingham-box-atm-phases-1-and-2>

¹² <https://www.roads.org.uk/road-schemes/m6-j10a-13-smart-motorway>

is a dual four lane carriageway (all lane running, with no hard shoulder) and variable speed limits. This scheme has been operational since February 2016¹³.

M6 motorway, Junctions 13-15

- 4.2.6 Works to upgrade the M6 motorway from a dual three lane carriageway with hard shoulder to All Lane Running dual four lane carriageway (all lane running, with no hard shoulder) and variable speed limits is on-going.
- 4.2.7 Construction commenced in March 2018 and is expected to be completed by Spring 2022¹⁴. Furthermore, Highways England report that at the time of writing (July 2020) the works are 70% completed¹⁵. During the construction phase, road users are likely to experience some additional delays and congestion. However, this is a temporary impact and once the Smart Motorway is active the capacity of this section of the M6 Junctions 13 (Stafford south and central) to 15 (Stoke-on-Trent) will be increased by approximately one third.

M6 motorway, Junctions 15-16

- 4.2.8 There are no current plans to upgrade the M6 motorway between Junctions 15 (Stoke-on-Trent) to 16 (Crewe). However, the A500 (T) Queensway is part of the SRN and follows a horseshoe alignment through Stoke-on-Trent connecting Junctions 15 to 16 of the M6 motorway. Traffic to/from Stoke-on-Trent from the south will typically use Junction 15 / A500 (T) Queensway and traffic to/from the north will typically use Junction 16 A500 (T) Queensway, therefore pressure on this section of the M6 motorway reduces compared to other sections of the M6 motorway to the south and north.
- 4.2.9 The A500 (T) Queensway is a two-lane dual carriageway with grade separated junctions, with the exception of Hanchurch Interchange. The combined lane capacity of the M6 motorway and the A500 (T) Queensway between M6 Junctions 15 to 16 is five lanes in each direction.

M6 motorway, Junctions 16-19

- 4.2.10 The M6 motorway north of Junction 16 has been upgraded to All Lane Running between Junctions 16 (Crewe) and 19 (Knutsford) and this became operational from March 2019¹⁶. This section of the M6 motorway is dual four lane carriageway (all lane running, with no hard shoulder).

¹³ <https://www.roads.org.uk/road-schemes/m6-j10a-13-smart-motorway>

¹⁴ <https://highwaysengland.co.uk/projects/m6-junction-13-to-junction-15-smart-motorway/>

¹⁵ <https://highwaysengland.co.uk/projects/m6-junction-13-to-junction-15-smart-motorway/>

¹⁶ <https://highwaysengland.co.uk/projects/m6-junctions-16-19-smart-motorway/>

Summary table

4.2.11 Table 1 below provides a brief summary of highway capacity and operations including recent Smart Motorway upgrades on the M6 motorway between Junctions 8- 19.

Table 1: Summary details of Smart Motorway upgrades and capacities on the M6 motorway Junctions 8-19

M6 section	Location (county)	Smart motorway upgrade	Status of M6 upgrade	Main components of upgrade	Maximum number of active traffic lanes per carriageway
Junctions 8-10A	West Midlands	Dynamic Hard Shoulder	Operational	Hard shoulder active during busy periods, variable speed limits	Four
Junctions 10A-11A	Staffordshire	Controlled Motorway	Operational	Variable speed limits	Three
Junctions 11A-13	Staffordshire	All Lane Running	Operational	All lane running, variable speed limits	Four
Junctions 13-15	Staffordshire	All Lane Running	Under construction est. completion Spring 2022	Once opened, all lane running, variable speed limits	Currently three, four when operational.
Junctions 15-16	Staffordshire	No upgrade	Not applicable	Not applicable	Three
Junctions 16-19	Cheshire	All Lane Running	Operational	All lane running, variable speed limits	Four

4.3 Baseline traffic volumes

4.3.1 Table 2 below documents traffic volumes on the M6 motorway in Staffordshire. There are two primary sources for this information. For Junctions 13 to 17 the “2016 baseline” traffic information has been extracted from the HS2 Phase 2a Environment Statement (ES) 2017 Volume 5 Transport Assessment (TA)¹⁷. It has not however been possible to obtain observed traffic data on all sections of the M6 motorway between Junctions 10A-13. Therefore, for Junctions 10A-13, baseline information has been extracted from Highways England’s Junction 13-15 Smart

¹⁷ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627113/E62-A_TR-001-000_Part_1_WEB.pdf

Motorway Programme Model as the model is validated to observed conditions. The baseline of this traffic model is 2012.

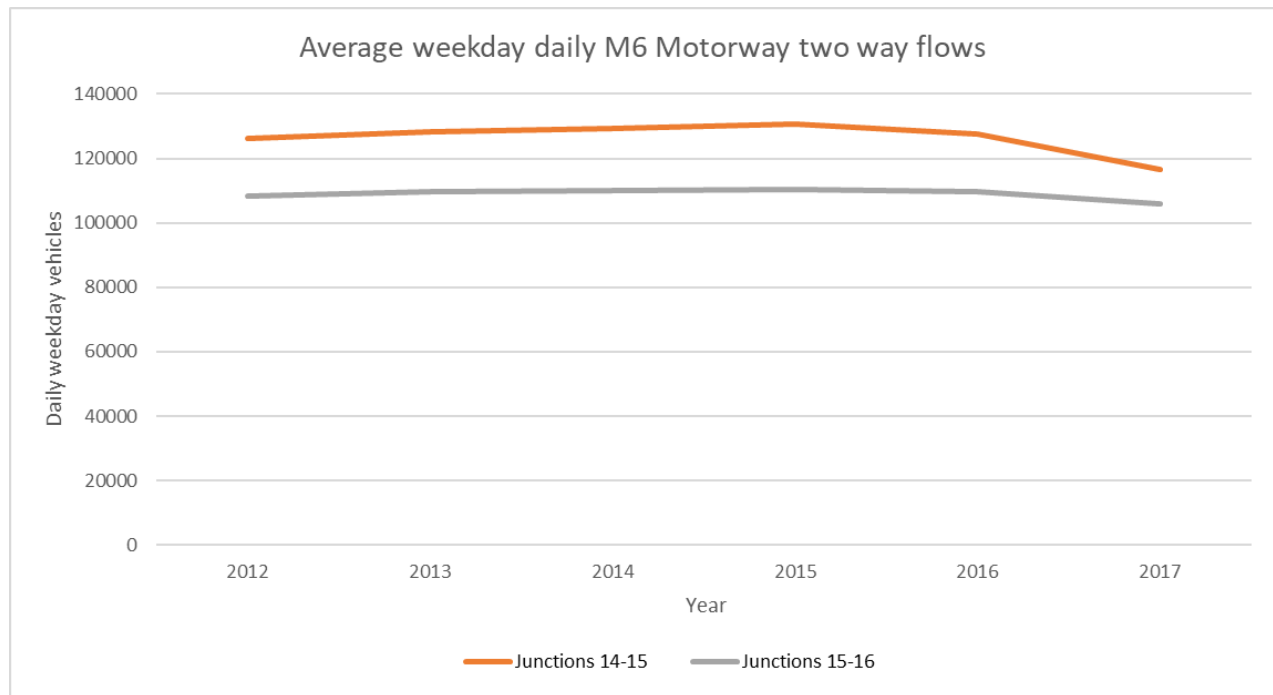
Table 2: Baseline traffic volumes on the M6 motorway, Junctions 10A-17, AM peak (08:00-09:00) and (17:00-18:00)

M6 section	Direction	Baseline year	AM peak (08:00-09:00)		PM peak (17:00-18:00)	
			All vehicles	HGVs	All vehicles	HGVs
Junctions 10A-11	NB	2012 traffic model data	3077	354	3848	380
	SB		2471	293	2934	286
Junctions 11-11A	NB		3726	423	4392	436
	SB		4060	481	4536	483
Junctions 11A - 12	NB		3729	423	4392	437
	SB		4060	482	4531	485
Junctions 12 – 13	NB		3989	460	4331	457
	SB		4199	484	4257	422
Junctions 13 – 14	NB	2016 observed data	4316	669	4148	517
	SB		3721	698	4286	674
Junction 14 - Yarnfield Ln	NB		4069	763	3938	559
	SB		3695	655	3859	648
Yarnfield Ln Junction 15	NB		4069	763	3938	559
	SB		3695	655	3859	648
Junctions 15 – 16	NB		3244	692	3343	534
	SB		3509	654	3645	645
Junctions 16 – 17	NB		3667	785	4026	619
	SB		3965	879	4391	768

4.3.2 It is recognised that the 2012 data is now eight years old. Figure 1 below has been provided to give an indication of traffic growth on the M6 motorway in Staffordshire since 2012. Figure 1 shows average weekday two-way traffic flows on the M6 motorway between Junctions 14 to 15 and Junctions 15 to 16. Average monthly traffic flows have been extracted from WebTRIS¹⁸ and then these flows have been averaged to produce a weekday yearly average. The smart motorway works on the M6 motorway between Junctions 13 to 15, which commenced in June 2018, means we are unable to provide reliable traffic data for the period 2018-2020.

¹⁸ Highways England's open data platform providing traffic flow data for external users accessed at <http://webtris.highwaysengland.co.uk>

Figure 1: Average weekday two traffic flows on the M6 motorway, 2012 to 2017



4.3.3 Figure 1 shows that there has been minimal traffic growth on the M6 motorway during the period 2012 to 2017. Traffic growth during this period, based on the data in Figure 1, is approximately on average 1% per annum. Smart motorway works on the M6 motorway in Staffordshire during this period may have impacted the level of traffic growth during this period.

4.4 HS2 Phase 2a construction traffic impact on the M6 motorway in Staffordshire

4.4.1 Table 3 and Table 4 illustrate two scenarios of future baseline traffic, and future baseline traffic with HS2 construction traffic, on the M6 motorway between Junctions 10A-17 in the AM peak (08:00-09:00) and PM peak (17:00-18:00) respectively. For Junctions 10A-13 this assessment utilises extracted future baseline traffic volumes directly from Highways England's Junction 13-15 Smart Motorway Programme Model. For M6 Junctions 13-17 future baseline traffic growth has been derived from growth rates from the same model.

4.4.2 Table 3 and Table 4 report HS2 Phase 2a construction traffic volumes during the peak month of HS2 construction. For all other months HS2 Phase 2a construction traffic would be no higher (and frequently lower) than the volumes reported in these tables. Furthermore this assessment has not taken into consideration potential reductions in HS2 Phase 2a construction traffic due to travel plan measures (such as the potential provision of buses to transport workers from hubs to work sites) and it is assumed that 50% of all workers would travel to and from work during the peak hours (08:00-09:00) and (17:00-18:00). Given that typical

weekday construction working hours will be 08:00-18:00, the vast majority of workers would need to travel to and from construction sites outside of these peak hours (08:00-09:00) and (17:00-18:00). Undertaking the assessment in this way means it represents a realistic worst-case assessment.

- 4.4.3 Table 3 and Table 4 cite theoretical motorway lane and carriageway capacities for a rural section of motorway. These are estimated highway capacities of the M6 mainline which follow the best practice guidance set out in Appendix D of Transport Analysis Guidance (TAG) Unit M3.1 Highway Assignment Modelling, May 2020¹⁹. Table 3 and Table 4 cite volume over capacity ratios for future baseline traffic on the M6 motorway and future baseline plus HS2 Phase 2a construction traffic. When designing new highway infrastructure in the UK, a general guide is that the highway scheme should be able to accommodate predicted traffic demand such that the volume over capacity ratio does not exceed the 85% threshold. Typically, a volume over capacity ratio on a highway link of 70-85% is described as 'approaching capacity', a volume over capacity ratio of 85-100% as 'at capacity' and above 100% as 'over capacity'. In Tables 3 and 4 links with volume over capacity ratio of less than 70% are coloured green; links with a volume over capacity ratio between 70-85% are coloured amber and links with a volume over capacity ratio of more than 85% are coloured red. Note in Table 3 the southbound link between Junctions 15-16 has a value of 70% as this figure has been rounded up. The actual value to one decimal place is 69.8% and as this is less than 70% this link has been coloured green. The same logic applies to the southbound link between Junction 12-13 in Table 4.

¹⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/888363/tag-unit-m3.1-highway-assignment-modelling.pdf

Table 3: Future baseline and HS2 construction traffic volumes on the M6 motorway J10A-17 and % of capacity used by future baseline and HS2 construction traffic, AM peak (08:00-09:00)

M6 section (midpoint between junctions)	Direction	2023 Baseline		2023 with HS2		With HS2 % change from 2023 baseline		Maximum number of active traffic lanes	Theoretical capacity of carriageway (vehicles per hour) without HS2 traffic	Theoretical capacity of carriageway (vehicles per hour) with HS2 traffic	% Volume / capacity ratio without HS2 traffic	% Volume / capacity ratio with HS2 traffic	% capacity used by HS2 traffic in peak month
		All vehicles	HGVs	All vehicles	HGVs	All vehicles	HGVs						
J10A-11	NB	3761	377	4089	483	8.7	28.2	3	6076	5938	62	69	7.0
	SB	2867	319	2989	425	4.3	33.3	3	5990	5761	48	52	4.0
J11-11A	NB	3791	436	4038	527	6.5	20.8	3	5962	5846	64	69	5.5
	SB	2878	443	2980	534	3.6	20.5	3	5679	5510	51	54	3.4
J11A - 12	NB	4893	509	5140	600	5.1	17.9	4	8062	7932	61	65	4.1
	SB	4969	566	5071	657	2.1	16.1	4	7960	7804	62	65	2.6
J12 – 13	NB	4850	490	5161	597	6.4	21.9	4	8093	7942	60	65	5.1
	SB	5095	520	5217	627	2.4	20.6	4	8083	7896	63	66	3.0
J13 – 14	NB	4751	736	4990	843	5.0	14.5	4	7563	7436	63	67	4.3
	SB	4136	776	4375	883	5.8	13.8	4	7273	7154	57	61	4.3
J14 - Yarnfield Lane	NB	4525	848	4727	941	4.5	11.0	4	7275	7177	62	66	3.7
	SB	4079	723	4281	817	5.0	13.0	4	7363	7246	55	59	3.7
Yarnfield Lane J15	NB	4525	848	4768	980	5.4	15.6	4	7275	7124	62	67	4.7
	SB	4079	723	4322	856	6.0	18.4	4	7363	7185	55	60	4.7

M6 section (midpoint between junctions)	Direction	2023 Baseline		2023 with HS2		With HS2 % change from 2023 baseline		Maximum number of active traffic lanes	Theoretical capacity of carriageway (vehicles per hour) without HS2 traffic	Theoretical capacity of carriageway (vehicles per hour) with HS2 traffic	% Volume / capacity ratio without HS2 traffic	% Volume / capacity ratio with HS2 traffic	% capacity used by HS2 traffic in peak month
		All vehicles	HGVs	All vehicles	HGVs	All vehicles	HGVs						
J15 – 16	NB	3613	770	3918	903	8.4	17.3	3	5297	5194	68	75	7.2
	SB	3815	711	4120	844	8.0	18.7	3	5463	5347	70	77	7.2
J16 – 17	NB	4057	869	4416	976	8.8	12.3	4	7054	7000	58	63	5.6
	SB	4293	879	4651	986	8.3	12.2	4	7130	7071	60	66	5.6

Table 4: Future baseline and HS2 construction traffic volumes on the M6 motorway J10A-17 and % of capacity used by future baseline and HS2 construction traffic, PM peak (17:00-18:00)

M6 section (midpoint between junctions)	Direction	2023 Baseline		2023 with HS2		With HS2 % change from 2023 baseline		Maximum number of active traffic lanes	Theoretical capacity of carriageway (vehicles per hour) without HS2 traffic	Theoretical capacity of carriageway (vehicles per hour) with HS2 traffic	% Volume / capacity ratio without HS2 traffic	% Volume / Capacity ratio with HS2 traffic	% capacity used by HS2 traffic in peak month
		All vehicles	HGVs	All vehicles	HGVs	All vehicles	HGVs						
J10A-11	NB	4691	411	4813	517	2.6	25.8	3	6178	6020	76	80	4.0
	SB	3472	321	3800	427	9.4	33.1	3	6139	5981	57	64	7.0
J11-11A	NB	4207	376	4309	467	2.4	24.2	3	6164	6013	68	72	3.4

M6 section (midpoint between junctions)	Direction	2023 Baseline		2023 with HS2		With HS2 % change from 2023 baseline		Maximum number of active traffic lanes	Theoretical capacity of carriageway (vehicles per hour) without HS2 traffic	Theoretical capacity of carriageway (vehicles per hour) with HS2 traffic	% Volume / capacity ratio without HS2 traffic	% Volume / Capacity ratio with HS2 traffic	% capacity used by HS2 traffic in peak month
		All vehicles	HGVs	All vehicles	HGVs	All vehicles	HGVs						
	SB	3411	483	3665	574	7.4	18.8	3	5765	5660	59	65	5.6
J11A - 12	NB	5733	472	5835	563	1.8	19.3	4	8296	8142	69	72	2.6
	SB	5691	524	5945	615	4.5	17.3	4	8189	8068	69	74	4.2
J12 – 13	NB	5177	486	5298	593	2.3	22.0	4	8170	7980	63	66	3.0
	SB	5334	446	5653	553	6.0	24.0	4	8281	8127	64	70	5.1
J13 – 14	NB	4631	577	4863	685	5.0	18.7	4	7852	7694	59	63	4.2
	SB	4767	750	5000	857	4.9	14.3	4	7540	7414	63	67	4.2
J14 - Yarnfield Lane	NB	4389	623	4557	716	3.8	14.9	4	7684	7542	57	60	3.3
	SB	4281	718	4449	812	3.9	13.1	4	7447	7317	57	61	3.3
Yarnfield Lane J15	NB	4389	623	4598	755	4.8	21.2	4	7684	7478	57	61	4.4
	SB	4281	718	4490	851	4.9	18.5	4	7447	7257	57	62	4.4
J15 – 16	NB	3745	598	4050	730	8.1	22.1	3	5639	5502	66	74	7.2
	SB	4047	716	4352	849	7.5	18.6	3	5524	5408	73	80	7.2
J16 – 17	NB	4406	678	4724	785	7.2	15.8	4	7572	7460	58	63	5.1
	SB	4841	846	5159	953	6.6	12.6	4	7384	7298	66	71	5.1

- 4.4.4 Table 3 and Table 4 show that, in the future baseline plus HS2 Phase 2a construction traffic scenario, traffic is not predicted to exceed the 85% threshold above which the M6 motorway would typically be considered to be operating at capacity. The minimum predicted headroom between this 85% threshold and the future baseline plus HS2 Phase 2a construction traffic scenario is 5% and generally it is circa 15-20%. Furthermore, the final column of both tables shows that during the peak month of construction HS2 Phase 2a construction traffic is no greater than 7.2% of the theoretical capacity of the M6 motorway between Junctions 10A-17 in both the AM (08:00-09:00) and PM (17:00-18:00) peak hours.
- 4.4.5 Average speeds on motorways will typically tend to decline once the volume over capacity exceeds the 50% threshold. However, given that the M6 motorway is already predominantly Smart Motorway (and the section between M6 Junctions 13-15 is expected to become Smart Motorway by Spring 2022) the actual speed limit on the motorway will be controlled and set at level that is safe and appropriate for the actual traffic volumes. Table 3 and Table 4 illustrate that the future baseline plus HS2 Phase 2a construction traffic is typically circa 15-20% below the 85% at capacity threshold and that HS2 Phase 2a construction traffic uses no more than 7.2%²⁰ of the theoretical highway capacity. Given this the addition of HS2 Phase 2a construction traffic is not expected to have a substantial impact on travel times. It should also be noted that the peak month and busy period for HS2 Phase 2a construction traffic will commence once the M6 Smart Motorway works between Junctions 13-15 are completed.
- 4.4.6 As explained previously the HS2 Phase 2a construction traffic volumes in Table 3 and Table 4 and construction volumes reported elsewhere in the SES2 and AP2 ES, Volume 5 TA²¹ are peak month construction traffic volumes. However, for the majority of the construction period, HS2 Phase 2a construction flows using the M6 motorway and other highways would be substantially lower.
- 4.4.7 Figure 2 below is a construction traffic histogram which shows average daily Phase 2a Heavy Goods Vehicle (HGV) combined two-way construction traffic volumes on the M6 motorway between Junctions 11 and 12²². The transport assessment for this environmental statement had assumed a construction start date of first quarter 2020. However, the profile of construction traffic movements across the HS2 construction period is not expected to be materially different, albeit with a different start date associated with a delay in Royal Assent for the Phase 2a hybrid Bill.

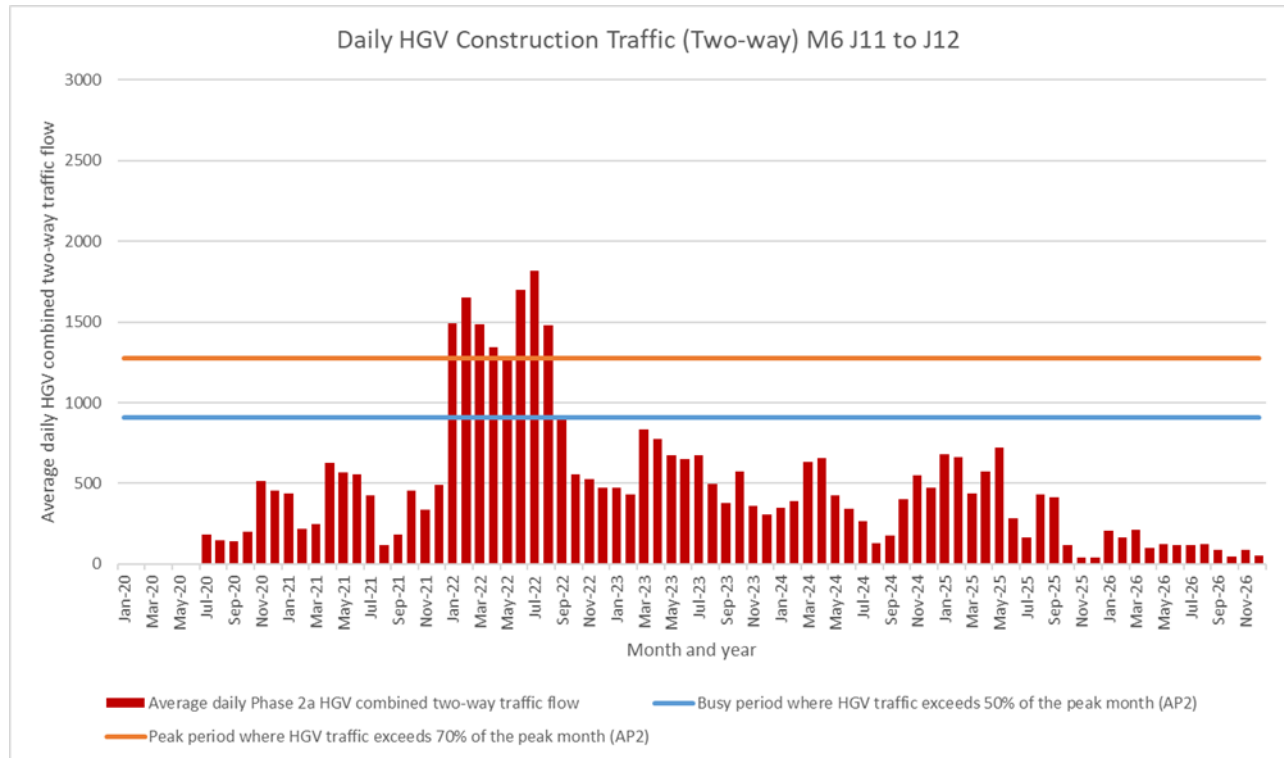
²⁰ A previous assessment using then current guidance on calculating highway capacities set out in Design Manual for Roads and Bridges (DMRB) TA46/97, indicated that HS2 Phase 2a construction traffic during the peak month using no more than approximately 5% of the link capacity. DMRB TA46/97 guidance was superseded by TAG Unit M3.1 in May 2020.

²¹

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/776242/J49_1_HS2_Phase_2a_AP2_ES_Volume_5_Transport_assessment_Part_1.pdf

²² Note that histograms reported in this section are based on the SES2 and AP2 ES that was published in February 2019

Figure 2: HS2 Phase 2a HGV construction traffic histogram M6 motorway Junctions 11-12

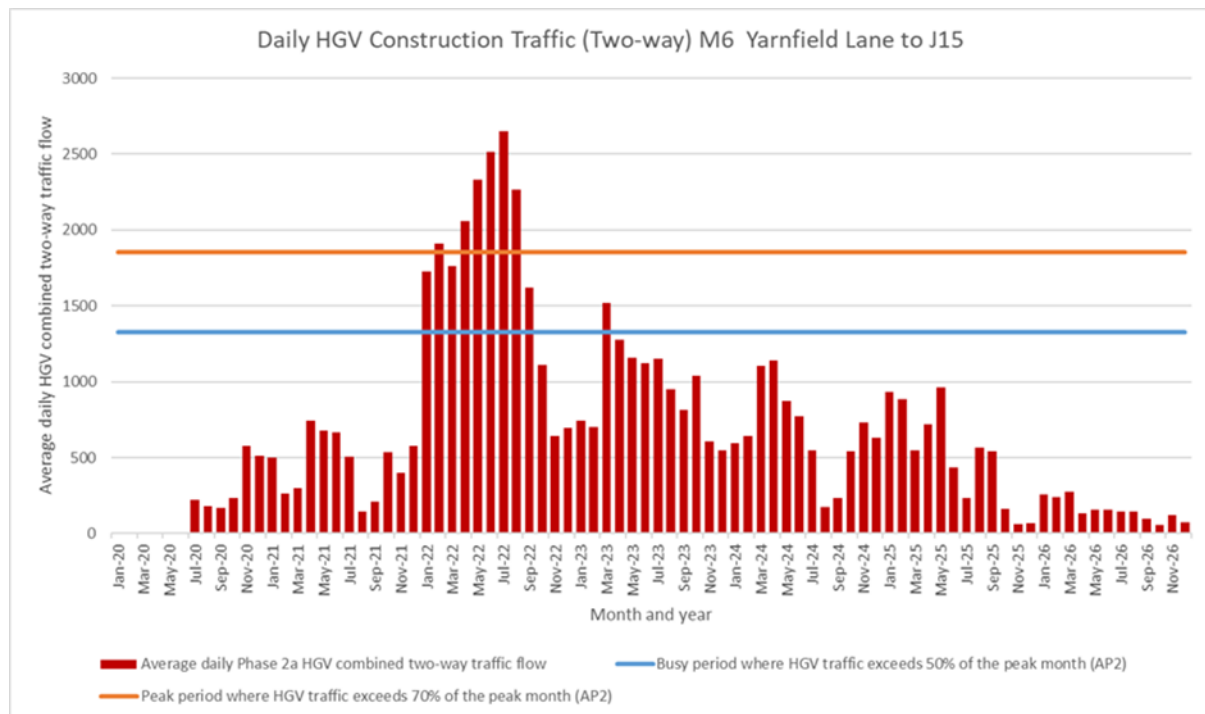


4.4.8 Figure 2 illustrates graphically the substantial variation in HS2 Phase 2a HGV construction traffic during the construction period. On this section of the M6 motorway the average daily combined two-way HGV flows during the peak month is 1,818 HGVs. The peak period duration (where HGV traffic exceeds 70% of the peak month flow) is eight months and the busy period (where HGV traffic exceeds 50% of the peak month flow) is nine months. Although the overall construction period is expected to last seven years, Figure 2 shows that the nine month busy period represents approximately 10% of the total construction period.

4.4.9 Figure 2 also indicates that the busy period of construction traffic on this section of the M6 motorway is predicted to commence approximately two years after the start of the construction period. The majority of the traffic generated during the nine month busy period is associated with the movement of excavated material. Having a relatively short busy period should make it easier to co-ordinate with any other highway works on the M6 motorway, such as the proposed M54-M6 Link Road, so that the two construction activities do not overlap i.e. peaks in HS2 traffic do not coincide with other disruption impacts on the motorway wherever reasonably practicable. HS2 will work with Highways England and other stakeholders to co-ordinate highway works in order to keep disruption to a minimum wherever reasonably possible.

4.4.10 Figure 3 below is a construction traffic histogram which shows average daily Phase 2a HGV combined two-way construction traffic volumes on the M6 motorway between the proposed slip roads at Yarnfield Lane and M6 Junction 15.

Figure 3: HS2 Phase 2a HGV construction traffic histogram M6 motorway Yarnfield Lane slips to Junction 15

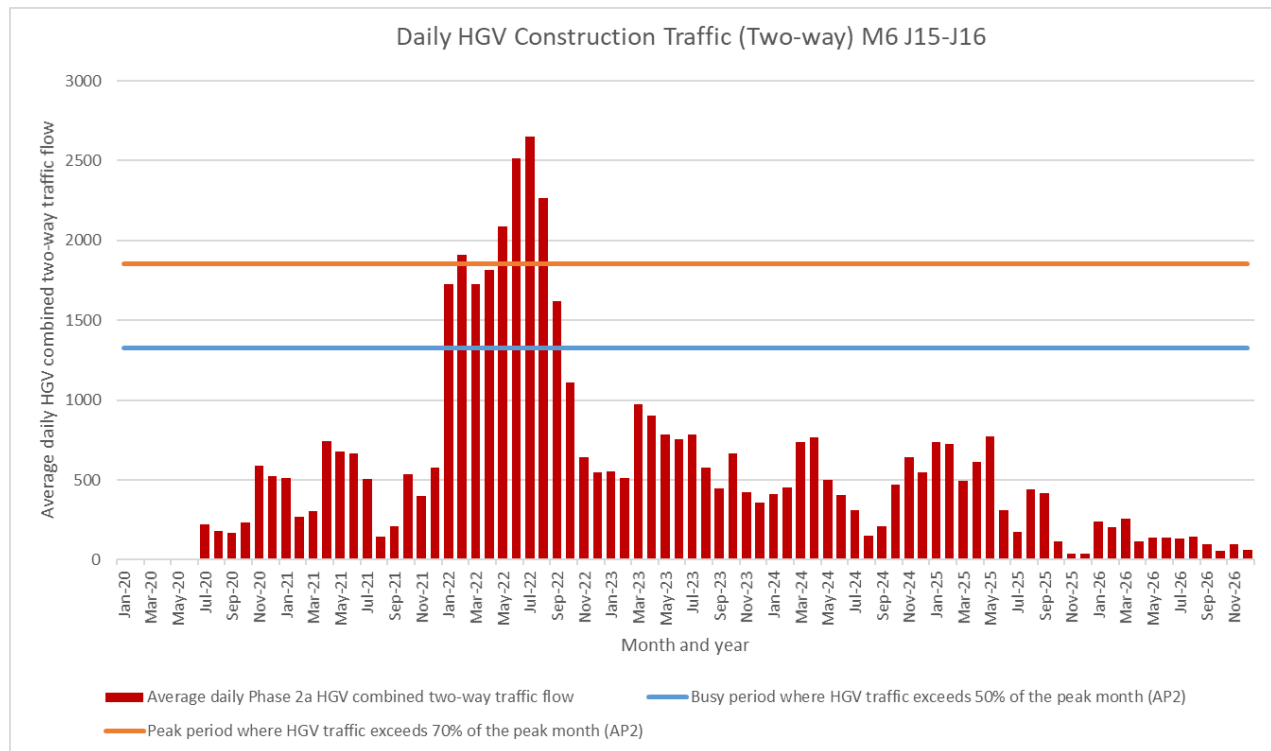


- 4.4.11 Figure 3 shows an average daily combined two-way HGV flow during the peak month of 2650 HGVs, a peak period duration of six months, and a busy period of ten months.
- 4.4.12 Figure 3 indicates that the busy period of construction traffic is predicted to commence approximately two years after the start of the construction period which would occur once the new M6 slip roads near Yarnfield Lane have been constructed. Therefore, if Royal Assent is granted this year, in late 2020, and HS2 construction commences in the first quarter of 2021, then the busy period might commence in early 2023 which would be around six to nine months after the estimated completion date for the M6 Junction 13-15 Smart Motorway works. Once the Smart Motorway works are completed the M6 motorway in Staffordshire between Junctions 11A-15 will become a dual four lane carriageway in both directions (all lane running, with no hard shoulder).
- 4.4.13 Figure 3 shows that there would be some HS2 phase 2a construction traffic using the M6 motorway during the period in which the new M6 slip roads are constructed near Yarnfield. However, HS2 Phase 2a construction traffic flows on the M6 motorway during this period are much lower than the peak and busy periods. Construction activities during the earlier phases of construction will include survey work, site set up, the movement of utilities and enabling works. Such activities generate lower traffic volumes than the major civils works such as the movement of excavated materials. Figure 3 shows traffic volumes in the second quarter of 2021 approximating to 25-28% of peak month traffic volumes. If we apply such factors to the HS2 Phase 2a peak month construction volumes in Tables 3 and 4

above, then HS2 Phase 2a construction volumes during the period of the new M6 slips works would be no higher than 70 vehicles per carriageway during the peak hours. Traffic volumes of 70 vehicles fall within the typical peak period daily variation of traffic on the M6 motorway. The cumulative assessment of the impact of HS2 traffic and traffic management measures will be carried out and delivered as part of HS2's regular collaborative working with Highways England. This assessment will be done to inform the development of HS2 proposals and enable the impacts to be fully understood in advance of the details being finalised.

4.4.14 Figure 4 below is a construction traffic histogram which shows average daily Phase 2a HGV combined two-way construction traffic volumes on the M6 motorway between Junctions 15 and 16.

Figure 4: HS2 Phase 2a HGV construction traffic histogram M6 motorway Junctions 15-16



4.4.15 On this section of the M6 motorway the average daily combined two-way HGV flows during the peak month is 2,650 HGVs. The peak period duration (where HGV traffic exceeds 70% of the peak month flow) is five months and the busy period (where HGV traffic exceeds 50% of the peak month flow) is nine months.

4.5 Alternative options

4.5.1 There are in principal two alternatives that could reduce use of the M6 motorway and these are as follows:

- Rail; and

- Alternative highway routes.

Rail

- 4.5.2 The working assumption for the Phase 2a scheme, based on the AP2 design, is that all surplus excavated material generated by the scheme near Stone would be exported from Stone via road as opposed to rail, including via the Yarnfield North embankment transfer node to the M6 slips. As such the SES2 and AP2 ES represents a reasonable worst-case assessment in terms of traffic impact.
- 4.5.3 The opportunity to use rail export has however been considered as an alternative to road export for exporting surplus excavated material off-site. Having explored the potential for construction of temporary railhead locations along the route, only the Norton Bridge to Stone Railway (NBS) connection to Network Rail and associated sidings would have the potential to be used as a railhead for rail export of surplus excavated material, subject to overcoming a number of challenges. As part of the ongoing design development process this opportunity will be assessed in more detail in accordance with an assurance given by the Promoter to Staffordshire County Council to explore, as far as is reasonably practicable, options for maximising the volume of excavated material removed via the Stone Railhead.
- 4.5.4 There are a number of constraints to using the NBS connection to Network Rail as a means of transporting surplus excavated material by rail. These include:
- Opportunities for rail transport of surplus excavated materials would be dependent upon the programme for construction, the periods when the surplus is generated and the availability of the rail infrastructure as well as the availability and cost of train paths on the rail network;
 - The AP2 construction programme assumed that the vast majority of surplus excavated materials would be generated prior to the installation of the connection to the Norton Bridge to Stone line by Network Rail which was planned for 2024. On this basis, surplus excavated materials would either need to be stockpiled on site pending future removal by rail, or removed by road as they are generated (as is currently proposed in AP2);
 - It is estimated that approximately 234,000m³ of surplus excavated material (out of the total for AP2 of 790,783m³) could be exported by rail if a single siding were to be available from 2023. This scenario would require a stockpiling area of circa 4ha and this scenario would involve additional double handling of materials. There may be opportunities for this additional on-site storage area to be provided within the land available. This would require further environmental assessment for the storage activity; and
 - Unless a disposal/restoration site with a suitable rail off-loading/handling facility is identified that could receive some or all of the surplus excavated material that will be generated by the HS2 Phase 2a scheme, additional road haul would be

required at the disposal destination to transport the surplus excavated material from the nearest available railhead to the disposal site. This would reduce the efficiency of rail export and result in the generation of additional road traffic.

- 4.5.5 In accordance with HS2's assurance to Staffordshire County Council once appointed the contractors will review the opportunity for increased export of surplus materials by rail. Once the railhead is established, if suitable train paths are available then suitable disposal sites will be investigated that are financially and environmentally viable potentially enabling construction traffic to be reduced.

Alternative highway routes

- 4.5.6 If less construction traffic were to use the M6 motorway this would require greater use of the more local road network. Using the local road network to route more HS2 Phase 2a construction traffic would create greater traffic impacts and effects on the local road network. It should be noted that using the local network could not in practice entirely remove the need for the vehicles to use the SRN.
- 4.5.7 Using the local road network would generally have greater impacts on the local populations. The Promoter has offered assurances to Staffordshire County Council to complete the new slip roads at Yarnfield as soon as reasonably practicable so as to reduce the impact of HS2 construction traffic on the local road network. Using the SRN to route HS2 Phase 2a construction traffic has less impact on local populations.

5 Sequencing of works on the M6 motorway

- 5.1.1 As part of the Proposed Scheme, HS2 have set out indicative plans for sequencing construction works including the civils works involving new slips roads that would access the M6 motorway at Yarnfield Lane and a viaduct over the M6 motorway at Meaford.
- 5.1.2 HS2 has engaged and will continue to engage with Highways England and other local authorities, including Staffordshire County Council as the local highway authority, to progress the Proposed Scheme. Proposed HS2 works will be co-ordinated with the existing M6 J13- 15 Smart Motorway works, and other planned works in the area in order to reduce, as far as reasonably practicable, potential disruption to road users and to manage situations where HS2 works may be concurrent with other planned works on the strategic and local networks, or where works may affect potential diversionary routes.
- 5.1.3 At this stage of the project the detailed design process has not commenced. The detailed design process will commence once Royal Assent has been granted. Taking

into account delays in the completion of the Phase 2a hybrid Bill House of Lords committee hearings, it is currently anticipated that this would be sometime in late 2020 or early 2021. After Royal Assent, detailed construction phasing plans and information will be developed to sequence the works, liaising with Highways England, and Staffordshire County Council as the relevant local highway authority.

- 5.1.4 After Royal Assent has been granted HS2 will be able to establish the start of the programme for mobilisation and construction works. At the time of writing (July 2020), the completion date for the M6 Junctions 13-15 Smart Motorway improvements is estimated to be in Spring 2022²³. It is possible therefore that some elements of the detailed planning, and construction of early works for HS2 required for slip roads to the M6 motorway near Yarnfield Lane may overlap with the completion of the implementation of the Highways England M6 Smart Motorway works between Junction 13 and 15. The current indicative HS2 Phase 2a AP2 construction programme assumes that the works to construct the M6 slips would commence on site approximately nine months following the start date of the HS2 Phase 2a mobilisation (see Appendix A for construction sequencing). Construction of the new slip roads (as part of the HS2 Phase 2a Proposed Scheme) could require closures of the nearside M6 lane 1 in both directions, to enable the slip roads to be safely connected to the motorway mainline. For periods of this work there would be three (out of four) active traffic lanes in both directions in the vicinity of Yarnfield Lane during the period in which the slip roads are connected to the M6 mainline.
- 5.1.5 Construction phasing and planning to date indicates that the new M6 slip roads could be completed within a period of up to nine months. During this period, we would expect both carriageways to maintain a minimum three lanes for general traffic in each direction throughout the day. This is subject to detailed design, construction methodologies and the location specific complexities of introducing new slip roads into an operational Smart Motorway. Occasionally additional carriageway space may be required for larger plant or for the safety of the operational motorway. Some off peak, typically 22:00-05:00 hours, overnight temporary carriageway restrictions would be required, with single lane running in either or both directions, dependent upon the work being undertaken, commencing late in the evening with full capacity restored ahead of the morning peak.
- 5.1.6 Construction of the new Yarnfield Lane M6 overbridge is assumed to require only one weekend of total closure of the M6 motorway between Junctions 14 and 15, to enable installation of the main structure of the replacement bridge over the motorway. Diversion routes will be put in place so that motorists are routed via a suitable alternative, in this instance the A34 dual carriageway, with motorists then able to gain access to the M6 motorway at the next junction. Once the main beams are installed, off peak overnight carriageway restrictions would be required to

²³ <https://highwaysengland.co.uk/projects/m6-junction-13-to-junction-15-smart-motorway/>

install the new concrete deck. Works of this nature would typically take around six months. The majority of the off-peak overnight carriageway restrictions would occur at the beginning and end of this period to install/remove the temporary equipment that supports the reinforcing steel and concrete before it has gained its strength. This temporary equipment also provides a safe platform for the construction operatives and the traffic on the operational motorway. These works will not necessarily occur during the same period as that to construct the new M6 slip roads.

- 5.1.7 Demolition of the existing Yarnfield Lane M6 overbridge will require some off peak overnight temporary carriageway restrictions. This would be required for preparatory works in advance of the demolition as well as for finishing works after the demolition. The bridge demolition itself is expected to require just one weekend total closure between M6 Junctions 14 and 15. The demolition of the existing Yarnfield Lane M6 overbridge will occur a number of years after the opening of the new proposed Yarnfield Lane M6 overbridge.
- 5.1.8 As part of the AP2 revised scheme the design of the Meaford viaduct has been amended so that the bridge over the M6 motorway would now be a single span bridge over the M6 motorway as opposed to a double span bridge. A visual representation of the proposed bridge structure spanning the M6 motorway is shown in Figure 5. The requirement for a bridge support between the northbound and southbound motorway carriageways has been removed through this change from a double span to a single span structure. This means that the M6 southbound carriageway would no longer have to be realigned to accommodate the proposed viaduct. Installation of the viaduct is expected to require one weekend closure between M6 Junctions 14 and 15.

Figure 5: Visual representation of the HS2 Phase 2a M6 Meaford viaduct incorporating a single span bridge over the M6 motorway



- 5.1.9 The contractor will be required to produce local traffic management plans that will aim to manage any disruption during the construction period. HS2 and its contractors will work collaboratively with the relevant highway authorities and other stakeholders to agree such plans. Managing disruption will involve sequencing highway works so that diversion routes are not disrupted at the same time by HS2 and other construction works, as far as is reasonably practicable.
- 5.1.10 Efficient highway access to the M6 motorway is considered to be essential as it reduces construction traffic on local roads by keeping it on the more appropriate strategic road network. The proposed M6 motorways slips at Yarnfield Lane would be implemented and operational in advance of the busy and peak construction traffic periods commencing in this community area.
- 5.1.11 Finally, the timing of any highway closures or highway capacity reductions will need to be agreed with the relevant highway authorities and other key stakeholders with mandatory advanced notice given of any closures and restrictions to affected road users in accordance with the framework set out in the HS2 phase 2a information

paper E3: Management of traffic during construction²⁴. A recent example from the construction of HS2 Phase 1 is the temporary weekend closure of the M42 motorway in Solihull between Junctions 6 and 7A (northbound) and 7 and 6 (southbound) to install a new bridge. HS2 and their appointed contractor worked closely with Highways England and affected local authorities for over 12 months to plan the closures and minimise disruption for the local community and the travelling public. Work to install this 65m bridge spanning the motorway was completed in just two days and ahead of schedule as the motorway reopened to users 22 hours earlier than planned²⁵.

6 Consideration and assessment of cumulative impacts

6.1 Introduction

- 6.1.1 As part of the Phase 2a AP2 Environmental Statement (ES) Transport Assessment (TA) HS2 considered cumulative impacts of other developments and transport schemes in combination with the traffic impacts of HS2 Phase 2a. Part of this assessment process involved extensive engagement with relevant planning and highway authorities including Staffordshire County Council (SCC) and Highways England (HE) to ensure that the TA captured appropriate cumulative impacts from other developments and transport schemes.
- 6.1.2 For HS2 Phase 2a the approach for capturing the impact of traffic growth associated with developments follows well established methodologies when assessing impact and is consistent with national and local policy and guidelines (see Section 2 and 3 of the Hs2 Phase 2a Environment Statement (ES) 2017 Volume 5 TA²⁶, for further details). The methodology includes a consideration of published Local Plans and development plan allocations which set out an area's anticipated future growth including both location and type of development. As a minimum, the traffic growth associated with these Local Plans is included within the transport assessment.
- 6.1.3 Local Plans provide the over-arching growth anticipated in an area but do not necessarily deal with local site-specific characteristics which are usually dealt with at the time a specific development site applies for planning permission. Therefore, the transport assessment methodology then goes on to further consider, where

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/828980/E3_Management_of_Traffic_During_Construction_v1.2.pdf

²⁵ <https://mediacentre.hs2.org.uk/news/hs2-installs-new-modular-bridge-over-m42-in-just-two-days>

²⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627113/E62-A_TR-001-000_Part_1_WEB.pdf

specific sites have developed more detailed proposals, the local impact of these in context to the proximity of the development and any interface with the HS2 scheme.

- 6.1.4 In addition to sites that are allocated within Local Plans, it is recognised that other development proposals may come forward which are over and above those considered as allocated. For these sites, factors including location, a likelihood of the development proceeding, timing, size, and the specific requirements of the relevant highway authority, have to be considered.
- 6.1.5 Furthermore, HS2 has worked in partnership with highway authorities that have developed their own area wide network traffic models. These network models have been used as tools to aid the understanding of Local Plans or the traffic assessment of transport schemes and developments, to ensure that these have been considered. As an example, to assess impacts along the M6 motorway, HS2 has used Highways England's Smart Motorway Programme SATURN model for Junctions 13 to 15. This model includes a number of other 'near certain' and 'more than likely to occur' developments and schemes in the local vicinity. For the town of Stafford and, in particular along the A513 Beaconside corridor, SCC's Stafford SATURN²⁷ model has been used to capture the combined cumulative impact of the substantial planned housing growth and HS2 construction traffic.
- 6.1.6 The approach to determining whether a development or scheme should be considered as relevant to the cumulative assessment is summarised in section 6.2 below. Sections 6.3 deals with the use of Highway England's Smart Motorway Programme M6 J13-15 Model and considers the likely impact, both from traffic generation and disruption due to highway construction works, of the M54-M6 Link Road and the West Midlands Strategic Rail Freight Interchange (SRFI).

6.2 Considerations for incorporating other developments and schemes as part of the Phase 2a AP2 Environmental Statement Transport Assessment

Location

- 6.2.1 Traffic volumes generated by developments will typically be at their highest at the primary access point(s) to the development. Then with increasing distance from a development the volume of traffic will tend to reduce as traffic movements disperse along multiple routes. Therefore, the traffic impact of a development typically decreases with increasing distance from its location. Consequently, when assessing development / scheme traffic impacts, a study area is first defined in which it is appropriate, generally because of geographical proximity, to capture

²⁷ SATURN (Simulation and Assignment of Traffic to Urban Road Networks) is a suite of software programs that calculates traffic assignments on road networks.

detailed local traffic impacts. Beyond this defined study area it is considered that the traffic impact of developments will be appropriately captured within general traffic growth included within the assessment.

- 6.2.2 In summary, when considering other developments and schemes to include as part of any cumulative assessment, the location of each development is vitally important. One has to determine if the development or scheme will have sufficient impact in the study area of HS2 Phase 2a to be considered worthy of inclusion in addition to general traffic growth projections. Typically, developments and schemes within one km of the proposed HS2 route alignment and/or developments located on or in close proximity to a proposed construction traffic route will always be considered.

Likelihood of development

- 6.2.3 Typically, a proposed development or scheme will only be considered as part of a cumulative assessment if there is a likelihood that the development or scheme will take place. For instance, a development with a valid planning permission and/or on a site in an adopted local plan would be typically included for consideration.

Timing

- 6.2.4 The timing of any development or scheme is equally important to consider. For instance, if a highway scheme is planned but its construction and operation does not coincide with HS2's planned construction then such a scheme would not need to be considered as part of any assessment. Where timing is less certain, a development may be included on a precautionary basis to ensure a robust assessment.

Size

- 6.2.5 The size of a development or scheme matters and therefore small developments such as small housing developments which do not generate traffic above a defined threshold may be excluded. As noted above, the greatest impact with a development will be closest to the site and the traffic impact of a development typically decreases with increasing distance from its location. For a small site, the impact is not expected to make any material difference beyond its immediate site access.

Highway authority request

- 6.2.6 Throughout the assessment period HS2 have undertaken regular engagement with affected highway authorities and other stakeholders. There is flexibility to adapt the general approach where necessary to address reasonable and legitimate requests from an affected highway authority. As an example, the Stafford SATURN

model was used to capture background traffic growth from planned housing growth on land north of Stafford. Staffordshire County Council (SCC) requested this approach, instead of the use of TEMPro²⁸ to predict background traffic growth. SCC considered that TEMPro was not suitable for estimating background traffic growth along the A513 Beaconside corridor, where development was concentrated, and the traffic model would be a far more accurate and robust tool for predicting background traffic growth.

The M54-M6 Link Road and West Midlands SRFI

- 6.2.7 Neither the M54-M6 link Road nor the West Midlands SRFI were included within the approved temporal scope of the HS2 Phase 2a Bill traffic assessment.
- 6.2.8 A list of developments and transport schemes that have been included in the traffic assessment as documented in Appendix D. Appendix D also refers to those developments and schemes that were incorporated into the two traffic models: Highways England's Smart Motorway Programme (SMP) M6 Junctions 13 to 15 Model used to assess impacts and effects on the M6 motorway and the Stafford SATURN model used to determine background traffic growth on the A513 Beaconside in Stafford.

6.3 Use of Highways England's Smart Motorway Programme (SMP) M6 Junctions 13 to 15 Model

- 6.3.1 This model was initially developed by Highways England and their appointed consultants to support the business case for Smart Motorway improvements on the M6 between Junctions 13 – 15. In agreement with Highways England it has subsequently been used as part of the HS2 Phase 2a traffic assessment to assess traffic impacts and effects on the M6 motorway.
- 6.3.2 The forecast models include future proposed developments and schemes located within the model study area. The process for determining which proposed schemes and developments are included in the forecast models is referred to as the uncertainty log classification²⁹. Only those developments and schemes which have been classified as either 'near certain' or 'more than likely' are included in the future baseline traffic model referred to as the reference case model.
- 6.3.3 The uncertainty log classification was developed in conjunction with Highways England and affected local highway authorities.

²⁸ Trip End Model Presentation Program provided by the Department for Transport and used to forecast traffic growth

²⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/275637/webtag-tag-unit-m4-forecasting-and-uncertainty.pdf

- 6.3.4 This model has been used by HS2 to assess HS2 construction traffic impacts on links and junctions in the HS2 study area between M6 Junctions 14-16. The approach to assessing impacts along the M6 motorway was agreed with Highways England as was the use of their traffic model.
- 6.3.5 The model does include multiple schemes and developments, but it does not include the M54-M6 link road nor the West Midlands Strategic Rail Freight Interchange (SRFI). As neither the M54-M6 Link road scheme nor the West Midlands SRFI were included as part of the transport assessment (for the reasons summarised above) the following sub-sections provide further commentary on their potential traffic impacts and whether such impacts will be substantial and thus merit more detailed consideration.

6.4 M54 - M6 Link Road

The M54 – M6 Link Road scheme is included in a list of schemes planned to be constructed for the Highways England road investment period from 2020 to 2025 (see Road Investment Strategy (RIS) 2³⁰). For this specific scheme this means that construction of the Link Road is expected to commence before the 1st April 2025, but it will not necessarily be open by that date. A plan showing the general arrangement of the scheme is shown in Appendix B. This scheme plan has been extracted from the Highways England website³¹. Highways England's website also refers to a proposed start date for construction of 2021 with a target completion date in 2024. The Secretary of State is expected to decide on the Development Consent Order (DCO) application for this new link road at some point in 2021 and therefore it is still not certain that the scheme will proceed.

- 6.4.1 The purpose of this scheme is to provide a direct link from the M54 motorway at Junction 1 to the M6 motorway at Junction 11. The scheme is located in the district of South Staffordshire which borders the West Midlands conurbation, with the city of Wolverhampton located to the south and the town of Cannock located to the north. Currently there are high volumes of strategic traffic using local roads, primarily the A460 corridor which passes through Featherstone and Shareshill, or alternatively the A449 (T) Stafford Road and A5 (T) Watling Street. Once constructed the new link road would reduce traffic primarily on these roads in South Staffordshire.
- 6.4.2 Assuming the DCO application is consented, the M54 -M6 Link Road when operational is unlikely to substantially increase traffic flows on the M6 motorway between Junctions 14 and 16 or any other HS2 construction traffic routes in a way which would affect the future baseline used in the transport assessment. The

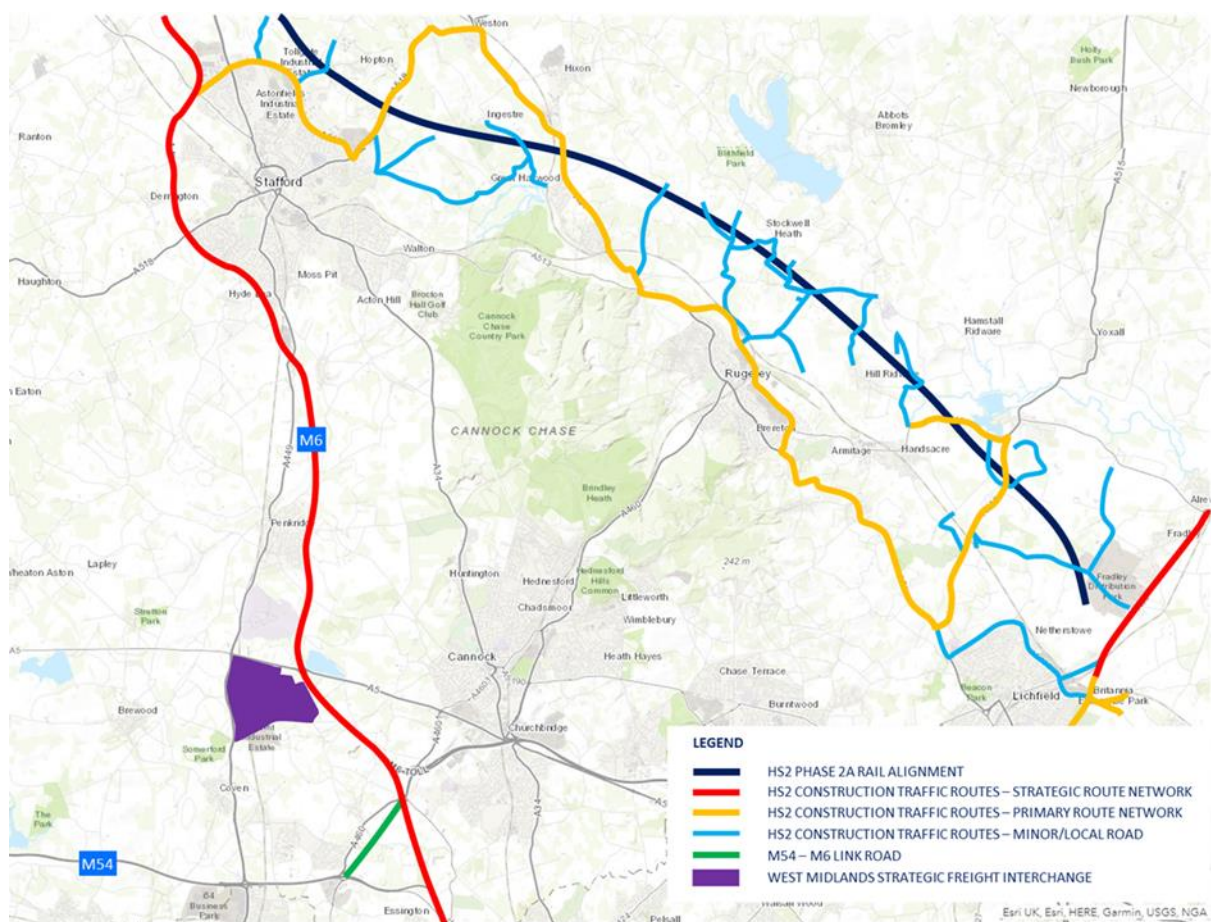
³⁰ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872252/road-investment-strategy-2-2020-2025.pdf

³¹ <https://highwaysengland.co.uk/projects/m54-to-m6-link-road/>

major traffic impacts of the scheme when operational, as noted above, would be to reduce existing traffic volumes along the A460 corridor, and a short stretch of the A5 and A449. Further the Link Road is unlikely to be operational in advance of the peak month of HS2 Phase 2a construction traffic.

6.4.3 Figure 6 provides a graphical representation and location of the HS2 route, HS2 construction traffic routes, the M54-M6 Link Road highway scheme and the West Midlands SRFI. Figure 6 shows that most HS2 construction traffic routes are located in relatively close proximity to the proposed HS2 route alignment (highlighted in dark blue). The Strategic Route Network (highlighted in red) is used to access HS2 construction compounds via primary construction traffic routes (highlighted in yellow) and minor construction traffic routes (highlighted in blue). Whilst both the M54-M6 Link road and the West Midlands SRFI are in close proximity to the M6 motorway, both are a substantial distance, approximately 22km (the equivalent distance along the M6 between Junctions 11 and 14) from the primary HS2 Phase 2a construction traffic routes.

Figure 6: HS2 Phase 2a construction traffic routes and location of the proposed M54-M6 Link Road and the proposed West Midlands SRFI



- 6.4.4 During construction of the M54-M6 Link Road there are two potential further impacts to be considered: additional construction traffic vehicles for the road construction itself; and disruption due to temporary highway closures. There is also the possibility that construction timescales for this road scheme could overlap with some works associated with the construction of HS2 Phase 2a.
- 6.4.5 The M54-M6 Link Road would generate construction traffic, and the associated vehicles would likely use the M6 motorway north and south of M6 Junction 11 to access the construction sites. At this stage we have been unable to obtain predicted traffic construction traffic volumes for the M54-M6 Link Road; however, given the size of the scheme (approximately three kms in length) and the relatively flat topography on which the alignment runs, it is not expected that the scheme will generate substantial traffic volumes on HS2 Phase 2a construction traffic routes, including the M6 motorway, so as to make any material difference to the HS2 Phase 2a transport assessment.
- 6.4.6 The Outline Traffic Management Plan³², in particular pages 3 to 4, provides further details of the temporary traffic management processes during construction of this scheme. Regarding highway closures on the M6 motorway, the construction of the M54-M6 Link Road will lead to some highway closures and restrictions on the M6 at Junction 11 plus associated diversions. The scheme involves construction of two new bridges over the M6 at Junction 11 (see Appendix B) plus demolition of existing structures and new realigned M6 slip roads which will tie-in to the existing motorway carriageways. It is anticipated that demolition of the existing structures at M6 Junction 11 will require a full weekend closure on both carriageways and installation of the new bridge deck will require overnight road closure. Tie in works of slip roads and entry to be completed under lane closures and or carriageway closures as required. It is also anticipated that there will be requirements for narrow lanes and speed limits temporarily reduced to 60 mph. Construction duration is expected to last for three years.
- 6.4.7 Table 3 and Table 4 document future baseline and HS2 Phase 2a construction traffic flows during the peak month of construction. The two-way peak hour HS2 construction traffic flows on the M6 motorway between Junctions 10A-11 is predicted to be 450 vehicles in the peak hour including 212 HGVs. However, even during the peak month of construction, future baseline plus HS2 Phase 2a construction is predicted to use no more than 80% of the overall capacity on any single carriageway, see Table 3 and Table 4. Furthermore (and as noted in Section 4) the busy period is predicted to last for approximately only 10% of the total length of the construction period so it is more likely that HS2 Phase 2a construction traffic flows would be substantially lower during any works disruption to M6 Junction 11 than the figures reported in Table 3 and Table 4.

³² <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010054/TR010054-000336-TR010054%20M54%207.5%20Outline%20Traffic%20Management%20Plan.pdf>

- 6.4.8 Whilst it is unlikely that the peak month of HS2 construction will coincide with any M6 closures or restrictions associated with the construction of the M54-M6 Link Road, it is likely that there could be some HS2 construction traffic on the M6 motorway in the vicinity of M6 Junction 11 during such works. Where there are highway restrictions such as narrow lanes associated with any works to M6 Junction 11, as noted above it is likely that there will be some temporary speed restrictions in place during the period of those works. We would therefore expect that affected road users would have to allow some extra time to complete their journeys. As such, the main driver for any delays would be the imposed speed restrictions rather than delays caused by additional HS2 construction traffic.
- 6.4.9 HS2 construction traffic vehicles will be travelling on the road network, including the M6 motorway, during weekdays, and the construction operating hours are between 08:00-18:00 and (when required) some Saturdays between 08:00-13:00. As noted above any closures of the M6 motorway associated with the M54-M6 Link Road would occur outside peak operating hours i.e. overnight and or during weekends. During periods of closures or restrictions we would anticipate that road users needing to access / egress the M6 at Junction 11 would likely be diverted to alternative strategic routes, the A449 (T) Stafford Road and A5 (T) Watling Street, thereby accessing and egressing the M6 at Junction 12. Elsewhere we would not anticipate construction of off-road sections of the M54-M6 link between both motorways, nor the connections to the M54 Junction 1 to have any substantial impact on the M6 motorway in the vicinity of the HS2 Phase 2a Proposed Scheme.
- 6.4.10 As noted above, HS2 will work with HE and local highway authorities in preparing local traffic management plans which, amongst other things, will ensure that the timing of any works is designed to keep disruption to road users to a minimum. Such plans will be prepared after Royal Assent when there would be greater certainty relating to the construction timescales for HS2 Phase 2a, and other proposals such as the M54 -M6 Link Road.

6.5 West Midlands Strategic Rail Freight Interchange (SRFI)

- 6.5.1 The Secretary of State for Transport approved a Development Consent Order (DCO) for the West Midlands SRFI³³ on the 4th May 2020. When complete, the SRFI is expected to provide up to 743,000 sqm of rail-served and rail-linked warehousing and create 8,550 direct jobs³⁴. The SRFI will be linked directly to the West Coast Mainline (WCML) and is capable of accommodating up to 10 trains per day and trains of up to 775 m long³⁵. Page 64 of the Design and Access Statement states

³³ also known more simply as the West Midlands Interchange but referred in this document in full as the West Midlands SRFI

³⁴ <https://www.westmidlandsinterchange.co.uk/>

³⁵ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR050005/TR050005-000317-Doc%206.2%20-%20ES%20Chp%204%20-%20Proposed%20Dvt.pdf>

that circa 25% of the warehousing will be directly rail linked and all of the warehousing will be rail served³⁶. The SRFI is strategically located to serve the West Midlands including the Black Country, Birmingham, Staffordshire, the M6 corridor and parts of Warwickshire. Direct highway access to the SRFI will be via new junctions on the A449 and A5 trunk roads plus a local road, Vicarage Road, whilst M6 Junction 12 lies immediately to the east of the site, see Figure 1 above.

- 6.5.2 The strategic need for the SRFI is understood to be from increasing global markets and a strong manufacturing presence in the West Midlands region, combined with the increasing need for fast and reliable transport links.
- 6.5.3 Indicative construction proposals of the SRFI are set out in its 'Environmental Statement (ES), Chapter 4 Description of the Proposed Development' under the sub-heading 'Indicative Phasing'³⁷, and also in the Transport Assessment³⁸. The ES states that the construction and occupation of the development will take approximately 15 years commencing in 2020/2021 through to completion in 2036. It is expected that the SRFI would be delivered in phases with the first phase taking approximately six years to complete.
- 6.5.4 Phase 1 represents approximately half of the total area of the site (see Appendix C³⁹). It is estimated from the schedule of accommodation which is set out on page 55 of the Design and Access Statement that Phase 1 includes approximately 270,000 sqm of warehousing, or around one third of the total allocation of 743,200 sqm. Phase 1 also includes much of the enabling infrastructure, including the initial rail terminal, the new A449 to A5 link road, and access junctions to the strategic road network. A conservative estimate, based on these assumptions, is that by the end of Phase 1, 2026, there could be approximately one third of warehousing constructed and operational.
- 6.5.5 Further assessment of the Transport Assessment for the SRFI, in particular Tables 35 and 36 which illustrate the volume of traffic accessing the M6 motorway at Junction 12 once the SRFI is fully operational, indicates that 76% of generated traffic in the AM peak has a destination to the south, whilst the figure rises further to 81% in the PM peak. The total peak hour traffic generated by the SRFI and accessing and egressing the M6 motorway north of Junction 12 is no more than 150 vehicles (PM peak) and the total heading southbound is approximately 600 vehicles (PM peak). However, these figures relate to full completion and occupation and, as noted

³⁶ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR050005/TR050005-000458-Doc%207.5%20-%20Design%20and%20Access%20Statement.pdf>

³⁷ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR050005/TR050005-000317-Doc%206.2%20-%20ES%20Chp%204%20-%20Proposed%20Dvt.pdf>

³⁸ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR050005/TR050005-000412-Doc%206.2%20ES%20Trans%20App%2015.1%20-%20Transport%20Ass.pdf>

³⁹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR050005/TR050005-000345-Doc%206.2%20-%20ES%20Fig%204.5%20-%20Indicative%20Phasing.pdf>

above, a robust estimate would be that a third of that figure could be reached by 2026, which approximates to 200 vehicles spread 50:50 over both carriageways i.e. 100 in each direction. By the year 2026 we could reasonably expect the busy period of HS2 construction to be completed. Therefore, we would expect that operational traffic generated by the West Midlands SRFI would be no higher than 100 vehicles per hour per carriageway during the busy period of HS2 Phase 2a construction.

- 6.5.6 The SRFI transport assessment also reports in Chapter 7 details of generated construction traffic. All construction traffic will be advised to use M6 Junction 12 to access the construction site via the A5 access. The transport assessment indicates that the annual average daily construction traffic flow associated with the SRFI equates to a total of 426 vehicle trips, of which 240 are HGVs and 186 are light vehicle movements. Spread out over the construction working day, 12 hours between 07:00 to 19:00, and then spread equally geographically i.e. 50% travels to and from the north of M6 Junction 12 and 50% travels to and from the south of M6 Junction 12, the daily construction traffic figures would generate an hourly average of approximately 20 vehicles per hour north and south of M6 Junction 12.
- 6.5.7 The SRFI will involve some highway works, in particular, new junctions on the A449 (T) Stafford Road and A5 (T) Watling Street to access the site. Both junctions are some distance from the M6 motorway and several miles away from the HS2 Phase 2a study area, such that whilst these works might cause some localised disruption, the impacts would not extend to the HS2 Phase 2a study area and vice versa, noting that closures of the M6 motorway associated with HS2 Phase 2a will be managed in such a way as to minimise disruption. The SRFI will involve no specific highway works on the M6 motorway. However, restrictions and possible closures (likely to be off peak, typically 22:00-05:00) of the A449 (T) Stafford Road and A5 (T) Watling Street will require traffic to be diverted and likely lead to an increase in traffic on the A460 and the M6 motorway between Junctions 11 and 12. In this respect the timing of any closures will need to be co-ordinated to avoid overlapping with any other nearby major highway closures, thereby keeping disruption to a minimum.
- 6.5.8 In summary, it is expected that the West Midlands SRFI will have very minimal impact on the M6 corridor in the vicinity of the HS2 Phase 2a scheme during the HS2 construction period.

7 Freeing up capacity on the West Coast Main Line (WCML)

- 7.1.1 One of the many benefits of the HS2 scheme is that it will free up capacity (in the form of train paths) on the WCML. This in turn will create further opportunities to improve many local and regional passenger services by increasing network capacity, and in doing so, reduce the volume of road traffic on the strategic and

local highway networks. In addition, HS2 provides opportunities to carry more freight by rail on the WCML rather than road.

- 7.1.2 Other benefits of moving more people and goods by rail rather than road will be that it will reduce pollution levels and greenhouse gas emissions and help the UK to reach its target of net zero carbon emissions by 2050. In March of this year the Department for Transport published *Decarbonising transport, Setting the challenge*⁴⁰. This document sets out the UK government's strategy to reach net zero emissions by 2050. Increasing rail use is a cornerstone of this strategy.
- 7.1.3 The HS2 Phase 2a ES (2017) Volume 1⁴¹, section 2.3 provides further details of projected growth in freight traffic and how the HS2 Phase 2a Proposed Scheme will release capacity on the WCML.

Demand for passenger and freight services is growing. Passenger rail journeys have more than doubled in the past 20 years, and journeys between London, Birmingham and Manchester have trebled in the same period. Total rail freight volumes have risen by 70 per cent since the mid-1990s. The WCML is now operated at a higher intensity than other major European fast lines, and despite an extensive £9 billion upgrade programme completed in 2008, 60 per cent of the additional peak intercity capacity created was used up by 2014. By 2033 further capacity will be required to accommodate demand.

Any released capacity delivered by the Proposed Scheme may also be beneficial for freight. Rail freight currently delivers £1.5 billion per annum of economic benefits. In 2011, around 42 freight trains per day used the WCML with 43 per cent of all freight journeys using it at some point. Network Rail's forecasts suggest that demand could nearly double by 2033 to 80 freight trains per day, with the majority of the growth being in intermodal freight.

Although this projected increase in rail freight traffic is good news for the UK economy, it is likely to pose a challenge for the current rail network. Network Rail estimate that the typical utilisation of intermodal freight paths today is around 85 per cent, which effectively means running at or near capacity and so future growth would be restricted. Government is investing in the railway to help meet this demand for freight traffic. However, significant capacity constraints for freight still exist.

Phase One and Phase 2a will provide some extra capacity for freight. However, most of the benefits for freight traffic travelling north of Birmingham are to be delivered once

⁴⁰ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/878642/decarbonising-transport-setting-the-challenge.pdf

⁴¹

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627559/E8_Volume_1_WEB.pdf

the whole of Phase Two has been built in 2033, through relinquishing the paths on the WCML that are used until that point.

Delivering the Proposed Scheme by 2027 will unlock some of these freight benefits earlier, contributing sooner to economic growth. The Proposed Scheme is expected to release capacity on the WCML slow lines between Birmingham and Basford yard, a major freight interchange immediately south of Crewe. This released capacity will mean that there is the potential to run additional freight services along this section of the WCML.

- 7.1.4 These points are echoed by the scheme promoters for the West Midlands SRFI. Notably page 30 of the DCO application Rail Operations Report⁴² states:

In this regard, the development of phase 1 HS2 will create additional network capacity complementing the WCML into which West Midlands Interchange would be connected. The DfT has noted the following in the context of the WCML:

DfT analysis of Network Rail's estimates suggests that growth in volumes will translate into an increase in demand for rail freight paths on the WCML each day from 42 today to 80 by 2033....A number of other investments are being progressed to relieve some of the freight pressures on the WCML. These include the Felixstowe to Nuneaton scheme which allows some freight traffic to bypass the southern end of the route and investment in gauge clearance on the Midland Main Line...In HS2, Government has chosen a transformational investment. Dedicated high speed lines will allow for faster, more frequent and more reliable inter-city travel whilst at the same time releasing capacity on the existing network to enable radical improvements to commuter and freight services.

The Bill to construct phase 1 of HS2 between London and Birmingham received Royal Assent on February 23rd 2017. Network Rail is currently leading an industry process known as "Capacity Plus" (Phase One WCML) to identify and develop options for the use of capacity released by transferring long distance high speed services onto HS2, including assessment of demand for additional freight paths arising from WMI and other developments.

- 7.1.5 In summary, there are clear synergies between HS2 and SRFIs like the one in the West Midlands. HS2 frees up capacity on existing rail lines thereby providing further opportunities to move freight traffic from road to rail. In doing so traffic congestion on the strategic and local road networks will be reduced as will emissions and greenhouse gases. This in turn will help the UK to achieve net zero carbon emissions by 2050. A new high speed rail network can thus be seen as

⁴² <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR050005/TR050005-000456-Doc%207.3%20-%20Rail%20Operations%20Report.pdf>

complementary to the implementation of Strategic Rail Freight Interchanges in the Midlands and the North of the United Kingdom.

8 Modelling and traffic impacts

8.1 M6 motorway

- 8.1.1 HS2 have used Highways England's SMP J13-15 Model to assess the traffic impact and effects of the HS2 Phase 2a construction traffic on the M6 motorway. The traffic model assessment concludes that there will be no substantial impacts or significant effects on the M6 motorway mainline. The assessment has reported a minor localised effect at M6 Junction 14 and a major effect at Junction 15 at the Hanchurch Interchange which would be upgraded in order to help mitigate the reported adverse construction traffic effect⁴³. The effects of the construction of the new M6 slips at Yarnfield Lane has not been modelled but the impact has been assessed using professional judgement. Section 5 of this report provides further details.
- 8.1.2 The Highways England SMP M6 Junctions 13 to 15 Model includes the Smart Motorway improvements along the M6 between Junctions 13-15 and other forecast developments and schemes classified as 'near certain' and 'more than likely'. HS2 has added to these traffic flows the average daily traffic flows during the peak month of construction. HS2 has assumed that 50% of workers will travel in the peak hours of 08:00-09:00 and 17:00-18:00, although the actual figure will probably be lower than this mainly because a typical working day for construction workers would be 08:00 – 18:00 and therefore most workers would need to be on site by 08:00 hours and leaving a worksite after 18:00 hours. In addition, for the purposes of a reasonable worst case assessment, HS2 has taken no account in the traffic modelling of potential sustainable travel plan measures which should reduce the effects of worker trips, such as the provision of buses to ferry workers to and from construction sites.
- 8.1.3 Analysis of the results shows that total HS2 construction traffic, during the peak month of construction, added to the future baseline traffic would be generally substantially below the 85% of capacity threshold capacity of the M6 motorway and would use up no more than 7.2% of that capacity. Furthermore, the peak month of HS2 construction occurs sometime after the Smart Motorway improvements between Junctions 13 – 15 are operational, post-2022 and after construction of the new M6 slip roads at Yarnfield.

⁴³ We grade effects as not significant, minor, moderate and major. Major effects require mitigation, not significant and minor effects do not require mitigation and moderate effects may or may not require mitigation.

8.2 Stafford

- 8.2.1 HS2 have assessed HS2 Phase 2a construction traffic impacts within the town of Stafford using SCC's traffic model to determine forecast traffic growth. This approach to forecasting traffic growth at affected junctions in Stafford was adopted in consultation with Staffordshire CC as it was recognised that the increase in traffic resulting from the planned housing growth in Stafford meant that use of the DfT's transport forecasting Trip End Model Presentation Program (TEMPro) to forecast traffic growth, could underestimate traffic growth particularly along the A513 Beaconside corridor. Highway capacity and safety improvements are proposed by HS2 at a number of junctions in Stafford to mitigate HS2 construction traffic impacts and take into consideration potential impacts from planned and committed developments.
- 8.2.2 The Promoter is aware of the housing growth in Stafford and associated junction improvements and other highway works. As noted previously if Royal Assent is granted for the Proposed Scheme, and construction commences, HS2 and its appointed contractors would work with the highway authority and other stakeholders in developing detailed local traffic management plans. At this stage it would be premature to draft detailed plans given that Royal Assent has not been granted, together with other uncertainties including the timing of the highway improvements associated with housing development in Stafford. HS2 regularly engages with the SCC highway authority and will continue to do so to agree appropriate traffic management plans for delivering the Proposed Scheme whilst keeping disruption to a minimum where reasonably practicable.

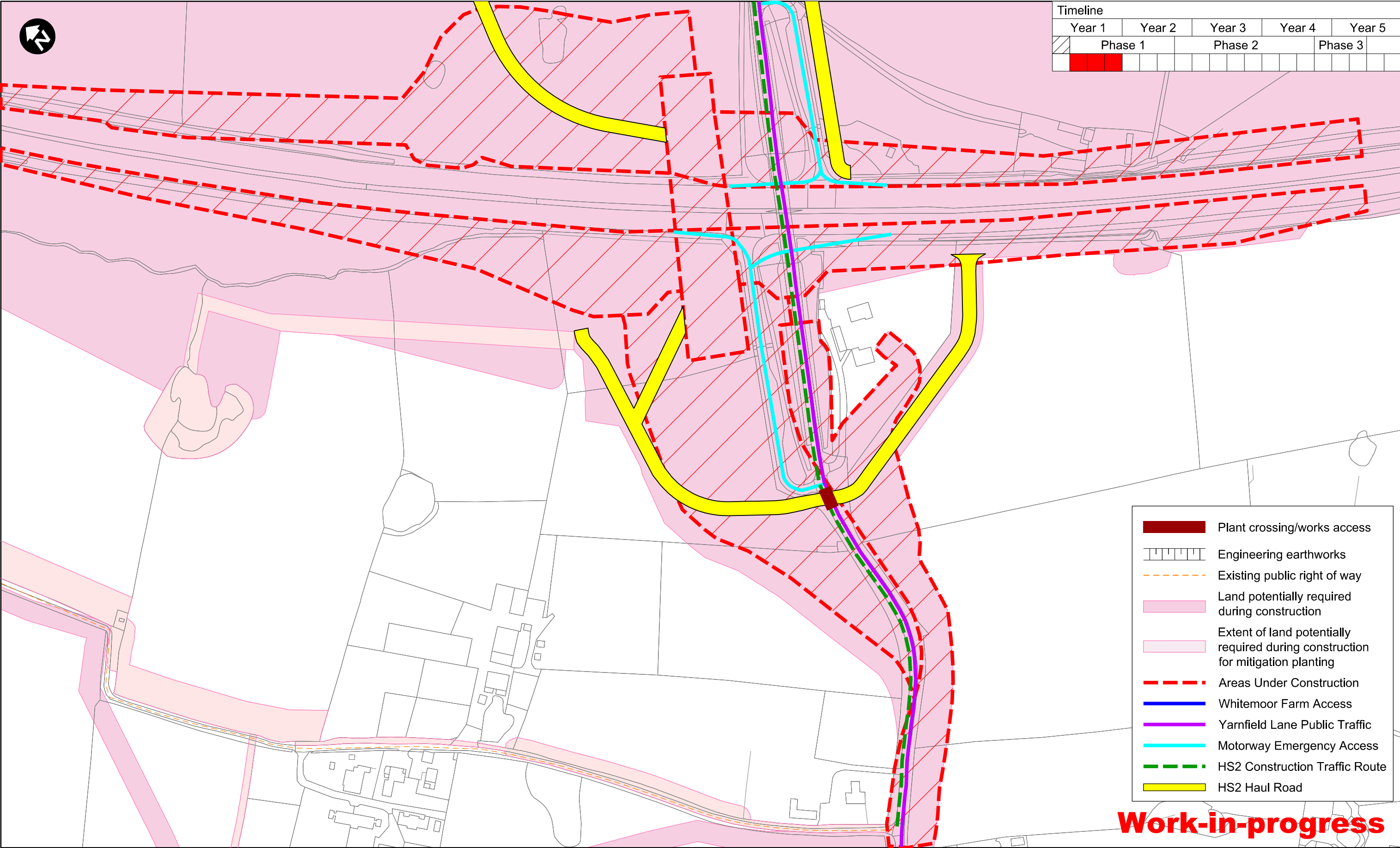
9 Summary and conclusions

- 9.1.1 This report has considered traffic and transport concerns raised by Theo Clarke, MP for the Stafford Constituency in her petition to the House of Lords Select Committee. The MP for Stafford has raised a number of concerns relating to the M6 motorway in Staffordshire and local roads in the town of Stafford that, in her view, could be severely disrupted during the HS2 Phase 2a construction period. Furthermore, the MP for Stafford is particularly concerned by the combined impact of HS2 construction and other major infrastructure projects in Staffordshire. The MP for Stafford, in her petition, refers to the M6 J13-15 Smart Motorway works, the West Midlands SRFI, the M54-M6 Link Road and the extensive planned housing development in Stafford.
- 9.1.2 This report considers each of the concerns raised in the MP's petition. Section 4 provides further details and context relating to construction traffic impacts on the M6 motorway between Junctions 10A-17.

- 9.1.3 Section 5 summarises those construction works which could result in closures and restrictions on the M6 Motorway in Staffordshire. Section 5 also provides further detail on how HS2 and the contractor would work with the relevant highway authorities in managing and sequencing the works, ensuring that wherever reasonably possible disruption is kept to a minimum, for instance by undertaking closures during weekends and in the vicinity of the new M6 slip roads near Yarnfield Lane, together with maintaining a minimum of three active traffic lanes during peak periods.
- 9.1.4 Section 6 of the report considers and provides an assessment of cumulative impacts with reference to the proposed M54-M6 Link Road and the West Midlands SRFI. The chapter begins with an explanation of the transport assessment methodology and how schemes and developments are selected as part of any cumulative impact assessment. The report notes that neither The M54-M6 Link Road scheme nor the West Midlands SRFI were not included in the cumulative transport assessment for HS2 Phase 2a as they are schemes that were outside the approved temporal scope of the assessment. However, the documents relating to both the link road scheme and SRFI development have been reviewed and it is concluded that the West Midlands SRFI will have minimal impact on the M6 motorway in Staffordshire during the HS2 Phase 2a construction works. The M54-M6 Link Road will result in some temporary closures and restrictions on the M6 motorway at Junction 11. Such closures could occur during the HS2 Phase 2a construction period. However, it is not considered likely that any restrictions on the M6 motorway at Junction 11 associated with the construction of The M54-M6 Link Road will conflict with HS2 Phase 2a construction since they will be focused on off-peak periods when HS2 construction traffic is not using the motorway. Furthermore, it is expected that any lane closures would generally avoid busy periods.
- 9.1.5 Section 7 of the report focuses on one of the major strategic benefits of the HS2 scheme, freeing up capacity on the West Coast Main Line (WCML). In doing so this provides more freight paths and enables more freight to move from road to rail. The West Midlands SRFI will be linked directly to the WCML and is capable of accommodating up to 10 trains per day and trains of up to 775 m long. There is a clear synergy between HS2 and SRFIs like the West Midlands SRFI. Shifting more freight from road to rail reduces traffic volumes and congestion on the highway network, traffic pollution and greenhouse gas emissions, and is part of the overall strategy to enable the UK to reach the target net zero carbon emissions by 2050.
- 9.1.6 Section 8 of the report provides a brief summary of the modelling approach to assess impacts on the M6 motorway in Staffordshire and on local roads in Stafford. It is noted that HS2 Phase 2a construction traffic during the peak month of construction together with future baseline traffic flows is substantially within the overall capacity of the M6 motorway and, indeed, uses no more than 7.2% of the theoretical capacity of the M6 motorway. It is also noted that HS2 and its contractor will continue to work closely with the relevant highway authorities and other

stakeholders to develop appropriate local traffic management plans and wherever reasonably practicable seek to further reduce any disruption on the highway network.

Appendix A – Indicative construction phasing for Yarnfield Lane and M6 slip roads



Timeline													
Year 1			Year 2			Year 3			Year 4			Year 5	
	Phase 1					Phase 2						Phase 3	

- Plant crossing/works access
- Engineering earthworks
- Existing public right of way
- Land potentially required during construction
- Extent of land potentially required during construction for mitigation planting
- Areas Under Construction
- Whitemoor Farm Access
- Yarnfield Lane Public Traffic
- Motorway Emergency Access
- HS2 Construction Traffic Route
- HS2 Haul Road

Work-in-progress

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Creator/Originator
Ove Arup & Partners International Ltd

Zone

Route Wide

Design Stage

Hybrid Bill - Interim Preliminary Design AP2

Drawing Title

Illustrative Construction Phasing
for Yarnfield Lane

Sheet 1

Project/Contract

C861 Hybrid Bill Additional Provision 2 AP2

Discipline/Function

Petitions

Drawn

DS

Checked

PJ

Approved

TE

Date

24/01/2019

Scale

1:2500

Size

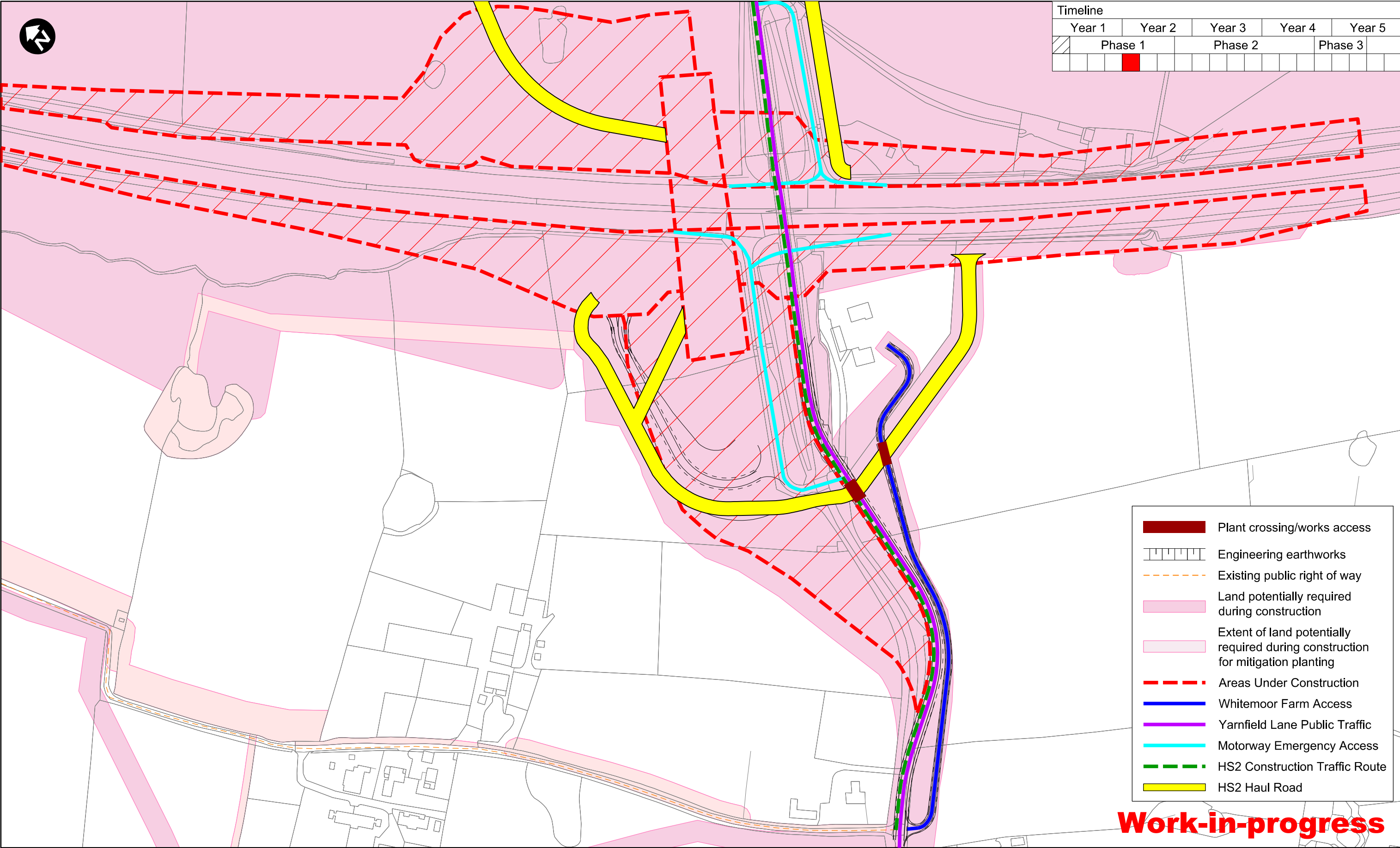
A3

Drawing No.

2PT02-ARP-PT-DSK-000-200014

Rev.

P00.1



Timeline														
Year 1			Year 2			Year 3			Year 4			Year 5		
	Phase 1					Phase 2						Phase 3		

- Plant crossing/works access
- Engineering earthworks
- Existing public right of way
- Land potentially required during construction
- Extent of land potentially required during construction for mitigation planting
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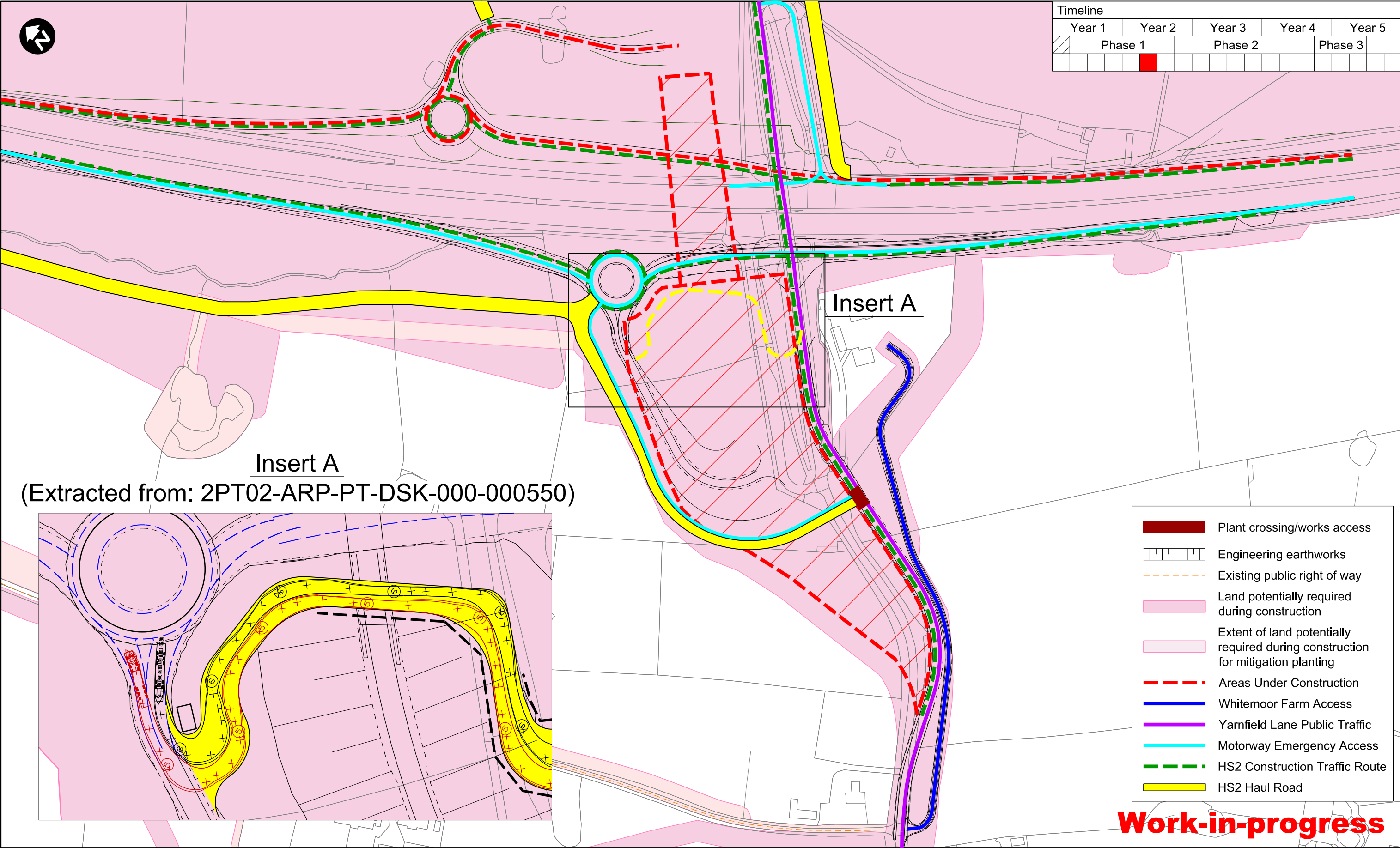
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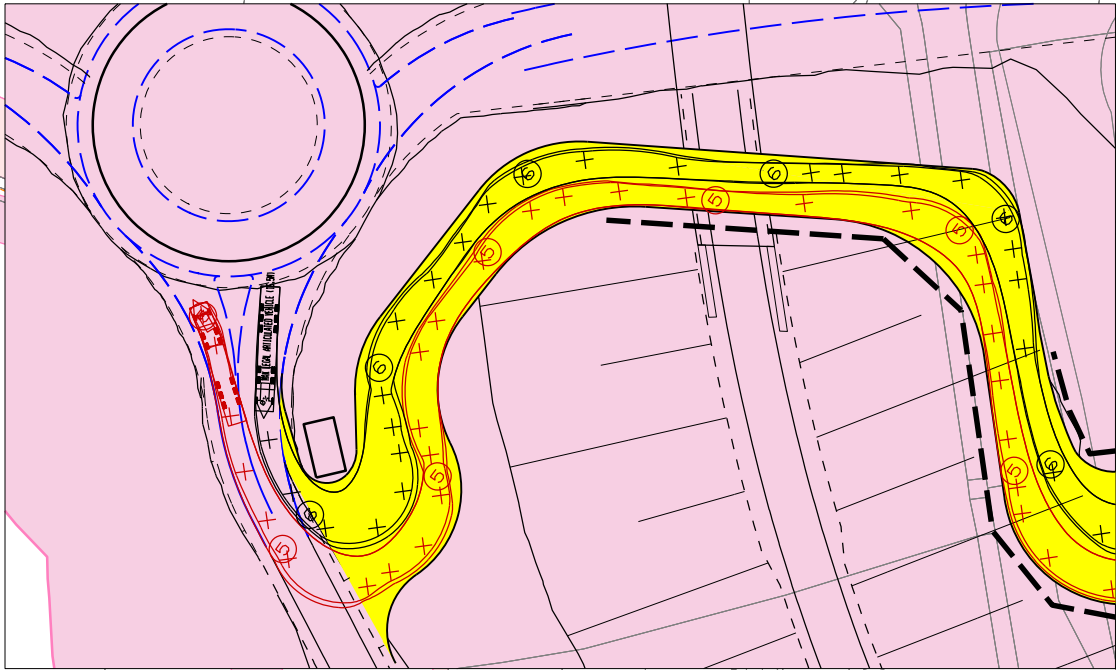
Creator/Originator
Ove Arup & Partners International Ltd

Zone	Route Wide		Project/Contract C861 Hybrid Bill Additional Provision 2 AP2		
Design Stage	Hybrid Bill - Interim Preliminary Design AP2		Discipline/Function Petitions		
Drawing Title	Illustrative Construction Phasing for Yarnfield Lane Sheet 2		Drawn DS	Checked PJ	Approved TE
			Date 23/01/2019	Scale 1:2500	Size A3
			Drawing No. 2PT02-ARP-PT-DSK-000-200015		Rev. P00.1



Timeline														
Year 1			Year 2			Year 3			Year 4			Year 5		
	Phase 1					Phase 2						Phase 3		

Insert A
(Extracted from: 2PT02-ARP-PT-DSK-000-000550)



- Plant crossing/works access
- Engineering earthworks
- Existing public right of way
- Land potentially required during construction
- Extent of land potentially required during construction for mitigation planting
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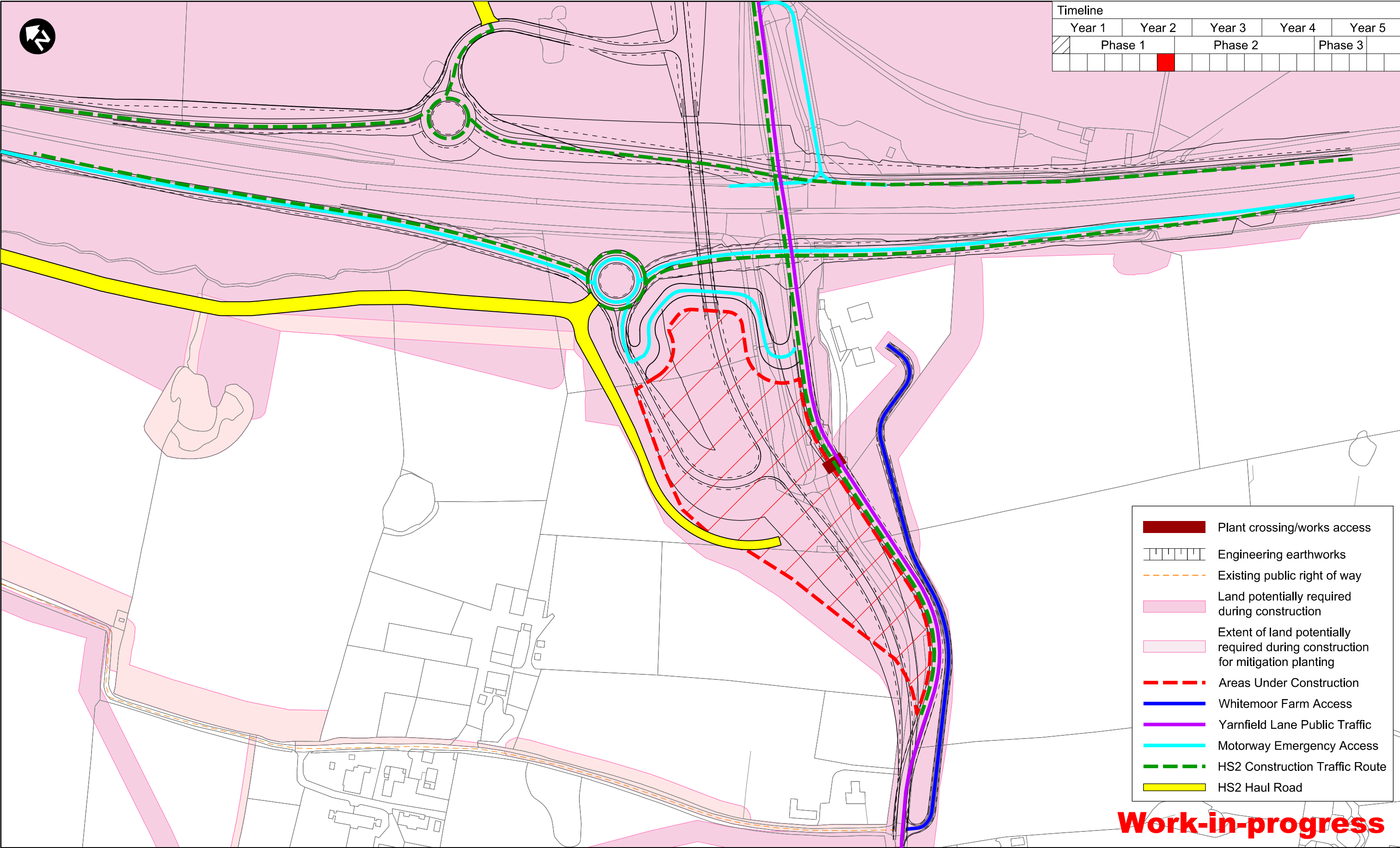
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Zone	Route Wide	
Design Stage	Hybrid Bill - Interim Preliminary Design AP2	
Drawing Title	Illustrative Construction Phasing for Yarnfield Lane	
	Sheet 3	

Project/Contract			C861 Hybrid Bill Additional Provision 2 AP2		
Discipline/Function			Petitions		
Drawn	Checked	Approved	DS	PJ	TE
Date	Scale	Size	27/02/2020	1:2500	A3
Drawing No.		Rev.	2PT02-ARP-PT-DSK-000-200016		P00.1



Timeline														
Year 1			Year 2			Year 3			Year 4			Year 5		
	Phase 1					Phase 2						Phase 3		

- Plant crossing/works access
- Engineering earthworks
- Existing public right of way
- Land potentially required during construction
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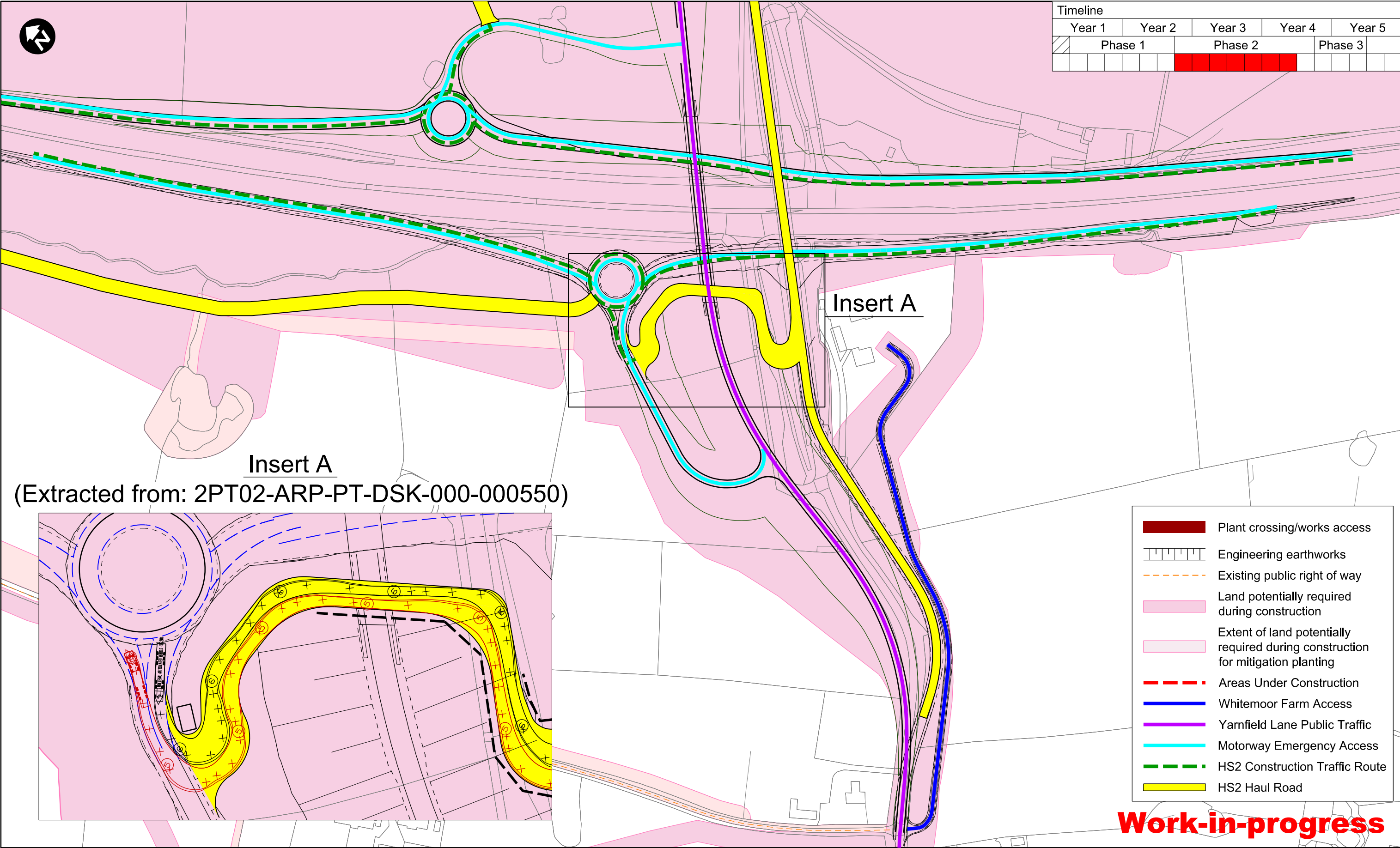
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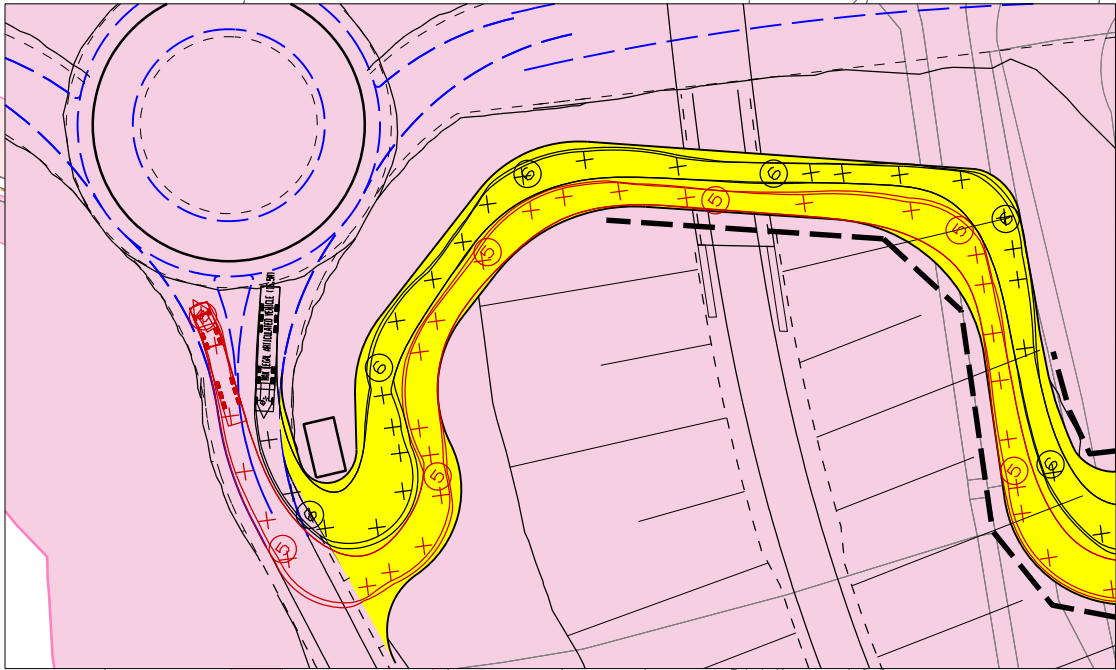
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Zone	Route Wide		Project/Contract C861 Hybrid Bill Additional Provision 2 AP2		
Design Stage	Hybrid Bill - Interim Preliminary Design AP2		Discipline/Function Petitions		
Drawing Title	Illustrative Construction Phasing for Yarnfield Lane Sheet 4		Drawn DS	Checked PJ	Approved TE
			Date 27/02/2020	Scale 1:2500	Size A3
			Drawing No. 2PT02-ARP-PT-DSK-000-200017		Rev. P00.1



Timeline														
Year 1			Year 2			Year 3			Year 4			Year 5		
	Phase 1					Phase 2						Phase 3		

Insert A
(Extracted from: 2PT02-ARP-PT-DSK-000-000550)



- Plant crossing/works access
- Engineering earthworks
- Existing public right of way
- Land potentially required during construction
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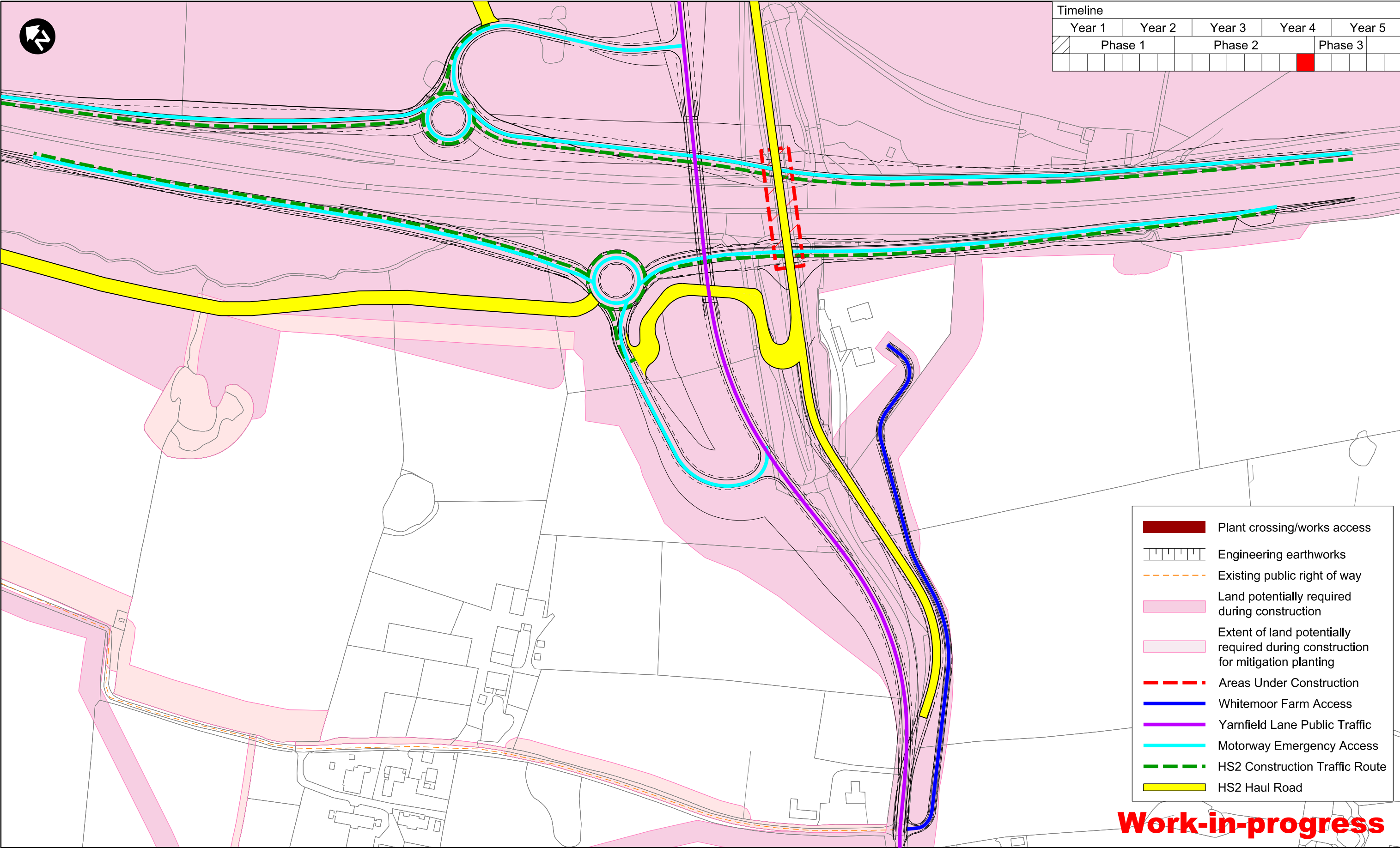
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Zone	Route Wide			Project/Contract		
Design Stage	Hybrid Bill - Interim Preliminary Design AP2			C861 Hybrid Bill Additional Provision 2 AP2		
Drawing Title	Illustrative Construction Phasing for Yarnfield Lane			Discipline/Function Petitions		
Sheet 5	Drawn	DS	Checked	PJ	Approved	TE
	Date	27/02/2020	Scale	1:2500	Size	A3
Drawing No.					Rev.	
2PT02-ARP-PT-DSK-000-200018					P00.1	



Timeline														
Year 1			Year 2			Year 3			Year 4			Year 5		
	Phase 1					Phase 2						Phase 3		

- Plant crossing/works access
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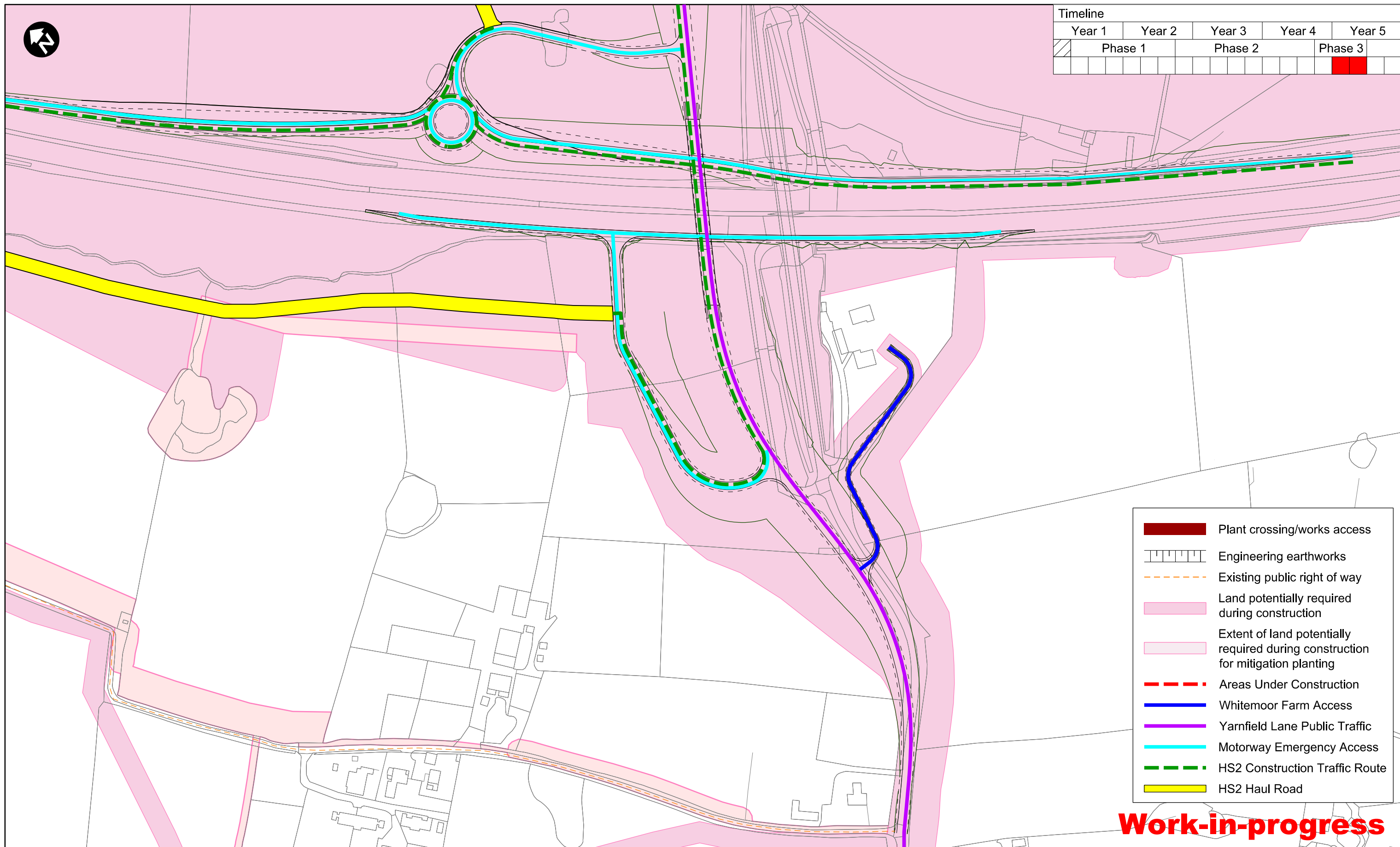
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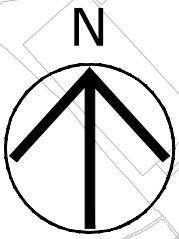
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			Date 11/02/2020	Scale 1:2500	Size A3
			Drawing No. 2PT02-ARP-PT-DSK-000-200019		Rev. P00.1



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R108 (54) as distortion can occur.

Appendix B– M54 to M6 Link Road Scheme Plan



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

IT IS ASSUMED THAT ALL WORKS ON THIS DRAWING WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROPRIATE METHOD STATEMENT.

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT.

EXCEPTIONAL RISKS RELATING TO THE WORKS ASSOCIATED WITH THIS DRAWING ARE IDENTIFIED BELOW.

CONSTRUCTION

MAINTENANCE / OPERATION /
DECOMMISSIONING / DEMOLITION

- NOTES**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
 - DO NOT SCALE FROM THIS DRAWING. USE ONLY PRINTED DIMENSIONS.
 - ALL DIMENSIONS IN MILLIMETRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.
 - GENERAL ARRANGEMENT BASED ON MODEL REV P03.

KEY

— LIMITS OF LAND TO BE ACQUIRED OR USED PERMANENTLY OR TEMPORARILY (THE ORDER LIMITS)

— LAND NOT INCLUDED WITHIN THE ORDER LIMITS

Purpose of issue

SUITABLE FOR INFORMATION

Client
Highways England
The Cusp
199 Wharfside Street
Birmingham
B1 1RN



Project Title

M54 M6 Link Improvements

Drawing Title

**GENERAL ARRANGEMENT
SCHEME WIDE**

Internal Project No. 60536736	Suitability S2
Scale @ A1 NTSH/NTSV	Zone Highways General

Drawing Number HE514465 -ACM -HGN - M54_SW_PR_Z -DR-CH-1001	1 Originator 1 Volume 1 Type 1 Role 1 Number
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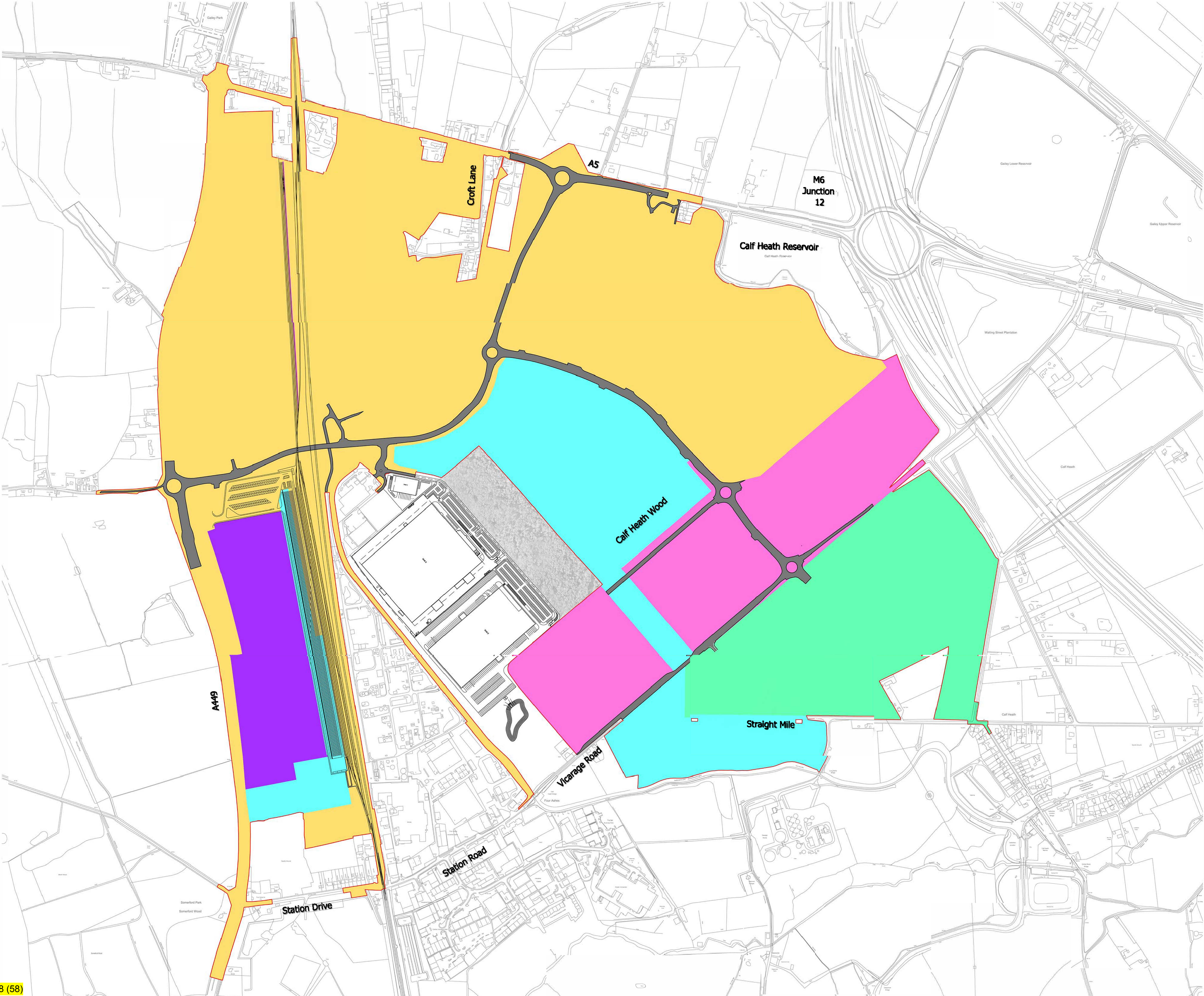
Rev
P07

Appendix C– West Midlands SRFI Indicative Phasing Plan



0m 50m 100m 200m 500m

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4
- PHASE 5



Revisions

**West Midlands Interchange**

Project

THE WEST MIDLANDS RAIL FREIGHT INTERCHANGE ORDER 201X

Drawing Status

ILLUSTRATIVE

Drawing Title

Drawing Size A1

ILLUSTRATIVE DCO PHASING PLAN

Regulation

5(2)(a)

Document

6.2 - Figure 4.5

Drawn SM

Date MARCH 2018

Scale 1/5000

Reviewed PMJS

Drawing No.

4049 - 1032

Rev.

17

Appendix D– List of Developments and Schemes included in the Transport Assessment

Highways England J13-15 SMP Model

Table 1: Highways England J13-15 SMP Model, development assumptions included in the model

Local Authority	Development	Degree of certainty	Development type	Total Dwellings	Gross Floor Area	Percentage complete by 2020
Cheshire	Barons Quay, Leicester Street, Northwich	More Than Likely	Commercial		16000	100%
Cheshire	Middlewich Road sites, Rudheath, Middlewich Roa	Near Certain	Housing	400		100%
Cheshire	Winnington Urban Village, Winnington Lane, Nort	Near Certain	Housing	1200		100%
Cheshire	Wincham Urban Village, Chapel Street / New Warr	Near Certain	Housing	1050		100%
Cheshire	Grange Farm, Hartford, Chester Road (A559), Nort	Near Certain	Housing	350		100%
Cheshire	Hollies Farm, School Lane, Hartford, School Lane,	Near Certain	Housing	350		100%
	Land Rear And Adjacent To Littler House, Littler La	Near Certain	Housing	295		100%
	wilmslow office park, , Wilmslow	Near Certain	Employment		14400	100%
	Plot A, Tytherington Buisness Park, Macclesfield	Near Certain	Employment		42720	100%

Local Authority	Development	Degree of certainty	Development type	Total Dwellings	Gross Floor Area	Percentage complete by 2020
	Plot B , Tytherington Buisness Park, Macclesfield	Near Certain	Employment		25560	100%
	Land to East of Railway and Between , Pochin Way	Near Certain	Employment		164000	100%
	Extension to Parkgate Industrial Estate, Land to No	Near Certain	Employment		34000	100%
	Land rear of Handforth Dean Retail, Kiln Croft Lan	More Than Likely	Employment		12800	100%
Shropshire	Phase 1, Tern Valley Business Park, market Drayto	Near Certain	Mixed		22000	30%
	Muller Dairy, Core St, north of A53, Market Drayto	Near Certain	Mixed		34000	30%
	Sych farm, Hales Sawmill, Phase 2 Market Drayton	Near Certain	Mixed		24000	30%
Staffordshire	Apedale Rd South, Newcastle	Near Certain	Housing	350		100%
	Land off Green Heath Rd, Hednesford	Near Certain	Housing	330		97%
	Land West of Pye Green Road, Cannock Urban Exte	Near Certain	Housing	750		72%

Local Authority	Development	Degree of certainty	Development type	Total Dwellings	Gross Floor Area	Percentage complete by 2020
	South of Norton Claines Urban Extension	Near Certain	Housing	670		73%
	Land North of Beaconside, Stafford	Near Certain	Housing	409		100%
	Yarnfield Park, Yarnfield	Near Certain	Housing	300		100%
	Lyne Hill Industrial Estate, Penkridge	More Than Likely	Housing	200		100%
	Uplands Mill, Uplands, Biddulph	More Than Likely	Housing	200		100%
	Mill Green, Eastern Park, Eastern Way, Cannock	Near Certain	Office		30400	100%
	Kingswood Lakeside, Zones A/B/C	Near Certain	Mixed		77000	30%
	Former Hawkins Works, Watling St, Bridgetown	Near Certain	Mixed		11600	30%
	Former Boumer Haulage Site, Watling St, Cannock	Near Certain	Mixed		12400	30%
	Beacon Business Park Extension	More Than Likely	Mixed		34040	100%
	Meaford Power Station	More Than Likely	General		166285	50%
	Hilton Main Industrial Estate, Featherstone	Near Certain	Mixed		10850	90%

Local Authority	Development	Degree of certainty	Development type	Total Dwellings	Gross Floor Area	Percentage complete by 2020
	Essington Brickworks Hobnock Road, Essington	Near Certain	General		17150	90%
	Powenash, Brownlees Road, Turnstall	Near Certain	Mixed		33400	60%
	John Pointons Site, Felthouse Lane	Near Certain	Mixed		60000	60%

Table 2: Highways England J13-15 SMP Model, transport scheme improvements included in the model

Road Authority	Scheme Name	Degree of certainty
Highways England	M6 J16 widening / signalisation	Certain
	M6 J10a-13 SMP	Certain
	M6 J16-19 SMP	More than Likely
	A556 Improvement Scheme	Certain
	M6 J17 Improvements	Certain
Cheshire East	Congleton Link Road	More than Likely
	Crewe Green Link Road	Certain
	Basford West Spine Road	Certain
	Middlewich Eastern Bypass	More than Likely
Staffordshire	Stafford Western Access Improvements	More than Likely

Stafford SATURN Model

Table 3: Stafford SATURN model, commercial development assumptions included in the model

Reference	Development Land Use	Site Area (Ha)	Degree of certainty	Opening Year or Open By
C1	Land at Riverside	1.38	Near Certain	2018
C2	Lammascote Road Leisure Centre	0.36	Near Certain	Completed
C3	Prime Point 14, J14 M6	1.03	Near Certain	Completed
C4	GEC A34 Lichfield Road	1.48	Near Certain	Completed
C5	Kingsmead / North Walls	0.93	Near Certain	2018
C6	MOD Stafford	6.02	Near Certain	2018
C7	Astonfields Industrial Estate	0.44	Near Certain	2018
C8	Tipping Street	0.30	Near Certain	Completed
C9	Tollgate Business Park	0.20	Near Certain	2018
C10	Staffordshire Technology Park	0.20	Near Certain	Completed
C11	Land at Beacon Business Park (B1/B2/B8)	0.82	Near Certain	2018
C12	Land at Beacon Business Park (B1/B8)	0.51	Near Certain	2018
C13	Beacon Business Park Extension (B1/B2/B8)	21.0	Near Certain	2018
C14	Beacon Business Park Extension (A3/A4)	0.42	Near Certain	2018
C15	Plot 23 Beacon Business Park	0.22	Near Certain	2025

Reference	Development Land Use	Site Area (Ha)	Degree of certainty	Opening Year or Open By
C16	Land at Paton Drive	3.34	Near Certain	2018
C17	Land south of Creswell grove adjoining the M6	10.65	Near Certain	2025
C18	Common Road Industrial Estate	0.82	Near Certain	2018
C19	East of Fairway	2.80	Near Certain	2018
C20	The Kings Arms Public House (East of Kingsway)	0.62	Near Certain	Completed
C21	West of Stone Road A34 (Redhill)_ 25ha	25.00	Near Certain	2018
C23	Riverway Offices (Old SCC Building)	0.41	Near Certain	2018

Table 4: Stafford SATURN model, housing development assumptions included in the model

Reference	Development Land Use	Quantity (Dwelling s)	Degree of certainty	Opening Year or Open By
H1	St Georges	379	Near Certain	Phased from 2018
H2	Former Universal Grinding Wheel, Doxey Rd	145	Near Certain	2018
H3	Former Staffordshire Police Headquarters	191	Near Certain	2025
H4	GEC A34 Lichfield Road	169	Near Certain	Completed
H5	Friars Terrace	45	Near Certain	2018
H6	Brunswick Terrace	59	Near Certain	Completed

Reference	Development Land Use	Quantity (Dwelling s)	Degree of certainty	Opening Year or Open By
H7	Derelict Land, Foregate Street	42	Near Certain	2018
H8	The Former Eagle Inn & 14/14A Newport Road	32	Near Certain	Completed
H9	Land At Castle Wharf/Castle View/Castle Street	24	Near Certain	Completed
H10	Site Off Mill Bank	20	Near Certain	Completed
H12	St Thomas Priory	25	Near Certain	2018
H13	Westhorpe And The Laurels, Rowley Avenue	27	Near Certain	2018
H14	Sandon road motors, Sandon road	25	Near Certain	Phased from 2025
H15	Land at Stone Road, south of Co- operative St.	36	Near Certain	2018
H16	Stafford North SDL (North of Parkside)	1100	Near Certain / More than Likely	Phased from 2018
H18	Stafford East SDL (West of Baswich Lane)	634	Near Certain	Phased from 2018
H19	East of Fairway	270	Near Certain	2033
H20	East of Stockton Lane	100	Near Certain	2025
H21	Stafford West SDL (South of Doxey Road)	170	More than Likely	2018
H22	Stafford West SDL (Castlefields Burleyfields)	1950	More than Likely	Phased from 2018
H24	Stafford West SDL (St. Modwens)	80	More than Likely	2025

Reference	Development Land Use	Quantity (Dwelling s)	Degree of certainty	Opening Year or Open By
H25	Borona (MoD Housing)	370	Near Certain	2018

Table 5: Staffordshire County Council Highways Improvement Schemes

Reference	Highway Scheme	Degree of certainty	Comments	Modelled Years
1	Town Centre Traffic Measures	Near Certain	Completed or programmed for completion by 2011	2018,2025, 2033
2	Lamascote Gyratory Signalisation	Near Certain	Completed 2009	2018,2025, 2033
3	A518 Weston Road / Hospital Junction Improvement	Near Certain	Completed	2018,2025, 2033
4	A518 Weston Road / Blackheath Lane / Beacon Business Park entrance	Near Certain	Under construction	2018,2025, 2033
5	Beaconside Urban Boulevard and Redhill Roundabout Signalisation	Near Certain		2025, 2033
7	A34 / Redhill Business Park Signals	Near Certain	Under construction	2018,2025, 2033
8	Stafford Eastern Distributor Road (between Beaconside and St. Thomas Lane))	Near Certain		2025,2033
9	M6 Junction 14 Improvements	Near Certain	Completed	2018,2025, 2033
10	New signals on Doxey Road / Reed Ave / Baxter Green	Near Certain	Completed	2018,2025, 2033

Reference	Highway Scheme	Degree of certainty	Comments	Modelled Years
11	Tesco Signal Improvements	Near Certain	Completed	2018,2025, 2033
12	New Pedestrian Crossing on Chell Road	Near Certain	Completed	2018,2025, 2033
13	New Signalised Junction at A34 Queensway / North Walls Car Park / St. Georges Development	Near Certain	Completed	2018,2025, 2033
14	"Stafford Western Access Road -	More than Likely	Comments	2018,2025, 2033

HS2 Phase 2a proposed Scheme

Apart from those locations where a traffic model has been used to determine traffic growth, background traffic growth has been based on TEMPro. TEMPro captures growth from local transport plans. In addition the list in Table 6 highlights those committed developments which are not captured in Local Plan growth.

Table 6: HS2 Scheme Additional Committed Developments, CA1 – 4 (Staffordshire)

CA	Development	Description
1	Royal Oak, Uttoxetter, Hill Ridware	Residential development comprises of approximately 42 dwellings.
	Watery Lane	Residential development of 750 dwellings
	former Norgren Factory	Mixed use development that includes 70 dwellings and retail.
2	Land off A34, North Redhill, Stafford	Comprises B1, B2 and B8
3	Land at East End of Gateway Avenue, Baldwins Gate, Newcastle Under Lyme	Comprising development of up to 113 residential dwellings

CA	Development	Description
	Land Between Common Lane and Eccleshall Road, Stone, Staffordshire	Comprising development of up to 92 residential dwellings
4	Land at End of Gateway Avenue, Baldwins Gate, Newcastle-under-Lyme, Staffordshire	Comprising development of up to 113 residential dwellings

Table 7: HS2 Phase 2a Proposed Scheme assumed highway improvements in Staffordshire

CA	Network	Description
1	Local Highway	Wood End Lane will be permanently realigned under the route approximately 300m to the south of its existing alignment. A new junction of Wood End Lane with Netherstowe Lane will be provided (Part of HS2 Phase 1 highway improvements)
		Temporary use of the existing junction between the A38 Rykneld Street and Wood End Lane at Hilliard's Cross as a route for construction traffic will require improvements to the junction between Wood End Lane and the connection to the southbound slip roads of the A38 Rykneld Street at Hilliard's Cross (Part of HS2 Phase 1 highway improvements)
		The Handsacre link, which connects HS2 Phase One to the WCML, crosses the A515 Lichfield Road and a new A515 Lichfield Road underbridge will provide access across the scheme. The Handsacre link will also require the permanent closure of a section (Part of HS2 Phase 1 highway improvements)
2	SRN	M6 smart motorway improvement scheme, to include hard-shoulder running and variable speed limits on the M6 between junction 13 and 15, the first section of which (junction 13 to junction 14) falls within this CA
	Local Highway	Beaconside Urban Boulevard and Redhill Roundabout (proposed signalisation)
		Stafford Eastern Distributor Road, new north / south road connecting Weston Road in the north with Tixall Road to the south and a new signalised junction will be provided at Tixall Road.
		Stafford Northern Perimeter Road

CA	Network	Description
3	SRN	M6 smart motorway improvement scheme, to include hard-shoulder running and variable speed limits on the M6 between junction 13 and 15, the second section of which (junction 14 to junction 15) falls within this CA
	Local Highway	Committed highway scheme improvements to junctions at the A51 Stone Bypass/ A34 Stafford Road/Brooms Road and the roundabout upgrade at the A34 The Fillybrooks/Meaford Road.
