HILLINGDON TRAFFIC STUDY SUMMARY REPORT

June 2016

1. Executive Summary

In December 2015 and January 2016 High Speed 2 Ltd (HS2 Ltd.) provided assurances to Transport for London (TfL) and Hillingdon Council (HC), respectively to engage actively with TfL and the London Borough of Hillingdon in developing the preparation of a scoping brief for a study to reduce HGV movements in the Ickenham area of Hillingdon, and in carrying out the study in accordance with the brief.

In the scoping brief for the study it was agreed the main aims were:

A. To reduce Heavy Goods Vehicle (HGV) traffic movements. In particular the peak two-way HGV movements from 1060 to a maximum of 550 per day at Swakeleys Roundabout.
B. Significantly reduce the area of sustainable placement in Hillingdon.

At this time HS2 Ltd. also reaffirmed the assurance given to Hillingdon Council in June 2015 to provide improvement measures to traffic flow and highway safety at key affected junctions along Swakeleys Road.

HS2 Ltd., TfL and HC have actively engaged in a series of workshops where a number of potential changes to the HS2 construction plan were suggested and discussed. By implementing the following measures and using traffic management measures, the Report's conclusion is that it is feasible that two-way peak HGV movements can be reduced to 550 per day, or below by:

1. Re-use of soil excavated from Copthall Cutting to construct Harvil Road embankments
2. Commencement of importation of engineering material for Gatemead and West Ruislip Retained Embankments earlier in the programme (noting that this does not reduce the overall quantum of HGV movements)
3. Use of Excavated Material from Copthall cutting for the interval embankment between HS2 and Chiltern Lines
4. Diversion of the Portal Excavated Material to Ruislip Golf Course

Table 4.1 of this report sets out the forecast road vehicle movements over the duration of the project.

These Measures 1 and 3 above are based on the assumptions that the material excavated from Copthall Cutting is appropriate and suitable (which can only be confirmed after ground investigation and laboratory testing is undertaken) for use in the road embankment and that results from ecology surveys do not present unexpected risks to placement of material in the construction sites required for these works. Measure 4 also requires HS2 and HC (as land owner) to reach a suitable agreement for the placement of material at Ruislip Golf Course.

It should be noted that the commencement of importation of engineering material for Gatemead and West Ruislip Retained Embankments earlier in the programme helps by flattening the peak rather than reducing the overall number of HGV traffic. A local visual / noise bund at Ruislip Golf Course using material excavated from the West Ruislip Tunnel Portal could avoid 60,000m3 of EM being removed by road and thereby reduce 80 two-way daily HGV movements during the peak period, and by 14,000 HGV movements in total.

Other options, all of which are interrelated, are being discussed between the parties and will be examined and completed by the end of August 2016 by HS2 Ltd., in conjunction with TfL and HC, to identify if they offer further opportunities to reduce HGVs and Sustainable Placement and are balanced by environmental benefits. If these benefits can be realised taking account of the timely and economic delivery of the Scheme and the reported EMRs, HS2 Ltd will require these measures or other reasonable alternatives to be adopted by the main contractor:

1. Replacement of all or part of the Gatemead and West Ruislip embankments with viaduct, to reduce the need for fill material imported and alluvial material exported by road.
2. Relocate the eastern approach tracks off the HS2 trace, to reduce the construction programme, and allow embankment fill materials to be imported later in the programme.
3. Make use of the existing Up Siding at West Ruislip to import some fill material for the West Ruislip embankment.
4. Consider relocating the concrete segment plant away from the area to reduce the environmental impact of the additional land required at Harvil Road.

In addition, and after this study is complete a number of road improvement and traffic management measures to deal with the remaining HGV movements will be discussed with HC and TfL, and providing acceptable solutions between the parties can be reached will be implemented by the project.

Through implementation of the following measures and working with Hillingdon Council, HS2 Ltd will aim to significantly reduce, and potentially eliminate, sustainable placement between Harvil Road and Breakspear Road South:

a. Re-use of soil excavated from Copthall Cutting to construct the Harvil Road embankments
b. Use of Excavated Material from Copthall cutting to construct the interval embankment between HS2 and Chiltern Lines
c. Provision of Excavated Material for beneficial use at Uxbridge Golf Course, subject to agreement with HC.
d. Creation of loading sidings at the West Ruislip Railhead by Harvil Road earlier in the programme, to remove additional material excavated from Copthall cutting by rail
e. Maximising so far as reasonably practicable the removal of excess Excavated Material by rail during the whole of the programme

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2. Introduction

High Speed 2 Ltd (HS2) provided assurances to Transport for London and London Borough of Hillingdon in January 2016 to engage actively with TfL and the London Borough of Hillingdon in developing the preparation of a scoping brief for a study to reduce HGV movements in the Ickenham area of Hillingdon, and in carrying out the study in accordance with the brief. In the scoping brief of the study it was agreed the aim would be to reduce the peak two-way Heavy Goods Vehicle movements from 1060 to a maximum of 550 per day at Swakeleys Roundabout. The study also aimed to reduce HS2 non-peak traffic and sustainable placement. The scope is contained in Appendix C of this report.

As part of the study HS2 also reaffirmed the assurance given to the HC in June 2015 to provide improvement measures to traffic flow and highways safety at key affected junctions along Swakeleys Road. This note provides a summary of the study and proposed future steps. A matrix of options, summary of HGV reductions and the more detailed engineering report provided by HS2's engineering and environmental consultants is contained within the Appendices.

2.1 Traffic Flows

Within the main Environmental Statement of the Hybrid Bill HS2 assessed a maximum of 1,860 two-way HGV movements per day over a 12 month peak period at Swakeleys Road, between the A40 roundabout and the junction with Harvil Road, see map with traffic routes in green dashed lines below:

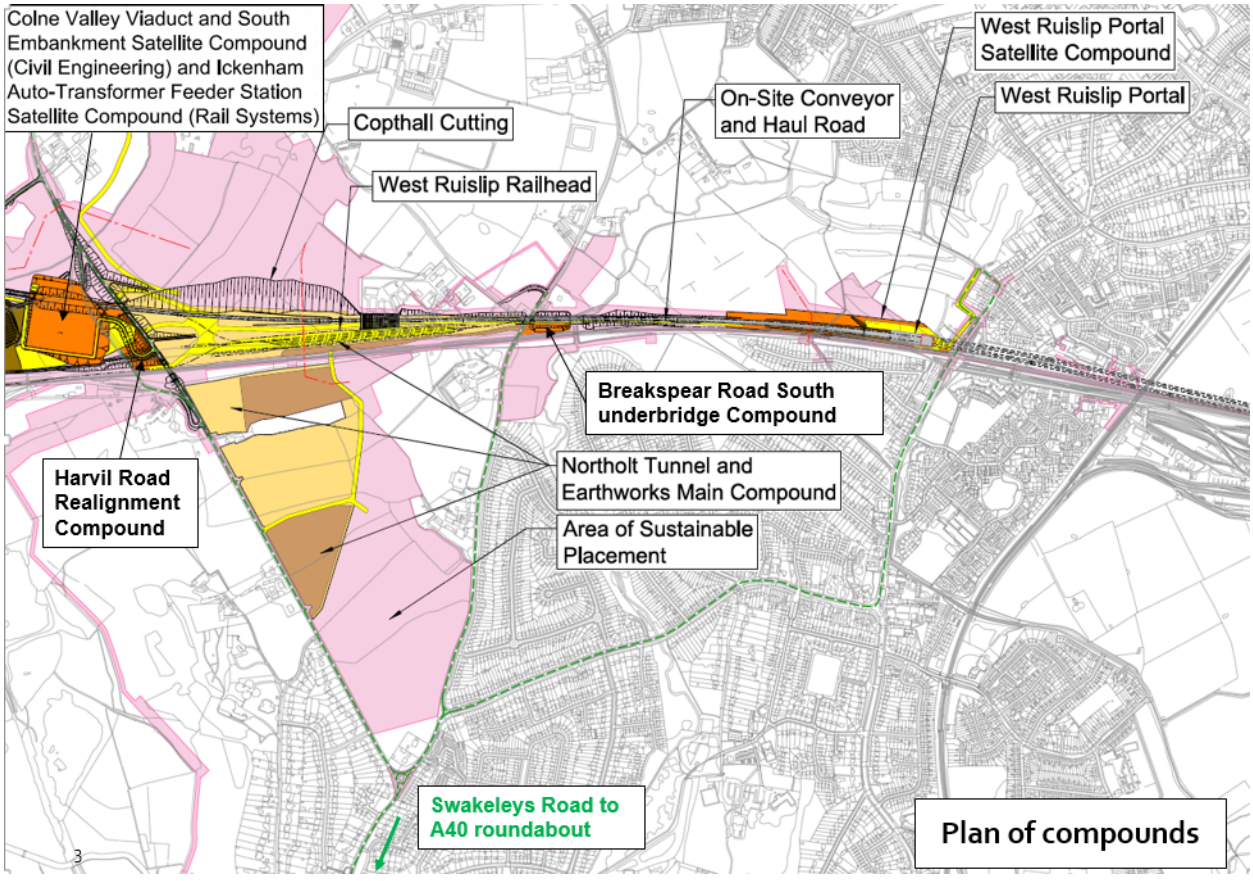

Figure 2.1.1 Plan of construction compounds showing traffic routes to the A40

The review and rescheduling of construction activities undertaken for Additional Provision 2 reduced the assessed maximum two-way HGV movements down to 1,460 HGVs per day over a 9 month period. Although this was assessed conservatively for environmental purposes the maximum expected peak was considered to be approximately 1,060 HGVs over a 6-7 month period. Although as can be seen by the Histogram below for the peak month the average expected peak HGV movements is actually 1,036 as the movements rise to a peak of 1,060 during this month this value is reported as the peak.

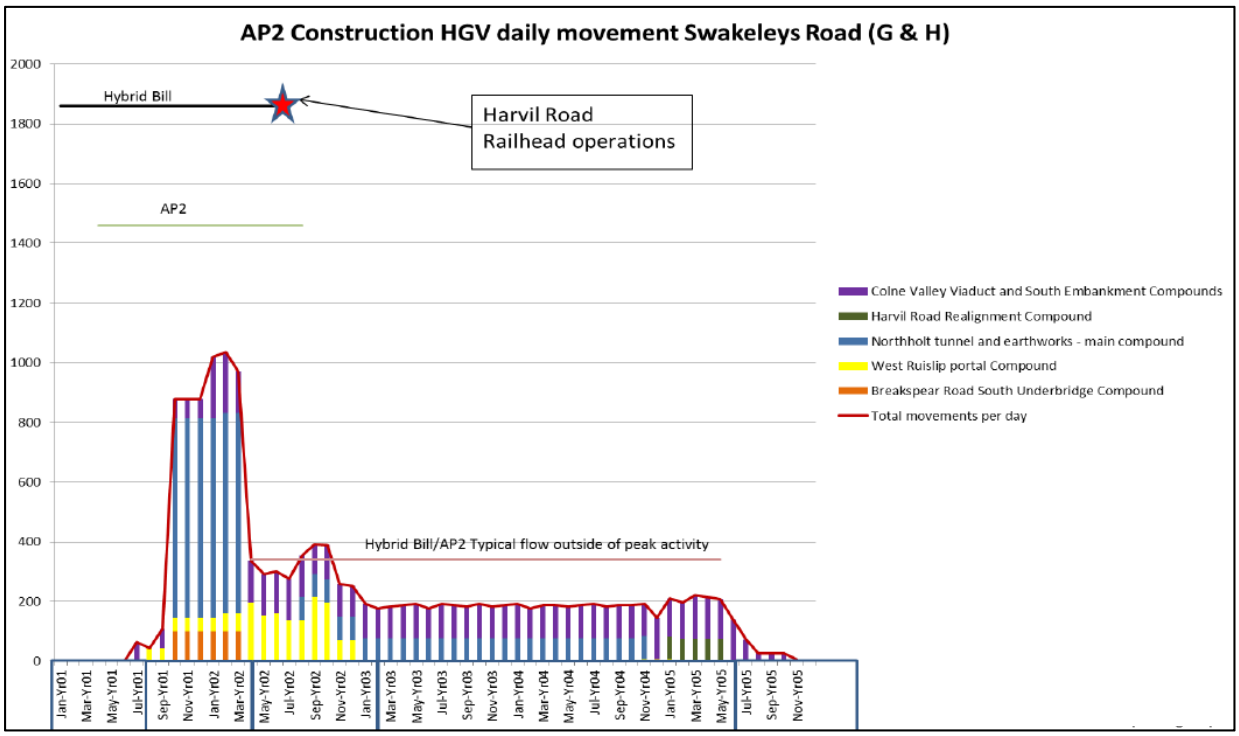

Figure 2.1.2 Histogram of AP2 HGV traffic flows

Approximately 75% of these peak movements are associated with the importation of 250,000m3 of engineering fill into the Northolt tunnel and earthworks compound for the construction of Gatemead, West Ruislip Retained and Harvil Road Embankments. The remaining movements are associated with the importation of concrete and steel reinforcement into all sites, exportation of excavated material from West Ruislip portal and the importation for the Colne Valley South Embankment.

2.2 Sustainable Placement

It is intended that the Excavated Material (approximately 1,200,000 m3) from tunnelling and 800,000m3 from the later stages of Copthall Cutting excavation is removed by rail, but under current assumptions approximately 930,000m3 of material from the early stage excavation of Copthall Cutting is to be sustainably placed. Of this, 370,000m3 will be placed at a triangle of land between Harvil Road and Breakspear Road South, to the south east of the Northolt Tunnel and Earthworks Main Compound. The above assumptions mean that the project is able to remove nearly 70% of total Excavated Material by rail at this location, with this potentially rising to 80% if sufficient train paths were available.

In addition to increasing the proportion of Excavated Material removed by rail this study aimed to reduce the volumes generated and to find alternative beneficial reuse for this material, prioritising

reduction of the area of sustainable placement at the Harvil Road and Breakspear Road South triangle.

3. Workshops and options considered

Representatives of HS2 Ltd., TfL and HC attended six workshops on the following topics:

1. Traffic and transport strategy and brainstorming of options.
2. Reduction and reuse of material for embankment construction and sustainable placement.
3. Review of embankment trace construction and delinking it from the tunnelling programme.
4. Review of TfL depot and other alternative sidings/ railheads to enable early importation of fill by rail.
5. Importation of fill and Traffic overview.
6. Conclusions and further steps.

These workshops were collaborative, open and productive. A total of 22 potential changes to the HS2 construction plan were suggested (many by TfL and HC) and then reported on by HS2's consultants. The results were then discussed and the group decided which ones should be taken forward and developed, which require further work and which should be parked or rejected. A joint TfL, HC and HS2 position statement was published by HS2 on the 4th April 2016, which highlighted benefits from a number of the key options.

https://www.gov.uk/government/publications/hillingdon-traffic-study-interim-position-statement-by-hs2-ltd

The options are explained in more detail in the matrix and technical report, contained in the appendices of this note.

4. Conclusions and proposals

4.1 Reduction of HGVs

Through further evaluation HS2 believes that by implementing the following options and use of traffic management HS2 Ltd. will be able to limit two-way HGV movements from the AP2 peak level of 1,060 HGVs per day to a capped peak maximum of 550 two-way HGV movements per day:

Initiative	Maximum Daily Two-way HGV movement **reduction**	Peak period of activity (months)
Harvil Road embankment - reuse of Excavated Material.	350 - 400	2 months
Early importation of some fill material for Gatemead and West Ruislip embankments. *	140	2 months
Use of Excavated Material for interval embankment.	20	3 months
Diversion of Ruislip Portal Excavated Material from road via the A40 to Ruislip Golf Course	80 - 130	4 months

Table 4.1 Maximum Daily two-way HGV movement reductions for key initiatives

**Note this lowers the peak number of HGVs in Hillingdon but does not reduce overall numbers*

As the peaks for these activities do not all coincide the numbers cannot be simply added to produce the overall peak reduction figure. See figure 4.1 below.

Additionally, off-peak traffic movements can be reduced by 80 HGV movements per day by using material excavated from the West Ruislip portal to form a bund within the 60m exclusion zone at West Ruislip Golf Course, rather than being removed from site by road. This could be further reduced by a further 50 HGV movements if the remainder of the material can be used within the redevelopment of the Course. This strategy will be subject to agreement between HS2 Ltd. and HC.

The combination of these measures reduces the peak and effectively brings it forward by approximately 6 months. The measures also reduce the off peak two-way HGV movement by approximately 100 HGV movements per day over a period of approximately 6 months. The re-profiled histogram of cumulative traffic movements below indicates the significant reduction of daily two-way HGV movements to a peak of 555. HS2 Ltd. is confident that this peak can be managed to maintain peak period movements to a maximum cap of 550 by the contractor's on site planning of delivery and detailed management of the programme as required. HS2 Ltd. is seeking to complete traffic modelling by the end of June, for validation by TfL and HC, to demonstrate that the local road network can handle this volume of HGVs satisfactorily, and that any additional traffic measures will not in themselves cause adverse local impacts.

This is based on the assumption that the material excavated from Copthall Cutting is appropriate and suitable for use in the road embankment (which can only be confirmed after ground investigation and laboratory testing is undertaken). The Excavated Material may require some treatment. It is also assumed that results from ecology surveys do not present unexpected risks to placement of material in the construction sites required for these works. Additionally the cap is

reliant upon an agreement being reached between HS2 Ltd. and HC for the placement of Excavated Material as a bund at Ruislip Golf Course.

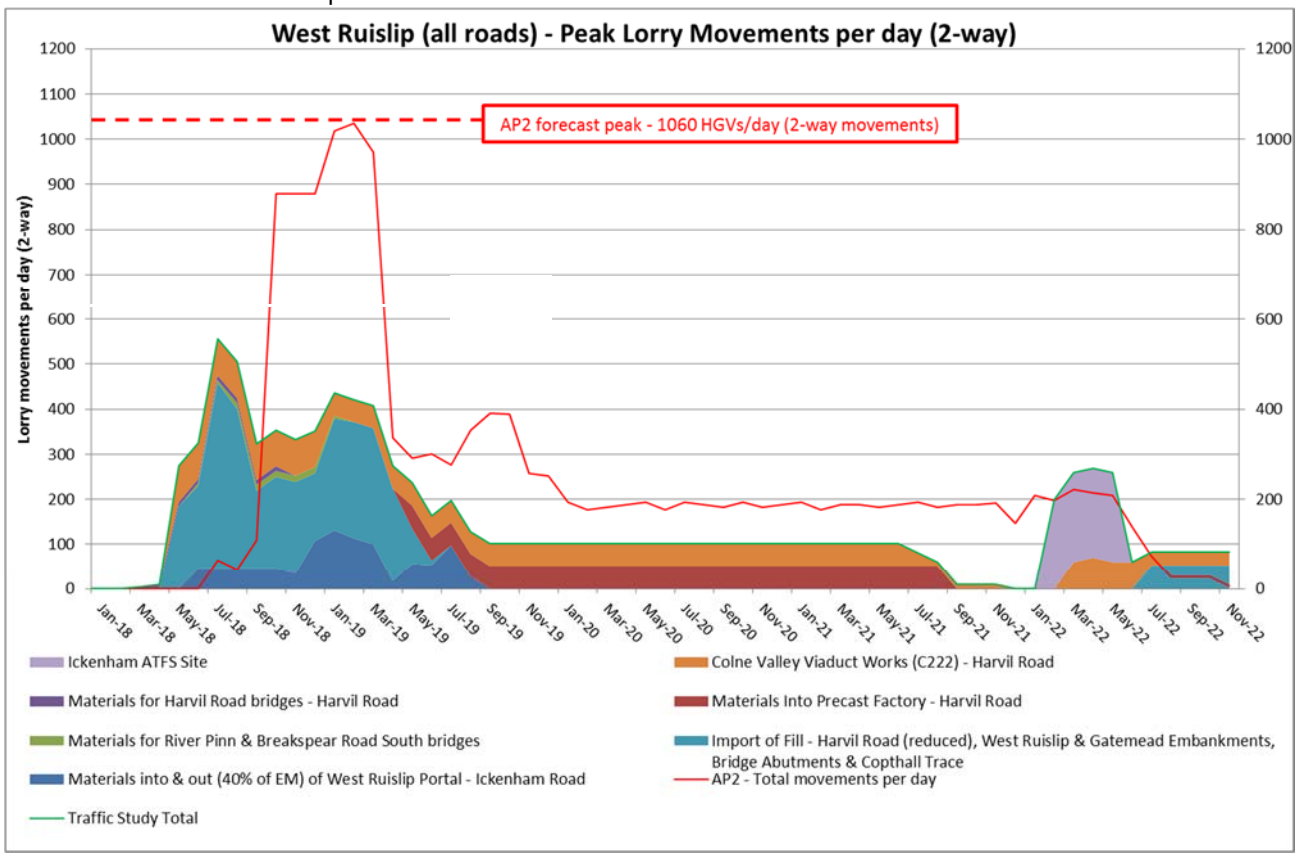

Figure 4.1 Cumulative Graph of Peak HGV movements at Swakeleys Roundabout

It should be noted that the increase spring 2022 and reductions in 2020 and 2021 are not directly due to changes as part of this study. These are due to revisions and a review of the programme of fill import and HGV movements for the Colne Valley Viaduct and South Embankment Satellite and Ickenham Auto-Transformer Feeder Station Satellite Compound.

4.1.1. Use of rail

The core options to reduce HGV movements and sustainable placement are generally reliant on the re-use of material. In addition to this HS2 Ltd. will continue to increase the use of rail where possible through progressing the installation of sidings earlier in the programme at West Ruislip Railhead and fully exploiting the railhead for removal of material previously earmarked for sustainable placement.

HS2 Ltd. has assumed it can secure at least 30 train paths per week on the Chiltern Line in and out of the railhead. As the railhead itself can accommodate over 40 trains per week the project will secure as many train paths as it can reasonably use in order to move the projected volume of material and reduce sustainable placement.

4.2 Sustainable Placement

Through implementation of the following initiatives HS2 Ltd., working with HC, intend to significantly reduce sustainable placement in the area between Harvil Road and Breakspear Road South:

Initiative	Potential reductions in sustainable placement
Re-use of soil excavated from Copthall Cutting to construct the road embankments for the Harvil Road realignment	74,000 m3
Use of Excavated Material from Copthall Cutting to construct the interval embankment between HS2 and Chiltern Lines	11,000 m3
Provision of Excavated Material to be beneficially used at Uxbridge Golf Course, subject to local agreement	135,000 m3

Table 4.2 Potential reductions in sustainable placement

The implementation of these initiatives would reduce the sustainable placement between Harvil Road and Breakspear Road South from approximately 370,000m3 to 150,000m3. HS2 Ltd. aims to further reduce this area of sustainable placement by increasing the removal of Excavated Material by rail and is developing a plan to construct sidings earlier in the programme at West Ruislip Railhead. It is expected that this could remove 12,000 to 15,000m3 for each additional month it is in operation. Therefore if the sidings could be opened six months prior to the main railhead and used by one train per day it could be assumed to remove an additional 70,000 to 90,000m3 of sustainable placement.

The potential area of sustainable placement which could be removed by implementing these initiatives is indicated on the plan below:

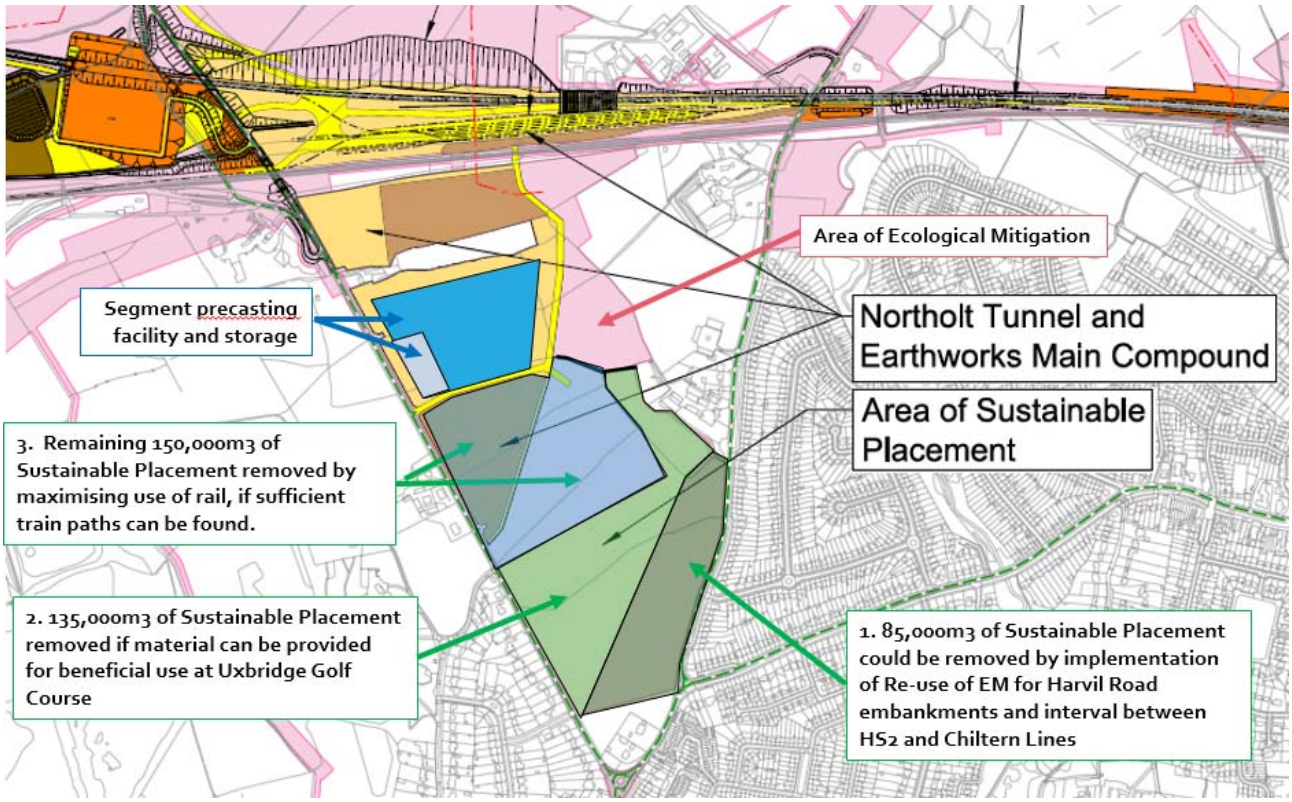

Figure 4.2 Indicative plan of potential sustainable placement reductions

Please note that Figure 4.2 is indicative. The priority would be to remove sustainable placement from areas closest to residents.

4.3 Further work and future steps

As can be seen from the Matrix in Appendix A, six options discussed above were agreed to be taken forward as a new core construction strategy for the project. Seven were rejected as inappropriate, again jointly by the TfL, Hillingdon and HS2 Ltd. There are however, four options where it has been agreed further work is required in order to make an informed decision and/or come to an agreement. These options are discussed below:

4.3.1. Construction of bridge structures instead of railway embankments

The technical report presents six options for constructing a range of longer bridges instead of sections of the West Ruislip Retained and Gatemead Embankments. These options reduce peak two-way movements of imported fill material by between 30 and 90 HGVs per day, and the volume of sustainable placement by up to 16,000 m3, but increase construction costs by between £0.6 and £20 million. As well as the HGV savings TfL and HC consider that this option will bring significant local environmental benefits with regard to flooding alleviation, preservation of the habitats surrounding the River Pinn, and maintaining an open and accessible environment.

However, HS2 Ltd. does not agree with the above conclusion. Currently these options are predicted to increase the duration of the critical path programme items by 1 to 3 months, and therefore HS2 Ltd. does not support any of these amendments. The impact to the critical path on the AP2 programme is the same as for the revised programme currently being developed. However TfL and HC do believe that they represent a worthwhile option.

Because of this difference of opinion, it is proposed that these options are reviewed in a joint sift exercise by TfL, HC and HS2 and considered further by HS2 Ltd.'s Engineering Delivery Team by the end of August, noting that this initiative can be linked to the option to reprogramme the trace construction as set out below.

4.3.2. Relocating the Eastern HS2 railhead connection off the trace

TfL and HC have suggested that relocating the eastern connections from the Chiltern Line to the new railhead off the trace would reduce programme risks (as completion of the trace would no longer be an early works item). They also believe that there could be cost savings from building narrower trace structures. It would also facilitate construction of a viaduct rather than embankment, which would bring reductions in HGV movements, and HC believe there would also be flood mitigation and other environmental benefits. This would be offset to some degree by the additional HGVs and land take required for temporary structures. This option in turn facilitates the removal of the segment factory as described below.

HS2 Ltd. has stated it will assess the feasibility of altering the eastern connections between the HS2 railhead and the Chiltern Mainline to see what impact that will have on the programme and construction and whether any benefit could be attained, and TfL and HC Hillingdon have agreed to work with HS2 Ltd. to review this by the end of August.

4.3.3. Relocation of segment factory from Harvil Road to an independent site

HC and TfL support a proposal to relocate the HS2 tunnel segment factories outside the borough, in order to avoid the vehicular movements and environmental harm associated with commissioning

and decommissioning a temporary industrial plant on greenfield land for several years, which would also harm the rural character of Ickenham village. It is recognised that this may require that HS2 Ltd. delivers manufactured segments to the tunnel portal by road, though this could be spread over a wider period of the day and outside peak hours. TfL and LBH firmly believe that the environmental impacts would be much lower than those created by the on site segment factory, which itself is 2 miles remote from the portal.

Although it is recognised that some projects have used factories remote from their tunnelling site, HS2 Ltd.'s tunnelling strategy locates their segment factories as close to the tunnelling operation as practical, in order to reduce programme risk and mileage travelled by completed segments. Although this option may result in a small increase of HGV movements this is offset by a reduction of smaller vehicles for other deliveries and workers and the vehicles generated by constructing and demolishing the plant. If segments were to be taken directly to the West Ruislip Portal (tunnel launch site) this would reduce HGV movements from Harvil Road but significantly increase them on Ickenham High Road.

This issue is debated within the technical report, but due to the disagreement in position, all parties agree that further work is required by the end of August to reach a satisfactory outcome.

5. Proposal

Arising out of the work completed so far, HS2 Ltd. will recommend the following options to reduce HGV movements on the A40 Swakeleys Roundabout to a maximum of 550 movements per day:

A. Use of Excavated Material to construct the Harvil Road embankment (subject to satisfactory soil testing).

B. Importation of fill material in advance of construction for West Ruislip Retained and Gatemead Embankments, to ensure that the maximum peak road traffic levels are not exceeded.

C. Use Excavated Material to infill the space between the HS2 and Network Rail embankments.

D. Use Excavated Material from the tunnel portal to create a bund and reprofiling of Ruislip Golf Course, to avoid this material being removed from site by road, subject to HC agreement and the appropriate planning permission being granted.

E. Undertake further studies as detailed below, in conjunction with TfL and HC.

5.1 Future Studies

In parallel to completion of this work and review of this study HS2 Ltd. will also:

1. Revise the traffic modelling and assessments undertaken as part of the June 2015 assurance, to take account of a reduction in HGVs to a maximum peak value of 550 per day.

2. Reconsider the traffic management proposals identified by the modelling, including the connections at the A40 Swakeleys Roundabout, and confirm the revised arrangements.

3. Undertake an air quality assessment to understand whether Environmental Minimum Requirements would be breached if the Uxbridge Golf Course Haul Road was not implemented.

4. Continue to investigate commissioning the Ruislip railhead early to enable excavated materials to be removed by rail

As an adjunct to this study HS2 LTD., TfL and HC will undertake the following further investigation works. Progress on this work will be reported to TfL and Hillingdon Council two weeks prior to the appearances in front of the House of Lords Select Committee, and all parties will agree a firm course of future action:

a) Development of proposals for reuse of material at Uxbridge and Ruislip Golf Courses.

b) Review the options for replacement of all or part of the Gatemead and West Ruislip embankments by bridges/viaducts to reduce movement of fill and Excavated Materials by road.

c) Further consideration of relocation of the eastern railhead approach track off the trace, to potentially remove trace material importation and construction from the programme's critical path.

d) Further review and discussion regarding the segment factory location.

In addition HS2 Ltd will use reasonable endeavours to convene meetings with local residents and a public information event before August 2016.

HS2 and HC (as land owner) will seek to reach a suitable agreement and support any necessary planning applications and the granting of the necessary planning permissions (by the planning authority) required for the placement of material on Uxbridge and Ruislip Golf Courses, in order to reduce HGV movements and/or sustainable placement.

Appendix A – Matrix of Options

No	Initiative	Reduction in daily peak two-way HGV / Total HGV movements	Reduction in Sustainable Placement	Dependencies	Key next actions
Agreed Initiatives to be considered by the Promoter for inclusion within contractual documentation					
1	Re-use of soil excavated from Copthall Cutting to construct Harvil Road embankments	350-400 HGVs Excavated Material can be reused saving 74,000 m^3 of fill importation and reducing total HGV movements by 17,400	Yes - 74,000 m^3	Ground Investigation Testing	Confirmation of design following ground investigation and laboratory testing results.
2a	Commence importation of material earlier in the programme for Gatemead and West Ruislip Retained Embankments	Peak movements reduced by 140 HGVs – but no overall reduction in HGVs	No	Completion of ecology surveys and assessments. Interaction with other construction elements.	Determine methodology and work out detailed programme to maximise benefit.
2b	Commence importation of material earlier in the programme for Harvil Road Embankments – secondary option to No. 1	Peak movements reduced by 120 HGVs – but no overall reduction in HGVs	No		
3	Use of Excavated Material for interval embankment between HS2 and Chiltern Lines	Yes – 20 HGVs Reduction in total HGV movements by 2,600	Yes – 11,000 m^3	Interface with Network Rail assets and eastern connection needs to be examined.	Discuss with Network Rail and include within contract documentation.
4	Use of material to reinstate southern holes at Uxbridge	No	Yes – 135,000 m^3	Needs planning permission but	HS2 Ltd. and HC to formulate a proposal and

No	Initiative	Reduction in daily peak two-way HGV / Total HGV movements	Reduction in Sustainable Placement	Dependencies	Key next actions
	Golf Course			consistent with previous application.	conclude agreement.
5a	Use of material to create a bund between HS2 line and Ruislip Golf Course	Yes – 80 HGVs Avoids 60,000m^3 of EM being removed by road reducing total HGV movements by 14,100	No	Partially outside bill limits but within golf course 60m exclusion zone. Requires amendment / relocation of ecological mitigation and HC consent/agreement.	HS2 Ltd. to provide proposal for bund and ecological mitigation.
5b	Use of material in the reconstruction of Ruislip Golf Course	Not assumed at this stage but would remove 50 HGVs Avoids 40,000m^3 of EM being removed by road reducing total HGV movements by 9,400	No	Requires HC consent/agreement.	HS2 Ltd. to discuss ecological mitigation and golf course remodelling with HC.
6	Construction of siding at West Ruislip Railhead earlier in the programme for either importing or exporting material	No– unless siding is used for importing fill instead of removing Excavated Material	Yes– 15,000 m^3 could be exported by rail per month	Requires early delivery of Network Rail connections.	HS2 Ltd. to work with Network Rail to develop and report on benefits of either using the siding for importing fill or exporting Excavated Material

No	Initiative	Reduction in daily peak two-way HGV / Total HGV movements	Reduction in Sustainable Placement	Dependencies	Key next actions
Initiatives under continuing discussion between HS2 Ltd., TfL and HC					
7	Construction of bridge structures instead of railway embankments – River Pinn to Breakspear Road 6 key options considered plus base Bill plan.	Yes – up to 90 HGVs dependent on option Reduces total HGV movements by 3,000 - 11,800	Yes – up to 16,000m^3 dependent on option	Programme as current work indicates options increase the critical path programme by 1 to 3 months. Cost benefit as some options deliver some environmental improvements but construction costs vary between £0.6 and £20 million.	HC and TfL believe that there should be strong overall benefits from pursuing this proposal. HS2 Ltd believe these options would delay project completion and do not bring significant benefits to outweigh the high associated costs No agreement yet between parties and it is recognised more work is needed to understand potential benefits and resolve programme issues.
8	Relocate eastern railhead connections so that the approach track avoids use of the trace	Potentially – allows imported fill material for the trace to be brought in by rail later in the programme	No	If this option is feasible it would remove the trace construction from the programme critical path Under this proposal segments would be road delivered to the portal	TfL and HC believe that this proposal would bring significant overall benefits in terms of reductions in cost, programme and environmental impacts. To remain under discussion. From HS2 Ltd.'s assessment to date the

No	Initiative	Reduction in daily peak two-way HGV / Total HGV movements	Reduction in Sustainable Placement	Dependencies	Key next actions
				site.	project does not believe this option is feasible but agrees further discussion and work is required to explore the option further and reach joint agreement. Need to tie in with Network Rail work under way on connections to and from the Chiltern Line. TfL and HC view this as a high priority for next stage development.
9	Retention of Railway 'Up-Sidings' at Ickenham Road for importation of fill	Yes – 28 HGVs. Assumed 15,000 m^3 of fill could be imported in a 6 month period	No	May only be one track due to proximity to retaining wall. Potentially involves work outside Bill limits and may require planning permission.	Option appears to be of limited benefit but HS2 Ltd. to continue to consider opportunity.
10	Relocation of segment factory from Harvil Road to an independent site	Small increase in HGVs. But savings in staff transport and HGVs associated with construction and demolition of the plant. Assume road borne segment deliveries to Ruislip		Reduction in compound size at Harvil Road required to create factory site and storage area but would require larger Ickenham portal site,	HC and TfL believe that the removal of the segment factory from the Harvil Road site would bring significant local environmental benefits. Further work to be

No	Initiative	Reduction in daily peak two-way HGV / Total HGV movements	Reduction in Sustainable Placement	Dependencies	Key next actions
		portal site		outside bill limits. Requires assessment of road deliveries to the tunnel portal. Ties in with option to relocate east railhead approach line off the trace (see above)	undertaken in the next steps, and option to be reviewed by HS2 Ltd. Delivery Team at Early Contractor Involvement stage, to understand if it can be shown to have environmental and/or financial benefits. TfL and HC view this as a high priority for next stage development.
Initiatives which have been parked – no further action unless circumstances change significantly					
11	Backfilling Copthall Cutting with SP fill after construction is completed in 2025/6 (as per original Bill proposal)	No – internal movements increased.	Yes – 120,000 m3 but required temporary placement for up to 7 years	HS2 Ltd. willing to consider if HC in favour. Entails additional activity later in the project and re-excavation of material that will be becoming naturalised	To be pursued if HC indicate there is strong support for this option.
12.	Use of Chiltern Line to deliver fill from running line overnight	Yes – reduced fill – 600 m3 per train	No	Requires Network Rail approval and overnight possessions. Needs a suitable reception site and	Considered to be significant environmental impacts for relatively minor benefits

No	Initiative	Reduction in daily peak two-way HGV / Total HGV movements	Reduction in Sustainable Placement	Dependencies	Key next actions
				likely to lead to increased environmental impacts on local residents.	
13	Use of TfL West Ruislip depot				Agreed 11th March that better options now exist at Up Sidings or railhead.
Possible traffic management measures					
14	Consideration of extending HGV movement hours to reduce movements at peak times, or during school holiday periods	No - reduction during peak hours only	No		To be the subject of further debate during normal traffic management discussions between HC and HS2 Ltd. as part of project development. Note that the proposals do not form part of the current ES and comprise possible options which are not agreed
15	Use of alternative traffic routes – Long Lane	No - but diverts traffic away from Swakeleys Road	No		
16	Use of alternative traffic routes – A412 etc.	No	No		
17	Gyratory or tidal traffic flows	No – could reduce traffic on AM/PM peaks on certain routes	No		

Appendix B – Data Tables for Agreed Initiatives and Viaduct Option

					Original Scheme		Proposed Amendments	
	Item	Start Date	Finish date	Peak Duration	Total no. of HGVs in AP2	Peak no. of 2-way HGV movements per day*	Revised total number of HGVs	Approximate Peak no. of 2-way HGV movements per day*
1	Re-use of soil excavated from Copthall Cutting to construct Harvil Road embankments	December 2018	February 2019	2 months	12,950	550 - 600	4,250 (Bulk movements via site haul road)	200
2a	Commence importation of material earlier in the programme for Gatemead and West Ruislip Retained Embankments	July 2018	November 2018	2 months	20,250	450 - 500	20,250	410 - 460
2b	Commence importation of material earlier in the programme for Harvil Road Embankments – secondary option to No. 1	June 2018	December 2018	2 months	12,950	550 - 600	12,950	430 - 480
3	Use of Excavated Material for interval embankment between HS2 and Chiltern Lines	July 2018	November 2018	3 months	N/A	N/A On site haulage	N/A	N/A On site haulage
4	Use of material to reinstate southern holes at Uxbridge Golf Course	August 2019	April 2021	TBC	0 (135,000m^3 to SP)	0	0 (Haul Road through golf course assumed)	0
5a	Use of material to create a bund between HS2 line and Ruislip Golf	November 2018	July 2019	8 months	13,000	150	5,900	70

	Course							
5b	Use of material in the reconstruction of Ruislip Golf Course	November 2018	July 2019	8 months	13,000	150	4,700	100
6	Construction of siding at West Ruislip Railhead earlier in the programme for either importing or exporting material	TBC	Prior to April 2019	N/A	-	-	-	-

* Note 50% of these movements are loaded and 50% are empty HGVs

Assumptions	Capacity of Lorry	8.5M^3	17T
	Conversion factor - m3 (of material) to tonne	0.49	
	Conversion factor - tonne (of material) to m3	2.058	

River Pinn Viaduct Options

Changes to AP2 HGV numbers as a result of options

	Amount of Imported Fill	Amount of material Sustainably Placed (Assumes all EM)	Total HGV No. for Other Movements (import concrete, steel etc...)	Total No. HGVs	Av./Peak HGVs per day (two way)	Total reduction in HGVs from base case	Reduction in Av. HGVs per day (two ways) from base case
Base	110,000m^3	25,000 m^3	870	18,200	178/390		
Option 1	90,000 m^3	27,500 m^3	1,510	16,750	150/360	1,500	28
Option 2	62,000 m^3	15,100 m^3	3,860	12,950	96/360	5,300	82

Option 3	42,000 m^3	17,600 m^3	5,340	12,360	90/360	5,900	88
Option 4	80,000 m^3	9,300 m^3	1,970	12,480	114/360	5,700	64
Option 5	100,000 m^3	14,800m^3	1,140	14,650	120/360	3,600	58
Option 6	105,000 m^3	13,000 m^3	630	14,520	110/360	3,700	68

Appendix C – Traffic Impacts Around Hillingdon - Agreed Remit

HS2 provided TfL an assurance on 7/12/15, the aim of which related to LB Hillingdon was to reduce the impacts of construction through Hillingdon including the impacts onto the A40.

The Promoter will engage with TfL and LBH in preparing a scoping brief that acts as a 'statement of ambition' for a study to produce proposals that reduce HGV movements in Hillingdon. The Study will seek to:

- Achieve a peak HGV vehicle movements (2 way) to a maximum of 550 per day at Swakeleys Roundabout;
- The target is to be assessed against efficient, timely and economic delivery of the project in compliance with the Promoter's requirements, the ES and EMRs.
    - The 550 target is a working maximum and can change upwards or downwards to maintain the constraints;
    - Assess what changes would need to be made to the HS2 Scheme to effect such a maximum HGV vehicle movement;
    - Methodology as to how vehicle movements are monitored;
    - Include in assessment use of different timings (increase working day)
- The reduction of HGV movements are to be assessed across the entire programme and not just the peak
    - Seek overall reduction on the non-peak volume of HGVs after setting a challenging working target cap for daily movements during the non-peak period.
- Maximising, as far as reasonably practicable, the volume of excavated and construction material from the construction of HS2 to be moved by rail so as to reduce significantly, and to the absolute minimum, the volume of construction traffic on the road and material to be sustainably placed in the Borough, exploring within this the construction programming sequence as far as practicable.
- Review the current HS2 Ltd programming to identify where opportunities exist to achieve significantly improved outcomes by changing the proposed sequencing of construction. This must include consideration of the timetabling of the importation of material for embankments and other works and in particular with the aim of commencing such importation after the railhead has been constructed. Furthermore, the timetabling of the haul road construction should be reviewed and consideration should be given to the possibility of connecting haul roads to avoid the use of local roads by HGVs.
- Include improvements to minimise workforce and other HS2 traffic (LGV/worker traffic)
- Include measures to improve traffic flow and highways safety at the affected roads and junctions, including but not to be limited to:

    i) the A40 Swakeleys roundabout

    ii) the Ickenham High Road/Swakeleys Road/Long Lane junction

    iii) Harvil Road/ Swakeleys Road junction

    iv) Breakspear Road South/ Swakeleys Road junction

- Look at Sustainable Placement sites
    - Assess how much SP sites can be reduced;
    - How current sites can be better used;

    - How material can be reused.
- Agree Project Milestones
- Interim statement on position in March

TfL will have a representative on the working group and should either TfL or LBH seek independent review, they can engage an independent reviewer at their own cost.

Such independent review to be an appropriate person skilled in logistics. The independent reviewer is only there to review and not seek to instruct HS2 consultants undertaking their work.

The study will be provided to the Promoter for his consideration no later than mid-May 2016.

Appendix D – Technical Report on HS2 Hillingdon Traffic and Construction Impacts by C221 - Mott Macdonald, with input from C251 – ETM